



This document describes the documented class exercises . The objective of the document is to present complete and easy to follow detailed procedures to describe the necessary steps for installation, configuration, and administration of Operating Systems.

Course Procedure Manual

420-632-AB OPERATING SYSTEMS II

Teacher: Michael Hughes
Student: Monica Perez Mata
Student id : 2498056

TABLE OF CONTENTS

1	Introduction	6
2	General activities	6
2.1	Splashtop and Computer	7
2.2	Verify VMWare Workstation Pro is installed	9
2.3	Updating VMware Workstation Pro.....	9
2.3.1	Post VMware Workstation Pro upgrade activities	18
2.4	Delete VM	21
2.5	Create a snapshot for VM	24
3	Operating Systems II – Windows	25
3.1	Install Windows	25
3.1.1	Windows 10 – client.....	25
3.1.1.1	Change name and give ip address	25
3.1.2	Windows 11 – client.....	35
3.1.2.1	Create a virtual machine	36
3.1.2.2	Installing windows 11	47
3.1.2.3	Change name	67
3.1.2.4	Set static IP	70
3.1.3	Windows Server 2019	76
3.1.3.1	Create a virtual machine for windows server 2019	76
3.1.3.2	Install a windows server virtual machine for windows 2019.....	81
3.1.3.3	Give static ip address	90
3.1.3.4	Change Computer name	92
3.1.3.5	Change time zone	94
3.1.3.6	Firewalls and security.....	96
3.1.4	Windows Server 2022	101
3.1.5	Windows Server 2025	115
3.2	Install Active Directory and Promote Server 2019 to a Domain Controller	142
3.2.1	Install Active Directory Domain Services (AD DS).....	142
3.2.2	Promote the Server to a Domain Controller	150
3.2.3	Verify Installation	155
3.2.4	Assign DNS server in Windows server 2019	159
3.3	Join a Windows Client to the domain.....	162
3.3.1	Create a user within an organizational unit in windows server.....	162
3.3.1.1	Create an organizational unit.....	162

3.3.1.2	Add user inside an organizational unit Accounting	165
3.3.2	Verify DNS is set in windows server	169
3.3.3	Set DNS server in windows 10 client.....	170
3.3.3.1	Set DNS server in windows client.....	170
3.3.3.2	Test the change of DNS server	174
3.3.4	Add windows 10 computer to a windows domain	174
3.3.5	Confirm user has been added to domain	178
3.3.6	Verify setup in windows 2019 server.....	180
3.4	Setup a shared home Folder and set permissions.....	184
3.4.1	Create users	184
3.4.2	Create folder Home.....	188
3.4.3	Set properties in Home folder	189
3.4.4	Fine tune permissions on home	192
3.4.5	Fine tune that each user has access to its stuff only	196
3.4.6	Create folders for users	202
3.4.7	Test on client.....	212
3.4.8	Test on the server	213
3.5	Lesson 5 Setup Department Folder	215
3.5.1	Create users into Accounting Organizational Unit.....	215
3.5.2	Set up a personal network storage location for each user.....	218
3.5.3	Create Senior Groups in Organizational Unit “Accounting”	221
3.5.3.1	Senior Global group	221
3.5.3.2	Senior Local group	226
3.5.3.3	Put global group SrAcctGlobal into local group SrAcctLocal	227
3.5.4	Create department folder “Acct” , set security and permissions	229
3.5.4.1	Create folder “Shared”	229
3.5.4.2	Create folder for Department inside Shared folder and set security and permissions..	234
3.5.5	Create Junior Groups in Organizational Unit “Accounting”	237
3.5.5.1	Global group JrAcct Global	237
3.5.5.2	Add users to JrAcctGlobal group	238
3.5.5.3	Junior local group JrAcctLocal	239
3.5.5.4	Add Global group to the local group.....	240
3.5.5.5	Set Security for department folder Shared	241
3.5.5.6	Set permissions to shared folder for group JrAcctLocal	242
3.5.6	TEST	243

3.5.6.1	Test user in Senior group	243
3.5.6.2	Test user in junior group.....	246
3.6	Set GPO to map Drive for ACCT.....	248
3.6.1	Open Group policy management	248
3.6.2	Create a GPO	250
3.6.3	Update GPO.....	260
3.6.4	Test GPO.....	260
3.7	Map Apps Folder in Acct GPO and Test	263
3.7.1	Create new folder Apps	263
3.7.1.1	Change Apps permissions.....	263
3.7.1.2	Security	265
3.7.2	Mapping apps folder.....	269
3.7.3	Test	271
3.8	Folder redirection.....	275
3.8.1	Personalize desktop in client windows 10.....	275
3.8.2	Set Group policy in Server.....	277
3.8.3	Verify Policy on windows 10	281
3.8.4	Verify Policy on Server	282
3.9	Install DHCP	283
3.9.1	Preparation	283
3.9.1.1	Modify VM to add a second network card.....	283
3.9.1.2	Server Second Ethernet card setup	287
3.9.2	Install DHCP on server.....	290
3.9.3	Configure DHCP	298
3.9.4	Set in Windows 10 box.....	309
3.9.5	VM setting for Client Windows 10	313
3.9.6	Test on server.....	316
3.10	Routing and Remote Access	317
3.10.1	Install Routing and Remote Access	317
3.10.2	Configure Remote Access.....	325
3.10.3	Test.....	330
3.11	WDS Windows Deployment service	331
3.11.1	Install WDS Server and Extract install.wim file	331
3.11.2	Image conversion from .esd to .wim file.....	349
3.11.3	Add Boot and Install Image and test WDS Deployment to install Windows 10 Pro.....	354
3.11.4	Test.....	364

3.11.4.1	Create a Multicast transmission	364
3.11.4.2	Create new VM	366
3.11.4.3	Power on machine and initiate installation procedure.....	368
3.11.4.4	Post installation activities	376
3.12	ADK	381
3.12.1	Install ADK	381
3.12.2	Extract WIM file and Create VM	392
3.12.2.1	Get esd file from DVD for windows 10 enterprise	392
3.12.2.2	Convert ESD To Wim File on Windows 10.....	395
3.12.2.3	Add windows enterprise image to WDS	398
3.12.2.4	Disable Image (optional)	399
3.12.2.5	Install Image.....	400
3.12.2.6	Add boot image in WSD	402
3.12.3	Create VM for windows 10 enterprise	406
3.12.4	Creating the answer files	406
3.12.4.1	Create new answer file for WDS	406
3.12.4.2	Autounattended	422
3.12.5	Using the answer files to automate a remote installation of Windows 10	427
3.12.6	WDS - Using the answer files to automate a remote installation of Windows 10 – Server	428
3.13	Deploy automatically windows 10.....	440
3.13.1	Create a VM	440
3.13.2	Power on the VM.....	441
3.14	Disk Partitions.....	446
3.14.1	Add HD to VM -Compare GPT/MBR NTFS/EXfat Simple/Spanned Drives	446
3.14.1.1	Add HD to VM	446
3.14.1.2	Adding Hardware to VMs.....	448
3.14.1.3	Disk Initialization	452
3.14.1.4	Extending and Shrinking Volumes	458
3.14.1.5	Add disk	459
3.14.1.6	Delete volume	461
3.14.1.7	Spanned volume	462
3.14.1.8	Shrink volume	466
3.14.2	Simple Spanned Striped Mirrored and Raid 5 Volumes	467
3.14.2.1	Simple Spanned Striped (Raid 0)	467

3.14.2.2	RAID 1 Mirrored	471
3.14.2.3	RAID 5	475
3.14.3	CLI - Select Disk create partitions and format	479
3.14.3.1	Open diskpart	480
3.14.3.2	Help command	481
3.14.3.3	Selecting a Disk.....	482
3.14.3.4	Creating partitions.....	483
3.14.3.5	Formatting the Partition	484
3.14.3.6	Creating Extended Partitions failed	484
3.14.3.7	Create Extended Partition	485
3.14.3.8	Create Logical Partition (inside extended partition).....	486
3.14.4	CLI - Create Fat32 Partitions and Delete partition	488
3.14.4.1	Preparation	488
3.14.4.2	Commands	489
3.14.5	CLI - Raid 1 Select volume and format drive assign Drive Letter	500
3.14.6	CLI - RAID 5 and Disk Striping.....	502
3.14.6.1	RAID 5	502
3.14.6.2	Stripping	507

1 Introduction

This document outlines the procedures learned during the courses

- 420-631-AB OPERATING SYSTEMS II

The aim of the document is to present complete and easy to follow detailed procedures to describe the necessary steps for all the procedures executed as class exercises.

Some of the procedures covered in this document are:

- Install in VMWare
 - Windows 10 and Windows 11
 - Windows Server 2019 and 2022
- **Disk Management:**
 - Create partitions, format disks, and set up RAID configurations.
 - Extend and shrink volumes.
 - Create simple, spanned, striped, mirrored, and RAID 5 volumes.
- **Group Policy Management:**
 - Create and edit Group Policy Objects (GPOs).
 - Map drives for home and shared folders.
 - Test GPOs on Windows clients.
- **Windows Deployment Services (WDS):**
 - Install WDS and extract install.wim files.
 - Add boot and install images.
 - Create multicast transmissions and deploy Windows 10 Pro automatically.
- **DHCP Configuration:**
 - Install and configure DHCP on the server.
 - Set IP address ranges and lease durations.
 - Verify DHCP settings on Windows clients.
- **Routing and Remote Access:**
 - Install and configure Routing and Remote Access.
 - Set up VPN and NAT.
 - Test internet connectivity on Windows clients.

2 General activities

This section describes the pre-requisites and the setup to work with procedures related to operating systems.

The required pre-requisites:

- 1) The use of Splashtop to securely access John Abbott College Computer Lab is up and running.
- 2) A computer is available to work in John Abbott College Computer Lab
- 3) Vmware Workstation Pro Virtual environment software is installed to create virtual machines on the assigned computer and is up and running.

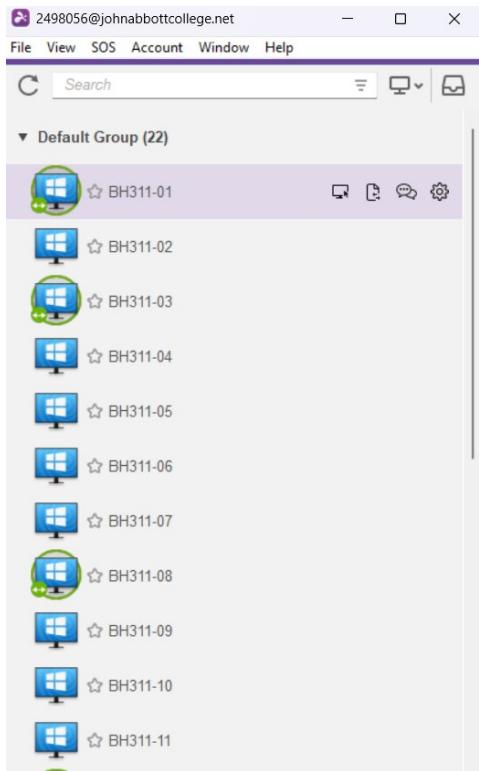
The procedures for installing Splashtop on your home computer are not included in this manual.

2.1 Splashtop and Computer

Splashtop Business is a remote desktop software that allows users to securely access their computers from anywhere. As a pre-requisite for all activities in this document, Splashtop Business is installed, and a PC is assigned, and both are working

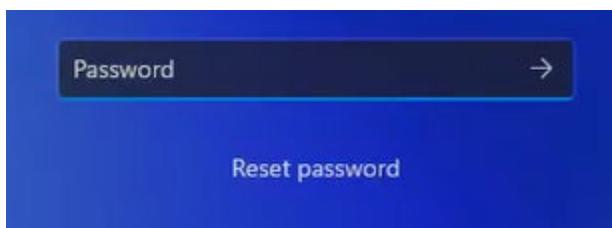


- A) Splashtop Business Application is installed in your home computer, user is logged in and a computer list appears on Splashtop Business, as shown in the image below:

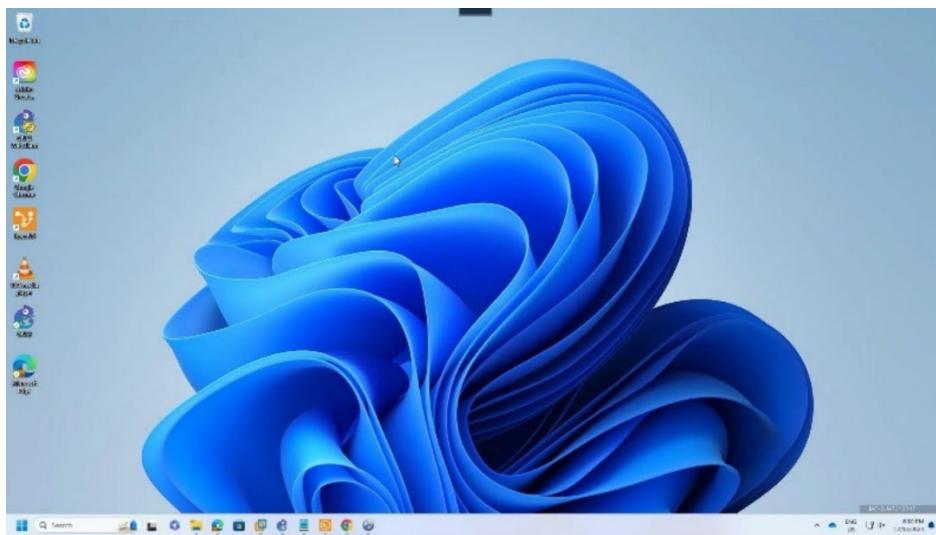


The computer assigned is correctly working when double click computer starts.

- B) User login to computer with appropriate user and password



C) Windows desktop (like the image below) appears when user logs in.



2.2 Verify VMWare Workstation Pro is installed

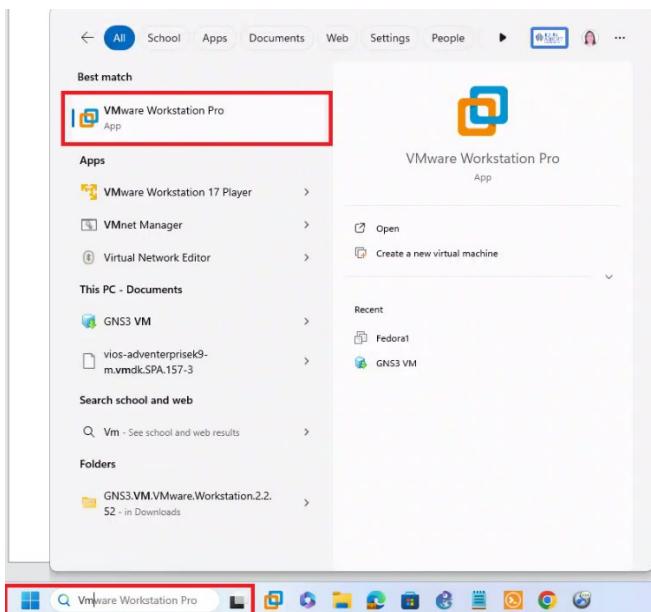
VMware Workstation Pro enables users to set up virtual machines (VMs) on a single physical machine.



As a pre-requisite for all activities in this document

- 1) Make sure VMware Workstation Pro is installed. Check in the search tab at the left down corner of the desktop and look for VMware Workstation Pro.

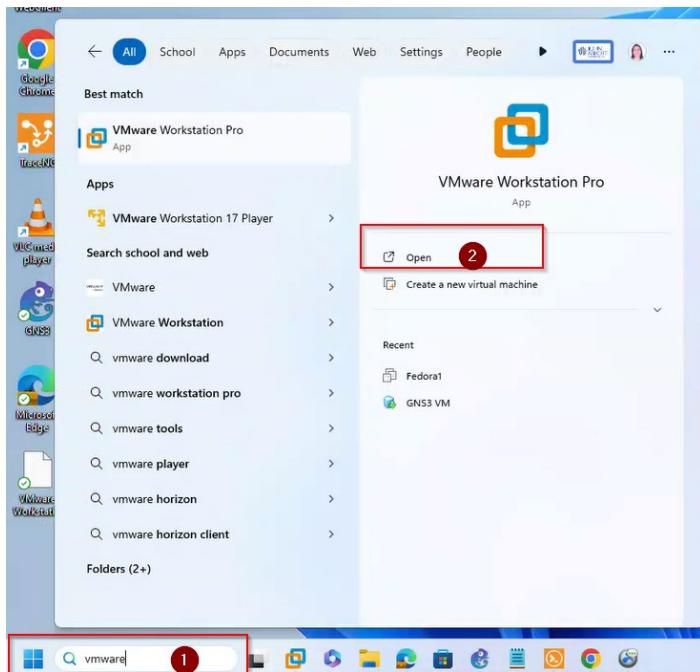
The application appears in the menu.



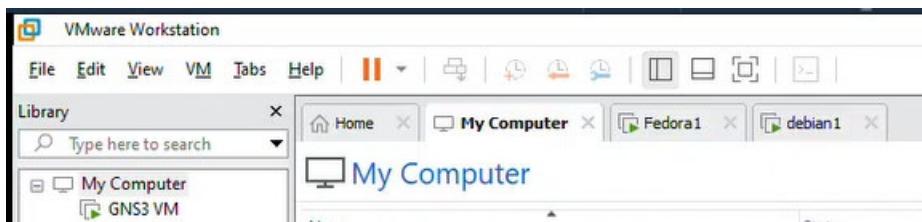
2.3 Updating VMware Workstation Pro

- A) Open the VMware Workstation App

- 1 Look for application in windows search
- 2 Once VMware Workstation Pro appears, open application

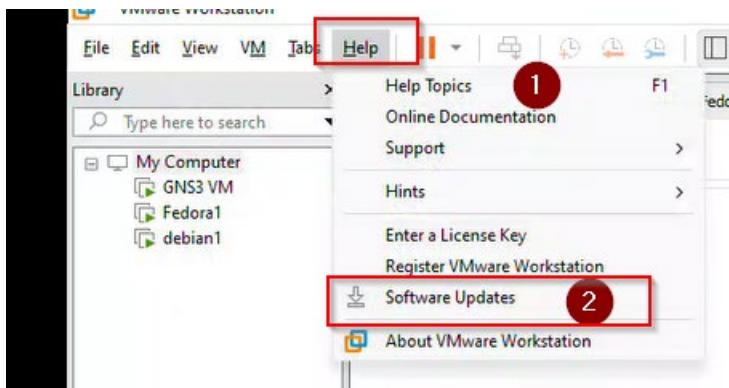


B) VMware workstation opens:

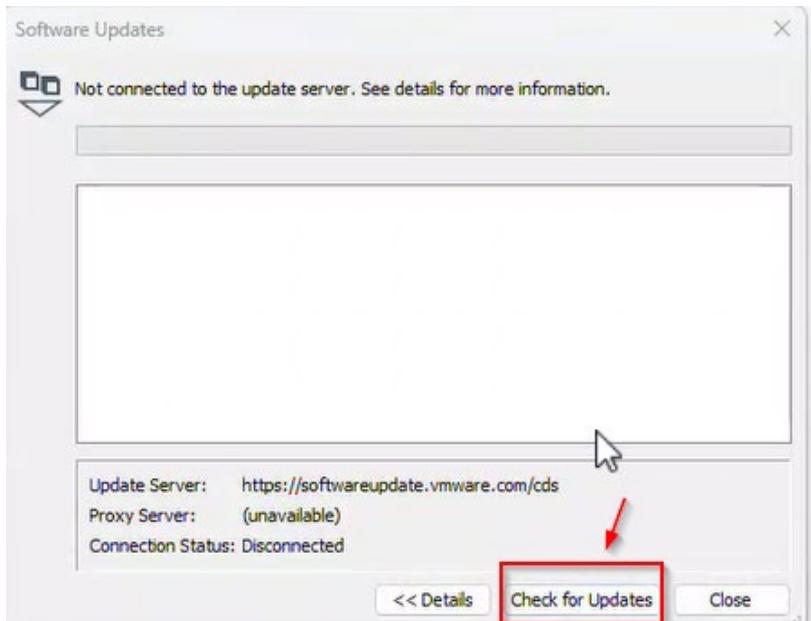


C) Select from top menu and submenu

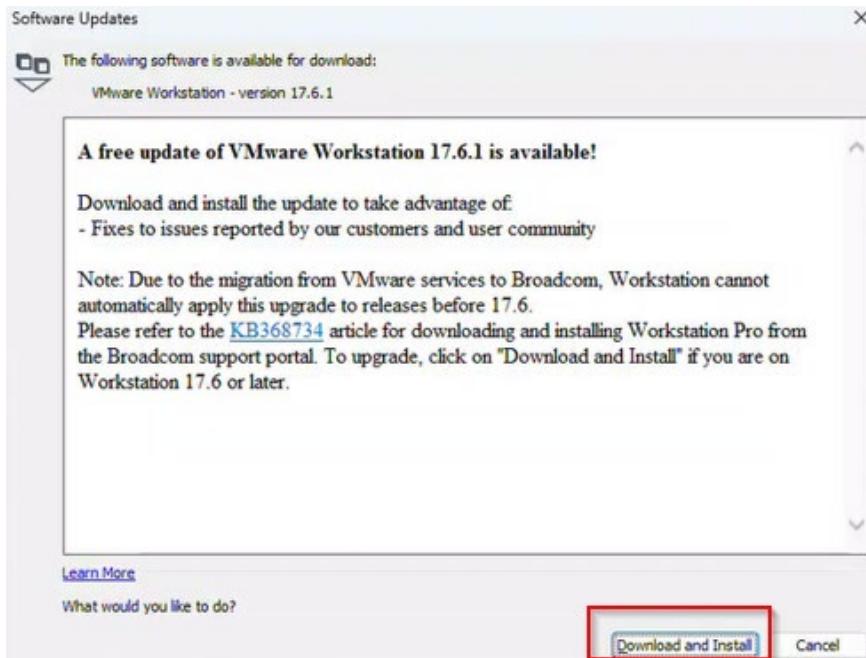
1. Help
2. Select Software Updates



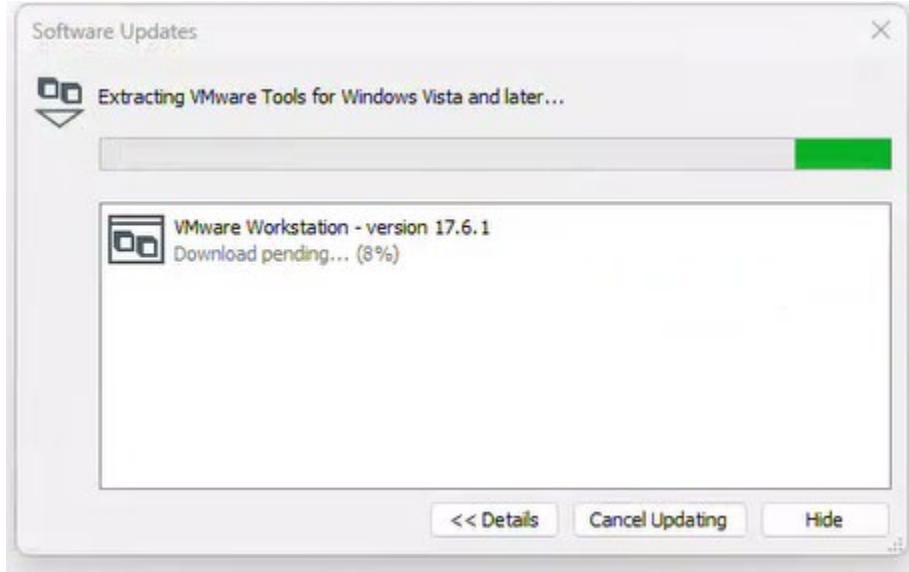
D) A new window will open, select Check for updates



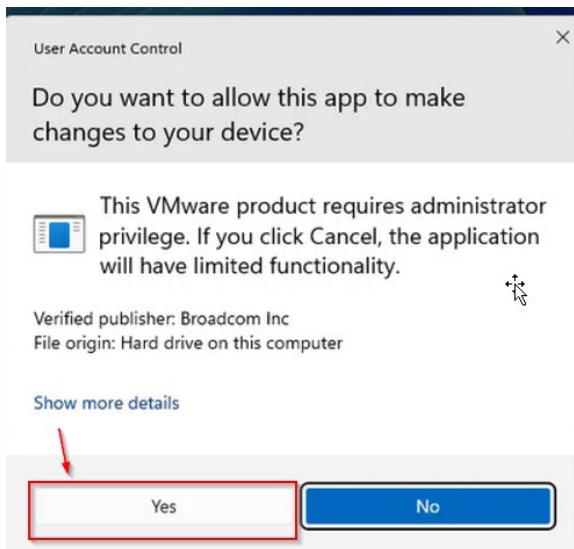
E) After a couple of second a second a new window appears indicating upgrades are available, click “Download and Install”



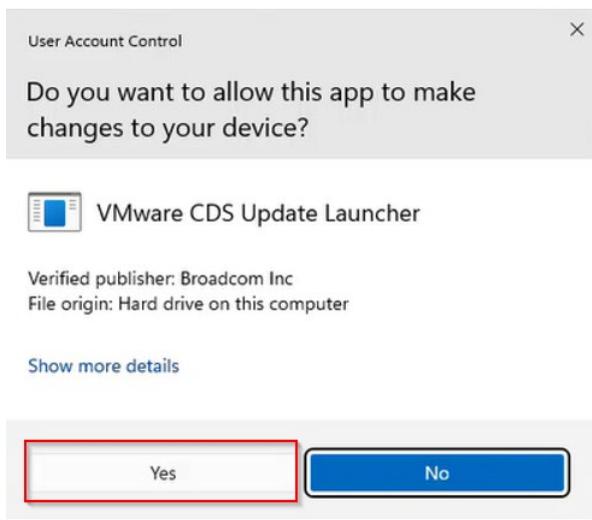
F) Wait while new VMWare version is extracting



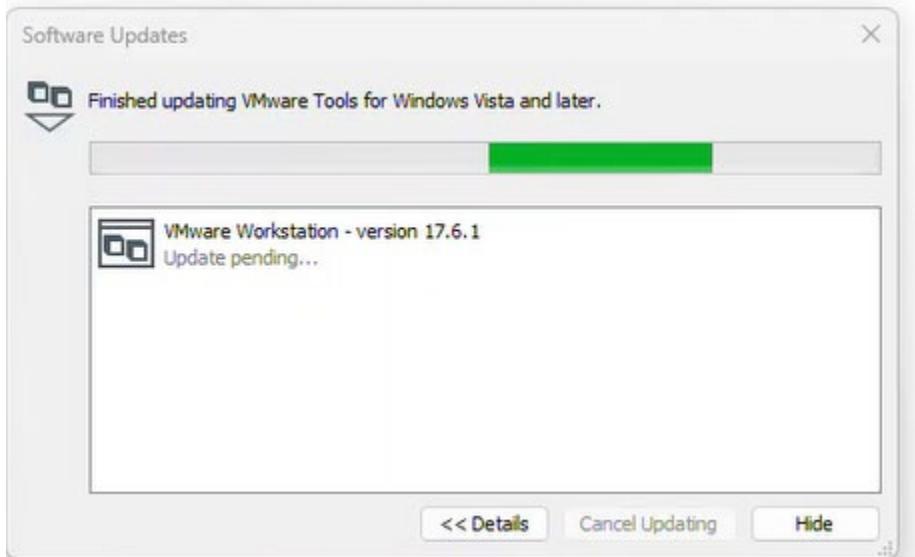
G) When prompted that “Do you want to allow this app to make changes to your device? This VMware product requires administrator privilege. Click “Yes”



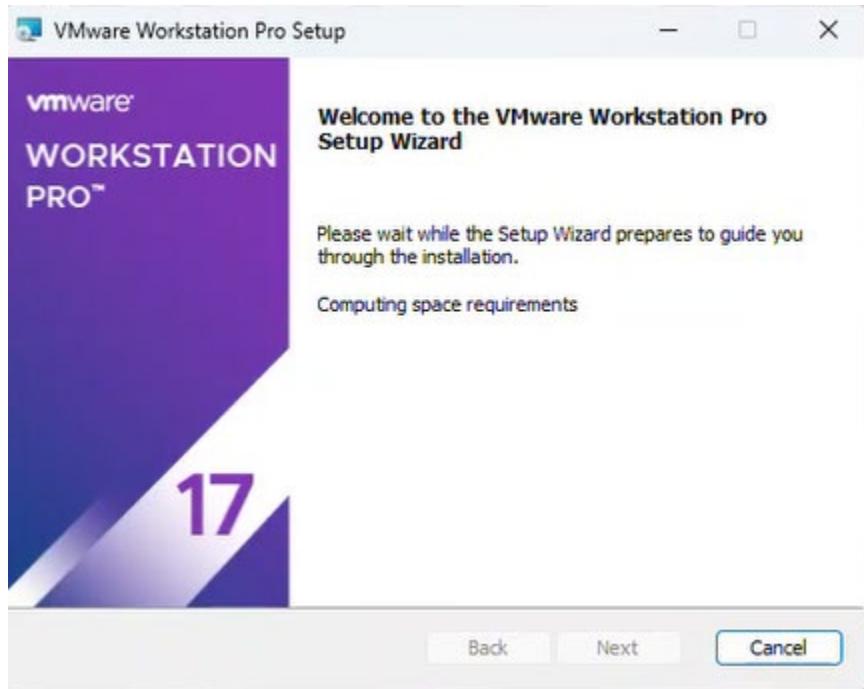
H) When prompted “Do you want to allow this app to make changes to your device? VMware CDS Update Launcher”, click “Yes”.



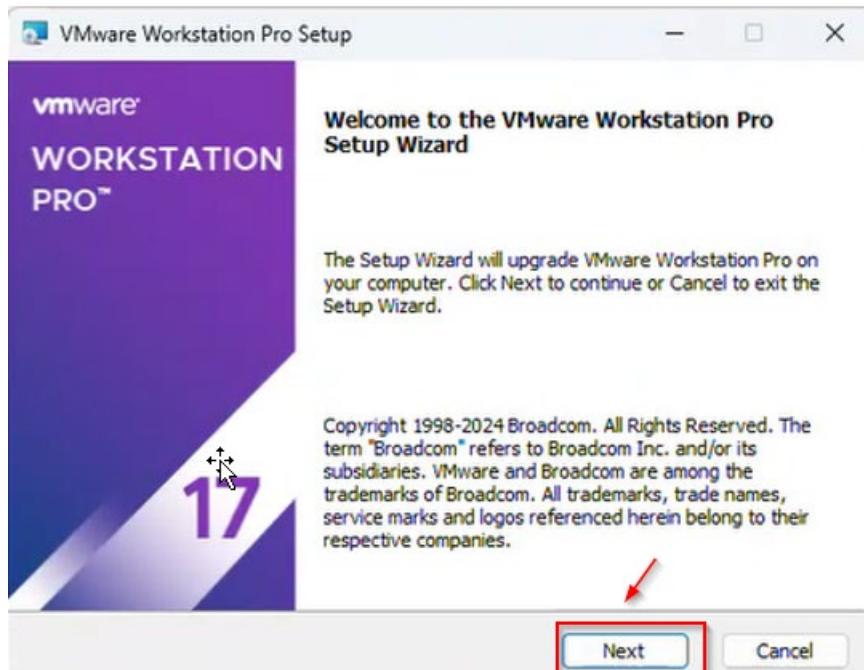
- I) Finished uploading VMware tools window appears, wait until finished.



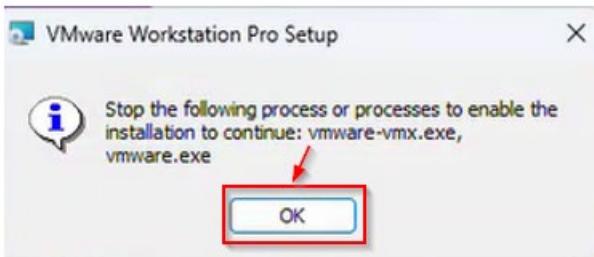
- J) New window with message “Welcome to VMware Workstation Pro Setup Wizard, wait until “Next” is enabled.



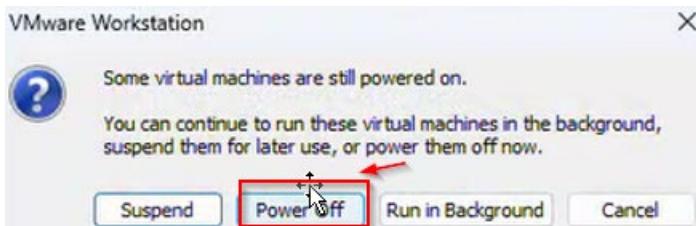
- K) When the in the window “Welcome to the VMware Workstation Pro Setup Wizard” “Next” is enabled, click on it.



- L) If the following window appears is because the VMWare Workstation is running virtual machines. Press “OK” and go ahead to close the VMWare Workstation

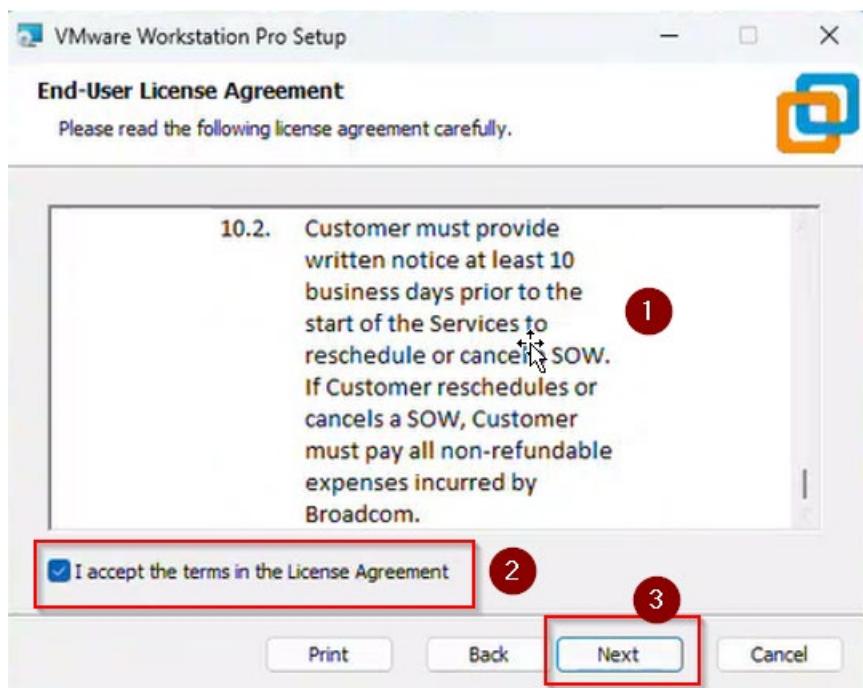


M) To Stop VMWare Workstation all virtual machines should be powered off. Press “Power Off”

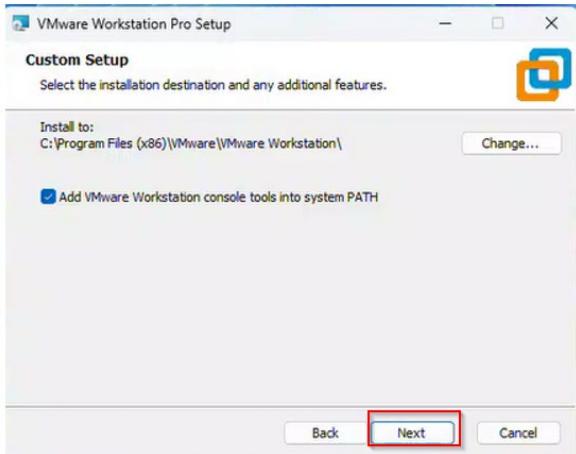


N) End-User License Agreement,

1. Read the End-User License Agreement
2. Accept the End-User License Agreement by Selecting “I accept the terms in the License Agreement”.
3. Click “Next”

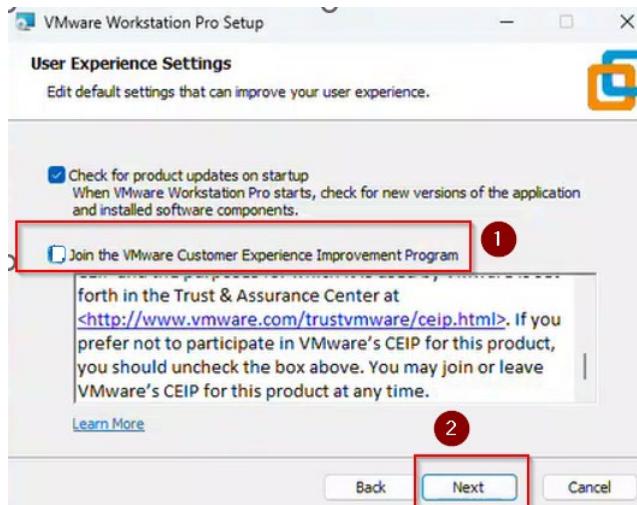


- O) In the “Custom Setup” window, keep the installation destination, select “Add VMWare Workstation console tools into system PATH” and then click “Next”

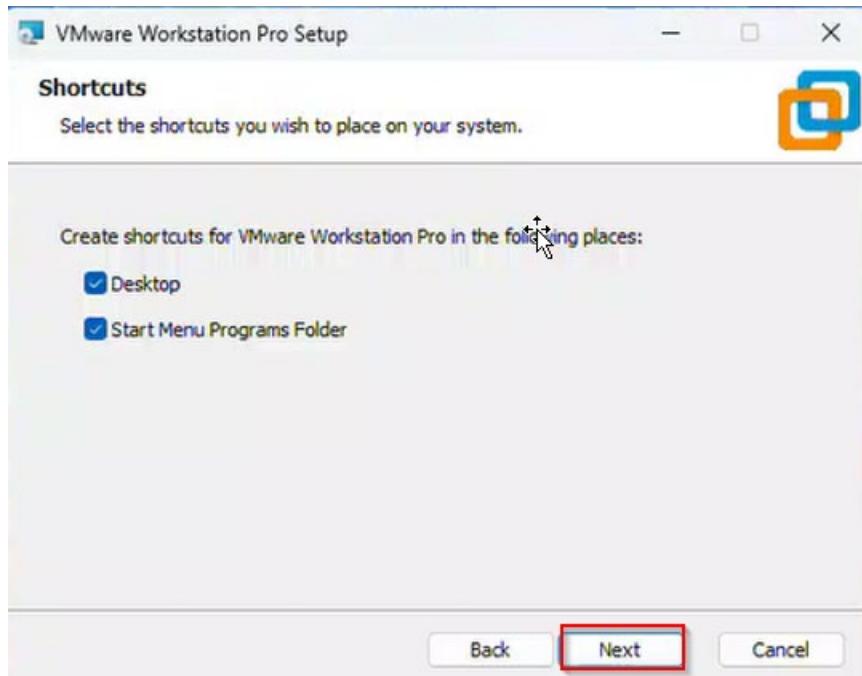


- P) When the “User Experience Settings” window pops up,

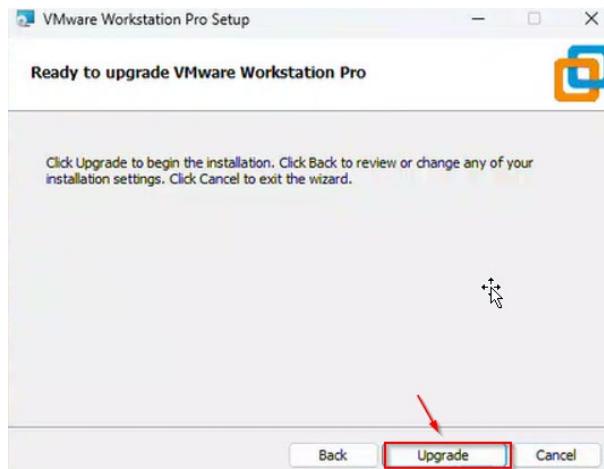
1. Uncheck the checkbox “Join the VMware Customer Experience Improvement Program”
2. Click “Next”



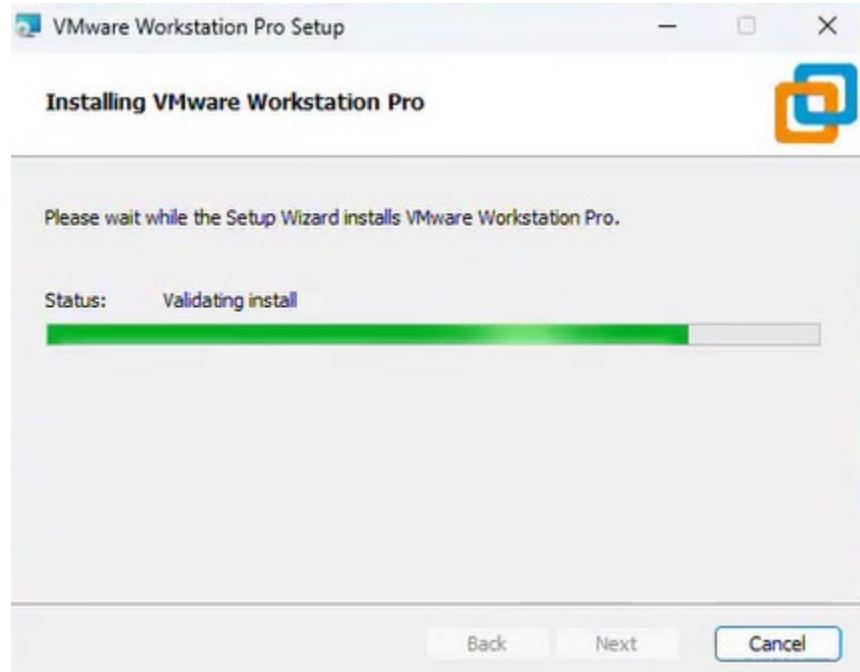
Q) When the “Shortcuts” window pops up, both boxes should be checked, then click “Next”.



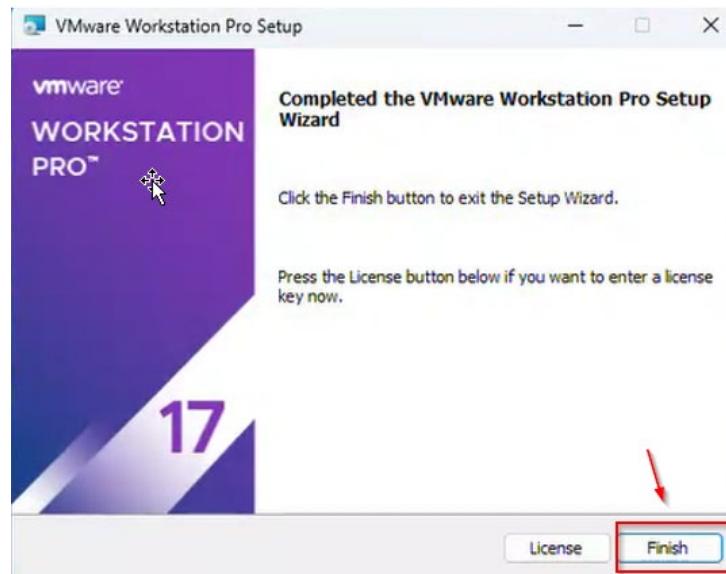
R) When the window “Ready to upgrade VMware Workstation Pro” appears click “Upgrade”



S) The window “Installing VMware Workstation Pro” showing the installation process is initiated, the green bar indicates the process status. Please wait this can take time.

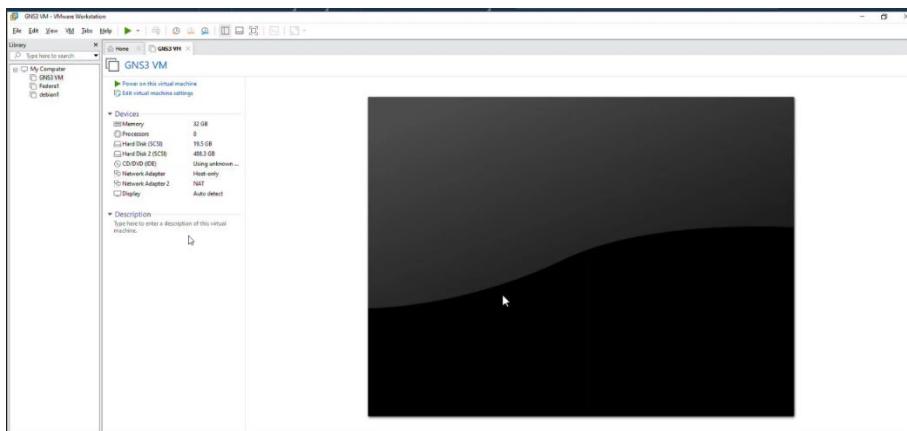


- T) When the “Completed the VMware Workstation Pro Setup Wizard” window pops up, click “Finish”.

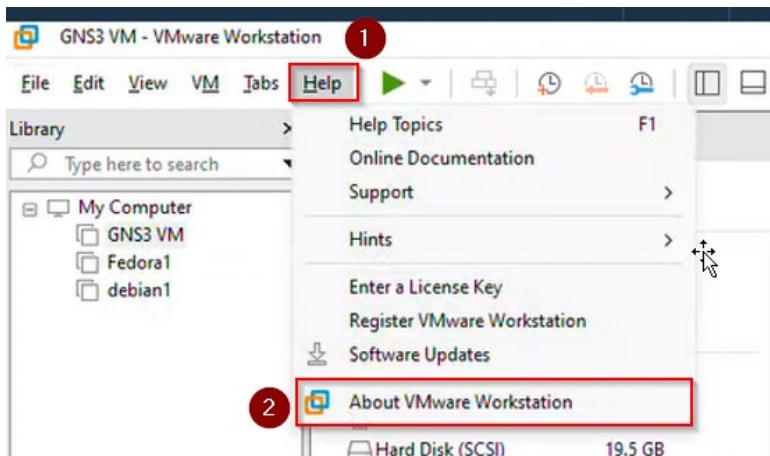


2.3.1 Post VMware Workstation Pro upgrade activities

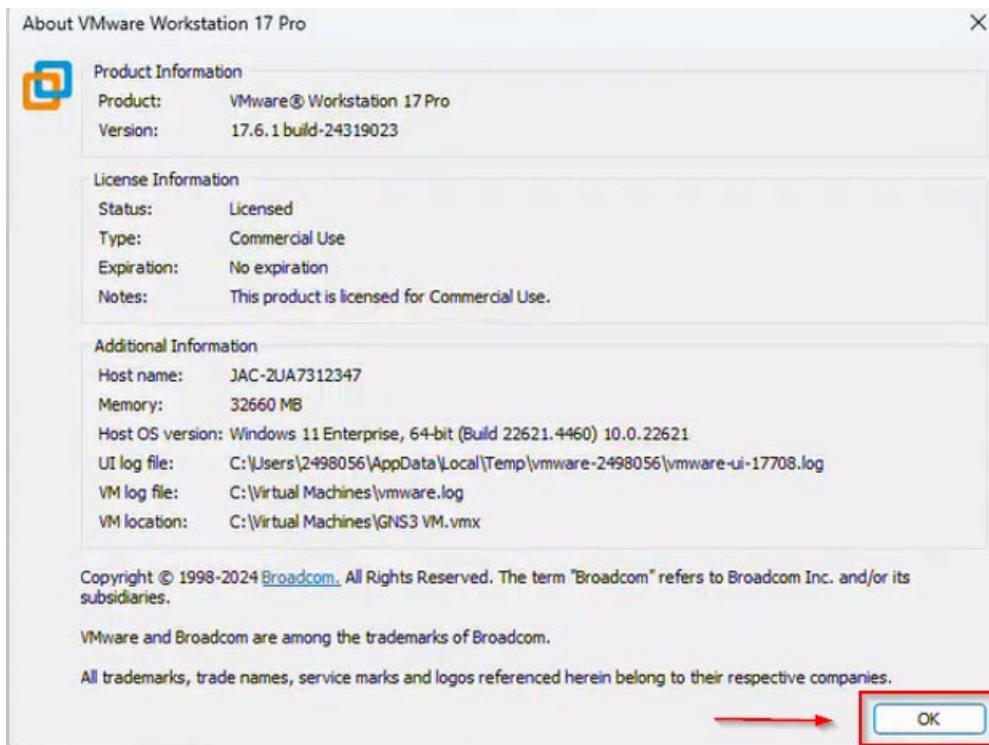
- A) When prompted “You must restart your system for the configuration changes made to VMware Workstation to take effect. Click “Yes” for restart or “No” if you plan to manually restart later.
- B) The virtual machines appear on the screen; virtual machines are not running.



- C) Verify the version of the VMWare workstation Select “Help” from the menu. A submenu will appear, select “About VMware Workstation.”



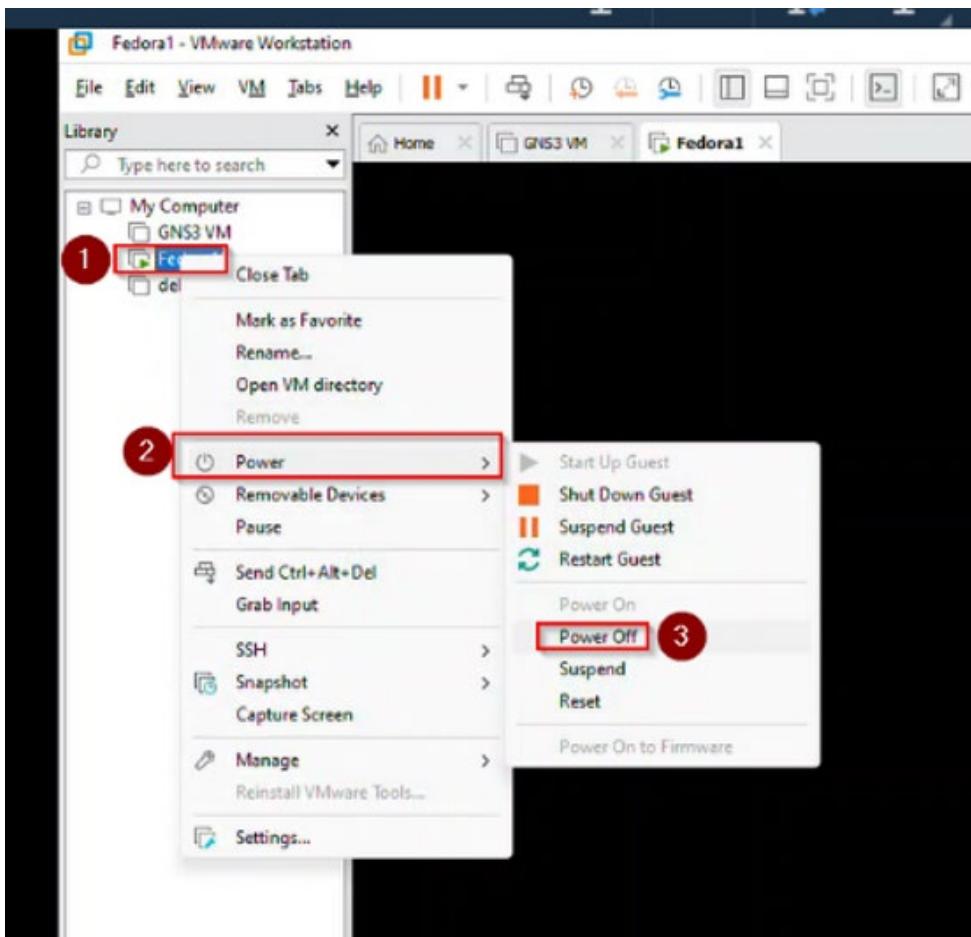
- D) The information about the installed software will pop up. Verify the latest version is installed. Click OK and you are ready to start the VMWare Workstation Pro.



2.4 Delete VM

A) Power off virtual machine if needed.

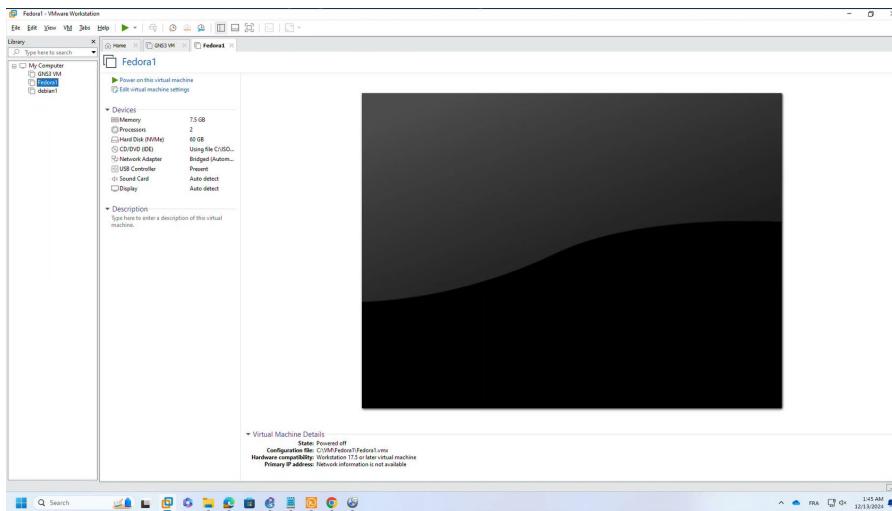
1. Select virtual machine to delete and right click to make submenu appear.
2. In the submenu select “Power>”
3. Submenu will appear select if machine is running “Power off”



4. A confirmation window will appear asking: Are you sure to want to power off the virtual machine <name>”? Press “Power off” to continue with the process.

