IT 331 On-Prem and Cloud Systems Administration

Lab #5

Spring 2021 – Professor Josh Edgar

This Lab begins the second Unit of our course, where from Weeks 8 through 12, we will focus on Windows systems administration. Windows is, of course, a wildly popular operating system used by many enterprises. Unlike Linux, you must pay for a license to use Windows in an enterprise environment – but many enterprises prefer this, because the licensing costs often include dedicated support, an invaluable resource in the case of a production outage.

Also unlike Linux, Windows servers typically run with a full Windows UI (although newer versions do make use of the PowerShell command line interface [CLI], something we'll play with later in the course), and are administered by actually clicking on a graphical interface. This means that you have to account for some additional resource consumption that doesn't exist on a CLI-only Linux system.

Just as you did with Red Hat, before you can work on Windows systems administration, you should first experience its installation process. In this Lab, you will install Windows Server 2019 on your local hypervisor.

Before you begin:

- You must have a VM hypervisor, such as VirtualBox or VMware, installed to do this Lab.
- This Lab's instructions assume that you are using VirtualBox. You may need to make small changes to these steps if you choose to use a different hypervisor.
- Download the Windows Server 2019 ISO image file from this link: https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2019
    - Under "Please select your experience," choose "ISO."
    - Complete the form with your information. Use "Marymount University" for company name, 1000+ for company size, and Researcher/Academic/Student for job title. Provide your Marymount.edu e-mail for work e-mail, and your personal phone number since you do not likely have a work number.
    - Allow **plenty of time** to download the ISO file - it is 5 GB in size and can only be downloaded from a mirror in the United States.

What you'll achieve:

- Install Windows Server 2019
- Perform some basic disk management to prepare a disk for installation
- Perform basic system update tasks
- Install a role

What you'll turn in with this Lab:

- Short answers to the review questions from each Task.

Task 1: Create a Virtual Machine and Install Windows Server

This task closely replicates Task 1 from Lab 1. You will use the ISO image you have downloaded from Microsoft, attach it to a new virtual machine (VM) you will create in our hypervisor, and install Windows Server 2019.

This guide assumes that you remember most of the steps for kicking off an OS installation in your hypervisor, since we just did it in Lab 1. Very few things will be different as far as getting the ISO loaded into a new VM, so these steps will be consolidated to save time. Please refer to the Lab 1 guide if you need specific step-by-step guidance on creating a VM in VirtualBox.

1. Open VirtualBox. If you wish, you can right-click on your old CentOS VM, click "Delete," and click "Delete all files" when prompted… we don't need this VM anymore.
2. Create a new VM entitled "Your Name's Windows Server VM."
3. If the "Type" and "Version" fields did not automatically change, set them to "Microsoft Windows" and "Windows 2019 (64-bit)," respectively. Click "Continue."
4. Set the recommended memory size to 2048 MB, or 2 GB. Click "Continue."
5. Create a new fixed-size VDI hard disk that is 50 GB in size.
6. Once your VM is created, attach the ISO file you downloaded.
7. Back at the VirtualBox main screen, select your VM, and click "Start." If prompted, select "Normal Start." Another pop-up may appear to confirm your ISO file. If so, simply click "Start" again.
8. You will see the Windows logo while the installer loads. Eventually, you should see a prompt with three (3) drop-down boxes. Provide the requested information, answer the below Review Question, and then click "Next."

   Review Question:
   8. What are the three (3) drop-down boxes asking you to configure?

9. Click "Install Now."
10. You will see "Setup is starting" for a moment, and then receive a prompt asking you which version of Windows to install. Select "Windows Server 2019 Standard Evaluation (Desktop Experience)" and click "Next."
11. Select "Custom: Install Windows Only (advanced)." We want the full installation experience.
12. You should now see a drive partitioning window, showing your 50 GB VDI drive as "unallocated space." This is a very brief introduction into disk management in Windows, which we'll experience more in a later Lab. You may be familiar with the C: drive being the default drive where Windows is typically installed. We must create that volume before proceeding with the installation. Click the "New" button with the yellow sun.
13. The default size for this volume should be 51200 MB. This is acceptable. Click "Apply."
14. A prompt will tell you that Windows may automatically create additional partitions. This is also acceptable. Click "OK."

