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# 6422A

**Implementing and Managing Windows  
Server® 2008 Hyper-V™**

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# Module 1

## Introduction to Windows Server 2008 Hyper-V

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# Lab Answer Keys

## Lab: Install Hyper-V and Perform Initial Configuration

### Exercise 1: Install Hyper-V

#### ► Task1: Enabling the Hyper V role in Windows Server 2008

1. As part of setup, your instructor has ensured that the computer has hardware assisted virtualization with the No-Execute Bit enabled.
2. Log on to **6422-Hyper-V##** as **Contoso##\Administrator**. To ensure each classroom has a unique computer name and domain, the Hyper-V servers have been assigned a two-digit number. When typing the computer name and domain throughout these labs, be sure to include these numbers.
3. On the **Start** menu, click **Administrative Tools | Server Manager**.
4. The Server Manager window opens. Maximize the window.
5. In the details pane, scroll down, and then click **Add Roles**.
6. The **Add Roles Wizard** appears. Click **Next**.
7. On the **Select Server Roles** page, select **Hyper-V**, and then click **Next**.
8. On the **Hyper-V** page, click **Next**.
9. On the **Create Virtual Network** page, select **Local Area Connection**, and then click **Next**.
10. On the **Confirm Installation Selections** page, click **Install**.
11. On the **Installation Results** page, click **Close**.
12. The **Add Roles Wizard** dialog box appears. Click **Yes**.
13. After the server restarts, log on as the domain administrator.
14. The **Resume Configuration Wizard** appears. Review the messages, and then click **Close**.

**Results:** After this exercise, you should have successfully installed the Hyper-V role.

### Exercise 2: Explore the Hyper-V Management Console

#### ► Task 1: Exploring Hyper-V Manager

1. On the **Start** menu, click **Administrative Tools | Hyper-V Manager**.
2. The Hyper-V Manager window opens. Maximize the window.
3. In the console tree, click **Hyper-V Manager**.
4. In the details pane, review the information in the **Introduction** and **Resources** sections.
5. In the **Actions** pane, click **Connect to Server**.
6. The **Select Computer** dialog box appears. Click **Cancel**.
7. In the console tree, click **6422-HYPER-V**. Review the sections of the details pane.
8. In the **Actions** pane, click **Hyper-V Settings**.
9. The **Hyper-V Settings** dialog box appears. Review the server level settings for Hyper-V. Click **Cancel**.



10. In the **Actions** pane, click **Virtual Network Manager**.
11. The **Virtual Network Manager** dialog box appears. Review the settings for Virtual Networks. Click **Cancel**.
12. In the **Actions** pane, click **New**. Review the wizards for creating **Virtual Machine**, **Hard Disk** and **Floppy Disk**.
13. In the **Actions** pane, click **Import Virtual Machine**. You can only import Virtual Machines that have been created and exported in Hyper-V.
14. The **Imported Virtual Machines** dialog box appears. In the **Import Path** field, type **E:\Mod01\Labfiles\SEA-SQL-01**, and then click **Import**.
15. In **Virtual Machines** pane, click **SEA-SQL-01**.
16. In the **Actions** pane, click **Start**, and then click **Connect**.
17. The SEA-SQL-01 on 6422-Hyper-V – Virtual Machine Connection window opens. Explore the menu and toolbar options. Experiment with working on the virtual machine. When finished, close this window.

**Results:** After this exercise, you should have become familiar with Hyper V Manager.

# Module 2

## Configure Hyper-V Settings and Virtual Networks

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# Lab Answer Keys

## Lab: Configuring Hyper-V and Virtual Networks

### Exercise 1: Configure Hyper-V Server Settings

#### ► Task1: Configuring Hyper-V server settings

1. Restore Hyper-V Manager.
2. In the **Actions** pane, click **Hyper-V Settings**.
3. The **Hyper-V Settings** dialog box appears. In the **Specify the default folder to store virtual hard disk files** field, type **E:\Hyper-V\Virtual Hard Disks**.
4. In the left pane, click **Virtual Machines**.
5. In the **Specify the default folder to store virtual machine configuration files** field, type **E:\Hyper-V**. Click **OK**.
6. In the **Actions** pane, click **New | Virtual Machine**.
7. The **New Virtual Machine Wizard** appears. Click **Next**.
8. On the **Specify Name and Location** page, in the **Name** field, type **SEA-SQL-02**, and then click **Next**.
9. On the **Assign Memory** page, in the **Memory** field, type **1024**. Click **Next**.
10. On the **Configure Networking** page, in the **Connection** list, click the **Virtual Network Adapter**. Click **Next**.
11. On the **Connect Virtual Hard Disk** page, click **Next**.
12. On the **Installation Options** page, click **Next**.
13. On the **Completing the New Virtual Machine Wizard** page, click **Finish**.
14. In the **Virtual Machines** pane, click **SEA-SQL-02**.
15. In the **Actions** pane, under **SEA-SQL-02**, click **Settings**.
16. The **Settings for SEA-SQL-02** dialog box appears. In the left pane, under **Hardware**, click **Memory**. In the **Memory** field, type **512**.
17. In the left pane, click **Processor**. In the **Number of logical processors** list click **2**.
18. Review the settings under **Resource control**. Review the information available through the **More about resource control link**. Click **OK**.

**Results:** After this exercise, you will have successfully configured the Hyper-V Server Settings and created a new virtual machine.

### Exercise 2: Configure Hyper-V Virtual Networks

#### ► Task 1: Configuring Hyper-V virtual network settings

1. In the **Actions** pane, click **Virtual Network Manager**.
2. In the left pane, click the existing Virtual Network.
3. In the **Name** field, type **Enterprise**.
4. Under **Connection type**, click **External**. Click the physical network adapter, and then click **Apply**.

5. If the **Apply Networking Changes** dialog box appears, click **Yes**.
6. In the left pane, click **New virtual network**.
7. In the right pane, click **Internal**, and then click **Add**.
8. In the **Name** field, type **Test Environment**.
9. Under **Connection type**, click **Internal only**. Click **Apply**.
10. If the **Apply Networking Changes** dialog box appears, click **Yes**.
11. In the left pane, click **New virtual network**.
12. In the right pane, click **Private**, and then click **Add**.
13. In the **Name** field, type **Isolated**.
14. Under **Connection type**, click **Private virtual machine network**. Click **OK**.
15. If the **Apply Networking Changes** dialog box appears, click **Yes**.
16. In the **Virtual Machines** pane, click **SEA-SQL-02**.
17. In the **Actions** pane, under **SEA-SQL-02**, click **Settings**.
18. The **Settings for SEA-SQL-02** dialog box appears. In the left pane, under **Hardware**, click **Network Adapter**.
19. In the right pane, in the **Network** list, click **Test Environment**.
20. Review the additional settings available, and then click **OK**.