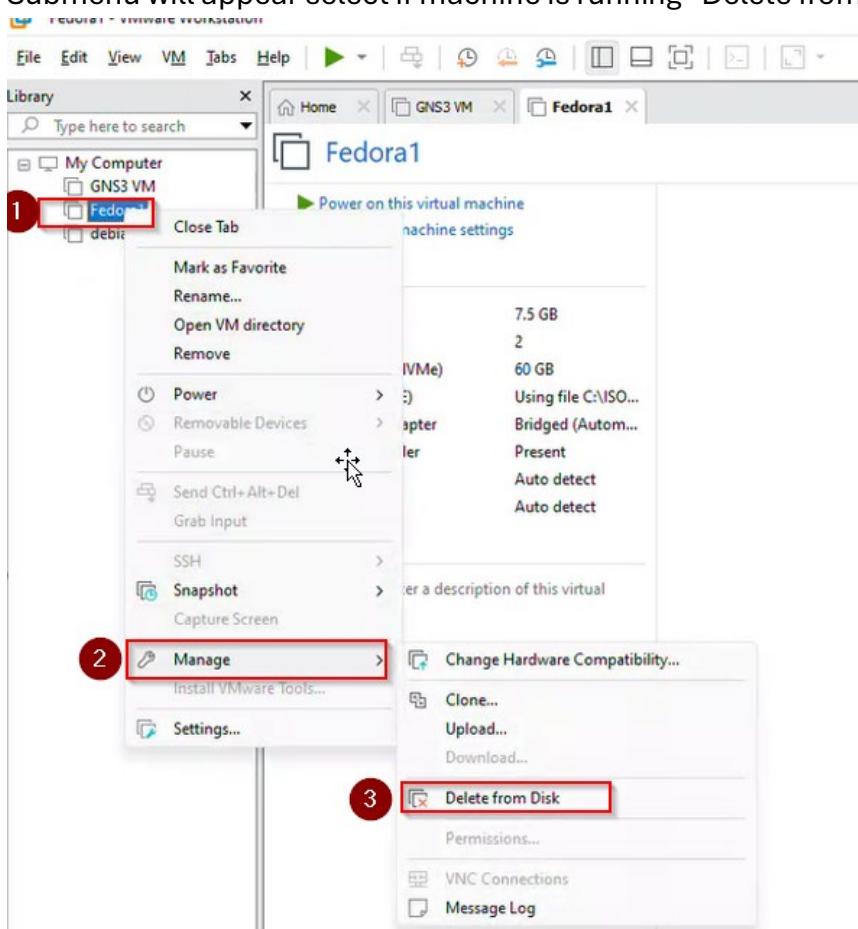


B) Verify virtual machine to be removed is turned off



C) Delete form disk

1. Select virtual machine to delete and right click to make submenu appear.
2. In the submenu select “Manage”
3. Submenu will appear select if machine is running “Delete from Disk”

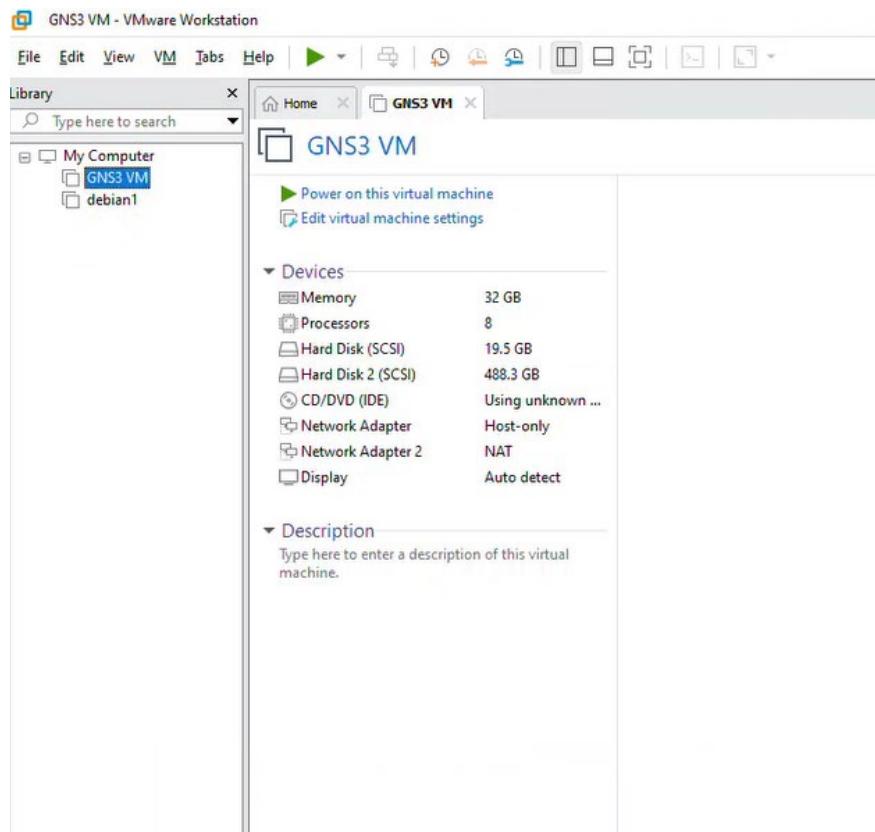


D) Confirm you want to delete VM Press “Yes”



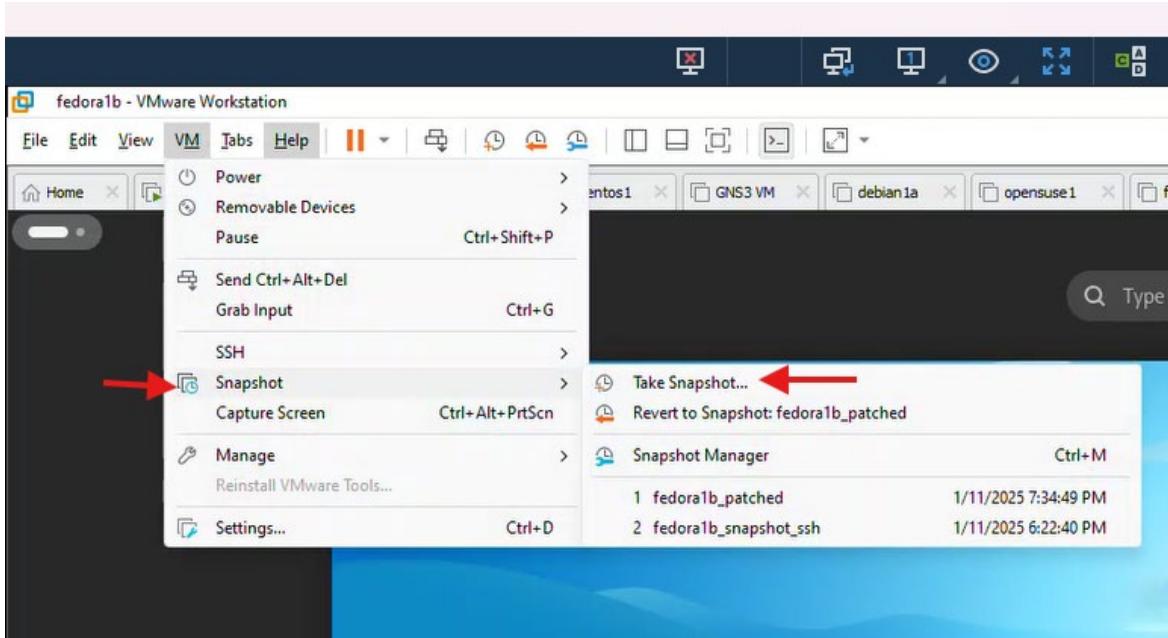
E) Immediately Deleted VM is removed from VMware Workstation Pro

Verify machine is removed from VMware Workstation Pro, VM does not appear on VMware Workstation Pro window.



2.5 Create a snapshot for VM

- A) From the VM you want tot take a snapshot select from Main menu “Snapshot” From Submenu Select “Take Snapshot”.



A window opens , give a name and a description to the snapshot. Press “Take Snapshot”



The process will start , It can take some time. Wait until; the snapshot finished to use the VM

The process per centage is seen at the bottom left of the VM



3 Operating Systems II – Windows

3.1 Install Windows

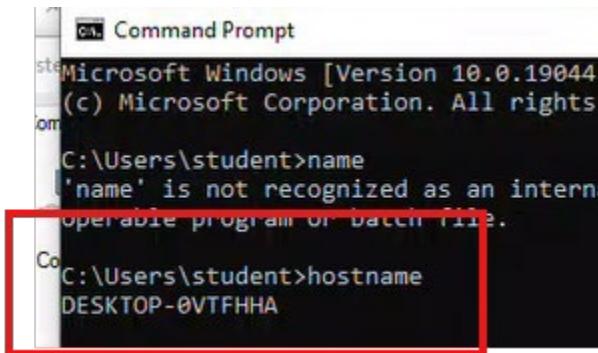
3.1.1 Windows 10 – client

Windows 10 installation is done in section [Install windows 10 in VMWare](#)

3.1.1.1 Change name and give ip address

3.1.1.1.1 Rename Windows 10

- From command line verify current computer name



```
Microsoft Windows [Version 10.0.19044.1]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>name
'name' is not recognized as an internal or
operable program or batch file.

C:\Users\student>hostname
DESKTOP-0VTFHHA
```

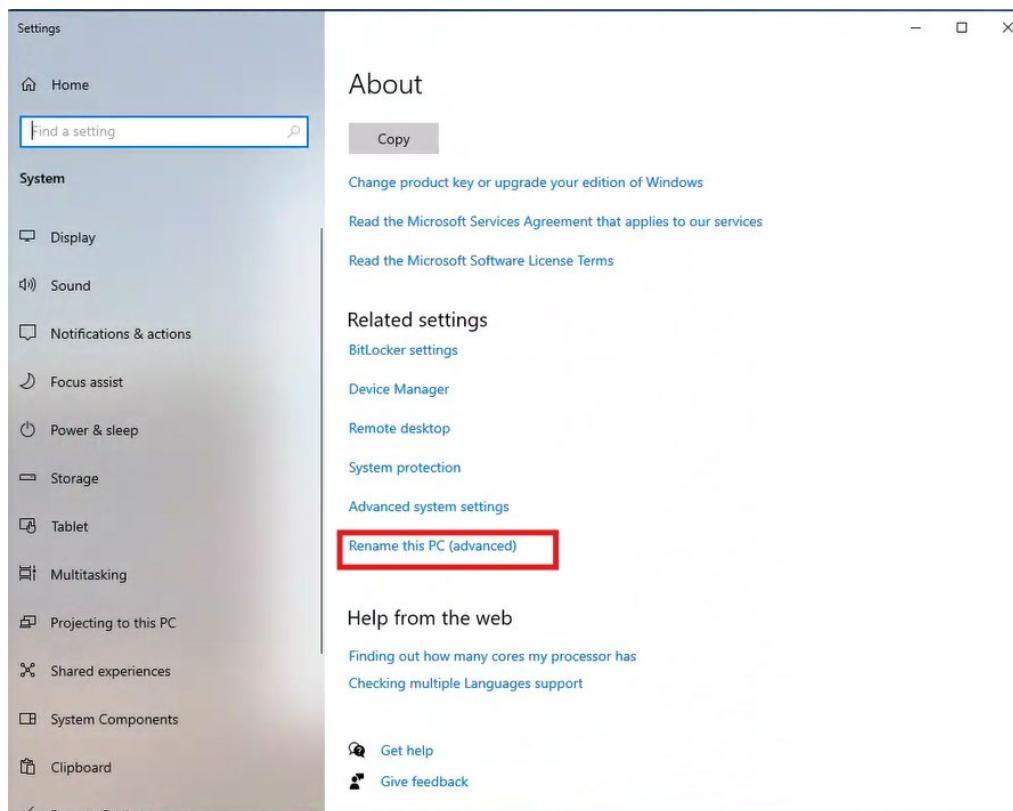
A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows the following text:
Microsoft Windows [Version 10.0.19044.1]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>name
'name' is not recognized as an internal or
operable program or batch file.

C:\Users\student>hostname
DESKTOP-0VTFHHA

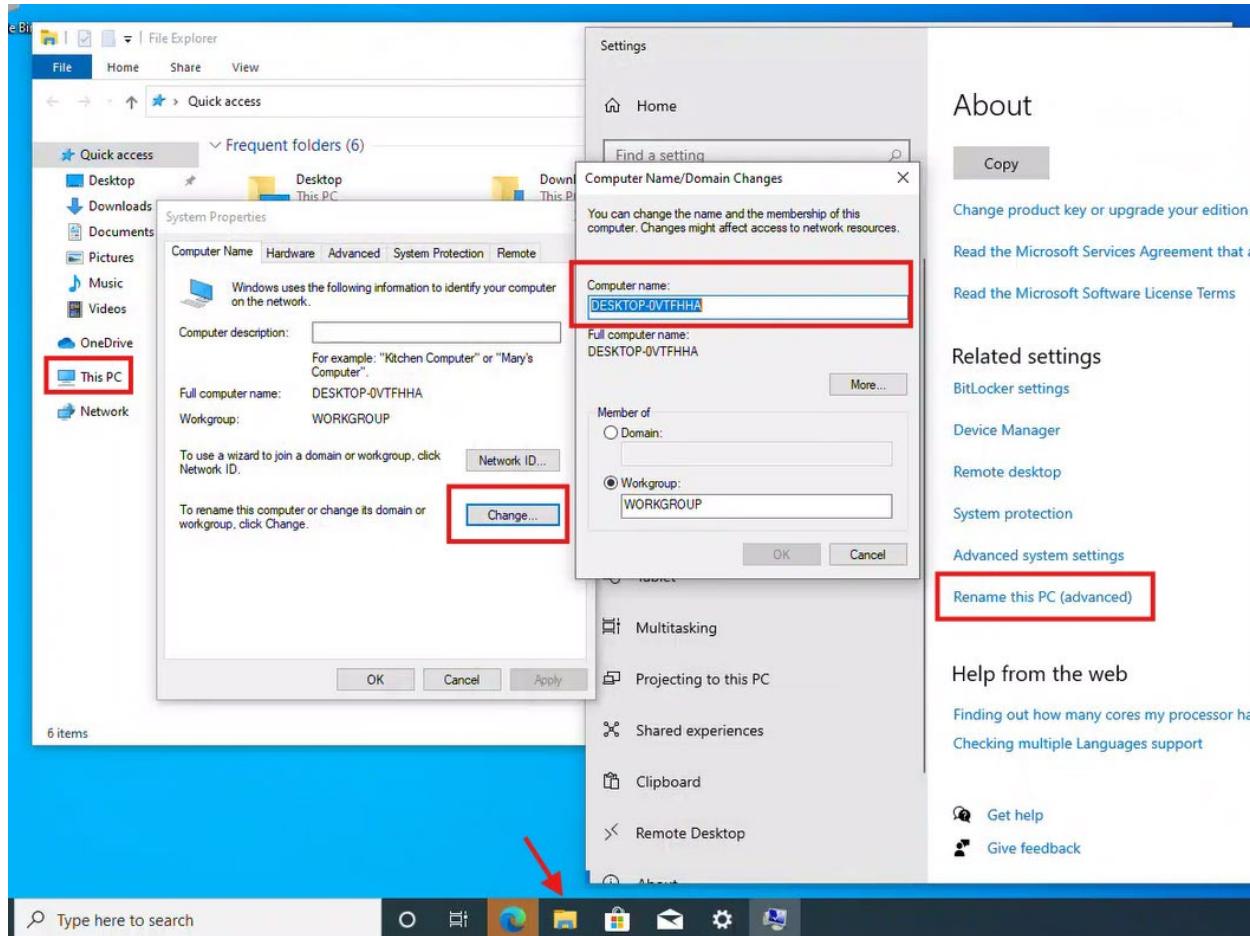
The last two lines of text are highlighted with a red rectangular box.

- Open This PC properties, select Rename this PC (Advanced)



C) Open the following windows to change the name

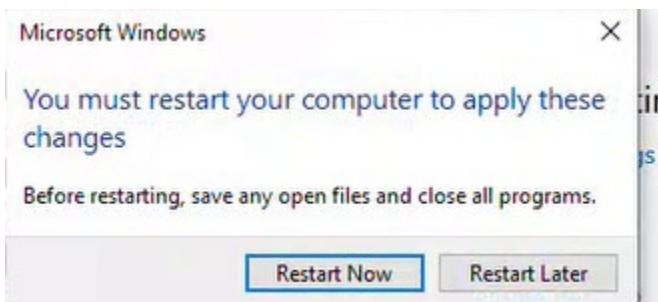
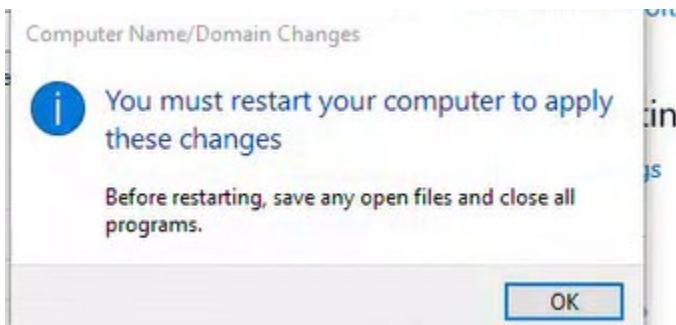
In system properties select change. Window Computer Name/domain change opens, give computer name win10-1a. Press Ok and ok to close windows. Close Settings window too.



Set the name as win10-1a



Reboot



When come back the computer name is set correctly

```
ca: Command Prompt  
Microsoft Windows [Version 10.0.19044.1288]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\student>hostname  
win10-1a  
C:\Users\student>
```

Change ip address windows 10 to a static ip

3.1.1.1.1 Verify current IP

```
C:\Users\student>ipconfig  
Windows IP Configuration  
  
Ethernet adapter Ethernet0:  
  
Connection-specific DNS Suffix . : studentservers.jac-servers.johnabbott.qc.ca  
Link-local IPv6 Address . . . . . : fe80::5850:e773:7c99:8c5d%9  
IPv4 Address . . . . . : 10.164.1.57  
Subnet Mask . . . . . : 255.255.0.0  
Default Gateway . . . . . : 10.164.0.1
```

ipconfig /?

```
C:\Users\student>ipconfig /?

USAGE:
  ipconfig [/allcompartments] [/? | /all |
    /renew [adapter] | /release [adapter] |
    /renew6 [adapter] | /release6 [adapter] |
    /flushdns | /displaydns | /registerdns |
    /showclassid adapter |
    /setclassid adapter [classid] |
    /showclassid6 adapter |
    /setclassid6 adapter [classid] ]

Where
  adapter           Connection name
                    (wildcard characters * and ? allowed, see examples)

Options:
  /?                Display this help message
  /all              Display full configuration information.
  /release          Release the IPv4 address for the specified adapter.
  /release6         Release the IPv6 address for the specified adapter.
  /renew            Renew the IPv4 address for the specified adapter.
  /renew6           Renew the IPv6 address for the specified adapter.
  /flushdns         Purges the DNS Resolver cache.
  /registerdns     Refreshes all DHCP leases and re-registers DNS names
  /displaydns      Display the contents of the DNS Resolver Cache.
  /showclassid     Displays all the dhcp class IDs allowed for adapter.
  /setclassid      Modifies the dhcp class id.
  /showclassid6    Displays all the IPv6 DHCP class IDs allowed for adapter.
  /setclassid6     Modifies the IPv6 DHCP class id.
```

The default is to display only the IP address, subnet mask and default gateway for each adapter bound to TCP/IP.

For Release and Renew, if no adapter name is specified, then the IP address leases for all adapters bound to TCP/IP will be released or renewed.

For Setclassid and Setclassid6, if no ClassId is specified, then the ClassId is removed.

Examples:

```
> ipconfig                   ... Show information
> ipconfig /all               ... Show detailed information
> ipconfig /renew              ... renew all adapters
> ipconfig /renew EL*          ... renew any connection that has its
                                name starting with EL
> ipconfig /release *Con*     ... release all matching connections,
                                eg. "Wired Ethernet Connection 1" or
                                "Wired Ethernet Connection 2"
> ipconfig /allcompartments   ... Show information about all
                                compartments
> ipconfig /allcompartments /all ... Show detailed information about all
                                compartments
```

```
C:\Users\student>■
```

Ipconfig /all

```
C:\Users\student>ipconfig /all

Windows IP Configuration

Host Name . . . . . : win10-1a
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : studentservers.jac-servers.johnabbott.qc.ca

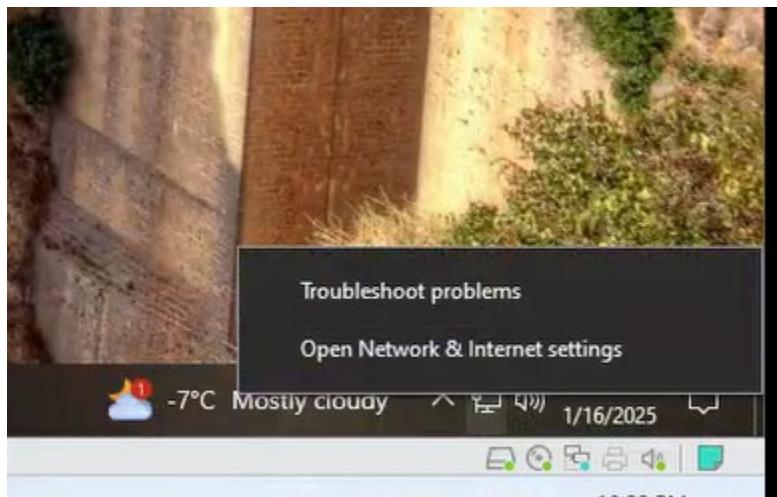
Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . : studentservers.jac-servers.johnabbott.qc.ca
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-E3-6F-F2
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::5850:e773:7c99:8c5d%9(Preferred)
IPv4 Address. . . . . : 10.164.1.57(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Lease Obtained. . . . . : Thursday, January 16, 2025 5:21:18 PM
Lease Expires . . . . . : Friday, January 17, 2025 2:51:14 AM
Default Gateway . . . . . : 10.164.0.1
DHCP Server . . . . . : 10.162.240.52
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
DNS Servers . . . . . : 10.162.240.201
                                         10.162.240.202
                                         10.172.240.209
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>
```

3.1.1.1.2 | Change Ip Address

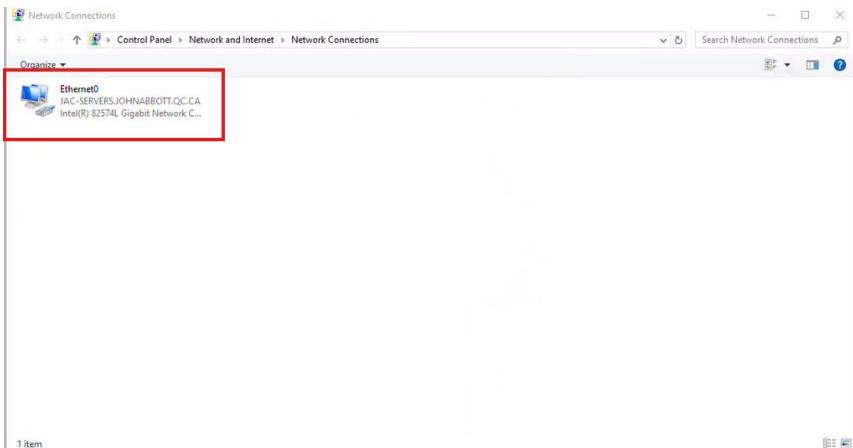
- A) Open network and Internet settings



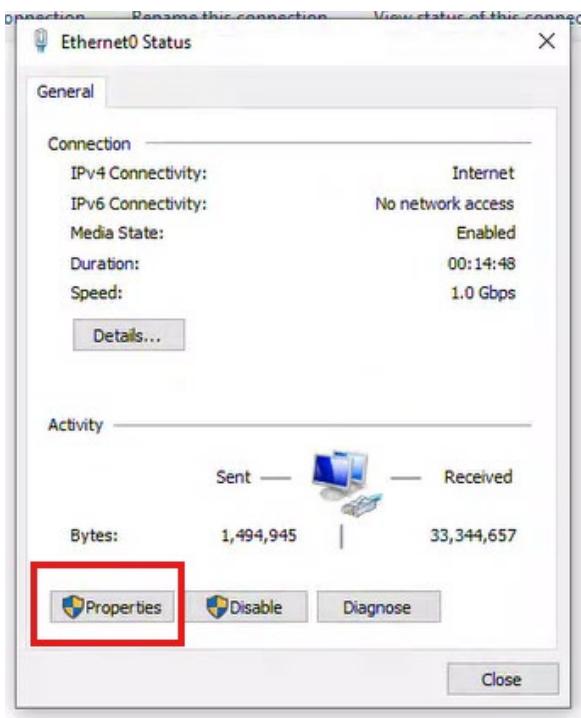
B) Select change adapter options



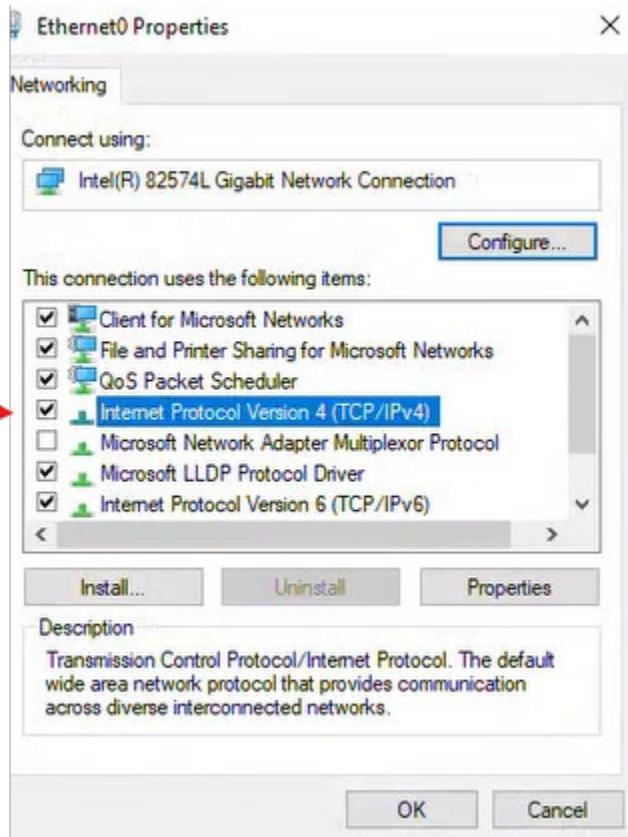
C) Select Ethernet 0



D) A window opens select Properties



E) Select IPV4



F) Give Ip addresses

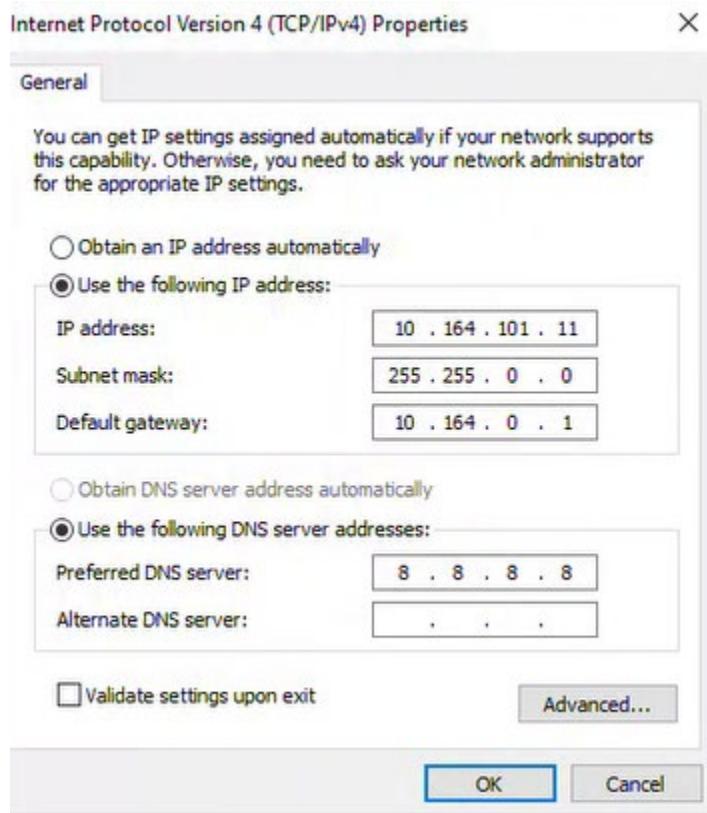
Select Use Following IP Address

IP address -10.164.101.11

Subnet mask 255.255.0.0

Gateway 10.164.0.1

Select Use following DNS Address set IP to 8.8.8.8



3.1.1.1.3 Verify static IP in Command line

Open CMD and give command ipconfig /all

```
Command Prompt
Microsoft Windows [Version 10.0.19045.5371]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>IPCONFIG /ALL

Windows IP Configuration

Host Name . . . . . : win10-1a
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-E3-6F-F2
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3d5f:eedd:957f:5947%9(PREFERRED)
IPv4 Address. . . . . : 10.164.101.11(PREFERRED)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
DNS Servers . . . . . : 8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>
```

A) Test ping

- Ping own ip – ping 10.164.101.1
- Ping gateway – 10.164.0.1
- Ping DNS – ping 8.8.8.8
- ping google.com

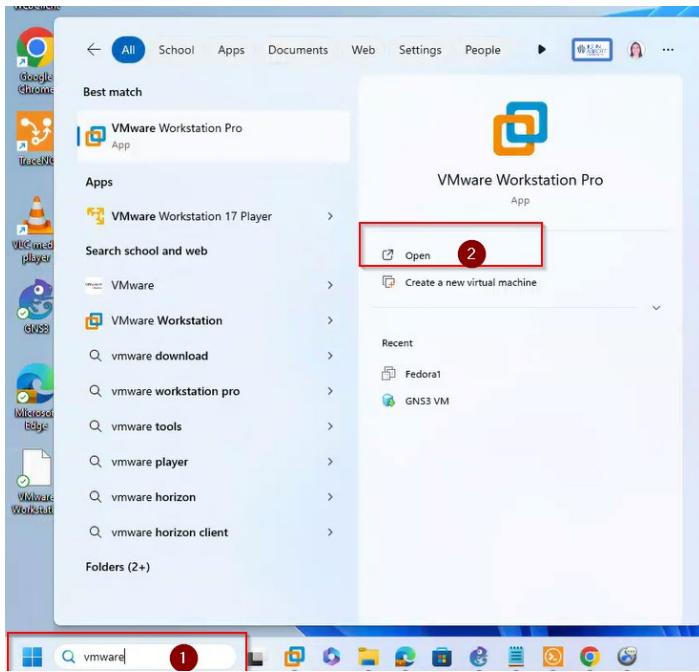
```
Pinging 10.164.101.11 with 32 bytes of data:  
Reply from 10.164.101.11: bytes=32 time<1ms TTL=128  
Reply from 10.164.101.11: bytes=32 time<1ms TTL=128  
Reply from 10.164.101.11: bytes=32 time<1ms TTL=128  
  
Ping statistics for 10.164.101.11:  
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 0ms, Average = 0ms  
Control-C  
^C  
C:\Users\student>PING 10.164.0.1  
  
Pinging 10.164.0.1 with 32 bytes of data:  
Reply from 10.164.0.1: bytes=32 time<1ms TTL=64  
Reply from 10.164.0.1: bytes=32 time<1ms TTL=64  
Reply from 10.164.0.1: bytes=32 time<1ms TTL=64  
  
Ping statistics for 10.164.0.1:  
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 0ms, Average = 0ms  
Control-C  
^C  
C:\Users\student>PING 8.8.8.8  
  
Pinging 8.8.8.8 with 32 bytes of data:  
Reply from 8.8.8.8: bytes=32 time=1ms TTL=118  
Reply from 8.8.8.8: bytes=32 time=1ms TTL=118  
  
Ping statistics for 8.8.8.8:  
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 1ms, Maximum = 1ms, Average = 1ms  
Control-C  
^C  
C:\Users\student>ping google.com  
  
Pinging google.com [142.250.69.110] with 32 bytes of data:  
Reply from 142.250.69.110: bytes=32 time=1ms TTL=118  
Reply from 142.250.69.110: bytes=32 time=1ms TTL=118  
Reply from 142.250.69.110: bytes=32 time=2ms TTL=118  
  
Ping statistics for 142.250.69.110:  
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:
```

3.1.2 Windows 11 – client

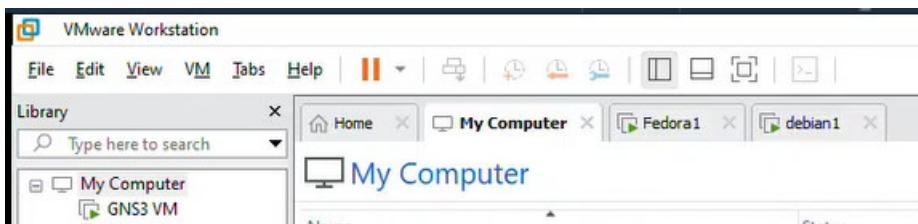
3.1.2.1 Create a virtual machine

A) Open the VMware Workstation App

- 1 Look for application in windows search
- 2 Once VMware Workstation Pro appears, open application

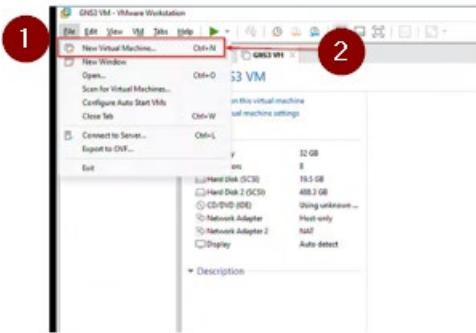


B) VMware workstation opens:

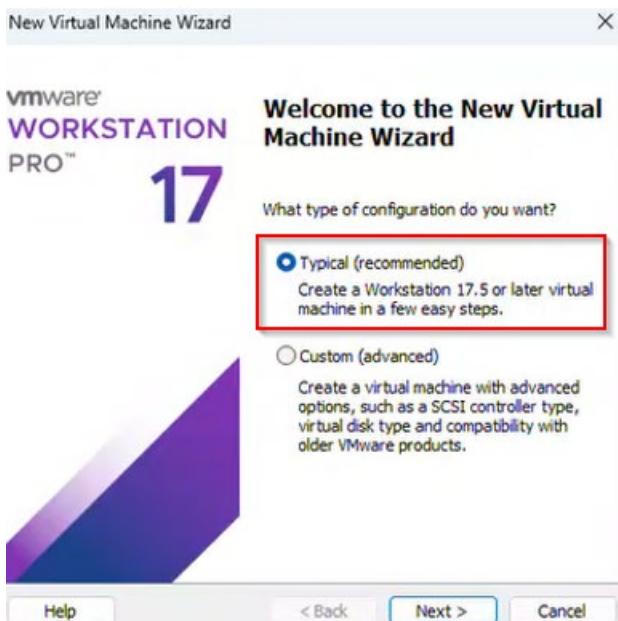


C) Select from top menu and submenu

1. File
2. New Virtual Machine...

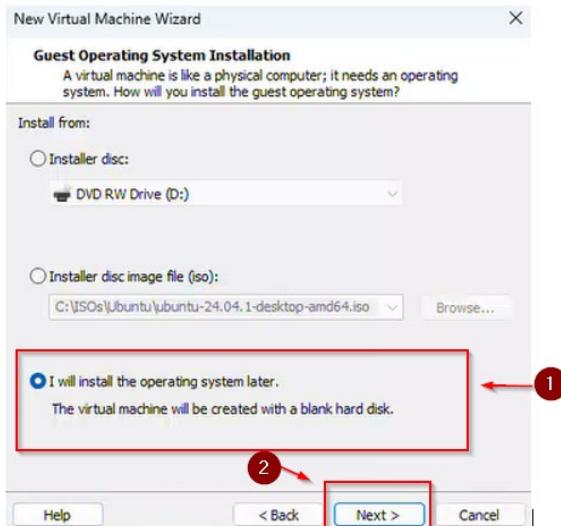


- D) When the “Welcome to the New Virtual Machine Wizard” window pops up, select “Typical (recommended)”, then click “Next >”



E) “Guest Operating System Installation” window pops up, please:

1. Select “I will install the operating system later. The virtual machine will be created with a blank hard disk.”.
2. Click “Next”

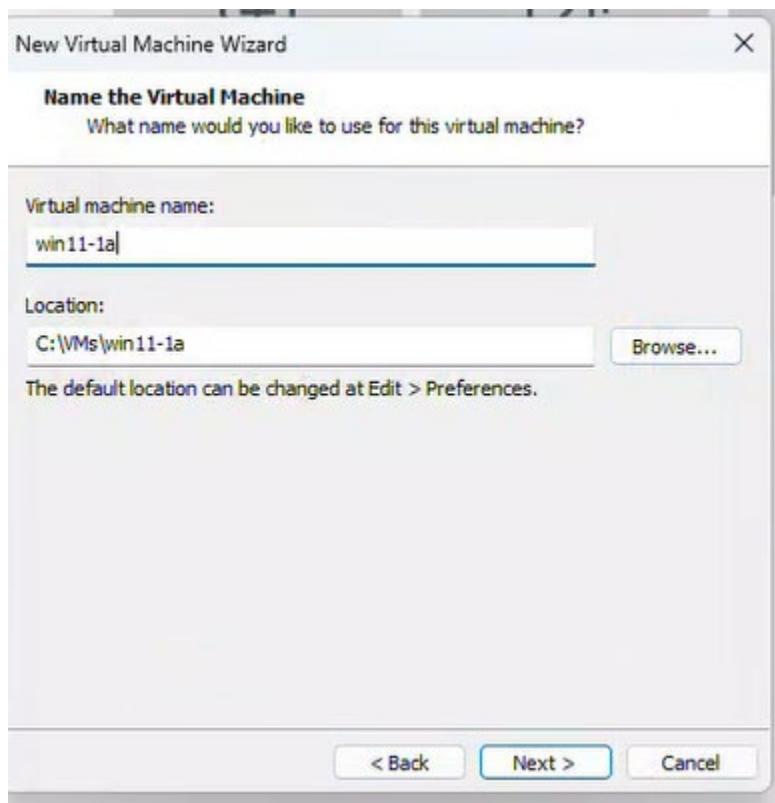


F) The window “Select a Guest Operating System Which operating system will be installed on this virtual machine?”

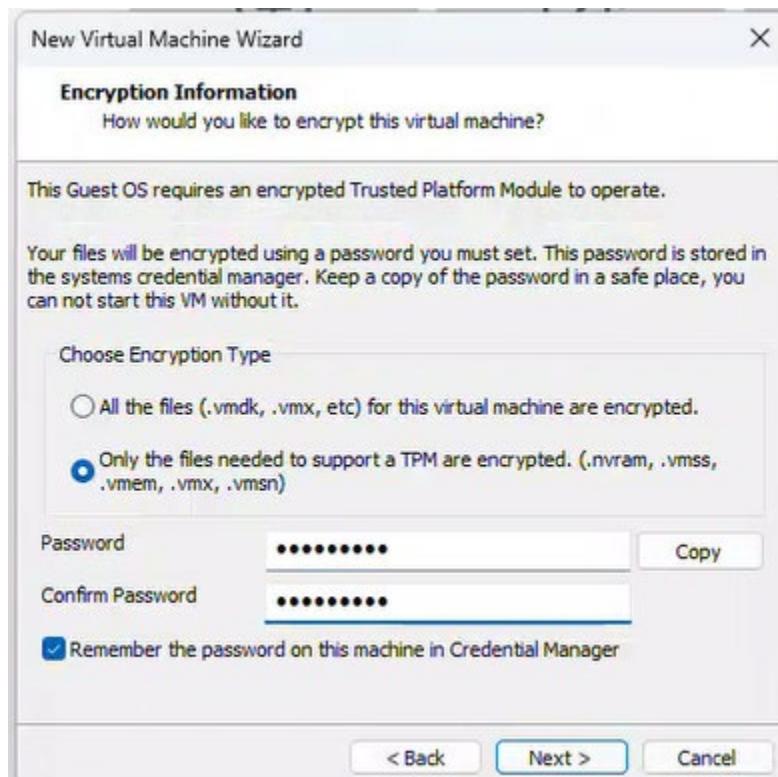
1. Select Microsoft Windows operating system
2. For Version, select “Windows 11 x64”
3. Select “Next”



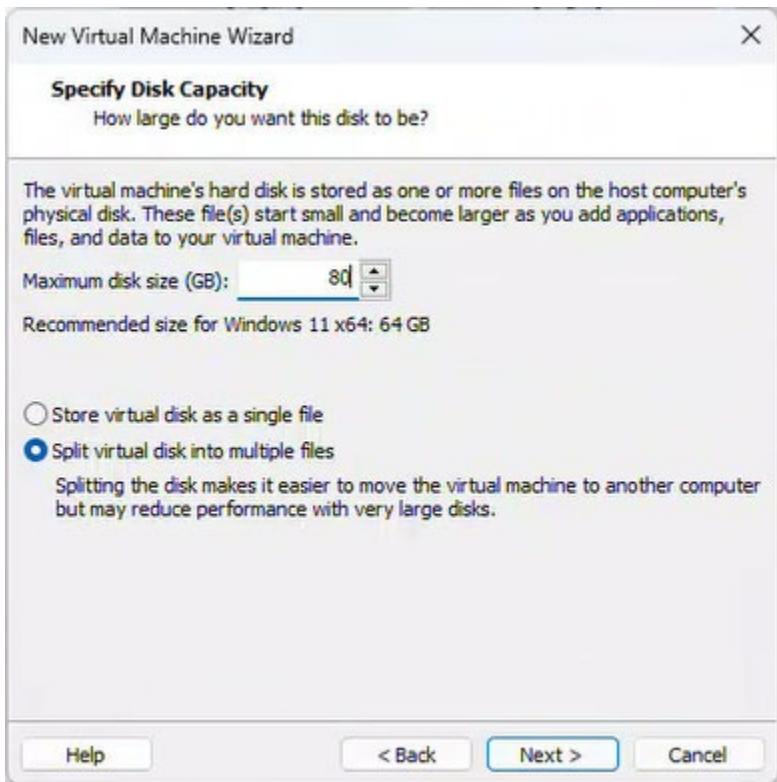
- G) In the window “Name the Virtual Machine”
1. Set name Virtual machine name: “win11-1a”
 2. For the location Browse to change directory



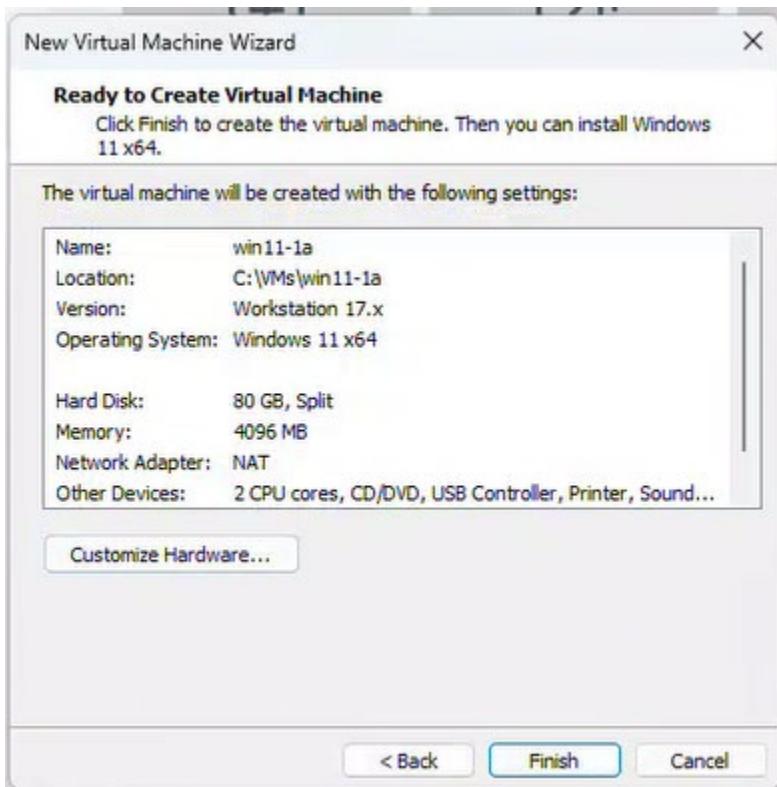
- H) In new virtual machine wizard Encryption information select the following and give the password



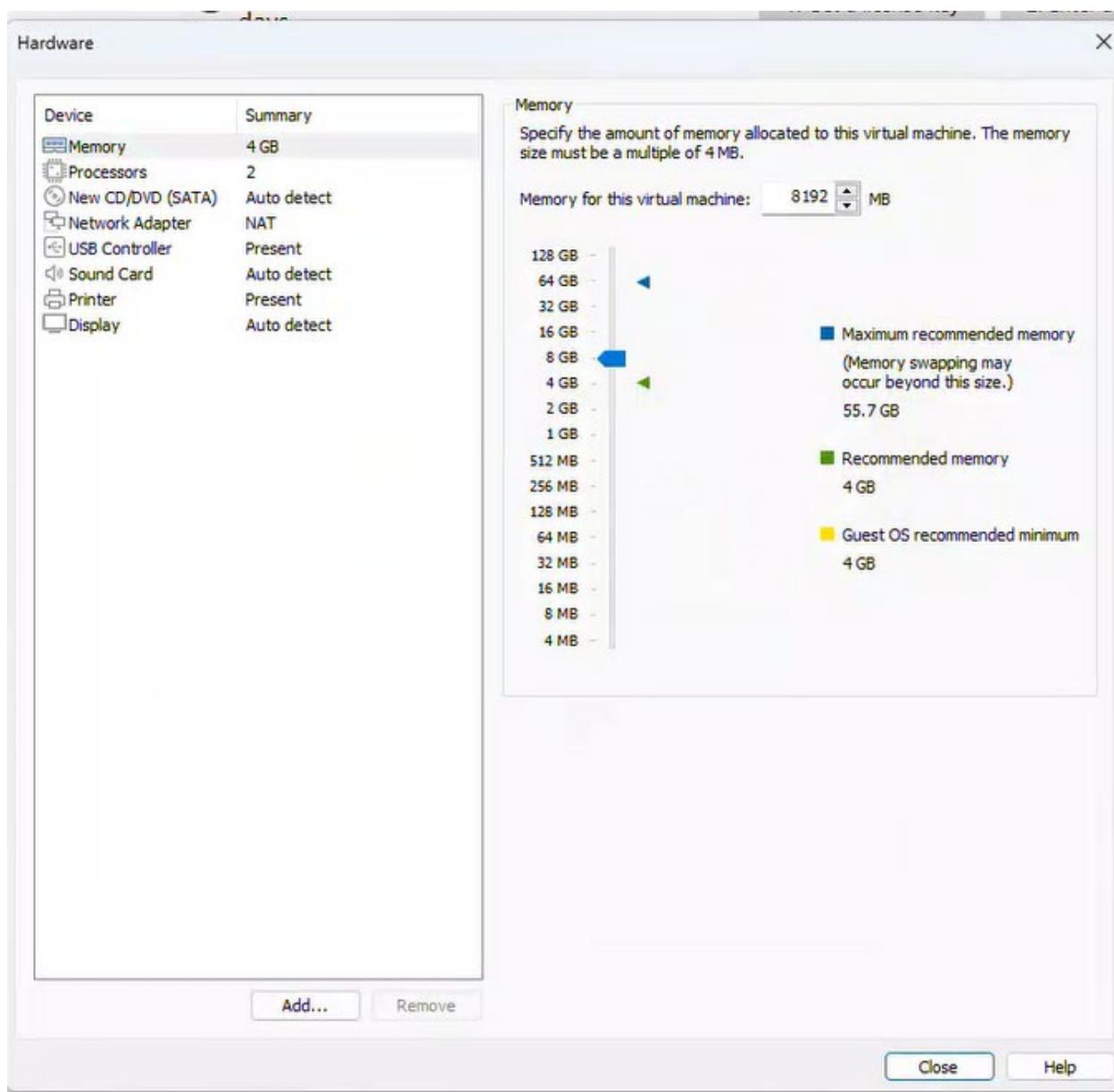
- I) Windows 11 should be 80 gigs



J) Give 8 gigs of RAM

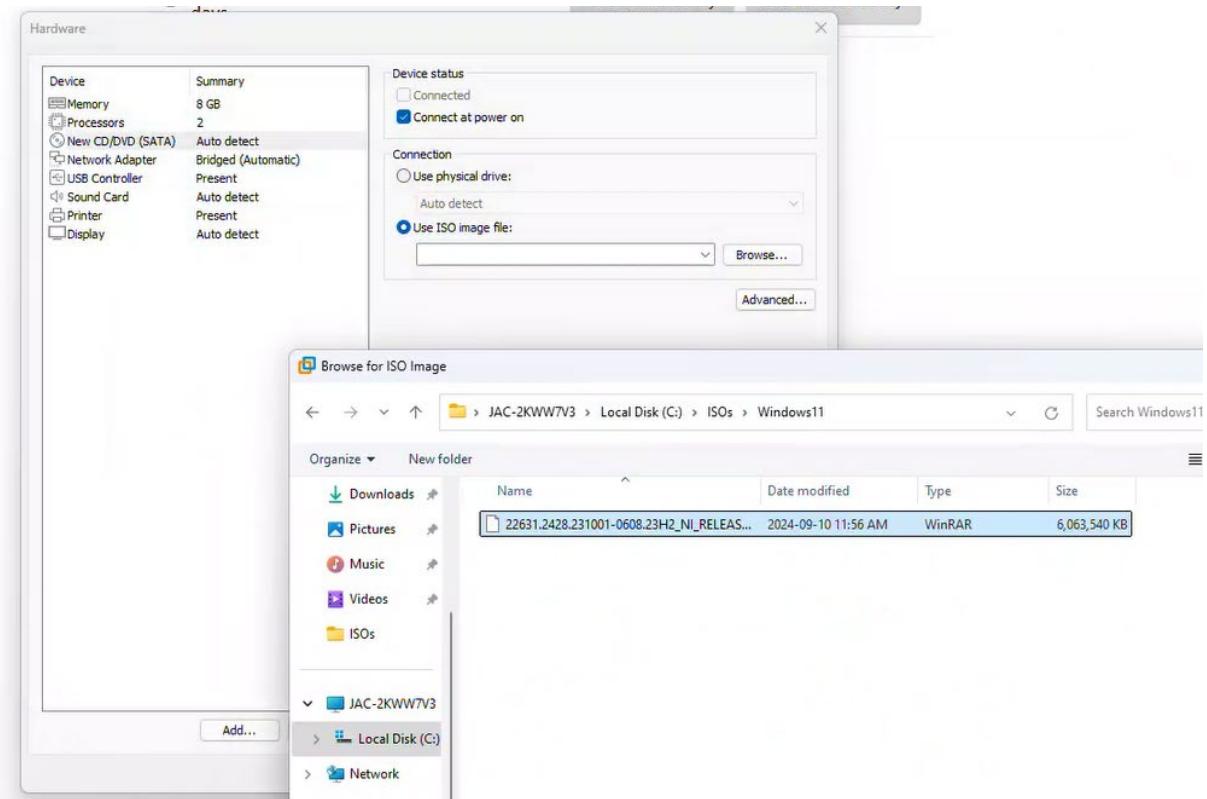


Add eight gigs of RAM

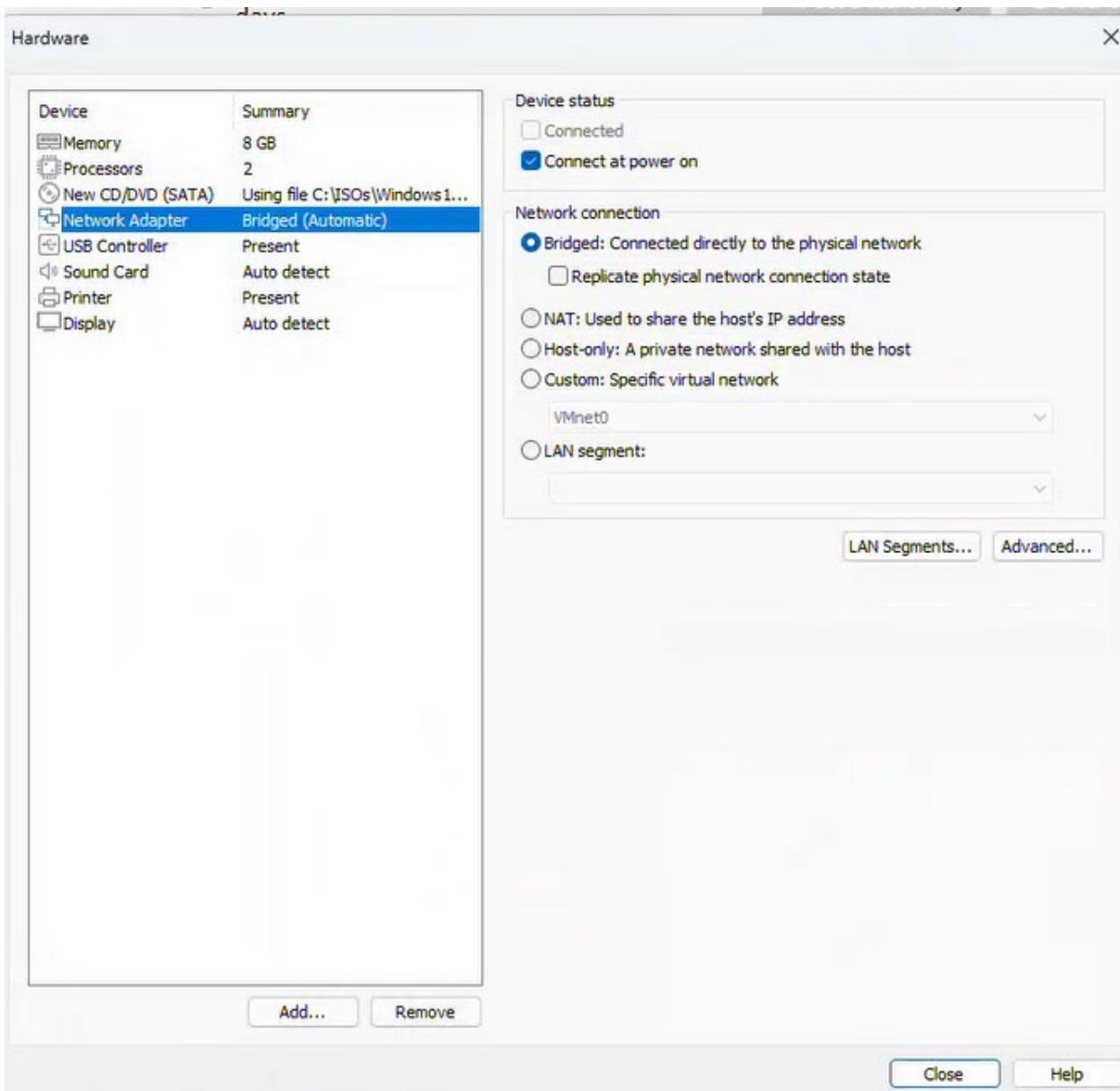


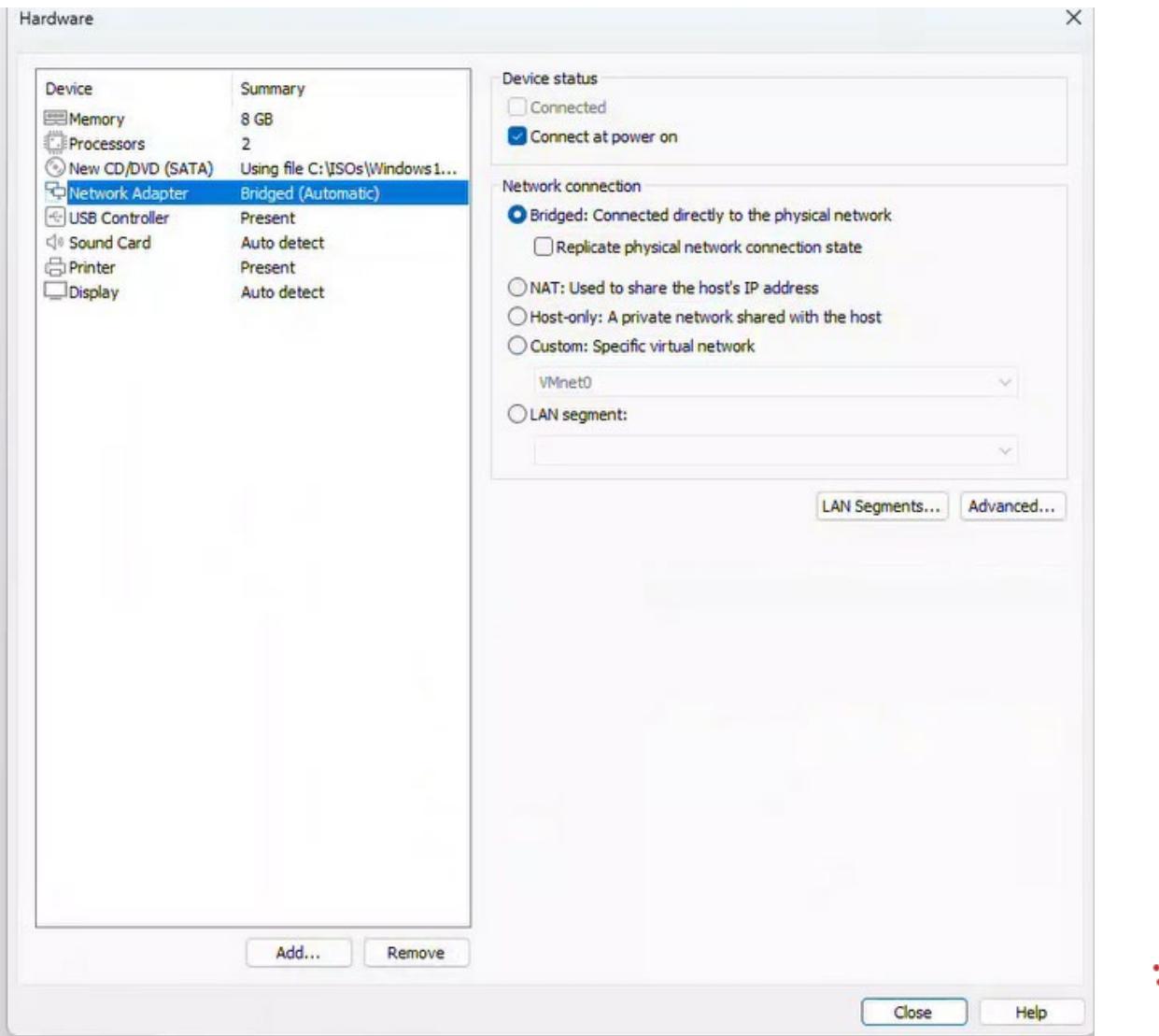
K) New CD/DVD (SATA)

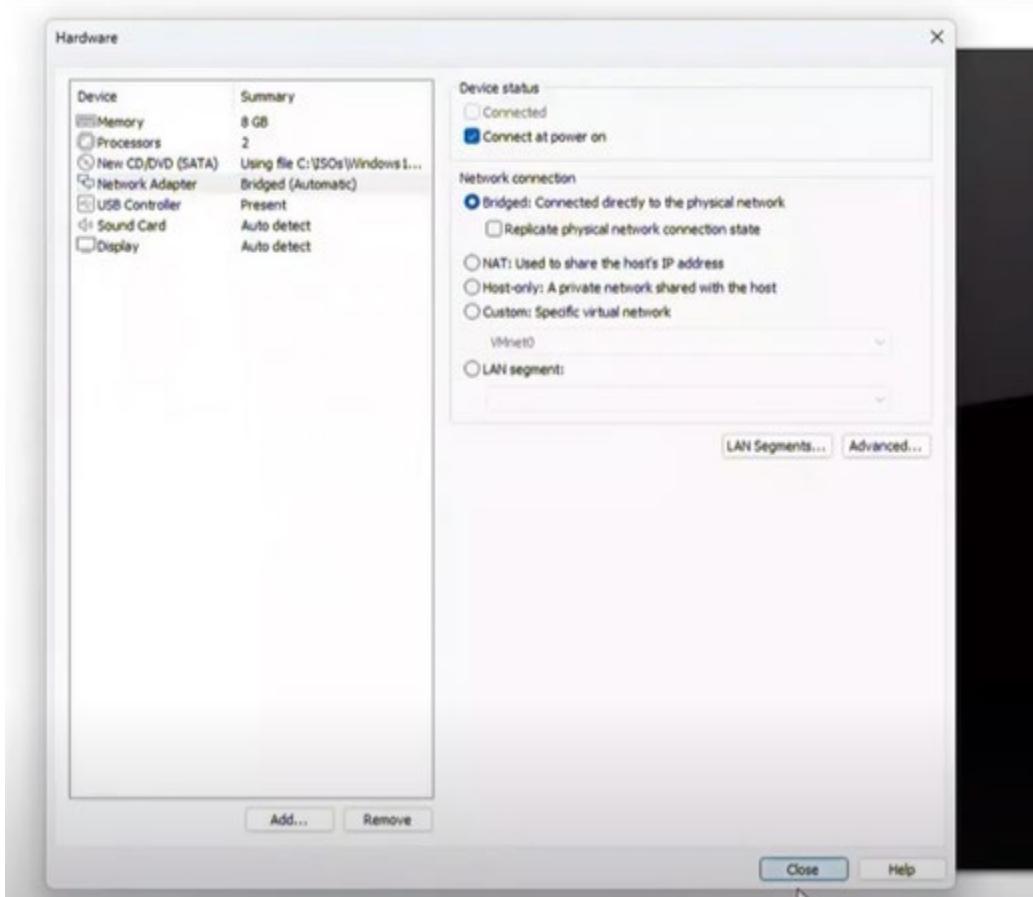
1. Select New CD/DVD (SATA)
2. Highlight Use ISO image file
3. select Browse.



