

Microsoft Hyper-V and Nexus 1000V Switch for Microsoft Hyper-V within a VMDC Architecture

August 23, 2013

CCDE, CCENT, CCSI, Cisco Eos, Cisco Explorer, Cisco HealthPresence, Cisco IronPort, the Cisco logo, Cisco Nurse Connect, Cisco Pulse, Cisco SensorBase, Cisco StackPower, Cisco StadiumVision, Cisco TelePresence, Cisco TrustSec, Cisco Unified Computing System, Cisco WebEx, DCE, Flip Channels, Flip for Good, Flip Mino, Flipshare (Design), Flip Ultra, Flip Video, Flip Video (Design), Instant Broadband, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn, Cisco Capital, Cisco Capital (Design), Cisco:Financed (Stylized), Cisco Store, Flip Gift Card, and One Million Acts of Green are service marks; and Access Registrar, Aironet, AllTouch, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Lumin, Cisco Nexus, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Continuum, EtherFast, EtherSwitch, Event Center, Explorer, Follow Me Browsing, GainMaker, iLYNX, IOS, iPhone, IronPort, the IronPort logo, Laser Link, LightStream, Linksys, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, PCNow, PIX, PowerKEY, PowerPanels, PowerTV, PowerTV (Design), PowerVu, Prisma, ProConnect, ROSA, SenderBase, SMARTnet, Spectrum Expert, StackWise, WebEx, and the WebEx logo are registered trademarks of Cisco and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1002R)

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Microsoft Hyper-V and Nexus 1000V Switch for Microsoft Hyper-V within a VMDC Architecture © 2013 Cisco Systems, Inc. All rights reserved.



CONTENTS

	Preface iii
	Document Goal iv
	Audience iv
CHAPTER 1	VMDC Architecture Overview 1-1
	VMDC "Typical Data Center" Design for FabricPath 1-2
	VMDC Tenancy Architecture 1-3
	Microsoft Private Cloud Compared to VMware vSphere 1-4
	vSphere Editions 1-5
	Microsoft Private Cloud Editions 1-6
	Interoperability 1-6
	VMDC Test Environment 1-6
CHAPTER 2	Microsoft Private Cloud Implementation 2-1
	SAN Implementation 2-1
	Boot from SAN Procedures 2-2
	Deployment Guidelines 2-4
	Microsoft Windows Server 2012 and Hyper-V Implementation 2-5
	Microsoft Windows Server 2012 Installation 2-6
	Microsoft Hyper-V Installation 2-10
	SQL Server 2012 Installation 2-14
	Deployment Guidelines 2-16
	Microsoft System Center 2012 2-16
	Deployment Guidelines 2-18
	Virtual Switch Module Installation on Nexus 1110 2-19
	Deployment Guidelines 2-19
CHAPTER 3	Nexus 1000V Switch for Microsoft Hyper-V Configuration 3-1
	Network and Tenants Under Test 3-1
	Nexus 1000V Switch for Microsoft Hyper-V VSM CLI Configuration 3-2
	Nexus 1000V Part 2: SCVMM Configuration 3-7
	Deployment Guidelines 3-39
	Adding VMs to Nexus V Switch for Hyper-V Logical Switch 3-40

Γ

Deployment Guidelines 3-43

I

1

CHAPTER $\overline{4}$

SCOM 2012 with UCS Management Pack 4-1

Installation and Configuration 4-1

Deployment Guidelines 4-1

Cisco UCS Management Pack for SCOM 4-2

Monitors and Alerts 4-3

Summary 4-5



Preface

Compute consolidation through virtualization has been a consistent factor in data center trends over the last decade. Systems evolved from separate compute, network, and storage administrative silos to converged infrastructures and operational domains, and from traditional top-down network management and hierarchical infrastructure models, to newer models incorporating centralized controllers and increasingly virtualized, software-defined infrastructures.

Capex savings achieved by leveraging under utilized CPU and memory resources are a key driver of server virtualization. For many years, VMware has led the market for compute virtualization, but in recent years a more frequently encountered theme is that of hypervisor commoditization, as hypervisors from Microsoft, Citrix, and even open source projects have evolved to match, or in some cases exceed, VMware capabilities. As function and feature gaps narrow, some vendors have significantly lowered licensing costs to further hasten reevaluation of solution cost/benefit ratios, particularly for entry point use cases.

A key consideration for those virtualizing Windows environments is that there is no licensing for the Microsoft Hyper-V hypervisor. Microsoft offers Hyper-V in a free standalone version, or bundled into its Windows Server 2012 license. These advances are great news for customers, who now have more choices for virtualization solutions. Customers can select the virtualization environment which best meets their needs, in terms of cost, scale, performance, and application requirements.

The news for customers who adopt the Cisco Virtualized Multiservice Data Center (VMDC) reference model in their data centers is that a recent code release (Release 5.2(1)SM1(5.1)), enables the Nexus 1000V Switch for Microsoft Hyper-V to support advanced switching for Hyper-V virtual machines (VMs), along with Systems Center Virtual Machine Manager (SCVMM) integration. The networking benefits of the Nexus 1000V Switch for Microsoft Hyper-V were previously available only in vSphere environments (per-VM visibility, granular QoS, security policies, segmentation, and vPath service chaining for virtualized services such as Virtual Security Gateway), are now also available in the Windows Server 2012 environments.

This consistent operational model enables customers to leverage preferred management solutions. As noted, the Nexus 1000V Switch for Microsoft Hyper-V now offers SCVMM integration; for those who rely on Systems Center Operations Manager (SCOM), Cisco partnered with Jalasoft to develop an SCOM plug-in. Finally, for those who have Powershell expertise and prefer to use it for simple "CRUD" (create, update, delete) operations, the Nexus 1000V Switch for Microsoft Hyper-V offers RESTful APIs.

The Nexus 1000V Switch for Microsoft Hyper-V and Cisco VM Fabric Extender (VM-FEX) bring VM visibility and policy granularity to the virtualized compute environment as the "missing link" for service assurance in the architecture that VMDC addresses: highly consolidated, highly virtualized yet highly secure, multi-service public or private cloud data centers. This represents a significant step toward hypervisor-agnosticism and enhanced customer options, while maintaining key architectural advantages.

Document Goal

This document presents a "first look" at inserting SCVMM and Hyper-V-based compute resources into the compute tier of the VMDC reference architecture. We highlight differences from vSphere in terms of networking constructs, including policy profile implications and "tenancy."

The following areas are addressed:

- VMDC Architecture Overview—VMDC architectural components and framework
- Implementation Guidance—on deploying Nexus 1000V Switch for Microsoft Hyper-V and Hyper-V in a VMDC environment
- Management—Management tools for monitoring (SCOM) Hyper-V

Audience

The target audience for this document includes sales engineers, field consultants, professional services, IT managers, Cisco channel partner engineering staff, and customers who have need cloud-ready data centers or have an existing VMDC implementation, and are considering Hyper-V based compute resources.



CHAPTER

VMDC Architecture Overview

The VMDC solution provides design and implementation guidance for enterprises deploying private cloud services, and for service providers (SPs) building virtual private and public cloud services. The Cisco VMDC solution integrates various Cisco and third-party products that are part of the cloud computing ecosystem. Cisco's VMDC system defines an end-to-end architecture, which an organization may reference for the migration or build out of virtualized, multiservice data centers for new cloud-based service models such as Infrastructure as a Service (IaaS). Figure 1-1 shows the basic architectural framework for VMDC. The solution scope includes integrated compute, network, and storage components, a functional layered infrastructure, and service definitions for intra-DC, inter-DC, and automation and service assurance models.

Figure 1-1 Basic VMDC Architecture Framework



Refer to the Cisco Virtualized Multiservice Data Center site for additional details on VMDC.

I

Validated VMDC architectural systems include a range of traditional hierarchical classic Ethernet models and a variety of Clos FabricPath-based models. Although this document focuses on inserting Hyper-V into a specific FabricPath-based topology model called a "Typical Data Center" design (for FabricPath), deployment considerations described in this document generally apply to all validated VMDC architectures.

VMDC "Typical Data Center" Design for FabricPath

A "Typical Data Center" design is a 2-tier FabricPath design, as shown in Figure 1-2. All VMDC architectures are built around modular building blocks called pods. Each pod uses a localized services attachment model. In a pod, Virtual Port Channels (vPCs) handle Layer 2 (L2) switching between the Edge devices and the compute. This provides an active-active environment that does not depend on Spanning Tree Protocol (STP) and converges quickly after failures. Figure 1-2 shows a VMDC pod using FabricPath between the Edge and Aggregation/Spine devices. In previously VMDC releases, vPCs were also used here as well. FabricPath replaces these vPCs.



Figure 1-2 VMDC 3.0.1 Typical Data Center Design

Hyper-V is used to implement hypervisor-based virtualization and enable the creation of VMs on physical servers. Hyper-V logically abstracts the server environment in terms of CPU, memory, and network touch points into multiple virtual software containers. In previous VMDC offerings, VMware's hypervisor was used.

The Cisco Nexus 1000V Switch for Microsoft Hyper-V L2 switch extends Cisco networking benefits to Microsoft Windows Server 2012 Hyper-V deployments. The Nexus 1000V Switch for Microsoft Hyper-V distributed virtual switching platform provides advanced features and is tightly integrated with the Hyper-V ecosystem.

Table 1-1 summarizes the capabilities and benefits of Cisco Nexus 1000V Switch for Microsoft Hyper-V switch when used in conjunction with Microsoft Hyper-V.

Capabilities	Features	Operational Benefits
Advanced Switching	Private VLANs, Quality of Service (QoS), access control lists (ACLs), portsecurity, and Cisco vPath	Get granular control of virtual machine-to-virtual machine interaction.
Security	Dynamic Host Configuration Protocol (DHCP) Snooping, Dynamic Address Resolution Protocol Inspection, and IP Source Guard	Reduce common security threats in data center environments.
Monitoring	NetFlow, packet statistics, Switched Port Analyzer (SPAN), and Encapsulated Remote SPAN	Gain visibility into virtual machine-to-virtual machine traffic to reduce troubleshooting time.
Manageability	Simple Network Management Protocol, NetConf, syslog, and other troubleshooting command-line interfaces	Use existing network management tools to manage physical and virtual environments.
	Similar RBAC concept like physical switches – TACACS+, RADIUS	Centralize Access Control Management across physical and virtual switches

Table 1-1 Nexus 1000V Switch for Microsoft Hyper-V Benefits

VMDC Tenancy Architecture

ſ

The Expanded Palladium tenancy model provides flexibility in server VLANs placement in different zones, public and private. This model was further refined in VMDC 3.0.1 for the private cloud use case. Public virtual routing and forwarding instances (VRFs) are combined into one common public zone. The model assumes there is an "infrastructure" demilitarized zone (DMZ) above the common public zone, so there is no need for a separate protected front-end zone (and VRF) to accommodate per-tenant DMZs. This is a norm in the Enterprise environment. The public zone is shared across multiple user organizations or "tenants" (infrastructure zone) and provides access to the public Internet and serves as a shared resource zone. Figure 1-3 shows a simplified, high-level version of this model.



Figure 1-3 Expanded Palladium Tenancy Model

Microsoft Private Cloud Compared to VMware vSphere

Microsoft and VMware are both leading providers of cloud technologies. While their base technologies differ, their models exhibit the common functional components shown in Table 1-2.

Cloud Technology	Microsoft	VMware	Notes
Hypervisor	Hyper-V	ESXi	Both Type-1 Hypervisor
VM Management	SCVMM	vCenter Server	
Self-Service	App Controller	vCloud Director	
Monitoring	SCOM	vCenter Operations Management Suite	
Protection	Data Protection Manager	vSphere Data Protection	
Service Management	Service Manager	vCloud Automation Center	
Automation	Orchestrator	vCenter Orchestrator	

Table 1-2 Microsoft vs. VMWare Cloud Technologies

However, as might be expected, Microsoft and VMware terminology differs. Figure 1-4 highlights key terms in the Microsoft and VMware hypervisor ecosystems.

VMware ESX	Microsoft Hyper-V
vMotion	Live Migration
Virtual Distr. Switch (VDS)	Logical Switch
Folder/DataCenter	Host Group
vmknic	Host VNIC
Port-group	Virtual PP + VM Networks
Distributed Resource Scheduling (DRS)	Dynamic Optimization
Distrib. Power Mgmt (DPM)	Power Management
vCenter, vCloud Director	SCVMM, Orchestrator
Site Recovery Manager	Hyper-V Replica
Update Manager (VUM)	Update Services (WSUS)
Virtual Machine Disk (VMDK)	Virtual Hard Disk (VHDX)
VXLAN	NVGRE

Figure 1-4 Hypervisor Terminology Comparison

Microsoft and VMware also have different licensing practices, as summarized in Table 1-3.

Table 1-3	Microsoft and VMware	Licensing
-----------	----------------------	-----------

Cloud Technology	Microsoft	VMware	License Required?
Hypervisor	Free	Free	Note: The Hypervisors are free to install. However, each VM will require a per vCPU license
VM Management	Included with System Center	Sold Separately	Y
Self-Service	Included with System Center	Part of vCloud Suite	Y
Monitoring	Included with System Center	Included with vSphere	Y
Protection	Included with System Center	Included with vSphere	Y
Service Management	Included with System Center	Part of vCloud Suite	Y
Automation	Included with System Center	Packaged with vCenter Server	Y

vSphere Editions

ſ

There are three editions of VMware vSphere: Standard, Enterprise, and Enterprise Plus. To support VM management, each edition requires the purchase of a vCenter Server. For Nexus 1000V Switch for Microsoft Hyper-V support, an Enterprise Plus license is also required.

Refer to the VMware vSphere with Operations Management website for additional details.



If Self-Service and Service Management are required, the user should consider purchasing the vCloud Suite, which includes a license for Enterprise Plus.

Microsoft Private Cloud Editions

Microsoft Private Cloud provides a Standard and a Datacenter Edition. The Standard Edition has a limitation on the number of vCPU and supported VMs, while the Datacenter Edition has unlimited support. The Nexus 1000V Switch for Microsoft Hyper-V is supported in both editions.

Refer to the Cisco Nexus 1000V Switch for Microsoft Hyper-V website for additional details on key benefits, features, and capabilities of Nexus 1000V with Microsoft Hyper-V.

Refer to the Microsoft Private Cloud website for additional details on key benefits, success stories, and how to evaluate or purchase Microsoft Hyper-V.

Refer to the Microsoft Private Cloud whitepaper for a comparative look at functionality, benefits, and economics.

Refer to VMware vSphere 5 vs. Microsoft Hyper-V 2012 for competitive performance results.

Interoperability

Both Microsoft and VMware can now manage multi-hypervisor environments.

Refer to the VMware vCenter Multi-Hypervisor Manager Documentation site to download the VMware vCenter Multi-Hypervisor Manager. Documentation for this plugin is also available on the webpage.

Microsoft System Center 2012 and SCVMM can manage multi-hypervisor environments. Refer to Managing VMware Infrastructure in VMM site for additional guidance.

VMDC Test Environment

Microsoft Hyper-V and Nexus 1000V Switch for Microsoft Hyper-V were tested in a VMDC 3.0.1 infrastructure. The system under test also leveraged the VMDC Virtual Management Infrastructure (VMI) for deploying the Nexus 1000V Switch for Microsoft Hyper-V Virtualized Switch Module (VSM).

Figure 1-5 shows how the Microsoft Hyper-V compute environment connects into the VMDC network infrastructure, VMI, and storage area network (SAN).

Γ



Table 1-4 lists the system hardware components and their associated software versions.

