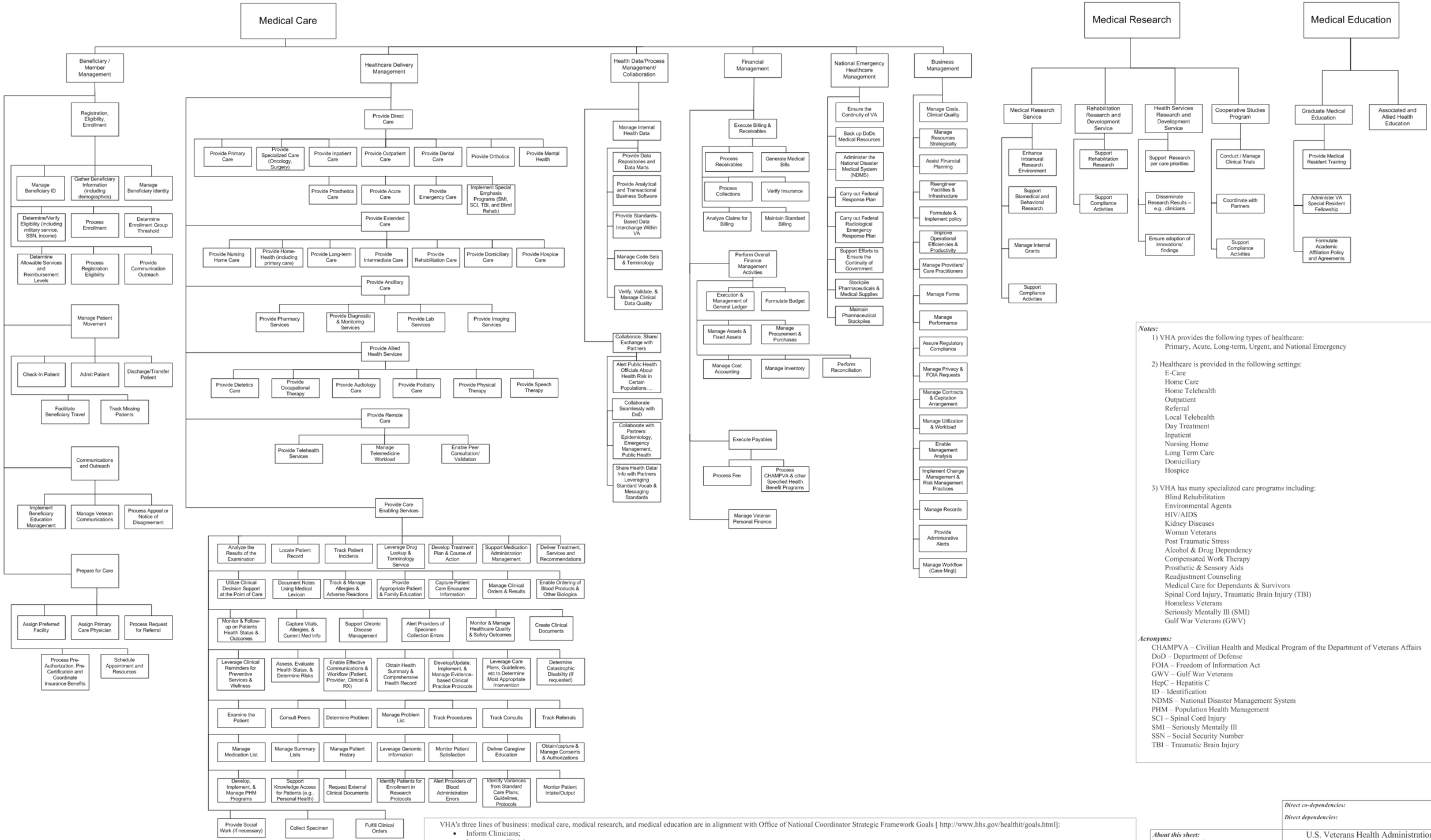


Notes:

1) VHA provides the following types of healthcare:
   Primary, Acute, Long-term, Urgent, and National Emergency

2) Healthcare is provided in the following settings:
   - E-Care
   - Home Care
   - Home Telehealth
   - Outpatient
   - Referral
   - Local Telehealth
   - Day Treatment
   - Inpatient
   - Nursing Home
   - Long Term Care
   - Domiciliary
   - Hospice

3) VHA has many specialized care programs including:
   - Blind Rehabilitation
   - Environmental Agents
   - HIV/AIDS
   - Kidney Diseases
   - Woman Veterans
   - Post Traumatic Stress
   - Alcohol & Drug Dependency
   - Compensated Work Therapy
   - Prosthetic & Sensory Aids
   - Readjustment Counseling
   - Medical Care for Dependants & Survivors
   - Spinal Cord Injury, Traumatic Brain Injury (TBI)
   - Homeless Veterans
   - Seriously Mentally Ill (SMI)
   - Gulf War Veterans (GWV)

Acronyms:

CHAMPVA – Civilian Health and Medical Program of the Department of Veterans Affairs
DoD – Department of Defense
FOIA – Freedom of Information Act
GWV – Gulf War Veterans
HepC – Hepatitis C
ID – Identification
NDMS – National Disaster Management System
PHM – Population Health Management
SCI – Spinal Cord Injury
SMI – Seriously Mentally Ill
SSN – Social Security Number
TBI – Traumatic Brain Injury

VHA's three lines of business: medical care, medical research, and medical education are in alignment with Office of National Coordinator Strategic Framework Goals [http://www.hhs.gov/healthit/goals.html]:

- Inform Clinicians;
- Interconnect Clinicians;
- Personalize Care; and
- Improve Population Health.

Also, VHA's three lines of business and functions that enable them are in alignment with Federal Enterprise Architecture Health Line of Business Sub-Functions:

- Access to Care;
- Population Health Management and Consumer Safety;
- Health Care Delivery Services;
- Health Care Research and Practitioner Education; and
- Health Care Administration.

About this sheet:

Domain: Business
Sub-domain: Functions
Level of detail: Conceptual
Description:
This sheet provides a hierarchy of the core business functions that VHA performs. Not all of these functions will necessarily be implemented in HealthgVet

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealthgVet

Drawing:

Business Function Coverage

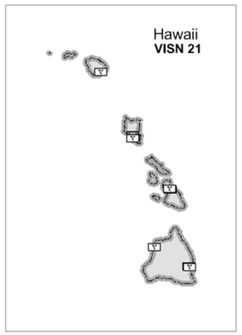
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

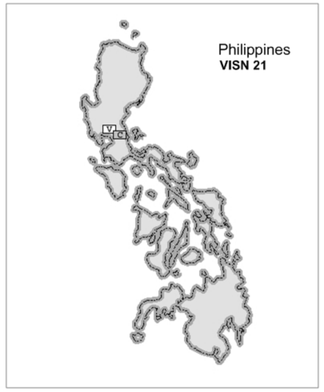
Sheet: A1

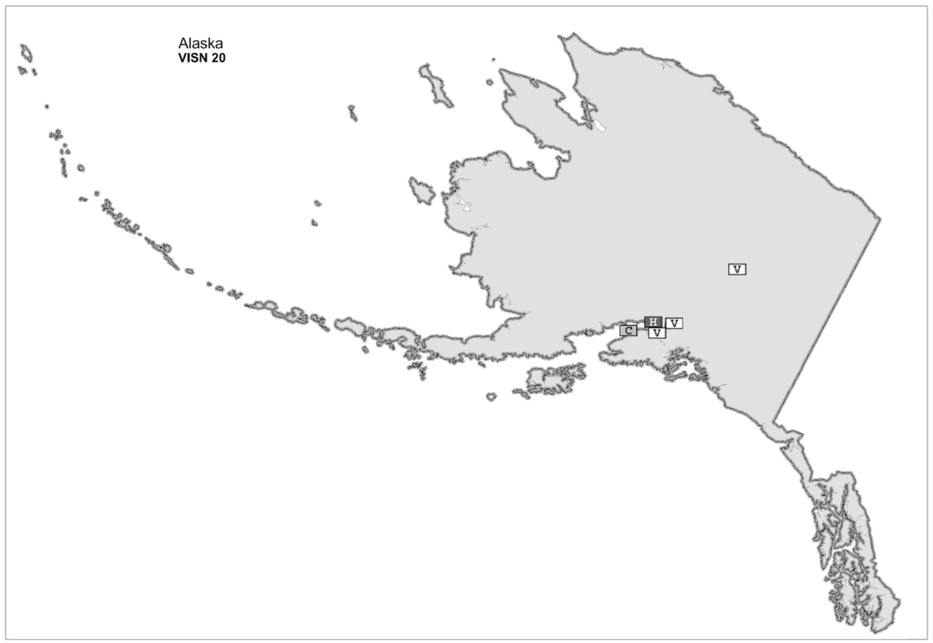
Blueprint Build: 00.06

Notes:
There are also many Home Telehealth points of care.

Acronyms and Abbreviations:
VISN – Veterans Integrated Service Network







Legend

- Hospital
- Vet Center
- Clinic(s)
- State Boundary
- VISN Boundary

About this sheet:
Domain: Business
Sub-domain: Locations
Level of detail: Logical
Description:
This sheet shows our geographic distribution of points of care. Future versions may add overlays of data centers.

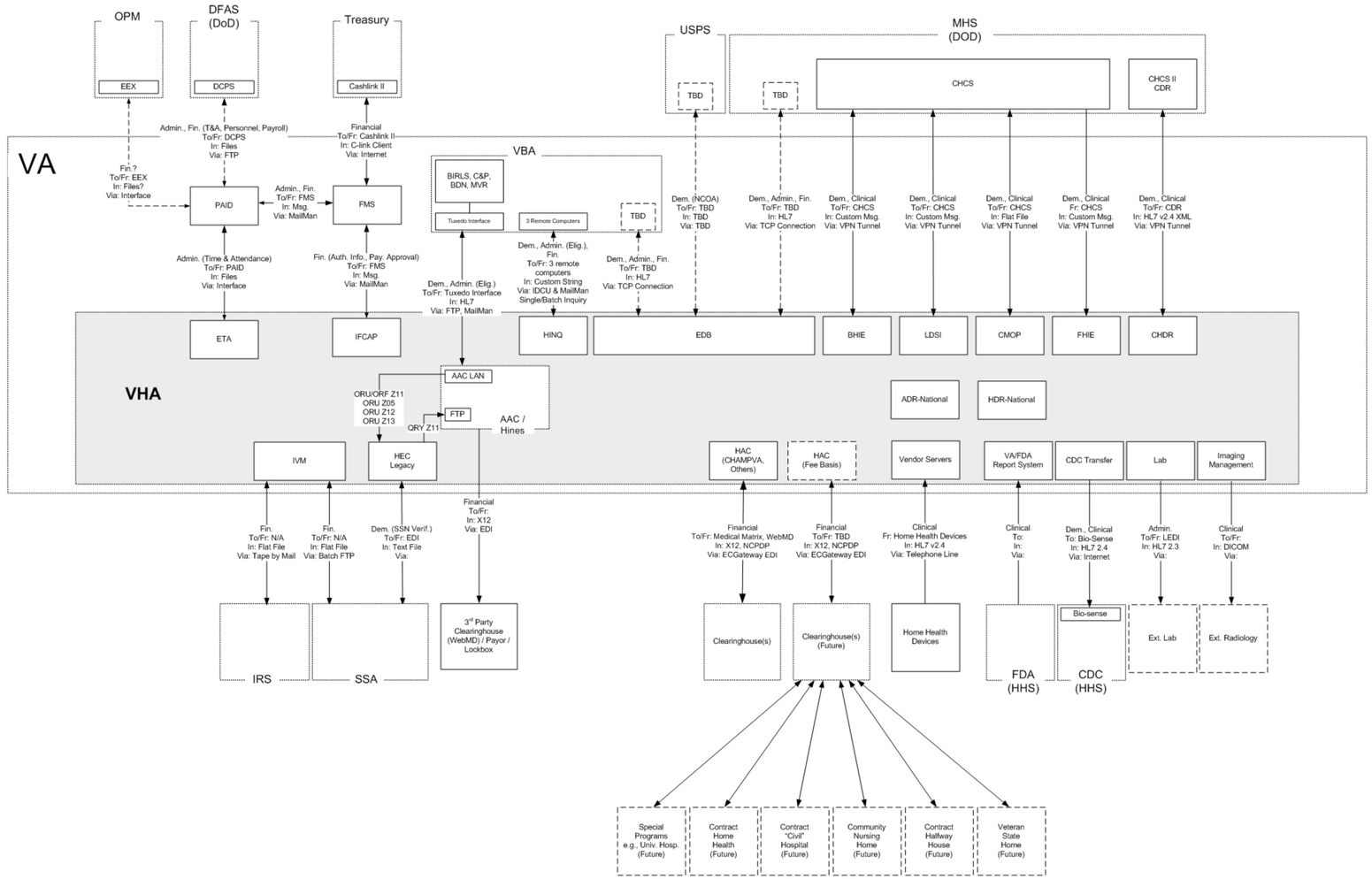
Direct co-dependencies:
Direct dependencies:

U.S. Veterans Health Administration
System: HealtheVet
Drawing:
Geographic Points of Care

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: A2

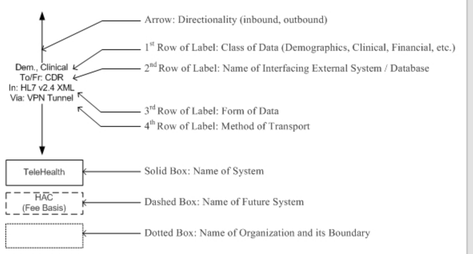
Blueprint Build: 00.06



Acronyms and Abbreviations:

- AAC – Austin Automation Center
- ADR – Administrative Data Repository
- BDN – Benefits Delivery Network
- BIRLS – Beneficiary Identification and Records Locator System
- BHIE – Bidirectional Health Information Exchange
- C&P – Compensation and Pension
- CDC – Center for Disease Control and Prevention
- CDR – Clinical Data Repository
- CHAMPVA – Civilian Health and Medical Program Veterans Administration
- CHCS – Composite Health Care System
- CHDR – Clinical/Health Data Repository
- CMOP – Consolidated Mail Outpatient Pharmacy
- DB – Database
- DCPS – Defense Civilian Pay System
- Dem. – Demographics
- DFAS – Defense Finance Accounting Service
- DICOM – Digital Imaging and Communications in Medicine
- DOD – Department of Defense
- DSI – Data Sharing Interface (CHCS-VistA)
- EDB – Enrollment Data Base
- EDI – Electronic Data Interchange
- EEX – Employee Express
- Elig. – Eligibility
- ETA – Enhanced Time and Attendance
- FHIE – Federal Health Information Exchange
- FDA – Food and Drug Administration
- Fin. – Financial
- FMS – Financial Management System
- Fr – From
- FTP – File Transfer Protocol
- HAC – Health Administration Center
- HDR – Health Data Repository
- HEC – Health Eligibility Center
- HHS – Department of Health and Human Services
- HINQ – Hospital Inquiry
- HL7 – Health Level 7
- IVM – Income Verification Match
- IDCU – Integrated Data Communications Utility
- IFCAP – Integrated Funds Distribution, Control Point Activity, Accounting And Procurement
- IRS – Internal Revenue Service
- LAN – Local Area Network
- LDSI – Laboratory Data Sharing and Interoperability
- LEDI – Laboratory Electronic Data Interchange
- Med. – Medical
- Msg. – Message
- MVR – Master Veteran Record
- N/A – Not Applicable
- NCOA – National Change of Address
- OPM – Office of Personnel Management
- ORF – Observational Results/Record Response
- ORU – Observational Results/Unsolicited
- QRY – Query
- PAID – Personnel and Accounting Integrated Data System
- SSA – Social Security Administration
- SSN – Social Security Number
- T&A – Time and Attendance
- TBD – To be determined
- TCP – Transmission Control Protocol
- USPS – U. S. Postal Service
- VBA – Veterans Benefits Administration
- VHA – Veterans Health Administration
- Verif. – Verification
- VPN – Virtual Private Network
- XML – eXtensible Markup Language

Legend



Direct co-dependencies:

Direct dependencies:

- TSPR
- HealthePeople Logical Model
- External VHA System Communication Spreadsheets

About this sheet:

Domain: Business
Sub-domain: Partners
Level of detail: Conceptual
Description:
This sheets shows the systems that VHA interacts with both within the VA and with outside parties including other governmental agencies. High level information about the protocol and type of information is also shown.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Information Exchange Partners

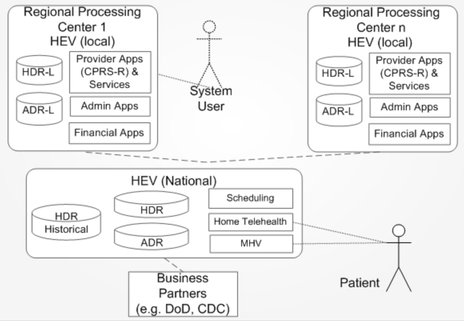
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: A3

Blueprint Build: 00.06

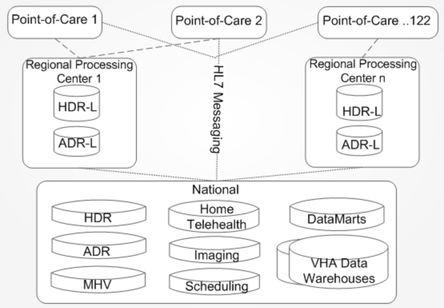
Pane 1: Business Viewpoint

The Business Viewpoint is concerned with the purpose, scope and policies governing the activities of the specified system within the organization of which it is a part.



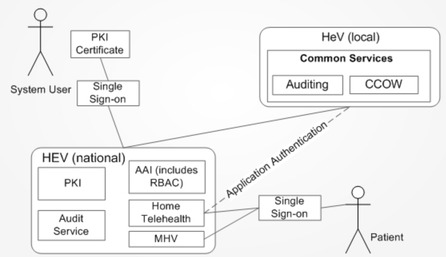
Pane 2: Information Viewpoint

The Information Viewpoint is concerned with the semantics of the information and the information that needs to be stored and processed in HealtheVet.



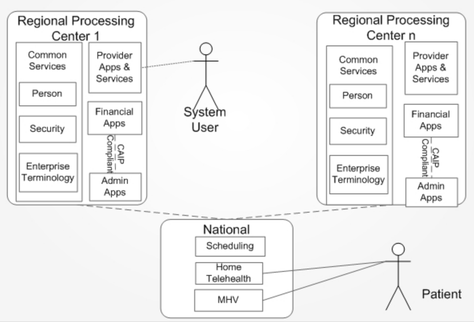
Pane 3: Security Viewpoint

The Security Viewpoint is concerned with the privacy and security required to support HealtheVet.



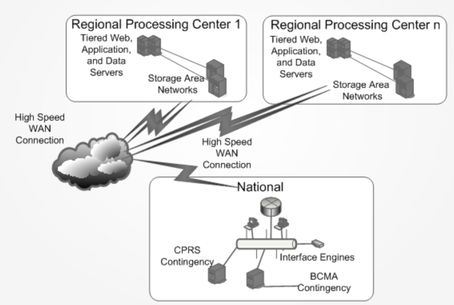
Pane 4: Computation Viewpoint

The Computation Viewpoint describes application functionality; defines the objects within the HealtheVet system, the activities within those objects, and the interactions that occur among objects in a distribution-transparent manner.



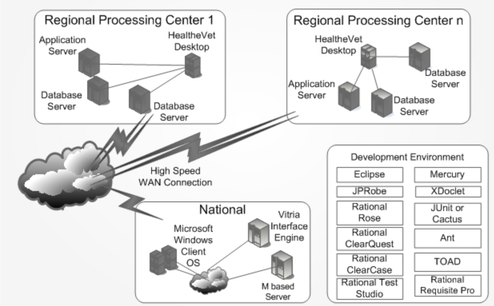
Pane 5: Infrastructure Viewpoint

The Infrastructure Viewpoint is concerned with the infrastructure required to support HealtheVet. Note that essential network and storage devices are mirrored for high availability.



Pane 6: Technology Viewpoint

The Technology Viewpoint is concerned with the choices of technology for implementation to support HealtheVet.



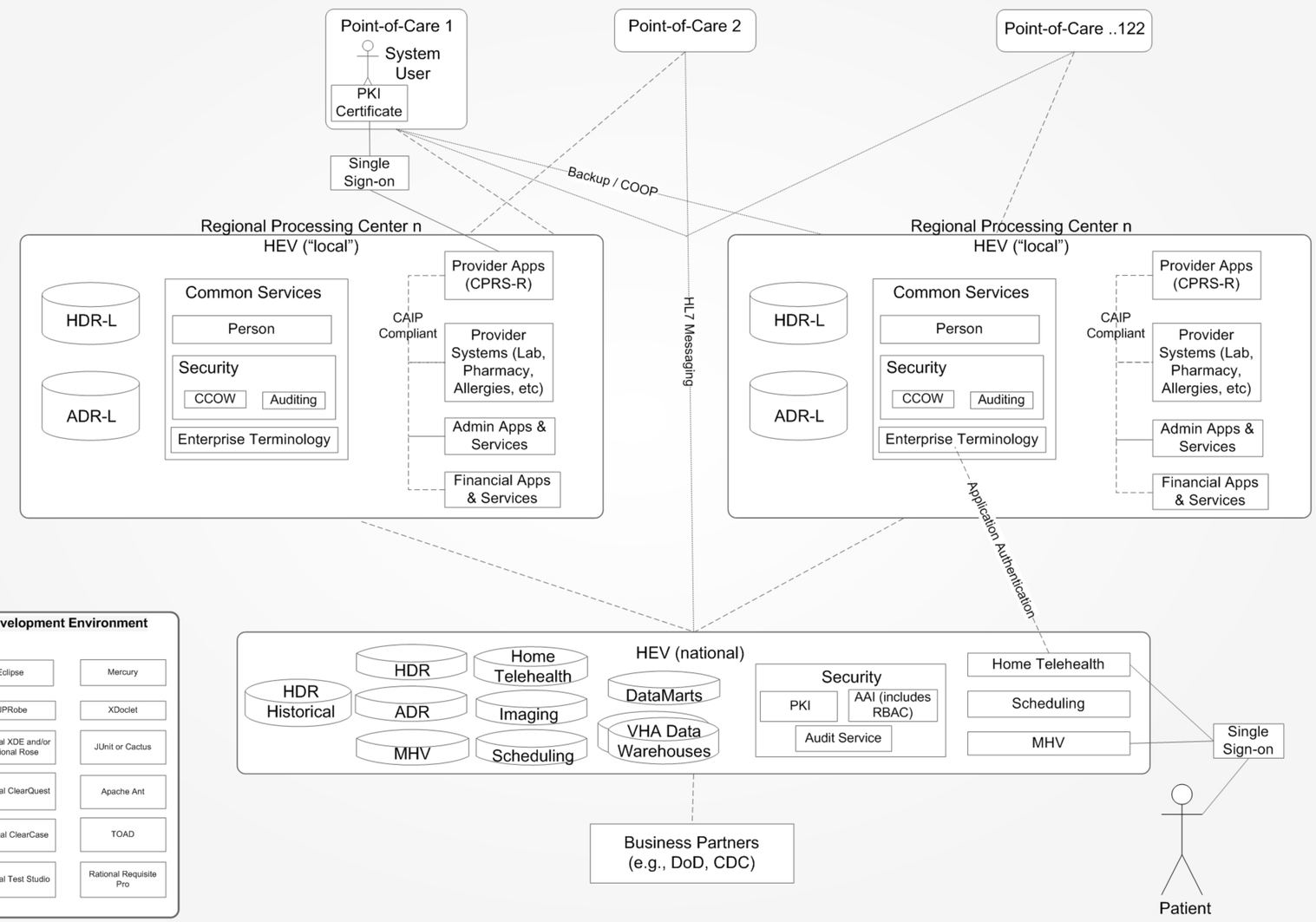
Pane 7: Standards Viewpoint

The Standards Viewpoint describes the set of adopted standards to support sharing and exchange of health information.

