Microsoft System Center 2012 R2

Evaluating System Center 2012 R2 with Windows Azure Pack

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Published: June 27, 2013

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Applies To

System Center 2012 R2

Feedback

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Revision history

Release Date	Changes
June 24, 2013	Original release of this guide.
June 25, 2013	Fixed incorrect prerequisite link in the Get Started with Hybrid Networking: Walkthrough Guide section.
June 27, 2013	Fixed two broken fwlinks.

Contents

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

Evaluation Guide for System Center 2012 R2 and the Windows Azure Pack

The Evaluation Guide for System Center 2012 R2 and the Windows Azure Pack is designed for hosting providers and large enterprises who want to create tenant and administrator portals to provide the same Infrastructure as a Service experience that is available through the Windows Azure Portal. Use this guide to set up and test these capabilities. The deployment guide describes how to set up the evaluation environment and the walkthroughs demonstrate the value and functionality of key scenarios enabled in this release.

⬥ **Important**

The scenarios described in this guide are for evaluation purposes only. Operation in a production environment is NOT supported.

Topics for Evaluating System Center 2012 R2 and the Windows Azure Pack

- [Deploying System Center 2012 R2 and Windows Azure Pack Evaluation](#)

  For step-by-step guidance on how to set up your evaluation environment, download the deployment guide from the Microsoft Download Center.

- [Get Started with Plans for Windows Azure Pack: Walkthrough Guide](#)

  This step-by-step walkthrough shows you how to provide your tenants with the plans (including services from resource providers) and add-ons that to choose for their subscriptions.

- [Get Started with Virtual Machine Roles: Walkthrough Guide](#)

  This step-by-step walkthrough shows you how to inspect the contents of a sample VM Role, install it a System Center 2012 R2 environment, and then use it to provision a new virtual machine.

- [Get Started with Hybrid Networking: Walkthrough Guide](#)

  This step-by-step walkthrough shows you how to verify that your hybrid network solution is fully functional. You will verify that network virtualization is working correctly using the Windows Server 2012 R2 Preview multi-tenant gateway, and that you can move a workload to a virtual machine located on the hosting service provider network.

- [Get Started with Service Management Automation: Walkthrough Guide](#)

  This step-by-step walkthrough shows you how to create and import runbooks, how to run a runbook, and how to view the jobs that track the runbook's progress.

Deploying System Center 2012 R2 and Windows Azure Pack Evaluation

This topic will walk you through the deployment process for the hardware and software required for evaluating System Center 2012 R2 and the Windows Azure Pack. You will be deploying six physical servers and two network switches in a lab environment. It is assumed that you will have deployed Windows Server® 2012 R2 Preview. It is further assumed that you have obtained a copy of SQL Server 2012 for use in these scenarios.

Hardware Configuration

The hardware required to perform a proper evaluation consists of six (6) physical servers and two (2) network switches. And while not every physical computer will host every component, the software that you will need for this evaluation is:

* Windows Server® 2012 R2 Preview

* SQL Server 2012

* Virtual Machine Manager

* Windows Azure Pack for Windows Server

* Service Management Automation*

* Service Provider Foundation*

📝 **Note**

*You will use the setup utility in Orchestrator to install Service Management Automation and Service Provider Foundation.

VHD Downloads for System Center 2012 R2

All of the System Center components are available on the Microsoft Connect website. System Center 2012 R2 Virtual Machine Manager and System Center 2012 R2 Orchestrator are available as VHDs and Windows Azure Pack will be installed using Web Platform Installer (WPI) as described in the following section. Download two self-extracting executable files which include deployment documentation from the following locations:

Virtual Machine Manager at http://go.microsoft.com/fwlink/p/?LinkId=311549

Orchestrator at http://go.microsoft.com/fwlink/p/?LinkId=311555

Deploying Windows Azure Pack in System Center 2012 R2

For this evaluation you can use the express installation option available in the Web Platform Installer to install all the pieces of Windows Azure Pack onto a single system. Express installation is used to create a proof of concept deployment and not to deploy Windows Azure Pack into production.

You will first need to prepare your computer for and install the Web Platform Installer. For more information see Windows Azure Pack installation requirements at http://go.microsoft.com/fwlink/p/?LinkId=309949.

After you have installed the Web Platform Installer, you can perform an express install of Windows Azure Pack. For more information see Install an express deployment of Windows Azure Pack at http://go.microsoft.com/fwlink/p/?LinkId=309947.

Hardware Configuration

You will need six (6) physical computers and two (2) network switches for your evaluation environment Two of the computers will serve as Management Scale Units (MSU), two Compute Scale Units (CSU), one gateway, and one file server. An example is shown in the following diagram.
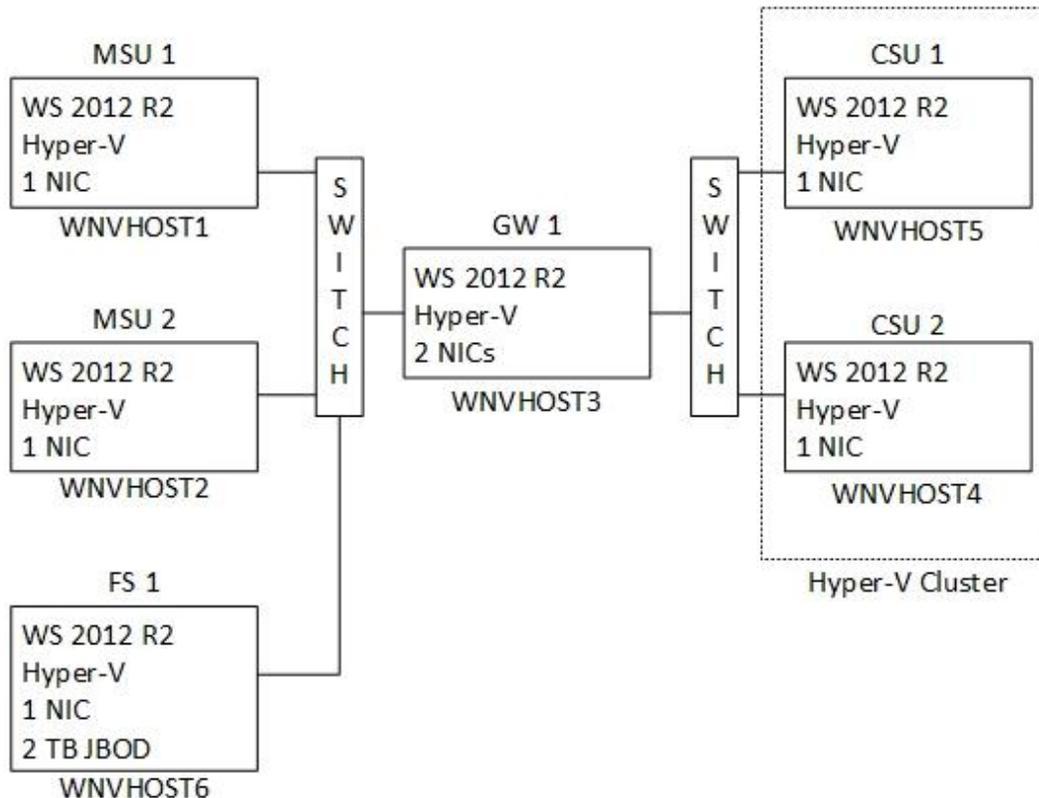
Each physical server must meet the following hardware requirements:

CPU	24-core
RAM	128 GB
Local Disk Space	40 GB

MSU Environment

Each of the two MSU computers will serve specific functions.

The first computer, MSU1 must be configured as follows:

- Computer Name: WNVHOST1
- Configured as a Hyper-V host
- Domain Controller: cor.adatum.com
- DNS Server
- Two Virtual Machines, each on their own virtual network, each running Windows Server 2012 R2 Preview.
    - One virtual machine named APP2 that is configured as a datacenter hosted application and web server for the Contoso tenant network.
    - The other virtual machine named APP2 that is configured as a datacenter hosted application and web server for the Fabrikam tenant network.

The second computer, MSU2 must be configured as follows:

- Computer Name: WNVHOST2
- Configured as a Hyper-V host
- Install SQL Server
- Install IPAM Server
- Install System Center 2012 R2 Virtual Machine Manager
- Two Virtual Machines, each on their own virtual network, each running Windows Server 2012 R2 Preview.
    - One virtual machine named APP1 that is configured as a datacenter hosted application and web server for the Contoso tenant network.
    - The other virtual machine named APP1 that is configured as a datacenter hosted application and web server for the Fabrikam tenant network.

Gateway Environment

The gateway consists of one physical computer running Windows Server 2012 R2 Preview that is configured as a Windows Network Virtualization Gateway. This computer is configured as follows:

- Computer Name: WNVHOST3
- Host one virtual machine running winserver_blue_2 named GatewayVM1, and that is configured as a cross-premises gateway for the hosted tenant networks.

CSU Environment

The two CSU computers will be part of a Hyper-V cluster.

The first computer, CSU1 must be configured as follows:

- Computer Name: WNVHOST4
- Configured as a Hyper-V host
- Seven virtual machines running winserver_blue_1 to simulate the Internet and an on-premises network
  - One virtual machine named INET1 that is configured as an Internet Domain Name System (DNS) server and web server.
  - One virtual machine named DC1 that is configured as a Contoso customer private intranet domain controller and DNS server.
  - One virtual machine named APP1 that is configured as a general application and web server for the Contoso domain.
  - One virtual machine named EDGE1 that is configured as an Internet edge server for the Contoso domain.
  - One virtual machine named DC1 that is configured as a Fabrikam customer private intranet domain controller and DNS server.
  - One virtual machine named APP1 that is configured as a general application and web server for the Fabrikam domain.
  - One virtual machine named EDGE1 that is configured as an Internet edge server for the Fabrikam domain.

The second computer, CSU2 is a Hyper-V cluster of CSU1:

Network Configuration

You will create six subnets to simulate the following:

1. The Internet, referred to as the Internet subnet (131.107.0.0/24).
2. An intranet, referred to as the Hosternet subnet (192.168.0.1/24) connected to the Internet subnet via a second network adapter on the WNV Gateway server WNVHOST3.
3. An intranet, referred to as the Contoso Corpnet subnet (10.0.0.0/24), separated from the Internet subnet by Contoso EDGE1.
4. An intranet, referred to as the Fabrikam Corpnet subnet (10.0.0.0/24), separated from the Internet subnet by Fabrikam EDGE1.

5. A Windows Network Virtualization virtual network, referred to as the Contoso VM Network (10.0.1.0/24), hosted on the simulated hoster datacenter servers WNVHOST1 and WNVHOST2.

6. A Windows Network Virtualization virtual network, referred to as the Fabrikam VM Network (10.0.1.0/24), hosted on the simulated hoster datacenter servers WNVHOST1 and WNVHOST2.

Computers on each subnet connect using a physical hub, switch, or virtual switch. See the following figure for the configuration of the Windows Server 2012 R2 Hyper-V Network Virtualization with System Center 2012 VMM R2 test lab.
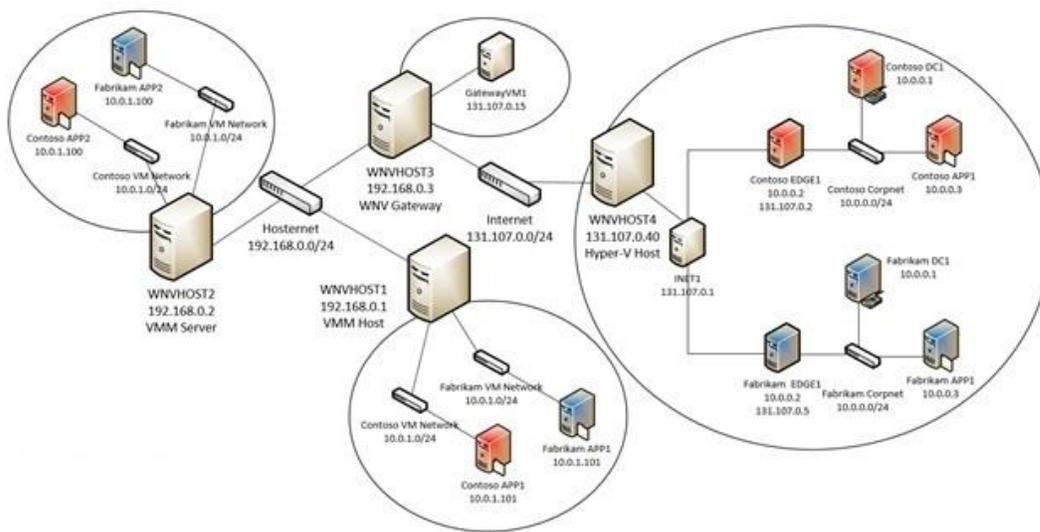
This document describes how to build out the Windows Server 2012 R2 Hyper-V Network Virtualization with System Center 2012 R2 in six sections:

- Steps for configuring the Hosternet subnet (WNVHOST1, WNVHOST2)
- Steps for configuring the Internet subnet (INET1 on WNVHOST4, and WNVHOST3)
- Steps for configuring the Contoso Corpnet subnet (DC1, APP1, and EDGE1 on WNVHOST4)
- Steps for configuring the Fabrikam Corpnet subnet (DC1, APP1, and EDGE1 on WNVHOST4)
- Steps for installing and configuring System Center 2012 Virtual Machine Manager R2 (WNVHOST2)
- Steps for implementing and testing Windows Network Virtualization (Contoso APP1 and APP2, Fabrikam APP1 and APP2)

This evaluation demonstrates operation of Windows Network Virtualization in a simulated hoster datacenter using Hyper-V virtualization and System Center 2012 Virtual Machine Manager R2. Simulated on-premises customer networks are used to demonstrate access to hosted cloud resources over a simulated Internet connection. The two customer networks share the same computer names and IP addresses to demonstrate the secure isolation provided by Windows Network Virtualization.

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

Hardware Requirements for Networking

The following are the minimum required components of this evaluation:

- The VHD for Windows Server® 2012 R2 Preview.
- The Windows Assessment and Deployment Kit (ADK) 8.1 source files. Windows ADK is available at the Microsoft Download Center at http://go.microsoft.com/fwlink/p/?LinkId=263698. To install the Windows ADK on a computer that does not have Internet access, first download the installer files. Next, copy the installer files to the offline computer. Then you can run ADKSetup.exe using either the GUI or the command line.
- The VHD for Microsoft SQL Server 2012.
- The VHD for System Center 2012 R2 Virtual Machine Manager.

> **Important**
>
> Run Windows Update on all computers or virtual machines either during the installation or immediately after installing the operating systems. After running Windows Update, you can isolate your physical or virtual test lab from your production network.

You must be logged on as a member of the Domain Admins group or a member of the local Administrators group on each computer to complete the tasks described in this guide.

Steps for Configuring the Hosternet Subnet

There are two steps to setting up the Hosternet subnet of the Windows Server 2012 R2 Hyper-V Network Virtualization with System Center 2012 VMM R2 Test Lab.

1. Configure WNVHOST1.
2. Configure WNVHOST2.

Configure WNVHOST1

WNVHOST1 is a physical server configured as a Windows Server 2012 R2 Hyper-V host, Domain Controller and DNS Server for the simulated hoster datacenter domain, corp.adatum.com, connected to a shared physical switch used to simulate a hoster datacenter connection. WNVHOST1 configuration consists of the following:

1. Install the operating system
2. Configure TCP/IP
3. Rename the computer
4. Configure WNVHOST1 as a DC and DNS server for corp.adatum.com
5. Create a user account for User1
6. Install the Hyper-V server role
7. Create a Hyper-V external virtual switch to simulate a connection to Hosternet

Configure WNVHOST2

WNVHOST2 is a physical server configured as a Windows Server 2012 R2 Hyper-V host, SQL server, and System Center 2012 Virtual Machine Manager, connected to a shared physical switch used to simulate a hoster datacenter connection (Hosternet). WNVHOST2 configuration consists of the following:

1. Install the operating system
2. Configure TCP/IP
3. Rename the computer and join the corp.adatum.com domain
4. Install the Hyper-V server role
5. Create a virtual switch

How to Configure WNVHOST1

Use the following procedures configure WNVHOST1

▶**To install the operating system on WNVHOST1**

1. Start the installation of Windows Server 2012 R2 Datacenter (Server with a GUI).
2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.
3. Connect WNVHOST1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.
4. Connect WNVHOST1 to a shared physical switch to which WNVHOST2 is also connected. This connection will be used to simulate the Hosternet subnet.

▶**To configure TCP/IP properties on WNVHOST1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.
2. Rename the Ethernet connection connected to the shared physical switch to **Hosternet**.
3. In the **Network Connections** window, right-click **Hosternet**, and then click **Properties**.
4. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
5. Select **Use the following IP address**. In IP address, type 192.168.0.1. In Subnet mask, type 255.255.255.0. In Preferred DNS server, type 127.0.0.1.
6. Click **Advanced**, and then click the **DNS** tab.
7. In **DNS suffix for this connection**, type **corp.adatum.com**, and then click **OK**.
8. Click **OK** twice to close the **Hosternet Properties** dialog box.
9. Close the **Network Connections** window.
10. From the **Tools** menu in Server Manager, click **Windows PowerShell**.
11. To disable the Windows Firewall on WNVHOST2, type the following command and press

ENTER.

```
Set-NetFirewallProfile -Profile Domain,Public,Private -
Enabled False
```

▶ **To rename the computer to WNVHOST1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.
2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.
3. In **Computer Name**, type **WNVHOST1**. Click **OK**.
4. When you are prompted that you must restart the computer, click **OK**.
5. On the **System Properties** dialog box, click **Close**.
6. When you are prompted to restart the computer, click **Restart Now**.
7. After the computer restarts, log on with the local administrator account.

▶ **To configure WNVHOST1 as a domain controller and DNS server**

1. Launch **Server Manager**.
2. On the **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.
3. Click **Next** three times to get to the server role selection screen.
4. In the **Select Server Roles** dialog, select **Active Directory Domain Services**. Click **Add Features** when prompted, and then click **Next**.
5. In the **Select features** dialog, click **Next**.
6. In the **Active Directory Domain Services** dialog, click **Next**.
7. In the **Confirm installation selections** dialog, click **Install**. Wait for the installation to complete.
8. In the **Installation Progress** dialog, click the **Promote this server to a domain controller link**.

   📝 **Note**

   If you close the "Installation Progress" dialog before it presents the promotion link, click the gray **Tasks** flag in the upper right section of **Server Manager**. When the installation is complete you will see the **Promote this server to a Domain Controller** link.

9. In the **Deployment Configuration** dialog, select **Add a new forest**. In the **Root domain name** field, type **corp.adatum.com**. Click **Next**.
10. In the **Domain Controller Options** dialog, leave the default values, specify a strong DSRM password twice, and then click **Next** four times to accept default settings for DNS, NetBIOS, and directory paths.
11. In the **Review Options** dialog, review your selections and then click Next.