L) Network adapter bridged

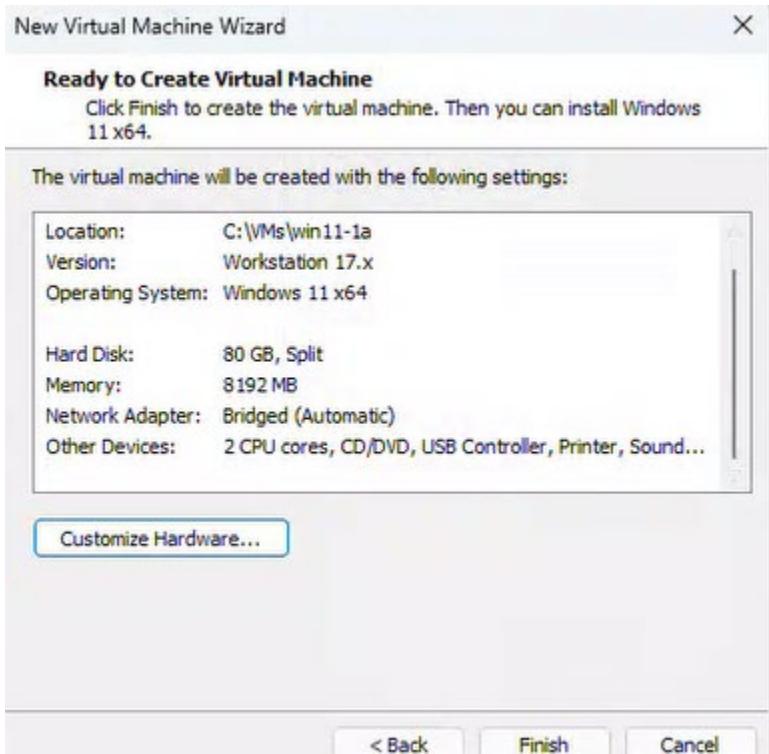






M) Review

We should be ok to setup windows 11



3.1.2.2 Installing windows 11

A) Power on the VM

The screenshot shows the Oracle VM VirtualBox Manager interface with the 'win11-1a' virtual machine selected. The main window displays the following details:

win11-1a

- Power on this virtual machine**
- Edit virtual machine settings**

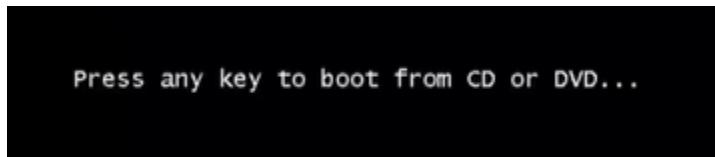
Devices

Memory	8 GB
Processors	2
Hard Disk (NVMe)	80 GB
CD/DVD (SATA)	Using file C:\ISO...
Network Adapter	Bridged (Autom...
USB Controller	Present
Sound Card	Auto detect
Printer	Present
Display	Auto detect
Trusted Platform Module	Present

Description

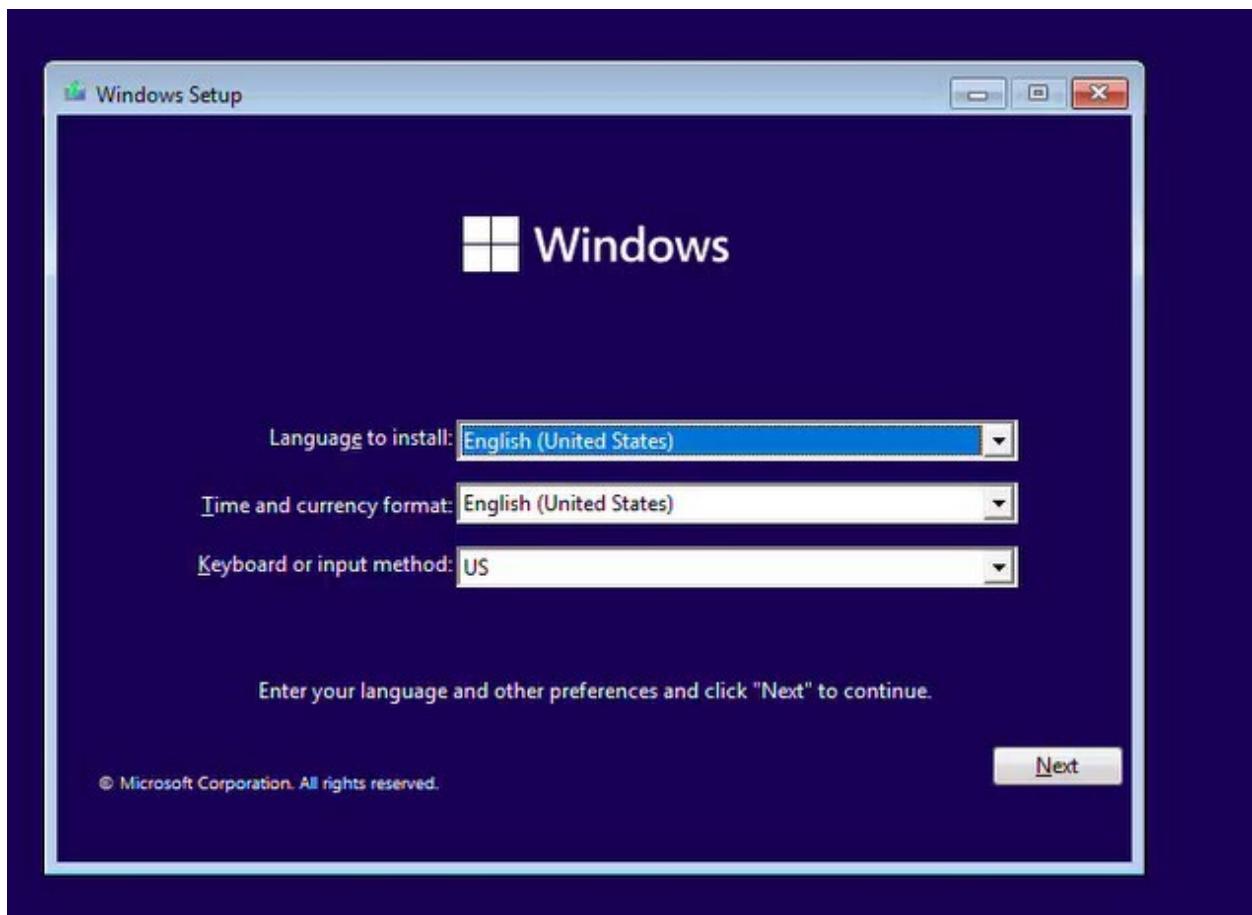
Type here to enter a description of this virtual machine.

B) Be quick to press any key to access installation menu.



If you missed it restart machine again and try to do it quicker

C) You will get the next window

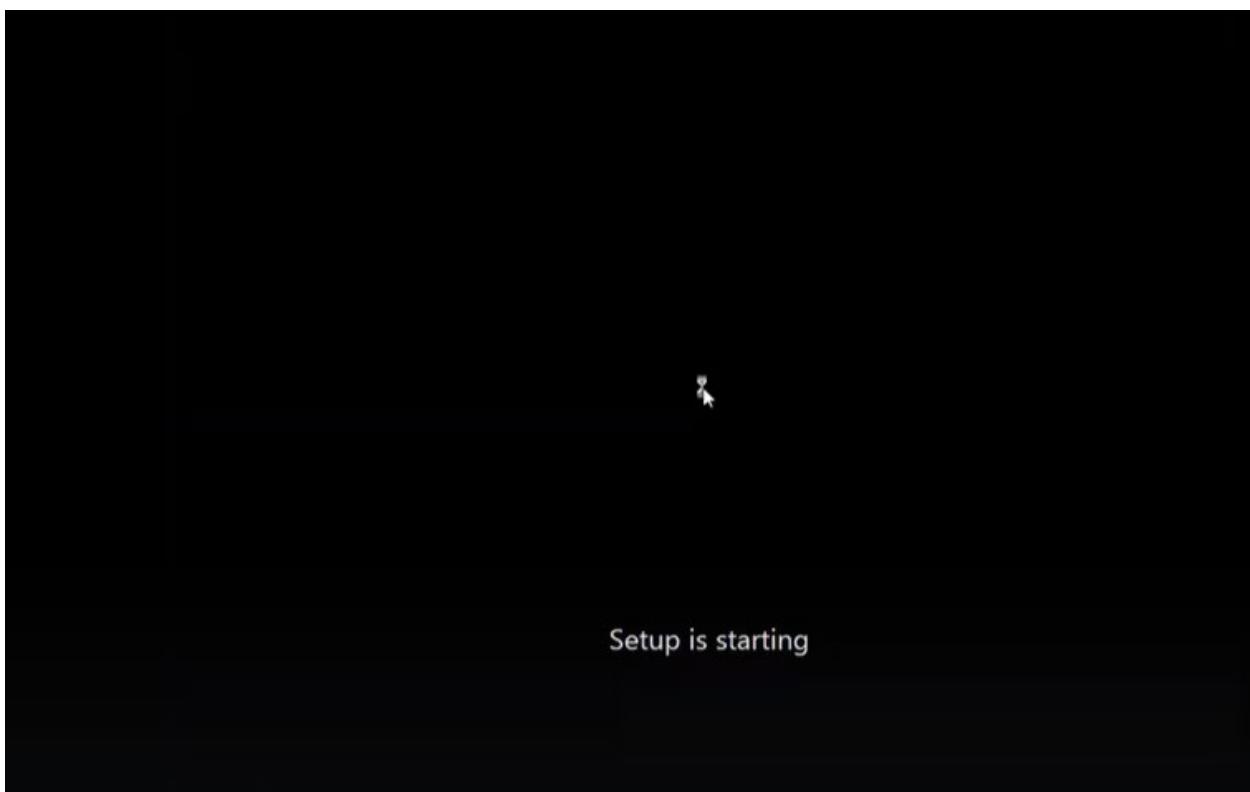


Click on Next

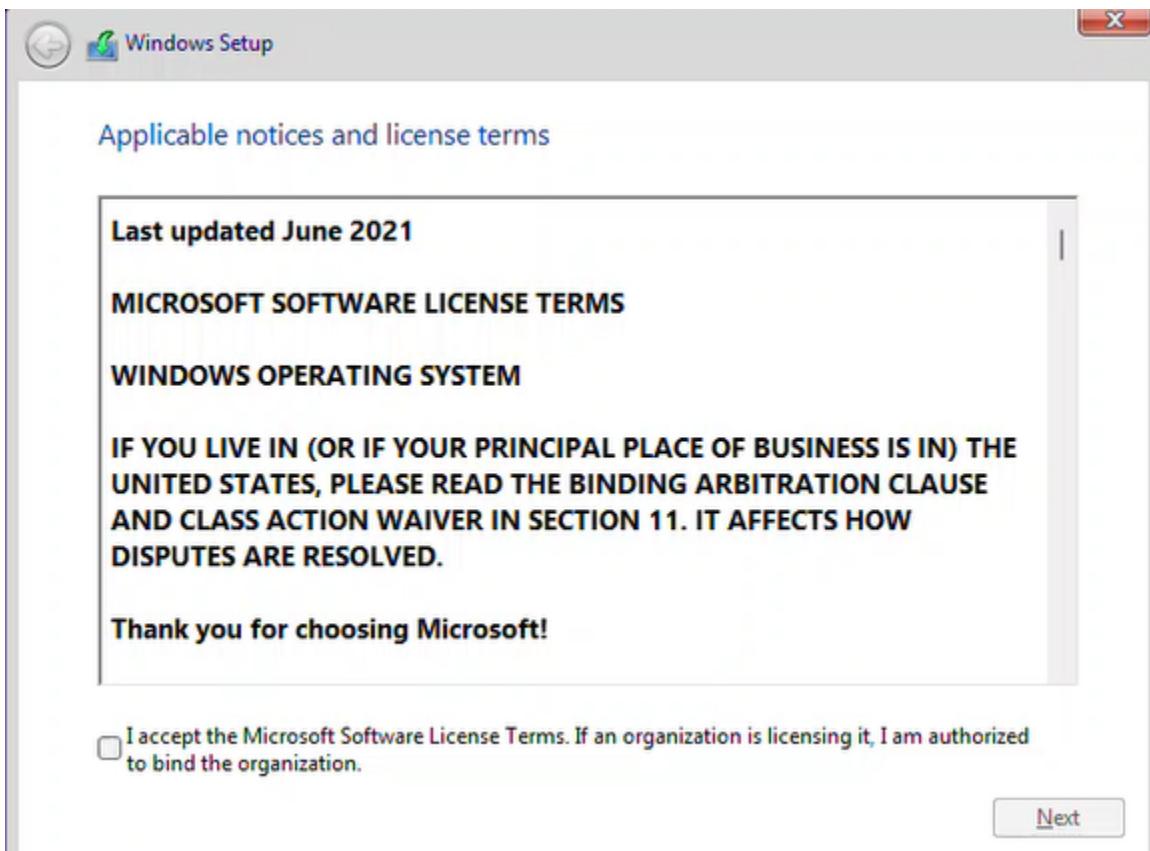
D) Click on Install now



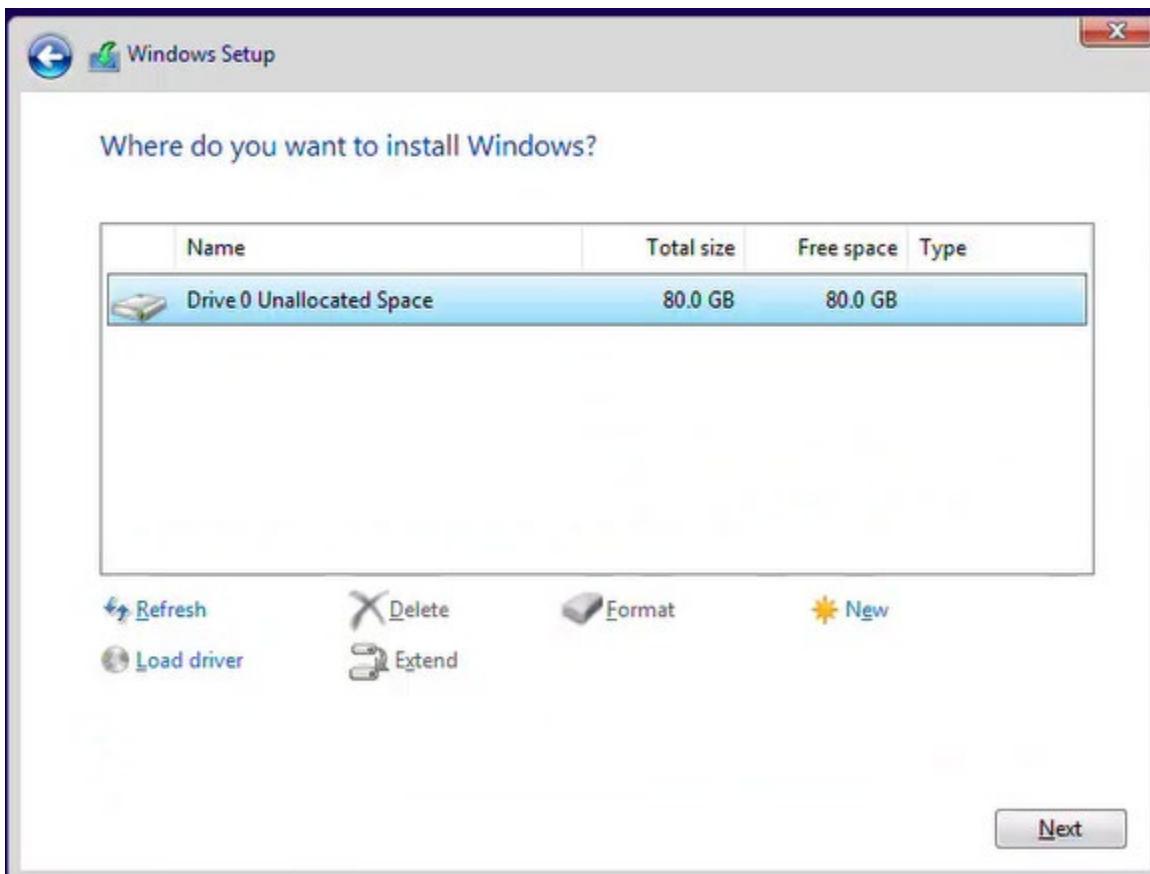
E) Installation starts



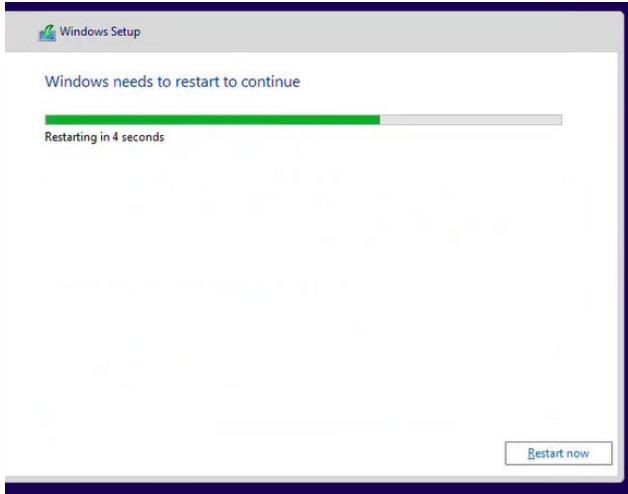
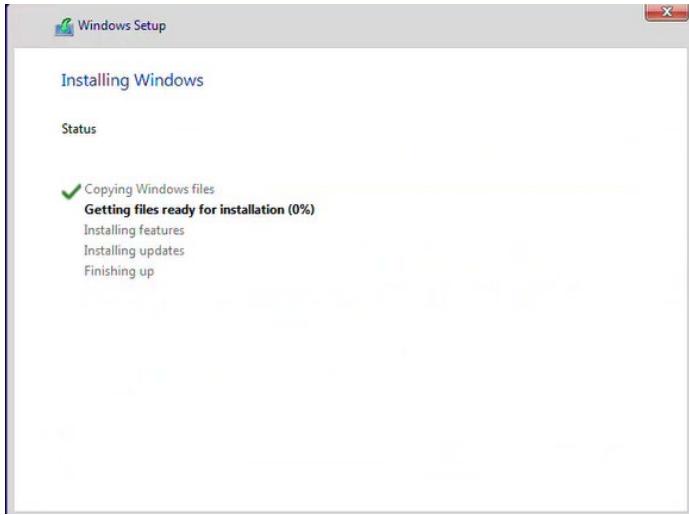
F) Accept the license Agreement



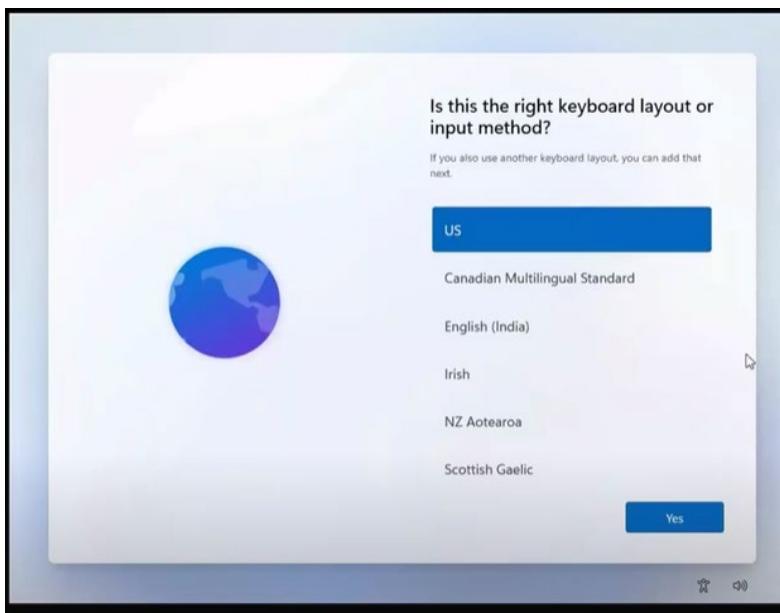
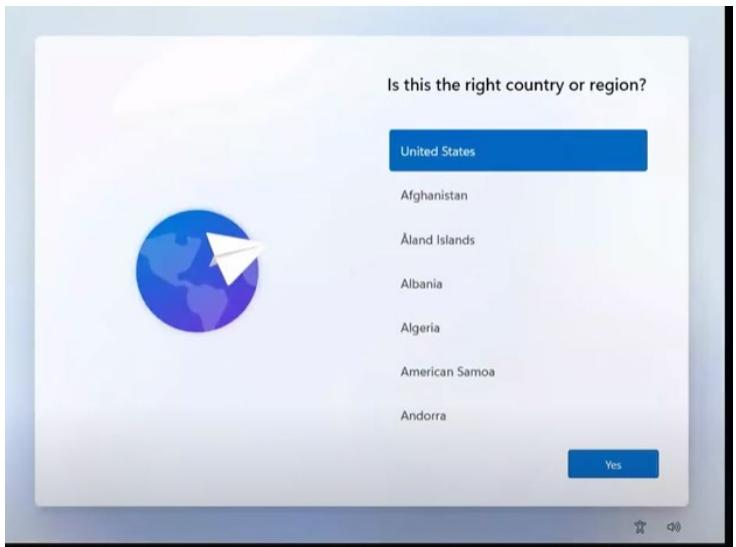
G) Select disk

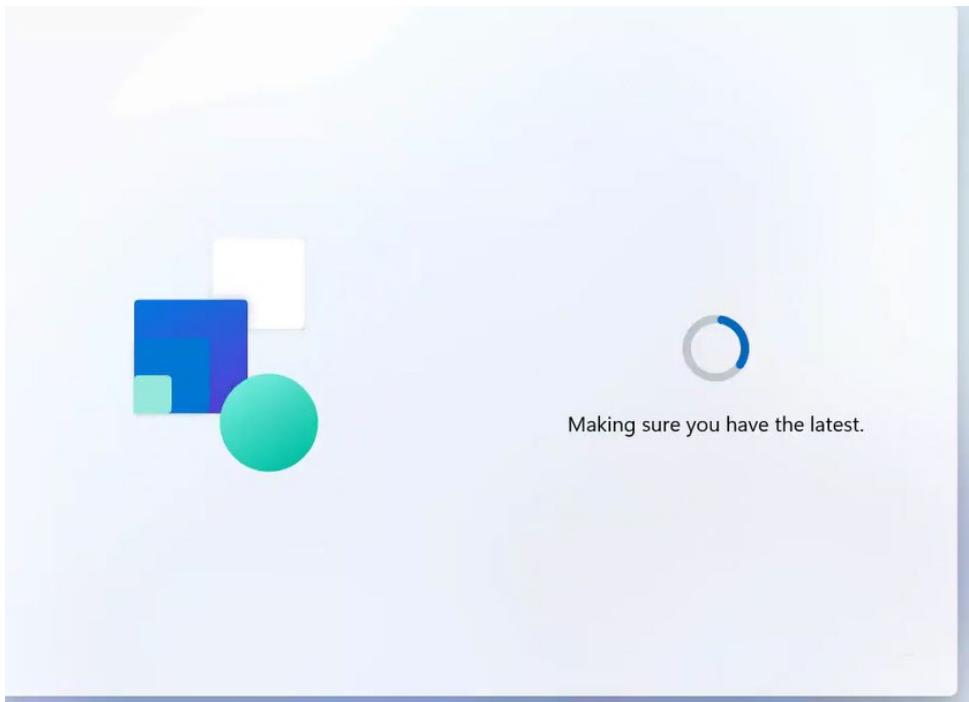


H) Installation starts

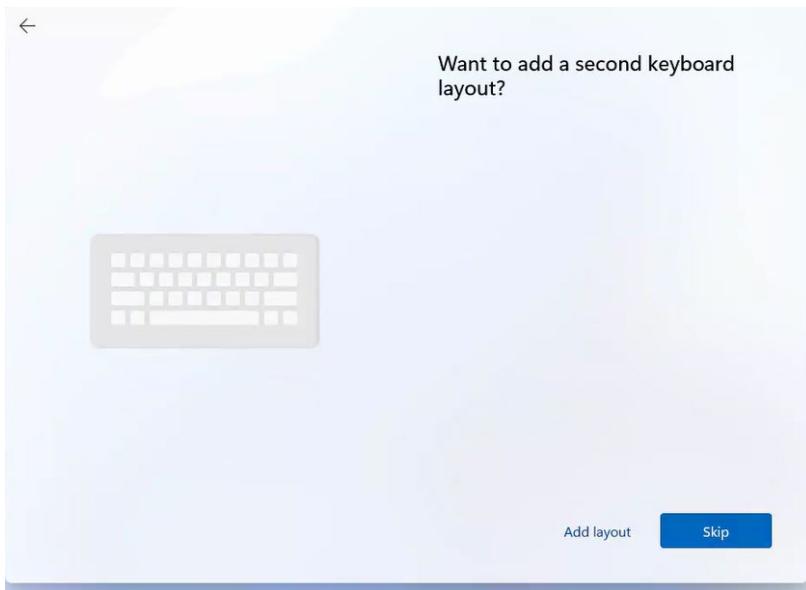


- I) At the end it will restart and a series of screen will appear select what is indicated below

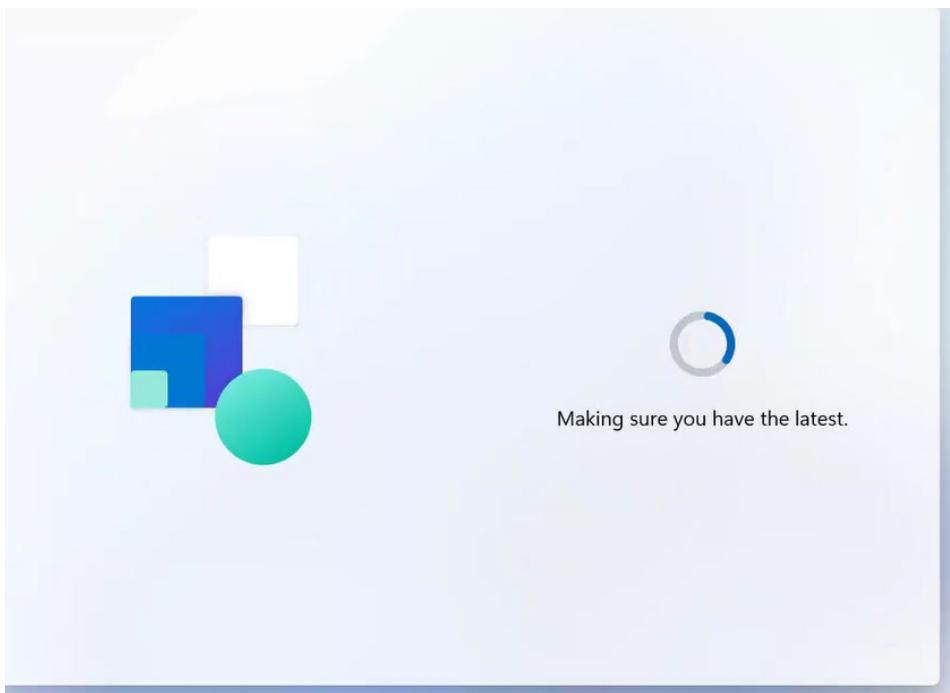




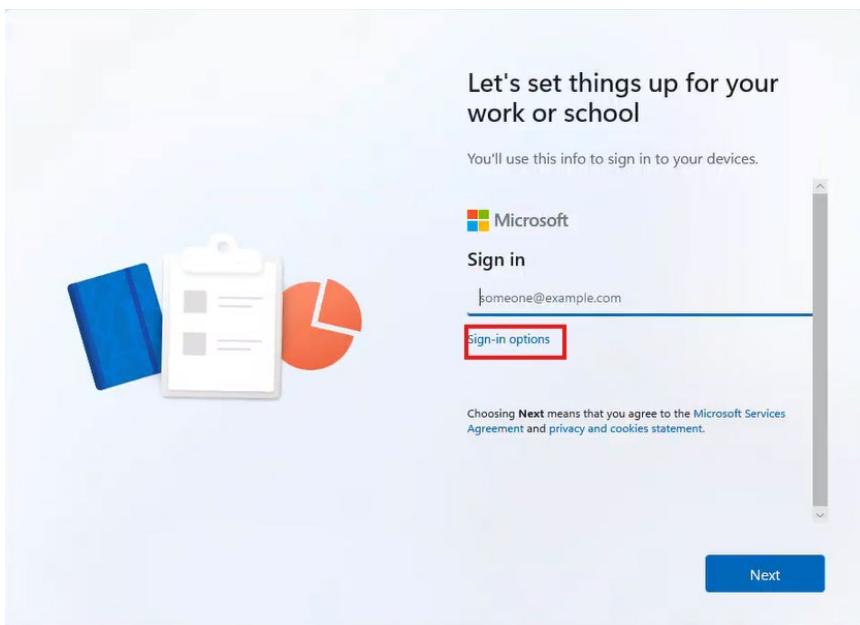
No second keyboard skip



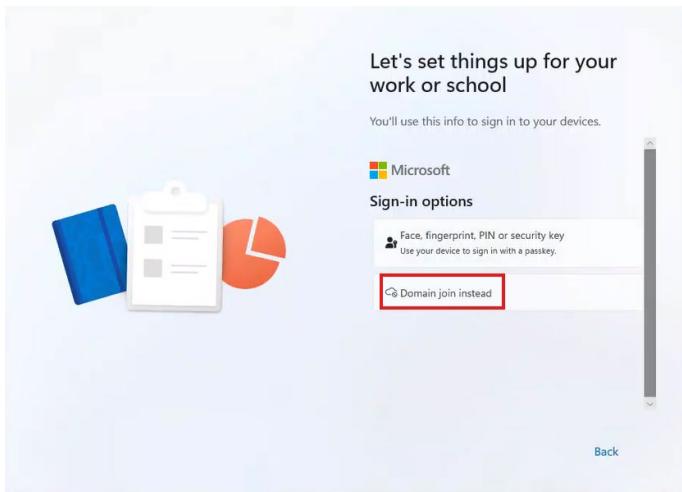
Checking updates



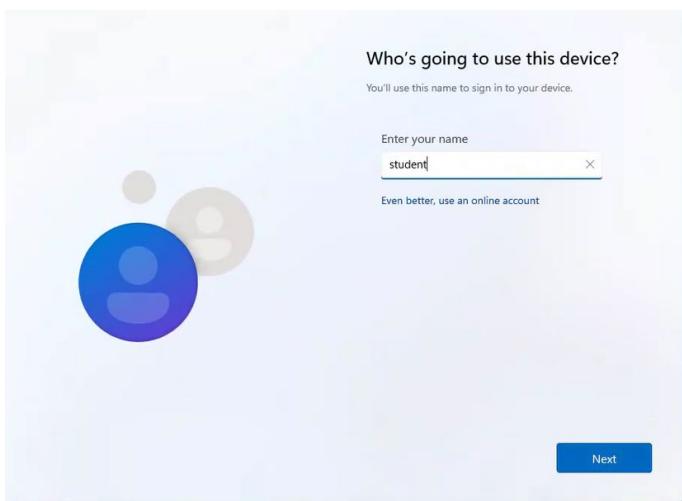
Now is asking for Microsoft do not give info . Click on sign in options



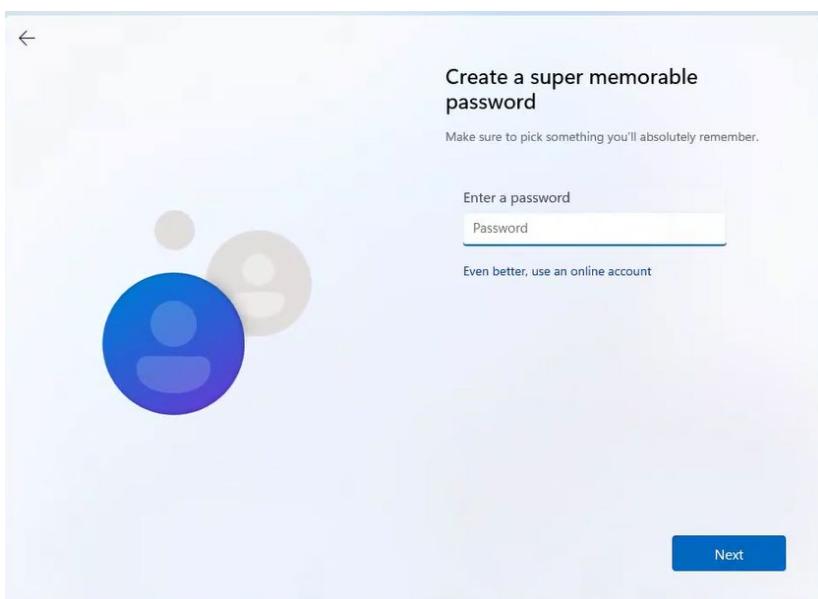
In sig in options select Domain join instead

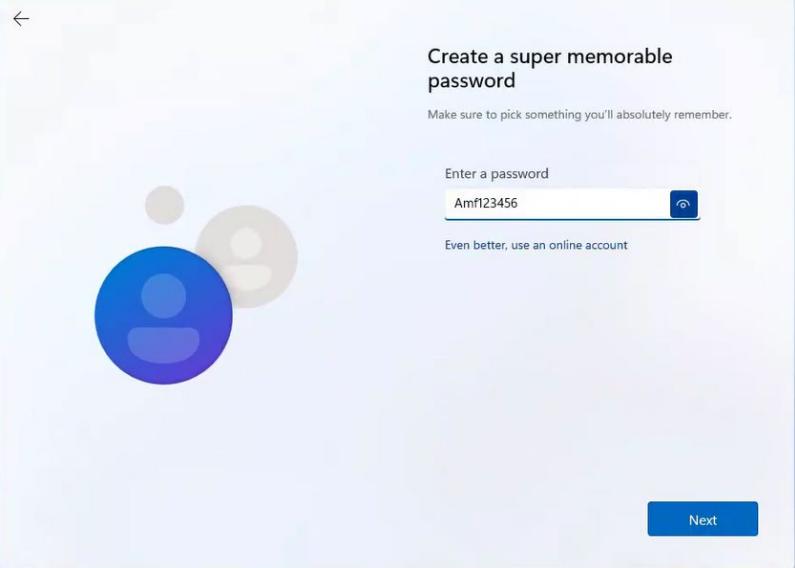


Enter your name as student

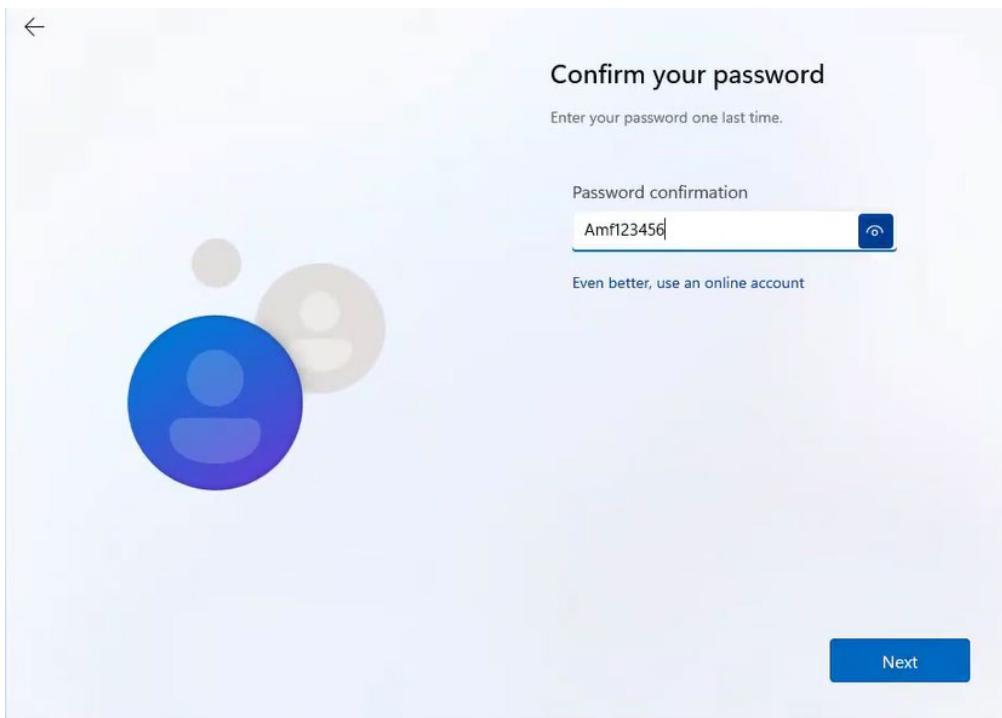


Give password as Amf123456





Confirm password



Set security questions

Now add security questions

Just in case you forget your password, choose 3 security questions. Make sure your answers are unforgettable.

Security question (1 of 3)

What was your first pet's name?

dog

Even better, use an online account

Now add security questions

Just in case you forget your password, choose 3 security questions. Make sure your answers are unforgettable.

Security question (2 of 3)

What's the name of the city where you v

montreal

Even better, use an online account

Now add security questions

Just in case you forget your password, choose 3 security questions. Make sure your answers are unforgettable.

Security question (3 of 3)

What was your childhood nickname?

mike

Even better, use an online account

Privacy settings

Make sure you scroll down to turn off all of them

Choose privacy settings for your device

Microsoft puts you in control of your privacy. Choose your settings, then select **Accept** to save them. You can change these settings at any time.

Location

You won't be able to get location-based experiences like directions and weather or enjoy other services that require your location to work.

No

Find my device

Windows won't be able to help you keep track of your device if you lose it.

No

Diagnostic data

Send only info about your device, its settings and capabilities, and whether it is performing properly.

Diagnostic data is used to help keep Windows secure and up to date, troubleshoot problems, and make product improvements.

Choose privacy settings for your device

Microsoft puts you in control of your privacy. Choose your settings, then select **Accept** to save them. You can change these settings at any time.

Microsoft apps and services.

No

Tailored experiences

The tips, ads, and recommendations you see will be more generic and may be less relevant to you.

No

Advertising ID

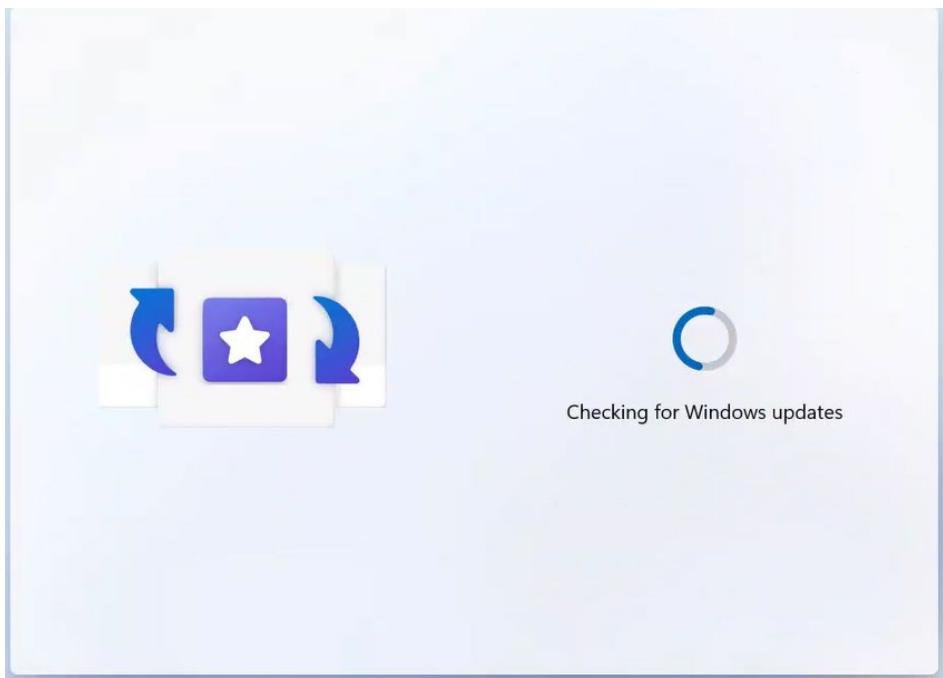
The number of ads you see won't change, but they may be less relevant to you.

No

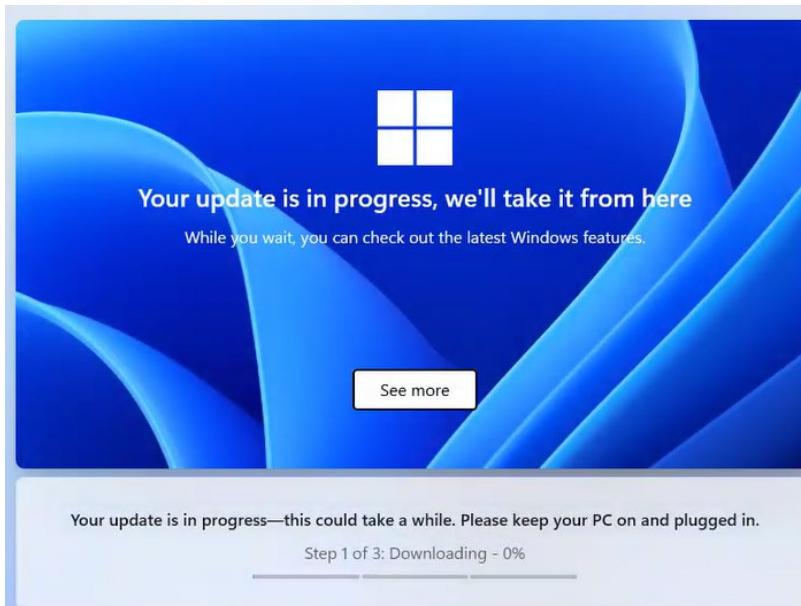
Select **Learn more** for info on the above settings, how Windows helps protect you from unsafe apps and web content, and the related data transfers and uses.

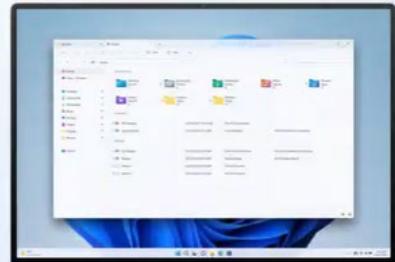
[Learn more](#)

Accept



Update in progress





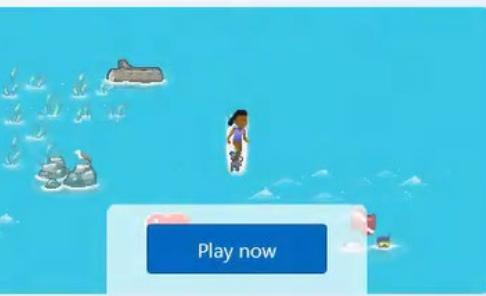
Organize files effortlessly

Drag and drop files between tabs in File Explorer to quickly move them where you want.

• • • •

Your update is in progress—this could take a while. Please keep your PC on and plugged in.

Step 1 of 3: Downloading - 6%



Surf the waves

Want to play a game while you wait? Check out the fan-favorite surf game! Type `edge://surf` in Microsoft Edge to play again later.

• • • •

Your update is in progress—this could take a while. Please keep your PC on and plugged in.

Step 2 of 3: Installing - 80%



When finish downloading the updates

.. .

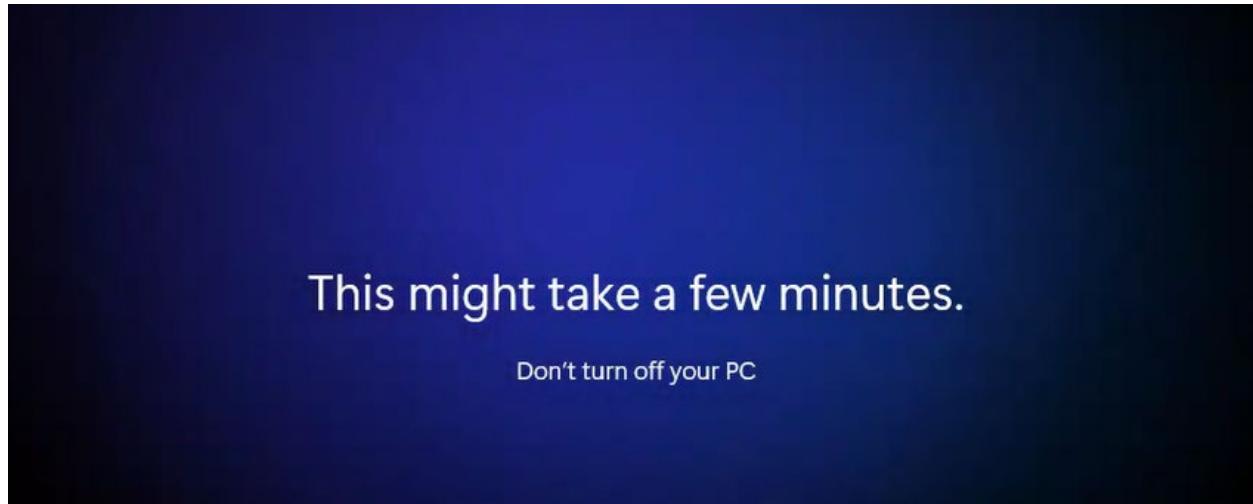
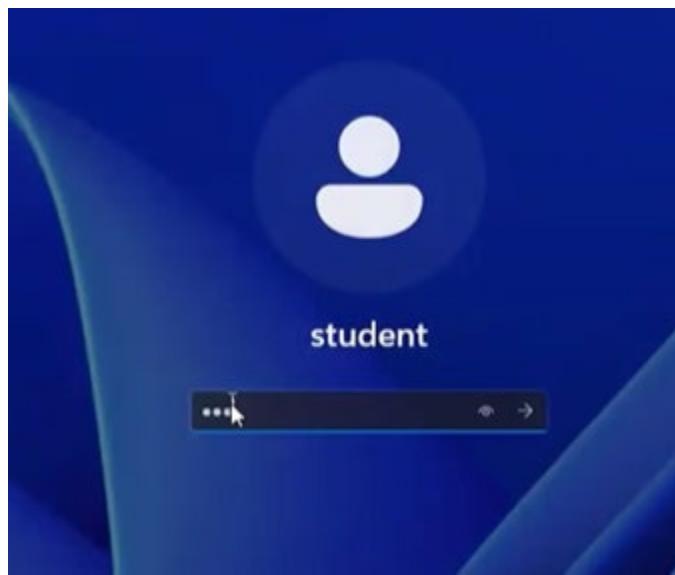
You're 7% there.
Please keep your computer on.

