****AZ-040T00A: Automating Administration with PowerShell

Hyper-V Virtual Machine Build Guide

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Table of Contents

[Virtual Hard Disk Requirements 1](#_Toc82108039)

[Section 1. MSL Images (not handed-off) 1](#_Toc82108040)

[Section 2. Course Specific Drives (for hand-off) 1](#_Toc82108041)

[Section 3. Repurposed Drives (for hand-off) (if applicable) 2](#_Toc82108042)

[Section 4. Rearm information (if applicable) 2](#_Toc82108043)

[Virtual Machine Settings 3](#_Toc82108044)

[Software 2](#_Toc82108045)

[User Accounts 4](#_Toc82108046)

[Configure Networking in Hyper-V Manager 5](#_Toc82108047)

[Creating Stand Alone Drives (Monolithic) 5](#_Toc82108048)

[Creating Course Specific Differencing Drives 6](#_Toc82108049)

[Create the Virtual Machine 6](#_Toc82108050)

[Start and Connect to the Virtual Machine 7](#_Toc82108051)

[Configure the Virtual Machine 7](#_Toc82108052)

[Configure DHCP 8](#_Toc82108053)

[To Prepare the Virtual Machine for Hand-off 10](#_Toc82108054)

[Start and Connect to the Virtual Machine 13](#_Toc82108055)

[Configure Network Settings 13](#_Toc82108056)

[Configure the Administrator profile 13](#_Toc82108057)

[Add Keyboard Layouts 15](#_Toc82108058)

[Add the computer to the Adatum.com domain 16](#_Toc82108059)

[Miscellaneous Settings 16](#_Toc82108060)

[To clear the event logs 17](#_Toc82108061)

[To Prepare the Virtual Machine for Hand-off 18](#_Toc82108062)

[Start and Connect to the Virtual Machine 20](#_Toc82108063)

[Configure Network Settings 20](#_Toc82108064)

[Add the computer to the Adatum.com domain 20](#_Toc82108065)

[Miscellaneous Settings 21](#_Toc82108066)

[To Prepare the Virtual Machine for Hand-off 21](#_Toc82108067)

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Version 1.2

# Virtual Hard Disk Requirements

# Section 1. MSL Images (not handed-off)

#### Base VHDs Used (created by MSL)

List all MSL base virtual hard disks (VHDs) used in the learning product.

| Base Virtual Hard Disks |
| --- |
| File name |
| Base19D-WS19-1809.vhd |
| Base20E-W10-2004-Office2019.vhd |
|  |

#### Standard Middle Tier VHDs Used (created by MSL)

List all MSL middle tier virtual hard disks (VHDs) used in the learning product.

| Standard Middle Tier Virtual Hard Disks |
| --- |
| File name |
| MT19B-LON-DC1.vhd |
|  |

# Section 2. Course Specific Drives (for hand-off)

#### Course Specific Differencing VHDs (designed specifically for this course)

List all virtual hard disks (VHDs) used in the learning product created specifically for this course. List the parent (middle tier or base image) VHD. **Note**: These will be part of the hand-off. Ensure that for each image listed, there is a corresponding section in the Build Guide to create the image.

| Virtual Hard Disks | Parent |
| --- | --- |
| File name | File name |
| AZ-040T00A-LON-DC1.vhd | MT19B-LON-DC1.vhd |
| AZ-040T00A-LON-SVR1.vhd | Base19D-WS19-1809.vhd |
| AZ-040T00A-LON-CL1.vhd | Base20E-W10-2004-Office2019.vhd |

#### Course Specific Monolithic VHDs (designed specifically for this course) – Includes Allfiles.vhd

List all stand-alone (monolithic) virtual hard disks (VHDs) used in the learning product created specifically for this course. Note: These will be part of the hand-off. Ensure that for each image listed, there is a corresponding section in the Build Guide to create the image.

| Virtual Hard Disks |
| --- |
| File name |
| AZ-040T00A-LON-DC1-Allfiles.vhd |
| AZ-040T00A-LON-SVR1-Allfiles.vhd |
| AZ-040T00A-LON-CL1-Allfiles.vhd |

# Section 3. Repurposed Drives (for hand-off) (if applicable)

#### Repurposed Middle Tiers & Existing Course Differencing Drives (leveraged from existing MSL course)

List all VHDs repurposed from existing courses. Note: Do not make any changes to these images. If you make any changes, they will become a course specific drive, and you should list it in the appropriate table.

| Virtual Hard Disks |
| --- |
| File name |
| N/A |

# Section 4. Rearm information (if applicable)

#### Virtual Hard Disk Rearm Settings for Operating Systems

List all bootable virtual hard disks (VHDs) that have an OS that requires rearming. These are the top tier differencing drives, or monolithic images.

