Home Lab Active Directory Setup using VirtualBox | Adding Users w/PowerShell

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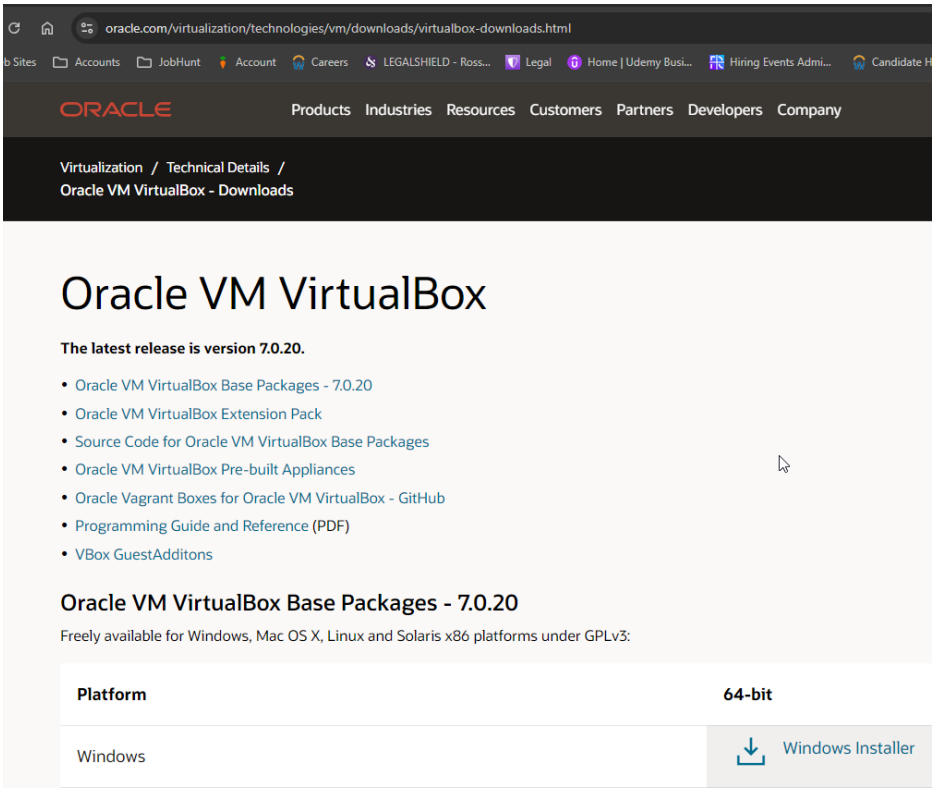
Introduction

In this project, we will deploy two virtual machines: a Windows Server 2019 instance and a Windows 10 client. The process includes creating a new domain, configuring Active Directory Domain Services (AD DS), Remote Access Service (RAS) with Network Address Translation (NAT), and Dynamic Host Configuration Protocol (DHCP) from the ground up. Upon completion, the configuration will be tested using the Windows 10 client.

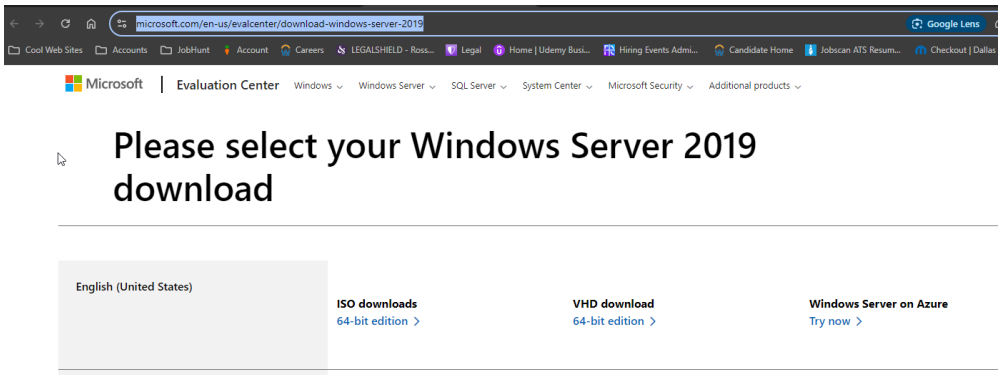
Download and Setup

1. First, we will download all the files we need.
2. Download Oracle VirtualBox from their website: https://www.oracle.com/virtualization/technologies/vm/downloads/virtualbox-downloads.html
    a. Ensure you download the correct version for your PC.

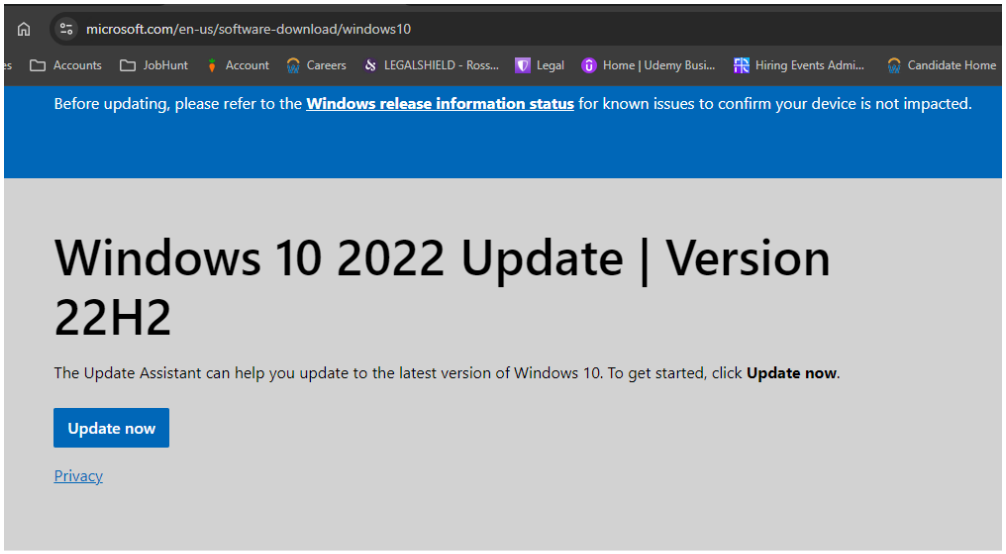


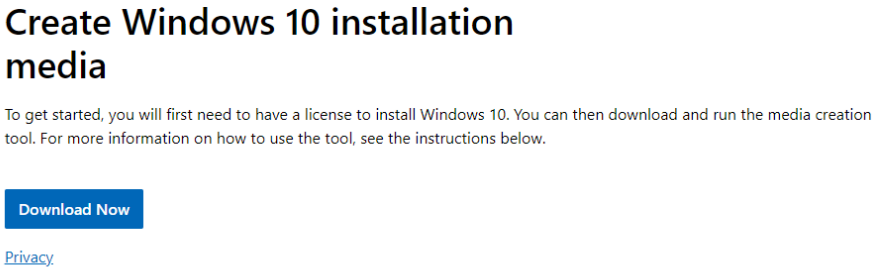
    b. Follow standard steps for installation.
3. Download the Windows Server 2019 ISO from: https://www.microsoft.com/en-us/evalcenter/download-windows-server-2019

a. Ensure you select the appropriate language.

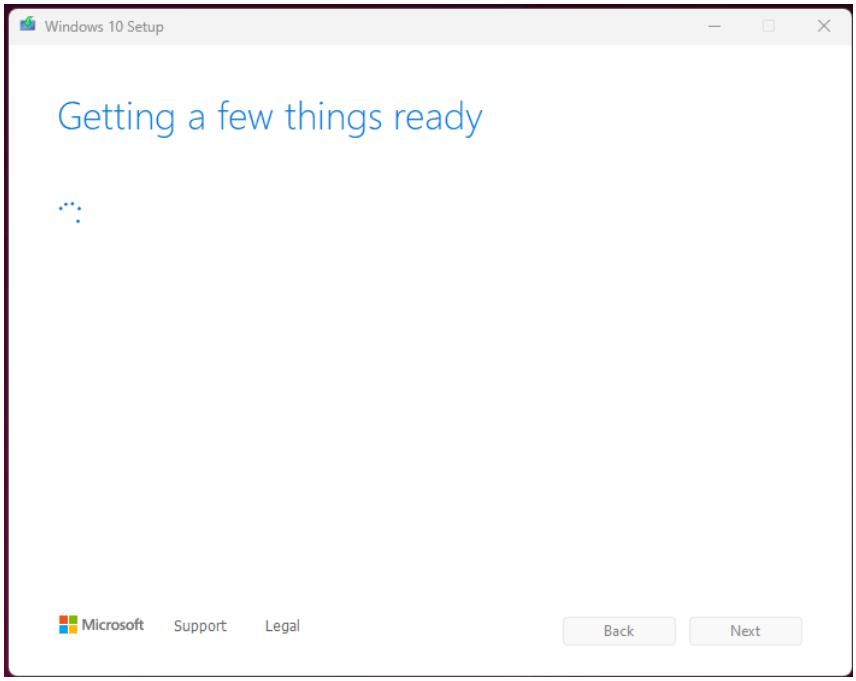


4. Download Windows 10 media creation from: https://www.microsoft.com/en-us/software-download/windows10.
    a. Windows 10 ISO will have to be created using the “Create Windows 10 installation media” software.

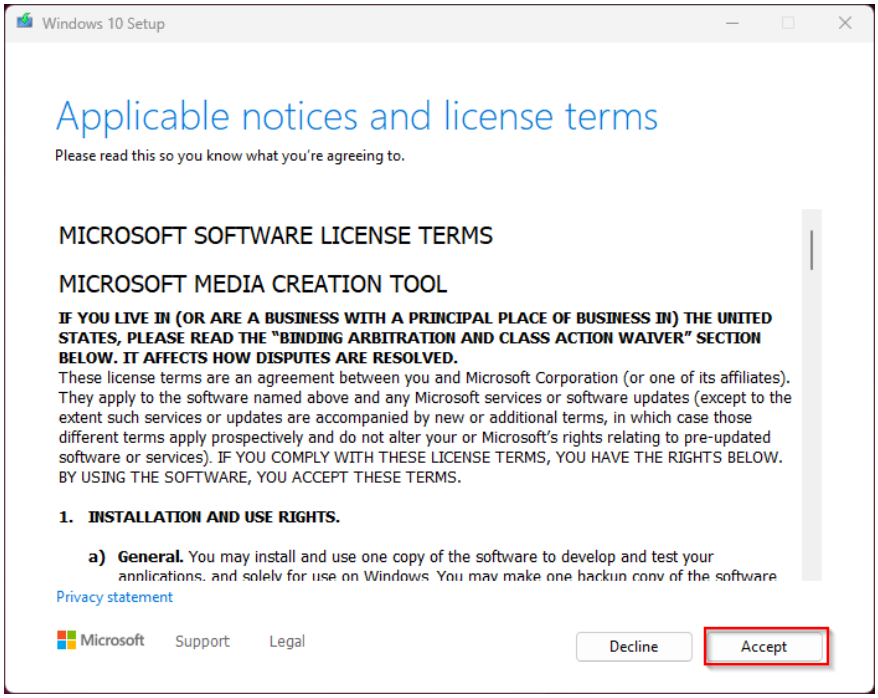




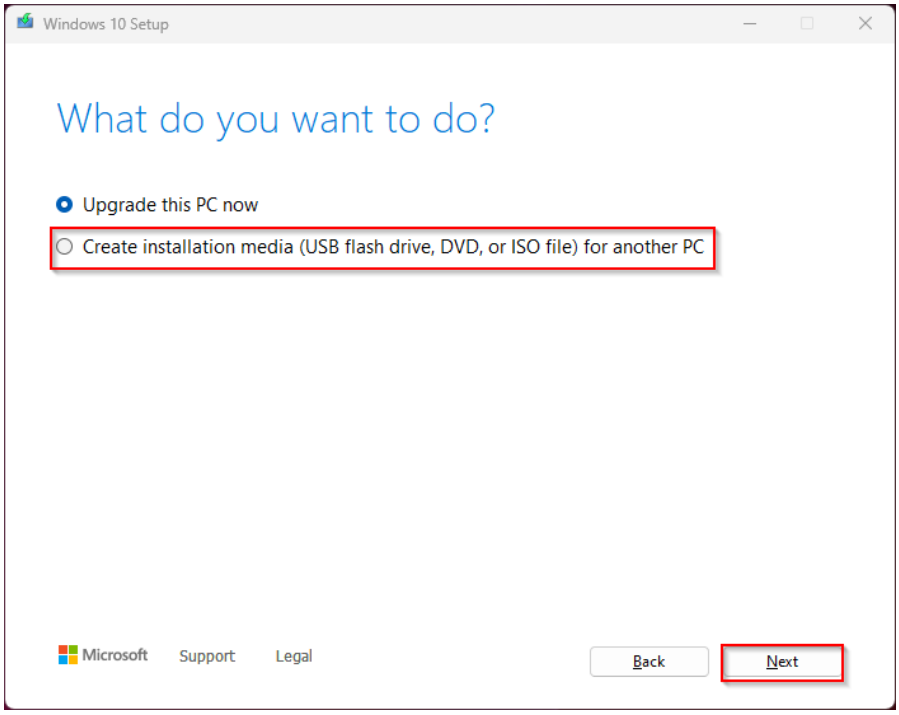
b. When your tool is first opened, it will take a moment to pull up applicable notices and license terms.



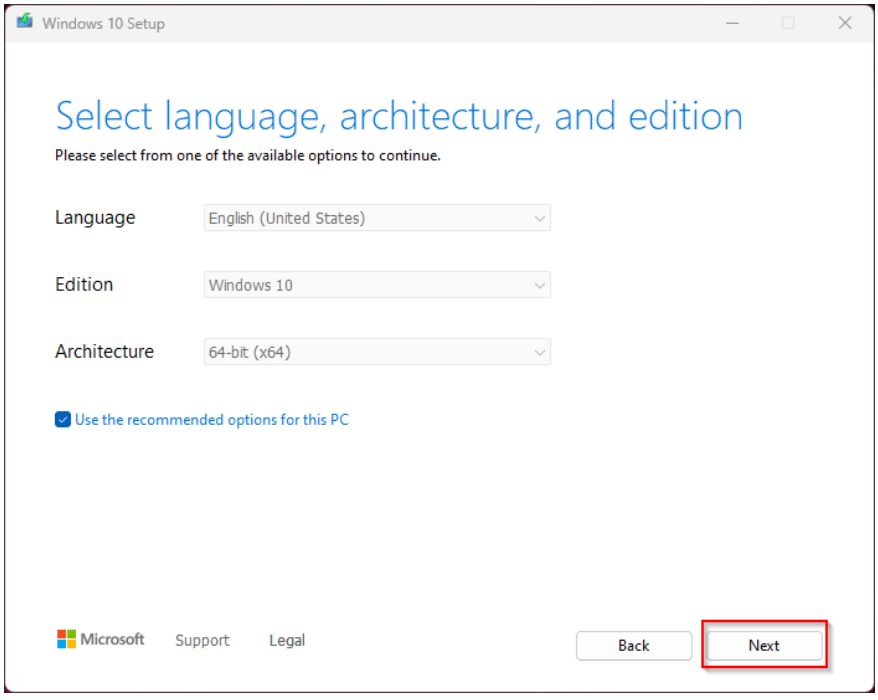
c. Once it populates, click Accept; bringing up the options will take a moment.



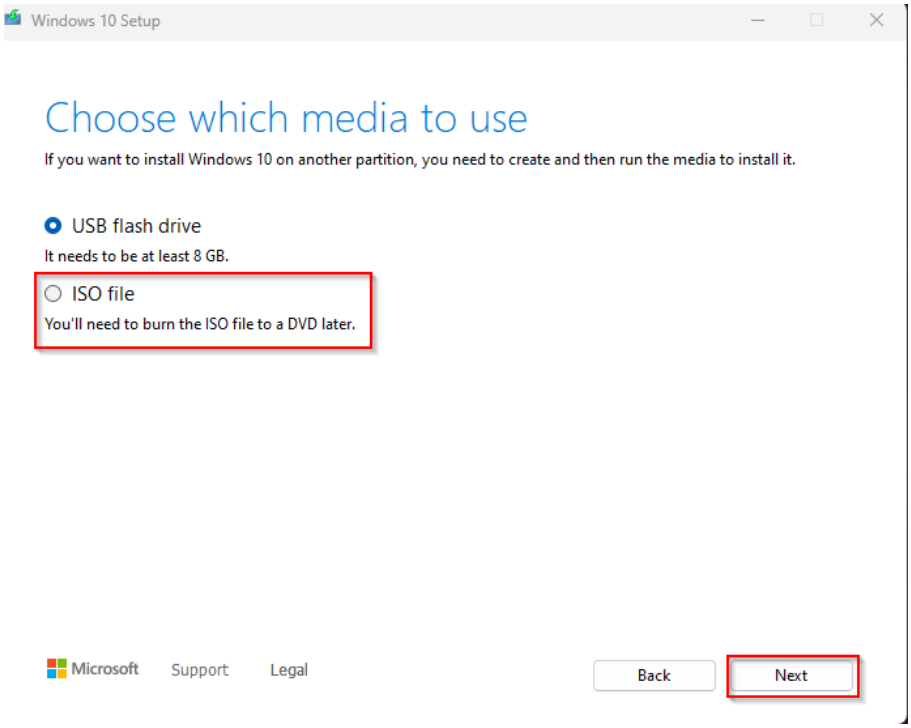
d. Click the tick button to Create an installation on media for another PC. This will allow you to create an ISO file.



e. On the next screen, leave defaults and select next.

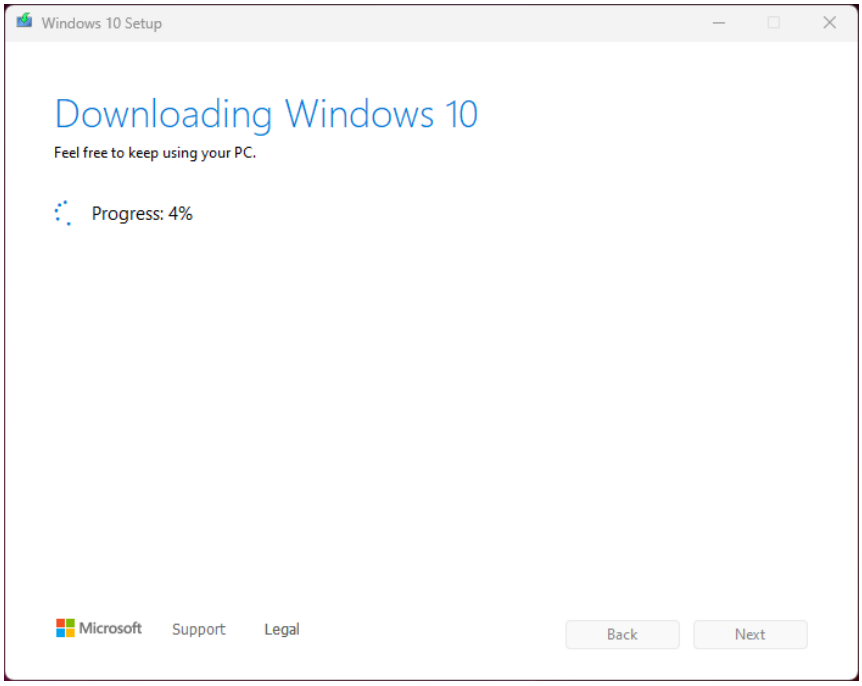


f. On the Choose which media to use section, tick the ISO file option and select next.

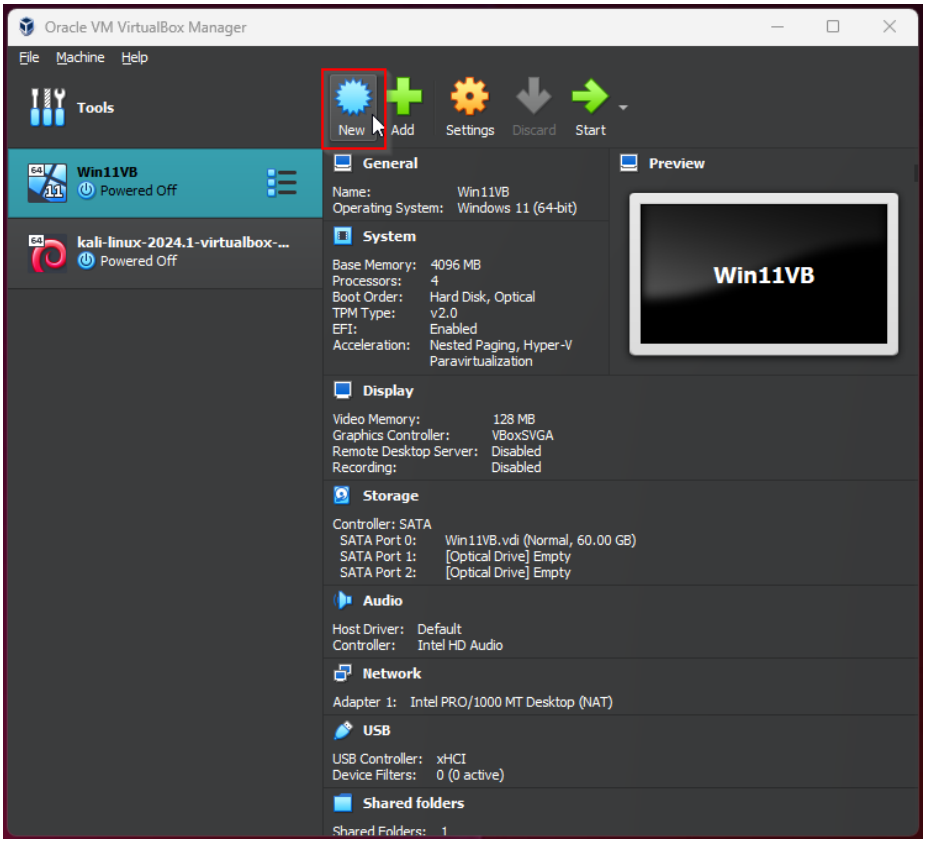


g. You will be prompted to choose a location to create the ISO. This can be on your desktop or any other place. Just remember where you are placing the file.