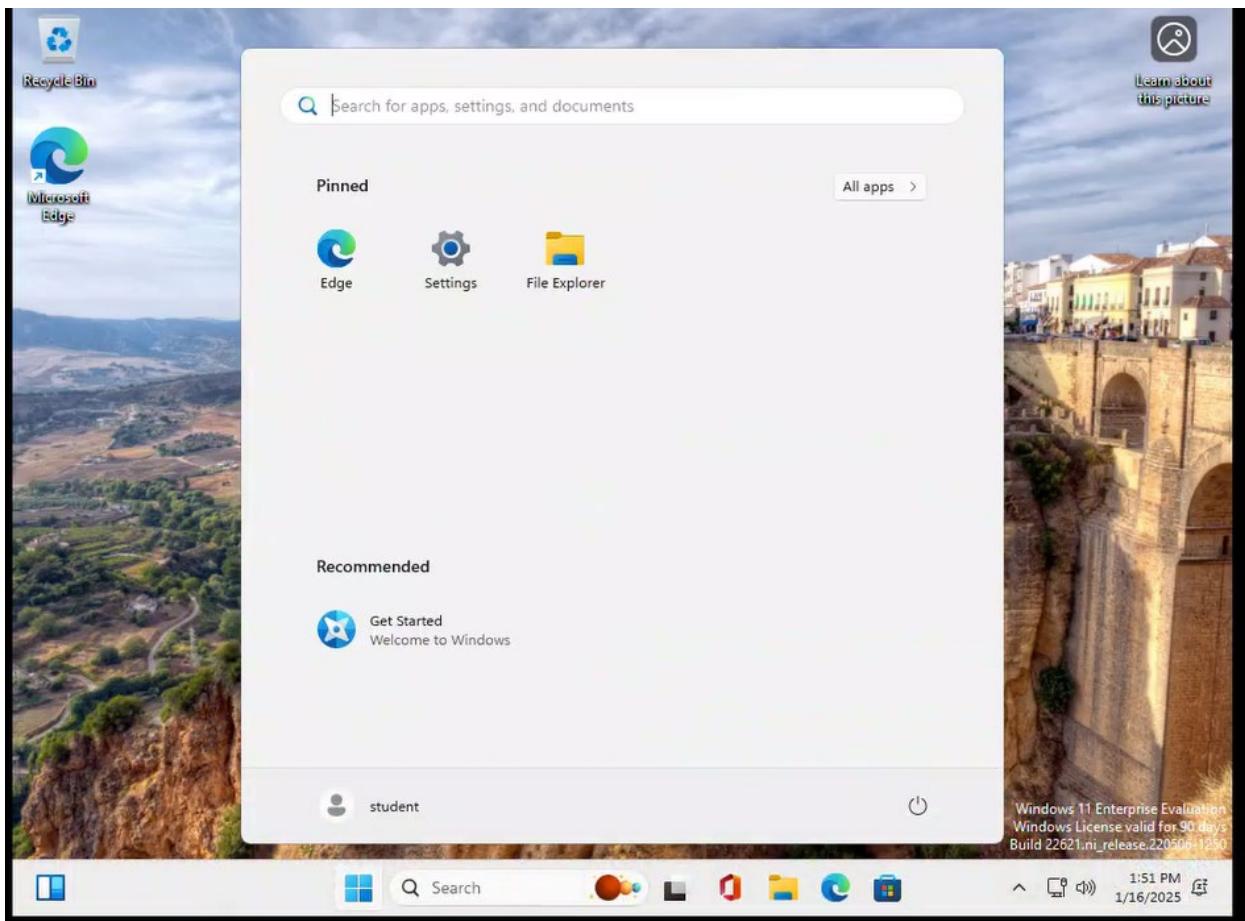


You're 96% there.
Please keep your computer on.

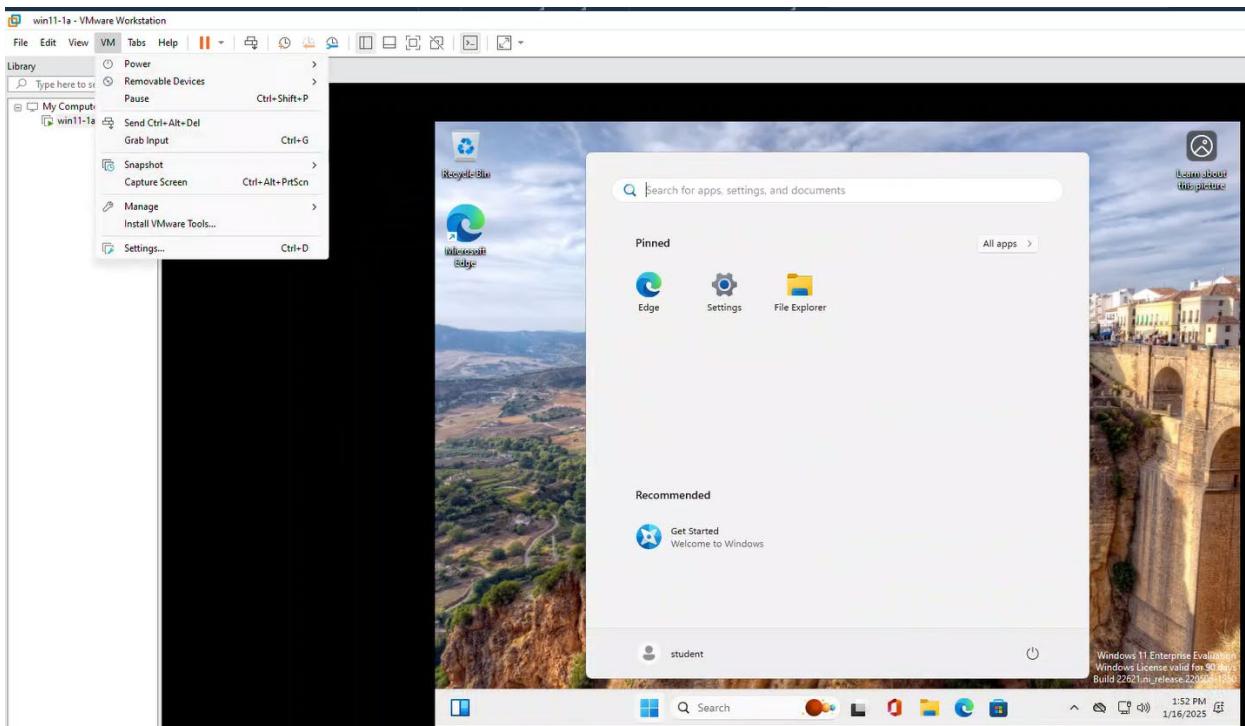
When finish the install of updates we will continue

Login as user student

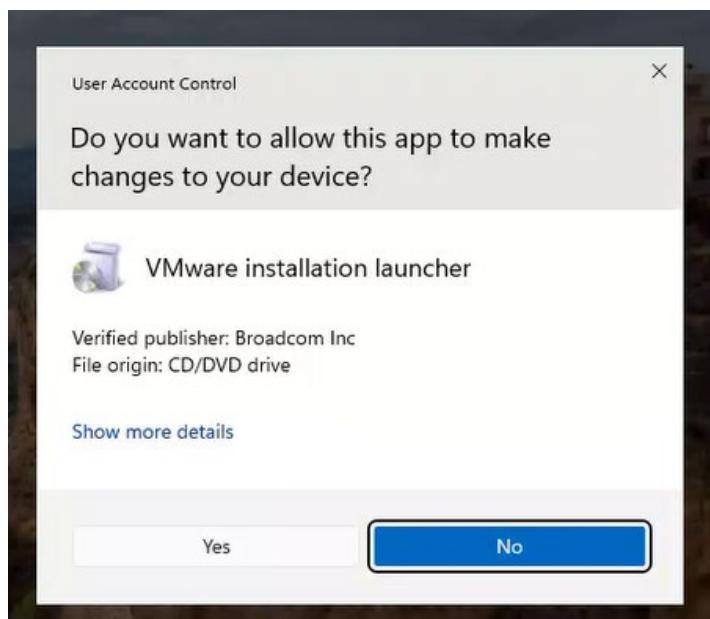
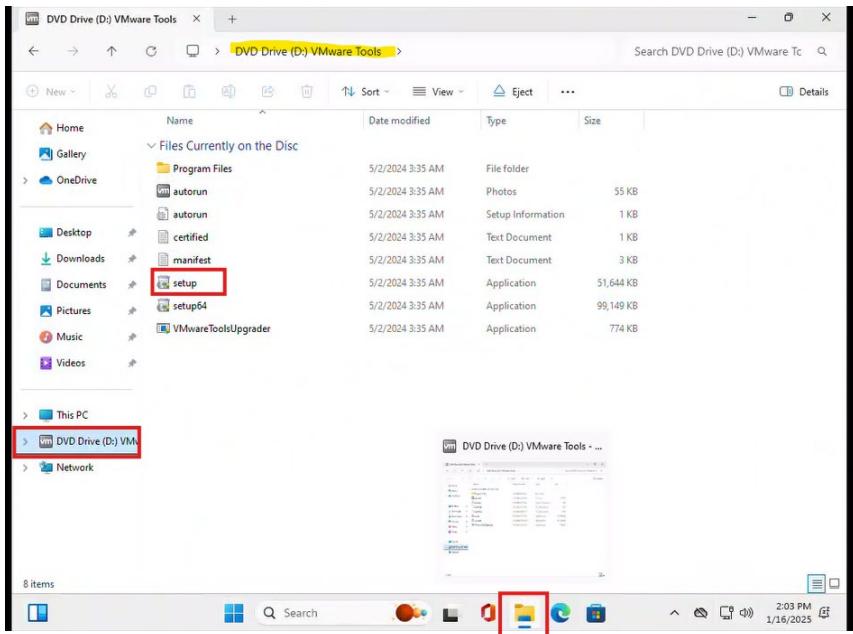


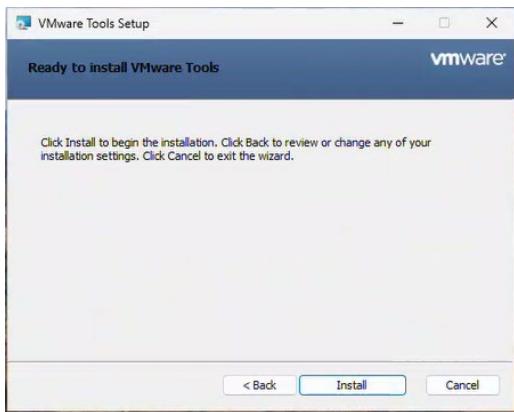
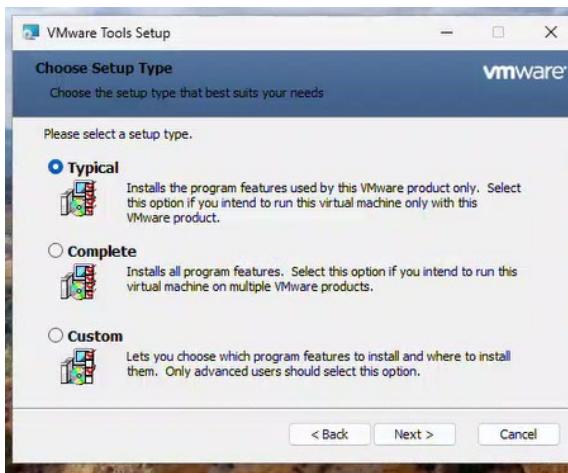
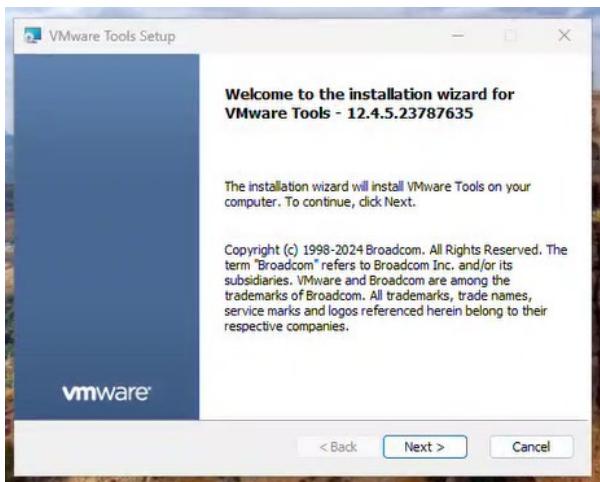


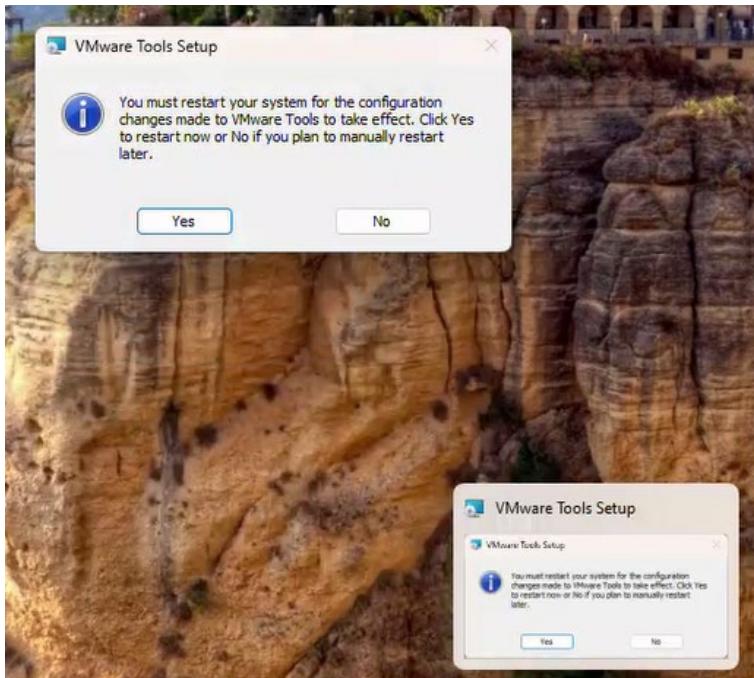
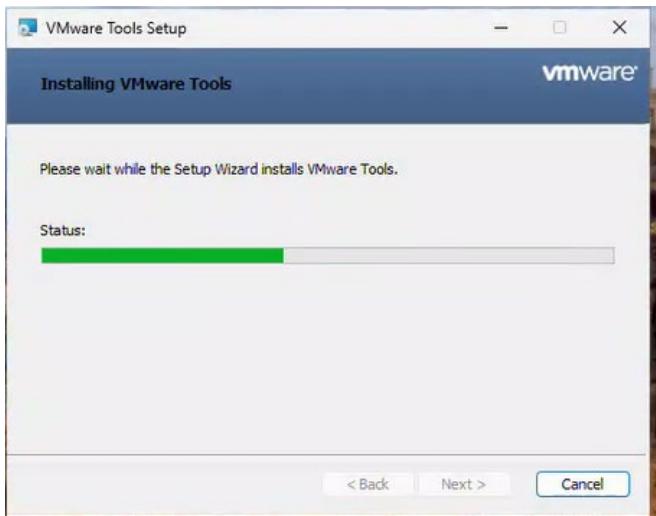
3.1.2.2.1 Install VMWare tools

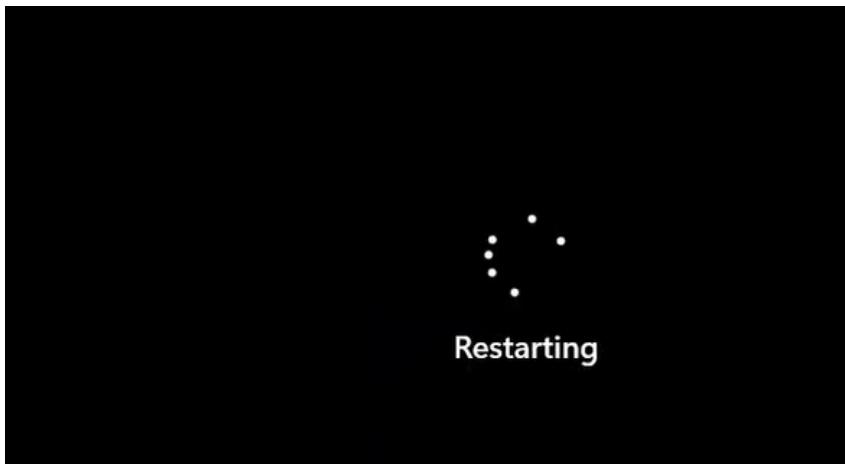


Open a folder , DVD Drive VMware tools and open setup





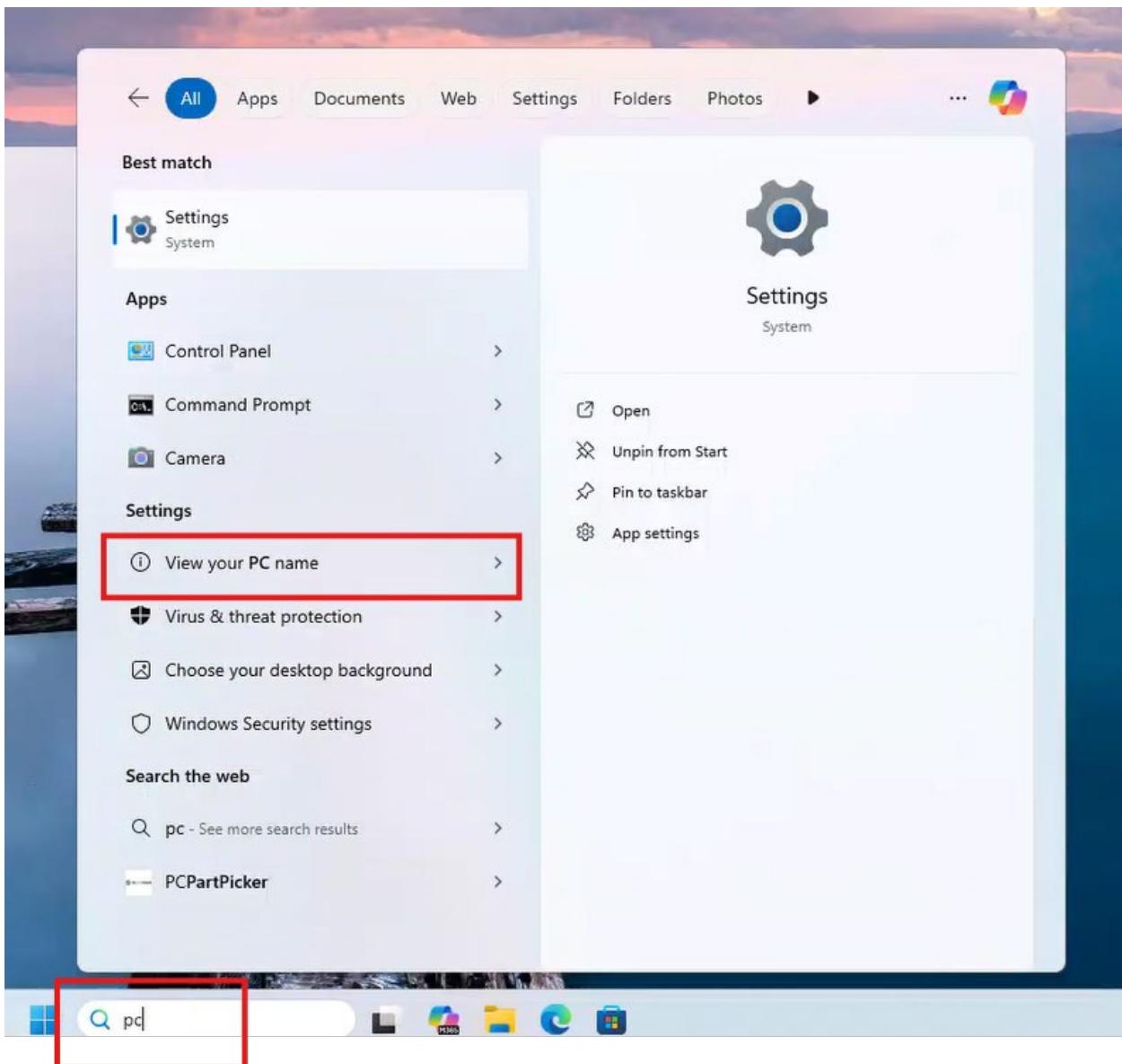


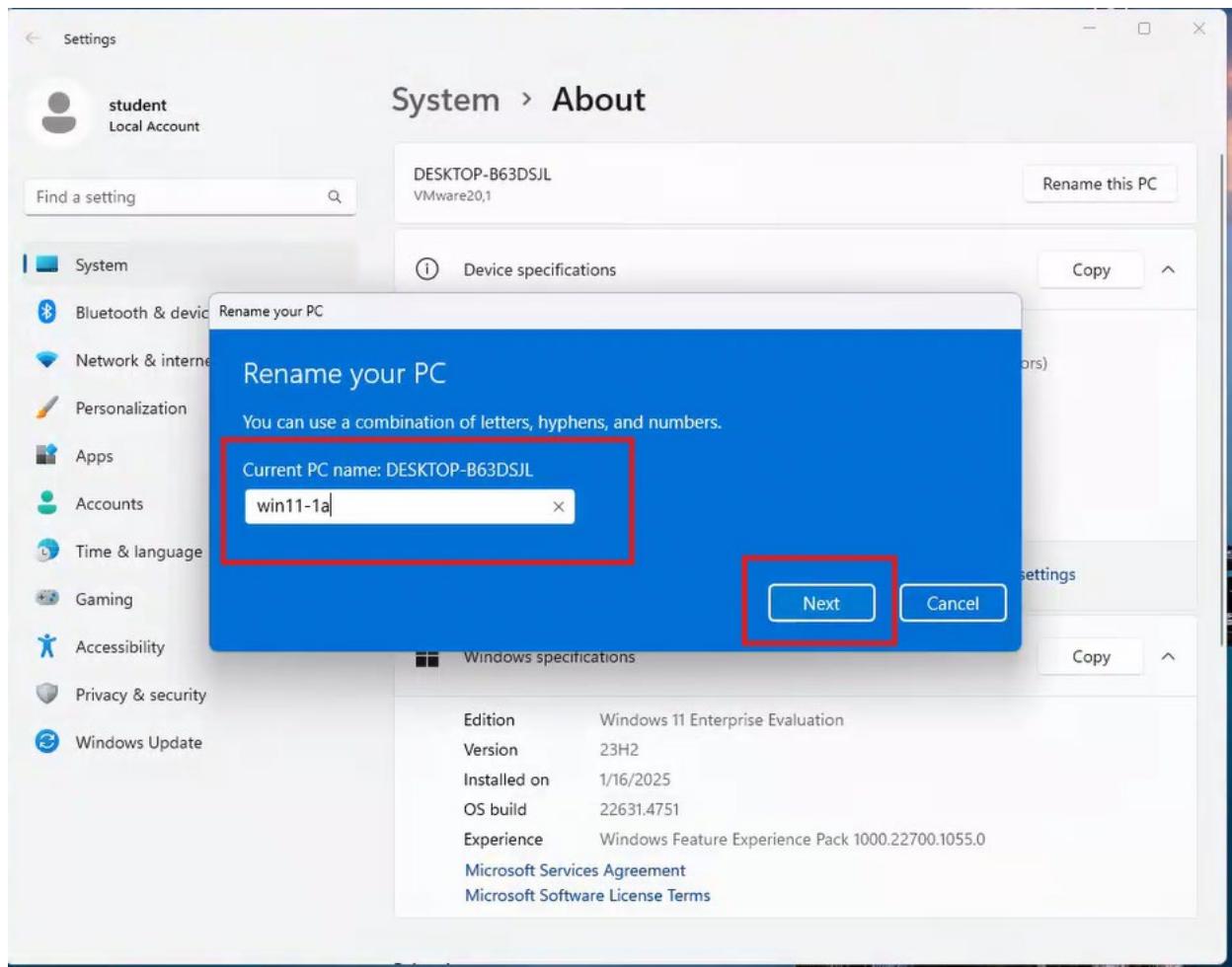


3.1.2.3 Change name

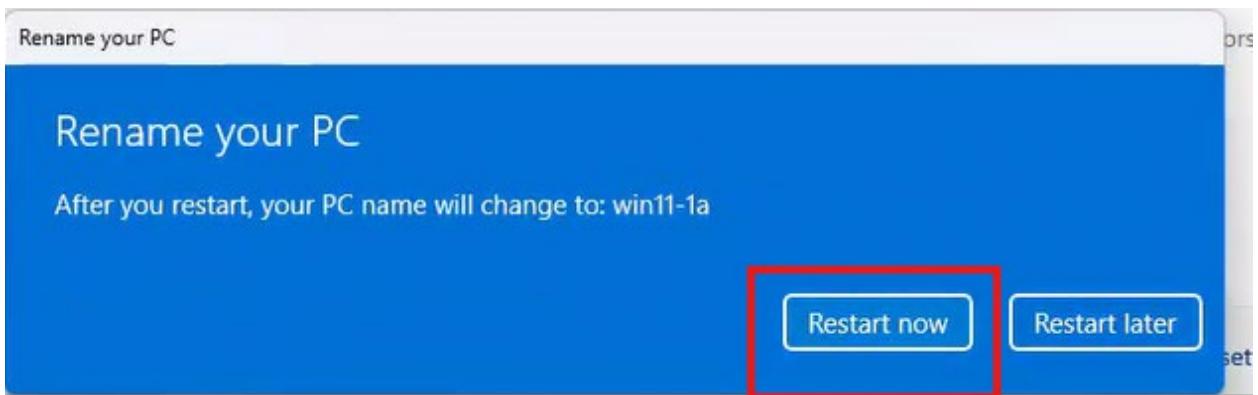
Change name windows 11

```
C:\Users\student>hostname  
DESKTOP-B63DSJL  
C:\Users\student>
```





Device specifications		Copy
Device name	DESKTOP-B63DSJL	
	win11-1a	
Processor	12th Gen Intel(R) Core(TM) i7-12700 2.11 GHz (2 processors)	
Installed RAM	8.00 GB	
Device ID	039F4877-9260-4ACC-B4FD-875672E0E73F	
Product ID	00329-20000-00001-AA905	
System type	64-bit operating system, x64-based processor	
Pen and touch	No pen or touch input is available for this display	

A screenshot of a Windows Command Prompt window titled "Command Prompt". The output shows the command "hostname" being run and the result "win11-1a".

```
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.

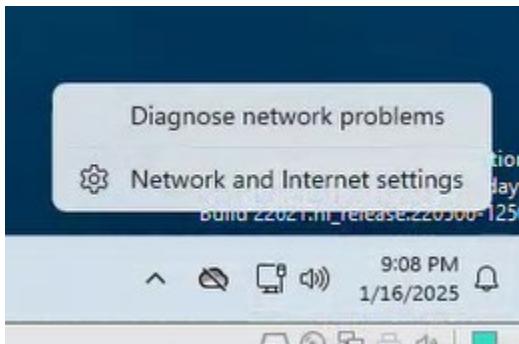
C:\Users\student>hostname
win11-1a

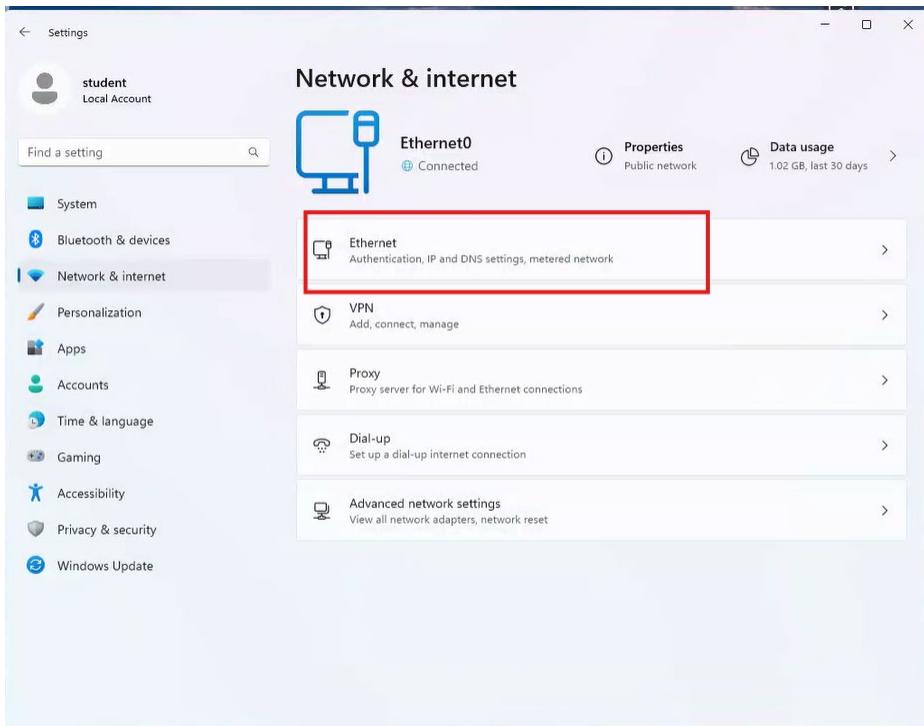
C:\Users\student>
```

3.1.2.4 Set static IP

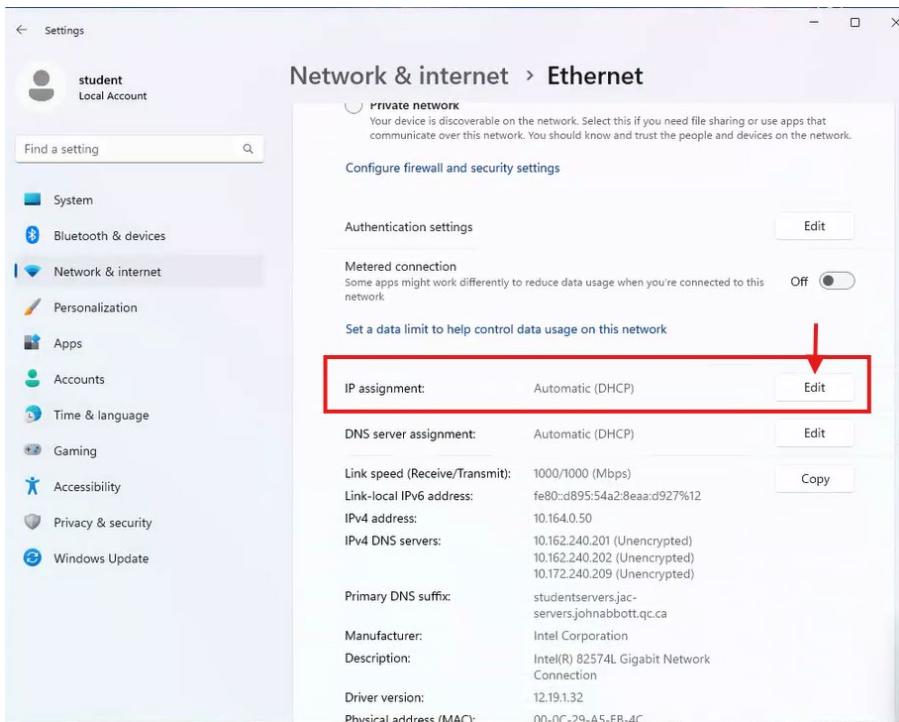
Change ip address windows 11

Right click on this icon  and select Network and Internet settings

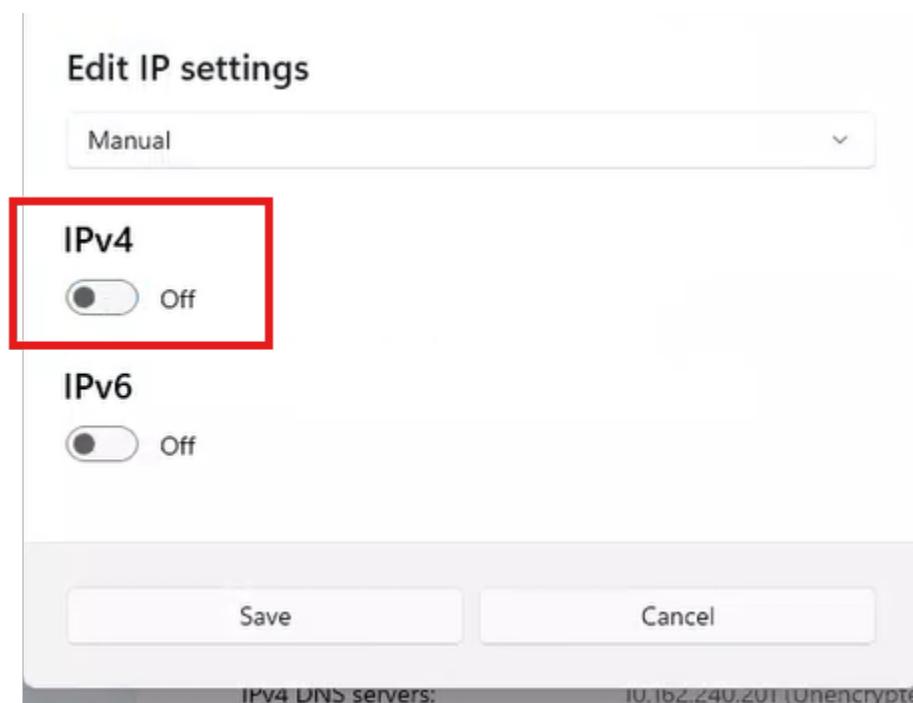
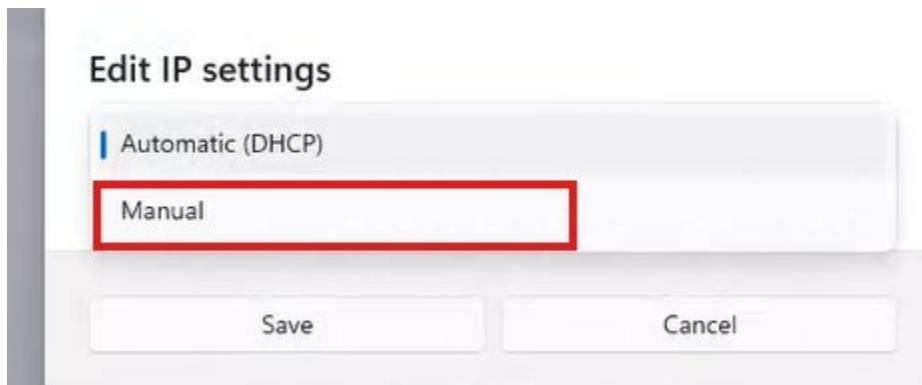




Ip address assignment /Edit



Change to manual



Edit IP settings

Manual

IPv4

On

IP address

10.164.101.12

Subnet mask

255.255.0.0

Gateway

10.164.0.1

Preferred DNS

8.8.8.8

X

DNS over HTTPS

Off

Alternate DNS

Save

Cancel

```
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>hostname
win11-1a

C:\Users\student>ipconfig /all

Windows IP Configuration

Host Name . . . . . : win11-1a
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address . . . . . : 00-0C-29-A5-EB-4C
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::d895:54a2:8eaa:d927%12(Preferred)
IPv4 Address. . . . . : 10.164.101.12(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
IPv6 DHCPv6 TA ID . . . . . : 10000000000000000000000000000000
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-1E-05-00-0C-29-A5-EB-4C
DNS Servers . . . . . : 8.8.8.8 ←
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>
```