**Results:** After this exercise, you will have configured Hyper-V Virtual Network Settings

# Module 3

## Hyper-V Remote Administration

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## Lab Answer Keys

### Lab: Accessing and Managing Hyper-V Remotely

#### Exercise 1: Configure the Windows Firewall

► **Task1: Configuring the Windows Firewall**

1. On the **Start** menu, click **Administrative Tools | Windows Firewall with Advanced Security**.
2. The Windows Firewall with Advanced Security window opens. Maximize the window.
3. In the console tree, click **Inbound Rules**.
4. In the details pane, double-click **Hyper-V - WMI (Async-In)**. Review the settings, and then click **Cancel**.
5. Double-click **Hyper-V - WMI (DCOM-In)**. Review the settings, and then click **Cancel**.
6. Double-click **Hyper-V - WMI (TCP-In)**. Review the settings, and then click **Cancel**.
7. Double-click **Hyper-V (RPC)**. Review the settings, and then click **Cancel**.
8. Double-click **Hyper-V (RPC-EPMAP)**. Review the settings, and then click **Cancel**.
9. Double-click **Hyper-V (SPL-TCP-In)**. Review the settings, and then click **Cancel**.
10. Double-click **Hyper-V Management Clients - WMI (Async-In)**. Review the settings, and then click **Cancel**.
11. Double-click **Hyper-V Management Clients - WMI (DCOM-In)**. Review the settings, and then click **Cancel**.
12. Double-click **Hyper-V Management Clients - WMI (TCP-In)**. Review the settings, and then click **Cancel**.
13. In the console tree, click **Outbound Rules**.
14. In the details pane, double-click **Hyper-V - WMI (TCP-Out)**. Review the settings, and then click **Cancel**.
15. Double-click **Hyper-V Management Clients - WMI (TCP-Out)**. Review the settings, and then click **Cancel**.
16. Close Windows Firewall with Advanced Security.

**Results:** After this exercise, you should have reviewed the Windows Firewall with Advanced Security settings for remotely managing Hyper-V.

#### Exercise 2: Install the Hyper-V Manager on Windows Vista

► **Task 1: Import and start SEA-WRK-001**

1. Restore Hyper-V Manager.
2. In the **Actions** pane, click **Import Virtual Machine**.
3. The **Import Virtual Machine** dialog box appears. In the **Import path** field, type **E:\Mod03\Labfiles\SEA-WRK-001**. Click **Import**.
4. In the details pane, click **SEA-WRK-001**.

5. In the **Actions** pane, click **Settings**.
6. The **Settings for SEA-WRK-001** dialog box appears. In the left pane, click **Network Adapter**.
7. In the right page, in the **Network** list, click **Enterprise**. Click **OK**.
8. In the **Actions** pane, click **Start**.

► **Task 2: Installing the Hyper-V manager on Windows Vista**

1. In the **Actions** pane, click **Connect**.
2. The **SEA-WRK-001 on local host** window opens. Perform the following steps within the SEA-WRK-001 virtual machine.
3. On the **Start** menu, right-click **Computer**, and then click **Properties**.
4. The System window opens. Maximize the window.
5. Under **Windows edition**, confirm that **Service Pack 1** is installed.
6. In the address bar, type **C:\Mod03\Labfiles**, and then press **ENTER**.
7. Double-click **Windows6.0-KB952627-x86**.
8. The **User Account Control (UAC)** dialog box appears. Click **Continue**.
9. The **Windows Update Standalone Installer** dialog box appears. Click **OK**.
10. The **Download and Install Updates** dialog box appears. When installation completes, click **Close**.

**Results:** After this exercise, you should have installed the Hyper-V Manager on Windows Vista.

### **Exercise 3: Connect to the Hyper-V Server Remotely**

► **Task 1: Connecting to the Hyper-V server remotely**

1. On the **Start** menu, click **Control Panel**.
2. The Control Panel window opens. Maximize the window.
3. Click **System and Maintenance**, and then click **Administrative Tools**.
4. Double-click **Hyper-V Manager**.
5. The **UAC** dialog box appears. Click **Continue**.
6. The Hyper-V Manager window opens. Maximize the window.
7. In the **Actions** pane, click **Connect to Server**.
8. The **Select Computer** dialog box appears. Click **Another Computer**.
9. In the **Computer Name** field, type **6422-HYPER-V##**. Click **OK**.
10. Review the message in the Virtual Machines pane. In order to manage Hyper-V remotely, you must connect using a domain user account that has permissions to manage the Hyper-V server.
11. In the SEA-WRK-001 on localhost window, click the **Shutdown** toolbar button.
12. The **Shut Down Machine** dialog box appears. Click **Shut Down**.
13. After the operating system shuts down, close SEA-WRK-001 on localhost.

**Results:** After this exercise, you should have connecting to the Hyper-V server remotely.

# Module 4

## Creating Virtual Hard Drives and Virtual Machines

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Lab Answer Keys

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# Lab Answer Keys

## Lab: Creating Virtual Hard Drives and Virtual Machines

### Exercise 1: Creating New Virtual Hard Drives

#### ► Task1: Creating a new virtual hard drive

1. Restore Hyper-V Manager.
2. In the **Actions** pane, click **New | Hard Disk**.
3. The **New Virtual Hard Disk Wizard** appears. Review the information available through the **More about virtual hard disks** link. Click **Next**.
4. On the **Choose Disk Type** page, review the descriptions under each virtual hard drive type.
5. Click **Dynamically expanding**, and then click **Next**.
6. On the **Specify Name and Location** page, in the **Name** field, type **SEA-WEB-01**.
7. Next to the **Location** field, click **Browse**.
8. The **Select Folder** dialog box appears. Browse to **E:\Hyper-V\Virtual HardDisks\**, and then click **OK**. Click **Next**.
9. On the **Configure Disk** page, click **Create a new blank virtual hard disk**.
10. In the **Size** field, type **250**, and then click **Next**.
11. On the **Completing the New Virtual Hard Disk Wizard** page, review the settings, and then click **Finish**.
12. On the **Start** menu, click **Computer**.
13. Navigate to **E:\Hyper-V\Virtual Hard Disks**. Verify the **SEA-WEB-01.vhd** file exists and note the size of the file.

#### ► Task 2: Replicating an existing virtual hard drive

1. Right-click **SEA-WEB-01.vhd**, and then click **Copy**.
2. On the **Edit** menu, click **Paste**.
3. Right-click **SEA-WEB-01 – Copy.vhd**, and then click **Rename**.
4. Type **SEA-WEB-02**, and then press ENTER.
5. Minimize Windows Explorer.

#### ► Task 3: Creating a new virtual hard drive from a physical hard drive

1. Restore Hyper-V Manager.
2. In the **Actions** pane, click **New | Hard Disk**.
3. The **New Virtual Hard Disk Wizard** appears. Click **Next**.
4. On the **Choose Disk Type** page, click **Next**.
5. On the **Specify Name and Location** page, in the **Name** field, type **SEA-Hyper-V-01.vhd**. Click **Next**.
6. On the **Configure Disk** page, click **Copy the contents of the specified physical disk**.

7. Restore Server Manager.
8. In the console tree, expand **Storage**, and then click **Disk Management**.
9. In the details pane, verify that the **C:\** drive is on **Disk 0**.
10. Minimize Server Manager.
11. In the **Physical Hard Disk list**, click **\\.\PHYSICALDRIVE0**. Click **Next**.
12. On the **Completing the New Virtual Hard Disk Wizard** page, review the settings, and then click **Finish**.
13. Restore Windows Explorer.
14. Verify the **SEA-Hyper-V.vhd** file exists and note the size of the file. It may take several minutes for the physical hard drive to be replicated to the Virtual Hard Disk (VHD) file. Press F5 to refresh as necessary. Depending on the size of physical drive, this process may take hours to complete.
15. Minimize Windows Explorer.
16. In the **Creating the new virtual hard disk** dialog box, click **Cancel**.
17. The **New Virtual Hard Disk Wizard** dialog box appears. Click **Close**, and then click **Cancel**.

**Results:** After this exercise, you should have 3 VHD files. Cancel the creation of SEAHyper-V-01.vhd creation.

## Exercise 2: Creating New Virtual Machines

### ► Task 1: Create the SEA-WEB-01 virtual machine

1. Restore Hyper-V Manager.
2. In the **Actions** pane, click **New | Virtual Machine**.
3. The **New Virtual Machine Wizard** appears. Review the **Before You Begin** information, and then click **Next**.
4. On the **Specify Name and Location** page, in the **Name** field, type **SEA-WEB-01**. Click **Next**.
5. On the **Assign Memory** page, in the **Memory** field, type **512**. Click **Next**.
6. On the **Configure Networking** page, in the **Connection** list, click **Test Environment**. Click **Next**.
7. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**.
8. Click **Browse**.
9. The **Open** dialog box appears. Click **SEA-WEB-01.vhd**, and then click **Open**.
10. Click **Next**.
11. On the **Completing the New Virtual Machine Wizard** page, review the settings.
12. Click **Finish**.

