Program Update

Rafael Richards MD, MS
Lead for CIDMO DMA Program 3.8 and
VISTA Point of Care Application Analytics (VPA2)

Rafael Richards MD MS has been a physician informaticist in VHA with a focus on the VHA information systems technology and architecture (VistA), leveraging its 400 million veteran-years of data and institutional knowledge to improve accessibility, interoperability, and clinical delivery of care to veterans. With the migration of the VistA systems to the VA Enterprise Cloud, he is now focused on cloud-based solutions to improve VHA clinician experience and workflows using cloud-based Vista point-of-care application analytics (VPA2).   Dr. Richards is also the co-director of VA anesthesia information systems, and supporting enterprise analytics and modernization.

Rafael graduated with a BS Engineering from Swarthmore College, MS Applied Mathematics from Lehigh University, Doctor of Medicine from Temple University. He completed residency in anesthesiology and critical care medicine at Harvard / Massachusetts General Hospital, and post-graduate certificate in blockchain technology from Massachusetts Institute of Technology. Before medical school he spent several years in biomedical engineering designing real-time critical care monitoring and analytics systems and was a scientific computing consultant with Apple Europe, IBM, Digital Equipment Corporation, and Mathematica in Oxford UK. He spent several years at University of Pennsylvania as a research associate in cardiothoracic anesthesiology studying real-time intraoperative stroke detection. He has over thirty scientific publications and proceedings, and a book chapter on anesthesiology informatics.   Rafael currently resides in Philadelphia, PA with his wife and two dogs. When not at home, he enjoys spending time her at his lake cottage in the the finger lakes of upstate NY, adventure travel, hiking, backcountry skiing, snowkiting, and sailing.

Executive Summary

Objective

Provide an empirical, data-driven approach to optimizing clinical staff workflows and efficiency via analytics of all transactional workflows of all users, usage, and transactions of VISTA's Point-of-Care Applications.

Background

Veteran care is provided using VISTA's point-of-care applications (CPRS, Brillians, BCMA and fifty others). To date the workflows of VISTA's applications have not been monitored, measured, analyzed or optimized for efficiency or performance. Over the past four years all VISTA systems were migrated to the VA Enterprise Cloud (VAEC), a federally certified commercial cloud managed by Amazon Web Services (AWS). In this new AWS platform the VISTA systems can take advantage of hundreds of commercial cloud-based services to improve veteran care.

In the VPA2 project we leverage AWS traffic mirroring to provide analytics of the traffic flows, transactions, users and usage of VISTA's point-of-care applications to target areas where we can optimize and improve user experience.

Clinical Focus

Clinician time is the most valuable commodity in VHA healthcare system. Clinician efficiency is a primary factor that determines Veteran access to care.

Impact

VHA provided 115 million veteran care encounters in FY22 using VISTA's point of care applications. At this scale saving one minute per encounter is the equivalent time savings as adding 1000 full time clinical staff to VHA's workforce, improving veteran access to care.
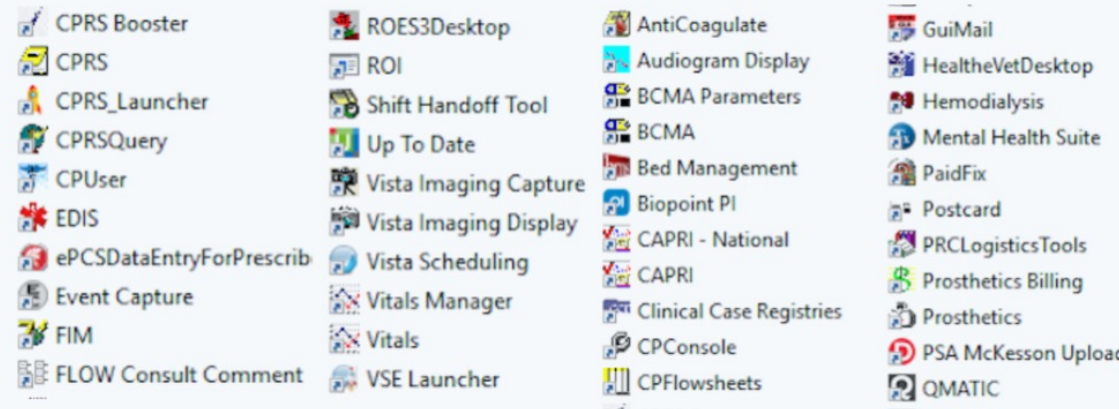
Support

CIDMO / FY24

Background

VHA clinical staff provide veteran care using a suite of VHA Information Systems Technology Architecture (VISTA) Point-of-Care Applications (VISTA Care Apps).   Each day 270,000 VHA staff at 1250 care facilities use VISTA Care Apps to create, store, and process over 4 million new documents, images, lab, and pharmacy orders in VISTA.

