# Setup Guide

The Official CompTIA® Nework+® Instructor Guide (Exam N10-007): 2019 Update

The CompTIA Network+ (N10-007) course uses Virtual Machine (VM)-based hands-on activities. The network uses three zones, representing a local network, an ISP, and an internet. VyOS VMs perform routing between the networks. There are various Windows and Linux servers and clients. The PFSENSE router/firewall is substituted for RT1-LOCAL in some activities.
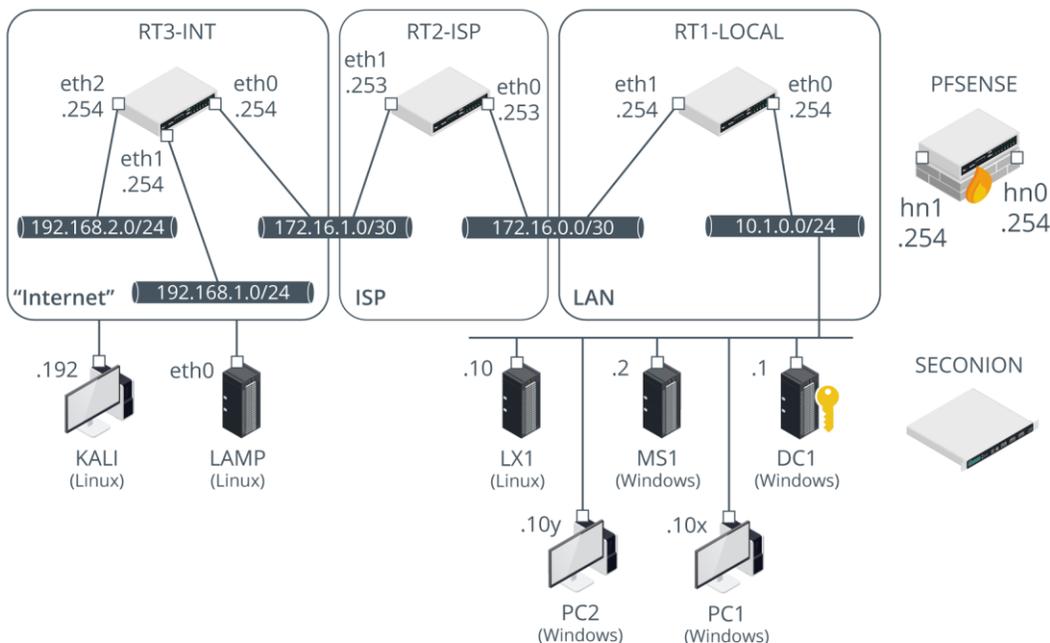
Lab network topology.

!

The Network+ 2019 Update and Security+ (N10-007) 2019 Update courses use the same environment so if you have already set up student PCs to run a Security+ course, the lab environment will already be configured to run Network+. You can also use the environment to run A+ (220-1000/220-1002) courses. If you have already configured an environment following the A+ setup guide, refer to the end of this guide for the updates that will be required to support Network+ activities.

If you have any difficulty in completing setup, please contact CompTIA at help.comptia.org/hc/en-us/requests/new

Equipment Requirements

The VM-based activities require one PC per student and one PC for the instructor set up in a classroom network. In these setup notes and student activities, the physical PC used for virtualization is referred to as the HOST.

STUDENT HOST PC REQUIREMENTS

The activities use multiple VMs running simultaneously so that each student can set up their own virtual network and complete the activities independently. Consequently, the activities require a relatively high specification machine for the HOST. These are recommended minimum specifications:

■ Windows 10 x64 Professional/Enterprise Branch 1803 or later with Hyper-V installed.

> **!** *The activities should work the same on any Hyper-V platform that can support Generation 2 and VM configuration version 8.0 but have only been tested on Windows 10 1803 and Windows 10 1809.*

■ 2 GHz multi-core x64 CPU with virtualization support.

■ 8—16 GB RAM.

> **!** *We have tried to design the activities so that they will run within an 8 GB HOST instance, but VM performance will be limited. A 12 or 16 GB HOST instance will offer better performance.*

■ 200 GB free disk space. An SSD will deliver much better performance than an HDD.

