



5000 Virtual Desktop Seats Cisco UCS and Nexus 1000V, Citrix XenDesktop and EMC VNX

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Cisco ONE/N1K Public Webinars, 1H 2013

Date/Time	Topic
Thur, Feb 21st at 0900 PST	Cisco Open Network Environment (Cisco ONE) – Next Phase of Network Programmability and SDN
Thur, Feb 28th at 0900 PST	Cisco One Platform Kit (onePK): Technical Deep Dive and key use cases
Wed, Mar 6th at 0900 PST	Nexus 1000V for Hyper-V with Microsoft SCVMM integration
Wed, Mar 13th at 0900 PST	Cisco ONE controller: Technical Deep Dive and key use cases
Wed, Mar 20th at 0900 PST	5000 Seat VDI Reference Architecture: Cisco UCS & Nexus 1000V, Citrix XenDesktop, and EMC VNX
Wed, Mar 27th at 0900 PST	Nexus 1000V v2.2 for vSphere: More scale, Multicast-less VXLAN, VXLAN Gateway
Wed, April 3rd at 0900 PST	Cloud Services Router (CSR 1000V): Technical deep dive and key use cases
Wed, April 10th at 0900 PST	Cloud Security with ASA 1000V and Virtual Security Gateway v2.1 (VSG)
Wed, April 17th at 0900 PST	Secure Hybrid Cloud solution with Nexus 1000V InterCloud & VNMC InterCloud
Wed, April 24th at 0900 PST	Nexus 1100 for Cloud Network Services: New Services & Ecosystem
Wed, May 1st at 0900 PST	Cloud Networking Services: vNAM and vWAAS
Wed, May 8th at 0900 PST	Virtualized Multiservice Data Center (VMDC) solution with Cloud Networking Services
Wed, May 15th at 0900 PST	Nexus 1000V for KVM (with OpenStack and VXLAN)

Register and view recordings/presentations here:

www.cisco.com/go/1000vcommunity

Agenda

- Solution Highlights
- Solution Architecture

Hardware

Software

- Solution Integration
- Test Tools and Protocol
- Solution Results
- More Information
- Call to Action



Solution Highlights



Solution Highlights

- **5000 XenDesktop 5.6 desktops booted in 40 minutes**

Windows 7 32-bit virtual machines with 1 vCPU, 1.5 GB RAM and 1 vNIC

- **5000 Virtual Desktop Users logged in and working productively in 30 minutes**

Once logged in, each user starts running a standardized knowledge worker workload within 15 seconds

- **5000 Seat UCS System contained in a single rack with space to grow**

Six UCS Chassis, two Cisco Nexus 5548UP switches, and two Cisco UCS 6248UPs leave 8 RU available for infrastructure

- **Pure Virtualization**

We continue to present a validated design that is 100% virtualized on ESXi 5.0 Update 1.

- **Cisco Nexus 1000V deployed to extend QoS and Network Team**

Nexus 1000V combines with UCS Manager and Nexus 5548UP access layer switches to insure end to end QoS.

The familiar Nexus OS allows the Network team to manage the VDI network seamlessly.

- **Citrix XenDesktop 5.6 and Provisioning Server 6.1 deliver!**

Provisioned Windows 7 desktops provide the right combination of performance and efficiency

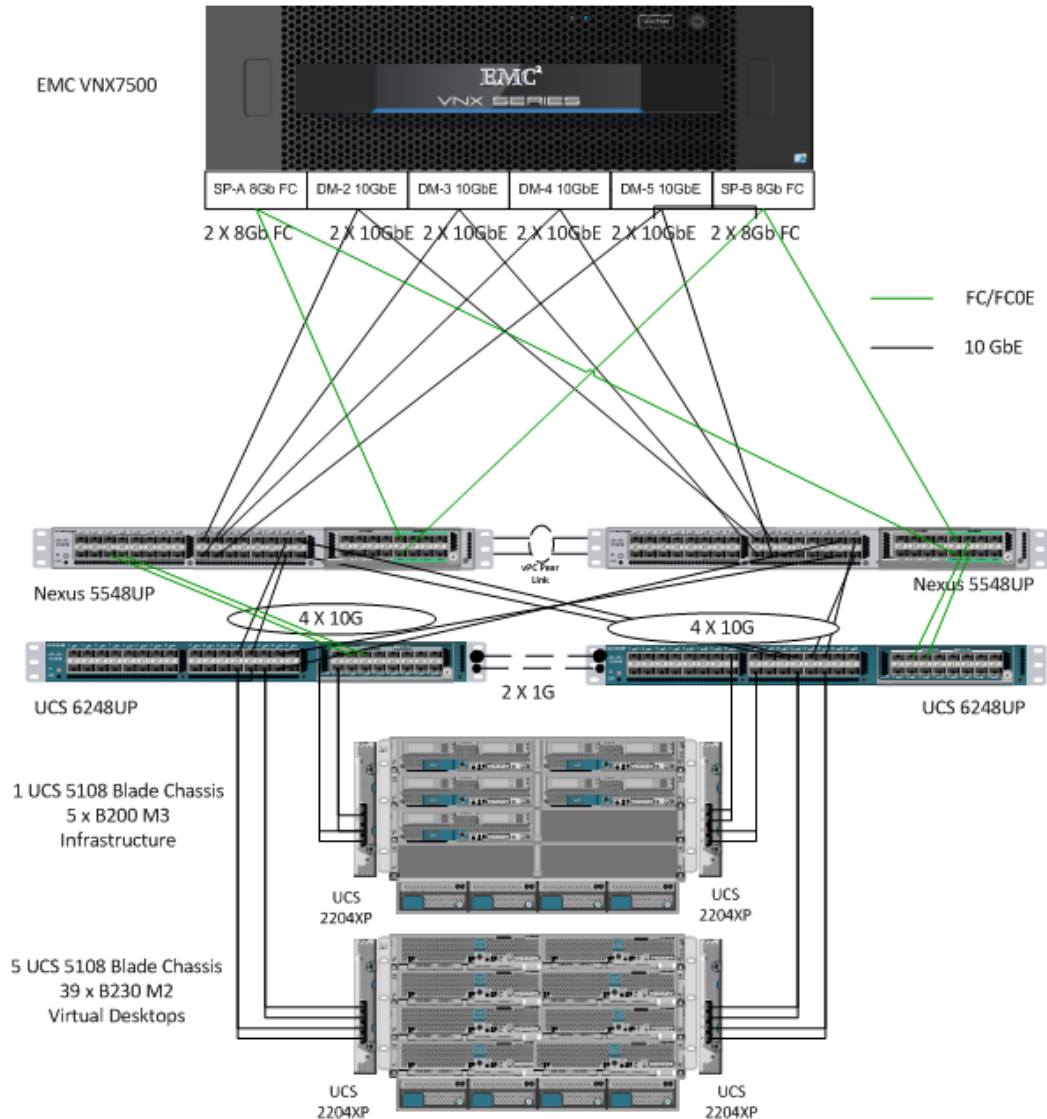
- **EMC VNX7500 storage handles the load with ease**

Both block and NFS storage resources were provided by a single system, utilizing EMC Fast Cache technology.