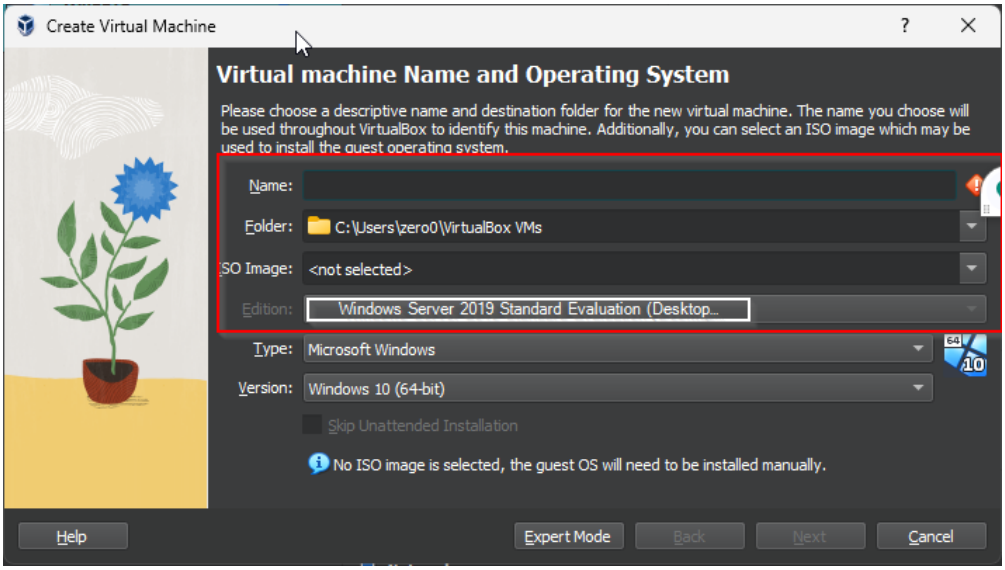
h. The creation process will start, and once that is done, you will have a Windows 10 ISO file.



5. Once you have both ISO files and have installed VirtualBox, we are ready to start.
6. Open VirtualBox and select New.

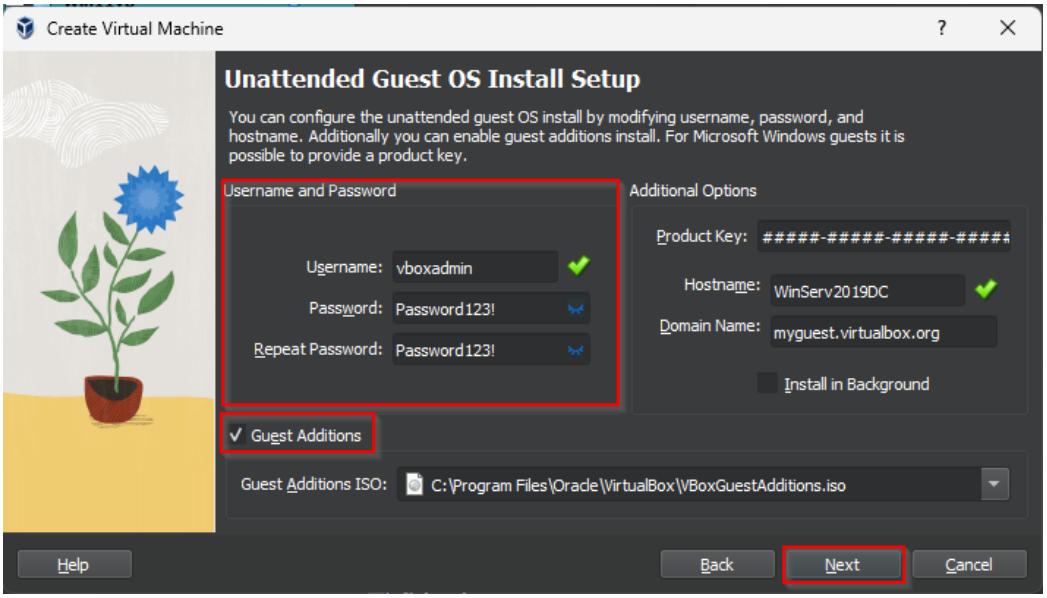


7. Give the VM a Name and select the folder to store the files. The default is ok. Select the Windows Server 2019 file you downloaded for the ISO Image and ensure the edition is set to Windows Server 2019 Standard Evaluation (Desktop Experience).

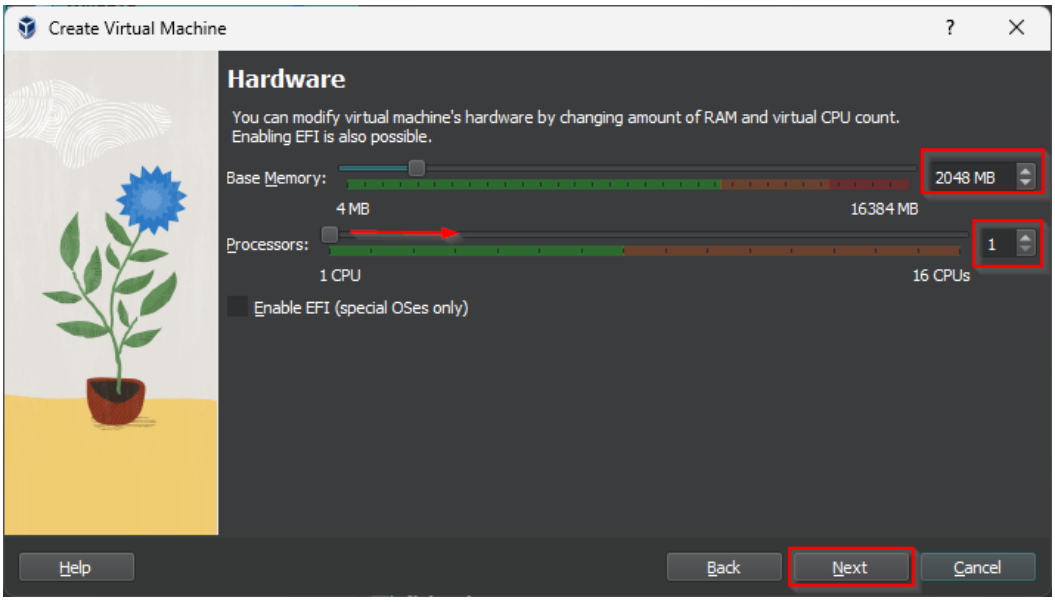


8. Once you hit the next button, you will be taken to the Unattended Guest OS Install Setup, where you can enter a preconfigured username and password along with

additional options. This will help speed up installation. I recommend creating an administrator account and password and checking the Guest Addition. Below is an example, but you can change your username and password to whatever you like.

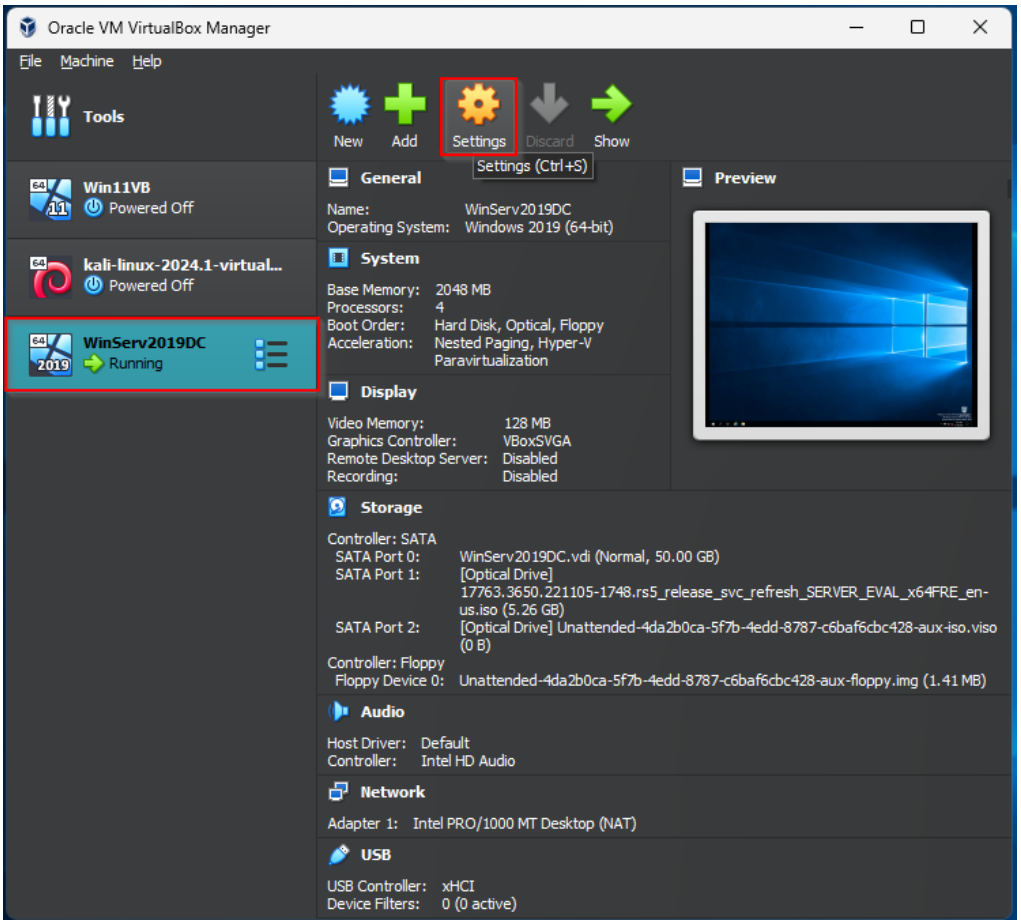


9. Next, you will be asked for hardware (RAM and Processors) amounts to be allocated to the virtual machine. I recommend at least 2GB of RAM and 4 processor cores if possible.



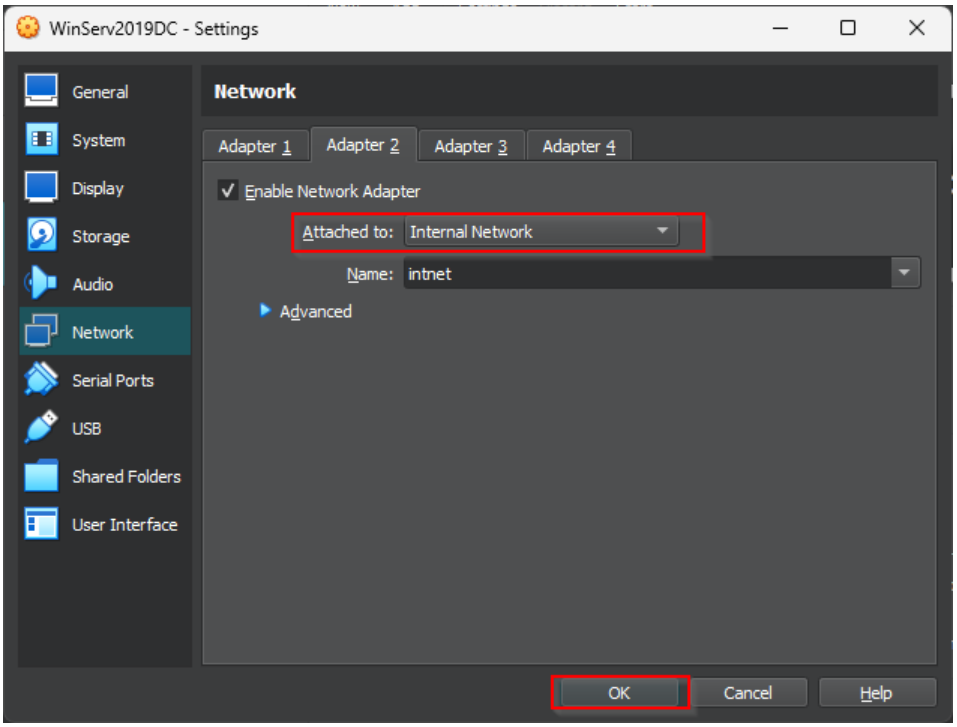
   a. Once you hit next, the VM might automatically boot. If this happens, shut it down, as we still need to configure our network adapter for our lab.

10. In VirtualBox Manager, click on Windows Server 2019 and select Settings.

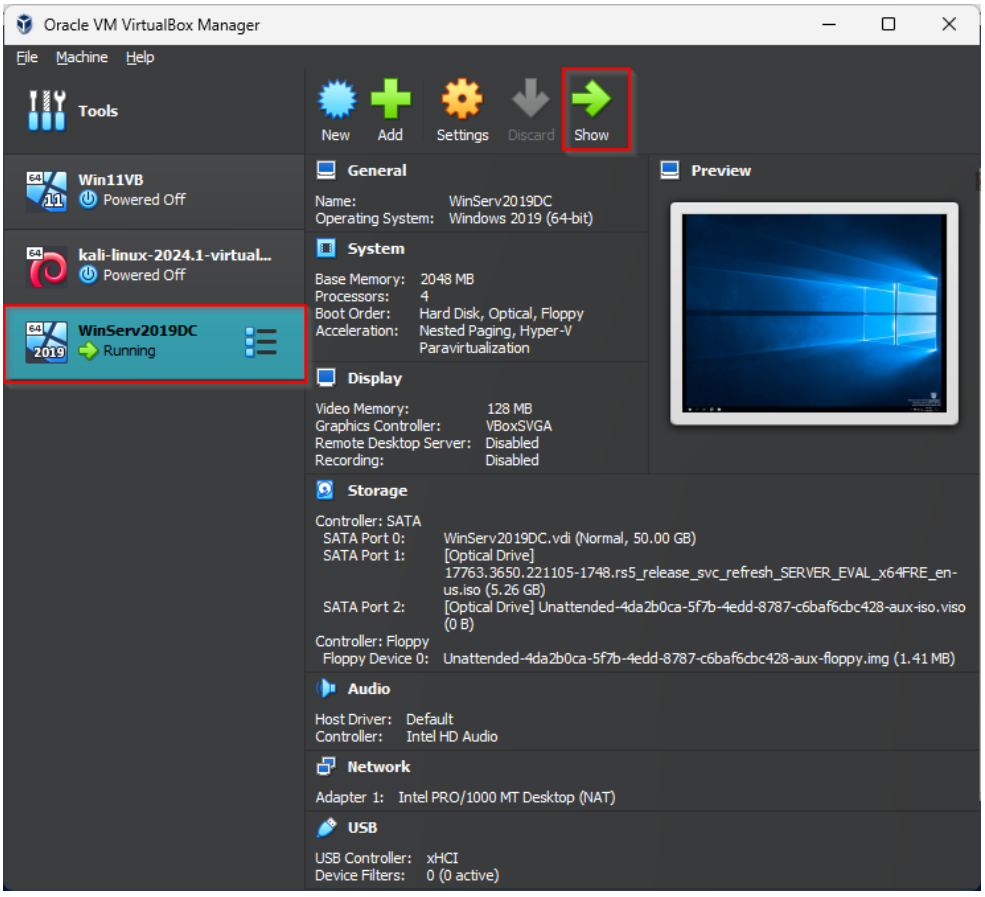


11. In the Network tab, leave the first adapter as is. This will be how the server connects to your home network. Select the second adapter and change the Attachment to the

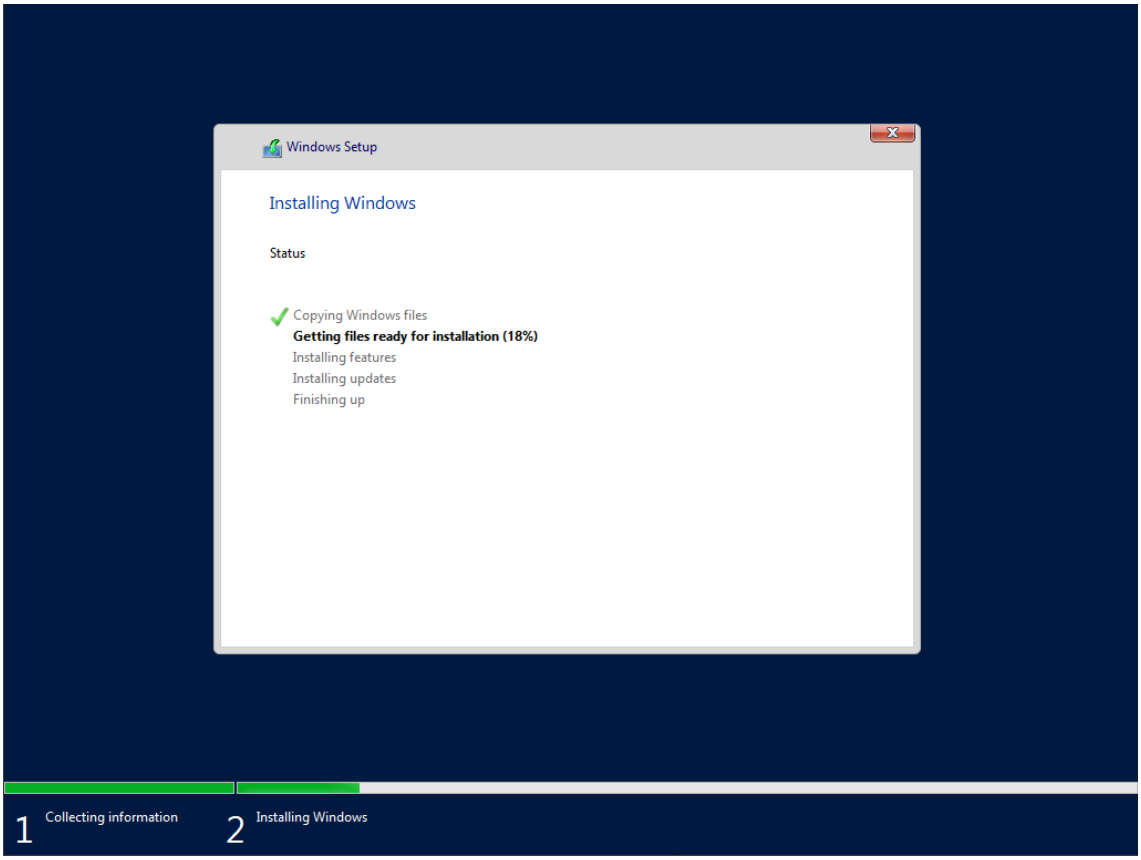
internal network. We will use this network to connect to the Windows 10 client.



12. Start the VM by double-clicking on the VM name or the green start arrow.



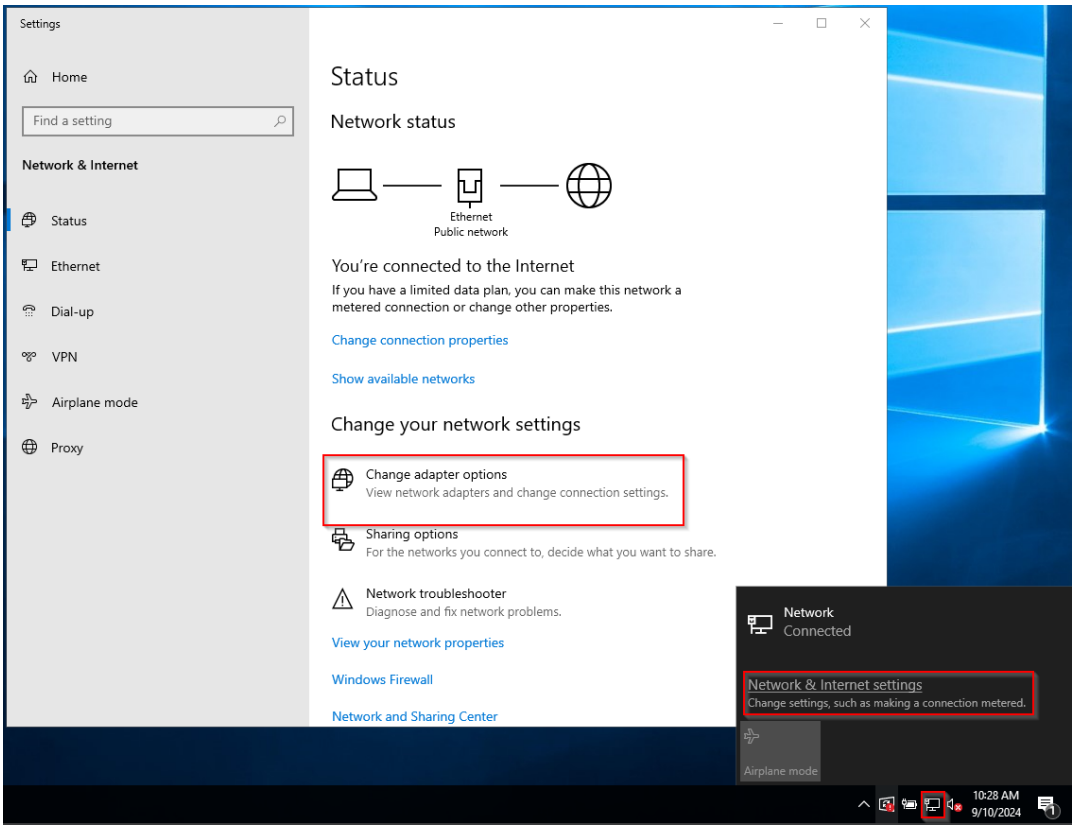
13. The installation process will take a few minutes, but once it is complete, you should be on the desktop screen of your Windows Server 2019.



