

Virtual Machine Manager in System Center 2012 Service Pack 1

Microsoft Corporation

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Authors

Tessa Wooley

Applies To

Community Technology Preview 2 (CTP2) of System Center 2012 Service Pack 1 (SP1)

Feedback

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Revision History

|  |  |
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Contents

[System Center 2012 SP1 - Virtual Machine Manager Step-by-Step Guide 5](#_Toc327443187)

[What's New in System Center 2012 SP1 - Virtual Machine Manager 6](#_Toc327443188)

[Network Virtualization 7](#_Toc327443189)

[VHDX Support 8](#_Toc327443190)

[SMB 3.0 File Shares 9](#_Toc327443191)

[Live Migration Enhancements 10](#_Toc327443192)

[Storage enhancements 12](#_Toc327443193)

[Provision a Physical Computer as a Hyper-V Host - Enhancements 13](#_Toc327443194)

[Support for VMM console add-ins 13](#_Toc327443195)

[System Requirements for VMM 13](#_Toc327443196)

[Evaluation Topology Requirements 15](#_Toc327443197)

[What You Can Evaluate in this CTP 18](#_Toc327443198)

[Install System Center 2012 SP1 - Virtual Machine Manager 21](#_Toc327443199)

[Configure the Fabric 23](#_Toc327443200)

[Prepare the Evaluation Environment - Checklists 24](#_Toc327443201)

[Add SMB 3.0 File Shares to Hyper-V Hosts and Clusters 32](#_Toc327443202)

[Create a Logical Network to Evaluate Network Virtualization 35](#_Toc327443203)

[Create VM Networks to Evaluate Network Virtualization 38](#_Toc327443204)

[Discover Storage Devices 42](#_Toc327443205)

[Prepare the Virtual Machine Building Blocks 45](#_Toc327443206)

[Download the Windows Server 2012 VHD and Create a Virtual Machine 45](#_Toc327443207)

[Convert the Virtual Hard Disk from VHD to VHDX and Copy to Library 46](#_Toc327443208)

[Create Virtual Machine Templates Using the Generalized VHDX 47](#_Toc327443209)

[Create Virtual Machines and Evaluate the New CTP Features 54](#_Toc327443210)

[Create Virtual Machines From the Virtual Machine Templates 55](#_Toc327443211)

[Migrate a Running Virtual Machine Without Downtime 57](#_Toc327443212)

[Evaluate Network Virtualization 61](#_Toc327443213)

[Evaluate Deep Discovery When You Provision a Physical Computer as a Hyper-V Host 66](#_Toc327443214)

[Add a Virtual Hard Disk Larger Than 2 TB to a Virtual Machine 68](#_Toc327443215)

[Convert a Virtual Hard Disk with Checkpoints from VHD to VHDX 69](#_Toc327443216)

[Appendix A: Example Names Used in This Guide 70](#_Toc327443217)

[Appendix B: Known Issues 72](#_Toc327443218)

# System Center 2012 SP1 - Virtual Machine Manager Step-by-Step Guide

This guide provides a step-by-step walkthrough that enables you to test the new features of Virtual Machine Manager (VMM) in the community technology preview 2 (CTP2) of System Center 2012 Service Pack 1 (SP1). This CTP is designed to be used with Windows Server® 2012 and to take advantage of new functionality that is provided by Windows Server 2012.

Important

 This CTP is intended for evaluation and deployment planning purposes only. Installing this CTP in a production environment is not supported.

 The procedures in this guide demonstrate key new feature areas that have been tested for VMM in this CTP. Please use the documented procedures for your evaluation. The purpose of this CTP is to obtain your feedback on these feature areas. Be aware that features and scenarios that are not included in this guide may not work.

Before you install and evaluate VMM in this CTP, review the following topics:

|  |  |
| --- | --- |
| Topic | Description |
| [What's New in System Center 2012 SP1 - Virtual Machine Manager](#z22f0d56069a740e1ae9404c5f2ecd133) | Information about the new features in VMM for this CTP. |
| [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905) | List of system requirements for VMM in this CTP. |
| [Evaluation Topology Requirements](#z47886420600f4f4688a0015b052af75e) | Instructions for setting up the evaluation topology to evaluate VMM in this CTP. |
| [What You Can Evaluate in this CTP](#zeee78cca81804736bee2cdf71215c639) | List of procedures to follow in this step-by-step guide to evaluate VMM in this CTP. |

The following resources will be helpful to you when you use this guide.

|  |  |
| --- | --- |
| Resource | Location |
| Windows Server 2012 .vhd file | [Microsoft Download Center](http://go.microsoft.com/fwlink/p/?LinkId=243488) |
| Windows Server 2012 documentation | [Microsoft TechNet Library](http://go.microsoft.com/fwlink/p/?LinkId=243485) |
| System Center 2012 SP1 - Virtual Machine Manager installation files | [Microsoft Download Center](http://go.microsoft.com/fwlink/p/?LinkId=243489) |

Note

This guide includes some links to System Center 2012 – Virtual Machine Manager documentation for overview and background information, and for procedures that also apply to this CTP.

# What's New in System Center 2012 SP1 - Virtual Machine Manager

VMM in the CTP2 of System Center 2012 SP1 provides several new features. The following list summarizes the new functionality in the CTP2 release, when compared to System Center 2012 – Virtual Machine Manager. Therefore, it includes functionality that was introduced in both the CTP1 and CTP2 releases of System Center 2012 SP1.

 [Network Virtualization](#z1)

Note

Support for network virtualization was introduced in CTP1. The CTP2 release adds support for using DHCP to assign customer addresses, and for using either the IP rewrite or Network Virtualization with Generic Routing Encapsulation (NVGRE) mechanism to virtualize the IP address of a virtual machine.

 [VHDX Support](#z2)

Note

Support for VHDX was introduced in CTP1. In the CTP2 release, you can convert a virtual hard disk format from .vhd to .vhdx, there are placement enhancements to determine the format of a virtual hard disk based on the operating system of the destination host (when you create a virtual machine with a blank virtual hard disk), and the provisioning of a physical computer as a Hyper-V host supports the use of a .vhdx file as the base operating system image. Additionally, you can use VMM to rapid provision virtual machines that use VHDX-based virtual hard disks from SAN-copy capable templates.

 [SMB 3.0 File Shares](#z3)

Note

Support for this feature was introduced in CTP1.

 [Live Migration Enhancements](#z4)

Note

Support for live migration enhancements was introduced in CTP1.

 [Storage enhancements](#z5)

Note

The CTP2 release adds support for the new Windows Standards-Based Storage Management service, which uses the same WMI-based programming interface that is included in Windows Server 2012. This new API enables you to discover storage by using multiple provider types. In addition, the CTP2 release adds support for the thin provisioning of logical units.

 [Provision a Physical Computer as a Hyper-V Host - Enhancements](#z6)

Note

The CTP2 release adds support for using a virtual hard disk that is in the .vhdx format as the base operating system image, and for performing deep discovery to retrieve more detailed information about the physical computer.

 [Support for VMM console add-ins](#z7)

Note

The CTP2 release enables you to create user interface (UI) extensions for the VMM console.

## Network Virtualization

VMM in this CTP release provides support for the network virtualization capabilities that are available in Windows Server 2012.

Network virtualization provides the ability to run multiple virtual network infrastructures, potentially with overlapping IP addresses, on the same physical network. With network virtualization, each virtual network infrastructure operates as if it is the only one that is running on the shared network infrastructure. This enables two different business groups that are using VMM to use the same IP addressing scheme without conflict. In addition, network virtualization provides isolation so that only virtual machines on a specific virtual network infrastructure can communicate with each other.

Network virtualization in Windows Server 2012 is designed to remove the constraints of VLAN and hierarchical IP address assignment for virtual machine provisioning. This enables flexibility in virtual machine placement because the virtual machine can keep its IP address regardless of which host it is placed on. Placement is not limited by physical IP subnet hierarchies or VLAN configurations.

To virtualize the network in Windows Server 2012, each virtual machine is assigned two IP addresses:

 A customer address. This IP address is visible to the virtual machine and is used by customers to communicate with the virtual machine.

 A provider address. This IP address is used by the Hyper-V computer that hosts the virtual machine. It is not visible to the virtual machine.

In the CTP2 release, there are two mechanisms that can be used to virtualize the IP address of a virtual machine. These mechanisms include the following:

 IP rewrite. IP rewrite modifies the customer IP address of the packets on the virtual machine before they are transferred on the physical network. When IP rewrite is used, a unique provider IP address is assigned to each virtual machine.

 Network Virtualization with Generic Routing Encapsulation (NVGRE). In NVGRE, all of the virtual machines packets are encapsulated with a new header before they are sent on the physical network. IP encapsulation offers better scalability because all of the virtual machines on a specific host can share the same provider IP address.

Note

By default, VMM uses IP rewrite in this CTP release. You can switch to NVGRE by using the VMM command shell when you create a VM subnet.

VMM creates the necessary IP address mappings for virtual machines to take advantage of the network virtualization capabilities in Windows Server 2012. To assign provider addresses, VMM uses an IP address pool that is associated with a logical network. To assign customer addresses, VMM uses an IP address pool that is associated with a virtual machine subnet (VM subnet), that is in turn associated with a virtual machine network (VM network).

New in this CTP, you can assign customer addresses through DCHP or by using static IP addresses. (The CTP1 release enabled static IP addressing only.) When you create an IP address pool for a VM subnet, the pool is automatically enabled to provision IP addresses by either mechanism. For DHCP to work correctly, the new DHCPv4 Server Switch Extension is required on all Windows Server 2012 Hyper-V hosts.

For more information about network virtualization in Windows Server 2012, see [Hyper-V Network Virtualization Overview](http://go.microsoft.com/fwlink/p/?LinkId=243484).

Important

Not all the capabilities of network virtualization in Windows Server 2012 are supported in this CTP.

## VHDX Support

In this CTP release, VMM supports the new version of the virtual hard disk format that is introduced in Windows Server 2012. This new format is referred to as VHDX. VHDX has a much larger storage capacity (up to 64 TB) than the older VHD format. It also provides data corruption protection during power failures. Additionally, it offers improved alignment of the virtual hard disk format to perform well on large-sector physical disks.

Support for VHDX in this CTP release includes the following:

 You can convert a virtual hard disk for a virtual machine that is deployed to a Windows Server 2012-based host from the .vhd to .vhdx virtual hard disk format. The conversion includes any associated checkpoints.

 If you create a new virtual machine with a blank virtual hard disk, VMM determines whether the format should be .vhd or .vhdx, depending on the operating system of the host that is selected during placement. If it is a Windows Server 2012-based host, VMM uses the .vhdx format. If it is a Windows Server 2008 R2 with SP1-based host, VMM uses the .vhd format.

 If you provision a physical computer as a Hyper-V host, you can specify a .vhdx file as the image for the base operating system.

 You can use VMM to rapid provision virtual machines that use VHDX-based virtual hard disks from SAN-copy capable templates. For more information, see [Rapid Provisioning a Virtual Machine by Using SAN Copy Overview](http://go.microsoft.com/fwlink/p/?LinkID=213761).

 A VMM library server that is running Windows Server 2012 automatically indexes .vhdx files.

 In addition to the small and large blank .vhd files that were available in previous versions of VMM, the VMM library in System Center 2012 SP1 also contains both a small (16 GB) and large (60 GB) blank .vhdx file.

For more information about the benefits of the VHDX format in Windows Server 2012, see [Hyper-V Virtual Hard Disk Format Overview](http://go.microsoft.com/fwlink/p/?LinkId=243107).

## SMB 3.0 File Shares

VMM in this CTP release includes support for designating network file shares on Windows Server 2012 computers as the storage location for virtual machine files, such as configuration, virtual hard disk (.vhd/.vhdx) files and checkpoints. This functionality leverages the new 3.0 version of the Server Message Block (SMB) protocol that is introduced in Windows Server 2012.

SMB 3.0 file shares provide the following benefits when used with VMM in this CTP release:

 Hyper-V over SMB supports file servers and storage at a reduced cost compared to traditional storage area networks (SANs).

 If you use SMB 3.0 file shares as the storage location for virtual machine files, you can live migrate running virtual machines between two stand-alone Hyper-V hosts or between two stand-alone Hyper-V host clusters. Because the storage location is a shared location that is available from both source and destination hosts, only the virtual machine state must transfer between hosts. For more information, see the “Live Migration Enhancements” section of this topic.

You can create SMB 3.0 file shares on both stand-alone Windows Server 2012 file servers and on clustered Windows Server 2012 file servers. In this step-by-step guide, only SMB 3.0 file shares on a stand-alone file server are used to demonstrate the concepts. If you use a stand-alone file server, you can designate an SMB 3.0 file share as the virtual machine storage location on a Windows Server 2012 Hyper-V host cluster. However, this is not a highly available solution.

Note

For more information about how to create a highly available SMB 3.0 file share, see the Windows Server 2012 topic [Scale-Out File Server for Application Data Overview](http://go.microsoft.com/fwlink/p/?LinkId=243987), and steps 1 and 2 of the “Deploy Scale-Out File Server” scenario that is linked to from that topic.

For more information about SMB 3.0 in Windows Server 2012, see [Server Message Block Overview](http://go.microsoft.com/fwlink/p/?LinkId=243108).