12. In the Prerequisites Check dialog, allow the validation to complete and verify that no errors are reported. Since this is the first DNS server deployment in the forest, you can safely ignore all warnings regarding DNS delegation. Click Install to start the domain controller promotion. Allow the installation to complete.

13. Allow the domain controller to restart. After the server restarts, logon using the CORP\Administrator credentials.

Create a user account in Active Directory on WNVHOST1

Next, create a user account in Active Directory that will be used when logging in to CORP domain member computers.

▶**To create a user account in Active Directory**

1. From Server Manager, click the **Tools** menu item, and then click **Active Directory Administrative Center**.

2. In the console tree, click the arrow to expand **corp (local)**, and then double-click **Users**. This adds Users as a recent navigation link in the console tree.

3. In the **Tasks** pane, click **New**, and then click **User**.

4. In the Create User dialog, type **User1** next to **Full name** and type **User1** next to **User SamAccountName logon: corp**.

5. In **Password**, type the password that you want to use for this account, and in **Confirm password**, type the password again.

6. Under Password options, select **Other password options**, and select **Password never expires**.

7. Scroll down to access the **Member of** section of the Create User dialog, and click **Add**. Type **Domain Admins; Enterprise Admins**, and then click **OK**.

8. Click **OK** to close the Create User dialog.

9. Exit the Active Directory Administrative Center.

Install the Hyper-V server role on WNVHOST1

Next, install the Hyper-V role on WNVHOST1, which will act as a host for virtual machines that are connected to the virtualized Contoso and Fabrikam tenant networks.

▶**To install the Hyper-V server role**

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **Hyper-V** and click **Add Features** when prompted**.**

4. Click **Next** six times to accept the default settings for features and Hyper-V, and then click **Install**.

5. Verify that the installation was successful, and then click **Close**.

6. Restart the WNVHOST1 server after Hyper-V installation completes. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Create a virtual switch on WNVHOST1

▶**To create a virtual switch on WNVHOST1**

1. From Server Manager, click the **Tools** menu item, and then click **Hyper-V Manager**.

2. In Hyper-V Manager console, select WNVHOST1, and then click **Virtual Switch Manager** in the Actions pane.

3. Verify that **External** is selected, and then click **Create Virtual Switch**.

4. Under Name, type **Hosternet**. Under External network, select the adapter connected to the Hosternet physical switch. Select the checkbox for **Allow management operating system to share this network adapter**. Click **OK**.

Step 2: Configure WNVHOST2

WNVHOST2 is a physical server configured as a Windows Server 2012 R2 Hyper-V host, SQL server, and System Center 2012 Virtual Machine Manager, connected to a shared physical switch used to simulate a hoster datacenter connection (Hosternet). WNVHOST2 configuration consists of the following:

- Install the operating system

- Configure TCP/IP

- Rename the computer and join the corp.adatum.com domain

- Install the Hyper-V server role

- Create a virtual switch

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

Install the operating system on WNVHOST2

▶**To install the operating system on WNVHOST2**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect WNVHOST2 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. While WNVHOST2 is connected to the Internet, install .NET 3.5 by running the following command from an elevated Windows PowerShell prompt:

   Install-WindowsFeature -Name NET-Framework-Core

   📝 **Note:**   If WNVHOST2 does not have an Internet connection, you can install .NET framework from the Windows source files by using the following command:

   DISM /Online /Enable-Feature /FeatureName:NetFx3 /All /LimitAccess /Source:E:\sources\sxs

5. Connect WNVHOST2 to a shared physical switch to which WNVHOST1 is also connected. This connection will be used to simulate the Hosternet subnet.

Configure TCP/IP properties on WNVHOST2

▶**To configure TCP/IP properties on WNVHOST2**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. Rename the network adapter connected to the Hosternet shared physical switch to **Hosternet**.

3. In the **Network Connections** window, right-click **Hosternet**, and then click **Properties**.

4. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

5. Select **Use the following IP address**. In **IP address**, type **192.168.0.2**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **192.168.0.1.**

6. Click **Advanced**, and then under IP Addresses, click **Add**. Type **172.16.1.2** for IP address, and type **255.255.255.0** for Subnet mask. Click **Add**.

7. Click the **DNS** tab.

8. In **DNS suffix for this connection**, type **corp.adatum.com**, and then click **OK**.

9. Click **OK** three times to close the **Hosternet Properties** dialog box.

10. Close the **Network Connections** window.

11. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

12. To disable the Windows Firewall on WNVHOST2, type the following command and press ENTER.

    Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False

Rename the computer to WNVHOST2 and join the corp.adatum.com domain

▶To rename the computer to WNVHOST2 and join the corp.adatum.com domain

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **WNVHOST2**. Under **Member of**, click **Domain**, and then type **corp.adatum.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.adatum.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Install the Hyper-V server role on WNVHOST2

Next, install the Hyper-V role on WNVHOST2, which will act as a host for virtual machines that are connected to the virtualized Contoso and Fabrikam tenant networks.

▶To install the Hyper-V server role

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **Hyper-V** and click **Add Features** when prompted**.**

4. Click **Next** six times to accept the default settings for features and Hyper-V, and then click **Install**.

5. Verify that the installation was successful, and then click **Close**.

6. Restart the WNVHOST2 server after Hyper-V installation completes. After the computer restarts, log on to the CORP domain with the **User1** account.

Create a virtual switch on WNVHOST2

▶**To create a virtual switch on WNVHOST2**

1. From Server Manager, click the **Tools** menu item, and then click **Hyper-V Manager**.

2. In Hyper-V Manager console, select WNVHOST2, and then click **Virtual Switch Manager** in the Actions pane.

3. Verify that **External** is selected, and then click **Create Virtual Switch**.

4. Under Name, type **Hosternet**. Under External network, select the adapter connected to the Hosternet physical switch. Select the checkbox for **Allow management operating system to share this network adapter**. Click **OK**.

Steps for Configuring the Internet Subnet

There are four steps to setting up the Internet subnet of the Windows Server 2012 R2 Hyper-V Network Virtualization with System Center 2012 VMM R2 This evaluation.

1. Configure WNVHOST4.
2. Configure INET1.
1. Configure WNVHOST3.

2. Configure GatewayVM1.

Step 1: Configure WNVHOST4

WNVHOST4 is a physical server configured as a Windows Server 2012 R2 Hyper-V host connected to a physical switch used to simulate an Internet connection. Virtual machines running

on WNHOST4 are used to simulate customer on-premises resources for the Contoso and Fabrikam corporate networks. WNVHOST4 configuration consists of the following:

- Install the operating system

- Configure TCP/IP

- Rename the computer

- Install the Hyper-V server role

- Create a Hyper-V external virtual switch to simulate a connection to the Internet

- Create two Hyper-V internal virtual switches to simulate the Contoso and Fabrikam corporate networks

- Create virtual machines on WNVHOST4 for INET1, Contoso DC1, Contoso APP1, Contoso EDGE1, Fabrikam DC1, Fabrikam APP1, and Fabrikam EDGE1

Install the operating system on WNVHOST4

▶**To install the operating system on WNVHOST4**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect WNVHOST4 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect WNVHOST4 a shared physical switch to which WNVHOST3 is also connected. This connection will be used to simulate the Internet subnet.

Configure TCP/IP properties on WNVHOST4

▶**To configure TCP/IP properties on WNVHOST4**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. Rename the adapter that is connected to the shared physical switch to **Internet**.

3. In the **Network Connections** window, right-click **Internet**, and then click **Properties**.

4. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

5. Select **Use the following IP address**. In **IP address**, type **131.107.0.40**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **131.107.0.1.**

6. Click **Advanced**, and then click the **DNS** tab.

7. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK**.

8. Click **OK** twice to close the **Internet Properties** dialog box.

9. Close the **Network Connections** window.

10. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

11. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

    New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

    New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

12. Close the Windows PowerShell window.

Rename the computer to WNVHOST4

▶**To rename the computer to WNVHOST4**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **WNVHOST4**. Click **OK**.

4. When you are prompted that you must restart the computer, click **OK**.

5. On the **System Properties** dialog box, click **Close**.

6. When you are prompted to restart the computer, click **Restart Now**.

7. After the computer restarts, log on with the local administrator account.

Install the Hyper-V server role on WNVHOST4

Next, install the Hyper-V role on WNVHOST4, which will act as a host for virtual machines that are connected to the Contoso Corpnet, Fabrikam Corpnet, and Internet subnets.

▶**To install the Hyper-V server role**

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **Hyper-V** and click **Add Features** when prompted**.**

4. Click **Next** six times to accept the default settings for features and Hyper-V, and then click **Install**.

5. Verify that the installation was successful, and then click **Close**.

Create virtual switches on WNVHOST4

▶**To create Internet, Contoso Corpnet, and Fabrikam Corpnet virtual switches on WNVHOST4**

1. From Server Manager, click the **Tools** menu item, and then click **Hyper-V Manager**.

2. In Hyper-V Manager console, select WNVHOST4, and then click **Virtual Switch Manager** in the Actions pane.

3. Verify that **External** is selected, and then click **Create Virtual Switch**.

4. Under Name, type **Internet**. Under External network, select the adapter connected to the Internet physical switch. Select the checkbox for **Allow management operating system to share this network adapter**. Click **Apply**.

5. In the Virtual Switch Manager window, click **New virtual network switch**. Under **What type of virtual switch do you want to create?**, select **Private**, and then click **Create Virtual Switch**.

6. Under Name, type **Contoso_Corpnet**, and then click **Apply**.

7. In the Virtual Switch Manager window, click **New virtual network switch**. Under **What type of virtual switch do you want to create?**, select **Private**, and then click **Create Virtual Switch**.

8. Under Name, type **Fabrikam_Corpnet**, and then click **Apply**.

9. Click **OK** to close Virtual Switch Manager.

Create virtual machines on WNVHOST4

▶**To create Internet, Contoso Corpnet, and Fabrikam Corpnet virtual machines on WNVHOST4**

1. In Hyper-V Manager console Actions pane, point to **New**, and then click **Virtual Machine**.

2. The New Virtual Machine Wizard opens. Click **Next**.

3. Name the new virtual machine **INET1**. Click **Next**.

4. Select the desired Hyper-V virtual machine generation, and then click **Next**.

5. Assign memory to allocate to the new VM, and then click **Next**.

6. On the Configure Networking page select a connection to the **Internet** virtual switch. Click **Next**.

7. On the Connect Virtual Hard Disk page, select an option to create a new virtual hard disk or specify a path to an existing virtual hard disk for INET1. Click **Next**.

8. On the Installation Options page, select the appropriate options to access the operating system setup media. Click **Next**.

9. On the Summary page, click **Finish**.

10. Repeat the previous steps to create additional virtual machines as listed in the following table:

Virtual Machine Name	Network Connections
INET1	One virtual adapter connected to the Internet virtual switch
Contoso_DC1	One virtual adapter connected to the Contoso_Corpnet virtual switch
Contoso_APP1	One virtual adapter connected to the Contoso_Corpnet virtual switch
Contoso_EDGE1	Two virtual adapters, one connected to the Contoso_Corpnet virtual switch, one connected to the Internet virtual switch
Fabrikam_DC1	One virtual adapter connected to the Fabrikam_Corpnet virtual switch
Fabrikam_APP1	One virtual adapter connected to the Fabrikam_Corpnet virtual switch
Fabrikam_EDGE1	Two virtual adapters, one connected to the Fabrikam_Corpnet virtual switch, one connected to the Internet virtual switch

Step 2: Configure INET1

INET1 configuration consists of the following:

- • Install the operating system
- • Configure TCP/IP

- • Rename the computer

- • Install the Web Server (IIS) and DNS server roles

- Create DNS records

- Install DHCP

- • Configure the NCSI web site

Install the operating system on INET1

▶**To install the operating system on INET1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect INET1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect the INET1 virtual machine to the Internet virtual switch on WNVHOST4.

Configure TCP/IP properties on INET1

▶**To configure TCP/IP properties on INET1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In the **Network Connections** window, right-click **Ethernet**, and then click **Properties**.

3. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

4. Select **Use the following IP address**. In **IP address**, type **131.107.0.1**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **127.0.0.1.**

5. Click **Advanced**, and then click the **DNS** tab.

6. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK**.

7. Click **OK** twice to close the **Ethernet Properties** dialog box.

8. Close the **Network Connections** window.

9. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

10. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

   New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

> **New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound**

11. Close the Windows PowerShell window.

Rename the computer to INET1

▶**To rename the computer to INET1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **INET1**. Click **OK**.

4. When you are prompted that you must restart the computer, click **OK**.

5. On the **System Properties** dialog box, click **Close**.

6. When you are prompted to restart the computer, click **Restart Now**.

7. After the computer restarts, log on with the local administrator account.

Install the DNS Server and Web Server (IIS) server roles on INET1

Next, install role services for INET1, which will act as an Internet web and DNS server for computers that are connected to the Internet subnet.

▶**To install the IIS and DNS server roles**

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **DNS Server** and click **Add Features** when prompted**.**

4. Select **Web Server (IIS)** and then click **Next**.

5. Click **Next** four times to accept the default DNS server and web server settings, and then click **Install**.

6. Verify that the installations were successful, and then click **Close**.

Create DNS records on INET1

Next, create DNS records for the INET1 and EDGE1 IPv4 addresses on the Internet subnet and for the Network Connectivity Status Indicator (NCSI).

▶ **To create A records**

1. From Server Manager, click the **Tools** menu item, and then click **DNS**.

2. In the console tree of DNS Manager, expand **INET1**, and click **Forward Lookup Zones**.

3. Right-click **Forward Lookup Zones**, click **New Zone**, and then click **Next**.

4. On the **Zone Type** page, click **Next**.

5. On the **Zone Name** page, type **isp.example.com**, and then click **Next**.

6. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.

7. In the console tree, expand **Forward Lookup Zones**, right click **isp.example.com**, and then click **New Host (A or AAAA)**.

8. In **Name**, type **INET1**. In **IP address**, type **131.107.0.1**. Click **Add Host**.

9. Click **OK**, and then click **Done**.

10. In the console tree, right-click **Forward Lookup Zones**, click **New Zone**, and then click **Next**.

11. On the **Zone Type** page, click **Next**.

12. On the **Zone Name** page, type **contoso.com**, and then click **Next**.

13. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.

14. In the console tree, right click **contoso.com**, and then click **New Host (A or AAAA)**.

15. In **Name**, type **EDGE1**. In **IP address**, type **131.107.0.2**.

16. Click **Add Host**. Click **OK**.

17. In the console tree, right-click **Forward Lookup Zones**, click **New Zone**, and then click

Next.

18. On the **Zone Type** page, click **Next**.

19. On the **Zone Name** page, type **msftncsi.com**, and then click **Next**.

20. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.

21. In the console tree, right click **msftncsi.com**, and then click **New Host (A or AAAA)**.

22. In **Name**, type **www**. In **IP address**, type **131.107.0.1**.

23. Click **Add Host**. Click **OK**.

24. In **Name**, type **dns**. In **IP address**, type **131.107.255.255**. Click **Add Host**. Click **OK**. Click **Done**.

24. Close the DNS Manager console.

Install and configure DHCP on INET1

Next, configure INET1 as a DHCP server so that DHCP clients can automatically configure themselves when connecting to the Internet subnet.

▶ **To install and configure the DHCP server role on INET1**

1. On the Server Manager **Dashboard** screen, under Configure this local server, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. In the Select Server Roles dialog, select **DHCP Server**, click **Add Features** when prompted, and then click **Next**.

4. In the Select features dialog, click **Next**.

5. Click **Next** on the Introduction screen, and then click **Install**.

6. Allow the installation to complete, and then in the Installation progress window, click the link for **Complete DHCP configuration**.

7. In the DHCP Post-Install configuration wizard, click **Commit**, and then click **Close**.

8. In the Installation progress window, click **Close**.

9. From the **Tools** menu in Server Manager, click **DHCP**.

10. In the DHCP console tree, expand **INET1**. Right-click **IPv4**, and click **New Scope**.

11. Click **Next** in the New Scope Wizard.

12. Type **Internet** for scope name, and then click **Next**.

13. Next to **Start IP Address**, type **131.107.0.100**, next to **End IP Address**, type **131.107.0.150**, and next to **Subnet Mask**, type **255.255.255.0**.

14. Click **Next** four times to accept default settings for exclusions, delay and lease duration.

15. On the **Router (Default Gateway)** dialog, type **131.107.0.1**. Click **Add**, and then click **Next**.

16. On the **Domain Name and DNS Servers** page, next to **Parent domain**, type **isp.example.com**. Under IP address, type **131.107.0.1**. Click **Add**, and then click **Next**.

17. On the WINS Servers page, click **Next**.

18. On the Activate Scope page, click **Next**, and then click **Finish**.

19. Close the DHCP Manager console.

Configure the NCSI web site on INET1

Windows clients attempt to connect to the URL http://www.msftncsi.com/ncsi.txt and resolve the name dns.msftncsi.com to determine if they have Internet connectivity. In the following procedure, you create the ncsi.txt file and place it in the WWWROOT directory on INET1.

▶**To configure the NCSI web site on INET1**

1. On INET1, launch **File Explorer**, and then navigate to **C:\inetpub\wwwroot**.

2. In the details pane, right click an empty area, point to **New**, and then click **Text Document**.

3. Rename the document to **ncsi**.

4. Double-click on **ncsi**.

5. In the **Notepad** window, type **Microsoft NCSI** and do *not* press ENTER to add a new line.

6. Click **File**, and then click **Exit**. In the **Notepad** dialog box, click **Save**.

7. Close the Windows Explorer window.

Step 3: Configure WNVHOST3

WNVHOST3 is a physical server configured to host a Network Virtualization Gateway virtual machine, with two network adapters. One adapter is connected to a physical switch used to simulate an Internet connection, and the second adapter is connected to a physical switch used to simulate a hoster datacenter connection (Hosternet). WNVHOST3 configuration consists of the following:

- Install the operating system

- Configure network connections

- Rename the computer and join the corp.adatum.com domain

- Install the Hyper-V server role

- Create a gateway virtual machine

Install the operating system on WNVHOST3

▶ **To install the operating system on WNVHOST3**
1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect WNVHOST3 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect one adapter on WNVHOST3 a shared physical switch to which WNVHOST2 is also connected. This connection will be used to simulate the Hosternet subnet.

5. Connect one adapter on WNVHOST3 a shared physical switch to which WNVHOST4 is also connected. This connection will be used to simulate the Internet subnet.

Configure network connections on WNVHOST3

▶ **To configure network connection properties on WNVHOST3**
1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click the network connection that is connected to the shared physical switch to which WNVHOST4 is also connected, and then click **Rename**.

