
Spectrum Health
Next Generation Clinical Desktop

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End State Vision – User Perspective

User Challenge	Business Solutions
<p>“Every time I open a new application I’m asked to log in again which over the course of a day adds up to a lot of time”</p>	<p>Provide a <u>Single Sign On</u> solution for core clinical and business applications.</p> <p>Provide <u>advanced authentication</u> technologies in appropriate locations</p>
<p>“I need to use several clinical applications during the course of my day to treat patients and it is very time consuming moving between applications to find what I’m looking for”</p>	<p>Provide patient centric <u>context integration</u> between core clinical applications, allowing users to move easily between applications while maintaining a consistent view of clinical information</p>
<p>“It takes too long to get into my applications because I have to start over from the beginning every time I move to another device”</p>	<p>Provide a <u>global desktop roaming</u> solution that will allow all users to roam between devices and locations while maintaining the state of their applications and data providing an “always on” solution”</p>
<p>“The way I access my applications and data varies depending on where I’m at, what device I’m on, and what job I’m performing”</p>	<p>Provide a <u>common user interface</u> and experience to all Spectrum Health Clinical and Business Applications regardless of device, location, workflow, role or organization</p>
<p>“I never know what to expect when I log into a device. Some are painfully slow, others provide an acceptable experience”</p>	<p>Provide <u>consistent and measurable performance</u> across all Spectrum Health Devices and Locations</p>

Project Objectives

Spectrum Health's goal was to define an enterprise "Clinical Desktop" using Single Sign-On, Context Management, and Desktop Virtualization to enhance the consistency of the user experience and improve workflow

This project helped achieve the stated goal by:

- Developing a comprehensive long term target state architecture for a Converged Clinical Desktop
- Defining a roadmap for implementation of the Converged Clinical Desktop
- Developing the Single Sign-On and Context Management project charter

Converged Clinical Desktop Technologies Overview

Technology Introduction

Single Sign-On and Context Management

Single Sign-On

- User is prompted once to enter a login and password. These credentials are then passed to subsequently accessed applications automatically throughout a defined period of time.
- Passive proximity badge or other biometric solutions may also be used to further simplify the login process

Context Management

- Technology used to create the appearance of application integration among and between disparate applications
- Caregivers select a specific patient in one application and have that same patient's information presented automatically as they navigate to subsequent CCOW enabled applications



Technology Introduction

Desktop and Application Virtualization

Desktop Virtualization

- The centralization of a traditional desktop or laptop operating system and applications within a server-centric environment typically hosted within a data center
- Users are presented a desktop experience on the workstation or thin client device; however, all data viewed on the screen resides in the data center