## Live Migration Enhancements

VMM in this CTP release includes several live migration enhancements that enable the migration of a running virtual machine with no downtime. The following table summarizes the live migration options that are available.

|  |  |
| --- | --- |
| Transfer Type | Description |
| Live | During live migration, only the virtual machine state is transferred to the destination server.  VMM in System Center 2012 SP1 supports the following new live migration options:  **** Live migration between two stand-alone Windows Server 2012 Hyper-V hosts.  **** Live migration between two Windows Server 2012 Hyper-V host clusters.  Note  This includes both highly available virtual machines and non-highly available virtual machines that are running on a cluster node.  To live migrate a virtual machine between two stand-alone hosts or two separate host clusters, the virtual machine (including virtual hard disks, checkpoints, and configuration files) must reside on an SMB 3.0 file share that is accessible from both the source and destination stand-alone hosts or host clusters.  Note  VMM in System Center 2012 SP1 also supports the live migration of a highly available virtual machine between two nodes in the same host cluster. Support for this exists in System Center 2012 – Virtual Machine Manager, when the virtual machine resides on available storage or on a cluster shared volume (CSV). In System Center 2012 SP1, the virtual machine can also reside on an SMB 3.0 file share. |
| Live (VSM) | Live virtual machine and storage migration (live VSM) is new in System Center 2012 SP1. During live VSM, both the virtual machine state and the virtual machine storage are transferred. For the live VSM option to be available, the virtual machine must reside on storage that is not visible to the destination host.  VMM in this CTP release of System Center 2012 SP1 supports the following:  **** Live VSM between two stand-alone Windows Server 2012 Hyper-V hosts. This transfer can occur between local disks or SMB 3.0 file shares.  **** Live VSM between two Windows Server 2012 Hyper-V host clusters. The virtual machine can be transferred to either a CSV or an SMB 3.0 file share on the destination host cluster. |
| Live Storage | Live storage migration is new in VMM in System Center 2012 SP1. During live storage migration, only the virtual machine storage is transferred.  VMM in this CTP release of System Center 2012 SP1 supports the following:  **** Live storage migration within the same Windows Server 2012 stand-alone host. Storage can be transferred between two SMB 3.0 file shares, between an SMB 3.0 file share and a local disk, or between two local disk locations.  **** Live storage migration on a cluster node from a CSV or SMB 3.0 file share to a different CSV or SMB 3.0 file share that is accessible from the cluster node. |

In addition, VMM can perform simultaneous live migrations (live, live VSM or live storage). This is especially useful when you want to evacuate a host for maintenance.

For more information about live migration in Windows Server 2012, see the following topics:

 [Virtual Machine Live Migration Overview](http://go.microsoft.com/fwlink/p/?LinkId=243109)

 [Virtual Machine Storage Migration Overview](http://go.microsoft.com/fwlink/p/?LinkId=244237)

## Storage enhancements

In this CTP release, the new Windows Standards-Based Storage Management service replaces the Microsoft Storage Management Service in System Center 2012 – Virtual Machine Manager. The new service uses the Windows Storage Management API, a WMI-based programming interface that is included in Windows Server 2012.

Important

The Windows Storage Management API supersedes the Virtual Disk Service (VDS) interface. Therefore, if you are using a storage array that uses only the VDS hardware provider (and not SMI-S), SAN transfer capabilities will no longer be available. A SAN transfer enables you to migrate a virtual machine from one location to another when the .vhd file is located on a storage array. The logical unit number (LUN) that contains the virtual machine is remapped from the source computer to the destination computer instead of transferring the files over the network.

In the CTP2 release, VMM supports the following types of storage providers:

 SMI-S CIM–XML

 SMP

Note

Support for the SMI-S CIM-XML provider existed in System Center 2012 – Virtual Machine Manager.

To evaluate the storage enhancements in this CTP, you must use the following storage arrays.

|  |  |
| --- | --- |
| Provider Type | Supported Arrays |
| SMI-S CIM-XML | See the “Supported Storage Arrays” section of [Configuring Storage Overview](http://go.microsoft.com/fwlink/p/?LinkID=212013) for the supported storage arrays. |
| SMP | Dell EqualLogic PS Series using iSCSI |

Besides the new provider type, the CTP2 release adds the following new functionality:

 Supports auto (dynamic) iSCSI target systems, such as the Dell EqualLogic PS Series. System Center 2012 – Virtual Machine Manager supported only static iSCSI target systems.

 Supports the thin provisioning of logical units through VMM. Your storage array must support thin provisioning, and thin provisioning must be enabled for a storage pool by your storage administrator.

## Provision a Physical Computer as a Hyper-V Host - Enhancements

In the CTP2 release, when you provision a physical computer (often a bare-metal computer) as a Hyper-V host, you can use a Windows Server 2012-based virtual hard disk that is in the .vhdx or .vhd format as the base operating system image. In addition, during the discovery process, you can run what is known as deep discovery to see more detailed information about the physical computer hardware before you deploy the operating system. In this CTP release, deep discovery functionality is partially enabled. You can view the physical network adapter information, information about the CPU and amount of memory, and can change the settings for the network adapter that VMM automatically designates as the management network adapter.

For background information about adding a physical computer as a Hyper-V host, see [Adding Physical Computers as Hyper-V Hosts Overview](http://go.microsoft.com/fwlink/p/?LinkID=212436) in the System Center 2012 – Virtual Machine Manager documentation.

## Support for VMM console add-ins

This CTP release adds support for user interface (UI) add-ins that can extend the functionality of the VMM console. For example, you can create console add-ins such as ribbon entries or custom views to supplement the VMM console with information that you feel is important to present, or something new that is based on your company’s needs or requirements. For information about console add-ins, see the [Virtual Machine Manager Add-in SDK](http://go.microsoft.com/fwlink/p/?LinkId=254359) in the TechNet Wiki.

# System Requirements for VMM

The following table lists the system requirements for VMM in this CTP. For information about how to set up your environment to evaluate the new features, see [Evaluation Topology Requirements](#z47886420600f4f4688a0015b052af75e).

|  |  |
| --- | --- |
| Component | Supported Operating System/Version Requirements |
| VMM management server | Windows Server 2012 |
| VMM console | **** Windows Server 2012  **** Windows 7 with Service Pack 1 (32 and 64-bit Professional, Enterprise, and Ultimate editions)  Important  You must first install Windows PowerShell 3.0 on a Windows 7 with SP1-based client to use the VMM command shell. You can download PowerShell 3.0 from the [Microsoft Download Center](http://go.microsoft.com/fwlink/?LinkId=254542). |
| Library server | Windows Server 2012  Note  Although you can use a Windows Server 2008 R2 with SP1-based library server, we recommend for this CTP that you use Windows Server 2012. This guide includes several procedures that involve virtual hard disks that use the .vhdx format. For any procedure that uses .vhdx, the library server must be running Windows Server 2012. |
| Database server | **** SQL Server 2012 (all editions except SQL Server Express)  **** SQL Server 2008 R2 with Service Pack 1 (64-bit Standard, Enterprise, and Datacenter editions) |
| File server | Windows Server 2012 |
| Virtual machine hosts | Hyper-V virtual machine hosts only, on the following operating systems:  **** Windows Server 2012  **** Windows Server 2008 R2 with SP1 (Enterprise and Datacenter editions)  Note  Supports both full installation or Server Core installation.  **** Hyper-V Server 2008 R2 with SP1  Important  In this CTP, you can add Windows Server 2008 R2 with SP1 and Hyper-V Server 2008 R2 with SP1 hosts. However, most of the new CTP features are only supported on Windows Server 2012 hosts. You can add Windows Server 2008 R2 SP1 hosts to assess backward compatibility, and to verify that placement will block virtual machine deployment to Windows Server 2008 R2 with SP1 hosts when using features that are only supported in Windows Server 2012. |
| PXE server  Note  A PXE server is required only if you want to evaluate the new features when you provision a physical computer as a Hyper-V host. | The PXE server must be provided through Windows Deployment Services, running on either of the following operating systems:  **** Windows Server 2012  **** Windows Server 2008 R2 |
| Guests | **** Windows Server 2012  **** Windows Server 2008 R2 with SP1 (Standard, Enterprise, and Datacenter editions)  **** Windows Web Server 2008 R2 with SP1 |
| Upgrade | You cannot upgrade from a previous version of VMM to this CTP. This includes upgrading from System Center 2012 – Virtual Machine Manager and from the first CTP (CTP1) of System Center 2012 SP1. |

For information about Windows Server 2012 system requirements, see [Installing Windows Server 2012](http://go.microsoft.com/fwlink/p/?LinkId=242443),

# Evaluation Topology Requirements

The following table describes the evaluation environment that is used in this step-by-step guide to demonstrate the new VMM features in this CTP. For a list of system requirements for VMM, see [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905).

Important

 This CTP is intended for evaluation and deployment planning purposes only. Installing this CTP in a production environment is not supported.

 When you set up your evaluation environment, do not exceed the maximum values that are listed in the table.

 The procedures in this guide demonstrate key new feature areas that have been tested for VMM in this CTP. Please use the documented procedures for your evaluation. The purpose of this CTP is to obtain your feedback on these feature areas. Be aware that scenarios that are not included in this guide may not work. For a list of procedures to follow in this step-by-step guide, see [What You Can Evaluate in this CTP](#zeee78cca81804736bee2cdf71215c639).

|  |  |
| --- | --- |
| Evaluation Topology | Requirements/Maximums |
| Two Hyper-V host clusters  Important  As described in the [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905) topic, to evaluate the new CTP features, the cluster nodes must be running Windows Server 2012. | **** Maximum of four nodes per cluster.  Note  In this step-by-step guide, two-node clusters are used as the examples.  **** Each cluster can be in a different subnet. Use a maximum of two subnets.  **** All hosts must use processors from the same manufacturer (for example, all AMD or all Intel).  Note  This is required for live migration.  **** Although not required, we recommend that Cluster Shared Volume (CSV) storage in the cluster is enabled. You can use this to try live storage migration and live VSM scenarios with CSV storage locations. In this guide, SMB 3.0 file shares are used in the procedures for live migration scenarios in a cluster. |
| Two stand-alone Hyper-V hosts  Important  As described in the [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905) topic, to evaluate the new CTP features, the hosts must be running Windows Server 2012. | **** Both hosts must use processors from the same manufacturer (for example, all AMD or all Intel).  Note  This is required for live migration. |
| Bare-metal computer (if you want to evaluate the provisioning of a physical computer as a Hyper-V host) | **** Must be capable of running Hyper-V.  **** Must have a baseboard management controller (BMC) that supports any one of the supported out-of-band management protocols. For more information, see the “BMC Requirements” section of the System Center 2012 – Virtual Machine Manager topic [Adding Physical Computers as Hyper-V Hosts Overview](http://go.microsoft.com/fwlink/p/?LinkID=212436). |
| VMM library server  Important  As described in the System Requirements topic, to evaluate the new .vhdx feature, the library server must be running Windows Server 2012. | The library server does not need the Hyper-V server role installed. |
| VMM management server | **** You can only install a stand-alone VMM management server. Installing a highly available VMM management server is not supported in this CTP.  **** The name of the computer on which you are installing the VMM management server cannot exceed 15 characters.  Note  You can install the VMM management server in a virtual machine. |
| VMM database | **** You can install SQL Server on the same computer as the VMM management server or on a separate computer.  **** The name of the computer on which SQL Server is installed cannot exceed 15 characters. |
| VMM console | Note  When you install a VMM management server, the VMM console is automatically installed on the computer. |
| File server (to host SMB 3.0 file shares) | **** We recommend that you use a dedicated file server. For SMB 3.0 files shares to work correctly with VMM, the file server must not be a Hyper-V host.  **** If desired, you can use a clustered Windows Server 2012 file server. You can use either the “File Server for general use” or the “File Server for scale-out application data” file server type. For more information about the “File server for scale-out application data” clustered file server type, see the Windows Server 2012 topic [File Server for scale-out application data overview](http://go.microsoft.com/fwlink/p/?LinkId=243987). |
| Storage | **** Storage arrays that were supported in System Center 2012 – Virtual Machine Manager. For the list of supported arrays, see [Configuring Storage Overview](http://go.microsoft.com/fwlink/p/?LinkID=212013).  **** Dell EqualLogic PS Series using iSCSI |
| Domain topology | For this CTP, all computers must be in the same Active Directory domain. |
| VMM user roles | For this CTP, you must perform all procedures in this guide as a member of the Administrator user role in VMM. The Delegated Administrator, Read-only Administrator, and Self-Service User user roles are not supported. |
| Private clouds | Creating private clouds in VMM is not supported in this CTP. |

# What You Can Evaluate in this CTP

The following table outlines the procedures that you will follow in this step-by-step guide.

Important

 The procedures in this guide demonstrate key new feature areas that have been tested for VMM in this CTP. Please use the documented procedures for your evaluation. The purpose of this CTP is to obtain your feedback on these feature areas. Be aware that scenarios that are not included in this guide may not work.