■ DVD-ROM drive.

■ Ethernet network card (supported by Windows host OS).

■ Internet access/IP—some activities require web access from the HOST. VMs should not be connected to the Internet or to the physical classroom network.

You will need product ISOs and (where applicable) product keys/licenses for the following x64 software:

■ 2x Windows Server 2016 Standard Edition.

■ Windows 7 Professional/Enterprise x64 Edition SP1 (Build 7601).

■ Windows 10 Professional/Enterprise x64 Edition (Build 1803).

If you do not have the specific build available, future versions of Windows 10 or Server 2016 should not substantially affect the activity steps. Windows 7 must have SP1 installed.

INSTRUCTOR HOST COMPUTER

You can configure the instructor PC in the same way as the student HOST PCs so that you can demonstrate the activity steps. The following additional items will be useful.

■ PowerPoint or PowerPoint Viewer.

■ Large monitor or screen to display the slides.

■ An Internet connection for demonstrating websites and other Internet resources will be useful but not essential.

■ Packet capture software such as Wireshark will be useful when covering the networking topics to show students examples of frames, packets, segments, and application protocol headers. All the VMs will have Wireshark installed but you may also want to install it to the HOST.

Setup Process

The setup process for the VM-based activities involves the following phases:

1) Prepare the HOST PC Hyper-V environment and download the VM images and data files.

2) Import the VyOS and Linux VMs from the preconfigured images.

3) Install the Windows Server VMs using your setup media and configure them by running the supplied scripts.

4) With the Windows Server VMs running, install the Windows desktop VMs using your setup media and configure them by running the supplied scripts

5) Create checkpoints for each VM to allow the activity environment to be reset.

Because students will have access to dual-use tools and malware examples, plus intentionally vulnerable OS instances (LX1 and LAMP) and Windows installations with weak passwords, you must take care to prevent misuse of the VMs. The VMs should not be permitted to connect to the Internet.

Some activities assume use of the web. If you do not want to allow Internet access on the Hyper-V HOST PCs, use different PCs for those activities or specify them as self-study, or omit them.

PHASE 1. FIRST STEPS

Within the classroom network you set up, prepare each HOST PC by completing the following steps. This part of setup should take about an hour, depending on the speed of your Internet connection.

1) Perform a default Windows 10 x64 Professional/Enterprise Edition Build 1803 or 1809 installation on the HOST PC.

2) Create a local administrator account for the student to use to run Hyper-V. Make sure the student is provided with the appropriate credentials to sign into the HOST PC.

3) Use **Programs and Features > Turn Windows features on or off** to enable Hyper-V. Make sure the management tools and PowerShell module are enabled for Hyper-V.
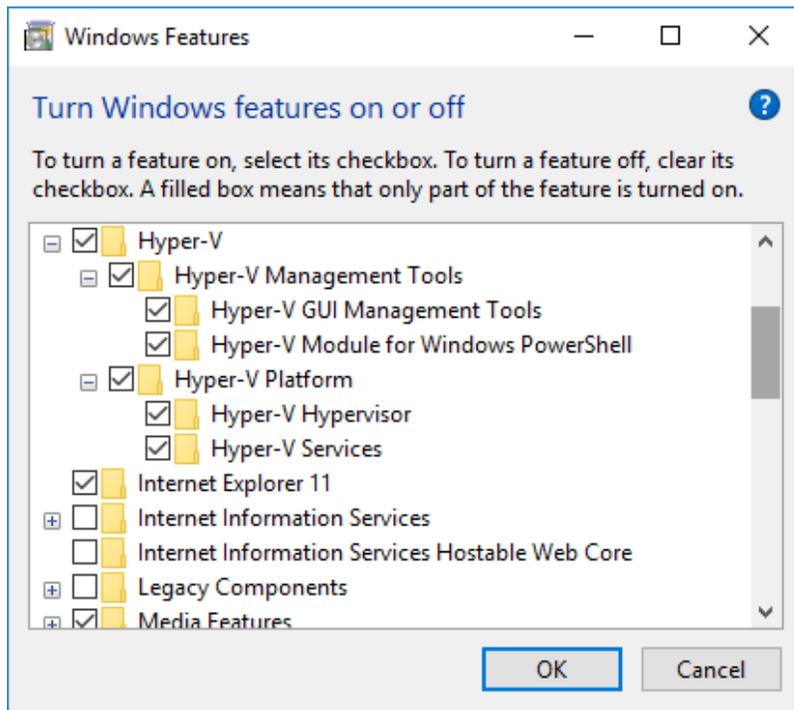
Make sure the management tools and PowerShell module are enabled for Hyper-V