3. Type **Internet**, and then press **ENTER**.

4. In the **Network Connections** window, right-click **Internet**, and then click **Properties**.

5. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

6. Select **Use the following IP address**. In **IP address**, type **131.107.0.30**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **131.107.0.1.**

7. Click **Advanced**, and then click the **DNS** tab.

8. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK**.

9. Click **OK** twice to close the **Internet Properties** dialog box.

10. In **Network Connections**, right-click the network connection that is connected to the shared physical switch to which WNVHOST2 is also connected, and then click **Rename**.

11. Type **Hosternet**, and then press **ENTER**.

12. In the **Network Connections** window, right-click **Hosternet**, and then click **Properties**.

13. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

14. Select **Use the following IP address**. In **IP address**, type **192.168.0.3**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **192.168.0.1.**

15. Click **Advanced**, and then under IP Addresses, click **Add**. Type **172.16.1.3** for IP address and type **255.255.255.0** for Subnet mask. Click **Add**.

16. Click the **DNS** tab.

17. In **DNS suffix for this connection**, type **corp.adatum.com**, and then click **OK**.

18. Click **OK** three times to close the **Hosternet Properties** dialog box.

19. Close the **Network Connections** window.

20. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

21. To disable the Windows Firewall on WNVHOST3, type the following command and press ENTER.

    Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False

22. Type **ping 131.107.0.1** and press ENTER to verify connectivity to INET1 from WNVHOST3.

23. Type **ping 192.168.0.2** and press ENTER to verify connectivity to WNVHOST2 from WNVHOST3.

Rename the computer to WNVHOST3 and join the corp.adatum.com domain

▶**To rename the computer to WNVHOST3 and join the corp.adatum.com domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to

Computer name in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **WNVHOST3**. Under **Member of**, click **Domain**, and then type **corp.adatum.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.adatum.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Install the Hyper-V server role on WNVHOST3

Next, install the Hyper-V role on WNVHOST3, which will act as a host for a gateway virtual machine that is connected to the Internet for site-to-site routing to the Contoso Corpnet and Fabrikam Corpnet subnets.

▶ **To install the Hyper-V server role**

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **Hyper-V** and click **Add Features** when prompted**.**

4. Click **Next** six times to accept the default settings for features and Hyper-V, and then click **Install**.

5. Verify that the installation was successful, and then click **Close**.

6. Restart the WNVHOST3 server after Hyper-V installation completes.

Create virtual switches on WNVHOST3

▶**To create Hosternet and Internet virtual switches on WNVHOST3**

1. From Server Manager, click the **Tools** menu item, and then click **Hyper-V Manager**.

2. In Hyper-V Manager console, select WNVHOST3, and then click **Virtual Switch Manager** in the Actions pane.

3. Verify that **External** is selected, and then click **Create Virtual Switch**.

4. Under Name, type **Hosternet**. Under External network, select the adapter connected to the Hosternet physical switch. Select the checkbox for **Allow management operating system to share this network adapter**. Click **Apply**.

5. In the Virtual Switch Manager console, click **New virtual network switch** in the console tree.

6. Verify that **External** is selected, and then click **Create Virtual Switch**.

7. Under Name, type **Internet**. Under External network, select the adapter connected to the Hosternet physical switch. Select the checkbox for **Allow management operating system to share this network adapter**. Click **OK**.

Create the Gateway virtual machine

▶**To create the software gateway virtual machine on WNVHOST3**

1. In Hyper-V Manager console Actions pane, point to **New**, and then click **Virtual Machine**.

2. The New Virtual Machine Wizard opens. Click **Next**.

3. Name the new virtual machine **GatewayVM1**. Click **Next**.

4. Select the desired Hyper-V virtual machine generation, and then click **Next**.

5. Assign memory to allocate to the new VM, and then click **Next**.

6. On the Configure Networking page select a connection to the **Internet** virtual switch. Click **Next**.

7. On the Connect Virtual Hard Disk page, select an option to create a new virtual hard disk or specify a path to an existing virtual hard disk for GatewayVM1. Click **Next**.

8. On the Installation Options page, select the appropriate options to access the operating system setup media. Click **Next**.

9. On the Summary page, click **Finish**.

10. In Hyper-V Manager console, right-click the **GatewayVM1** virtual machine, and then click **Settings**.

11. Click **Add Hardware** in the console tree, and then select **Network Adapter**. Click **Add**.

12. Connect the new network adapter to the **Hosternet** virtual switch, and then click **Apply**.

13. Repeat steps 11 and 12 to add a second virtual network adapter connected to the Hosternet virtual switch. GatewayVM1 should have three virtual adapters, with one connected to the Internet virtual switch and two connected to the Hosternet virtual switch. Click **OK** to close the Settings for GatwayVM1 on WNVHOST3 dialog.

Step 4: Configure GatewayVM1 on WNVHOST3

GatewayVM1 is a virtual machine configured as a Windows Network Virtualization Gateway. GatewayVM1 must be configured with three virtual network adapters. One adapter is connected to the external virtual switch on WNVHOST3 used to simulate an Internet connection, and the other two adapters are connected to the external virtual switch on WNVHOST3 used to simulate a hoster datacenter connection (Hosternet). GatewayVM1 configuration consists of the following:

- Install the operating system

- Configure network connections

- Rename the computer and join the corp.adatum.com domain

- Install the RRAS server role

Install the operating system on GatewayVM1

▶**To install the operating system on GatewayVM1**

1. Connect to the GatewayVM1 virtual machine running on WNVHOST3.

2. Start the installation of Windows Server 2012 R2.

3. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

4. Verify that GatewayVM1 has three virtual adapters, with one connected to the Internet virtual switch and two connected to the Hosternet virtual switch.

Determine which virtual adapter is connected to the Internet on GatewayVM1

GatewayVM1 has three virtual adapters, with one connected to the Internet virtual switch and two connected to the Hosternet virtual switch. To configure an appropriate IP address for Internet access, you must determine which adapter is connected to the Internet virtual switch.

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

▶**To determine the Internet network connection on GatewayVM1**

1. In Hyper-V Manager console, right-click the **GatewayVM1** virtual machine, and then click **Settings**.

2. In the console tree, expand the virtual network adapter connected to the **Internet** virtual switch, and then click **Advanced Features**.

3. Note the value listed for the **MAC address** dynamically assigned to this virtual adapter.

4. Connect to the **GatewayVM1** virtual machine.

5. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

6. Type **ipconfig /all** and press ENTER to display the Windows IP Configuration on GatewayVM1. Find the Physical Address (MAC address) you determined to be assigned to the Internet switch, and note the name of the adapter to which it is assigned.

Configure network connections on GatewayVM1

▶**To configure network connection properties on GatewayVM1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click the network connection that is connected to the Internet virtual switch determined in the previous step, and then click **Rename**.

3. Type **Internet**, and then press ENTER.

4. In the **Network Connections** window, right-click **Internet**, and then click **Properties**.

5. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

6. Select **Use the following IP address**. In **IP address**, type **131.107.0.15**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **131.107.0.1.**

7. Click **OK** twice to close the **Internet Properties** dialog box.

8. In **Network Connections**, right-click one of the other network connections, and then click **Rename**.

9. Type **Management**, and then press **ENTER**.

10. In the **Network Connections** window, right-click **Management**, and then click **Properties**.

11. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

12. Select **Use the following IP address**. In **IP address**, type **192.168.0.15**. In **Subnet mask**, type **255.255.255.0**. In **Preferred DNS server**, type **192.168.0.1.**

13. Click **OK** twice to close the **Management Properties** dialog box.

14. In **Network Connections**, right-click the remaining network connection, and then click **Rename**.

15. Type **Back End**, and then press **ENTER**.

16. In the **Network Connections** window, right-click **Back End**, and then click **Properties**.

17. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

18. Select **Use the following IP address**. In **IP address**, type **172.16.1.15**. In **Subnet mask**, type **255.255.255.0**.

19. Click **OK** twice to close the **Back End Properties** dialog box.

20. Close the **Network Connections** window.

21. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

22. To disable the Windows Firewall on GatewayVM1, type the following command and press ENTER.

    Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False

23. Type **ping inet1.isp.example.com** and press ENTER to verify name resolution and connectivity over the simulated Internet. You should receive four replies from 131.107.0.1.

24. Type **ping wnvhost2.corp.adatum.com** and press ENTER to verify name resolution and connectivity over the management network. You should receive four replies from 192.168.0.2.

Rename the computer to GatewayVM1 and join the corp.adatum.com domain

▶**To rename the computer to GatewayVM1 and join the corp.adatum.com domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **GatewayVM1**. Under **Member of**, click **Domain**, and then type **corp.adatum.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.adatum.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Install the Remote Access server role on GatewayVM1

Next, install the Remote Access role on GatewayVM1, which will act as a gateway virtual machine that is connected to the Internet for site-to-site routing to the Contoso Corpnet and Fabrikam Corpnet subnets.

▶**To install the Remote Access server role**

1. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. On the **Select Server Roles** page, select **Remote Access** and then click **Next**.

4. On the Features selection screen, click **Next**.

5. On the Remote Access screen, click **Next**.

6. On the Role Services selection screen, click to select **the DirectAccess and VPN (RAS)** and the **Routing** role services. Click **Add Features** when prompted, and then click **Next**.

7. Click **Next** twice to accept the default settings for Web Server Role and Role Services, and then click **Install**.

8. Verify that the installation was successful, and then click **Close**.

Steps for Configuring the Contoso Corpnet Subnet

The Contoso Corpnet subnet is used to simulate a customer on-premise network infrastructure. A cross-premises VPN connection will be established later in order to access the cloud hoster network. There are four steps to setting up the Contoso Corpnet subnet on **WNVHOST4**.

1. Configure DC1.

2. Configure APP1.

3. Configure EDGE1.

4. Test access to resources on APP1.

The following sections provide details about how to perform these steps.

Step 1: Configure DC1

DC1 is a virtual machine running on the WNVHOST4 server. DC1 provides the following services:

- • A domain controller for the corp.contoso.com Active Directory Domain Services (AD DS) domain

- • A DNS server for the corp.contoso.com DNS domain

- • A DHCP server for the Corpnet subnet

DC1 configuration consists of the following:

- • Install the operating system

- • Configure TCP/IP

- • Install Active Directory and DNS

- • Install DHCP

- • Create a user account in Active Directory

Install the operating system on DC1

First, install Windows Server 2012 R2 as a standalone server.

▶**To install the operating system on DC1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying Windows Server 2012 R2 Datacenter (Server with a GUI) and a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect DC1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect DC1 to the Contoso_Corpnet virtual switch on WNVHOST4.

Configure TCP/IP properties on DC1

Next, configure the TCP/IP protocol with a static IP address of 10.0.0.1 and the subnet mask of 255.255.255.0.

▶**To configure TCP/IP on DC1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet**.

   📝 **Note**

   The link may not immediately appear. Wait for the network interfaces to be enumerated.

2. In **Network Connections**, right-click **Ethernet**, and then click **Properties**. Note that the "Ethernet" interface name may be different on your computer.

3. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

4. Select **Use the following IP address**. In **IP address**, type **10.0.0.1**. In **Subnet mask**, type **255.255.255.0**. In **Default gateway**, type **10.0.0.2**. Select **Use the following DNS server addresses. In Preferred DNS server, type 127.0.0.1.**

5. Click **OK** and then close the Ethernet Properties dialog.

6. Close the **Network Connections** window.

7. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

8. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

   New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

   New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

9. Close the Windows PowerShell window.

10. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

11. On the **Computer Name** tab of the System Properties dialog, click **Change**.

12. In **Computer name**, type **DC1**, click **OK** twice, and then click **Close**. When you are prompted to restart the computer, click **Restart Now**.

13. After restarting, login using the local Administrator account.

Configure DC1 as a domain controller and DNS server

Next, configure DC1 as a domain controller and DNS server for the corp.contoso.com domain.

▶**To configure DC1 as a domain controller and DNS server**

1. Launch **Server Manager**.

2. On the **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

3. Click **Next** three times to get to the server role selection screen.

4. In the **Select Server Roles** dialog, select **Active Directory Domain Services**. Click **Add Features** when prompted, and then click **Next**.

5. In the **Select features** dialog, click **Next**.

6. In the **Active Directory Domain Services** dialog, click **Next**.

7. In the **Confirm installation selections** dialog, click **Install.** Wait for the installation to complete.

8. In the **Installation Progress** dialog, click the **Promote this server to a domain controller** link.

   📝 **Note:** If you close the "Installation Progress" dialog before it presents the promotion link, click the gray **Tasks** flag in the upper right section of **Server Manager.** When the installation is complete you will see the **Promote this server to a Domain Controller** link.

9. In the **Deployment Configuration** dialog, select **Add a new forest**. In the **Root domain name** field, type **corp.contoso.com**. Click **Next**.

10. In the **Domain Controller Options** dialog, leave the default values, specify a strong DSRM password twice, and then click **Next** four times to accept default settings for DNS, NetBIOS, and directory paths.

11. In the **Review Options** dialog, review your selections and then click **Next**.

    📝 **Note:** You can also click the **View script** button to review and save the PowerShell commands that Server Manager will run during DC Promotion.

12. In the **Prerequisites Check** dialog, allow the validation to complete and verify that no errors are reported. Since this is the first DNS server deployment in the forest, you can safely ignore all warnings regarding DNS delegation. Click **Install** to start the domain controller promotion. Allow the installation to complete.

13. Allow the domain controller to restart. After the server restarts, logon using the CORP\Administrator credentials.

Install and configure DHCP on DC1

Next, configure DC1 as a DHCP server so that remote computers can automatically obtain an IP address when establishing site-to-site VPN connections.

▶**To install and configure the DHCP server role on DC1**

1. In the **Dashboard** console of Server Manager, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. In the **Select server roles** dialog, select **DHCP Server**, click **Add Features** when

prompted, and then click **Next**.

4. In the **Select features** dialog, click **Next**.

5. Click **Next** on the DHCP Server screen, and then click **Install**.

6. Allow the installation to complete, and then in the Results window, click the link for **Complete DHCP configuration**.

7. In the DHCP Post-Install configuration wizard, click **Next**, and then click **Commit**.

8. On the Summary page, click **Close**.

9. In the Add Roles and Features Wizard, click **Close**.

10. From the **Tools** menu in Server Manager, click **DHCP**.

11. In the DHCP console tree, expand **dc1.corp.contoso.com**, and click **IPv4**. Right-click **IPv4**, and click **New Scope**.

12. Click **Next** in the New Scope Wizard.

13. Type **Corpnet** for scope name, and then click **Next**.

14. Next to **Start IP Address**, type **10.0.0.100**, next to **End IP Address**, type **10.0.0.200**, and next to **Subnet Mask**, type **255.255.255.0**.

15. Click **Next** eight times to accept all scope option default settings, and then click **Finish**.

16. Close the DHCP Manager console.

Create a user account in Active Directory on DC1

Next, create a user account in Active Directory that will be used when logging in to CORP domain member computers.

►**To create a user account in Active Directory**

1. From the **Tools** menu in Server Manager, click **Active Directory Administrative Center**.

2. In the console tree, click the arrow to expand **corp (local)**, and then double-click **Users**. This adds Users as a recent navigation link in the console tree.

3. In the **Tasks** pane, click **New**, and then click **User**.

4. In the Create User dialog, type **User1** next to **Full name** and type **User1** next to **User SamAccountName logon: corp**.

5. In **Password**, type the password that you want to use for this account, and in **Confirm password**, type the password again.

6. Under Password options, select **Other password options**, and select **Password never expires**.

7. Scroll down to access the **Member of** section of the Create User dialog, and click **Add**. Type **Domain Admins; Enterprise Admins**, and then click **OK**.

8. Click **OK** to close the Create User dialog.

9. Exit the Active Directory Administrative Center.

10. Sign out of DC1 as the Administrator user, and then sign in using the **User1** account.

Step 2: Configure APP1

APP1 is a virtual machine running on the WNVHOST4 server. APP1 provides web and file sharing services. APP1 configuration consists of the following:

*   •   Install the operating system.

*   •   Configure TCP/IP.

*   •   Join the computer to the domain.

*   •   Install the Web Server (IIS) role.

*   •   Create a shared folder.

Install the operating system on APP1

▶ **To install the operating system on APP1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect APP1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect APP1 to the Contoso_Corpnet virtual switch on WNVHOST4.

Configure TCP/IP properties on APP1

▶ **To configure TCP/IP properties on APP1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click **Ethernet**, and then click **Properties**. Note that the "Ethernet" interface name may be different on your computer.

3. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

4. Select **Use the following IP address**. In **IP address**, type **10.0.0.3**. In **Subnet mask**, type **255.255.255.0**.

5. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **10.0.0.1**.

6. Click **OK**, and then click **Close**. Close the **Network Connections** window.

7. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

8. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

   New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

   New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

9. To check name resolution and network communication between APP1 and DC1, type **ping dc1.corp.contoso.com** in the command prompt window and press ENTER.

10. Verify that there are four replies from 10.0.0.1.

11. Close the Windows PowerShell window.

Join APP1 to the CORP domain

▶**To join APP1 to the CORP domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **APP1**. Under **Member of**, click **Domain**, and then type **corp.contoso.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.contoso.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Install the Web Server (IIS) role on APP1

Next, install the Web Server (IIS) role to make APP1 a web server.

▶**To install the Web Server (IIS) server role**
1. In the **Dashboard** console of Server Manager, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. In the **Select Server Roles** dialog, select **Web Server (IIS)**, and then click **Next**.

4. Click **Next** three times to accept the default Web Server role settings, and then click **Install**.

5. Allow the installation to complete, and then click **Close**.

Create a shared folder on APP1

Next, create a shared folder and a text file within the folder.

▶**To create a shared folder**
1. From the desktop taskbar, click **File Explorer**.

2. Expand **This PC**, and then double-click **Local Disk (C:)**.

3. Right-click in the details pane, point to **New**, and then click **Folder**.

4. Type **Files**, and then press **ENTER**. Leave the **Local Disk** window open.

5. From the Start screen, click the down arrow for the All Apps link, and then type **Notepad**. Right-click **Notepad**, and then click **Run as administrator**.

6. In the **Untitled – Notepad** window, type **This is a shared file**.

7. Click **File**, click **Save**, double-click **This PC**, double-click **Local Disk (C:)**, and then double-click the **Files** folder.

8. In **File name**, type **Example.txt**, and then click **Save**. Close the Notepad window.

9. In the **Local Disk** window, right-click the **Files** folder, point to **Share with**, and then click **Specific people**.

10. Click **Share**, and then click **Done**.

11. Close the **Local Disk** window.

Step 3: Configure EDGE1

EDGE1 is a virtual machine running on the WNVHOST4 server. EDGE1 configuration consists of the following:

- • Install the operating system.

- • Configure TCP/IP.

- • Join the computer to the domain.

EDGE1 must have two network adapters installed. Connect one adapter to the Contoso_Corpnet virtual switch on WNVHOST4, and connect the second adapter to the Internet virtual switch on WNVHOST4.