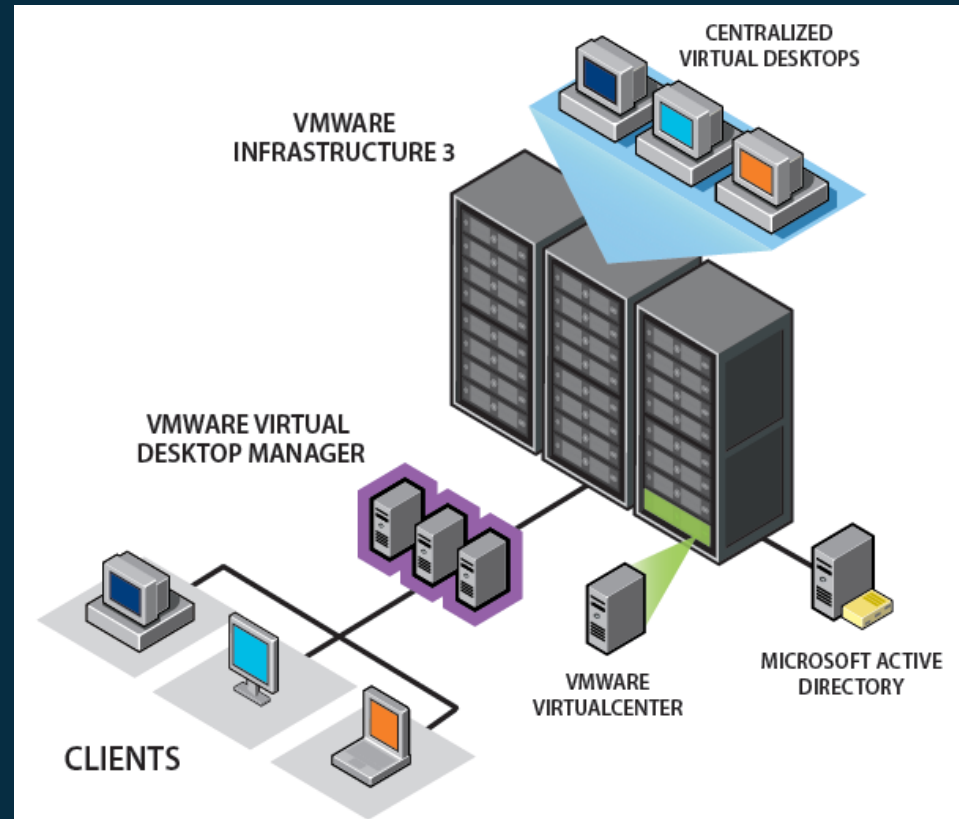


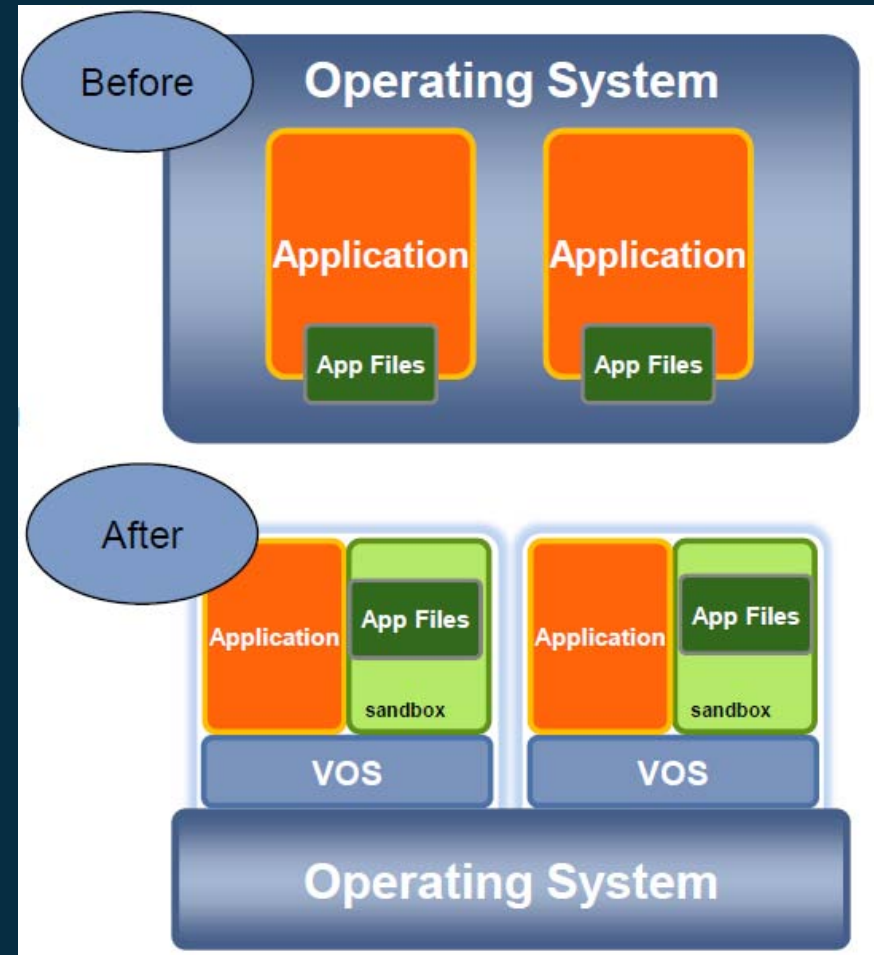
Image Source: VMware

Technology Introduction

Desktop and Application Virtualization

Application Virtualization

- Provides the ability to execute applications without impacting the underlying Operating System of the workstation.
- Once virtualized, applications are presented to the device Operating System with software serving to present the appearance of a fully installed instance of the application



Workflow Analysis

Workflow Analysis Approach and Goals

Interview clinical application analysts

Determine the workflow benefits of:

- SSO only vs. SSO + Context Management licenses
- Persistent VDI vs. Non-persistent VDI

Sell the concepts and benefits of technologies being evaluated

- Discuss each technology individually
- What value do these technologies provide to the clinical workflow

VDI Workflow – Interview Questions

1. Use of multiple workstations during normal workflow
2. Perceived value of 'roaming desktop' to workflow
3. Value of Persistent vs. Non-persistent desktop
4. Value of accessing clinical desktop outside Spectrum Health facilities (i.e. – home, office, remote site)
5. Use of streaming media in normal workflow
6. Use of USB attached peripheral devices
7. Use of applications not included in standard VDI image
8. Need/desire to save documents to 'My Documents' folder

Application Cross-walk

Users of	Also use	Cerner	Epic	McKesson PACS	SoftMed	OBTV	EndoTool	ICIS	Cardio PACS	GE MUSE	Varian	NIS	Internet Explorer
Epic		Green	Black	Green									Green
McKesson PACS		Green	White	Black	Green				Green				Green
SoftMed		Green	Green	Green	Black								Green
OBTV		Green	White	Green	Green	Black							Green
EndoTool		Green	White	Green	White	White	Black	Green					Green
ICIS		Green	White	Green	Green		White	Black		Green			Green
Cardio PACS		Green	White	Green	Green			White	Black	Green			Green
GE MUSE		Green	White	Green	White				Green	Black			Green
Varian		Green	White	Green	White					White	Black		Green
NIS		Green	White	Green	Green	Green					White	Black	Green
Internet Explorer		Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Black

Summary – SSO/CCOW Workflow Analysis

14,000 – Approximate users of Cerner

5,400 – Users benefit from Context Management and Single Sign-On

Count based on workflow analysis of major applications
Cardiology PACS, OB/TV, Epic-SHMG/MMPC Data
unavailable for analysis

9,400 – Users of Cerner exclusively

Summary – VDI Workflow Analysis

Remote access capability would be vastly improved with VDI

5,800 – Physician and nursing staff identified in Cerner for potential benefit from Virtual Desktops

1,500 – SHMG/MMPC staff
Likely some overlap with Cerner count

Clinical Desktop Vision and Recommendations

Implementation Concepts

Phased implementation over 2 – 3 years to achieve full vision

SSO and Context Management will be deployed independent of desktop virtualization

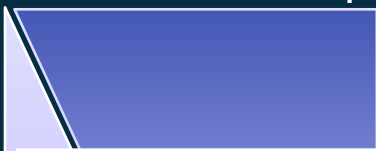

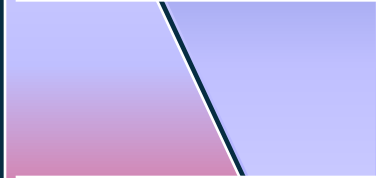



Limit the number of applications included for initial SSO and Context Management implementation

SSO and Context management will not grant access to applications beyond a users specific role

Non-persistent desktops will be assigned to users by default, possible exceptions include:

- Providers
- Department Managers

Path to Converged Clinical Desktop

Converged Clinical Desktop	Stage	Benefits	Risks
	Desktop Virtualization Enterprise Wide	All the below	All the below
	Desktop Virtualization for Remote Access	Consistent workstation experience. Centralized mgmt	License management
	Application Virtualization	Agile software delivery Desktop agnostic	Not approved for use by all application vendors
	User and Patient Context Management	Reduced chance of viewing / updating incorrect patient record	Complex workflows may require 'bridge', even for CCOW apps
	Single Sign-On	Bridged access to interrelated systems	Users forget application passwords. Limited scope, staff will want more
			

Traditional 'Fat' Client Desktop

Implementation Strategy

Pre-implementation Considerations

Single Sign-On and Context Management

- Evaluate CCOW compatibility for applications
- Create new Bridge Developer role