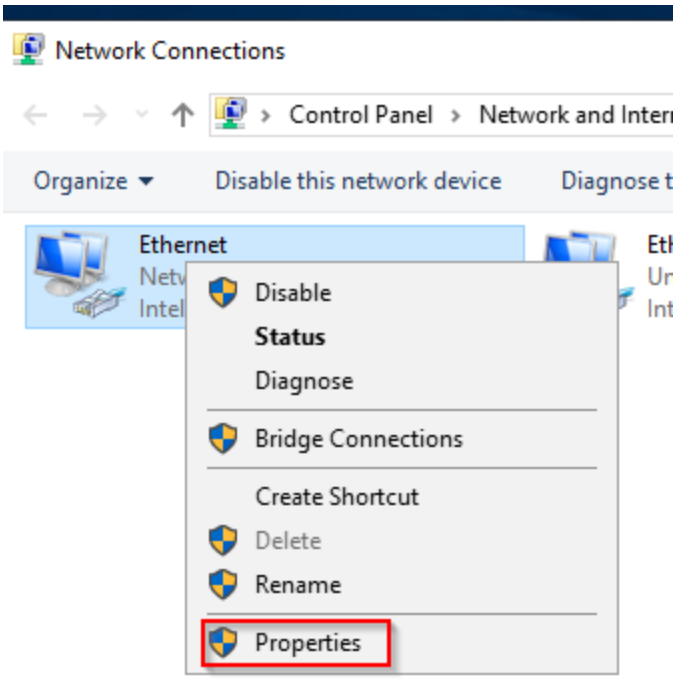
14. Repeat the install process for Windows 10 ISO ensuring to .

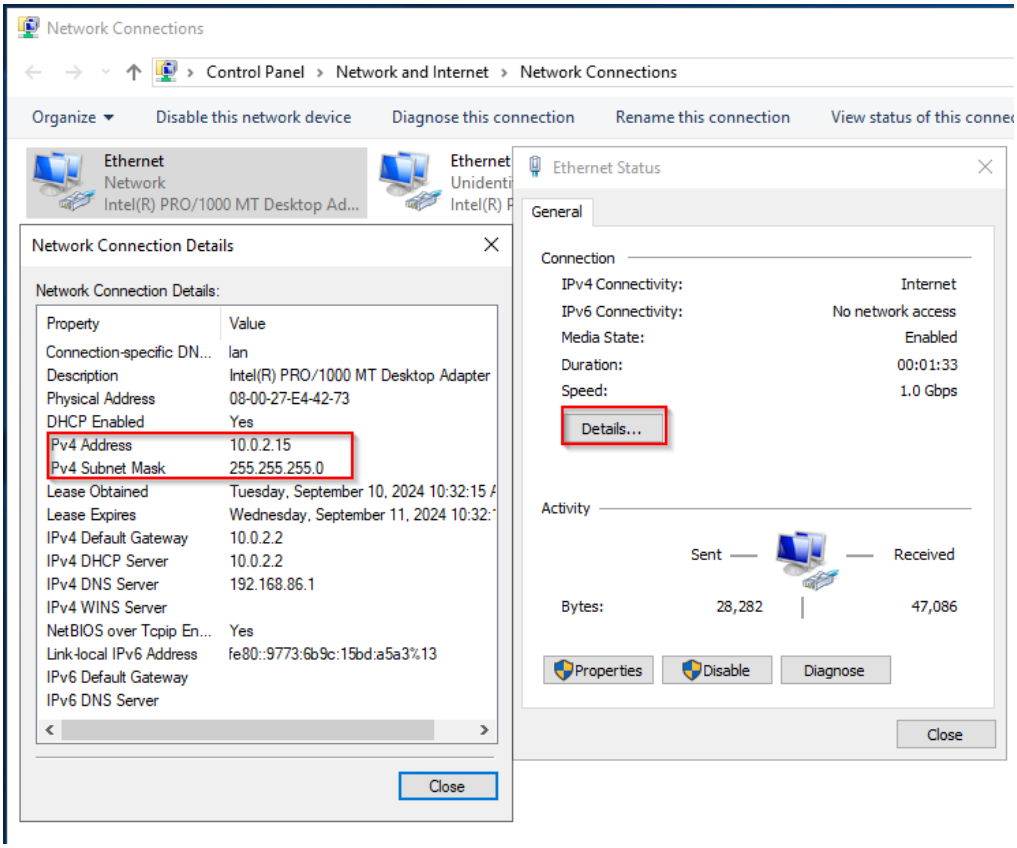
Windows Server 2019 Network Configuration

1. On the Windows Server, click the network icon at the bottom right of the window, select Network & Internet settings, and then select Change adapter options.

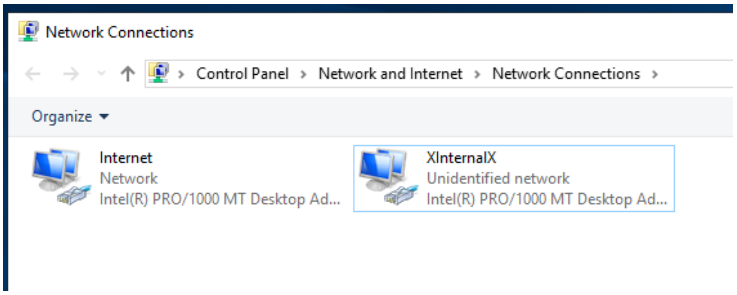


2. For verification, you can right-click on the network adapter, select properties, and then select details to see the IP address of the network connection. If it starts with your local IP, as shown in the image below, then you know that it is an external NIC.

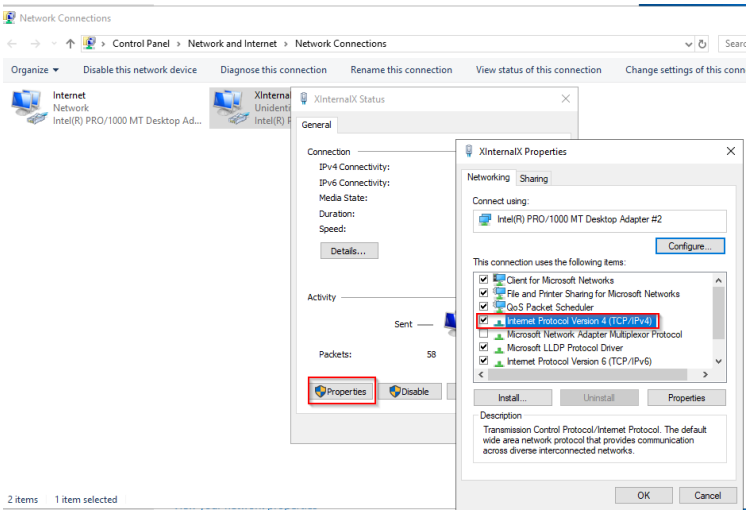

Network Connections
Control Panel
Network and Inter
Organize
Disable this network device
Diagnose t
Ethernet
Netv
Intel
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties


Network Connections
Control Panel
Network and Internet
Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connec
Ethernet
Network
Intel(R) PRO/1000 MT Desktop Ad...
Ethernet
Unidenti
Intel(R) P
Network Connection Details
Network Connection Details:
Property
Value
Connection-specific DN...
lan
Description
Intel(R) PRO/1000 MT Desktop Adapter
Physical Address
08-00-27-E4-42-73
DHCP Enabled
Yes
Pv4 Address
10.0.2.15
Pv4 Subnet Mask
255.255.255.0
Lease Obtained
Tuesday, September 10, 2024 10:32:15 A
Lease Expires
Wednesday, September 11, 2024 10:32:
IPv4 Default Gateway
10.0.2.2
IPv4 DHCP Server
10.0.2.2
IPv4 DNS Server
192.168.86.1
IPv4 WINS Server
NetBIOS over Tcpip En...
Yes
Link-local IPv6 Address
fe80::9773:6b9c:15bd:a5a3%13
IPv6 Default Gateway
IPv6 DNS Server
Close
Ethernet Status
General
Connection
IPv4 Connectivity:
Internet
IPv6 Connectivity:
No network access
Media State:
Enabled
Duration:
00:01:33
Speed:
1.0 Gbps
Details...
Activity
Sent
Received
Bytes:
28,282
47,086
Properties
Disable
Diagnose
Close

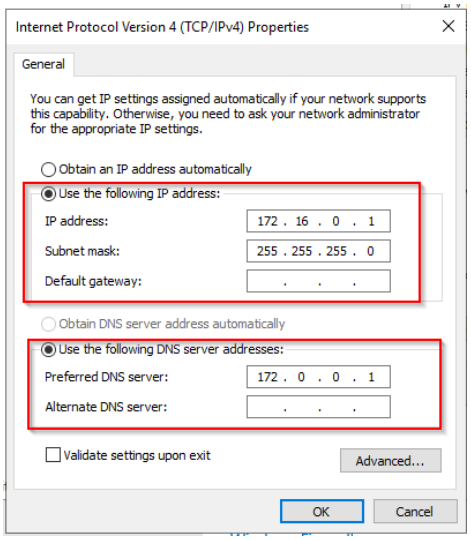
3. Now that you have identified each network adapter, make sure to name them so that you can distinguish between them.



4. Now, we will change the IP address of the internal network adapter to match the diagram above. Again, right-click on the internal network adapter and select properties. Then double-click on IPv4.

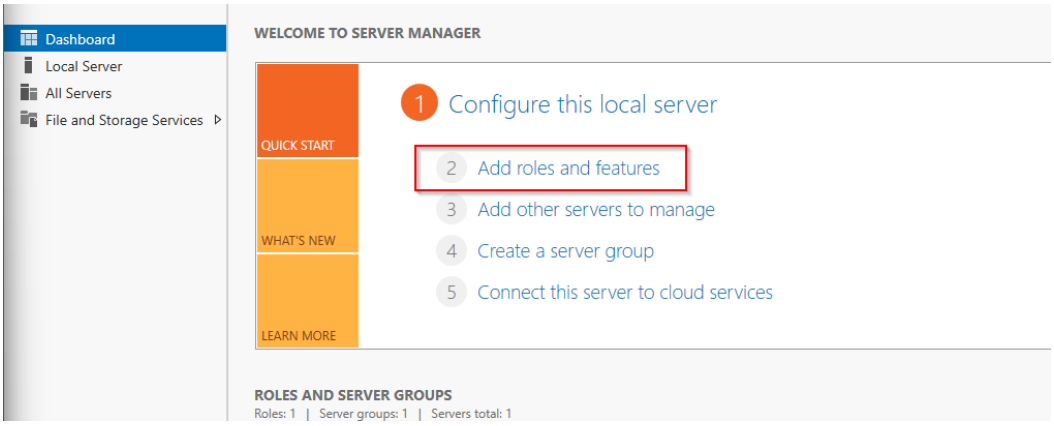


5. Enter the IP address, Subnet mask, and DNS entry below. Don't worry about the default gateway; that will be itself, so no IP is needed. The loopback address will be used as the preferred DNS. This could also be left blank.

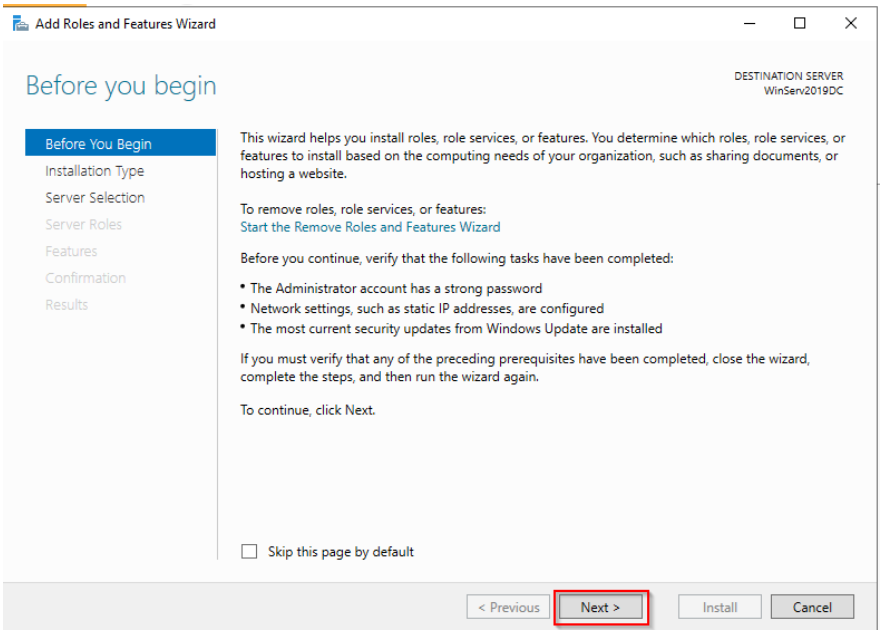


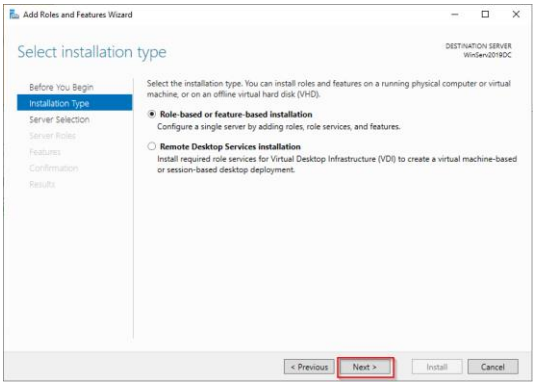
Active Directory Install

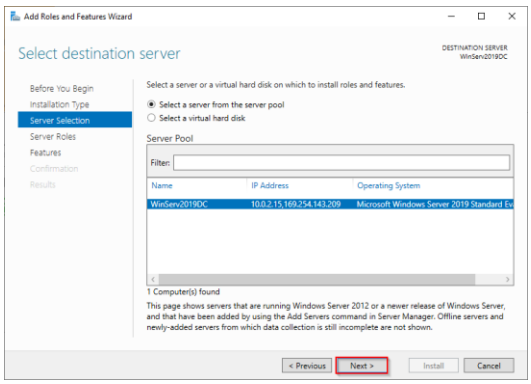
1. Now, we are going to install Active Directory Domain Services. From the Welcome to Server Manager, select Add Roles and Features.



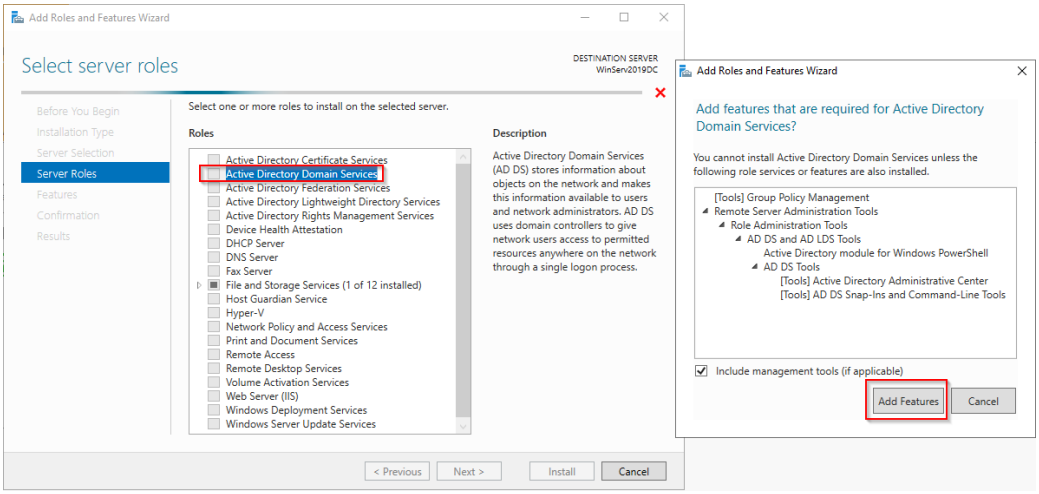
2. Click the Next button three times to get past the screens below. You may leave all the settings with the default selection.



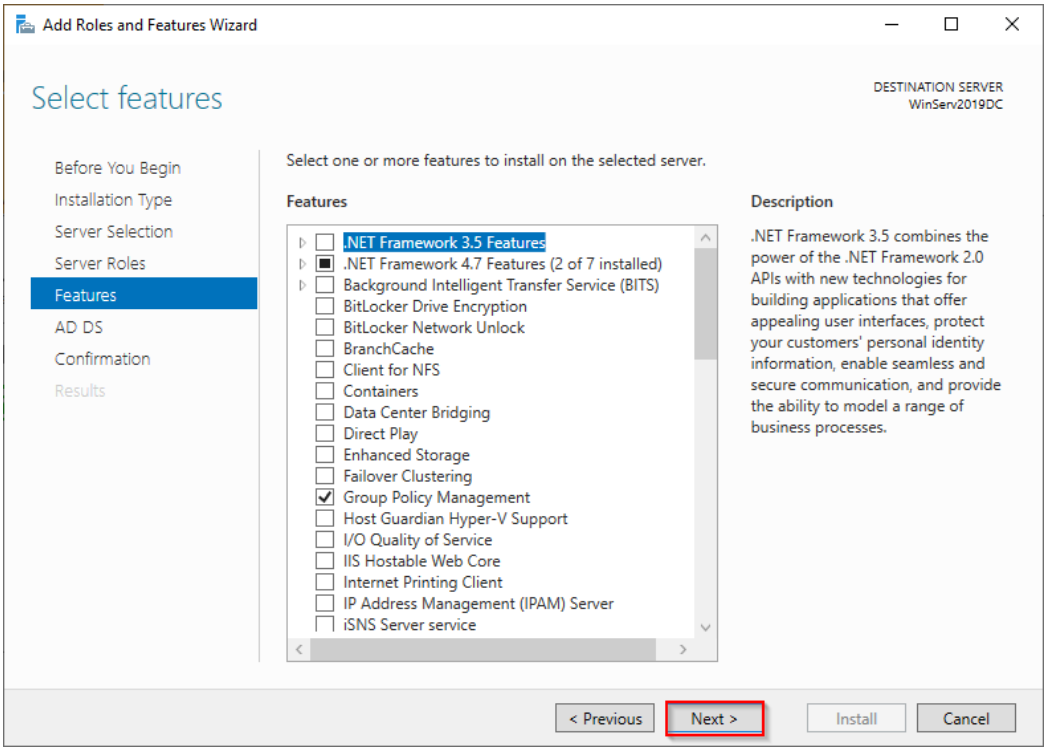




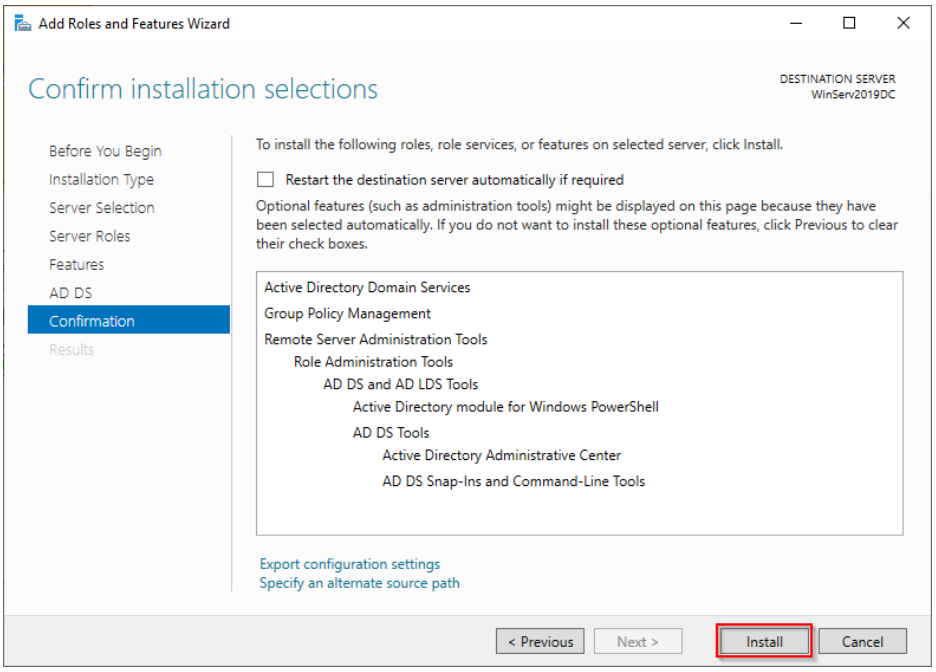
3. In the Server Roles section, select the Active Directory check box and select Add Features. Note you must be logged in as Admin for this to complete.