| Virtual Hard Disks (Bootable only) | OS | Rearm  (For Windows Server 2012) |
| --- | --- | --- |
| File name | The operating system used | Yes/No - # of times run |
| N/A | Windows Server 2019 | No rearms performed at the diff drive level. Will be rearmed during classroom setup. |

# Virtual Machine Settings

#### Virtual Machines

List all virtual machines (VMs) used in the learning product created specifically for this course. List all of the VHDs used in the virtual machine. **Note**: Ensure that for each virtual machine listed, there is a corresponding section in the Build Guide to create the virtual image.

| VM Name | Computer Name | VHDs | Requires Internet Access? | Memory | Networking | ISO attached? | Description & Settings |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Name* | *Usually the name of the virtual machine without the number of the course.* | *List all the VHDs used for this Virtual Machine (to include:)*   * *Monolithic drives* * *Course Specific Differencing Drive* * *AllFiles* | *Indicate Yes/No as appropriate* | *If dynamic memory is used, list min & max.* | *List the number of emulated NICS. Also list if NICs are Legacy or Synthetic* | *List the name of the ISO (if required)* | *Describe the role of the virtual machine in the learning product* |
| AZ-040T00A-LON-DC1 | LON-DC1 | Hard Disk: AZ-040T00A-LON-DC1.vhd  Hard Disk: AZ-040T00A-LON-DC1-Allfiles.vhd | No | Startup: 4096 MB | Network: Private Network  Synthetic | N/A | Windows Server 2019  Domain controller in the Adatum.com domain |
| AZ-040T00A-LON-SVR1 | LON-SVR1 | Hard Disk: AZ-040T00A-LON-SVR1.vhd  Hard Disk: AZ-040T00A-LON-SVR1-Allfiles.vhd | No | Startup: 4096 MB | Network: Private Network  Synthetic | N/A | Windows Server 2019  Member of the Adatum.com domain |
| AZ-040T00A-LON-CL1 | LON-CL1 | Hard Disk: AZ-040T00A-LON-CL1.vhd | No | Startup: 4096 MB | Network: Private Network  Synthetic | N/A | Windows 10 Enterprise client computer  Member in the Adatum.com domain |

#### 

#### Virtual Machines & Module mappings

List all modules in the course, and the names of all of the virtual machines used in each. For modules with multiple labs, separate the virtual machine column by the lab. If a module does not have a lab that uses a virtual machine, put N/A.

| Module | Virtual machine |
| --- | --- |
| *List the module number* | *List the Virtual Machines used in this module.* |
| 1 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 |
| 2 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 * AZ-040T00A-LON-SVR1 |
| 3 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 * AZ-040T00A-LON-SVR1 |
| 4 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 * AZ-040T00A-LON-SVR1 |
| 5 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 |
| 6 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 |
| 7 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 * AZ-040T00A-LON-SVR1 |
| 8 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 |
| 9 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 |
| 10 | * AZ-040T00A-LON-DC1 |
| 11 | * AZ-040T00A-LON-DC1 * AZ-040T00A-LON-CL1 * AZ-040T00A-LON-SVR1 |

#### Classroom Configuration

| Virtual Machine Name | Computer Name | Internet Protocol (IP) Address | Domain Name System (DNS) Server | Default Gateway |
| --- | --- | --- | --- | --- |
| AZ-040T00A-LON-DC1.vhd | LON-DC1 | 172.16.0.10/16 | 172.16.0.10 | 172.16.0.1 |
| AZ-040T00A-LON-SVR1.vhd | LON-SVR1 | 172.16.0.11/16 | 172.16.0.10 | 172.16.0.1 |
| AZ-040T00A-LON-CL1.vhd | LON-CL1 | 172.16.0.40/16 | 172.16.0.10 | 172.16.0.1 |

# Software

The following table shows all the software needed to set up the virtual machines for this learning product, including the version, whether the version that was tested for the learning product is retail or evaluation, and where the software can be obtained. Record the same information for software that is included in the course as an ISO image to be used in conjunction with the virtual machines.

