Lab A: Creating and Using Hyper-V Virtual Switches

Scenario

A. Datum Corporation has implemented the Hyper-V virtualization platform in one of their subsidiaries. You have created several test virtual machines and familiarized yourself with many of the configuration options. The next step is to implement and test network connectivity for the virtual machines. You have been asked to verify current Hyper-V networking, and explore the differences between various Hyper-V virtual switch types.

Objectives

After completing this lab, you will be able to:

- Create and use Hyper-V virtual switches.

Lab Setup

Estimated Time: 20 minutes

Virtual machines: 20409B-LON-HOST1, 20409B-LON-HOST2, 20409B-LON-DC1, 20409B-LON-PROD1, 20409B-LON-PROD2, 20409B-LON-TEST1, and 20409B-LON-TEST2

User name: **Adatum\Administrator**

Password: **Pa$$w0rd**

For this lab, you will use the available virtual machine environment. Before you begin the lab, you must complete the following steps:

1. Sign in to the LON-HOSTx computer as **Adatum\Administrator** with the password of **Pa$$w0rd**.
2. On LON-HOST1 start **Hyper-V Manager**.
3. In Hyper-V Manager, click **20409B-LON-DC1**, and in the Actions pane, click **Start**.
4. In the Actions pane, click **Connect**. Wait until the virtual machine starts.
5. Sign in by using the following credentials:
   - User name: **Adatum\Administrator**
   - Password: **Pa$$w0rd**
6. Repeat steps 2 and 3 for **20409B-LON-TESTx** and **20409B-LON-PRODx**. The letter x is 1 for the first student in the team, and 2 for the second student in the team.
7. For **20409B-LON-TESTx** and **20409B-LON-PRODx**, sign in as **Administrator**. For both accounts, use the password **Pa$$w0rd**.

LON-HOST1 and LON-HOST2 are sometimes referenced as LON-HOSTx, which indicates that each student performs the lab tasks on his or her computer.

 **Note:** You will be working in pairs. Communicate clearly with your lab partner, and cooperate fully with each other during this lab.

Exercise 1: Creating and Using Windows Server 2012 R2 Hyper-V Virtual Switches

Scenario

The Hyper-V virtualization platform is now installed, and you need to demonstrate to junior administrators the different networking options that you can configure in Hyper-V. You will first show them the current Hyper-V host networking configuration. After that, you will create new virtual network adapters in a parent partition, and then show them as new network connections. You will also create different types of Hyper-V virtual switches, and explore with junior administrators the connectivity options when using each of them.

The main tasks for this exercise are as follows:

1. Verify current Hyper-V network configuration.
2. Create virtual network adapters in a parent partition.
3. Create virtual switches.
4. Use Hyper-V virtual switches.

▶ Task 1: Verify current Hyper-V network configuration

1. On LON-HOSTx, in Hyper-V Manager, confirm that **External Network** is the only virtual switch present.
2. Confirm that LON-HOSTx has two network connections: **Ethernet 2** and **vEthernet (External Network)**.
3. View the properties of the **Ethernet 2** network connection, and confirm that it is using only the **Hyper-V Extensible Virtual Switch**, and that the check boxes for all other items are not selected.
4. View the properties of the **vEthernet (External Network)** network connection, and confirm that it is using most items, but is not using the **Hyper-V Extensible Virtual Switch**, which is the only item for which the check box is not selected.

▶ Task 2: Create virtual network adapters in a parent partition

1. On LON-HOSTx, in Windows PowerShell, use the cmdlet **Get-VMNetworkAdapter** with the **All** parameter to confirm that one network adapter named **External Network**, is present on the system.
2. Use the Windows PowerShell cmdlet **Add-VMNetworkAdapter** with the **ManagementOS** parameter to add the following three virtual network adapters to the parent partition:
   - **Management**
   - **Storage**
   - **Live Migration**
3. Use the Network Connections window to confirm that three network connections have been added to LON-HOSTx, and that they are named:
   - **vEthernet (Management)**
   - **vEthernet (Storage)**
   - **vEthernet (Live Migration)**

4. View the properties of the **vEthernet (Management)** network connection, and confirm that the network connection is using most items, including **Internet Protocol Version 4 (TCP/IPv4)**, but it is not using the **Hyper-V Extensible Virtual Switch**.
5. In Windows PowerShell, use the cmdlet **Get-VMNetworkAdapter** with the **All** parameter to confirm that the network adapters that you added by using Windows PowerShell are present on the system.