Solution Architecture



5000 Seat Citrix Hosted Virtual Desktop Architecture

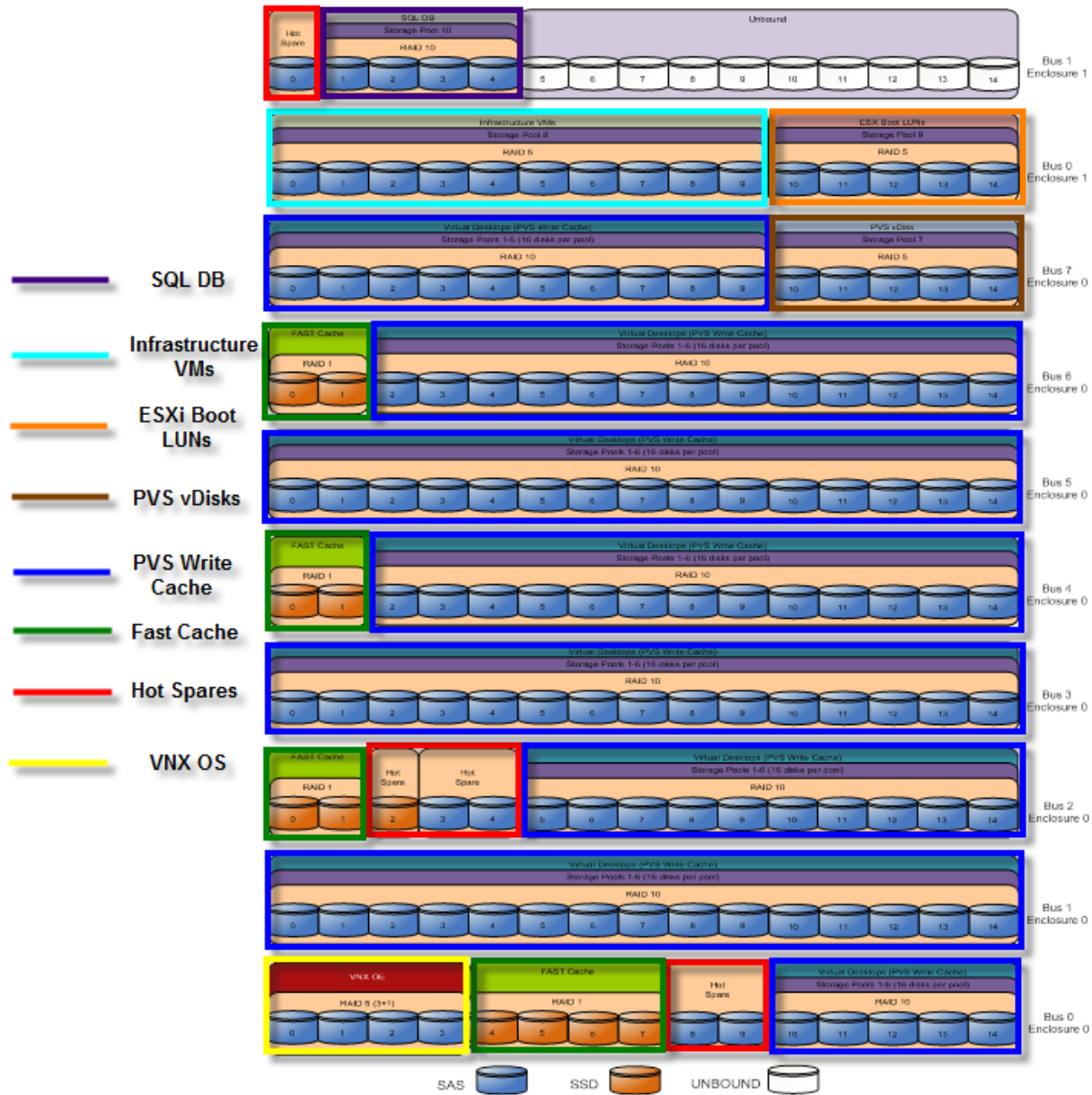


EMC VNX7500 Used in the Solution

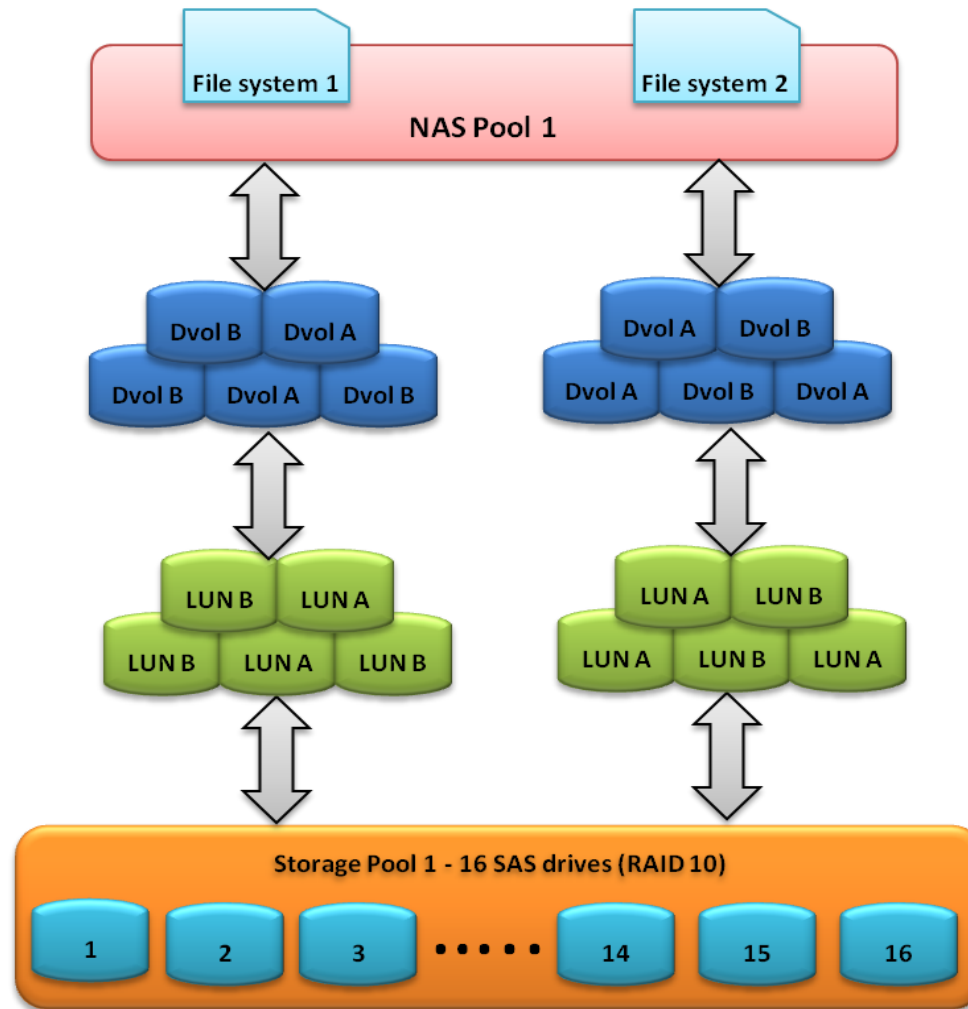
VNX



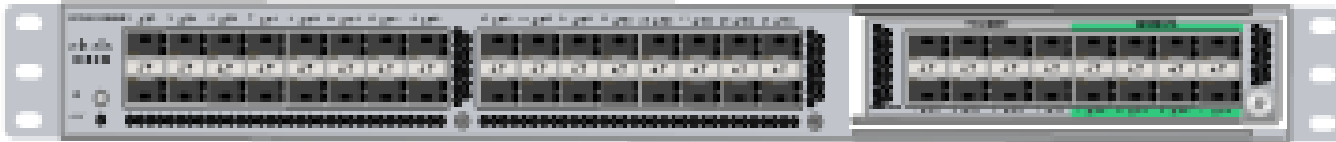
EMC VNX7500 Storage Layout



File Based Storage for PVS Write Cache



Nexus 5548UP and UCS 6248UP FI

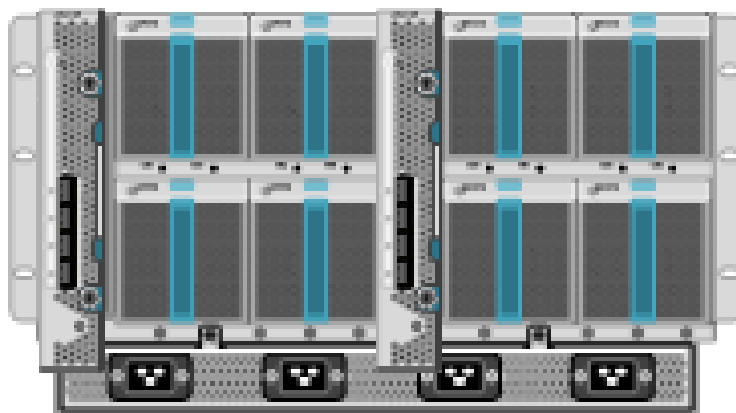


Cisco Nexus 5548UP Access Layer Switch



Cisco UCS 6248UP Fabric Interconnect

Cisco Blade Chassis and IO Modules



Cisco UCS 5108 Blade Chassis

Hot-swappable power supplies

Hot-swappable fan units

Multi-path IO

Infrastructure and VDI Blades



Infrastructure Blades (5)
UCS B200 M3



Windows 7 Virtual Desktop Blades (39)
UCS B230 M2

Software Versions

Layer	Compute	Version or Release	Details
Compute	Cisco UCS Fabric Interconnect	2.0(4a)	Embedded Management
	Cisco UCS B200 M2 Cisco UCS B230 M2	2.0(4a) 2.0(4a)	Hardware BIOS Hardware BIOS
Network	Nexus Fabric Switch	5.2(1)N1(1)	Operating System Version
Storage	EMC VNX7500	File: 7.1.47-5 Block: 05.32.000.5.006	Operating System Version
Software	Cisco UCS Blade Hosts	B200: VMware ESXi 5.0 Update 1 B230: VMware ESXi 5.0 Update 1	Operating System Version Virtual Switch appliance version
	Cisco Nexus 1000V	4.2(1)SV1(5.2)	
Desktop Broker	Citrix XenDesktop	5.6 Feature Pack 1	Desktop Management
Desktop Provisioning	Citrix Provisioning Server	6.1	Desktop Creation and Maintenance

Solution Integration



Base Network Integration

- The network played a pivotal role in deployment, management and performance in the environment
- Cisco Nexus 5548UPs provided:
 - 10GE Layer 2 switching,
 - QoS
 - FC and IP connectivity to storage resources,
 - Port Channeling for bandwidth aggregation and fault tolerance
- Cisco Nexus 1000V provided:
 - Unified switch configuration for each Virtual Desktop Cluster
 - Extension of the UCS QoS Policies to the Virtual Desktop Hosts