 Before you perform these procedures, review the information in [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905) and [Evaluation Topology Requirements](#z47886420600f4f4688a0015b052af75e).

|  |  |
| --- | --- |
| Procedure | Reference Topic |
| Install VMM | [Install System Center 2012 SP1 - Virtual Machine Manager](#z0cb1d36726f84dc9a28d37251145aa8b) |
| Create two stand-alone Hyper-V hosts and two Hyper-V host clusters outside of VMM. | [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253)  Important  Make sure that you carefully review the checklists because there are important steps such as enabling the Windows Network Virtualization Filter driver and installing the DHCP Server switch extension on the cluster nodes. |
| Add a library server and library share to the VMM console. | [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253) |
| Create a host group structure in the VMM console. | [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253) |
| Add the hosts and host clusters to VMM. | [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253) |
| Configure networking in the Fabric workspace of the VMM console. | [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253) |
| On the file server, create an SMB 3.0 file share (outside of VMM). | [Add SMB 3.0 File Shares to Hyper-V Hosts and Clusters](#z4087d5b0324d4389bf7802ea09104ddb) |
| Add the SMB 3.0 file share to stand-alone hosts and host clusters. | [Add SMB 3.0 File Shares to Hyper-V Hosts and Clusters](#z4087d5b0324d4389bf7802ea09104ddb) |
| Configure a logical network in the VMM console that you can use to evaluate network virtualization. | [Create a Logical Network to Evaluate Network Virtualization](#z73058b3e9dd84287b638c66e5e40fee7) |
| Configure VM networks in the VMM console that you can use to evaluate network virtualization.  Create VM subnets that use the IP rewrite and the NVGRE mechanisms to virtualize the IP address of a virtual machine. | [Create VM Networks to Evaluate Network Virtualization](#z5305dc7ac72d47c39cf080d73ae531aa) |
| Discover supported storage devices and evaluate their functionality. | [Discover Storage Devices](#z9d75b26add904599b948c85709b15010) |
| Create a generalized Windows Server 2012 image that uses the new .vhdx virtual hard disk format. During this process, you convert a .vhd file to a .vhdx file. | **** [Download the Windows Server 2012 VHD and Create a Virtual Machine](#zbdf0aea023ef419bb5060dbd950ef531)  **** [Convert the Virtual Hard Disk from VHD to VHDX and Copy to Library](#z2a27173641ee4404a23f8f5f264ba8c5) |
| Create virtual machine templates using the generalized Windows Server 2012 image (.vhdx file) as the source. Create the following:  **** Stand-alone virtual machine template  **** Highly available virtual machine template  **** Highly available virtual machine template with network virtualization settings (using both DHCP and static IP addressing) | [Create Virtual Machine Templates Using the Generalized VHDX](#z8488807a451f4403945e4d724622ad51) |
| Create and deploy virtual machines from the virtual machine templates, using the SMB 3.0 file share as the location for the virtual machines. Create the following:  **** One stand-alone virtual machine  **** One highly available virtual machine (without network virtualization settings)  **** Five virtual machines to evaluate network virtualization | [Create Virtual Machines From the Virtual Machine Templates](#ze4943e414d7841f8859c76ea05e986cf) |
| Evaluate the live migration enhancements, including the following:  **** Live migration between the two host clusters (using an SMB 3.0 file share)  **** Live migration between two stand-alone hosts (using an SMB 3.0 file share)  **** Storage migration on a stand-alone host | [Migrate a Running Virtual Machine Without Downtime](#zee455c53314a446d8d35a23b9d23f86f) |
| Evaluate that network virtualization works correctly. You can evaluate the following:  **** Verify that an IP address is successfully obtained when a virtual machine is configured to use a static IP address or a DHCP address from a VM subnet.  **** Verify that virtual machines in different VM networks are isolated from one another.  **** Verify that Network Virtualization with Generic Routing Encapsulation (NVGRE) is working correctly, where a single provider address is used for all virtual machines on the same host.  **** Verify that virtual machines in different VM subnets (in the same VM network) can communicate with each other. | [Evaluate Network Virtualization](#zf70128644cc940f5b660001b775ecfb5) |
| Provision a physical computer as a Hyper-V host, using a .vhdx file as the virtual hard disk format for the base operating system image. Also, try the new deep discovery feature to view detailed information about the physical computer. | [Evaluate Deep Discovery When You Provision a Physical Computer as a Hyper-V Host](#zbbebee4c2351489eaf57d7314e0b520e) |
| Verify that you can add a virtual hard disk (.vhdx file) larger than 2 TB to an existing virtual machine. | [Add a Virtual Hard Disk Larger Than 2 TB to a Virtual Machine](#za2ce55482c1948958be7527168b6480a) |
| Verify that you can convert a virtual machine’s hard disk and checkpoint files from the .vhd to .vhdx virtual hard disk format. Also, try using the VMM command shell to delete the source .vhd file when you perform a conversion. | [Convert a Virtual Hard Disk with Checkpoints from VHD to VHDX](#zfcd7ecc67bc747f381183841e954506f) |

# Install System Center 2012 SP1 - Virtual Machine Manager

Before you install VMM in this CTP of System Center 2012 SP1, review the information in the following topics:

 [System Requirements for VMM](#z48d948cdd23245f4b4515fd3d98a8905)

 [Evaluation Topology Requirements](#z47886420600f4f4688a0015b052af75e)

In addition, be aware of the following:

 Installing the VMM Self-Service Portal is not supported.

 In this CTP, a highly available VMM management server is not supported.

 You must have at least 2 GB of RAM on the computer on which you install the VMM management server. 4 GB of RAM is recommended.

Note

If you install the VMM management server in a virtual machine and you are using the Dynamic Memory feature of Hyper-V, you must set the startup RAM for the virtual machine to be at least 2048 MB.

Account requirements   Membership in the local Administrators group, or equivalent, on the computer that you are configuring is the minimum required to complete this procedure.

To install the VMM management server

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Install the following prerequisites on the computer where you want to install VMM:   |  |  | | --- | --- | | Prerequisite | More Information | | .NET Framework 4.5 | This is not a required prerequisite, as VMM will automatically install this feature if it is missing during VMM Setup. .NET Framework 4.5 is available as a feature in Server Manager. | | Windows Assessment and Deployment Kit (Windows ADK) | You can download Windows ADK from the [Microsoft Download Center](http://go.microsoft.com/fwlink/p/?LinkId=252922). When you install Windows ADK, select the Deployment Tools and the Windows Preinstallation Environment features.  Note  Windows ADK replaces Windows Automated Installation (Windows AIK) as a VMM prerequisite in the CTP2 of System Center 2012 SP1. | | SQL Server 2008 R2 Command Line Utilities or SQL Server 2012 Command Line Utilities, depending on which version of SQL Server you install.  Note  If you do not install these utilities, this will not block the installation. These utilities are required if you plan to deploy services that use SQL Server data-tier applications (.dacpac files). | Locate the Command Line Utilities in the following feature packs:   [Microsoft SQL Server 2008 R2 Feature Pack](http://go.microsoft.com/fwlink/p/?LinkID=210563)   [Microsoft SQL Server 2012 Feature Pack](http://go.microsoft.com/fwlink/p/?LinkId=253555) |   2. Install Microsoft SQL Server on the computer where you want to install VMM, or on a different computer that is reachable from the VMM management server. The following software is required:   |  |  | | --- | --- | | Software | More Information | | .NET Framework 3.5 | .NET Framework 3.5 is required for SQL Server installation. For information about how to install the .NET Framework 3.5 feature in Windows Server 2012, see [Install or uninstall roles, role services, or features](http://go.microsoft.com/fwlink/p/?LinkId=252921). | | SQL Server 2008 R2 with SP1 or SQL Server 2012 | When you install SQL Server, select the Database Engine Services and the Management Tools - Complete features. |   3. To install the VMM management server, follow the steps in [How to Install a VMM Management Server](http://go.microsoft.com/fwlink/p/?LinkID=244296).  Note  Although the steps are for System Center 2012 – Virtual Machine Manager, most also apply to this CTP. |

# Configure the Fabric

In this section, you will prepare the physical infrastructure that you can use to evaluate the new VMM features in this CTP release. The procedures in this section include the following:

 [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253)

This topic includes checklists that will help you prepare the stand-alone Windows Server 2012 Hyper-V hosts, create the Windows Server 2012 Hyper-V host clusters, and add the required fabric prerequisites to the VMM console.

 [Add SMB 3.0 File Shares to Hyper-V Hosts and Clusters](#z4087d5b0324d4389bf7802ea09104ddb)

In this procedure, you will configure each host for SMB 3.0 file share access. This includes verifying the host management Run As account, and adding an SMB 3.0 file share as a storage location on each stand-alone host and host cluster.

 [Create a Logical Network to Evaluate Network Virtualization](#z73058b3e9dd84287b638c66e5e40fee7)

In this procedure, you will create a logical network, an associated network site, and an IP address pool that you can use to evaluate network virtualization.

 [Create VM Networks to Evaluate Network Virtualization](#z5305dc7ac72d47c39cf080d73ae531aa)

In this procedure, you will create VM networks, VM subnets, and IP address pools that you can use to evaluate network virtualization.

 [Discover Storage Devices](#z9d75b26add904599b948c85709b15010)

In this procedure, you will discover any supported storage devices, and try to perform actions such as creating and deleting logical units, or assigning storage to hosts.

# Prepare the Evaluation Environment - Checklists

Use the following checklists to prepare your evaluation environment for VMM in this CTP release of System Center 2012 SP1.

Tip

For a list of example names that are used in this guide, see [Appendix A: Example Names Used in This Guide](#zcfe240cbb8a24ec19612a71a831c3a85).

1. Prepare the stand-alone Hyper-V hosts

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| --- | --- | --- |
|  | Task | References |
|  | Add the Hyper-V server role to two stand-alone Windows Server 2012 hosts. During role installation, in the Add Roles and Features Wizard, do the following:  **** Select the Allow this server to send and receive live migrations of virtual machines check box.  **** Make sure that Use Credential Security Support Provider (CredSSP) is selected as the authentication protocol.  Note  In this guide, StandAlone1 and StandAlone2 are used as the stand-alone host example names. | See the Windows Server 2012 topic [Install the Hyper-V role and Configure a Virtual Machine](http://go.microsoft.com/fwlink/p/?LinkId=243990). |
|  | On each stand-alone host make sure that the virtual network switches are named exactly the same. To do this:  1. Open Hyper-V Manager, click the server name, and then in the Actions menu click Virtual Switch Manager.  2. In the Name box for each virtual switch, make sure that names are identical on all servers.  For example, if you have an external virtual switch named External-CORP, make sure to use the same name on all servers.  Important  In the CTP, this is required for live migration to succeed between two stand-alone hosts.  Note  In the examples in this guide, we walk you through evaluating network virtualization on highly available virtual machines. However, having a cluster is not a requirement for network virtualization.  If you want to prepare a stand-alone host for network virtualization, you must enable the Windows Network Virtualization Filter driver. To assign IP addresses from a VM subnet through DHCP, you must install and enable the DHCPv4 Server Switch Extension on each host.  For information about both of these procedures, see the second through fourth tasks in the checklist for Step 2. Create the Hyper-V host clusters. |  |

2. Create the Hyper-V host clusters

|  |  |  |
| --- | --- | --- |
|  | Task | References |
|  | On the hosts that you want to use for cluster nodes, add the Hyper-V server role. During role installation, in the Add Roles and Features Wizard, do the following:  **** Optionally, clear the Allow this server to send and receive live migrations of virtual machines check box.  Note  If you do not clear this setting, the wizard will configure migration to allow any available network for migration. If you want to make sure that only cluster configured networks are used, clear the check box. The setting is then enabled during cluster creation.  **** Make sure that Use Credential Security Support Provider (CredSSP) is selected as the authentication protocol.  Note  In this guide, the following cluster names are used as examples:  **** Cluster1: Consists of Cluster1Node1 and Cluster1Node2.  **** Cluster2: Consists of Cluster2Node1 and Cluster2Node2. | See the Windows Server 2012 topic [Install the Hyper-V role and Configure a Virtual Machine](http://go.microsoft.com/fwlink/p/?LinkId=243990). |
|  | On each host, install the DHCPv4 Server Switch Extension. The extension is required for VMM to assign IP addresses by using DHCP on a VM network.  The DHCPv4 Server Switch Extension (DHCPExtn.msi) is included with the VMM installation files, in the \amd64\Setup\msi\DHCPExtension folder. You must install the switch extension with elevated privileges. To do this, open a command prompt with elevated privileges, and then install the .msi file at the command prompt. |  |
|  | On each Hyper-V server that you want to use as a cluster node (in any cluster that you use for evaluation), make sure that you have at least two external virtual network switches, and that the switches are named exactly the same.  For example, name one virtual switch External–CORP, and one NetVirt. You will use the NetVirt switch to evaluate network virtualization.  Also, you must enable the DHCP Server switch extension on the switch that you want to use for network virtualization.  To configure the virtual switches, follow these steps:  1. Open Hyper-V Manager, click the server name, and then in the Actions menu click Virtual Switch Manager.  2. In the Name box for each virtual switch, make sure that names are identical on all servers. For example, if you have external virtual switches named External-CORP and NetVirt, make sure to use the same switch names on all nodes.  Important  In the CTP, this is required for live migration to succeed between two host clusters.  3. Expand the switch that you want to use for network virtualization, for example (NetVirt), and then click Extensions. Under Switch extensions, select the Microsoft VMM DHCPv4 Server Switch Extension check box, and then click OK. |  |
|  | On each cluster node, enable the Windows Network Virtualization Filter driver for the physical network adapter that you want to use to evaluate network virtualization. For example, enable this driver on the physical network adapter that is associated with the NetVirt switch.  To enable the driver, open the properties of the network adapter that has the Hyper-V Extensible Virtual Switch enabled (that is used by the NetVirt switch), select the Windows Network Virtualization Filter driver check box, and then click OK.  Tip  To quickly open network settings, in Server Manager, click Local Server. In the PROPERTIES pane, click the IP address information next to a network adapter. This opens Network Connections in Control Panel. |  |
|  | By using the Failover Cluster Manager tool in Windows Server 2012, create two Hyper-V clusters. Although not required, we recommend that the clusters use cluster shared volume (CSV) storage.  Important  For this CTP release of System Center 2012 SP1, you must create the clusters outside of VMM. | See the Windows Server 2012 topic: [Failover Clustering Overview](http://go.microsoft.com/fwlink/p/?LinkId=243991).  For general steps on how to create a failover cluster, see the topic [Step 1: Install Prerequisites for Scale-Out File Server](http://go.microsoft.com/fwlink/p/?LinkId=243992). Although this topic does not exactly match this scenario, you can use it as a guideline for installation steps. It also includes information about how to add a cluster shared volume.  Note  In the To install the roles and features section, you only need to install the Failover Clustering feature. |

