Virtual Desktop Infrastructure Implementation in the Port of Halifax

Jim Nicoll
Director, Information & Technology Services
Halifax Port Authority
Halifax, Nova Scotia
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Agenda:

• Introduction/Background
• IT Operational Challenges
• The Response
• The Solution
• Lessons Learned
A Canadian Strategic Asset

- Shortest ocean transit times on North Atlantic & Suez routes than any other East Coast Port
- PostPanamax capable today
- Connected to central Canada and beyond
- Direct, multiple services to Europe, Middle East and Southeast Asia
Catchment area allows access to 40% of North American population
Serving Over 150 Countries on Every Continent
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Halifax Port Authority

- One of 18 Canadian Port Authorities
  - Independent federal agencies governed by the Canada Marine Act

- Mandate to develop, market and manage our assets to promote trade & transportation
  - Serve as a catalyst for local, regional & national economies
Virtual Desktop Infrastructure Implementation in the Port of Halifax

Three Lines of Business

- **Cargo (2012 figures)**
  - Containerized Cargo: 416,572 TEU
  - General Cargo: 444,494 MT
  - Bulk Cargo: 5,586,734 MT

- **Cruise (2012 figures)**
  - 134 vessel calls
  - 252,847 passengers

- **Real Estate**
  - Manage 260 acres
  - Highest and Best Use of managed properties
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

**IT Responsibilities**

- **Supporting user base**
  - 75 full time staff located in 7 buildings in Halifax
  - 20 contract security staff (24x7)
  - 20 students, contractors and temporary staff
  - 5 remote offices (US – 2, Europe, India, Asia)
  - Several “road warriors”

- **Administrative systems and applications**
  - Microsoft Office Suite
  - Financials (GL, AR, AP, FA)
  - Port Management (vessels, cargo, services)
  - Real Estate Management
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

IT Responsibilities (Cont’d)

➢ Security systems and applications
  • Video analytics (cameras, controllers)
  • Access control (biometrics, gates, turnstiles)
  • Perimeter fence monitoring (fencing, PFMS cables)
  • Marine domain awareness (radar, AIS feeds)

➢ Miscellaneous systems and applications
  • Digital signage
  • Seaport lighting systems (decorative)
  • Video conferencing
  • VOIP phone system
  • Mobile device support
IT Responsibilities (Cont’d)

- Innovation
  - Air Gap Management System (2 harbour bridges)
  - Dwell Time Management System
  - Key Performance Indicators (Rail service level agreement)
  - Interactive HalifaxGetsItThere website
  - Transit Time Calculator
  - Interactive Route Map
  - Container Tracking
  - Technology as Infrastructure – Supply Chain Efficiency
Virtual Desktop Infrastructure  
Implementation in the Port of Halifax

**IT Challenges**

- Increase value of IT to the business
  - Reduce time spent supporting infrastructure
  - Increase time spent on supporting the business

- Multi-year workstation replacement strategy
  - Running some older hardware at the workstation level
  - Inconsistencies among desktop hardware
  - Hard to manage and upgrade workstation software
  - Running older versions of software (WinXP, Office 2003)
  - Inconsistencies among desktop software versions
Virtual Desktop Infrastructure Implementation in the Port of Halifax

**IT Challenges (cont’d)**

- High rate of desktop failures and issues
- Challenges with remote support
- Lack of control over desktop environment
- User desire for improved system access
  - Consistent user experience
  - Access to all services
  - Any time
  - Any place
  - Any device
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

The Response

Desktop Services Delivery Study

- Review available technologies and emerging best practices
- Assess against desired characteristics
- Select preferred solution
  - Preliminary design
  - Order of magnitude cost
  - Cost/Benefit analysis
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Alternatives considered

1. Evergreen Strategy
   Replace/upgrade **all** desktop hardware and applications on a regular cycle (3-4 years)

2. Virtual Session
   One OS and one application image on the server is accessed by all users within their own individual sessions (Remote Desktop Connection)

3. Virtual Desktop Infrastructure - Preferred Solution
   “Desktops” run on centrally managed pool of virtual machines located on a server in the data centre; each user has their own virtual machine
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Virtual Desktop - Concepts

- Each user’s desktop runs as a separate, unique virtual machine resident on a centralized server in the data centre.