### ► Task 2: Add the second VHD to SEA-WEB-01

1. In the **Virtual Machines** pane, click **SEA-WEB-01**.
2. In the **Actions** pane, under **SEA-WEB-01**, click **Settings**.
3. The **Settings for SEA-WEB-01** dialog box appears. In the left pane, click **IDE Controller 0**.



4. In the right pane, click **Hard Drive**, and then click **Add**.
5. Under **Media**, click **Browse**.
6. The **Open** dialog box appears. Click **SEA-WEB-02.vhd**, and then click **Open**.
7. Click **Apply**.

► **Task 3: Mount the operating system installation media**

1. In the left pane, under **IDE Controller 1**, click **DVD Drive**.
2. In the right pane, under **Media**, click **Image file**.
3. Click **Browse**.
4. The **Open** dialog box appears. Navigate to **E:\Mod04\Labfiles**.
5. Click **6001.18000.080118-1840\_amd64fre\_Server\_en-us-KRMSXFRE\_EN\_DVD.iso**, and then click **Open**.
6. In the **Settings for SEA-WEB-01** dialog box, click **OK**.

► **Task 4: Connect to the Virtual Machine and install Windows Server® 2008**

1. In the **Virtual Machines** pane, click **SEA-WEB-01**.
2. In the **Actions** pane, click **Start**.
3. In the **Actions** pane, click **Connect**.
4. The Virtual Machine may be unable to capture the mouse until the Hyper-V Integration Services are installed. If this is the case, use the keyboard to start the Windows Server 2008 installation.
5. The SEA-WEB-01 on 6422-Hyper-V – Virtual Machine Connection window opens. When the **Install Windows** wizard appears, press ENTER twice.
6. On the **Type your product key for activation** page, click **Next**.
7. The **Install Windows** dialog box appears. Review the message, and then click **No**.
8. On the **Select the edition of Windows that you purchased** page, click **Windows Server 2008 Enterprise (Server Core Installation)**.
9. Select **I have selected the edition of Windows that I purchased**, and then click **Next**.
10. On the **Please read the license terms** page, select **I accept the license terms**, and then click **Next**.
11. On the **Which type of installation do you want** page, click **Custom (advanced)**.
12. On the **Where do you want to install Windows** page, click **Next**. The installation will now complete.
13. Close SEA-WEB-01 on localhost.

**Results:** After this exercise, you should have one virtual machine created from the previous exercises VHDs, and Windows Server 2008 installing on the VM.

# Module 5

## Virtual Machine Settings, Snapshots, and High Availability

### Contents:

Lab Answer Keys

2

# Lab Answer Keys

## Lab: Managing Virtual Machines

### Exercise 1: Configure Virtual Machine Settings

#### ► Task1: Configure critical virtual machine settings

1. Restore Hyper-V Manager.
2. In the **Virtual Machines** pane, click **SEA-WEB-01**.
3. In the **Action** pane, under **SEA-WEB-01**, click **Settings**.
4. The **Settings for SEA-WEB-01** dialog box appears. In the left pane, under **Hardware**, click **Processor**.
5. Review the information available through the **More about virtual processors** and **More about resource control** links.
6. In the **Virtual machine reserve (percentage)** field, type **20**.
7. In the **Virtual machine limit (percentage)** field, type **80**.
8. In the **Relative weight** field, type **75**.
9. Click **Apply**.
10. In the left pane, under **Management**, click **Automatic Start Action**.
11. In the right pane, click **Always start this virtual machine automatically**.
12. In the left pane, under **Management**, click **Automatic Stop Action**.
13. In the details pane, review the settings.
14. Click **OK**.
15. In the **Virtual Machines** pane, click **SEA-SQL-01**.
16. In the **Action** pane, under **SEA-SQL-01**, click **Settings**.
17. The **Settings for SEA-SQL-01** dialog box appears. In the left pane, under **Hardware**, click **Processor**.
18. In the **Virtual machine reserve (percentage)** field, type **20**.
19. In the **Virtual machine limit (percentage)** field, type **80**.
20. In the **Relative weight** field, type **50**.
21. Click **Apply**.
22. In the left pane, under **Management**, click **Automatic Start Action**.
23. In the right pane, click **Always start this virtual machine automatically**.
24. In the left pane, under **Management**, click **Automatic Stop Action**.
25. In the right pane, click **Shut down the guest operating system**.
26. Click **OK**.

#### ► Task 2: Configure non-critical virtual machine settings

1. In the **Virtual Machines** pane, click **SEA-WRK-001**.

2. In the **Action** pane, under **SEA-WRK-001**, click **Settings**.
3. The **Settings for SEA-WRK-001** dialog box appears. In the left pane, under **Hardware**, click **Processor**.
4. In the **Virtual machine reserve (percentage)** field, type **0**.
5. In the **Virtual machine limit (percentage)** field, type **20**.
6. In the **Relative weight** field, type **25**.
7. Click **Apply**.
8. In the left pane, under **Management**, click **Automatic Start Action**.
9. In the right pane, click **Nothing**.
10. In the left pane, under **Management**, click **Automatic Stop Action**.
11. In the right pane, click **Turn off the virtual machine**.
12. Click **OK**.

**Results:** After this exercise, you will have successfully configured the VM settings for the virtual machines.

## Exercise 2: Monitor Hyper-V Performance

### ► Task 1: Adding counters to the Performance Monitor

1. On the **Start** menu, click **Administrative Tools | Reliability and Performance Monitor**.
2. The Reliability and Performance Monitor window opens. Maximize the window.
3. In the console tree, click **Performance Monitor**.
4. In the details pane, review the Counter % **Processor Time**.
5. Click the **Add** toolbar button, the green plus sign (+).
6. The **Add Counters** dialog box appears. Select **Show description**.
7. In the **Available counters** list, scroll up and expand **Hyper-V Hypervisor**.
8. Click **Logical Processors**, and then click **Add >>**.
9. Click **Partitions**, and then click **Add >>**.
10. Click **Virtual Processors**, and then click **Add >>**.
11. Expand **Hyper-V Hypervisor Logical Processor**.
12. Click % **Guest Run Time**, and then click **Add >>**.
13. Click % **Hypervisor Run Time**, and then click **Add >>**.
14. Click % **Total Run Time**, and then click **Add >>**.
15. Click **OK**.

### ► Task 2: Using the Performance Monitor

1. Restore Hyper-V Manager.
2. In the **Virtual Machines** pane, right-click **SEA-SQL-02**, and then click **Start**.
3. Right-click **SEA-WEB-01**, and click **Shut Down**.

4. The **Shut Down Machine** dialog box appears. Click **Shut Down**.
5. When the state of **SEA-WEB-01** is **Off**, in the **Actions** pane, click **Settings**.
6. The **Settings for SEA-WEB-01** dialog box appears. In the left pane, click **Processor**.
7. In the **Number of logical processors** list, click **2**.
8. Click **OK**.
9. In the **Actions** pane, click **Start**.
10. Restore Reliability and Performance Monitor.
11. Review the graph.
12. Click the **Change Graph Type** toolbar button (or press CTRL+G) to alternate the type of graphs.

