50331D PowerShell Setup Guide

(Microsoft Azure or Hyper-V)

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Introduction

Many trainers are in need of a quick and easy method of configuring classroom computers. Using PowerShell scripts to automate your setup offers a number of advantages. When using this method to setup the 50331 class, the following advantages become apparent:

1. The setup can be completed in less than one hour.
2. The scripts can be easily modified to setup other Microsoft classes.
3. An "emergency setup" for a student or for testing purposes is much faster & easier.
4. The class setup can be easily customized for blended & bootcamp deliveries.
5. Online and Internet Deliveries can be more easily facilitated.

You must be using a Windows client or server that supports Hyper-V 3.0 or higher to use this guide. Experience using and editing PowerShell scripts, Azure and Hyper-V Manager will be helpful. Use the free resources on http://www.technet.com and other sites to learn more about Hyper-V and PowerShell. The 50331 course has detailed instructions on using command-line tools (Module 5) and a PowerShell / Azure tutorial (Appendix B).

50331 Server Setup

There are two setup options available for creating the virtual machines used for 50331D class labs:

1. Microsoft Azure PowerShell
2. Hyper-V 3.0 PowerShell

When using either option, make sure that the PowerShell modules on the host machine are up-to-date and always use an Administrator console when running the commands.

Note: If the class resources do not include a Microsoft Azure subscription, students may qualify for a free one based on offers from the web-site. From the Microsoft Azure web-site (http://www.azure.com), have them sign up for a new free subscription if the instructor decides to use this platform.

Microsoft Azure PowerShell

This is the faster and easier setup option if you have a Microsoft Azure subscription. **50331AzureSetup.ps1** is used to configure a Windows 10 class (**50331AzureSetup_cs.ps1** can be used if working with Azure Cloud Shell). **50331AzureSetup_ALL.ps1** is used to configure a class that uses all three current Windows clients (Windows 7, 8 & 10). The Hyper-V PowerShell setup also supports all three client types and the instructions appear in the next section.

If you elect to use Azure VMs for the class labs, Azure PowerShell cmdlets must be installed on the host machine. This can be done by running the following commands:

- Import-Module AzureRM (Azure Resource Manager)
- Import-Module Azure (Azure Service Management)

The class setup files are available from the Courseware Marketplace (http://shop.courseware-marketplace.com) or Skillpipe (http://skillpipe.courseware-marketplace.com. They can also be copied from the Student CD that comes with the course manual. Create a folder named **Labfiles.<Course Number>** on the C: drive of the host machine. Extract all the files and folders from **50331D-ENU_PowerShellSetup.zip** to the **C:\Labfiles.<Course Number>** folder (e.g. C:\Labfiles.50331D). Use environment variables named **%Labfiles%** and **%WorkFolder%** to point to your setup folder.

The following variables in the %WorkFolder%50331AzureSetup.ps1 file should be configured before running the script:

- **$SubscriptionID**: The "Subscription Name" of your Azure account
- **$workFolder**: If C:\Labfiles.<Course Number> cannot be used for the setup files, update this variable.
- **$namePrefix**: Change "aa" to use the initials of your name
- **$TimeZone**: Change "Eastern Standard Time" to the local time zone

The script is mostly automatic and will only ask for your Azure subscription credentials at the beginning of the process. The VMs should be created in 30 – 60 minutes. When the script is finished, a text file named 50331AzureSetup[DateTime].txt will be created in the $WorkFolder location (preferably C:\Labfiles.<Course Number>). The Internet IP addresses for the VMs can be located in this file. Use the Remote Desktop application to connect to the virtual machines using their Internet IPs. An Azure PowerShell tutorial can be found in the updated version of Appendix B (**50331D_PowerShell_Tutorial_MB.pdf**).

Here are a few recommendations to keep in mind when working with Microsoft Azure virtual machines:

1. Regularly check your balance on the Azure Portal to ensure there are enough funds for the class.
2. Store unrelated objects in separate Resource Groups.
3. Make sure that Storage Account names are in lower case.
4. Delete resources as soon as you are finished working with them.
5. To include additional files on the VM hard-drive, add them to the %WorkFolder%Tools folder.

