Lab Answer Key: Module 13: Implementing Server Virtualization with Hyper-V

Lab: Implementing Server Virtualization with Hyper-V

Exercise 1: Installing the Hyper-V® Role onto a Server

Task 1: Install the Hyper-V role onto a server

1. On LON-HOST1, in Server Manager, click Local Server.
2. In the Properties pane, click the IPv4 address assigned by DHCP, IPv6 enabled link.
3. In the Network Connections dialog box, right-click the network object, and then click Properties.
4. In the Properties dialog box, click Internet Protocol Version 4 (TCP/IPv4), and then click Properties.
5. In the Properties dialog box, on the General tab, click Use the following IP address, and then configure the following:
   o IP Address: 172.16.0.31
   o Subnet mask: 255.255.0.0
   o Default gateway: 172.16.0.1
6. On the General tab, click Use the following DNS server addresses, and then configure the following:
   o Preferred DNS server: 172.16.0.10
7. Click OK to close the Properties dialog box.
8. In the Properties dialog box of the network object click Close.
9. Close the **Network Connections** dialog box.

10. In the Server Manager console, from the **Manage** menu, click **Add Roles and Features**.

11. In the Add Roles and Features Wizard, on the **Before you begin** page, click **Next**.

12. On the **Select installation type** page, click **Role-based or feature-based installation**, and then click **Next**.

13. On the **Select destination server** page, ensure that LON-HOST1 is selected, and then click **Next**.

14. On the **Select server roles** page, select **Hyper-V**.

15. In the Add Roles and Features Wizard, click **Add Features**.

16. On the **Select server roles** page, click **Next**.

17. On the **Select features** page, click **Next**.

18. On the **Hyper-V** page, click **Next**.

19. On the **Virtual Switches** page, verify that no selections have been made, and then click **Next**.

20. On the **Virtual Machine Migration** page, click **Next**.

21. On the **Default Stores** page, review the location of the **Default Stores**, and then click **Next**.

22. On the **Confirm installation selections** page, click **Restart the destination server automatically if required**.

23. In the Add Roles and Features Wizard, review the message regarding automatic restarts, and then click **Yes**.

24. On the **Confirm Installation Selections** page, click **Install**.

After a few minutes, the server restarts automatically. Ensure that you restart the machine from the boot menu as **20410C-LON-HOST1**. The computer will restart
Task 2: Complete Hyper-V role installation and verify settings

1. Sign in to LON-HOST1 using the account Administrator with the password Pa$$word.

2. When the installation of the Hyper-V tools completes, click Close to close the Add Roles and Features Wizard.

3. In the Server Manager console, click the Tools menu, and then click Hyper-V Manager.

4. In the Hyper-V Manager console, click LON-HOST1.

5. In the Hyper-V Manager console, in the Actions pane, with LON-HOST1 selected, click Hyper-V Settings.

6. In the Hyper-V Settings for LON-HOST1 dialog box, click the Keyboard item. Verify that the Keyboard is set to the Use on the virtual machine option.

7. In the Hyper-V Settings for LON-HOST1 dialog box, click the Virtual Hard Disks item.

8. Verify that the location of the default folder to store Virtual Hard Disk files is C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks, and then click OK.

Results: After completing this exercise, you should have installed the Hyper-V role onto a physical server.

Exercise 2: Configuring Virtual Networking

Task 1: Configure the external network
1. In the Hyper-V Manager console, click **LON-HOST1**.

2. From the **Actions** menu, click **Virtual Switch Manager**.

3. In the **Virtual Switch Manager for LON-HOST1** dialog box, click **New virtual network switch**. Ensure that **External** is selected, and then click **Create Virtual Switch**.

4. In the Virtual Switch Properties area, enter the following information, and then click **OK**:
   - **Name**: **Switch for External Adapter**
   - **External Network**: Mapped to the host computer’s physical network adapter. (This varies depending on the host computer.)

5. In the **Apply Networking Changes** dialog box, review the warning, and then click **Yes**.

**Task 2: Create a private network**

1. In Server Manager, on the **Tools** menu, open **Hyper-V Manager**, and then click **LON-HOST1**.

2. From the **Actions** menu, click **Virtual Switch Manager**.

3. Under **Virtual Switches**, click **New virtual network switch**.

4. Under **Create virtual switch**, click **Private**, and then click **Create Virtual Switch**.

5. In the Virtual Switch Manager dialog box, in the Virtual Switch Properties section, configure the following settings, and then click **OK**:
   - **Name**: **Private Network**
   - **Connection type**: **Private network**

**Task 3: Create an internal network**
1. In Server Manager, on the Tools menu, open Hyper-V Manager, and then click LON-HOST1.