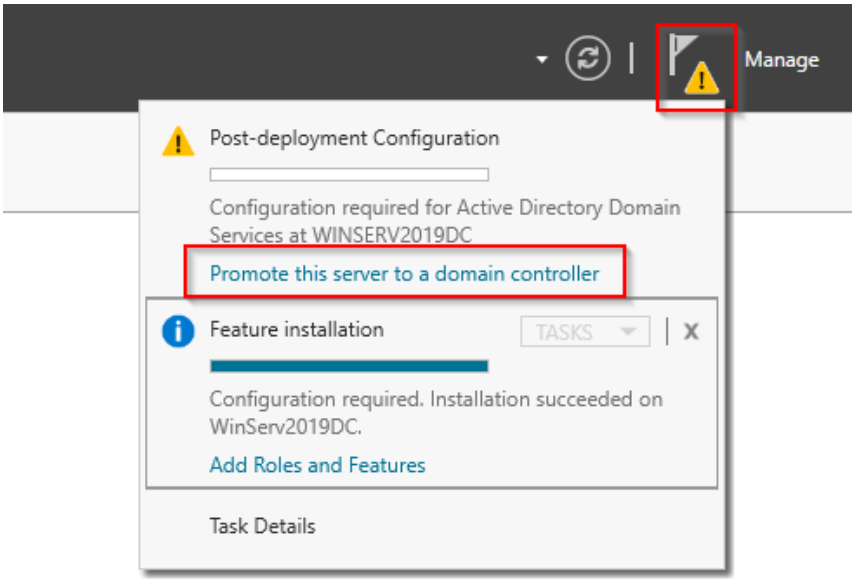
4. Click Next on Features, leaving everything as default.



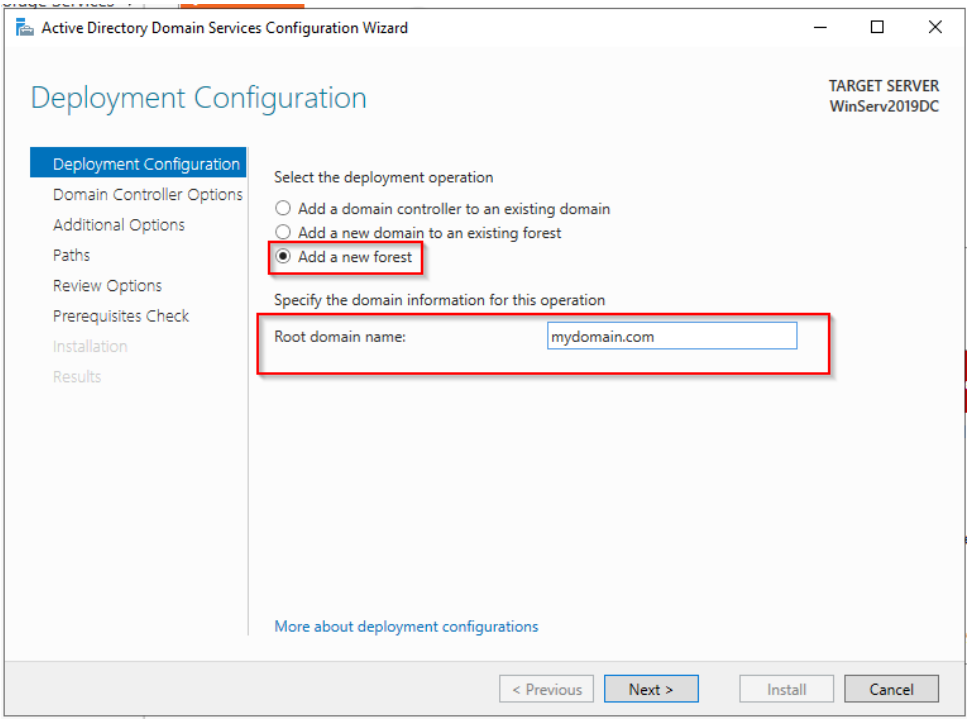
5. Finally, click Install.



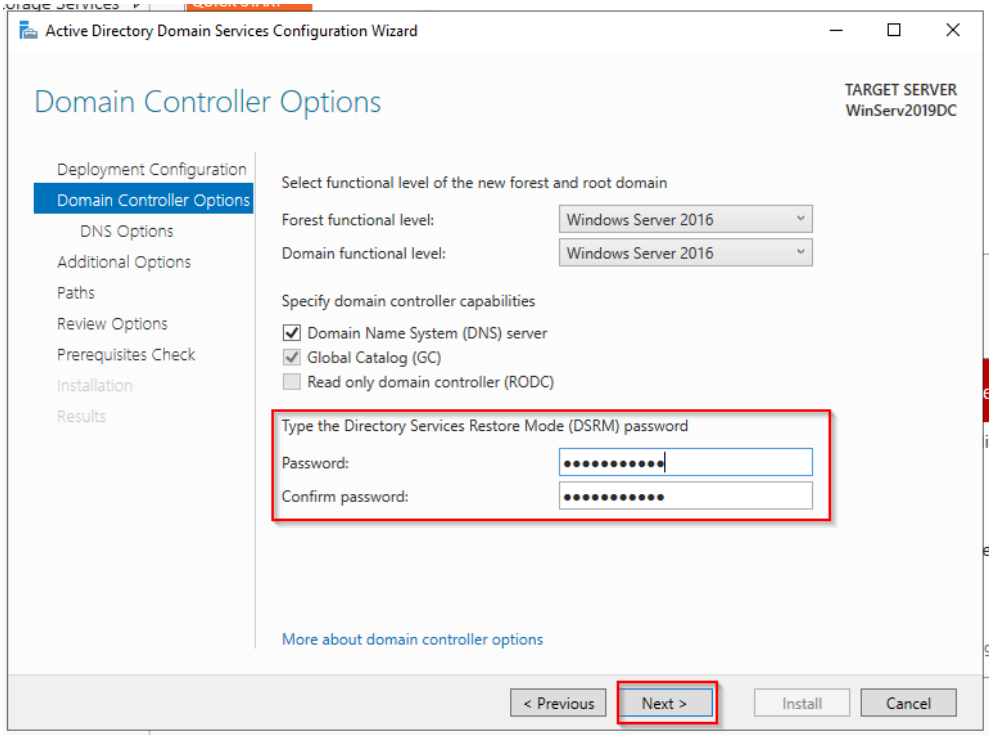
6. Once this is done and you are returned to the Welcome to Server Manager window, you will notice a yellow exclamation point by the flag in the upper right corner. Click on it and select Promote this server to a domain controller.



7. Select Add a new forest and give it a domain name. For this example, I will use mydoamin.com.

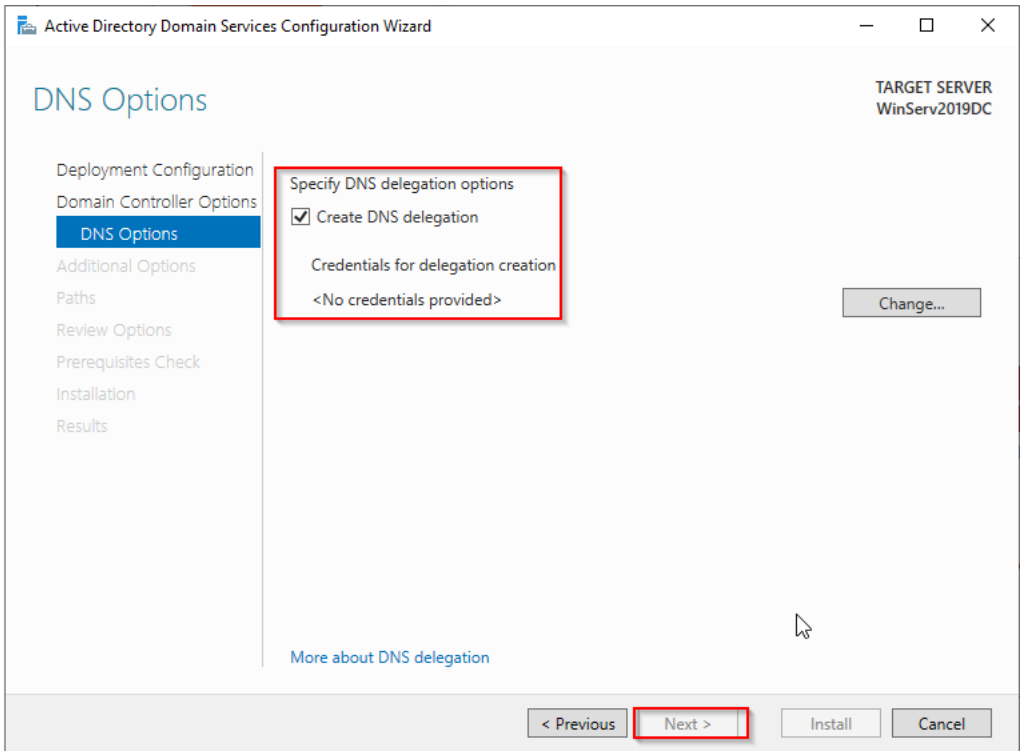


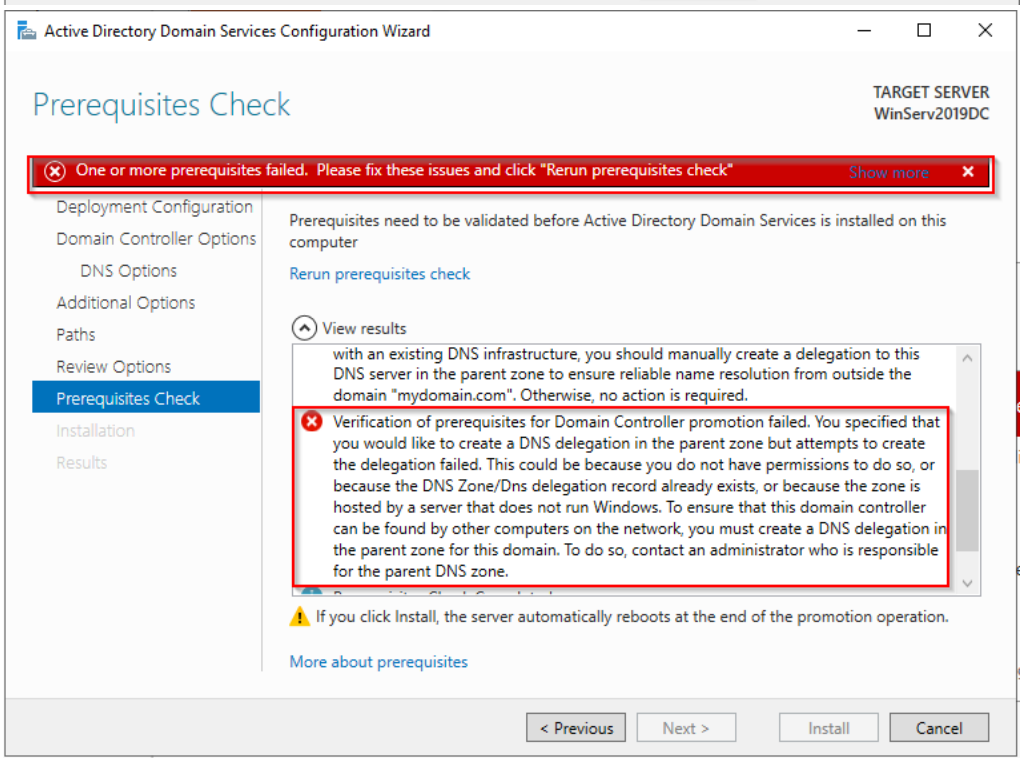
8. Next, you will need to create a restore password even though we won't use it.



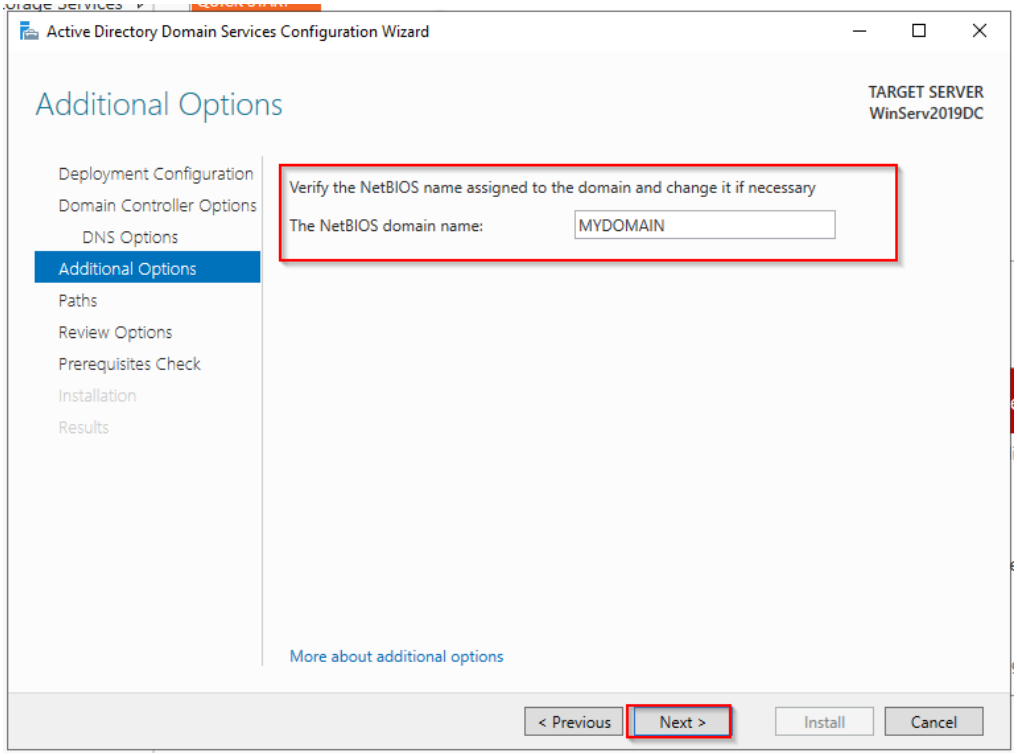
9. Ensure Create DNS delegation is unselected and select next. Also, if you are not logged in as an administrator, you will not be able to process it without creating an account. Do not do this, or you will receive an error. Instead, ensure you are logged

in with the administrator account before doing this.

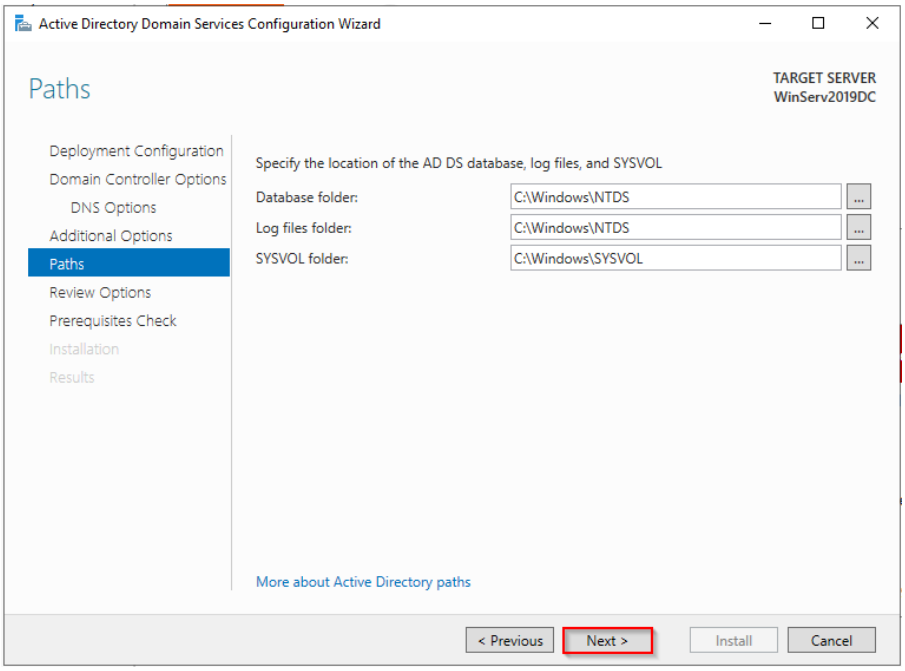




10. Next, it will verify the domain name. Just click Next.

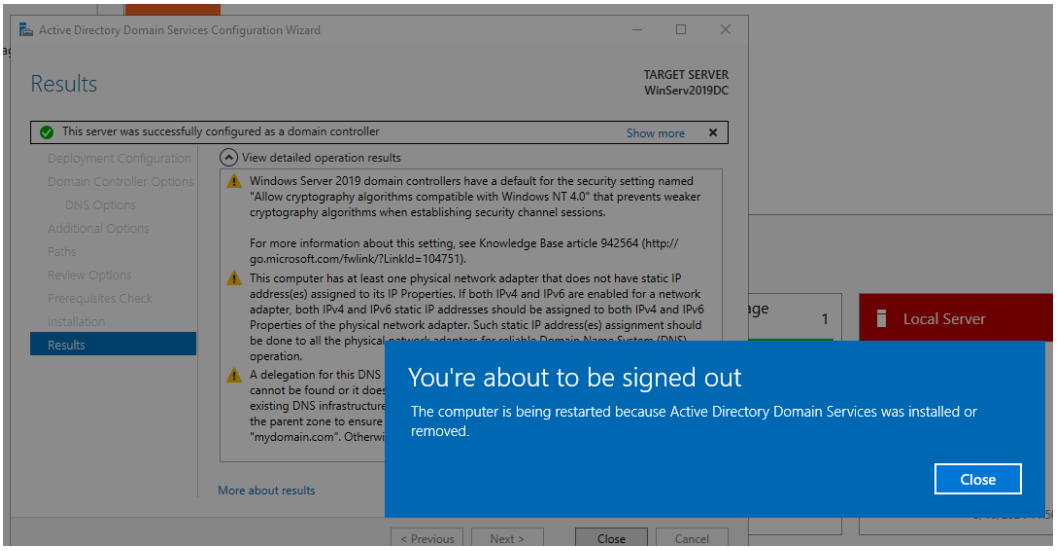


11. This will show you where database files will be stored. The defaults for this home lab setup are fine. Make a note and click Next.



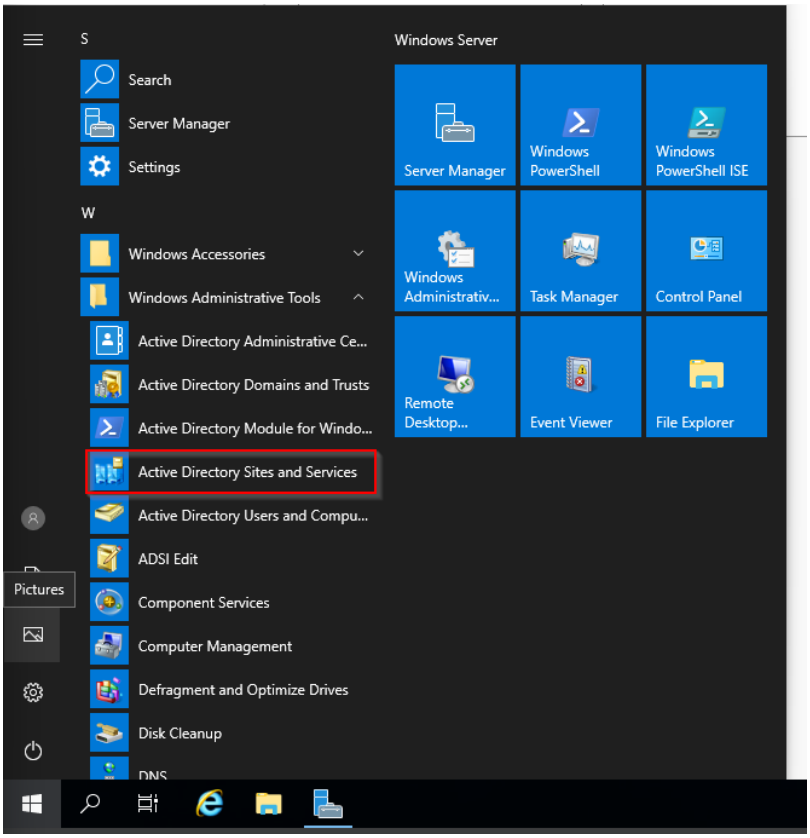
12. Next, you will review your choices, click Next again, and be taken to the Prerequisite Check. Once this is done, click Install. Once the installation is done, you will need to

restart for changes to take effect.