VHA staff ⟷ VISTA Care Apps ⟷ *workflow* ⟷ VISTA

VISTA Database

- 4 million new documents, lab, imaging, and pharmacy orders each day
- 500 million veteran-years of cumulative data and knowledge

VISTA Care Applications (50+)

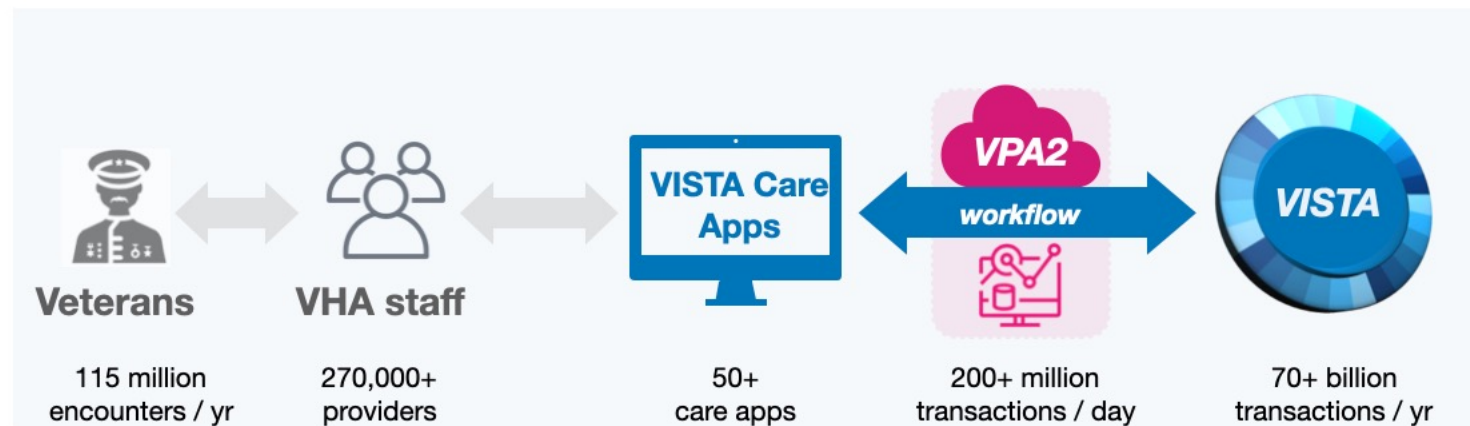|			
CPRS Booster	ROES3Desktop	AntiCoagulate	GuiMail
CPRS	ROI	Audiogram Display	HealtheVetDesktop
CPRS_Launcher	Shift Handoff Tool	BCMA Parameters	Hemodialysis
CPRSQuery	Up To Date	BCMA	Mental Health Suite
CPUser	Vista Imaging Capture	Bed Management	PaidFix
EDIS	Vista Imaging Display	Biopoint PI	Postcard
ePCSDataEntryForPrescrib	Vista Scheduling	CAPRI - National	PRCLogisticsTools
Event Capture	Vitals Manager	CAPRI	Prosthetics Billing
FIM	Vitals	Clinical Case Registries	Prosthetics
FLOW Consult Comment	VSE Launcher	CPConsole	PSA McKesson Upload
		CPFlowsheets	QMATIC

VISTA Care Apps

- VISTA Care Apps are a suite of 50+ applications installed on all 400,000 desktop computers at all VAMCs
- Use the VISTA database for all their transactions and data management
- VISTA Care Apps include CPRS, Brillians, Vista Imaging, and BCMA

VISTA Care App Analytics Framework

The cloud-based VISTA Point-of-Care Application Analytics (VPA2) framework captures and enables analysis of all care transactions (workflows) between VISTA Care Applications and the VISTA database.

Veterans	VHA staff	VISTA Care Apps	VPA2 workflow	VISTA
115 million encounters / yr	270,000+ providers	50+ care apps	200+ million transactions / day	70+ billion transactions / yr

The VPA2 framework provides - for the first time - comprehensive real-world transactional traffic (workflow) monitoring and analytics on the usage of VistA Point of Care Applications, and thus enables data-driven improvement to the workflows and efficiency of VHA clinical staff.