3. Add the required fabric prerequisites in the VMM console

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| --- | --- | --- |
|  | Task | References |
|  | In the VMM console, add a Windows Server 2012-based library server and one or more library shares to VMM.  Important | [How to Add a Library Server or Library Share](http://go.microsoft.com/fwlink/p/?LinkID=212437) |
|  | In the VMM console, create a host group structure.  For example, create the following host group structure:  All Hosts  Cluster HG  Stand-Alone HG | [How to Create a Host Group Structure](http://go.microsoft.com/fwlink/p/?LinkID=223185) |
|  | In the VMM console, add the stand-alone Hyper-V hosts and the Hyper-V host clusters to VMM.  Important  If you want to try using SMB 3.0 file shares, you must use a Run As account to add the hosts and clusters.  Add the hosts and clusters to the appropriate host group. For example:  **** Add Cluster1 (nodes Cluster1Node1 and Cluster1Node2), and Cluster2 (nodes Cluster2Node1 and Cluster2Node2) to the Cluster HG host group.  **** Add StandAlone1 and StandAlone2 to the Stand-Alone HG host group. | [How to Add Trusted Hyper-V Hosts and Host Clusters](http://go.microsoft.com/fwlink/p/?LinkId=242897) |
|  | In the VMM console, configure networking in the Fabric workspace.  1. Make sure that a logical network exists that you can use for virtual machines.  By default VMM creates a logical network based on the first DNS suffix label of the connection-specific DNS suffix when you add a Hyper-V host to VMM. For example, if you add a host that uses the corp.contoso.com DNS suffix, VMM creates a logical network named “corp.” If this network already uses a DHCP server, virtual machines that are configured to use this logical network can also obtain addresses via DHCP. If you want to create static IP address pools that are managed by VMM, you must create a logical network, network sites and IP address pools.  Important  In this CTP release, if you want to use a logical network that uses DHCP, you must create an associated network site. When you do, set the VLAN to 0, and leave the IP subnet field empty.  2. On each host, associate the physical network adapters on each host with the correct logical network.  3. Verify that one or more common virtual networks are listed for the host clusters. | **** [Configuring Networking Overview](http://go.microsoft.com/fwlink/p/?LinkID=212012)  Note  Specifically, review the “Logical Networks”, “Network Sites”, “Static IP Address Pools”, and “Assigning Logical Networks to Hosts” sections of the topic.  Important  In this CTP release, if you want to use a logical network that uses DHCP, you must create an associated network site. When you do, set the VLAN to 0, and leave the IP subnet field empty.  **** [How to Create a Logical Network](http://go.microsoft.com/fwlink/p/?LinkID=212420)  **** [How to Create IP Address Pools](http://go.microsoft.com/fwlink/p/?LinkID=212422)  **** [How to Configure Network Settings on a Hyper-V Host](http://go.microsoft.com/fwlink/p/?LinkID=212537)  Note  Specifically, see the “To associate logical networks with a physical network adapter (for an external virtual network)” procedure in the topic.  **** To verify that one or more common virtual networks are listed for the host clusters, in the VMM console, in the Fabric workspace, right-click the host cluster, and then click Properties. Click the Virtual Networks tab. Make sure that the virtual networks are listed. If the same virtual switch is associated with a common logical network on each cluster node (and the same IP subnets and VLANs are associated with the logical network in the advanced properties of the physical network adapter on each cluster node), the associated logical network is also listed. |

# Add SMB 3.0 File Shares to Hyper-V Hosts and Clusters

You can use the following procedures to add Server Message Block (SMB) 3.0 file shares to Hyper-V stand-alone hosts and host clusters in VMM. You must add the SMB 3.0 file share path to each stand-alone host or host cluster that will access the share.

Prerequisites:

 Create a file share on a Windows Server 2012-based file server that is in the same Active Directory domain as the virtual machine hosts. For example, create a file share that is named \\fileserver1\smbfileshare. When you create the file share, you do not have to assign specific permissions at the share or file system level. VMM automatically assigns the required permissions.

Important

 We recommend that you use a dedicated file server.

 For SMB 3.0 files shares to work correctly with VMM, the file server must not be a Hyper-V host. This also applies to a highly available file server. Do not add the file server (stand-alone or cluster) as a managed host in VMM.

 The file share must not be added as a VMM library share.

 The VMM service account must have local administrative permissions on the file server where the SMB 3.0 share resides. You must assign these permissions outside of VMM.

 If you used a domain account for the VMM service account, add the domain account to the local Administrators group on the file server.

 If you used the local system account for the VMM service account, add the computer account for the VMM management server to the local Administrators group on the file server. For example, for a VMM management server that is named VMMServer01, add the computer account VMMServer01$.

Tip

To add a computer account to a group, in the Select Users, Computers, Service Accounts, or Groups dialog box, click Object Types, select the Computers check box, and then click OK.

 Any host or host cluster that will access the SMB 3.0 file share must have been added to VMM by using a Run As account. VMM automatically uses this Run As account to access the SMB 3.0 file share.

Note

If you specified explicit user credentials when you added a host or host cluster, you can remove the host or cluster from VMM, and then add it again by using a Run As account.

To configure a stand-alone host for SMB 3.0 file share access

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| --- |
| 1. Open the Fabric workspace.  2. In the Fabric pane, expand Servers, and then expand All Hosts.  3. Locate and then click the stand-alone host that you want to configure. Then, on the Host tab, in the Properties group, click Properties.  For example, open the properties for the host StandAlone1.  4. In the Host Name Properties dialog box, click the Host Access tab.  5. In the Run As account box, verify that a Run As account is listed that has local administrator privileges on the host.  Note  By default, the Run As account that was used to add the host to VMM is listed. If you want to change the Run As account, click Browse, and then select an existing Run As account or click Create Run As Account to create a new account. Do not use the same account that you used for the VMM service account.  6. In the Host Name Properties dialog box, click the Storage tab.  7. On the toolbar, next to File share, click Add share.  8. In the File share path box, enter an SMB 3.0 file share path in the format \\server\_name\share\_name, and then click OK.  For example, enter a file share path of \\fileserver1\smbfileshare.  Tip  To confirm that the host has access, open the Jobs workspace to view the job status. Or, open the host properties again, and then click the Storage tab. Under File Shares, click the SMB 3.0 file share. Verify that a green checkmark appears next to Access to file share.  9. Repeat this procedure for any stand-alone host that you want to access the SMB 3.0 file share. For example, repeat this procedure on the host StandAlone2. |

To configure a host cluster for SMB 3.0 file share access

|  |
| --- |
| 1. Open the Fabric workspace.  2. In the Fabric pane, expand Servers, and then expand All Hosts.  3. Locate and then right-click the cluster node that you want to configure, and then click Properties.  For example, open the properties for the cluster node Cluster1Node1.  4. In the Host Name Properties dialog box, click the Host Access tab.  5. In the Run As account box, verify that a Run As account is listed that has local administrator privileges on the host.  Note  By default, the Run As account that was used to add the host to VMM is listed. If you want to change the Run As account, click Browse, and then select an existing Run As account or click Create Run As Account to create a new account. Do not use the same account that you used for the VMM service account. You must use the same Run As account on all cluster nodes.  6. Repeat steps 3 through 5 on each node of the host cluster.  For example, repeat steps 3 through 5 on cluster node Cluster1Node2.  7. After you have verified the host management Run As account on each cluster node, click the host cluster that contains the nodes. Then, on the Host Cluster tab, in the Properties group, click Properties.  For example, open the properties for the host cluster Cluster1.  8. In the Cluster Name Properties dialog box, click the File Share Storage tab.  9. In the File share storage pane, click Add.  10. In the Add File Share dialog box, in the File share path box, enter an SMB 3.0 file share path in the format \\server\_name\share\_name, and then click OK.  For example, enter a file share path of \\fileserver1\smbfileshare.  11. Click OK to apply the changes and to close the dialog box.  Tip  To confirm that the cluster has access, open the Jobs workspace to view the job status. To view the access status, free space, and total capacity for the share, open the host cluster properties again, and then click the File Share Storage tab.  12. Repeat this procedure for any host cluster that you want to access the SMB 3.0 file share. For example, repeat this procedure on host cluster Cluster2, and its associated nodes Cluster2Node1 and Cluster2Node2. |

# Create a Logical Network to Evaluate Network Virtualization

To evaluate network virtualization in this CTP, you must first configure the logical network that VMM will use to assign provider addresses (PAs). The PA appears in the packets on the network that are exchanged with a Hyper-V server that hosts a virtual machine. The PA is visible on the physical network, but not to the virtual machine.

Note

This guide uses only one network site as the example. If you want to use more than one network site, make sure that your routing infrastructure is configured to route traffic between the subnets in each site, and assign the appropriate default gateways to IP address pools when you create the logical network.

|  |  |
| --- | --- |
| Task | Procedure |
| Create a logical network and an associated network site. | [To create a logical network and a network site](#z8) |
| Create an IP address pool for the network site in the logical network. | [To create an IP address pool for the logical network](#z9) |
| Associate the logical network with the physical network adapter on each host. | [To associate the logical network with the physical network adapter on the host](#z10) |

Tip

For more information about networking in VMM, see [Configuring Networking Overview](http://go.microsoft.com/fwlink/p/?LinkID=212012).

## 

To create a logical network and a network site

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| --- |
| 1. Open the Fabric workspace.  2. On the Home tab, in the Show group, click Fabric Resources.  3. In the Fabric pane, expand Networking, and then click Logical Networks.  4. On the Home tab, in the Create group, click Create Logical Network.  The Create Logical Network Wizard opens.  5. On the Name page, enter a name and optional description for the logical network, and then click Next.  For example, enter the name PA\_Net, with the description Logical network for provider addresses.  6. On the Network Site page, click Add, and then do the following:  a. Under Host groups that can use this network site, select the check box next to each host group to which you want to make the logical network available.  For example, select the Cluster HG check box.  b. Under Associated VLANs and IP subnets, to enter the VLANs and IP subnets that you want to assign to the network site, click Insert row.  c. Under VLAN and IP subnet, enter the information appropriate for your environment.  For example, for VLAN, enter 0, and for IP subnet, enter 10.0.0.0/24.  Important  In this CTP, you must use static IPv4 addresses for network virtualization. Also, VLAN must be set to 0 or left blank.  d. In the Network site name box, you can enter a new name for the network site.  For example, enter PA\_Site1.  7. On the Network Site page, click Next.  8. On the Summary page, click Finish.  Tip  For more information, see [How to Create a Logical Network](http://go.microsoft.com/fwlink/p/?LinkID=212420). |

## 

To create an IP address pool for the logical network

|  |
| --- |
| 1. Open the Fabric workspace.  2. On the Home tab, in the Show group, click Fabric Resources.  3. In the Fabric pane, expand Networking, and then click Logical Networks.  4. In the Logical Networks and IP Pools pane, click the logical network where you want to create the IP address pool.  For example, click PA\_Net.  5. On the Home tab, in the Create group, click Create IP Pool.  The Create Static IP Address Pool Wizard opens.  6. On the Name page, do the following, and then click Next.  a. Enter a name and optional description for the IP address pool.  For example, enter the name PA\_Site1\_Pool.  b. In the Logical network list, make sure that the correct logical network is selected.  For example, select PA\_Net.  7. On the Network Site page, make sure that Use an existing network site is selected, and that the appropriate selections are made in the Network site and IP subnet lists, and then click Next.  For example, make sure that PA\_Site1 and 10.0.0.0/24 are selected.  8. On the IP address range page, make the selections appropriate for your environment, and then click Next.  9. Optionally, on the Gateway page, make the selections appropriate for your environment, and then click Next.  10. Optionally, on the DNS page, make the selections appropriate for your environment, and then click Next.  11. Optionally, on the WINS page, make the selections appropriate for your environment, and then click Next.  12. On the Summary page, confirm the settings, and then click Finish.  Tip  For more information, see [How to Create IP Address Pools](http://go.microsoft.com/fwlink/p/?LinkID=212422). |

## 

To associate the logical network with the physical network adapter on the host

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| 1. Open the Fabric workspace.  2. In the Fabric pane, expand Servers, expand All Hosts, and then locate and click the host group where the host resides.  For example, click Cluster HG.  3. In the Hosts pane, click the host that you want to configure.  For example, click Cluster1Node1.  4. On the Host tab, in the Properties group, click Properties.  5. In the Host Name Properties dialog box, click the Hardware tab.  6. Under Network Adapters, expand the physical network adapter that you want to configure, and then click the virtual switch.  For example, locate the physical network adapter that is associated with the example NetVirt switch, and then click the switch.  7. Under Logical network connectivity, select the check box next to the logical network that you want to associate with the physical adapter.  For example, select the PA\_Net check box, and then click OK.  Tip  For more information, see [How to Configure Network Settings on a Hyper-V Host](http://go.microsoft.com/fwlink/p/?LinkID=212537).  8. Repeat this procedure for each host that you plan to use for network virtualization. For example, repeat this procedure on the following hosts:   Cluster1Node2   Cluster2Node1   Cluster2Node2  Tip  For a cluster, after the cluster refresher runs, you can verify that the virtual switch and the logical network are correctly associated. To verify, under the appropriate host group, right-click the cluster name, click Properties, and then click the Virtual Networks tab. VMM lists the virtual switches and the logical networks to which they are associated.  For example, under the Cluster HG host group, right-click Cluster1, click Properties, and then click Virtual Networks. The virtual switch NetVirt is listed together with the logical network PA\_Net. |

# Create VM Networks to Evaluate Network Virtualization

After you have configured a logical network for provider addresses, you can use the following procedures to create VM networks with associated VM subnets and IP address pools. VMM uses the IP address pools that are associated with a VM network to assign customer addresses to virtual machines that use network virtualization. The customer address is visible to the virtual machine and is used by customers to communicate with the virtual machine (for example, if a customer uses Ping or connects by using Remote Desktop Connection).

In this CTP you can configure network virtualization to use either IP rewrite or Network Virtualization with Generic Routing Encapsulation (NVGRE). These are two mechanisms to virtualize the IP address of the virtual machine. By default, VMM uses IP rewrite in the CTP2 release. (CTP1 also used IP rewrite.) In the procedures below, you create VM subnets that use IP rewrite, and a VM subnet that uses NVGRE. Realize that all VM subnets in a VM network must use the same mechanism.

Note

For more information about these mechanisms, see [Hyper-V Network Virtualization Overview](http://go.microsoft.com/fwlink/p/?LinkId=243484) in the Windows Server 2012 documentation.