The table also includes a column to track whether the product group has approved inclusion of the software for the life of the product and a column to track compliance verification.

| Filled in by VM Developer | | | | | | Filled in by FTE requesting permission | | Filled in by Compliance PM |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Software  &  Version | Installed as part of | Source Location | Where Installed | Software Usage / Justification | EULA in TFS  <*name*> | Software Entry  Link | QERM  or  CPx | Verifying Build Guide |
|  | | | | | | | | |
| WMI Explorer 2.0.0.2 | N/A | https://github.com/vinaypamnani/wmie2/releases/tag/v2.0.0.2 | AZ-040T00A-LON-CL1 | Needed for labs | N/A | [Link](https://microsoft.sharepoint.com/teams/PDGVirtualization/_layouts/15/listform.aspx?PageType=4&ListId=%7B18B67922%2DC0EB%2D4CFF%2DA694%2D1AC76B079EF6%7D&ID=540&ContentTypeID=0x0100B80C984796C4B042B3DF5E99B64120C1) | N/A  Low risk – Publicly available | Jamesco  9/23/2021 |
| PowerShell v7.1.3 | N/A | <https://github.com/PowerShell/PowerShell/releases/tag/v7.1.3>  https://docs.microsoft.com/en-us/powershell/scripting/install/installing-powershell-core-on-windows | AZ-040T00A-LON-CL1  AZ-040T00A-LON-DC1  AZ-040T00A-LON-SVR1 | Needed for labs | N/A | [Link](https://microsoft.sharepoint.com/teams/PDGVirtualization/_layouts/15/listform.aspx?PageType=4&ListId=%7B18B67922%2DC0EB%2D4CFF%2DA694%2D1AC76B079EF6%7D&ID=654&ContentTypeID=0x0100B80C984796C4B042B3DF5E99B64120C1) | N/A  Low risk – Publicly available | Jamesco  9/23/2021 |

# User Accounts

The following table lists all user or group accounts used in the learning product. These accounts should be localized using MILS-approved names. List only accounts created specifically for this course, or changes to existing accounts.

| User or Group Name | Logon Name  (include location) | Password (NA for group accounts) | Other Account Properties |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

#### Setup Files

The following table lists all installation files that are not already listed in the software section and that are required for the creation of the virtual machines. (For example, a script to configure AD or create a share).

| File or Folder Name | Path in Source Depot |
| --- | --- |
|  |  |

# Configure Networking in Hyper-V Manager

1. In **Server Manager**, click **Tools**, and then click **Hyper-V Manager**.
2. In **Hyper-V Manager**, click the local computer, and then on the **Actions** pane, click **Virtual Switch Manager**.
3. In the **Virtual Switch Manager** dialog box, select **New virtual network switch**. Ensure that **Private** is selected, and then click **Create Virtual Switch**.
4. In the **Virtual Switch Properties** area of the **Virtual Switch Manager** dialog box, specify the following information, and then click **OK**:

* Name: **Private Network**
* Connection type: **Private network**

# Creating Stand Alone Drives (Monolithic)

This section lists any Stand Alone drives created for this learning product. This does not include Microsoft Learning base images.

#### Create the AZ-040T00A-LON-DC1-Allfiles Drive

1. In **Hyper-V Manager,** in the **Actions** pane, click **New**, and then click **Hard Disk**.
2. In the New Virtual Hard Disk Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Choose Disk Format** page, click **VHD** and then click **Next**.
4. On the **Choose Disk Type** page, ensure **Dynamically expanding** is selected and then click **Next**.
5. On the **Specify Name and Location** page, in the Name box, type **AZ-040T00A-LON-DC1-Allfiles.vhd**, and in the Location box, type **C:\Program Files\Microsoft Learning\AZ040T00\Drives**.
6. On the **Configure Disk** page, click **Next**.
7. On the **Completing the** **New Virtual Hard Disk Wizard** page, click **Finish**.
8. Create a folder structure that matches the English version of the course and place the labfiles within the folders.

#### Create the AZ-040T00A-LON-SVR1-Allfiles Drive

1. In **Hyper-V Manager,** in the **Actions** pane, click **New**, and then click **Hard Disk**.
2. In the New Virtual Hard Disk Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Choose Disk Format** page, click **VHD** and then click **Next**.
4. On the **Choose Disk Type** page, ensure **Dynamically expanding** is selected and then click **Next**.
5. On the **Specify Name and Location** page, in the Name box, type **AZ-040T00A-LON-SVR1-Allfiles.vhd**, and in the Location box, type **C:\Program Files\Microsoft Learning\AZ040T00\Drives**.
6. On the **Configure Disk** page, click **Next**.
7. On the **Completing the** **New Virtual Hard Disk Wizard** page, click **Finish**.
8. Create a folder structure that matches the English version of the course and place the labfiles within the folders.

# Creating Course Specific Differencing Drives

In this section lists the differencing drives that are specific to this learning product.