 - Comfortable interface for experienced Nexus OS team members

Network VLANs Deployed

VLAN Name	VLAN ID	Purpose	Native
ML-VDA	800	Virtual Desktops	No
ML_DC-VM-MGMT	801	ESXi, N1KV Management	Yes
ML_DC-VMMOTION	802	vMotion	No
ML_DC-INF	803	Infrastructure VMs	No
ML_DC-STRG	804	NFS Storage	No
ML_Launcher-Inf	851	Login VSI Launchers	No
ML-N1KV_CTRL	900	N1KV Control	No
ML-N1KV_PK	901	N1KV Packet	No

QoS System Class and Policy

- QoS System Class Configuration

The screenshot shows the Cisco Unified Computing System Manager interface. On the left, a tree view shows the hierarchy: LAN > LAN Cloud > Fabric B > QoS System Class, with a red arrow pointing to it. The main pane displays a table of QoS System Classes:

Priority	Enabled	CoS	Packet Drop	Weight	Weight (%)	MTU	Multicast Optimized
Platinum	<input checked="" type="checkbox"/>	5	<input checked="" type="checkbox"/>	10	22	9000	<input type="checkbox"/>
Gold	<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>	9	20	normal	<input type="checkbox"/>
Silver	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	8	18	normal	<input type="checkbox"/>
Bronze	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	7	15	normal	<input type="checkbox"/>
Best Effort	<input checked="" type="checkbox"/>	Any	<input checked="" type="checkbox"/>	5	11	normal	<input type="checkbox"/>
Fibre Channel	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	5	14	fc	N/A

QoS Policies were assigned to QoS System Class

The screenshot shows the configuration for a QoS Policy. The left pane shows the tree view: LAN > Policies > root > QoS Policies > QoS Policy Platinum, with a red box around it. The main pane shows the configuration for 'QoS Policy Platinum':

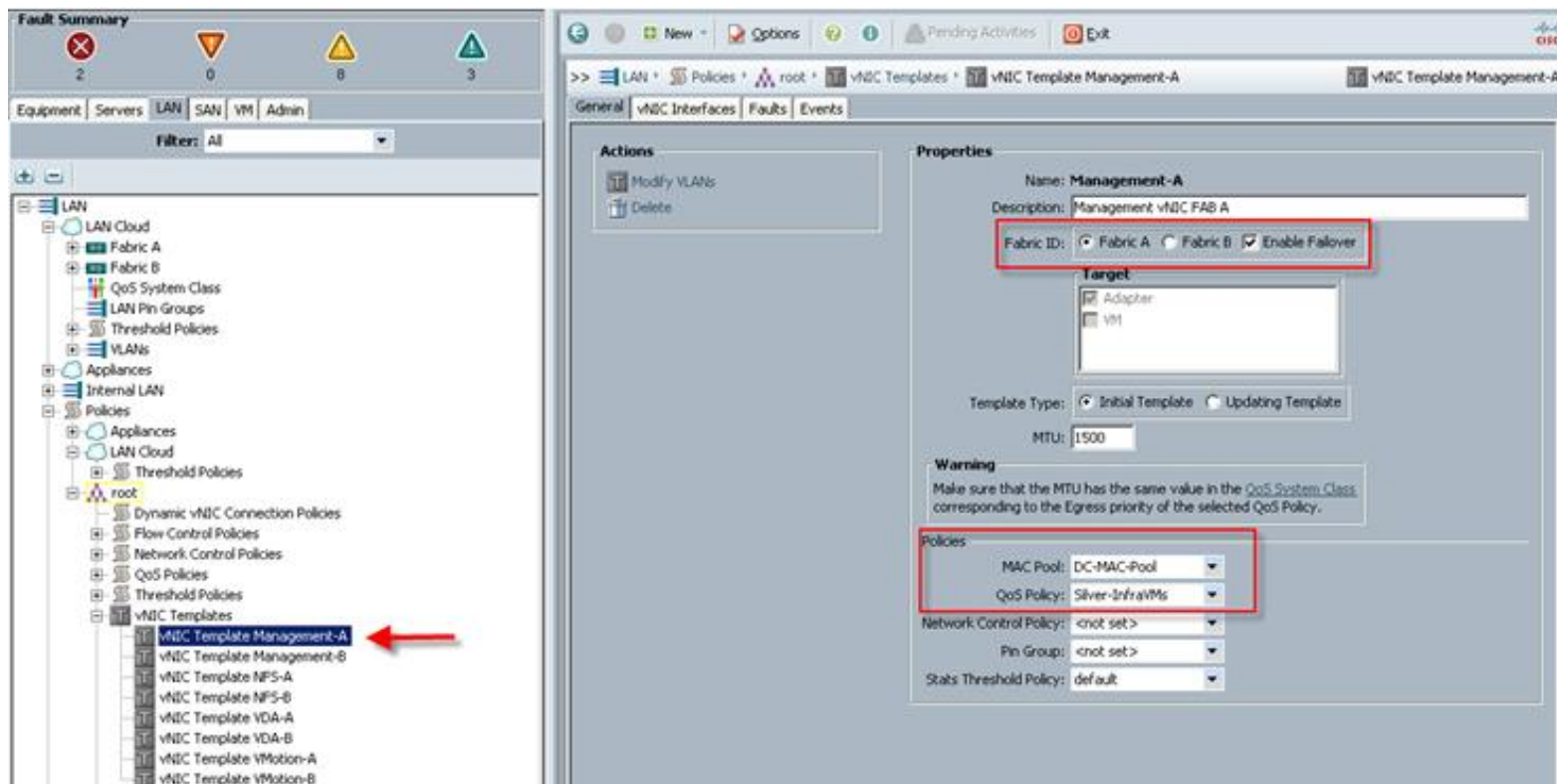
Actions: Delete, Show Policy Usage

Properties: Name: Platinum

Egress: Priority: Platinum (highlighted with a red box), Burst(Bytes): 10240, Rate(Kbps): line-rate, Host Control: None Full