Table 1-4	Hardware Components and Associated Software Versions
-----------	--

Component	Typical VMDC Topology Software Version
Nexus 7000 (Aggregation-edge/Access-Edge/Core)	6.1.3
Nexus 5500 (Access-edge) w N2K-2232 and N2K-2248 FEX	5.2.1.N1.3
Catalyst 6500 (DSN and VSS)	12.2(33)SXJ3
ASA SM (In Extended Topology)	8.5(1)
ACE 30 (In Extended Topology)	A5.2.2
Unified Computing System	2.1.1(e)
Nexus 1000V Switch for Microsoft Hyper-V	5.2.1.SM1.5.1
1110 VSA	4.2(1)SP1(5.1a)
UCS Host OS	Windows Server 2012

Microsoft Hyper-V and Nexus 1000V Switch for Microsoft Hyper-V within a VMDC Architecture

Component	Typical VMDC Topology Software Version
Virtual Machine Guest Operating System	CentOS 6.4
System Center Virtual Machine Manager	Windows Server 2012 UR2 Version 3.1.6020.0

Table 1-4 Hardware Components and Associated Software Versions (continued)



снарте 2

Microsoft Private Cloud Implementation

In this section, we explore the implementation of a Microsoft Private Cloud solution through integrating the Microsoft Cloud OS into UCS. UCS is a computing systems comprising computing hardware, compute switching fabric, and virtualization and management software. These resources are integrated into a cohesive system that can be managed as an entity.

This provides unique benefits in the data center, such as:

- Hardware virtualization for streamlined deployment
- Ease of Cabling
- Single point of management for the compute resources (including blades, chassis and compute switching fabric)
- High Availability (including 1:N redundancy if desired)

Compute resources in the System Under Test included:

- 2 Cisco UCS 5108 Chassis
- 2 Cisco UCS 2208XP IOMs per chassis
- 2 Cisco UCS B200 M2 Blade Series Serves per chassis
- 2 Cisco UCS 6248UP Fabric Interconnects

The Cloud OS involves the simultaneous operation of several enterprise technologies including:

- UCS SAN Booting
- Windows Server 2012
- SQL Server 2012
- System Center 2012

Refer to the VMWare vSphere with Operations Management website for additional details on VMWare vSphere.

Refer to the Microsoft Private Cloud-Making it Real white paper to learn more about Microsoft's strategic and technical differentiation.

SAN Implementation

The B200 M2 Series server blades in UCS are configured to boot from SAN. UCS has two Fibre Channel port channels that connect Fabric A and Fabric B to two MDS switches. The MDS switches connect to a NetApp storage device.

I

Details on the Service Profile creation for a server Hyper-V on UCS are found Figure 29 of the Deployment Guide.

Boot from SAN Procedures

Before starting, review the Common Errors during Windows SAN Boot Install on NetApp Storage Cisco internal document for lessons learned about the Windows SAN boot install.

Step 1 Shutdown all but one path to the boot logical unit number (LUN)

Microsoft supports only one path to the boot LUN when installing the OS. The Fibre Channel port channel (FC Po10) that connects to the MDS switches was disabled in UCS Manager (UCSM). All but one member of the second Fibre Channel port channel (FC Po20) was disabled.

Step 2 Map to fiber over Ethernet network interface card (fNIC) drivers and ISO image (Optional)

During OS installation, fNIC drivers must be installed in order to scan for the SAN boot LUN. To do this, map to the driver location using the UCS KVM console connection Virtual Media tab before starting the installation, and map to the ISO location of the OS to be installed.

As shown in Figure 2-1, in order to map to more than one image at a time, the FNIC drivers were copied locally (C:tmp in the Drive column). The ISO OS installation image was on a mapped drive to a network share.

Instead of mapping to both images at the same time, you could map and unmap as needed to go between the fNIC drivers and the OS during installation. However, mapping to multiple images supports not having to unmap and remap during installation.

Figure 2-1 shows a display from the KVM Virtual Media tab for what was mapped.

Γ

	V2-C263-P1	(Chassis - 2 S	erver - 3) - KVM Co	nsole				>		
е	Help									
, B	Boot Server 🧠	😹 Shutdown Sei	rver 🔐 Reset							
M	Console Properties									
VM	M Virtual Media									
d	lient View									
	Mapped	Read Only	Drive					Exit		
L			A: - Floppy					Create Image		
L		1	🗟 E: - CD/DVD					Add Image		
L		1	🛓 D: - CD/DVD					Add Inage		
L	7	1	🚽 C:\tmp\x64.img	- Floppy Image	File			Remove Image		
			A Y:\ISO\WMDC4\	Win2012\en_win	dows_server_20	012_x64		Details ±		
L										
L										
L										
l										
	etails Target Drive	Mapped	To	Read Bytes	Write Bytes	Duration	1	_		
	etails Target Drive irrtual CD/DVD	Mapped	To 50/VMDC4\Win2012	Read Bytes	Write Bytes	Duration 00:00:01]	USB Reset		
	etails Target Drive Irrtual CD/DVD Removable Disk	Mapped P:\ts Sc:\tr	To :O\VMDC4\Win2012 mp\x64.img - Flopp	Read Bytes	Write Bytes	Duration 00:00:01 00:00:21]	USB Reset		
	etails Target Drive irbual CD/DVD Lemovable Disk	Mapped Y: US C: \tr Not mapp	To :O\VMDC4\Win2012 mp\x64.lmg - Flopp ped	Read Bytes .0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21	1	USB Reset		
	etails Target Drive Irtual CD/DVD Removable Disk Toppy	Mapped Y:\s C:\r Not mapp	To SO (VMDC4 (Win2012 mp \x64.img - Flopp bed	Read Bytes .0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21]	USB Reset		
R	etails Target Drive Îrtual CD/DVD Removable Disk Îoppy	Mapped Y:12 C:\tr Not mapp	To SO (VMDC4\Win2912 mp\x64.lmg - Flopp bed	Read Bytes 0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21	1	USB Reset		
	etails Target Drive Îrtual CD/DVD Removable Disk Îoppy	Mapped Y: [JS C: \tr Not map;	To SO (VMDC4\Win2012 mp\x64.lmg - Flopp bed	Read Bytes 0	Write Bytes 0 0	Duration 00:00:01 00:00:21	1	USB Reset		
	etails Target Drive Îrtual CD/DVD Removable Disk Îoppy	Mapped Y: \[S C:\tr Not map;	To SO (VMDC 4\Win 2012 mp)x64.img - Flopp ted	Read Bytes .0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21		USB Reset		
	etails Target Drive Îrtual CD/DVD Removable Disk Îoppy	Mapped Y:\IS C:\tr Not map;	To SO\VMDC4\Win2012 mp\x64.img - Flopp sed	Read Bytes .0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21		USB Reset		
	etails Target Drive Irtual CD/DVD Removable Disk Hoppy	Mapped Y: \/s C: \/t Not map;	To :O\VMDC4\Win2012 mp\x64.lmg - Flopp ped	Read Bytes 0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21	1	USB Reset		
	etails Target Drive Irtual CD/DVD Removable Disk Hoppy	Mapped Y: \Is C: \tr Not map;	To SO (VMDC 4 (Win 2012 mp)x64.lmg - Flopp bed	Read Bytes .0 0	Write Bytes 0 0	Duration 00:00:01 00:00:21		USB Reset		

Figure 2-1 Mapped KVM Virtual Media

If you forget to remap to an ISO image, the disk comes online but Windows fails to install and produces the following error:

N	lame	Total Size	Free Space	Туре
0	isk 6 Unallocated Space	20.0 GB	20.0 GB	
a 🖓	isk 8 Unallocated Space	20.0 GB	20.0 GB	Offline
Ins	tall Windows			x
2 De	N			
Vind	L3			
				Mast

Figure 2-2 Forgot to re-map to ISO image



To proceed to the next step, you must remove the driver CD, insert the Windows CD, and refresh.

Step 3 Verify the NetApp LUNs are type **Windows GPT**. There are 2 Windows options for Type in the NetApp used during the testing, Windows and Windows GPT.

Figure 2-3 NetApp LUN configuration for B-Series Servers

LUNs										
LUN Management Initiator Groups										
🗟 Create 🗟 Clone 📝 Edit 🗙 Delete 🧔 Status 🔻 🎇 Refreshi										
Name	Container Path	Thin Provisioned	Available Size	Total Size	% Used	Туре	Status			
V2-C1B1-P1_boot	/vol/V2_C1B1_P1_boot_vol	No	200.03 GB	200.03 GB	0.0%	Windows GPT	😔 Online	-		
V2-C1B2-P1_boot	/vol/V2_C1B2_P1_boot_vol	No	199.94 GB	200.03 GB	0.04%	Windows GPT	😔 Online			
V2-C1B3-P1_boot	/vol/V2_C1B3_P1_boot_vol	No	192.11 GB	200.03 GB	3.96%	Windows GPT	😔 Online			
V2-C1B4-P1_boot	/vol/V2_C1B4_P1_boot_vol	No	199.94 GB	200.03 GB	0.04%	Windows GPT	😔 Online			

Deployment Guidelines

- **1.** Refer to Windows Boot from Fibre Channel SAN guide for an overview and the detailed instructions the administrator should follow.
- **2.** Refer to Support for booting from a Storage Area Network (SAN) for information about booting a Windows server from a SAN.

I

3. Shutdown all but one path to Boot LUN.

Refer to Windows Setup in a boot from SAN configuration reports. Setup was unable to create a new system partition or locate an existing system partition.

4. Configure the NetApp Boot LUN as Windows GUID Partition Table (GPT).

Microsoft Windows Server 2012 and Hyper-V Implementation

This section covers Microsoft Windows Server 2012 and Hyper-V implementation. A common misconception of Microsoft Hyper-V is that it is a Type-2 hypervisor because installation of Windows Server 2012 is required. However, Hyper-V is considered a Type-1 hypervisor because VMs can interface directly with the hypervisor layer, bypassing the operating system layer.

There are two versions of Hyper-V. The first is a standalone product called Microsoft Hyper-V Server 2012. This free product is available for download from Microsoft. The second version is the Hyper-V feature bundled with Microsoft Windows Server 2012.

For Microsoft Server 2008 R2, there were three editions: Standard, Enterprise, and Datacenter. For Windows Server 2012, the Enterprise edition was eliminated. The Standard and Datacenter editions support installing Hyper-V.

🖕 / V2-C2B3-P1 (Chassis - 2 Server - 3) - KVM Console
File View Macros Tools Help
🚙 Boot Server 🔄 Shutdown Server 😂 Reset
KVM Console Properties
KVM Virtual Media
KVM Virtual Media Select the operating system you want to install Operating system Windows Server 2012 Datacenter (Server Core Installation) x64 7/26/2012 Windows Server 2012 Datacenter (Server with a GUI) x64 Description: This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be trun on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."

Figure 2-4 Data Center Edition

I

The choice between Standard and Datacenter Edition depends upon the number of active VMs required in the datacenter. Standard Edition supports a maximum of two VMs, but the Datacenter Edition does not limit active VMs.

Microsoft Windows Server 2012 Installation

The Windows Server 2012 edition (Standard or Datacenter) to be installed depends upon the product key entered. To simplify installation, use the GUI to install Windows Server 2012 using the GUI. This is also the reason why it is better to install the full Windows Server 2012 instead of the standalone Hyper-V server.

Step 1 Install Windows Server 2012.

Refer to the Installing Windows Server 2012 site for detailed guidance.

Step 2 After the installation completes, install the Cisco eNIC drivers to enable the network interface cards (NICs). The drivers are available on the Cisco software download site.

Figure 2-5 NIC Driver Installation



Step 3 After the NICs are enabled, verify that the server joins an Active Directory (AD) domain. This also satisfies the Network Time Protocol (NTP) requirement.

ſ

View Macros Tools Help 3oot Server 🔩 Shutdown Server 🥝 Reset	
Boot Server 🔜 Shutdown Server 🤐 Reset	
Console Properties	
Virtual Media	
System	
-) 💿 👻 🕆 🖳 🕨 Control Panel 🕨 All Control Panel Items 🕨 System	V C Search Control Panel ,0
Control Panel Home	
System Properties	x
Device Manag Computer Name/Domain Changes	
Remote setting	
Advanced syst You can change the name and the membership of this computer. Changes might affect access to network resources.	^{mputer} Windows Server [®] 2012
Computer name:	
V2-C2B3-P1	X5690 @ 3.47GHz 3.46 GHz (2 processors)
Full computer name:	
V2C2B3-P1	x64-based processor
More	available for this Display
Member of	
Domain:	😵 Change settings
vmdc.net	
O Workgroup:	
WORKGROUP	
See also OK Cancel	ctivation
Action Center	
Windows Upd OK Cancel	Apply
	7.14.014
	P 20 13 14 PM
agged in as computeToken @10.0.64.100 Not registered with UCS Central	System Time: 2013-06-19T

Figure 2-6 Joining an AD Domain

- **Step 4** On the AD server, verify that the **Administrator** account has Domain Administrator access. Add the **scymmadmin** account and grant it the Domain Administrator access.
- **Step 5** On the Windows Server 2012 server, verify that the AD **Administrator** and **scvmmadmin** accounts are available and add them if they are not available. After AD **Administrator** and **scvmmadmin** accounts are available, log off and log on as the Domain Administrator.

🇼 / ¥2-C2	283-P1 (Chassis - 2 Server	- 3) - K¥M Console			
File View	Macros Tools Help				
👍 Boot Ser	rver 🜙 Shutdown Server	🤐 Reset			
KVM Consol	e Properties				
KVM Virtu	al Media				
-		o 00 o	o o oo o		
		User Accounts	X	the second second	
Rec		USCI ACCOUNTS			
Us	sers Advanced			and the second	
	Use the list below	to grant or deny users	access to your computer,		
	and to change par	sswords and other sett	ings.	anager	
	Users for this computer:			stem32\cmd.exe	
	User Name	Domain	Group	erved.	<u>^</u>
	Administrator	VMDC	Administrators		
	Numerical Administrator	V2-C2B3-P1	Administrators		
	🗟 scvmmadmin	VMDC	Administrators		
	[A <u>d</u> d	Semove Properties		
		Summer and a second seco			
	Password for Administrat	or			
	To change you	r password, press Ctrl-,	Alt-Del and select Change		
	Password.	r			
			Keset Password		
		OK	Cased Analy	à	н
		UK.			
				-	
			<u>\$2</u>	🔺 🕩 🤤	1:04 PM
			V	1 10	6/19/2013
🔒 Logged in	ascomputeToken@10.0	0.64.100 Not register	ed with UCS Central	Syst	em Time: 2013-06-19T15:56

Figure 2-7 Administrator and scvmmadmin Accounts

Step 6 After logging in, turn off the Windows Firewall in the Windows Firewall control panel.

ſ



Figure 2-8 Disabling Windows Firewall

Step 7 Verify that Windows Server 2012 can access the internet and activate Windows.

P	Windows Activation		- U X
🍥 💿 🕤 🛧 🏲 🕨 Control Panel 🕨	System and Security + Action Center + Windows Activation	✓ C Search Control Pane	ρ,
ð	Windows isn't activated		
ſ		×	
	💿 훢 Windows Activation		
	R.		
	Activating Windows		
	This might take a few minutes		
	-		
		· · · · ·	
		\odot	
		Ŭ	
			Cancel

Figure 2-9 Windows Activation

Microsoft Hyper-V Installation

Although Microsoft Hyper-V is included in Windows Server 2012, Hyper-V is not installed by default. After the initial Windows Server 2012 install finishes, the System Administrator must add the Hyper-V role manually. This section outlines the steps to install and configure Hyper-V.

Step 1 In Server Manager, bring up Add Roles and Features Wizard.

ſ

Re.				Server Manager	r					-	D X
	L	Add Roles and Features Wi	zard		x		<u>a</u>	IF			
	Select server role	Select one or more roles to install on the selecte	d server.	DESTINATION SERV V2-C283-P1.vmdc	tver Loet		• @	Mana <u>o</u>	ge Tools	View	Help
	Instaliation Type Server Selection Server Roles Peatures Application Server Role Services Hyper-V Virtual Switches Migration Default Stores Confirmation Results	Roles Active Directory Rights Management Se Application Server DHOP Server DNS Server Fax Server Fax Server Bill And Storage Services (Installed) PHEPST Network Policy and Access Services Print and Document Services Remote Access Remote Desktop Services Volume Activation Services	vices	ption -V provides the services that in use to create and manag machines and their resour titual machine is a virtualiza tete system that operates is desecution environment. T you to run multiple operat is simultaneously.	at ge rces. red n an This ting					Hid	e =
		Web server (IIIs) Windows Deployment Services Windows Server Update Services Vindows Server Update Services Vindows Server Update Services	us Next >	Install Cance	el	Servers 1 ageability					
		Performance	Services		Sen	vices					
		BPA results	Performance		Perf	formance					
			BPA results		BPA	results					~

Figure 2-10 Add Roles and Features Wizard

Step 2 In the Wizard, click **Next** until the "Server Roles" window appears. Verify that the **Hyper-V** role is selected and click **Next**. In the **Features** window, verify that **Failover Clustering** and **Multipath I/O** are selected.