#### Create the AZ-040T00A-LON-DC1 Differencing Drive:

1. In Hyper-V Manager, click the host computer name, and in the Actions pane, click **New**, and then click **Hard Disk**.
2. In the New Virtual Hard Disk Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Choose Disk Format** page, select **VHD** and then click **Next**.
4. On the **Choose Disk Type** page, click **Differencing**, and then click **Next**.
5. On the **Specify Name and Location** page, in the **Name** field, type **AZ-040T00A-LON-DC1** and in the **Location** field, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives**. Click **Next**.
6. On the **Configure Disk** page, click **Browse**, and browse to the folder location where the parent virtual hard disk is located. (For example**, C:\Program Files\Microsoft Learning\Base\Drives\MT19B-LON-DC1.vhd**). Click the parent virtual disk name, click **Open**, and then click **Next**.
7. On the **Completing the** **New Virtual Hard Disk Wizard** page, click **Finish**.

# Create the Virtual Machine

1. In **Hyper-V Manager**, click the host computer name, and in the **Actions** pane, click **New**, and then click **Virtual Machine**.
2. In the New Virtual Machine Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Specify Name and Location** page, in the **Name box**, type **AZ-040T00A-LON-DC1**, select the **Store the virtual machine in a different location** check box, and in the **Location** field type **D:\Program Files\Microsoft Learning\AZ040T00\Drives**\ and then click **Next**.
4. On the **Specify Generation** page, select **Generation 1** and then click **Next**.
5. On the **Assign Memory** page, in the **Memory** field, type **4096** and then click **Next**.
6. **O**n the **Configure Networking** page, select **Private Network** from the drop down list, and then click **Next**.
7. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**, and in the **Location** box, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives\AZ-040T00A-LON-DC1.vhd**, and then click **Next**.
8. **On the Completing the New Virtual Machine Wizard page, click Finish.**
9. In **Hyper-V Manager**, under Virtual Machines, right-click **AZ-040T00A-LON-DC1** and click **Settings.**
10. Select **IDE Controller 0** and then click **Add**. Add the **AZ-040T00A-LON-DC1-Allfiles.vhd** file.
11. Click **OK** to close the Settings dialog box.

**Start and Connect to the Virtual Machine**

1. In **Hyper-V Manager**, under Virtual Machines, right-click **AZ-040T00A-LON-DC1** and click **Start**.
2. Right-click **AZ-040T00A-LON-DC1** and click **Connect**. Wait for the virtual machine to start and then sign in as **Adatum\Administrator** with the password of **Pa55w.rd**.

**Configure the Virtual Machine**

#### Configure Network Settings in the Virtual Machines

1. In each virtual machine, in Server Manager, click **Local Server**.
2. Next to **Ethernet**, click the link that represents the IP Address.
3. Right-click **Ethernet**, and click **Properties**.
4. In the **Ethernet Properties** dialog box, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
5. In the **Internet Protocol (TCP/IP) Properties** dialog box, configure the network settings as required for your labs. Ensure that these settings are also listed in the Classroom Configuration table above.
6. Click **OK** twice and close the open windows.

**Configure DHCP**

1. On LON-DC1, click **Manage**, and then click **Add Roles and Features**.
2. On the Before you begin page, click **Next**.
3. On the Select installation type page, click **Next**.
4. On the Server Selection page, click **Next**.
5. On the Server Roles page, select the **DHCP Server** checkbox, click **Add Features**, and then click **Next**.
6. On the Features page, click **Next**.
7. On the DHCP Server page, click **Next**.
8. On the Confirmation page, click **Install**.
9. When the installation finishes, click **Close**.
10. In Server Manager, click the flag beside Manage, and click **Complete DHCP Configuration**. Click **Next**, click **Commit**, and click **Close**.
11. Click **Tools**, and then click **DHCP**.
12. Right-click **IPv4** and click **New Scope.**
13. Click **Next**, and then enter the following in the relevant wizard pages. Accept the defaults for the other pages.

* Scope Name: Adatum
* Starting IP address: 172.16.0.160
* Ending IP address: 172.16.0.190
* Subnet mask: 255.255.0.0
* Router (Default Gateway): 172.16.0.1
* Domain Name and DNS Servers: IP address: 172.16.0.10