**Results:** After this exercise, you will have experience with the new Hyper-V performance monitor counters.



# Module 6

## Migration of Virtual Machines to Hyper-V

### Contents:

Lab Answer Keys

**2**

# Lab Answer Keys

## Lab: Managing Virtual Machines

### Exercise 1: Migrate Existing Virtual Machines to Hyper-V

- ▶ **Task1: Copy the Virtual Server 2005 virtual hard disk (VHD) files to Hyper-V**
  1. Restore Windows Explorer.
  2. Browse to **E:\Mod6\Labfiles**.
  3. Click **WS03 NoVMAdd.vhd**, and then press CTRL+click **WS03 VMAdd.vhd**.
  4. On the **Edit** menu, click **Copy**.
  5. Browse to **E:\Hyper-V\Virtual Hard Disks**.
  6. On the **Edit** menu click **Paste**.
- ▶ **Task 2: Create Hyper-V VMs**
  1. Restore Hyper-V Manager.
  2. In the **Actions** pane, click **New | Virtual Machine**.
  3. The **New Virtual Machine Wizard** appears. Click **Next**.
  4. On the **Specify Name and Location** page, in the **Name** field, type **SEA-SRV-01**. Click **Next**.
  5. On the **Assign Memory** page, in the **Memory** field, type **256**. Click **Next** twice.
  6. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**.
  7. Click **Browse**.
  8. The **Open** dialog box appears. Double-click **WS03 VMAdd.vhd**.
  9. Click **Finish**.
  10. In the **Actions** pane, click **New | Virtual Machine**.
  11. The **New Virtual Machine Wizard** appears. Click **Next**.
  12. On the **Specify Name and Location** page, in the **Name** field, type **SEA-SRV-02**. Click **Next**.
  13. On the **Assign Memory** page, in the **Memory** field, type **256**. Click **Next** twice.
  14. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**.
  15. The **Open** dialog box appears. Double-click **WS03 NoVMAdd.vhd**.
  16. Click **Finish**.
  17. In the **Virtual Machines** pane, click **SEA-WEB-01**, and then press CTRL+click **SEA-WRK-001**.
  18. In the **Actions** pane, click **Shut Down**.
  19. In the **Virtual Machines** pane, click **SEA-SRV-01**, and then press CTRL+click **SEA-SRV-02**.
  20. In the **Actions** pane, click **Start**.

**Results:** After this exercise, you should have two virtual machines created. One will have the VM Additions still installed and the other will not.

## Exercise 2: Troubleshoot Issues on the Migrated VMs

### ► Task 1: Migrate the SEA-SRV-01 VM to Hyper-V

1. In the **Virtual Machines** pane, click **SEA-SRV-01**.
2. In the **Actions** pane, click **Connect**.
3. The SEA-SRV-01 on localhost window opens. After the server boots, click the **CTRL+ALT+DEL** toolbar button.
4. Click the mouse pointer inside the window.
5. Review the message at the bottom of the window.
6. Perform the remaining steps in this task within the SEA-SRV-01 Virtual Machine.
7. If the **Service Manager** dialog box appears, click **OK**.
8. Log on as **Administrator**. In the **Password** field, type **Pa\$\$w0rd**.
9. The **Windows Protection Activation** dialog box appears. Click **No**.
10. The **New Hardware Wizard** dialog box appears. Click **Cancel**.
11. Press RIGHTALT+LEFT ARROW to release the mouse.
12. On the **Action** menu, click **Insert Integration Services Setup Disk**.
13. The **Virtual Machine Additions Detected** dialog box appears. Review the message, and then click **OK**.
14. On the **Start** menu, click **Control Panel | Add or Remove Programs**.
15. The Add or Remove Programs window opens. Click **Virtual Machine Additions**, and then click **Remove**.
16. The **Add or Remove Programs** dialog box appears. Click **Yes**.
17. The **Virtual Machine Additions** dialog box appears. Click **Yes**.
18. When the virtual machine reboots, log on as **Administrator**. In the **Password** field, type **Pa\$\$word**.
19. If the **Service Manager** dialog box appears, click **OK**.
20. The **Windows Protection Activation** dialog box appears. Click **No**.
21. The **New Hardware Wizard** dialog box appears. Click **Cancel**.
22. On the desktop, double-click **My Computer**.
23. Double-click **Integration Services Setup (D:)**.
24. The **HAL Upgrade Required** dialog box appears. Review the message, and then click **OK**.
25. The **Restart Required** dialog box appears. Click **Yes**.
26. When the virtual machine restarts, log on as **Administrator**. In the **Password** field, type **Pa\$\$w0rd**.
27. The **Windows Protection Activation** dialog box appears. Click **No**.
28. The **New Hardware Wizard** dialog box appears. Click **Cancel**.
29. The **Hyper-V Integration Services** dialog box appears. This process may take several minutes to complete.

30. The **Files Needed** dialog box appears. In the **Copy files from** field, type **C:\Win2k3\I386**, and then click **OK**.
31. The **Installation Complete** dialog box appears. Review the message, and then click **Yes**.
32. When the virtual machine reboots, log on as **Administrator**. In the **Password** field, type **Pa\$\$w0rd**.
33. The **Windows Protection Activation** dialog box appears. Click **No**.
34. The Virtual Machine is now ready for use on the Hyper-V server.
35. Close the SEA-SRV-01 on localhost – Virtual Machine Connection window.

► **Task 2: Migrate the SEA-SRV-02 VM to Hyper-V**

1. Restore Hyper-V Manager.
2. In the **Virtual Machines** pane, double-click **SEA-SRV-02**.
3. The **SEA-SRV-02 on localhost** window opens. After the server boots, click the **CTRL+ALT+DEL** toolbar button.
4. Click the mouse pointer inside the window.
5. Perform the following steps using the keyboard within the SEA-SRV-01 Virtual Machine.
6. Log on as **Administrator**. In the Password field, type **Pa\$\$w0rd**.
7. If the **Service Manager** dialog box appears, click **OK**.
8. The **Windows Protection Activation** dialog box appears. Click **No**.
9. The **New Hardware Wizard** dialog box appears. Click **Cancel**.
10. Press CTRL+ALT+LEFT ARROW. In the SEA-SRV-02 on localhost window, on the **Action** menu, click **Insert Integration Services Setup Disk**.
11. The **HAL Upgrade Required** dialog box appears. Review the message, and then click **OK**.
12. The **Restart Required** dialog box appears. Review the message, and then click **OK**.
13. When the virtual machine restarts, log on as **Administrator**. In the **Password** field, type **Pa\$\$w0rd**.
14. If the **Service Manager** dialog box appears, click **OK**.
15. The **Windows Protection Activation** dialog box appears. Click **No**.
16. The **New Hardware Wizard** dialog box appears. Click **Cancel**.
17. The **Files Needed** dialog box appears. In the **Copy files from** field, type **C:\Win2k3\I386**, and then click **OK**.
18. The **Installation Complete** dialog box appears. Review the message, and then click **Yes**.
19. When the virtual machine restarts, log on as **Administrator**. In the **Password** field, type **Pa\$\$w0rd**.
20. The **Windows Protection Activation** dialog box appears. Click **No**.
21. The Virtual Machine is now ready for use on the Hyper-V server.
22. Close the SEA-SRV-02 on localhost – Virtual Machine Connection window.

**Results:** After this exercise, you should have two virtual machines working with Hyper-V Integration Services installed.

# Module 7

## Introduction to System Center Virtual Machine Manager

### Contents:

Lab Answer Keys

**2**

# Lab Answer Keys

## Lab: Using VMM to Manage Hyper-V

### Exercise 1: Configure VMM

#### ► Task1: Open Virtual Machine Manager Administrator Console

1. On the **Start** menu, click **All Programs | Microsoft System Center | Virtual Machine Manager 2008 | Virtual Machine Manager Administrator Console**.
2. The **Connect to Server** dialog box appears. Click **Connect**.