Assign QoS Policy to vNIC Templates

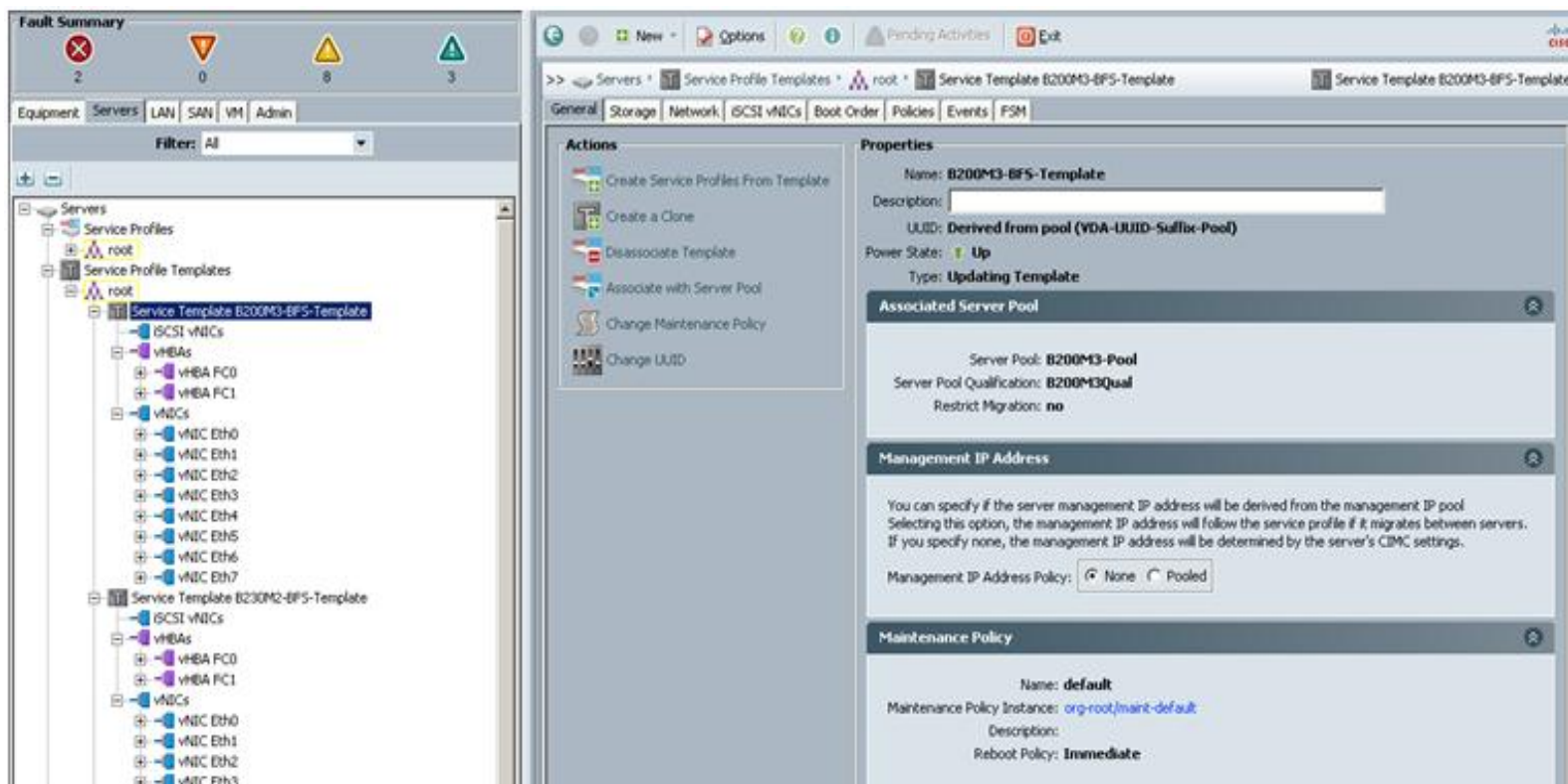
- vNIC Templates were created for each fabric and assigned VLANs and QoS Policy



- Each vNIC in a pair was assigned to the same VLAN(s)

Create Service Profiles and Templates

- Service Profile Templates for Each Server Role



Service Profiles are created and assigned

Hypervisor Integration

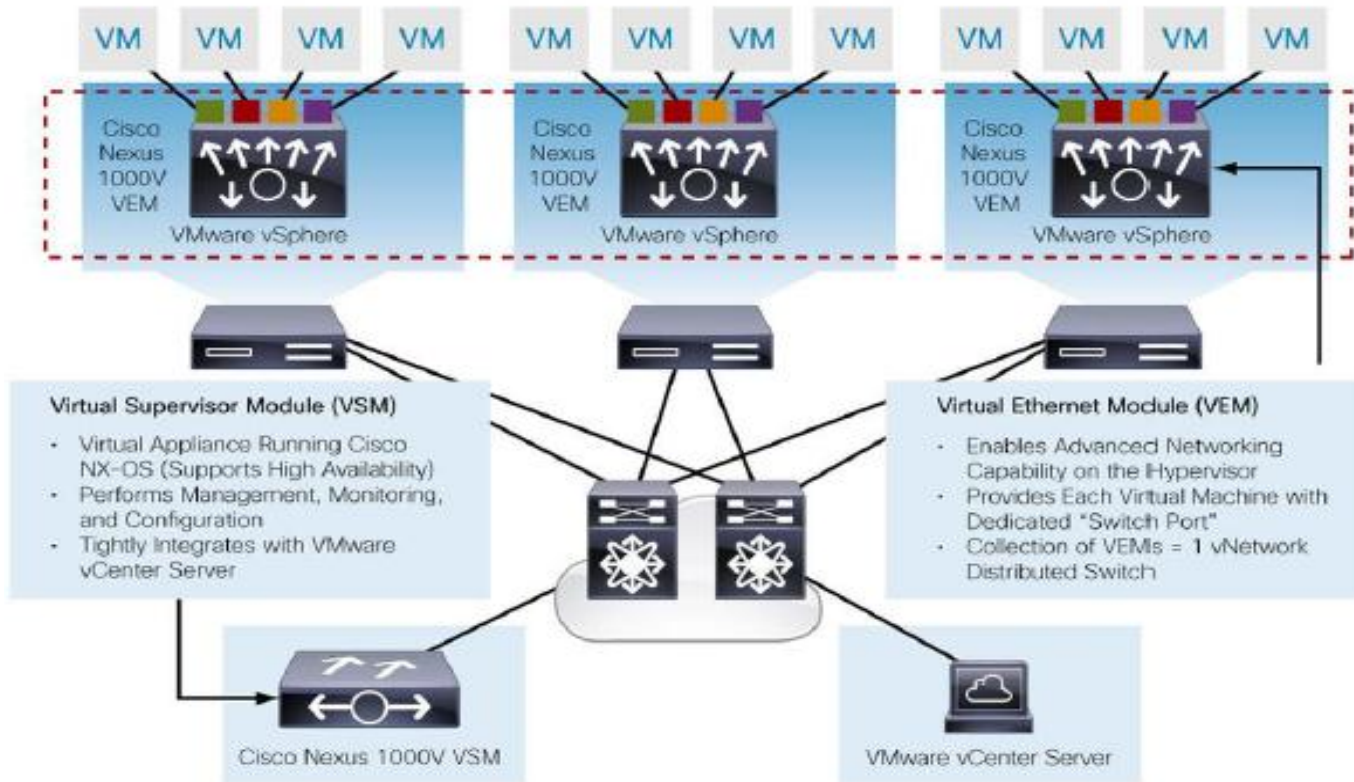
The screenshot displays the vSphere Client interface for a host named DC-VC-01. The top menu bar includes File, Edit, View, Inventory, Administration, Plug-ins, and Help. Below the menu is a breadcrumb navigation path: Home > Inventory > Hosts and Clusters. The main content area shows a tree view of the inventory:

- DC-VC-01
 - MLQ3
 - DC-INF (highlighted)
 - DC-VDA1
 - DC-VDA2
 - DC-VDA3
 - Launchers

On the right side, a sidebar titled DC-INF is visible, containing a 'Getting Started' section with the heading 'What is a C' and the text 'A cluster is a cluster, the f resources. T within it.' Below this, the text 'Cluster are' is partially visible.

