Deploying Virtual Desktops

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VDI Deployment Snapshot

• Chose VMware View for our VDI deployment in Oct 2009
• Over 800 hosted desktops deployed across 17 offices tied back to a centralized data center
• Started with View 3.0 then 4.0 and now 4.6
• Host servers running ESXi 4.1
• Average hosted desktop bandwidth footprint is 150Kbps

VDI Deployment Snapshot

• 3 WAN circuits to each office
  – 45Mbps IP VPN WAN for HD video and VDI
  – 6Mbps MPLS burstable to 50Mbps
  – 6Mbps MPLS (soon to be replaced with 45Mbps IP VPN)
  – 300Mbps circuits at the data center
VDI Deployment Snapshot

• Server clusters
  - 5-node N+1 configuration clusters (80 desktops per host)
  - IBM 3850 X5 series w/4 (8-core) Nehalem CPUs/256Gb RAM
  - Each server node has redundant Emulex 4Gbps HBAs and 8 1Gbps Ethernet ports (2 teamed=Service Console/2 teamed=VM Traffic/2 teamed=vMotion/2=spare)
  - Each server node connects to redundant Brocade SAN fabric switches, Cisco 3750G top of cabinet switches and then back to our core Cisco 6513’s

• Storage
  - Dual NetApp FAS3140 NAS controllers running in an active/active configuration for high availability
  - Each contains a 256Gb Performance Accelerator Module for disk caching
  - 20TB of fiber channel storage allocated to VDI today
VDI Deployment Snapshot

- Thin Client
  - HP TC5740
  - Running Windows Embedded Standard (WES) 2009
  - Currently evaluating the Samsung NC240 zero client
  - Expecting to get 5 years of life minimum out of our thin client hardware

VDI Deployment Snapshot

- Hosted desktop
  - Using linked clones
  - Persistent desktop
  - 23.5Gb of disk storage
    - 20Gb Operating System disk
    - 2Gb user data disk (for Windows user profile)
    - 1.5Gb scratch disk
    - Mapped external home directory “H” drive (unlimited)
    - Leveraging NetApp’s deduplication
  - 2Gb of RAM
  - 1 vCPU

The VDI Value Proposition

- ROI?
  - $1250 and up per user (based on a 1200 user deployment)
  - Don’t just look at the up front cost to deploy VDI when analyzing the return on investment
  - You also need to look at the value and benefits that come with delivering the desktop as a service
The VDI Value Proposition

- VDI's value-add:
  - Remote access
  - Security
  - BYOD (anytime, anywhere from any device)
  - Desktop hardware lifecycle (5 year minimum)
  - Minimizing “tech touches”
  - Desktop management/minimizing user impact
  - Desktop time to delivery
  - Business continuity

VDI Vitals

- The three most critical factors to any VDI deployment:
  - The user experience
  - The user experience
  - The user experience

- Test, assess, adjust and improve (rinse and repeat)
VDI Infrastructure Vitals

• View PCoIP
  – PCoIP is a dynamic protocol
    • Define the floor and ceiling bandwidth, minimum and maximum image quality, frame rate and audio bandwidth limit values
    • Foley’s average view desktop bandwidth footprint is 150Kbps

• WAN and QoS
  – WAN redundancy/fail over capability is critical in Foley’s centralized data center model
  – Assign highest level priority for the PCoIP protocol to ensure optimal WAN performance

• Access
  – Internal access is load balanced via F5 Global Traffic Managers between two redundant View Manager connection servers
• Security
  – Microsoft Forefront AV
    • Quick scans nightly between 8:30 PM and 4:00 AM
    • Full scans weekly on Saturday
    • Scans are staggered by group and scheduled via SCCM
VDI Infrastructure Vitals

- Monitoring
  - vCenter as primary monitoring/alerting tool
  - Stratusphere is used for analyzing host and guest performance metrics
  - Orion NetFlow is used for monitoring/analyzing WAN-based hosted desktop traffic
  - IBM Director/NimBUS by Nimsoft for server hardware health monitoring

- Application Deployment
  - Base installs to master image via Microsoft System Center Configuration Manager (SCCM)
  - Microsoft App-V is used for app virtualization

VDI Technical Reference Information

Essential View Documentation:

- Storage considerations for VMware View
- View PCoIP Network Sizing Guide
- Anti-Virus Deployment for VMware View Guide
- Server and Storage Sizing for VMware VDI: A Prescriptive Approach
- vSphere Troubleshooting Guide

VDI Technical Reference Information

- VMware View on NetApp Deployment Guide
- Netapp and VMware View Solution Guide
- Guide to Deploying Netapp FAS with VMware View
- My Virtual Cloud VDI Blog
  [http://myvirtualcloud.net/]
- Planet VDI Virtualization Blog Aggregator
  [http://www.vmware.com/vmtn/planet/v12n/]

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VDI Technical Reference Information

Essential View Documentation:
- VMware Community – View Forums
  http://communities.vmware.com/community/vmtn/entdesk/view?view=discussions
- Master VDI Template Checklist
  http://myvirtualcloud.net/?p=929
- Kendrick Coleman ISO for Advanced VM Administration

Deploying Virtual Desktops

Rengie Mendoza
Citrix Systems Engineer
Loeb & Loeb LLP

- 650 Users
- 6 Offices
- Data Center in Eagan, MN
Remote Access

• Previous Remote Access Infrastructure
  - XenApp 4.5 (Legacy Environment - Desktop)
  - XenApp 5 (Published Apps)
  - XenApp 6 (Published Apps)
  - Juniper SSL VPN

VDI Project/ Image Refresh

• Windows 7/Office 2010 Image Refresh
• VDI Infrastructure to Replace Current Remote Access Solution and Internal Desktops

VDI Infrastructure in a Nutshell

• XenDesktop 5
• Provisioning Services
• AppSense for Managing User Profiles and Application Settings
• XenServer 5.6 for VM Guests
• VMMware vSphere for Server Components
VDI Endpoints

- Thick Clients
  - Desktops
  - Laptops
- Thin Clients
  - Wyse Terminals

VDI Targets

- Non-Persistent VM’s
  - Power Users
- Persistent VM’s
  - Everybody Else

VDI Design

- Thick Clients/VDI
  - Identical Image (Core Apps)
- Thin Clients
  - Citrix Appliance Lock
- Kiosk Workstations
- All endpoints Managed by AppSense
  - Deploy Firm Application Settings
  - Retain user personalization
VDI Infrastructure

- OS/Image is Streamed by Provisioning Server
  - vDisk hosted from a FC LUN
- Guests on Citrix XenServer
  - HP GL7 Blades
- Accessed via Web Interface/PN Agent Site
  - WI: Remote or Internal

VDI Infrastructure

- Non-Core Applications are Hosted from XenApp 5/6

VDI +

- Consistent Look & Feel
- Personalized Setting Roams with User
- Anytime, Anywhere, Any Approved Device
VDI Challenges

- Performance
- Management
  - A lot of moving parts
- Monitoring

Roadmap

- Improve VDI Performance

Deploying Virtual Desktops

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About Us
- 300+ Attorneys
- AmLaw 200 - 162

Location
- 8 Locations - Centralized Datacenter Environment
- Main Office – Kansas City, Missouri

Infrastructure
- VMware View 4.6
- vSphere 4.1 Enterprise Plus

Past
- Platform – Citrix or VMware
- Infrastructure Considerations – Upgrades
- Delivery Means – Zen, View or Other 3\textsuperscript{rd} Party Broker
- Delivery Method – Thin Client, Zero Client or Centralized Management Solution
- Costs / ROI

Present
- 300 Virtual Desktops / 150+ Users
- VMware View 4.6
- Samsung NC240 PCoIP Zero Client
- Cisco Nexus 5020 Switching / 4900M Routing
- HP ProLiant 460c G7 / Dell PowerEdge M610
- EMC Celerra NS-480
- 25 – 30 Virtual Desktops per Host
Future

• Bandwidth Infrastructure Adjustments
• Off-Site Storage / Desktop Replication
• VMware vSphere 5
• Complete AppSense Installation
• Windows 7 / Office 2010
• Application Streaming
• Consumerization of Personal Devices

Lessons Learned

• Training / Marketing
• User adoption
• 90% Rule
• Non-User Business Use
• Help Desk Roles Changed
• ROI – It’s not about the money!