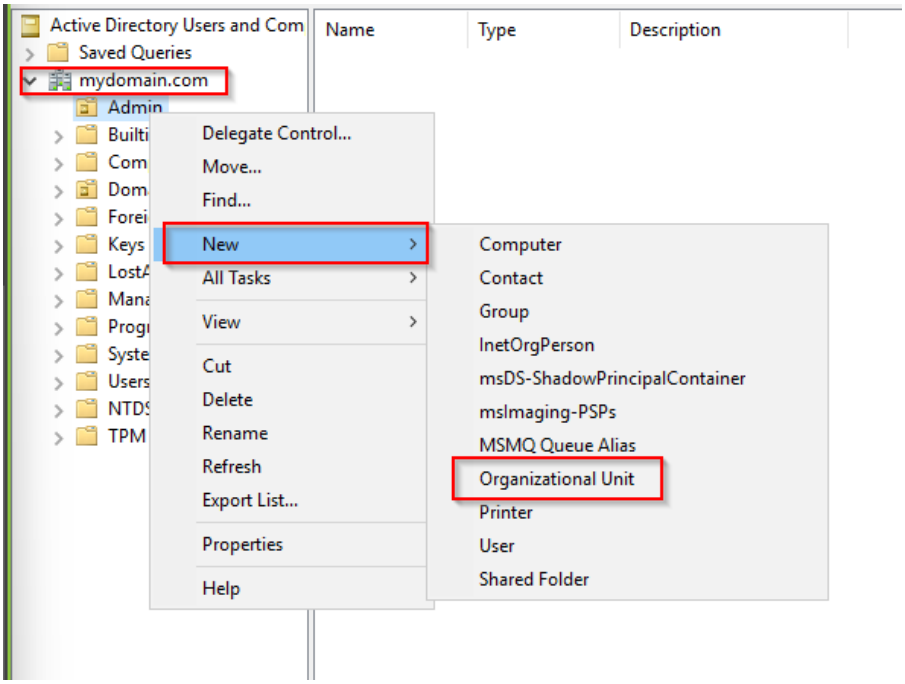


Creating Administrator Account

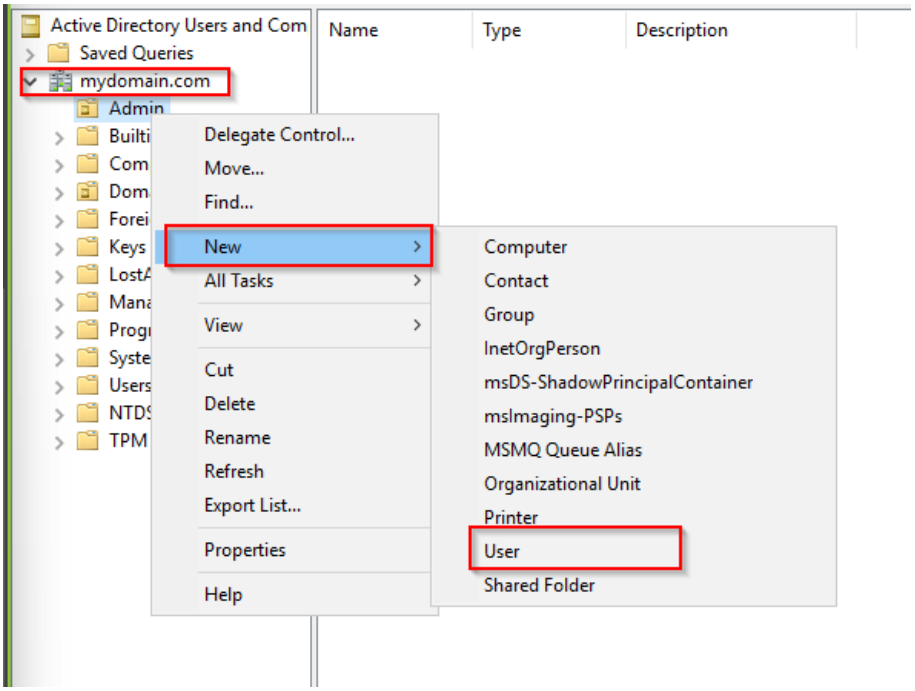
1. Now, we will create our admin user account. Click on Start and open the Windows admin tools. Select Active Directory Sites and Services.



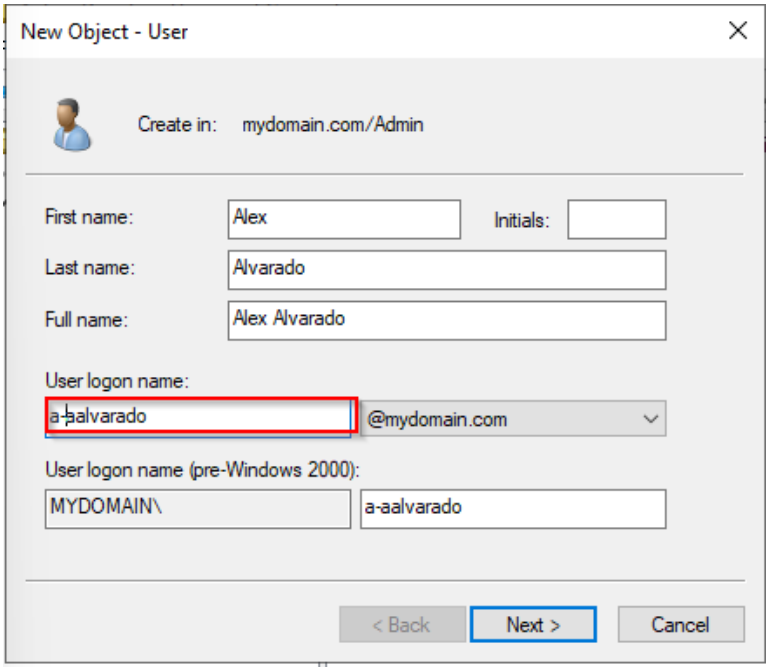
2. Right-click on your domain and select New and Organizational unit. I named my OU Admin, but you can name it any way you like if you know this group is for admins.

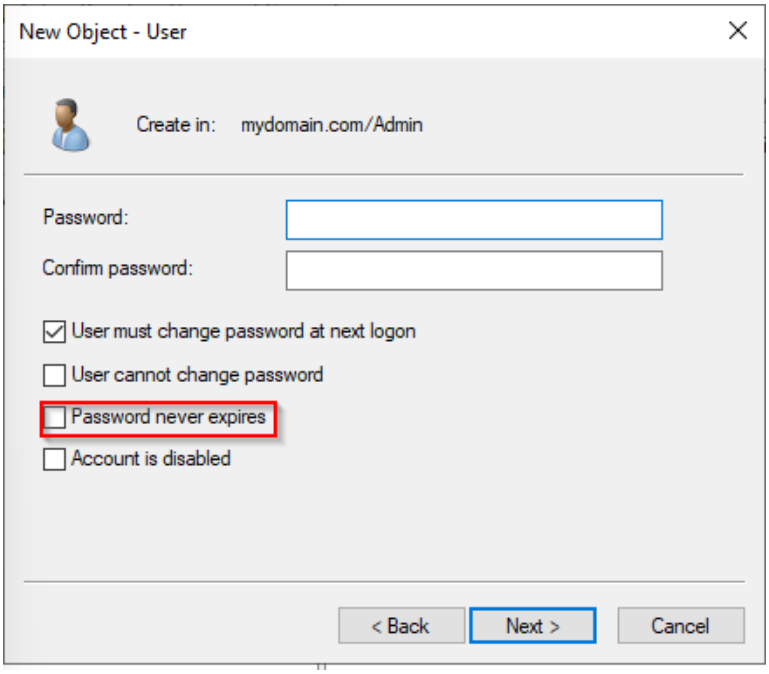


3. Next, Right-click on the Admin OU and select New and User.

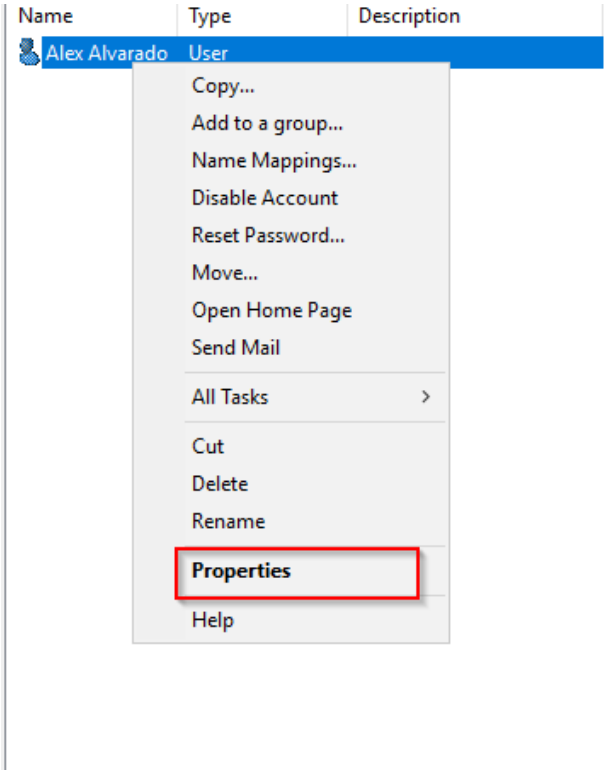


4. Fill in the required information. In this case, I used my name and added a to signify that his will be an admin account. When creating a password, make sure to deselect, The User must change the password at the next logon and select Password never expires.

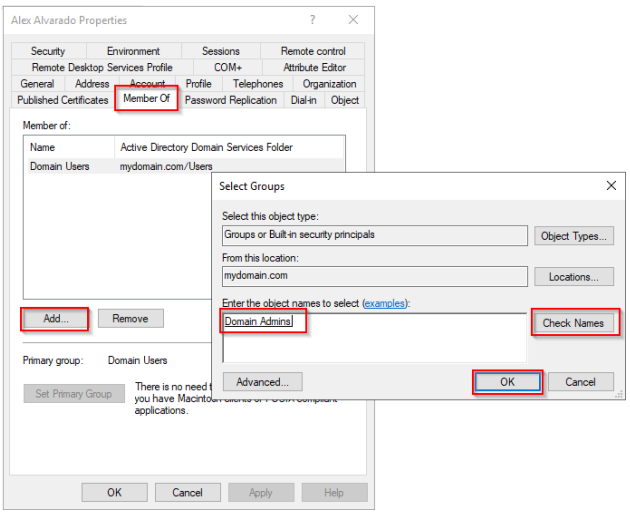

New Object - User
Create in: mydomain.com/Admin
First name:
Alex
Initials:
Last name:
Alvarado
Full name:
Alex Alvarado
User logon name:
a-aalvarado
@mydomain.com
User logon name (pre-Windows 2000):
MYDOMAIN\
a-aalvarado
< Back
Next >
Cancel

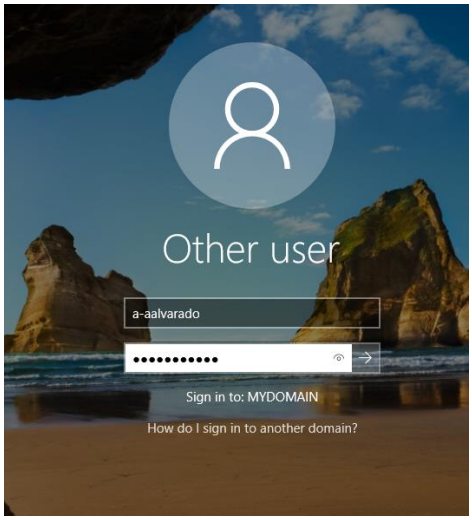

New Object - User
Create in: mydomain.com/Admin
Password:
Confirm password:
User must change password at next logon
User cannot change password
Password never expires
Account is disabled
< Back
Next >
Cancel

5. Now that the account is created, we must give it admin privileges. Right-click on the username and select properties.



6. Go to the Member Of tab and select Add. In the object names box, enter Domain Admins and click Check Names; it should now be underlined. Click the OK button, and the user will have admin rights. We can log out of the Local Administrator account and log in with our new user account.

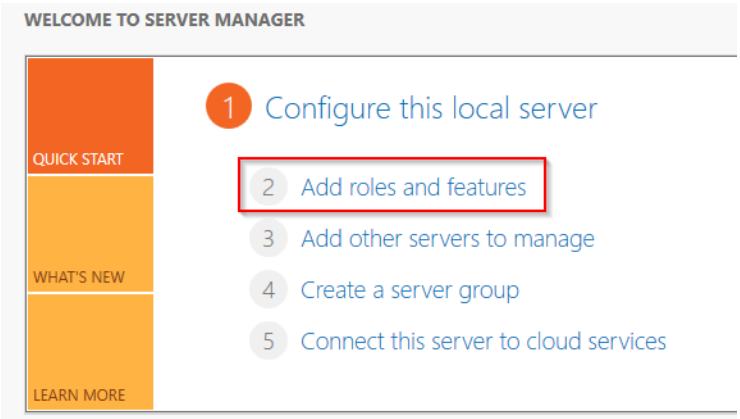




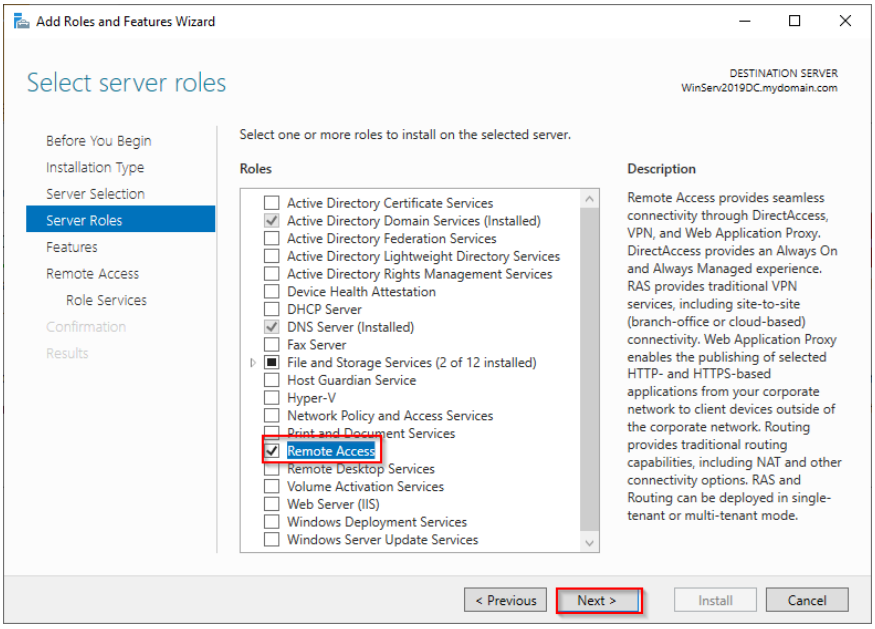
RAS/NAT Install

This will allow our Windows 10 client to reach the internet via our Domain Controller.

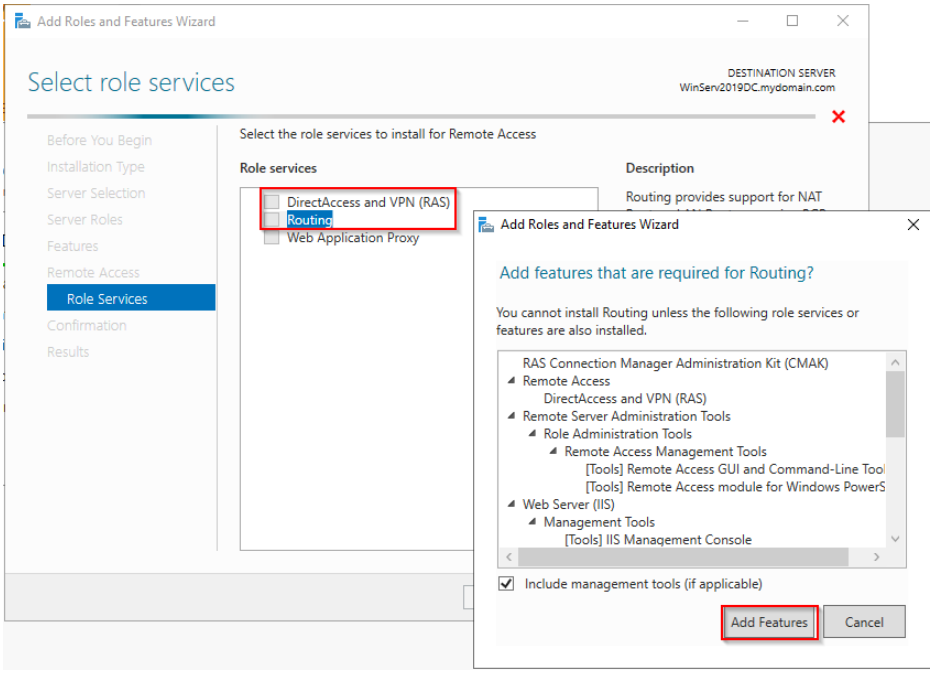
1. From the Server Manager screen, select Add Roles and Features. This process will be very similar to when we configured Active Directory.



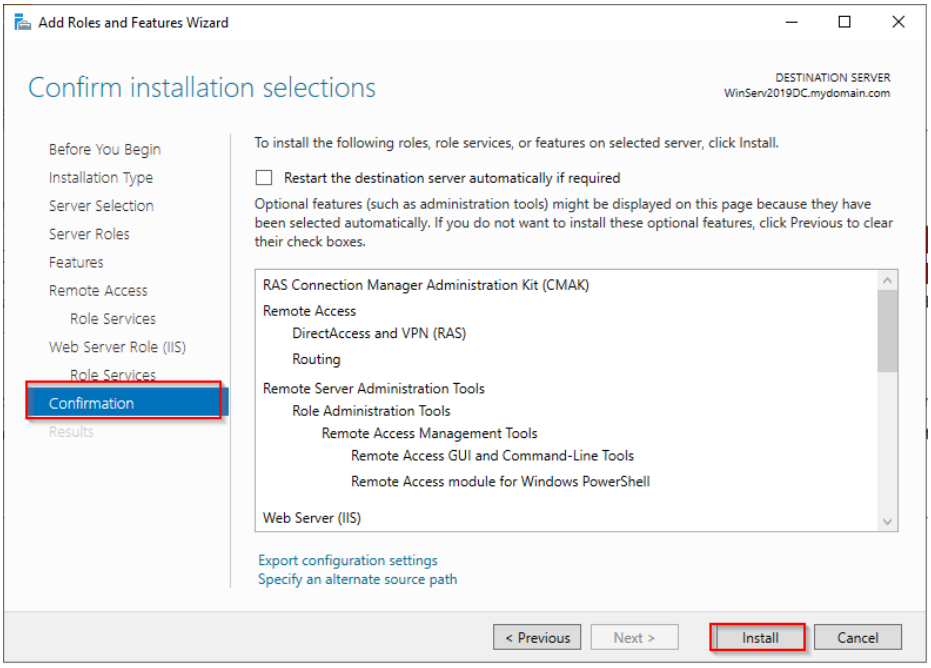
2. Click next until you get to the Server Roles section. Select Remote Access.



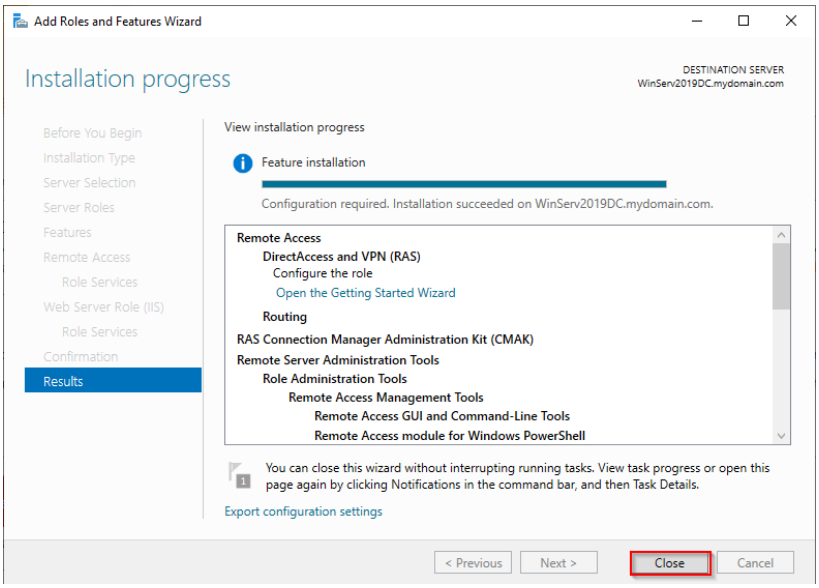
3. Again, click next until you get to Role Services. Check the Routing option and select Add Features. This will automatically enable DirectAccess and VPN (RAS).



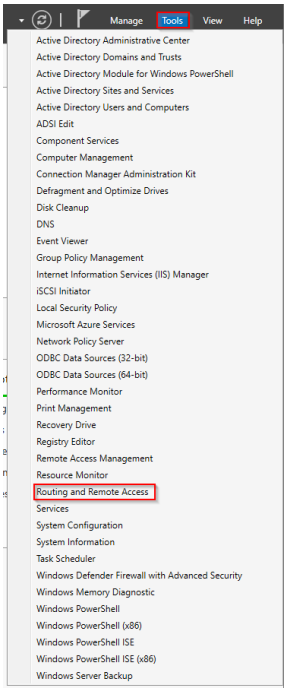
4. Click next until you get to Confirmation, and then select Install.