In the procedures in this topic, you do the following:

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| Task | Example Names |
| **** Create two VM networks that are each associated with the logical network that you created for provider addresses.  **** Create two VM subnets for the first VM network, and one VM subnet for the second VM network. For the VM subnet in the second VM network (Green\_VMSubnet1), you use the VMM command shell to set the virtualization mechanism to NVGRE. The other VM subnets use IP rewrite.  Note  You must create two VM subnets for the first VM network to verify that virtual machines that are in different VM subnets (but in the same VM network) can successfully communicate. | Logical network: PA\_Net  VM networks:  **** Blue\_VMNet  **** Green\_VMNet  VM subnets:  **** Blue\_VMSubnet1  **** Blue\_VMSubnet2  **** Green\_VMSubnet1 |
| Create an IP address pool for each VM subnet in each VM network. | IP address pools:  **** Blue\_Pool1  **** Blue\_Pool2  **** Green\_Pool1 |

## 

To create a VM network and associated VM subnets that uses IP rewrite as the mechanism to virtualize the IP address

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| 1. Open the VMs and Services workspace.  2. On the Home tab, in the Create group, click Create VM Network.  The Create VM Network Wizard opens.  3. On the Name page, do the following, and then click Next.  a. Enter a name and optional description for the VM network.  For example, enter Blue\_VMNet.  b. In the Logical network list, click the logical network that you created for provider addresses.  For example, click PA\_Net.  4. On the VM Subnets page, click Add, and then do the following:  a. In the Name box, enter a name for the VM subnet.  For example, enter Blue\_VMSubnet1.  b. In the Subnet box, enter an IP subnet that is appropriate for your environment.  For example, enter 192.168.1.0/24.  Important  In this CTP, you must use IPv4 addresses to evaluate network virtualization.  5. Repeat the previous step to add a second subnet.  For example, add a subnet that is named Blue\_VMSubnet2, with the IP subnet 192.168.2.0/24, and then click Next.  6. On the Summary page, click Finish.  The Jobs dialog box appears. Make sure the job has a status of Completed, and then close the dialog box.  7. Verify that the VM network appears in the VM Networks and IP Pools pane. To do this, in the VMs and Services pane, click VM Networks. |

To create a VM network and associated VM subnet that uses NVGRE as the mechanism to virtualize the IP address

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| 1. Open the VMs and Services workspace.  2. On the Home tab, in the Create group, click Create VM Network.  The Create VM Network Wizard opens.  3. On the Name page, do the following, and then click Next.  a. Enter a name and optional description for the VM network.  For example, enter Green\_VMNet.  b. In the Logical network list, click the logical network that you created for provider addresses.  For example, click PA\_Net.  4. On the VM Subnets page, click Next, and then on the Summary page, click Finish.  5. To configure a VM subnet to use NVGRE, you must create the VM subnet by using the VMM command shell instead of the user interface (UI). Use the New-SCVMSubnet cmdlet with the VMSubnetType parameter. For example, create a VM subnet that is named Green\_VMSubnet1, with an IP subnet of 192.168.1.0/24, as shown in the following commands:  PS C:\> $SubNetVLan = New-SCSubnetVLan -Subnet "192.168.1.0/24"  PS C:\> $VMNetwork = Get-SCVMNetwork -Name "Green\_VMNet"  PS C:\> New-SCVMSubnet -Name "Green\_VMSubnet1" -SubnetVLan $SubnetVLan -VMNetwork $VMNetwork -VMSubNetType "GREWindowsNetworkVirtualization"  Note   For more information about New-SCVMSubnet, see [Virtual Machine Manager Cmdlet Reference for Service Pack 1](http://go.microsoft.com/fwlink/p/?LinkId=254865).   In this CTP, you must use IPv4 addresses to evaluate network virtualization.   To better demonstrate how network virtualization works, we recommend that Blue\_VMSubnet1 and Green\_VMSubnet1 use the same IP subnet.  For example, Blue\_VMSubnet1 and Green\_VMSubnet1 both use 192.168.1.0/24.  6. To verify that the VM subnet was created, you can view the properties of Green\_VMNet in the UI, and then click the VM Subnets tab. |

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To create an IP address pool for each subnet in each VM network

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Open the VMs and Services workspace.  2. In the VMs and Services pane, click VM Networks.  3. In the VM Networks and IP Pools pane, right-click the VM network where you want to create the IP address pool, and then click Create IP Pool.  For example, right-click Blue\_VMNet, and then click Create IP Pool.  The Create Static IP Address Pool Wizard opens.  4. On the Name page, do the following, and then click Next.  a. Enter a name and optional description for the IP address pool.  For example, enter Blue\_Pool1.  b. In the VM network list, make sure that the correct VM network is selected.  For example, click Blue\_VMNet.  c. In the VM subnet list, click the VM subnet from which you want to create the IP address pool.  For example, in the VM subnet list, click Blue\_VMSubnet1.  5. On the IP address range page, configure a starting and ending IP address, and then click Next.  For the examples in this guide, we recommend that you accept the default range.  Important  By default, VMM does not include the first IP address in the subnet as part of the IP address range. The first IP address in the subnet is reserved for internal use as a gateway between VM subnets. For example, for the 192.168.1.0/24 IP subnet, the default IP address range starts with 192.168.1.2.  6. On the Gateway page, click Next.  7. On the DNS page, click Next.  8. On the WINS page, click Next.  9. On the Summary page, confirm the settings, and then click Finish.  The IP address pool is listed under the VM network name.  To evaluate network virtualization, you must create an IP address pool for each VM network and each VM subnet. For example, use the steps in this procedure to create the following IP address pools, using the default ranges:   |  |  |  | | --- | --- | --- | | IP Address Pool Name | VM Network | VM Subnet | | Blue\_Pool2 | Blue\_VMNet | Blue\_VMSubnet2 | | Green\_Pool1 | Green\_VMNet | Green\_VMSubnet1 | |

# Discover Storage Devices

You can use the following procedures to discover and manage storage on supported storage arrays in the CTP2 release of System Center 2012 SP1. You can also try the thin provisioning of logical units, if your storage array supports thin provisioning and thin provisioning is enabled for a storage pool by your storage administrator.

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| Provider Type | Supported Arrays |
| SMI-S CIM-XML | See the “Supported Storage Arrays” section of [Configuring Storage Overview](http://go.microsoft.com/fwlink/p/?LinkID=212013) for the supported storage arrays. |
| SMP | Dell EqualLogic PS Series using iSCSI  Note  Contact Dell to obtain the Dell EqualLogic Host Integration Tools. |

To discover storage by using the SMI-S CIM-XML provider

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| 1. VMM in System Center 2012 SP1 supports the same storage arrays that were supported in System Center 2012 – Virtual Machine Manager.  Review and follow the procedures in the [Configuring Storage Overview](http://go.microsoft.com/fwlink/p/?LinkID=212013) section of the System Center 2012 – Virtual Machine Manager documentation to verify that the same System Center 2012 – Virtual Machine Manager functionality works correctly on a supported storage array using the new Windows Standards-Based Storage Management service. The [Configuring Storage Overview](http://go.microsoft.com/fwlink/p/?LinkID=212013) topic contains a table of supported storage arrays.  In addition, if the storage pool is configured to support thin provisioning, when you create a logical unit through VMM, try the Create thin storage logical unit with capacity committed on demand option. Support for thin provisioning of logical units is new in CTP2.  Note  If you are using an EMC Symmetrix storage array, when you try to register a logical unit to a host cluster through VMM, the operation may fail. This is a known issue in the CTP2 release. To work around this issue, manually add the initiator ports to the correct initiator group by using the EMC Symmetrix Management Console, and then retry the operation in VMM. |

To discover storage by using the SMP provider

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| 1. Install the Dell EqualLogic Host Integration Tools on the VMM management server, and then restart the server.  Note  You must contact Dell to obtain the Dell EqualLogic Host Integration Tools.  2. Start the VMM command shell as an administrator. Import the EqualLogic PowerShell Tools module and then add the storage provider by using the New-EqlGroupAccess cmdlet. Then, import the storage provider into VMM by using the Import-SCStorageProvider cmdlet. For example:  PS C:\> Import-Module -Name "C:\Program Files\EqualLogic\bin\EQLPSTools.dll"  PS C:\> New-EqlGroupAccess -GroupName "EqlGroup" -GroupWKAddress 10.0.0.0 -GroupMKAddress 10.0.0.1 -UserName Administrator -Password "AcctPassword"  PS C:\> Import-SCStorageProvider  Note  The import may take a while depending on the number of storage pools and logical units that already exist on the array.  3. To verify whether the provider was imported, in the Fabric workspace of the VMM console, in the Fabric pane, expand Storage, and then click Providers.  In the Providers pane, verify that the provider appears, with a status of Responding.  4. To bring the storage pools under management and to assign classifications, follow these steps:  a. In the Arrays pane, right-click the array, and then click Properties.  b. In the Array Name Properties dialog box, click the Storage Pools tab.  c. Under Storage Pools, select the check box next to each storage pool that you want VMM to manage.  d. Under Classification, select an existing classification or create a new one. To create a new one, click Create classification, enter a classification, click Add, and then in the Classification list, select the new classification.  e. When you are finished, click OK.  f. Open the Jobs workspace, and verify that the Sets Storage Array job completes.  5. Verify that you can create and delete logical units. To do this, follow these steps:  a. In the Fabric pane, under Storage, click Classifications and Pools.  b. In the Classifications, StoragePools, and Logical Units pane, click the desired storage pool.  c. On the Home tab, click Create Logical Unit.  d. In the Create Logical Unit dialog box, enter a name, optional description, and size.  e. If the storage pool is configured to support thin provisioning, optionally click Create thin storage logical unit with capacity committed on demand, and then click OK.  When the job completes, in the Classifications, StoragePools, and Logical Units pane, verify that the new logical unit is listed under the pool.  f. To remove the logical unit, click the logical unit. Then, on the Home tab, in the Remove group, click Remove. Review the warning message, and then click OK to continue.  Verify that the logical unit is removed from the list.  6. To allocate a storage pool to a host group, follow the procedures in the System Center 2012 – Virtual Machine Manager topic [How to Allocate Storage Pools to a Host Group](http://go.microsoft.com/fwlink/p/?LinkID=212429).  7. To allocate a logical unit to a host group, follow the procedures in in the System Center 2012 – Virtual Machine Manager topic [How to Allocate Logical Units to a Host Group](http://go.microsoft.com/fwlink/p/?LinkID=212428).  8. To configure storage on a Hyper-V host, follow the procedures in in the System Center 2012 – Virtual Machine Manager topic [How to Configure Storage on a Hyper-V Host](http://go.microsoft.com/fwlink/p/?LinkID=212536). Try assigning a logical unit to a host, with an assigned drive letter.  Note  Make sure that you review the prerequisites section, as the Multipath I/O (MPIO) feature must be installed, and the Microsoft iSCSI Initiator Service on the host must be started and set to Automatic. Additionally, for the EqualLogic array, you must create an iSCSI session as described in the “To create an iSCSI session on a host” procedure in the [How to Configure Storage on a Hyper-V Host](http://go.microsoft.com/fwlink/p/?LinkID=212536) topic.  9. Create a virtual machine and make sure that the virtual machine location and hard disk is located on the drive letter that represents the logical unit. |

# Prepare the Virtual Machine Building Blocks

In this section, you prepare the elements or “building blocks” that you need to create virtual machines that you can use to evaluate the new features in this CTP release. The procedures in this section include the following:

 [Download the Windows Server 2012 VHD and Create a Virtual Machine](#zbdf0aea023ef419bb5060dbd950ef531)

In this procedure, you download the Windows Server 2012 .vhd file, and then create a stopped virtual machine that you will then convert to the .vhdx virtual hard disk format.

 [Convert the Virtual Hard Disk from VHD to VHDX and Copy to Library](#z2a27173641ee4404a23f8f5f264ba8c5)

In this procedure, you try the new conversion functionality to convert a virtual hard disk from the .vhd to .vhdx format. Then, you copy the .vhdx file to the VMM library so that it can be used as the source virtual hard disk in virtual machine templates.

 [Create Virtual Machine Templates Using the Generalized VHDX](#z8488807a451f4403945e4d724622ad51)

In this procedure, you create templates for stand-alone and highly available virtual machines, and templates that use the new network isolation features. The virtual machine templates use the generalized Windows Server 2012 .vhdx file as the virtual hard disk source.

# Download the Windows Server 2012 VHD and Create a Virtual Machine

You can use this procedure to download the generalized Windows Server 2012 .vhd, and then create a virtual machine.

To download the Windows Server 2012 .vhd and create a virtual machine

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| 1. Download the Windows Server 2012 .vhd file from the [Microsoft Download Center](http://go.microsoft.com/fwlink/p/?LinkId=243488). Double-click the file to expand the VHD.  2. Outside of VMM, copy the .vhd file to the library share on the VMM library server.  3. Optionally, rename the VHD to WS2012.vhd.  Note  WS2012.vhd is the example name that is used in this guide.  4. In the Library workspace of the VMM console, refresh the library share and make sure that the .vhd file appears.  5. Create a virtual machine that uses the WS2012.vhd file. To do this, follow these steps:  a. Open the VMs and Services workspace.  b. On the Home tab, in the Create group, click the Create Virtual Machine drop-down arrow, and then click Create Virtual Machine.  The Create Virtual Machine Wizard opens.  c. Make sure that Use an existing virtual machine, VM template, or virtual hard disk is selected, click Browse, and then click the Windows Server 2012 .vhd file.  d. On the Select Source page, click Next.  e. On the Specify Virtual Machine Identity page, enter a name. For example, enter the name WS2012, and then click Next.  f. On the Configure Hardware page, configure hardware settings, and then click Next.  g. On the Select Destination page, click Place the virtual machine on a host, and then click Next.  h. On the Select Host page, select a Windows Server 2012-based host as the destination, and then click Next.  i. On the Configure Settings page, click Next.  j. On the Select Networks page, click Next.  k. On the Add Properties page, make sure that you select the correct operating system in the Specify the operating system you will install in the virtual machine list. For example, make sure that Windows Server 2012 is selected, and then click Next.  l. On the Summary page, click Create to deploy the virtual machine.  Important  Make sure that you do not select the option to start the virtual machine after deploying it. |

# Convert the Virtual Hard Disk from VHD to VHDX and Copy to Library

You can use the following procedures to convert an existing virtual machine’s virtual hard disk that is in the .vhd format to the .vhdx format, and then copy the .vhdx file to the VMM library. To perform a conversion, the virtual machine must be deployed to a Windows Server 2012-based virtual machine host, and the virtual machine must be stopped. You cannot convert a .vhd file that is stored in the library.