- Separates desktops from access points
  - Can use multiple devices to access the same desktop
  - Uses efficient protocols to pass mouse clicks, keystrokes, and display output between access device and server

- Separates user profiles, operating system, applications and data
  - A user is assigned an available VM on the server, and their ‘desktop’ is assembled when they connect.
Virtual Desktop Infrastructure Implementation in the Port of Halifax

Virtual Desktop – Conceptual Diagram
Virtual Desktop Infrastructure Implementation in the Port of Halifax

Virtual Desktop – Basic Architecture

- Security Server
- Connection Server
- Virtual Desktops
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Virtual Desktop - Benefits

• Reduce hardware and application deployment and support costs through centralized desktop/app deployment and management, and improved desktop reliability

• Better manage software licenses and associated licensing costs

• Lower capital costs by extending the life of desktop hardware and enabling the use of low cost ‘Thin Clients’

• Lower power consumption and related expenses – a greener solution
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Virtual Desktop - Benefits (cont’d)

• Bolster security of user data, and simplify Disaster Recovery by separating workstation processing and storage from workstation hardware – data remains in the data centre

• Boost productivity and flexibility by providing users with anywhere and any device access to their work
Virtual Desktop Infrastructure Implementation in the Port of Halifax

The Approach

➢ VDI Proof of Concept

- Insure all HPA applications work as expected, including resource intensive apps
- Evaluate performance: as good as or better than current environment
- Gauge user experience
- Determine ease of set-up, administration and management
- Evaluate Vendor Support
Virtual Desktop Infrastructure Implementation in the Port of Halifax

Alternatives considered

1. VMware View
   • View Client Desktop
   • Teracici PCoIP protocol
   • ThinApp for application packaging and deployment

2. Citrix
   • XenDesktop
   • Citrix HDX protocol
   • XenApp for application packaging and deployment

Decision was made to proceed with VMware View solution, primarily due to superior local support availability.
Virtual Desktop Infrastructure Implementation in the Port of Halifax

The Solution

- Hardware acquired and installed
  - HP DL360 servers
  - HP P4300 ISCSi SANs
  - Dell Wyse P20 Zero Clients

- VMware View installed and configured

- Created Base Image - Windows 7 and Office 2010

- Packaged common applications

- Provisioned initial pool of desktops
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

The Solution (cont’d)

- User Training
  - Groups of 10
  - VDI Concepts
  - Windows 7
  - Office 2010

- Roll-out
  - Installed client hardware and migrated each group after training
  - Currently have approximately 30 users migrated
  - Roll out continues
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Lessons Learned

➢ VDI can be complex
  • Leverage support from hardware and software vendors
  • Leverage experience with server virtualization

➢ Build a robust environment
  • Insure your network is performing optimally
  • Fast, efficient storage is a must
  • Network, server and storage redundancy is a must

➢ Change management is critical
  • User expectations must be managed
  • User perception must be managed
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Lessons Learned (cont’d)

- Make good use of application provisioning
  - Keep the base image small
  - Distribute applications using application packaging tools
  - Be prepared to package more applications than you expect

- VDI is not optimal for all applications
  - Graphic intensive apps may not perform as well as desired
  - Investigate the use of virtual GPU technology for these applications

- VDI may not be cost effective for smaller operations
  - Initial capital cost of hardware and software
  - Operating cost savings depend on scale of operation
Virtual Desktop Infrastructure
Implementation in the Port of Halifax

Lessons Learned (cont’d)

- VDI delivers benefits
  - Central control and management of desktops
  - Easy to do mass software upgrades
  - Easy to roll back to prior versions of software
  - Flexibility to run older versions of applications (even those that require an older version of an operating system)
  - Virtual client software extends life of existing desktop hardware
  - Zero, or thin, clients save power and desktop real estate
  - Data is kept securely in the Data Centre
  - Performance via Internet similar to LAN performance
  - Users have access to familiar desktop and all of their apps any time, anywhere, any device (within reason)
AAPA Port Technology Seminar
May 16, 2013

Virtual Desktop Infrastructure Implementation in the Port of Halifax

Thank You