1. Close the DHCP window.

#### To install an Enterprise root CA

1. Open Server Manager, and then click Add roles and features.
2. Under Roles Summary, click Add roles, and then click Next.
3. On the Before You Begin page, click **Next**.
4. On the Installation Type page, click **Next**.
5. On the Server Selection page, click **Next**.
6. On the Select Server Roles page, click Active Directory Certificate Services, and then click Add Features. Click Next three times.
7. On the Select Role Services page, ensure that Certification Authority and Certification Authority Web Enrollment are both selected, click Add Features, and then then click Next twice.
8. On the Role Services page, click Next and then click **Install**.
9. After the installation completes, click **Configure Active Directory Certificate Services on the destination server**.
10. On the Credentials page, click Next.
11. On the Role Services page, select both Certification Authority and Certification Authority Web Enrollment. Click Next.
12. On the Setup Type page, click Enterprise CA, and then click Next.
13. On the CA Type page, click Root CA, and then click Next.
14. On the Private Key page, click Create a new private key, and then click Next.
15. On the Cryptography for CA page, click Next.
16. On the CA Name page, enter AdatumCA for the common name and click Next.
17. On the Validity Period page, enter 20 years and click Next.
18. On the Certificate Database page, click Next.
19. On the Confirmation page, click Configure.
20. On the Results page, click Close.
21. On the Installation progress results page, click Close.
22. Open the registry editor to HKLM\system\CurrentControlSet\Services\CertSvc\Configuration\AdatumCA\
23. Modify the Validity Period Units to 10 years.
24. Open Certification Authority console, expand AdatumCA, right-click Revoked Certificates, select All Tasks and Publish. Click OK.
25. Create a duplicate of the Web Server template and name it Adatum Web Server. Configure the validity period to be 10 years. Configure security to allow authenticated users to read and enroll. Issue the Adatum Web Server certificate.
26. Create a duplicate of the Code Signing template and name it Adatum Code Signing. Configure the validity period to be 10 years. Configure security to allow authenticated users to read and enroll. Issue the certificate.

#### Miscellaneous Settings

1. Edit the Default Domain Policy GPO. Under Administrative Templates\system\power management\Video and Display Settings, enable the Turn off the display (plugged in) setting and set the time to 0 seconds.
2. Create the groups and user accounts listed in the User Accounts table above.
3. Run the VM cleanup script as per WWL standards.

#### Install PowerShell

* 1. Install the latest version of PowerShell. (As of this writing it is 7.1.3). Enable all check boxes except Enable PowerShell remoting.
  2. Connect to the Internet and update help for both PowerShell 5.1 and PowerShell 7. (Update-help)

# To Prepare the Virtual Machine for Hand-off

1. With the VM running, merge any Snapshots created during development.  
   **Important Note**: Snapshots are not supported for the final hand off of any virtual machines for MSL and any ISO’s that are mounted to the VM must be disconnected.
2. On the VM, click **Start**, point to **All Programs**, click **Accessories**, right-click **Command Prompt**, and then click **Run as administrator**.
3. If a key was used during installation follow these steps, otherwise, skip to #4.:  
   At the command prompt, type **slmgr –ipk AAAAA-BBBBB-CCCCC-DDDDD-EEEEE**, (This is an example only - this will replace the existing key with a compromised one. Use one of the blocked keys identified in the **MSL\_VM\_Standards-Guidelines** document located on the VRT for your particular operating system) and then press ENTER. After approximately two minutes, the **Windows Script Host** dialog box appears.  
   In the **Windows Script Host** dialog box, click **OK**.

**Important**: Ensure that there is at least one rearm left in the VM prior to handing off the VM. For the command to determine how many rearms are available, see the table below:

|  |  |  |
| --- | --- | --- |
| **Command** | **Affect** | **Notes:** |
| slmgr –rearm | Resets the activation state. Puts computer in to Grace state. | Should have one left for CPLS. |
| slmgr –dlv | Determine number of rearms left. | Should have one left for CPLS. |
| slmgr –ipk <*compromised/blocked product key*> | Injects a previously blocked key in to VM | Used if VM is activated during development |

(**Important** **Note**: *If using Windows Server 2012 or Windows 8, skip to number #6*)

1. At the command prompt, type **slmgr –rearm**, and then press ENTER.
2. In the **Windows Script Host** dialog box, click **OK**.
3. Close the Command prompt.
4. Shut down the virtual machine (Do NOT reboot).
5. Export the virtual machine to c:\Export.
6. Identify and remove the MSL base image and MSL middle tier VHDs from the export folder - C:\Export\VirtualMachineName\Virtual Hard Disks.
7. Create the VM-Pre-Import script for each VM and store it in the exported virtual machine root folder.   
   This script will create the symbolic links on the import computer for the base/mid-tier images removed. For detailed instructions on creating the VM-Pre-Import script, see the MSL\_VM\_Standards-Guidelines document.

**Important**: Ensure that you have identified all of the middle tier VHDs in the Virtual Hard Disks section in this Build Guide. If you have created any course specific middle tier or stand-alone (monolithic drives), you will need to hand that off as well.