Install the operating system on EDGE1

First, install Windows Server 2012 R2 as a standalone server.

▶**To install the operating system on EDGE1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying Windows Server 2012 R2 (full installation) and a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect EDGE1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect one network adapter to the Contoso_Corpnet subnet and the other to the Internet subnet.

Configure TCP/IP properties on EDGE1

Configure the TCP/IP protocol with static IP addresses on both interfaces.

▶**To configure TCP/IP properties on the Corpnet adapter**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click the network connection that is connected to the

Corpnet subnet, and then click **Rename**.

3. Type **Corpnet**, and then press **ENTER**.

4. Right-click **Corpnet**, and then click **Properties**.

5. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

6. Select **Use the following IP address**. In **IP address**, type **10.0.0.2**. In **Subnet mask**, type **255.255.255.0**.

7. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **10.0.0.1**.

8. Click **Advanced**, and then the **DNS** tab.

9. In **DNS suffix for this connection**, type **corp.contoso.com**, and then click **OK** three times to close the network properties dialog.

10. In the **Network Connections** window, right-click the network connection that is connected to the Internet subnet, and then click **Rename**.

11. Type **Internet**, and then press **ENTER**.

12. Right-click **Internet**, and then click **Properties**.

13. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

14. Select **Use the following IP address**. In **IP address**, type **131.107.0.2**. In **Subnet mask**, type **255.255.255.0**.

15. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **131.107.0.1**.

16. Click **Advanced**. On the **IP Settings** tab, click **Add** under **IP Addresses**. In the **TCP/IP Address** section, type **131.107.0.3** in **IP address**, type **255.255.255.0** in **Subnet mask**, and then click **Add**.

17. Click the **DNS** tab.

18. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK** three times to close the network properties dialog.

19. Close the **Network Connections** window.

20. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

21. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

    New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

    New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

22. To check name resolution and network communication between EDGE1 and DC1, type

ping dc1.corp.contoso.com in the command prompt window and press ENTER.

23. Verify that there are four responses from 10.0.0.1.

24. Close the Windows PowerShell window.

Join EDGE1 to the CORP domain

▶**To join EDGE1 to the CORP domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **EDGE1**. Under **Member of**, click **Domain**, and then type **corp.contoso.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.contoso.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Step 4: Test access to resources on APP1

Test connectivity to file and web resources on APP1 from DC1 while APP1 is directly connected to the Contoso Corpnet subnet. Later, APP1 will be moved to the simulated hoster datacenter.

▶**To test access to file and web resources on APP1**

1. Sign in to DC1 using the **CORP\User1** domain account.

2. From the desktop taskbar, click the **File Explorer** icon.

3. In the address bar, type **\\app1\Files**, and then press **ENTER**.

4. You should see a folder window with the contents of the Files shared folder.

5. In the **Files** shared folder window, double-click the **Example.txt** file. You should see the contents of the Example.txt file.

6. Close the **Example - Notepad** window.

7. Close File Explorer.

8. In Server Manager, select **Local Server** in the console tree.

9. Under Properties for DC1, next to IE Enhanced Security Configuration, click **On**.

10. Change the IE ESC option to **Off** for Administrators. Click **OK**.

11. Start **Internet Explorer**.

12. In the address bar, type **http://app1.corp.contoso.com** and then press ENTER.

13. Verify that the default Internet Information Services web page is displayed from APP1.

14. Close Internet Explorer.

Steps for Configuring the Fabrikam Corpnet Subnet

The Fabrikam Corpnet subnet is used to simulate a customer on-premises network infrastructure. A cross-premises VPN connection will be established later in order to access the cloud hoster network. There are four steps to setting up the Fabrikam Corpnet subnet on **WNVHOST4**.

1. Configure DC1.

2. Configure APP1.

3. Configure EDGE1.

4. Test access to resources on APP1.

The following sections provide details about how to perform these steps.

Step 1: Configure DC1

DC1 is a virtual machine running on the WNVHOST4 physical server. DC1 provides the following services:

- • A domain controller for the corp.fabrikam.com Active Directory Domain Services (AD DS) domain

- • A DNS server for the corp.fabrikam.com DNS domain

- • A DHCP server for the Fabrikam Corpnet subnet

DC1 configuration consists of the following:

- • Install the operating system
- • Configure TCP/IP
- • Install Active Directory and DNS
- • Install DHCP
- • Create a user account in Active Directory

Install the operating system on DC1

First, install Windows Server 2012 R2 as a standalone server.

▶**To install the operating system on DC1**

1. Start the installation of Windows Server 2012 R2.
2. Follow the instructions to complete the installation, specifying Windows Server 2012 R2 (full installation) and a strong password for the local Administrator account. Log on using the local Administrator account.
3. Connect DC1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.
4. Connect DC1 to the Fabrikam_Corpnet virtual switch on WNVHOST4.

Configure TCP/IP properties on DC1

Next, configure the TCP/IP protocol with a static IP address of 10.0.0.1 and the subnet mask of 255.255.255.0.

▶**To configure TCP/IP on DC1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet**.

2. In **Network Connections**, right-click **Ethernet**, and then click **Properties**.

3. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

4. Select **Use the following IP address**. In **IP address**, type **10.0.0.1**. In **Subnet mask**, type **255.255.255.0**. In **Default gateway**, type **10.0.0.2**. Select **Use the following DNS server addresses. In Preferred DNS server, type 127.0.0.1.**

5. Click **OK** and then close the Ethernet Properties dialog.

6. Close the **Network Connections** window.

7. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

8. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

   New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

   New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

9. Close the Windows PowerShell window.

10. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

11. On the **Computer Name** tab of the System Properties dialog, click **Change**.

12. In **Computer name**, type **DC1**, click **OK** twice, and then click **Close**. When you are prompted to restart the computer, click **Restart Now**.

13. After restarting, login using the local Administrator account.

Configure DC1 as a domain controller and DNS server

Next, configure DC1 as a domain controller and DNS server for the corp.fabrikam.com domain.

▶**To configure DC1 as a domain controller and DNS server**

1. Launch **Server Manager**.
2. On the **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.
3. Click **Next** three times to get to the server role selection screen.
4. In the **Select Server Roles** dialog, select **Active Directory Domain Services**. Click **Add Features** when prompted, and then click **Next**.

5. In the **Select features** dialog, click **Next**.

6. In the **Active Directory Domain Services** dialog, click **Next**.

7. In the **Confirm installation selections** dialog, click **Install.** Wait for the installation to complete.

8. In the **Installation Progress** dialog, click the **Promote this server to a domain controller** link.

   📝 **Note:** If you close the "Installation Progress" dialog before it presents the promotion link, click the gray **Tasks** flag in the upper right section of **Server Manager.** When the installation is complete you will see the **Promote this server to a Domain Controller** link.

9. In the **Deployment Configuration** dialog, select **Add a new forest**. In the **Root domain name** field, type **corp.fabrikam.com**. Click **Next**.

10. In the **Domain Controller Options** dialog, leave the default values, specify a strong DSRM password twice, and then click **Next** four times to accept default settings for DNS, NetBIOS, and directory paths.

11. In the **Review Options** dialog, review your selections and then click **Next**.

    📝 **Note:** You can also click the **View script** button to review and save the PowerShell commands that Server Manager will run during DC Promotion.

12. In the **Prerequisites Check** dialog, allow the validation to complete and verify that no errors are reported. Since this is the first DNS server deployment in the forest, you can safely ignore all warnings regarding DNS delegation. Click **Install** to start the domain controller promotion. Allow the installation to complete.

13. Allow the domain controller to restart. After the server restarts, logon using the CORP\Administrator credentials.

Install and configure DHCP on DC1

Next, configure DC1 as DHCP server so that remote computers can automatically obtain an IP address when establishing site-to-site VPN connections.

▶**To install and configure the DHCP server role on DC1**

1. In the **Dashboard** console of Server Manager, under **Configure this local server**, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. In the **Select server roles** dialog, select **DHCP Server**, click **Add Features** when prompted, and then click **Next**.

4. In the **Select features** dialog, click **Next**.

5. Click **Next** on the DHCP Server screen, and then click **Install**.

6. Allow the installation to complete, and then in the Results window, click the link for **Complete DHCP configuration**.

7. In the DHCP Post-Install configuration wizard, click **Next**, and then click **Commit**.

8. On the Summary page, click **Close**.

9. In the Add Roles and Features Wizard, click **Close**.

10. From the **Tools** menu in Server Manager, click **DHCP**.

11. In the DHCP console tree, expand **dc1.corp.fabrikam.com**, and click **IPv4**. Right-click **IPv4**, and click **New Scope**.

12. Click **Next** in the New Scope Wizard.

13. Type **Corpnet** for scope name, and then click **Next**.

14. Next to **Start IP Address**, type **10.0.0.100**, next to **End IP Address**, type **10.0.0.200**, and next to **Subnet Mask**, type **255.255.255.0**.

15. Click **Next** eight times to accept all scope option default settings, and then click **Finish**.

16. Close the DHCP Manager console.

Create a user account in Active Directory on DC1

Next, create a user account in Active Directory that will be used when logging in to CORP domain member computers.

▶ **To create a user account in Active Directory**

1. From the **Tools** menu in Server Manager, click **Active Directory Administrative Center**.

2. In the console tree, click the arrow to expand **corp (local)**, and then double-click **Users**. This adds Users as a recent navigation link in the console tree.

3. In the **Tasks** pane, click **New**, and then click **User**.

4. In the Create User dialog, type **User1** next to **Full name** and type **User1** next to **User SamAccountName logon: corp**.

5. In **Password**, type the password that you want to use for this account, and in **Confirm password**, type the password again.

6. Under Password options, select **Other password options**, and select **Password never expires**.

7. Scroll down to access the **Member of** section of the Create User dialog, and click **Add**.

Type **Domain Admins; Enterprise Admins**, and then click **OK**.

8. Click **OK** to close the Create User dialog.

9. Exit the Active Directory Administrative Center.

10. Sign out of DC1 as the Administrator user, and then sign in using the **User1** account.

Step 2: Configure APP1

APP1 is a virtual machine running on the WNVHOST4 server. APP1 provides web and file sharing services. APP1 configuration consists of the following:

*   •   Install the operating system.
*   •   Configure TCP/IP.
*   •   Join the computer to the domain.
*   •   Install the Web Server (IIS) role.
*   •   Create a shared folder.

Install the operating system on APP1

▶ **To install the operating system on APP1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect APP1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect APP1 to the Fabrikam_Corpnet virtual switch on WNVHOST4.

Configure TCP/IP properties on APP1

▶**To configure TCP/IP properties on APP1**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click **Ethernet**, and then click **Properties**.

3. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

4. Select **Use the following IP address**. In **IP address**, type **10.0.0.3**. In **Subnet mask**,

type **255.255.255.0**.

5. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **10.0.0.1**.

6. Click **OK**, and then click **Close**. Close the **Network Connections** window.

7. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

8. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

    New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

    New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

9. To check name resolution and network communication between APP1 and DC1, type **ping dc1.corp.fabrikam.com** in the command prompt window and press ENTER.

10. Verify that there are four replies from 10.0.0.1.

11. Close the Windows PowerShell window.

Join APP1 to the CORP domain

▶**To join APP1 to the CORP domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **APP1**. Under **Member of**, click **Domain**, and then type **corp.fabrikam.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.fabrikam.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and

log on to the CORP domain with the **User1** account.

Install the Web Server (IIS) role on APP1

Next, install the Web Server (IIS) role to make APP1 a web server.

▶ **To install the Web Server (IIS) server role**

1. In the **Dashboard** console of Server Manager, click **Add roles and features**.

2. Click **Next** three times to get to the server role selection screen.

3. In the **Select Server Roles** dialog, select **Web Server (IIS)**, and then click **Next**.

4. Click **Next** three times to accept the default Web Server role settings, and then click **Install**.

5. Allow the installation to complete, and then click **Close**.

Create a shared folder on APP1

Next, create a shared folder and a text file within the folder.

▶ **To create a shared folder**

1. From the desktop taskbar, click **File Explorer**.

2. Expand **This PC**, and then double-click **Local Disk (C:)**.

3. Right-click in the details pane, point to **New**, and then click **Folder**.

4. Type **Files**, and then press **ENTER**. Leave the **Local Disk** window open.

5. From the Start screen, click the down arrow for the All Apps link, and then type **Notepad**. Right-click **Notepad**, and then click **Run as administrator**.

6. In the **Untitled – Notepad** window, type **This is a shared file**.

7. Click **File**, click **Save**, double-click **This PC**, double-click **Local Disk (C:)**, and then double-click the **Files** folder.

8. In **File name**, type **Example.txt**, and then click **Save**. Close the Notepad window.

9. In the **Local Disk** window, right-click the **Files** folder, point to **Share with**, and then click **Specific people**.

10. Click **Share**, and then click **Done**.

11. Close the **Local Disk** window.

Step 3: Configure EDGE1

EDGE1 is a virtual machine running on the WNVHOST4 server. EDGE1 configuration consists of the following:

- • Install the operating system.
- • Configure TCP/IP.
- • Join the computer to the domain.

EDGE1 must have two network adapters installed. Connect one adapter to the Fabrikam_Corpnet virtual switch on WNVHOST4, and connect the second adapter to the Internet virtual switch on WNVHOST4.

Install the operating system on EDGE1

First, install Windows Server 2012 R2 as a standalone server.

▶**To install the operating system on EDGE1**

1. Start the installation of Windows Server 2012 R2.

2. Follow the instructions to complete the installation, specifying Windows Server 2012 R2 (full installation) and a strong password for the local Administrator account. Log on using the local Administrator account.

3. Connect EDGE1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012 R2.

4. Connect one network adapter to the Fabrikam_Corpnet virtual switch and the other to the Internet virtual switch on WNVHOST4.

Configure TCP/IP properties on EDGE1

Configure the TCP/IP protocol with static IP addresses on both interfaces.

▶**To configure TCP/IP properties on the Corpnet adapter**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile.

2. In **Network Connections**, right-click the network connection that is connected to the Corpnet subnet, and then click **Rename**.

3. Type **Corpnet**, and then press **ENTER**.

4. Right-click **Corpnet**, and then click **Properties**.

5. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

6. Select **Use the following IP address**. In **IP address**, type **10.0.0.2**. In **Subnet mask**, type **255.255.255.0**.

7. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **10.0.0.1**.

8. Click **Advanced**, and then the **DNS** tab.

9. In **DNS suffix for this connection**, type **corp.fabrikam.com**, and then click **OK** three times to close the network properties dialog.

10. In the **Network Connections** window, right-click the network connection that is connected to the Internet subnet, and then click **Rename**.

11. Type **Internet**, and then press **ENTER**.

12. Right-click **Internet**, and then click **Properties**.

13. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

14. Select **Use the following IP address**. In **IP address**, type **131.107.0.5**. In **Subnet mask**, type **255.255.255.0**.

15. Select **Use the following DNS server addresses**. In **Preferred DNS server**, type **131.107.0.1**.

16. Click **Advanced**. Click the **DNS** tab.

17. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK** three times to close the network properties dialog.

18. Close the **Network Connections** window.

19. From the **Tools** menu in Server Manager, click **Windows PowerShell**.

20. To configure the firewall to allow ICMPv4 ping packets, type the following commands and press ENTER after each command.

    New-NetFirewallRule –DisplayName "Allow ICMPv4-In" –Protocol ICMPv4

    New-NetFirewallRule –DisplayName "Allow ICMPv4-Out" –Protocol ICMPv4 – Direction Outbound

21. To check name resolution and network communication between EDGE1 and DC1, type **ping dc1.corp.fabrikam.com** in the command prompt window and press ENTER.

22. Verify that there are four responses from 10.0.0.1.

23. Close the Windows PowerShell window.

Join EDGE1 to the CORP domain

▶**To join EDGE1 to the CORP domain**

1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile.

2. In the **System Properties** dialog box, click the **Computer Name** tab. On the **Computer Name** tab, click **Change**.

3. In **Computer Name**, type **EDGE1**. Under **Member of**, click **Domain**, and then type **corp.fabrikam.com**.

4. Click **OK**.

5. When you are prompted for a user name and password, type **User1** and its password, and then click **OK**.

6. When you see a dialog box welcoming you to the corp.fabrikam.com domain, click **OK**.

7. When you are prompted that you must restart the computer, click **OK**.

8. On the **System Properties** dialog box, click **Close**.

9. When you are prompted to restart the computer, click **Restart Now**.

10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account.

Step 4: Test access to resources on APP1

Test connectivity to file and web resources on APP1 from DC1 while APP1 is directly connected to the Fabrikam Corpnet subnet. Later, APP1 will be moved to the simulated hoster datacenter.

▶**To test access to file and web resources on APP1**

1. Sign in to DC1 using the **CORP\User1** domain account.

2. From the desktop taskbar, click the **File Explorer** icon.

3. In the address bar, type **\\app1\Files**, and then press **ENTER**.

4. You should see a folder window with the contents of the Files shared folder.

5. In the **Files** shared folder window, double-click the **Example.txt** file. You should see the contents of the Example.txt file.

6. Close the **Example - Notepad** window.

7. Close File Explorer.

8. In Server Manager, select **Local Server** in the console tree.

9. Under Properties for DC1, next to IE Enhanced Security Configuration, click **On**.

10. Change the IE ESC option to **Off** for Administrators. Click **OK**.

11. Launch **Internet Explorer**.

12. In the address bar, type **http://app1.corp.fabrikam.com** and then press ENTER.

13. Verify that the default Internet Information Services web page is displayed from APP1.

14. Close Internet Explorer.

Steps for Installing and Configuring System Center 2012 Virtual Machine Manager R2

There are five steps to installing and configuring System Center 2012 Virtual Machine Manager R2 on the **WNVHOST2** server.

1. Install Windows Assessment and Deployment Kit (ADK) 8.1

2. Install and configure SQL Server 2012.

3. Install and configure System Center 2012 R2 Virtual Machine Manager.

4. Deploy the Microsoft Software Gateway.

5. Install and configure IPAM on WNVHOST2.

Step 1: Install Windows Assessment and Deployment Kit (ADK)

WNVHOST2 is a physical server configured as a Windows Server 2012 R2 Hyper-V host and simulated hoster network corp.adatum.com domain member. The next step is to install Windows Assessment and Deployment Kit (ADK) on WNVHOST2 in preparation for installation of System Center 2012 Virtual Machine Manager R2. Windows ADK is available at the [Microsoft Download Center](#). If WNVHOST2 has Internet access, you can run the installation using ADKSetup.exe. ADK Setup downloads installation packages from the Internet while it runs. If WNVHOST2 does not have Internet access, copy the offline installation package to WNVHOST2. For instruction on installing Windows ADK on an offline computer, see the Appendix of this document.