Business	Business Process Modeling Notation (BPMN), Unified Modeling Language (UML) Version 1.4 (Use Cases)
Information	NDF-RT, RXNorm, SNOMED CT (Result Contents), HL7 Version 2.4 – (Demographics and Units), CVX and MVX codes from HL7 2.3.1 (Immunizations), HL7 CDA Release 1.0 & higher, DICOM, LOINC (Lab Results and Test Order Names), FDA, NLM, VA, CVX and MVX codes from HL7 version 2.3.1, NCPDP, HUGN
Computation	HL7 V3 , x12 (HIPAA standards), HL7 Version 2.4 & higher, X12, IEEE 1073, IEEE 270, Java 2 Enterprise Edition (J2EE), Java Language, JavaScript, Enterprise Java Beans, PERL, XSLT, HTML, XHTML, EDI, ODBC, OLEDB, OASIS, SQL, SQL for Java, DICOM, HL7, SQL, IEEE 11073, NCDCP, XML, LOINC, WSDL, UDDI, LDAP, PDF, RTF, DOC, GIF, MPEG, JPEG, JPEG 2000
Security	HL7: RBAC Permissions, ASTM: Basic Roles, ASTM: PMI, ASTM: ID, OASIS: SAML, OASIS: XACML, OASIS: SPML, OASIS: RBAC Profile, NIST: RBAC, ESIG, HL7: ESIG, ASTM: ESIG, NCPDP: ESIG, INFORMATION ASSURANCE AND SECURITY MANAGEMENT, NIST Guidance
Infrastructure	IEEE 1073 (Instrument Data Exchange), SNMP v3 (IETF RFC 2272), MIB, MIB-II (IETF RFC 1155, RFC 1157, RFC 1213, RFC 2819), RMON (IETF RFC 2021, RFC 2034): IEEE 802.3x, IEEE 802.1Q (VLAN):, FDDI (ISO 9314):, IEEE 802.11x :, ISDN (FIPS 182) ITU Q.931, FRAME RELAY ANSI T1.606, ANSI T1.618, ATM, ANSI T1.627, T1.629, T1.630, TCP/IP (IETF RFCs 791, 793, 919, 922, 959, 1122), UDP, DHCP (IETF RFC 2131), ICMP (IETF RFC 792), BGP (IETF RFC 1771), OSPF (IETF RFC 1583)
Technology	Microsoft (MS) Windows XP), MS Windows 2003 (*Emerging*), IEEE 1003 POSIX for UNIX and LINUX, MS SMS v2, MIB-II, RMON (IETF RFC 1155, 1213, 1757), Post Office Protocol (POP) IETF RFC 1939, Simple Mail Transfer Protocol (SMTP) IETF RFC 821, MS Exchange (5.5 or later), TELNET (IETF RFC 854, 855, 856), Simple Object Access Protocol (SOAP) , MS Back Office, MS Office (2000 or later)

Pane 8: Composite Viewpoint

The Composite Viewpoint is a consolidation of all the viewpoints and meant to give the viewer an overall understanding of the key pieces which make up HealtheVet.



Acronyms and Abbreviations:

- AAI – Authorization and Authentication Infrastructure
- ADR – Administrative Data Repository
- ADR-L – Administrative Data Repository Local
- Ant – Another Neat Tool
- Apps – Applications
- BCMA – Bar code Medication Administration
- CAIP – Cross-Application Integration Protocol
- CCOW – Clinical Context Object Workgroup
- CDC – Centers for Disease Control and Prevention
- COOP – Continuity Of Operations
- CPRS – Computerized Patient Record System
- CPRS-R – Computerized Patient Record System Reengineered
- CVX – Vaccines Administered
- DICOM – Digital Imaging and Communications in Medicine
- DOC – Document and Documentation (file name extension)
- DOD – Department of Defense
- EDI – Electronic Data Interchange
- FDA – Food and Drug Administration
- FMS – Financial Management System
- GIF – Graphics Interchange Format (file name extension)
- HDR – Health Data Repository
- HDR-L – Health Data Repository-Local
- HL7 – Health Level 7 (standard for electronic data exchange/messaging protocol)
- HTML – Hypertext Markup Language
- HUGN – Human Gene Nomenclature
- IEEE – Institute of Electrical and Electronic Engineering
- JPEG – Joint Photographic Experts Group (file name extension)
- LDAP – Lightweight Directory Access Protocol
- LOINC – Logical Observation Identifiers, Names, and Codes
- M – MUMPS
- MHV – My HealtheVet
- MPEG – Moving Picture Experts Group (file name extension)
- MVX – Manufacturers of Vaccines
- NCPDP – National Council for Prescription Drug Programs
- NDF-RT – National Drug File-Reference Terminology
- NLM – National Library of Medicine
- OASIS – Organization for the Advancement of Structured Information Standards
- ODBC – Open Database Connectivity
- OLE DB – Object Linking and Embedding Database
- OS – Operating System
- PDF – Portable Document Format
- PKI – Public Key Infrastructure
- RBAC – Role-Based Access Control
- RTF – Rich Text Format
- SQL – Structured Query Language
- TOAD – Tool for Oracle Application Developers
- UDDI – Universal Description, Discovery and Integration
- WAN – Wide Area Network
- WSDL – Web Services Description Language
- XHTML – Extensible HyperText Markup Language
- XML – Extensible Mark-up Language
- XSLT – eXtensible Style Language Transformations

This sheet is under reconstruction and will be significantly changed in the next release. Included for completeness only. Replacement page to be distributed for comment separately upon completion.

Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Solution
Sub-domain: Architecture
Level of detail: Conceptual
Description:
The Conceptual Architecture is a high level, representational view of the HealtheVet environment characterized through distinct architectural viewpoints.

U.S. Veterans Health Administration

System: HealtheVet

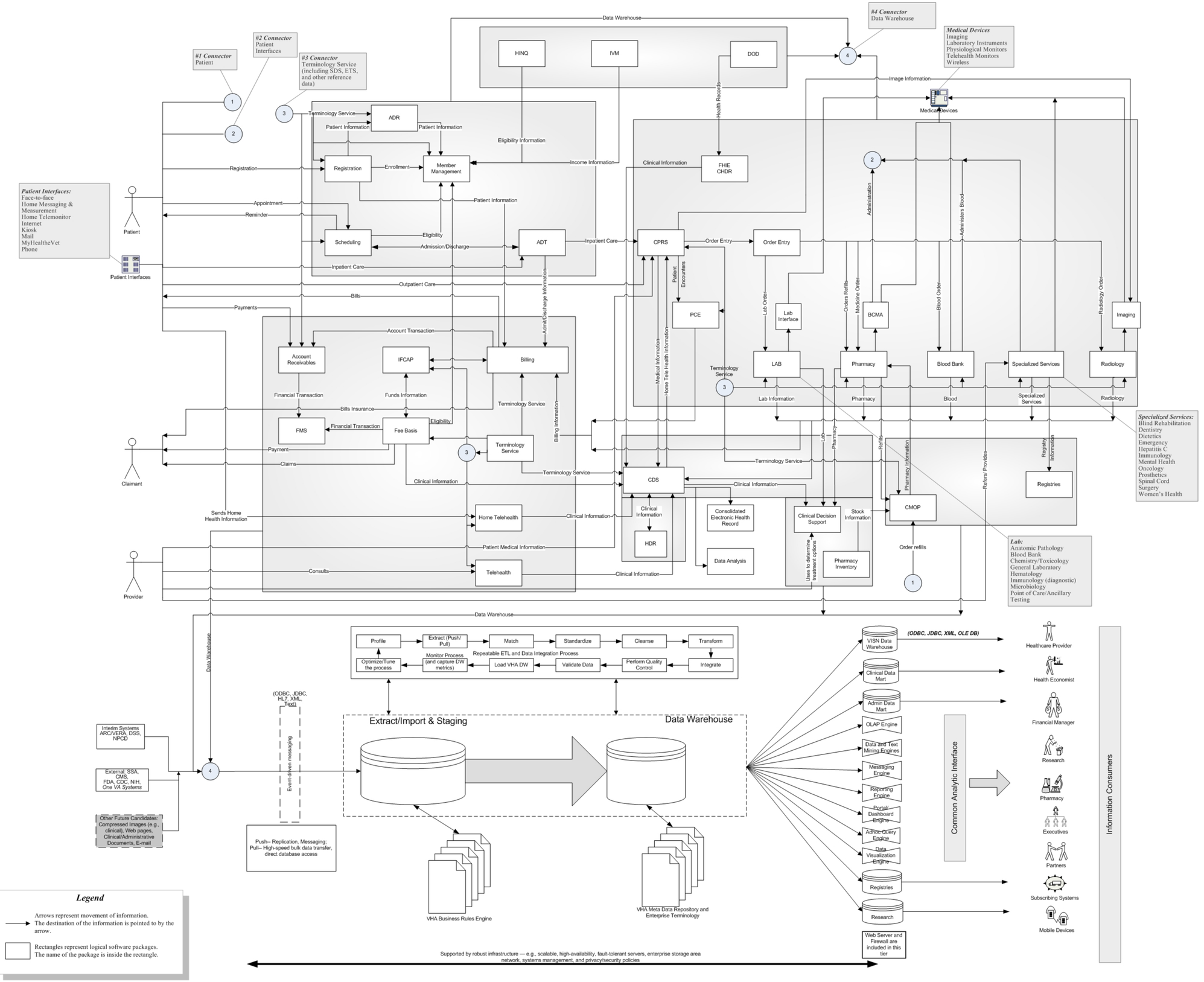
Drawing:

Conceptual Architecture

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: A4

00004.00001.20051017



Notes:

Other external data providers exist apart from the ones shown. They include:
- Clearing Houses
- CDC
- DOD
- Employer
- FDA
- IRS
- SSA
- Treasury
- USPS
- VBA
- WebMD

Acronyms and Abbreviations:

ADR – Administrative Data Repository
ADT – Admission, Discharge, Transfer / Registration
BCMA – Bar code Medication Administration
CHDR – Clinical/Health Data Repository
CPRS – Computerized Patient Record System
CMOP – Consolidated Mail Outpatient Pharmacy
CDC – Center for Disease Control
CDS – Clinical Data ervice
DOD – Department of Defense
ETS – Enterprise Terminology Service
FHIE – Federal Health Information Exchange
FMS – Financial Management System
FDA – Food and Drug Administration
HINQ – Hospital Inquiry
HDR – Health Data Repository
IFCAP – Integrated Funds Distribution, Control Point Activity, Accounting and Procurement
IVM – Income Verification Match
IRS – Internal Revenue Service
PCE – Patient Care Encounter
RFID – Radio Frequency Identifier
SSA – Social Security Administration
SDS – Standard Data Service
USPS – United States Postal Services
VBA – Veterans Benefits Administration

Sample VHA DW Metrics

# of data sources/producers; data volume; extract/transfer rate; transform rate; loading rate; refresh frequency; % suspect data; % validated for data quality; workload profile-- % complex vs. % tactical queries; average mining data preparation time; average report/cube build time; report/cube delivery time; DW system uptime; average resolution time (help desk, technical issues); # of unique consumers; # of concurrent consumers; average access time; information access frequency; average information retrieval time; DW satisfaction Index; %retrospective vs. %predictive consumer base; # of system consumers; # of information/data stewards; # of conformed dimensions supporting more than 1 subject area/fact.

Legend

Arrows represent movement of information. The destination of the information is pointed to by the arrow.

Rectangles represent logical software packages. The name of the package is inside the rectangle.

About this sheet:

Domain: Information
Sub-domain: Movement
Level of detail: Conceptual
Description:
This sheet shows the conceptual movement of information between systems/datastores starting with user transactions and ending with analytical processing.

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Information Processing

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: A5

Blueprint Build: 00.06

Business Function:	Accounts Receivable	Admission, Discharge, Transfer, Registration (ADT/R)	Automated Medical information Exchange	Beneficiary Travel	Computerized Patient Record System (CPRS)	Decision Support System (DSS)	Dentistry	Dietetics	Engineering	Fee Basis	Home Based Primary Care	Incomplete Records Tracking	Integrated Funds Distribution, Control Point Activity, Accounting and Procurement	Integrated Patient Funds	Integrated Billing	Kernel	Laboratory	Library	Lexicon Utility	Mailman	Mental Health	Missing Patient Register	Nursing	Occurrence Screen	Oncology	Patient Representative	Patient Care Encounter (PCE)	Pharmacy	Primary Care Management Module	Prosthetics	Quality, Audiology and Speech Analysis and Reporting	Radiology/Nuclear Medicine	Remote Order Entry System	Record Tracking	Resident Assessment Instrument/Minimum Data Set	Scheduling	Social Work	Surgery	VA Fileman	Veteran Identification Card	VistA Health Level Seven (HL7)	VistA Imaging System	Visual Impairment Service Team
Registration, Eligibility, Enrollment	■												■															■										■			■
Manage Patient Movement	■			■																	■											■										
Communications and Outreach	■																										■	■														■
Prepare for Care	■								■																		■						■									
Provide Direct Care				■		■	■													■		■		■		■	■	■	■	■	■				■					■	■
Provide Extended Care				■						■												■					■															
Provide Administrative Alerts		■																			■							■														
Provide Ancillary Services																■						■					■	■		■											■	
Provide Allied Health Services				■			■															■								■	■											
Provide Remote Care				■												■						■																			■	
Provide Care Enabling Services			■		■	■	■				■					■		■		■	■	■	■	■	■	■	■	■	■	■	■	■	■		■						■
Manage Internal Health data						■				■						■									■		■			■												
Collaborate, Share/Exchange with Partners						■										■											■			■												
Execute Billing and Receivables	■													■																												
Perform Overall Finance Management Activities	■			■		■				■			■	■	■														■												
Execute Payables				■						■			■																■												
Respond to and Manage Internal Emergencies																																									
Back up DoDs Medical Resources																■											■														
Carry out Federal Response Plan (External Emergencies)																■											■										■				
Maintain Stockpiles Pharmaceuticals and Medical Supplies																											■														
Management Performance						■															■									■												
Manage Costs, Clinical Quality						■										■												■											■			
Manage Utilization and Workload						■										■																										
Formulate and Implement Policy																																									
Assure Regulatory Compliance						■										■																										
Manage Resources Strategically						■										■																										
Enable Management Analysis						■										■											■		■													■
Improve Operations Efficiencies and Productivity						■																																			■
Manage Privacy and FOIA requests																																									
Assist Financial Planning						■										■																										■
Implement change Management and Risk Management Practices						■																																			
Manage Providers/Care Practitioners						■									■												■														
Manage Contracts and Capitalization Arrangement						■		■				■																■														
Reengineer Facilities and Infrastructure							■																																		
Manage Records								■																																	
Manage Forms									■																																
Manage Veteran Personal Finance										■																															
Manage Workflow																																								■

Notes:

1. The term "Business Function", on this sheet, is equivalent to "High-Level Activity" in the OIT VHA LOB decomposition model (located on A1).
2. The "Business Function" list only represents those activities in the "Medical Care" LOB. It does not include activities in other LOBs (e.g. "Medical Education" or "Medical Research").
3. The "Software Product" list represents current products, not planned re-hosted or future products.
4. The "Software Product" list is comprised of "major" products extracted from the VistA Monograph.
5. A "Business Function" that does not map to a "Software Product" indicates a gap where that LOB decomposition activity is not supported by current VHA system software.
6. There may be other products available, outside the VHA, that meet gaps or supplement the above product list (e.g., VA or DoD products).

Acronyms and Abbreviations:

DoD – Department of Defense
FOIA – Freedom of Information Act
LOB – Line of Business
OIT – Office of Information and Technology
VistA – Veterans Health Information Systems and Technology Architecture

Legend:

■ Shaded cells indicate that the given row (business function) is partly implemented through the given column (software product)

Pages B1, B2 and B3 are being refined to enhance depiction of the "to-be" state as it is defined.

Direct co-dependencies:

Direct dependencies:
Business Function model (A1)

About this sheet:

Domain: Information
Sub-domain: Systemized Functions
Level of detail: Logical
Description:
The mapping from high level functions (left hand column) to products in the existing VistA system (top row). This sheet will be updated in future releases to focus on "to be" versus "as is". In addition A1 (business functions) will tie into the first few B series more cleanly along with VHA Business Integration Model (VBIM).

U.S. Veterans Health Administration

System: HealtheVet

Drawing:
"As Is" Function to Product Dependency

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B1

Blueprint Build: 00.06

| Software Product | Enabling Component | Accident Tracking | Account Collections | Accounts Payable | Accounts Receivable | ADT Management | Allergies/Adverse Reaction Management | Anesthesia Procedure Administration | Appointment Management | Asset Management | Audiology Care Management | Beneficiary Education Management | Beneficiary Related Travel Management | Benefits Management | Billing Management | Blind Rehabilitation Management | Blood Product Management | Budget Management | Caregiver Agreement Management | Caregiver Education Management | Case Management | Claim Analysis | Clinical Decision Support | Clinical Order Management | Clinical Practice Protocol Management | Clinical Procedure Management | Clinical Reminder Management | Clinical Results | Clinical Risk Assessment | Consent & Authorization Management | Contract Management | Controlled Substances Management | Cost & Workload Management | Dental Care Management | Diagnostic Testing | Dietetic Care Management | Document Management | Domiciliary Care Management | Electronic Health Record Management | Emergency Care Management | Employee Travel | Equal Employment Opportunity Mgmt | Equipment Management | Facilities Management | Financial Planning Management | Financial Reconciliation Management | General Ledger | Healthcare Quality Management | Healthcare Safety Management | Hospital Home Health Care Management | Image Management | Incident Tracking | Inpatient Medication Administration | Insurance Coordination | Inventory Management | Laboratory Testing | Mental Health Care Management | Missing Patient Tracking | Non-Electronic Health Record Management | Non-VA Care Management | Oncology Care Management | Outpatient Medication Administration | Patient Health Tracking & Follow-up | Patient Intake and Output Tracking | Patient Knowledge Access Management | Patient Non-Electronic Health Record Mgmt | Patient Satisfaction Monitoring | Patient Treatment Plan Management | Person Demographics Management | Person Identification Management | Physical Therapy Care Management | Podiatry Care Management | Police & Security | Population Health Management | Prescription Mail Out | Primary Care Management | Problem List Management | Procedures Tracking | Procurement/Purchases Management | Prosthetics Care Management | Provider/Practitioner Management | Radiology/Nuclear Medicine Management | Social Work Care Management | Special Health Benefit Program Mgmt | Speech Care Management | Spinal Cord Injury Management | Surgical Procedure Administration | Veteran Communication Management | Veteran ID Card Management | Veterans Personal Finance Management | Vitals Measurement Tracking | Voluntary Timekeeping Management |
|---|---|---

	Suppport Service	Member Management	Education	Financial Management	Healthcare Delivery Management	Administrative
Information	Calendar					
	Desktop Database					
	E-Mail					
	Spreadsheet					
	Word Processing					
Infrastructure	Alerts Management					
	Bulk Mailing					
	Context Management					
	Correspondence					
	Cost & Workload Mgmt					
	Delivery					
	Job Scheduling					
	Log					
	Metadata Registry					
	Naming/Directory					
	Personalization					
	Project Tracking					
	Reporting					
	Resource Scheduling					
	System Management					
	Tasking					
	Terminology Management					
	Workflow Management					
Comm	Active Directory					
	Data Network					
	Time					
	Voice Network					
User Interface	Character Based					
	HealtheVet Desktop					
	Windowing					
System	Application Server					
	Availability					
	Data Server					
	Operating System					
	Personal Digital Assistant					
	Rich Client					
	Thin Client					
Security	Accountability					
	Audit					
	Authentication					
	Authorization					
	Confidentiality					
	Data Integrity					
	Non-repudiation					

Legend:
Shaded cells indicate that the given row (support services) is used by/is depended upon by the given column (enabling component)

Pages B1, B2 and B3 are being refined to enhance depiction of the “to-be” state as it is defined.

About this sheet:
Domain: Information
Sub-domain: Infrastructure dependencies
Level of detail: Logical
Description:
The mapping from business components (columns) to support services/components (rows). This sheet will be updated in future releases with better integration of A1 (business functions), the first few B series and the VIA Business Integration Model (VBIM).