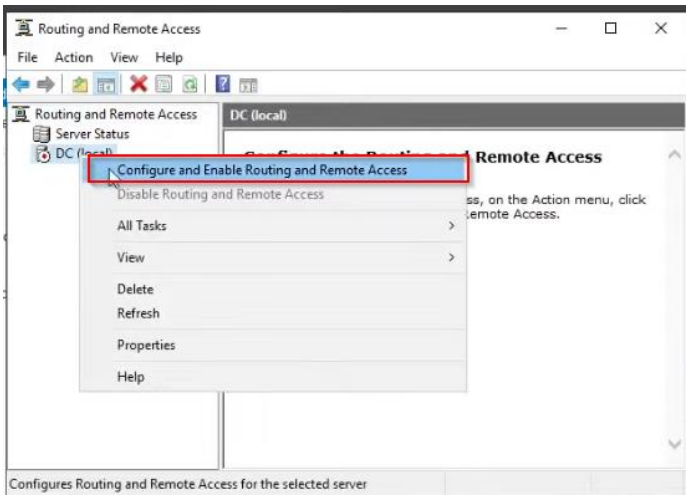
5. Once the installation is done, select Close.



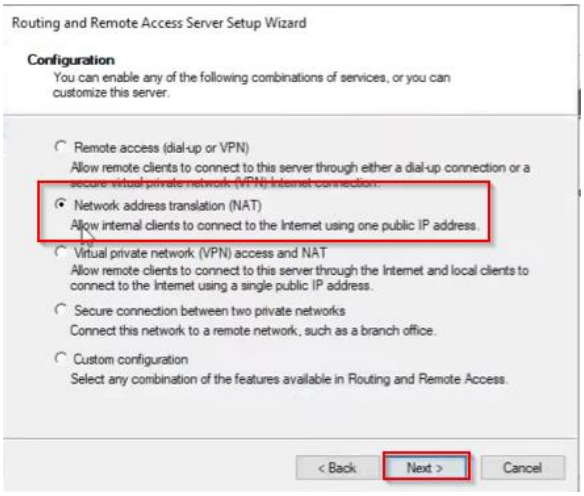
6. At the top right of the welcome to server manager screen, select Tools, Routing, and Remote Access.



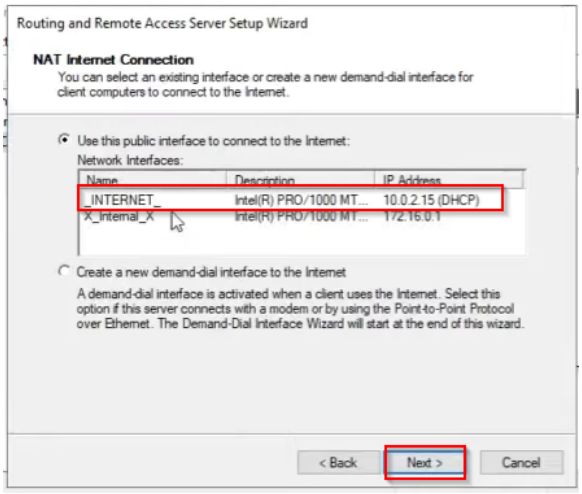
7. Right-click on DC, select Configure, and enable Routing and Remote Access.



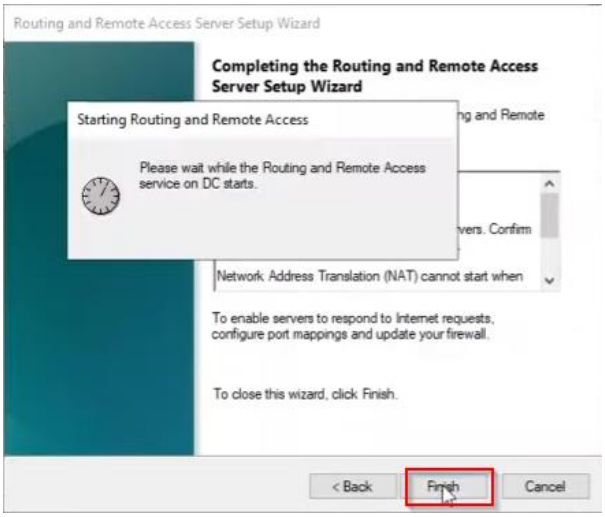
8. Click next, then select Network address translation (NAT).



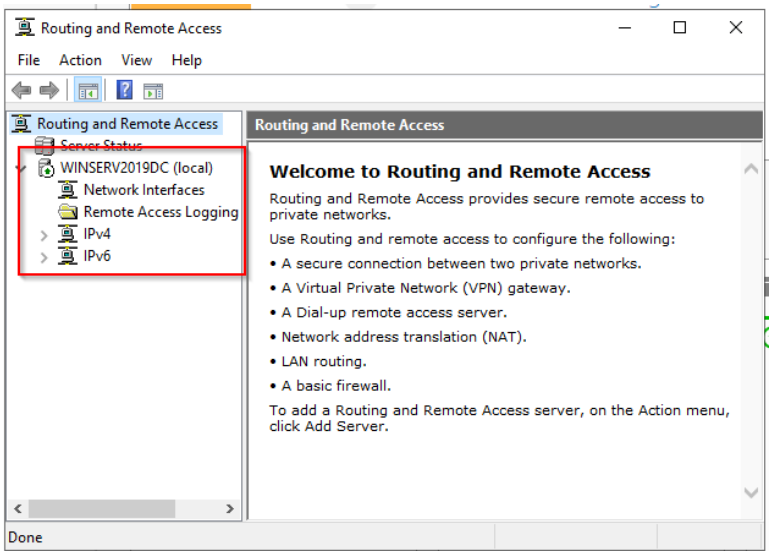
9. Next, we select our external (Internet) network interface. This is why, in earlier steps, we labeled each network interface. Select your Internet interface and click Next.



10. This should take a few minutes then select Finished.



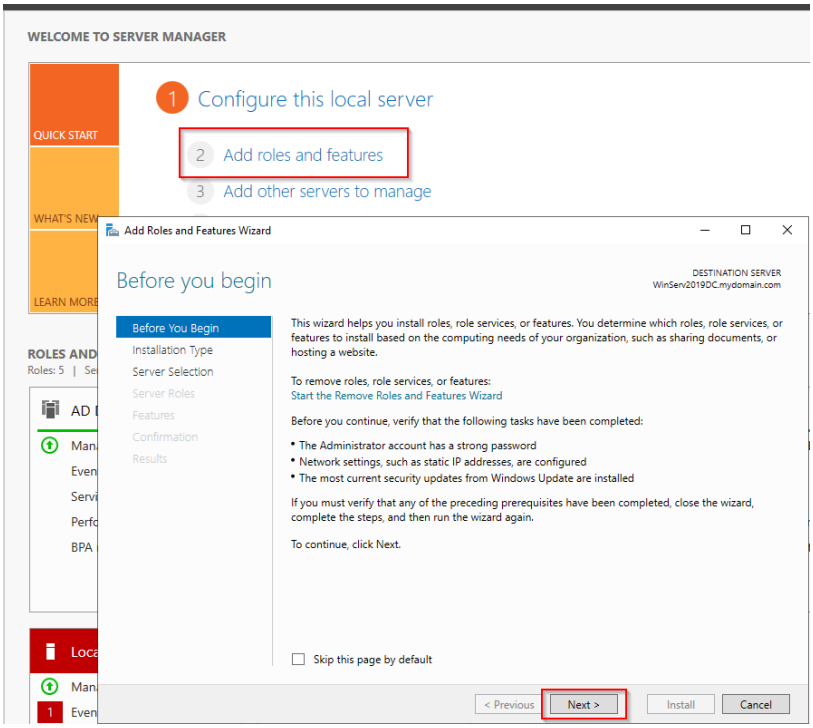
11. Now, you can see that your server has a green arrow.



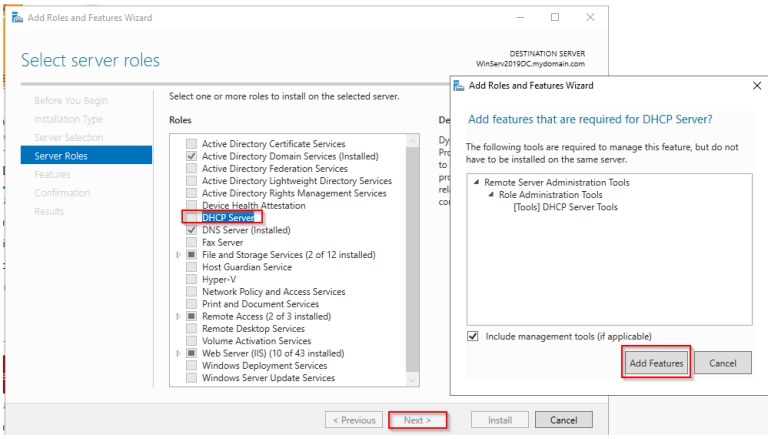
Configure DHCP

This will be done so that when we configure the Windows 10 client, it will gain internet access via the DHCP server.

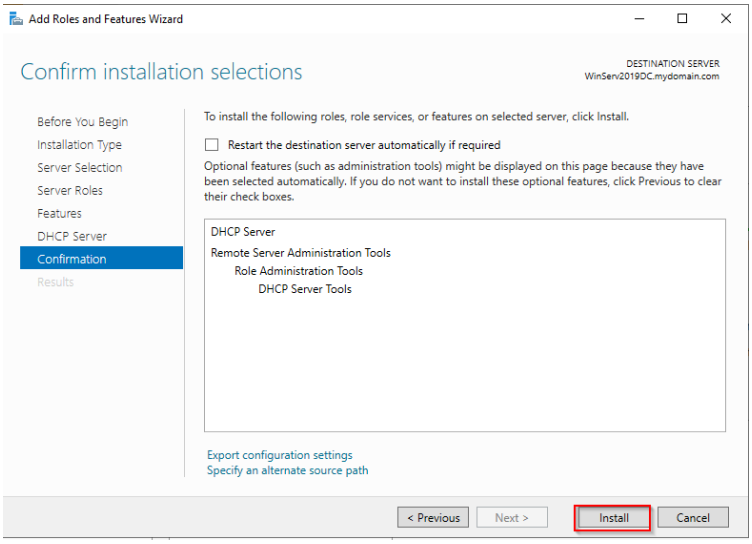
1. Once again, from the Welcome to Server Manager screen, select Add Roles and Features. Click next until you get to the Server Roles.



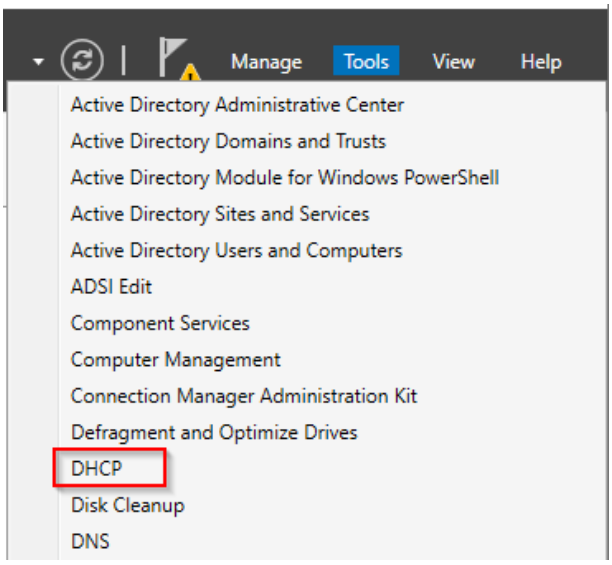
2. Click on DHCP Server and Add Features in the Server Roles section. Then click Next until you get to the Confirmation page.



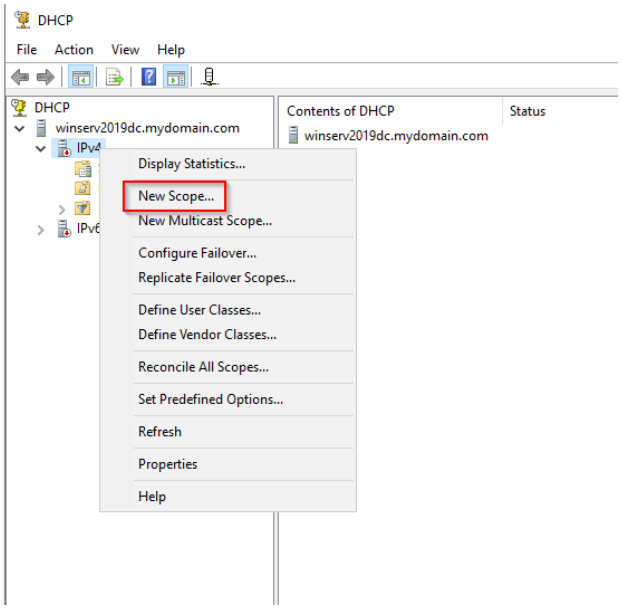
3. Click Install, and once it is done, you can click the Close button.



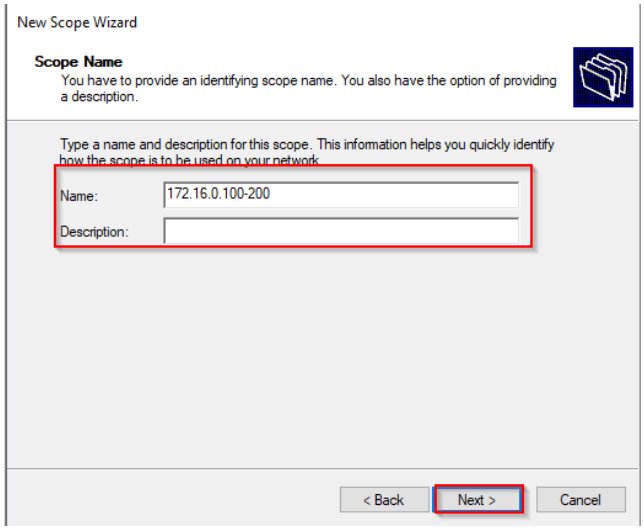
4. Select Tools on the top right corner of the Welcome to Server Manager page and select DHCP. It's time to configure our IP range.



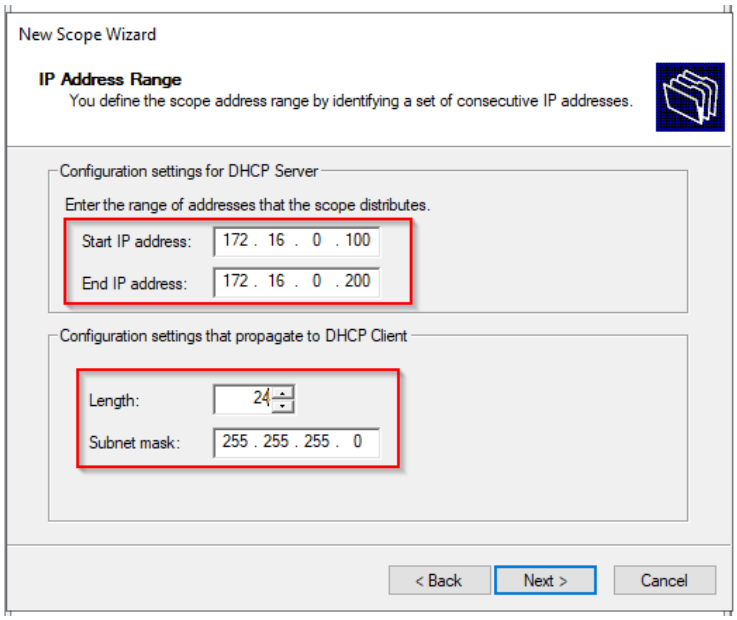
5. Expand your domain and right click on IPv4 and select New Scope.



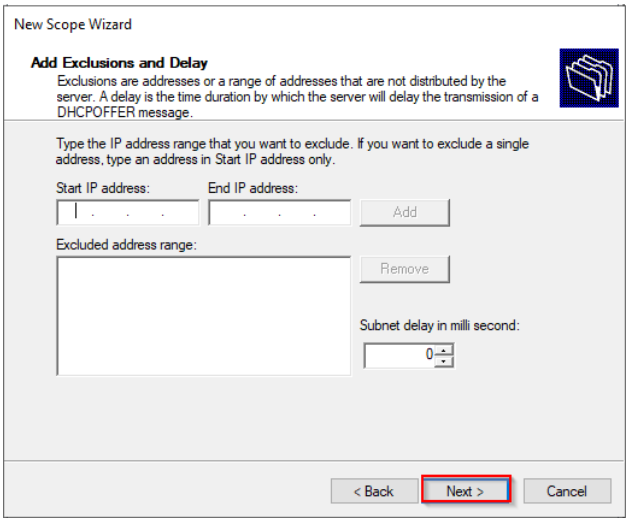
6. Click next and give it a Name. For this lab, I will name it the IP range we will use.



7. Next, we enter the IP range and subnet mask identified in our diagram.

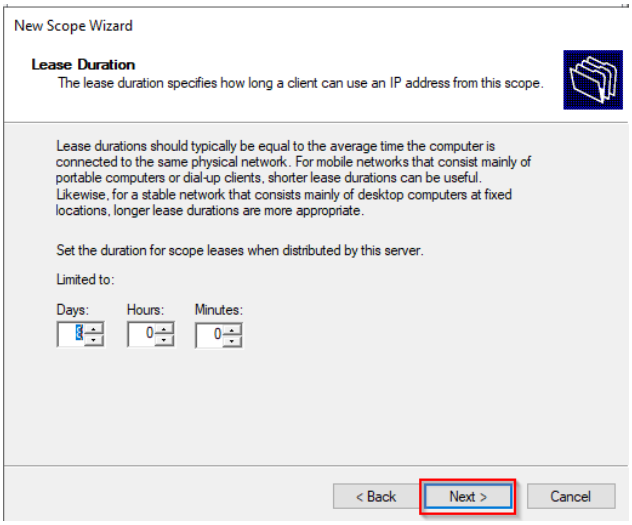


8. Next, it will ask for any IP exclusions. We do not have any for this lab. Still, a larger organization will most likely exclude specific devices that should maintain a particular IP address and not be assigned one randomly. Click Next.

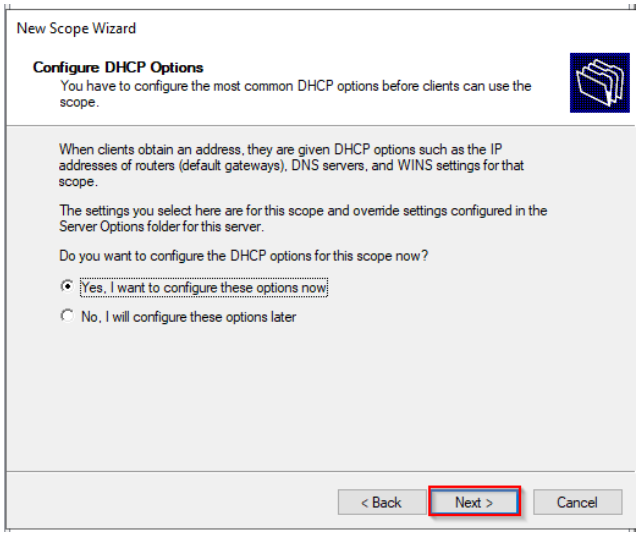


9. The Lease Duration is how long a device can have the same IP address before it is assigned to another device. Again, we will leave the default for our lab environment, but if your business constantly had people connecting and disconnecting, you

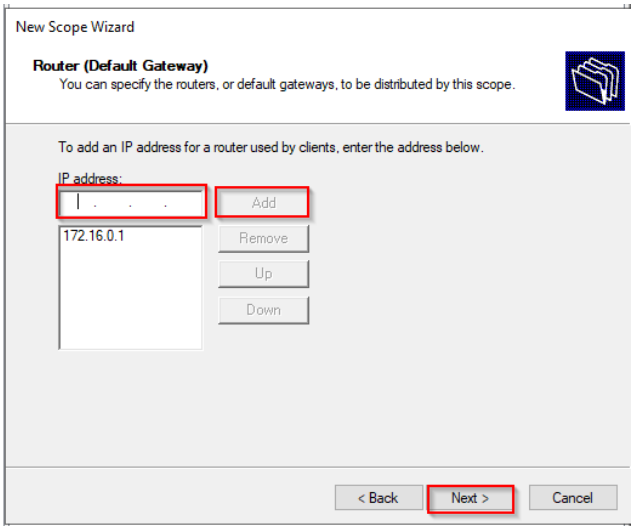
would want to change this to maybe only a few hours. Click Next.



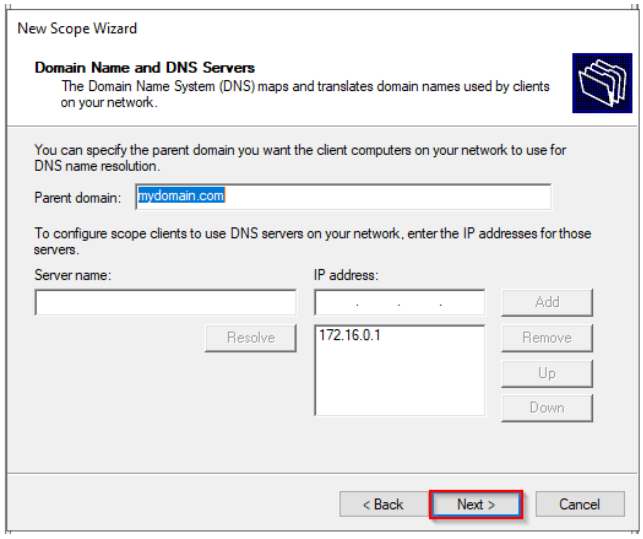
10. To finish the configuration, click Next.