B	Add Roles and Features Wizard	_ _ X
Select features		DESTINATION SERVER WIN-0JFUJ49ER67
Before You Begin	Select one or more features to install on the selected server.	
Installation Type	Features	Description
Server Selection	Client for NFS	Multipath I/O, along with the
Server Roles	Data Center Bridging	Microsoft Device Specific Module
Features	Enhanced Storage	(DSM) or a third-party DSM, provides support for using multiple
Confirmation	✓ Failover Clustering	data paths to a storage device on
Posults	□ Group Policy Management ■	Windows.
inesolits	Ink and Handwriting Services	
	Internet Printing Client	
	IP Address Management (IPAM) Server	
	iSNS Server service	
	LPR Port Monitor	
	Management OData IIS Extension	
	Media Foundation	
	Message Queuing	
	✓ Multipath I/O	
	Network Load Balancing V	
	< III >	
	< Previous Next	> Install Cancel

Figure 2-11 Features Wizard

Step 3 With the Hyper-V role selected, the Wizard prompts for the creation of virtual switches. Depending on the number of available NICs, it is a good practice to create at least one switch for management. At the same time, reserve at least one NIC for the Nexus 1000V Switch for Microsoft Hyper-V.

Γ

Ъ.	Add Ro	les and Features Wizard	_ D X
Create Virtual Sw Before You Begin Installation Type Server Selection Server Roles Features Hyper-V Virtual Switches	Add Ro Virtual machines require role, you can create virtu One virtual switch will b at least one virtual switc can add, remove, and m Network adapters: Name V Ethernet	es and Features Wizard e virtual switches to communicate with other compute al machines and attach them to a virtual switch. e created for each network adapter you select. We rec h now to provide virtual machines with connectivity t odify your virtual switches later by using the Virtual S Description Cisco VIC Ethernet Interface	DESTINATION SERVER V2-C283-P1.vmdc.net ers. After you install this commend that you create o a physical network. You witch Manager.
Virtual Switches Migration Default Stores Confirmation Results	Ethernet Ethernet Ethernet Ethernet We recommend than network adapter, do	Cisco VIC Ethernet Interface Cisco VIC Ethernet Interface III t you reserve one network adapter for remote access o not select it for use with a virtual switch.	to this server. To reserve a
		< Previous Next >	Install Cancel

Figure 2-12 Creating Virtual Switches

Step 4 Verify that Live Migrations are selected. This is a key advantages of Hyper-V.

Figure 2-13 Live Migration Option

L	Add Roles and Features Wizard	_ _ X
CVirtual Machine Before You Begin Installation Type Server Selection Server Roles Features Hyper-V Virtual Switches Migration Default Stores	Add Roles and Features Wizard Migration Hyper-V can be configured to send and receive live migrations of virtual mm Configuring Hyper-V now enables any available network on this server to b you want to dedicate specific networks for live migration, use Hyper-V setti Allow this server to send and receive live migrations of virtual machines Authentication protocol Select the protocol you want to use to authenticate live migrations. Use Credential Security Support Provider (CredSSP) This protocol is less secure than Kerberos, but does not require you to delegation. To perform a live migration, you must be logged on to th Use Kerberos This protocol is more secure but requires you to set up constrained d	DESTINATION SERVER V2-C283-P1.wmdc.net achines on this server. e used for live migrations. If ings after you install the role.
Confirmation Results	Inis protocol is more secure but requires you to set up constrained d environment to perform tasks such as live migration when managing If this server will be part of a cluster, do not enable migration now. Inst server for live migration, including specifying networks, when you creat < Previous Next >	legation in your this server remotely. ead, you will configure the te the cluster.

Step 5 Use the Defaults for the rest of the Wizard. Once the installation completes, reboot the server. The Windows Server 2012 server might reboot several times to install the added Roles and Features. This is normal. Simply wait until all the installation completes.

<u>Note</u>

Run Windows Update to ensure that all installed components are running the latest versions.

Figure 2-14 Windows Update

r i i i i i i i i i i i i i i i i i i i	Windows Update		L	- -	×
🔄 💿 👻 🕇 🐝 🕨 Control Pa	nel 🔸 All Control Panel Items 🔺 Windows Update	~ ¢	Search Control Panel	ş	2
Control Panel Home	Windows Update				
Check for updates					
Change settings	Checking for updates				
View update history					
Restore hidden updates					
	Most recent check for updates: Never				
	Updates were installed: Never				
	You receive updates: For Windows and other products from Microsoft Update				
See also					
Installed Updates					

SQL Server 2012 Installation

Before setting up Microsoft System Center 2012, we highly recommend that the System Administrator sets up a dedicated Microsoft SQL Server 2012 instance. Although System Center can install SQL Express, it is prudent to use the full version of SQL Server because it enables users to back up the database or set up MSCS clustering, which supports easy database recovery if a disaster occurs.

Step 1 Installing the SQL Server is straightforward. Unless MSCS clustering is required, no Windows Server 2012 customization is needed. Simply install Windows Server 2012 (either Standard or Enterprise) and then install SQL Server 2012 onto Windows Server 2012. After installation finishes, run Windows Update to obtain the latest patches and updates.

Refer to Install SQL Server 2012 from the Installation Wizard guide for information on installing SQL server.

Step 2 Verify that all SQL Server services are running and bring up the SQL Server Configuration Manager.

	Sql Serv	er Config	uration Mar	nager			_	X	
File Action View Help Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Services Image: Sever Sever Services Image: Sever Sever Sevices Image: Sever Sever Sevices Imag	Name SQL Server Integr SQL Full-text Filte SQL Server (MSS SQL Server Analy SQL Server Repor SQL Server Browser SQL Server Browser SQL Server Agent	State Running Running Running Running Running Stopped Running	Start Mode Automatic Manual Automatic Automatic Automatic Manual Automatic	Log On As NT Service\MsDtsS NT Service\MSSQL NT Service\MSSQL VMDC\Administrator NT AUTHORITY\LO NT Service\SQLSER	Process ID 1260 2716 1320 1360 1396 0 2088	Service Type SQL Server Analysis Server Report Server SQL Agent			

Figure 2-15 SQL Server Configuration Manager

Step 3 Add, view, delete, or perform maintenance on any databases using SQL Server Management Studio.

Microsoft SQL Server Management Studio (Administrator) _ 0 × File Edit View Debug Tools Window Help 🎦 🕶 🖅 😅 🛃 🤰 🔔 New Query 📑 🔧 📸 🤧 🖓 🖓 🖉 // - 🔍 - 💭 - 🖏 🖓 🙀 🕨 - 🛛 🖄 🚆 Object Explorer Connect 🕶 📑 📑 👕 🐼 🗉 🐻 VMI-HYPERV-SQL (SQL Server 11.0.3128 🖃 🚞 Databases 🗉 🚞 System Databases 🗉 🧰 Database Snapshots 표 🧻 OperationsManager 🗄 🧻 ReportServer ReportServerTempDB 🕀 间 SC01 🖃 🧻 VirtualManagerDB2 Database Diagrams 🗉 🚞 Views ⊞ 🚞 Synonyms ⊞ 🚞 Programmability 🗉 🚞 Service Broker 🗉 🚞 Storage 🗉 🧻 VirtualManagerDB3 🗉 🚞 Security 🗉 🚞 Server Objects E
 Replication 🗉 🚞 AlwaysOn High Availability 🗉 📸 SQL Server Agent

Figure 2-16 SQL Server Management Studio



I

The necessary databases are automatically created when any System Center 2012 components are installed. No user intervention is necessary.

Deployment Guidelines

- 1. If a System Center 2012 component cannot communicate with SQL Server 2012, the problem might be caused by Windows Firewall. Disable Windows Firewall on all servers.
- 2. We highly recommend making periodic database backups to ensure effective disaster recovery. For more information about database backups, refer to Create a Full Database Backup (SQL Server).
- **3.** Before installing System Center 2012, the System Administrator should create a test database and verify that all servers can connect to that test database.

Microsoft System Center 2012

This section describes Microsoft System Center 2012 (MSC) and System Center Virtual Machine Manager 2012 (SCVMM).

Refer to Installing System Center 2010 – Virtual Machine Manager for installation guidance.

SCVMM is part of MSC. Evaluation copies of MSC can be downloaded from the Microsoft System Center 2012 website.

SCVMM can reside on a VM or a physical server. The Administrator can base the decision on preference and the availability of resources.

SCVMM requires a MS-SQL database server and an Active Directory server with the existing setup.

- **Step 1** Connect the Windows Server 2012 server to the AD domain where the Hyper-V servers resides on.
- Step 2 The installation prompts for database information and automatically create a database instance on the server. If no database server is available, MS-SQL Express is automatically installed. After the installation finishes, the Virtual Machine Management (VMM) Console icon should appear on the Windows Server 2012 desktop.

Γ



Figure 2-17 Virtual Machine Management Console Icon

Step 3 Bring up the VMM Console. You can now add Hyper-V hosts and the Nexus 1000V Switch for Microsoft Hyper-V.

Administrator - VMI-SCVMM.vmdc.	net - Virtu	al Machir	ne Manag	ger								_ 0	x
Home Folder													^ 🕜
Create Create Virtual Service Machine - Create Create Host Cloud Group Create	Create VM Network	Assign Cloud Cloud	Overview	VMs S	Services how	VM Networks	PowerShell Jobs PRO Window						
VMs and Services < N	VMs (0)												
ổ Tenants													٩
a Clouds	Name	St *	Vir 👻	Availa	Host	Cloud	Job Status	Ŧ	0	" Us	* CPU A	Service	Opera
🚢 VM Networks						There are no	o items to show in th	is view					
길 Storage													
🚞 All Hosts													
													*
w VMs and Services													
Fabric													
🧮 Library													
🖺 Jobs													
Settings													
•													

Figure 2-18 VMM Console

Deployment Guidelines

SCVMM requires .NET Framework 3.5 and .NET Framework 4.0 to be installed on the Windows Server 2012 server that SCVMM resides on. While .NET 4.0 can easily be added through the Roles and Features Wizard, installing .NET 3.5 through the same wizard will only result in an error. This is a known Microsoft issue. The only workaround to this issue is to use the following method.

- 1. Verify that the Windows Server 2012 server can connect to the internet.
- 2. Bring up the KVM console using UCSM.
- 3. Mount the Windows Server 2012 installation media onto the CD/DVD drive (D:).
- 4. Enter the following command on a DOS prompt:

```
dism /online /enable-feature /featurename:NetFX3 /all /Source:d:\sources\sxs
/LimitAccess
```

Figure 2-19 dism Output

C:\Users\administrator.NEWTECH>dism /online /enable-feature /featurename:NetFX3 /all /Source:D:\sources\sxs /LimitAccess
Deployment Image Servicing and Management tool Version: 6.2.9200.16384
Image Version: 6.2.9200.16384
Enabling feature(s) [===========] The operation completed successfully.
C:\Users\administrator.NEWTECH>

5. Repeat the same command and procedure for "asp.net".

dism /online /enable-feature /featurename:iis-aspnet /all /Source:d:\sources\sxs
/LimitAccess

This should satisfy all the prerequisites for SCVMM.

Virtual Switch Module Installation on Nexus 1110

The Cisco Nexus 1000V Switch for Microsoft Hyper-V Distributed Virtual Switch requires a Virtual Supervisor Module (VSM) for control and management. The VSM controls multiple Virtual Ethernet Modules (VEMs) as one logical modular switch. However, while a physical switch uses linecards for Ethernet connectivity, VEMs are logical entities running in software inside physical servers.

In this test setup, VSMs were deployed in a Nexus 1110 Virtual Service Appliance (VSA), instead of in a Windows Server 2012 blade with Hyper-V enabled. From an architectural perspective, the idea is that the VSA resides in the management pod (called "VMI"), colocated with other management servers, rather than with production resources.

The deployment procedure for the Nexus 1000V Switch for Microsoft Hyper-V VSMs (VSBs) for Hyper-V is the same as for VMware deployments.

Refer to Installing VSM on Cisco Cloud Service Platform for additional guidance.

Refer to Cisco Nexus Virtual Services Appliance Release Notes, Release 4.2(1)SP1(5.1a) for more information about new features and caveats.

Deployment Guidelines

1. Use the correct ISO image for Hyper-V.

When creating the VSB, use the correct ISO for Hyper-V, as described in Step 4 of *Configuring Virtual Service Blades* in the Configuration guide.

2. Use a unique Domain ID in the VSM.

The Domain ID configured in the VSBs must be different than the domain ID used for the Nexus 1110 VSA. If domain IDs are not unique, the secondary VSA continuously reboots and message similar to this is seen:

```
2013 Jun 1 10:07:53 vsm-1 %KERN-1-SYSTEM_MSG: Dropping received frames from duplicate VSM saddr (0x1010000) - kernel
```



See CSCtq75997 more information.

1





Nexus 1000V Switch for Microsoft Hyper-V Configuration

This section describes how to configure the Nexus 1000V Switch for Microsoft Hyper-V in a VMDC solution.

- VSM CLI Configuration
- SCVMM Configuration

Figure 3-1 compares the SCVMM and Nexus 1000V Switch for Microsoft Hyper-V terminology that will be referenced in each section.

The reader should be familiar with these terms to better understand the role of each object as it pertains to the entire configuration and how each relates to SCVMM and the Nexus 1000V Switch for Microsoft Hyper-V.

SCVMM Terminology	Cisco Nexus 1000V Terminology
Logical Networks	Logical Networks
Network Sites	Network Segment Pools
VM Network Definitions	Network Segments
IP-Pools	IP-Pools & IP-Pool Templates
Port-Classifications	Port-profiles

Figure 3-1 SCVMM and Nexus 1000V Switch for Microsoft Hyper-V Terminology

Network and Tenants Under Test

I

Three private tenants and one public tenant logical networks were created.

Six **network segment pools** were created, three public (T1, T2, T3) and three private (PT1, PT2, PT3). The three public network segment pools were configured as members of the public tenant logical network; the three private network segment pools were each configured as an individual member of a the three private tenant logical networks.

Only one **network segment** per public network segment pool was created. Two network segments per private network segment pool were created.

The **IP pool templates** and **port-profiles** are described in the IP Pool templates and Port-profiles sections later in the doc.

The configuration looks like this:

```
logical network PublicTenants
   network segment pool T1
      network segment T1-NetworkSegment101
   network segment pool T2
      network segment T2-NetworkSegment102
   network segment pool T3
      network segment T3-NetworkSegment103
logical network PrivateTenant1
   network segment pool PT1
      network segment PT1-NetworkSegment2013
      network segment PT1-NetworkSegment2014
logical network PrivateTenant3
   network segment pool PT2
      network segment PT2-NetworkSegment2023
      network segment PT2-NetworkSegment2024
logical network PrivateTenant3
   network segment pool PT3
      network segment PT3-NetworkSegment2033
      network segment PT3-NetworkSegment2034
```

Refer to Cisco Nexus 1000V for Microsoft Hyper-V Network Segmentation Manager Configuration Guide for more information about Microsoft networking concepts, command details, and implementation.

Refer to Cisco Nexus 1000V for Microsoft Hyper-V Release Notes, Release 5.2(1)SM1(5.1) for new features and caveats.

Nexus 1000V Switch for Microsoft Hyper-V VSM CLI Configuration

This section describes how to configure the Nexus 1000V with Hyper-V using the Network Segmentation Manager (NSM) CLI on the VSM.

Step 1 Create Logical Networks.

A logical network (for example, internet, intranet, DMZ) is a connectivity abstraction that models separate networks managed by an enterprise. Logical network abstraction hides VLANs and IP subnets from users (VM network administrators, the tenant administrators, and the server administrators), except for the fabric administrator managing the physical fabric.

In other words, a logical network is composed of one or more network segment pools and each network segment pool is a group of VLANS, IP subnets, or VLAN/IP subnet pairs.

I

The following logical networks configuration shows three private tenants and one public tenant.

nsm logical network PublicTenants nsm logical network PrivateTentant1 nsm logical network PrivateTentant2
nsm logical network PrivateTentant3

Step 2 Create Network Segments Pools.