1. Browse to C:\Export\ and compress the export folder for each virtual machine.

#### Create the AZ-040T00A-LON-SVR1 Differencing Drive:

1. In **Hyper-V Manager**, click the host computer name, and in the Actions pane, click **New**, and then click **Hard Disk**.
2. In the New Virtual Hard Disk Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Choose Disk Format** page, click **VHD**. Click **Next**.
4. On the **Choose Disk Type** page, select **Differencing** and then click **Next**.
5. On the **Specify Name and Location** page, in the Name box, type **AZ-040T00A-LON-SVR1.vhd** and in the **Location** field, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives**, and then click **Next**.
6. On the **Configure Disk** page, type the fully qualified path to the middle tier (or base) virtual hard disk file. Such as **C:\Program Files\Microsoft Learning\Base\Base19D-WS19-1809.vhd,** orclick **Browse**, and browse to the folder location where the parent virtual hard disk is located. (For example, c:\Program Files\Microsoft Learning\Base\)
7. On the Completing the New Virtual Hard Disk Wizard, click **Finish**.

#### Create the AZ-040T00A-LON-SVR1 Virtual Machine

1. In **Hyper-V Manager**, click the host computer name, and in the **Actions** pane, click **New**, and then click **Virtual Machine**.
2. In the New Virtual Machine Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Specify Name and Location** page, in the **Name box**, type **AZ-040T00A-LON-SVR1**, select the **Store the virtual machine in a different location** check box, and in the **Location** field type **D:\Program Files\Microsoft Learning\AZ040T00\Drives\**, and then click **Next**.
4. On the **Specify Generation** page, select **Generation 1**, and then click **Next**.
5. On the **Assign Memory** page, in the **Memory** field, type **4096** and then click **Next**.
6. **O**n the **Configure Networking** page, select **Private Network** from the drop down list, and then click **Next**.
7. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**, and in the **Location** box, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives\AZ-040T00A-LON-SVR1.vhd**, and then click **Next**.
8. On the **Completing the New Virtual Machine Wizard** page, click **Finish**.
9. In **Hyper-V Manager**, under Virtual Machines, right-click **AZ-040T00A-LON-SVR1** and click **Settings.**
10. Select **IDE Controller 0** and then click **Add**. Add the **AZ-040T00A-LON-SVR1-Allfiles.vhd** file.
11. Click **OK** to close the Settings dialog box.

**Start and Connect to the Virtual Machine**

1. In **Hyper-V Manager**, under Virtual Machines, right-click **AZ-040T00A-LON-SVR1** and click **Start**.
2. Right-click **AZ-040T00A-LON-SVR1** and click **Connect**.
3. Wait for the virtual machine to start, and then on the **Hi there** page, click **Next**.
4. On the license terms page, click **Accept**.
5. In the password page, provide the password **Pa55w.rd**. Click **Finish**.
6. Sign in as **Administrator** using a password of **Pa55w.rd**.

**Configure Network Settings**

1. In each virtual machine, in Server Manager, click **Local Server**.
2. Next to **Ethernet**, click the link that represents the IP Address.
3. Right-click **Ethernet**, and click **Properties**.
4. In the **Ethernet Properties** dialog box, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
5. In the **Internet Protocol (TCP/IP) Properties** dialog box, configure the network settings as required for your labs. Ensure that these settings are also listed in the Classroom Configuration table above.
6. Click **OK** twice and close the open windows.

**Configure the Administrator profile**

1. On the **Start** screen, right-click **This PC**, and then click **Properties**.
2. On the **View basic information about your computer** page, click **Advanced system settings**.
3. In the **System Properties** dialog box, under **Performance**, click **Settings**.
4. On the **Performance Options** dialog box, on the **Visual Effects** tab, select **Adjust for best performance**, and then click **OK**.
5. In the **System Properties** dialog box, click **OK**.
6. Right-click the Taskbar and click **Properties**
7. On the **Taskbar Properties** dialog box, click **Notification Area**.
8. On the **Notification Area Icons** page, set all **Behaviors** to **Hide icon and notifications**.
9. Click **Turn system icons on or off**, and set all of the **Behaviors** to **Off** except for Action Center. Click **OK** twice.
10. On the **Jump Lists** tab, under **Privacy**, clear both the check boxes, and then click **OK**.
11. In the top breadcrumb, click **Control Panel**.
12. In Control Panel, click **System and Security**, and then click **Action Center**.
13. In the **Action Center** dialog box, under Security, click T**urn off messages about Windows Update**.
14. Click **Change Action Center settings**, and on the **Turn messages on or off** page, clear all check boxes available. Click **OK**.
15. In the top breadcrumb, click **Control Panel**.
16. In Control Panel, click **Network and Internet**, then click **Internet Options**.
17. In the **Internet Properties** dialog box, under **Home page**, type **about:blank**.
18. Under **Browsing history**, select all check boxes and click **Delete**.
19. Click **OK**.
20. In the top breadcrumb, click **Control Panel**.
21. In Control Panel, click **System and Security**, and then click **Turn automatic updating on or off**.
22. On the **Choose how Windows can install updates** page, click **Never check for updates (not recommended)**, and then click **OK**.
23. Click **Administrative Tools**, and then double click **Computer Management**.
24. Expand **Local Users and Groups**, and click **Users**.
25. Right-click **Administrator**, and click **Properties**. Set the password to never expire, and click **OK**