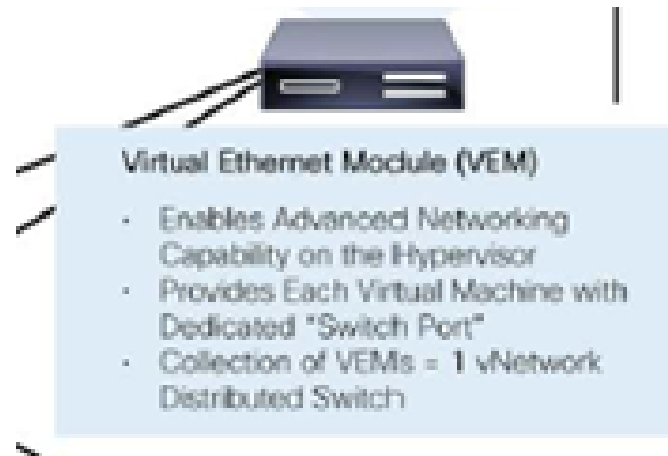
Nexus 1000V Design

- Nexus 1000V integrated with ESXi 5.0 Update 1 vCenter
- Nexus Product Architecture

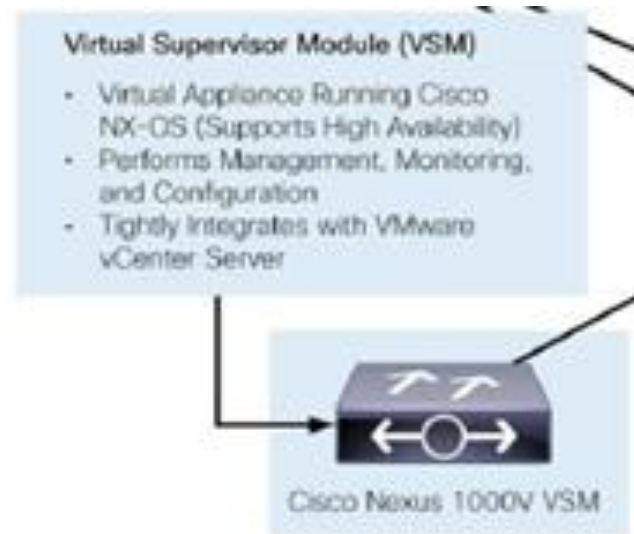


Nexus 1000 V Components

- Virtual Ethernet Module (VEM)



- Virtual Supervisor Module (VSM)



Configuring the Nexus 1000V in L3 Mode

- Download & install the installation wizard

[http://www.cisco.com/cisco/software/release.html?mdfid=282646785&flowid=3090&softwareid=282088129&release=4.2\(1\)SV1\(5.2\)&reind=AVAILABLE&rellifecycle=&reltype=latest](http://www.cisco.com/cisco/software/release.html?mdfid=282646785&flowid=3090&softwareid=282088129&release=4.2(1)SV1(5.2)&reind=AVAILABLE&rellifecycle=&reltype=latest)

- Start the wizard from your download host and configure the Nexus 1000 V Distributed Switch

Nexus 1000V Installation Management Center

Steps

1. Enter vCenter Credentials
2. Select the VSP's host
3. Select OVA File to create VSM
4. Configure Networking
5. Configure VSM
6. Review Configuration
7. Configure Migration
8. DNS Migration


Enter vCenter Credentials

vCenter IP:

Port (https only):

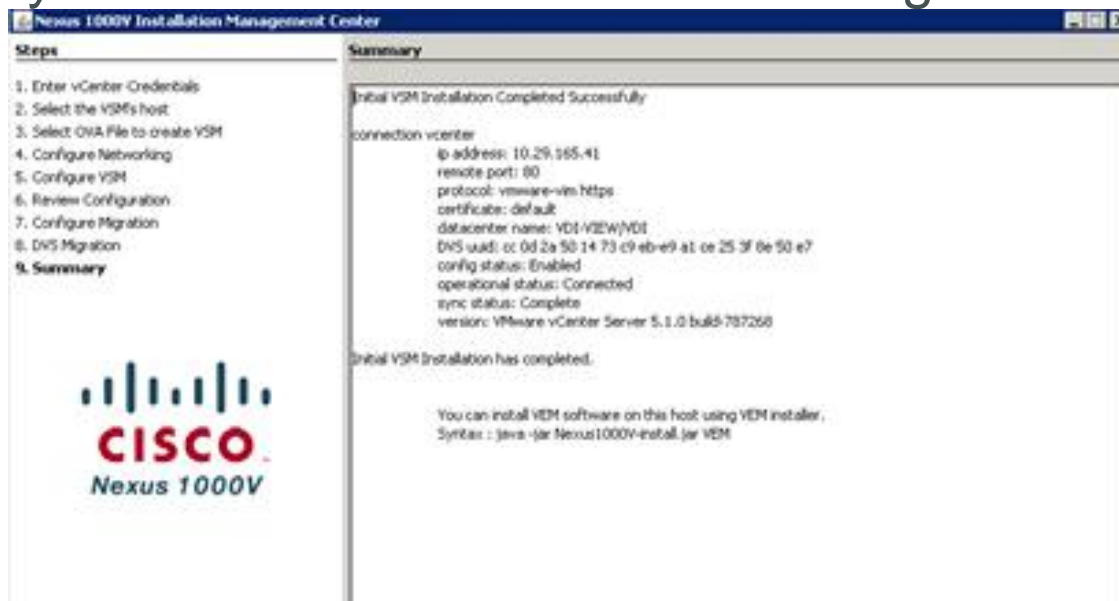
vCenter User ID:

vCenter Password:


CISCO
Nexus 1000V

Configuring the Nexus 1000V in L3 Mode

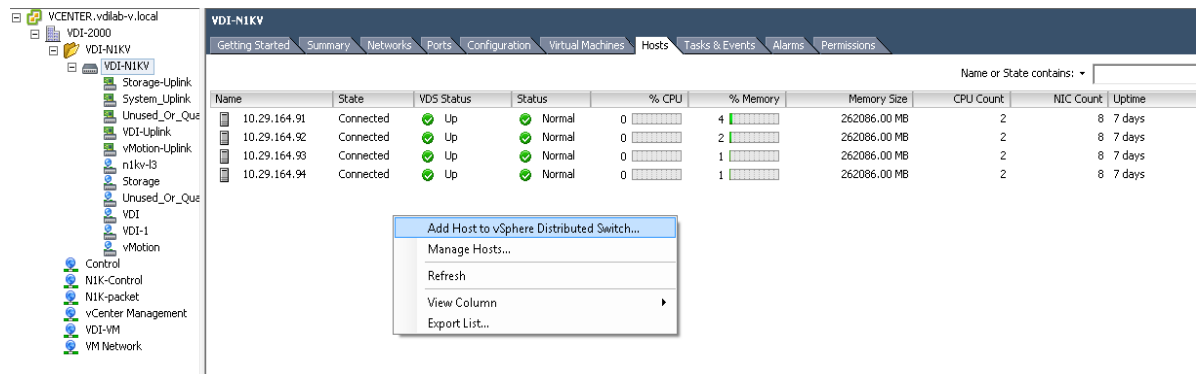
- Summary Screen for the Installation Management Center