Create Azure Virtual Machines

Verify that files in the %WorkFolder%50331D-ENU_PowerShellSetup.zip archive have been extracted to the %WorkFolder% folder. Perform all the following steps with administrator credentials:

1. From an "Administrator: Command Prompt", start a PowerShell session and execute the script **%WorkFolder%50331AzureSetup.ps1**. The script should not be interrupted. Do not proceed until the script is finished. This may take about 30 minutes (See Note below for configuring a class with all Windows clients).

2. When the previous step is complete, connect to the domain controller (**NYC-DC1**) using the Remote Desktop Connection application. Instead of using the computer name, use the Internet IP address specified in the %WorkFolder%50331AzureSetup[DateTimeStamp].txt file. Connect using the Contoso\Admin1 account with a password of Pa$$w0rd. Verify that the domain name is Contoso and the primary IP address is 192.168.10.100 (**ipconfig /all**). If there was an error during the setup, you should be able to connect using the NYC-DC1\Adminz account with a password of Pa$$w0rdPa$$w0rd.

3. Connect to the Windows 10 client computer (**Student10**) using the Remote Desktop Connection application. Instead of using the computer name, use the Internet IP address specified in the %WorkFolder%50331AzureSetup[DateTimeStamp].txt file. Connect using the Student10\Admin1 account with a password of Pa$$w0rd. Verify connectivity with the domain controller (**Test-Connection NYC-DC1**). To speed up the process of joining the computer to the domain, you may run the C:\Classfiles\CLX\joindomain.ps1 script on the Student10 computer. If there was an error during the setup, you should be able to connect using the Student10\Adminz account with a password of Pa$$w0rdPa$$w0rd.

4. If there were problems during the setup, delete the existing virtual machines and create new ones using the 50331AzureSetup.ps1 script. Before attempting a new setup, verify the parameters in the script and the information in this section of the setup. Azure VMs can be restarted using the **Restart-AzureRMVM** cmdlet. **Get-AzureRMVM** will provide the status of existing VMs.

Note: *When configuring the class to include ALL Windows clients (by using **50331AzureSetup_ALL.ps1**), the setup will create virtual machines for Windows 7, 8 and 10. If the Admin1 login fails for any of the clients, use the default script login (***[ComputerName]\Adminz** *with a password of* **Pa$$w0rdPa$$w0rd***) to complete a manual setup. Copy all the files and folders from the* **Classfiles** *share of the domain controller (NYC-DC1) to the C:\Classfiles folder of the client computer. Run* **C:\Classfiles\config.cmd** *with Administrator Credentials on the client computer to complete its setup.* When using an RDP (Remote Desktop Protocol) client like Remote Desktop Connection, use "ComputerName\UserName" when providing login credentials (e.g. Student7\Admin1).

Hyper-V 3.0 PowerShell

This setup option will work for Windows 7, 8 or 10 client configurations. The host computer must support at least version 3.0 of Hyper-V. The hardware and operating system requirements are listed below. More specific and detailed requirements for Hyper-V 3.0 can be found at http://www.microsoft.com/hyper-v. Internet connectivity is not necessary to complete the lab exercises. The Instructor computer and student machines must have network connectivity.

Hardware Requirements

All classroom computers must be 64-bit and meet the following minimum requirements:

- Intel Virtualization Technology (Intel VT) or AMD Virtualization (AMD-V) processor
- Dual 200 GB hard disks 7200 RPM SATA or better (200GB free space on the C: Drive)
- 4 GB RAM (8GB RAM recommended)
- DVD drive
- Network adapter
- Super VGA (SVGA) 17-inch monitor
- Microsoft Mouse or compatible pointing device
- Sound card with amplified speakers
- Projection display device that supports SVGA 1024 x 768 pixels (16-bit colors)

Operating System Requirements:

The operating system must be running Windows Server 2012, Windows Server 2012 Core or Windows 8 64-bit and have the following resources installed:

1. Hyper-V Server Role
2. 50331 Classroom & PowerShell Setup Files
3. Hyper-V PowerShell Tools

1. Install Hyper-V Server Role

If Hyper-V is not already setup on the server, perform the following steps on the host machine using a Command Prompt with elevated Administrator credentials. Use resources on the http://www.technet.com web-site to verify that your operating system has the necessary prerequisites for installing Hyper-V (e.g. Remote Desktop on Windows Server 2012 Core):