2. From the Actions menu, click Virtual Switch Manager.


4. Under Create virtual switch, click Internal and then click Create Virtual Switch.

5. In the Virtual Switch Manager dialog box, in the Virtual Switch Properties section, configure the following settings, and then click OK:
   - Name: Internal Network
   - Connection type: Internal network

**Task 4: Configure the Media Access Control (MAC) address range**

1. In Server Manager, on the Tools menu, open Hyper-V Manager, and then click LON-HOST1.

2. On the Actions menu, click Virtual Switch Manager.


4. On MAC Address Range settings, configure the following values, and then click OK:
   - Minimum: 00-15-5D-0F-AB-A0
   - Maximum: 00-15-5D-0F-AB-EF

5. Close the Hyper-V Manager console.

**Results:** After completing this exercise, you should have configured virtual switch options on a physically-deployed Windows Server 2012 server running the Hyper-V role.
Exercise 3: Creating and Configuring a Virtual Machine

Task 1: Create differencing virtual hard disks

1. On the taskbar, click the File Explorer icon.
2. Expand This PC, expand drive E, expand Program Files, expand Microsoft Learning, and then expand Base.

   ![Note: The drive letter may depend upon the number of drives on the physical host machine.]

3. In the Base folder, verify that the Base14A-WS12R2.vhd hard disk image file is present.
4. Click the Home tab, and then click the New Folder icon twice to create two new folders. Right-click each folder and rename the folders to the following names:
   - LON-GUEST1
   - LON-GUEST2
5. Close File Explorer.
6. In the Server Manager console, click Tools, and then click Hyper-V Manager.
7. In the Hyper-V Manager console, in the Actions pane, click New, and then click Hard Disk.
8. In the New Virtual Hard Disk Wizard, on the Before You Begin page, click Next.
9. On the Choose Disk Format page, click VHD, and then click Next.
10. On the Choose Disk Type page, click Differencing, and then click Next.
11. On the Specify Name and Location page, specify the following details, and then click Next:
Name: LON-GUEST1.vhd

Location: E:\Program Files\Microsoft Learning\Base\LON-GUEST1\Base14A-WS12R2.vhd

12. On the Configure Disk page, type the location: E:\Program Files\Microsoft Learning\Base \Base14A-WS12R2.vhd, and then click Finish.

13. On the desktop, on the taskbar, click the Windows PowerShell® icon.

14. At the Windows PowerShell prompt, type the following command to create a new differencing virtual hard disk to be used with LON-GUEST2, and then press Enter:

```powershell
New-VHD "E:\Program Files\Microsoft Learning\Base\LON-GUEST2\LON-GUEST2.vhd"
-ParentPath "E:\Program Files\Microsoft Learning\Base\Base14A-WS12R2.vhd"
```


16. In the Hyper-V Manager console, in the Actions pane, click Inspect Disk.

17. In the Open dialog box, browse to E:\Program Files\Microsoft Learning\Base\LON-GUEST2\, click LON-GUEST2.vhd, and then click Open.

18. In the Virtual Hard Disk Properties dialog box, verify that LON-GUEST2.vhd is configured as a differencing virtual hard disk with E:\Program Files\Microsoft Learning\Base \Base14A-WS12R2.vhd as a parent, and then click Close.

**Task 2: Create virtual machines**

1. In Server Manager, on the Tools menu, open Hyper-V Manager, and then click LON-HOST1.

2. In the Hyper-V Manager console, in the Actions pane, click New, and then click Virtual Machine.
3. In the New Virtual Machine Wizard, on the Before You Begin page, click Next.

4. On the Specify Name and Location page, click Store the virtual machine in a different location, enter the following values, and then click Next:
   - Name: LON-GUEST1
   - Location: E:\Program Files\Microsoft Learning\Base\LON-GUEST1\ 

5. On the Specify Generation page, select Generation 1 and then click Next.

6. On the Assign Memory page, enter a value of 1024 MB, select the Use Dynamic Memory for this virtual machine option, and then click Next.

7. On the Configure Networking page, for the connection, click Private Network, and then click Next.

8. On the Connect Virtual Hard Disk page, click Use an existing virtual hard disk. Click Browse, browse to E:\Program Files\Microsoft Learning\Base\LON-GUEST1\lon-guest1.vhd, click Open, and then click Finish.