4) Open Hyper-V Manager and select **Hyper-V Settings** from the *Actions* pane. Configure the following settings:

   ○ Select the **Virtual Hard Disks** node, and in the *Specify the default folder* box, enter `C:\COMPTIA-LABS`

   ○ Select the **Virtual Machines** node, and in the *Specify the default folder* box, enter `C:\COMPTIA-LABS`

   ○ Select the **Enhanced Session Mode Policy** node then check the **Allow enhanced session mode** check box.

5) Select **OK**.

6) Either disable security software on the HOST or create exceptions for the following folders:

   ○ C:\COMPTIA-LABS

   ○ C:\COMPTIA-LABS-mups

7) Use the following link to download the setup script:

   https://comptiacdn.azureedge.net/comptia-learning/GETVMS2.zip

8) Extract the contents of the zip to C:\.

   You should now have five files in C:\COMPTIA-LABS:

   ○ C:\COMPTIA-LABS\getvms.ps1

   ○ C:\COMPTIA-LABS\getvms-update.ps1

   ○ C:\COMPTIA-LABS\comptia-labs1-hashes.txt

   ○ C:\COMPTIA-LABS\comptia-labs2-hashes.txt

   ○ C:\COMPTIA-LABS\comptia-labsody-hashes.txt

The setup files are split across a number of multi-part self-extracting archives. You can use the getvms.ps1 script to download them.

9) On the **HOST** PC, open a PowerShell prompt with elevated privileges (right-click **Start** and select **Windows Powershell (Admin)**).

10) Execute the following commands:

`Set-ExecutionPolicy Unrestricted`

[Confirm with Y]

`C:\COMPTIA-LABS\getvms.ps1`

The script will download each archive part to the folder *C:\COMPTIA-LABS-mups* and verify it against its precomputed hash. If the download is successful, the script will extract the files to *C:\COMPTIA-LABS*.

⚠ **By default, the script will also download an ISO file containing Windows malware, including the EICAR test string, Actual Keylogger, Cain. This disc image is used to complete part of the anti-virus activity. If you do not want to retrieve this file, comment out the marked section of the getvms script.**

If a part is not validated, an error will be written to *C:\COMPTIA-LABS-mups_errors.txt*. Use the links in that file to download missing or corrupted parts individually. When you have downloaded all the parts, complete the following steps to extract the files manually—you do NOT need to complete these steps if the script has executed without errors:

a) Once all the archive parts have been downloaded successfully, run **C:\COMPTIA-LABS-MUPS\COMPTIA-LABS1.exe**.

b) In the *Extract to* box, enter `c:\`
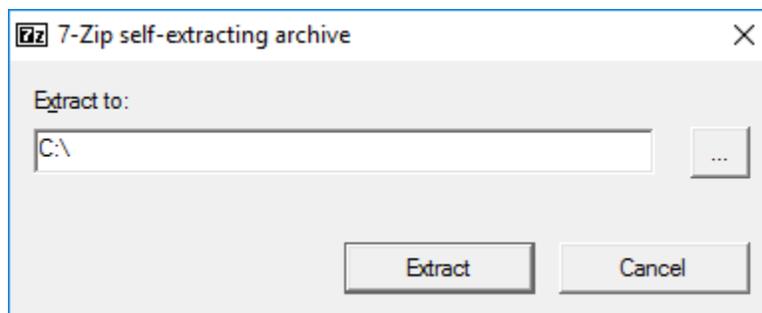
Extract files to the c:\ drive

c) Select the **Extract** button. The folders and files will be extracted to the C:\COMPTIA-LABS folder (check the screenshot below to confirm the layout).

d) Repeat to extract **C:\COMPTIA-LABS-MUPS\COMPTIA-LABS2.exe**. Note that some files and folders will be overwritten—this is expected behavior.