▶ Task 3: Create virtual switches

1. On LON-HOSTx, in Hyper-V Manager, try to create an external virtual switch.

Note: You should get an error, because the physical network adapter is already bound to the external switch.

2. In Hyper-V Manager, create an internal virtual switch and name it **Internal Switch**.
3. Use the Network Connections window to confirm that a network connection is added and that it is named **vEthernet** (Internal Switch).
4. View the properties of vEthernet (Internal Switch), and confirm that the network connection is using most items, including **Internet Protocol Version 4 (TCP/IPv4)**, but that it is not using **Hyper-V Extensible Virtual Switch**.
5. Use the Windows PowerShell cmdlet **Get-VMNetworkAdapter** with the **All** parameter to confirm that there is a network adapter named **Internal Switch** present on the system.
6. On LON-HOSTx, in Hyper-V Manager, create a private virtual switch, and name it **Private Switch**.
7. Use the Network Connections window to confirm that no network connection was added when you created the private virtual switch.
8. In Windows PowerShell, use the **Get-VMNetworkAdapter** cmdlet with the **All** parameter to confirm that no network connection was added when you created the private virtual switch.
9. Use Hyper-V Manager to confirm that **External Network**, **Internal Switch** and **Private Switch** have the same two extensions available: **Microsoft NDIS Capture**, which is not enabled, and **Microsoft Windows Filtering Platform**, which is enabled.

▶ Task 4: Use Hyper-V virtual switches

1. On LON-HOSTx, connect both the LON-PRODx and LON-TESTx virtual machines to the **Private Switch** virtual switch.
2. Confirm that LON-PRODx has an IPv4 address of **10.0.0.*x*5** (where *x* is 1 if you are using LON-HOST1, and *x* is 2 if you are using LON-HOST2).
3. Open Windows PowerShell in Administrator mode, and to try to ping IP address **10.0.0.*x*6**.
4. Confirm that four replies are received

Note: LON-TESTx has an IP address of 10.0.0.x6.

5. On LON-HOSTx, connect the LON-PRODx virtual machine to an Internal Switch.
6. On LON-PROD*x*, try to ping the IP address **10.0.0.x6**, and confirm that it does not have connectivity with LON-TESTx.
7. On LON-HOSTx, try to ping IP address **10.0.0.x5**.

Note: Confirm that the destination host is unreachable. This is because the virtual network adapter in LON-HOSTx that is connected to the Internal switch does not have IP address from the same subnet as LON-PRODx.

8. On LON-HOSTx, configure the **vEthernet (Internal Switch)** network connection with the following settings:
   - IP address: **10.0.0.100**
   - Subnet mask: **255.255.255.0**
9. On LON-HOSTx, try to ping IP address **10.0.0.x5**. Confirm that four replies are returned, which confirms that LON-HOSTx and LON-PRODx now have network connectivity.
10. On LON-HOSTx, connect the LON-PRODx virtual machine to the **External Network** virtual switch.
11. On LON-PRODx, use the Windows PowerShell cmdlet **Set-NetIPInterface** to enable dynamic TCP/IP configuration for the **Ethernet** network connection. To do this, you will need to run Windows PowerShell in Administrator mode.
12. In Windows PowerShell, use **ipconfig** to confirm that LON-PRODx obtained the IP address from the DHCP server. Write down the LON-PRODx IPv4 address.
13. On LON-HOSTx, try to ping the IP address of LON-PRODx, and confirm that four replies are returned.
14. On LON-DC1, try to ping the IP address of LON-PRODx, and confirm that four replies are returned.

Note: Leave the virtual machines running, as you will use them in the next lab.

Results: After completing this exercise, you should have created and used Hyper-V virtual switches.