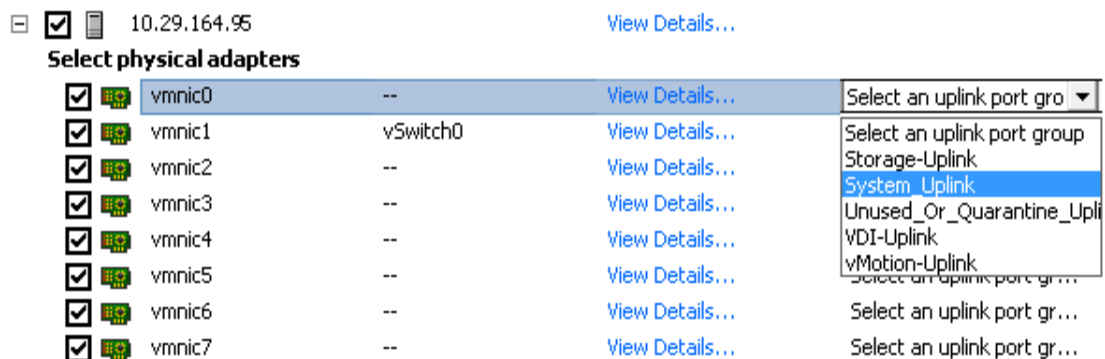
- Configure additional parameters on the VSMs
VLANs, frame size, Qos Policies
Port Profiles and Port Groups

Add Hosts to the Nexus 1000V VSM

- Add a Host



- Assign Uplinks



Verify All Hosts Registered with VSM

- From the command line on the VSM virtual machine in config mode:

sh module

```
VDI-N1KV(config)# sh module
Mod  Ports  Module-Type                Model                Status
---  ---
1    0       Virtual Supervisor Module  Nexus1000V           active *
2    0       Virtual Supervisor Module  Nexus1000V           ha-standby
16   248    Virtual Ethernet Module    NA                    ok
17   248    Virtual Ethernet Module    NA                    ok
18   248    Virtual Ethernet Module    NA                    ok
19   248    Virtual Ethernet Module    NA                    ok
20   248    Virtual Ethernet Module    NA                    ok

Mod  Sw                Hw
---  ---
1    4.2(1)SV1(5.2)    0.0
2    4.2(1)SV1(5.2)    0.0
16   4.2(1)SV1(5.2)    VMware ESXi 5.1.0 Releasebuild-799733 (3.1)
17   4.2(1)SV1(5.2)    VMware ESXi 5.1.0 Releasebuild-799733 (3.1)
18   4.2(1)SV1(5.2)    VMware ESXi 5.1.0 Releasebuild-799733 (3.1)
19   4.2(1)SV1(5.2)    VMware ESXi 5.1.0 Releasebuild-799733 (3.1)
20   4.2(1)SV1(5.2)    VMware ESXi 5.1.0 Releasebuild-799733 (3.1)

Mod  Server-IP          Server-UUID              Server-Name
---  ---
1    10.29.165.47       NA                        NA
2    10.29.165.47       NA                        NA
16   10.29.164.93       9476f312-1321-e111-0000-1b0000000006e  10.29.164.93
17   10.29.164.91       9476f312-1321-e111-0000-1b0000000005f  10.29.164.91
18   10.29.164.94       9476f312-1321-e111-0000-1b0000000007e  10.29.164.94
19   10.29.164.92       9476f312-1321-e111-0000-1b0000000001f  10.29.164.92
20   10.29.164.95       9476f312-1321-e111-0000-1b0000000004e  ESXi5-BFS-Srv5
```