#### ► Task 2: Add a new host group

1. In the **Actions** pane, click **New host group**.
2. Type **Contoso**, and then press ENTER.

#### ► Task 3: Add a Hyper-V host

1. In the **Actions** pane, click **Add host**.
2. The **Add Hosts** wizard appears. In the **Password** field, type **Pa\$\$w0rd**, and then click **Next**.
3. On the **Select Host Servers** page, in the **Host server name** field, type **6422-Hyper-V##**, and then click **Add**.
4. In the **Selected servers** list, click **6422-Hyper-V##.contoso.com**, and then click **Next**.
5. The **Virtual Machine Manager** dialog box appears. Review the message, and then click **Yes**.
6. On the **Configuration Settings** page, in the **Add the selected new hosts to the following host group** list, expand **All Hosts**, and then click **Contoso**.
7. Click **Next**.
8. On the **Host Properties** page, in the **Add the following paths** field, type **E:\Hyper-V**. Click **Add**, and then click **Next**.
9. On the **Summary** page, click **Add Hosts**.
10. The Jobs window opens. Maximize the window. Review the status and description of each job. When the jobs finish, close the Jobs window.
11. In the details pane, under **6422-Hyper-V##.Contoso.com**, review the **CPU**, **Memory**, **Storage**, **Operating system**, **Virtualization software**, and **Virtual machines** information. It may take several minutes for this information to populate.

**Results:** After this exercise, you should have added 6422-Hyper-V to the Contoso host group in the Virtual Machine Manager Administrator Console.

### Exercise 2: Manage Hosts

#### ► Task 1: View host information

1. In the details pane, double-click **6422-Hyper-V##.Contoso.com**.
2. The **Host Properties for 6422-Hyper-V##.Contoso.com** dialog box appears. Review the information available for this VM Host on each of the tabs.

3. Click **Cancel**.

► **Task 2: View virtual machines**

1. In the left pane, click **Virtual Machines**.
2. In the details pane, double-click **SEA-WEB-01**.
3. The **Virtual Machine Properties for SEA-WEB-01** dialog box appears. Review the information available for this VM on each of the tabs.
4. Click **Cancel**.
5. In the details pane, click **SEA-SRV-01**, and then press CTRL+click **SEA-SRV-02**.
6. In the **Actions** pane, click **Shut down**.
7. The **Virtual Machine Manager** dialog box appears. Review the message, and then click **Yes**.

► **Task 3: Create virtual networks**

1. In the left pane, click **Hosts**.
2. In the details pane, double-click **6422-Hyper-V.contoso.com**.
3. The **Host Properties for 6422-Hyper-V##.Contoso.com** dialog box appears. Click the **Networking** tab.
4. Click **Add**.
5. In the **Name** field, type **VMM Network**.
6. Under **Network bindings**, click **Physical network adapter**.
7. Select **Host access**.
8. Click **OK**.
9. The **Virtual Machine Manager** dialog box appears. Review the message, and then click **Yes**.

**Results:** After this exercise, you should have created a network named VMM Network.

## Exercise 3: Create a New Virtual Machine

► **Task 1: Create a new virtual machine**

1. In the **Actions** pane, click **New virtual machine**.
2. The **New Virtual Machine** wizard appears. Click **Create the new virtual machine with a blank virtual hard disk**, and then click **Next**.
3. On the **Virtual Machine Identity** page, in the **Virtual machine name** field, type **LON-DC-01**. Click **Next**.
4. On the **Configure Hardware** page, in the **Size** field, type **20**.
5. In the left pane, under **Hardware Profile**, click **Memory**.
6. In the **Virtual machine memory** field, type **256**.
7. In the left pane, under **Hardware Profile**, click **Processor**.
8. Under **CPU**, in the **Number of CPUs** list, click **2**.

9. In the **CPU type** list, click **1.80 GHz Pentium 4**.
10. Click **Next**.
11. On the **Select Destination** page, review the options, and then click **Next**.
12. On the **Select Host** page, click **6422-Hyper-V##.Contoso.com**.
13. Review the tabs under **Details**, and then click **Next**.
14. On the **Select Path** page, click **Next**.
15. On the **Select Networks** page, in the **Virtual Network** list, click **Internal Network-VMM Network**.
16. Click **Next**.
17. On the **Additional Properties** page, in the **Action when physical server stops** list, click **Shut down guest OS**.
18. Under **Operating system**, in the **Specify the operating system you will install in the virtual machine** list, review the available options. Click **Windows Server 2003 Enterprise x64 Edition**.
19. Click **Next**.
20. On the **Summary** page, click **Create**.
21. The Jobs window opens. Review the jobs required to create the virtual machine. When all the jobs complete, close the Jobs window.

**Results:** After this exercise, you should have created a new virtual machine named LON-DC-01.

## Exercise 4: Create a VM from an Existing Hard Disk

### ► Task 1: Create a new VM from an existing hard disk

1. In the **Actions** pane, click **New virtual machine**.
2. The **New Virtual Machine** wizard appears. Click **Browse**.
3. The **Select Virtual Machine Source** dialog box appears. Click **Blank Disk – Large**, and then click **OK**. Click **Next**.
4. On the **Virtual Machine Identity** page, in the **Virtual machine name** field, type **LON-DC-02**, and then click **Next**.
5. On the **Configure Hardware** page, click **Next**.
6. On the **Select Destination** page, click **Next**.
7. On the **Select Host** page, click **Next**.
8. On the **Select Path** page, click **Next**.
9. On the **Select Networks** page, in the **Virtual Network** list, click **VMM Network**.
10. Click **Next**.
11. On the **Additional Properties** page, click **Next**.
12. On the **Summary** page, click **Create**.
13. The Jobs window opens. Review the jobs required to create the virtual machine. When all the jobs complete, close the Jobs window.



**Results:** After this exercise, you should have created a new virtual machine named LON-DC-02.

## Exercise 5: Convert a VMware Virtual Machine

### ► Task 1: Copy files to library share

1. On the **Start** menu, click **Computer**.
2. The Windows Explorer window opens. Navigate to **E:\ Mod07\Labfiles**.
3. Click **SEA-APP-01.vmdk**, and then CTRL-click **Windows Server 2003 Enterprise Edition.vmx**.
4. On the **Edit** menu, click **Copy**.
5. In the address bar, type **\\6422-Hyper-V##.contoso.com\msscvmmlibrary**, and then press ENTER.
6. On the **Edit** menu, click **Paste**.
7. Wait for the copy process to complete.
8. Close Windows Explorer.

### ► Task 2: Refresh library

1. Restore Virtual Machine Manager.
2. In the left pane, click **Library**.
3. In the **Library Servers** pane, click **6422-Hyper-V.Contoso.com**.
4. In the **Actions** pane, Under **Library Server**, click **Refresh**.

### ► Task 3: Convert virtual machine

1. In the **Actions** pane, click **Convert virtual machine**.
2. The **Convert Virtual Machine Wizard** appears. Click **Browse**.
3. The **Select Virtual Machine Source** dialog box appears. Click **SEA-APP-01**, and then click **OK**. Click **Next**.
4. On the **Virtual Machine Identity** page, click **Next**.
5. On the **Virtual Machine Configuration** page, in the **Memory** field, type **256**. Click **Next**.
6. On the **Select Host** page, click **6422-Hyper-V##.Contoso.com**, and then click **Next**.
7. On the **Select Path** page, click **Next**.
8. On the **Select Networks** page, in the **Virtual Network** list, click **VMM Network**.
9. Click **Next**.
10. On the **Additional Properties** page, click **Next**.
11. On the **Summary** Page, click **Create**.
12. The Jobs window opens. Review the jobs required to create the virtual machine. When all the jobs complete, close the Jobs window.