Direct co-dependencies:

Direct dependencies:
Business Functions (A1); Component/service list

U.S. Veterans Health Administration

System: HealtheVet

Drawing:
Enabling Component-Support Component Dependency

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B3

Blueprint Build: 00.06

Enabling Components

Member Management

Appointment Management	
AS	DS
J	
L	U
I	S,I
L	N
C	O
07/2000	04/2006

Benefits Management	T
AS	DS
J	
W	W
S	S
N	N
C	O
03/2004	09/2005

Case Management	T
AS	DS
J	
W	W
S	S
N	N
C	O

Person Demographics Management	
AS	DS
J	
L	U
I	I
L,N	L,N
C	C,O
04/2003	03/2005

Person Identification Management	
AS	DS
J	
L	U
I	I
L,N	L,N
C	C,O
02/2003	06/2005

Veteran ID Card Management	
AS	DS
P	P
08/2003	

Education

Beneficiary Education Management	T
AS	DS
J	J
L	L
I	I
L,N	L,N
C	C

Caregiver Education Management	T,R
AS	DS
J	J
L	L
I	I
L,N	L,N
C	C
01/2007	

Patient Knowledge Access Mgmt	T
AS	DS
J	J
L	L
I	I
N	N
C	O
09/2003	

Financial Management

Account Collections	
AS	DS

Accounts Payable	
AS	DS
P	P

Accounts Receivable	
AS	DS
P	P

Asset Management	
AS	DS

Billing Management	
AS	DS
P	P

Budget Management	
AS	DS

Capitation Agreement Management	
AS	DS

Claim Analysis	
AS	DS

Financial Planning Management	
AS	DS

Financial Reconciliation Management	
AS	DS

General Ledger	
AS	DS
P	P

Insurance Coordination	
AS	DS
L,N	L,N

Inventory Management	
AS	DS

Non-VA Care Management	T
AS	DS
J	
L	L
N	N
C	O

Procurement/ Purchases Management	
AS	DS

Project Cost Accounting Management	T
AS	DS
J	
L	L
N	N
J	O

Veterans Personal Finance Mgmt	T
AS	DS
J	
L	L
I	I
L	L
J	C
09/2002	05/2005

Healthcare Delivery Management

ADT Management	T
AS	DS
J,P	J,P
L	L
L,R	L,R
TBD	

Allergies/ Adverse Reactions	T,M
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O
03/2004	

Anesthesia Procedure Administration	R
AS	DS
J	
L	L
I	I
L	L
C	C

Audiology Care Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
11/2006	

Blind Rehabilitation Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
09/2002	08/2005

Blood Product Management	T
AS	DS
D	
W	W
I	I
L	L
C	M
01/2002	02/2006

Clinical Decision Support	T,R,M
AS	DS
J	
L	L
I	S
L	N
C	O

Clinical Order Management	R
AS	DS
L	L,U
I	I,S
L,N	L,N
C	C,O
03/2004	

Clinical Practice Protocol	T
AS	DS
J	
L	L
L	L
C	C

Clinical Procedure Management	R
AS	DS
J	
L	L,U
I	I,S
L,N	L,N
C	C,O

Clinical Registry Management	
AS	DS
J	
L,N	L,N

Clinical Risk Assessment	R
AS	DS
J	
L	L
N	N
C	O

Clinical Reminder Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
03/2004	

Clinical Results	
AS	DS

Consent & Authorization Management	R,T
AS	DS
J	
L	L
L,N	L,N
C	C,O

Controlled Substances Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
08/2004	04/2007

Dental Care Management	T
AS	DS
J	
L	L
L,N	L,N
C	C
05/2005	

Diagnostic Testing	R
AS	DS
J	
L	L
I	I
L	L
C	C

Dietetic Care Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
11/2002	

Document Management	R
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O
03/2004	

Domiciliary Care Management	T
AS	DS
J	
L	L
L	L
C	C

Emergency Care Management	
AS	DS

Healthcare Quality Management	T,M
AS	DS
J	
L	L
L	L
C	C

Health Care Safety Management	
AS	DS

Hospital Home Health Care Mgmt	R
AS	DS
J	
L	L
I	I
L	L
C	C

Image Management	R,T
AS	DS
J	
L	L,U
I	I
L,R,N	L,R,N
C	C,O,J
06/2002	

Incident Tracking	
AS	DS

Inpatient Medication Administration	R,M
AS	DS
J	
L	L
I	I
L	L
C	C
08/2004	04/2007

Laboratory Testing	R
AS	DS
J	
L	L
I	I
L	L
C	C
02/2003	09/2009

Mental Health Care Management	R
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O
01/2006	

Oncology Care Management	T,M
AS	DS
J	
L	L
L	L
C	C
11/2005	

Outpatient Medication Administration	R,M
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O
08/2004	04/2007

Patient Health Tracking & Follow-up	R
AS	DS
P	P
N	N

Patient Intake & Output Tracking	T,M
AS	DS
J	
L	L
L,N	L,N
C	C,O
01/2004	

Patient Satisfaction Monitoring	T
AS	DS
J	
L	L
L	L
C	C

Patient Treatment Plan Mgmt	R
AS	DS
J	
L	L
I	I
L	L
C	C
12/2003	

Physical Therapy Care Management	R
AS	DS
J	
L	L
I	I
L	L
C	C

Podiatry Care Management	R
AS	DS
J	
L	L,U
I	I
L,N	L,N
C	C,O

Population Health Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
03/2004	

Primary Care Management	R
AS	DS
J	
L	L,U
I	I
L,N	L,N
C	C,O

Problem List Management	T,M
AS	DS
J	
L	L
I	I
L	L
C	C
03/2004	

Procedure Tracking	T,M
AS	DS
J	
L	L
I	I
L	L
C	C

Prosthetics Care Management	R
AS	DS
J	
L	L
I	I
N	N
C	O
01/2005	

Provider/ Practitioner Management	T,M
AS	DS
J	
L	L
I	I
L	L
C	C

Radiology/ Nuclear Medicine	T
AS	DS
J	
L	L
L	L
C	C
12/2005	

Social Work Care Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
10/2005	

Special Health Benefit Program Mgmt	
AS	DS

Speech Care Management	R
AS	DS
J	
L	L
I	I
L	L
C	C

Spinal Cord Injury Management	R
AS	DS
J	
L	L
I	I
L	L
C	C
10/2004	02/2006

Surgical Procedure Administration	R
AS	DS
J	
L	L
I	I
L	L
C	C
01/2006	

Vitals Measurement Tracking	T,M
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O
11/2004	

Administrative

Accident Tracking	T
AS	DS
J	
L	L
I	I
L,N	L,N
C	C,O

Beneficiary Travel Management	T
AS	DS
J	
L	L
I	I
N	N
C	O

Contract Management	
AS	DS

Equal Employment Opp. Mgmt	T
AS	DS
J	
L	L
N	N
C	O

Electronic Health Record Management	T
AS	DS
J	
L	L
N	N
C	O

Employee Travel	T
AS	DS
P	P
N	N
06/2004	

Equipment Management	
AS	DS
L	L

Facilities Management	
AS	DS
L	L

Missing Patient Tracking	
AS	DS
J	
L	L
N	N
C	O

Non-Electronic Health Record Management	T
AS	DS
J	
L	L
L	L
C	C
10/2007	

Perscription Mail Out	T
AS	DS
J	
L,R	L,R
I	I
N	N
C	O
08/2004	04/2007

Police & Security	T,M
AS	DS
J	
L	L
N	N
C	O
10/2007	

Veteran Communication Management	T,M
AS	DS
J	
L	L
L	L
C	C

Voluntary Timekeeping Management	W
AS	DS
D	
W	W
O	O
N	N
C	M
01/2002	05/2003

Support Components

Infrastructure

Alerts Management	T
AS	DS
J	
L	L
I	I
L,N	L,N
	C,O

Bulk Mailing	
AS	DS
N	N

Context Management	T,M
AS	DS
P	P
L	L
	L
02/2003	09/2005

Correspondence	
AS	DS
L,N	L,N

Cost & Workload Management	T,M
AS	DS
J	
L	L
L,N	L,N
C	O

Delivery	T
AS	DS
J,P	J,P
L	L
I	
L,N	L,N
04/2004	08/2005

Job Scheduling	
AS	DS
J	
L	
I	
L,N	L,N
	C,O

Log	
AS	DS
J	
L	
I	
L,N	L,N

Metadata Registry	T
AS	DS
J	
L	L
I	I
N	N

Naming/ Directory	W
AS	DS
J	
L	U
I	I
L,N	L,N
	C,O
06/2004	08/2005

Personalization	
AS	DS
L	L
I	I
L,N	L,N
	C,O

Project Tracking	T
AS	DS
P	P
N	N

Reporting	
AS	DS
P	P
L	U
I	I,S
L,R,N	L,R,N

Resource Scheduling	
AS	DS
J	
L	L,U
I	I
L,N	L,N
	C,O

System Management	
AS	DS
J	
L	L,U
I	I,S
L,N	L,N

Tasking	
AS	DS
J	
L	
I	I
L,N	L,N

Terminology Management	T
AS	DS
J	
L	L
I	I
L,R,N	L,R,N
C	C,O
01/2003	08/2005

Workflow Management	
AS	DS
L,R,N	L,R,N

System

Application Server	
AS	
J,D	
L,W	
I	
L,R,N	

Availability	
AS	DS
P	P
L,R,N	L,R,N

Data Server	
	DS
	U,L
	I,S
	L,R,N
	O,C

Operating System		
C	AS	DS
W	L,W	L,U
P,W	I	I,S
L	L,R,N	L,R,N

Personal Digital Assistant	
C	
W	
L	

Rich Client	
C	
J	
W	
L	

Thin Client	
C	
J	
W	
L	

Communication

Active Directory	T,M
AS	DS
P	P
W	W
I	I
L,R,N	L,R,N

Data Network	
AS	DS
L,R,N	L,R,N

Time	
AS	DS
L,R,N	L,R,N

Voice Network	
AS	DS
L,R,N	N

Security

Accountability	
AS	DS

Authentication		
C	AS	DS
J	J	
W	L	L,U
P,W	I	I,S
L	L,R,N	L,R,N
04/2004		

Authorization		
C	AS	DS
J	J	
W	L	L,U
P,W	I	I,S
L	L,R,N	L,R,N
04/2004		

Audit	
AS	DS
J	
L	L

Confidentiality	
AS	DS

Data Integrity	
AS	DS

Non-repudiation	
AS	DS

User Interface

Character Based		
C	AS	DS
W	L,W	L,U
P,W	I	I,S
L	L,R,N	L,R,N

HealtheVet Desktop	
C	
J	
W	
P	
L	
10/2003	11/2005

Windowing		
C	AS	DS
W	L,W	L,U
P,W	I	I,S
L	L,R,N	L,R,N

Information

Calendar	R
C	
P	
W	
P	
L	

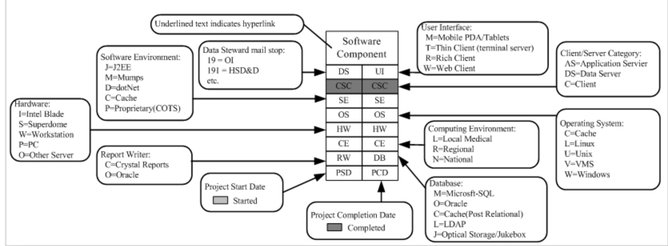
Desktop Database	R
C	DS
P	P
W	W
P	P
L	L

E-mail	R
C	
P	
W	
P	
L	

Spreadsheet	R
C	
P	
W	
P	
L	

Word Processing	R
C	
P	
W	
P	
L	

Legend



About this sheet:

Domain: Information
Sub-domain: Components
Level of detail: Logical
Description:
This sheets shows high level deployment attributes for each component.

Direct co-dependencies:

Direct dependencies:
Component/service list

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Component Attribute Reference

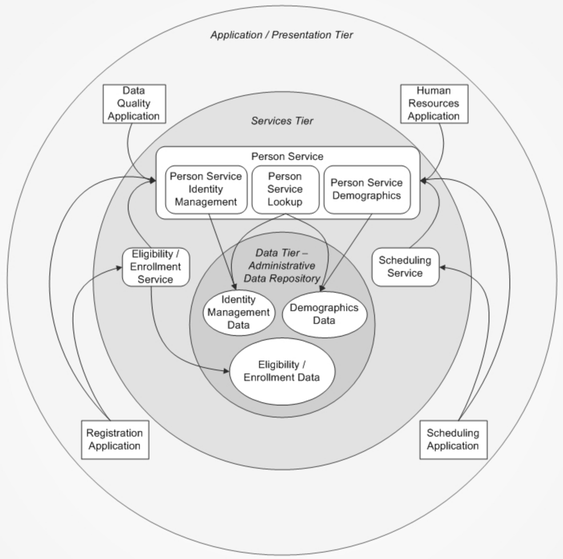
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B4

Blueprint Build: 00.06

Pane 1: Administrative Data Repository (ADR) and Person Services

Pane One shows sample applications and services using Person Services and the data in ADR.

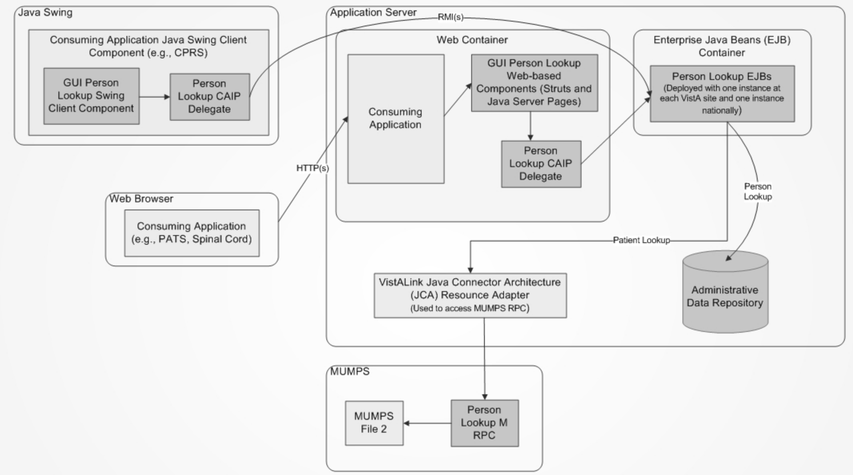


Legend

- Arrows represent invocations of components The target of the invocation is pointed to by the arrow.
- Shaded circles delineate the tiers of the architecture. The name of the tier is shown in italics at the top of the circle.
- Rectangles represent applications or user interfaces. The name of the application or user interface in inside the rectangle.
- Rounded rectangles represent services. The name of the service is inside the rounded rectangle.
- Ellipses represent logical groupings of data in a persistent data store. The name of the grouping is inside of the ellipse.

Pane 2: Person Service Lookup Architecture

Pane Two shows the interim (migration) architecture for Person Service Lookup. Note that the legacy MUMPS system still provides Patient Lookup information while the Administrative Data Repository provides Person Lookup information.

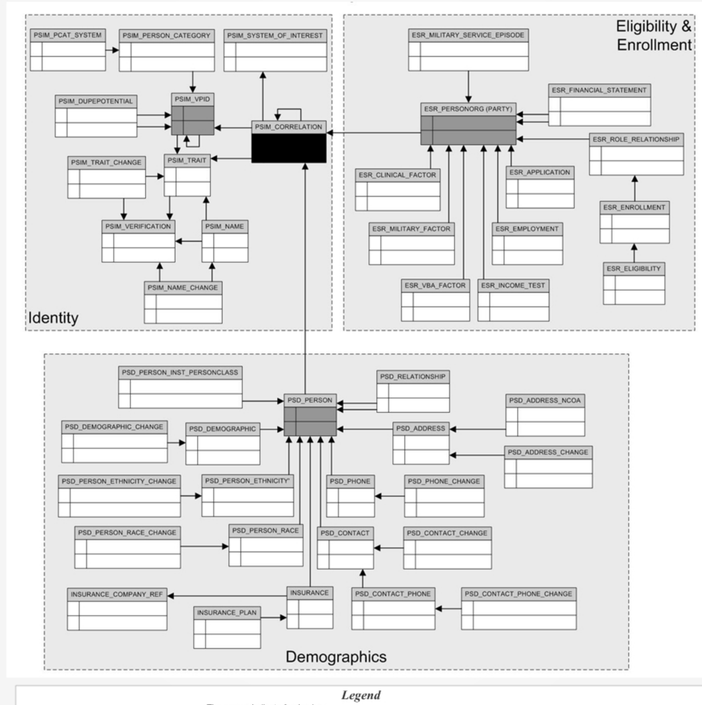


Legend

- Arrows represent invocations of components The target of the invocation is pointed to by the arrow. In some cases the captions indicate the transport mechanism, in others they indicate the logical information being retreived.
- Lightly shaded rectangles represent components that are not built as part of the Person Service Lookup effort. The name of the component is in inside the rectangle.
- Moderately shaded rectangles represent components built in whole or in part as part of the Person Service Lookup effort. The name of the component is inside the rectangle.
- Rounded rectangles represent logical software environments or containers provided by the Java standards and the software we purchase. The name of the environment is in the upper left corner of the rounded rectangle.
- Moderately shaded cylinders represent persistent data stores built in whole or in part as part of the Person Service Lookup effort. The name of the data store is inside the cylinder.

Pane 3: Administrative Data Repository (ADR) Logical Data Model

Pane Three shows the logical data model broken down by sub-domain. Note that the "sub-domain" integrating element is the PSIM_CORRELATION table.

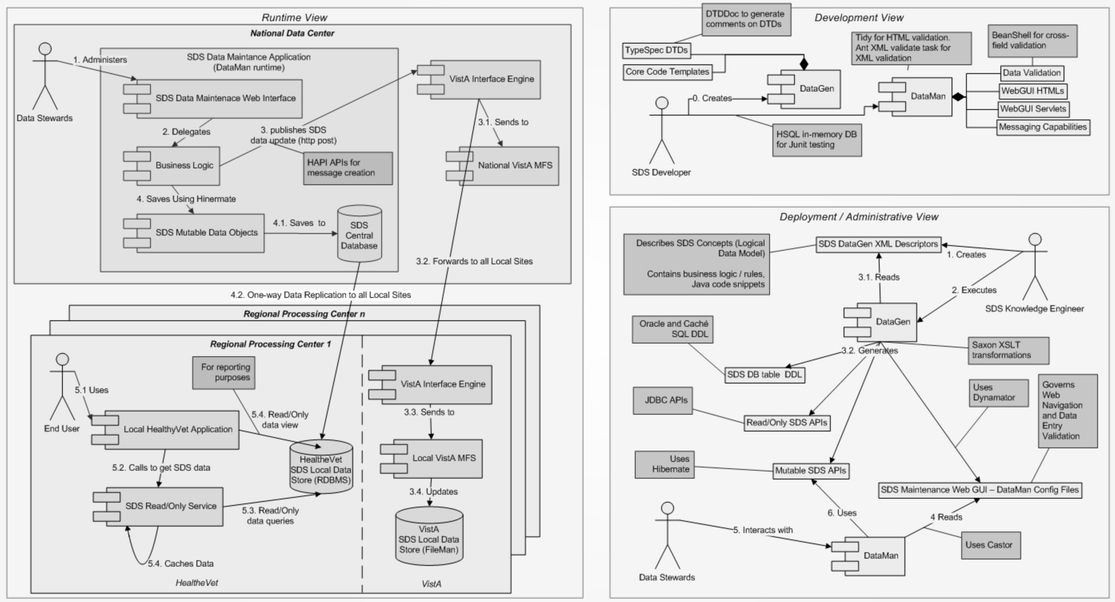


Legend

- The arrows indicate foreign key relationships or dependencies. The target of the arrow is where the key or dependency exists.
- The rectangles indicate logical table names.

Pane 4: Standard Data Service

Pane Four shows Standard Data Service during migration in three sub-views: Runtime, Development, and Deployment/Administrative.

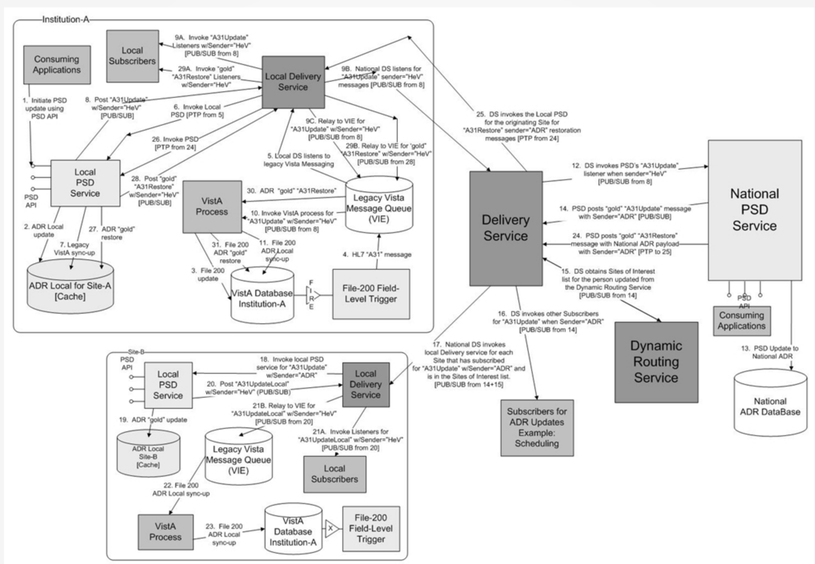


Legend

This diagram generally uses UML notation.

Pane 5: Person Service Demographics Messaging Architecture

Pane Five shows several different locations and how updates to Person Service Demographics data flows throughout the VHA systems. In particular the "A31" message flow is shown during the migration effort while VistA is still present.



Legend

- Arrows represent invocations of components The target of the invocation is pointed to by the arrow. The label represents the logical action taking place.
- Rectangles represent components of the system. The name of the component is inside the rectangle.
- Rounded rectangles represent deployment locations. The name of the location is in the upper left corner of the rounded rectangle.
- Cylinders represent persistent data stores. The name of the data store is inside the cylinder.

Acronyms and Abbreviations:

- ADR – Administrative Data Repository
- CAIP – Cross Application Integration Protocol
- CPRS – Computerized Patient Record System
- DDL – Data Definition Language
- DTD – Document Type Definition
- HAPI – HL7 Application Programming Interface
- HTML – Hypertext Markup Language
- HTTP(s) – Hypertext Transport Protocol
- JDBC – Java Database Connectivity
- MFS –
- PATS – Patient Advocate Tracking System
- PSD – Person Service Demographics
- RMI(s) – Remote Method Invocation (secure)
- RPC – Remote Procedure Call
- UML – Unified Modeling Language
- SDS – Standard Data Service
- SQL – Structured Query Languagem
- VIE – Vitria Interface Engine
- VistA – Veterans Health Information Systems and Technology Architecture
- XML – eXtensible Markup Language

About this sheet:

- *Domain:* Information
- *Sub-domain:* Common Services
- *Level of detail:* Logical
- *Description:* This sheet shows several common (core) business services.

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Common Business Services

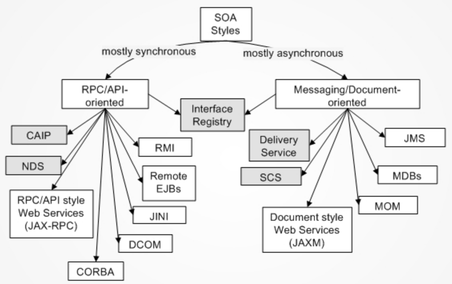
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B5

Blueprint Build: 00.06

Pane 1: Integration Styles of Service Oriented Architecture

Pane One shows a general taxonomy of the integration styles for service oriented architecture. The HealtheVet architecture is designed to support all of the styles and mechanisms shown.



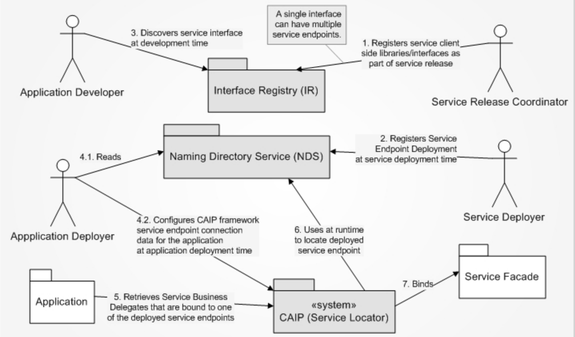
Legend

Shaded rectangles indicate components that are common technology components being built as part of the common technology services of the HealtheVet effort.