15. You will now see two (2) partitions that Windows has automatically created for you. One is labeled "System Reserved," so we must leave that one alone. It's only using about 500 MB, anyway. Click on the partition that is *not* reserved – most likely "Drive 0 Partition 2," and then click "Next."

It may take 5 minutes or so before you are prompted to complete the next step.

16. When prompted with the "Customize settings" window, create an Administrator password, and confirm it. Then click "Finish."
    Note: The password has to meet some default standards. Don't be surprised if an easy password is refused by the installer. Come up with something semi-complicated.
17. You should now be faced with a Windows lock screen that probably doesn't look much different from any Windows PC you've previously used. However, you have to use Control-Alt-Delete to unlock the OS, and you can't use that key combination in VirtualBox. For VirtualBox on Mac, you can go to the Input menu at the top toolbar, click Keyboard, and then click "Insert Ctrl-Alt-Del."
    This step may look slightly different on VirtualBox for Windows, but the same functionality should be available.
18. Enter the password you created in step 16, and press the "Enter" key.

Welcome to your Windows Server installation!

Task 2: Update the Operating System

When installing a new operating system, one of the first administrative tasks we should perform is downloading and installing system updates. This is a best practice for both Windows and Linux systems. The ISO image that you download for any OS is likely to be somewhat outdated. Critical security patches and other feature updates are usually distributed incrementally over the Internet. It's important that we shore up our fresh OS with these updates before we configure anything else.

19. Dismiss the window about Windows Admin Center. We won't use that right now.

    Review Question:
    19. What is the name of the administrative application that is open by default on your first login?

20. Click "Configure this local server."
21. A lot of information about your "hardware" (mainly your VirtualBox application, with some of the features of your host machine being passed through) will appear in the Properties section. In the second column, find "Windows Update," and click the link to the right of it which says "Install updates automatically using Windows Update."

The window that appears is for Windows Update settings, and you'll notice that it isn't terribly different from the same settings that exist on a regular Windows PC. You can change how you

want updates to be applied. The default setting was stated in the link we clicked – updates will be installed automatically as they are found. This is fine for our VM, but in a production environment, we'd want to click that link and then change the settings to only install updates manually, after you've been able to test them in a development environment.

22. Although the window that appears will tell us that no updates are available, this is simply because our VM is too new for it to have checked yet. Click the "Check for Updates" button to force a check. Then wait for any updates that are found to be downloaded and installed.

The download and install may take up to one hour, and doesn't require much input from you. Feel free to take a break, and come back to your VM in one hour.

23. The updates will require a reboot of the system. Click "Restart Now."

Observe how you can also schedule a restart – this is useful when administering a production system that serves a business purpose, as you wouldn't want to interrupt that work to perform a restart. You could schedule the restart for a very low peak usage time, such as 2:00 AM. We're going to just go ahead and do it now, since no one uses our VM but ourselves.

It will take about 5 minutes for the reboot and finalization of updates to complete. Once done, repeat the steps to inject a Ctrl-Alt-Del into the system to unlock it and enter your administrator password. The system update is now complete!

Task 3: Install the DNS Server Role

The various functions a Windows server can perform are bulked together into "roles." You can install roles from the Server Manager at just about any time, and all required services to perform that role will be installed. Typically, you'd have different servers performing different roles, and you could also use Server Manager to manage the roles on other servers, not just the local one you're using. For this VM and our subsequent Labs, though, we're going to configure a single Windows server with numerous roles.