**Add Keyboard Layouts**

1. In the Control Panel, click Add a language.
2. On the **Change your language preferences** page, click **Add a language**, and add the following languages:

* Chinese (Simplified)
* Chinese (Traditional)
* Czech
* Danish
* Dutch (Netherlands)
* English (United Kingdom)
* French (France)
* French (Canada)
* French (Switzerland)
* German (Germany)
* German (Switzerland)
* Italian (Italy)
* Japanese
* Korean
* Polish
* Portuguese (Brazil)
* Portuguese (Portugal)
* Russian
* Spanish (Argentina)
* Spanish (Spain)
* Swedish (Sweden)

1. Click **Advanced Settings**.
2. Click **Apply language settings to the welcome screen, system accounts, and new user accounts**.
3. Click **Copy settings**.
4. Select the **Welcome screen and system accounts**, and the **New user accounts** check boxes, and click **OK** twice.
5. Close the **Language** window.

**Add the computer to the Adatum.com domain**

1. In the Control Panel, click **System and Security**, and then click **System**.
2. Click **Advanced system settings**.
3. On the **Computer Name** tab, click **Change**.
4. In the **Computer name** field, type **LON-SVR1**.
5. Select **Domain**, and then type **Adatum.com**. Click **OK**.
6. In the **Windows Security** dialog box, type **Administrator** for the **User Name**, and **Pa55w.rd** as the **Password**. Click **OK**.
7. In the **Computer Name/Domain Changes** dialog box, click **OK**. Click **OK** again.
8. Click **Close**, and then click **Restart Now**.
9. After the computer reboots, log on as **Adatum\Administrator** using a password of **Pa55w.rd**.

**Miscellaneous Settings**

1. Disable and turn off Windows Update.
2. Enable a File and printer sharing firewall exception.

#### Install PowerShell

1. Install the latest version of PowerShell. (As of this writing it is 7.1.3). Enable all check boxes except Enable PowerShell remoting.
2. Connect to the Internet and update help for both PowerShell 5.1 and PowerShell 7. (Update-help)

**To clear the event logs**

1. In the Control Panel, click **Administrative Tools**, click **Event Viewer**.
2. In the **Event Viewer** dialog box, expand **Windows Logs**.
3. Right-click **Application**, and then click **Properties**.
4. In the **Log Properties** dialog box, in the **Maximum log size (KB)** box, type **1028**, click **OK**.
5. In the **Event Viewer** dialog box, click **OK**.
6. Right-click **Security**, and then click **Properties**.
7. In the **Log Properties** dialog box, in the **Maximum log size (KB)** box, type **1028**, click **OK**.
8. In the **Event Viewer** dialog box, click **OK**.
9. Right-click **Setup**, and then click **Properties**.
10. In the **Log Properties** dialog box, in the **Maximum log size (KB)** box, type **1028**, click **OK**.
11. In the **Event Viewer** dialog box, click **OK**.
12. Right-click **System**, and then click **Properties**.
13. In the **Log Properties** dialog box, in the **Maximum log size (KB)** box, type **1028**, click **OK**.
14. In the **Event Viewer** dialog box, click **OK**.
15. Right-click **Application**, click **Clear Log**, and then click **Clear**.
16. Right-click **Security**, click **Clear Log**, and then click **Clear**.
17. Right-click **Setup**, click **Clear Log**, and then click **Clear**.
18. Right-click **System**, click **Clear Log**, and then click **Clear**.
19. Right-click **Forwarded Events**, click **Clear Log**, and then click **Clear**.
20. Close Event Viewer.
21. Close Control Panel.

**To Prepare the Virtual Machine for Hand-off**

1. Merge any Snapshots created during development.
2. Shut down the virtual machine.
3. Export the virtual machine to c:\Export.
4. Identify and remove the MSL base image and MSL middle tier VHDs from the export folder - C:\Export\VirtualMachineName\Virtual Hard Disks.

**Important**: Ensure that you have identified all of the middle tier VHDs in the Virtual Hard Disks section in this Build Guide. If you have created any course specific middle tier or stand-alone (monolithic drives), you will need to hand that off as well.