Do pings to test

```
C:\Users\student>
C:\Users\student>ping 10.164.101.12

Pinging 10.164.101.12 with 32 bytes of data:
Reply from 10.164.101.12: bytes=32 time<1ms TTL=128

Ping statistics for 10.164.101.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\student>ping 10.164.0.1

Pinging 10.164.0.1 with 32 bytes of data:
Reply from 10.164.0.1: bytes=32 time<1ms TTL=64

Ping statistics for 10.164.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\student>ping google.com

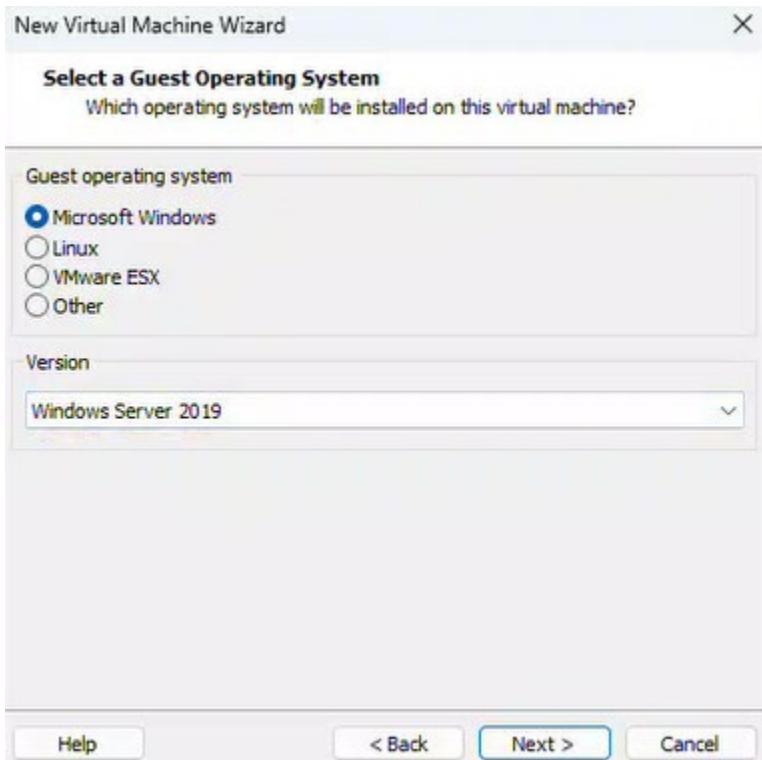
Pinging google.com [142.250.69.78] with 32 bytes of data:
Reply from 142.250.69.78: bytes=32 time=2ms TTL=117
Reply from 142.250.69.78: bytes=32 time=1ms TTL=117
Reply from 142.250.69.78: bytes=32 time=1ms TTL=117
Reply from 142.250.69.78: bytes=32 time=1ms TTL=117

Ping statistics for 142.250.69.78:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

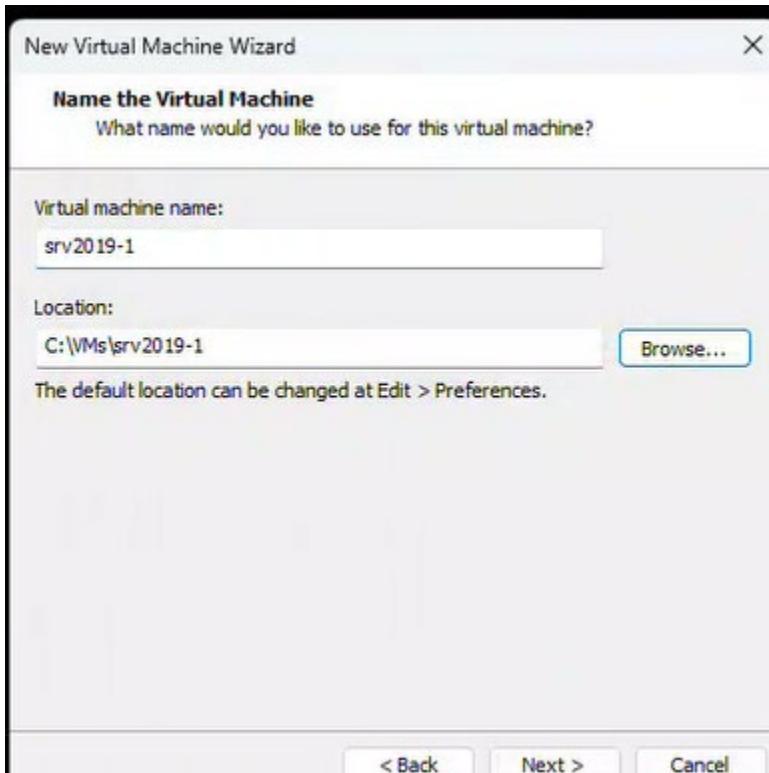
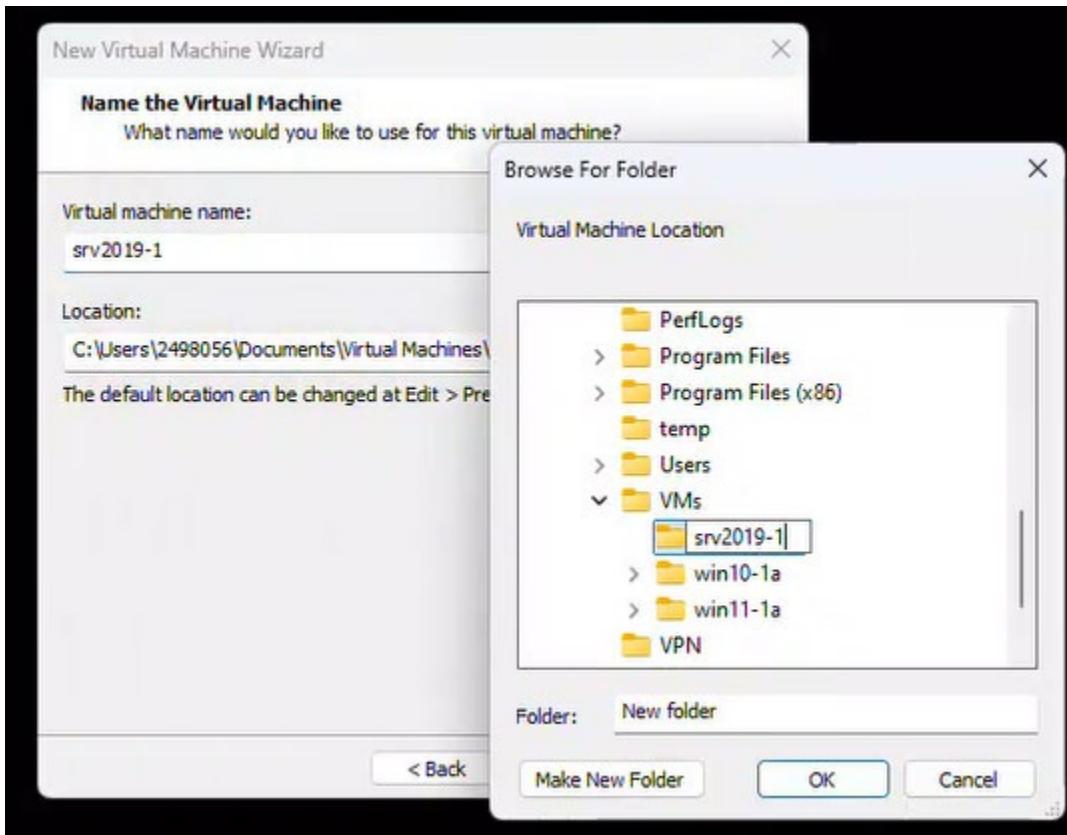
3.1.3 Windows Server 2019

3.1.3.1 Create a virtual machine for windows server 2019

- A) When the “Select a Guest Operating System” window pops up, select “Microsoft Windows” as your Guest operating system and select "Windows Server 2019" for your Version from the dropdown menu, then click “Next >”.



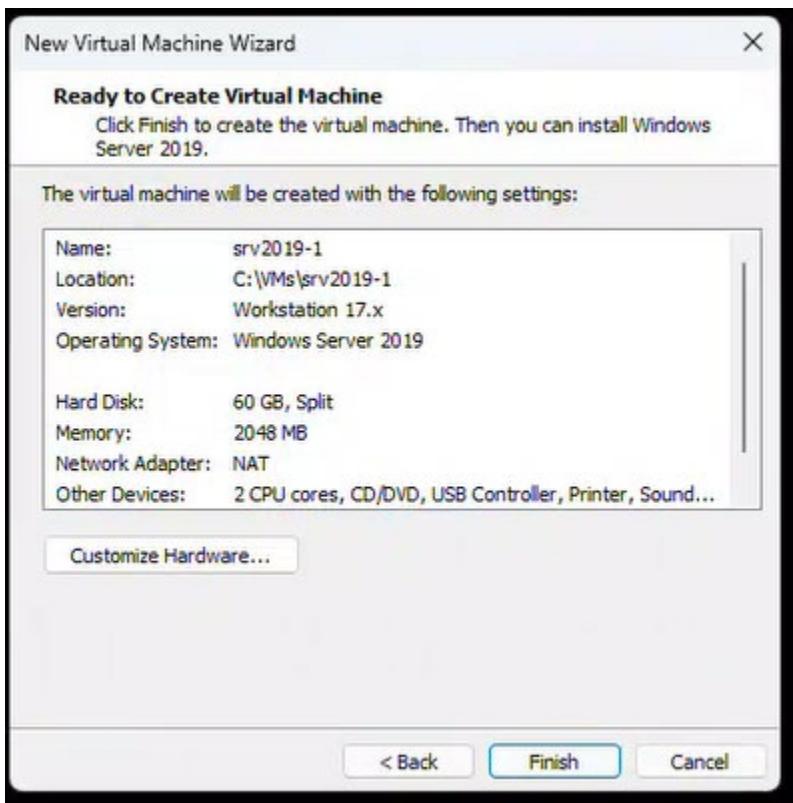
- B) When the “Name the Virtual Machine” window pops up, rename the virtual machine to “srv2019-*your station number*” (I.e. srv2019-1 for station 1). For location, click “Browse...”, then scroll down to find your computer (I.e. JAC-XXXXXXX), then click on the “VMs” folder, then click “Make New Folder” and name it “srv2019-*your station number*” (I.e. srv2019-1). Click on the “srv2019-1” folder, then click “OK”. Then click “Next >”.



- C) Keep the Maximum disk size (GB) at 60.0, and keep it “Split virtual disk into multiple files. Then click “Next>”.



D) Select Customize hardware



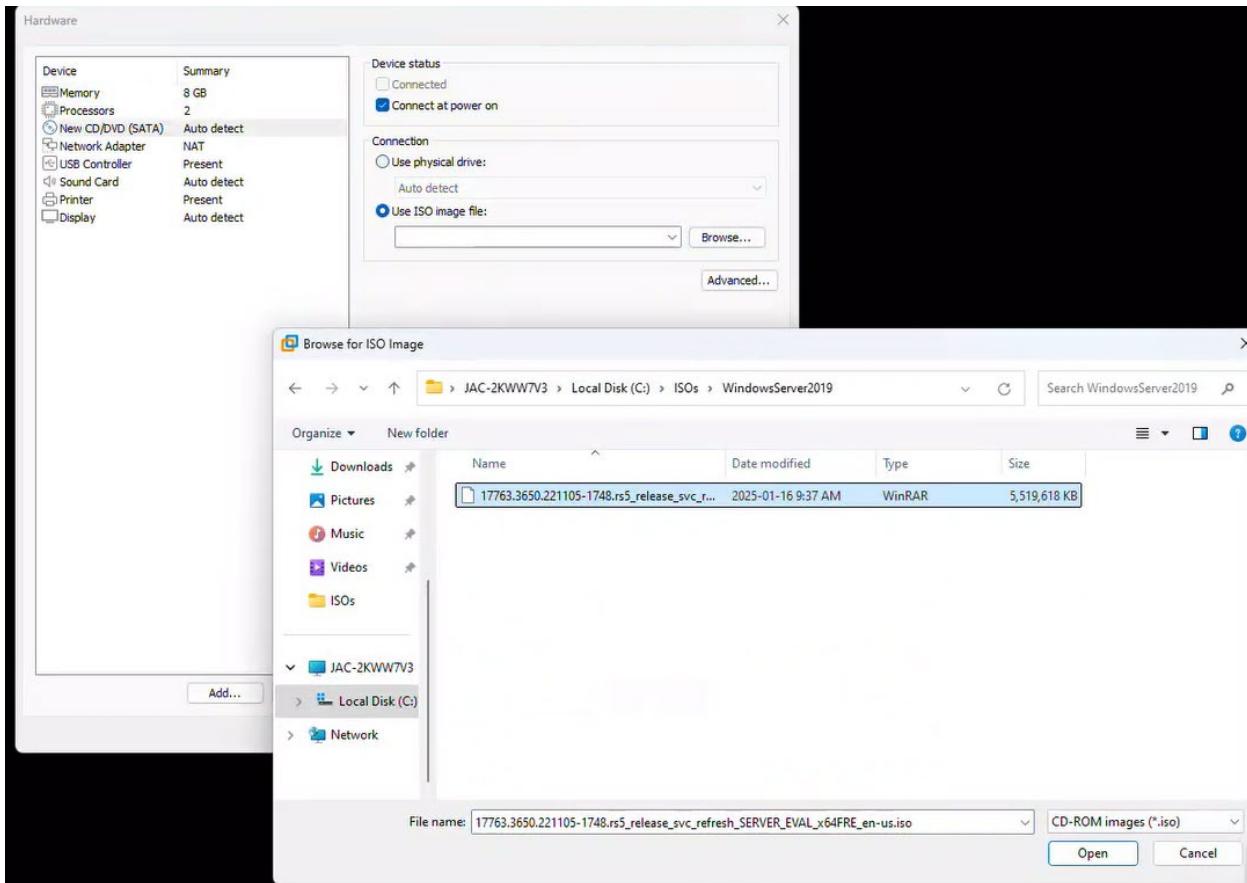
E) For windows Hardware:

Memory set it at 8 GB.

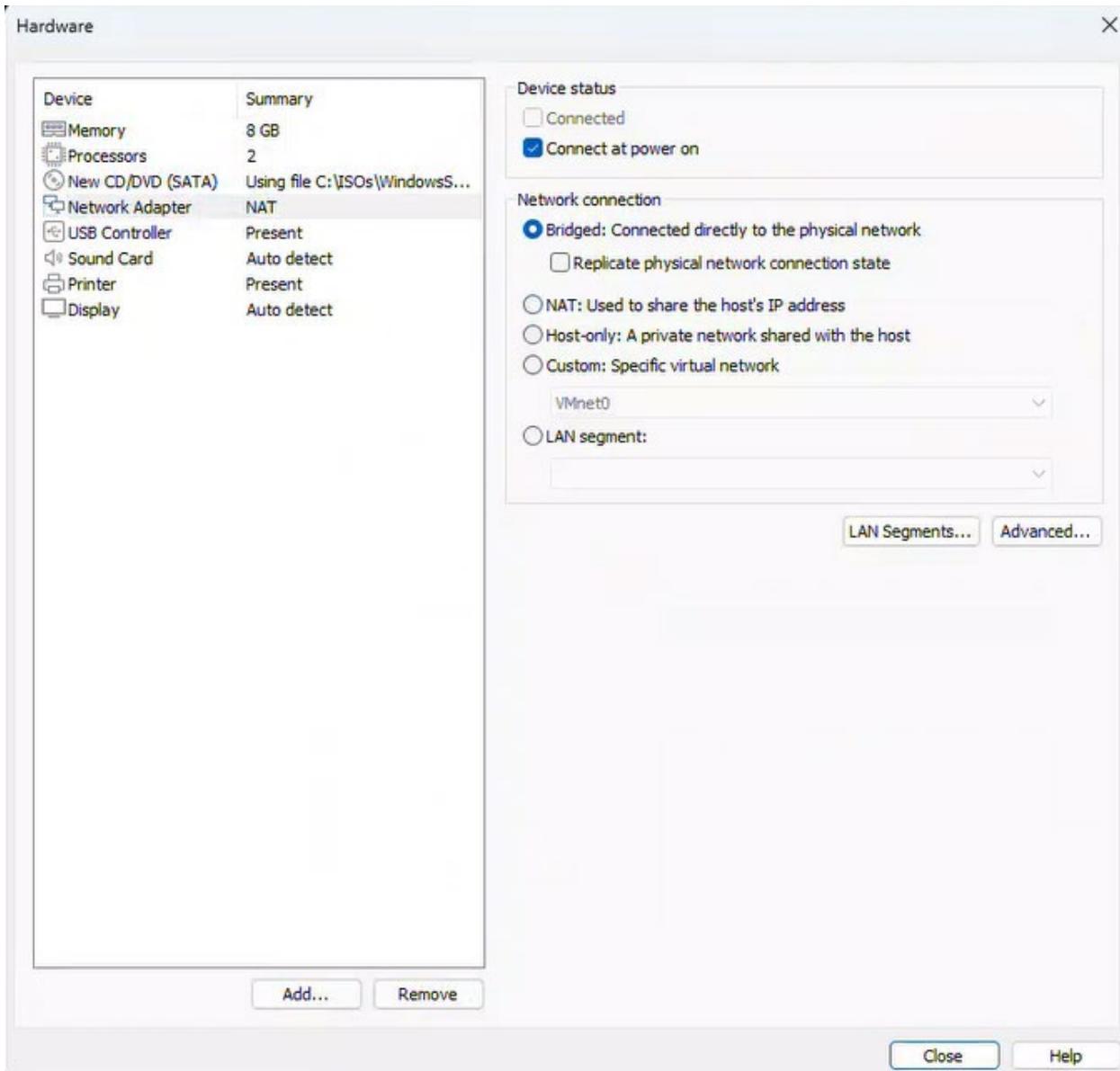
Processors leave it as 2

For Network Adapter, under Network connection, select “Bridged: Connected directly to the physical network”.

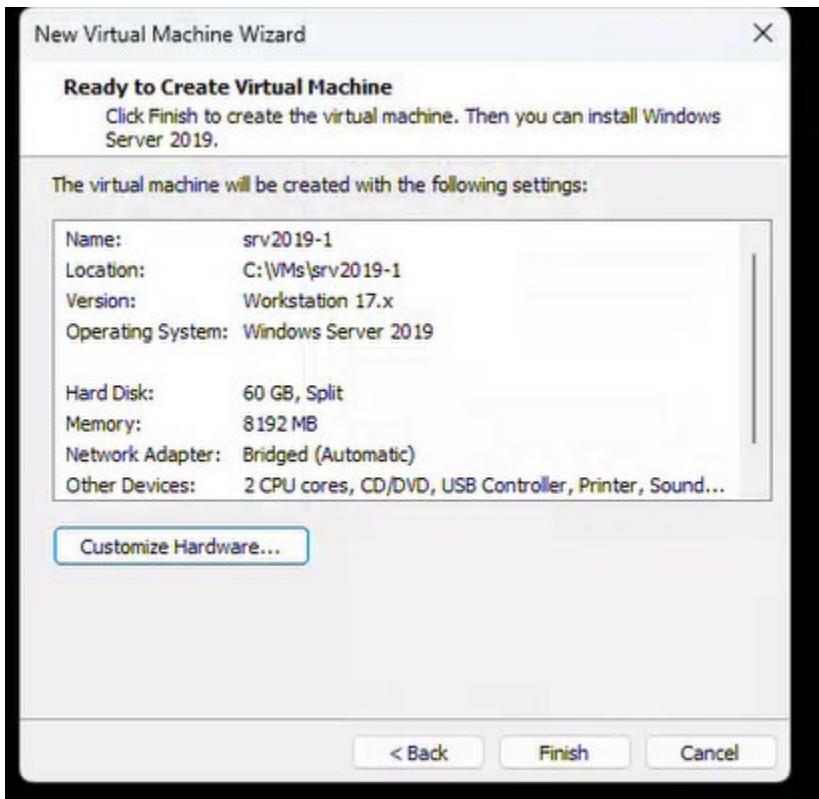
For New CD/DVD (SATA), Select “Use ISO Image file”, click “Browse” and locate the Windows 10 ISO. Select it and press Open



F) Click “Close”

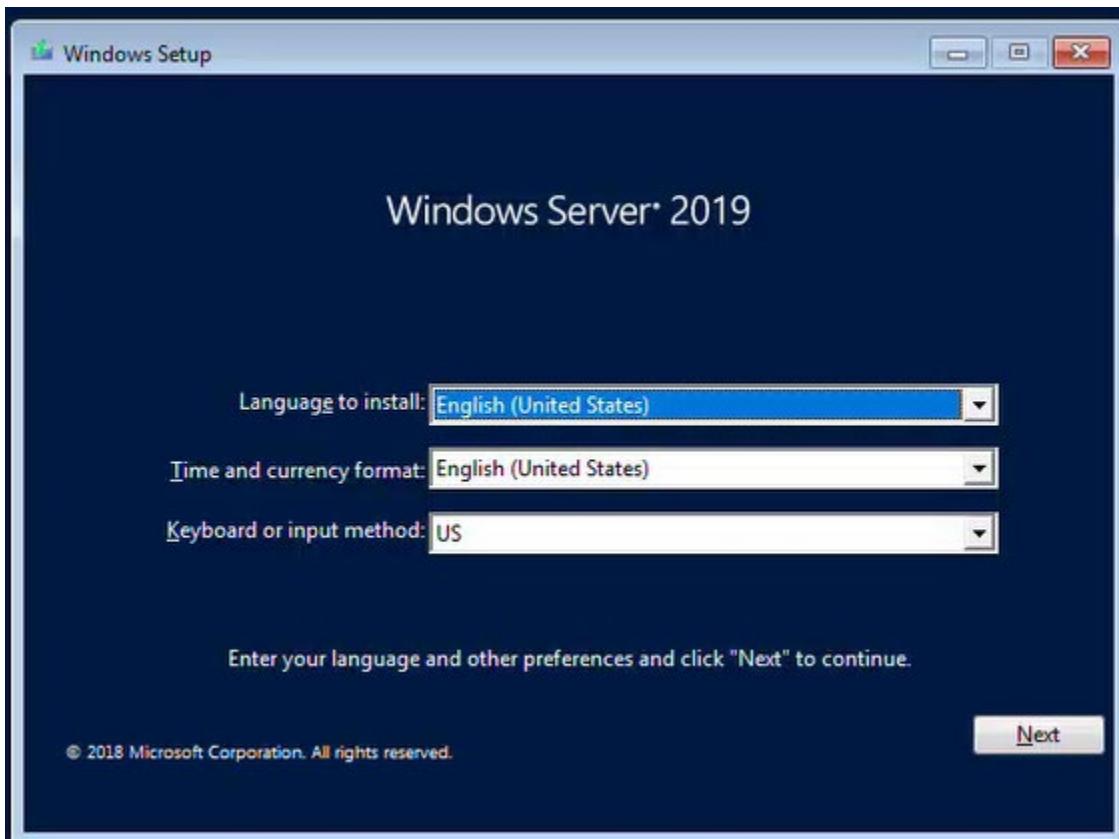


G) Click on finish

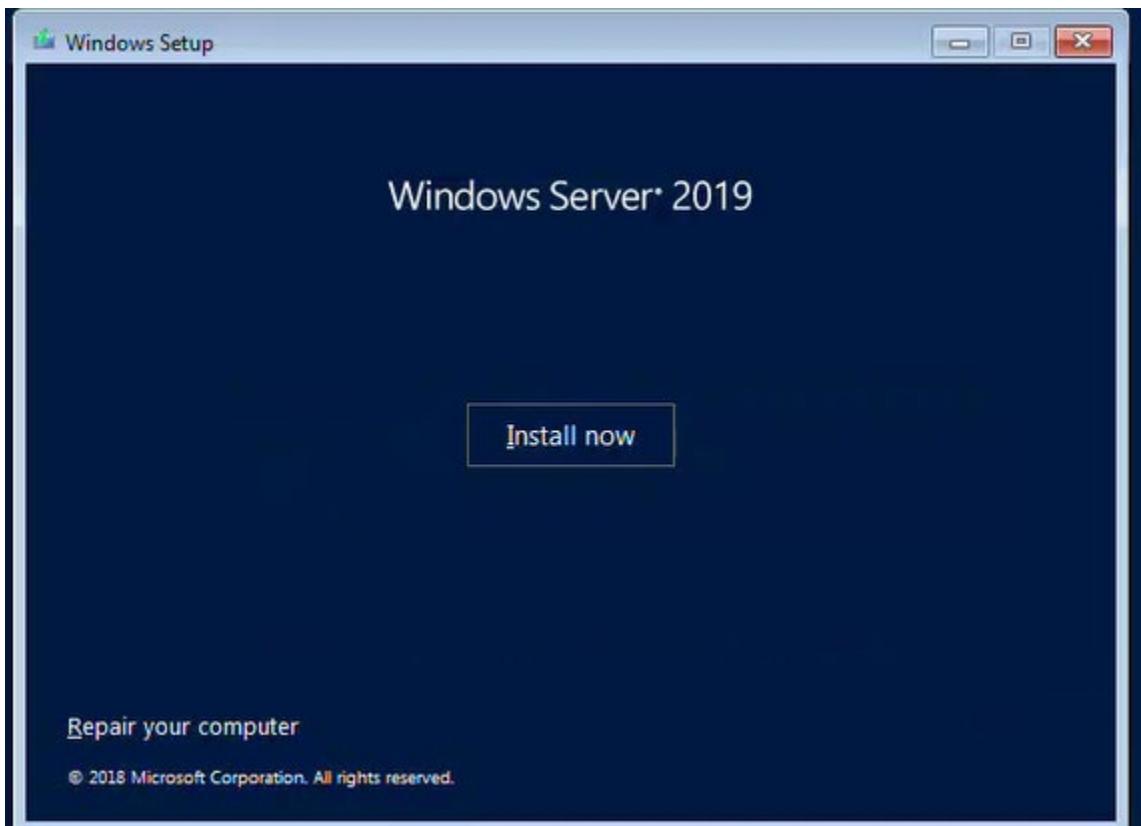


3.1.3.2 Install a windows server virtual machine for windows 2019

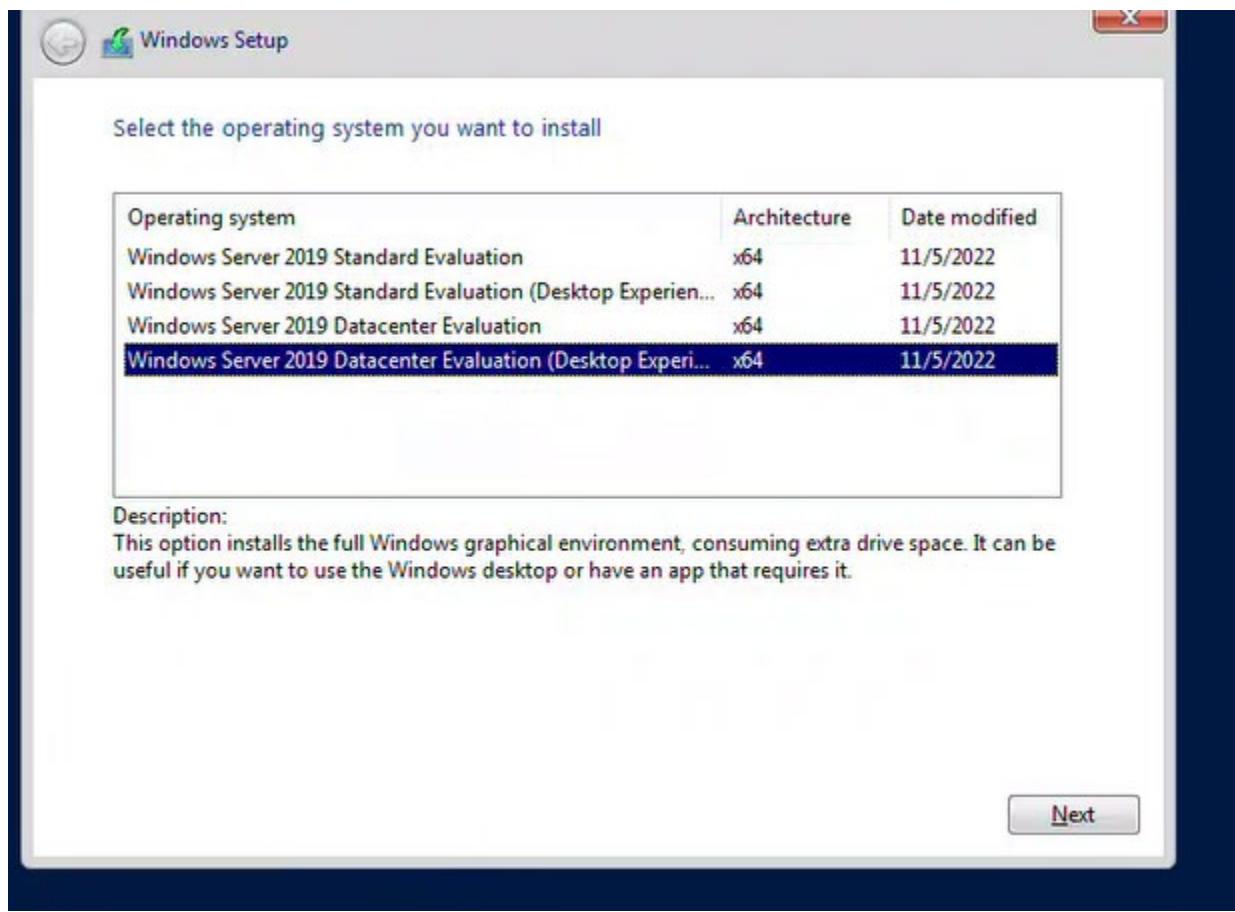
- Reboot the virtual machine and press any key quickly to get into DVD CD config
- "Windows Setup" window appears, keep the language, time and currency format to "English (United States) and the Keyboard or input method to "US", then click "Next".



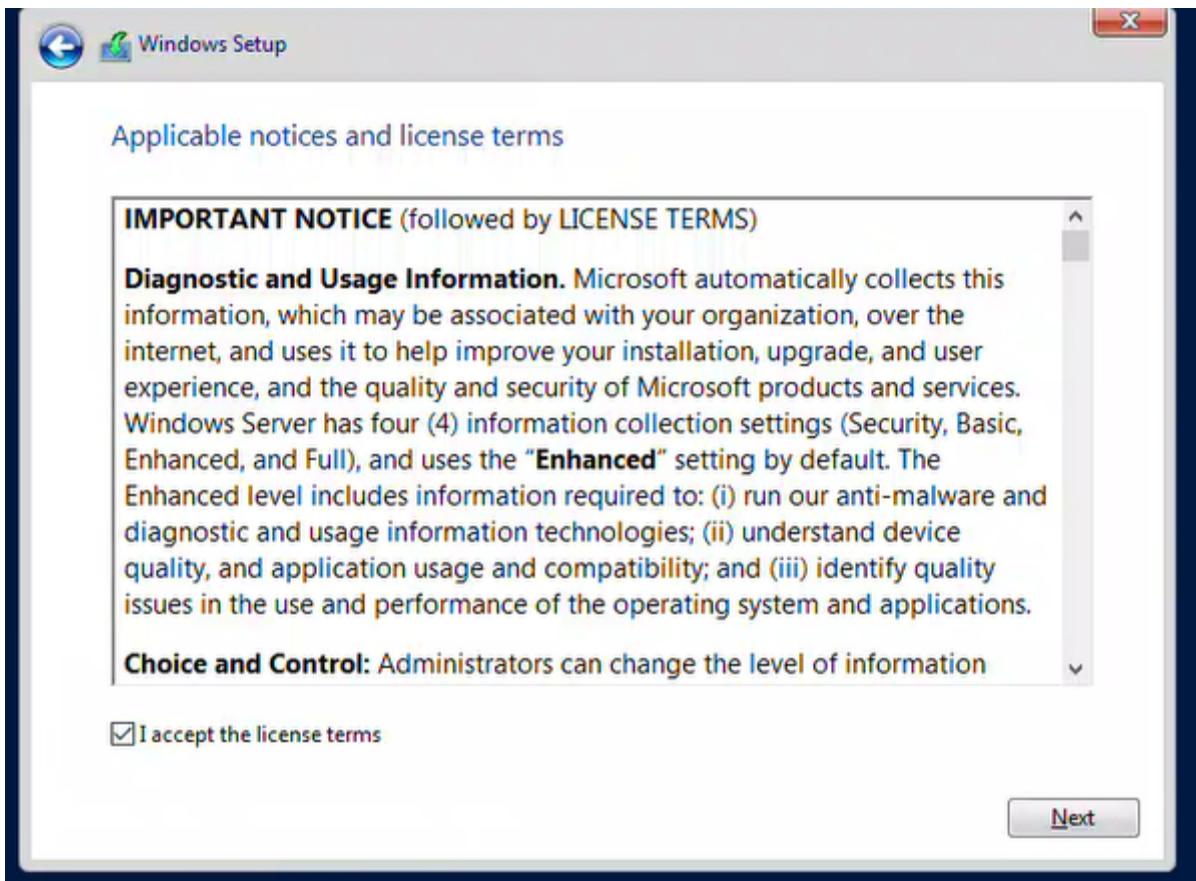
C) Click Install now



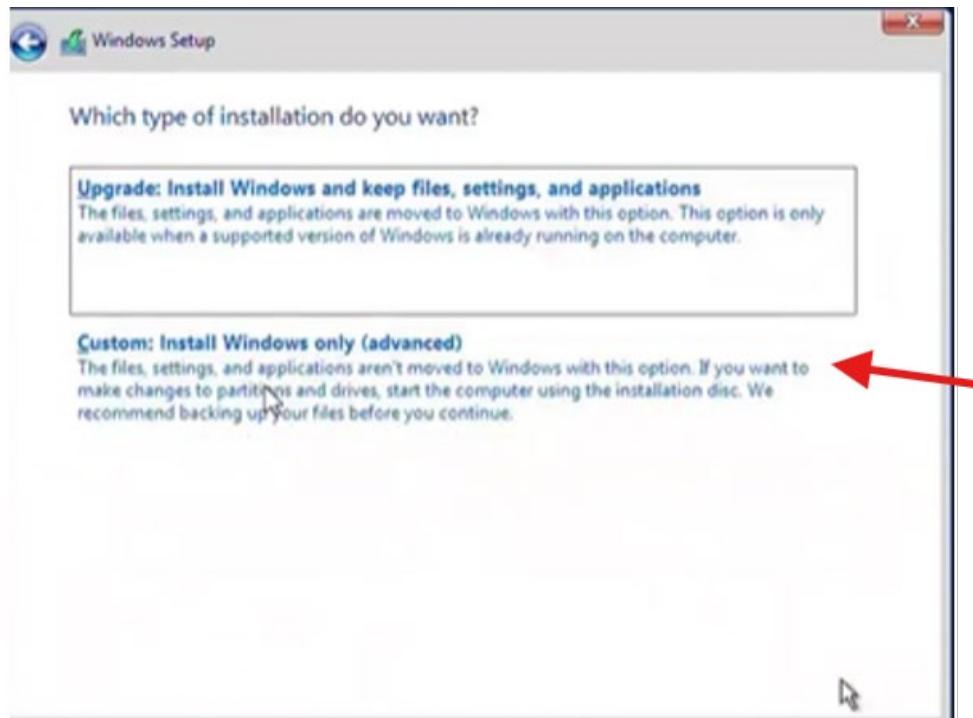
- D) When asked to “Select the operating system you want to install”, select the last option, “Windows Server 2019 Datacenter Evaluation (Desktop experience), then click “Next”.



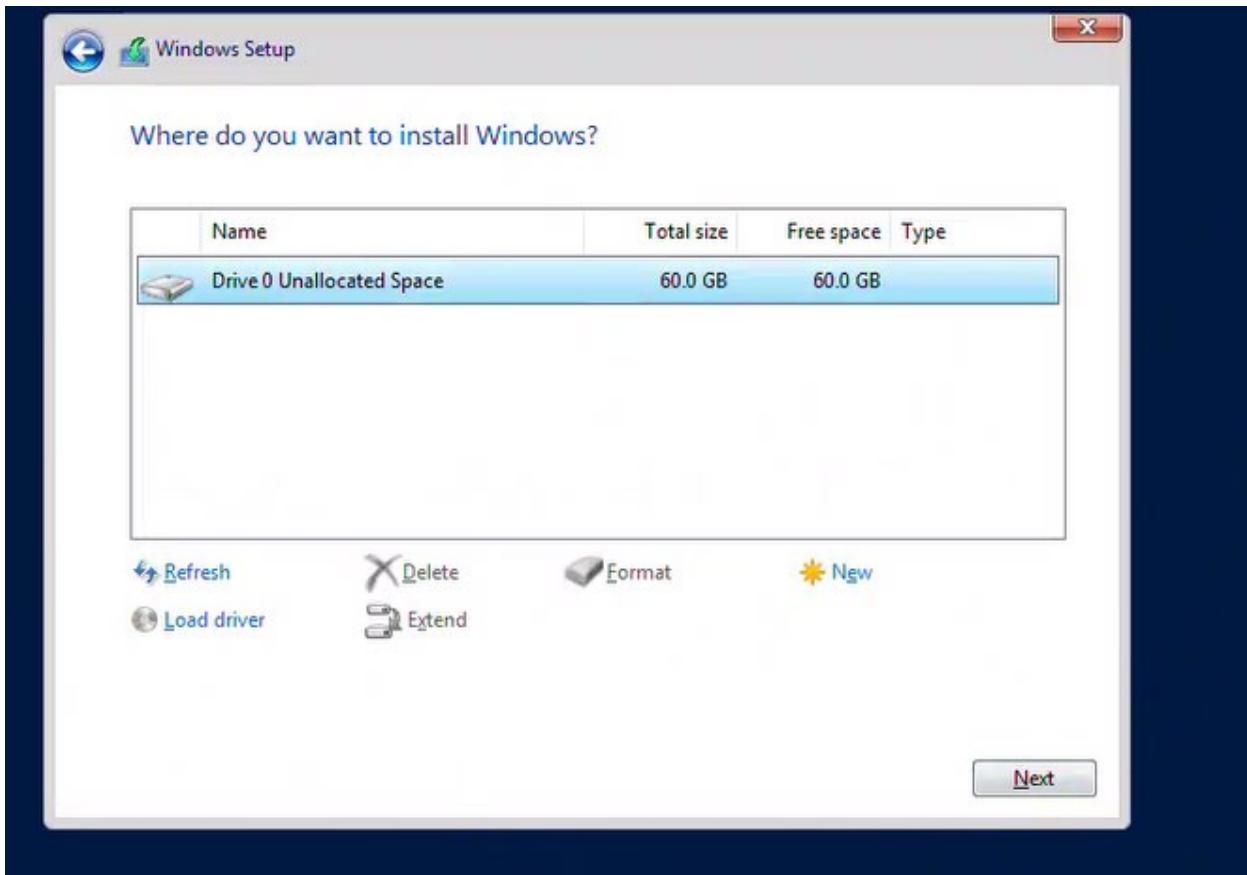
- E) Accept the license terms” at the bottom, then click “Next”.



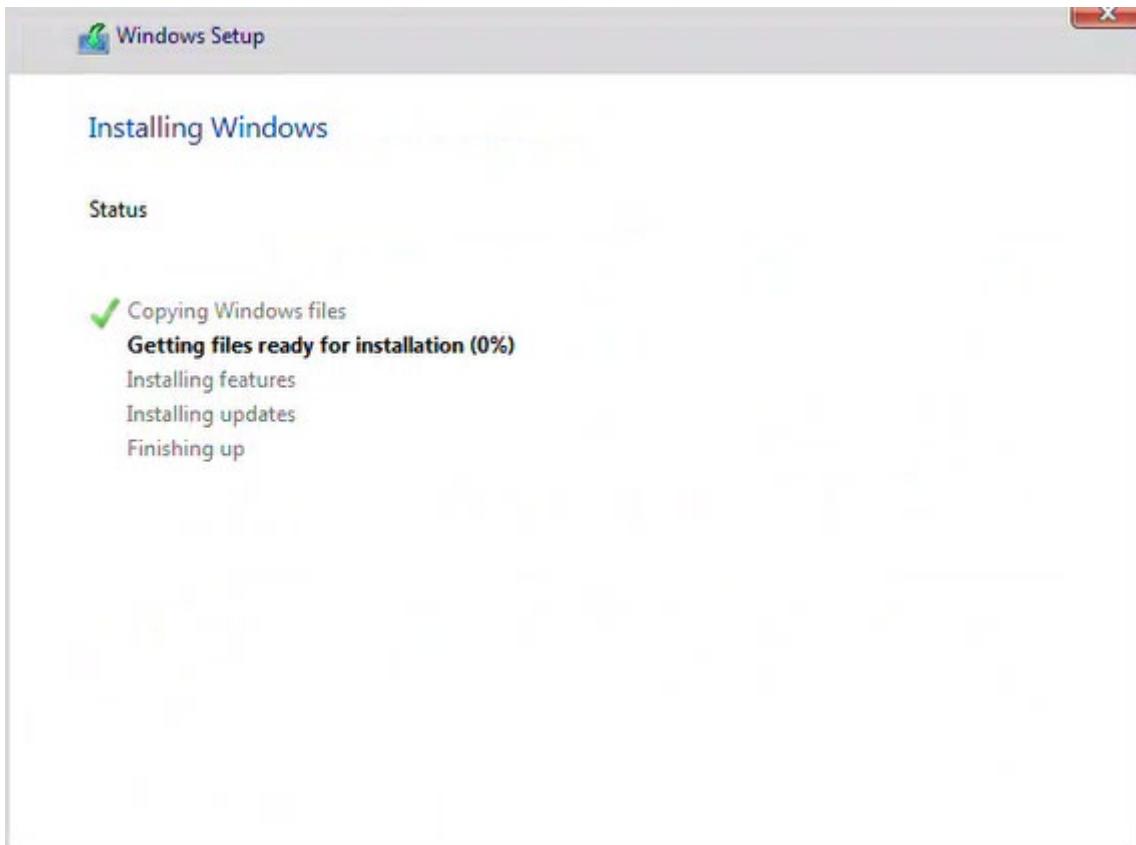
F) Select **Custom install**



G) Select the disk and Next

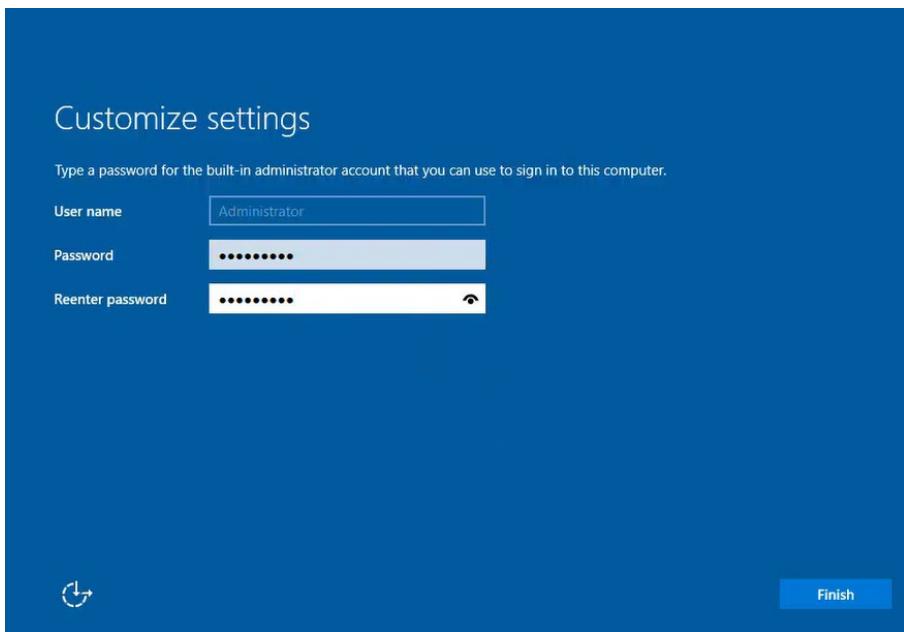


H) Installation starts , wait

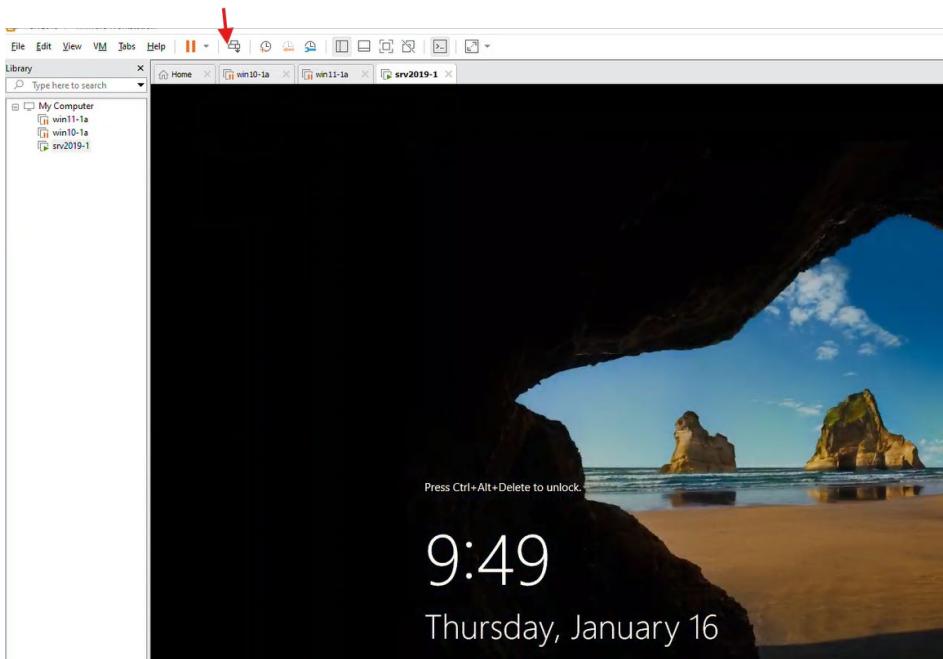


I) Machine will reboot itself, wait until comes back and this window appears

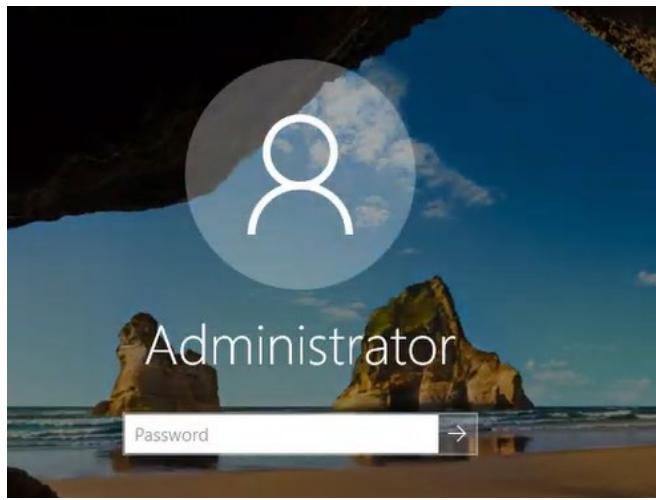
Set password and confirm password as “Amf123456” and click on finish



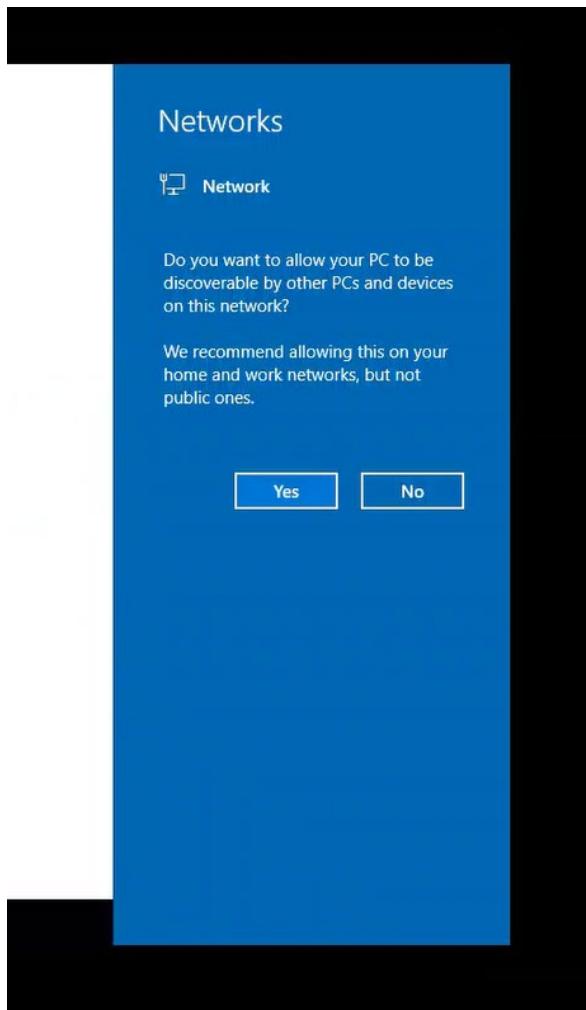
J) When it comes back click on the top bar the ctrl-alt-del icon



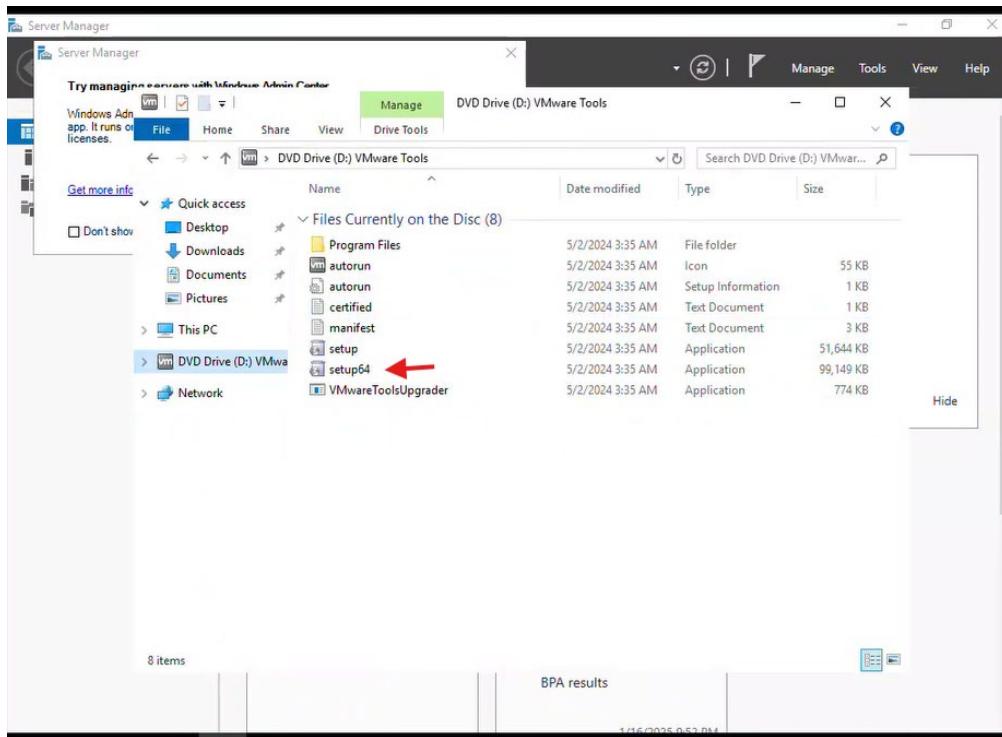
K) Login as Administrator passwd Amf123456



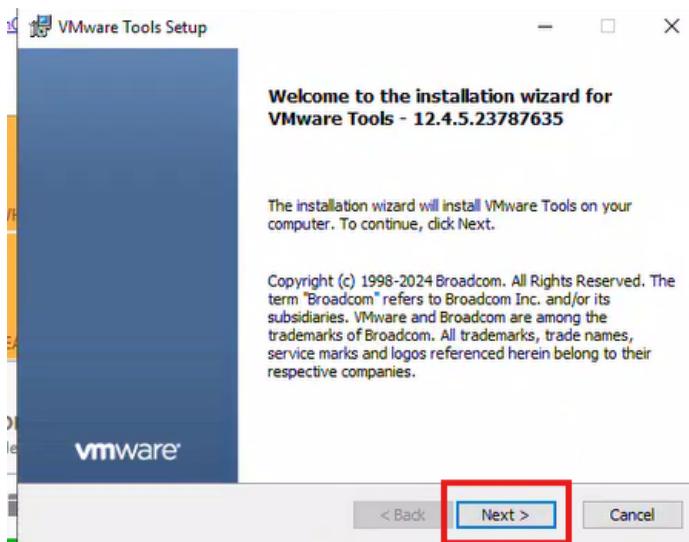
L) When asked “Do you want to allow your PC to be discoverable by other PCs and devices on the network?”, click “Yes”.

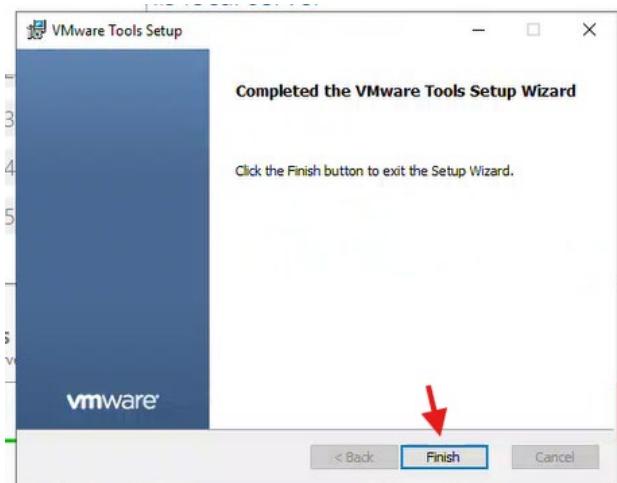
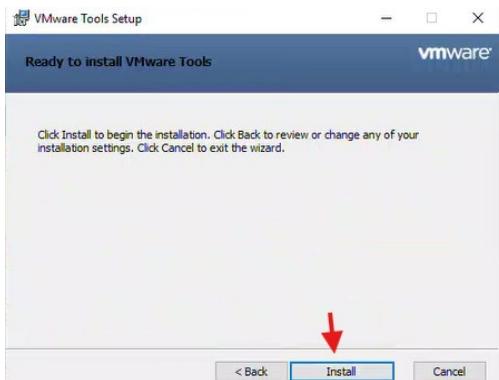
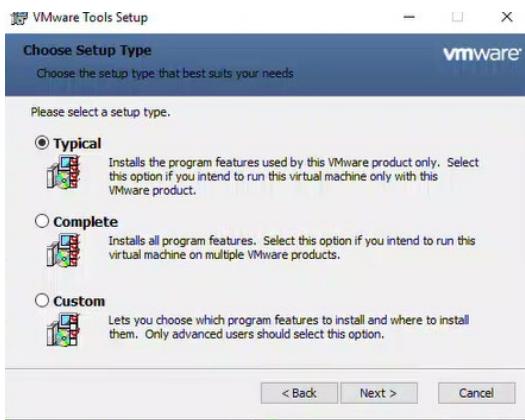


- M) Windows Server 2019 should now be booted; however, it won't be filling the entire screen. Click on "VM" in the toolbar at the top, then click "Install VMware tools".
 Disk will pop up if missed open the file explorer select DVD and click on setup 64

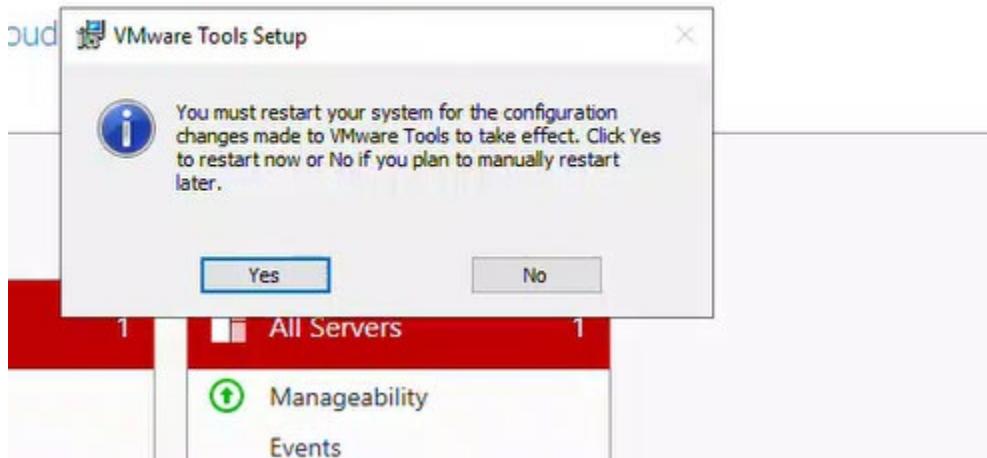


- N) When the "VMware Tools Setup" window pops up, click "Next >", then select "Typical", then click "Next >", then click "Install". Allow everything to install, then click "Finish."



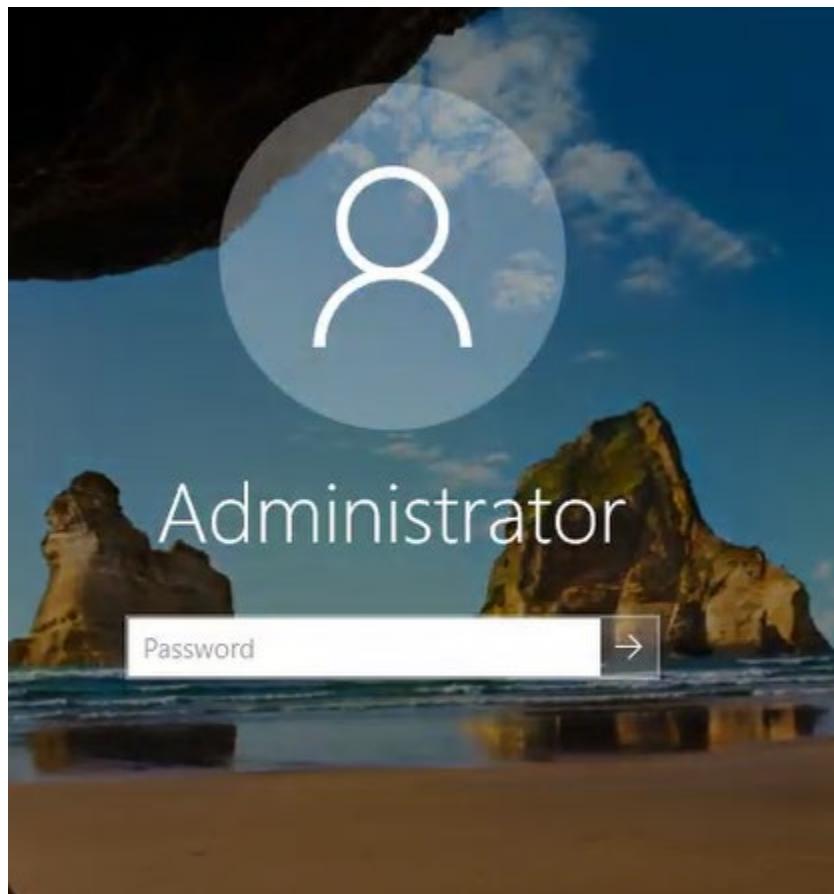


O) It will then prompt you to restart your system. Click “Yes” and allow the system to reboot.



3.1.3.3 Give static ip address

- Login As Administrator with password Amf123456



b. Inside Local server select IPV4 address assigned by DHCP, IPV6 enabled

The screenshot shows the Windows Server 2019 Local Server properties window. The 'Local Server' tab is selected. In the 'Ethernet0' section, the status 'IPv4 address assigned by DHCP, IPv6 enabled' is highlighted with a red box. Below this, the operating system version is Microsoft Windows Server 2019 Datacenter Evaluation and hardware information shows VMware, Inc. VMware20.1.

PROPERTIES
For WIN-039PDV90HQH

Computer name	WIN-039PDV90HQH	Last installed updates	Never
Workgroup	WORKGROUP	Windows Update	Install updates automatically using Windows Update
Windows Defender Firewall	Private: On	Real-Time Protection	On
Remote management	Enabled	Feedback & Diagnostics	Settings
Remote Desktop	Disabled	IE Enhanced Security Configuration	On
NTP Synchronization	Disabled	Time zone	(UTC-08:00) Pacific Time (US & Canada)
Ethernet0	IPv4 address assigned by DHCP, IPv6 enabled	Product ID	00431-20000-00000-AA974 (activated)

EVENTS
All events | 13 total

Server Name	ID	Severity	Source	Log	Date and Time
WIN-039PDV90HQH	10149	Warning	Microsoft-Windows-Windows Remote Management	System	1/17/2025 12:46:58 AM
WIN-039PDV90HQH	134	Warning	Microsoft-Windows-Time-Service	System	1/17/2025 12:46:49 AM
WIN-039PDV90HQH	134	Warning	Microsoft-Windows-Time-Service	System	1/17/2025 12:46:47 AM
WIN-039PDV90HQH	134	Warning	Microsoft-Windows-Time-Service	System	1/17/2025 12:46:45 AM
WIN-039PDV90HQH	7023	Error	Microsoft-Windows-Service Control Manager	System	1/17/2025 12:46:45 AM
WIN-039PDV90HQH	7023	Error	Microsoft-Windows-Service Control Manager	System	1/17/2025 12:46:45 AM
WIN-039PDV90HQH_10149	Warning	Microsoft-Windows-Windows Remote Management	System	1/16/2025 9:59:20 PM	

SERVICES
All services | 207 total

c. Select Ethernet0

The screenshot shows the Windows Control Panel Network Connections window. The 'Ethernet0' interface is selected, showing its properties: JAC-SERVERS.JOHNABBOTT.QC.CA and Intel(R) 82574L Gigabit Network C... Below the interface list, there is a table of service logs.

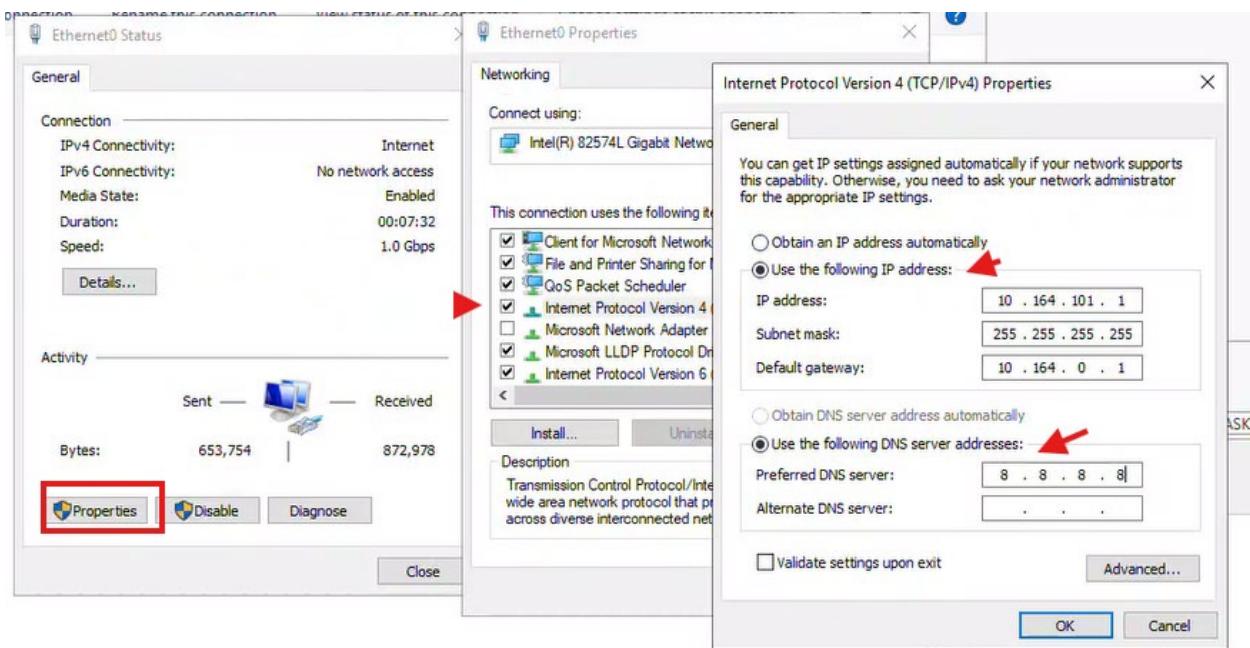
Network Connections

Item	Type	Source	Log	Date and Time
Ethernet0	Intel(R) 82574L Gigabit Network C...	JAC-SERVERS.JOHNABBOTT.QC.CA	System	1/17/2025 12:46:45 AM

1 item

Item	Type	Source	Log	Date and Time
190HQH	Error	Microsoft-Windows-Service Control Manager	System	1/17/2025 12:46:45 AM
190HQH	Error	Microsoft-Windows-Service Control Manager	System	1/17/2025 12:46:45 AM

d. In window General, Select Properties , next Window “Networking” appears select Internet Protocol Version IPV4



3.1.3.4 Change Computer name

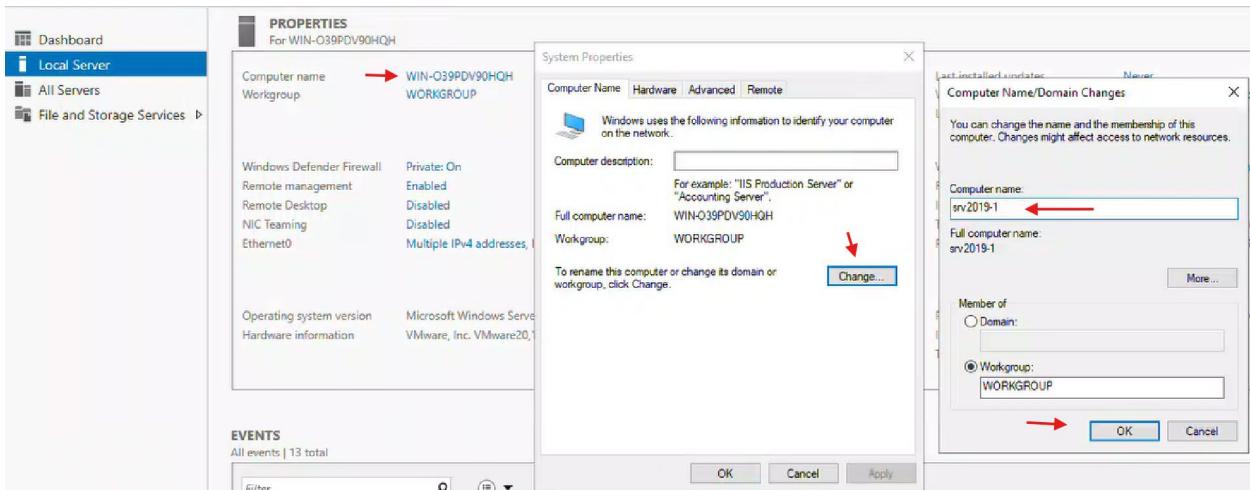
A) Check current name

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.3650]
(c) 2018 Microsoft Corporation. All rights reserved.

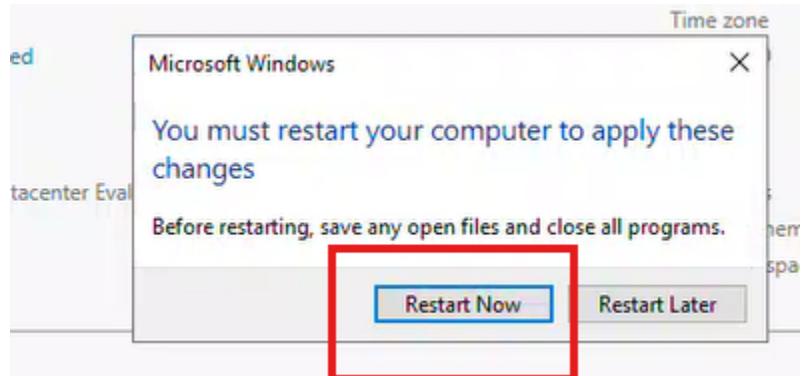
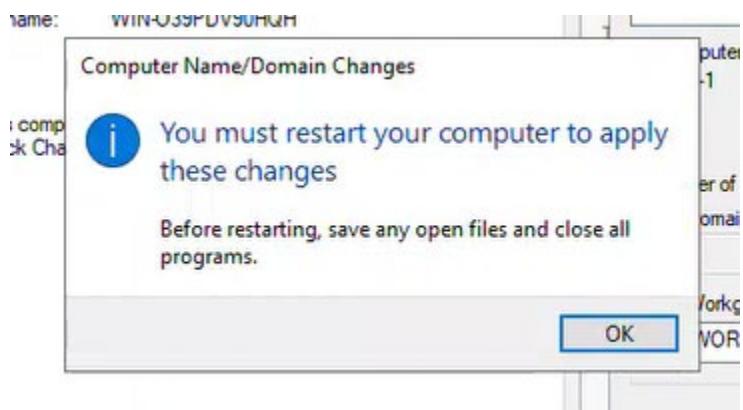
C:\Users\Administrator>hostname
WIN-039PDV90HQH

C:\Users\Administrator>
```

B) In server manager / Local server select the “computer Name” In the next window select “Change” then set the name to srv2019-1



C) Allow to restart computer



D) After restart comes back check New name and ip had been assigned

```

C:\Users\Administrator>hostname
srv2019-1

C:\Users\Administrator>ipconfig /all

Windows IP Configuration

Host Name . . . . . : srv2019-1
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

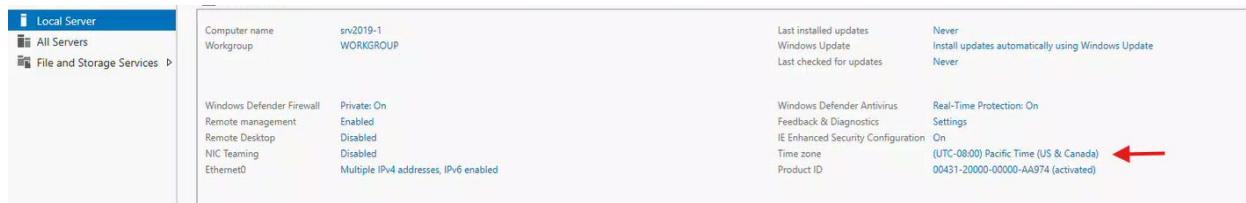
Ethernet adapter Ethernet0:

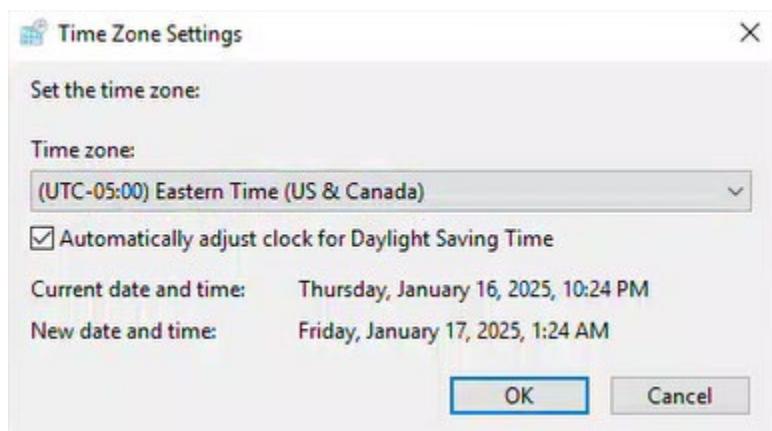
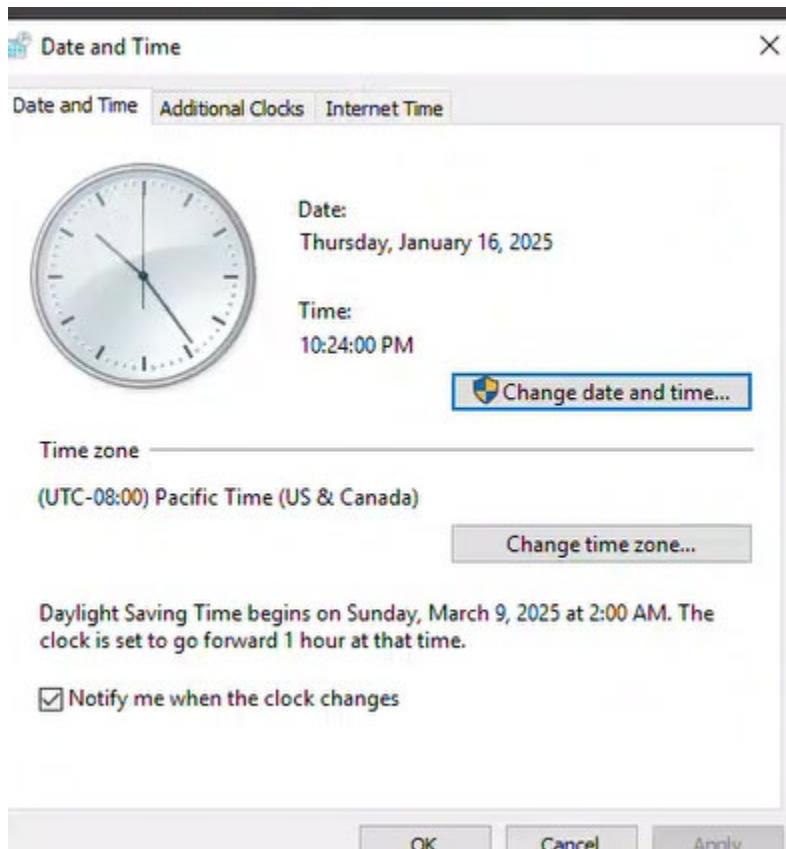
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-ED-9C-8C
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::2f27:593d:ad7a:83e%6(PREFERRED)
IPv4 Address. . . . . : 10.164.101.1(Duplicate)
Subnet Mask . . . . . : 255.255.0.0
Autoconfiguration IPv4 Address. . . . . : 169.254.113.159(PREFERRED)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-D1-6E-00-0C-29-ED-9C-8C
DNS Servers . . . . . : 8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

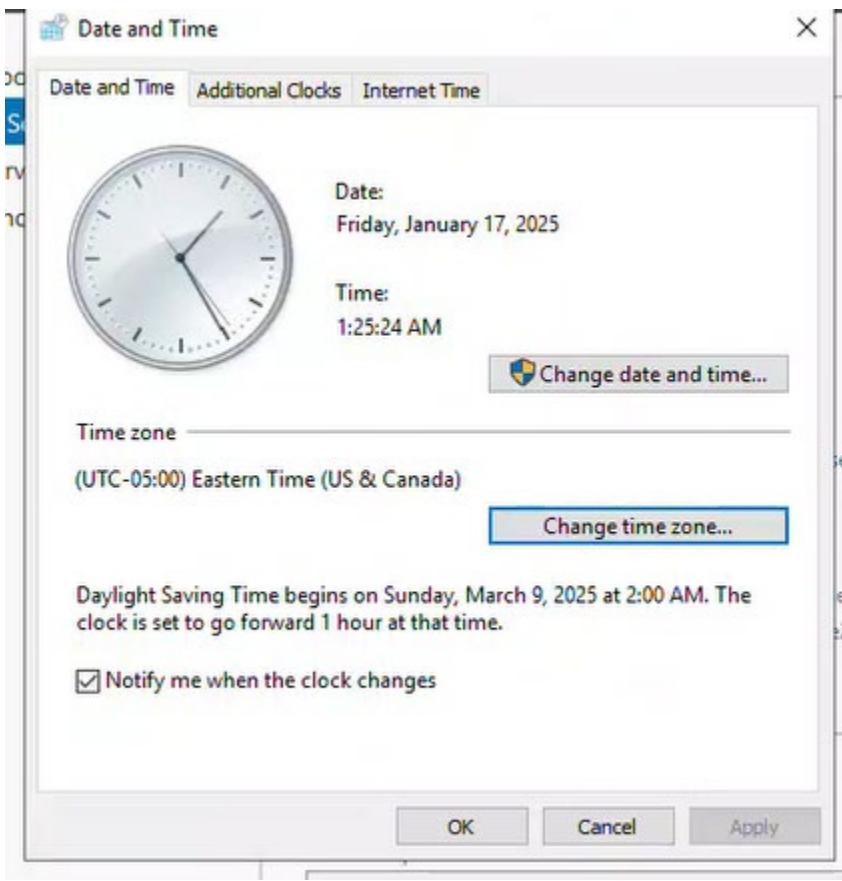
C:\Users\Administrator>

```

3.1.3.5 Change time zone







3.1.3.6 Firewalls and security

In a server you can not browse the internet

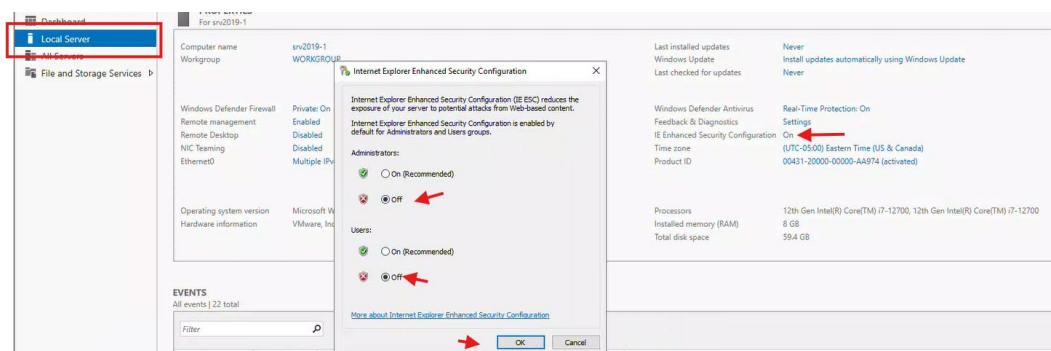
If you try to browse the internet it does not work since it is being blocked

In a work environment do not browse the internet on a server if you infect the server,

But we will use it for lab

A) Inside Local server select IE Enhanced Security Configuration.