1. Logon to the system with an Administrator account. Open an Administrator:PowerShell console.

2. Execute: **Enable-WindowsOptionalFeature –Online –FeatureName Microsoft-Hyper-V** (the command **Dism /Online /Enable-Feature /FeatureName:Microsoft-Hyper-V /All** can also be used).
3. Verify that the operation completed without any errors.
4. Shutdown and restart the operating system.
5. Logon to the system with an Administrator account.
6. When the installation is complete, proceed to the next step.

2. Install 50331 Classroom & PowerShell Setup Files

Download the 50331 classroom files from the Courseware Marketplace (http://shop.courseware-marketplace.com) or Skillpipe (http://skillpipe.courseware-marketplace.com. The classroom files can also be extracted from the Student CD that comes with the course manual. Create a folder named **Labfiles.<Course Number>** (same location as %WorkFolder% or $WorkFolder) on the C: drive of the host machine. Extract all the files and folders from **50331D-ENU_Classfiles.iso** & **50331D-ENU_PowerShellSetup.zip** to the %WorkFolder% folder.

Note: The ***50331_setup_ps3.ps1*** script in the 50331D-ENU_PowerShellSetup.zip archive assumes that all installation resources are located in the %WorkFolder% folder. To modify the installation location, memory used by the Virtual Machines or the name of the ISO images, read the *"***Customizing the Setup***"* section in this document.

Download ISO files for the following software products to the %WorkFolder% folder. They are all available from the MSDN web-site, TechNet or http://www.microsoft.com/download. Always choose the 64-bit version of the ISO file when a choice is given:

1. Windows Server 2008 R2 (Rename to **windows2008r2.iso**)
2. Windows 7 Enterprise (Rename to **windows7.iso**)
3. Windows 10 Enterprise (Rename to **windows10.iso**)
4. WAIK for Windows 7
5. Windows 7 SDK
6. Windows 7 Remote Server Administration Tools
7. Windows 10 Remote Server Administration Tools (If Available)

Note: The Windows 10 Enterprise ISO is only needed for customized deliveries of the class using information in ***50331D-ENU_Windows10_Curriculum.pdf****. The same instructions for Windows 10 can be used for Windows 8.*

3. Install Hyper-V PowerShell Tools

Windows Server 2012 and Windows 8 already have PowerShell 3.0 installed. The Hyper-V PowerShell tools will not work on earlier operating systems. If Hyper-V was previously configured and you are unsure if all its components were installed properly, be sure to perform the steps in the section: *Install Hyper-V Server Role*.

To verify that the components were installed properly, load the module (**Import-Module Hyper-V**) and list the cmdlets available for it (**Get-Command –Module Hyper-V**).

Create Hyper-V Virtual Machines

Verify that files in the %WorkFolder%50331D-ENU_PowerShellSetup.zip archive have been extracted to the %WorkFolder% folder. Perform all the following steps with administrator credentials:

5. From an "Administrator: Command Prompt", start a PowerShell session and execute the script **%WorkFolder%50331_Setup_ps3.ps1**. The script should not be interrupted. Do not proceed until the script is finished. This can take about 30 minutes.

6. When the previous step is complete, verify that the virtual machine server (50331-GEN-SRV) setup is complete by connecting to it in the Hyper-V Manager console. Even if the script is finished running, you might have to wait another 30 minutes for the server setup to be complete.

7. When the previous step is complete, mount the %WorkFolder%50331D-ENU_Classfiles.iso to the 50331-GEN-SRV Hyper-V image. Copy all the files from the ISO to the existing C:\Classfiles folder on the image.

8. Verify that the IP, DNS, DHCP and Active Directory components are working properly. Check the Event Log for errors generated during setup.