11) Obtain the necessary product ISOs plus an appropriate product key and/or license for each Windows OS. Please note that CompTIA cannot provide you with Windows media or licenses. Contact your Microsoft licensing partner.

12) You need to specify the location of your Windows media ISO installation files:

- EITHER: open the **C:\COMPTIA-LABS\setupvms3-winservers** and **C:\COMPTIA-LABS\setupvms4a-winclients** scripts for editing in the Windows PowerShell ISE and adjust the values of the variables **$win2016iso**, **$win10iso**, **$win7iso** to the paths to your Windows installation media ISO files.

- OR: rename your ISOs to `C:\COMPTIA-LABS\win2016.iso`, `C:\COMPTIA-LABS\win10.iso`, and `C:\COMPTIA-LABS\win7.iso`

> **!** *The scripts configure the VMs with a conservative amount of system memory. You can edit the scripts to increase this (`-MemoryStartupBytes`) if you have more than 8 GB available on the HOST (or adjust the settings in Hyper-V afterwards).*

Layout of C:\COMPTIA-LABS with all downloads extracted and ISOs copied to the suggested filenames.

13) Install the following software on the HOST PC:

`c:\COMPTIA-LABS\autopsy-4.10.0-64bit.msi`

PHASE 2. IMPORTING THE VYOS AND LINUX VMS

Verify that the prebuilt VM folders are downloaded and installed to the **C:\COMPTIA-LABS** folder as shown in the screenshot above.

1) On the **HOST** PC, open a PowerShell prompt with elevated privileges (right-click **Start** and select **Windows Powershell (Admin)**).

2) Execute the following commands (assuming ExecutionPolicy is already set to Unrestricted):

   `C:\COMPTIA-LABS\setupvms1-switches`

   `C:\COMPTIA-LABS\setupvms2-linux`

   These scripts will create the virtual switches used in the activities, import the preconfigured VMs to your Hyper-V server, and start the **RT1-LOCAL** VM. The remainder of setup should take about another hour, depending on the speed of the HOST PC.

PHASE 3. INSTALLING THE WINDOWS SERVER VMS

The Windows VMs use an attended install and are then configured by running several PowerShell scripts. You need to select the appropriate date and time plus product key information for each Windows Server VM.

1) Execute the following command in the elevated PowerShell prompt:

   `C:\COMPTIA-LABS\setupvms3-winservers`

   The script will configure each VM and add the appropriate Windows ISO file to the virtual DVD drive.

   ⚠️ *The script will remove any existing VMs with the same name as those used in the activities and delete the associated VHDs.*

2) Open the Hyper-V management console. Verify that the **RT1-LOCAL** VM is running.

3) Open session consoles for each Windows Server VM (DC1 and MS1). Complete the following steps on each VM:

   ○ Start the VM, and then in its connection window, press a key to boot from the setup disc.

   ○ Choose the appropriate time/currency and keyboard formats, and then select **Install Now**.

   ○ Enter your product key if prompted.

   ○ Select the **Server 2016 Standard (Desktop Experience)** option.

   ○ Accept the license agreement.

   ○ Select a **Custom installation**.

   ○ Accept the default disk options and select **Next** to start installation.

CONFIGURING THE DC1 VM

Once installation is complete, you will run some scripts to configure the **DC1** VM. This VM will run AD, CA, DNS, and IIS. Make sure you complete ALL these tasks *before* you try to configure the client VMs.

> **!**
>
> *If you experience any problems running the scripts, comment out the "restart" command if it is present so that you can read any error message more easily or execute them selectively in the PowerShell ISE.*

1) When setup is complete, on the *Customize Settings* page, enter `Pa$$w0rd` in the *Password* and *Reenter password* boxes, and then select **Finish**.