By default, VMM does not automatically delete the original .vhd file during the conversion process. Therefore, conversion requires free disk space on the host that is equivalent to the size of the .vhd file.

Note

You can use the VMM command shell to delete the source file during conversion. For more information, see the “To delete the source file when you convert a .vhd to .vhdx” procedure in the topic [Convert a Virtual Hard Disk with Checkpoints from VHD to VHDX](#zfcd7ecc67bc747f381183841e954506f).

To convert a VHD file to a VHDX file

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| 1. In the VMs and Services workspace, locate and then click the host to which you deployed the generalized Windows Server 2012 virtual machine in the previous procedure.  2. In the VMs pane, right-click the stopped virtual machine, and then click Properties.  3. In the Virtual Machine Name Properties dialog box, click the Hardware Configuration tab.  4. Under Bus Configuration, make sure that the virtual hard disk is selected. In the properties for the .vhd file, select the Convert virtual disk to VHDX check box, and then click OK.  The status of the virtual machine changes to Updating.  5. When the job completes, open the properties of the virtual machine. Click the Hardware Configuration tab and view the properties for the virtual hard disk. Verify that the path of the file indicates PathOfVirtualMachine.vhdx.  Important  Do not start the virtual machine. In the following procedure, you copy the generalized .vhdx file to the VMM library. |

To copy the generalized .vhdx file to the VMM library

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| 1. Browse to the location where the generalized virtual machine’s .vhdx file is stored.  Note  Notice that VMM does not automatically delete the original .vhd file during the conversion process.  2. Copy the .vhdx file to a library share in the VMM library, and then refresh the library share. This .vhdx file will be used in several procedures throughout this guide. |

# Create Virtual Machine Templates Using the Generalized VHDX

In the following procedures, you create five virtual machine templates that use the generalized Windows Server 2012 image (.vhdx file) as the source.

 In the first procedure, you create a template for stand-alone virtual machines. With this template, you can create a virtual machine that you can use to try live migration of a running virtual machine between two stand-alone hosts.

 In the second procedure, you create a template that has the high availability setting enabled. From this template you can create a virtual machine that you can use to try live migration of a running virtual machine between two Hyper-V host clusters.

 In the third procedure, you create three templates that have the appropriate network virtualization settings configured. From these templates, you can create virtual machines to evaluate network virtualization and to verify the following:

 That a virtual machine can obtain an IP address from a VM subnet through DHCP.

 That virtual machines in different VM networks are isolated from one another.

 That Network Virtualization with Generic Routing Encapsulation (NVGRE) works correctly, where a single provider address is used for all virtual machines on the same host.

 That virtual machines that are in different VM subnets (in the same VM network) can successfully communicate.

The following table summarizes the example names that are used in these procedures.

|  |  |
| --- | --- |
| Template Name | Template Purpose |
| Stand-Alone VM Template | Template for a stand-alone virtual machine. |
| Highly Available VM Template | Template for a highly available virtual machine. |
| Blue HAVM Template - Static | Template for a highly available virtual machine that has network settings configured for network virtualization, using a static IP address. Uses the PA\_Net logical network, the Blue\_VMNet VM network, and the Blue\_VMSubnet1 IP subnet. |
| Blue HAVM Template - DHCP | Template for a highly available virtual machine that has network settings configured for network virtualization, using a DHCP address. Uses the PA\_Net logical network, the Blue\_VMNet VM network, and the Blue\_VMSubnet2 IP subnet. |
| Green HAVM Template - Static | Template for a highly available virtual machine that has network settings configured for network virtualization, using a static IP address. Uses the PA\_Net logical network the Green\_VMNet VM network, and the Green\_VMSubnet1 IP subnet. |

To create a stand-alone virtual machine template

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Open the Library workspace.  2. On the Home tab, in the Create group, click Create VM Template.  The Create VM Template Wizard opens.  3. On the Select Source page, click Use an existing VM template or a virtual hard disk stored in the library, click Browse, click the generalized Windows Server 2012 .vhdx file, and then click OK.  4. On the Select Source page, click Next.  5. On the VM Template Identity page, in the VM Template name box, enter a name for the template, and then click Next.  For example, enter the name Stand-Alone VM Template.  6. On the Configure Hardware page, configure hardware settings, and then click Next. For CTP evaluation, we recommend the following settings.   |  |  | | --- | --- | | Setting | Instructions | | Processor (under General) | If you plan to try the live migration of a virtual machine between two stand-alone hosts that have different processor versions, select the Allow migration to a virtual machine host with a different processor version check box.  Note  This setting enables greater flexibility in live or saved-state migrations. However, it reduces the functionality of the virtual machine’s processor. Therefore, use this setting only when needed. | | Memory | We recommend that you use Dynamic memory. | | Network Adapters |  Configure network connectivity settings. Click the network adapter that you want to configure, click Connected to a logical network, and then click the desired logical network.  For example, click the CORP logical network.   If you are using a static IP address pool, click Static IP (from a static IP Pool), and specify the IP protocol version. |   7. On the Configure Operating System page, configure the following settings, and then click Next:   |  |  | | --- | --- | | Setting | Instructions | | Admin Password (under General Settings) | Specify the password of the local administrator account. | | Product Key (under General Settings) | Enter the product key: D87P2-FNXP8-9CWH2-HGVG8-78KXV | | Operating System (under General Settings) | Select Windows Server 2012. | | Domain/Workgroup (under Networking) | Specify the domain or workgroup settings. |   8. On the Configure Applications page, click Next.  9. On the Configure SQL Server page, click Next.  10. On the Summary page, click Create.  11. To verify that the template was created, in the Library pane, expand Templates, and then click VM Templates.  In the Templates pane, verify that the template appears. |

To create a highly available virtual machine template

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Click the stand-alone template that you created in the previous procedure. Then, on the Template tab, in the Create group, click Create VM Template.  2. On the VM Template Identity page, in the VM Template name box, enter the name of the template, and then click Next.  For example, enter the name Highly Available VM Template.  3. On the Configure Hardware page, do the following, and then click Next:   |  |  | | --- | --- | | Setting | Instructions | | Processor (under General) | If you plan to try the live migration of a virtual machine between two host clusters that have different processor versions, select the Allow migration to a virtual machine host with a different processor version check box.  Note  This setting enables greater flexibility in live or saved-state migrations. However, it reduces the functionality of the virtual machine’s processor. Therefore, use this setting only when needed. | | Network Adapters | Confirm the network settings. | | Availability (under Advanced) | Select the Make this virtual machine highly available check box. |   4. On the Configure Operating System page, verify the settings, and then click Next.  5. On the Configure Applications page, click Next.  6. On the Configure SQL Server page, click Next.  7. On the Summary page, click Create.  8. To verify that the template was created, in the Library pane, expand Templates, and then click VM Templates.  In the Templates pane, verify that the template appears. |

To create network virtualization virtual machine templates (with static IP addressing)

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| --- | --- | --- | --- | --- | --- | --- |
| 1. Click the highly available template that you created in the second procedure. Then, on the Template tab, in the Create group, click Create VM Template.  2. On the VM Template Identity page, in the VM Template name box, enter the name of the template, and then click Next.  For example, enter the name Blue HAVM Template - Static.  3. On the Configure Hardware page, do the following, and then click Next:   |  |  | | --- | --- | | Setting | Instructions | | Processor (under General) | If you plan to test the live migration of a virtual machine between two host clusters that have different processor versions, select the Allow migration to a virtual machine host with a different processor version check box.  Note  This setting enables greater flexibility in live or saved-state migrations. However, it reduces the functionality of the virtual machine’s processor. Therefore, use this setting only when needed. | | Network Adapters | Under Connectivity, do the following:   Select Connected to a VM network and then select the appropriate settings for VM network and VM subnet.  For example, click Blue\_VMNet for the VM network and click Blue\_VMSubnet1 for the VM subnet.   Select Static IP (from a static IP Pool) and make sure that IPv4 only is selected in the IP protocol version list.  Important  In this CTP, you must use IPv4 addresses to evaluate network virtualization. |   4. On the Configure Operating System page, verify the settings, and then click Next.  5. On the Configure Applications page, click Next.  6. On the Configure SQL Server page, click Next.  7. On the Summary page, click Create.  8. To verify that the template was created, in the Library pane, expand Templates, and then click VM Templates.  In the Templates pane, verify that the template appears.  9. Repeat this procedure to create a template that is named Green HAVM Template - Static. Use the following settings for the network adapter:   Under Connectivity, select Connected to a VM network.   From the VM network list, select Green\_VMNet.   From the VM subnet list, select Green\_VMSubnet1.   Select Static IP (from a static IP Pool) and make sure that IPv4 only is selected in the IP protocol version list. |

To create a network virtualization virtual machine template (with DHCP addressing)

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| --- | --- | --- | --- | --- | --- | --- |
| 1. Click the Blue HAVM Template - Static highly available template that you created in the previous procedure. Then, on the Template tab, in the Create group, click Create VM Template.  2. On the VM Template Identity page, in the VM Template name box, enter the name of the template, and then click Next.  For example, enter the name Blue HAVM Template - DHCP.  3. On the Configure Hardware page, do the following, and then click Next:   |  |  | | --- | --- | | Setting | Instructions | | Processor (under General) | If you plan to try the live migration of a virtual machine between two host clusters that have different processor versions, select the Allow migration to a virtual machine host with a different processor version check box.  Note  This setting enables greater flexibility in live or saved-state migrations. However, it reduces the functionality of the virtual machine’s processor. Therefore, use this setting only when needed. | | Network Adapters | Under Connectivity, do the following:   Select Connected to a VM network and then select the appropriate settings for VM network and VM subnet.  For example, click Blue\_VMNet for the VM network and click Blue\_VMSubnet2 for the VM subnet.   Select Dynamic IP and make sure that IPv4 only is selected in the IP protocol version list.  Important  In this CTP, you must use IPv4 addresses to evaluate network virtualization. |   4. On the Configure Operating System page, verify the settings, and then click Next.  5. On the Configure Applications page, click Next.  6. On the Configure SQL Server page, click Next.  7. On the Summary page, click Create.  8. To verify that the template was created, in the Library pane, expand Templates, and then click VM Templates.  In the Templates pane, verify that the template appears. |

# Create Virtual Machines and Evaluate the New CTP Features

In this section, you will create virtual machines, and then evaluate several of the new VMM features in this CTP release of System Center 2012 SP1. The procedures in this section show how to do the following:

 [Create Virtual Machines From the Virtual Machine Templates](#ze4943e414d7841f8859c76ea05e986cf)

In this procedure, you create Windows Server 2012 virtual machines from the virtual machine templates. You create a stand-alone virtual machine and a highly available virtual machine without network virtualization settings, and highly available virtual machines that are configured for network virtualization.

 [Migrate a Running Virtual Machine Without Downtime](#zee455c53314a446d8d35a23b9d23f86f)

In this procedure, you try the live migration of virtual machines between stand-alone hosts and host clusters, and live storage migration from one location to another on a stand-alone host.

 [Evaluate Network Virtualization](#zf70128644cc940f5b660001b775ecfb5)

In this procedure, you evaluate network virtualization. Procedures include verifying that a virtual machine obtains an IP address through DHCP from a VM subnet, verifying that virtual machines in different VM networks are isolated from one another, verifying that Network Virtualization with Generic Routing Encapsulation (NVGRE) works correctly, and verifying that virtual machines in different VM subnets (in the same VM network) can successfully communicate.

 [Evaluate Deep Discovery When You Provision a Physical Computer as a Hyper-V Host](#zbbebee4c2351489eaf57d7314e0b520e)

In this procedure, you can use deep discovery to retrieve detailed information about a physical computer during the discovery of physical computers on the network, automatically install an operating system (using a virtual hard disk in the .vhdx format), and convert the computers into managed Hyper-V hosts.

 [Add a Virtual Hard Disk Larger Than 2 TB to a Virtual Machine](#za2ce55482c1948958be7527168b6480a)

In this procedure, you can add a virtual hard disk that is larger than 2 terabytes (TB) to an existing virtual machine, using the new VHDX virtual hard disk format.

 [Convert a Virtual Hard Disk with Checkpoints from VHD to VHDX](#zfcd7ecc67bc747f381183841e954506f)

In this procedure, you can convert a virtual hard disk that has checkpoints from the .vhd to the .vhdx virtual hard disk format. An additional procedure shows how to use the VMM command shell to delete the source .vhd file when you perform a conversion.

# Create Virtual Machines From the Virtual Machine Templates

In the following procedure, you create virtual machines from the virtual machine templates, and deploy the virtual machines to an SMB 3.0 file share.

 To try live migration between two stand-alone hosts, you must create a virtual machine that is based on the stand-alone virtual machine template, Stand-Alone VM Template.

 To try live migration between two Hyper-V host clusters, you must create a virtual machine that is based on the highly available virtual machine template, Highly Available VM Template.

 To evaluate network virtualization, you must create two virtual machines that are based on the Blue HAVM Template - Static virtual machine template, two virtual machines that are based on the Green HAVM Template - Static virtual machine template, and one virtual machine that is based on the Blue HAVM Template - DHCP.

Note

See step 14 of this procedure for a table that shows the example source templates, virtual machine names and destination hosts that are used in this topic.