Install Windows Assessment and Deployment Kit (ADK) on WNVHOST2

▶**To install the Windows ADK on WNVHOST2**
1. Right-click **ADKSetup.exe**, and then click **Run as administrator**.

2. Click **Install the Assessment and Deployment Kit to this computer**, specify the location where you want to install the Windows ADK features, and then click **Next**.

3. On the CEIP screen, click **Next**.

4. Click **Accept** to accept the license agreement.

5. On the feature selection screen, select **Deployment Tools** and **Windows Preinstallation Environment (Windows PE)**. Click **Install**.

6. Wait for the installation to complete, and then click **Close**.

Step 2: Install and configure SQL Server 2012

The next step is to install SQL Server 2012 on WNVHOST2 in preparation for installation of System Center Virtual Machine Manager.

Install SQL Server 2012 on WNVHOST2

▶**To install SQL Server 2012 on WNVHOST2**
1. Insert the SQL Server installation media. From the root folder, double-click **Setup.exe**. To install from a network share, locate the root folder on the share, and then double-click **Setup.exe**.

2. The Installation Wizard runs the SQL Server Installation Center. To create a new installation of SQL Server, click **Installation** in the left-hand navigation area, and then click **New SQL Server stand-alone installation or add features to an existing installation**.

3. The System Configuration Checker runs a discovery operation. To continue, click **OK**. You can view the details on the screen by clicking **Show Details**, or as an HTML report by clicking **View detailed report**.

4. On the Product Key page, select an option to indicate whether you are installing a free edition of SQL Server, or a production version of the product that has a PID key.

5. To continue, click **Next**.

6. On the License Terms page, review the license agreement, select the **I accept the license terms** check box, and then click **Next**. To help improve SQL Server, you can also enable the feature usage option and send reports to Microsoft.

7. On the Product Updates page, the latest available SQL Server product updates are

displayed. If you don't want to include the updates, clear the **Include SQL Server product updates** check box. If no product updates are discovered, SQL Server Setup does not display this page and auto advances to the Install Setup Files page.

8. On the Install Setup files page, Setup provides the progress of downloading, extracting, and installing the Setup files. If an update for SQL Server Setup is found, and is specified to be included, that update will also be installed.

9. On the Setup Support Rules page, click **Next**.

10. On the Setup Role page, select **SQL Server Feature Installation**, and then click **Next**.

11. On the Feature Selection page, under Instance Features, select **Database Engine Services**. Click **Next** to continue.

12. On the Installation Rules page, Setup verifies the system state of your computer before Setup continues. Click **Next** to continue.

13. On the Instance Configuration page, specify **Default instance**. Click **Next** to continue.

14. Click **Next** on the Disk Space Requirements page.

15. On the Server Configuration page, click **Next**.

16. On the Server Configuration tab of the Database Engine Configuration page, click **Add Current User** to specify a SQL Server administrator, and then click **Next**.

17. On the Error Reporting page, specify the information that you want to send to Microsoft that will help improve SQL Server. Click **Next**.

18. The System Configuration Checker will run a set of rules to validate your computer configuration with the SQL Server features that you have specified. Click **Next**.

19. The Ready to Install page shows a tree view of installation options that were specified during Setup. On this page, Setup indicates whether the Product Update feature is enabled or disabled and the final update version. To continue, click **Install**. SQL Server Setup will first install the required prerequisites for the selected features followed by the feature installation.

20. During installation, the Installation Progress page provides status so that you can monitor installation progress as Setup continues.

21. After installation, the Complete page provides a link to the summary log file for the installation and other important notes. To complete the SQL Server installation process, click **Close**.

Step 3: Install and configure System Center 2012 R2 Virtual Machine Manager

Install System Center Virtual Machine Manager on WNVHOST2

WNVHOST2 configuration consists of the following:

- Install System Center 2012 R2 Virtual Machine Manager.

- Configure System Center VMM.

▶ **To install System Center Virtual Machine Manager on WNVHOST2**

1. To start the Virtual Machine Manager Setup Wizard, on your installation media, right-click **setup.exe**, and then click **Run as administrator**.

   📝 **Note**

   > Before beginning the installation of VMM, close any open programs and ensure that there are no pending restarts on the computer. For example, if you have installed a server role by using Server Manager or have applied a security update, you may need to restart the computer and then log on to the computer with the same user account to finish the installation of the server role or the security update.

2. On the main setup page, click **Install**.

3. If you have not installed Microsoft .NET Framework, VMM will prompt you to install now.

4. On the **Select features to install** page, select the **VMM management server** check box, and then click **Next**.

   📝 **Note**

   > The VMM console is automatically installed when you install a VMM management server.

5. On the **Product registration information** page, provide the appropriate information, and then click **Next**.

6. On the **Please read this license agreement** page, review the license agreement, select the **I have read, understood, and agree with the terms of the license agreement** check box, and then click **Next**.

7. On the **Join the Customer Experience Improvement Program (CEIP)** page, select either option and then click **Next**.

8. On the **Microsoft Update** page, select whether to deliver VMM updates automatically, and then click **Next**.

9. On the **Installation location** page, use the default path or type a different installation

path for the VMM program files, and then click **Next**.

10. The computer on which you are installing the VMM management server will be checked to ensure that the appropriate hardware and software requirements are met. If a prerequisite is not met, a page will appear with information about which prerequisite has not been met and how to resolve the issue. If all prerequisites have been met, the **Database configuration** page appears.

11. On the **Database configuration** page, do the following:

   Specify **WNVHOST2** as the server name.

   Leave the **Port** box empty.

   Select **New database**, and accept the default name **VirtualManagerDB**.

   Click **Next**.

12. On the **Configure service account and distributed key management** page, select **Local System account**. Click **Next**.

13. On the **Port configuration** page, use the default port numbers, and then click **Next**.

   ◆ **Important**

   > The ports that you assign during the installation of a VMM management server cannot be changed without uninstalling and reinstalling the VMM management server.

14. On the **Library configuration** page, ensure that **Create a new library share** is selected, and then click **Next**.

   📝 **Note**

   > The default library share created by VMM is named **MSSCVMMLibrary** and the folder is located at **%SYSTEMDRIVE%\ProgramData\Virtual Machine Manager Library Files**. **ProgramData** is a hidden folder.
   >
   > After the VMM management server is installed, you can add library shares and additional library servers by using the VMM console or by using the VMM command shell.

15. On the **Installation summary** page, review your selections and then click **Install** to install the VMM management server.

16. After you click **Install**, the **Installing features** page appears and installation progress is displayed. On the **Setup completed successfully** page, click **Close** to finish the installation.

17. To open the VMM console, ensure that the **Open the VMM console when this wizard closes** check box is selected.

   📝 **Note**

   > If there is a problem with setup completing successfully, consult the log files in the

%SYSTEMDRIVE%\ProgramData\VMMLogs folder. **ProgramData** is a hidden folder**.**

Configure System Center Virtual Machine Manager on WNVHOST2

WNVHOST2 is a physical server configured as a Windows Server 2012 R2 Hyper-V host, SQL server, and System Center 2012 R2 Virtual Machine Manager, connected to a shared physical switch used to simulate a hoster datacenter connection (Hosternet). Configuration of System Center 2012 R2 VMM on WNVHOST2 consists of the following:

- Add WNVHOST1, WNVHOST2 and WNVHOST3 as VMM Hosts

- Define the Management logical network

- Create an IP pool associated with the Management logical network

- Define the Internet logical network

- Define the Back End (NetVirt) logical network

- Create an IP pool associated with the Back End (NetVirt) logical network

- Assign logical networks to the VMM host servers

- Define VM networks for Management and Internet

First, add the evaluation Hyper-V host servers as VMM hosts, so that they can host tenant VMs using network virtualization.

▶**To add WNVHOST1, WNVHOST2 and WNVHOST3 as VMM Hosts**
1. From the desktop shortcut on WNVHOST2, click **Virtual Machine Manager Console**.

2. Click **Connect**.

3. Open the **Fabric** workspace.

4. In the **Fabric** pane, expand **Servers,** and then select **All Hosts.**

5. On the **Home** tab, in the **Add** group, click **Add Resources**, and then click **Hyper-V Hosts and Clusters**. The Add Resource Wizard starts.

6. On the **Resource location** page, click **Windows Server computers in a trusted Active Directory domain**, and then click **Next**.

7. On the **Credentials** page, next to **Run As account**, click **Browse**.

8. In the **Select a Run As Account** dialog, click **Create Run As Account**. Next to name, type **Adatum User1**. Next to User name, type **CORP\User1**. Type the password for User1, and then confirm the password. Click **OK**.

9. In the **Select a Run As Account** dialog, select **Adatum User1**, and then click **OK**.

10. On the **Credentials** page, click **Next**.

11. On the **Discovery Scope** page, click **Specify Windows Server computers by names**. In the **Computer names** box, enter **WNVHOST1**, **WNVHOST2**, and **WNVHOST3**. Type each server name on its own line in the entry window. Select the checkbox for **Skip AD verification** and then click **Next**.

12. On the **Target resources** page, click **Select all** to select **WNVHOST1.corp.adatum.com**, **WNVHOST2.corp.adatum.com**, and **WNVHOST3.corp.adatum.com**, and then click **Next**. Click **OK** in the resultant dialog prompt.

13. On the Host settings page, click **Next**.

14. On the **Summary** page, confirm the settings, and then click **Finish**.

15. The **Jobs** dialog box appears to show the job status. Make sure that the job has a status of **Completed w/ Info**, and then close the dialog box.

16. To verify that the host servers were successfully added, in the **Fabric** pane, select **All Hosts**, and then in the **Hosts** pane, verify that the host status for each server is listed as **OK**.

▶**To define the Management logical network**

1. In the **Fabric** pane, expand **Networking**, and then click **Logical Networks**. Logical networks represent an abstraction of the underlying physical network infrastructure. By default, when you add a Hyper-V host to VMM management, VMM automatically creates logical networks that match the first DNS suffix label of the connection-specific DNS suffix on each host network adapter. Since we added connection-specific DNS suffixes to the host adapters, they are easily identified in this interface.

2. In the Logical Networks detail pane, right-click the logical network named **corp**, and then click **Properties**.

3. Change the **Name** value to **Management**. Click **Network Site**. Under Network sites, click **Add**.

4. Under **Host groups that can use this network site**, select **All Hosts**.

5. Under **Associated VLANs and IP subnets**, click **Insert row**. Type **192.168.0.0/24** under IP subnet. Click **OK**.

▶**To create an IP pool for the Management logical network**

1. In the **Fabric** pane, expand **Networking**, and then click **Logical Networks**.

2. Right-click **Management**, and then click **Create IP Pool**.

3. The **Create Static IP Address Pool Wizard** opens.

4. On the **Name** page, enter **Management IP Pool** as the name. Click **Next**.

5. In the Network Site page, verify that **Use an existing network site** is selected, and that Management_0 is selected with IP subnet 192.168.0.0/24.

6. Click **Next**.

7. On the IP address range page, change the Starting IP address **to 192.168.0.100**. Change Ending IP address to **192.168.0.200**. Click **Next**.

8. On the Gateway page, click **Next**.

9. On the DNS page, click **Next**.

10. On the WINS page, click **Next**.

11. On the Summary page, click **Finish**.

▶ **To define the Internet logical network**

1. In the Logical Networks detail pane, right-click the logical network named **isp**, and then click **Properties**.

2. Change the **Name** value to **Internet**. Next to Description, type **External Networks**.

3. Click **Network Site**. Under Network sites, click **Add**.

4. Under **Host groups that can use this network site**, select **All Hosts**.

5. Under **Associated VLANs and IP subnets**, click **Insert row**. Type **131.107.0.0/24** under IP subnet. Click **OK**.

▶ **To define the Back End (NetVirt) logical network**

1. Right-click **Logical Networks**, and then click **Create Logical Network**. The Create Logical Network wizard launches.

2. Next to **Name**, type **Back End (NetVirt)**. Next to Description, type **Tenant Networks**. Select the checkbox box **Allow new VM networks created on this logical network to use network virtualization**.

3. Click **Next**. Under Network sites, click **Add**.

4. Under **Host groups that can use this network site**, select **All Hosts**.

5. Under **Associated VLANs and IP subnets**, click **Insert row**. Type **172.16.1.0/24** under IP subnet. Click **Next**.

6. On the Summary page, click **Finish**.

▶**To create an IP pool for the Back End (NetVirt) logical network**

1. In the **Fabric** pane, expand **Networking**, and then click **Logical Networks**.

2. Right-click **Back End (NetVirt)**, and then click **Create IP Pool**.

3. The **Create Static IP Address Pool Wizard** opens.

4. On the **Name** page, enter **NetVirt IP Pool** as the name. Click **Next**.

5. In the Network Site page, verify that **Use an existing network site** is selected, and that **Back End (NetVirt)_0** is selected with IP subnet **172.16.1.0/24**.

6. Click **Next**.

7. On the IP address range page, change the Starting IP address **to 172.16.1.100**. Change Ending IP address to **172.16.1.200**. Click **Next**.

8. On the Gateway page, click **Next**.

9. On the DNS page, click **Next**.

10. On the WINS page, click **Next**.

11. On the Summary page, click **Finish**.

▶**To assign logical networks to the VMM host servers**

1. Open the **Fabric** workspace.

2. In the **Fabric** pane, expand **Servers,** and then select **All Hosts.**

3. Right-click **WNVHOST3** in the details pane, and then click **Properties**.

4. Click **Hardware**, and then scroll to the **Network Adapters** section.

5. Under the **Internet** network adapter, click **Logical network connectivity**. Select the **Internet** logical network and the **131.107.0.0/24** network subnet.

6. Under the **Hosternet** network adapter, click **Logical network connectivity**. Select both the **Back End (NetVirt)** subnet on **172.16.1.0/24** and the **Management** subnet on **192.168.0.0/24**.

7. Click **OK** to close the WNVHOST3 Properties dialog.

8. Right-click **WNVHOST2**, and then click **Properties**.

9. Click **Hardware**, and then scroll to the **Network Adapters** section.

10. Under the **Hosternet** network adapter, click **Logical network connectivity**. Select both the **Back End (NetVirt)** subnet on **172.16.1.0/24** and the **Management** subnet on **192.168.0.0/24**.

11. Click **OK** to close the WNVHOST2 Properties dialog.

12. Right-click **WNVHOST1**, and then click **Properties**.

13. Click **Hardware**, and then scroll to the **Network Adapters** section.

14. Under the **Hosternet** network adapter, click **Logical network connectivity**. Select both the **Back End (NetVirt)** subnet on **172.16.1.0/24** and the **Management** subnet on **192.168.0.0/24**.

15. Click **OK** to close the WNVHOST1 Properties dialog.

▶**To define VM networks for Management and Internet**

1. Open the **VMs and Services** workspace.

2. Under VMs and Services, select **VM Networks.**

3. Right-click the VM Network named **corp,** and then click **Properties.**

4. On the **Name** page, change the name to **Management**, and then in the **Logical network** list, select **Management**. Click **OK**.

5. Right-click the VM Network named **isp,** and then click **Properties.**

6. On the **Name** page, change the name to **Internet**, and then in the **Logical network** list, select **Internet**. Click **OK**.

Step 4: Install and configure the Microsoft Software Gateway on WNVHOST2

Windows Server 2012 R2 includes a new inbox network virtualization gateway provider that integrates with System Center 2012 R2 VMM. The Microsoft Software Gateway configuration consists of the following:

- Configure the WNVHOST3 server as a dedicated gateway host

- Install the gateway as a VMM Network Service

- Create tenant VM Networks

- Create IP Pools for the VM Networks

Configure the WNVHOST3 server as a dedicated gateway host

▶**To add WNVHOST3 as a dedicated gateway host**

1. In Virtual Machine Manager Console, on the **Home** tab, in the **Window** group, click **PowerShell**. A VMM PowerShell console launches.

2. Type the following command and then press ENTER to configure the WNVHOST3 Hyper-V server as a dedicated gateway host in VMM.

    set-scvmhost -VMHost wnvhost3.corp.adatum.com -IsDedicatedToWNVGateway $true

Install the gateway as a network service

▶**To add the Microsoft Software Gateway Provider**

1. In Virtual Machine Manager Console on WNVHOST2, open the **Fabric** workspace.

2. In the **Fabric** pane, expand **Networking**, and then select **Network Service**.

3. Right-click **Network Service**, and then click **Add Network Service**. The Add Network Service Wizard launches.

4. In Name, type **Gateway1**, and then click **Next**.

5. On the Manufacturer and Model page, select **Microsoft** as the Manufacturer and **Microsoft Windows Server Gateway** as the Model, and then click **Next**.

6. On the Credentials page, click **Browse**. Select the **Adatum User1** account, and then click **OK**. Click **Next**.

7. On the Connection String page, type **VMHost=wnvhost3.corp.adatum.com;RRASServer=GatewayVM1.corp.adatum.com** and then click **Next**.

8. On the Certificates page, click **Next**.

9. On the Provider page, click **Test**.

10. Verify that no failures are recorded, and then click **Next**.

11. On the Host Group page, select **All Hosts**, and then click **Next**.

12. On the Summary page, click **Finish**. Wait for the Jobs dialog to display the Add network service device status as **Completed**. Close the Jobs dialog.

13. In the **Fabric** pane, select **Network Service**.

14. Verify that Gateway1 is listed in the details pane. Right-click **Gateway1**, and then click

Properties.

15. Click **Connectivity** in the console tree.

16. Select **Enable front end connection**. Next to **Front end network adapter**, select **Internet**. Next to **Front end network site**, select **Internet_0**.

17. Select **Enable back end connection**. Next to **Back end network adapter**, select **Back End**. Next to **Back end network site**, select **Back End (NetVirt)_0**.

18. Click **OK** to close the Gateway1 Properties dialog.

19. Switch to the **Jobs** workspace and wait for the **Add gateway connection for Network gateway** job to complete.

Create Tenant VM Networks

▶**To create tenant VM networks on the Back End (NetVirt) logical network**

First, create a tenant VM network for the Contoso tenant hosted resources.

1. Open the **VMs and Services** workspace.

2. In the **VMs and Services** pane, click **VM Networks**.

3. On the **Home** tab, in the **Create** group, click **Create VM Network**.

4. The **Create VM Network Wizard** opens.

5. On the **Name** page, enter **Contoso VM Network**, and then in the **Logical network** list, select **Back End (NetVirt)**. Click **Next**.

6. On the **Isolation** page, select **Isolate using Hyper-V network virtualization**, and then click **Next**.

7. On the **VM Subnets** page, click **Add**, enter **Contoso VM Subnet** as the name for the IP subnet and specify the subnet by using CIDR notation **10.0.1.0/24**. Click **Next**.

8. On the Connectivity page, select **Connect to another network through a VPN tunnel**, and select **Connect directly to an additional logical network** using **Direct routing**. Verify that **Gateway1** is selected as the Gateway device, and then click **Next**.

9. On the VPN Connections page, next to Subnet, type **10.254.254.0/29**. Under **Specify VPN connections**, click **Add**.