2) In the *Connect to DC1* dialog box, set the VM console window to an appropriate resolution. Select **Show options**, check the **Save my settings for future connections on this virtual machine** box, and then select the **Connect** button.

> **!**
>
> *If no "Connect to" dialog is shown, verify that the connection is working in Enhanced session mode (View menu). If the Enhanced session mode option is greyed out, logon then restart the VM.*

3) Sign into the VM as Administrator with `Pa$$w0rd`

4) On the **HOST**, open **C:\COMPTIA-LABS** and copy the **LABFILES** folder.

5) In the **DC1** VM, open **File Explorer,** then paste the copied folder in the root of the **C:** drive.

6) When file copy has completed, open **PowerShell** and run the following script:

   `Set-ExecutionPolicy Unrestricted`

   [Confirm with Y]

   `c:\labfiles\dc1-setup1`

> **!**
>
> *Always ensure you are opening the 64-bit PowerShell environment—NOT PowerShell (x86).*

7) When the DC1 VM reboots, sign back in as **Administrator**. Open **PowerShell** and run the following script:

   `c:\labfiles\dc1-setup2`

8) When the DC1 VM reboots, sign in to the domain as `Administrator`.

9) Open **PowerShell**.

10) Point to the network status icon. If the network is listed as "Network" or "Unidentified," run the following command:

    `c:\labfiles\RestartNLA`

11) Point to the network icon—it should now be identified as "corp.515support.com."

> *This script will be set to run as a task at startup but if NLA does fail to identify the domain profile during the activities, get students to run this script manually and restart the DHCP server on MS1.*

12) In PowerShell, run the following script:

`c:\labfiles\dc1-setup3`

13) Leave the DC1 and RT1-LOCAL VMs running while you complete configuration of the other VMs.

CONFIGURING THE MS1 VM

You will run some scripts to configure the MS1 VM. This VM will run DHCP, IIS, and a third-party email server (hMail).

1) When setup is complete, on the *Customize Settings* page, type `Pa$$w0rd` in the *Password* and *Reenter password* boxes, and then select **Finish**.

2) In the *Connect to MS1* dialog box, set the VM console window to an appropriate resolution. Select **Show options**, check the **Save my settings for future connections to this virtual machine** box, and then select the **Connect** button.

3) Sign in as Administrator with `Pa$$w0rd`.

4) Open **PowerShell** and run the following script:

`Set-ExecutionPolicy Unrestricted`

[Confirm with Y]

`\\DC1\labfiles\ms1-setup1`

[Confirm with R]

5) When the MS1 VM has restarted, sign back in as `515support\Administrator`.

6) Select **Start**, right-click **Windows Powershell**, and select **More > Run as administrator**. At the UAC prompt, select **Yes**. Run the following script:

`\\DC1\labfiles\ms1-setup2`

[Confirm with R]

7) To complete setup, install the hMailServer application.

   o Run the **C:\LABFILES\hMailServer-5.6.6.exe** setup program.

   o Complete the setup wizard by accepting the defaults and using `Pa$$w0rd` when prompted for installation credentials.

   o When the program has installed, in the *Connect* dialog box, check **Automatically connect at startup**, and then select the **Connect** button. Input `Pa$$w0rd` to logon.

   o Select the **Add Domain** button.

   o In the *Domain* box, type `515support.com` and then select **Save**.

   o Expand **Settings→Protocols** and select **SMTP**, then select the **Delivery of e-mail** tab.

   o In the *Local host name* box, type `mail.515support.com` and then select **Save**.

- Under *Settings* select **Logging** then check the **Enabled** box. Under *Log*, check **Application**, **SMTP**, and **IMAP,** and then select **Save**.

- Expand **Settings→Advanced** then select **Auto-ban** and uncheck the **Enabled** box. Select **Save**.

- Under **Settings→Advanced** select **Scripts** then check the **Enabled** box.

- Select **Show scripts**. Navigate to **C:\LABFILES** and then double-click the **ms1-hmail** VBscript. In the confirmation prompt, select **OK**.

- In hMailServer Administrator, select **Save**.

- Expand **Domains→515support.com** and select **Accounts** to verify that the domain accounts have been added.