To create virtual machines from the virtual machine templates

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| 1. Open the VMs and Services workspace.  2. On the Home tab, in the Create group, click the Create Virtual Machine drop-down arrow, and then click Create Virtual Machine.  3. On the Select Source page, click Use an existing virtual machine, VM template, or virtual hard disk, and then click Browse.  4. In the Select Virtual Machine Source dialog box, click the desired template, and then click OK.  For example, to create the stand-alone virtual machine, click the Stand-Alone VM Template virtual machine template.  5. On the Select Source page, click Next.  6. On the Specify Virtual Machine Identity page, enter a name in the Virtual machine name box, and then click Next.  For example, name the stand-alone virtual machine StandAloneVM1.  7. On the Configure Hardware page, click Next.  8. On the Select Destination page, click Place the virtual machine on a host, and then click Next.  9. On the Select Host page, review the placement ratings, select the desired host, and then click Next.  For example, deploy the stand-alone virtual machine StandAloneVM1 to the host StandAlone1.  10. On the Configure Settings page, do the following to configure the SMB 3.0 file share as the location for the virtual machine files and storage, and then click Next.  a. Under Locations, click Virtual Machine Location. In the Virtual machine path box, verify that the SMB 3.0 file share is the storage location. If it is not, click Browse, locate and then click the SMB 3.0 file share, and then click OK.  For example, select the SMB 3.0 file share \\fileserver1.contoso.com\smbfileshare as the storage location.  Note  If you are placing the virtual machine on a host cluster, if you click Browse, in the Select Destination Folder dialog box, the SMB 3.0 file shares are listed under the File Shares node.  b. Under Machine Resources, click Virtual Hard Disk. In the Destination path box, verify that the same SMB 3.0 file share that was specified for the virtual machine location is designated as the destination path. If it is not, click Browse, locate and then click the SMB 3.0 file share, and then click OK.  11. On the Add Properties page, click Next.  12. On the Summary page, select the Start the virtual machine after deploying it check box, and then click Create.  Note  To try live migration, the virtual machine must be running.  13. Repeat this procedure to create the virtual machines that are listed in the following table.  Important  Make sure that you deploy the virtual machines BlueVM1, BlueVM2 and BlueVM3 to the same cluster node, for example Cluster1Node2. Also, make sure that you deploy the virtual machines GreenVM1 and GreenVM2 to the same cluster node, for example Cluster2Node2. This is important to test network virtualization later in this guide.   |  |  |  | | --- | --- | --- | | Source Template Name | Virtual Machine Name/Computer Name | Destination Host | | Stand-Alone VM Template | StandAloneVM1 | StandAlone1 | | Highly Available VM Template | HAVM1 | Cluster1Node1 | | Blue HAVM Template - Static | BlueVM1 | Cluster1Node2 | | Blue HAVM Template - Static | BlueVM2 | Cluster1Node2 | | Blue HAVM Template -DHCP | BlueVM3 | Cluster1Node2 | | Green HAVM Template - Static | GreenVM1 | Cluster2Node2 | | Green HAVM Template - Static | GreenVM2 | Cluster2Node2 | |

# Migrate a Running Virtual Machine Without Downtime

You can use the following procedures to migrate a virtual machine without downtime. These procedures demonstrate some of the new live migration features. These include:

 [Live migration of a running virtual machine between two stand-alone hosts](#z13)

Note

The virtual machine configuration files and virtual hard disk must be located on an SMB 3.0 file share.

 [Live migration of a running highly-available virtual machine between two different host clusters](#z14)

Note

The virtual machine configuration files and virtual hard disks must be located on an SMB 3.0 file share.

 [Live storage migration between two locations on a stand-alone host](#z15)

 [Simultaneous live migrations](#z16)

Warning

Whenever live migration (of any type) of a highly-available virtual machine occurs between two host clusters, the virtual machine temporarily loses its high availability status. Therefore, a host failure during this transfer will result in the virtual machine being unavailable. For live migration between host clusters, we recommend that you use SMB 3.0 file shares as the storage location. Because the storage does not have to be migrated, the time where high availability status cannot be guaranteed is very short.

This topic does not cover all possible live migration scenarios. For an overview of the possible live migration tests that you can perform, see the table in the “Live Migration Enhancements” section of the [What's New in System Center 2012 SP1 - Virtual Machine Manager](#z22f0d56069a740e1ae9404c5f2ecd133) topic.

Note

If you try live virtual machine and storage migration (live VSM) between two stand-alone hosts or between two host clusters, when you run the Migrate Virtual Machine Wizard, any changes you make on the Select Networks page do not take effect in the CTP release. Therefore, do not modify these settings.

## 

To live migrate a virtual machine between two stand-alone hosts

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| --- |
| 1. Open the VMs and Services workspace.  2. In the VMs and Services pane, expand All Hosts. Locate and then click the stand-alone host from which you want to migrate a virtual machine.  For example, click the host StandAlone1 in the host group Stand-Alone HG.  3. In the VMs pane, click the running virtual machine that you want to migrate. (If it is not running, start the virtual machine).  For example, click the virtual machine StandAloneVM1.  4. On the Virtual Machine tab, in the Virtual Machine group, click Migrate Virtual Machine.  The Migrate Virtual Machine Wizard starts.  5. On the Select Host page, review the destination hosts and their associated transfer types.  The Live transfer type appears if both hosts are configured to see the same SMB 3.0 file share.  6. Click the destination host where the transfer type is Live, and then click Next.  For example, click the host StandAlone2.  7. On the Summary page, click Move.  8. To track the job status, open the Jobs workspace.  9. To verify that the virtual machine was migrated, in the VMs and Services workspace, in the VMs and Services pane, locate and then click the destination host. In the VMs pane, verify that the virtual machine is listed, with a status of Running. |

## 

To live migrate a virtual machine between two host clusters

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| --- |
| 1. Open the VMs and Services workspace.  2. In the VMs and Services pane, expand All Hosts. Locate and then click the cluster node from which you want to try the live migration of a highly available virtual machine.  For example, click the cluster node Cluster1Node1.  3. In the VMs pane, click the running virtual machine that you want to migrate. (If it is not running, start the virtual machine.)  For example, click the virtual machine HAVM1.  4. On the Virtual Machine tab, in the Virtual Machine group, click Migrate Virtual Machine.  The Migrate Virtual Machine Wizard starts.  5. On the Select Host page, review the destination hosts and their associated transfer types.  The Live transfer type is available for any destination cluster nodes that are configured to see the same SMB 3.0 file share.  6. Click a cluster node that is in a different host cluster, and then click Next.  For example, click the cluster node Cluster2Node1.  7. On the Summary page, click Move.  8. To track the job status, open the Jobs workspace.  9. To verify that the virtual machine was migrated, in the VMs and Services workspace, in the VMs and Services pane, locate and then click the destination host. In the VMs pane, verify that the virtual machine is listed, with a status of Running. |

## 

To live migrate storage between two locations on a stand-alone host

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| --- |
| 1. Open the VMs and Services workspace.  2. In the VMs and Services pane, expand All Hosts. Locate and then click the stand-alone host where the virtual machine resides.  For example, click the host StandAlone2 in the host group Stand-Alone HG.  3. In the VMs pane, click the running virtual machine on which you want to try live storage migration. (If it is not running, start the virtual machine.)  For example, click the virtual machine StandAloneVM1.  4. On the Virtual Machine tab, in the Virtual Machine group, click Migrate Storage.  The Migrate Virtual Machine Wizard starts.  5. On the Select Path page, in the Storage location list, click one of the default storage locations on the host. Or, click Browse to view all possible storage destinations, click the destination SMB 3.0 file share or location on the local hard disk, and then click OK.  Important  In this CTP, if you specify an SMB 3.0 file share in the Storage location list, make sure that you use the fully qualified domain name (FQDN) of the destination server in the share path. For example, instead of \\fileserver1\smbshare, use \\fileserver1.contoso.com\smbshare.  6. Optionally, select the Add this path to the list of default storage locations on the host, and then click Next.  7. On the Summary page, click Move.  8. To track the job status, open the Jobs workspace. |

## 

To try simultaneous live migrations

|  |
| --- |
| 1. To try simultaneous live migrations, perform any of the procedures in this topic on multiple virtual machines so that two migrations are happening at the same time on the same host. In the user interface, you cannot multi-select virtual machines to perform live migrations. Instead, you must manually start each migration.  Note  For this CTP release, do not exceed two simultaneous live, live VSM or live storage migrations per host. By default, this is the number of simultaneous live migration and storage migrations allowed in Hyper-V. For example, a host can participate in one outgoing live migration plus one incoming, two outgoing live migrations, or two incoming live migrations. Live migrations and live storage migrations are independent. Therefore, you can perform two live migrations and two live storage migrations simultaneously. VMM considers live VSM as one live migration and one storage migration.  To view the Hyper-V settings, open Hyper-V Administrator on the host, and then in the Actions pane, click Hyper-V Settings. Under Server, there are both Live Migrations and Storage Migrations settings.  2. In the Jobs workspace, verify that the migrations are occurring simultaneously. |

# Evaluate Network Virtualization

The procedures in this topic show how you can evaluate network virtualization in this CTP by using the network virtualization virtual machines that you created in the [Create Virtual Machines From the Virtual Machine Templates](#ze4943e414d7841f8859c76ea05e986cf) topic. In these procedures, you can do the following:

|  |  |
| --- | --- |
| Task | Procedure |
| View the network connection details of a virtual machine to confirm that an IP address is obtained from the correct IP address pool. This includes verifying that an IP address is successfully obtained when a virtual machine is configured to use a static IP address or a DHCP address. | [To view the network connection details of a virtual machine that is using network virtualization](#z17) |
| Verify that virtual machines in different VM networks are isolated from one another. | [To verify isolation between virtual machines provided by network virtualization](#z18) |
| Verify that Network Virtualization with Generic Routing Encapsulation (NVGRE) is working correctly, where a single provider address is used for all virtual machines on the same host. | [To verify that NVGRE is working correctly](#z19) |
| Verify that virtual machines in different VM subnets (in the same VM network) can communicate with each other. | [To verify routing between multiple VM subnets in the same VM network](#z20) |

Important

For network virtualization to work, you must have enabled the Windows Network Virtualization Filter driver on the physical network adapter that is associated with the virtual switch that you are using for network virtualization on each host. To use DHCP for a VM network, you must have installed the DHCPv4 Server Switch Extension (DHCPExtn.msi) on each host, and enabled the extension in Hyper-V Manager. These requirements are described in the second through fourth tasks of the checklist “Step 2. Create the Hyper-V host clusters” in the [Prepare the Evaluation Environment - Checklists](#z86307d3335bf42be8f2049cd8fc6b253) topic.

## 

To view the network connection details of a virtual machine that uses network virtualization

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Open the VM and Services workspace.  2. On the Home tab, in the Show group, click VMs.  3. In the VM and Services pane, click All Hosts.  4. In the VMs pane, click the virtual machine on which you want to view the assigned IP address.  For example, click BlueVM1.  5. On the Virtual Machine tab, in the Properties group, click Properties.  6. In the Virtual Machine Name Properties dialog box, click the Hardware Configuration tab.  7. Under Network Adapters, click the network adapter. In the results pane, scroll to the bottom, and then click Connection details.  In the Connection Details dialog box, you can view the following information for the virtual machine:   The logical network   The virtual network   The physical MAC address   The VLAN ID   The IP address pool   The assigned IPv4 address  For example, for the BlueVM1 virtual machine, you will see network connection details that are similar to the following:   |  |  | | --- | --- | | Property | Value | | Logical network | PA\_Net | | Virtual network | NetVirt | | Static IP address pool | Blue\_Pool1 | | IPv4 address | 192.168.1.2 |   The 192.168.1.2 address is the IP address that a customer would use to connect to the BlueVM1 virtual machine, for example, when using Ping or Remote Desktop Connection.  8. Select a virtual machine from a different VM network and view its network connection details.  For example, view the network connection details for the GreenVM1 virtual machine. You will see network connection details that are similar to the following:   |  |  | | --- | --- | | Property | Value | | Logical network | PA\_Net | | Virtual network | NetVirt | | Static IP address pool | Green\_Poo1 | | IPv4 address | 192.168.1.2 |   Notice that the GreenVM1 virtual machine uses the same IP address (192.168.1.2) as the BlueVM1 virtual machine, but the IP address is from Green\_Pool1. One of the benefits of network virtualization is that virtual machines in different VM networks can use the same IP address.  9. Select a virtual machine from a VM network that was configured to use DHCP and view its network connection details.  For example, view the network connection details for the BlueVM3 virtual machine. You will see network connection details that are similar to the following:   |  |  | | --- | --- | | Property | Value | | Logical network | PA\_Net | | Virtual network | NetVirt | | Static IP address pool | Blue\_Pool2 | | IPv4 address | 192.168.2.2 |   Notice that the BlueVM3 virtual machine successfully obtained an IP address from the subnet that is associated with Blue\_Pool2. |

## 

To verify isolation between virtual machines provided by network virtualization

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| --- |
| 1. To verify that virtual machines in different VM networks are isolated from one another, you can do the following:  a. On one of the virtual machines in one of the VM networks, create a shared folder. In the shared folder, create a text file that identifies which VM network the virtual machine is on.  For example, on the BlueVM1 virtual machine, create a shared folder that is named Test. In that shared folder, create a text file that is named This is a blue computer.  b. From another virtual machine in the same VM network, connect to the shared folder on the first virtual machine by using the IP address of the virtual machine.  For example, from the BlueVM2 virtual machine, connect to \\192.168.1.2\Test. Verify that you see a file that is named This is a blue computer.  2. Repeat step 1 on a virtual machine in a different VM network. Make sure the virtual machine on which you create the shared folder and text file uses the same IP address as the virtual machine where you created the shared folder and text file in step 1.  For example, on the GreenVM1 virtual machine, create a shared folder that is named Test. In that shared folder, create a text file that is named This is a green computer. From the GreenVM2 virtual machine, connect to \\192.168.1.2\Test. Verify that you see a file that is named This is a green computer.  Even though virtual machines in different VM networks can have the same IP address, network virtualization isolates the virtual machines because they are in different VM networks. Only the virtual machines in the same VM network can communicate with each other.  Tip  For the shared folder example to work, make sure that the File and Printer Sharing (Echo Request – ICMPv4-In) inbound rule is enabled on the Windows Firewall on each virtual machine.  You can perform a similar test by installing IIS on one virtual machine in each VM network and then creating a simple Web page (by using Default.htm) that identifies which VM network the Web page is on. Then, from another virtual machine in the VM network, you can use Internet Explorer to connect to the Web page (for example, http://192.168.1.2). You should see the appropriate Web page for the VM network. For example, you will see the Green Web page that is hosted on the GreenVM1 virtual machine when you connect from the GreenVM2 virtual machine. |