10. Next to **Name**, type **Contoso VPN Connection**.

11. Next to **Remote endpoint**, type **131.107.0.2**.

12. Click **Authentication**. Select **Authenticate using the following credentials**, and then click

Browse.

13. In the Select a Run As account dialog, click **Create Run As Account**.

14. In the Create Run As Account dialog, Next to Name, type **Contoso User1 Account**. Next to User name, type **User1@corp.contoso.com**, and then type and confirm the password for User1. Clear the checkbox for **Validate domain credentials**, and then click **OK**.

15. In the Select a Run As account dialog, verify that **Contoso User1 Account** is selected, and click **OK**.

16. Click **Routes**, and then click **Add**. Type **10.0.0.0/24**, under **Subnet**, and then click **Next**.

17. On the **Summary** page, click **Finish**.

18. The **Jobs** dialog box appears to show the job status. Make sure that the job has a status of **Completed**, and then close the dialog box.

Next, create a tenant VM network for the Fabrikam tenant hosted resources.

1. In the **VMs and Services** pane, click **VM Networks**.

2. On the **Home** tab, in the **Create** group, click **Create VM Network**.

3. The **Create VM Network Wizard** opens.

4. On the **Name** page, enter **Fabrikam VM Network**, and then in the **Logical network** list, select **Back End (NetVirt)**. Click **Next**.

5. On the **Isolation** page, select **Isolate using Hyper-V network virtualization**, and then click **Next**.

6. On the **VM Subnets** page, click **Add**, enter **Fabrikam VM Subnet** as the name for the IP subnet and specify the subnet by using CIDR notation **10.0.1.0/24**. Click **Next**.

7. On the Connectivity page, select **Connect to another network through a VPN tunnel**, and select **Connect directly to an additional logical network**. Verify that **Gateway1** is selected, and then click **Next**.

8. On the VPN Connections page, next to Subnet, type **10.254.254.0/29**. Under **Specify VPN connections**, click **Add**.

9. Next to **Name**, type **Fabrikam VPN Connection**.

10. Next to **Remote endpoint**, type **131.107.0.5**.

11. Click **Authentication**. Select **Authenticate using the following credentials**, and then click **Browse**.

12. In the Select a Run As account dialog, click **Create Run As Account**.

13. In the Create Run As Account dialog, Next to Name, type **Fabrikam User1 Account**. Next to User name, type **User1@corp.fabrikam.com**, and then type and confirm the password for User1. Clear the checkbox for **Validate domain credentials**, and then click **OK**.

14. In the Select a Run As account dialog, verify that **Fabrikam User1 Account** is selected, and click **OK**.

15. Click **Routes**, and then click **Add**. Type **10.0.0.0/24**, and then click **Next**.

16. On the **Summary** page, click **Finish**.

17. The **Jobs** dialog box appears to show the job status. Make sure that the job has a status of **Completed**, and then close the dialog box.

18. Verify that the VM networks **Contoso VM Network** and **Fabrikam VM Network** appear in the **VM Networks and IP Pools** pane.

Create IP Pools for the VM Networks

▶**To create IP pools associated with the VM networks**

1. Open the **VMs and Services** workspace.

2. On the **Home** tab, in the **Show** group, click **VM Networks**.

3. Right-click **Contoso VM Network**, and then click **Create IP Pool**.

4. The Create IP Pool Wizard opens.

5. In Name, type **Contoso IP Pool**. Select **Contoso VM Network** and **Contoso VM Subnet (10.0.1.0/24)**. Click **Next**.

6. On the IP address range page, change Starting IP address to **10.0.1.100**, change Ending IP address to **10.0.1.200**, and then click **Next**.

7. On the Gateway page, click **Next**.

8. On the DNS page, next to DNS server address, click **Insert**. Type a DNS Server address of **10.0.0.1**. Next to DNS suffix, click **Insert**. Type a DNS suffix of **corp.contoso.com**. Click **Next**.

9. On the WINS server page, click **Next**.

10. On the Summary page, click **Finish**.

11. The **Jobs** dialog box appears to show the job status. Make sure that the job has a status of **Completed**, and then close the dialog box.

12. Right-click **Fabrikam VM Network**, and then click **Create IP Pool**.

13. The Create IP Pool Wizard opens.

14. In Name, type **Fabrikam IP Pool**. Select **Fabrikam VM Network** and **Fabrikam VM Subnet (10.0.1.0/24)**. Click **Next**.

15. On the IP address range page, change Starting IP address to **10.0.1.100**, change Ending IP address to **10.0.1.200**, and then click **Next**.

16. On the Gateway page, click **Next**.

17. On the DNS page, next to DNS server address, click **Insert**. Type a DNS Server address of **10.0.0.1**. Next to DNS suffix, click **Insert**. Type a DNS suffix of **corp.fabrikam.com**. Click **Next**.

18. On the WINS server page, click **Next**.

19. On the Summary page, click **Finish**.

20. The **Jobs** dialog box appears to show the job status. Make sure that the job has a status of **Completed**, and then close the dialog box.

21. Verify that the VM networks **Contoso VM Network** and **Fabrikam VM Network** appear in the **VM Networks and IP Pools** pane with associated IP pools of 10.0.1.0/24.

Step 5: Install and configure IPAM on WNVHOST2

Windows Server 2012 R2 IPAM provides virtualized address space management through a VMM plugin. Install and deploy the IPAM feature on WNVHOST2 so that it can interact with the VMM installation. IPAM configuration on WNVHOST2 consists of the following steps.

- Install the IPAM feature

- Deploy IP Address Management on WNVHOST2

- Deploy the IPAM VMM plugin

- Access the virtualized address space in IPAM

Install the IPAM feature

▶**To install the IPAM feature on WNVHOST2**

1. On WNVHOST2, in the **Dashboard** console of Server Manager, click **Add roles and features**.

2. Click **Next** four times to get to the **Features** selection screen.

3. In the Select features dialog, select **IP Address Management (IPAM) Server**, click **Add**

Features when prompted, and then click **Next**.

4. On the Confirmation screen, select Restart the destination server automatically if required, and then click **Install**.

5. Allow the installation to complete, and then click **Close**.

Deploy IP Address Management

Use the Automated Deployment method to deploy IP Address Management on WNVHOST2.

▶**To deploy IPAM**

1. On the Server Manager menu, click **Tools** and then click **Windows PowerShell**.

2. Type the following command at the Windows PowerShell prompt, and then press ENTER.

   Invoke-IpamGpoProvisioning -Domain corp.adatum.com -GpoPrefixName IPAMGPO -DelegatedGpoUser User1 -IpamServerFqdn wnvhost2.corp.adatum.com -Force

3. In Server Manager on WNVHOST2, click **IPAM** in the console tree.

4. Verify that you are connected to **WNVHOST2.corp.adatum.com**.

5. Click **Provision the IPAM server**.

6. In the Provision IPAM wizard, click **Next**.

7. On the Configure database screen, leave **Windows Internal Database** selected, and click **Next**.

8. On the Select provisioning method screen, select **Group Policy Based**, and next to GPO name prefix, type **IPAMGPO**. Click **Next**.

9. On the Summary screen, click **Apply**.

10. In the **Completion** dialog box, confirm that IPAM provisioning completed successfully, and then click **Close**.

11. Under IPAM Server Tasks, click **Configure server discovery**.

12. In the Configure Discovery Settings wizard, next to **(root domain) corp.adatum.com**, click **Add**.

13. Click **OK** to apply the discovery scope.

14. Under IPAM Server Tasks, click **Start server discovery**.

15. Click **Server Inventory** in the console tree. When the discovery process completes, the console should show WNVHOST1 as a discovered server. Note that Manageability

Status is displayed as Unspecified, and IPAM access status is Blocked. In order to apply the GPO setting configured previously, you must set manageability status for the server.

16. Right-click the entry for **WNVHOST1**, and click **Edit Server**.

17. In the Add or Edit Server dialog, change Manageability status to **Managed**. Click **OK**.

18. The IPAM settings will be applied the next time group policy is applied to WNVHOST1. To speed up this process, you can switch to WNVHOST1 and run gpupdate or restart the server.

19. After updating policy on WNVHOST1, right-click **WNVHOST1** in the IPAM Server Inventory console, and then click **Refresh Server Access Status**.

20. Once IPAM Access Status shows as **Unblocked**, right-click the WNVHOST1 entry and click **Retrieve All Server Data**.

Deploy the IPAM VMM plugin

IPAM integration with System Center 2012 R2 VMM is enabled as a network service. Configure the IPAM network service on WNVHOST2.

▶ **To configure the IPAM VMM plugin on WNVHOST2**

1. In Virtual Machine Manager Console on WNVHOST2, open the **Fabric** workspace.

2. In the **Fabric** pane, expand **Networking**, and then select **Network Service**.

3. Right-click **Network Service**, and then click **Add Network Service**. The Add Network Service Wizard launches.

4. In Name, type **IPAM**, and then click **Next**.

5. On the Manufacturer and Model page, select **Microsoft** as the Manufacturer and **Microsoft Windows Server IP Address Management** as the Model, and then click **Next**.

6. On the Credentials page, click **Browse**. Select the **Adatum User1** account, and then click **OK**.

7. Click **Next**.

8. On the Connection String page, type **WNVHOST2.corp.adatum.com**, and then click **Next**.

9. On the Provider page, click **Test**. In the test results pane, verify that Connection API, Capability discovery API, and Retrieve system info API are shown as Implemented, and that no tests failed. Click **Next**.

10. On the Host Group page, select **All Hosts**, and then click **Next**.

11. On the Summary page, click **Finish**.

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

Access the virtualized address space in IPAM

▶**To use IPAM to view the virtualized address space**
1. In Server Manager on WNVHOST2, click **IPAM** in the console tree.

2. In the IPAM console, click **Virtualized IP Address Space**.

3. Examine the IP address ranges for the virtualized address space. These address ranges were automatically imported to the IPAM database from VMM.

Steps for Implementing and Testing Windows Network Virtualization

There are four steps to implementing and testing Windows Network Virtualization in the System Center 2012 Virtual Machine Manager R2 evaluation.

1. Establish site-to-site VPN connections between the simulated customer on-premise environments running on WNVHOST4 and the Network Virtualization Gateway running on WNVHOST3.

2. Deploy tenant virtual machines to a VMM host to leverage Windows Network Virtualization and cross-premises VPN connectivity.

Step 1: Establish site-to-site VPN connections

In this step, you will install and configure RRAS on the EDGE1 servers for both Contoso and Fabrikam. These servers will be used to establish cross-premise VPN connections to make hosted cloud resources available to the on-premise customer corpnet environments.

Install RRAS on Contoso EDGE1 and create a site-to-site VPN connection to GatewayVM1 running on WNVHOST3

▶**To install RRAS on EDGE1**
1. On the WNVHOST4 server, connect to the **Contoso EDGE1** virtual machine.

2. Sign in as CORP\User1.

3. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

4. Click **Next** three times to get to the server role selection screen.

5. On the **Select Server Roles** page, select **Remote Access** and then click **Next**.

6. On the Features selection screen, click **Next**.

7. On the Remote Access screen, click **Next**.

8. On the Role Services selection screen, click to select **the DirectAccess and VPN (RAS)** and the **Routing** role services. Click **Add Features** when prompted, and then click **Next**.

9. Click **Next** twice to accept the default settings for Web Server Role and Role Services, and then click **Install**.

10. Verify that the installation was successful, and then click **Close**.

▶**To establish a site-to-site VPN connection between EDGE1 and WNVHOST3**

1. On the **Contoso EDGE1** server running on **WNVHOST4**, click **Start**, and then click **Routing and Remote Access**.

2. In Routing and Remote Access, right-click **EDGE1 (local)** in the console tree, and then click **Configure and Enable Routing and Remote Access**.

3. The **Routing and Remote Access Server Setup Wizard** appears. Click **Next**.

4. On the **Configuration** page, select **Secure connection between two private networks. Connect this network to a remote network such as a branch office**, and then click **Next**.

5. On the **Demand-Dial Connections** page, verify that **Yes** is selected, and then click **Next**.

6. On the **IP Address Assignment** page, select **Automatically**. Click **Next**.

7. Click **Finish**.

8. The Demand-Dial Interface Wizard will start. Click **Next**.

9. On the **Interface Name** page, type **GatewayVM**. Click **Next**.

10. On the **Connection Type** page, select **Connect using virtual private networking (VPN)**. Click **Next**.

11. On the **VPN Type** page, select **IKEv2**. Click **Next**.

12. On the Destination Address page, type **131.107.0.15**, and then click **Next**.

13. On the Protocols and Security page, select **Route IP packets on this interface**. Click **Next**.

14. On the Static Routes for Remote Networks page, click **Add**. In Destination, type **10.0.1.0**. In Network Mask, type **255.255.255.0**. In Metric, type **1**. Click **OK**, and then click **Next**.

15. On the Dial-Out Credentials page, click **Next**.

16. On the Completing the Demand-Dial Interface Wizard page, click **Finish**.

17. In the Routing and Remote Access console, click **Network Interfaces**.

18. Right-click the **GatewayVM** demand dial interface listed in the details pane, and then click **Properties**.

19. Select the **Security** tab, and then under **Authentication**, select **Use preshared key for authentication.** Type your administrator password next to Key (this is the administrator password used for the CORP\User1 account).

20. Under **Data encryption**, change the option to **No encryption allowed (server will disconnect if it requires encryption)**. Click **OK**.

21. Right-click the **GatewayVM** demand dial interface, and click **Connect**. Verify that Connection State is listed as **Connected**.

Install RRAS on Fabrikam EDGE1 and create a site-to-site VPN connection to WNVHOST3

▶ **To install RRAS on EDGE1**

1. On the WNVHOST4 server, connect to the **Fabrikam EDGE1** virtual machine.

2. Sign in as CORP\User1.

3. On the Server Manager **Dashboard** screen, under **Configure this local server**, click **Add roles and features**.

4. Click **Next** three times to get to the server role selection screen.

5. On the **Select Server Roles** page, select **Remote Access** and then click **Next**.

6. On the Features selection screen, click **Next**.

7. On the Remote Access screen, click **Next**.

8. On the Role Services selection screen, click to select **the DirectAccess and VPN (RAS)** and the **Routing** role services. Click **Add Features** when prompted, and then click **Next**.

9. Click **Next** twice to accept the default settings for Web Server Role and Role Services, and then click **Install**.

10. Verify that the installation was successful, and then click **Close**.

▶**To establish a site-to-site VPN connection between EDGE1 and WNVHOST3**

1. On the **Fabrikam EDGE1** server running on **WNVHOST4**, click **Start**, and then click **Routing and Remote Access**.

2. In Routing and Remote Access, right-click **EDGE1 (local)** in the console tree, and then click **Configure and Enable Routing and Remote Access**.

3. The **Routing and Remote Access Server Setup Wizard** appears. Click **Next**.

4. On the **Configuration** page, select **Secure connection between two private networks. Connect this network to a remote network such as a branch office**, and then click **Next**.

5. On the **Demand-Dial Connections** page, verify that **Yes** is selected, and then click **Next**.

6. On the **IP Address Assignment** page, select **Automatically**. Click **Next**.

7. Click **Finish**.

8. The Demand-Dial Interface Wizard will start. Click **Next**.

9. On the **Interface Name** page, type **GatewayVM**. Click **Next**.

10. On the **Connection Type** page, select **Connect using virtual private networking (VPN)**. Click **Next**.

11. On the **VPN Type** page, select **IKEv2**. Click **Next**.

12. On the Destination Address page, type **131.107.0.15**, and then click **Next**.

13. On the Protocols and Security page, select **Route IP packets on this interface**. Click **Next**.

14. On the Static Routes for Remote Networks page, click **Add**. In Destination, type **10.0.1.0**. In Network Mask, type **255.255.255.0**. In Metric, type **1**. Click **OK**, and then click **Next**.

15. On the Dial-Out Credentials page, click **Next**.

16. On the Completing the Demand-Dial Interface Wizard page, click **Finish**.

17. In the Routing and Remote Access console, click **Network Interfaces**.

18. Right-click the **GatewayVM** demand dial interface listed in the details pane, and then click **Properties**.

19. Select the **Security** tab, and then under **Authentication**, select **Use preshared key for authentication.** Type your administrator password next to Key (this is the administrator password used for the CORP\User1 account).

20. Under **Data encryption**, change the option to **No encryption allowed (server will disconnect if it requires encryption)**. Click **OK**.

21. Right-click the **GatewayVM** demand dial interface, and click **Connect**. Verify that

Connection State is listed as **Connected**.

View the site-to-site VPN connections on GatewayVM1

After you configure GatewayVM1 as a multitenant S2S VPN server using VMM, it cannot be managed from the RRAS user interface on GatewayVM1. You can use the following Windows PowerShell commands to display the RRAS configuration.

▶**To view the S2S VPN connections on GatewayVM1**
1. On the WNVHOST3 server, connect to the **GatewayVM1** virtual machine. Sign in as CORP\User1.

2. From the Server Manager console **Tools** menu, click **Windows PowerShell**.

3. In the Windows PowerShell window, type the following command and press ENTER to display the VPN S2S connections configured by VMM as part of the tenant VM Network creation steps.

   Get-VpnS2SInterface | fl

   Note that there are two VPN interfaces created, one for the Contoso Routing Domain, and one for the Fabrikam Routing Domain.
4. Type the following commands to display the network routing compartments configured for each Routing Domain, and the network information associated with the WNV adapter network compartments.

   Get-NetCompartment

   ipconfig /allcompartments

Get Started with Plans for Windows Azure Pack: Walkthrough Guide

This step-by-step walkthrough shows you how to create plans and add-ons by using the management portal for administrators in Windows Azure Pack for Windows Server. These tasks enable your tenants to view available plans and add-ons on the management portal for tenants as they choose options for the subscriptions.

This document assumes that you have some familiarity with the management portal and know how to provision services, such as website clouds and VM clouds. After you complete this walkthrough, you will:

- Know how to author plans and add-ons.
- Have a broad understanding of how to administer accounts, subscriptions, and plans for an optimal experience for your tenants.

Time requirements

The procedures in this document usually take an hour or less if all the services that are needed for the plans and add-on are provisioned in the management portal.

Walkthrough steps

- [Prerequisites](#)
- [Step 1: Author a plan](#)
- [Step 2. Set properties for a plan](#)
- [Step 3: Modify a plan](#)
- [Step 4: Configure a plan](#)
- [Step 5: Advertise a plan](#)
- [Step 6: Change access to a plan](#)
- [Step 7: Clone a plan](#)
- [Step 8: Author an add-on](#)

Prerequisites

Before you can create a plan or add-on, you must have one or more of the following services provisioned in management portal for administrators:

- Website Clouds
- VM Clouds
- Service Bus Clouds
- SQL Servers
- MySQL Servers

Only the services that you have already provisioned will be available to you when you author a plan or add-on.