1. Browse to C:\Export\ and compress the export folder for each virtual machine.

#### Create the AZ-040T00A-LON-CL1 Differencing Drive

1. In **Hyper-V Manager,** in the Actions pane, click **New**, and then click **Hard Disk**.
2. In the New Virtual Hard Disk Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Choose Disk Format** page, click **VHD** and then click **Next**.
4. On the **Choose Disk Type** page, select **Differencing** and then click **Next**.
5. On the **Specify Name and Location** page, in the Name box, type **AZ-040T00A-LON-CL1.vhd** and in the **Location** field, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives**, and then click **Next**.
6. On the **Configure Disk** page, type the fully qualified path to the middle tier (or base) virtual hard disk file. Such as **C:\Program Files\Microsoft Learning\Base\** **Base20E-W10-2004-Office2019.vhd,** orclick **Browse**, and browse to the folder location where the parent virtual hard disk is located. (For example, c:\Program Files\Microsoft Learning\Base\Drives). Click Next.
7. On the Completing the New Virtual Hard Disk Wizard, click **Finish**.

#### Create the AZ-040T00A-LON-CL1 Virtual Machine

1. In **Hyper-V Manager,** in the **Actions** pane, click **New**, and then click **Virtual Machine**.
2. In the New Virtual Machine Wizard, on the **Before You Begin** page, click **Next**.
3. On the **Specify Name and Location** page, in the **Name box**, type **AZ-040T00A-LON-CL1**, select the **Store the virtual machine in a different location** check box, and in the **Location** field type **D:\Program Files\Microsoft Learning\AZ040T00\Drives\**, and then click **Next**.
4. On the **Specify Generation** page, select **Generation 1** and then click **Next**.
5. On the **Assign Memory** page, in the **Memory** field, type **4096** and then click **Next**.
6. **O**n the **Configure Networking** page, select **Private Network** from the drop down list, and then click **Next**.
7. On the **Connect Virtual Hard Disk** page, click **Use an existing virtual hard disk**, and in the **Location** box, type **D:\Program Files\Microsoft Learning\AZ040T00\Drives\AZ-040T00A-LON-CL1.vhd**, and then click **Next**.
8. On the **Completing the New Virtual Machine Wizard** page, click **Finish**.

**Start and Connect to the Virtual Machine**

1. In **Hyper-V Manager**, under Virtual Machines, right-click **AZ-040T00A-LON-CL1** and click **Start**.
2. Right-click **AZ-040T00A-LON-CL1** and click **Connect**.
3. Wait for the virtual machine to start, and in the Virtual Machine Connection window, log on **Admin** using a password of **Pa55w.rd**.

**Configure Network Settings**

1. Open the **Control Panel**.
2. In the Control Panel, click **View network status and tasks**.
3. In the window, click **Change adapter settings**.
4. Right-click **Ethernet**, and click **Properties**.
5. In the **Ethernet Properties** dialog box, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
6. In the **Internet Protocol (TCP/IP) Properties** dialog box, configure the network settings as listed in the Classroom Configuration table above.
7. Click **OK** twice and close the open windows.

**Add the computer to the Adatum.com domain**

1. In the Control Panel, click **System and Security**, then click **System**.
2. Click **Advanced system settings**.
3. On the **Computer Name** tab, click **Change**.
4. In the **Computer name** field, type **LON-CL1**.
5. Select **Domain**, and then type **Adatum.com**. Click **OK**.
6. In the **Windows Security** dialog box, type **Administrator** for the **User Name**, and **Pa55w.rd** as the **Password**. Click **OK**.
7. In the **Computer Name/Domain Changes** dialog box, click **OK**. Click **OK** again.
8. Click **Close**, and then click **Restart Now**.
9. After the computer reboots, sign in as **Adatum\Administrator** using a password of **Pa55w.rd**.

**Miscellaneous Settings**

1. Clean up the profile as per the latest standards**.**
2. Turn off and disable the Windows Update service.
3. Install the following RSAT optional features for Windows 10:
   * Active Directory Domain Services and Lightweight Directory Services Tools
   * BitLocker Drive Encryption Administration Utilities
   * DHCP Server Tools
   * DNS Server Tools
   * Group Policy Management Tools
   * File Services Tools
   * Server Manager
4. Install WMI Explorer.
5. Update to the latest version of Microsoft Edge.

#### Install PowerShell

1. Install the latest version of PowerShell. (As of this writing it is 7.1.3). Enable all check boxes except Enable PowerShell remoting.
2. Connect to the Internet and update help for both PowerShell 5.1 and PowerShell 7. (Update-help)

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**Important**: Ensure that you have identified all of the middle tier VHDs in the Virtual Hard Disks section in this Build Guide. If you have created any course specific middle tier or stand-alone (monolithic drives), you will need to hand that off as well.

1. Browse to C:\Export\ and compress the export folder for each virtual machine.