A network segment is associated with a unique broadcast domain and facilitates the availability of the network resources to a VM. SCVMM uses the VM networks and the VM subnets to provide the isolated virtual machine networks.

When a Nexus 1000V manages the virtual network, the VMM administrator creates the VM networks that use external isolation. To create external isolation, the network administrator creates network segments on the Nexus 1000V and provisions the isolated networks using VLANs and private VLANs.

Note

In Nexus 1000V for Microsoft Hyper-V, a VLAN is not created to define a bridge domain. Instead, a network segment is created on the VSM. Creating a network segment triggers VLAN auto-creation.

The following configuration shows network segment pools.

nsm network segment pool T1 nsm network segment pool T2 nsm network segment pool PT1 nsm network segment pool PT2 nsm network segment pool PT3

Step 3 Add each Network Segment Pool to the Logical Network.

The T1, T2, and T3 segment pools are members of the same public tenant logical network. The PT1, PT2, and PT3 segment pools are members of unique logical networks.

The following configuration shows mapping for network segment pools into logical networks.

```
nsm network segment pool T1
member-of logical network PublicTenants
nsm network segment pool T2
member-of logical network PublicTenants
nsm network segment pool T3
member-of logical network PublicTenants
nsm network segment pool PT1
member-of logical network PrivateTentant1
nsm network segment pool PT2
member-of logical network PrivateTentant2
nsm network segment pool PT3
member-of logical network PrivateTentant3
```

Step 4 Create IP Pool Templates.

Server administrators can manage IP addresses for the virtual environment using IP pool templates. You can use the IP pool templates to assign a range of IP addresses to hosts and VMs in the Microsoft SCVMM-managed environment. When creating an IP pool template for a VM network, you can define a range of IP addresses for VMs managed by SCVMM.

The following configurations shows IP pool templates that were created.

```
nsm ip pool template PT1-VL2013-IP-Pool
    ip address 200.1.3.2 200.1.3.250
    network 200.1.3.0 255.255.255.0
    default-router 200.1.3.253
nsm ip pool template PT1-VL2014-IP-Pool
    ip address 200.1.4.2 200.1.4.250
    network 200.1.4.0 255.255.255.0
    default-router 200.1.4.253
nsm ip pool template PT2-VL2023-IP-Pool
```

```
ip address 200.2.3.2 200.2.3.250
  network 200.2.3.0 255.255.255.0
  default-router 200.2.3.253
nsm ip pool template PT2-VL2024-IP-Pool
 ip address 200.2.4.2 200.2.4.250
  network 200.2.4.0 255.255.255.0
  default-router 200.2.4.253
nsm ip pool template PT3-VL2033-IP-Pool
  ip address 200.3.3.2 200.3.3.250
  network 200.3.3.0 255.255.255.0
  default-router 200.3.3.253
nsm ip pool template PT3-VL2034-IP-Pool
  ip address 200.3.4.2 200.3.4.250
  network 200.3.4.0 255.255.255.0
  default-router 200.3.4.253
nsm ip pool template T1-VL101-IP-Pool
 ip address 10.101.1.2 10.101.1.250
  network 10.101.1.0 255.255.255.0
  default-router 10.101.1.253
nsm ip pool template T2-VL102-IP-Pool
 ip address 10.102.1.2 10.102.1.250
 network 10.102.1.0 255.255.255.0
  default-router 10.102.1.253
nsm ip pool template T3-VL103-IP-Pool
  ip address 10.103.1.2 10.103.1.250
```

ip address 10.103.1.2 10.103.1.2
network 10.103.1.0 255.255.255.0
default-router 10.103.1.253

Step 5 Create Network Segments.

Configure each network segment to be a member of the previously configured network segment pools. Configure each network segment as an access port with an access VLAN. Import the previously configured IP pool for each network segment. Publish each network segment.

The Step 9VM Network Creation., page 3-36 commands are added automatically and appear later in this section when configuring VM networks in SCVMM.

VM networks enable the SCVMM administrator to create an isolated virtual Layer 3 (L3) network. Each VM network can have multiple VM subnets (virtual L2 domain). Microsoft SCVMM 2012 supports VLAN-backed and network virtualization (NVGRE)-backed VM networks. The Nexus 1000V supports VLAN-backed VM networks only.

The following configuration shows network segments that were created.

```
nsm network segment T1-NetworkSegment101
 member-of network segment pool T1
  switchport access vlan 101
  ip pool import template T1-VL101-IP-Pool
  publish network segment
  switchport mode access
nsm network segment T2-NetworkSegment102
 member-of network segment pool T2
  switchport access vlan 102
  ip pool import template T2-VL102-IP-Pool
  publish network segment
  switchport mode access
nsm network segment T3-NetworkSegment103
  member-of network segment pool T3
  switchport access vlan 103
  ip pool import template T3-VL103-IP-Pool
  publish network segment
```

switchport mode access

```
nsm network segment PT1-NetworkSegment2013
 member-of vmnetwork PT1-NetworkSegment2013
 member-of network segment pool PT1
  switchport access vlan 2013
  ip pool import template PT1-VL2013-IP-Pool
  publish network segment
  switchport mode access
nsm network segment PT1-NetworkSegment2014
 member-of network segment pool PT1
 switchport access vlan 2014
  ip pool import template PT1-VL2014-IP-Pool
 publish network segment
  switchport mode access
nsm network segment PT2-NetworkSegment2023
  member-of network segment pool PT2
  switchport access vlan 2023
  ip pool import template PT2-VL2023-IP-Pool
 publish network segment
  switchport mode access
nsm network segment PT2-NetworkSegment2024
 member-of network segment pool PT2
  switchport access vlan 2024
  ip pool import template PT2-VL2024-IP-Pool
  publish network segment
  switchport mode access
nsm network segment PT3-NetworkSegment2033
 member-of network segment pool PT3
  switchport access vlan 2033
  ip pool import template PT3-VL2033-IP-Pool
  publish network segment
  switchport mode access
nsm network segment PT3-NetworkSegment2034
 member-of network segment pool PT3
  switchport access vlan 2034
  ip pool import template PT3-VL2034-IP-Pool
  publish network segment
  switchport mode access
```

Step 6 Create Port profiles.

Unlike the Nexus 1000V for ESX, in which a port profile identifies both network policy and network isolation (VLAN), SCVMM networking decouples this information into a VM network and the port classification. When the Nexus 1000V is used with Hyper-V, the network administrator creates network segments to isolate networks. The SCVMM server administrator uses network segments in the resulting VM networks. The network administrator defines creates port profiles to define port policy. The server administrator uses port profiles to create a port classification.

To deploy a VM to the virtual access layer, choose the port classification, VM network, and the VM subnet. When a VM is deployed, a port profile is dynamically created on the Nexus 1000V for each unique combination of port classification, VM network, and VM subnet. All other VMs deployed with the same policy to this network reuse the dynamic port profile, which is a combination of network isolation and network policy.

Note The generated profile should be neither modified nor inherited in other port profiles.

When a port-attach notification is received, the port profile globally unique identifier (GUID) and network segment GUID are generated. A GUID provides a unique reference for the port profile and the network segment.

When a GUID is generated, a new port profile, combining the port profile and the VLAN, is created on the VSM. This auto-created port-profile is inherited on the interface. If more than one port uses the same combination of port profile and network segment, the port profile is shared. Port profiles are dynamically created during the interface attach process.

The following configuration shows port-profiles that were created.

```
port-profile type vethernet T1-PortProfile
 no shutdown
  state enabled
 publish port-profile
port-profile type vethernet T2-PortProfile
 no shutdown
 state enabled
 publish port-profile
port-profile type vethernet T3-PortProfile
 no shutdown
 state enabled
 publish port-profile
port-profile type vethernet PT1-PortProfile
 no shutdown
 state enabled
 publish port-profile
port-profile type vethernet PT2-PortProfile
 no shutdown
 state enabled
 publish port-profile
port-profile type vethernet PT3-PortProfile
 no shutdown
  state enabled
 publish port-profile
```

Step 7 Create Uplink Port Profile and Network Uplink.

An uplink port profile is essentially a template that defines a list of network segment pools to be associated with any (physical) network adapters to which the uplink port profile is applied. An uplink port profile enables you to specify protocols and port policy for the uplink adapter, using an Ethernet port profile to be specified.

I

The following configuration shows uplink port-profiles.

```
port-profile type ethernet UplinkPortProfile
channel-group auto mode on mac-pinning
no shutdown
max-ports 512
state enabled
nsm network uplink UCS-Uplink
import port-profile UplinkPortProfile
allow network segment pool T1
allow network segment pool T2
allow network segment pool T3
allow network segment pool PT1
allow network segment pool PT2
allow network segment pool PT2
allow network segment pool PT3
publish network uplink
```

<u>Note</u>

When a new segment is created and tied to an existing network segment pool in the list under the network uplink, VLANs are inherited in the NSM created profile as shown.

The following configuration shows an Ethernet UCS-Uplink port-profile.

```
port-profile type ethernet UCS-Uplink
inherit port-profile UplinkPortProfile
switchport mode trunk
switchport trunk allowed vlan 101-103,2013-2014,2023-2024,2033-2034
no shutdown
max-ports 512
description NSM created profile. Do not delete.
state enabled
```

```
<u>Note</u>
```

The Switchport allow vlan add command is not needed.

Nexus 1000V Part 2: SCVMM Configuration

This section provides guidance on how to create the N1000V logical switch (VSM and VEMs) in Hyper-V through SCVMM.

Step 1 Download Cisco Nexus 1000V Package.

The Nexus 1000V for Hyper-V package (zip file) is available at the download URL location provided with the software. Complete the following steps to download the package.

Download the Cisco Nexus 1000V for Microsoft Hyper-V package for Microsoft System Center Virtual Machine Manager (SCVMM) 2012. The package contains the following files:

- Virtual Supervisor Module (VSM) ISO (n1000vh-dk9.5.2.1.SM1.5.1.iso)
- Virtual Ethernet Module (VEM) MSI package (Nexus1000V-VEM-5.2.1.SM1.5.1.msi)
- Cisco VSEM Provider MSI package (Nexus1000V-VSEMProvider-5.2.1.SM1.5.1.msi)
- Cisco SCVMM VM Template (Cisco Nexus1000V VSM Template)
- Cisco Installer App (Cisco.Nexus1000VInstaller.UI.exe)
- **Step 2** Install the Virtual Switch Extension Manager Provider.

To establish communication between SCVMM and the Nexus 1000V VSM, the Virtual Switch Extension Manager (VSEM) provider must be installed on the SCVMM server.

a. Run the Cisco VSEM Provider MSI package (Nexus1000V-VSEMProvider-5.2.1.SM1.5.1.msi) that comes with the Nexus 1000V Package.

Follow the link to where the MSI was downloaded and double-click MSI to run it.

b. Follow the prompts as shown in Figure 3-2, Figure 3-3, and Figure 3-4 until the install is complete.

🎉 💽 🚯 = I	Application Tools	VMM		-	D X
File Home Share View	/ Manage				~ ()
€ 💮 ד ↑ 🎚 « Nexus1000.	.5.2.1.SM1.5.1 → VMM	v د ا	Search VM	M	P
Same Name		Date mo	odified	Туре	Size
E Desktop	SM Template	6/3/201	2 8 35 DM	File folder	
🎉 Downloads	Open Fi	ile - Security Warning	×	Windows Insta	ller
Kecent places We can Libraries Documents Music Pictures Videos Local Disk (C;)	't verify who created th Name:1\VMM Type: Windows From: Z:\JSO\W	nis file. Are you sure you want to run this nNexus1000V-VSEMProvider-5.2.1.SM1.5.1 s Installer Package MDC4\N1KV\n1000vh-dk9.5.2.1.SM1.5.1\M Run Cance	f ile? I.O.msi Jexu		
👳 CIFS (\\dssg-neta 👽 Network	This file is in a location you don't recognize ca the location. <u>What's th</u>	n outside your local network. Files from loc an harm your PC. Only run this file if you to <u>ne risk?</u>	ations rust		
2 items 1 item colored COLIC		III			2 Per 1
2 items i item selected 684 KB					()

Figure 3-2 Run the MSI Installer

Γ

🎉 🛃 🚺 = I		Application Too	ols VMM	x
File Home	Share View	Manage		< 😧
€ 🖲 ד ↑ 퉱	« Nexus1000v.5.2	.1.SM1.5.1 → VI	MM v C Search VMM	٩
🚖 Favorites	뉁	Cisco Nex	us 1000V VSEM Provider Setup	Size
💻 Desktop 鷆 Downloads		P	Please read the Cisco Nexus 1000V VSEM File folder Provider License Agreement Windows Installer	
 Recent places Libraries Documents Music Pictures Videos Videos Computer Local Disk (C:) CIFS (\\dssg-n 	ciju Cist		A CONTAINT: PLEASE READ THIS END USER LICENSE AGREEMENT CAREFULLY. DOWNLOADING, INSTALLING OR USING CISCO DR CISCO-SUPPLIED SOFTWARE CONSTITUTES ACCEPTANCE OF THIS AGREEMENT. CISCO SYSTEMS, INC. OR ITS SUBSIDIARY LICENSING THE SOFTWARE INSTEAD OF CISCO SYSTEMS, INC. ("CISCO") IS WILLING TO LICENSE ITS SOFTWARE TO YOU ONLY UPON THE CONDITION THAT YOU ACCEPT ALL OF THE TERMS CONTAINED IN THIS END USER LICENSE AGREEMENT PLUS ANY ADDITIONAL LICENSE OR THE LICENSE SET FORTH IN	
<table-of-contents> Network</table-of-contents>		Print	Back Install Cancel	
2 items 1 item sele	cted 684 KB			

Figure 3-3 Read and Accept the License Agreement



Figure 3-4 Select Finish when the Installer completes

Step 3 Verify that VSEM Provider is installed properly.

Go to **Settings > Configuration Providers**. Confirm that **Cisco Systems Nexus 1000V** is listed as a **Configuration Provider**.

Home							^ 🕜
Create Import Console Add-in Import Backup	P RO Window						
Settings <	Configuration Providers (2)						
🕎 General	· ·	1			1		٩
4 🎎 Security	Name	Status	Туре 👻	Version	Publisher	Manufacturer	Model
🥵 User Roles	Cisco Systems Nexus 1000V	Active	Virtual Switc	1.0	Cisco Syste	Cisco Syste	Nexus 1000V
🛃 Run As Accounts	Ø Microsoft Network Load Balancing (NLB)	Active	Load balancer	3.1.6011.0	System Cent	Microsoft	Network Loa
Servicing Windows Sonfiguration Providers System Center Settings Console Add-ins							
	Cisco Systems Nexus 1000V						*
	Description: Provider for Cisco Systems Nexus 100 Cisco Systems Nexus 1000V	0V Virtual Switch E	Extension Manager				
WMs and Services							
J. Fabric							
🧮 Library							
📋 Jobs							
Settings							

Figure 3-5 Cisco VSEM Provider installed

Step 4 Copy VEM MSI to SCVMM repository.

The VEM is an MSI file that must be placed in the following location on the SCVMM server: ALLUSERSPROFILE%\Switch Extension Drivers, for example, C:\ProgramData\Switch Extension Drivers. SCVMM uses the MSI file during the Add host operation to install VEM code on the host.



I

Do not install VEM code on the SCVMM server; only copy the file to the specified location.

Step 5 Add VSEM (Connect SCVMM to VSM).

The following procedures add the VSEM that was just installed. This step is required to connect SCVMM to the VSM in Hyper-V.

In these steps, the login account and the MGMT IP address configured in the VSM are needed to establish the communication between SCVMM and the VSM. Once the VSEM is added, the configuration that was created in the CLI of the VSM can be pulled in the SCVMM.

a. Right-click Switch Extension Manager and select Virtual Switch Extension Manager...