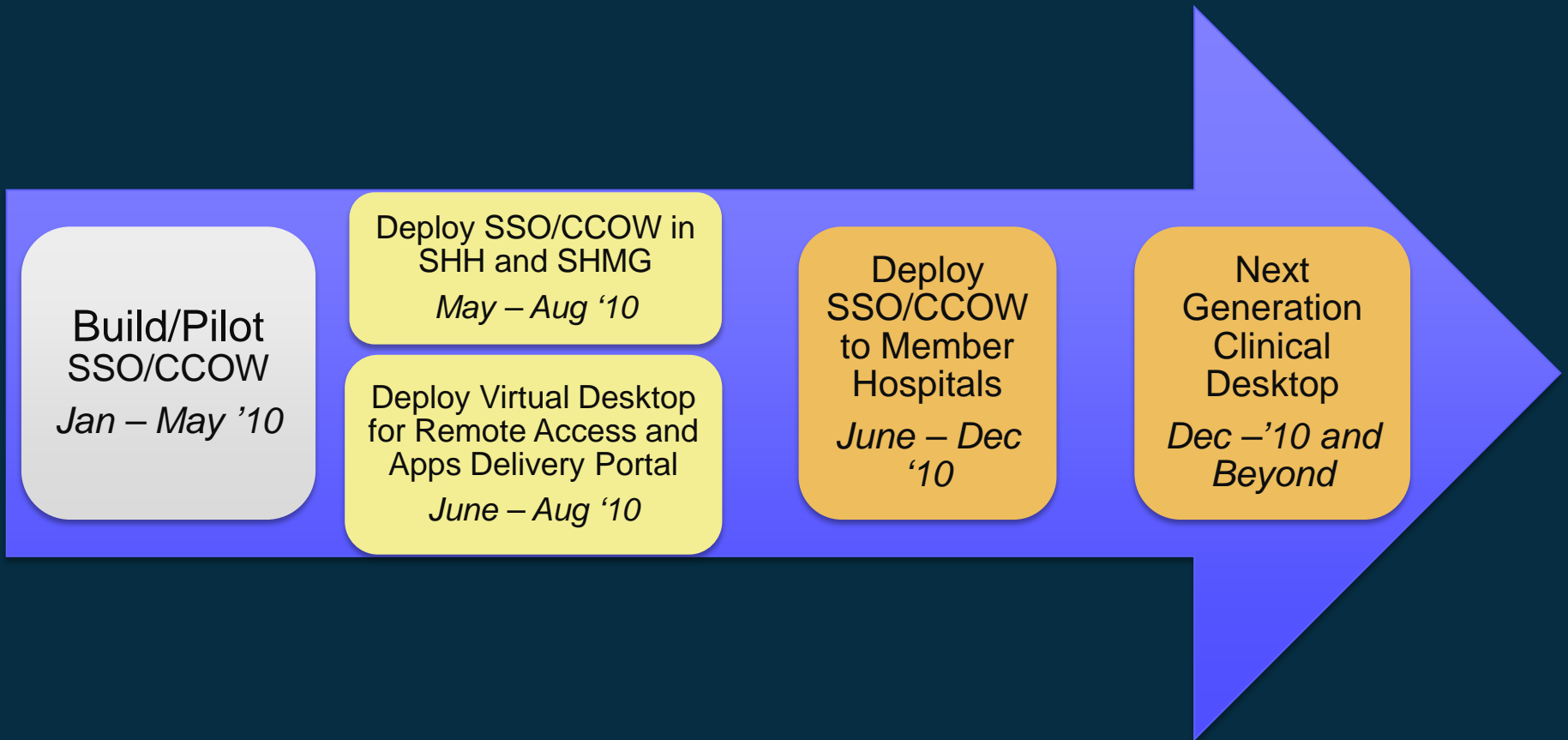
Desktop and Application Virtualization

- Timing requirements for repackaging of applications in ThinApp
- Define validation script for repackaged applications
- Identify clinical analysts to perform application validation

Communication and Training

- Utilize multiple methods including: Facilitated training for department leadership/Super Users, web training, Quick Reference Guides, Rounding during go-live
- Coordinate communications with all levels of leadership, including clinical department heads

High Level Timeline



Lessons Learned

1. SSO and Context Management should be viewed as a clinical application, not infrastructure technology, and needs to be treated as such
2. Don't assume CCOW will 'just work'
3. Limit the number of applications for initial SSO and Context Management implementation
4. Take the necessary time to educate the user community on the benefits of SSO, Context Management, and VDI
5. Consider the impact to complementary services as a result of SSO and Context Management (e.g. - remote access)

Questions?

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