Citrix Technologies Integration

- Citrix XenDesktop 5.6 Feature Pack 1

Remote PC

Universal Print Server

Mobility Pack

HDX 3D Pro

XenClient Enterprise

Simple License Service

- Citrix Provisioning Server 6.1

Standardized Image Streaming

Single Image Management

Significant disk space savings

- Citrix Profile Management

Folder Redirection

Diagnostics

Easy Integration

Cookie Management

Localization

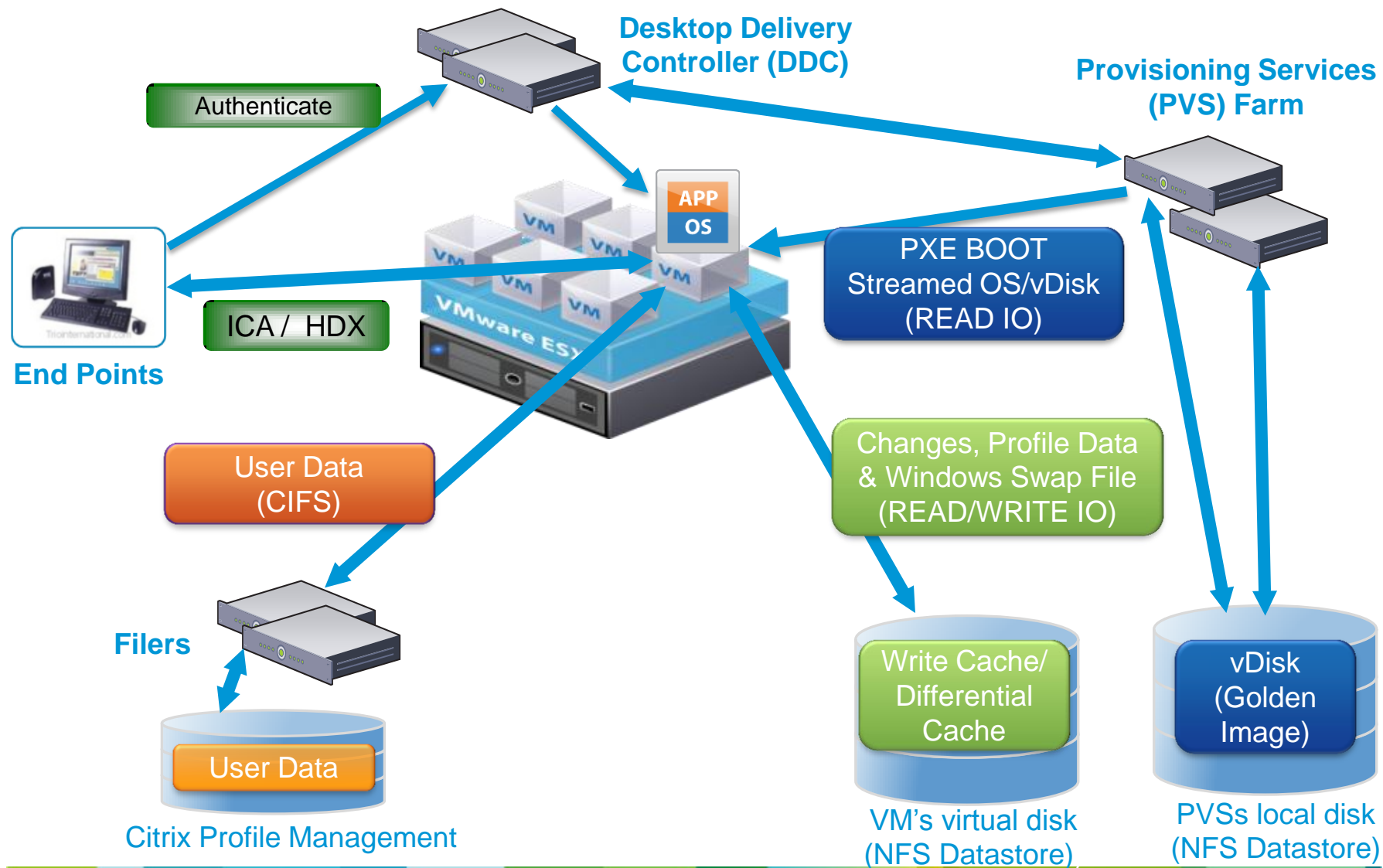
Streamed user profiles

Profile Migration

Active write back Diagnostics

Consistent Settings

Citrix XenDesktop Architecture



Test Tool and Protocols

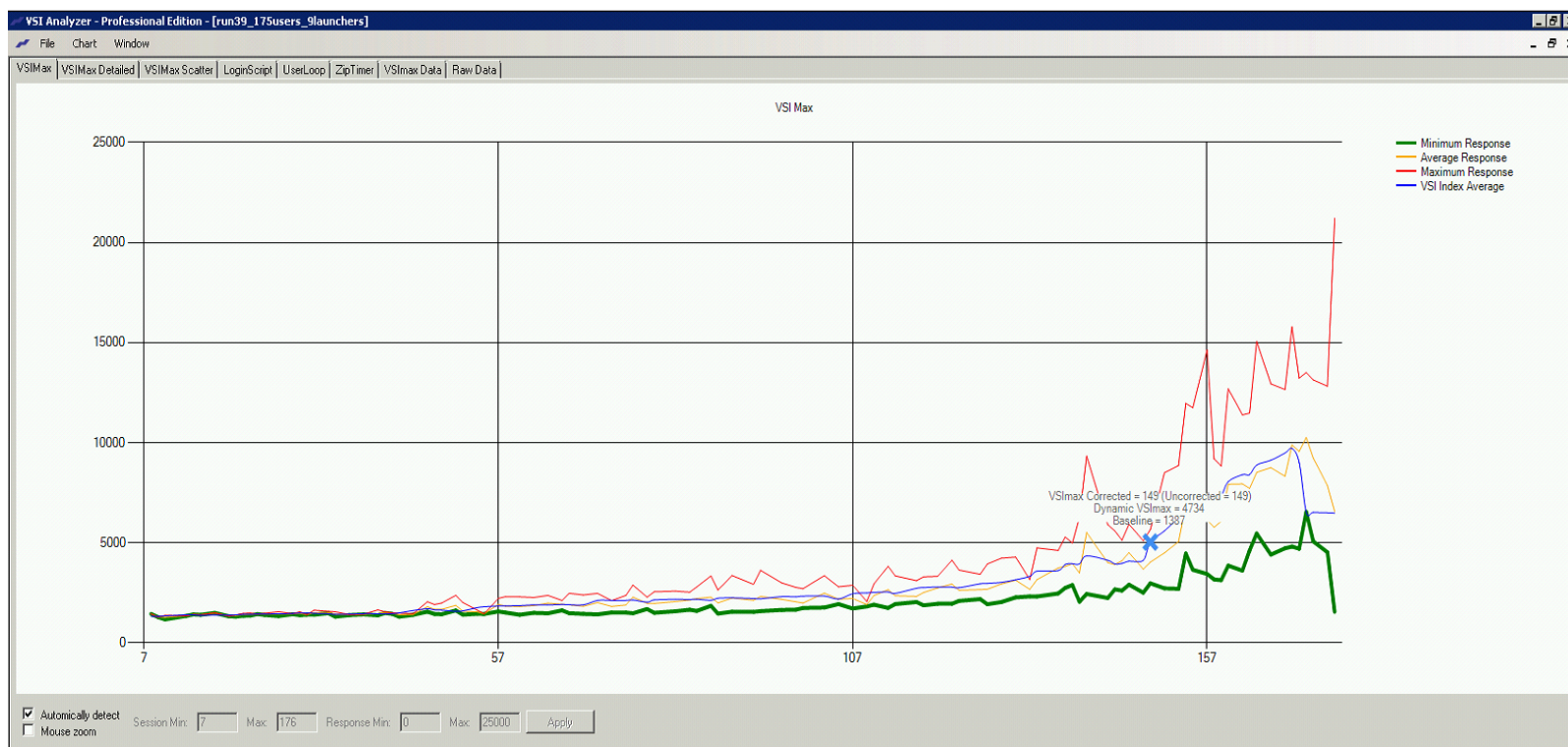


Test Protocol And Test Tool

- Cisco VDI Test Protocol for XenDesktop
 - Provides Boot Process Requirements
 - Provides Workload and Test Process Requirements
 - Provides Reproducibility Requirements
 - Provides Data Capture Requirements
 - Provides Success Criteria
- Login VSI Workload Generator
 - Medium (Knowledge worker) Workload
 - Parallel Launching
 - Stress Test
 - End User Experience Measurement