> **!** *If the accounts are not added, investigate connectivity problems between DC1 and MS1, such as NLA setting an incorrect firewall profile.*

- Select **Exit**.

8) Leave the **DC1**, **MS1**, and **RT1-LOCAL** VMs running while you complete configuration of the other VMs.

PHASE 4. INSTALLING THE CLIENT VMS

You need to select the appropriate date and time plus product key information for the Windows 10, Windows 7, and (optionally) Windows 8.1 VMs.

1) On the HOST, in the elevated PowerShell prompt execute the following command:

```
C:\COMPTIA-LABS\setupvms4a-winclients
```

The script will configure each VM and add the appropriate Windows ISO file to the virtual DVD drive.

> **!** *The script will remove any existing VMs with the same name as those used in the activities and delete the VHDs.*

2) Open the Hyper-V management console then open session consoles for each Windows client VM. Complete the following steps on each Windows client VM (PC1, PC2, and optionally PC3):

- Open the connection window and start the VM and then press a key to boot from the setup disc.

- Choose appropriate time/currency and keyboard formats then select **Install Now**.

- Enter your product key if prompted.

- Accept the license agreement.

- Select a **Custom installation**.

- Accept the default disk options and select **Next** to start installation.

CONFIGURING THE PC1 (WINDOWS 10) VM

Once installation is complete, you will run two scripts to join the domain and install applications for use in the course.

1) Complete the initial settings wizard by making the following choices:

   o When prompted, configure regional options and keyboard.

   o At the *Let's connect you to a network* screen, select **Skip for now**.

   o At the *Who's going to use this PC*, create a user named **Admin** then select **Next**.

   o At the *Create a super memorable password* screen, select **Next**, leaving the *Password* box blank.

   o At the *Make Cortana your personal assistant* screen, select **No** (or **Decline** depending on the release version).

   o At the *Choose privacy settings for your device*, select **Accept**.

   Wait a few minutes for the installation to complete.

2) In the *Connect to PC1* dialog box, set the VM console window to an appropriate resolution. Select **Show options**, check the **Save my settings for future connections to this virtual machine** box, then select the **Connect** button.

3) Select **Sign in**.

4) On the **HOST**, open **C:\COMPTIA-LABS** then copy the **LABFILES** folder.

5) In the **PC1** VM, open the root of the **C:** drive in Explorer then paste the copied folder.

6) Right-click **Start** and select **Windows Powershell (Admin)**. At the UAC prompt, select **Yes**. Run the following script:

   `Set-ExecutionPolicy Unrestricted`

   `[Confirm with Y]`

   `c:\labfiles\pc1-setup1`

7) When the VM restarts, select **Other user**. Enter `515support\Administrator` with password `Pa$$w0rd`

8) Right-click **Start** and select **Windows Powershell (Admin)**. At the UAC prompt, select **Yes**. Run the following script:

   `c:\labfiles\pc1-setup2`

9) You should see icons for various tools and utilities appearing on the Desktop after a few minutes. The Webserver Stress Tool will run as the script executes. You can just ignore it. The VM will restart when the script finishes. You can continue with installing PC2 while the script runs.

10) Shut down the VM.

CONFIGURING THE PC2 (WINDOWS 7) VM

Once installation is complete, you will run a script to join the domain and install applications for use in the course.

1) Complete the initial settings wizard by making the following choices:

- On the first *Set Up Windows* page, enter `Admin` in the *User name* box and `PC2` in the *PC name* box, then select **Next**.

- On the *Set a password* page, enter the password as `Pa$$w0rd` and put `515support default` as the hint. Select **Next**.

- If prompted, on the *Type your product key* page, enter your product key and select **Next**.

- Choose the **Ask me later** option on the *Windows Update* page.

- Adjust the date and time settings if necessary then select **Next**.

- On the *Current location* page, select **Work network**.

2) Wait a few minutes for the installation to complete.

3) Select **Start**, type `PowerShell` and press **CTRL+SHIFT+ENTER**. At the UAC prompt, select **Yes**.