9. Because the scripts also complete the installation of Windows Client (7, 8 or 10) on the 50331-GEN-CLI image, it will complete the steps specified in Lab 1, Exercise 1 of the course manual. This can be prevented by commenting out the following lines in the 50331_Setup_ps3.ps1 script:

    - set-vmfloppydiskdrive $CLI1 $WorkFolder"w7install.vfd"
    - start-vm $CLI1

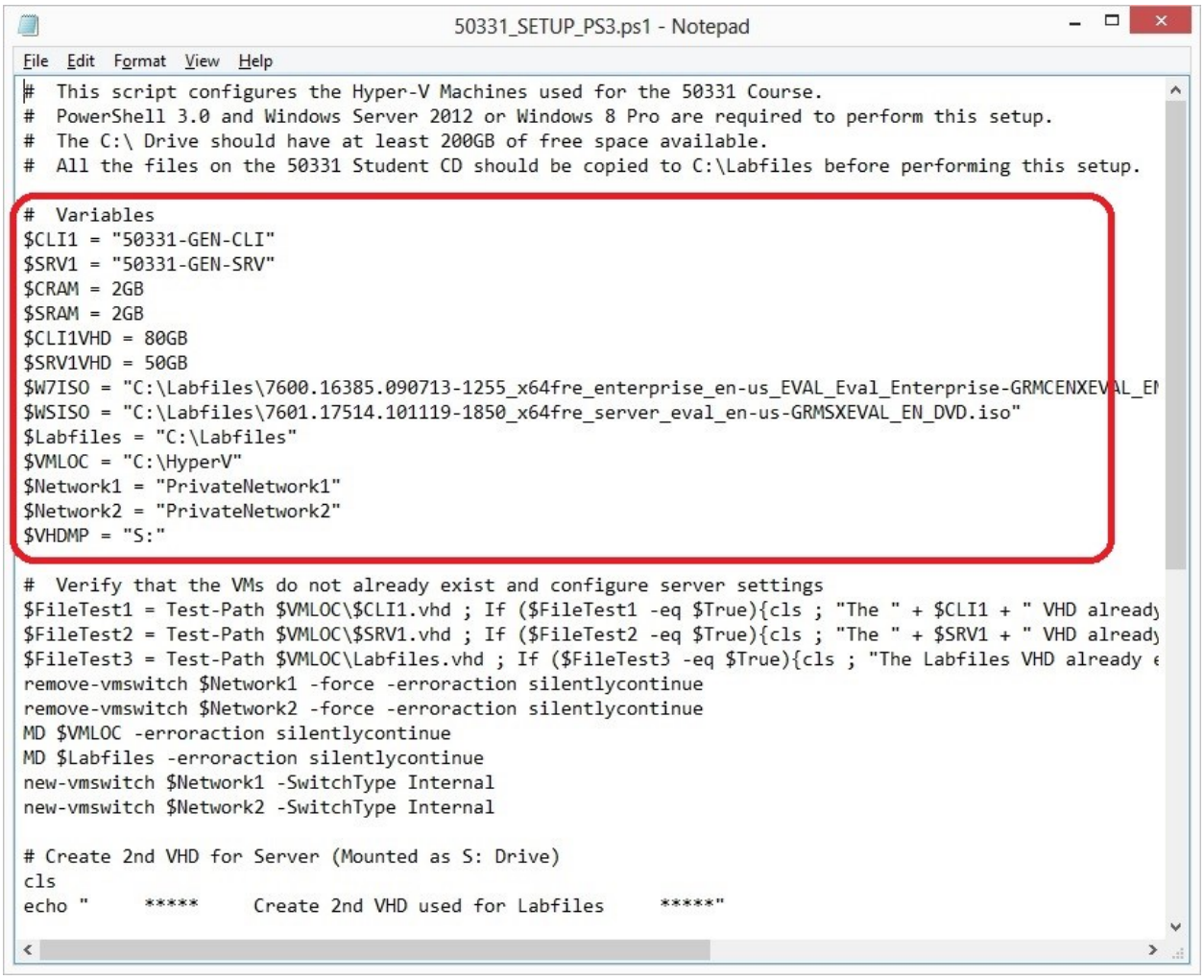
If the client VM (50331-GEN-CLI) is assigned an IP address in the range 192.168.20.X instead of 192.168.10.X, this means the Network Adapters have not been configured properly on the server VM (50331-GEN-SRV). If this is the case, open the Hyper-V Manager console, right click the 50331-GEN-SRV VM and choose "Settings". Exchange the virtual switches (PrivateNetwork1 & PrivateNetwork2) assigned to the two existing Network Adapters. Save the changes and close the "Settings" window. Release and renew the IP address on the client VM to verify that it has a new IP address in the range 192.168.10.X.