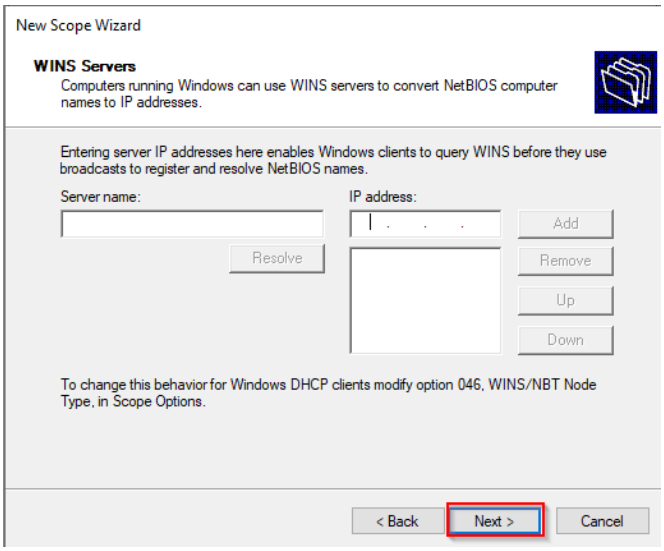
11. Now, to set up the Default Gateway, this will be our Windows 2019 Server. Enter the IP address of your server and select Add. Click Next.



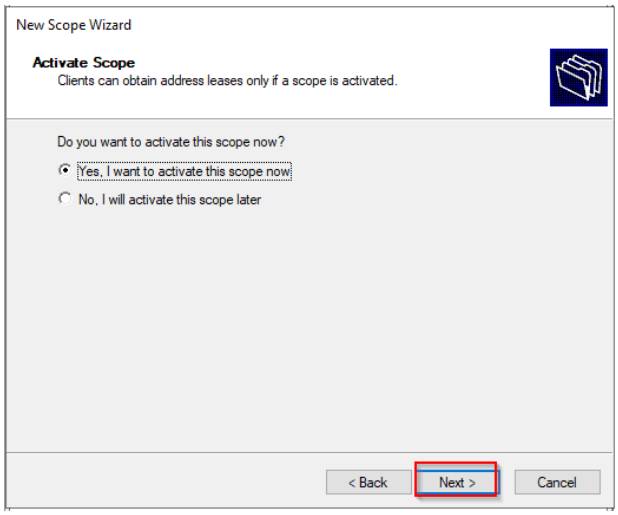
12. Your domain should automatically appear, click Next.



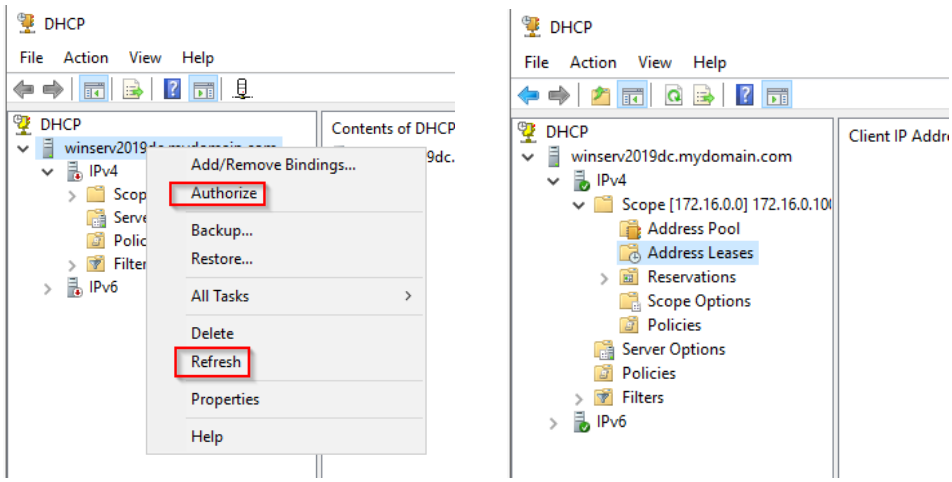
13. You can skip WINS Servers. It's an outdated technology. Click Next.



14. Click Next and Finish to activate the new IP Scope.



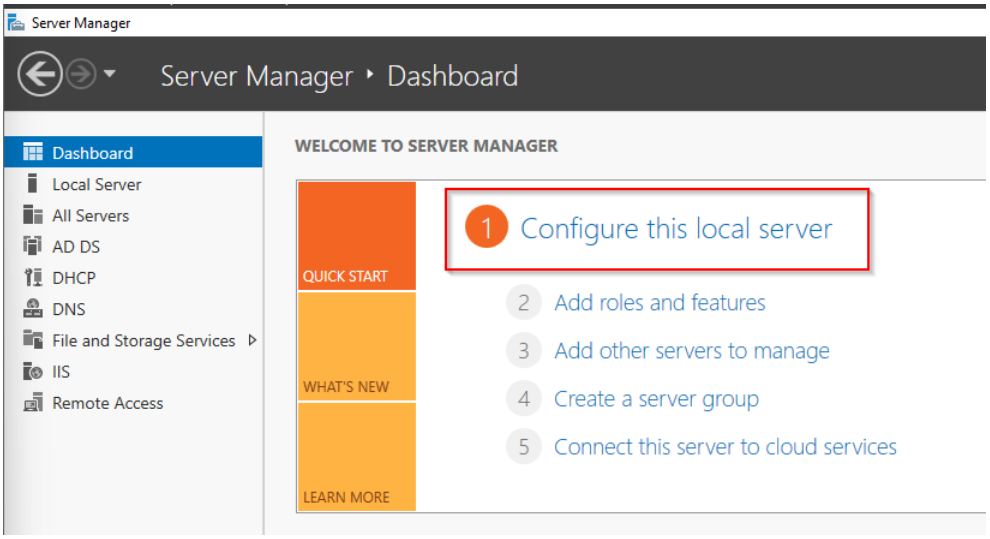
15. Next, right-click on the domain and select Authorize. Then right-click again and choose Refresh. You should get a green check under IPv4 and IPv6.



Use PowerShell script to create multiple users.

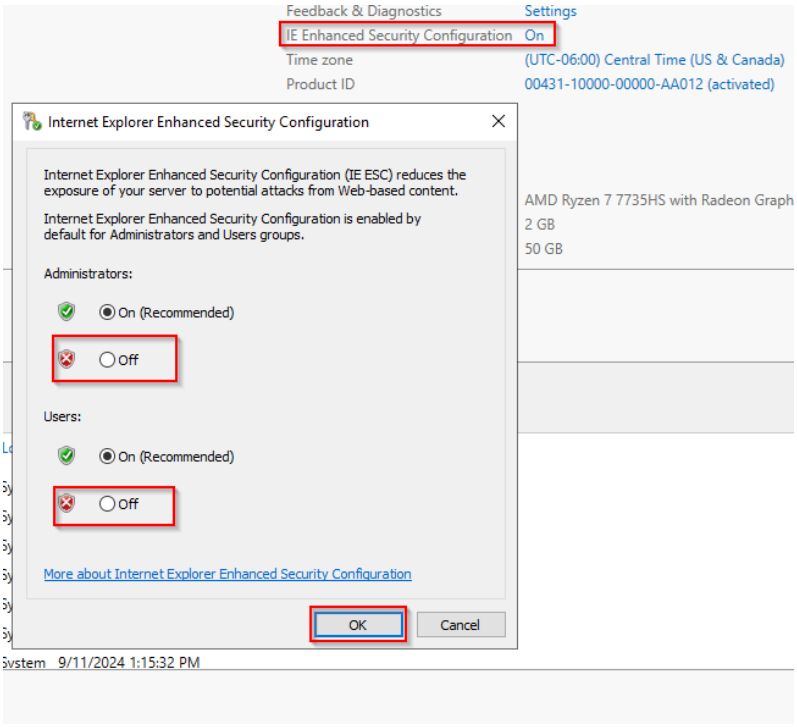
I will have the script I used in my GitHub folder, but I will briefly explain what it will do. Lines 2 and 3 will create two variables: one that will hold our password for the new accounts we create, and the second will have the list of users we will add. The users were generated from a random name generator and saved to the names text file. Lines 6 and 7 will create a secure string for the password to be passed to AD and create a new OU named NEWUSERS while removing the protect container from the accidental deletion option. Lines 9 through 23 create a loop that takes each username and splits the first and last name by the space between them. Then, a user is created using only the first letter of their name and their last name. It also adds the password from line 2 and ensures the user password does not expire, and then repeats for each name on the text file. Next I will walk you trough running the script.

1. From the Welcome to server manager screen, select Configure this local server.

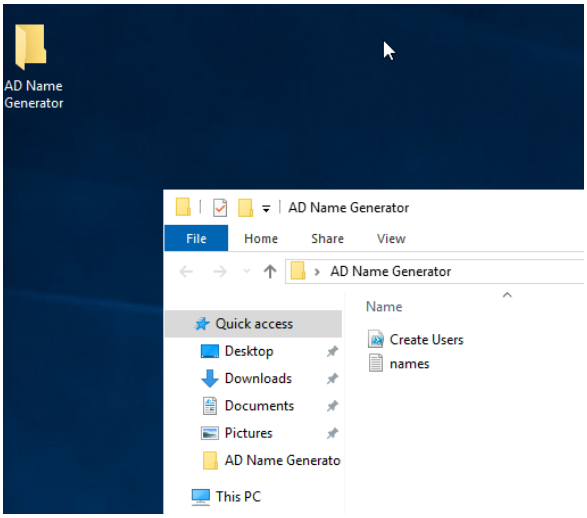


2. Select IE Enhanced Security Configuration and disable Admin and User protection. Note that in the real world, this is not recommended, but for this home lab example, it's okay. This will allow you to download the PowerShell script from the web

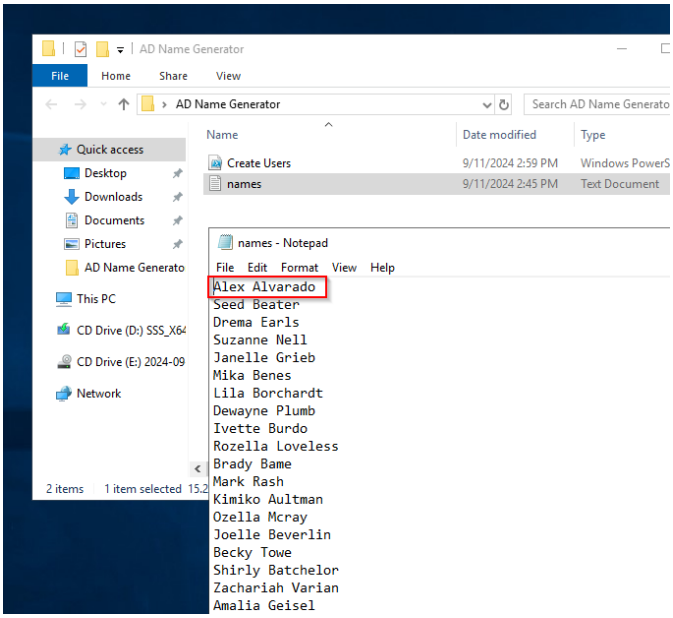
browser.



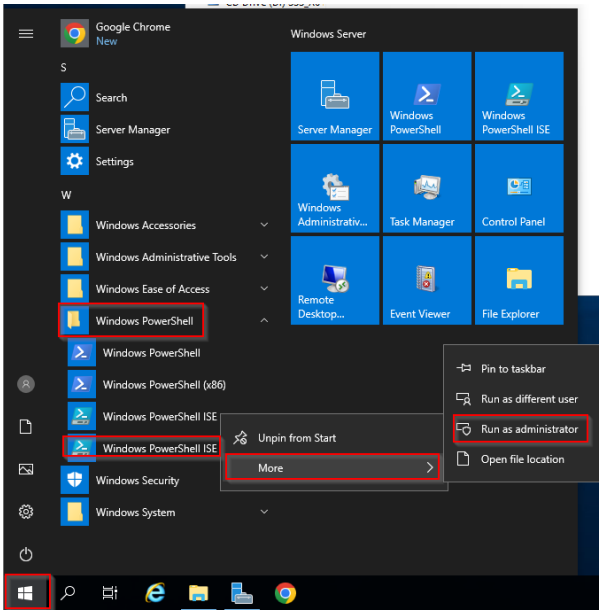
3. Place the files on your desktop and unzip them. You should see the Create Users script and names text file.



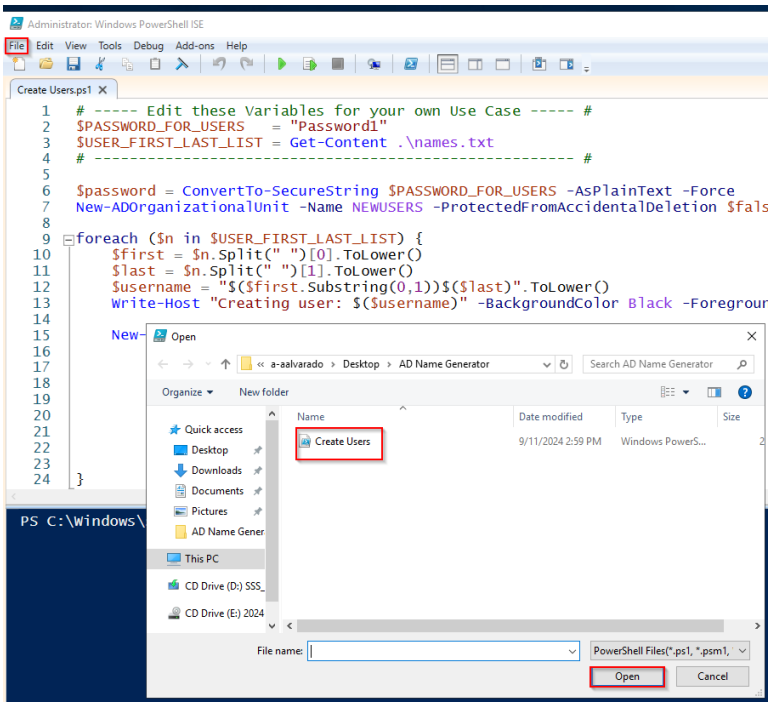
4. Open the names text file and add your name to the top to have the script create an account for you.



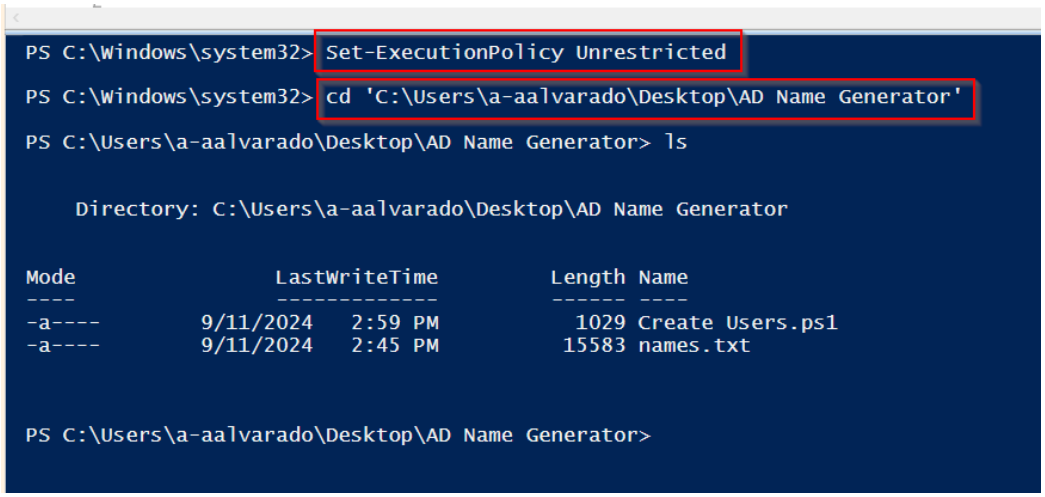
5. Click on Start, Windows PowerShell, right-click on the ISE version, select More, and then Run as administrator.



6. Click File, Open, and select the Create Users PowerShell script.

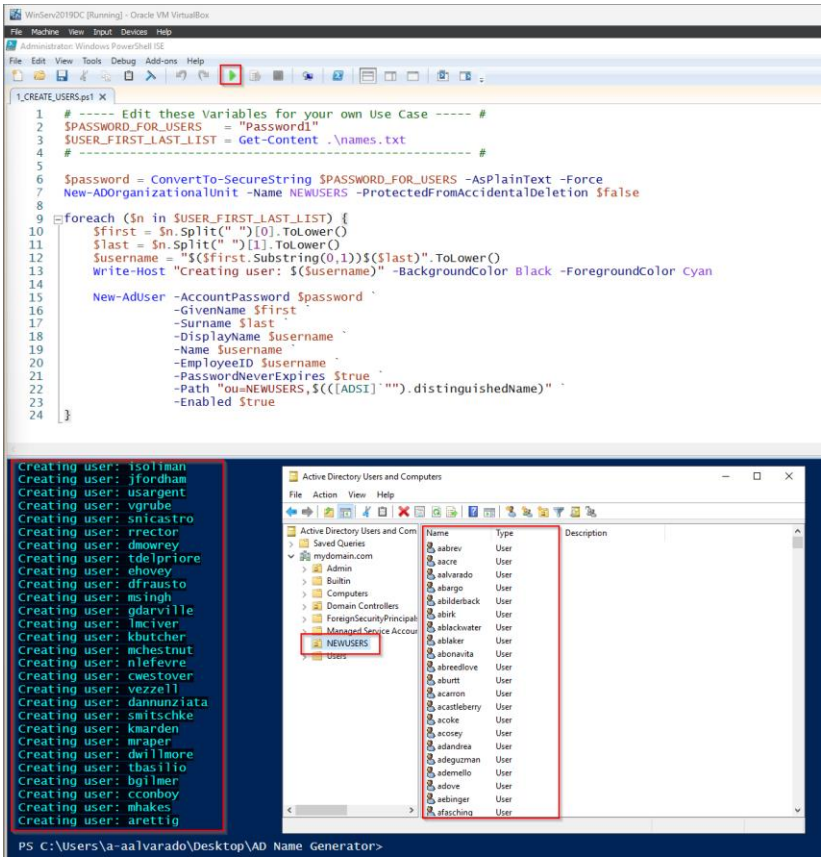


7. To run the script, you must do two things. First, disable the execution policy by running the Set-ExecutionPolicy Unrestricted command in PowerShell, and second, navigate to the path where the name text file is. You will be promted to confirm changes once you execute the unrestricted option just select Yes to All.



8. Hit the green play button, and the script will create new users in the NEWUSERS OU. You can verify this by opening Active Directory User and Computers and clicking on

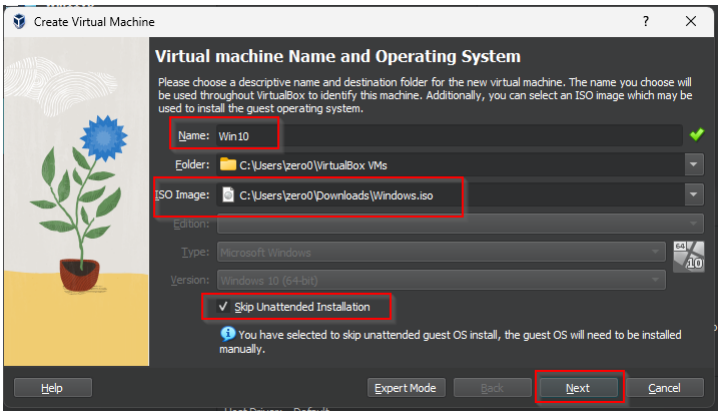
the folder.



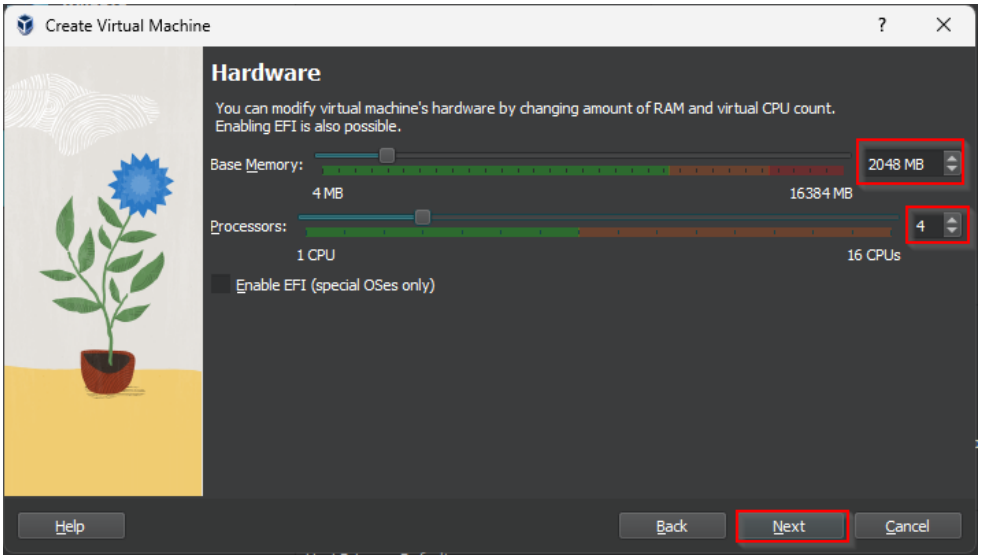
Configure Windows 10 Virtual Machine

This will be very similar to how we created the Windows Server 2019 virtual machine.