Unshaded rectangles indicate base technologies or standards that have compliant components built as necessary for each individual business service of the HealtheVet effort.

Pane 2: Components to Support RPC Style Interactions

Pane Two shows the components or services built to support the RPC style of service interactions.



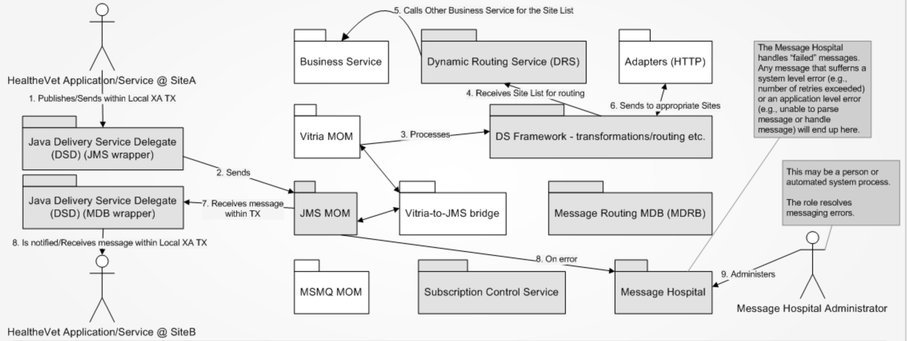
Legend

Shaded packages indicate components that are common technology components being built as part of the common technology services of the HealtheVet effort.

Unshaded packages indicate base technologies or standards that have compliant components built as necessary for each individual business service of the HealtheVet effort.

Pane 3: Components to Support Messaging Style Interactions

Pane Three shows the components or services built to support the messaging style of service interactions.



Legend

Shaded packages indicate components that are common technology components being built as part of the common technology services of the HealtheVet effort.

Unshaded packages indicate base technologies or standards that have compliant components built as necessary for each individual business service of the HealtheVet effort.

Acronyms and Abbreviations:

- API – Application Programming Interface
- BW – BusinessWare
- CAIP – Cross-Application Integration Prototype
- CORBA – Common Object Request Broker Architecture
- DCOM – Distributed Component Object Model
- ebXML – Electronic Business using eXtensible Markup Language
- EJB – Enterprise Java Beans
- HL7 – Health Level 7
- HTTP – Hypertext Transport Protocol
- IDL – Interface Definition Language
- JAX – Java APIs for XML
- JAXM – Java APIs for XML Messaging
- JMS – Java Message Service
- MDB – Message Driven Bean
- MIME – Multipurpose Internet Mail Extensions
- MOM – Message Oriented Middleware
- NDS – Naming and Directory Service
- RMI – Remote Method Invocation
- RPC – Remote Procedure Call
- SCS – Subscription Control Service
- SMTP – Simple Mail Transport Protocol
- SOAP – Simple Object Access Protocol
- SOAP-ENV – Simple Object Access Protocol Envelope
- TX – Transaction
- VistA – Veterans Health Information Systems and Technology Architecture
- VO – Value Object
- XA – X/Open specification for distribute transactions
- XML – eXtensible Markup Language

Pane 4: Components to Support General Computing

Pane Four shows the components or services built to support the needs of a production grade system regardless of whether a service oriented architecture is being built.

Legend

Shaded packages indicate components that are common technology components being built as part of the common technology services of the HealtheVet effort.

Unshaded packages indicate base technologies or standards that have compliant components built as necessary for each individual business service of the HealtheVet effort.

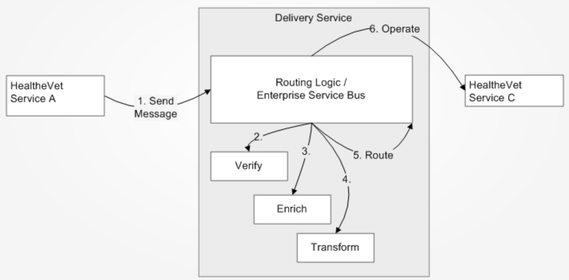
Pane 5: Types of Delivery Service Envelopes

Pane Five shows the various types of Delivery Service supported envelopes that messages can be sent inside.

Pane 6: Subsystems of Delivery Service

Pane 7: VET(R)O Pattern used by Delivery Service

Pane Seven shows the VET(R)O pattern which stands for: Verify; Enrich; Transform; Route; Operate



Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Information
Sub-domain: Infrastructure
Level of detail: Logical
Description:
This sheet depicts the common (core) shared infrastructure services upon which HealtheVet relies.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Common Infrastructure Services

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

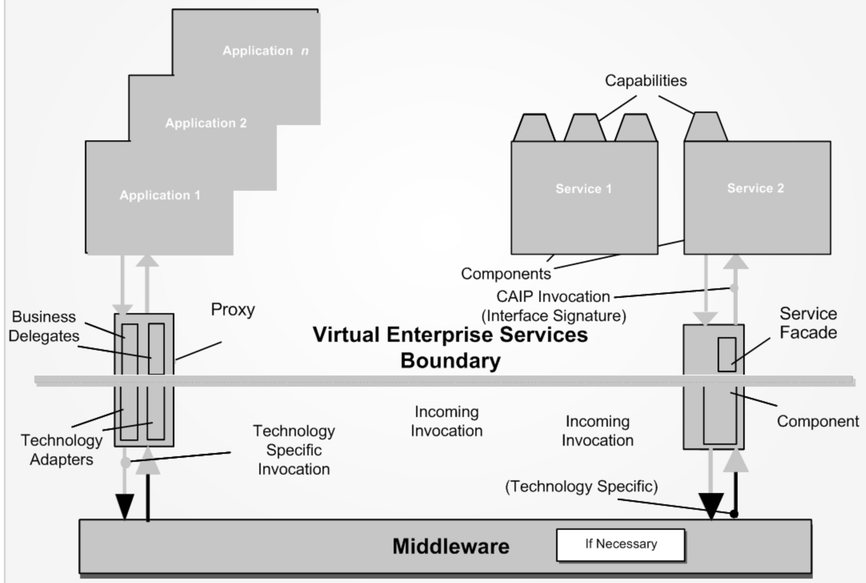
Sheet: B6

Blueprint Build: 00.06

Pane 1: CAIP Concept Architecture

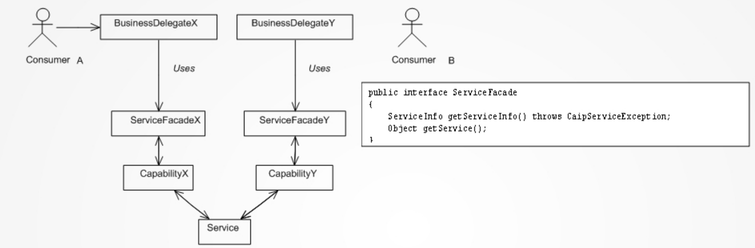
Pane One is a conceptual depiction of the middleware architecture. Effectively, applications will not be making middleware calls directly. Instead they will use established CAIP protocols to interact with "Business Delegates" that have responsibility to route requests via middleware to the appropriate service. The business delegates are technology specific so as to directly interface with the applications (e.g., a Java application will use a Java business delegate).

The technology adapters will transform the invocation call into a middleware technology. Specifically, one business delegate may well have technology adapters to multiple middleware technologies. All platform-specific middleware concerns remain encapsulated inside the respective technology adapter.

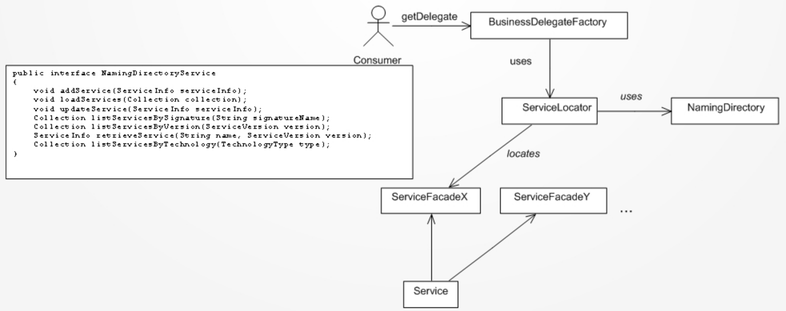


Pane 2: Business Delegate Architecture

Pane Two illustrates more detail about the business delegates. The first part demonstrates the relationship between the delegates and the service facades, effectively showing the flow as queries pass through this infrastructure. Also included is the interface signature for the ServiceFacade. Note that the ServiceFacade references a CAIPServiceException and not middleware-specific exceptions. This is consistent with the approach that CAIP is middleware platform agnostic, thus allowing for differences among varying middleware alternatives. Irrespective of the actual transport technology, the exception handling is done at a higher level encapsulating the platform-specific differences and shielding applications from them.




```
public interface ServiceFacade
{
    ServiceInfo getServiceInfo() throws CaipServiceException;
    Object getService();
}
```

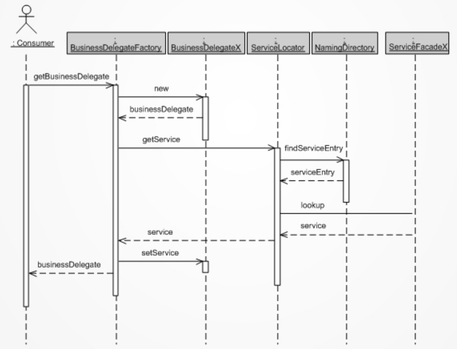



```
public interface NamingDirectoryService
{
    void addService(ServiceInfo serviceInfo);
    void loadServices(Collection collection);
    void updateService(ServiceInfo serviceInfo);
    Collection listServicesBySignature(String signatureName);
    Collection listServicesByVersion(ServiceVersion version);
    ServiceInfo retrieveService(String name, ServiceVersion version);
    Collection listServicesByTechnology(TechnologyType type);
}
```

Pane 3: The Dynamic Component Integration Model

Pane Three demonstrates the dynamic aspects of application integration, showing the flow of control among the components during an invocation. This UML sequence diagram is a complement to the component diagram in Panel Two. Note that the integration approach uses several industry design patterns, such as Abstract Factory (Gamma). The use of the factory allows for a single higher level call to result in the instantiation of the appropriate business delegate.

The Service Locator in conjunction with the Naming and Directory Service are used to support dynamic service discovery. Using this approach, VHA is positioned to allow new services to come online and be integrated into the enterprise as they are deployed. The addition of a new service into the directory allows it to be "found" and used appropriately. This eliminates point-to-point bindings between applications allowing for increased flexibility. Further, it allows for more flexible deployment opportunities, allowing multiple service instances to distribute workload, etc., all unbeknownst to the invoking application. The client application, a service call is made via a delegate and that call is serviced. The details about how the request was carried over the transport layer and even the destination servicing the request are hidden from the caller.



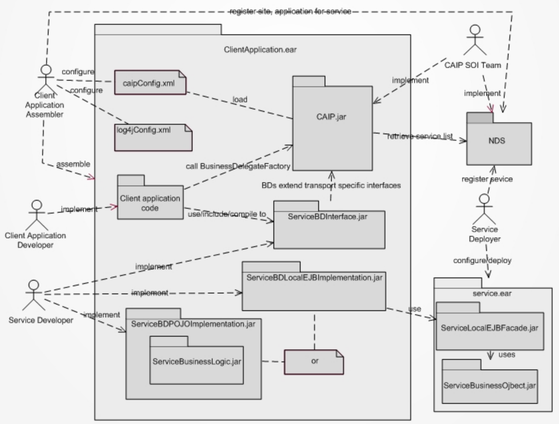
Notes:
Content follows practices put forth in Design Patterns: Elements of Reusable Object-oriented Software (Gamma et. al., hardcover)

Pane 4: Configuring for CAIP

Pane Four illustrates, from a programmers point of view, the use of the CAIP framework in a Java environment. This is an illustration of a sample use case, configuring CAIP. It depicts the roles of application, service provider, and the CAIP teams proper, as well as key settings files and interaction among CAIP infrastructure components.

The service provider develops a service and its capabilities. The Service Provider also defines the business delegate interface for the service as well as a technology-specific implementation of the interface. Finally, the Service Provider maintains entries in the Naming/Directory Service (NDS) for the service.
The application assembler integrates a service's capabilities by utilizing the business delegates in their application. The application assembler maintains the CAIP framework configuration, which contains a list of delegates used by an application as well as the connection information to the NDS. The application assembler also is responsible for ensuring that there are the needed NDS site and application entries for the services to be used.

Significantly richer detail about the configuration and applied use of the CAIP framework is available in the CAIP Developers Guide.



Pane 5: Inter-Component Integration with VHA Health Information Model (VHIM)

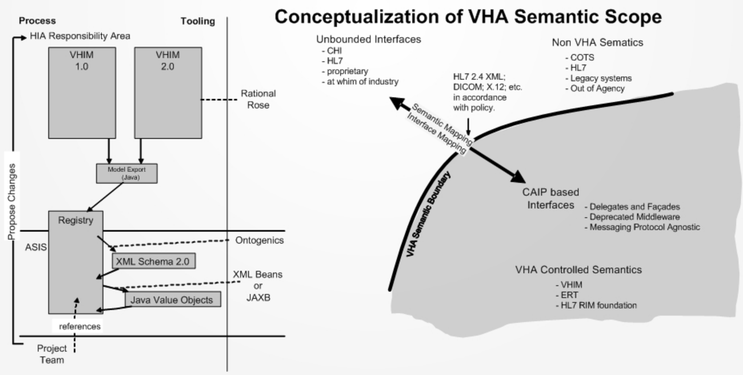
Pane Five illustrates the impact of the VHA Health Information Model (VHIM) as it computationally integrates with this architecture. VHIM is an information-view model, effectively describing the content of interest to VHA and establishing codesets, relationships, and constraints to which VHA applications must comply. There are three distinct categories of content within the VHIM: the domain model, the datatypes, and the template model. This discussion will focus on the templates.

In brief, a template is a structure capable of transporting the domain content relevant for that template. A template identifies and maintains structural integrity of the content it carries, along with some constraint (such as relationships, cardinality, required fields, and so on). These templates play a vital role to inter-component integration.

When making cross-component invocations, these templates serve as the payload mechanism for transporting content. Let's consider a Java based example. To pass a laboratory result from one component to another requires the successful transport of both structure and semantic. The templates provide the structure to instantiate this invocation. Within an application, data payload will be instantiated as a collection of Java value objects that are consistent with the VHIM. [The VHIM team will be producing these value objects as libraries resulting from a process and off-the-shelf tooling]. Instances of these value objects will be created and populated with the information of interest within an application.

To communicate this to another component, a template will be created and the value objects populated into the template. The template then becomes a parameter of the CAIP-based invocation call to the Business Delegate that is acting as a proxy for the service we wish to invoke. Effectively, this template consists of a root class and a navigation path allowing traversal of the payload. Since this representation is formal and rigorous, and the traversal is deterministic, this allows for a repeatable way to transfer content.

By requiring the use of VHIM-conformant templates in the CAIP interface signatures, we are assured that data flowing between components complies with the established semantics in the VHIM. Any details specific to transport-level passing of this content (for example, EJB, HL7 messaging, and so on) is managed within the delegate and the technology adapter. At the point the payload is delivered to the service that will handle the request, the content will have been re-formed in the template-based structure and semantic.



Direct co-dependencies:
HIA Service Architecture Requirements:
http://vaww.va.gov/vhaea/scripts/hiadocdetail.asp?RID=507

Direct dependencies:
CAIP Project Documentation:
http://vista.med.va.gov/CommonServices/

CAIP Specification, Developers Guide:
http://vista.med.va.gov/CommonServices/Project%20Artifacts%20and%20Docs/CAIP/CS_CAIP_Developer_Guide.doc

CAIP SOA Governance Document:
http://vista.med.va.gov/CommonServices/Project Artifacts and Docs/CAIP/SOA Governance Guidance v0.99.doc

About this sheet:
Domain: Information
Sub-domain: Integration
Level of detail: Logical
Description:
This sheet depicts how services will integrate and interoperate across HealtheVet. This is basically a depiction of CAIP.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Inter-Component Integration

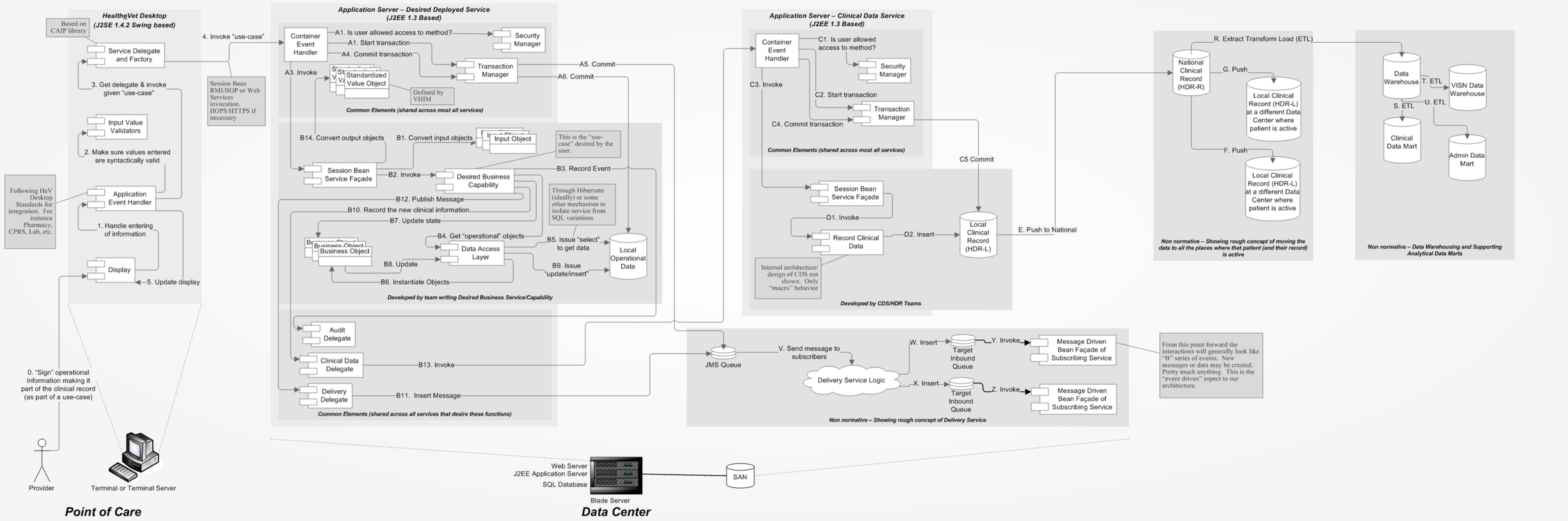
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B7

Blueprint Build: 00.06

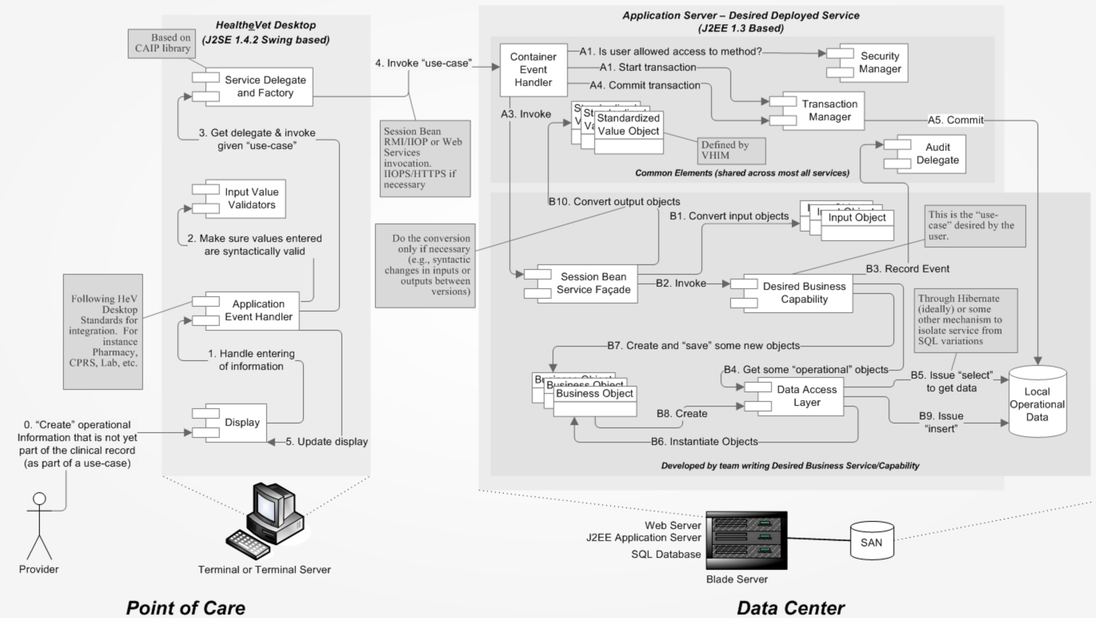
Pane 1: Creating Clinical Data Ready for the Patient Record

Pane One shows the interactions to take a piece of Operational data and move it into the Clinical Record. For instance: Signing an order, signing and releasing the results of a lab test, administering a medication



Pane 2: Creating Operational Data

Pane Two shows Interactions to create a piece of Operational data – data that should not currently appear in the Clinical Record. For instance: Starting to create an order, intermediate steps in the pharmacy of filling an order



Notes:

The reader is referred to:
http://vista.med.va.gov/vistaarch/HealtheVet/Models/Applied%20Software%20Architecture.htm
for an additional "static" view of the design components (versus interactions for various scenarios).

Acronyms and Abbreviations:

CDS – Clinical Data Service
HDR-L – Local Health Data Repository
HDR-N – National Health Data Repository
J2EE – Java 2 Enterprise Edition
J2SE – Java 2 Standard Edition
JMS – Java Messaging Service
SAN – Storage Area Network
SQL – Structured Query Language
VHIM – VHA Health Information Model

About this sheet:

Domain: Solution
Sub-domain: Example
Level of detail: Logical
Description:
This sheet shows sample scenarios pulling together the information and technology architectures. The business interactions are not meant to be accurate but instead representative of typical flows and interactions.
This is a post-migration perspective. During migration additional components and interactions may exist.