Add Resources - Add Stade	学 Services 前 Virtual Machines 姓 Hosts how	Window Window Depende	endent ces encies Refresh	Remove Remove	Properties Properties	
sbric «	Virtual Switch Extension	on Managers (0)				
MI Hosts	Name				Connection s	tring
VCherk Servers Vcherk Server Vcherk Server Vcherk Server Vcherk Server Vchus Server Vchus Server Networking vchus Logical Networks MAC Address Pools						
Load Balancers VIP Templates Switch Extension M Logical Switches Native Port Profiles Port Classifications	Switch Extension Manag	ger				
Cload Balancers Cload Balance	Switch Extension Manag	jer				
Cload Balancers Cload Balancers Cload Salancers Cload Salance	Switch Extension Manaş	ger				
Cload Balancers Classifications VMs and Services Fabric Library Code Classifications Library Classifications Classifi	Switch Extension Mana;	ger				
Load Balancers VIP Templates Switch Extension M Add Virtual Logical Switches Port Classifications VMs and Services Fabric Library Jobs	Switch Extension Mana;	ger				

Figure 3-6 Add VSEM

b. Add the Connection string and select **Run As Account.**

10.0.72.101 is the IP address of the VSM created on the Nexus 1110x. The created account uses the login credentials required to log in to VSM.

ſ

3	Add Virt	ual Switch Extension Manager Wizard	×
💐 General		Alle	Ach
General Host Groups	Enter connecti Select a manufactu connection string a	on settings for the extension manager to add rer, model, and configuration provider for the extension manager. Enter the nd credentials to be used.	
Summary	Manufacturer:	Cisco Systems, Inc.	-
	Model:	Nexus 1000V	-
	Provider:	Cisco Systems Nexus 1000V	•
	Connection string:	http://10.0.72.101	
	RunAs account:	VSM-Admin Br	rowse
		Previous	Cancel

Figure 3-7 Add VSEM Wizard

Refer to Installing Cisco Nexus 1000v for Microsoft Hyper-V for more information about creating a **Run As Account**.

c. Verify that no additional configuration, such as proxy, is required.

Open a browser and test the connection to the VSM. Browse to http://<VSM IP Address>. Output similar to Figure 3-5 should be seen:



Figure 3-8 Browse to VSM

d. Select the host group to which the VSEM is available.

3	Add Virtual Switch Extension Manager Wizard
💐 Host Gi	oups
General	Host groups that can use this virtual switch extension manager
Host Groups	The virtual switch extension manager will be available to the following host groups.
Summary	All Hosts
	Previous Next Cancel

Figure 3-9 Add VSEM Wizard All Hosts

e. Confirm the VSEM settings and click Finish.

3	Add Virtual S	witch Extension Manager \	Wizard	×
💐 Summary				
General Host Groups	Confirm the setting	gs		View Script
Summary	Manufacturer: Model: Configuration provide Connection string: RunAs Account: Host groups:	Cisco Systems, Inc. Nexus 1000V rr: Cisco Systems Nexus 1000V http://10.0.72.101 VSM-Admin All Hosts		
			Previous	sh Cancel

f. Verify that Virtual Switch Extension Manager is installed.

Γ

II •	Home										^ (Q
+ Create	Add Resources •	Overview	Fabric Resources	Services Virtual Machines	Window	View Dependent Resources	Refresh	Remove	Propertie	5	
Fabric	ADD		51	Virtual Switch Extensio	on Managa	Dependencies	Kerresh	Remove	Propertie	5	
* <u>99</u> 9	Servers				on Manage	ers (1)					٩
	All Hosts Library Servers			Name Kisco Nexus 1000	/ Chassis v	ersion 5.2(1)SM1(5.1)) - V2-Hyper	V-VSM-P1	C	onnection string ttp://10.0.72.101	
	PXE Servers Update Server vCenter Server VMM Server	5									
-	Networking 1 Logical Netwo	rks	E								
	MAC Address	Pools s									
3	VIP Templates										
	Switch Extensi Logical Switch Native Port Pro Port Classificat	on Manager: es ofiles tions	•								
M	VMs and Servio	es									
1	Fabric										
=	Library										
	Jobs										
	Settings										

Figure 3-11 Verify VSEM is installed

Step 6 Create Logical Switch in SCVMM.

After VSEM is added (Step 5), do the following:

- 1. Create a logical switch on VMM using VSEM.
- 2. Define extensions and port profiles for the logical switch.
- 3. Create classifications containing the native port profile and a port profile for each extension.
 - a. Right-click Logical Switch and select Create Logical Switch.

Home								^ 🔞
Create IP Pool Create Logical Network Create VIP Template Logi	Create Create	Add Resources	Overview Fabric	Services Virtual Machines Hosts	Window	View Dependent Resources	Remove	Properties
Create	, cor o mich	Add	SI	10W	•	Dependencies	Remove	Properties
Fabric ¢	Logical Switches (0))						AN
4.885								ام
All Heate								-
Libran/ Servers	Ivame							
DXF Servers			There	are no items to show in	this view			
Lundate Server								
VCenter Servers								
VMM Server								
E A Maturada a								
- Networking								
MAC Address Rools								
Load Balancers								
VIP Templates								
B Switch Extension Managers								~
Logical Switz								
Native Port Reate Logical Swi	itch							
Port Classifications								
VMs and Services								
Pabric								
🧮 Library								
📋 Jobs								
Settings								
•								

Figure 3-12 Create Logical Switch

b. Read the text and click Next.

Γ



Figure 3-13 Create Logical Switch Getting Started

c. Name the logical switch.

In this case, the hostname of the VSM was used. Use defaults for SR-IOV.

I



Figure 3-14 Create Logical Switch Name

d. Check the previously configured VSEM (V2-HyperV-VSM-P1) and click Next. The VSEM has the following attributes: Extension type: Forwarding
Extension Manager: Cisco Nexus 1000V Chassis Only one virtual switch extension can be selected.



Figure 3-15 Create Logical Switch Select VSEM

e. Select Team in the uplink mode field and click Add to add the uplink port profile.

Note The mode should always be **Team**, whether using a single uplink or multiple uplinks.

ſ



Figure 3-16 Create Logical Switch Select Add Uplink

f. Select the uplink port profile and click OK.

	No. And	Constant of a stand of the stand		X	П	Dunnahla
orik TCr		Create Logical Switch Wizard		<u> </u>	live	Propertie
	nlink				ive	Propertie
n n		Add Uplink Port Profile	×	and Ath		
rvers Getting St	ted Salact a	port profile		tch		
All Hosts	Select a	port prome	9 3969	ich .		
Library Servers General	The port pro adapter that	ofile selected here will be available for use by the host at connect to this logical switch.	physical	stance of this switch is		
PXE Servers Extensions	ouplet in	e connect to this logical switch				
Center Server Uplink	Port profiles	UCS-Uplink	•			
VMM Server Virtual Por	- Summary					
vir courr of	Host grou	ups: All Hosts		Peleti Add		
Summary	Network	sites: PT1, PT2, PT3, T1, T2, T3		Edit		
MAC Address						
Load Balancen				Kemove		
/IP Templates					-	
Switch Extensi						
Logical Switch						
Native Port Pn						
Port Classificat						
Ms and Servic		OK	Cancel			
hule						
ione						
			Previous	Next Cancel		
brary						

Figure 3-17 Add Uplink Port Profile

g. Confirm the uplink port profile settings and click Next.

By default, the host group **All Hosts** is created in Hyper-V. The network sites PT1, PT2, PT3, T1, T2 and T3 were created during Nexus 1000V CLI configuration.

ſ

Create Logical 🔤 Cr Network 🔄 Cr	🖉 Uplink		Create Logical Sv	vitch Wizard		X Ne	Properties Properties
abric * 20 Servers All Hosts * Library Servers * Update Server * VCenter Server * VMM Server * Networking * Logical Netwo * Logical Switch * Logical Switch * Networking * Logical Switch * Networking * Networ	Getting Started General Extensions Uplink Virtual Port Summary	Specify the u The uplink port p created. Uplink mode: T Uplink Port Prof UCS-Uplink	uplink port profiles orofiles configured here earm illes: file Host Groups All Hosts	that are part of this logica are available for use on hosts where Network Sites PT1, PT2, PT3, T1, T2, T3	I switch an instance of this swite M Add False Edit Remo	th is	<u>م</u>
 Library Jobs Settings 				Previous	Next Cano	ai	

Figure 3-18 Create Logical Switch Note Host Groups and the Network site

h. Specify the Port Classifications and click Next.

Port Classifications must be created in SCVMM and linked to port-profiles created in the VSM. The port-profiles were created previously in the "Nexus 1000V Switch for Microsoft Hyper-V VSM CLI Configuration" section on page 3-2; one port classification per port profile was created. When adding VMs to the logical switch, the port classification and VM network are selected when configuring network adapters (see VM Deployment).

Refer to **Creating Logical Switch in SCVMM** in Installing Cisco Nexus 1000V for Microsoft Hyper-V for additional guidance for creating port classifications.

till Scre	sate IP Pool	🔆 🔶 🖉	110 ×	Services	2	R	2
Create Logical	2	Create Logical S	witch Wiz	ard		x	ive Properties
	· · · · · · · · · · · · · · · · · · ·						we Properties
Fabric	Tritual Port						
All Hosts	Getting Started	Specify the port classification	s for virtu	al ports part of	f this logical s	switch	٩
Library Servers	General Extensions	The port classifications configured here virtual machines.	will be avai	lable for use by virtu	ial network adapt	ers in a host or	
Update Server VCenter Server	Uplink	Virtual ports:	les si.				
🐌 VMM Server	Virtual Port	Port Classification PT1-PortProfile	Ealse	Marked For Deletion False		Add	
🔺 📥 Networking	Summary	PT2-PortProfile	False I	False		Edit	
vin Logical Netwo		PT3-PortProfile	False I	False		Remove	
MAC Address		T1-PortProfile	False I	False			
VID Templetee		T2-PortProfile	False I	False		Set Default	
Switch Extensi		T3-PortProfile	False I	False		Clear Default	v
Logical Switch							
D Native Port Pr							
Port Classificat							
w VMs and Servic							
Pabric Fabric							
🧮 Library				Previou	s Next	Cancel	
📋 Jobs					, i i i i i i i i i i i i i i i i i i i	111	
Settings							
-	*						

Figure 3-19 Create Logical Switch Specify the Port Classifications

i. In the Summary panel, confirm the settings and click Finish to create the logical switch.

Figure 3-20 Create Logical Switch Specify Confirm Settings

ate Logical	2	Create Lo	gical Switch Wizard		x	ve Properties
ate Logical 2 Cr Retwork 2 Cr Servers All Hosts Update Servers Update Server VCMM Server VMM Server VMM Server MAC Address MAC Address WIP Templates WIP Templates Month Setensi	Getting Started General Extensions Uplink Virtual Port Summary	Create Lo Y Confirm the settings Name: Description: Single Root //O Virtualizatio Switch uplink mode: Virtual switch extensions: Uplink port profile sets: Virtual port profile sets:	V2-HyperV-VSM-P1 n: Disabled Team V2-HyperV-VSM-P1 1 6	111	View Script	ve Propertie
Logical Switch Native Port Pr Port Classificat VMs and Servic Fabric Library Jobs Settions				Previous Filigh	Cancel	

ſ

j. Manually refresh the VSEM.

After the Nexus 1000V logical switch is created, manually refresh VSEM to force the updates to appear in SCVMM.

Home							^ 🔞
Add Create •	Fabric Resources Hosts	 PowerShell Jobs PRO 	View Dependent Resources	() Refresh	Remove	Properties	
Add	Show	Window	Dependencies	Refresh	Remove	Properties	
Fabric 4	Virtual Switch Extension Manag	ers (1)					- 1
Update Server							٩
🗧 vCenter Servers	Name				Conr	nection string	
VMM Server	Karaka Cisco Nexus 1000V Chassis v	ersion 5.2(1)SM1(5	.1) - V2-HyperV-VSM	-P1	http:	//10.0.72.101	
🖌 📥 Networking							
ntr Logical Networks							
🛎 MAC Address Pools							
🖄 Load Balancers							
VIP Templates							
Switch Extension Mana							
Cogical Switches							
Port Classifications	Cisco Nexus 1000V Chassis ver	sion 5.2(1)SM1(5.1)	- V2-HyperV-VSM-P	1			~
Gateways							
	Extension manager information	on					
Storage	Name: Cisco Nexus	1000V Chassis versi	on 5.2(1)SM1(5.1) -				
VMs and Services	V2-HyperV-V	SM-PT					
Fabric							
🧮 Library							
📋 Jobs							
Settings							
-							
Sten 7 Add	d VEMs (Hosts) to the	e Nexus 100	0V.				

Figure 3-21 Manual Refresh of the VSEM

a. Right-click All Hosts and select Add Hyper-V Hosts and Clusters..

*	+	۲	0 1		8	0	d		2		
Create	Add Resources •	Overview Fabric Resources Compliance	Scan Remed	liate Co	ompliance roperties	Updati Agent	e Reassociate	Win	dow		
Create	Add	Show	Com	pliance			Agent				
abric 🕂 👥 Sen	vers	< Hosts (0)									
A 🛄	ll Hosts 🛛 😽	Create Service	25	~	Role		Job Status	-	CPU Average	Available Me	 Operating System
ili ili	brary Serve	Create Virtual Machine				There are	na items to sha	w in t	his view		
10	Indate Serve	Add Hyper-V Hosts and Clusters									
	Center Serve	Add Citrix XenServer Hosts and Clus	ters								
i v	MM Server	Add VMware ESX Hosts and Clusters									
	tworking	Create Host Group									
The Lo	ogical Netw 👛	Move									
🔳 M	IAC Address 🛋	View Networking									
🟙 La	oad Balance 🗙	Delete									
VI VI	IP Template	Properties									
100 ·	witch Extension	nunugers									
	ogical Switches Istics Dest DesEls										
p,	ort Classification	,									
🔯 VM	ls and Services										
J. Fab	pric										
🚎 Ціб	rary										
📋 Job	55										
🔽 Set	ttings										
		+									

Figure 3-22 Add Hyper-V Hosts

b. Select the appropriate computer location and click Next.

All hosts in the test bed were in a trusted Active Directory domain.

Figure 3-23 Add Hyper-V Hosts Windows Computer Location



c. Click Browse to see a list of Run As Accounts.

I



Figure 3-24 Add Hyper-V Hosts Specify Credentials

d. Select the Run As account created during the Hyper-V install.

The account is different than the **Run As account** used to install VSEM. The scymmadmin account was created in Active Directory and is a domain administrator account for the local domain.

See the "Microsoft Windows Server 2012 Installation" section on page 2-6 for more information about the scymmadmin account.

Create Add Resources	1		Add Resource W	/izard	x]
Create Add	· Curdant	i e le				
Fabric			Select a Run As A	ccount	x	
A PP Servers						٩
All Hosts	Resource location	Select a Run	As account			* Operating System
💦 Library Servers	Credentials				P II the Hyper-V role and	_
PXE Servers	Discovery scope	Name	Description	User Role		
🍺 Update Server	-	NT AUTHORITY	System			
VCenter Server	larget resources	NT AUTHORITY	LocalS		Browse	
P VMM Server	Host settings	NT AUTHORITY	Netwo			
4 📥 Networking	Summary	VSM-Admin		Administrator		
🖬 Logical Netwo		Administrator		Administrator		
👅 MAC Address		scymmadmin		Administrator		
🔛 Load Balancer		1				
VIP Templates					ator on the host	-
👪 Switch Extensi					d manually, then they	~
H Logical Switch					dded, the VMM service	
Native Port Pr				Create Run Ar Accor	any future access to it.	
Port Classificat				Create Nail As Accor	ant	
🚋 VMs and Servic				Ok3 Cance		
1. Fabric		R				
🧮 Library				Previous	Next Cancel	
Jobs					411	

Figure 3-25 Add Hyper-V Hosts Select Run As Account

e. Enter the hostname of each host to add as a VEM and click Next.

e Add San Add	Add Resource Wizard	
e Add	iscovery scope	
Servers All Hosts EUbrary Servers Update Servers Update Servers Uventer Server Switch Extensi Uventer Server	cation Specify the search scope for virtual machine host candidates Search for computers by whole or partial names, FQDNs, and IP addresses. Alternatively, you may generate an Active Directory query to discover the desired computers. © Specify Windows Server computers by names urces js Enter the computer names of the hosts or host candidates that you want VMM to manage. Each computer name must be on a separate line. Computer names: V2-c1b3-p1 V2-c2b1-p1 V2-c2b2-p1	Operating
Native Port Pn Port Classificat VMs and Servic Fabric	Skip AD verification Examples: server1 server1.contoso.com 10.0.1.1 2a01:110:1e:3:88ffcfe44:23	
Library	Previous Next Cancel	
Jobs		

Figure 3-26 Add Hyper-V Hosts Enter Hostnames

f. After hosts are discovered, select each host to add and click Next.