A sub window opens Set Off in Administrators and users



- B) Turn off firewalls. Select windows Defender Firewall, click “Public: On”. Then turn off the firewalls for Domain Network, Private Network, and Public Network, by clicking each one, and clicking the slider to “off”.

The screenshot shows two windows side-by-side. On the left is the 'Server Manager' interface under 'Local Server' properties. It displays the computer name as 'srv2019-1' and workgroup as 'WORKGROUP'. Under 'Windows Defender Firewall', it shows 'Private: On' with several network profiles listed: Remote management (Enabled), Remote Desktop (Disabled), NIC Teaming (Disabled), and Ethernet0 (Multiple IPv4 addresses). Below this, 'Operating system version' is Microsoft Windows Server 2019 and 'Hardware information' is VMware, Inc. VMware. An 'EVENTS' section shows two entries: SRV2019-1 ID 10149 Warning Microsoft-Windows-Firewall/Perf and SRV2019-1 ID 134 Warning Microsoft-Windows-Firewall/Perf. On the right is the 'Windows Security' window. It has a sidebar with 'Home', 'Virus & threat protection', and 'Firewall & network protection'. The main area shows three network types: 'Domain network' (firewall on, red arrow), 'Private network (active)' (firewall on, red arrow), and 'Public network' (firewall on, red arrow). A red arrow points to the 'Private network' status. At the bottom of the security window are links for 'Allow an app through firewall', 'Network and Internet troubleshooter', 'Firewall notification settings', 'Advanced settings', and 'Restore firewalls to default'.

This screenshot provides a detailed look at the 'Domain network' settings within the Windows Security interface. The left sidebar includes 'Home', 'Virus & threat protection', 'Firewall & network protection' (selected), 'App & browser control', and 'Device security'. The main content area starts with a definition of a domain network as 'Networks at a workplace that are joined to a domain.' Below this is the 'Active domain networks' section, which states 'Not connected'. To the right, there are links for 'Change your privacy settings', 'View and change privacy settings for your Windows 10 device', 'Privacy settings', 'Privacy dashboard', and 'Privacy Statement'. The 'Windows Defender Firewall' section explains its role in protecting the device while on a domain network. It shows a slider switch set to 'Off' with the note 'Domain firewall is off. Your device may be vulnerable.' Below this is the 'Incoming connections' section, which prevents incoming connections on a domain network. A checkbox labeled 'Blocks all incoming connections, including those in the list of allowed apps.' is present. At the bottom left is a 'Settings' icon.

[Home](#)[Virus & threat protection](#)[Firewall & network protection](#)[App & browser control](#)[Device security](#)

Private network

Networks at home or work, where you know and trust the people and devices on the network, and where your device is set as discoverable.

[Change y](#)[View and
for your l](#)[Privacy se](#)[Privacy da](#)[Privacy St](#)

Active private networks

[Network](#)

Windows Defender Firewall

Helps protect your device while on a private network.

Private firewall is off. Your device may be vulnerable.

Off

Incoming connections

Prevents incoming connections when on a private network.

Blocks all incoming connections, including those in the list of allowed apps.



🔌 Public network

Networks in a public place such as an airport or coffee shop, and where your device is set as not discoverable.

🏠 Home

🔗 Virus & threat protection

🛡 Firewall & network protection

💻 App & browser control

🔒 Device security

Active public networks

Not connected

C

V

fi

P

P

P

Windows Defender Firewall

Helps protect your device while on a public network.

Public firewall is off. Your device may be vulnerable.

Off

Incoming connections

Prevents incoming connections when on a public network.

Blocks all incoming connections, including those in the list of allowed apps.

ⓘ Firewall & network protection

Who and what can access your networks.

- ✖ Windows Defender Firewall is using settings that may make your device unsafe.

[Restore settings](#)

🖥 Domain network

Firewall is off.

[Turn on](#)

🔒 Private network (active)

Firewall is off.

[Turn on](#)

🌐 Public network

Firewall is off.

[Turn on](#)

C) Select Allservers to refresh the screen

SERVERS
All servers | 1 total

Server Name	IPv4 Address	Manageability	Last Update	Windows Activation
SRV2019-1	10.164.101.1, 169.254.113.159	Online - Performance counters not started	1/16/2025 10:36:21 PM	00431-20000-00000-AA974

EVENTS
All events | 22 total

D) Go back to local servers and now the changes will be reflected on Local server

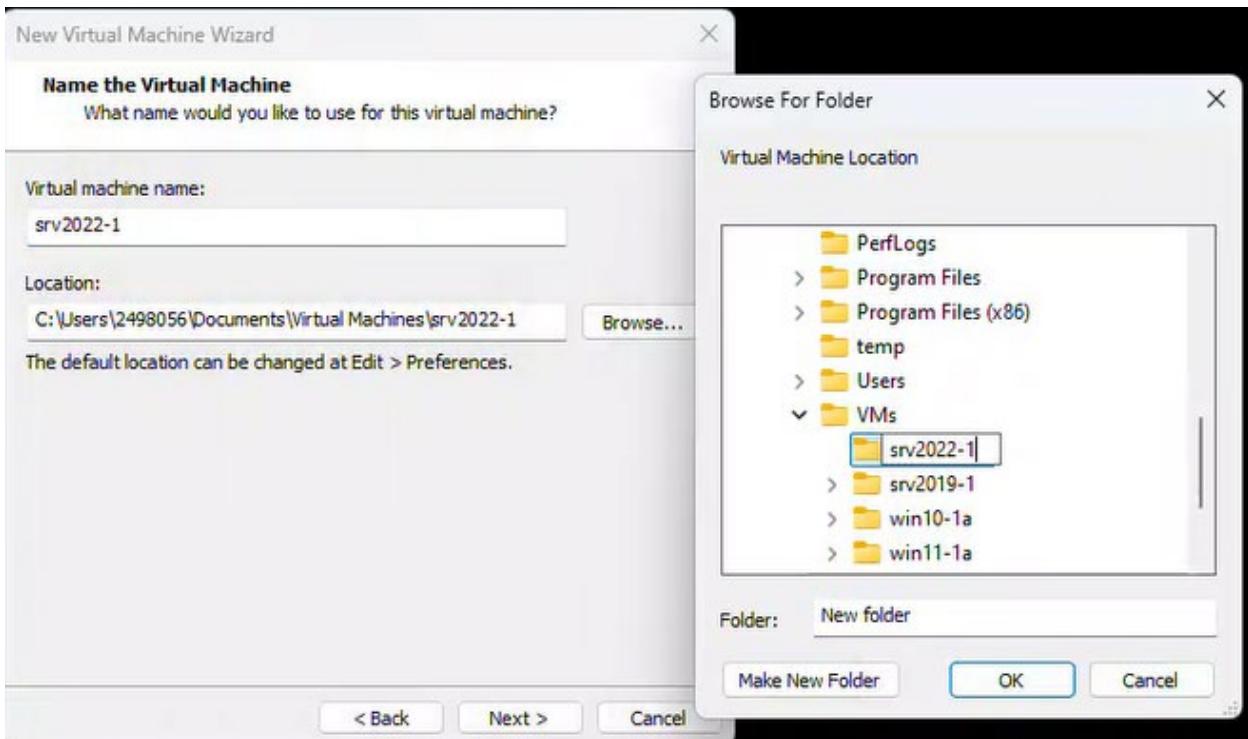
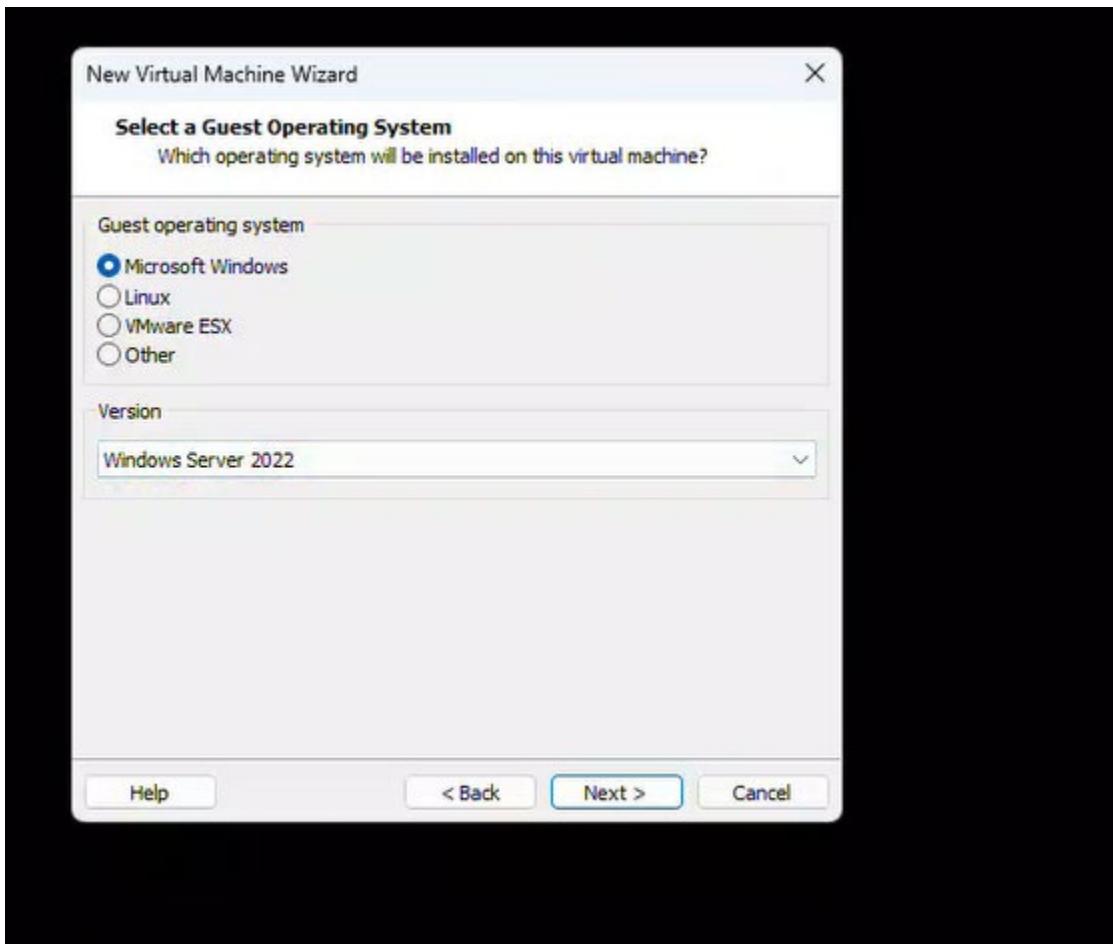
PROPERTIES
For srv2019-1

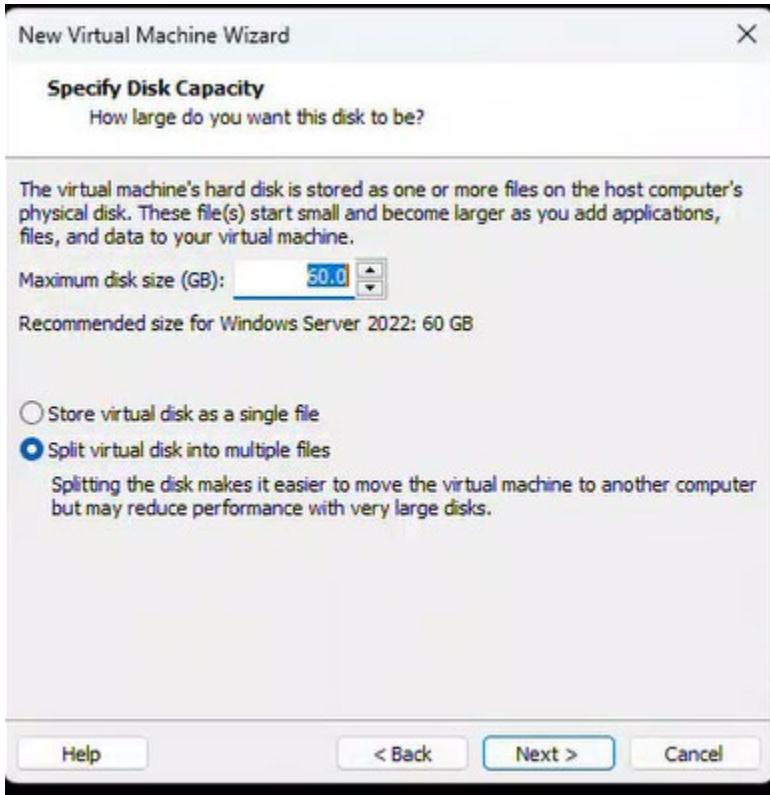
Computer name	srv2019-1 WORKGROUP	Last installed updates	Never
Workgroup		Windows Update	Install updates automatically using Windows Update
		Last checked for updates	Never
Windows Defender Firewall	Private: Off Enabled	Windows Defender Antivirus	Real-Time Protection: On
Remote management	Enabled	Feedback & Diagnostics	Settings
Remote Desktop	Disabled	IE Enhanced Security Configuration	Off
NIC Teaming	Disabled	Time zone	(UTC-05:00) Eastern Time (US & Canada)
Ethernet0	Multiple IPv4 addresses, IPv6 enabled	Product ID	00431-20000-00000-AA974 (activated)
Operating system version	Microsoft Windows Server 2019 Datacenter Evaluation	Processors	12th Gen Intel(R) Core(TM) i7-12700, 12th Gen Intel(R) Core(TM) i7-12700
Hardware information	VMware, Inc. VMware20.1	Installed memory (RAM)	8 GB
		Total disk space	59.4 GB

EVENTS
All events | 22 total

3.1.4 Windows Server 2022

Install Windows Server 2022





Device Summary

Memory	8 GB
Processors	2
New CD/DVD (SATA)	Using file C:\ISOs\WindowsServer2022\WindowsServer2022-DVD.iso
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect
Printer	Present
Display	Auto detect

Memory

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine: MB

128 GB - 64 GB - 32 GB - 16 GB - 8 GB - 4 GB - 2 GB - 1 GB - 512 MB - 256 MB - 128 MB - 64 MB - 32 MB - 16 MB - 8 MB - 4 MB

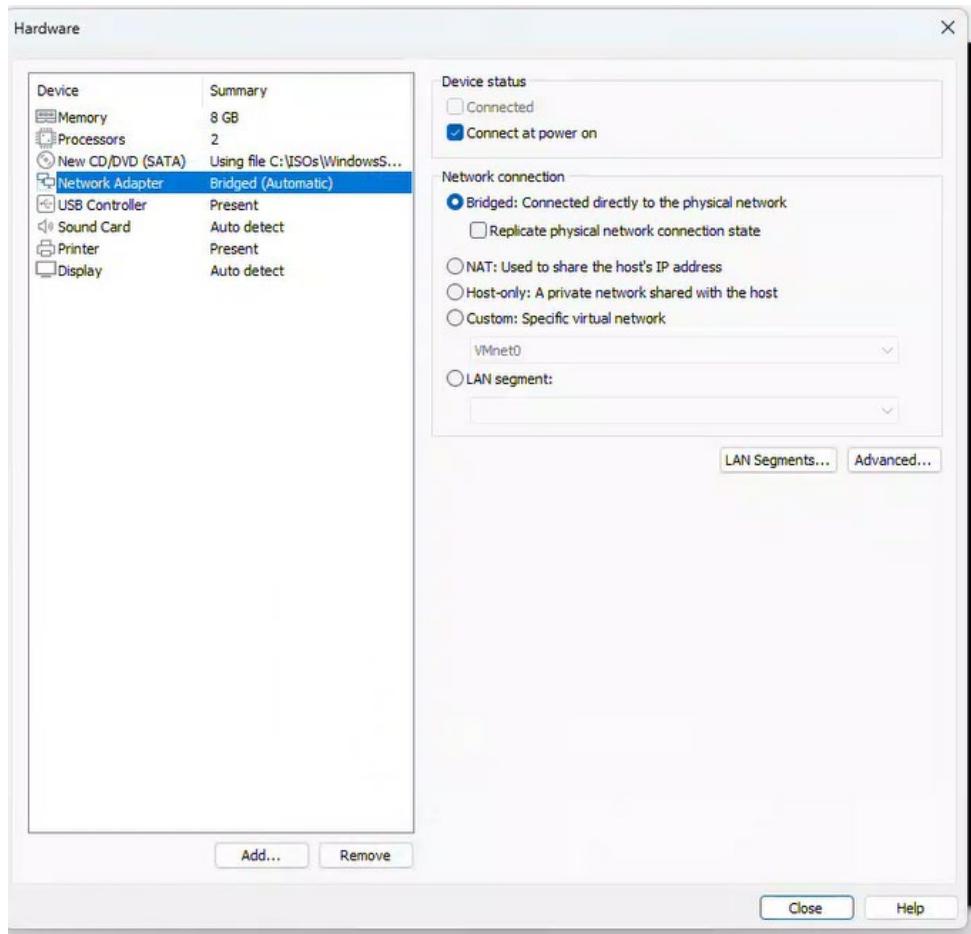
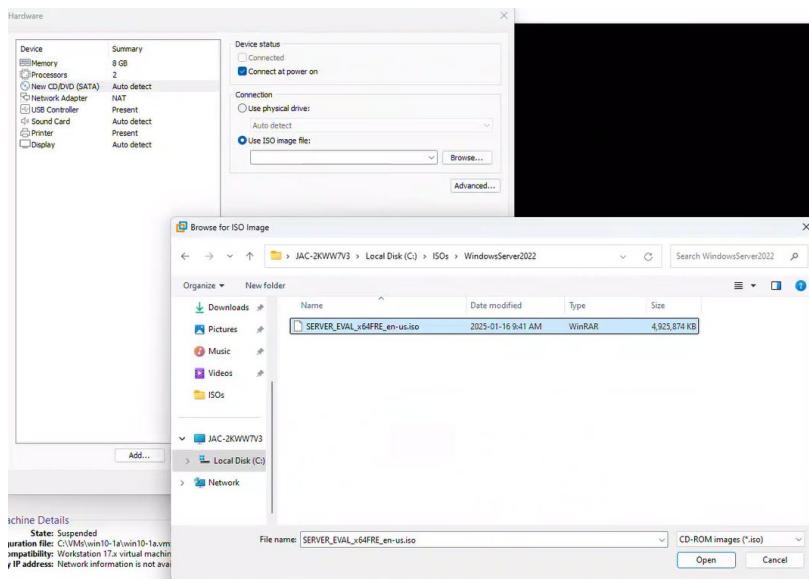
■ Maximum recommended memory (Memory swapping may occur beyond this size.)
55.7 GB

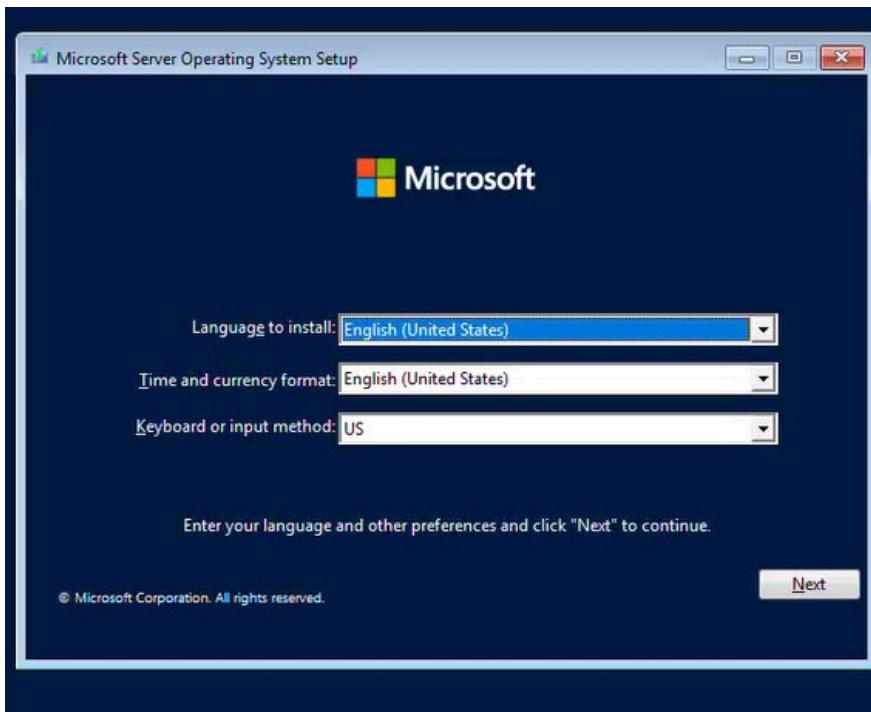
■ Recommended memory 2 GB

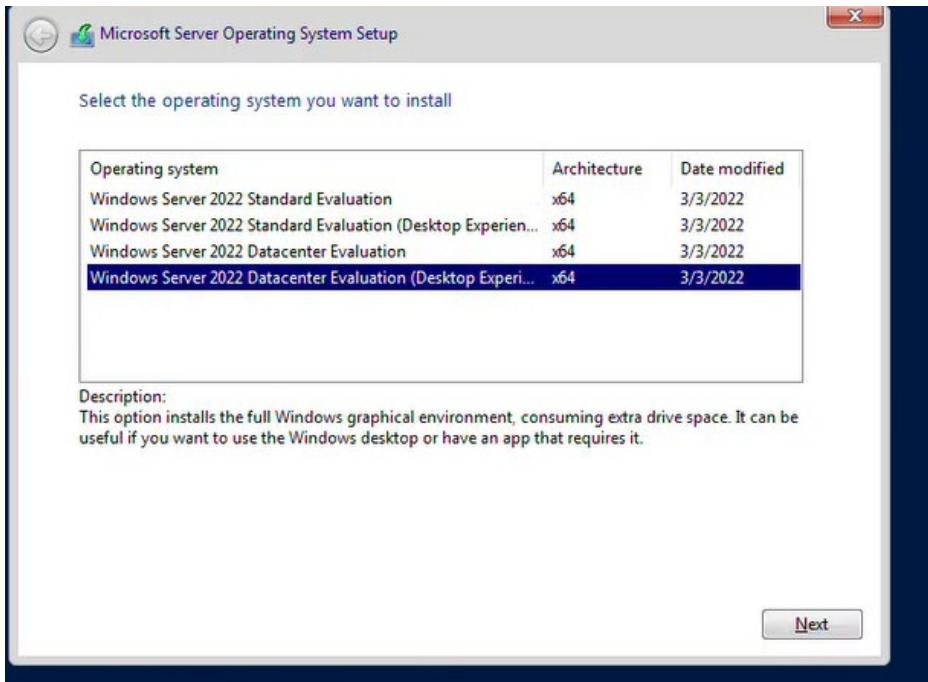
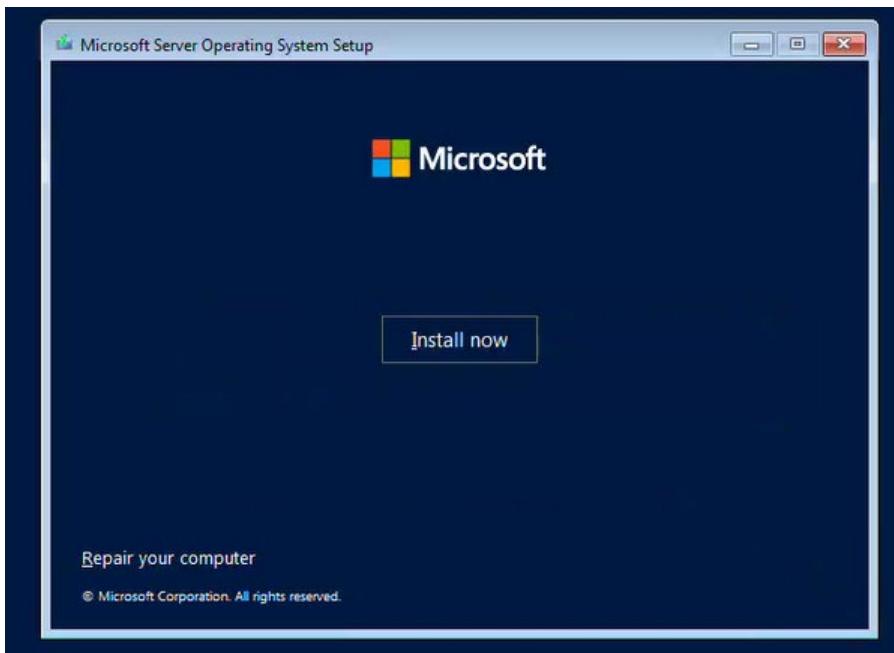
■ Guest OS recommended minimum 1 GB

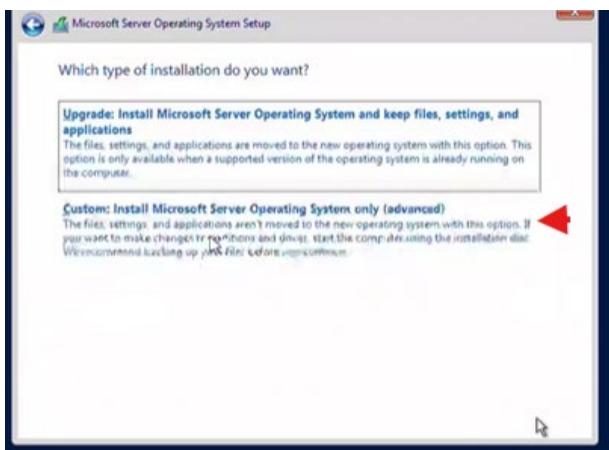
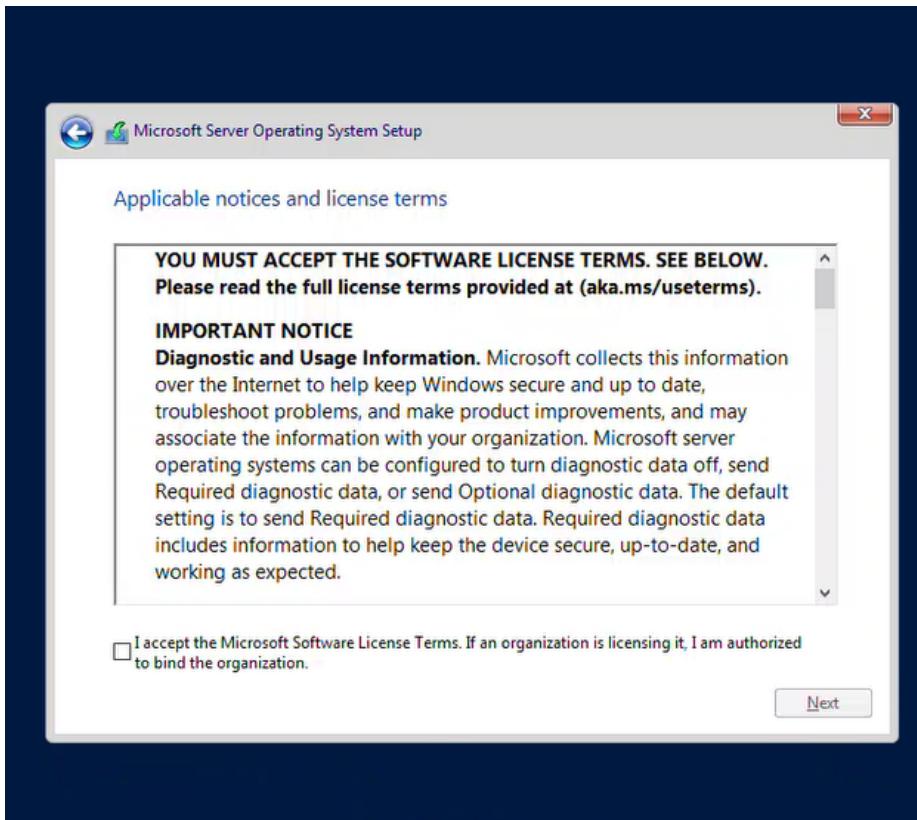
Add... Remove Close Help

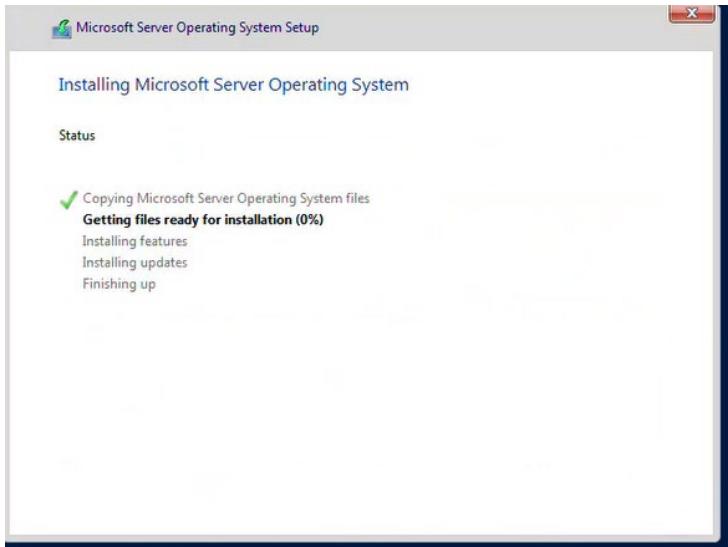
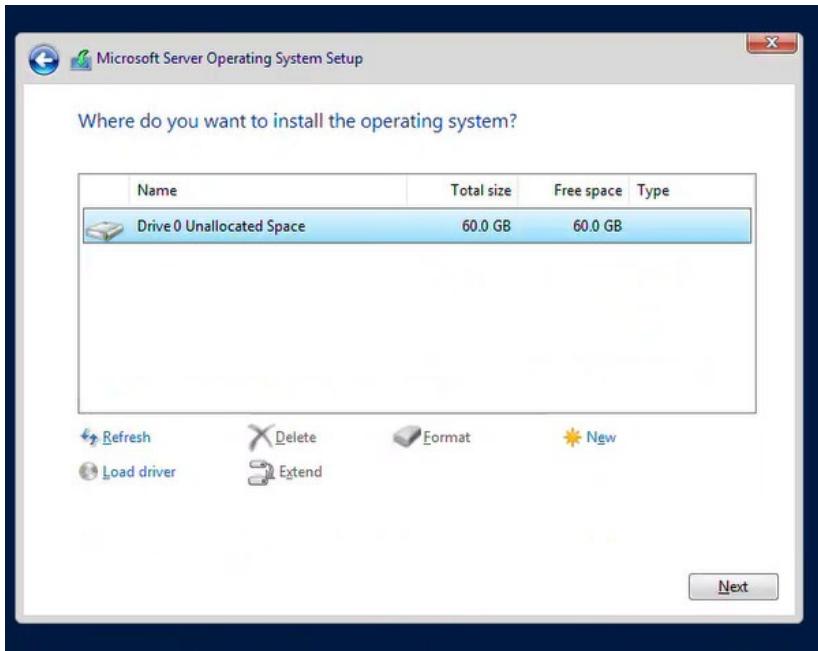
■	Maximum recommended memory (Memory swapping may occur beyond this size.)
■	Recommended memory
■	Guest OS recommended minimum

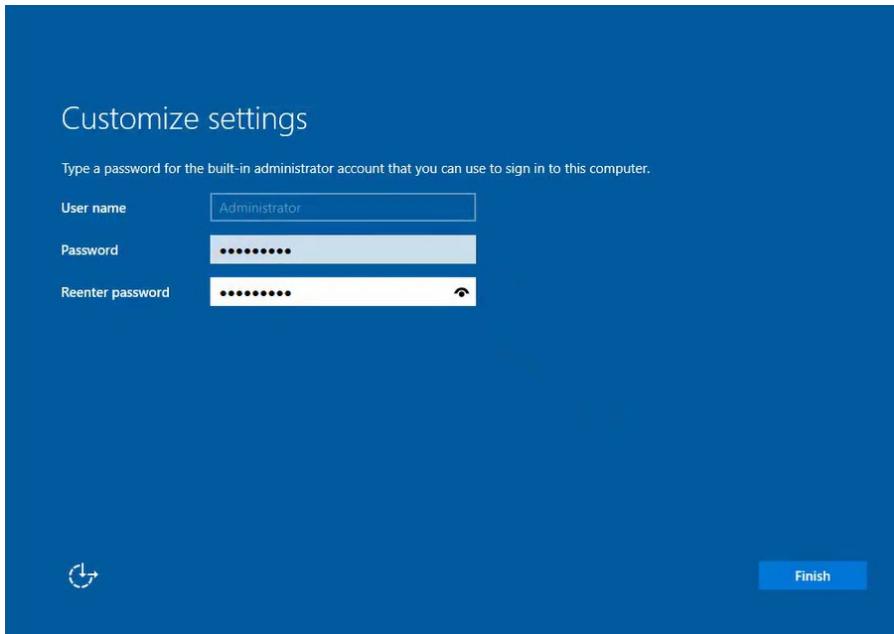
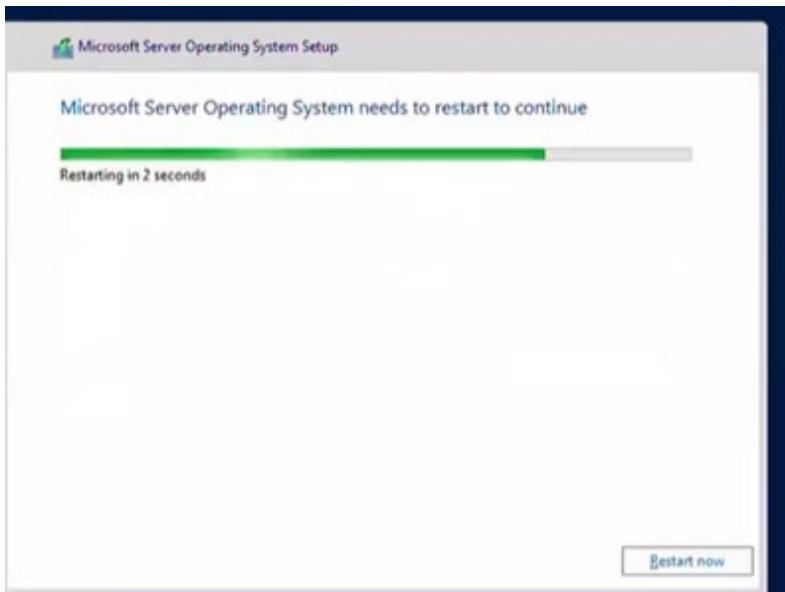


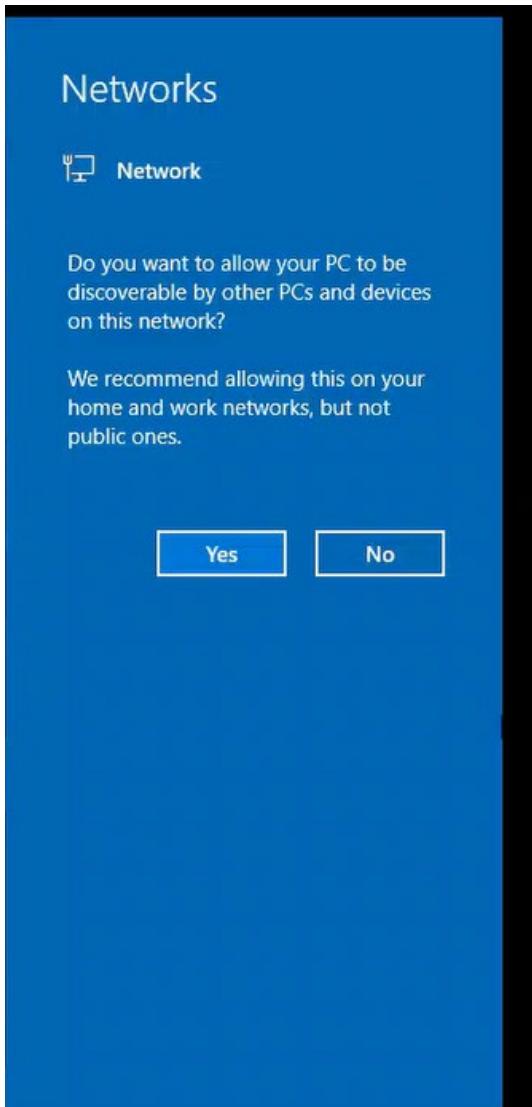
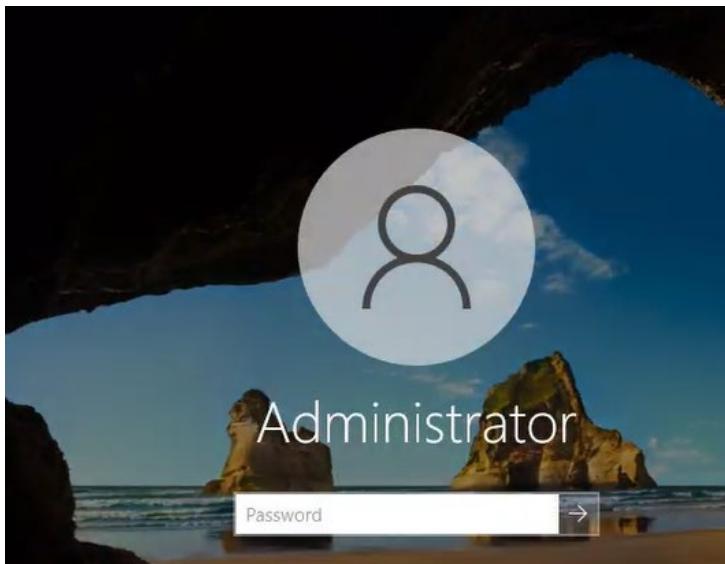


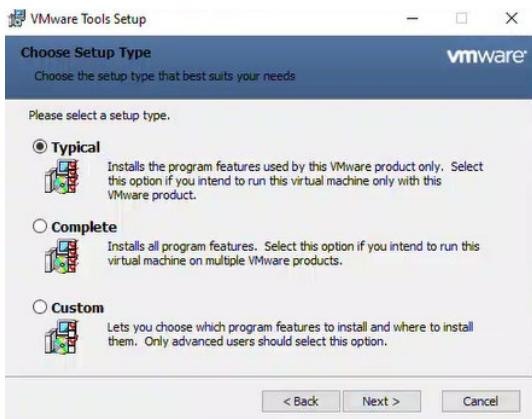
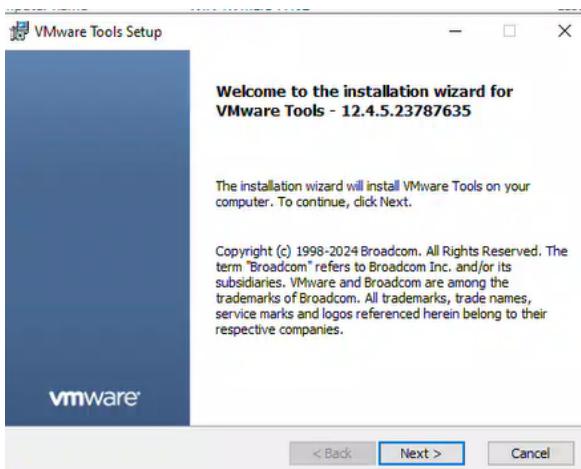
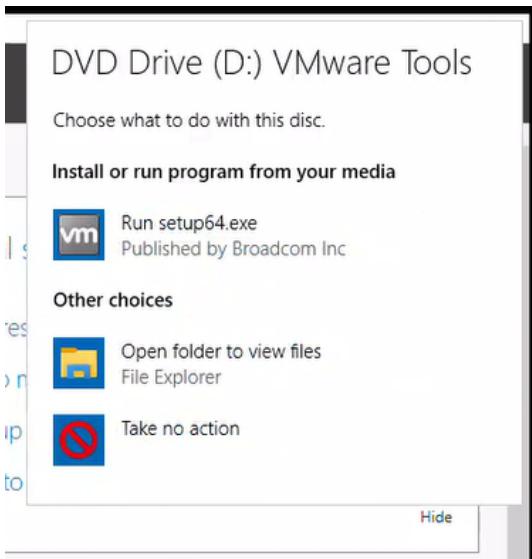


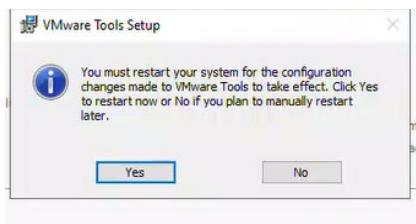
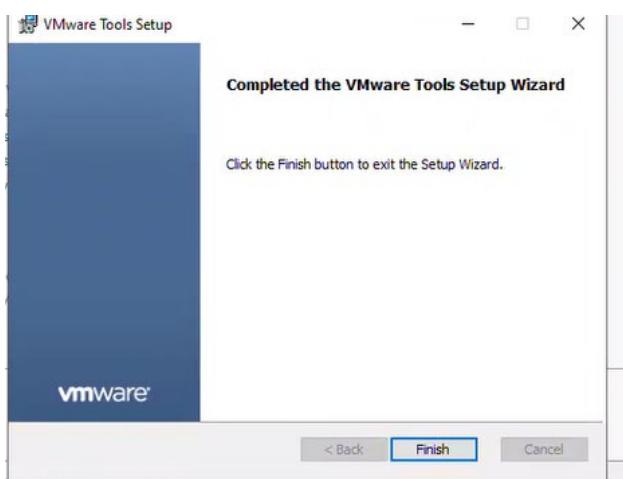
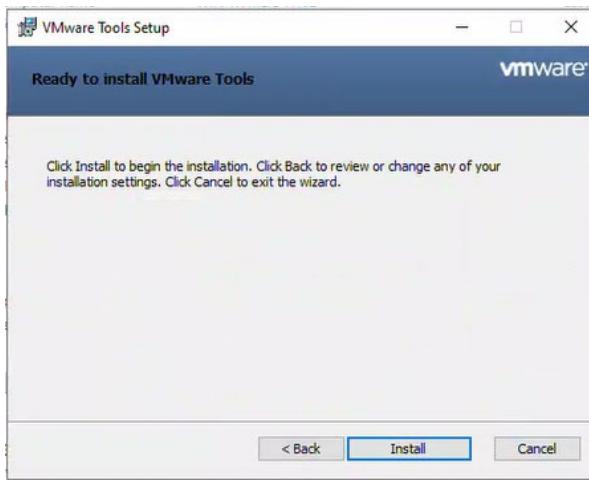


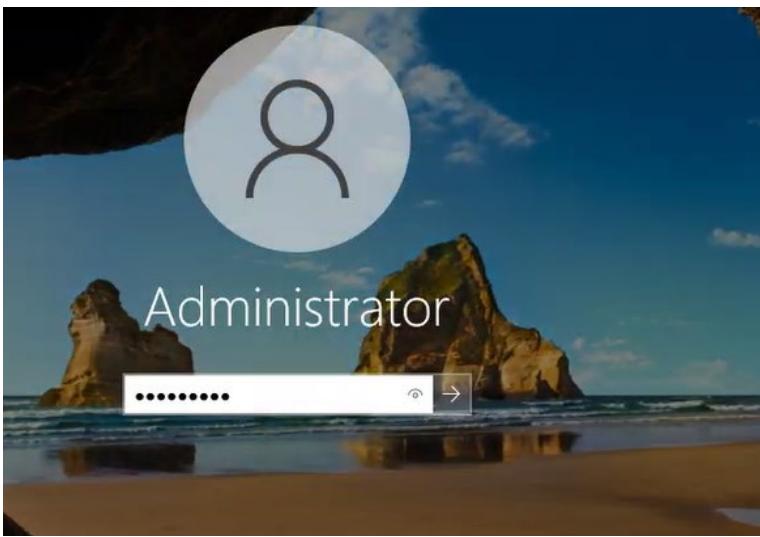










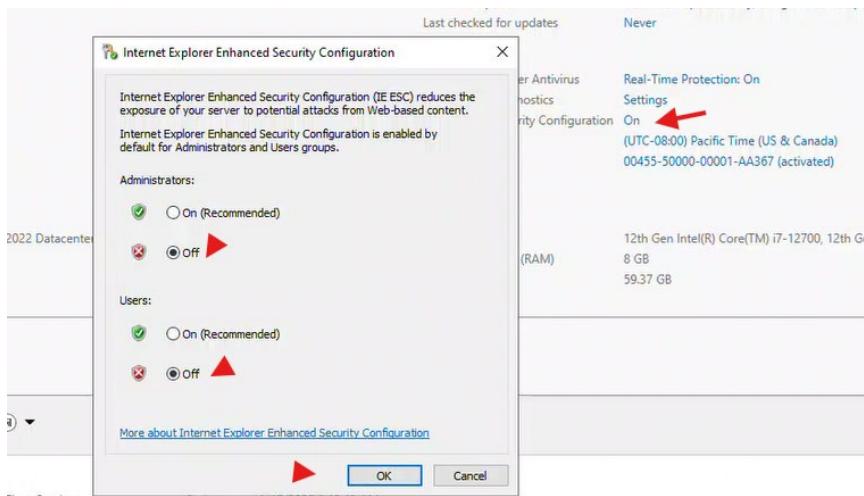
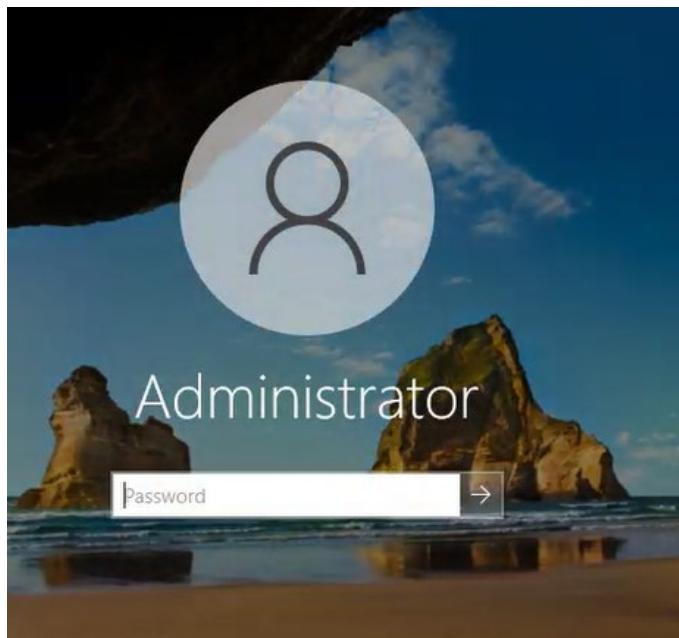
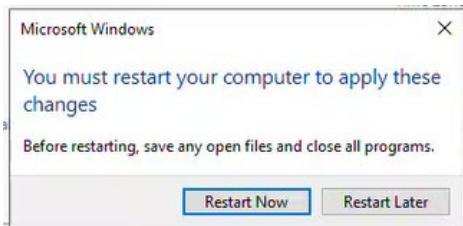
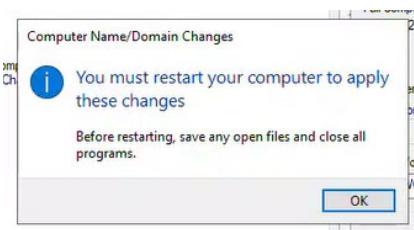


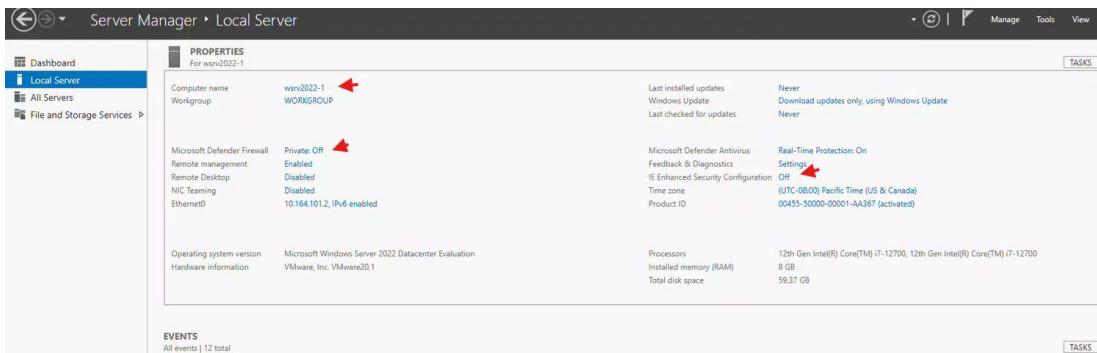
This screenshot displays the Microsoft Endpoint Manager Admin Center interface. On the left, a navigation pane includes "Dashboard", "Local Server", "All Servers", and "File and Storage Services". The "Local Server" section is selected, showing details for "WIN-RVMLIU417J2". It lists the computer name as "WIN-RVMLIU417J2" and the workgroup as "WORKGROUP". Under "Microsoft Defender Firewall", "Remote management" is set to "Enabled". Under "NIC Teaming", "Ethernet0" is listed with an IP address of "10.164.101.2, IPv6 enabled". The "Events" section shows a list of recent events, including warnings about the Windows Time Service and Microsoft Windows Service Control Manager.

To the right, a "Network Connections" window is open, showing the "Ethernet0" connection. It displays the connection status, activity (Sent: 149,139, Received: 565,768 bytes), and properties for "Internet Protocol Version 4 (TCP/IPv4)". The "General" tab shows the IP address as "10 . 164 . 101 . 2", subnet mask as "255 . 255 . 0 . 0", and default gateway as "10 . 164 . 0 . 1". The "Advanced..." button is visible at the bottom right of the "Internet Protocol Version 4 (TCP/IPv4) Properties" dialog.

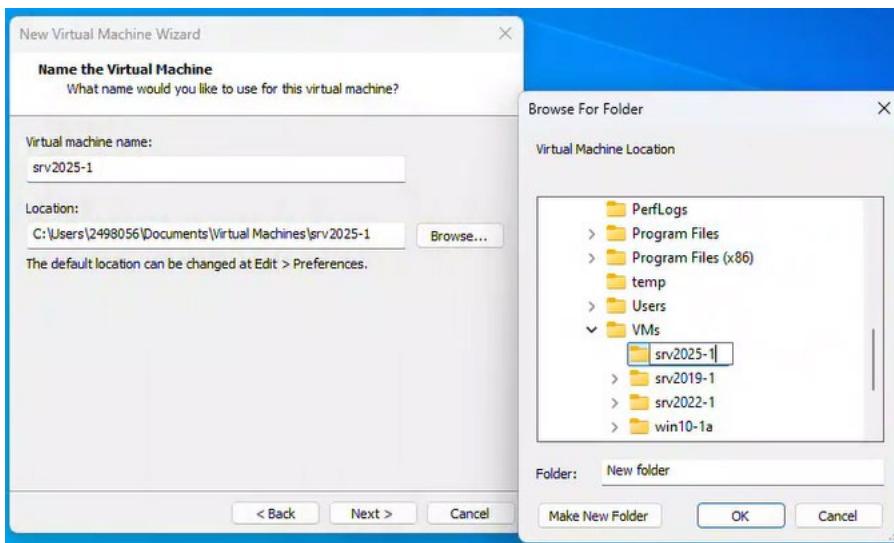
This screenshot shows the "Properties" dialog for the "WIN-RVMLIU417J2" computer. The "Computer Name" tab is selected, displaying the current computer name as "WIN-RVMLIU417J2" and the workgroup as "WORKGROUP". The "Computer description" field contains "Windows uses the following information to identify your computer on the network." The "Full computer name" is listed as "WIN-RVMLIU417J2" and the "Workgroup" as "WORKGROUP". A red arrow points to the "Computer name" field, and another red arrow points to the "Change..." button.