9. On the desktop, on the taskbar, click the Windows PowerShell icon.

10. At the Windows PowerShell prompt, type the following command to create a new virtual machine named LON-GUEST2, and then press Enter:

        New-VM -Name LON-GUEST2 -MemoryStartupBytes 1024MB -VHDPath "E:\Program Files\Microsoft Learning\Base\LON-GUEST2\LON-GUEST2.vhd" - SwitchName "Private Network"


12. In the Hyper-V Manager console, click LON-GUEST2.

13. In the Actions pane, under LON-GUEST2, click Settings.

15. In the Settings for LON-GUEST2 on LON-HOST1 dialog box, click Automatic Stop Action, and set the Automatic Stop Action to Shut down the guest operating system.

16. Click OK to close the Settings for LON-GUEST2 on LON-HOST1 dialog box.

Task 3: Enable resource metering

1. On the taskbar, click the Windows PowerShell icon.

2. At the Windows PowerShell prompt, enter the following commands to enable resource metering on the virtual machines, pressing Enter at the end of each line:

   ```powershell
   Enable-VMResourceMetering LON-GUEST1
   Enable-VMResourceMetering LON-GUEST2
   ```

**Results:** After completing this exercise, you should have deployed two separate virtual machines using a sysprepped virtual hard disk file as a parent disk for two differencing virtual hard disks.

Exercise 4: Using Virtual Machine Checkpoints

Task 1: Deploy Windows Server 2012 in a virtual machine

1. In the Hyper-V Manager console, click LON-GUEST1.

2. In the Actions pane, click Start.
3. Double-click **LON-GUEST1** to open the Virtual Machine Connection Window.

4. In the LON-GUEST1 on LON-HOST1 - Virtual Machine Connection window, perform the following steps:
   
   o On the **Settings** page, click **Next** to accept the Region and Language settings.
   
   o On the **Settings** page, click **I Accept**.
   
   o On the **Settings** page, type the password **Pa$$w0rd** twice, and then click **Finish**.

5. In the LON-GUEST1 on LON-HOST1 - Virtual Machine Connection window, from the **Action** menu, click **CTRL+Alt+Delete**.

6. Sign in to the virtual machine using the account **Administrator** and the password **Pa$$w0rd**.

7. On the virtual machine, in the Server Manager console, click **Local Server**, and then click the randomly assigned name next to the computer name.

8. In the **System Properties** dialog box, on the **Computer Name** tab, click **Change**.

9. In the **Computer Name** field, type **LON-GUEST1**, and then click **OK**.

10. In the **Computer Name/Domain Changes** dialog box, click **OK**.

11. Click **Close** to close the **System Properties** dialog box.

12. In the **Microsoft Windows** dialog box, click **Restart Now**.

**Task 2: Create a virtual machine checkpoint**

1. Sign in to the LON-GUEST1 virtual machine using the **Administrator** account and the password **Pa$$w0rd**

2. In the Server Manager console, click the **Local Server** node, and verify that the name of the computer is set to **LON-GUEST1**.
3. In the Virtual Machine Connection window, from the **Action** menu, click **Checkpoint**.

4. In the **Checkpoint Name** dialog box, type the name **Before Change**, and then click **Yes**.

**Task 3: Modify the virtual machine**

1. In the Server Manager console, click **Local Server**, and then next to **Computer name**, click LON-GUEST1.

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

3. In the **Computer Name** field, type LON-Computer1, and then click **OK**.

4. In the **Computer Name/Domain Changes** dialog box, click **OK**.

5. Close the **System Properties** dialog box.

6. In the **Microsoft Windows** dialog box, click **Restart Now**.

7. Sign back in to the LON-GUEST1 virtual machine using the **Administrator** account and the password **Pa$$w0rd**.

8. In the Server Manager console, click **Local Server**, and verify that the server name is set to LON-Computer1.

**Task 4: Revert to the existing virtual machine checkpoint**

1. In the Virtual Machine Connection window, from the **Action** menu, click **Revert**.

2. In the **Revert Virtual Machine** dialog box, click **Revert**.

3. In the Server Manager console, in the Local Server node, in the **Virtual Machines** list, verify that the **Computer Name** is now set to LON-GUEST1.
Task 5: View resource metering data

1. On LON-HOST1, on the taskbar, click the Windows PowerShell icon.

2. To retrieve resource metering information, at the Windows PowerShell prompt, enter the following command, and then press Enter:

   ```
   Measure-VM LON-GUEST1
   ```

   Note the average CPU, average random access memory (RAM), and total disk usage figures.


**Results:** After completing this exercise, you should have used virtual machine checkpoints to recover from a virtual machine misconfiguration.

Revert the virtual machines

After you finish the lab, restart the computer in Windows Server 2012 by performing the following steps:

1. On the taskbar, click the Windows PowerShell icon.

2. At the Windows PowerShell command prompt, type the following command, and then press Enter:

   ```
   Shutdown /r /t 5
   ```

3. From the Windows Boot Manager, select Windows Server 2012.