**Results:** After this exercise, you should have converted LON-EX-01 to a VMM compatible format.

## Exercise 6: VMM Administration

### ► Task 1: View job information

1. In the left pane, click **Jobs**.
2. In the details pane, click **Virtual-to-virtual conversion**.
3. At the bottom of the details pane, click the **Details** tab, and then review the steps and progress.
4. Click the **Change Tracking** tab.
5. Review the **Property**, **Previous Value**, and **New Value** information.

### ► Task 2: Set placement defaults for virtual machines

1. In the left pane, click **Administration**, and then click **General**.
2. In the details pane, double-click **Placement Settings**.
3. The **Placement Settings** dialog box appears. Set **Memory free** to **Very Important**.
4. Set **Network Utilization** to **Very Important**.
5. Click **OK**.

### ► Task 3: Grant user remote access

1. In the details pane, double-click **Remote Control**.
2. The **Remote Control** dialog box appears. Click **Add**.
3. In the **Enter the object name to select** field, type **Administrator**.
4. Click **Check Names**.
5. Click **OK** twice.

**Results:** After this exercise, you should have viewed job details, set placement defaults for virtual machines and granted the user Administrator remote control.

# Module 8

## Managing the VMM Virtual Machine Image Library and Checkpoints

### Contents:

Lab Answer Keys

2

# Lab Answer Keys

## Lab A: Using the VMM Library

### Exercise 1: Configure Library Resources

#### ► Task1: Show hidden files and folders

1. Restore Windows Explorer.
2. On the **Tools** menu, click **Folder Options**.
3. The **Folder Options** dialog box appears. Click the **View** tab.
4. In the **Advanced settings** field, under **Hidden files and folders**, select **Show hidden files and folders**.
5. Click **OK**.

#### ► Task 2: Add a shared folder

1. Navigate to **C:\ProgramData**.
2. On the **File** menu, click **New | Folder**.
3. Type **ContosoResources**, and then press ENTER.
4. Right-click **ContosoResources**, and then click **Share**.
5. The **File Sharing** dialog box appears. Click **Share**, and then click **Done**.

#### ► Task 3: Add a library share

1. Restore Virtual Machine Manager.
2. In the left pane, click **Library**.
3. In the **Resources** pane, click **6422-HYPER-V##.contoso.com**.
4. Right-click **6422-HYPER-V##.contoso.com**, and then click **Add library share**.
5. The **Add Library Share** wizard appears. Select **ContosoResources**, and then click **Next**.
6. On the **Summary** page, click **Add Library Shares**.

#### ► Task 4: Add resources to the library share

1. Restore Windows Explorer.
2. Navigate to **E:\Mod04\Labfiles**, and then click **6001.18000.080118-1840\_amd64fre\_Server\_en-us-KRMSXFRE\_EN\_DVD.iso**.
3. On the **Edit** menu, click **Copy To Folder**.
4. The **Copy Items** dialog box appears. Navigate to **C:\ProgramData\ContosoResources**, and then click **Copy**.
5. Navigate to **E:\Hyper-V\Virtual Hard Disks**, and then click **WS03 VMAdd.vhd**.
6. On the **Edit** menu, click **Copy To Folder**.
7. The **Copy Items** dialog box appears. Navigate to **C:\ProgramData\ContosoResources**, and then click **Copy**.

► **Task 5: Configure library refresh**

1. Restore Virtual Machine Manager.
2. In the **Resources** pane, click **6422-HYPER-V.contoso.com | ContosoResources**.
3. In the **Actions** pane, click **Library settings**.
4. The **Library Settings** dialog box appears. In the **Library refresh interval (hours)** field, type **2**, and then click **OK**.

► **Task 6: Manually refresh library share**

- In the **Library Servers** pane, right-click **ContosoResources**, and then click **Refresh**.

**Results:** After this exercise, you should have created a shared folder, added the library share for the folder to VMM, and then added resources to the VMM library.

## Exercise 2: Work with Templates

► **Task 1: Create a template**

1. In the **Actions** pane, click **New template**.
2. The **New Template Wizard** appears. Click **From an existing virtual machine currently located on a host**.
3. Click **Browse**.
4. The **Select Template Source** dialog box appears. Click **SEA-WRK-001**, and then click **OK**.
5. Click **Next**.
6. The **Virtual Machine Manager** dialog box appears. Review the message, and then click **Yes**.
7. On the **Template Identity** page, in the **Template name** field, type **Contoso Windows Server 2003**.
8. Click **Next**.
9. On the **Configure Hardware** page, click **Next**.
10. On the **Guest Operating System** page, under **Networking**, click **Domain / Workgroup**.
11. Click **Domain**.
12. In the **Domain** field, type **Contoso**.
13. In the **Domain user** field, type **contoso\administrator**.
14. In the **Password** and **Confirm** fields, type **Pa\$\$w0rd**.
15. Under **General Settings**, click **Admin Password**.
16. In the **Password** and **Confirm** fields, type **Pa\$\$w0rd**.
17. Click **Next**.
18. On the **Select Library Server** page, click **Next**.
19. On the **Select path** page, click **Browse**.
20. The **Select Destination Folder** dialog box appears. Click **ContosoResources**, and then click **OK**.
21. Click **Next**.
22. On the **Summary** page, click **Create**.

23. In the left pane, click **Jobs**.
24. In the details pane, click **Create template**.
25. Click the **Details** tab, and then review the steps and status of the template creation. When the job completes, continue with the next task.

► **Task 2: Create a VM from a template**

1. In the **Actions** pane, click **New virtual machine**.
2. The **New Virtual Machine** wizard appears. Click **Browse**.
3. The **Select Virtual Machine Source** dialog box appears. Click **Contoso Windows Server 2003**, and then click **OK**.
4. Click **Next**.
5. On the **Virtual Machine Identity** page, in the **Virtual machine name** field, type **SEA-APP-02**.
6. Click **Next**.
7. On the **Configure Hardware** page, click **Next**.
8. On the **Guest Operating System** page, click **Identity Information**.
9. In the **Computer name** field, type **SEA-APP-02**.
10. Click **Admin Password**.
11. In the **User name** field, type **Admin**.
12. Click **Product Key**.
13. In the **Product Key** field, type **XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX**.
14. Click **Next**.
15. On the **Select Destination** page, click **Next**.
16. On the **Select Host** page, click **Next**.
17. On the **Select Path** page, click **Next**.
18. On the **Select Networks** page, click **Next**.
19. On the **Additional Properties** page, click **Next**.
20. On the **Summary** page, click **Create**.
21. The Jobs window opens. Click **Create virtual machine**.
22. Review the steps and status of the virtual machine creation. Continue with the next exercise as this process completes in the background.

**Results:** After this exercise, you should have created a new virtual machine named SEA-APP-01 from the Contoso Windows Server 2003 template.

## Exercise 3: Create Profiles

► **Task 1: Create a hardware profile**

1. Restore Virtual Machine Manager.
2. In the left pane, click **Library**.

3. In the **Actions** pane, click **New hardware profile**.
4. The **New Hardware Profile** dialog box appears. In the **Name** field, type **Default Hardware Profile**.
5. Click the **Hardware Settings** tab.
6. In the **Network location** list, click **Internal Network**.
7. Click the **Network Adapter** toolbar button, and then click **Synthetic network adapter**.
8. In the left pane, click **Memory**.
9. In the **Virtual machine memory** field, type **256**.
10. Click **OK**.