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VAEC VISTA App Analytics

VISTA Care App Analytics Implementation

All VISTA systems have been migrated to the VA Enterprise Cloud (VAEC), a federally-certified commercial cloud provided by Amazon Web Services (AWS). VPA2 leverages VISTA's new AWS-based technology and platform to provide secure cloud-native streaming traffic analytics.
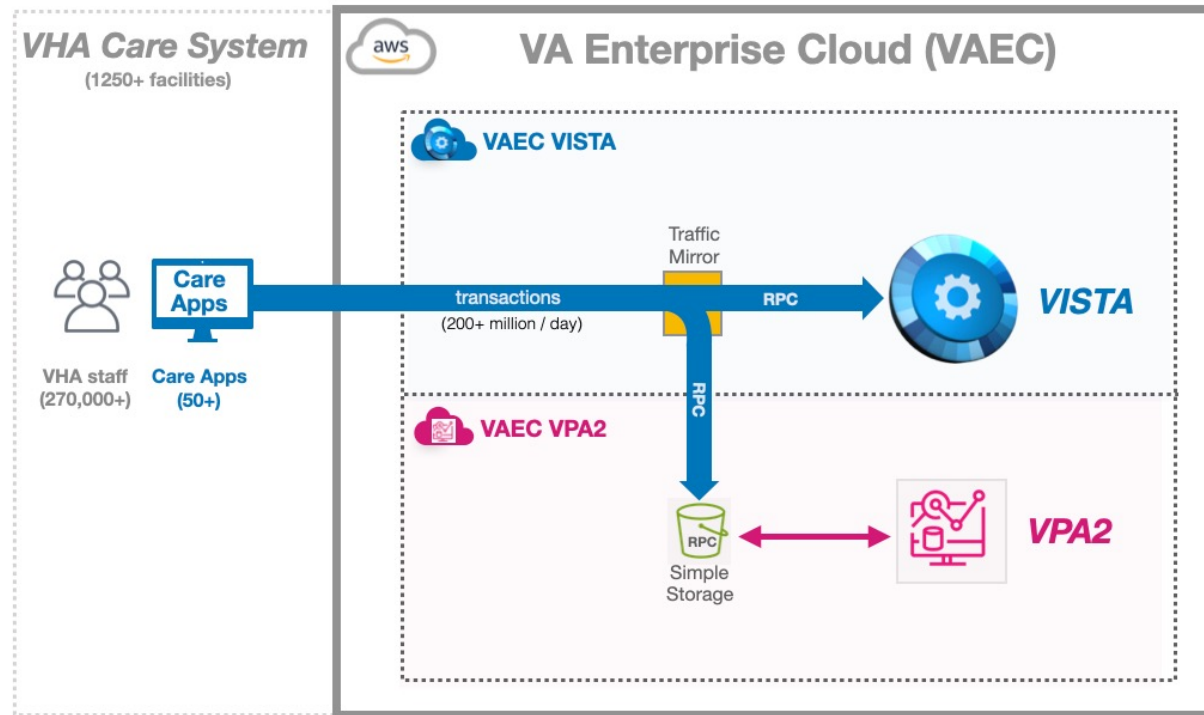
AWS is a leading commercial cloud services provider

VAEC-based VISTA inherits hundreds of new features, functionality, and services in the AWS cloud, including security, scalability, and traffic monitoring.

VPA2 is implemented in the same secure cloud as VISTA, which enables streaming analytics of VISTA traffic and applications without limitations.

VAEC VISTA

VISTA: VHA Information Systems Technology Architecture
Care Apps: CPRS, Brillians, BCMA (and 50+ others)
VAEC: VA Enterprise Cloud
RPC: Remote Procedure Call (transaction)
AWS: Amazon Web Services
VPC: Virtual Private Cloud

VAEC VISTA
U.S. GovCloud: FedRAMP-HIGH
VA: RiskVision (425 controls)
DoD: eMASS (1600+ controls)
NIST: FISMA-HIGH, FIPS
HHS: HIPAA

App Analytics
VASI ID: VAM
VA: T4NG-0411
TAC: 19-54164
ATO: 2020-01
IOC: 2020-03

U.S. GovCloud Certified

VISTA Care Application Analytics

- **User types and volume of use**
  physicians, nurses, administration (100+ other)
- **Application types and volume of use**
  CPRS, Brillians, Imaging, BCMA (50+ other)
- **Connection volumes, frequency, and duration**
  Where, when, and how long are application connecting?
- **Types of user authentication and relative use**
  PIV? User/pass? Remote / local?
- **Performance and timing**
  Execution times of transactions determines end-user workflow experience
- **Local VAMC workflow vs Enterprise standard workflow**
  Local VistA RPCs vs cross-VistA RPCs

VISTA Care App Analytics Benefits

VISTA Care App Analytics enables improvement in the following areas by providing real-world data on the usage of point of care applications

User Experience:
- *Real-world usage of VHA point-of-care applications (CPRS, Brillians, Vista Imaging…)*
- *Real-world timings for all user interactions with all menus, options, and actions such as login time, time to open large complex documents, time to access and open images, etc.*

Strategic Investment:
- *Identification of unused or little used features, functions, and applications which may be then safely retired, reducing complexity, cognitive burden, and cost of maintenance*

Enterprise Standardization:
- *Identification of variations of usage of applications and functionality across multiple different VA medical centers.*
- *Initially three representative VISTAs/VAMCs will be analyzed*

Workflow:
- *Identification of 'hotspots' of application inefficiency (redundant workflow, workarounds, latency) to target simplification and acceleration*

CIDMO Action / Follow-up:

- *Seeking clinically active CIDMO informaticists interested in piloting VISTA Care App Analytics at their VAMC.*
- *Three representative VAMCs of varying size and complexity*
- *Assist with identifying application 'hotspots' of high latency*
- *Input on other areas of focus for application analytics*

Contact

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Information

cloudvista.github.io/app-analytics