Direct co-dependencies:

Direct dependencies:
HDR and CDS architectures.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Component Interactions - Updates

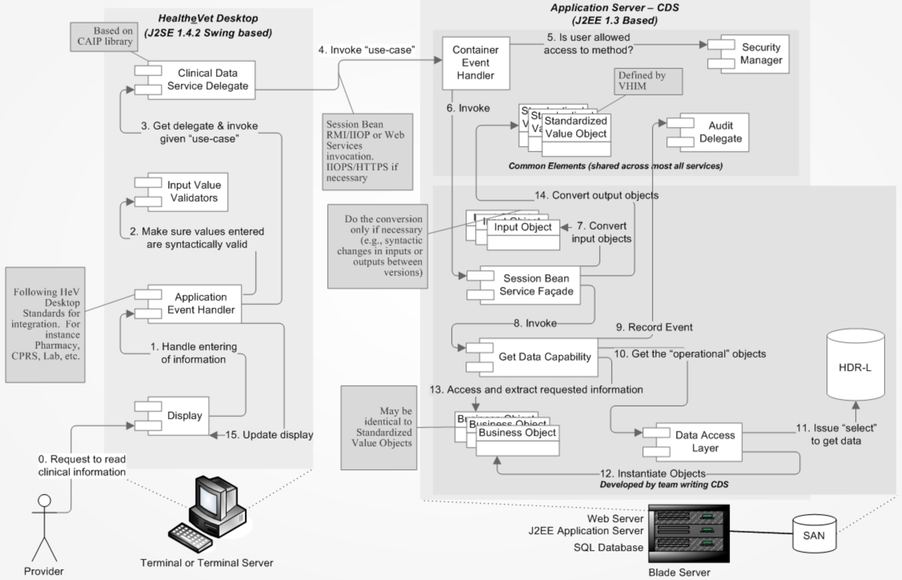
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B8

Blueprint Build: 00.06

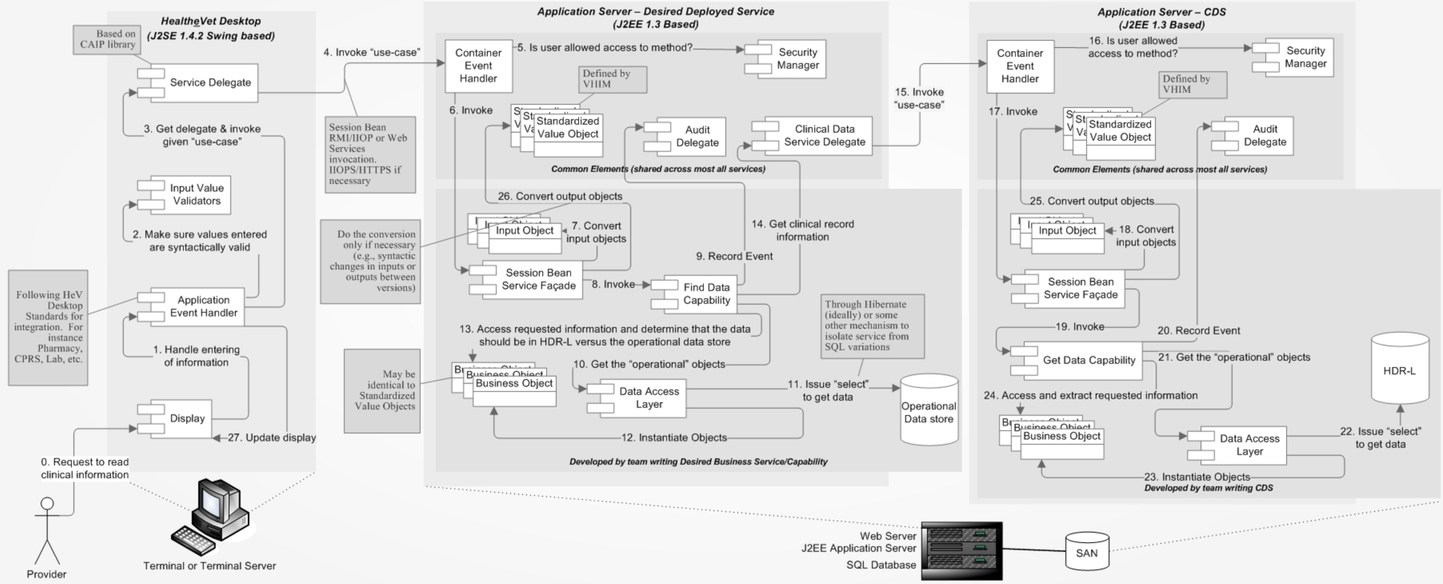
Pane 1: Interactions to Read Clinical Data – Direct Access to Clinical Data Service

Pane One shows the scenario where the caller needs clinical data and is programmed to use CDS to use to locate the information desired versus asking the service that contains the business logic for performing updates to information. An example might be to read signed orders or look at allergies.



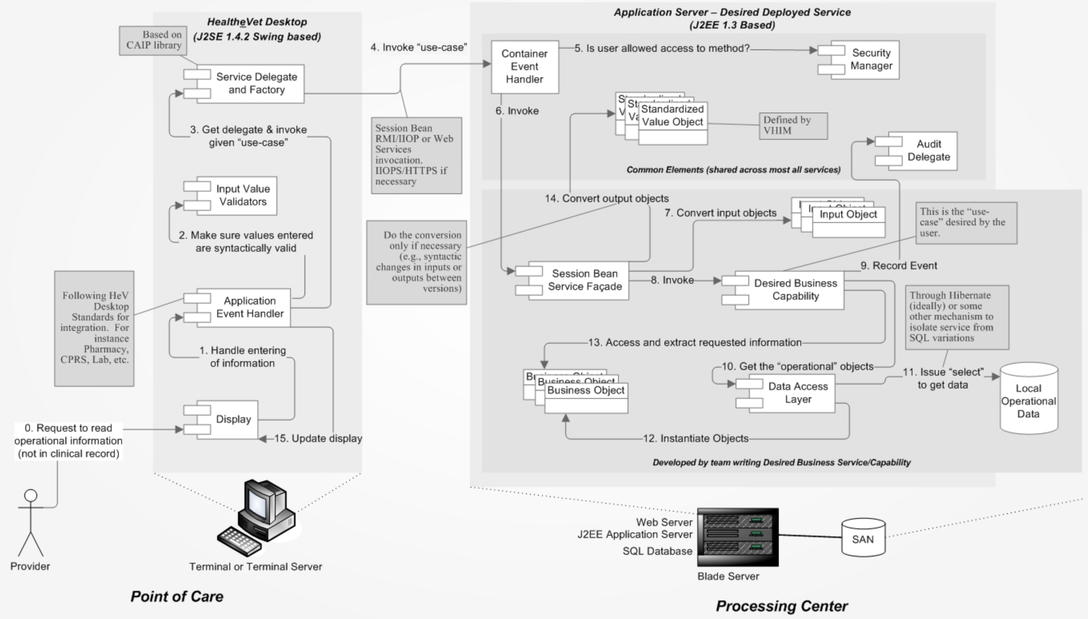
Pane 2: Interactions to Read Clinical Data – Asking the Authoritative Update Service

Pane Two shows the scenario where the caller needs clinical data and is not sure if that information is in CDS or the service that encodes the business logic for updates to that information. In this case the service looks to see if it has the information and if not (or only has part of it) it then asks CDS on behalf of the caller. An example might be to read signed orders or look at allergies.



Pane 3: Interactions to Read Non-Clinical Data (or Data not yet part of the Clinical Record)

Pane Three shows the scenario where the caller needs clinical data and is programmed to use CDS to use to locate the information desired versus asking the service that contains the business logic for performing updates to information. An example might be to read the information about the automated dispensing machine used for filling an order in the pharmacy or read un-released lab results.



Notes:

The reader is referred to:
http://vista.med.va.gov/vistaarch/HealtheVet/Models/Applied%20Software%20Architecture.htm
for an additional "static" view of the design components (versus interactions for various scenarios).

Acronyms and Abbreviations:

CDS – Clinical Data Service
HDR-L – Local Health Data Repository
HDR-N – National Health Data Repository
J2EE – Java 2 Enterprise Edition
J2SE – Java 2 Standard Edition
JMS – Java Messaging Service
SAN – Storage Area Network
SQL – Structured Query Language
VHIM – VHA Health Information Model

Direct co-dependencies:

Direct dependencies:
HDR and CDS architectures.

About this sheet:

Domain: Solution
Sub-domain: Example
Level of detail: Logical
Description:
This sheet shows sample scenarios pulling together the information and technology architectures. The business interactions are not meant to be accurate but instead representative of typical flows and interactions.
This is a post-migration perspective. During migration additional components and interactions may exist.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Component Interactions - Reads

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: B9

Blueprint Build: 00.06

Notes:

Note: In order to reduce clutter, this diagram contains only the major clinical classes.
Please see:
http://vaww.va.gov/vhaea/scripts/vhim.asp
for complete details.

Acronyms and Abbreviations:

See the model for definitions of the types.

Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Information

Sub-domain: VHIM

Level of detail: Logical

Description:
An abstract of the VHA Healthcare Information Model. This model is used for information interchange between HealtheVet systems, especially with the Clinical Data Service.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:
VHA Healthcare Information Model (VHIM) 3.2

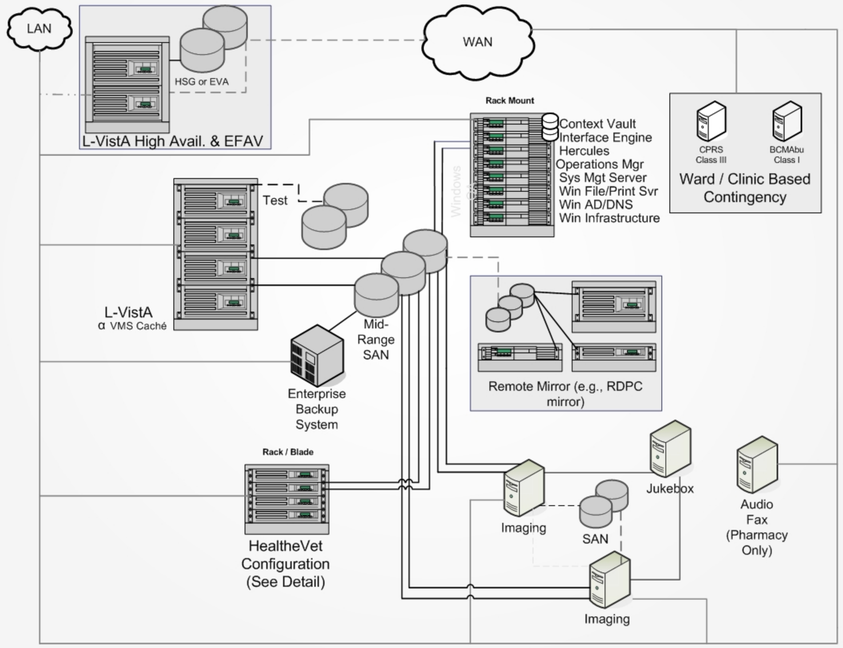
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: C1

Blueprint Build: 00.06

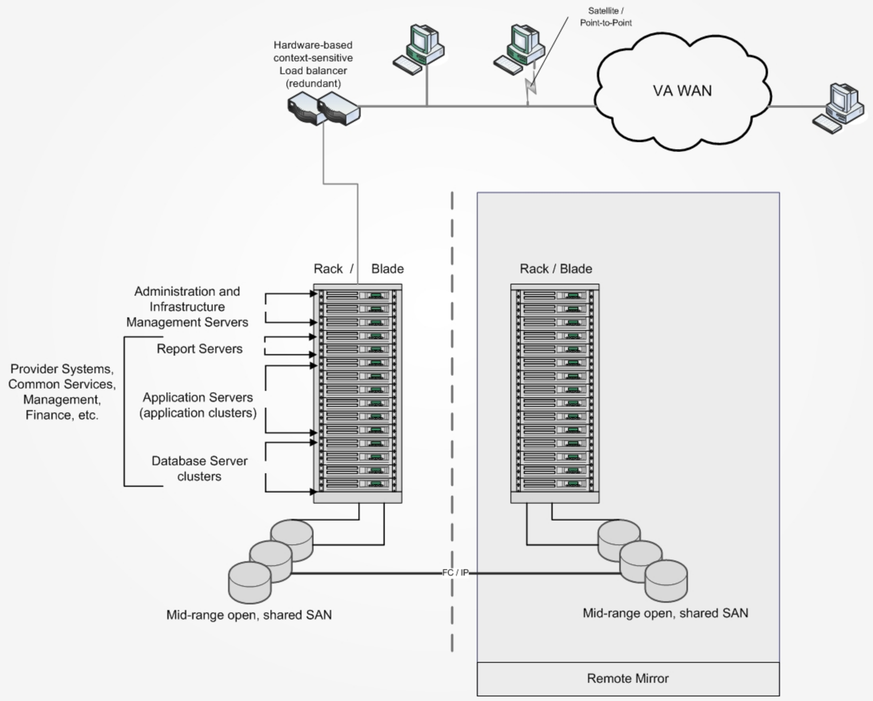
Pane 1: Typical Near-Term Local / Regional Field Configuration

Pane One shows the current network links and general hardware allocation currently in the field or soon to be in the field. This is a short term view of a typical Regional Data Processing Center (RDPC), but also reflects some local sites, and may change as migration progresses.



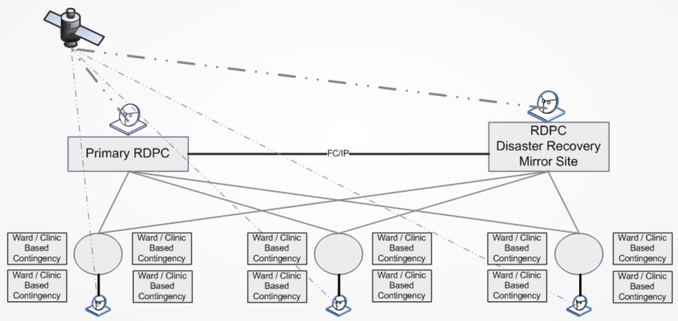
Pane 2: HealtheVet Configuration

Pane Two shows the current network links and general hardware allocation currently in the field or soon to be in the field. This is a short term view and will change as migration progresses.



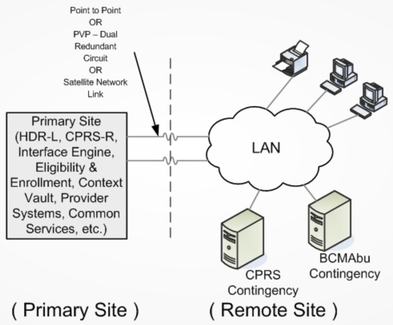
Pane 3: RDPC Contingency & Disaster Recovery Configuration

Pane Three shows a summary view of the network or data center outage response. Traffic will be diverted through alternate communications links and/or to an alternate regional processing center.



Pane 4: Remote Site Configuration

Pane Four shows a summary view of how remote points of care access the processing center.



Legend

Black lines denote physical connections that aren't general purpose communications networks

Gray lines denote general purpose communications networks (things supporting TCP/IP)

Acronyms and Abbreviations:

- AD – Active Directory
- BCMAbu – Bar Code Medication Administration backup/contingency system
- CPRS-R – Rehosted Computerized Patient Record System
- DNS – Domain Name Service
- EFAV – Enhanced Fail-over Access for VistA
- FC/IP – Fiber Channel over Internet Protocol
- HDR-L – Local Health Data Repository
- LAN – local area network
- L-VistA – Legacy VistA
- OA – Office Automation
- PVP – permanent virtual pipe
- RDPC – Regional Data Processing Center
- SAN – storage area network
- TCP/IP – Transmission Control Protocol/Internet Protocol
- VA – Department of Veterans Affairs
- VAMC – Department of Veterans Affairs Medical Center
- VISN – Veterans Integrated Service Network
- VistA - Veterans Health Information Systems and Technology Architecture
- WAN – wide area network

About this sheet:

Domain: Technology
Sub-domain: Physical
Level of detail: Logical
Description:
This sheet shows the logical elements that will exist in the field in support of HealtheVet along with what will exist in support of HealtheVet-VistA

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Field Distributed Configuration

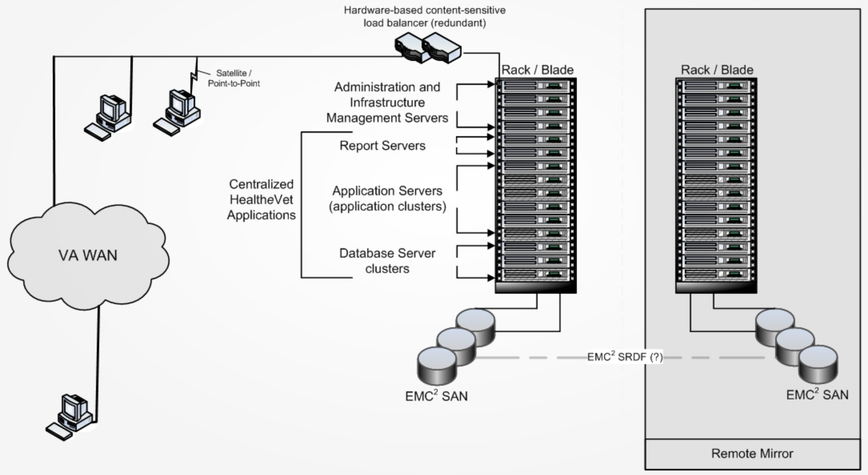
APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: D1

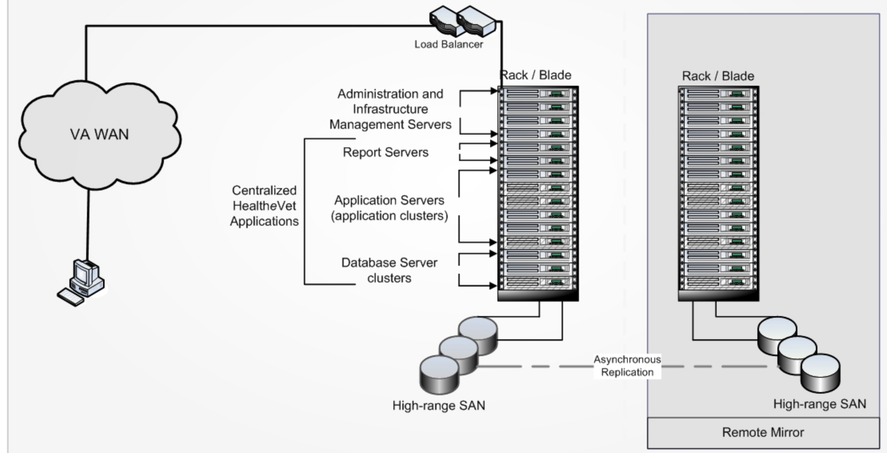
Blueprint Build: 00.06

Pane 1: Tier-1 Regional Processing Center – HealtheVet Configurations

Pane One shows the planned regional processing center.



Pane 2: Corporate Data Center – HealtheVet Configurations

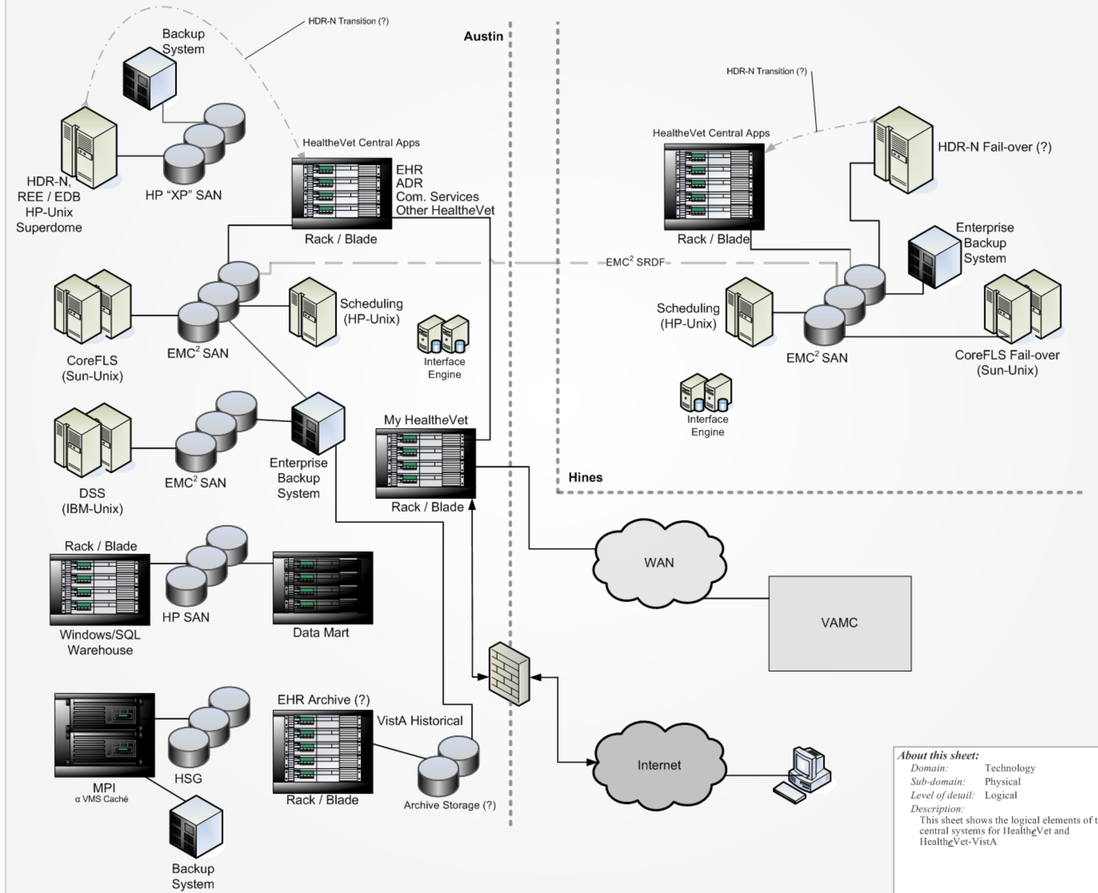


Acronyms and Abbreviations:

- AD – Active Directory
- ADR – Administrative Data Repository
- CMOP – Consolidated Mail Outpatient Pharmacy
- CoreFLS – Financial and Logistics System
- DNS – Domain Name Service
- DSS – Decision Support System
- EDB – Enrollment Database
- EHR – Electronic Health Record
- FC/IP – Fiber Channel over Internet Protocol
- FS – File Server
- HDR-N – National Health Data Repository
- HeV – HealtheVet
- HP – Hewlett Packard
- MPI – Master Patient Index
- OA – Office Automation
- PATS – Patient Advocate Tracking System
- RAI/MDS – Resident Assessment Instrument / Minimum Data Set
- REE – Registration, Eligibility, & Enrollment
- RUM – Resource Usage Monitor
- SAGG – Statistical Analysis Global Growth
- SAN – storage area network
- SRDF – Symmetrix Remote Data Facility
- SQA – Software Quality Assurance
- SQL – Sequential Query Language
- VA – Department of Veterans Affairs
- VACO – VA Central Office
- VAMC – Veterans Affairs Medical Center
- VistA – Veterans Health Information Systems and Technology Architecture
- VMS – Virtual Memory System
- VPFS – Veterans Personal Finance System
- WAN – Wide Area Network