► **Task 2: Create a guest operating system profile**

1. In the **Actions** pane, click **New guest OS profile**.
2. In the **Name** field, type **Default Guest OS Profile**.
3. Click the **Guest OS** tab.
4. Click **Admin Password**.
5. In the **Password** and **Confirm** fields, type **Pa\$\$w0rd**.
6. Click **Product Key**.
7. In the **Product Key** field, type **XXXXX-XXXXX-XXXXX-XXXXX-XXXXX**.
8. Click **Operating System**.
9. In the **Operating system** list, click **64-bit edition of Windows Server 2008 Standard**.
10. Click **OK**.

**Results:** After this exercise, you should have created a hardware profile named Default Hardware Profile, and a guest operating system profile named Default Guest OS Profile.

## Exercise 4: Deploy a Virtual Machine from the Library

► **Task 1: Create a new VM in the library**

1. In the **Actions** pane, click **New virtual machine**.
2. The **New Virtual Machine** wizard appears. Select **Create the new virtual machine with a blank virtual hard disk**.
3. Click **Next**.
4. On the **Virtual Machine Identity** page, in the **Virtual machine name** field, type **SEA-APP-03**.
5. Click **Next**.
6. On the **Configure Hardware** page, click **Next**.
7. On the **Select Destination** page, select **Store the virtual machine in the library**.
8. Click **Next**.
9. On the **Select Library Server** page, click **Next**.
10. On the **Select path** page, click **Browse**.

11. The **Select Destination Folder** dialog box appears. Click **ContosoResources**, and then click **OK**.
12. Click **Next**.
13. 13. On the **Summary** page, click **Create**.

► **Task 2: Deploy a VM from the Library**

1. Restore Jobs.
2. Click **Create virtual machine**.
3. Review the results under the **Details** tab. If this job is still running, wait for the job to complete before continuing to the next step. If the job is taking too long to complete, continue to the next exercise.
4. In the left pane, click **Library**.
5. In the details pane, click **SEA-SRV-01**.
6. In the **Actions** pane, click **Deploy**.
7. The **Deploy Virtual Machine** wizard appears. Click **Next**.
8. On the **Select Path** page, click **Next**.
9. On the **Select Networks** page, click **Next**.
10. On the **Summary** page, click **Deploy**.

**Results:** After this exercise, you should have created a hardware profile named Default Hardware Profile, and a guest operating system profile named Default Guest OS Profile.

## Exercise 5: Create a Self-Service Policy

► **Task 1: Create a self-service user role**

1. Restore Virtual Machine Manager.
2. In the left pane, click **Administration**.
3. In the **Administration** pane, click **User Roles**.
4. In the **Actions** pane, click **New user role**.
5. The **Create User Role** wizard appears. In the **User role name** field, type **Self-Service Users**.
6. Click **Next**.
7. On the **Add Members** page, click **Add**.
8. The **Select Users or Groups** dialog box appears. In the **Enter the object names to select** field, type **Administrator**.
9. Click **Check Names**, and then click **OK**.
10. Click **Next**.
11. On the **Select Scope** page, select **Contoso**, and then click **Next**.
12. On the **Virtual Machine Permissions** page, click **Only selected actions**.
13. Clear the check boxes for **Remove**, **Remote connection** and **Shutdown**.

**Note:** The following should be selected: Start, Stop, Pause and resume, Checkpoint, Local administrator.



14. Click **Next**.
15. On the **Virtual Machine Creation Settings** page, select **Allow users to create new virtual machines**.
16. Click **Add**.
17. The **Select a Template** dialog box appears. Click **Contoso Windows Server 2003**, and then click **OK**.
18. Select **Set quota for deployed virtual machines**.
19. In the **Maximum quota points allowed** field, type **10**.
20. Click **Next**.
21. On the **Library Share** page, select **Allow users to store virtual machines in a library**.
22. Click **Browse**.
23. The **Select Destination Folder** dialog box appears. Click **ContosoResources**, and then click **OK**.
24. Click **Next**.
25. On the **Summary** page, click **Create**.

► **Task 2: Open the self-service portal**

1. On the **Start** menu, click **All Programs | Microsoft System Center | Virtual Machine Manager 2008 | Virtual Machine Manager Self-Service Portal**.
2. The Internet Explorer window opens. In the **Domain\username** field, type **Contoso##\administrator**.
3. In the **Password** field, type **Pa\$\$w0rd**.
4. Click **Log On**.

► **Task 3: Create a New VM**

1. In the left pane, click **New Computer**.
2. The New Virtual Machine – Windows Internet Explorer window opens. In the **Name** field, type **SEA-APP-03**.
3. In the **Computer Name** field, type **SEA-APP-03**.
4. In the **Administrator Password** and **Confirm Password** fields type, **Pa\$\$w0rd**.
5. In the **OS Product Key** field, type **XXXXX-XXXXX-XXXXX-XXXXX-XXXXX**.
6. Click **Create**.
7. The **Windows Internet Explorer** dialog box appears. Click **OK**.
8. Close Internet Explorer.

**Results:** After this exercise, you should have created a self-service user role, logged onto the Self-Service Portal as bhoffman and created a new VM.

## Lab B: Managing Checkpoints

### Exercise 1: Perform Checkpoint Operations

#### ► Task 1: Create a checkpoint

1. Restore Virtual Machine Manager.
2. In the left pane, click **Virtual Machines**.
3. In the details pane, click **SEA-SQL-01**.
4. In the **Actions** pane, click **New checkpoint**.
5. The **New Checkpoint** dialog box appears. Click **Create**.

#### ► Task 2: View checkpoint properties

1. In the **Actions** pane, click **Manage checkpoints**.
2. The **Virtual Machine Properties for SEA-SQL-01** dialog box appears. Under **Available checkpoints**, click the **SEA-SQL-01**.
3. Click **Properties**.
4. The **Properties For Checkpoint SEA-SQL-01** dialog box appears. Click **OK**.

#### ► Task 3: Create a new checkpoint from the properties dialog box

1. Click **New**.
2. The **New Checkpoint** dialog box appears. In the **Name** field, type **SEA-SQL-01 Second Checkpoint**, and then click **Create**.

#### ► Task 4: Delete a checkpoint

1. Under **Available Checkpoints**, click **SEA-SQL-01 Second Checkpoint**.
2. Click **Remove**.
3. The **Virtual Machine Manager** dialog box appears. Click **Yes**.

#### ► Task 5: Restore a VM to a checkpoint

1. Under **Available checkpoints**, click **SEA-SQL-01**.
2. Click **Restore**.
3. The **Virtual Machine Manager** dialog box appears. Click **Yes**.
4. Click **OK**.

**Results:** After this exercise, you should have created a new checkpoint, viewed the properties of a checkpoint, deleted a checkpoint and then restored a VM to a checkpoint.

# Module 9

## PowerShell and Disaster Recovery

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# Lab Answer Keys

## Lab A: Using PowerShell with VMM

### Exercise 1: Introduce the VMM Command Shell

► **Task1: Open the VMM command shell from the Start menu**

1. On the **Start** menu, click **All Programs | Microsoft System Center | Virtual Machine Manager 2008 | Windows PowerShell – Virtual Machine Manager**.
2. The Windows PowerShell window opens. If the **Do you want to run software from this untrusted publisher** prompt appears, type **A**, and then press ENTER.

► **Task 2: Display Help topics**

1. Type **Get-Help about\_VMM**, and then press ENTER. Review the output.
2. Type **Get-Help about\_VMM\_Tutorial**, and then press ENTER. Review the output.
3. Type **Get-Help about\_VMM\_Scripting**, and then press ENTER. Review the output.