Customizing the Setup

The setup specified in the previous section can be customized for modular/blended deliveries of 50331 or other Microsoft classes. To change the image settings, modify the %WorkFolder%50331_setup_ps3.ps1 file. The variables at the beginning of the file allow you to change the memory, drive & network settings. The memory settings used should leave at least 1GB of RAM (2GB recommended) for the host machine. The %WorkFolder%HostMemory.reg.txt file has a sample registry update entry that might be used to make this change (*Read your Hyper-V documentation for more details before making any such changes*). The drive settings should leave at least 20% free space on the partition selected. Here is a description of each of the variables:

$CLI1	*The name of the image used to install Windows 7.*
$SRV1	*The name of the image used to install the Windows Server 2008 R2 domain controller.*
$CRAM	*The amount of memory assigned to the Windows 7 image.*
$SRAM	*The amount of memory assigned to the Windows Server image.*
$CLIVHD	*The size of the virtual hard drive used by Windows 7.*
$SRV1VHD	*The size of the virtual hard drive used by Windows Server.*
$W7ISO	*The name and location of the ISO used to install Windows 7 Enterprise.*
$WSISO	*The name and location of the ISO used to install Windows Server 2008 R2 Enterprise.*
$VMLOC	*The location where you want the image VHD or VHDX files to be created.*
$Network1	*The virtual network connection shared by the client and server computers.*
$Network2	*The second virtual network connection used by the server.*

If the script is used to configure multiple groups of images on the same machine, the $Network*X* variables should be modified. The script looks for and removes these virtual networks before recreating them. For faster setups, the ISO variables ($W7ISO & $WSISO) can point to files on a separate physical drive than that used to store the VHD or VHDX files ($VMLOC).



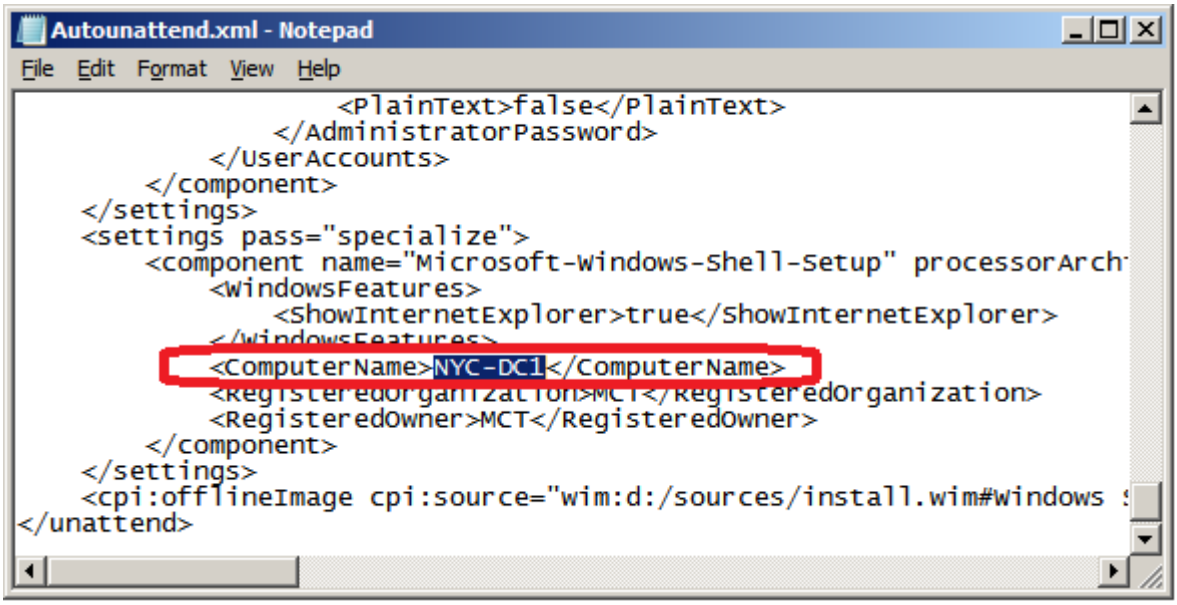
50331_Setup_ps3.ps1

For additional details about the Hyper-V PowerShell cmdlets used in the 50331_setup_ps3.ps1 script, use the following commands:

- **Get-Command –Module Hyper-V**
- **Get-Help <Hyper-V Cmdlet> -Examples**

When using the setup files to configure classes other than 50331, you have the option of changing computer name, Active Directory (AD), DHCP, DNS, Printer and IP settings. The VFD (Virtual Floppy Disks) must be modified to do this. Windows 7 is configured with the w7install.vfd file and Windows Server with the wsinstall.vfd file. The files on these virtual floppy drives can be modified by using an existing Hyper-V image or with tools like WinImage.

To change the computer name, modify the Autounattend.xml file on the VFD using Notepad. On the Windows 7 VFD, search and replace all occurrences of Student1 with the new name you choose. On the Windows Server VFD, search and replace occurrences of NYC-DC1.



Autounattend.xml

The change the AD configuration, modify the dcunattend.old file. This file replaces dcunattend.txt during the setup process. To import and add domain objects after AD is setup, modify the ad.cmd file. Familiarity with the ldifde.exe, dsadd.exe, dsmod.exe, dsacls.exe and net.exe commands is necessary to understand this file.

The DHCP Server settings can be modified by changing the dhcp.cmd file. It configures the service and imports scope settings from the dhcpdb file. An easy way to modify this service is to export your existing DHCP Server database using the netsh.exe command and replace the existing database file on the floppy (e.g. **netsh dhcp server export dhcpdb all**).

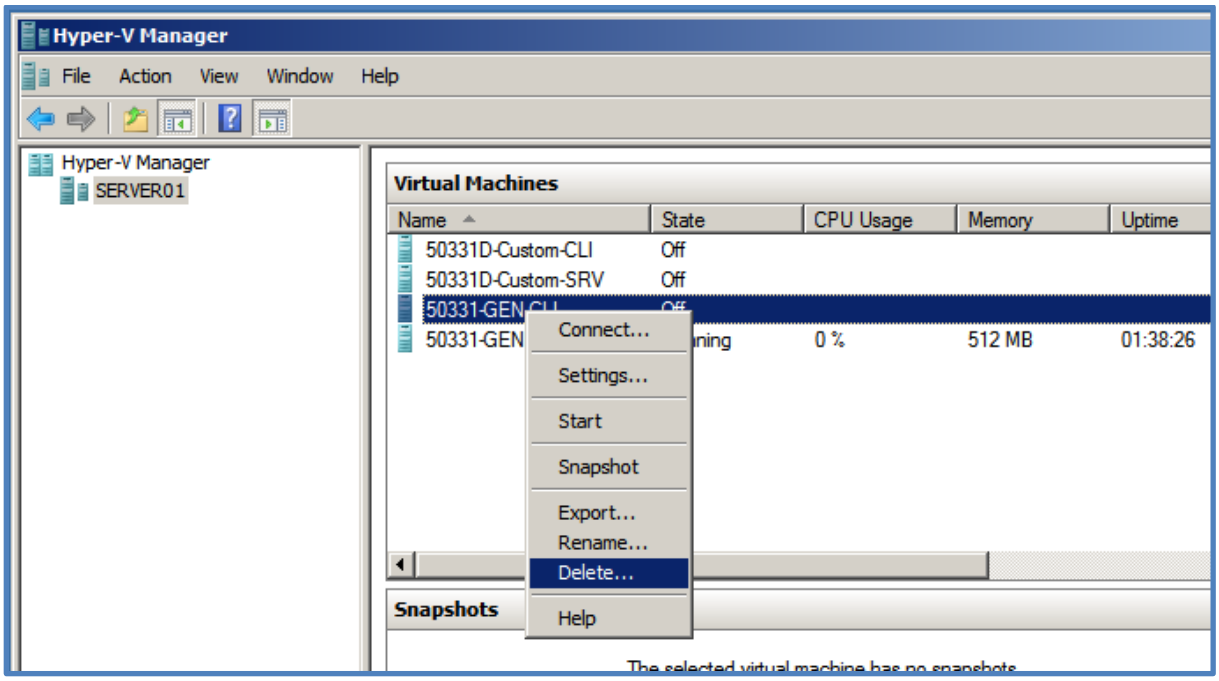
The DNS Server is installed during the configuration of Active Directory and configured using the dns.cmd file. Familiarity with the dnscmd.exe command is needed before changing this file that creates and configures DNS zones (e.g. **dnscmd /zoneadd xyz.com /dsprimary**).