Pane 3: Tier-1 Regional Processing Center

Pane 4: VA Corporate Data Center Configuration



Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Technology
Sub-domain: Physical
Level of detail: Logical
Description:
This sheet shows the logical elements of the central systems for HealtheVet and HealtheVet-VistA

U.S. Veterans Health Administration

System: HealtheVet

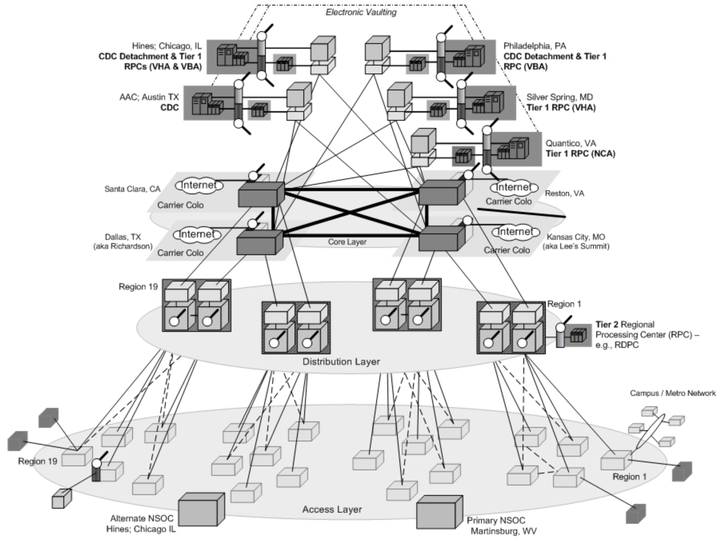
Drawing:

Centralized Physical Configuration

APPROVAL	INITIALS	DATE	Sheet:
VHA Chief Architect:			D2
Chief Health Informatics Officer:			
Chief Information Officer:			
Program Management Officer:			

Blueprint Build: 00.06

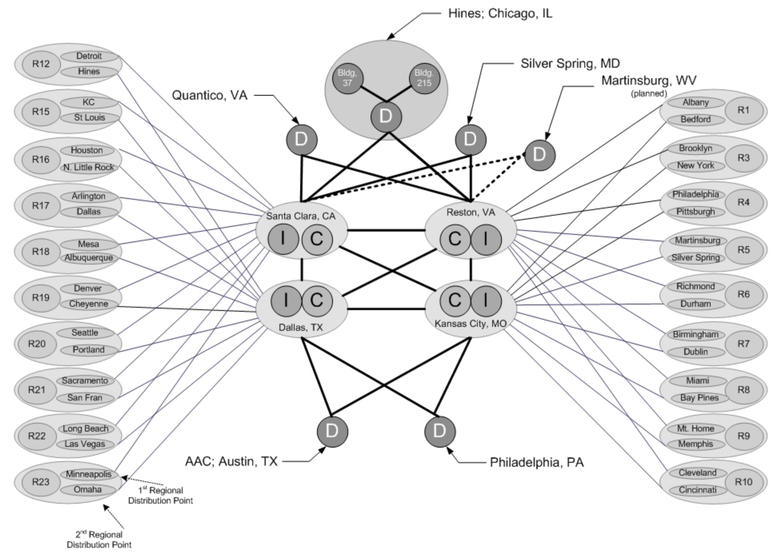
Pane One: One-VA Physical Infrastructure Design



Legend:

- Core Node
- Distribution Node
- Access Node
- Remote Facilities
- Business Partners
- Internet Facing Security Zone
- Intranet Facing Security Zone
- Network & Security Operations Center (NSOC)
- Security Boundaries (Multiple Policies)
- Intrusion Detection

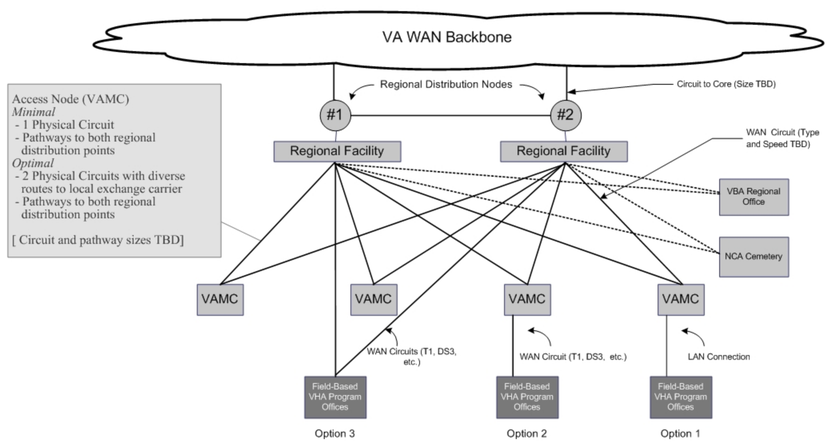
Pane Two: VA WAN Backbone



Legend:

- C — TMP Core Site
- I — One-VA Internet Gateway
- D — Corporate Data Center
- Rn — Regional WAN

Pane Three: Regional WAN and VISN Connectivity

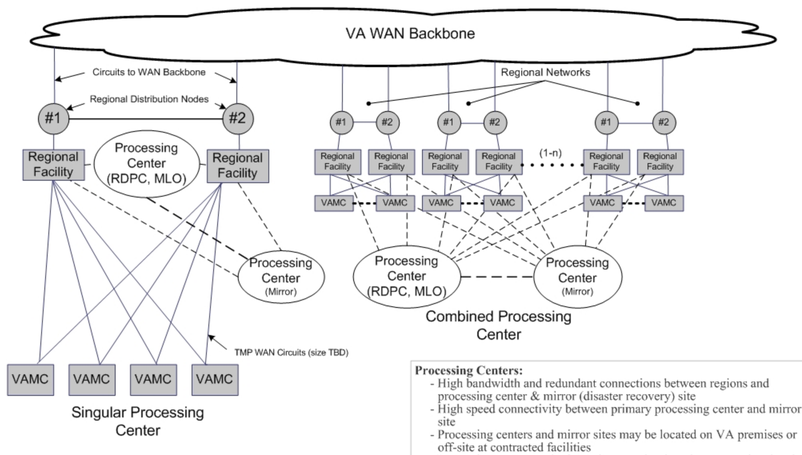


Access Node (VAMC)
Minimal
- 1 Physical Circuit
- Pathways to both regional distribution points

Optimal
- 2 Physical Circuits with diverse routes to local exchange carrier
- Pathways to both regional distribution points

[Circuit and pathway sizes TBD]

Pane Four: Regional WAN and Processing Center Connectivity



Processing Centers:
- High bandwidth and redundant connections between regions and processing center & mirror (disaster recovery) site
- High speed connectivity between primary processing center and mirror site
- Processing centers and mirror sites may be located on VA premises or off-site at contracted facilities
- Processing centers and mirror sites may be shared across regional and VISN boundaries (RDPC options)
- Connectivity from to processing centers (& mirror sites) generally done via dedicated (i.e., not TMP) circuits/pathways

Acronyms and Abbreviations:
- Aka – Also known as
- Bldg – Building
- CDC – Centers for Disease Control and Prevention
- MLO – Minimum Level of Operations (VISN collocated data center)
- NSOC – Network and Security Operations Center
- RDPC – Regional Data Processing Center
- RPC – Regional Processing Center
- TBD – To be determined
- TMP – Telecommunications Modernization Project
- VAMC – VA Medical Center
- VISN – Veterans Integrated Service Network
- WAN – Wide area network

Direct co-dependencies:

Direct dependencies:

About this sheet:
- *Domain:* Technology
- *Sub-domain:* Physical
- *Level of detail:* Logical
- *Description:* This sheet shows the logical telecommunications links and architecture in support of HealtheVet.

U.S. Veterans Health Administration

System: HealtheVet

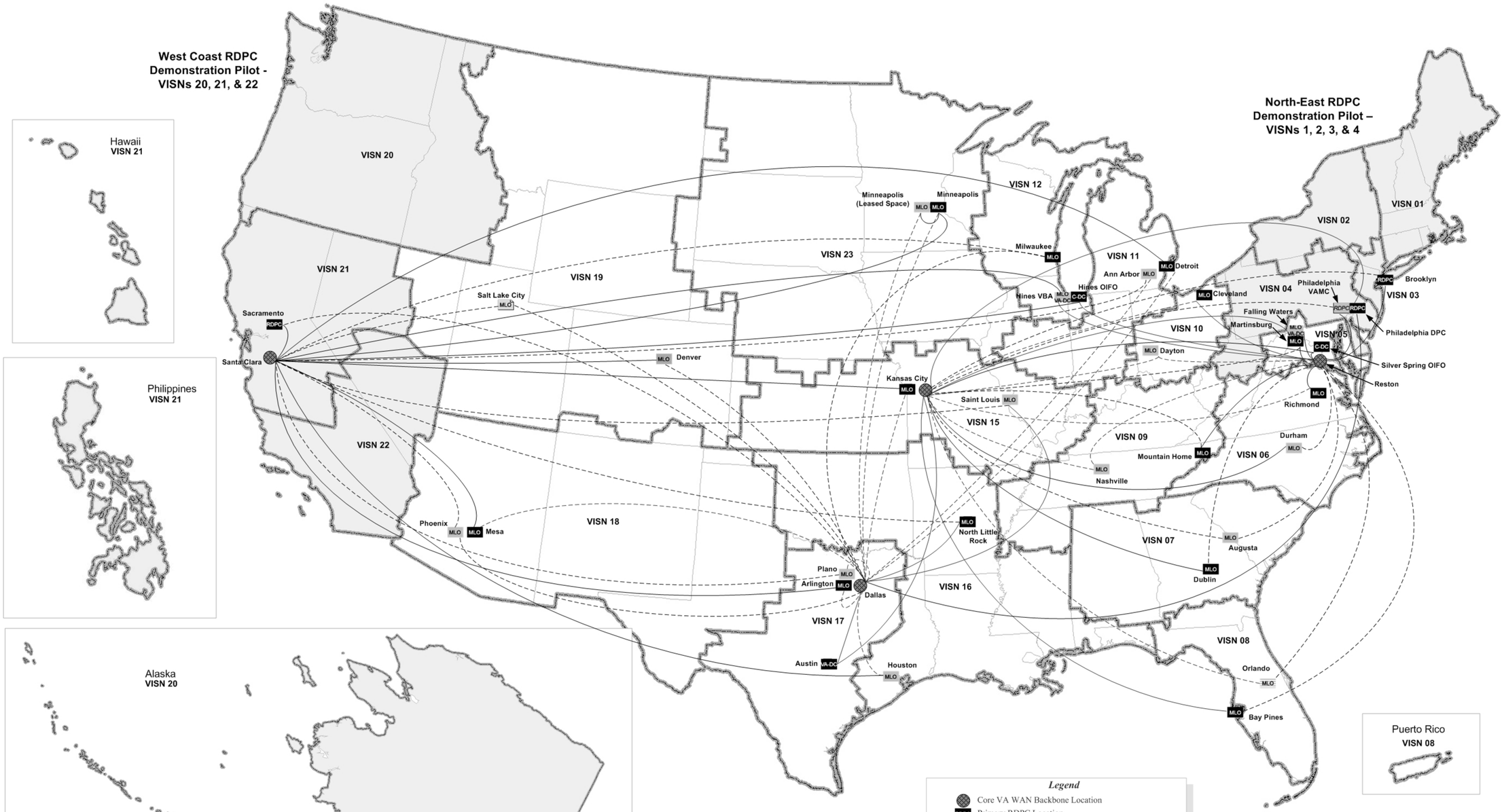
Drawing:

Telecommunication Physical Infrastructure

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: D3

Blueprint Build: 00.06



Legend

- Core VA WAN Backbone Location
- Primary RDPC Location
- Possible Secondary RDPC Location
- Interim RDPC Location
- Primary MLO Location
- Secondary MLO Location
- Long-Term Secondary MLO Location
- Primary or Secondary MLO Location
- Possible Secondary MLO Location
- Primary VA Corporate DC Location
- Central DC Location
- Secondard MLO / Secondary VA Corporate DC Location
- State Boundary
- VISN Boudary
- Direct/near-direct WAN circuit
- Intervening demarcation site on WAN circuit path

Notes:

Please note that the below maps are not to scale. All core WAN locations are directly interconnected. All national data centers (C-DC, VA-DC, DPC) may have direct WAN circuits to all four VA WAN backbone sites.

Core VA WAN Backbone Locations
- Dallas, TX (aka Richardson)
- Kansas City, MO (aka Lee's Summit)
- Reston, VA
- Santa Clara, CA

Primary RDPC Locations
- Brooklyn VAMC
- Sacramento leased space (Herackles)

Interim RDPC Locations
- Philadelphia VAMC (moves to Philadelphia DPC)
- Sacramento VAMC (moves to leased space within 1,000 miles)

Primary VA Corporate Data Center Location
- Austin Automation Center

Seondary VA Corporate Data Centers
- Hines VBA (building 215)
- Philadelphia DPC (for VBA)

Central Data Center Locations
- Falling Waters (leased space)
- Hines OIFO (building 37)
- Silver Spring OIFO

Primary MLO Locations
- Arlington (leased space)
- Bay Pines VAMC
- Cleveland VAMC
- Detroit VAMC
- Dublin VAMC
- Kansas City VAMC
- Martinsburg VAMC
- Mesa Regional Office
- Milwaukee VAMC
- Minneapolis VAMC
- Mountain Home VAMC
- North Little Rock Regional Office
- Richmond VAMC

Secondary MLO Locations
- Ann Arbor VAMC
- Augusta VAMC
- Dayton VAMC
- Durham VAMC (may move to leased space in Durham)
- Falling Waters DPC (leased space)
- Hines VBA (building 215)
- Houston VAMC
- Minneapolis (leased space in Plymouth)
- Nashville VAMC
- Phoenix (leased space)
- Plano (leased space)
- Saint Louis VAMC

Long-Term Secondary MLO Location
- Orlando VAMC (may be leased space)

Possible MLO Locations
- Denver (leased space)
- Salt Lake City VAMC

Primary or Secondary MLO Location
- Denver VAMC

Acronyms and Abbreviations:

C-DC – Central data center
DC – Data center
DPC – Data processing center
MLO – Minimum level of operations (collocated VISN data center)
OIFO – Office of Information Field Office
RDPC – Regional Data Processing Center
VA-DC – VA corporate data center
VAMC – VA Medical Center
VBA – Veterans Benefit Administration
VISN – Veterans Integrated Service Network
WAN – Wide area network

About this sheet:

Domain: Technology
Sub-domain: Physical
Level of detail: Logical
Description:
This sheet shows proposed data centers and connectivity circa 2007 in support of HealtheVet.

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Proposed 2007 Data Center Topology

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

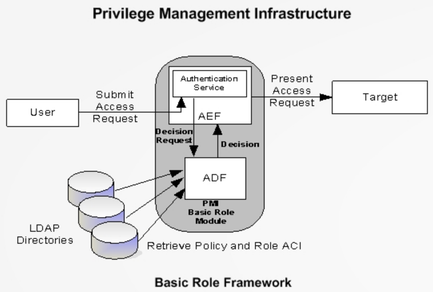
Sheet: D4

Blueprint Build: 00.06

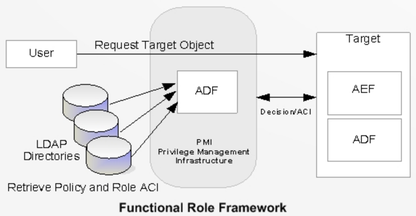
Acronyms and Abbreviations:
Listed on sheet E2

Pane 1: Framework View

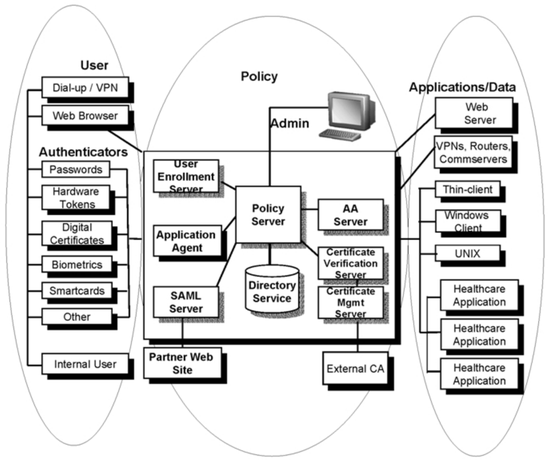
The Framework View establishes the scope model for the security architecture. It establishes the high-level context for security of interest to planners.

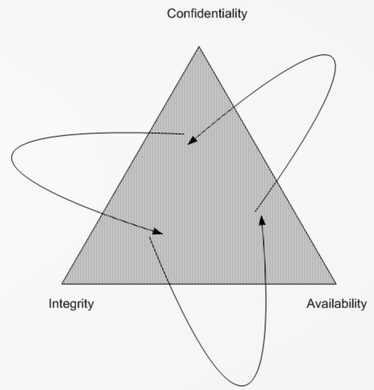


Basic Role Framework



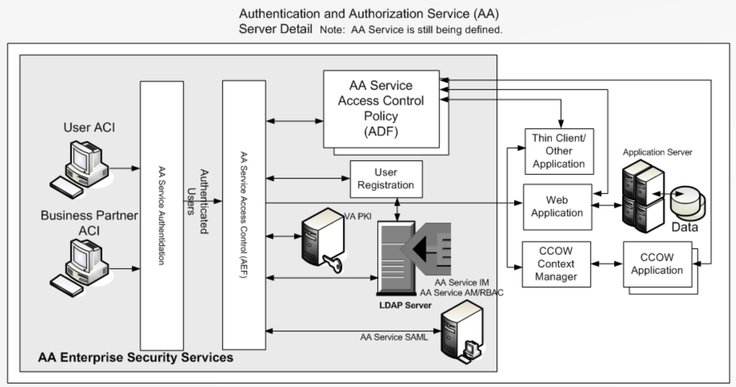
Functional Role Framework

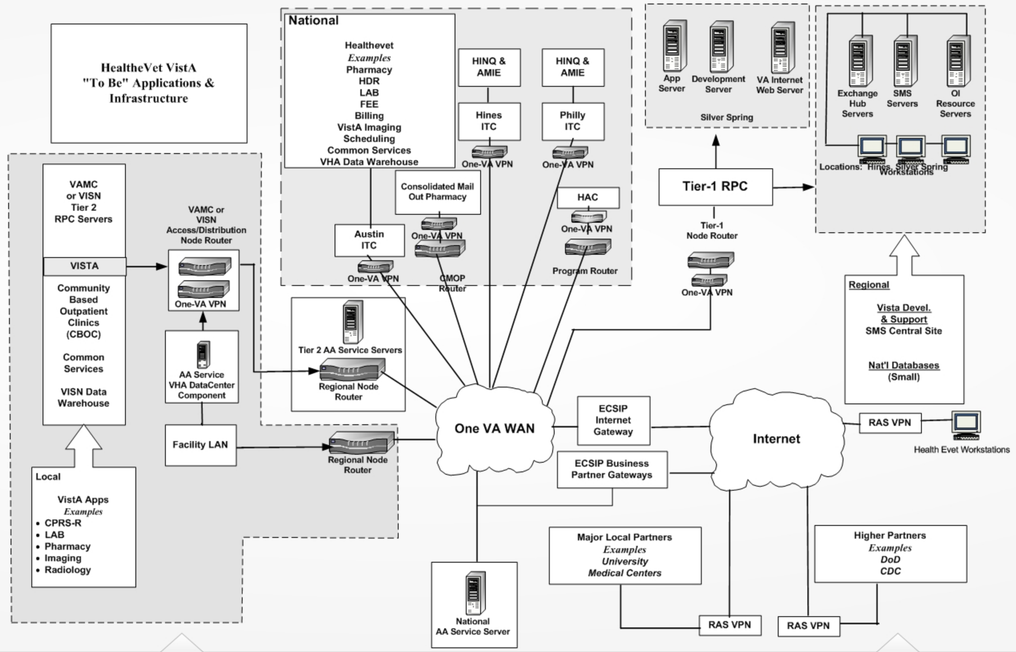




Pane 2: System View

The System View focuses on technical aspects of the security architecture. It establishes the methods, specifications, system diagrams and high-level design of the security architecture. This view is still an architectural model and not an "as-built" or implementation view.