Although we won't tinker with the DNS Server itself, this is a fairly simple role to provision on a Windows server, so we'll install that one as part of our Lab.

24. In Server Manager, near the top right of the window, click "Tools."

    Review Question:
    24. Do you see "DNS" in the list of Tools? Why or why not?

25. Close the Tools menu. Next to Quick Start option 2, click "Add roles and features."

26. You will be prompted with a page that explains how roles work, and things you should already have done before installing them, such as setting a static IP (so that the server that performs a role is always found at the same IP address). Read through all of this, but we're going to ultimately ignore this advice by clicking "Next."
27. Verify that the radio button next to "Role-based or feature-based installation" is selected and click "Next."

    You will be shown the "Server Pool." Remember earlier how we learned that Server Manager can be used to administer numerous Windows servers on a particular domain or network. You'd group those servers into "pools," and from this screen, select which one to make changes to.

28. Since we're only making changes to our local server itself, you can select the default option – your "Standard Evaluation" installation – and then click "Next."
29. The next page lists out the numerous roles you can install on this server. Locate "DNS Server" in the list, check the box to the left of it, and then click "Next."
30. A pop-up window will appear, talking about features that are needed for the DNS Server. Windows has automatically detected that, to provision itself as a DNS Server, it needs to gather some dependencies – much like how "yum" did during some of our Linux Labs. In this case, it needs the Role Administration Tool called DNS Server Tools. We do need this, so make sure that the box is checked for "Include management tools (if applicable)" and then click "Add Features."

    The next screen will show you a list of features – which are additional Windows Server capabilities that are not as broad as roles. Hey, wait… didn't we just add a feature?

    Review Question:

    30. In the features list, scroll down to "Remote Server Administration Tools," and click the little arrow to the left of the checkbox to expand this section. Click a similar arrow next to "Role Administration Tools" to expand that section as well. You may need to scroll down a little bit to see all of those Tools. One of them should have a checkmark next to it already. Which one is it? Why is it already checked?

31. Leave this item checked. Click "Next" to continue past the features screen.
32. A summary of what the DNS Server role does will appear. You can read through this if you'd like to learn more about DNS servers, but it's not entirely pertinent to our Lab. Click "Next" to continue.
33. The final confirmation screen will recap what we are installing. Both the DNS Server role and the Tools feature that it requires are on this list. Above the list of installations, notice a checkbox for "Restart the destination server automatically if required." You can check this, since it's only our own personal server, but in the real world, you would want to coordinate a reboot with other members of your team and organization. Remember, Server Manager can control other servers… you don't want to cause unexpected reboots to other machines while the users are in the middle of their work!

34. Click the “Install” button at the bottom right of the window.
35. Wait a few seconds, and then, in the same place, you can click the “Close” button. Server Manager doesn’t require that you keep this window open while you wait for installation to complete. You can “Close” the window, and then monitor its progress by clicking on the blue flag icon  at the top right of Server Manager.
36. Once the notifications under the blue flag tell you that the installation has succeeded, click “Tools” again, at the top right of Server Manager.

Review Question:

36. Now do you see “DNS” in the list of Tools? Why or why not?

Removing Roles and Features is pretty much the same level of simplicity. You’d go back through the same wizard and uncheck the role/feature, and then wait for the uninstallation process to complete. You don’t have to do that for your DNS Server role; this is just for learning purposes, so that you know it’s just as easy to remove a role as it is to add one.

That’s essentially all there is to basic Windows server administration. It, of course, can get way more complicated than this, but you’ve at least become somewhat familiar with the Server Manager UI and have a functional understanding of Roles and Features. In future Labs, we’ll dig into some of the more advanced services that Windows Servers can offer – ones you’ve most likely experienced at an internship, or can expect to see in your future careers.

The grading rubric for this Lab is 1 point for each of the five (5) Review Questions in this document.

Please upload your answers to the Review Questions, preferably in a separate document, to Canvas.