The shared printers are configured on the server using the rundll32 command in the run2.cmd file. These commands should be edited with care since some of the parameters are case-sensitive.

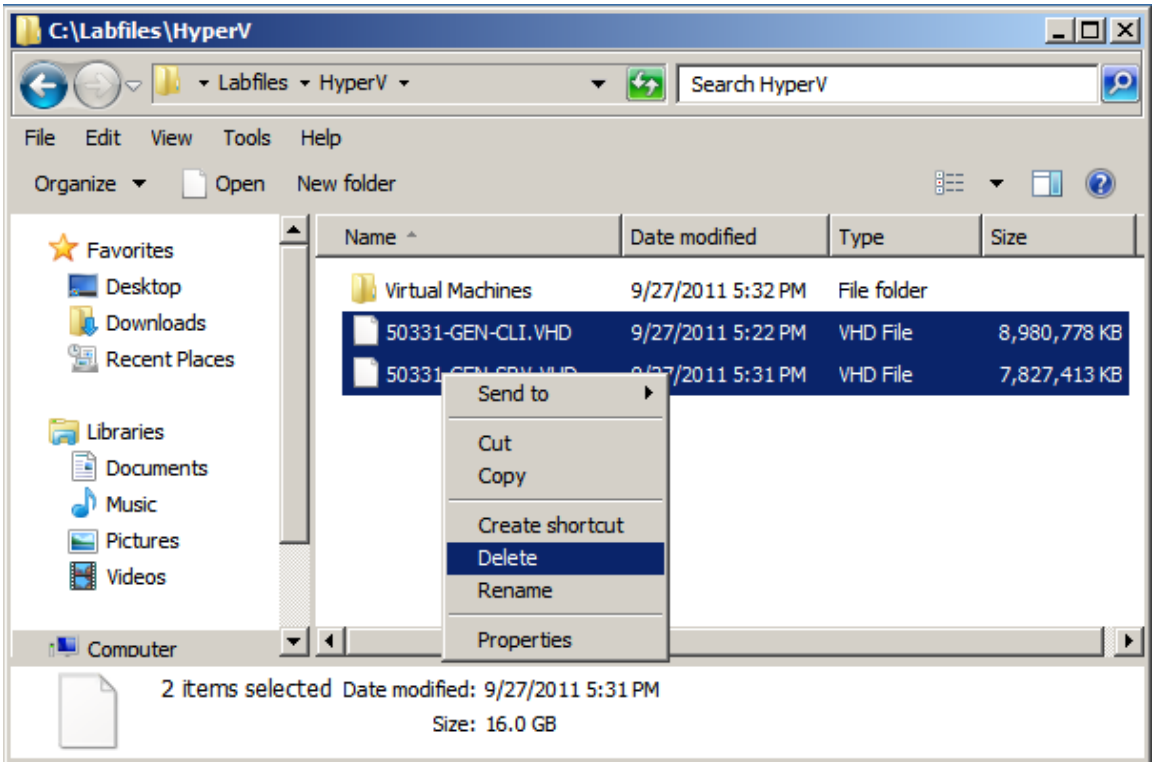
The static IP settings for the server are configured using PowerShell cmdlets in ip.ps1. The netsh.exe command can also be used to perform this task.

Clean Up

After you are finished with an image it can be deleted from the Hyper-V Manager. Make sure that you also remove the VHD file(s) associated with that image by going to the $VMLOC folder and deleting it.



Hyper-V Manager (Deleting an image)



Windows Explorer (Deleting VHD files)