Resources	Add Reso	urce Wizard	
Add 🔶			
arger r	esources		ALL LINE
rs Pacaurra lacation	6 L		
Hosts	Select the computers that y	ou want to add as hosts	-
ary Servers Credentials	Discovered computers:		
Discovery scope	Computer Name	Operating System	Hypervisor
nter Server Target resources	v2-c2b1-p1.vmdc.net	Windows Server 2012 Datacenter	Hyper-V
M Server	v2-c1b3-p1.vmdc.net	Windows Server 2012 Datacenter	Hyper-V
most setungs	v2-c1b4-p1.vmdc.net	Windows Server 2012 Datacenter	Hyper-V
Summary	V2-c2b2-p1.vmdc.net	Windows Server 2012 Datacenter	Hyper-V
Ical Netwo			
C Address			
Tomplator			
remplates			
ical Switch			
ive Port Pre			
t Classificat			
and Servic			
c	Select all Refresh	Stop	
ry		Previous	Slext Cancel
			aii

Figure 3-27 Add Hyper-V Hosts Select the Hosts

g. Assign hosts to a host groups.

Leave Reassociate this host with the VMM environment unchecked and click Next.

Figure 3-28 Add Hyper-V Hosts Assign the Host Group

te Add 😭	Add Resource Wizard	
te Add Host s	ettings	<u> </u>
Servers Resource location All Hosts Library Servers Discovery scope Update Server Turget genurger	Specify a host group and virtual machine placement path settings for hosts Assign the selected computers to the following host group: Host group: All Hosts	 Operating System
Vertifier Server VMM Server Networking Migration Settings MAC Address Load Balancer 20 VIP Templates	If any of the selected hosts are currently managed by another Virtual Machine Manager (VMM) environment, select this option to reassociate the hosts with this VMM management server. Reassociate this host with this VMM environment VMM uses virtual machine placement paths as default locations to store virtual machines placed on a host. To add a new virtual machine placement path, specify a path and click Add. Add the following nate:	
Switch Extensi Logical Switch Native Port Pri	Add Selected virtual machine placement paths: Remove	
Port Classificat VMs and Servic Fabric		
Library Jobs	Previous Next Cancel	
Settings		

h. Enable Live Migration and click Next.

ſ



Figure 3-29 Add Hyper-V Hosts Enable Live Migration

i. Confirm the Settings and click Finish.

* +		
Create Add Sesources	Add Resource Wizard	×
Add Resources Create Add Fabric Add Pabric Resources All Hosts Resources All Hosts Dis Update Server Dis Update Server Dis VCenter Server Dis VIM Server Ho Mc Address Sur WLogical Networ Sur VIP Templates VIP	Add Resource Wizard Esource location Confirm the settings View S redentials iscovery scope Resource type: Hyper-V capable Windows Servers arget resources Resource type: Hyper-V capable Windows Servers lost settings Computer same based discovery 4 computer same based discovery digration Settings Host settings: Host settings: ummary All Hosts All Hosts	cript
Switch Extensi Logical Switch Native Port Pr Port Classificat VMs and Servic Fabric Library Library Jobs Zettings	Previous Finish Can	el di

Figure 3-30 Add Hyper-V Hosts Confirm Settings

j. Verify All Hosts are seen in the All Hosts group.

	-		11	-	0		0-	0	d	1	a		
Create	Add	Overview	Fabric	Compliance	Scan	Remedia	te Compliance	Update	Reassociate	Wi	ndow		
Create	Add		Show			Compl	iance	Agent	Agent		•		
Fabric			< Ho	sts (4)									
A 99 Ser	vers		-										P
4 🚞 A	II Hosts		Na	ime	Host S	Status	* Role	J.	ob Status	-	CPU Average	Available Me	* Operating System
2	v2-c1b3-p1		1	v2-c1b4-p1.v	m C	K	Host	 Ca	mpleted		2 %	182.28 GB	Microsoft Windo
1	v2-c1b4-p1		1	v2-c2b1-p1.w	m C	Ж	Host	Co	ompleted		2 %	182.52 GB	Microsoft Windo
1	v2-c2b1-p1		Ð	v2-c1b3-p1.v	m C	K	Host	Co	ompleted		0 %	0 KB	Microsoft Windo
1	v2-c2b2-p1		= 2	v2-c2b2-p1.v	m C	Ж	Host	Co	ompleted		4 %	182.58 GB	Microsoft Windo
₩ Ve	/MM Server tworking ogical Networks /IAC Address Poc oad Balancers /IP Templates	Иs											v
🔯 VN	As and Services												
🛃 Fal	bric												
🧧 Lib	orary												
lol 🛄	bs												
🔀 Se	ttings												
			-										

Figure 3-31 Add Hyper-V Hosts Verify All Hosts

Step 8 Add Each Host to Logical switch.

a. Right-click the host to be added and select Properties.

Create	Add Resources -	Overview Resources	Scan Remediate	e Compliance Properties	Update Reassociate Agent	Window		
Create	Add	Show	Complia	ince	Agent			
Fabric		< Hosts (1)						
🔺 👥 Serve	:rs							م
🔺 🚞 All	Hosts	Name	Host Status	- Role	Job Status	CPU Average	Available Me	* Operating System
	2-c1b3-p1 2-c1b4-p1	Create Service	т ОК	Host	Completed	0 %	0 KB	Microsoft Windo
₽ v. Į v.	2-c2b1-p1	Refresh Refresh Virtual Machines	_					
PXE	Servers	Shut Down						
iie Upo iii vCe	date Server enter Servers	Reset						
I A Notu	M Server	Power On Power Off						
the Log	jical Network	 View Status Start Maintenance Mode 						
E Loa	C Address Po	 Stop Maintenance Mode Run Script Command 						
JE VIP	Templates	Move to Host Group						
🔯 VMs	and Services	Remove Cluster Node						
ूं Fabri	ic i	Connect via RDP						
🧮 Libra	iry	Remove	-					
Jobs		Properties						
I <u>∢-</u> Setti	ngs							

b. Add New Logical Switch.

Γ

In the **Host Properties > Virtual Switches** window, select **New Virtual Switch** and **New Logical Switch** to add the host to the Nexus 1000V.

As seen in Figure 3-33, a standard External switch was already created for management. In Hyper-V, multiple switches can exist on the host.

* +	e	🕐 O 🔶 🖩	0	0 0	
Create Add Resources	8	v2-c1b3-p1.v	mdc.net Properties		
Create Add Fabric	General Status Hardware Host Access Virtual Machine Paths Reserves Storage Virtual Switches Nigration Settings Placement Servicing Windows Custom Properties	New Virtual Switch New Verder Switch New Star03rd Switch New Star03rd Switch Science Uncertainty Cisco VIC Ethernet Interfa External	w Virtual Network Adap me: scription: External Network adapter: Logical network Internal Allow host access Private	Cisco VIC Ethernet Interface - Virtual Switcl Cisco VIC Ethernet Interface Cisco VIC Ethernet Interface Cisco VIC Ethernet Interface - Virtual Switch ess using VLAN: 0 using VLAN: 0	P Operating System Microsoft Windo
Library	View Script			OK Cancel	
Jobs					1
Settings					

Figure 3-33 Host Properties New Logical Switch

c. Add physical adapters to the logical switch team.

There are two adapters, VIC Ethernet interface 3 and VIC Ethernet interface 4 that will be used on each host. Add these to the logical switch.

1

 Resources 	8	v2-c1b5-p1.v	machet Properties		_	
eate Add	General	🐥 New Virtual Switch 💐 Ne	ew Virtual Network Adapter 🏋 De	lete		
Servers	Status Hardware	 Cisco VIC Ethernet Interfa External Cisco VIC Ethernet Interfa 	Logical switch: V2-HyperV-VSI The logical switch supports teamin more than one physical adapter the	you connect her as a	• Operating S	
v2-c1b3-p1	Host Access	V2-HyperV-VSM-P1	single uplink. Physical adapters:			Microsoft W
v2-c2b1-p1 v2-c2b2-p1	Virtual Machine Paths	Logical Switch	Adapter Cisco VIC Ethernet Interfa	Uplink Port Prof	Add	
Library Servers	Reserves		Cisco VIC Ethernet Interface Cisco VIC Ethernet Interface #2			
Update Server	Storage		Cisco VIC Ethernet Interface	E .		
VCenter Server	Virtual Switches			-		
Networking the Logical Netwo	Migration Settings					
MAC Address	Placement					
VIP Templates	Servicing Windows					
VMs and Servic	Custom Properties		4 [•		
Fabric						
Library	View Script			ОК	Cancel	
Jobs						

Figure 3-34 Host Properties Add Physical Adapter 1

Add the second physical adapter 2 and hit OK.

 Resources 		the cross print	macher roperties	
ate Add	General	👍 New Virtual Switch 👅 Ne	w Virtual Network Adapter 🏋 Delete	
Servers	Status Hardware	Cisco VIC Ethemet Interfa External Cisco VIC Ethemet Interfa External	Logical switch: V2-HyperV-VSM-P1 The logical switch supports teaming which mean more than one physical adapter they will work to	s if you connect gether as a
v2-c1b3-p1	Host Access	V2-HyperV-VSM-P1	single uplink. Physical adapters:	Microsoft V
<pre>v2-c2b1-p1 v2-c2b2-p1</pre>	Virtual Machine Paths	Logical Switch	Adapter Uplink Port P Cisco VIC Ethernet Interfa 🔻 UCS-Uplink	Add Remove
Library Servers	Reserves		Cisco VIC Ethernet Interfa 💌 UCS-Uplink	
Update Server	Storage		Cisco VIC Ethernet Interface #2	
VMM Server	Virtual Switches		Cisco VIC Ethernet Interface #3	
- Networking	Migration Settings			
MAC Address	Placement			
VIP Templates	Servicing Windows			
VMs and Servic	Custom Properties		< <u> </u>	Σ
Fabric				
Library	View Script		ОК	Cancel
Jobs				

Figure 3-35 Host Properties Add Physical Adapter 2

d. Click **OK** to continue to add host to the logical switch.

Γ

eate Add • Resources		v2-c1b3-p1.v	mdc.net Propert	ties		X	
reate Add	General	👍 New Virtual Switch 🔳 Ne	ew Virtual Network.)	Adapter 🗙 Dele	te		
NC Servers	Status	Cisco VIC Ethernet Interfa External	Logical switch: The logical switcl	V2-HyperV-VSM	-P1 which means if y	vou connect	
v2-c1b3-p1	Hardware	External	more than one p single uplink.	hysical adapter the	y will work toget	ner as a	Microsoft Wir
V2-c1b4-p1	Host Access	V2-HyperV-VSM-P1	Physical adapters	R.			
v2-c2b1-p1	Virtual Machine Paths	Vietual M	Adapter		Jplink Port Prof	Add	
Library Servers	Reserves	Virtual Ma	achine wanager		Ē	nemore	
Update Server	Storage	While Virtual Machine Manag temporarily lose network con on other network operations	ger is applying the cl nectivity. This may in nrogress.	hanges, the host m have an adverse eff	ay ject		
VMM Server	Virtual Switches	Do you want to continue?					
Networking the Logical Networking	Migration Settings						
MAC Address	Placement			ок са Са	incel		
Load Balancer	Servicing Windows			- 10			
VIP Templates							
VIP Templates	Custom Properties		4	ш	*		
VIP Templates VMs and Servic Fabric	Custom Properties		•	.H.	•		
VIP Templates VMs and Servic Fabric	Custom Properties		4		ОК	Cancel	
VIP Templates VIS and Servic Fabric Library Jobs	Custom Properties		4	11	OK	Cancel	

Figure 3-36 Host Properties Continue to Add Host to Logical Switch

e. Verify that the VEM is installed on the VSM.

Figure 3-37 shows the output seen on the VSM when the VEM is added to the Logical switch.