► **Task 3: View Help topics as a text file**

1. Type **Get-Help about\_VMM | out-file c:\about\_VMM.txt**, and then press ENTER.
2. Type **notepad C:\about\_VMM.txt**, and then press ENTER.
3. The Notepad window opens. Read through the text file.
4. Close Notepad.
5. Type **Get-Help about\_VMM\_Tutorial | out-file c:\about\_VMM\_tutorial.txt**, and then press ENTER.
6. Type **notepad C:\about\_VMM\_tutorial.txt**, and then press ENTER.
7. The Notepad window opens. Read through the text.
8. Close Notepad.

**Results:** After this exercise, you should have viewed help information for VMM PowerShell topics and saved the help topics to text files.

### Exercise 2: Use Basic PowerShell Cmdlets

► **Task 1: List all PowerShell Cmdlets**

1. Restore Windows PowerShell.
2. Type **Get-Command**, and then press ENTER.

► **Task 2: Use PowerShell to manage services**

1. Type **get-service**, and then press ENTER.
2. Type **stop-service -name VMMAgent**, and then press ENTER.
3. Type **start-service -name VMMAgent**, and then press ENTER.

**Results:** After this exercise, you should have successfully stopped and started the Virtual Machine Manager Agent service.

## Exercise 3: Use VMM Cmdlets

### ► Task 1: List VMM Cmdlets

1. Type **Get-Command -PSSnapin Microsoft.SystemCenter.VirtualMachineManager**, and then press ENTER.
2. Type **Get-Help New-VM -detailed**, and then press ENTER.

### ► Task 2: Connect to the VMM server

- Type **Get-VMMServer -Computersname "6422-Hyper-V##.contoso##.com"**, and then press ENTER.

### ► Task 3: Display specific properties of the VMM server

- Type **Get-VMMServer -Computersname "6422-Hyper-V##.contoso##.com" | Format-List -property Name, FullyQualifiedDomainName, PlacementGoal, MemoryPriority, DiskIOPriority, CPUPriority, NetworkPriority**, and then press ENTER.

### ► Task 4: Display all properties available for the VMM server

1. Type **\$VMMServer = Get-VMMServer -Computersname "6422-Hyper-V##.contoso##.com"**, and then press ENTER.

**Note:** In PowerShell the \$ symbol signifies a variable. In this example, you are storing the output in the VMMServer variable.

2. Type **\$VMMServer | Get-Member**, and then press ENTER.

### ► Task 5: Create a VM checkpoint

1. Type **\$Checkpoint = Get-VM | where {\$\_.Name -eq "SEA-SQL-01"} | New-VMCheckpoint**.
2. Type **\$Checkpoint**, and then press ENTER.

### ► Task 6: Start a VM

- Type **start-vm -vm "SEA-SRV-02"**, and then press ENTER.

### ► Task 7: Get a list of failed jobs on a VMM server

- Type **Get-Job | where {\$\_.Status -eq "Failed"} | Format-List -property Name, ID, Status**, and then press ENTER.

**Note:** There may not be any failed jobs listed. The command will complete successfully if you don't receive any errors.

### ► Task 8: Backup VMM server

- Type **backup-vmmserver -path "c:\users\administrator"**, and then press ENTER.

**Results:** After this exercise, you should have successfully viewed properties of the VMM Server, created a Checkpoint for SEA-DC-02, started SEA-DC-02, viewed a list of failed jobs and backed up the VMM server.

## Exercise 4: PowerShell Scripts in VMM Wizards

### ► Task 1: Start the Add Library Share Wizard

1. Minimize Windows PowerShell.

2. Restore Windows Explorer, and then navigate to **E:\**.
3. On the **File** menu, click **New | Folder**.
4. Type **NewLibrary**, and then press ENTER.
5. Right-click **NewLibrary**, and then click **Share**.
6. The **File Sharing** dialog box appears. Click **Share**, and then click **Done**.
7. Restore Virtual Machine Manager.
8. In the left pane, click **Library**.
9. In the **Library Servers** pane, right-click **6422-Hyper-V##.contoso##.com**, and then click **Add library shares**.
10. The **Add Library Share** wizard appears. Select **NewLibrary**, and then click **Next**.

► **Task 2: Save Add Library Share Wizard script**

1. On the **Summary** page, click **View Script**.
2. The Notepad window opens. On the **File** menu, click **Save As**.
3. The **Save As** dialog box appears. In the **File Name** field, type **Add\_Library\_Share.ps1**.
4. In the **Save as type** field, select **All Files**.
5. Click **Save**, and then close Notepad.
6. In the **Add Library Share** wizard, click **Cancel**.
7. The **Virtual Machine Manager** dialog box appears. Click **Yes**.

► **Task 3: View execution policy**

1. Restore Windows PowerShell – Virtual Machine Manager.
2. Type **get-executionpolicy**, and then press ENTER.

► **Task 4: Set execution policy**

- Type **set-executionpolicy unrestricted**, and then press ENTER.

**Note:** This is not a secure setting and should only be used in testing scenarios.

► **Task 5: Verify execution policy**

- Type **get-executionpolicy**, and then press ENTER.

► **Task 6: Run Add\_Library\_Share.ps1 script**

- Type **c:\users\administrator\documents\Add\_Library\_Share.ps1**, and then press ENTER.

► **Task 7: Verify new library share**

1. Restore Virtual Machine Manager.
2. In the left pane, right-click **6422-Hyper-V##.Contoso##.com**, and then click **Refresh**.
3. Click **NewLibrary**.

**Results:** After this exercise, you should have saved the PowerShell script from the Add Library Wizard and then ran the script successfully.

## Exercise 5: Create a Simple VMM Script

### ► Task 1: Create Get-VM.ps1

1. Restore Windows PowerShell.
2. Type **Set-Location c:\users\administrator**, and then press ENTER.
3. Type **notepad Get-VM.ps1**, and then press ENTER.
4. The **Notepad** dialog box appears. Click **Yes**.
5. The Notepad window opens. Type the following:

```
# filename: Get-VM.ps1
Write-Host
write-host -backgroundColor blue "The following are virtual
machines located on SEA-Hyper-V##:"
get-vm -vmmserver 6422-hyper-v##.contoso##.com | format-list -
property Name, Owner, Description, OperatingSystem
Write-Host
# end of script
```

### ► Task 2: Save Get-VM.ps1

1. On the **File** menu, click **Save**.
2. Close Notepad.

### ► Task 3: Run Get-VM.ps1

1. Type **.\Get-VM**, and then press ENTER.
2. Type **exit**, and then press ENTER.

**Results:** After this exercise, you should have created and ran a PowerShell script that listed the virtual machines located on 6422-Hyper-V.

## Lab B: Creating Backups

### Exercise 1: Use Windows Server Backup to Backup Virtual Machines

#### ► Task 1: Install Windows Server Backup

1. Restore Server Manager.
2. In the console pane, click **Features**.
3. In the right pane, click **Add Features**.
4. The **Add Features Wizard** appears. Expand **Windows Server Backup Features**, and then select **Windows Server Backup**.
5. Click **Next**.
6. On the **Confirm Installation Selections** page, click **Install**.
7. On the Results page, click **Close**.

#### ► Task 2: Schedule a backup

1. In the console pane, expand **Storage**, and then click **Windows Server Backup**.
2. In the **Actions** pane, click **Backup Once**.
3. The **Backup Once Wizard** appears. Click **Next**.
4. On the **Select backup configuration** page, click **Custom**, and then click **Next**.
5. On the **Select backup items** page, click **Next**.
6. On the **Specify destination type** page, click **Next**.
7. On the **Select backup destination** page, in the **Backup destination** list, click **Local Disk (E:)**. Click **Next**.
8. On the **Specify advanced options** page, click **Next**.
9. On the **Confirmation** page, click **Backup**.

**Results:** After this exercise, you should have scheduled a backup using the Backup Once Wizard.



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