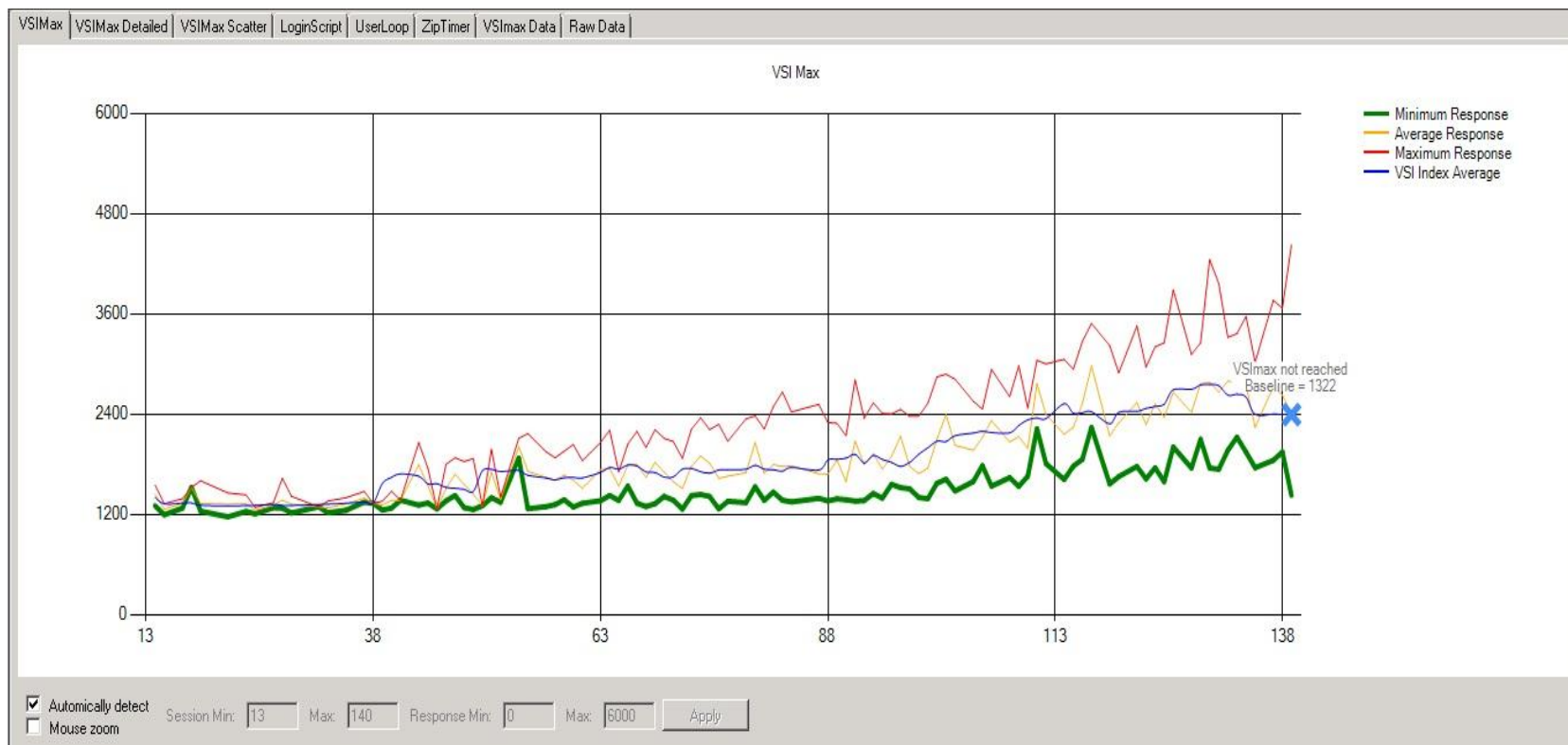
Solution Results

- Single UCS B200 M2 Login VSI Stress Test Result -149 Users



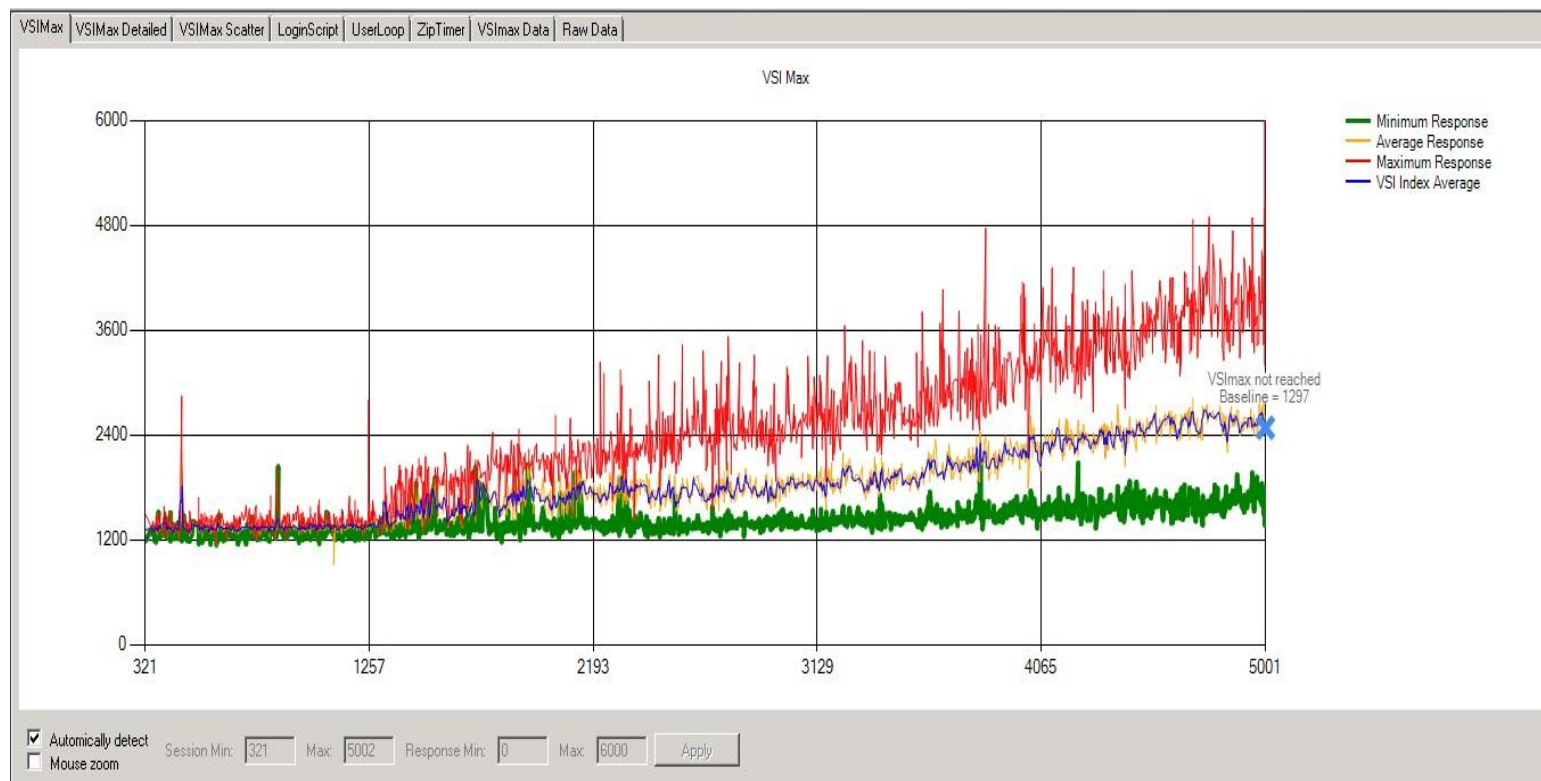
Solution Results

- Single UCS B230 M2 Maximum Recommended Workload - 139



Solution Results

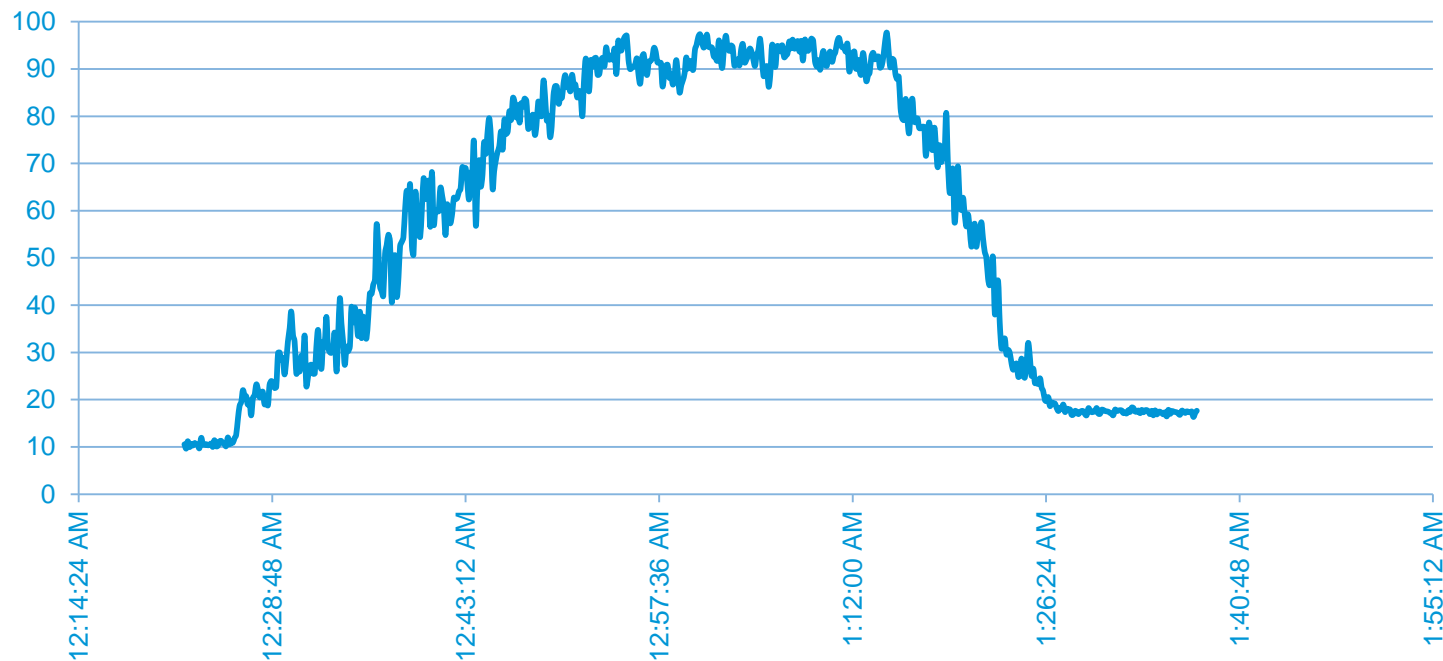
- 5000 User Results – Login VSI End User Experience



Solution Results

- 5000 User Results – Sample UCS B230 M2 CPU Utilization

\\DC-VDA1-B230-CH5-BL-01\Physical Cpu(_Total)\%
Core Util Time



More Information



More Information

- Reference Architecture-Based Design for 5000 Seat Virtual Desktop Infrastructure
http://www.cisco.com/en/US/docs/unified_computing/ucs/UCS_CVDs/citrix_emc_ucs_scaleVDI.html
- Cisco Nexus 1000V Series Switches
<http://www.cisco.com/go/1000v>
- Citrix XenDesktop Modular Reference Architecture
<http://support.citrix.com/article/CTX133162>
- Performance Best Practices for VMware vSphere 5.0
http://www.vmware.com/pdf/Perf_Best_Practices_vSphere5.0.pdf
- EMC VNX7500 Unified Storage System
<https://store.emc.com/Solve-For/Storage-Products/VNX7500/p/VNX-7500-STOR-001-1Q13-0025>

Call to Action



Call to Action

- Read the 5000 Seat Desktop Virtualization CVD
- Take advantage of the Cisco Nexus 1000V in your DV environment
- Plan your large scale deployment of Citrix XenDesktop on UCS, Nexus Switching, and EMC VNX Series Storage
- Contact your Cisco, EMC and Citrix Solution Team
- Visit <http://cisco.com/go/vdi>

Q & A



Thank you.