1 0 Virtual Supervisor Module Nexus1000V active * 2 0 Virtual Supervisor Module Nexus1000V na=standby 4 288 Virtual Ethernet Module NA ok 5 288 Virtual Ethernet Module NA ok 1 5.2(1)SM1(5.1) 0.0 ok 2 5.2(1)SM1(5.1) 0.0 0.0 4 5.2(1)SM1(5.1) Unidow Server 2012 - Datacenter (6.2.9200. 6.30) 5.2(1)SM1(5.1) 5 5.2(1)SM1(5.1) Window Server 2012 - Datacenter (6.2.9200. 6.30) 6 5.2(1)SM1(5.1) Window Server 2012 - Datacenter (6.2.9200. 6.30) 6 5.2(1)SM1(5.1) Window Server 2012 - Datacenter (6.2.9200. 6.30) 6 5.2(1)SM1(5.1) Window Server 2012 - Datacenter (6.2.9200. 6.30) 6 00-19-07-65-63-48 NA 1 00-19-07-65-63-48 NA 2:00-019-07-65-63-48 NA 2:00-02-00-00-00 NA 4:02-00-02-00-00-00 NA 4:02-00-02-00-00-00 NA 4:02-00-02-00-00-00 NA 4:02-00-02-00-00-00 NA	V2-H Mod	yper9-V Ports	SM-P1(conf. Module-Ty	íg−net–sēg≯# sho mod⊤ œ	Model		Status								
Mod Su Hu 1 5.2(1)SM1(5,1) 0.0 2 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 5 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 5 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 6 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) Mod MC-Address(es) Server 2012 - Datacenter (6.2.9200, 6.30) 1 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 2 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 4 02-00-0c-00-06-00 to 02-00-06-00 NA Server-Neme 6 02-00-0c-00-06-00 to 02-00-06-80 NA 4 02-00-0c-00-06-00 to 02-00-06-80 NA 5 02-00-0c-00-06-00 to 02-00-06-80 NA 4 02-00-0c-00-06-00 to 02-00-06-80 NA 4 02-00-0c-00-06 to 02-00-06-80 NA 5 02-00-0c-00-06 to 02-00-06-80 NA 4 10.0,072,101 NA NA 4 10.0,0.65,1 627037AB-FABE-2211-0025-B59	1 2 4 5 6	0 0 288 288 288 288	Virtual S Virtual S Virtual E Virtual E Virtual E	upervisor Module upervisor Module thernet Module thernet Module thernet Module	Nexus1000V Nexus1000V NA NA NA		active * ha-standby ok ok ok								
1 5.2(1)SM1(5,1) 0.0 2 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 5 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 5 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) 6 5.2(1)SM1(5,1) Nindows Server 2012 - Datacenter (6.2.9200, 6.30) Mod MGC-Address(es) Serial-Num 1 00-19-07-6c-5s-a8 to 00-19-07-6c-62-a8 NA 2 00-19-07-6c-5b-a8 to 00-19-07-6c-62-a8 NA 2 00-0-0c-00-04-00 to 02-00-0c-00-06-80 NA 5 02-00-0c-00-06-00 to 02-00-0c-00-06-80 NA 6 02-00-0c-00-06-00 to 02-00-0c-00-06-80 NA 7 10.0,72,101 NA NA 4 10.0,65,4 627057AB-FABE-E211-0025-B59102200004 V2-C184-P1 5 10.0,65,2 627057AB-FABE-E211-0025-B59102200004 V2-C184-P1 6 10.0,65,2 627057AB-FABE-E211-0025-B59102200004 V2-C184-P1 6 10.0,65,2 627057AB-FABE-E211-0025-B59102200004 V2-C281-P1 6 10.0,65,2 627057AB-FABE-E211-0025-B59102200004 V2-C184-P1 6 10.0,065,2 627057AB-FABE-E211-0025-B	Mod	S⊎		Hw											
Made MAC-Address(es) Serial-Num 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 200-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 402-00-0c-00-04-00 to 02-00-06-00 to 02-00-06-80 NA 502-00-0c-00-06-00 to 02-00-0c-00-06-80 NA 602-00-0c-00-06-00 to 02-00-0c-00-06-80 NA Made Server-IP Server-UUID 1 10.0,72,101 NA 1 10.0,65,4 627037AB-FABE-E211-0025-B59102200004 V2-C1B4-P1 5 10.0,65,1 627037AB-FABE-E211-0025-B59102200002 V2-C1B4-P1 6 10.0,65,2 627037AB-FABE-E211-0025-B59102200002 V2-C2B1-P1 6 10.0,65,2 627037AB-FABE-E211-0025-B5910220002 V2-C2B1-P1 72-HuperV-VSM-P1(config-net-seg)# V2-HuperV-VSM-P1(config-net	1 2 4 5 6	5,2(1) 5,2(1) 5,2(1) 5,2(1) 5,2(1) 5,2(1)	SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1)	0.0 0.0 Windows Server 2012 Windows Server 2012 Windows Server 2012	- Datacenter (- Datacenter (- Datacenter ((6.2.92) (6.2.92) (6.2.92)	00, 6,30) 00, 6,30) 00, 6,30)								
1 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 2 00-19-07-6c-5a-a8 to 00-19-07-6c-62-a8 NA 4 02-00-0c-00-06-00 to 02-00-0c-00-080 NA 5 02-00-0c-00-06-00 to 02-00-0c-00-06-80 NA 6 02-00-0c-00-06-00 to 02-00-0c-00-06-80 NA Mod Server-IP Server-UUD Server-Name 1 10.0.72.101 NA NA 2 10.0.72.101 NA NA 2 10.0.65.4 627C87AB-FABE-E211-0025-B59102200004 V2-C1B4-P1 5 10.0.65.1 627C87AB-FABE-E211-0025-B59102200001 V2-C2B1-P1 6 10.0.65.2 627C87AB-FABE-E211-0025-B59102200002 V2-C2B2-P1 * this terminal session V2-HyperV-VSM-P1(config-net-seg)# V2-HyperV-VSM-P1(config-net-seg)# 013 Jun 10 16:00:33 V2-HyperV-VSM-P1 XVEM_MGR-2-VEM_MGR_DETECTED; Host V2-C1B3-P1 detected as module 2013 Jun 10 16:00:33 V2-HyperV-VSM-P1 XVEM_MGR-2-MOD_ONLINE; Module 3 is online V2-HyperV-VSM-P1(config-net-seg)#	Mod	MAC-Ad	dress(es)		Serial-Num										
Mod Server-IP Server-UUID Server-Name 1 10.0.72.101 NA NA 2 10.0.72.101 NA NA 4 10.0.65.4 627037AB-FABE-E211-0025-B59102200001 V2-C1B4-P1 5 10.0.65.1 627037AB-FABE-E211-0025-B59102200001 V2-C2B1-P1 6 10.0.65.2 627037AB-FABE-E211-0025-B59102200002 V2-C2B2-P1 * this terminal session V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# 2013 Jun 10 16:00:33 V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)# V2-HuperV-VSM-P1(config=net-seg)#	1 4 5 6	00-19- 00-19- 02-00- 02-00- 02-00-	07-6c-5a-a 07-6c-5a-a 0c-00-04-0 0c-00-05-0 0c-00-06-0	3 to 00-19-07-6c-62-a8 3 to 00-19-07-6c-62-a8 0 to 02-00-0c-00-04-80 0 to 02-00-0c-00-05-80 0 to 02-00-0c-00-06-80	NA NA NA NA										
1 10.0.72.101 HA NA 2 10.0.72.101 HA NA 4 10.0.65.4 627087AB-FABE-E211-0025-B5910220001 V2-C1B4-P1 5 10.0.65.1 627087AB-FABE-E211-0025-B5910220002 V2-C2B1-P1 6 10.0.65.2 627087AB-FABE-E211-0025-B5910220002 V2-C2B2-P1 * this terminal session V2-HyperV-VSM-P1(config=net-seg)# V2-HyperV-VSM-P1(config=net-seg)# 013 Jun 10 16:00:33 V2-HyperV-VSM-P1 XVEM_MGR-2-VEM_MGR_DETECTED; Host V2-C1B3-P1 detected as module 2013 Jun 10 16:00:33 V2-HyperV-VSM-P1 XVEM_MGR-2-MOD_ONLINE; Module 3 is online V2-HyperV-VSM-P1(config=net-seg)# 02-HyperV-VSM-P1 XVEM_MGR-2-VEM_MGR_DETECTED; Host V2-C1B3-P1 detected as module 2013 Jun 10 16:00:fig=net-seg)# 02-HyperV-VSM-P1 (config=net-seg)# 02-HyperV-VSM-P1 (config=net-seg)# 02-HyperV-VSM-P1(config=net-seg)# 02-	Mod	Server	-IP	Server-UUID		Serve	-Name								
* this terminal session V2-HyperV-VSM-P1(config-net-seg)# V2-HyperV-VSM-P1(config-net-seg)# V2-HyperV-VSM-P1(config-net-seg)# 2013 Jun 10 16:00:33 V2-HyperV-VSM-P1 XVEM_MGR-2-MOD_ONLINE: Module 3 is online V2-HyperV-VSM-P1(config-net-seg)# V2-HyperV-VSM-P1(config-net-seg)#	1 2 4 5 6	10.0.7 10.0.7 10.0.6 10.0.6 10.0.6	2,101 2,101 5,4 5,1 5,2	NA NA 627C87AB-FABE-E211-0025 627C87AB-FABE-E211-0025 627C87AB-FABE-E211-0025	-B59102200004 -B59102200001 -B59102200002	NA NA V2-01] V2-02] V2-02]	84-P1 81-P1 82-P1								
V2-HyperV-VSM-P1(config-net-seg)# V2-HyperV-VSM-P1(config-net-seg)#	* th V2-H V2-H V2-H 2013	is term. yperV-V. yperV-V. yperV-V. Jun 10	inal sessi SM-P1(conf. SM-P1(conf. SM-P1(conf. 16:00:33	⊐n ig-net-seg)# ig-net-seg)# 2013 Jun 10 y2-HyperV-VSM-P1 %VEM_MG) 16;00;33 V2+ R-2-MOD_ONLINE	lyperV-V I: Modul	/SM-P1 %VEM_M le 3 is onlin	IGR-2-VEM_M Ie	IGR_DETECT	ED: Host	V2-C1B	3-P1 det	ected as	: module	3
	V2-H V2-H	yperV-V yperV-V	SM-P1(conf. SM-P1(conf.	ig-net-seg)# ig-net-seg)#											

f. After all hosts were added to the logical switch, they are seen as VEMs in the VSM. Execute **show module** on the VSM to verify these hosts are seen as VEMs.

1

Mod	Ports	Module-	Туре	Model	Status
1 2 3 4 5 6	0 0 288 288 288 288 288	Virtual Virtual Virtual Virtual Virtual Virtual	Supervisor Module Supervisor Module Ethernet Module Ethernet Module Ethernet Module Ethernet Module	Nexus1000V Nexus1000V NA NA NA NA	active * ha-standby ok ok ok ok
Mod	S⊌		Hu		
1 2 3 4 5 6 Mod	5.2(1) 5.2(1) 5.2(1) 5.2(1) 5.2(1) 5.2(1) 5.2(1)	SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1) SM1(5.1)	0.0 0.0 Windows Server 200 Windows Server 200 Windows Server 200 Windows Server 200	2 - Datacenter (2 - Datacenter (2 - Datacenter (2 - Datacenter (2 - Datacenter ((6,2,9200, 6,30) (6,2,9200, 6,30) (6,2,9200, 6,30) (6,2,9200, 6,30)
100 	MHC-HO	dress (es	/	Serial-Num	
1 2 3 4 5 6	00-19- 02-00- 02-00- 02-00- 02-00- 02-00-	07-6c-5a 07-6c-5a 0c-00-03 0c-00-04 0c-00-05 0c-00-06	-a8 to 00-19-07-6c-62-a8 -a8 to 00-19-07-6c-62-a8 -00 to 02-00-0c-00-03-86 -00 to 02-00-0c-00-04-80 -00 to 02-00-0c-00-05-80 -00 to 02-00-0c-00-06-80	NA NA NA NA NA NA NA	
Mod	Server	-IP	Server-UUID		Server-Name
123456	10.0.7 10.0.7 10.0.6 10.0.6 10.0.6 10.0.6	2.101 2.101 5.3 5.4 5.1 5.2	NA NA 627C87AB-FABE-E211-00 627C87AB-FABE-E211-00 627C87AB-FABE-E211-00 627C87AB-FABE-E211-00	125-B59102200003 125-B59102200004 125-B59102200001 125-B59102200002	NA NA V2-C1B3-P1 V2-C1B4-P1 V2-C2B1-P1 V2-C2B1-P1 V2-C2B2-P1

Figure 3-38 All Host Added as a VEM

g. Verify interfaces are added to Logical Switch.

Because each host has two Cisco VIC Ethernet interfaces, two Ethernet interfaces per host are seen, along the port-channel interfaces.

These are:

Eth3/1 Eth3/2 Eth4/1 Eth4/2 Eth5/1 Eth5/2 Eth6/1 Eth6/2

Po1 Po2

Po3 Po4

ſ

These interfaces and port-channels can get verified by executing **show interface brief** on the VSM:

Port VRF		Staf	tus IP	Address		Speed	MTU
mgmt0		up	10,	0,72,101		 1000	1500
Ethernet Interface	VLAN	Туре	Mode	Status	Reason	 Speed	Port Ch #
 Eth3/1	1	eth	trunk	up	none	10G	1
Eth3/2	1	eth	trunk	up	none	10G	1
Eth4/1	1	eth	trunk	up	none	10G	2
Eth4/2	1	eth	trunk	up	none	10G	2
Eth5/1	1	eth	trunk	up	none	10G	3
Eth5/2	1	eth	trunk	up	none	10G	3
Eth6/1	1	eth	trunk	up	none	10G	4
Eth6/2	1	eth	trunk	up	none	10G	4
Port-channel Interface	VLAN	Туре	Mode	Status	Reason	 Speed	Protoco.
Po1	1	eth	trunk	up	none	 a-10G	(D) none
Po2	1	eth	trunk	up	none	a-10G((D) none
Po3	1	eth	trunk	up	none	a-10G((D) none
Po4	1	eth	trunk	up	none	a-10G((D) none
Dent VDC		St at	tuo TP	Oddoooo		 Casad	MTI I

Figure 3-39 Show Interface Brief

Step 9 VM Network Creation.

After the Nexus 1000V Switch for Microsoft Hyper-V Logical switch has been installed, the VM Networks can get created.

a. Verify the Logical Networks created on the N1000V are seen in Hyper-V.

Create Logical Network	te Logi	Create ical Switch	Add Resources •	Overview Re	abric sources	s Machines	Window	View Dependent	dent Remove	Properties
abric	4	Logical Networks an	nd IP Pools (6)				Б			
A All Hosts		Name		Subnet	Regin Address	End Add	334	Available Add	Available Add	Available Add
v2-c1b3-p1		Cisco VIC Ethe	ernet	outriet	beginnearess				President Protoni	And able Add
v2-c1b4-p1		Cisco VIC Ethe	ernet							
🕴 v2-c2b1-p1		very PrivateTentan	t1							
🖉 v2-c2b2-p1	-	why PrivateTentan	t2							
http://www.commune.com/commune.com/commune.com/commune.com/commune.com/commune.com/commune.com/com/com/com/com/com/com/com/com/com/		very PrivateTentan	t3							
TXE Servers		why PublicTenants	5							
찬 Update Server										
VCenter Servers										
🕞 VMM Server										
🔺 📥 Networking										
The Logical Networks										
🗯 MAC Address Pools										
Load Balancers										
🚟 VIP Templates 🔓	+									
WMs and Services										
🔝 Fabric										
🚟 Library										
📋 Jobs										
Settings										
	+									

Figure 3-40 Logical Networks

b. Right-click VM Network and select Create VM Network.

reate Create Virtual Create Create H ervice Machine - Cloud Group Create	st Create VM Network	Assign Cloud Cloud	Overview	VMs Service Show	s VM Networks	Window			
Is and Services	VM Network	cs and IP Poo	4s (2)						
Clouds	Name	V/IC Ethernet	A	Virtual Switch		Sub	net	Available Address	5
VM Networks Storage	VM Network	thernet	Interface #2	2 - Virtual Switc	h				
All Hosts									
v2-c1b3-p1 v2-c1b4-p1									
 v2-c1b3-p1 v2-c1b4-p1 v2-c2b1-p1 v2-c2b2-p1 									
 ₹ v2-c1b3-p1 ₹ v2-c1b4-p1 ₹ v2-c2b1-p1 ₹ v2-c2b1-p1 									
 ₹2-c1b3-p1 ₹2-c1b4-p1 ₹2-c2b1-p1 ₹2-c2b2-p1 									
 2<<1b3-p1 2<<2b4-p1 2<<2b1-p1 2<<2b2-p1 	_								
 v2-c1b3-p1 v2-c1b4-p1 v2-c2b1-p1 v2-c2b2-p1 v2-c2b2-p1 									

Figure 3-41 Create VM Network

c. Create the VM network name and select the logical network.

Administrator -	vmi-scvmm2.vmdc.net - V	irtual Machine Manager	- 0	x
Home	Folder			~ 🕐
23	놀 📑 🏝	a 🖉 🍈 🎄 🚣 👩		
Create Create Virtua Sensice Machine T	<u>\$</u> .	Create VM Network Wizard		
Service machine				
VMs and Services	Mame			
🥵 Tenants	Name			٩
a Clouds	halite	Specify a name and description for the VM network	ddresses	
J. VM Networks	isolation	Name: T1-VL101		
ј Storage	Summary	Description:		
🔺 🚞 All Hosts		Logical network: PublicTenants		
v2-c1b3-p1				
v2-c2b1-p1				
v2-c2b2-p1				
-				
VMs and Servic				
🖳 Fabric				
🧮 Library		Previous Vext Cancel		~
Jobs			1	
Settings				
	*			

Figure 3-42 Create VM Network Name

d. Select the network segment.

Γ

Administrator -	vmi-scvmm2.vmdc.net - V	'irtual Machine Manager	_	ō	x
Home	Folder				^ 🕜
*	🍐 📑 🏦				
Create Create Virtua	<u>a.</u>	Create VM Network Wizard			
Service Machine *					
VMs and Services	solation				
📬 Tenants					٩
Clouds	Name	Configure the isolation for this VM network, or select automatic to have it	ddresses		
	Isolation	configured for you			
alla VIVI Networks	Summary	O Automatic			
Storage		Specify an externally supplied VM network			
All Hosts		External VM network			
v2-c1b4-p1		User defined T2-NetworkSegment101 T2-NetworkSegment102			
v2-c2b1-p1		T3-NetworkSegment103			
🕷 v2-c2b2-p1					
-					
WMs and Service					
🗓 Fabric					
🚟 Library		Previous Next Cancel			~
jobs					
Settings					
			9 16	12-11	DM
			er 10	12-111	141
e . Co	onfirm the VM	network settings.			

Figure 3-43 Select Network Segment

Figure 3-44 Confirm VM Network Settings


f. Follow the same steps to create the remaining VM Networks.

Home Folder				^ 🕜		
	PowerShell					
	Jobs					
Create Assign Overview VM	Is Services VM Networks PRO					
Cloud	Show Window					
VMs and Services <	VM Networks and IP Pools (12)					
🥵 Tenants				٩		
Claude	Name	Subnet Available Addresses				
Ciouds	Lisco VIC Ethernet Interface #2 - Virtual Switch			*		
📥 VM Networks	L New Virtual Switch0			_		
길 Storage	PT1-VL2013					
A C All Hosts	2017 PT1-VL2013-IP-Pool	200.1.3.0/24	247			
A B V2-Cluster	□ ▲ PT1-VL2014					
v2-c1b3-p1	PT1-VL2014-IP-Pool	200.1.4.0/24	249			
v2-c1b4-p1	E 4 PT2-VL2023					
v2-c2b1-p1	201 PT2-VL2023-IP-Pool	200.2.3.0/24	249			
v2-c2b2-p1	□ ▲ PT2-VL2024					
👖 v2-c2b3-p1	22 PT2-VL2024-IP-Pool	200.2.4.0/24	249			
	E 🚣 PT3-VL2033			E		
	201 PT3-VL2033-IP-Pool	200.3.3.0/24	249			
	E PT3-VL2034					
	201 PT3-VL2034-IP-Pool	200.3.4.0/24	249			
WMs and Services	🖂 🚢 T1-VL101					
🐶 Fabric	T1-VL101-IP-Pool	10.101.1.0/24	249			
🚍 186	🗉 🚢 T2-VL102					
	T2-VL102-IP-Pool	10.102.1.0/24	249			
Jobs	🖂 🚢 T3-VL103					
Settings	T3-VL103-IP-Pool	10.103.1.0/24	249			
				¥		
•				×.		