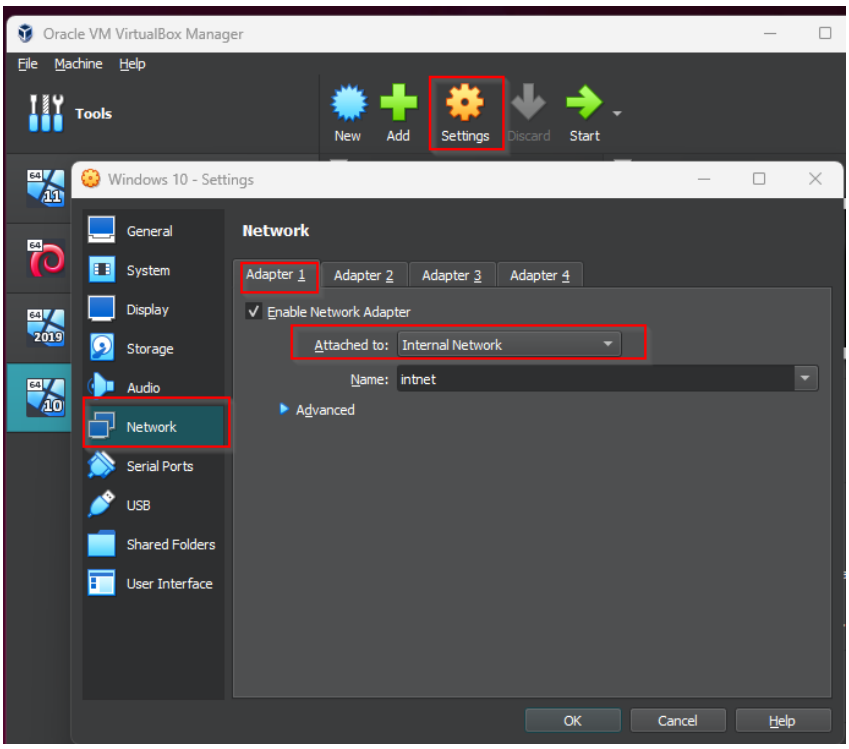
1. Open Oracle VM Virtual Box, select New, give the VM a name, and select the ISO image we created at the beginning of the document. Ensure to check Skip Unattended Installation or it will force you to create an account and enter a product key. Click Next.



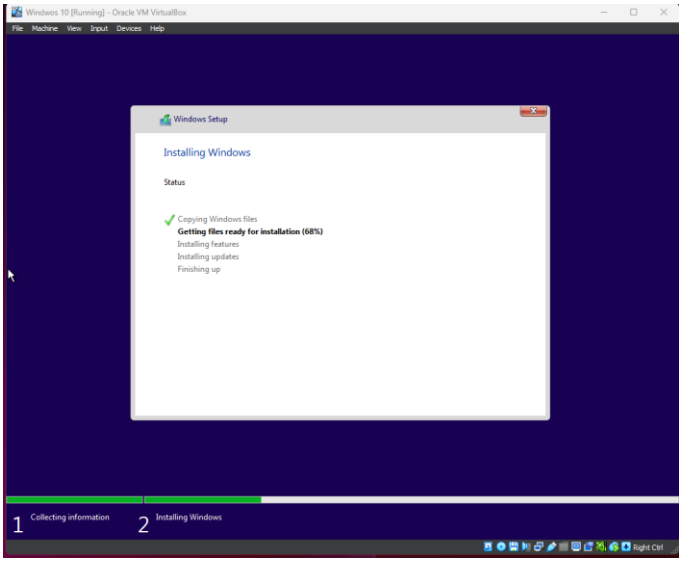
2. Like the server, give the VM 2 GB of RAM and about four processing cores if you have the resources. Click Next.



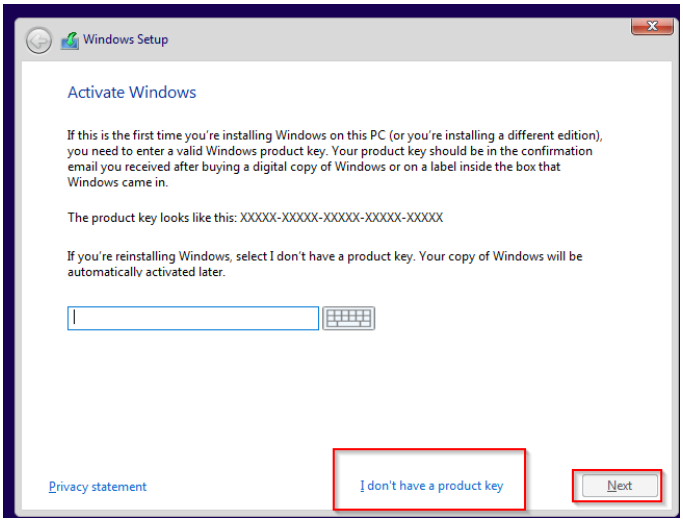
3. Click next on the default storage setting and finish. Next, we will open Settings, click on Network, and change Adapter 1 to Internal Network. This will allow our VM to connect to your Windows 2019 server and receive an IP from the DHCP services we configured.



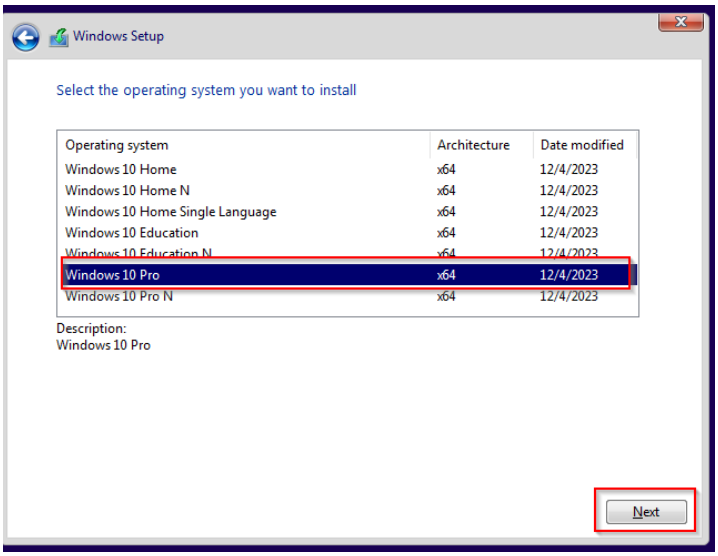
4. Now, we can double-click or click the start arrow on the Windows 10 VM and run through the installation process.



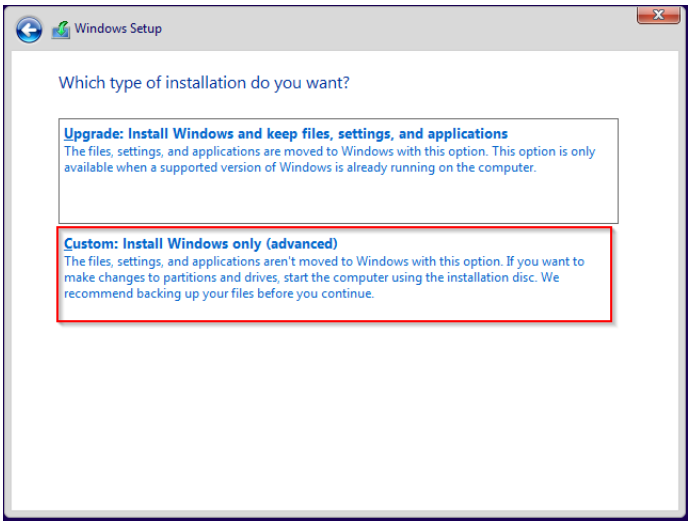
5. Select I don't have a product key and Next.

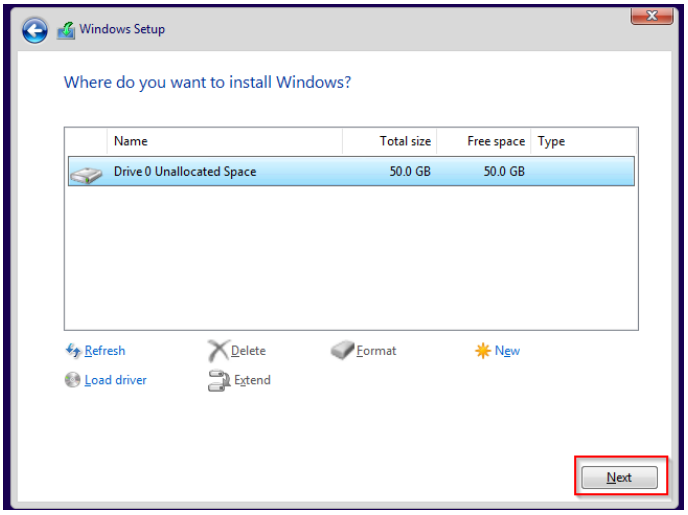


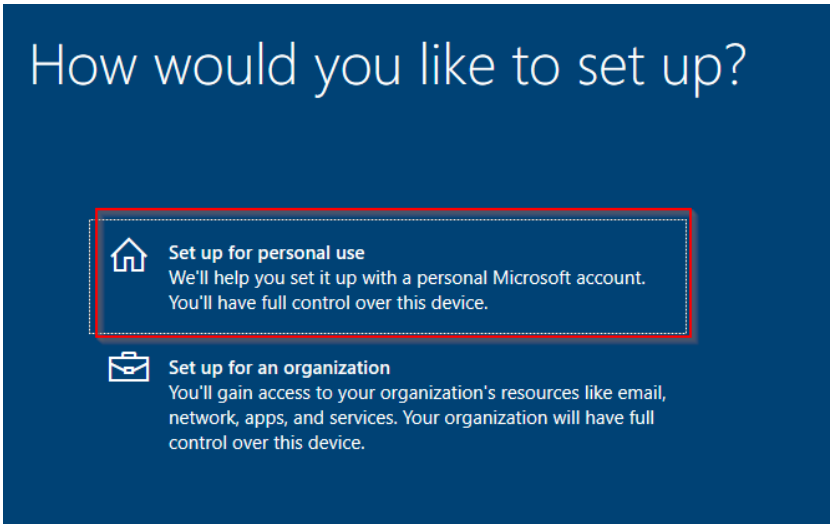
6. Ensure to install Windows 10 Pro so that we can join this client to the Domain.

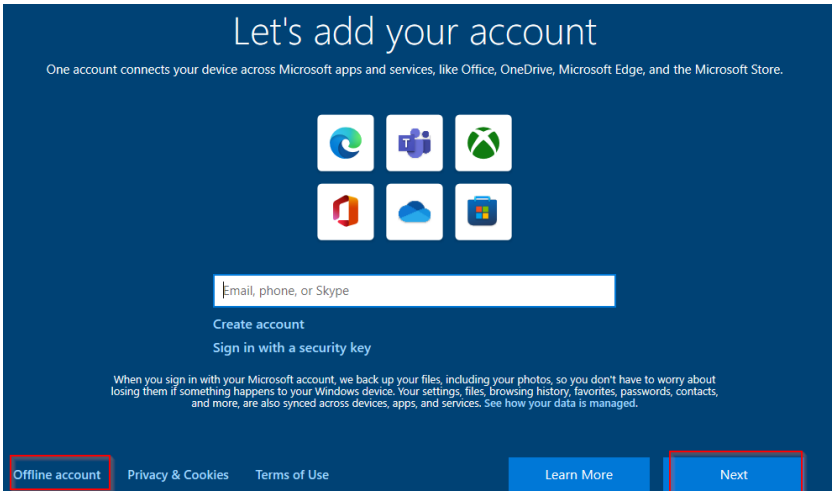


7. Select Custom Installation and click Next on the Where do you want to install Windows screen.

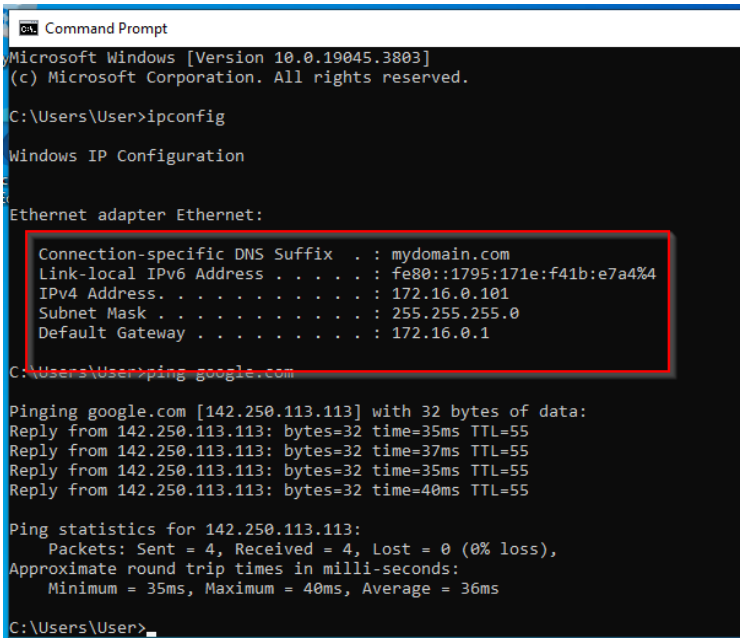




8. Once Windows is installed, follow standard setup steps and create a regular user account with no password. This will not matter as we will be joining it in the domain. During the setup process ensure to select the options below so you don't have to create a Microsoft account.
9. 

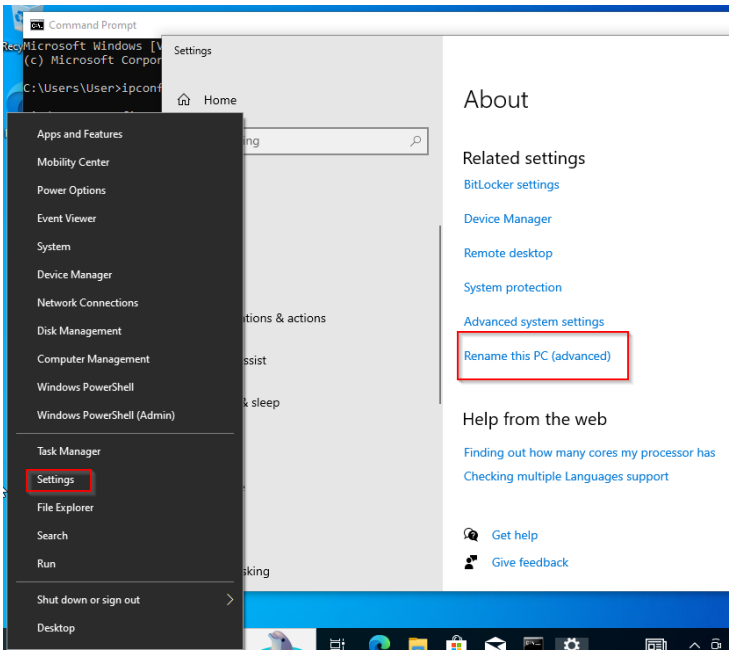


10. Open the command prompt on the desktop and run the command ipconfig to see your network settings. Ensure you have IP, Subnet Mask, and Definitive Gateway. This lets us know our network configuration on the server is working.

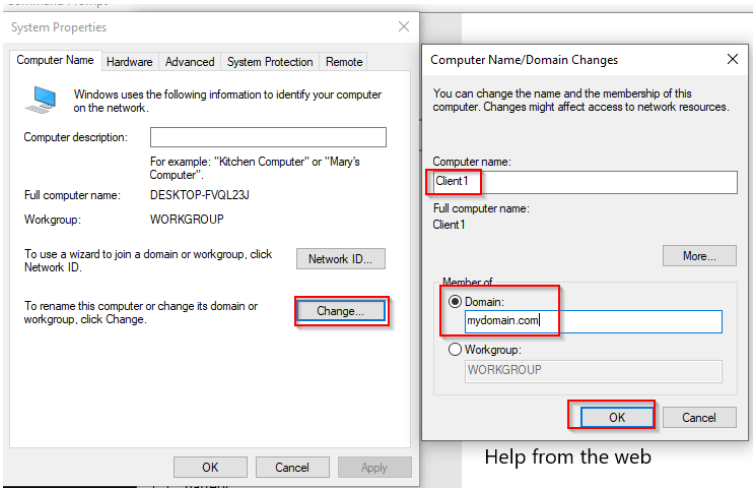


Join VM to the Domain

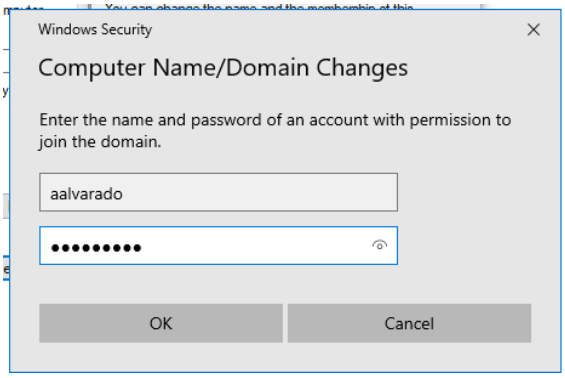
1. Now, we will rename our Windows 10 VM and join it to the domain at the same time. Right-click on the Start button and select Settings. Scroll down until you see Rename this PC (advanced).



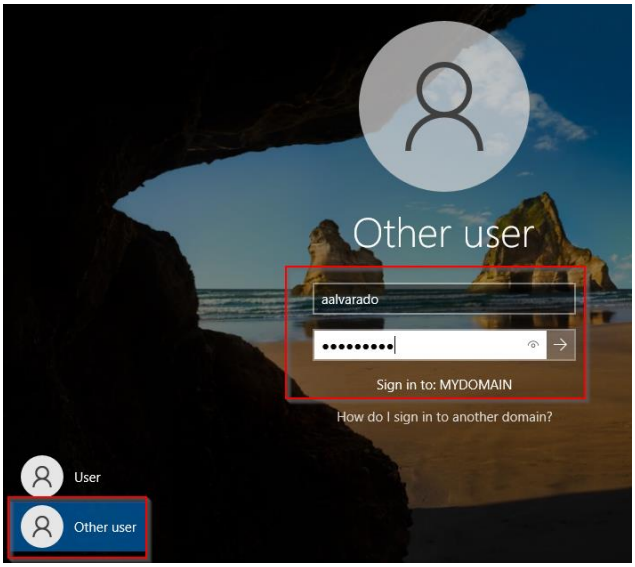
2. Under the Computer Name tab, click Change, and name the computer Client1 as shown in our diagram. Also, we will select the Domain radio button and enter our domain name (mydomain.com).



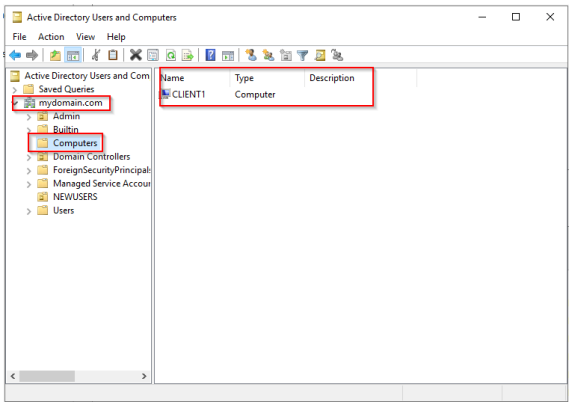
3. You will be prompted to an account with permission to join the domain. Both your admin and user accounts should work for this.



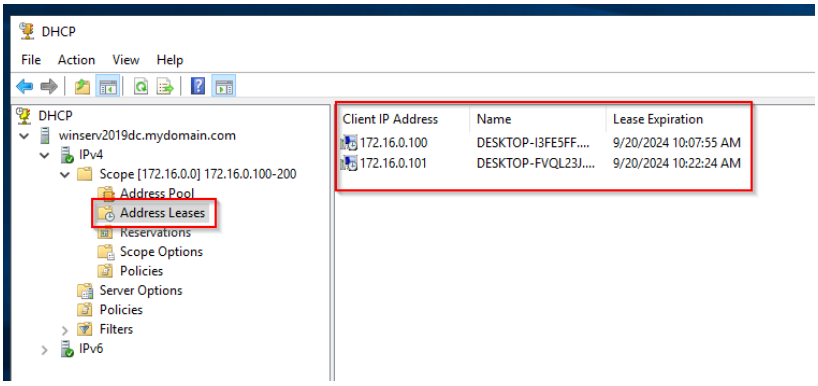
4. Finally, the computer will reboot to apply changes, and you can log in with your normal user account that we created when running the PowerShell script.



5. You can confirm by logging into your server, opening Active Directory User and Computer, clicking on the drop-down menu for your domain, and selecting the computers folder. You should now see Clent1 in the computer folder.



6. You should also be able to open DHCP and click on the Address Lease folder to see the lease that was created when you butted up the Windows 10 VM. I have two because I did it twice, haha.



I hope you have found this tutorial helpful. If you have any questions, get stuck, or want me to cover something else, please contact alex@alvaradoonline.com Thank you.