Security Services by Layer

OSI Layers	Security Services	TCP/IP Layers
Layer 7: Application	Peer Entity/Data Origin Authentication Access Control Service Connection/Connectionless Confidentiality Selective Field/Traffic Flow Confidentiality Connection Integrity With/Without recovery Selective Field Connection Integrity Connectionless Integrity Selective Field Connectionless Integrity Non-repudiation, Origin/Delivery	Application
Layer 6: Presentation	Connection/Connectionless Confidentiality Selective Field Confidentiality	
Layer 5: Session		
Layer 4: Transport	Peer Entity/Data Origin Authentication Access Control Service Connection/Connectionless Confidentiality Connection Integrity With/Without recovery Connectionless Integrity	Transport (TCP)
Layer 3: Network	Peer Entity/Data Origin Authentication Access Control Service Connection/Connectionless Confidentiality Traffic Flow Confidentiality Connection Integrity Without recovery Connectionless Integrity	Internet (IP)
Layer 2: Data Link	Connection/Connectionless Confidentiality	Data Link
Layer 1: Physical	Connection Confidentiality Traffic Flow Confidentiality	Physical

Greater Service Assurance

Greater Granularity of Control

Continued on E2

Continued on E2

Continued on E2

Direct co-dependencies:

Direct dependencies:

About this sheet:
Domain: Technology
Sub-domain: Security
Level of detail: Conceptual
Description:
The framework and system views of security (sheet E2 has the developer views)

U.S. Veterans Health Administration
System: HealtheVet
Drawing:
Security Architecture – Framework and System Views

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

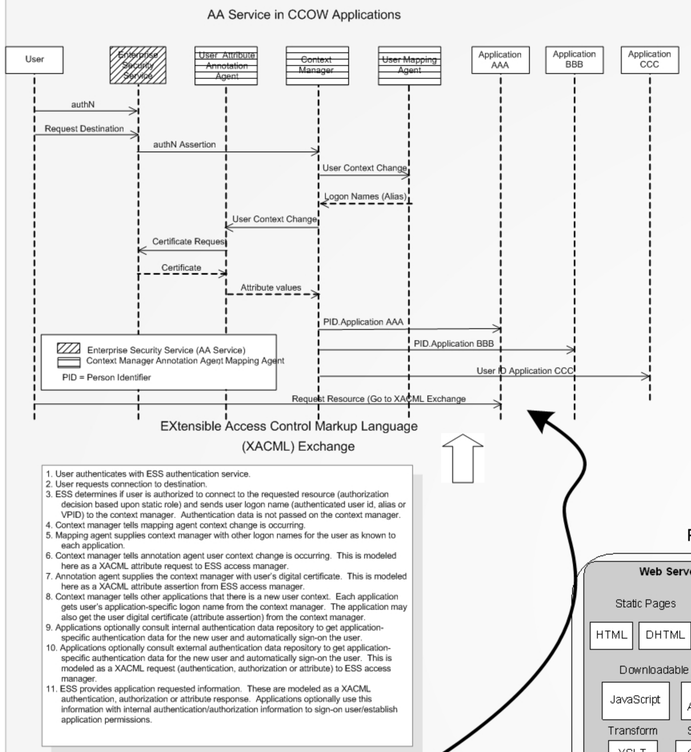
Sheet: E1

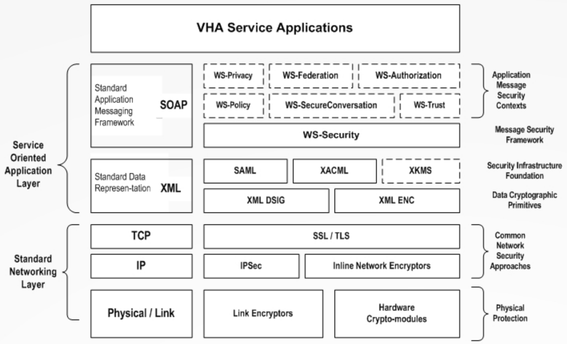
Blueprint Build: 00.06

Continued From E1

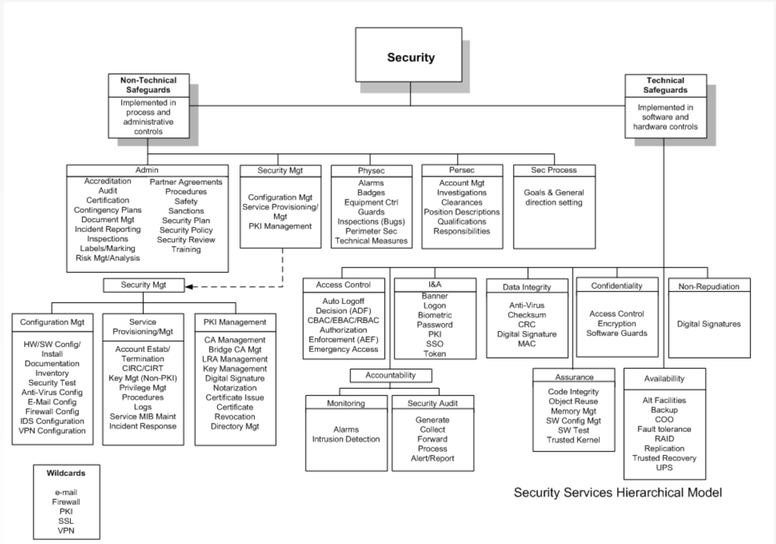
Pane 3: Developer View

The Developer View is constrained by the Framework and System Views. It identifies specific technologies, tools, products and services to be employed in any instantiation of the design as conceived by the developers. It also contains specific use cases and flow diagrams to explain the interaction of system components.

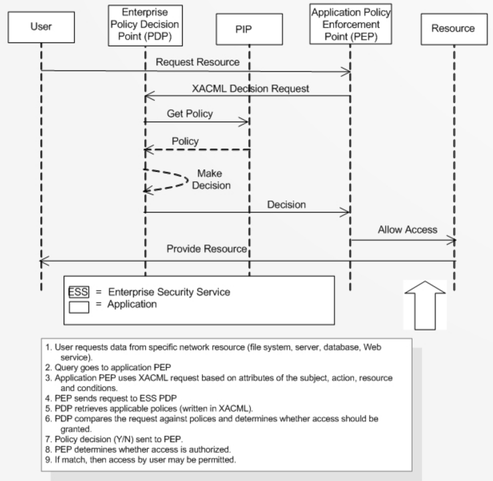


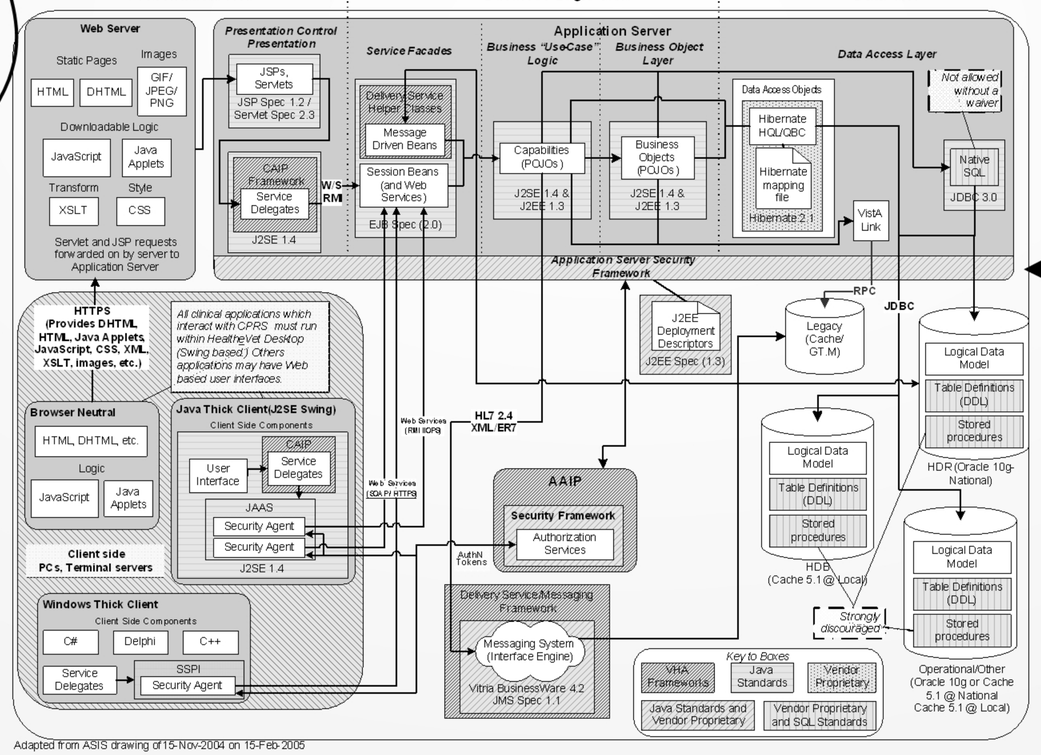


Adapted from DoD Net_Centric Enterprise Services (NCES) Version 0.3 (Pilot) March 1, 2004

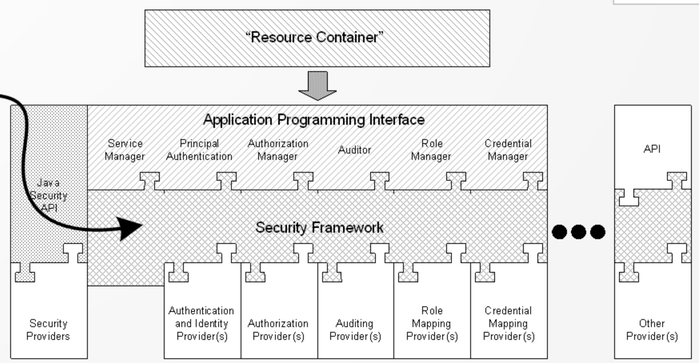


Security Services Hierarchical Model





Adapted from ASIS drawing of 15-Nov-2004 on 15-Feb-2005



From: Building an Application Security Infrastructure, Business Integration Journal, pp. 36-39 (2004)

Permission to use copyright material requested

Acronyms and Abbreviations:

AA – Authentication and Authorization
AA Service – Authentication and Authorization Service
ACI – Access Control Information
ADF – Access Control Decision Function
AEF – Access Control Enforcement Function
AMIE – Automated Medical Information Exchange
API – Application Programmer Interface
CA – Certification Authority
CAIP – Cross-Application Integration Protocol
CBAC – CBAC Context-Based Access Control
CBOC – Community Based Outpatient Clinic
CCOW – Clinical Context Object Workshop
CDC – Centers for Disease Control and Prevention
CIRC – Computer Incident Response Capability
CIRT – Computer Incident Response Team
CMOP – Computerized Mail Outpatient Pharmacy
COO – Continuity of Operations
CPRS-R – Computerized Patient Record System-Re-Engineering
CRC – Cyclic Redundancy Check
CSS – Cascading Style Sheets
DDL – Data Definition Language
DHTML – Dynamic HyperText Markup Language
DoD – Department of Defense
DSIG – Digital Signature
EBAC – Entity-Based Access Control
ECSIP – Enterprise Cyber Security Infrastructure Project
EJB – Enterprise Java Bean
ENC – Encoding
FEE – Fee Basis
GIF – Graphics Interchange Format
HAC – Health Administration Center
HDR – Health Data Repository
HINQ – Hospital Inquiry
HQL – Hibernate Query Language
HTML – HyperText Markup Language
HTTP(S) – HyperText Transport Protocol (Secure)
HW – Hardware
I&A – Identification and Authentication
IDS – Intrusion Detection System
IP – Internet Protocol
IPSEC – IP Security Protocol
ITC – Information Technology Conference
J2SE – Java 2 Platform, Standard Edition
JAAS – Java Authentication and Authorization Service
JDBC – Java Database Connectivity
JMS – Java Messaging Service
JPEG – Joint Pictures Expert Group
JSPs – Java Server Pages
LAN – Local Area Network
LDAP – Lightweight Directory Access Protocol
LRA – Local Registration Authority
MAC – Message Authentication Code
MIB – Management Information Base
OSI – Open System Interconnect
OSS – Open Source Software
PIP – Policy Information Provider
PKI – Public Key Infrastructure
PMI – Privilege Management Infrastructure
PNG – Portable Network Graphics
POJO – Plain Old Java Object
QBC – Query By Criteria (Hibernate related)
RAID – Redundant Array of Independent Disks
RAS – Remote Access Services
RBAC – Role-Based Access Control
RMI – Remote Method Invocation
RPC – Remote Procedure Call
SAML – Security Assertion Markup Language
SMS – System Management Server
SOAP – Simple Object Access Protocol
SQL – Structured Query Language
SSL/TLS – Secure Sockets Layer/Transport Layer Security
SSO – Single Sign On
SW – Software
TCP – Transmission Control Protocol
UPS – Uninterruptible Power Supply
VAMC – Veterans Administration Medical Center
VISN – Veterans Integrated Service Networks
VistA – VA Information Systems and Technology Architecture
VPID – VA Person ID
VPN – Virtual Private Network
WAN – Wide Area Network
WS – Web Service
XACML – Extensible Access Control Markup Language
XKMS – XML Key Management Specification
XML – eXtensible Markup Language
XSLT – eXtensible Stylesheet Language Transformations

Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Technology
Sub-domain: Security
Level of detail: Logical
Description:
A developer view of security (sheet E1 has he framework and system views)

U.S. Veterans Health Administration

System: HealtheVet

Drawing:
Security Architecture – Developer View

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: E2

Blueprint Build: 00.06

Detailed engineering analyses of the operational dependability mechanisms of the system and failure modes is currently planned. When complete it will be available on the HIA website.

Availability Assumptions

AA1. Maximum tolerable scheduled and unscheduled HealtheVet service downtime is limited to 43 minutes once per month for "mission critical information" systems as defined by tiered levels of service availability requirements identified for each service or product. Specific components required to provide these services have higher levels of target and minimum availability within each of these service availability tiers:

Level 1 Service Availability – Downtime Tolerant, Important for Operations
- 90% minimum availability (16.8 hrs/wk maximum downtime)
- 95% availability design target (8.4 hrs/wk maximum downtime)
- 99% availability target for components (7.3 hrs/month maximum)

Level 2 Service Availability – Important for Productivity
- 95% minimum availability
- 99% availability design target
- 99.9% availability target for components (43.8 minutes/month, 8.8 hrs/year maximum downtime)

Level 3 Service Availability – Business Vital information
- 99% minimum availability
- 99.9% availability design target
- 99.99% availability target for components (52 minutes/year maximum downtime)

Level 4 Service Availability – Mission Critical Information
- 99.9% minimum availability
- 99.99% availability design target
- 99.999% availability target for components (5.2 minutes/year maximum downtime)

AA2. Additional scheduled maintenance windows on weekends or after hours are allowable provided contingency systems or procedures are established, feasible, and followed, providing tolerable levels of performance and capacity as documented in service level agreements.

Performance Assumptions

PA1. Performance metrics will be determined in a baseline analysis of VistA and translated to performance targets and tolerance limits for HealtheVet components. These will include both business productivity performances, which depend on usability factors, as well as system response times. In addition, generic system performance requirements may be determined for certain types and complexities of operations including disaster recovery operations. These performance requirements must be shown to work in HealtheVet platform architectures and topologies.

Dependability Goals

Physical

DG01. Enable increases in available computing resources to be added easily and cost effectively (scalability).

DG02. Enable dynamic failover and replacement protection.

DG03. Allow flexible reallocation of resources (including reprovisioning).

DG04. Permit interoperability of heterogeneous devices.

DG05. Accommodate adaptation of future technologies, by using industry standards and aligning with industry trends.

DG06. Use mature hardware components with proven history as building blocks.

Logical

DG21. Develop software low in bug counts.

DG22. Be capable of taking advantage of increases in computing resources.

DG23. Enable flexibility in switching vendors

Data

DG41. Ensure no data is lost.

DG42. Ensure access to data, especially patient data, can only be done by authorized individuals.

Management

DG61. Reduce complexity of managing the environment (simplify and standardize).

DG62. Non-disruptive maintenance and support (concurrently maintainable).

DG63. Permit remote management and monitoring.

DG64. Automate problem detection and correction.

DG65. Minimize costs of long term maintenance.

DG66. Enable tight control over configuration and changes.

DG67. Support central distribution of patches, updates, and changes.

Cross-cutting

DG81. Improve security.

DG82. Meet performance expectations.

DG83. Be resilient to denial of service issues involving bandwidth, connection attempts, or resource utilization.

DG84. Eliminate single points of failure at all levels from individual resources to building level including:
- DG84a. Backups
- DG84b. CPUs and/or servers
- DG84c. Dependent services (either HeV built or "stock" like DNS, DHCP, etc.)
- DG84d. Disks and storage network
- DG84e. Network components
- DG84f. Power/Environmental
- DG84g. System Administrators/Operators

DG85. Maintain separate environments for:
- DG85a. Production
- DG85b. Production (time delayed by a few weeks) Mirror
- DG85c. Quality Assurance
- DG85d. Development
- DG85e. Disaster Recovery

Realizations

Physical

R01. Deploy onto high availability blade servers with features to scale up and/or out capacity, repurpose servers, and provide N+1 excess performance capacity, possibly utilizing virtualization techniques.
← AA1, PA1, DG01, DG02, DG03, DG06, DG82, DG84b

R02. Install context-sensitive load balancers and network redirection.
← AA1, PA1, DG02, DG83

R03. Redundant communications links and hardware at all network levels (LAN, VISN level, enterprise WAN).
← DG06, DG84e

R04. Adhere to open, industry standards and minimizes proprietary solutions.
← DG05, DG23, DG65
(Not shown since it's not tied to any single piece of equipment.)

R05. Maintain point of care contingency systems (ward, clinic, etc.) for critical systems.
← AA1, AA2, DG02, DG62, DG84* (for critical systems)

R06. Have spare parts readily available.
← AA1, DG02

R07. Provide "concurrently maintainable" data center infrastructure for HealtheVet production deployments, including utility services. (not pictured)
← AA1, AA2, DG62, DG84

Logical

R21. Use mature software components (COTS or Open Source) that have a proven industry track record for quality.
← DG21

R22. Adhere to open software APIs/standards.
← DG05, DG23

R23. Avoid use of proprietary vendor features except when absolutely required.
← DG23

R24. Use clustered deployment of the applications/services.
← AA1, DG02, DG22, DG82, DG84

R25. Perform detailed capacity planning analyses and tests and plan increases in computing resources accordingly.
← PA1, DG82

R26. Maintain a categorization of applications according to performance, availability and capacity needs and leverage hardware accordingly.
← AA1, PA1, DG82

R27. Use transparent container managed security (authentication and authorization) to the extent feasible.
← DG42, DG81

R28. Utilize secure (confidential and integrity assured) communications protocols and/or networks.
← DG42, DG81

R29. Produce and maintain a developer guidance document listing robust coding practices including:
Handling restarts.
Failures of dependencies.
Analysis of logic especially boundary checks and returned value checks
Assume failures will happen and code "defensively".
← AA1, DG21

Data

R41. Maintain and test backups (as tape or optical).
← DG41

R42. Maintain offsite backups.
← DG41, DG84a

R43. Adopt national master patient record with local sites capable of being populated from it.
← DG41, DG84a

R44. Implement "add only" approach (versus allowing "edits") to the patient record.
← DG41, DG81

R45. Maintain audit records of access to data.
← DG42

R45. Utilize a RAID based SAN with remote site mirroring for storing data
← DG41, DG84d

Management

R61. Consolidate hardware resources into a small number of data centers.
← DG61, DG65

R62. Develop a common template for all data centers.
← DG61. DG65, DG66

R63. Use a common set of "prebuilt" and identical configurations across sites and servers.
← DG61. DG65, DG66, DG67

Cross-cutting

R81. Perform robust testing of the environment under failure modes.
← AA1

R82. Produce and maintain change control documentation for all changes, both software and hardware.
← DG61, DG66

R83. Maintain a failure and disaster recovery plan.
← AA1, DG84

R84. Maintain a dependency graph of components (both HeV built and off-the-shelf) that is integrated with the contingency plans and used for operational planning to properly predict impacts of a scheduled outage.
← AA1, AA2, DG62

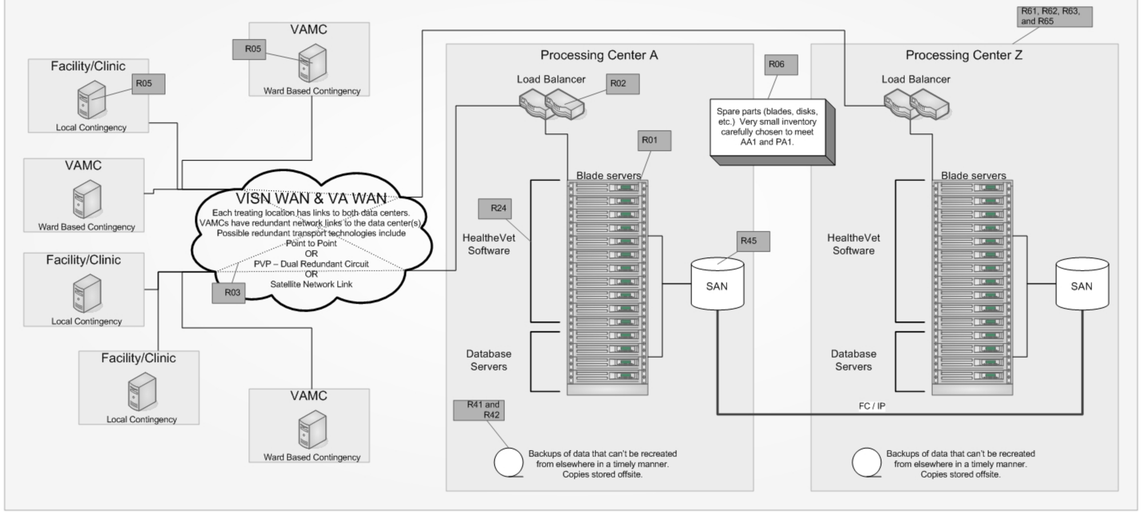
R85. Implement limited access data centers and tightly controlled operating environments.
← DG66, DG81

Unrealized Dependability Goals

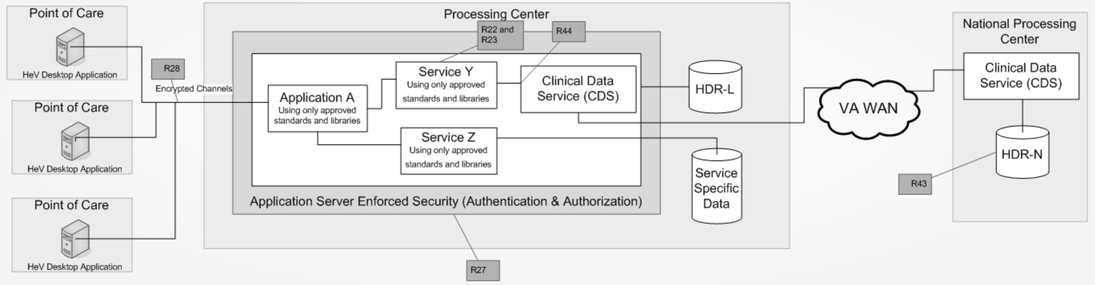
The realizations of the following Dependability Goals are not organizationally accepted or management approved at this time. They are currently being addressed and when resolved will appear on a future version of this sheet:

DG04, DG05, DG63, DG64, DG85

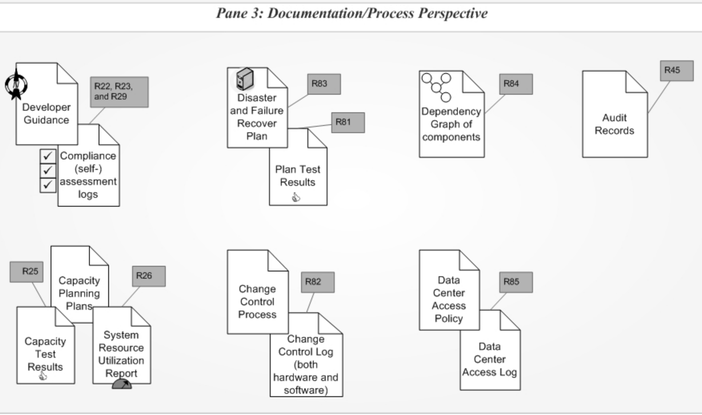
Pane 1: Physical Perspective



Pane 2: Logical Perspective



Pane 3: Documentation/Process Perspective



Acronyms and Abbreviations:

CDS – Clinical Data Service
COTS – Commercial Off The Shelf
CPU – Central Processing Unit
DHCP – Dynamic Host Configuration Protocol
DNS – Domain Name Service
FC/IP – Fiber Channel over Internet Protocol
HDR-L – Health Data Repository – Local
HDR-N – Health Data Repository – National
HeV – HealtheVet
PVP – Permanent Virtual Pipe
SAN – Storage Area Network
VAMN – VA Medical Center
VistA – Veterans Health Information Systems and Technology Architecture
VISN – Veterans Integrated Service Network
WAN – Wide Area Network

Direct co-dependencies:

Direct dependencies:

About this sheet:

Domain: Solution
Sub-domain: Dependability
Level of detail: Logical
Description:
This sheet shows the goals and realization mechanisms for dependability.