Figure 3-45 All VM Networks

g. Verify the network segment are now a "member-of" the correct VM Networks. This line of the configuration is automatically added to the CLI as noted Step 5Create Network Segments., page 3-4.

```
nsm network segment T1-NetworkSegment101
member-of vmnetwork T1-NetworkSegment101
member-of network segment pool T1
switchport access vlan 101
ip pool import template T1-VL101-IP-Pool
publish network segment
switchport mode access
```

At this point, the logical switch, including VSM and VEMs, is installed. VMs can now be added to the logical switch.

Deployment Guidelines

ſ

1. Manually refresh the VSEM. Hyper-V performs a periodic refresh every 30 minutes; changes in the Nexus 1000V are not automatically updated in Hyper-V. Manually refresh the VSEM to force updates to show up in SCVMM.

2. Manually remove NetSwitchTeam. If a host is deleted from SCVMM, NetSwitchTeam is not removed from the host.

If hosts are removed and added again, the hosts is not added to the logical switch because NetSwitchTeam still exists on the hosts.

This error is seen in the Jobs section:

Error (25238)

Creating the adapter team failed with error An internal error has occurred trying to contact the v2-c1b4-p1.vmdc.net server.

WinRM: URL: [http://v2-c1b4-p1.vmdc.net:5985], Verb: [GET], Resource: [http://schemas.microsoft.com/wbem/wsman/1/wmi/root/scvmm/ErrorInfo?ID=1001]

Check that WS-Management service is installed and running on server v2-c1b4-p1.vmdc.net. For more information use the command "winrm helpmsg hresult". If v2-c1b4-p1.vmdc.net is a host/library/update server or a PXE server role then ensure that VMM agent is installed and running. Recommended Action

ensure the team is functioning correctly and retry the operation

To clear this condition, open Windows PowerShell and do the following:

```
PS C:\Users\Administrator.VMDC> Get-NetSwitchTeam *
Name : V2-HyperV-VSM-P12b352411-1eff-4e95-bc84-9f0fb5a339a4
Members : {Ethernet 5, Ethernet 4}
```

PS C:\Users\Administrator.VMDC> Get-NetSwitchTeam | Remove-NetSwitchTeam

After the obsolete NetSwitchTeam is removed, the host can be added to the Logical switch.

3. Verify that hosts ports show up in VSM. In UCSM, each host had two MGMT and two DATA vNICs. The DATA vNICs were used for NetSwitchTeam. On one or two occasions, when a host was added to the Nexus 1000V logical switch, only one interface showed up in the VSM for that VEM, even though both interfaces were selected. The procedure to add the host to the Nexus 1000V had to be repeated, and the interface that did not show up had to be added to the newly created Nexus 1000V connection.

This can be verified by logging into the VSM and looking at the output **from show interface brief**. Look for the VEM and the ports. A **show port-channel summary** should shows those ports added to the port-channel.

- 4. Close and reopen SCVMM. On occasion, odd behavior was seen, such as hosts not responding to messages. Connecting to hosts using Remote Desktop Protocol (RDP) showed that the hosts were in the correct state. Closing and reopening the SCVMM app cleared this state. This is most likely a winrm issue that needs further investigation when it happens again.
- 5. Create a Gold Template for SCVMM. After three to four weeks, SCVMM became unstable. A new SCVMM was created, and a Gold Template was generated from that VM, in case the instability recurs.
- **6.** Refer to Cisco Nexus 1000V for Microsoft Hyper-V Installation Guide, Release 5.2(1)SM1(5.1) for information about creating the Nexus 1000V logical switch in Hyper-V SCVMM.

Adding VMs to Nexus V Switch for Hyper-V Logical Switch

This section shows the process for adding Virtual Machines to the Nexus 1000V Switch for Microsoft Hyper-V Logical switch.

Step 1 Go to the **VM Properties** page.

Right-click the VM and select Properties.

Step 2 Select **Hardware Configuration** and select the adapter to add to the logical switch.

There are two adapters in the test VMs. One connects to the Microsoft external switch for Management and the other connects to the Nexus 1000V.

Step 3 Select the VM network.

On the network adapter properties page, click **Browse** to see a list of available VM networks.

Home	Folder Host	Virtual Machine				^ 🔞
Create Shut	OPower Off OF	set 🔒 Migrate PT1	Storage	roperties	×	
Down Create VMs and Services	General	Save As New:	. Disk 🗢 SCSI Adapte Select a VM Netv	r 🧟 DVD 🐨 Network Adar vork	x Remove	5
🥵 Tenants	Status Hardware Configuration	Select a VM Netwo Change the network that	<mark>rk</mark> is used for deploying t	his service.	~	₽ ▼ ▼ ▼ C. S. O
🚢 VM Networks	Checkpoints		1	م	Browse	V A C V A C
Storage	Custom Properties	Name Cisco VIC Ethernet Int	Description	Owner VMDC\Administrator	× ×	V A C
 All Hosts W2-Cluster 	Settings	PT1-VL2013		VMDC\Administrator		V., A., C.,
v2-c1b3-p	Actions	PT1-VL2014 PT2-VL2023		VMDC\Administrator VMDC\Administrator	=	
v2-c1b4-p	Servicing Windows	PT2-VL2024		VMDC\Administrator		
v2-c2b2-p*	Dependencies	PT3-VL2033 PT3-VL2034		VMDC\Administrator		
4, 12 CLOS P	Validation Errors	T1-VL101		VMDC\Administrator		
	Access	12-01102	Create	VM Network Clear selectio	n	^
🗽 VMs and Serv				OK Cancel	→	of virtual
Eabric Fabric	ALL AND	1			✓	≡
📕 Library	View Script				OK Cancel	
Jobs						
Settings	Go to rela	ted object	Storage (1 di	sks)	Daily performance (CPU)	
	 Host: v2 	2-c1b3-p1.vmdc.net	Total storage	20.00 GB):	2	Average

Figure 3-46 Select a VM Network

Step 4 Select the classification.

ſ

After selecting the VM network, click the Classification drop-down and select the classification profile.



Figure 3-47 Select Classification

Step 5 After selecting the classification, click OK.

Step 6 Verify the Virtual Machine has been deployed by issuing a "show interface virtual" from the CLI of the VSM:

V2-HyperV-VSM-P1# show interface virtual

Port	Adapter	Owner	Mod	Host
Veth1	Net Adapter	PT1-vSTC1-VL2013	3	V2-C1B3-P1
Veth2	Net Adapter	PT1-vSTC1-VL2014	3	V2-C1B3-P1
Veth3	Net Adapter	PT3-vSTC1-VL2033	3	V2-C1B3-P1
Veth4	Net Adapter	T1-VSTC1-VL101	3	V2-C1B3-P1
Veth5	Net Adapter	PT2-vSTC1-VL2023	4	V2-C1B4-P1
Veth6	Net Adapter	PT2-vSTC1-VL2024	4	V2-C1B4-P1
Veth7	Net Adapter	PT3-vSTC1-VL2034	4	V2-C1B4-P1
Veth8	Net Adapter	T2-vSTC1-VL102	4	V2-C1B4-P1
Veth9	Net Adapter	PT1-vSTC2-VL2013	5	V2-C2B1-P1
Veth10	Net Adapter	PT1-vSTC2-VL2014	5	V2-C2B1-P1
Veth11	Net Adapter	PT3-vSTC2-VL2033	5	V2-C2B1-P1
Veth12	Net Adapter	T3-vSTC1-VL103	5	V2-C2B1-P1
Veth13	Net Adapter	PT2-vSTC2-VL2023	6	V2-C2B2-P1
Veth14	Net Adapter	PT2-vSTC2-VL2024	6	V2-C2B2-P1
Veth15	Net Adapter	PT3-vSTC2-VL2034	6	V2-C2B2-P1
Veth16	Net Adapter	LM-Windows Server 2012 -01		4 V2-C1B4-P1
Veth17	Net Adapter	LM-Win2008-02	4	V2-C1B4-P1

Deployment Guidelines

ſ

- 1. Select the correct interfaces when adding network adapters. In UCSM, each host has two MGMT and two DATA vNICs. From the Windows OS perspective, four VIC interfaces are presented. Ensure that the correct interfaces are selected when adding the hosts to virtual switches. Check the MAC addresses.
- **2.** Refer to **Connecting VMs to Logical Switch** in Cisco Nexus 1000v for Microsoft Hyper-V Installation Guide, Release 5.2(1)SM1(5.1) for more information.

1





SCOM 2012 with UCS Management Pack

Microsoft System Center Operations Manager (SCOM) 2012 is a key component of Microsoft Private Cloud, and provides basic orchestration and monitoring for Private Cloud components. Cisco provides a plug-in for SCOM that enables users to monitor UCS. In order to minimize downtime, users can create e-mail alerts that report Private Cloud failures.

Installation and Configuration

Like SCVMM, SCOM a part of the Microsoft Private Cloud Suite. Users can install SCOM on the same server as the SCVMM, or on a standalone SCOM server. This decision depends upon resource restrictions and the preference of the System Administrator.

Before installation, ensure that the Windows Server 2012 server that SCOM will reside on can communicate with the SQL Server. No other adjustment to SQL is necessary. During SCOM installation, SQL automatically creates the necessary database and files.

Refer to the Microsoft System Center site for more installation details.

Deployment Guidelines

Since SQL 2012 resides on a standalone server separate from SCOM, the installation program might not be able to detect the SQL Server instance when attempted to install SQL Server Reporting Services (SSRS).

I

|--|

perations Manager Setup	
nfiguration	
SQL Server instance for reporting services	
Select the SQL Server instance on which you want to host SQL Server Server Report Server will integrate the security of the selected SSRS in Any reports that were previously installed on this SQL Server instance	Reporting Services (SSRS). This installation of an SQL stance with Operations Manager role-based security. might become inaccessible.
SQL Server instance	
200	
	Previous Next > Cancel

This is normal, because SCOM expects a local installation of SQL Server Express. However, because the full version of SQL Server 2012 already exists in the ecosphere with backup and redundancy, the local installation of SQL Server Express was unnecessary. To work around this issue, perform the following step:

Ensure that both SQL Server and SCOM Server are in the same domain.

- 1. Install SCOM without the reporting server.
- 2. Install reporting services directly onto the SQL Server.
- **3.** On the SCOM Server, open and close the Operation Management Console and reporting service should now be available.

Cisco UCS Management Pack for SCOM

After the SCOM installation finishes, users can install a Cisco plug-in, UCS Management Pack, which is downloaded in the form of a Windows Installer (*.msi) file. This plug-in enables users to monitor various UCS components.

Before beginning the installation, download the UCS Management Pack.

The UCS Management Pack file, Cisco.UCS.MP.xxxx.vx.xx-x64.msi, should be saved on the desktop of the SCOM server. When the download finishes, double-click the file to install the program. When the installation finishes, a "Cisco Unified Computing System" folder should appear in SCOM.



Figure 4-2 Cisco Folder SCOM

For detailed information about installing and deploying UCS Management Pack, refer to the Quick Start Guide.

Monitors and Alerts

ſ

In SCOM, users can view Private Cloud status and configuration information. Users can view the Cisco UCS folder for UCS status and configuration information. In order to minimize downtime, users can create e-mail alerts that report UCS failures.

1

	Diagram - vmdc-hyperv - Operations Manager		_ D X
<u>File E</u> dit <u>V</u> iew <u>G</u> o Tas <u>k</u> s <u>T</u> ools <u>H</u> elp			
Search 🕶 🝦 🖬 👼 🔎 🔍	🗨 100% 🔹 👘 🚷 🕄 Layout direction 👻 🏇 Filter by health 👻 Layers 🖲 🚱 💽 📮 🐺 Scope	₽ Fi <u>r</u>	d 🚺 Tasks 🕡 🖕
Monitoring <	Diagram		 Tasks
Active Alerts		^	2
Discovered Inventory			Maintenance Mode 🔥
Distributed Applications Task Status			Start Maintenance Mode
INIX/Linux Computers			Edit Maintenance Mode
🔢 Windows Computers			Stop Maintenance Mode
Agentless Exception Monitoring	Ciscol ICS		
Application Monitoring			
Management Pack Events			
🙆 State Summary			
🔺 🚘 Cisco UCS Instance	* * *		
CiscoUCS			
Cisco UCS Manager - Cisco UCS			
Ciscol CS State View	CiscoUCS 🐳 CiscoUCS 🐳		
	HW Invent Operating Service Pr		
Miscellaneous Alerts			
🙆 State Summary			
4 🚰 HWInventory		~	
S Diagram	٢	>	
	Detail View	~	
Show or Hide Views			
New View 🕨	Select any node or line on the diagram above to display its details		
Monitoring			
Authoring			
P Reporting			
🍪 Administration			
My Workspace			
•			
Keady			

Figure 4-3 SCOM UCS Diagram

			Ch	assis State View - vi	mdc-hyperv - Op	perations Manage	er				– – X
<u>File E</u> dit <u>V</u> iew <u>G</u> o Tas <u>k</u> s <u>T</u> ools <u>H</u> elp											
Search 👻 🝦 🌆 Scope 👂 Fin	nd	🗵 T <u>a</u> sks 🕡	Ŧ								
Monitoring	<	Chassis State Vie	ew (2)								 Tasks
Management Pack Events	~	State	Name	ld	Config State	Connection Path	Connection St	LcTs	License State		
State Summary		🕢 Healthy	Chassis 2	2	ok	A,B	A,B	1969-12-31T19:	license-ok		
4 🕼 Cisco UCS Instance		🕢 Healthy	Chassis 1	1	ok	A,B	A,B	1969-12-31T19:	license-ok		State Actions
🔺 🚰 CiscoUCS											🛒 Start Maintenance Mod
Cisco UCS Manager - Cisco UCS											Edit Maintenance Mode
CiscoUCS Alert View	=										Stop Maintenance Mode
👯 CiscoUCS State View											
🗲 Diagram											Personalize view
Miscellaneous Alerts											Tasks ^
🚳 State Summary											Entity Departies
4 🚈 HW Inventory											Church Properties
🛁 Diagram											Health Explorer
4 🚰 Chassis											Navigation ^
Chassis Alert View											
Chassis State View											Alert View
State Summary (Chassis)											≤ Diagram View
A j Blade											12 Event View
Plade State View											🚾 Performance View
State Summary (Blade)											👯 State View
InterfaceCard	_										Network Vicinity Dashbe
	~	<		III						>	Via retroit frendy basis
×		Detail View								~	Report Tasks
Show or Hide Views											Agent Counts by Date, I
New View 🕨		🖳 Chassis p	roperties of	Chassis 2							Alert Longing Latency
		Display Na	me	Chassis 2							Alasta
Monitoring		Full Path N	ame	CiscoUCS\Chassis 2							Aleris
Authoring		Description	i ied Name	sys/chassis_2							Availability
		Model	ico nome	N20-C6508							Configuration Changes
Reporting		Revision		0							📔 Data Volume by Manag
🚳 Administration		Serial Num	ber	FOX1637GBQD							📔 Data Volume by Workflo
		Vendor User Label		CISCO Systems Inc							Event Analysis
My Workspace		ld		2							Health
	•	Config Stat	te	ok						Y	
Pandy		Connection	n Path	ΔR							

Figure 4-4 Chassis State View

Summary

ſ

Cisco Unified Computing System is a versatile computing platform capable of effectively supporting Microsoft Hyper-V and CloudOS. With the addition of Cisco Nexus 1000v, the virtual network becomes scalable and easy to manage. Utilizing the design and methodology of the Virtual Multiservice Data Center (VMDC), customers can build a highly secure, scalable, and self-serviceable private cloud to satisfy their infrastructure needs.

1