## 

To verify that NVGRE is working correctly

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| 1. Open the Fabric workspace.  2. In the Fabric pane, expand Networking, and then click Logical Networks.  3. In the Logical Networks and IP Pools pane, expand the logical network that you created for provider addresses, and then click the associated IP address pool.  For example, expand PA\_Net, and then click PA\_Site1\_Pool.  4. In the pool details (at the bottom), under IP address usage, view the Available addresses and Total addresses values.  5. If you created VM subnets with the virtualization mechanism set to NVGRE, you can confirm that NVGRE is working by checking the number of available provider IP addresses.  If you deploy multiple virtual machines that are assigned customer addresses from a VM subnet that is set to NVGRE, and you deploy them to the same host, VMM uses only one provider address for those virtual machines. With NVGRE, VMM uses only one provider address per host. For a VM subnet that uses IP rewrite, VMM uses a provider address for each virtual machine that is created.  If you used the example VM subnets and virtual machines that are used in this guide, you should have three virtual machines (BlueVM1, BlueVM2 and BlueVM3) that are deployed to one host where the VM subnet uses IP rewrite, and two virtual machines (GreenVM1 and GreenVM2) that are deployed to a host where the VM subnet uses NVGRE.  Therefore, a total of four provider addresses should be used (three for the Blue virtual machines, and one for the Green virtual machines). If you started with 254 available addresses, you should see a total of 250 available addresses. |

## 

To test routing between multiple VM subnets in the same VM network

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| 1. From a virtual machine that uses an IP address from one VM subnet, try to ping a virtual machine that uses an IP address from a different subnet in the same VM network.  For example, from the virtual machine BlueVM1 (that uses an IP address from Blue\_VMSubnet1, for example 192.168.1.2), try to ping the virtual machine BlueVM3 (that uses an IP address from Blue\_VMSubnet2, for example 192.168.2.2).  2. Verify that the ping is successful.  Tip  If the ping is not successful, make sure that the File and Printer Sharing (Echo Request – ICMPv4-In) inbound rule is enabled on the Windows Firewall on each virtual machine.  A successful ping indicates that routing between the VM subnets is working correctly. By default, VMM uses the first IP address in a VM subnet as the default gateway. |

# Evaluate Deep Discovery When You Provision a Physical Computer as a Hyper-V Host

In the following procedure, you can use VMM to discover a physical computer (often a bare-metal computer), install an operating system, and convert it to a Hyper-V host. This capability exists in System Center 2012 – Virtual Machine Manager. The CTP2 release of System Center 2012 SP1 adds the following capabilities:

 You can use a virtual hard disk that is in the .vhdx format as the base operating system image.

Note

Only Windows Server 2012 can boot from a .vhdx file. If you want to use Windows Server 2008 R2 with SP1 as the base operating system image, you must use a .vhd file.

 During discovery of the physical computers, VMM can show more detailed information about the physical computer before you deploy the operating system. This is known as deep discovery. In this CTP release, you can verify whether the information is successfully returned during deep discovery. You can also change settings for the network adapter that VMM automatically designates as the management network adapter.

Warning

During deep discovery, the computers are automatically turned off and on. There is no graceful shutdown of the operating system. Therefore, if you are trying deep discovery on a computer has an existing operating system, there is potential data loss.

To try using a .vhdx file and deep discovery when you add physical computers as Hyper-V hosts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. Review and follow the procedures in the [Adding Physical Computers as Hyper-V Hosts Overview](http://go.microsoft.com/fwlink/p/?LinkID=212436) section of the System Center 2012 – Virtual Machine Manager documentation, with the following exceptions:   We recommend that you upgrade the Baseboard Management Controllers (BMCs) to the latest firmware.   The PXE server can be running Windows Server 2008 R2 or Windows Server 2012.   When you create a host profile as described in [How to Create a Host Profile](http://go.microsoft.com/fwlink/p/?LinkID=212435), use a generalized Windows Server 2012-based .vhdx file.  2. When you discover the physical computers as described in [How to Discover Physical Computers and Deploy as Hyper-V Hosts](http://go.microsoft.com/fwlink/p/?LinkId=253353), note the following:   On the Discovery scope page, if you enter a single IP address for a baseboard management controller, make sure that the Skip deep discovery check box is cleared. By default, VMM performs deep discovery. If you enter an IP subnet or IP range, after you click Next, make sure that the Skip deep discovery for the selected computers check box is cleared for all discovered computers.  Warning  During deep discovery, the computers are automatically turned on, and then turned off when discovery completes. There is no graceful shutdown of the operating system. Therefore, if you are trying deep discovery on a computer has an existing operating system, there is potential data loss.   On the Deployment customization page, wait until deep discovery completes. Realize that the deep discovery process may take several minutes. It typically completes in less than five minutes. The timeout interval is one hour. When deep discovery completes, VMM displays the Deep discovery completed successfully message.  Verify that VMM displays the following information for each computer:   |  |  | | --- | --- | | For the IP address of the BMC |  The CPU type   The CPU count   The amount of memory  Note  You can also view the IP address of the BMC, the SMBIOS ID, and the serial number. However, you can view these values without performing deep discovery. | | For each network adapter |  The adapter ID   The MAC address   The common device name (CDN), if it is configured in the network adapter firmware |   You can also configure IP address assignment (either DHCP or Static) for the management network adapter. If you click the ellipses, you can view details about the network configuration. If the IP assignment type is set to Static, you can view or change the logical network, IP subnet, IP range and IP address information.  Important  In this CTP, you can only make changes to the network adapter that VMM automatically designates as the management network adapter. Although it looks like you can modify settings for any network adapter, any changes to those settings will not take effect. This includes changing which network adapter is configured as the management network adapter. |

# Add a Virtual Hard Disk Larger Than 2 TB to a Virtual Machine

The following procedure shows how to add a dynamic virtual hard disk that is larger than 2 terabytes (TB) to an existing virtual machine that is hosted on a Windows Server 2012-based server. The new VHDX hard disk format supports disks larger than 2 TB.

To add a virtual hard disk to an existing virtual machine

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| --- |
| 1. Open the VMs and Services workspace.  2. Click All Hosts.  3. In the VMs pane, click the virtual machine that you want to add another disk to.  4. On the Virtual Machine tab, in the Properties group, click Properties.  5. Click the Hardware Configuration tab.  6. On the toolbar, next to New, click Disk.  Note  Do not change the default setting of Create a new virtual hard disk, or the disk type of Dynamic.  7. In the Size box, enter a disk size larger than 2 TB. For example, enter 3072 gigabytes (GB).  8. Click OK to close the dialog box.  9. After the virtual machine updates and has a job status of Completed, connect to the virtual machine.  10. On the virtual machine, open Computer Management.  11. In the Computer Management tool, expand Storage, and then click Disk Management.  In the results pane, the new disk appears with a status of unknown and offline.  12. Right-click the disk (for example, Disk 1), and then click Online.  13. Right-click the disk again, and then click Initialize Disk.  14. In the Initialize Disk dialog box, click GPT (GUID Partition Table) as the partition style, and then click OK.  15. Right-click the unallocated disk space, and then click New Simple Volume.  16. Follow the steps in the New Simple Volume Wizard to create the volume, assign a drive letter or path, and to format the volume.  17. To verify that the disk was created, open Windows Explorer. In the left pane, click Computer.  The disk is listed as a hard disk drive. |

# Convert a Virtual Hard Disk with Checkpoints from VHD to VHDX

You can use the procedures in this topic to do the following:

 Convert a virtual machine’s hard disk from the .vhd to .vhdx virtual hard disk format. The conversion includes any associated checkpoint files.

 Use the VMM command shell to delete the source .vhd file (and any associated .avhd files) when you convert a virtual hard disk format to .vhdx.

By default, VMM does not automatically delete the source .vhd file and any associated checkpoint files during the conversion process. Therefore, conversion requires free disk space on the host that is equivalent to the size of the source virtual hard disk files.

To convert a virtual machine with checkpoints from the .vhd format to .vhdx

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| 1. In the VMs and Services workspace, create a virtual machine that uses the .vhd virtual hard disk format. For example, create a virtual machine using the Windows Server 2012 .vhd that you downloaded and added to the VMM library.  2. Deploy the virtual machine to a Windows Server 2012-based host. You do not have to start the virtual machine.  3. In the VMs and Services workspace, in the VMs and Services pane, locate and then click the host to which you deployed the virtual machine.  4. In the VMs pane, right-click the virtual machine, and then click Create Checkpoint.  5. In the New Checkpoint dialog box, click Create.  6. On the host where you deployed the virtual machine, browse to the location where the virtual machine’s virtual hard disk is stored. Verify that there is a .vhd file and an .avhd file.  7. In the VMs pane, right-click the stopped virtual machine, and then click Properties.  8. In the Virtual Machine Name Properties dialog box, click the Hardware Configuration tab.  9. Under Bus Configuration, make sure that the virtual hard disk is selected. In the properties for the .vhd file, select the Convert virtual disk to VHDX check box, and then click OK.  The status of the virtual machine changes to Updating.  10. When the job completes, browse to the location on the host where the virtual machine’s .vhd file was stored. Verify that there is now a .vhdx file and an .avhdx file.  This indicates that both the base image and the checkpoint were successfully converted. |

To delete the source file when you convert a .vhd to .vhdx

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| 1. Open the VMM command shell and run the following commands:  PS C:\> $VM = Get-SCVirtualMachine -Name "VM01"  PS C:\> $VirtDD = Get-SCVirtualDiskDrive -VM $VM  PS C:\> Convert-SCVirtualDiskDrive -VirtualDiskDrive $VirtDD -VHDX -BlockSizeBytes 1MB -DeleteSource -ValidateOnCompletion  For more information about Convert-SCVirtualDiskDrive, see [Virtual Machine Manager Cmdlet Reference for Service Pack 1](http://go.microsoft.com/fwlink/p/?LinkId=254865).  2. When the job completes, browse to the location on the host where the virtual machine’s .vhd file was stored. Verify that there is now only a .vhdx file (and one or more .avhdx files if there were associated checkpoints). |

# Appendix A: Example Names Used in This Guide

The following is a list of the example names that are used in this guide. You can of course use your own naming conventions when you set up your evaluation environment.

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| Entity | Example names | Notes |
| Stand-alone hosts | **** StandAlone1  **** StandAlone2 | Both hosts are assigned to the Stand-Alone HG host group. |
| Clusters (and cluster nodes) | **** Cluster1 (Cluster1Node1, Cluster1Node2)  **** Cluster2 (Cluster2Node1, Cluster2Node2) | Both clusters are assigned to the Cluster HG host group. |
| Host groups | **** Cluster HG  **** Stand-Alone HG |  |
| File server and SMB 3.0 file share | \\fileserver1\smbfileshare | When the fully qualified domain name is used, the example is \\fileserver1.contoso.com\smbfileshare. |
| External virtual switches | **** External-CORP  **** NetVirt | NetVirt is used to evaluate network virtualization. |
| Logical networks | **** CORP  **** PA\_Net | PA\_Net is used to evaluate network virtualization (for provider addresses) and is associated with the NetVirt virtual switch. |
| Network site (associated with PA\_Net) | **** PA\_Site1 | PA\_Site1 is associated with the 10.0.0.0/24 subnet and is assigned to the Cluster HG host group. |
| IP address pool (associated with PA\_Net) | **** PA\_Site1\_Pool | Uses the default range. |
| VM networks | **** Blue\_VMNet  **** Green\_VMNet | Both Blue\_VMNet and Green\_VMNet are associated with the PA\_Net logical network. |
| VM subnets (associated with the appropriate VM network) | **** Blue\_VMSubnet1  **** Blue\_VMSubnet2  **** Green\_VMSubnet1 | **** Both Blue\_VMSubnet1 and Green\_VMSubnet1 are associated with the 192.168.1.0/24 subnet.  **** Green\_VMSubnet1 is configured to use NVGRE.  **** Blue\_VMSubnet2 is associated with the 192.168.2.0/24 subnet. |
| IP address pools (associated with the appropriate VM network) | **** Blue\_Pool1  **** Blue\_Pool2  **** Green\_Pool1 | Uses the default range. |
| Virtual machine templates | **** Stand-Alone VM Template  **** Highly Available VM Template  **** Blue HAVM Template - Static  **** Blue HAVM Template - DHCP  **** Green HAVM Template - Static | **** Stand-Alone VM Template and Highly Available VM Template are used to create virtual machines to try live migration.  **** Blue HAVM Template - Static, Blue HAVM Template – DHCP, and Green HAVM Template - Static are used to create virtual machines to evaluate network virtualization. |
| Virtual machines | **** StandAloneVM1  **** HAVM1  **** BlueVM1, BlueVM2, BlueVM3  **** GreenVM1, GreenVM2 | Created by using the virtual machine templates. |

# Appendix B: Known Issues

The following are known issues for VMM in this CTP of System Center 2012 SP1:

 This CTP is available only in English.

 The on-the-box Help has not been updated from System Center 2012 – Virtual Machine Manager.

 The Help topics for the VMM cmdlets have not been updated from System Center 2012 – Virtual Machine Manager.

 Links in VMM Setup and the VMM console to online content have not been updated and currently point to content for System Center 2012 – Virtual Machine Manager.