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Operational Dependability

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: E3

Blueprint Build: 00.06

Pane 1: Schedule of VA Standards

Pane one lists the standards allowed by the VA that can be used by HealtheVet projects.

INFORMATION/DATA

Supporting Applications
License and System Management
MS SMS v2, MIB-II, RMON (IETF RFC 1155, 1213, 1757)
Office Development
MS Back Office
Office Automation
MS Office

Electronic Mail Services
MS Exchange (5.5 or later)
Post Office Protocol (POP) IETF RFC 1939
Simple Mail Transfer Protocol (SMTP) IETF RFC 821

Native Formats
Document Format
PDF, RTF, DOC, XML, HTML
Graphic Format
GIF, JPEG, OpenGL, PNG, SVG
Audio Format
MP3
Video Format
MPEG-1, MPEG-2, MPEG-4

Simple Object Access Protocol (SOAP)

Information Modeling
Clinical Information (Text-based) HL7 2.4
Business Information ASC X12, HL7 2.4
Medical Images DICOM 3.1 JPEG 2000
Digital Image Compression (ISO/IEC 10918.1-2), GIF
Video Compression (MPEG 1) (ISO/IEC 11172.1-4), MPEG 2
Documents & Hypertext Documents- SGML, XML, HTML

Data Representation
Database
RDBMS, Cache, Oracle SQL Server
Repository
Patient Record Architecture-HL7, Drug Codes-NDC
Vocabulary
Lab & Clinical Observation Codes- LOINC, Mental Disorder Codes-DSM IV
Multiaxial Medical Nomenclature, SNOMED/SNOMED-CT
Outpatient Procedures- CPT- 4, Patient Diagnosis- ICD-9-CM
MetaData IEEE 1484 Series, MetaData ISO 11179, ANSI, X 3.285, SMI, MOF, CWM

Meta Data Services
XML, DT4TD, XPOINT
Schema, DataType, Namespace
WSDL, Model, Exchange, UDDI
Registry, Design, Implementation

APPLICATION/SOFTWARE

Programming Languages

Java Language, Java Script, Enterprise Java Beans

Common Presentation Services
Access Standards Board for 508

Information Exchange Protocols

N-Tier Architecture

Client Tier

GUI Client
Java 2 Standard Edition (J2SE)

Mobile Client
IEEE 1073

Web Client
JavaScript, J2SE

Data Tier
URL, CSS, CSS Mobile
CGI, PERL, Java2 Servlets & JSPs, JavaBean
SQL, IEEE 11073, NCDCP
XML, LOINC, WSDL
UDDI, LDAP, GIF
MPEG, JPEG, JPEG 2000

Application Tier
Java 2 Enterprise Edition (J2EE)
XSLT, XPATH,
PERL, XSLT, HTML, XHTML
EDI, ODBC, OLEDB,OASIS
SQL, SQL for Java
DICOM, HL7

Character-Based Interface
TELNET (IETF RFC 854, 855, 856)

SECURITY

Confidentiality
NIST FIPS PUBs 46-3,171, 180-2,185, 186-2
IETF RFCs 2246, 2406, 2409, 2633, 2660
ISO/IEC 10181-5: 1996

Encryption
NIST FIPS PUBs 46-3, 140-2, 171, 180-2, 185, 186-2
RFCs 2246, 2406, 2409, 2633, 2660
ASTM E1762-95, E1986-98

Virtual Private Networks
IETF RFCs 2401, 2402, 2406, 2409

Checksum
NIST FIPS PUBs 180-1, 198

Digital Signature
FIPS PUBs 140-2, 186-2
IETF RFCs 2807, 3075, 3076, 3275

Public Key Infrastructure
NIST FIPS PUB 140-2
IETF RFCs 2459, 2510, 2511, 2528, 2559, 2560, 2585, 2587, 3280

Access Control
ASTM E1985-98, E1986-98, E1762-95, E2084-95, E2212-02a
ISO 10181-3: 1996
ANSI INCITS 359-2004 - RBAC
OASIS XACML

Identification and Authentication

IETF RFC 2865
OASIS SAML

Identity and Access Management
HL7: CCOW
OASIS SPML
ASTM E1714-00

Biometrics
ANSI/INCITS 358
ANSI X9.84
ANSI/NIST – ITL-1-2000
CBEFF – NISTIR 6529

Security Token
NIST FIPS PUB 140-2

Intrusion Detection Devices
NIST SP 800-31

Privacy
NIST FIPS PUB 1402
IETF RFC 2196

Electronic Signature
ASTM E 1762-95
ASTM E 2084-00

INFRASTRUCTURE

System Software/Hardware

Server Operating Systems
MS Windows 2000 or later, MS Windows 2003
IEEE 1003 POSIX for UNIX and LINUX

Multimedia
FIPS PUB 178

Network Management
ITU T.120 (T.120- T.132)
H.221,H.223 ,H.230, H.231 H.242, H.243, H.245 H.261
ITU H.320
ITU H.323 (LAN) ITU H.310 (ATM), ITU Q.931 (ISDN)
SNMP v3 (IETF RFC 2272) MIB, MIB-II (IETF RFC 1155, RFC 1157, RFC 1213, RFC 2819)
RMON (IETF RFC 2021, RFC 2034)

Network Connectivity

OSI Physical and Data Link Layer
IEEE 802.3x, 10Base, 100Base Fast, 1000Base Gigabit Ethernet

Fiber Distributed Data Interface (FDDI) (ISO 9314)

Wiring
Category 5 (CAT-5), Category 6 (CAT-6) Unshielded Twisted Pair

Telecommunications

LOCAL AREA NETWORKS
IEEE 802.1q (VLAN)
TCP/IP (IETF RFCs 791, 793, 919, 922, 959, 1122)

Wireless
IEEE 802.11X
EAP, TTLS, WTLS
PEAP, Protected EAP
TTLS-EAP
WEP, TKIP, TWPA

WIDE AREA NETWORKS

OSI Layer 2 Protocols
ISDN (FIPS 182) ITU Q.931, FRAME RELAY
ANSI T1.606, ANSI T1.618, ATM
ANSI T1.627, T1.629, T1.630

OSI Layer 3 Protocols
UDP, ICMP (IETF RFC 792)
DHCP (IETF RFC 2131),BGP (IETF RFC 1771)
OSPF (IETF RFC 1583)

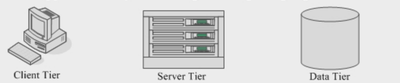
Schedule of CHI Standards

Domain	CHI Adopted Standard
Messaging Standards	Health Level 7 (HL7) Version 2.3
Retail pharmacy transactions	NCPDP SCRIPT
Instrument Data Exchange	IEEE 1073
Imaging (intra-agency)	DICOM
Laboratory Results Names	LOINCLab
Test Order Names	LOINCLab
Result Contents	SNOMED CT
Medications	
Federal Drug Terminologies	(FDA, NLM, VA)
Demographics	Health Level 7 (HL7) Version 2.4 and higher
Immunizations	CVX and MVX codes from HL7 Version 2.3.1
Units	HL7 Version 2.4+
	CHI Recommended Standard
Interventions/ Procedures	SNOMED CT
Clinical Encounters	Health Level 7 (HL7) Version 2.4 and higher
Diagnosis/ Problem List	SNOMED CT
Medical Devices/Supplies	No recommendation.
Anatomy/Physiology	SNOMED CT
Population Health	No recommendation
History and Physical	Defer
Nursing	SNOMED CT
Genes and Proteins	Human Gene Nomenclature (HUGN) for genes. No recommendation for Proteins
Text-Based Reports	HL7 CDA Release 1.0- and higher
Disability	Future Work
Financial/ Payment	(Billing HIPAA) HIPAA approved code sets
Chemical (UMLS)	Conditional: EPA Substance Registry System

Pane 2: HealtheVet Application of VA Standards

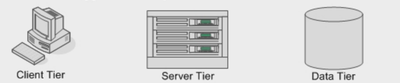
Pane Two shows how many of the standards in Pane One will be used in the construction of HealtheVet.

Application/Software Programming Languages



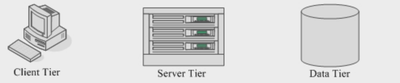
- Client Tier: Java 2 Standard Edition; JavaScript; XSLT
- Server Tier: Java 2 Enterprise Edition; Perl
- Data Tier: SQL

Application/Software Data Formats



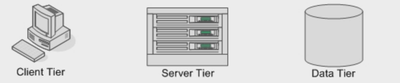
- Client Tier: (X)HTML; GIF; JGEP; PNG; PDF; RTF; DOC; MP3; MPEG-1/-2/-4
- Server Tier: JDBC rows/columns; XML
- Data Tier: RDBMS; All types allowed by SQL plus blobs storing types allowed on client tier

Operating Environment



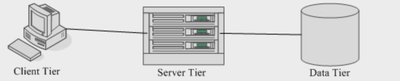
- Client Tier: Microsoft Windows 2000 or XP; Java 2 Standard Edition; Graphical Microsoft Windows based Terminal Servers
- Server Tier: Linux; Java 2 Enterprise Edition; HTTP Server
- Data Tier: HP-UX and/or Linux; Caché and/or Oracle

Information Modeling Mechanisms



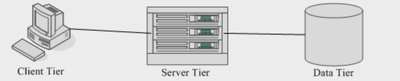
- Client Tier: N/A
- Server Tier: UML
- Data Tier: DDL; NDC; LOINC; DSM-IV; SNOMED; CPT-4; ICD-9-CM

Communications Content Format



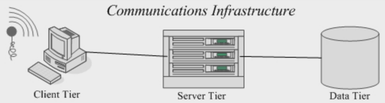
- Client Tier: (X)HTML; GIF, JPEG, PNG; PDF, RTF, DOC; MP3; MPEG-1/-2/-4; CSS, XSLT; JavaScript; Java Applets
- Server Tier: SQL commands; SQL rows and columns

Communications Protocols



- Client Tier: HTTP(s); RMI over IIOP(s); TCP/IP
- Server Tier: TCP/IP

Communications Infrastructure



- Client Tier: IEEE 801.11x (wireless); IEEE 802.3x (Ethernet) at 10, 100 and 1000 Mbps; Modems; Dedicated leased circuits
- Server Tier: FDDI; IEEE 802.3x (Ethernet) at 10, 100 and 1000 Mbps; ATM

Notes:

The Schedule of VA Standards is produced and maintained through the use of an evergreening process, consistent with the dynamic and ongoing changes that occur within the scope of technology and the Blueprint for HealtheVet. As an evolving document, it is updated periodically to address emerging standards that are ratified and obsolete standards that are retired. The evergreening process of the Schedule of VA Standards is the key to ensuring alignment and compatibility between current standards and the technologies and services that support the Blueprint for HealtheVet.

Acronyms and Abbreviations:

ANSI – American National Standards Institute
CHI – Computer Human Interface
CPT – Current Procedural Terminology
DICOM – Digital Imaging and Communications for Medicine
DSM-IV – Diagnostic and Statistical Manual, 4th Edition
EPA – Environmental Protection Agency
FDA – Food and Drug Agency
HIPAA – Health Information Portability and Accountability Act
HL7 – Health Level 7
HTML – Hypertext Markup Language
HTTP(s) – Hypertext Transport Protocol (secured)
HUGN – Human Gene Nomenclature
ICD – International Classification of Diseases
IEEE – Institute of Electrical and Electronic Engineering
ISO/IEC – International Standards Organization/ International Electrotechnical Commission
LOINC – Logical Observation Identifier Names and Codes
MIB-II – Management Information Base 2
MPEG – Moving Picture Experts Group
MS – Microsoft
NDC – National Drug Code
NLM – National Library of Medicine
RDBMS – Relational Database Management System
RFC – Request for Comments
RMON – Remote Monitoring
SGML – Standard Generalized Markup Language
SMI – Storage Management Initiative
SMS – Systems Management Software
SMTP – Simple Mail Transport Protocol
SNOMED CT – Systematized Nomenclature of Medicine Clinical Terms
SQL – Structured Query Language
UDDI – Universal Description, Discovery and Integration
UML – Unified Modeling Language
UMLS – Unified Medical Language System
XML – eXtensible Markup Language

About this sheet:

Domain: Solution
Sub-domain: Standards
Level of detail: Logical
Description:
The standards profile that HealthgVet components will adhere to.

Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: HealtheVet

Drawing:

Architectural Standards Profile

APPROVAL	INITIALS	DATE:
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: F1

Blueprint Build: 00.06

Vision

The vision of Health**e**Vet is to be VA's next generation healthcare information system that becomes the industry benchmark for care quality, safety, and patient satisfaction.

Mission/Purpose

Health**e**Vet will provide patient-centric data repositories, enhanced clinical decision support and analytical capabilities, personalized care and access to health information for patients, and increased opportunities for information exchanges with healthcare partners.

Health**e**Vet includes the phased replacement of the existing VistA-Legacy system on a new technology platform. As Health**e**Vet is implemented, the VistA-Legacy system, national databases and registries will be retired.

- Health**e**Vet is a comprehensive system that will support a full range of users including clinical, research, education, administrative, financial and management.
- Health**e**Vet promotes seamless integration of care between VA and DoD.
- Health**e**Vet is designed as an affordable option for providers in rural and medically underserved communities.

Health Care Drivers

Business Drivers
- Veterans Integrated Service Network (VISN) Realignment
- OneVA
- Agency Collaboration
- Care Management
- Population-based Health Schemes
- Inpatient to Outpatient Outsourcing Shift
- Quality and Performance Management
- Veteran Demographics
- Cross Business Line Integration
- Patient Access to Health Centered Systems
- Patient Safety
- Assume Leadership Role in Health Care Education and Research

Technology Drivers
- E-commerce digital convergence
- Digital Convergence
- E-Healthcare via high speed technology and portals

Expectations

Department of Veterans Affairs
- Compliance with OneVA Enterprise Architecture
- Fully utilize OneVA Telecommunications infrastructure
- Implement centralized user and system security management
- Cost Effective

Veterans Health Administration
- Centralized Legal Electronic Health Record (HER) Repository for Text & Coded Data
- Single Access Point for Legal EHR
- Privacy & Security of Information
- Record Archival & Retrieval Ability
- Purge Capability to be determined
- Design Optimized for Operations (health care delivery – Vet-Centric)
- Connected (record sharing)

Office of Information
- Rollout of (functional & useful) Health Data Repository (HDR) by September 2005
- Will not Lose Functionality & Performance
- Policy adherence on Data Standards & Interchanges as Systems are Replaced (Consolidated Health Informatics [CHI], VHA-VA, VA-Department of Defense [DoD], VA)
- Standard Data Representation to Minimize Vendor Dependence
- Highly portable Vendor Independent Logical Design

User
- System Availability & Performance
- Predetermined with Data Currency
- Longitudinal Record Access (Continuum of Care Including Non-VA, Home Care)
- Transactional & Analytical Ability (Audit?)
- Application Extensibility at Local Level (with Core Systems Lockdown)
- Operational Efficiency (productivity) with Conformance Mechanism

Veteran
- Accessibility
- Data Quality
- Privacy & Security of Information

Design Goals

Six dominant elements describe the broad architectural goals of the health information architecture.
These elements are discussed as separate entities for presentation purposes.
In reality, the goals are interrelated and do not stand alone.
The elements are the following:

- Patient Health Centered
- Services Oriented
- Standards Based
- Secure
- Component Based
- Web Enabled

Success Requisites

Legislative Compliance
Health Insurance Portability and Accountability Act of 1996 (HIPAA)
Government Performance and Results Act (GPRA)
Veterans Millennium Bill of 1999
Privacy Act
Security
Accessibility
Single Sign-on
Software/Hardware Trust
Identification and Authentication
Technical Performance
Availability
Scalability
Reliability
Interoperability
Manageability
Serviceability
Maintainability

Interim Critical Attributes **(final list of critical attributes is being defined)**

Adaptability is key to the VHA's future architecture. However, the architecture must possess other critical attributes as well. Eight critical attributes are listed below along with corresponding performance measures.

Adaptable: The future information infrastructure comprises flexible or easily replaceable components that can readily adapt at the same pace as our business.

Performance measure: Is the EA (Enterprise Architecture) tactically agile such that major business initiatives can move forward without delays caused by infrastructure barriers?

Patient health centered: The information technology (IT) systems are configured and tuned to focus on supporting the health of the veteran population, contributing to maximizing patient functionality, outcomes measurement, and health value.

Performance Measure: Are IT systems designed and developed from a patient-centric, global perspective?

Accessible: The architecture facilitates the users' ability to obtain or supply the right information in the desired form quickly and easily.

Performance Measure: Does the architecture provide various user interface types that are available at the right access points and satisfy the needs of the various categories of users (e.g., providers, support staff, veterans?

Interoperable: VHA's architecture provides a framework that facilitates reliable and seamless data exchange between heterogeneous applications throughout the business enterprise in a consistent manner.

Performance Measure: Does the architecture employ standards-based data interchange methods that maintain data integrity and provide for multi-point sharing?

Connected: The architecture promotes membership of the VHA's information systems (and consequently our users) into a much larger community

Performance Measure: Does the architecture make possible data interchange with external knowledge sources (via the Internet), alliances, partners, administrations, and agencies?

Secure: The security architecture preserves and protects against unwanted loss, damage, or disclosure of data.

Performance Measure: Are documented breaches and the results of planned penetration studies within acceptable limits? Are continuous architectural improvements being made in *anticipation* of future needs?

Maintainable: The architecture uses highly leveraged, cost effective, modular, and readily available technologies.

Performance Measure: Does the architecture avoid unnecessary complexity, tightly coupled systems, native interfaces, and proprietary solutions where reasonably avoidable?

Standards based: The architecture makes extensive use of standards.

Performance Measure: Does the architecture widely employ the standards identified in the VHA Standards Profile?

An Enterprise Architecture that possesses these attributes serves as the glue that binds the organizational aspects of business processes, information needs, application systems, data definitions, and delivery systems.

Blueprint for Health**e**Vet Reference Links

Acronym List	http://vaww1.va.gov/med/acronyms/acronym.cfm
CHI Standards	http://www.hhs.gov/healthit/attachment_3/v.html
VA EA Standards	http://vaww.va.gov/OIT/EAM/EAservice/EAv2-1Collection/default.asp ,Volume II

Frequently Asked Questions

What is the Blueprint for Healthe**Vet?**
The Blueprint for Health**e**Vet contains graphical descriptions of the services and technologies to be used by developers, implementers and support teams to support business functions of the VHA enterprise. The visual depictions are a roadmap and tool for defining the health information architecture, which aligns with the VA Enterprise Architecture (EA). The Blueprint for Health**e**Vet is developed by a cross-organizational team of Domain Subject Matter Experts and Owners, overseen by the office of Health Information Architecture, and is a collaborative product of the VHA business and information technology communities.

What is the purpose of the Blueprint for Healthe**Vet?**
The Blueprint for Health**e**Vet support the priorities, goals, and strategies documented in the One-VA EA. The primary purpose of the Blueprint for Health**e**Vet is to promote understanding and communication of the Health**e**Vet architecture in support of the EA goals.

What is the scope of the current release?
Blueprint for Health**e**Vet version 1.0 represents an "As Is" model as well as a "To Be" representation to the extent that management has agreed to the direction.

Who is the primary audience?
Blueprint for Health**e**Vet version 1.0 is expected to reach a wide range of stakeholders which will include architects, system developers and designers, project managers, implementation and support personnel, and others who wish to obtain useful information about the services and standards that comprise the Blueprint for Health**e**Vet .

What are the plans for updating the information?
The team expects to provide quarterly update revisions of the Blueprint for Health**e**Vet.

I have suggestions for improvement to the Healthe**Vet Blueprints. Whom should I contact?**
Feedback regarding needed corrections, suggestions, and recommendations can be submitted through the Blueprint for Health**e**Vet change management process via the HIA web site. A web-based change request / issue report form is available at this location: http://vaww.va.gov/vhaea/scripts/visualarchitecture.asp.

The Blueprint for Health**e**Vet Oversight Group may be contacted using the OI HIA Blueprint for Health**e**Vet Oversight distribution list in the Outlook Global Address List.

Blueprint for Health**e**Vet Content Responsibility

Sheet	Subject Matter Expert	Domain Owner	Content Responsibility
A1	Satish Gattadahallli	Don Cannatti	Health Information Architecture (HIA) – Collaboration and Support
A2	Jack Bates	TBD	Office of Health Data and Informatics
A3	Dennis Park	Don Cannatti	HIA-Collaboration and Support
A4	Susan Dahlberg	Steve Wagner	HIA-Standards and Engineering
A5	Arup Sen	Don Cannatti	HIA-Collaboration and Support
B1	Donna Harrigan	Don Cannatti	HIA-Collaboration and Support
B2	Don Oestreicher	Catherine Pfeil	Health Systems Design and Development (HSD&D) - Development and Infrastructure Support
B3	Don Oestreicher	Catherine Pfeil	HSD&D - Development and Infrastructure Support
B4	Don Oestreicher	Catherine Pfeil	HSD&D - Development and Infrastructure Support
B5	Keith Cox	Mark Warner	HSD&D - Management Systems
B6	Keith Cox	Mark Warner	HSD&D - Management Systems
B7	Ioana Singureanu	Steve Wagner	HIA-Standards and Engineering
B8	David Reed	Steve Wagner	HIA-Standards and Engineering
B9	David Reed	Steve Wagner	HIA-Standards and Engineering
C1	Galen Mulrooney	Steve Wagner	HIA-Standards and Engineering
D1	John Beaufait	Gerry Barry	Health Systems Implementation, Training and Enterprise Support (HSITES) – Enterprise Management Center
D2	John Beaufait	Gerry Barry	HSITES - Enterprise Management Center
D3	Dave Bradley	Dave Bradley	OI Technical Advisor-Telecommunications
D4	John Beaufait	Anne Ellis	HIA-Technology Integration
E1	Mike Davis	Steve Wagner	HIA-Standards and Engineering
E2	Mike Davis	Steve Wagner	HIA-Standards and Engineering
E3	John Beaufait	Anne Ellis	HIA-Technology Integration
F1	Reggie Terrell	Steve Wagner	HIA-Standards and Engineering
F2	Adriaan Denkers	Anne Ellis	HIA-Technology Integration

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Direct co-dependencies:

Direct dependencies:

U.S. Veterans Health Administration

System: Health**e**Vet

Drawing:

Supplemental Notes

APPROVAL	INITIALS	DATE
VHA Chief Architect:		
Chief Health Informatics Officer:		
Chief Information Officer:		
Program Management Officer:		

Sheet: F2

Blueprint Build: 00.06