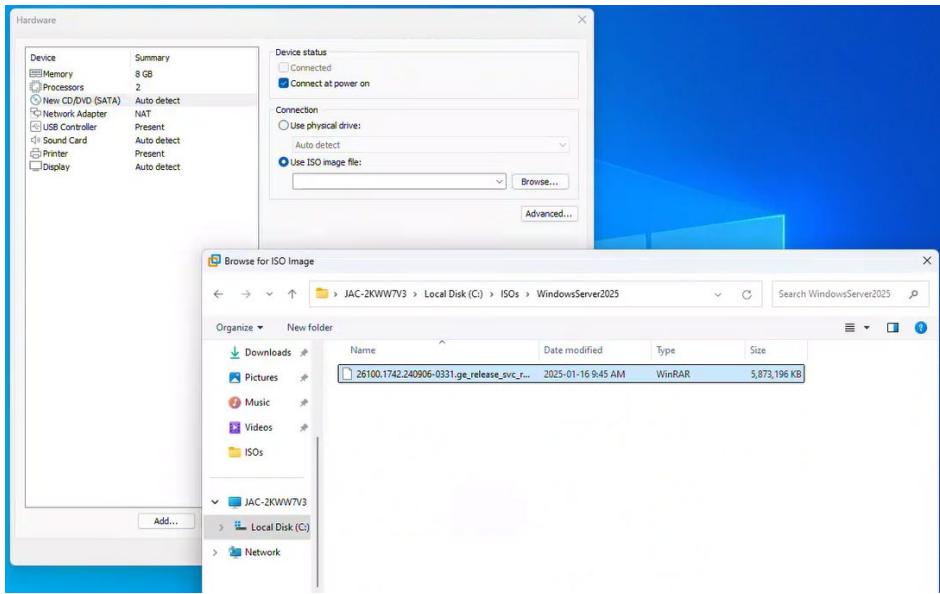
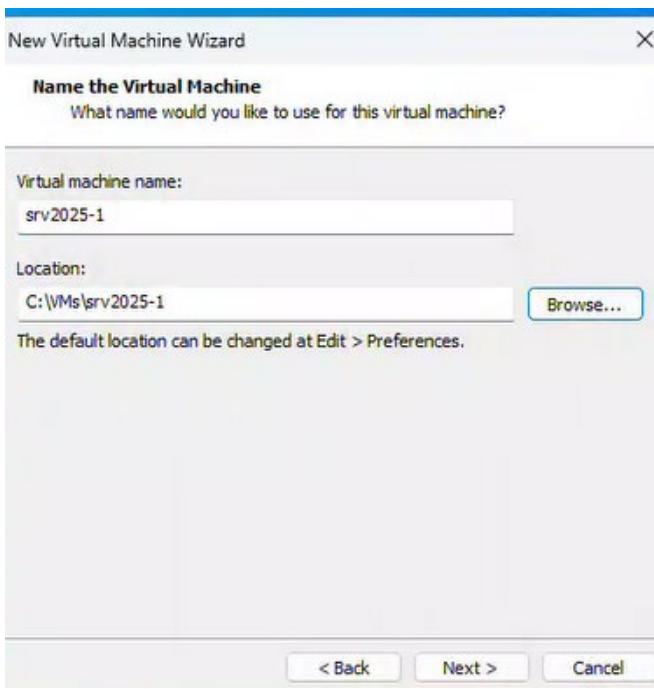
On the right, a "Computer Name/Domain Changes" dialog is open. It allows changing the computer name to "wsrv2022-1" and the workgroup to "WORKGROUP". The "OK" button is highlighted.

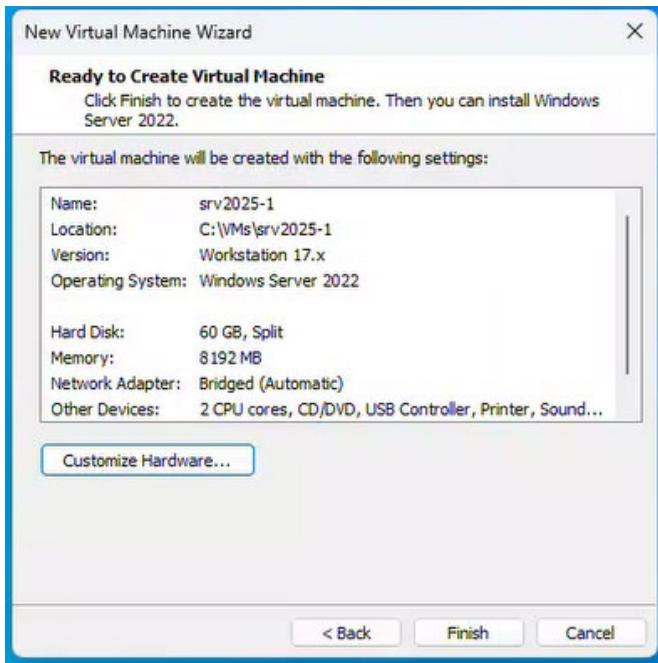
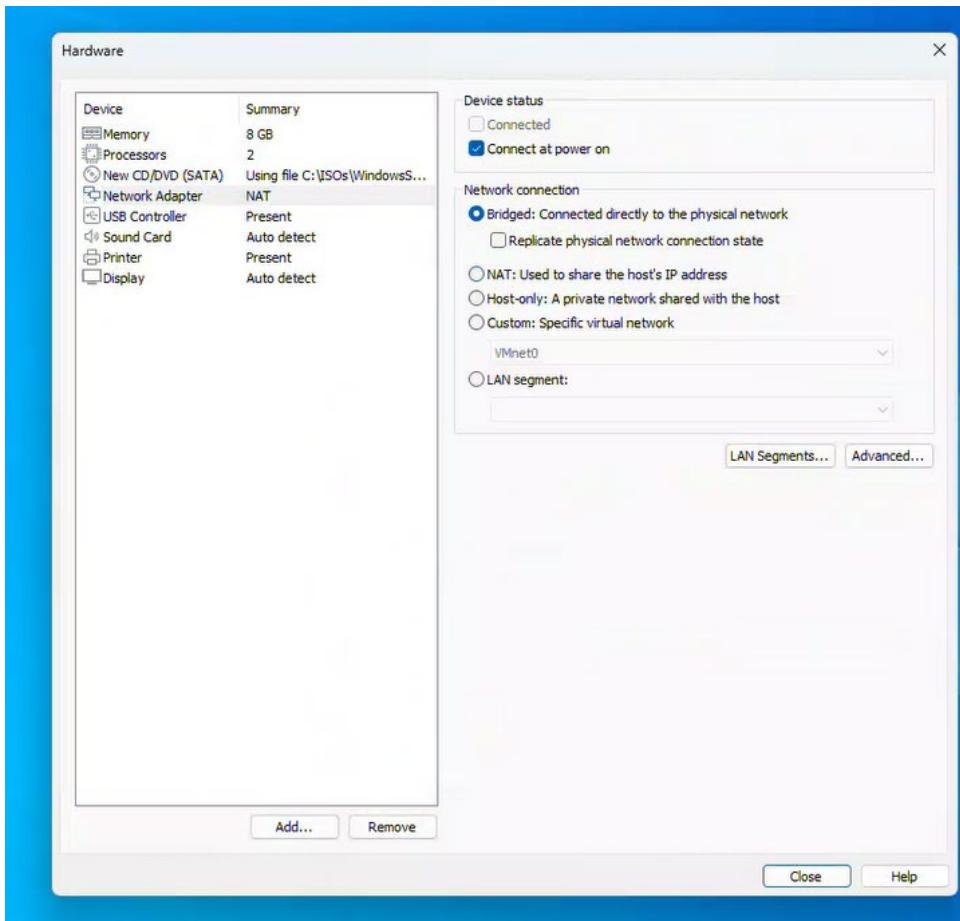


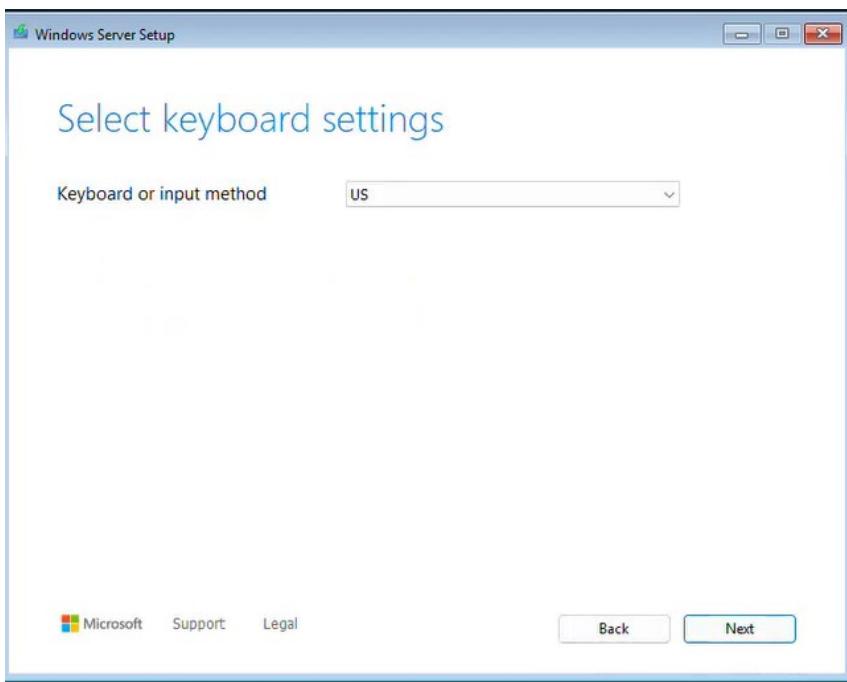
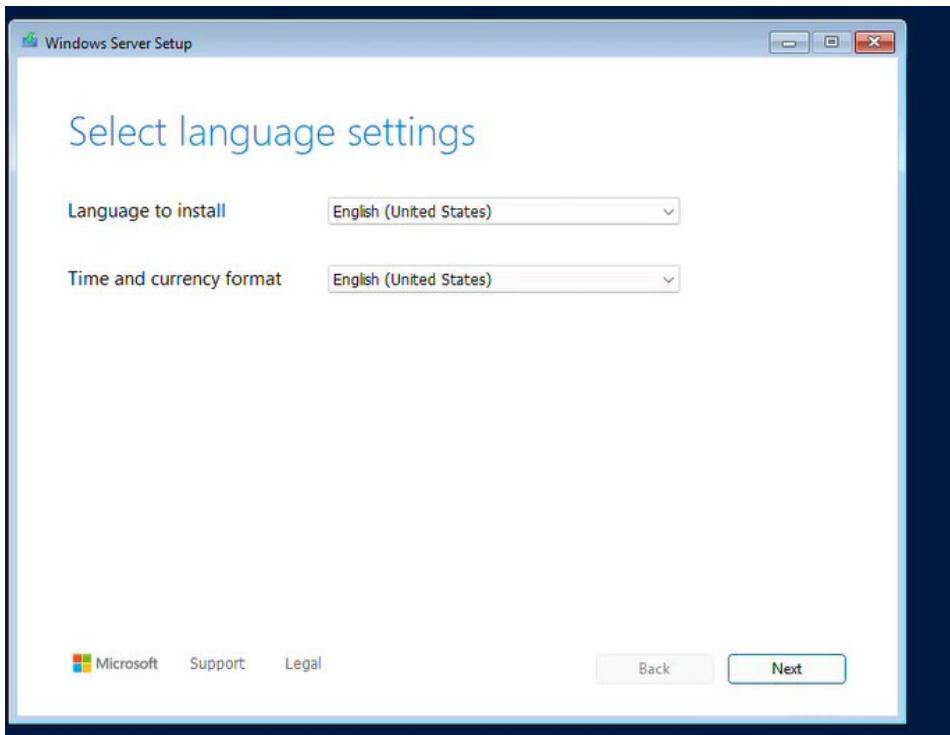


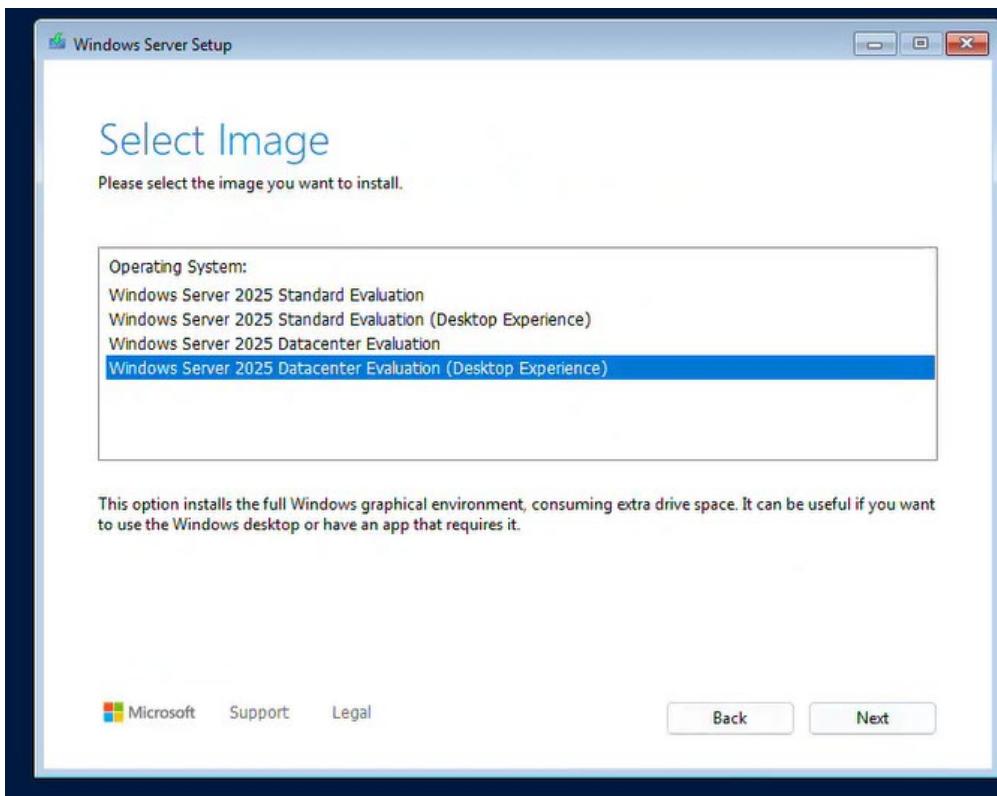
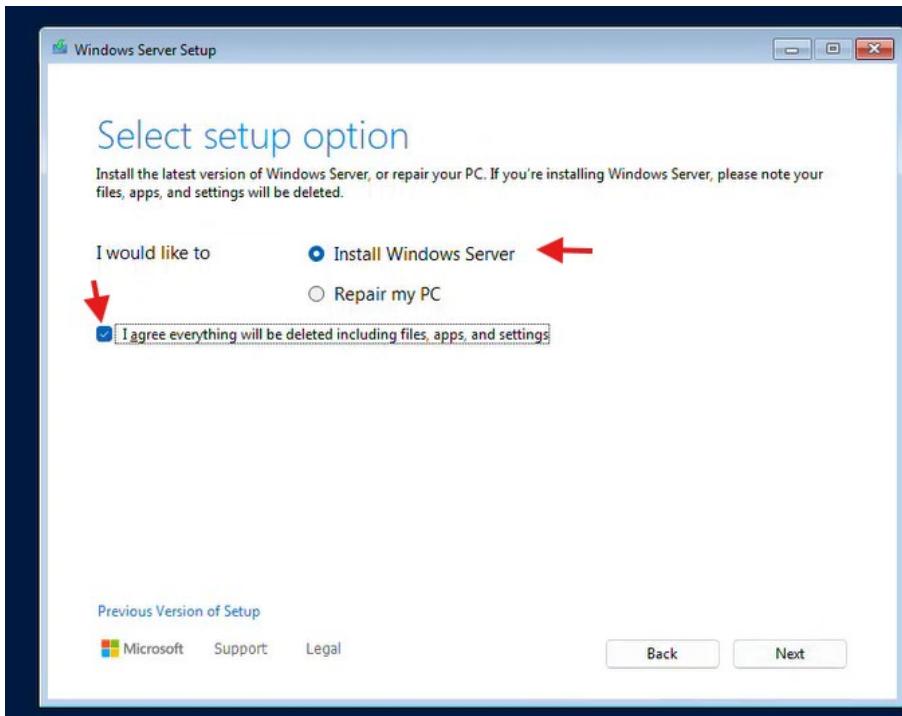
3.1.5 Windows Server 2025

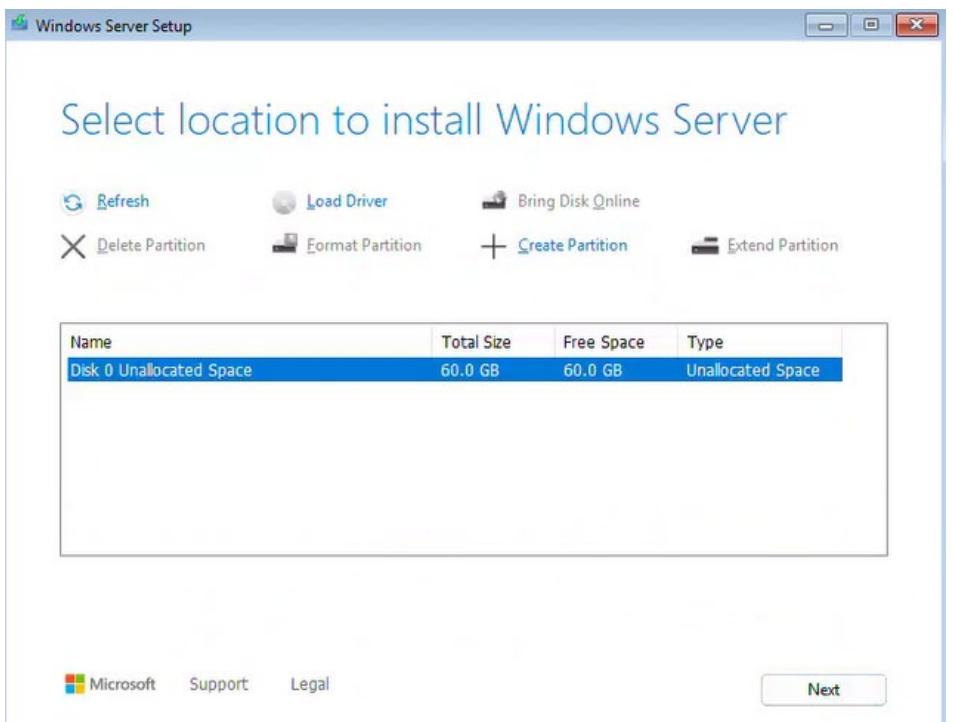
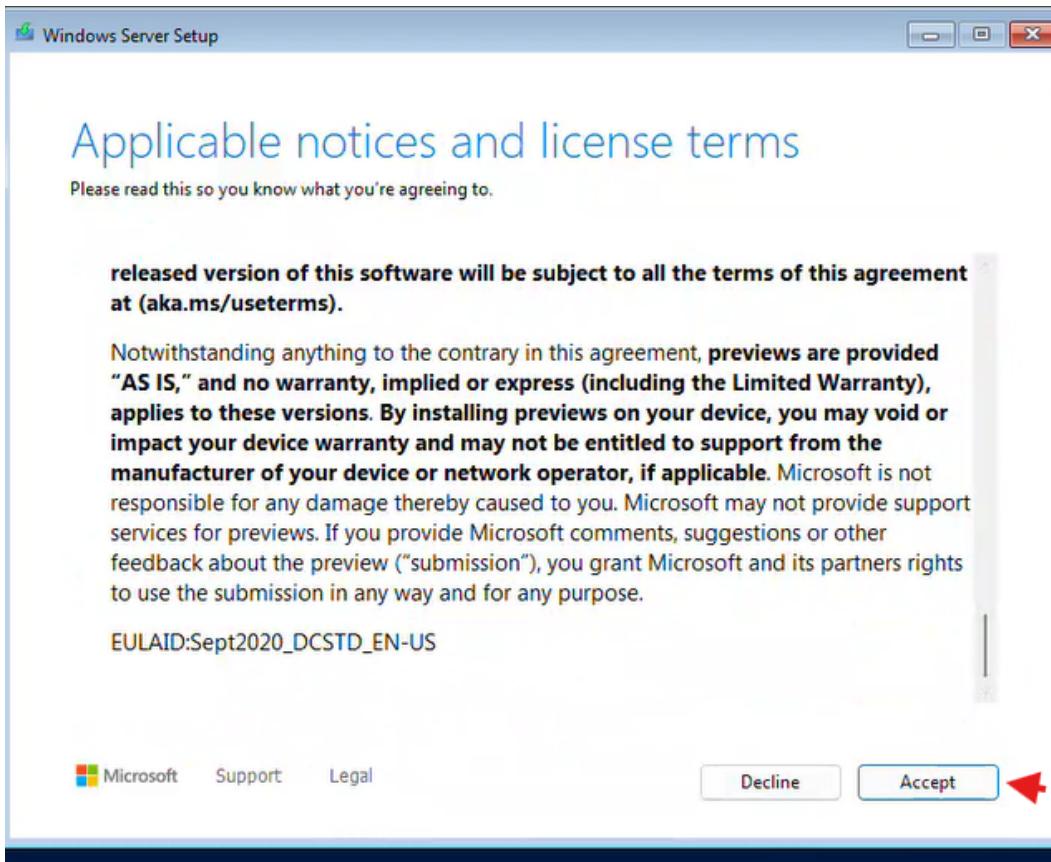


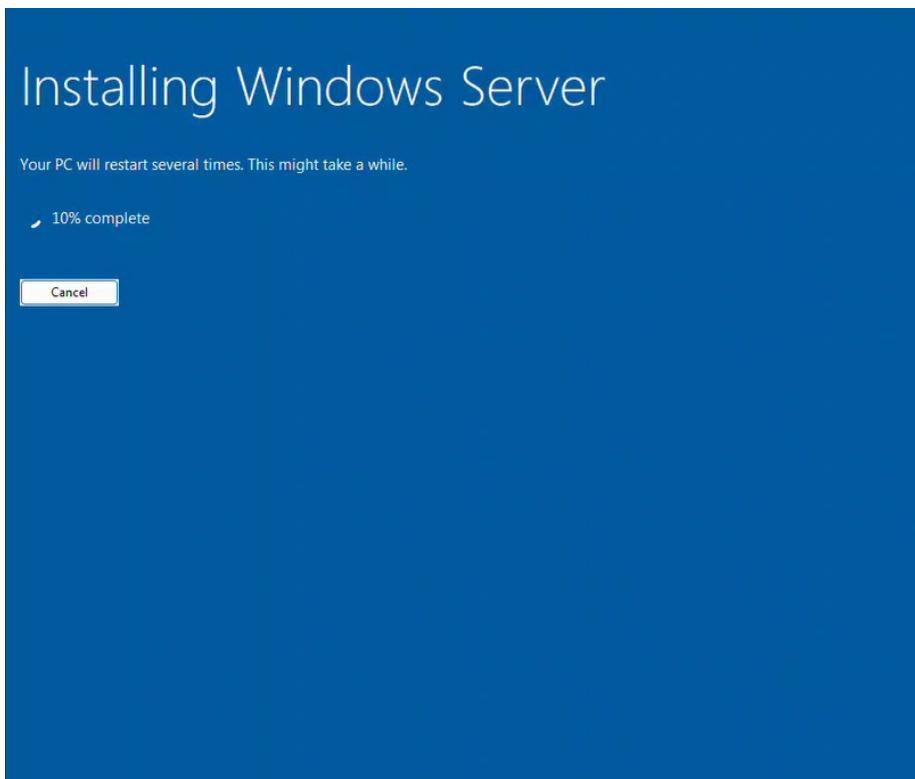
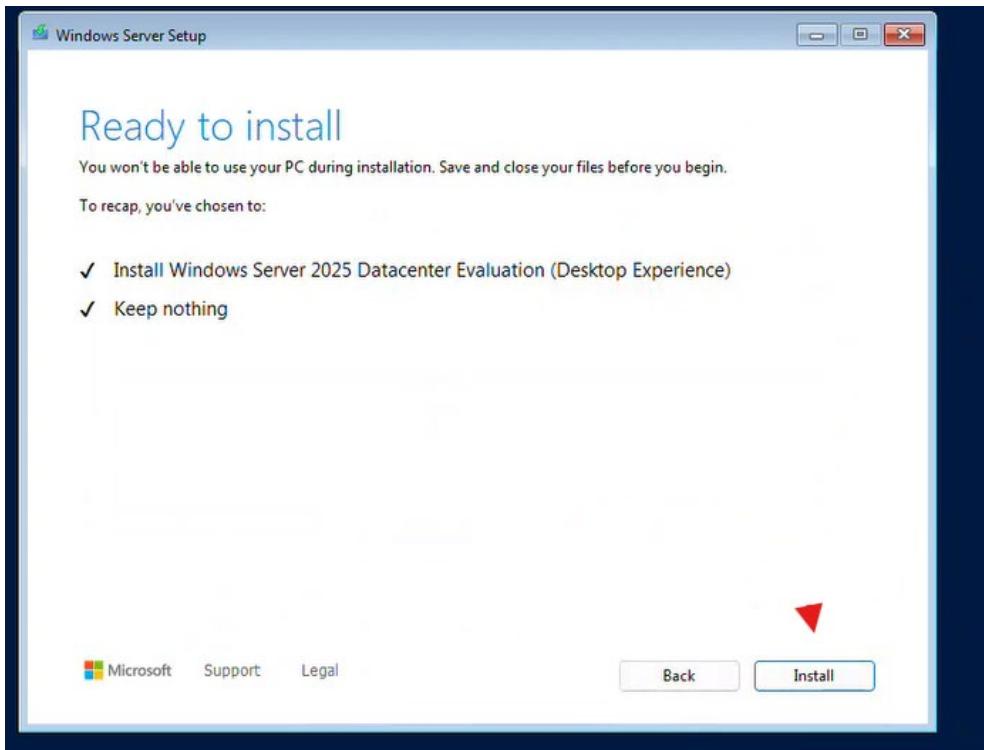












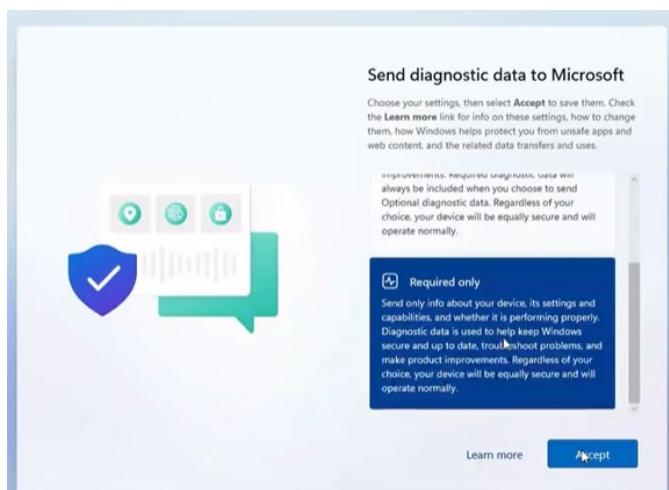
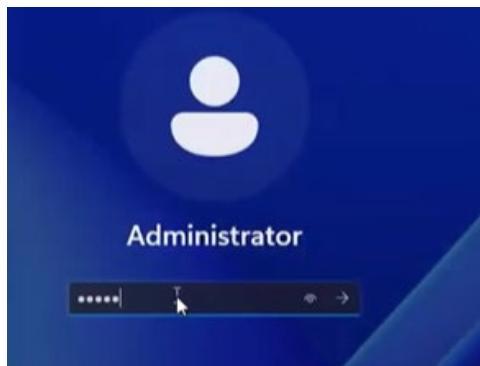
Customize settings

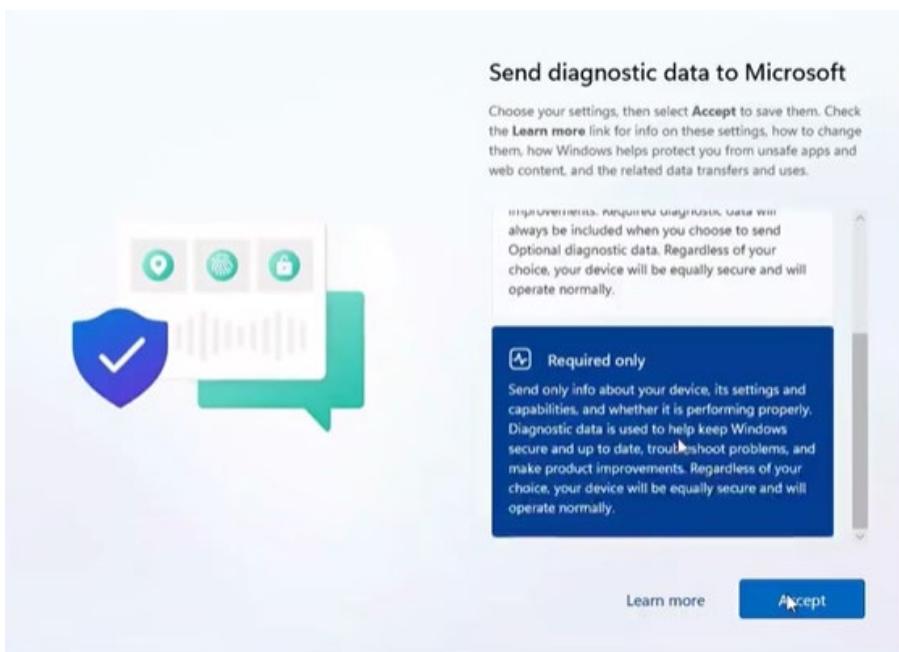
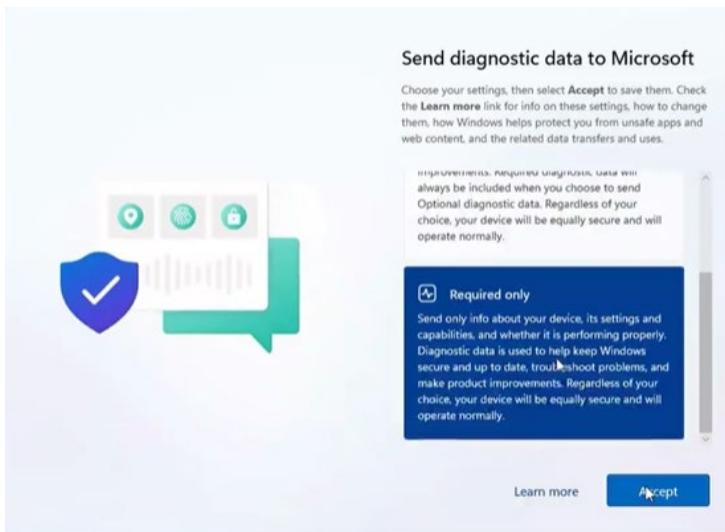
Type a password for the built-in administrator account that you can use to sign in to this computer.

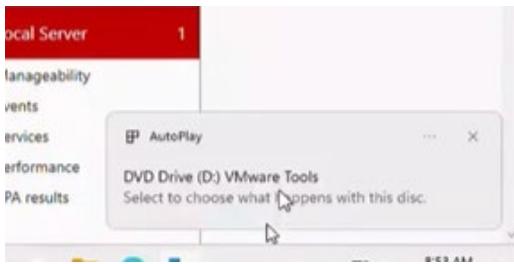
User name	Administrator
Password	***** 
Reenter password	



Finish







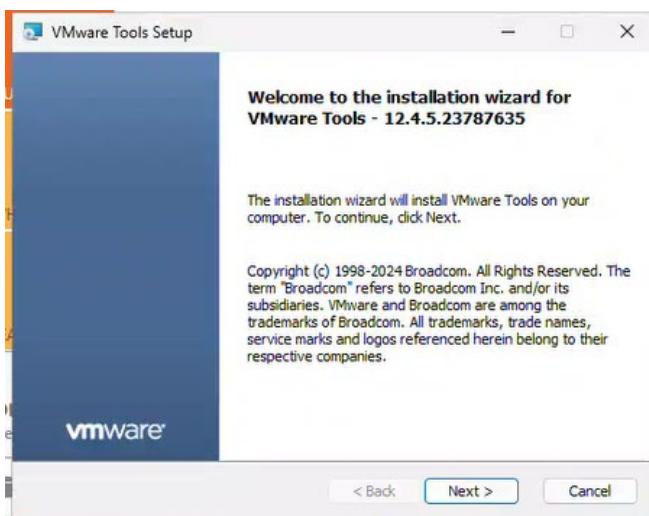
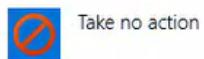
DVD Drive (D:) VMware Tools

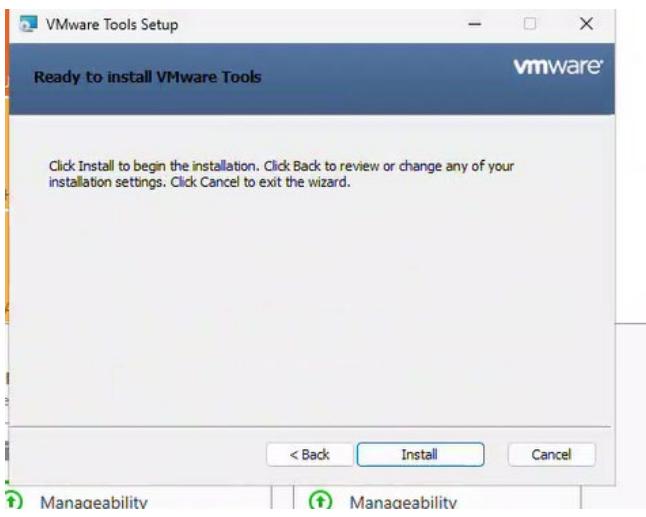
Choose what to do with this disc.

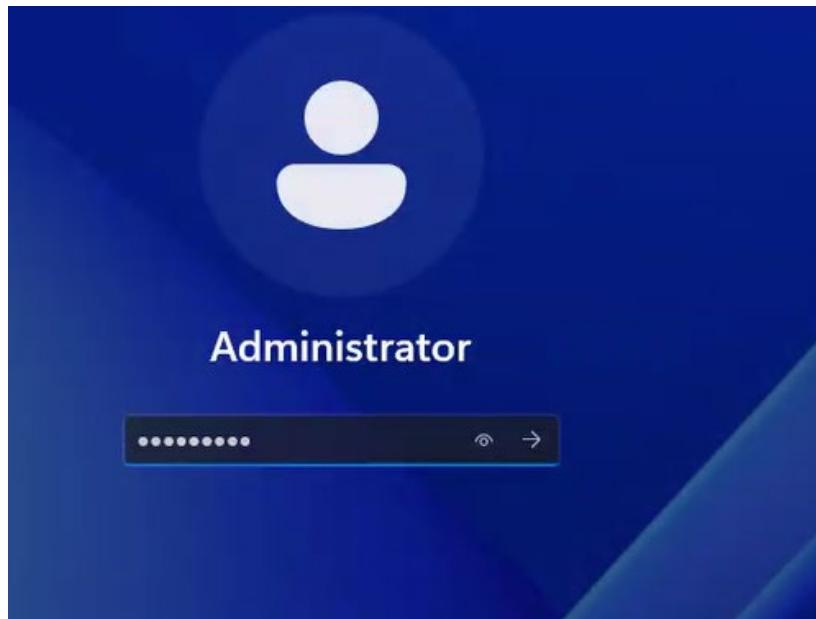
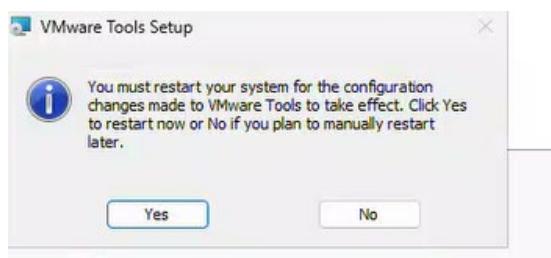
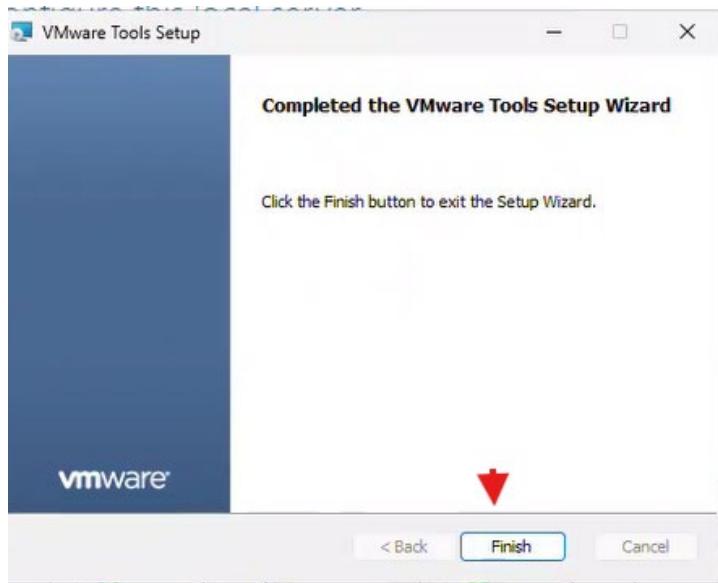
Install or run program from your media

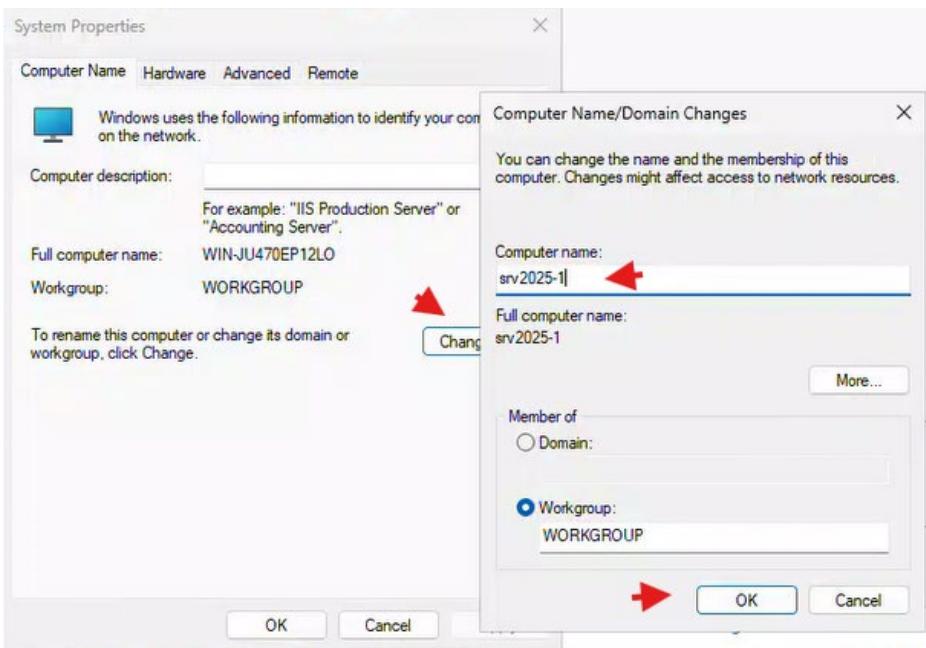
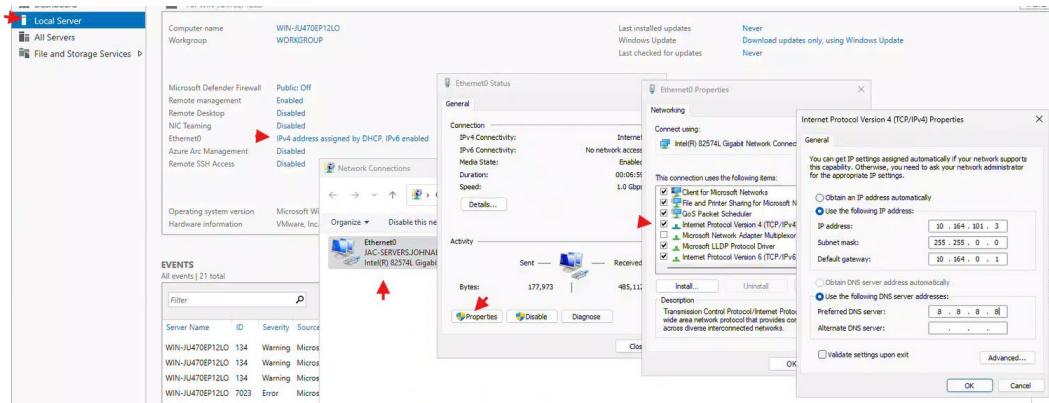
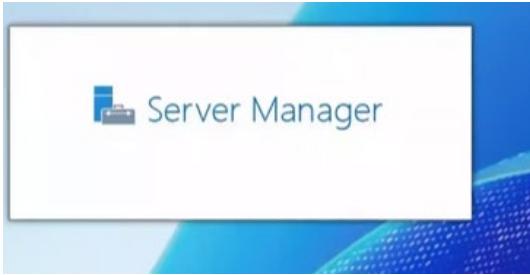


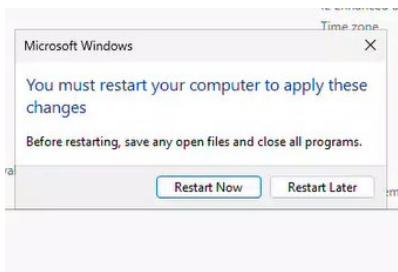
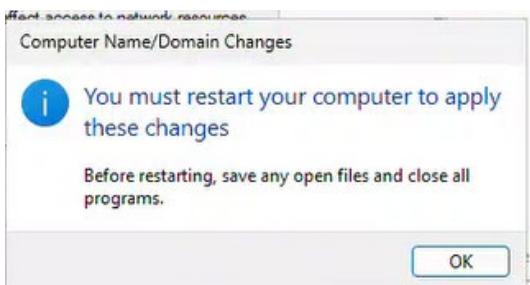
Other choices











PROPERTIES For WIN-JU470EP12LO

Computer name WIN-JU470EP12LO
Workgroup WORKGROUP

Microsoft Defender Firewall Public: Off
Remote management Enabled
Remote Desktop Disabled
NIC Teaming Enabled
Ethernet0 10.164.101.3, IPv6 enabled
Azure Arc Management Disabled
Remote SSH Access Disabled

Microsoft Defender Antivirus Real-Time Protection: On
Feedback & Diagnostics Settings: Off
IE Enhanced Security Configuration Time zone: (UTC-05:00) Eastern Time (US & Canada)
Product ID: Not activated

Last installed updates Windows Update
Download updates only, using Windows Update
Last checked for updates Never

Operating system version Microsoft Windows Server 2025 Datacenter Evaluation
Hardware information VMware, Inc. VMware20.1

Processors 12th Gen Intel(R) Core(TM) i7-12700, 12th Gen Intel(R) Core(TM) i7-12700
Installed memory (RAM) 8 GB

TASKS

Dashboard

Local Server

All Servers

PROPERTIES For sv2025-1

Computer name sv2025-1
Workgroup WORKGROUP

Microsoft Defender Firewall Public: Off
Remote management Enabled
Remote Desktop Disabled
NIC Teaming Enabled
Ethernet0 10.164.101.3, IPv6 enabled
Azure Arc Management Disabled
Remote SSH Access Disabled

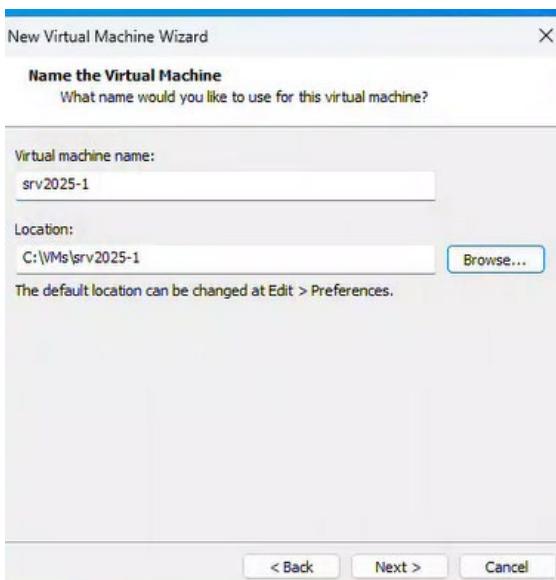
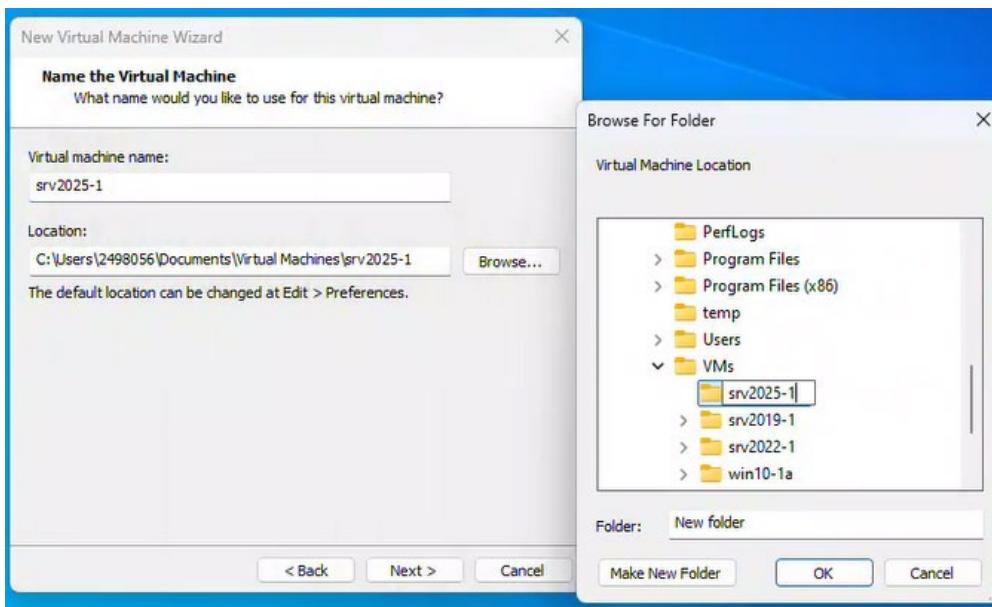
Microsoft Defender Antivirus Real-Time Protection: On
Feedback & Diagnostics Settings: Off
IE Enhanced Security Configuration Time zone: (UTC-05:00) Eastern Time (US & Canada)
Product ID: 00492-10000-00001-AA235 (activated)

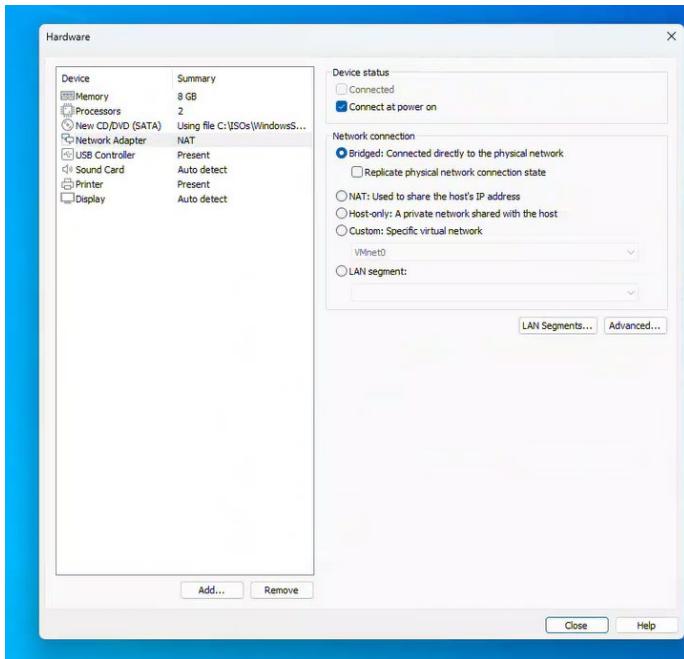
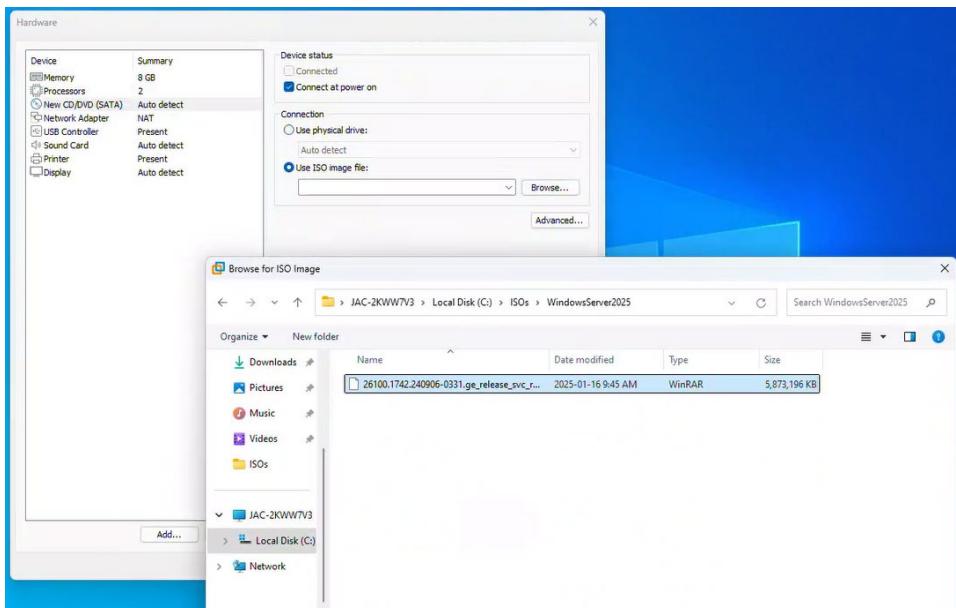
Last installed updates Windows Update
Download updates only, using Windows Update
Last checked for updates Never

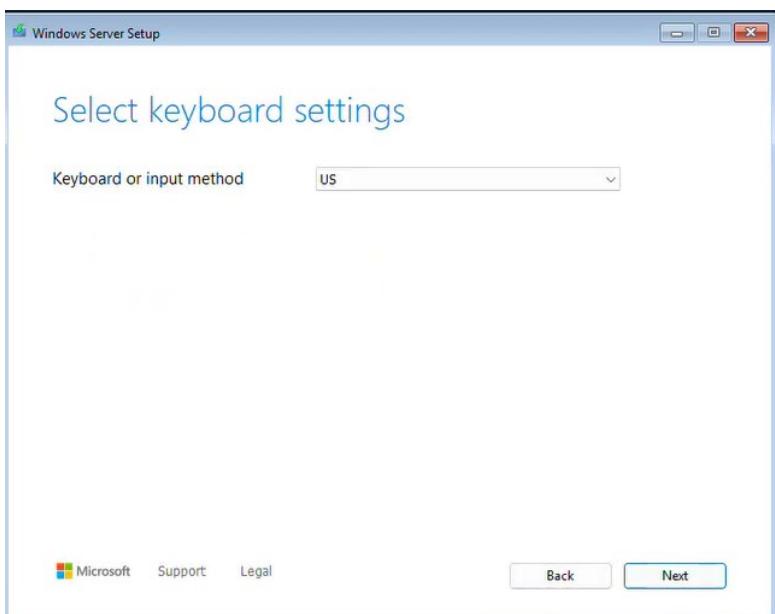
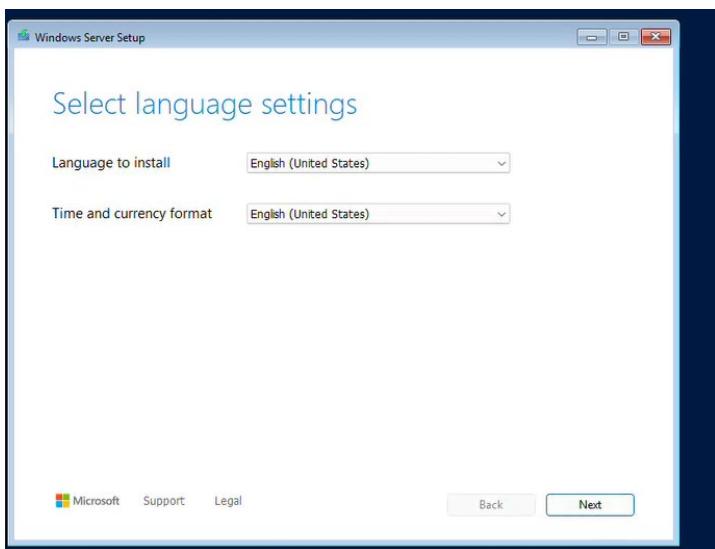
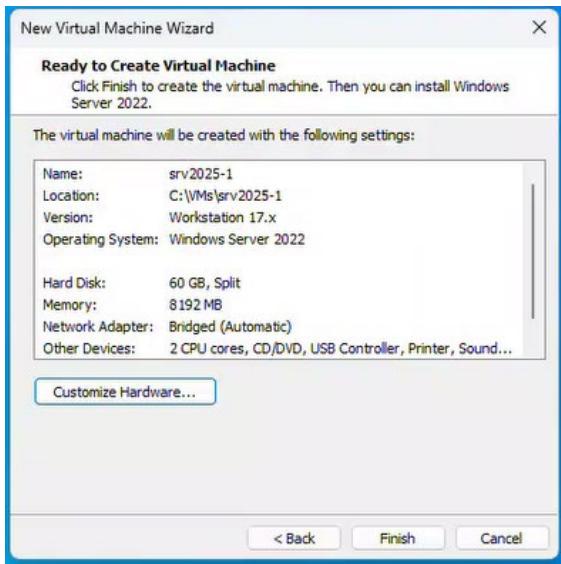
Operating system version Microsoft Windows Server 2025 Datacenter Evaluation
Hardware information VMware, Inc. VMware20.1