4) Execute the following commands:

   `Set-ExecutionPolicy Unrestricted`

   [Confirm with Y]

   `\\DC1\labfiles\pc2-setup`

   [Confirm with R]

5) The Webserver Stress Tool will run as the script executes. You can just ignore it. When the VM reboots, select **Switch User** then select **Other User** and log back in as `515support\Administrator`.

6) Shut down the **PC2** VM.

(OPTIONAL) CONFIGURING THE PC3 (WINDOWS 8.1) VM

If you want to use the environment to run A+ courses, you may also want to install a Windows 8.1 VM. *You do not need this VM to run Network+ or Security+ courses.*

1) On the HOST, open the **C:\COMPTIA-LABS\setupvms4b-win8client** script for editing in the Windows PowerShell ISE and adjust the value of the variables **$win8iso** to the path to your Windows 8.1 installation media ISO file. Save and close the file.

2) On the HOST, in the elevated PowerShell prompt execute the following command:

   `C:\COMPTIA-LABS\setupvms4b-win8client`

3) From Hyper-V Manager, open a connection window for the PC3 VM.

4) When automated setup finished, complete the OOBE configuration steps. On the *Personalize* page, in the *PC name* box, type `PC3`, and then select **Next**.

5) Select **Use express settings**.

6) Select **Create a local account**.

7) Enter *User name* as `Admin` and configure the password as `Pa$$w0rd`.

8) Select **Finish**.

9) Once the profile has been built, shut down the VM.

(OPTIONAL) LINUX VMS AND KEYBOARD LAYOUT

Students will also complete some activities on various Linux VMs. These VMs have been created as part of the scripts you have run already. The Linux VMs have been created using standard US keyboard layouts. If you are using a different keyboard layout, you may want to adjust the settings in each VM. The means of doing this are as follows:

- LX1 (`centos` / `Pa$$w0rd`)—**Applications > System Tools > Settings > Region & Language**.

- RT* VyOS Routers (`vyos` / `Pa$$w0rd`)—run `sudo dpkg-reconfigure keyboard-configuration`

- KALI (`root` / `Pa$$w0rd`) —**Settings > Region and Language**.

- LAMP (`lamp` / `Pa$$w0rd`) —run `sudo dpkg-reconfigure keyboard-configuration`

- PFSENSE (`admin` / `Pa$$w0rd`) —use option `8` to get shell then run `kbdcontrol -l uk.iso.kbd` (replace "uk" as appropriate). This VM is mostly operated via the web console though.

- SECONION (`administrator` / `Pa$$w0rd`) —**Settings** (top-left icon) **> All Settings > Keyboard > Layout**.

PHASE 5. CREATING CHECKPOINTS

To complete setup, shut down the remaining VMs and create checkpoints.

1) Shut down the **DC1** and **MS1** VMs.

2) In Hyper-V Manager, double-click the **RT1-LOCAL** VM to open a connection window. Enter `vyos` as the login and `Pa$$w0rd` as the password. Type `poweroff` then press `ENTER` and confirm with `Y`

3) Close any open VM console windows.

   Checkpoints are saved images of the disk and VM config file in a particular state. Create a checkpoint now so that the VMs can be completely reset to the start of class state.

4) In the Hyper-V Management console, ensure that the *State* of each VM is listed as **Off**.

5) Open a PowerShell prompt with elevated privileges (`WINDOWS` > `windows PowerShell` > `CTRL+SHIFT+ENTER`).

6) Execute the following command:

   `C:\COMPTIA-LABS\setupvms5-checkpoint`

7) Optionally, once the script has completed, optionally set the execution policy back to restricted:

   `Set-ExecutionPolicy Restricted`

   `[Confirm with r]`

To revert the course and prepare for the next class, make sure the following actions have been completed (students are prompted to complete these actions where relevant in the course):

1) Apply the **Initial Config** checkpoints to all VMs then delete any checkpoints created by the students during the activities.

2) Delete any VMs that the students created (RESTORE VM in the A+ backup activity and VMx in the A+ scripting activity for instance).

3) Delete the contents of the **C:\COMPTIA-LABS\TEMP** folder (used in A+).