Plans overview

The Windows Azure Pack enables you to define plans to which your tenants can choose to subscribe, selecting only those plans that they qualify for based on billing, capacities, usage, and other considerations.

After establishing an account, a tenant can do the following:

- Subscribe to one or more plans. Each subscription is associated with one plan.
- Buy add-ons that are associated with a plan.
- Upload a management certificate.
- Designate one or more co-administrators who can manage services within a subscription.

User accounts and subscriptions

An account is the highest level of control. A tenant can sign up to create an account, or an administrator can create it. Each account can have one or more subscriptions. A subscription is associated with one plan. A plan can have one or more add-ons associated with it. Tenants can add and remove a plan's add-ons from their subscription.

Administering accounts and subscriptions

As an administrator, you can perform the following tasks on accounts and subscriptions:

- Create or remove a user account for a tenant.
- Add a subscription to a tenant's account.
- Suspend or delete a subscription.
- Reset an account's password, configure the required password strength, and enable or disable Forgot Password (the default is Disable).
- Add and remove email notifications.
- Enable or disable self-service subscription management. (The default is Enable.)
- Require account validation (the default is No).

If you suspend a subscription, you can continue to modify the plan that is associated with the subscription, but the tenant will not be able to access any of the plan's resources.

States of a subscription

A subscription has the following states:

- Active
- Suspended
- Pending delete, and Deleted
- Locked and Unlocked (resource quota)
- In-sync and Out-of-sync (with a plan)

Actions on a subscription

The administrator and the tenant can both do the following to an individual subscription:

- Add and remove co-administrators of the subscription.
- Add and remove add-ons that are associated with the subscription's plan.

Plans and add-ons

A tenant cannot access any services unless that tenant is subscribed to at least one plan. Plans, also known as service plans, define the resources, capabilities, and limitations of the hosting services that are offered to a tenant according to a scope that is determined by the hosting service provider. The scope of various plans is typically defined by the capabilities of the resource

providers, the pricing structure that a tenant can choose from, and by other business or organizational requirements.

Before you author a plan or add-on, the services that you provide in your plan or add-on must be previously provisioned, so that they will be available when you author the plan or add-on. Provisioning resources includes tasks such as registering URL endpoints for services and creating databases.

Add-ons are optional plan services that the tenant can choose to include in the subscription. Think of add-ons as services that are available as a-la-carte options in addition to the core services that the plan provides.

If you want to add a service to a plan, and have it be included without the tenant's interaction, you should add the service directly to the plan instead of creating it as an add-on.

Quotas provide limits on resource usage that are acceptable to the resource provider who provides the service.

States of plans and add-ons

The following table lists states and status values for plans and add-ons.

Plan states and status	Add-on states and status
• Public Tenants can subscribe to a plan only when the plan is public. • Private The initial state after creation. • Decommissioned The plan is active, but will not accept any new subscriptions. • Configured or Not Configured If configured, the plan has a specified invitation code and the maximum number of subscriptions allowed is specified or marked as unlimited. • Update in progress The plan is being updated and is currently unavailable.	• Available The add-on has not been purchased by the tenant. • Acquired The add-on has been purchased. • Active The add-on is linked to a plan. • Decommissioned The add-on is active, but will not accept any new subscriptions. • Configured or Not Configured If configured, the add-on has a specified maximum number of purchases allowed to the subscription or is marked as unlimited. • In-sync The add-on has been validated for the subscription by Windows Azure Pack. • Out-of-sync The add-on has not been validated for the subscription by Windows Azure Pack.

Rules and guidelines for plans and add-ons

Consider the following as you author plans and guidelines and administer them:

- You can delete a plan only if it there are no tenants who are subscribed to the plan.
- You cannot remove a service from a plan if there is there is a subscription that is using the service.
- When you clone a plan, all plan properties are copied to the new plan, including quotas, configurations, and advertisements.
- Only the administrator can add an add-on to a plan.
- You cannot add an add-on to a plan if that plan is in a decommissioned state.

Step 1: Author a plan

To authoring a plan, you must specify the services that you want to have included with the plan, and specify the add-ons that you want tenants to optionally add to their subscription.

▶**To author a plan**

1. In the management portal, click **Plans**, and then click **New**.
2. Click **Create Plan.**
3. On the **Authoring a Hosting Plan** wizard, do the following:
   - Specify a friendly name for the plan.
   - Select one or more of the following services to include in the hosting plan, provided that they have been previously provisioned. For each service, specify the available resource for that service.
     - Website Clouds
     - VM Clouds
     - Service Bus Clouds
     - SQL Servers
     - MySQL Servers
   - Select one or more of the available add-ons to include in the plan. For each add-on, specify the available resource for that service.

   The plan that you created should be listed on the **Plans** tab in the content pane. Now you can modify the plan by adding and removing services and add-ons, configure its access, set the maximum subscription limit, and advertise the plan.

Step 2. Set properties for a plan

After you create a plan, you must specify values for specific properties of the plan, depending on the services in the plan.

▶**To set properties for a plan**

1. In the management portal, click **Plans**.
2. Click the plan you want to modify. The plan's **Dashboard** appears.

   The **Dashboard** includes statistics, a list of services, and a list of add-ons. If applicable, additional property settings for the plan are displayed, which can include the following:

   - Configurable features and resources for the service. For example, templates, hardware profiles, and networks for virtual machine clouds.
   - Quotas for usage limits.

3. After all the applicable properties have been set, click **Save** on the command bar.

   You can now author an add-on at any time. Feel free to do the procedure Step 8: Author an add-on before continuing with the next step.

Step 3: Modify a plan

After you create a plan, you can add and remove services of the plan and also add and remove add-ons.

▶**To modify a plan**

1. In the management portal, click **Plans**.
2. Click the plan you want to modify. The plan's **Dashboard** appears.
3. To add a service, click **Add Service** on the command bar to be presented with the list of available services that you can add to your plan. To remove a service, select the service to be removed and click **Remove Service**.

Step 4: Configure a plan

Before a plan can be made public, it must be configured. A configured plan has a specified invitation code so that tenants who know the code can subscribe to the plan. Configuring a plan also requires that you specify the maximum number of allowable subscriptions.

▶**To configure a plan**

1. In the management portal, click **Plans**.
2. Click the plan you want to configure. The plan's **Dashboard** appears.
3. Click the **Configure** tab.
4. Specify an invitation code so that tenants can sign up for your plan on the management portal for tenants. You must provide prospective tenants with the invitation code.
5. Specify a value for the maximum number of allowed subscriptions per account, or select the unlimited check box. This value is the maximum number of times that a tenant can

add this plan to their subscription.

6. On the command bar, click **Save**.

Step 5: Advertise a plan

You can add, edit, and delete advertisements that are shown on the tenant portal when a tenant views available plans. You can also export plan details to XML or publish them to the Microsoft Web Hosting Gallery.

▶ **To advertise a plan**

1. In the management portal, click **Plans**.
2. Click the plan you want to advertise. The plan's **Dashboard** appears.
3. Click the **Advertise** tab.
4. On the command bar, click **Add Advertisement** and provide the text that advertises your plan, such as the number of virtual machines, resource capabilities, marketing promotions, and so on.

   You can also edit and delete advertisements.
5. On the content pane, click **Export plan details into XML file** to save for your records.
6. On the content pane, click **Import plan details to Web Hosting Gallery** to publish your plan to the Microsoft Web Hosting Gallery.

Step 6: Change access to a plan

After you have authored a plan, made the required configurations, and provided the required settings, you are ready to make the plan public so that tenants can subscribe to it.

You will also need to change the access if you want to make the plan private again or decommission it. For a list of possible states, see <u>States of plans and add-ons</u>.

▶ **To change access to a plan**

1. In the management portal, click **Plans**.
2. Select the plan.
3. On the command bar, click **Change Access**.
4. Choose the state that you want to apply to the plan.

Step 7: Clone a plan

You can clone a plan to use as a template for creating other plans.

▶ **To clone a plan**

1. In the management portal, click **Plans**.
2. Select the plan.
3. On the command bar, click **Clone Plan**.
4. Specify the name for the cloned plan.

   The cloned plan will have all the services, add-ons, configurations, and property values of the plan from which it was cloned.

Step 8: Author an add-on

Authoring an add-on is similar to authoring a plan except that you are choosing a service, or services, that you want to provide as optional to your subscribers.

▶**To author an add-on**

1. On the **All Items** navigation pane, click **Plans**, and then click **New**.
2. Click **Create Add-On.**
3. On the **Authoring a Hosting Add-On** wizard, do the following:
   - Specify a friendly name for the add-on.
   - Select one or more of the available services to include in the add-on.

   The add-on that you created should be listed on the **Add-ons** tab in the content pane.

You can modify, configure, and specify settings for an add-on as you do for plans. These tasks include the following:

- Add and remove services from an add-on.
- Configure an add-on by setting the maximum number of times the add-on can be added to a plan, or by setting it to unlimited.
- Advertise an add-on by adding, editing, removing text advertisements. Unlike plans, add-on advertisements details cannot be exported to XML files or be published in the Microsoft Web Hosting Gallery.
- Change access to an add-on. For a list of possible states, see States of plans and add-ons.
- Clone an add-on.

See also

Evaluation Guide for System Center 2012 R2 and the Windows Azure Pack

Get Started with Virtual Machine Roles: Walkthrough Guide

Virtual Machine Roles enable a hosting provider to make offerings available to their tenants by using a standard and reusable artifact that can be used in both, in on-premises hosting environments and in Windows Azure. They can be authored in a standard format that can be easily copied and modified to suit different hosting scenarios.

This step-by-step walkthrough shows you how to inspect the contents of a sample Virtual Machine Role, install it in a Microsoft System Center 2012 R2 environment, and then use it to provision a new virtual machine.

This document assumes that you have a basic understanding of System Center 2012 R2 that includes how to use the Service Admin Portal and Tenant Portal. After you complete this walkthrough, you understand the contents of a Virtual Machine Role and how to install a Virtual Machine Role in a System Center 2012 R2 environment.

You'll learn:

- How to unpack the Registry Definition and Resource Extension packages that make up a Virtual Machine Role.

- How to interpret the contents of the Virtual Machine Role packages.

- How to prepare a virtual hard disk (VHD) to be used with a Virtual Machine Role.

- How to install a Virtual Machine Role and make it available to tenants.

- How to provision a new virtual machine from a Virtual Machine Role.

Time requirements

The procedures in this document require approximately 90 minutes for a new user to complete. This estimate assumes that the testing environment is already configured.

Walkthrough steps

- **Prerequisites**
- Step 1: Extract and inspect the Virtual Machine Role packages
- Step 2: Install the Resource Extension
- Step 3: Prepare the virtual hard disk
- Step 4: Install the Resource Definition
- Step 5: Add gallery item to a plan
- Step 6: Create a Virtual Machine Role by using Tenant Portal
- Step 7: Change the settings for the Virtual Machine Role
- Step 8: Scale out the Virtual Machine Role
- Step 9: Update the Virtual Machine Role

Prerequisites

The only prerequisite for this walkthrough is to have an operational version of System Center 2012 R2.

Step 1: Extract and inspect the Virtual Machine Role packages

To start, extract the packages that make up the Virtual Machine Role and then inspect their contents. The files in the packages are written in JavaScript Object Notation (JSON) which provides an open, text-based format for data exchange. It is similar to XML in that it is human-readable and platform-independent, but it is less verbose. Hosting providers can either obtain Virtual Machine Roles from external parties or create their own to provide customized offerings to their tenants.

▶ **To extract the Virtual Machine Role packages**

1. Open the **Gallery Items** folder.
2. Create a new subfolder with the name **Gallery Items Unpacked**.
3. Copy the files **WS2012IISResExtV1.resextpkg** and **WS12IISV1.resdefpkg** into the **Gallery Items Unpacked** folder.
4. Create two subfolders in the **Gallery Items Unpacked** folder and name them **Resdef** and **Resext**.
5. Change the file name extension for each package to **.zip**.
6. Extract the contents of **WS12IISV1.resdefpkg.zip** into the **Resdef** folder and the contents of **WS2012IISResExtV1.resextpkg.zip** into the **Resext** folder.

▶ **To inspect the contents of the Resource Extension**

1. Open the **Resextpkg** folder.
2. Open **WS2012IISResExt.resext** in Notepad and explore its contents. This file is formatted in JSON and contains the definition of the application to install.
3. Note the different sections that include the following:
   - Name, Publisher, and Version that identify the particular Resource Extension.
   - Resource Extension Parameters that define parameters that are provided by the tenant when they provision a new Virtual Machine Role.
   - Resource Requirements that define the requirements of the virtual hard disks (VHDs) to be used with the Virtual Machine Role.
   - Application Profile that defines the required steps to install the application and the operating system resources that must be enabled to support it.
4. Explore the rest of the contents of the folder that includes the application payload in the **IISWS2012** folder. This payload contains the required files for the installation of the

application. In this case, it is a file with a single command that contains the script to perform the configuration.

▶**To inspect the contents of the Resource Definition**

1. Open the **Resdefpkg** folder.
2. Open **WS2012IISResDef.resdef** in Notepad and explore its contents. This file describes the virtual machine container that hosts the application as defined in the Resource Extension section.
3. Note the different sections that include the following:
   - Name, Publisher, Version, and Type that identify the particular Resource Definition.
   - Resource Parameters that define parameters that are provided by the tenant when they provision a new Virtual Machine Role.
   - Resource Extension References that define the Resource Extensions that can be used with this Resource Definition and the parameter values that they require.
   - Intrinsic Settings that specify the detailed configuration settings for the virtual machine.

▶**To inspect the contents of the View Definition**

1. Open the **Resdefpkg** folder.
2. Open **WS2012IISViewdef.viewdef** in Notepad and explore its contents. This file describes the user interface to present to the tenant to collect values for the parameters in the Resource Definition.
3. Note the different sections that include the following:
   - Label, Publisher, and Description that identify the particular Resource Definition.
   - Sections that define the different dialog boxes in the user interface.
   - Categories that provide a logical grouping for settings.
   - Parameters that define the different values to be collected from the tenant.

Now that you have inspected the contents of the packages, install them in the Gallery and make them available to tenants.

Step 2: Install the Resource Extension

The Resource Extension package is installed in Virtual Machine Manager (VMM). There is currently no user interface to support this process, and it is performed with Windows PowerShell commands.

▶**To import the Resource Extension into Virtual Machine Manager**

1. Run the VMM command shell as an administrator.
2. Run the following Windows PowerShell commands:

a.

When prompted about Execution Policy Change, select **Y**.

b.

Modify the path according to the folder that you created.

c.

3. You should receive various messages that report that the gallery item is imported.

4. Verify that the gallery item has been imported by running the following Windows PowerShell command:

```
Get-CloudResourceExtension
```

With the Resource Extension installed, you next prepare the virtual hard disk (VHD) that is to be used with the Virtual Machine Role.

Step 3: Prepare the virtual hard disk

The Resource Extension specifies tags that it requires to identify a VHD as valid for it to use. In this step, you add the required tags to a VHD so that it can be used with the Virtual Machine Role.

▶ **To add tags to the virtual hard disk**

1. Look again at the View Definition file and find the parameter with the name *VMRoleOSVHDImageNameVersion*.

2. Note that the parameter includes two tags which are both required on the VHD for it to be used with the Virtual Machine Role. The tags in this case are **WindowsServer2012** and **Datacenter**.

3. Run the following Windows PowerShell commands to add the tags to the VHD:

```
$label1 = "WindowsServer2012"

$label2 = "Datacenter"

$labels = New-Object
"System.Collections.Generic.List[System.String]"

$vhd = Get-SCVirtualHardDisk | where {$_.Name -eq 'WINDOWS
SERVER 2012 DATACENTER.vhd'}

Set-SCVirtualHardDisk -VirtualHardDisk $vhd -Tag $labels
```

4. Verify that the tags were set correctly by running the following command:

```
$vhd.Tag
```

The output should include the two tags **WindowsServer2012** and **Datacenter**.

With the Resource Extension installed and the virtual hard disk prepared, you can now install the Resource Definition.

Step 4: Install the Resource Definition

The Resource Definition is imported by using the Service Admin Portal. Install two versions of the same definition so that you can test the update procedure in a later procedure.

▶ **To import the Resource Definition**

1. Open the Service Admin Portal.
2. Navigate to the **VM Clouds** workspace.
3. Click the Gallery tab.
4. Click **Import**.
5. Select and import the **WS12IISV1.resdefpkg** file in the **Gallery Items** folder.
6. Note that the gallery item now is listed on the **Gallery** tab.
7. Select and import the **WS12IISV2.resdefpkg** file in the **Gallery Items** folder.
8. Note that the gallery item now is listed on the **Gallery** tab.

Now that the packages for the Virtual Machine Role have been installed, you can publish the gallery item to make it available to tenants.

Step 5: Add gallery item to a plan

To make the Virtual Machine Role available to the tenant, you need to add it to a plan. In this procedure, you publish the Virtual Machine Role that you installed. Only the original version is available in this step. You make the update available in a later procedure.

▶ **To publish the gallery item**

1. On the **Gallery** tab, select the 1.0.0.0 version of the **WS2012 with IIS Role** gallery item that you just imported.
2. Click the arrow next to the gallery item name.
3. Explore the details of the gallery item.
4. Navigate back and click **Make Public**.
5. Select the **Plans** workspace in the Service Admin Portal.
6. Select the plan that you created in the previous exercise.
7. Select the **Virtual Machine Clouds** service.
8. Scroll to the **Gallery** section.
9. Click **Add Gallery Items**.
10. Select both of the gallery items that you imported, and then click **Save**.

The Virtual Machine Role is now available to the tenant as part of the **Airlift** plan.

Step 6: Create a Virtual Machine Role by using Tenant Portal

You now take the role as a tenant and provision a new virtual machine that is based on the Virtual Machine Role that you just installed. You then inspect the details of the instance that you created.

▶ **To create a virtual machine based on a Virtual Machine Role**

1. Log on with a tenant user account.
2. Open the **Tenant Portal**.
3. Select the **Gallery** workspace.
4. Select **New**, and then select **Virtual Machine Role**.
5. Select **version 1.0.0.0** of the gallery item that you added in the previous procedure.
6. Type a name for your Virtual Machine Role such as **IISRole**. The name cannot contain spaces, or the creation fails.
7. Follow the wizard to provide values for each of the settings by using the following guidelines:
   a. Keep the default Instance Count of 1.
   b. Select a **VM Size** of **Extra Small**.
   c. Note that the only VHD that you can select is the one that you tagged in the previous procedure.
8. After several minutes, the Virtual Machine Role appears in a provisioning state. The primary reason for the delay is waiting for the VHD to be copied.