Updating an Existing A+ Environment

If you have already completed setup for A+ (220-1000/220-1002) and you do not want to repeat the whole setup process, please complete the following tasks to update the activity environment to support Network+ and Security+.

1) If you have not already done so, use the following link to download the updated setup script and then extract the contents to C:\COMPTIA-LABS, overwriting any existing files:

   https://comptiacdn.azureedge.net/comptia-learning/GETVMS2.zip

2) On the **HOST** PC, open a PowerShell prompt with elevated privileges (START > `windows PowerShell` > **CTRL+SHIFT+ENTER**).

3) Execute the following commands:

   `C:\COMPTIA-LABS\getvms-update.ps1`

   The script will download and extract the additional and replacement files for the Network+ and Security+ activities.

4) When download and file extraction is complete, in the c:\COMPTIA-LABS\setupvms2-linux.ps1, delete or comment out (add # at the start of each line) lines 6-34 so that your existing RT1-LOCAL and LX1 VMs are not overwritten. Run the script to create the additional VMs.

   `C:\COMPTIA-LABS\setupvms2-linux.ps1`

5) Delete any existing checkpoints from all VMs.

6) Boot and connect to the following VMs: DC1, MS1, PC1, PC2, LX1.

7) On the HOST, copy the contents of the updated C:\COMPTIA-LABS\LABFILES folder.

8) Sign in to **DC1** as `Administrator` / `Pa$$w0rd`, and paste the clipboard contents to the C:\LABFILES folder, choosing to overwrite any existing files.

9) Run the following PowerShell commands from an administrative prompt (you can also find these in the updated dc1-setup3.ps1 script). These commands allow zone transfers and disable ESC for Internet Explorer.

```
Set-DnsServerPrimaryZone -Name 'corp.515support.com' -SecureSecondaries
TransferAnyServer

Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Active Setup\Installed
Components\{A509B1A7-37EF-4b3f-8CFC-4F3A74704073}" -Name "IsInstalled" -Value
0

Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Active Setup\Installed
Components\{A509B1A8-37EF-4b3f-8CFC-4F3A74704073}" -Name "IsInstalled" -Value
0

New-ItemProperty -Path "HKCU:\SOFTWARE\Microsoft\Internet Explorer\Main" -
Name "NoProtectedModeBanner" -PropertyType DWORD -Value 1
```

10) Sign in to **MS1** as `515support\Administrator` / `Pa$$w0rd`, and select **Start**, right-click the **Windows PowerShell** tile, and select **More > Run as administrator**. At the UAC prompt, select **Yes**. Run the following command:

```
Copy-Item \\DC1\LABFILES\* c:\LABFILES -recurse -force -passthru
```

11) Install OpenSSL using **C:\LABFILES\Win64OpenSSL_Light-1_1_0f.exe**

12) If you skipped hMail Server installation, complete that now, using the steps provided above.

13) Sign in to **PC1** as `515support\Administrator` / `Pa$$w0rd`, and paste the clipboard contents to the C:\LABFILES folder, choosing to overwrite any existing files.

14) Sign in to **PC2** as `515support\Administrator` / `Pa$$w0rd`, and select **Start**, type `PowerShell` and press `CTRL+SHIFT+ENTER`. At the UAC prompt, select **Yes**. Run the following command:

```
Copy-Item \\DC1\LABFILES\* c:\LABFILES -recurse -force -passthru
```

15) Add a desktop shortcut to **c:\labfiles\ipscan-win64-3.5.3.exe**, naming it `Angry IP Scanner` (alternatively students can just run the program from labfiles during the exercises rather than using the desktop shortcut).

16) Sign in to the LX1 VM (`centos` / `Pa$$w0rd`) and run the following commands:

```
sudo firewall-cmd --zone=public --permanent --add-service=https

sudo firewall-cmd --zone=public --permanent --add-service=http
```

17) Shut down any running VMs.

18) Run the checkpoint script:

```
C:\COMPTIA-LABS\setupvms5-checkpoint
```

19) Install the Autopsy software to the HOST, using the **c:\COMPTIA-LABS\autopsy-4.10.0-64bit.msi installer**.