▶ **To view the dashboard for the Virtual Machine Role**

1. After provisioning is completed, click the arrow next to the Virtual Machine Role that you created in the previous procedure.
2. Click the **Dashboard** tab.
3. Note how the Virtual Machine Role uses a portion of your quota by looking at the green bars and reading details for CPU, memory, storage, and number of virtual machines.

▶ **To view the details of the VM instance in a Virtual Machine Role**

1. Click the **Instances** tab of the Virtual Machine Role.
2. Click the arrow next to the virtual machine name.
3. On the **Dashboard** page, note the usage graph, quota, devices, and details about the virtual machine on the right side.
4. Click **Connect**, and then select **Desktop** to connect to the desktop by opening the .rdp file that is downloaded to your client.
5. Click **Stop** to stop the virtual machine.
6. Click the **Configure** tab.

7. Note that you can change the virtual machine size when the virtual machine is stopped.
8. Note that you can attach and detach devices when the virtual machine is stopped.
9. You can also expand a disk if it is using the VHDX format.
10. Select the **Dashboard** tab and start the virtual machine again.

You now have an instance of the Virtual Machine Role and have viewed its details. In the next steps, you make changes to the instance of the Virtual Machine Role.

Step 7: Change the settings for the Virtual Machine Role

In this procedure, you change the settings for the Virtual Machine Role instance that you just created.

▶ **To update settings for the Virtual Machine Role**

1. Click the **Configure** tab of the Virtual Machine Role.
2. Note that you can review the settings that you previously provided.
3. Note the settings that can be updated such as the setting for **VM Size**.
4. Change the **VM Size** to **Small**.

Step 8: Scale out the Virtual Machine Role

In this procedure, you increase the instance count of the Virtual Machine Role.

▶ **To scale out the Virtual Machine Role**

1. Select the **Scale** tab of the Virtual Machine Role.
2. Increase the instance count from **1** to **2** and save your change.

   📝 **Note**

   Ignore any error messages about failed operation and refresh the portal. You should see an instance count of 2.

3. Note that the new virtual machine instance uses the new **VM Size** setting that you selected in the previous step.

Step 9: Update the Virtual Machine Role

In this procedure, you offer the updated version of the Virtual Machine Role to the tenant and then act as the tenant to update the instance that you provisioned.

▶**To change the version of a Virtual Machine Role**

1. In the Service Admin Portal, select version 1.1.0.0 of the gallery item that you installed in the previous procedure.

2. Click **Make Public**.

3. Open the Tenant Admin Portal.

4. Locate and select the Virtual Machine Role that you created.

5. Select the **Dashboard** tab.

6. Note that there is a message at the top of the screen that notifies you of the new version.

7. Click **Make Public** to change the version of the Virtual Machine Role. Note that you must complete the wizard again in case you must make changes to the Resource Definition.

Get Started with Hybrid Networking: Walkthrough Guide

This step-by-step walkthrough shows you how to verify that your hybrid network solution is fully functional. You will verify that network virtualization is working correctly by using the Windows Server 2012 R2 Preview multi-tenant gateway.

This document assumes that you have a basic understanding of Windows Network Virtualization and network virtualization gateways. For more information, see Hyper-V Network Virtualization Overview.

In this walkthrough, you'll learn:

- How to move a virtual machine from the tenant network to the hosting provider network.

- How to connect the tenant's virtual machine to their own private virtual network.

- How to test that the tenant still has network connectivity to the virtual machine that now resides on the hosting provider network.

Time requirements

60 minutes

Get help from others or provide feedback

If you have questions or feedback regarding the content of this document, post a message to the Microsoft Windows Server Platform Networking Forum.

Walkthrough steps

- Prerequisites
- Step 1: Deploy the Tenant Virtual Machines
- Step 2: Verify Connectivity on APP2
- Next steps

Prerequisites

Before you start this walkthrough, you must set up the infrastructure as described in the Evaluating System Center 2012 R2 with Windows Azure Pack guide at http://go.microsoft.com/fwlink/p/?LinkId=302336.

Step 1: Deploy the Tenant Virtual Machines

In this step, you will deploy the customer tenant virtual machines in the simulated data center environment. Contoso APP2 and Fabrikam APP2 will be deployed on WNVHOST2, where they will have a single connection to their respective tenant VM network. Although the virtual machines will have the same names and IP addresses, they will be securely isolated from each other while maintaining access to their respective on-premises domain environments over the Internet.

Create a virtual hard disk for the APP2 virtual machines

The next step will deploy new hosted virtual machines for each tenant named APP2. This procedure requires a generalized virtual hard disk stored in the VMM Library. If you already have a generalized Windows Server 2012 R2 VHD to use, name the VHD file **Server2012R2Base.vhd**, and copy it to the **%SYSTEMDRIVE%\ProgramData\Virtual Machine Manager Library Files\VHDs** directory on the WNVHOST2 server. For instruction on how to create a generalized hard disk file on WNVHOST2, see the Appendix section of this document.

▶**To deploy the APP2 tenant virtual machines on WNVHOST2**

1. In Virtual Machine Manager Console, open the **VMs and Services** workspace.
2. On the **Home** tab, in the **Create** group, click **Create Virtual Machine**. The **Create Virtual Machine Wizard** opens.
3. On the **Select Source** screen, click **Browse**.
4. Double-click **Server2012R2Base.vhd** to select it, and then click **Next**.
5. Type **Contoso APP2** for virtual machine name, and then click **Next**.
6. On the **Configure hardware** screen, provide settings for memory, and then select the **Network Adapter 1** setting in the console tree.
7. Under Connectivity, select **Connected to a VM network**, and then click **Browse**.
8. Select **Contoso VM Network**, and then click **OK**.
9. Click **Next**.
10. On the **Select Destination** screen, select **Place the virtual machine on a host**, and then click **Next**.
11. On the **Select Host** screen, select **WNVHOST2.corp.adatum.com**, and then click **Next**.
12. On the **Configure Settings** screen, click **Next**.
13. Review the options on the **Add properties** screen, adjust the settings as needed, and then click **Next**.
14. On the **Summary** page, select **Start the virtual machine after deploying it**, and then

click **Create**.

15. The **Jobs** dialog box appears. Ensure that the job has a status of **Completed**, and then close the dialog box.

16. Verify that Contoso APP2 is now running on WNVHOST2.

17. Right-click WNVHOST2, and then click **Create Virtual Machine**. The **Create Virtual Machine Wizard** starts.

18. On the **Select Source** screen, click **Browse**.

19. Double-click **Server2012R2Base.vhd** to select it, and then click **Next**.

20. Type **Fabrikam APP2** for virtual machine name, and then click **Next**.

21. On the **Configure hardware** screen, provide settings for memory, and then select the **Network Adapter 1** setting in the console tree.

22. Under **Connectivity**, select **Connected to a VM network**, and then click **Browse**.

23. Select **Fabrikam VM Network**, and then click **OK**.

24. Click **Next**.

25. On the **Select Destination** screen, select **Place the virtual machine on a host**, and then click **Next**.

26. On the **Select Host** screen, select **WNVHOST2.corp.adatum.com**, and then click **Next**.

27. On the **Configure Settings** screen, click **Next**.

28. Review the options on the **Add properties** screen, adjust the settings as needed, and then click **Next**.

29. On the **Summary** page, select **Start the virtual machine after deploying it**, and then click **Create**.

30. The **Jobs** dialog box appears. Ensure that the job has a status of **Completed**, and then close the dialog box.

31. Verify that Fabrikam APP2 is now running on WNVHOST2.

32. Start an elevated **Windows PowerShell** window on WNVHOST2.

33. Type **Get-NetVirtualizationLookupRecord** and press **ENTER**.

    The mapping of Customer and Provider addresses is shown. Note that both Contoso APP2 and Fabrikam APP2 virtual machines have the same CustomerAddress value of 10.0.1.100. The common Customer Addresses are isolated from one another by means of their unique CustomerID and VirtualSubnetID values. Note that each tenant network also has a virtualized instance of a gateway at the Customer Address of 10.0.1.1.

    There are two Provider Addresses, one for each tenant, automatically assigned by VMM in the 172.16.1.100-200 IP address range. These addresses were assigned by the DHCP extension running on WNVHOST2 from the Management IP Pool.

34. Type **Get-NetVirtualizationCustomerRoute** and press **ENTER**. The gateway addresses that are assigned to each virtual machine correspond to the WNV Gateway-managed address of 10.254.254.2.

35. Type **Get-SCIPAddress** and press **ENTER**. Information is displayed for each Provider Address and Customer Address allocated by the IP Pools defined in Virtual Machine

Manager.

36. Switch to the WNV Gateway host server WNVHOST3. From a Windows PowerShell prompt, run Get-NetVirtualizationLookupRecord and then run Get-NetVirtualizationCustomerRoute. Examine the mapping of Customer and Provider addresses that are published to the gateway server by the Virtual Machine Manager server WNVHOST2.

Verify network connectivity for the APP2 virtual machines

The Contoso APP2 and Fabrikam APP2 virtual machines are both hosted on the WNVHOST2 server. Although they share the same IP address, they are securely isolated from one another in the datacenter using network virtualization. Verify that these virtual machines have network connectivity to remote resources in their respective customer on-premises environments over the Internet through the multitenant site-to-site gateway running on WNVHOST3.

Step 2: Verify Connectivity on APP2

The Contoso APP2 and Fabrikam APP2 virtual machines are both hosted on the WNVHOST2 server. Although they use the same IP address, they are securely isolated from one another in the data center using network virtualization. Verify that these virtual machines have network connectivity to remote resources in their respective customer on-premises environments over the Internet through the multitenant site-to-site gateway running on WNVHOST3.

▶ **To test access to the Contoso domain from APP2 hosted on WNVHOST2**

1. On WNVHOST2, connect to the **Contoso APP2** virtual machine.
2. Complete the mini-setup process when starting the virtual machine for the first time, and then sign in as the local Administrator.
3. From the Server Manager console **Tools** menu, click **Windows PowerShell**.
4. In the Windows PowerShell window, type **ipconfig /all** to display the Windows IP configuration. Note that the address 10.0.1.100 was assigned automatically by the Virtual Machine Manager DHCP Server component running on WNVHOST2.
5. In the Windows PowerShell window, type **ping 10.0.0.2** and press **ENTER** to verify connectivity to the internal interface on Contoso EDGE1 through the datacenter physical network, the virtualization gateway, and the cross-premises VPN connection over the Internet. You should receive four replies from 10.0.0.2.
6. Type **ping 10.0.0.1** and press **ENTER** to verify connectivity to the remote DC1 server on the Contoso corpnet subnet. You should receive four replies from 10.0.0.1.
7. Repeat the previous steps on the Fabrikam APP2 virtual machine to verify connectivity to the remote resources on the Fabrikam corpnet subnet.

You have now successfully demonstrated that you have two tenants, each connected to their own private virtual network at a hosting provider. A multi-tenant gateway connects both tenant's networks via a site-to-site VPN tunnel.

Next steps

For more information about hybrid networking, see the .

Appendix

This appendix describes how to create a generalized virtual hard disk in Hyper-V.

▶**To create a virtual hard disk on WNVHOST2**

1. From the **Tools** menu in Server Manager, click **Hyper-V Manager**. Expand Hyper-V Manager, and select **WNVHOST2**.
2. In Hyper-V Manager console Actions pane, point to **New**, and then click **Virtual Machine**.
3. The **New Virtual Machine Wizard** opens. Click **Next**.
4. Name the new virtual machine **Server2012R2Base**.
5. Select the checkbox for **Store the virtual machine in a different location**. Next to **Location**, type **%SYSTEMDRIVE%\ProgramData\Virtual Machine Manager Library Files\VHDs** and then click **Next**.
6. Select **Generation 1**. Click **Next**.
7. Assign 2048 MB of memory to allocate to the new virtual machine, and then click **Next**.
8. On the **Configure Networking** page, click **Next**.
9. On the **Connect Virtual Hard Disk** page, change the location to **%SYSTEMDRIVE%\ProgramData\Virtual Machine Manager Library Files\VHDs**, and then click **Next**.
10. On the **Installation Options** page, select the appropriate options to access the operating system setup media. To install from an ISO image file, select **Install an operating system from a boot CD/DVD-ROM**, and supply the path to the installation media file. Click **Next**.
11. On the Summary page, click **Finish**.
12. Start the **Server2012R2Base** virtual machine. Set appropriate language, time and keyboard options. Click **Next**.
13. On the Windows Setup screen, click **Install now**.
14. Select **Windows Server 2012 R2 Datacenter (Server with a GUI)** and then click **Next**.
15. Accept the license terms, and then click **Next**.
16. Click **Custom: Install Windows only (advanced)**.
17. On the **Where do you want to install Windows** page, click **Drive 0 Unallocated Space**.
18. Click **Next**.
19. Follow the instructions to complete the installation of Windows Server 2012 R2 Preview, specifying a strong password for the local Administrator account. Log on using the local Administrator account.

20. Start **C:\Windows\System32\Sysprep\Sysprep.exe**
21. In the **System Preparation Tool** dialog, select **Enter System Out-of-Box Experience (OOBE)**. Select the **Generalize** checkbox, and under **Shutdown Options**, select **Shutdown**. Click **OK**.
22. Sysprep will generalize the installation of Windows Server 2012 R2 Preview and then shut down the virtual machine.

See also

- [Hyper-V Network Virtualization Overview](#)

Get Started with Service Management Automation: Walkthrough Guide

Service Management Automation is a feature of the management portal for administrators in Windows Azure Pack for Windows Server. You can use it to automate administrative tasks in the management portal. You automate your tasks by using runbooks, which run Windows PowerShell commands. You can also use a runbook to run another runbook within its workflow. When the secondary runbook is finished, runbook implementation returns to the calling runbook.

This step-by-step walkthrough shows you how to create and import runbooks, how to run a runbook, and how to view the jobs that track the runbook's progress.

This document assumes that you have installed the Service Management Automation web service and one or more runbook workers. Also, you must download one or more of the runbooks that have been posted on [CodePlex](#), which is the free open source project hosting site that Microsoft provides for this release of Windows Azure Pack. After you complete this walkthrough, you will know how to manage runbooks in Windows Azure Pack Automation.

You'll learn:

- How to specify the web service endpoint to enable the Automation feature in Windows Azure Pack
- How to import a runbook
- How to edit a runbook
- How to test and publish a runbook
- How to add global settings for runbooks to use
- How to run a runbook
- How to track the progress of a runbook

Time requirements

[This topic is pre-release documentation and is subject to change in future releases. Blank topics are included as placeholders.]

The procedures in this document require 40 to 60 minutes for a new user to complete. These time estimates assume that the Windows Azure Pack environment is already configured. They do not include the time that is required to set up the Windows Azure Pack environment.

Walkthrough steps

- **Prerequisites**
- **Step 1: Specify the web service endpoint**
- **Step 2: Import a runbook**
- Step 3: Edit a runbook
- Step 4: Run a runbook
- Next steps

Prerequisites

The prerequisites for this walkthrough are to install the Service Management Automation web service and to have an operational version of Windows Azure Pack for Windows Server. For more information, see Installing the Service Management Automation Web Service or Deploying Windows Azure Pack for Windows Server.

Step 1: Specify the web service endpoint

The Service Management Automation web service provides a network address or endpoint that Automation uses to perform all of its functions. After you install Windows Azure Pack, specify the web service endpoint to turn on the Automation feature. When you install the web service, make sure that you keep a record of the endpoint URL.

▶**To specify the web service endpoint**

1. In the management portal for administrators in Windows Azure Pack for Windows Server, click **Automation**.

2. Click **Register the Service Management Automation endpoint** and supply the following information:

   - The service URL and port. They were configured when you installed the web service.

   - The user name of a user account that can access the Service Management Automation web service. Accounts with access to the Service Management Automation web service are also configured during installation.

   - The access password for the user account.

That's it! You're done. All Automation functionality in Windows Azure Pack for Windows Server is now available to you. It's time to begin working with runbooks.

Step 2: Import a runbook

In this preview release, no runbooks are installed with the feature. You must have downloaded one or more runbooks from CodePlex to proceed.

▶**To import a runbook**

1. In the management portal for administrators in Windows Azure Pack for Windows Server, click **Automation**.
2. On the **Automation** page, click the **Runbooks** tab.
3. On the **Runbooks** page, click **Import Runbook**.
4. Click the **Folder** icon to browse to the file that you want to import.
5. When the file is imported, a notification of the task's success appears.

Now that you have imported a runbook, it is displayed in the list of runbooks on the **Runbooks** tab, and it is available to be selected so that you can use the Command bar commands such as **Delete**.

Step 3: Edit a runbook

After importing a runbook, you must publish it to make it available to run. To do that, you must first edit it, which does not require that you make any changes, so that you can test the runbook and publish it.

▶**To edit a runbook**

1. In the management portal for administrators in Windows Azure Pack for Windows Server, click **Automation**.
2. On the **Automation** page, click the **Runbooks** tab.
3. On the **Runbooks** page, click the name of a runbook in the list.
4. Click **Author**, and then click **Draft**.
5. If the runbook was not previously in draft mode, click **Edit Runbook**.
6. Do one or more of the following:
   - Click **Insert** to insert an activity, a setting, or another runbook.
   - Click **Save** to save the runbook draft in its current state.
   - Click **Discard Draft** to stop editing the runbook and to discard your changes.
   - Click **Test** to test the runbook for any execution errors. You can see the output from the runbook test in the **Output Pane**.
   - Click **Publish** to make the runbook available to run. Any scheduled or manual start of the runbook runs the published version of the runbook.

You've now seen how to edit a runbook and take the draft runbook through the steps to test and publish. In the previous step 6, you were invited to insert a "setting" into a runbook. A setting is a

global resource that is available to be used in all runbooks. The **Resources** page in Automation displays the various settings that are globally available to use in or are available to be used in association with a runbook. Settings include variables, schedules, Windows PowerShell credentials, certificates, and connections. Connections are defined in integration modules.

Step 4: Run a runbook

Now that you have a published runbook available to you, you can run it.

▶**To run a runbook**

1. In the management portal for administrators in Windows Azure Pack for Windows Server, click **Automation**.
2. On the **Automation** page, click the **Runbooks** tab.
3. On the **Runbooks** page, click the runbook information anywhere outside of the blue **Name** column to select the runbook. If it is published and available to run, click **Start** on the Command bar.
4. While the runbook is running, you can click **View Jobs** in the runbook notification to view job output.
5. While the runbook is running or after the runbook has completed, you can click the name of the runbook on the **Runbooks** tab, and then click the **Jobs** tab to see a list of jobs for that runbook that are arranged by time stamp. Click a time stamp in the **Job Start** column of the list to see details for the job.

Congratulations, you ran a runbook!

Next steps

In this tutorial, you've seen how to import, edit, and run a runbook in the Automation feature of Windows Azure Pack for Windows Server. Feel free to explore the other features in Automation such as **Resources** on your own. You can also read the other walkthroughs that are available at Evaluation Guide for System Center 2012 R2 and the Windows Azure Pack.