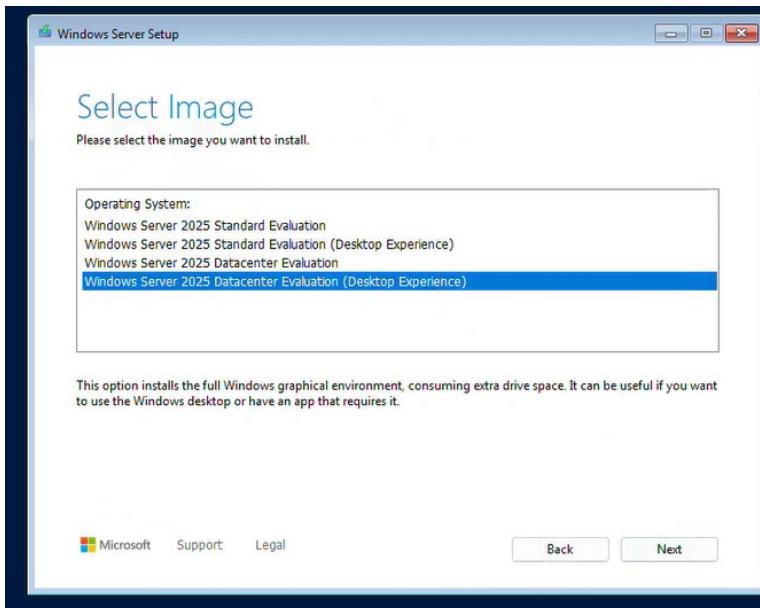
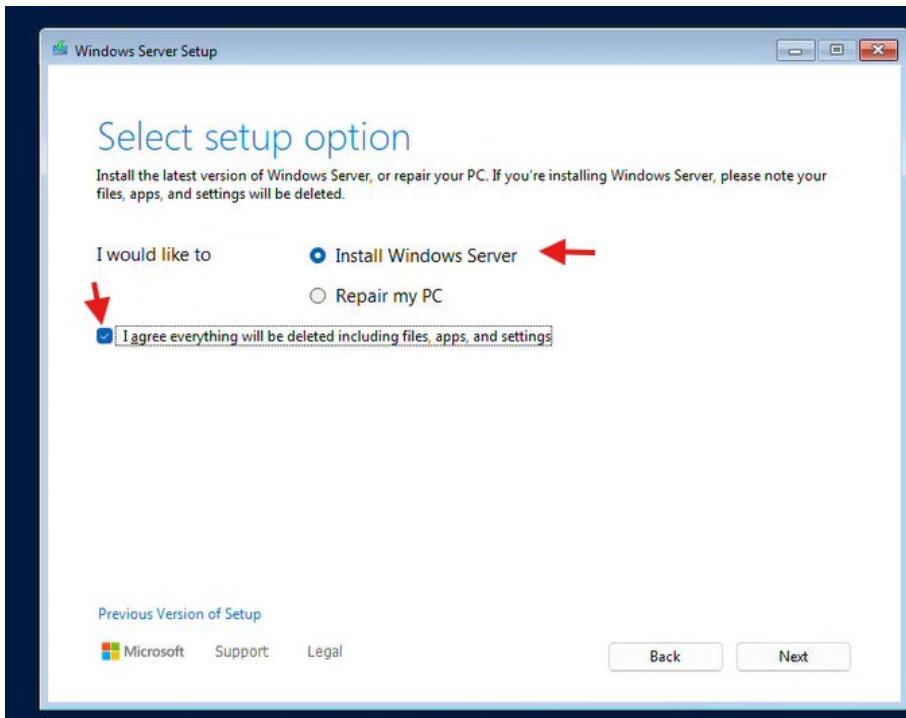
Processors 12th Gen Intel(R) Core(TM) i7-12700, 12th Gen Intel(R) Core(TM) i7-12700
Installed memory (RAM) 8 GB

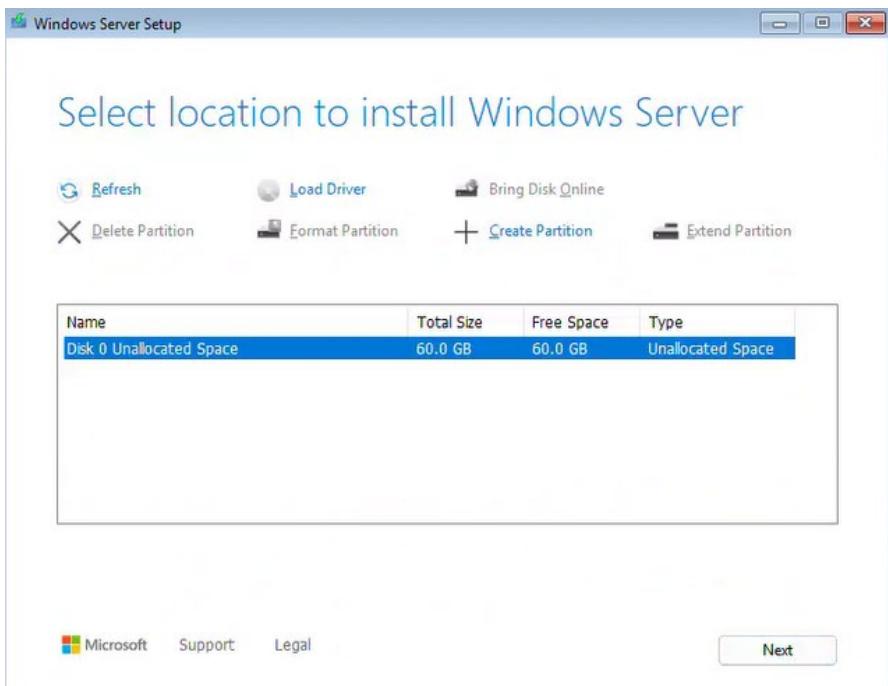
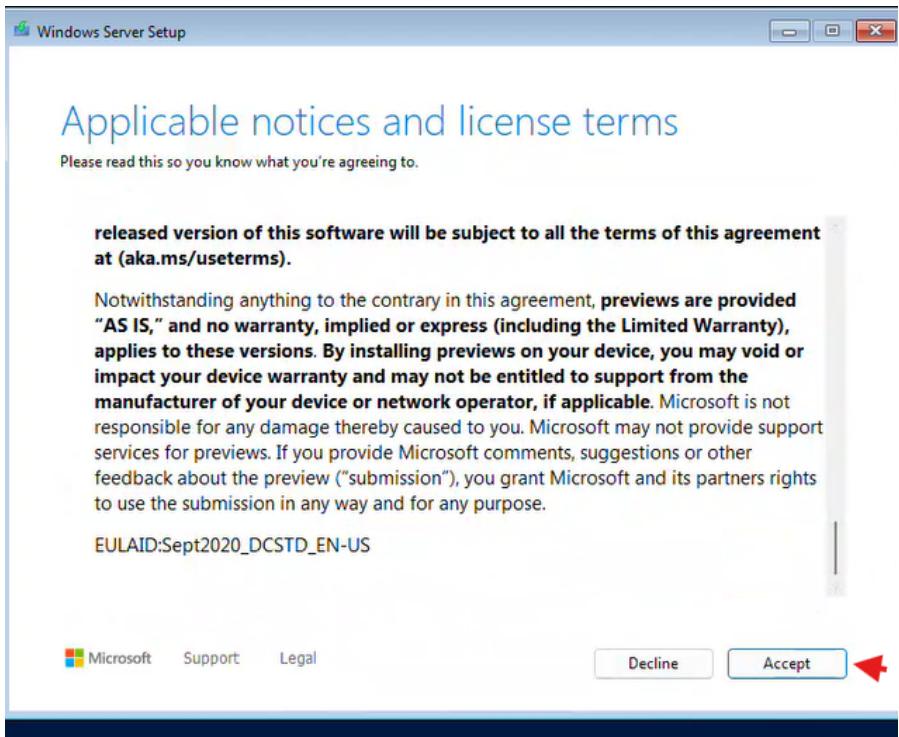
EVENTS

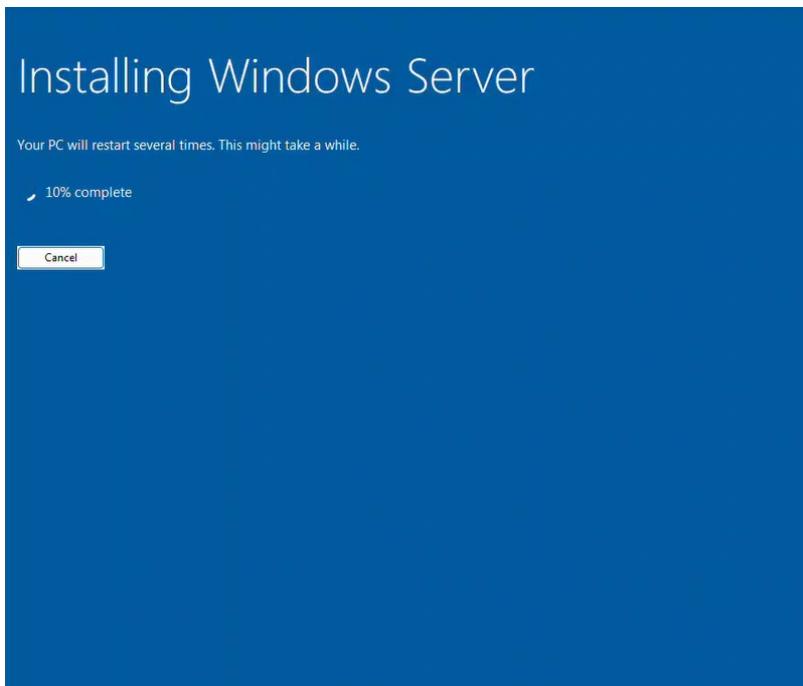
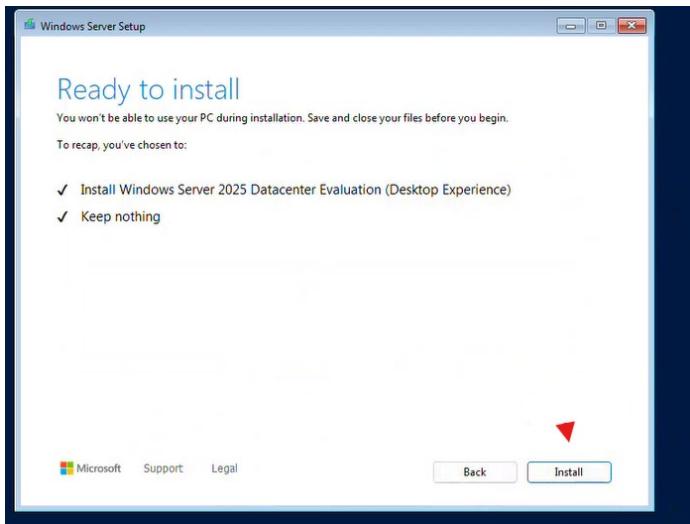


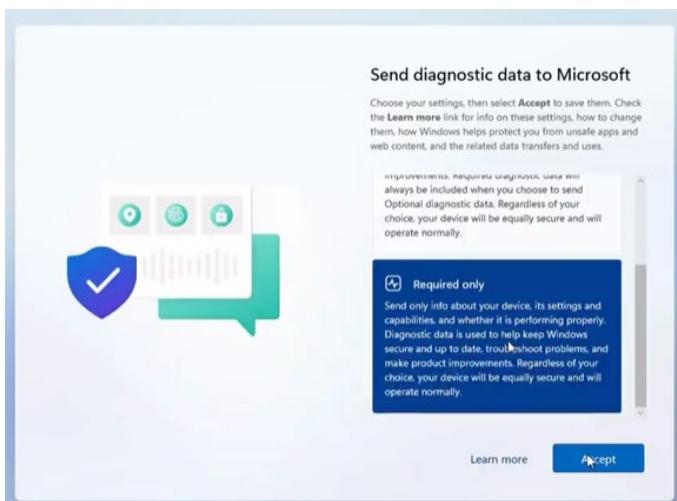
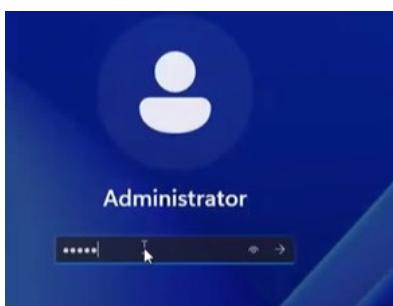
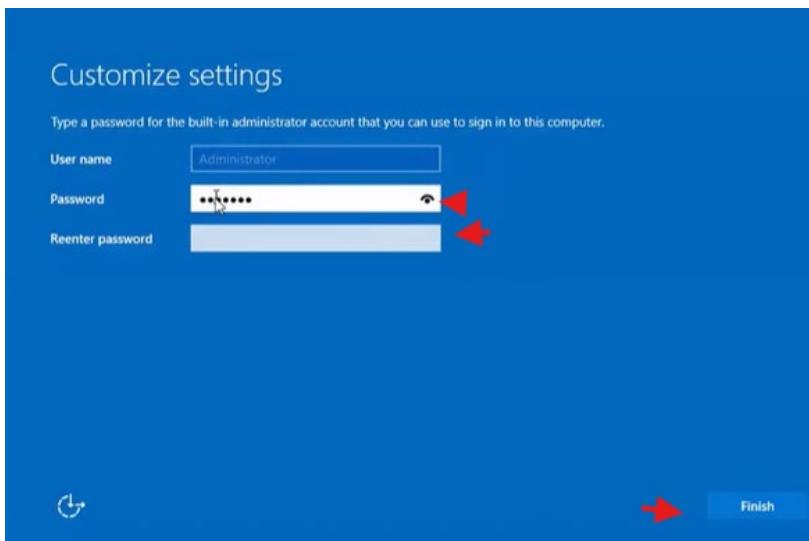


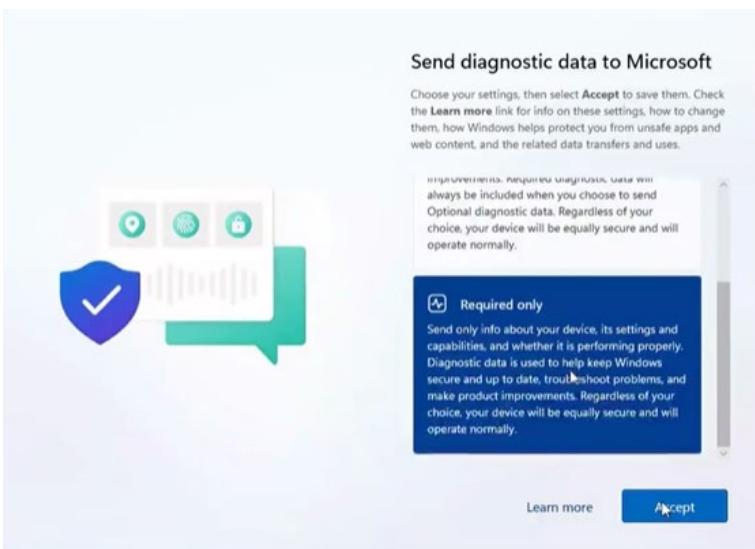
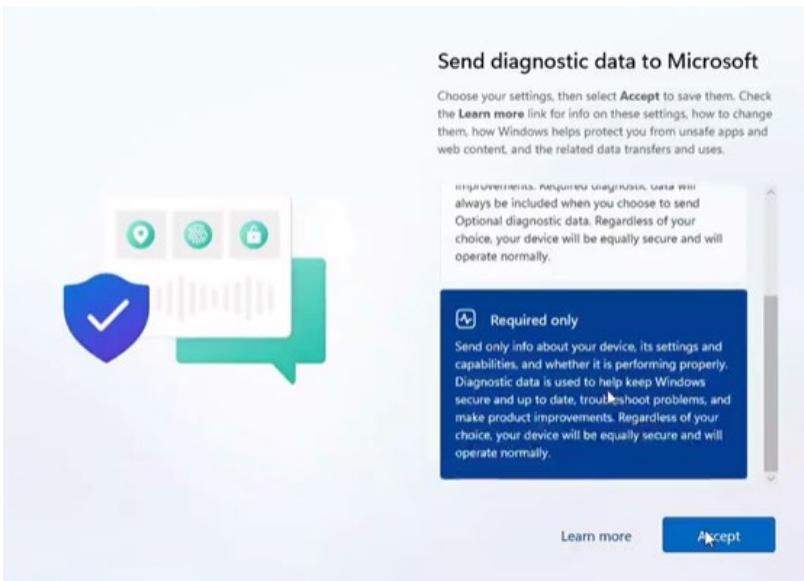


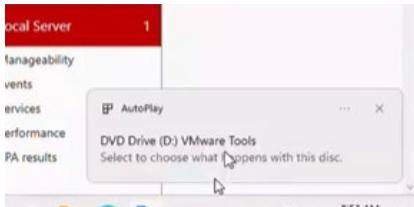












DVD Drive (D:) VMware Tools

Choose what to do with this disc.

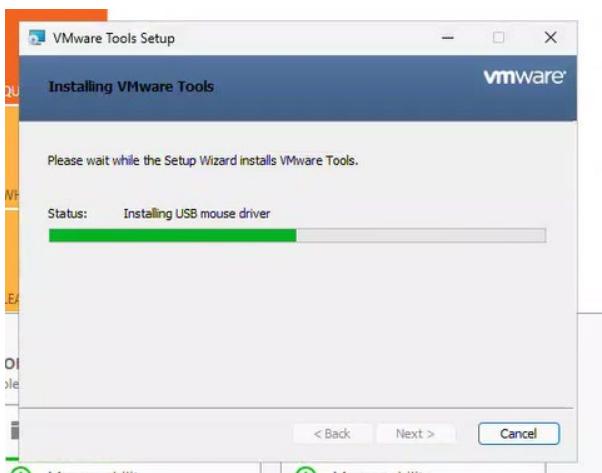
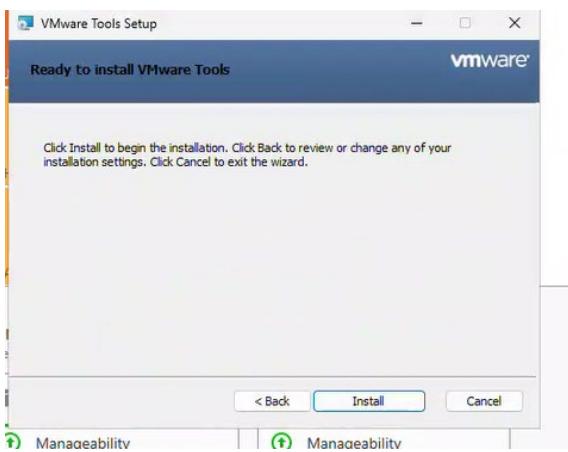
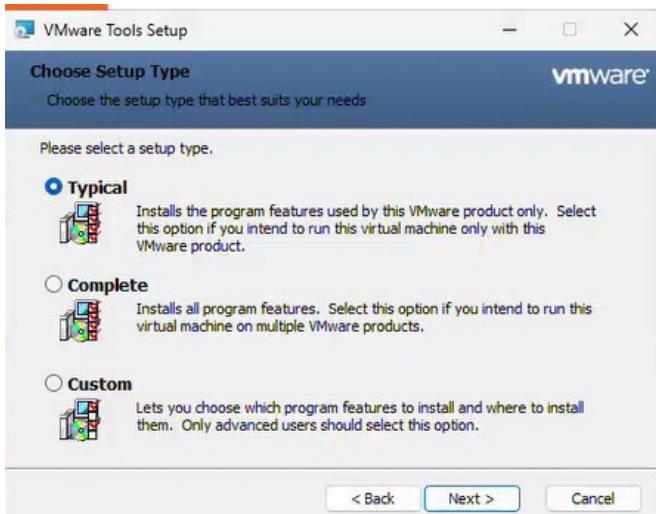
Install or run program from your media

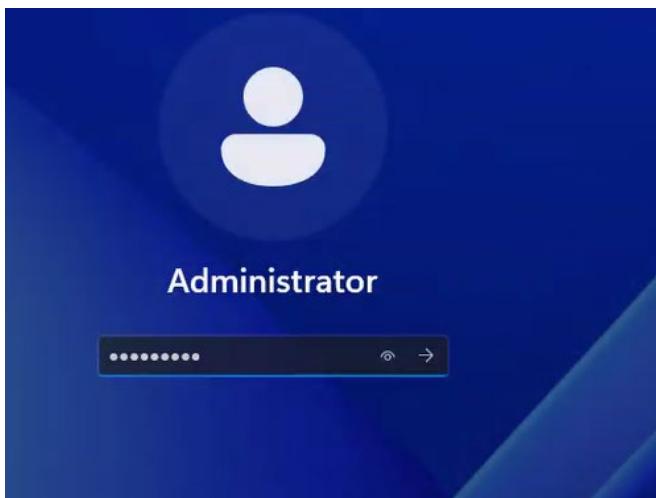
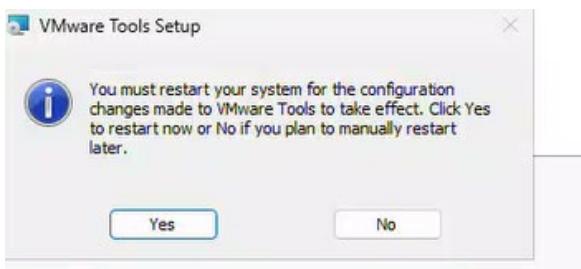
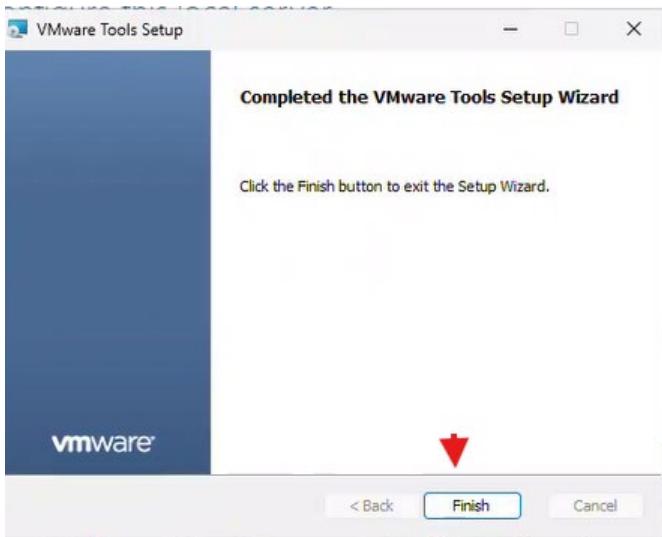
Run setup64.exe
Published by Broadcom Inc

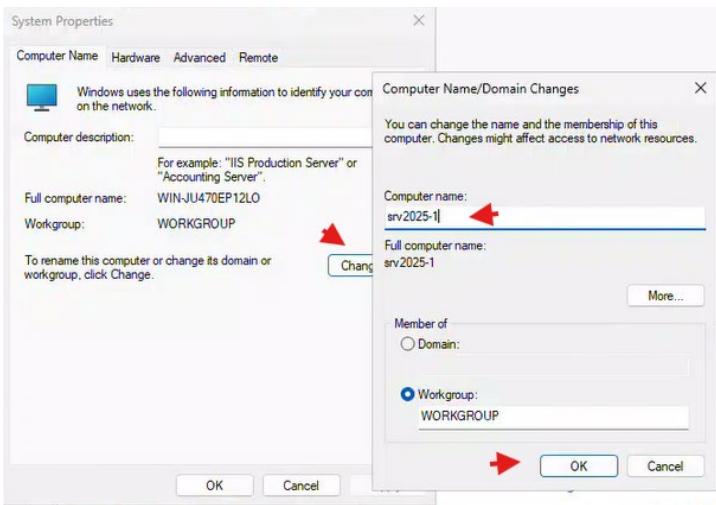
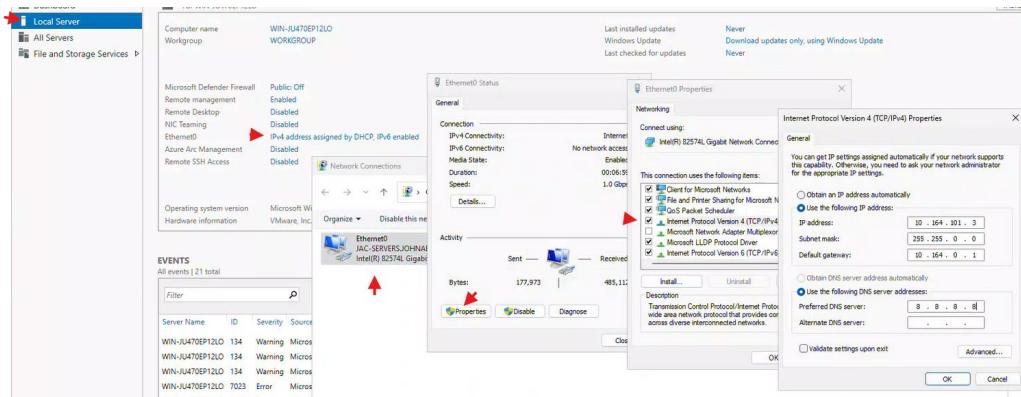
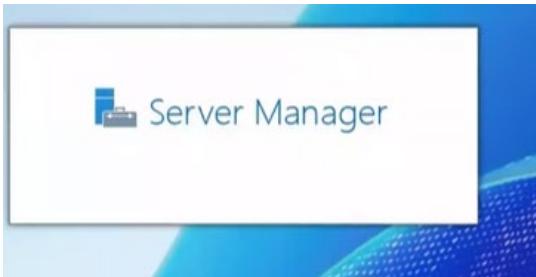
Other choices

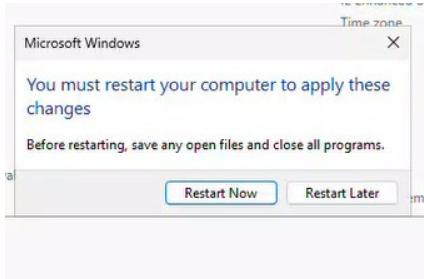
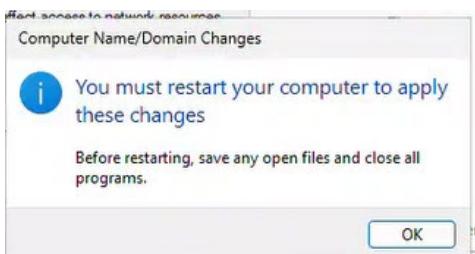
- Open folder to view files
File Explorer
- Take no action











PROPERTIES For WIN-IU470EP1ZLO

Computer name	WIN-IU470EP1ZLO	Last installed updates	Never
Workgroup	WORKGROUP	Windows Update	Download updates only, using Windows Update
Microsoft Defender Firewall		Public: Off	Real-Time Protection: On
Remote management	Enabled	Feedback & Diagnostics	Settings
Remote Desktop	Disabled	IE Enhanced Security Configuration	Off
NIC Teaming	Disabled	Time zone	(UTC-05:00) Eastern Time (US & Canada)
Ethernet0	10.164.101.3, IPv6 enabled	Product ID	Not activated
Azure Arc Management	Disabled		
Remote SSH Access	Disabled		
Operating system version	Microsoft Windows Server 2025 Datacenter Evaluation	Processors	12th Gen Intel(R) Core(TM) i7-12700, 12th Gen Intel(R) Core(TM) i7-12700
Hardware information	VMware, Inc. VMware20.1	Installed memory (RAM)	8 GB

TASKS

PROPERTIES For sv2025-1

Computer name	sv2025-1	Last installed updates	Never
Workgroup	WORKGROUP	Windows Update	Download updates only, using Windows Update
Microsoft Defender Firewall		Public: Off	Real-Time Protection: On
Remote management	Enabled	Feedback & Diagnostics	Settings
Remote Desktop	Disabled	IE Enhanced Security Configuration	Off
NIC Teaming	Disabled	Time zone	(UTC-05:00) Eastern Time (US & Canada)
Ethernet	10.164.101.3, IPv6 enabled	Product ID	00492-10000-00001-AA253 (activated)
Azure Arc Management	Disabled		
Remote SSH Access	Disabled		
Operating system version	Microsoft Windows Server 2025 Datacenter Evaluation	Processors	12th Gen Intel(R) Core(TM) i7-12700, 12th Gen Intel(R) Core(TM) i7-12700
Hardware information	VMware, Inc. VMware20.1	Installed memory (RAM)	8 GB

EVENTS

3.2 Install Active Directory and Promote Server 2019 to a Domain Controller

Once we install Active Directory what we're going to do is we're going to set up this box as a what is called a domain controller it's in charge of controlling access to resources within the domain.

3.2.1 Install Active Directory Domain Services (AD DS)

Active Directory (AD) is a directory service developed by Microsoft for Windows domain networks. It serves as a centralized and standardized system that automates network management of user data, security, and resources, making it easier to manage and secure the IT environment of an organization.

Active Directory is a database which centralizes the usernames the passwords the listing of computers printers and all resources in your network inside the database then what you do is you take your 5 servers you join them all to the same domain and when a person logs into the domain they can have access to all five of the servers without needing a username and a password on each of the individual boxes.

- A) Login to Windows Server 2019
- B) Makes sure you have static ip address

Open command line and type ipconfig /all

```
C:\Users\Administrator>hostname
srv2019-1

C:\Users\Administrator>ipconfig/all

Windows IP Configuration

Host Name . . . . . : srv2019-1
Primary Dns Suffix . . . . . : station1.com
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : station1.com

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-ED-9C-8C
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::2f27:593d:ad7a:83e%14(PREFERRED)
IPv4 Address. . . . . : 10.164.101.1(Preferred) ←
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1 ←
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-D1-6E-00-0C-29-ED-9C-8C
DNS Servers . . . . . : ::1
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\Administrator>
```

- C) Verify connectivity
 - ping 10.164.101.1
 - ping 10.164.0.1
 - ping google.com

```
C:\Users\2498056>ping 10.164.101.1

Pinging 10.164.101.1 with 32 bytes of data:
Reply from 10.164.101.1: bytes=32 time=1ms TTL=128
Reply from 10.164.101.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.164.101.1:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
Control-C
^C
C:\Users\2498056>ping 10.164.101.1

Pinging 10.164.101.1 with 32 bytes of data:
Reply from 10.164.101.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.164.101.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\2498056>ping 8.8.8.8

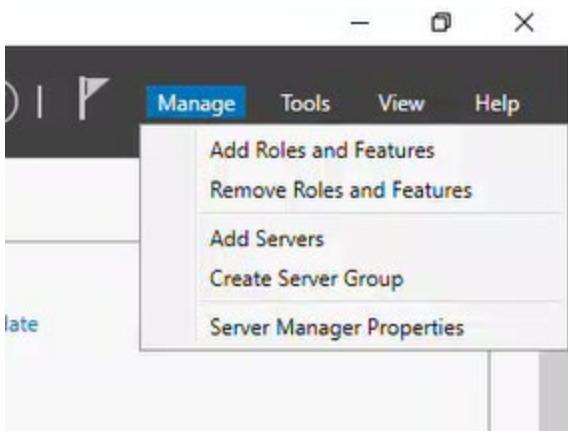
Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=1ms TTL=118

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

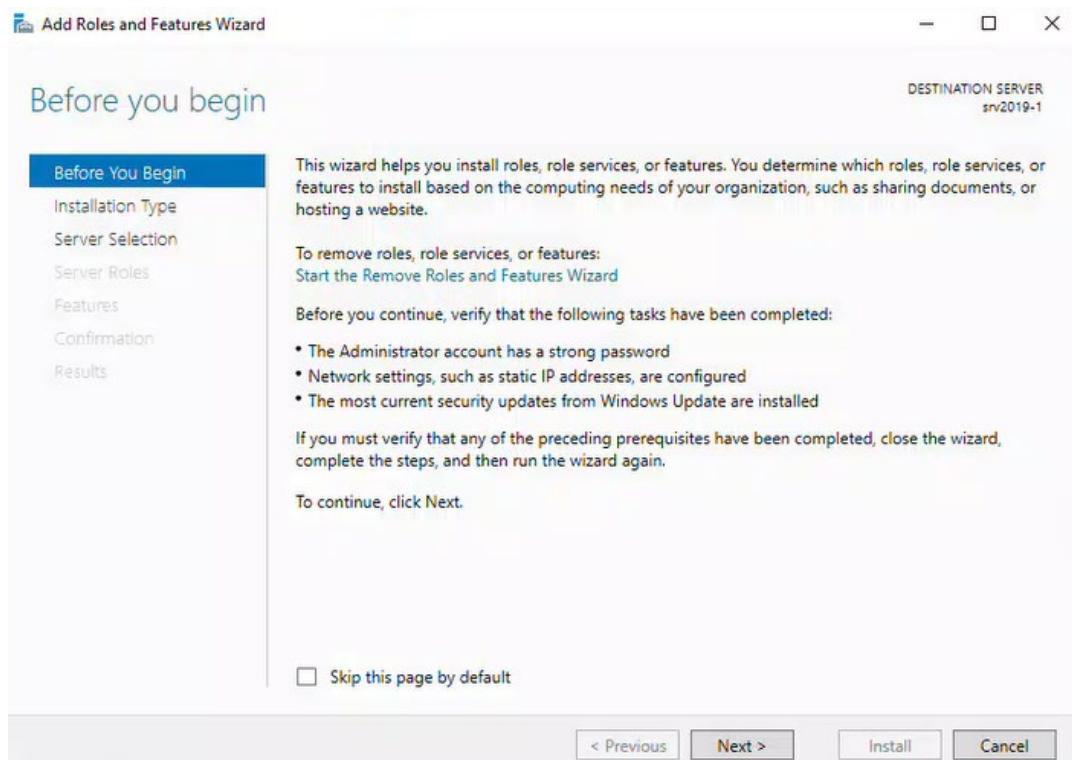
C:\Users\2498056>ping google.com

Pinging google.com [142.251.33.174] with 32 bytes of data:
Reply from 142.251.33.174: bytes=32 time=8ms TTL=115
Reply from 142.251.33.174: bytes=32 time=8ms TTL=115
Reply from 142.251.33.174: bytes=32 time=19ms TTL=115
Reply from 142.251.33.174: bytes=32 time=8ms TTL=115
```

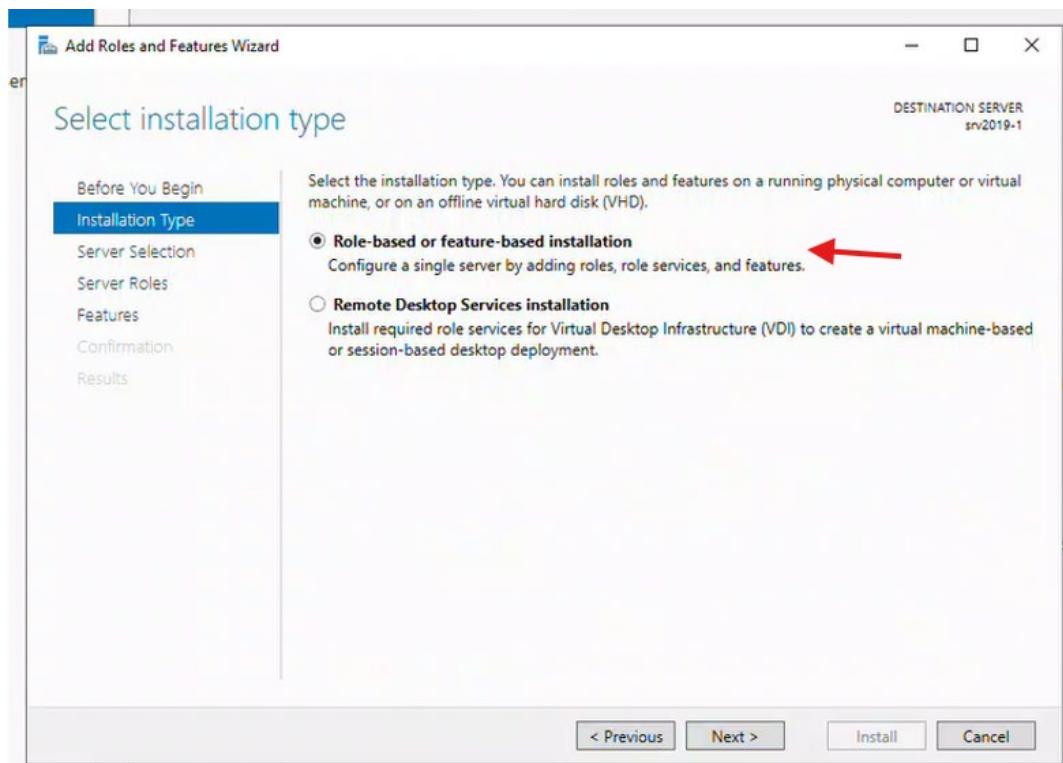
D) Add Roles and Features: Click Manage > Add Roles and Features



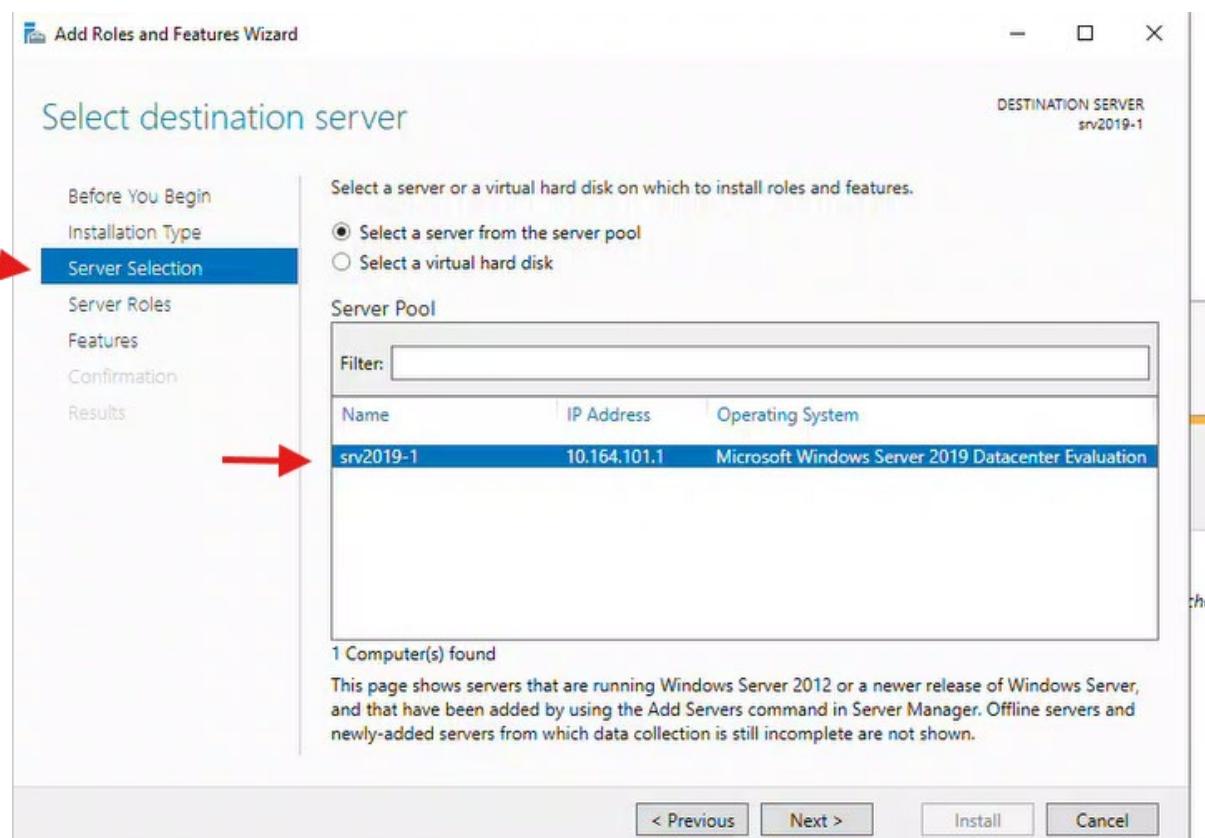
E) Add roles and features Wizard appears click Next



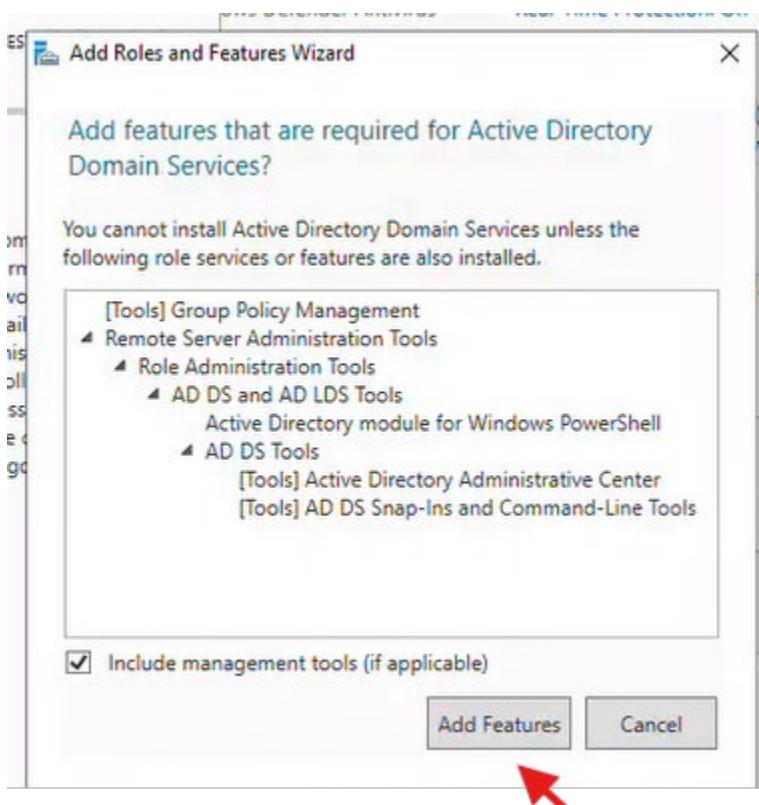
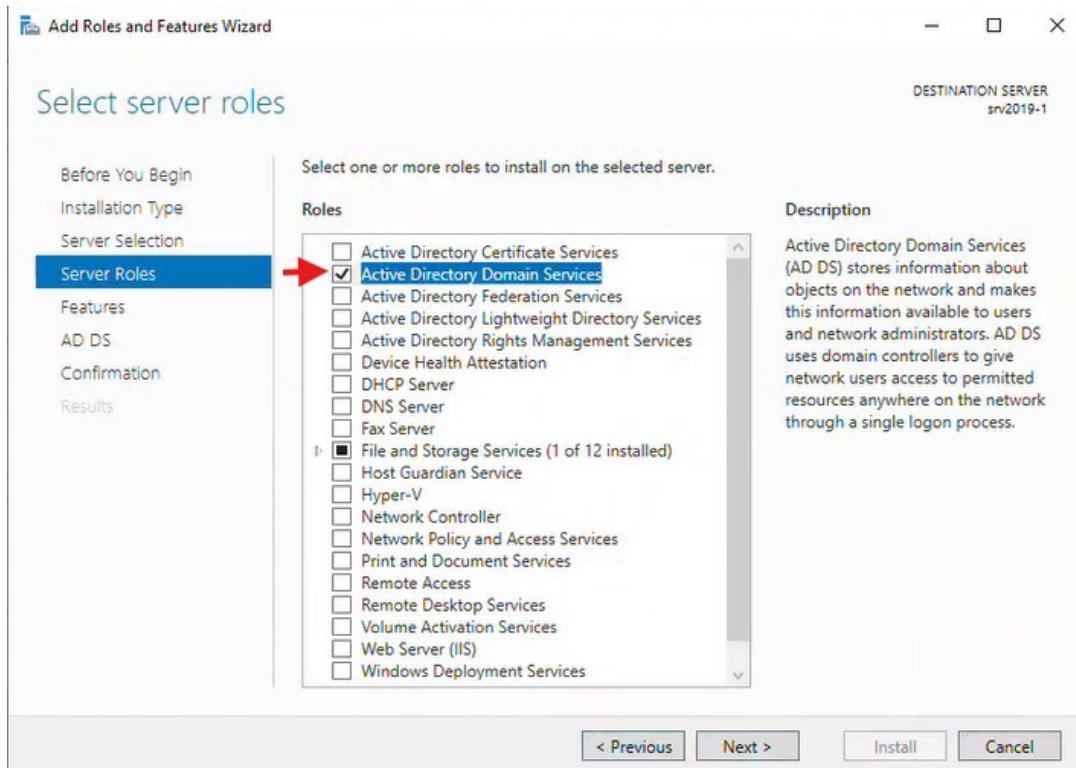
F) Installation Type: Choose Role-based or feature-based installation and click Next



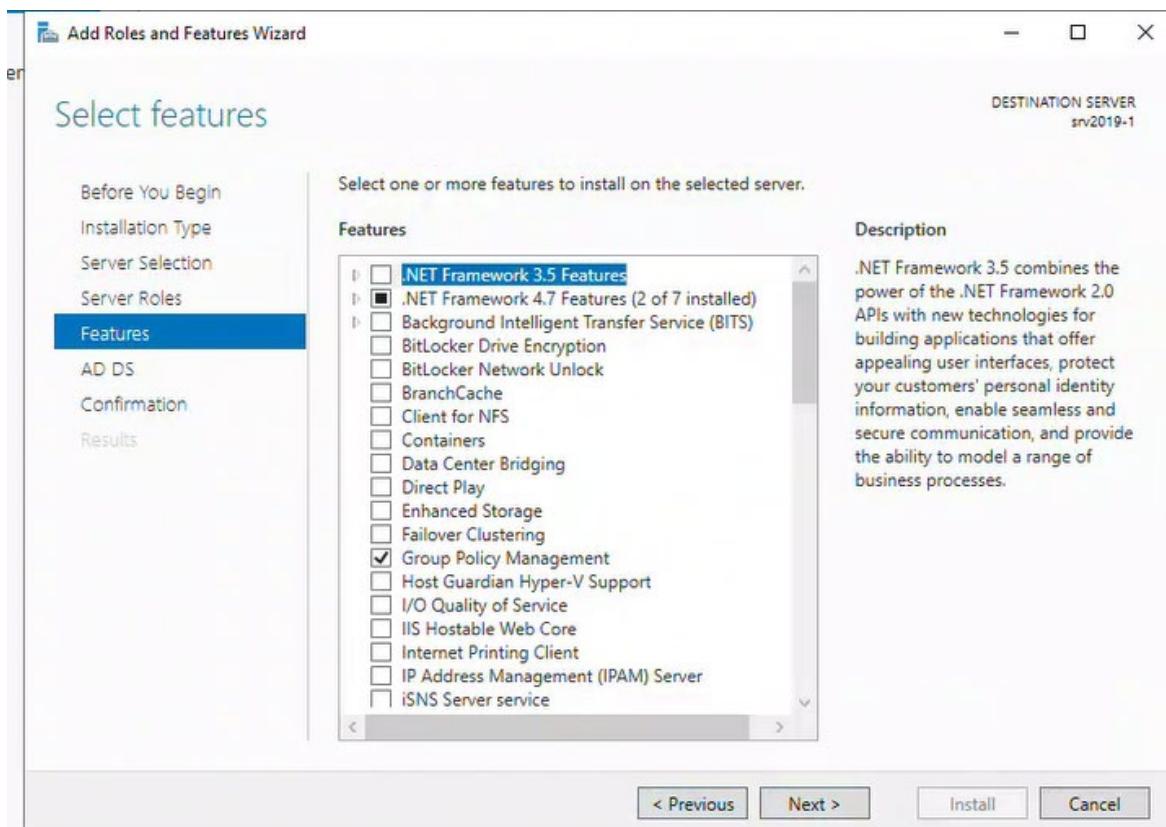
G) Server Selection: Select the server you want to install AD DS on and click Next



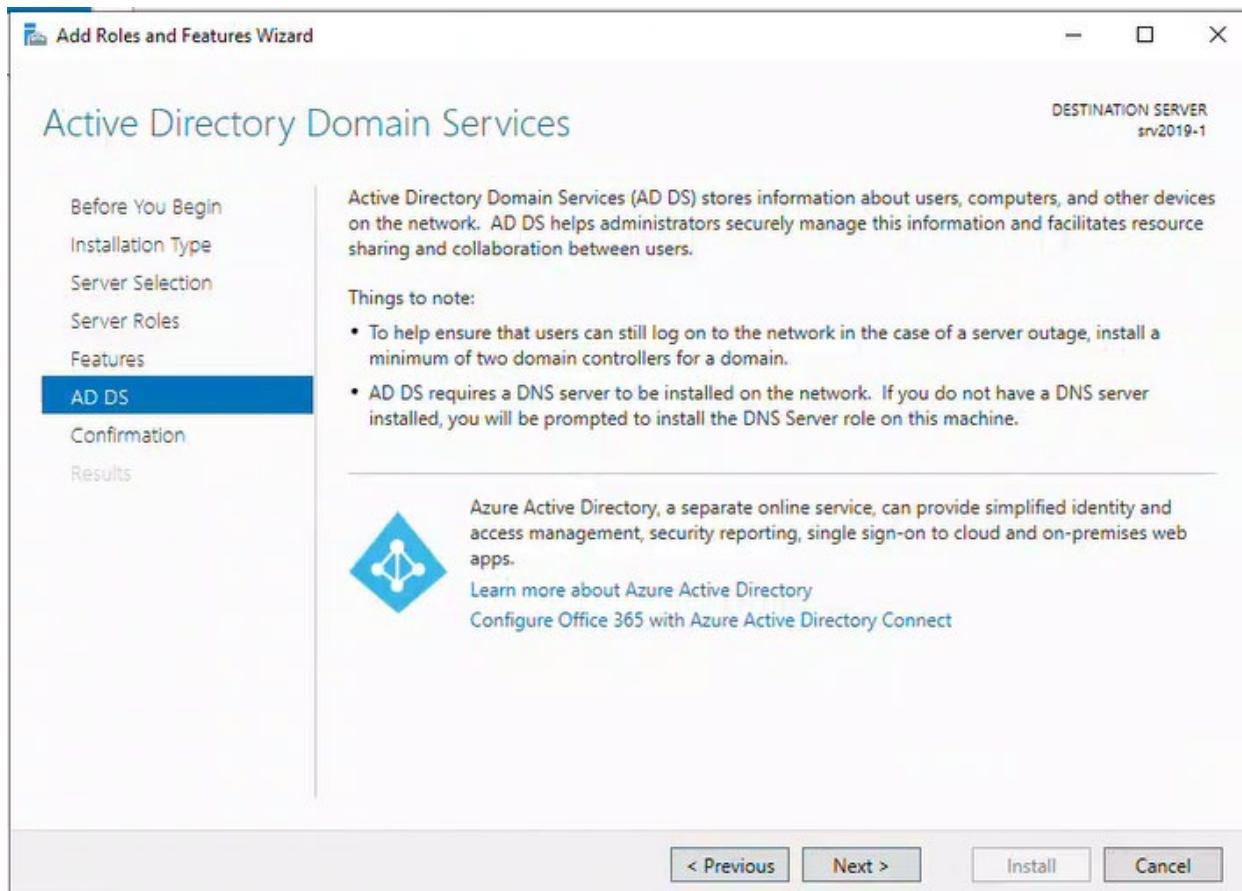
H) Server Roles: Check Active Directory Domain Services (very important to choose just the second option), new small window will appear and click Add Features



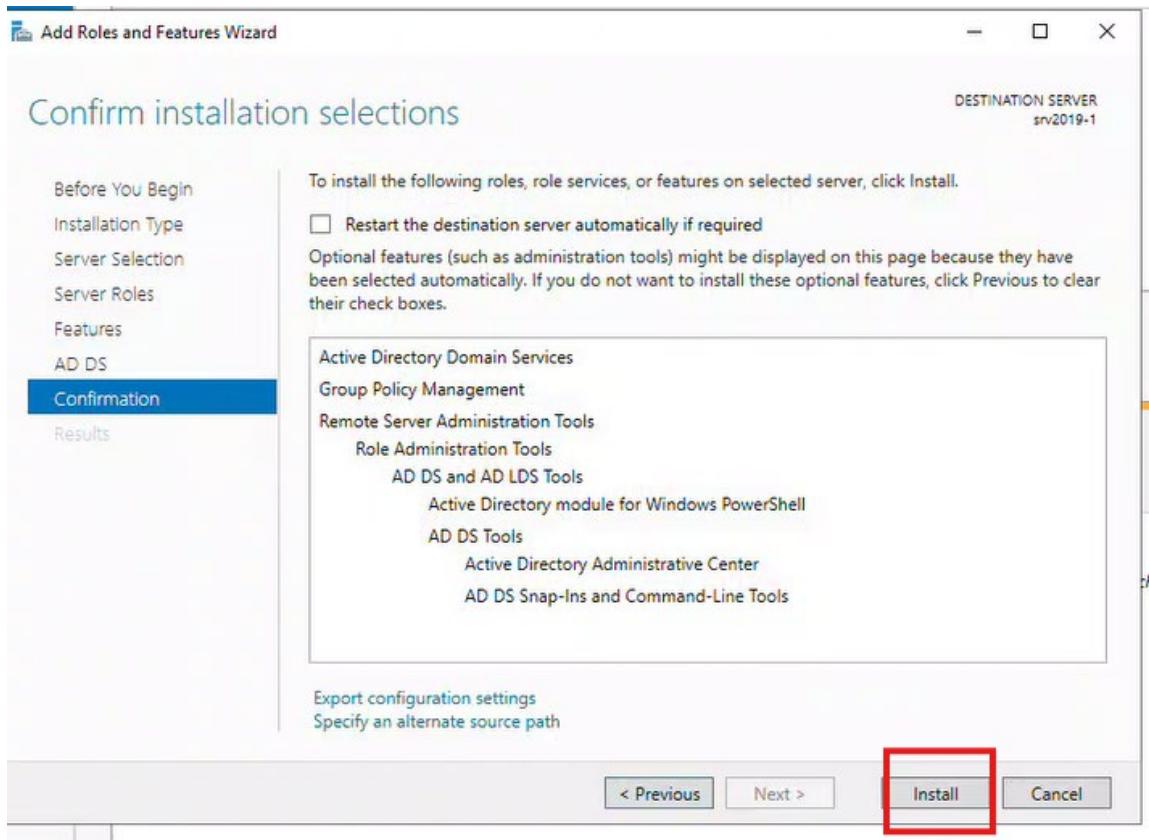
I) Select Features: Click Next (features are chosen by default)



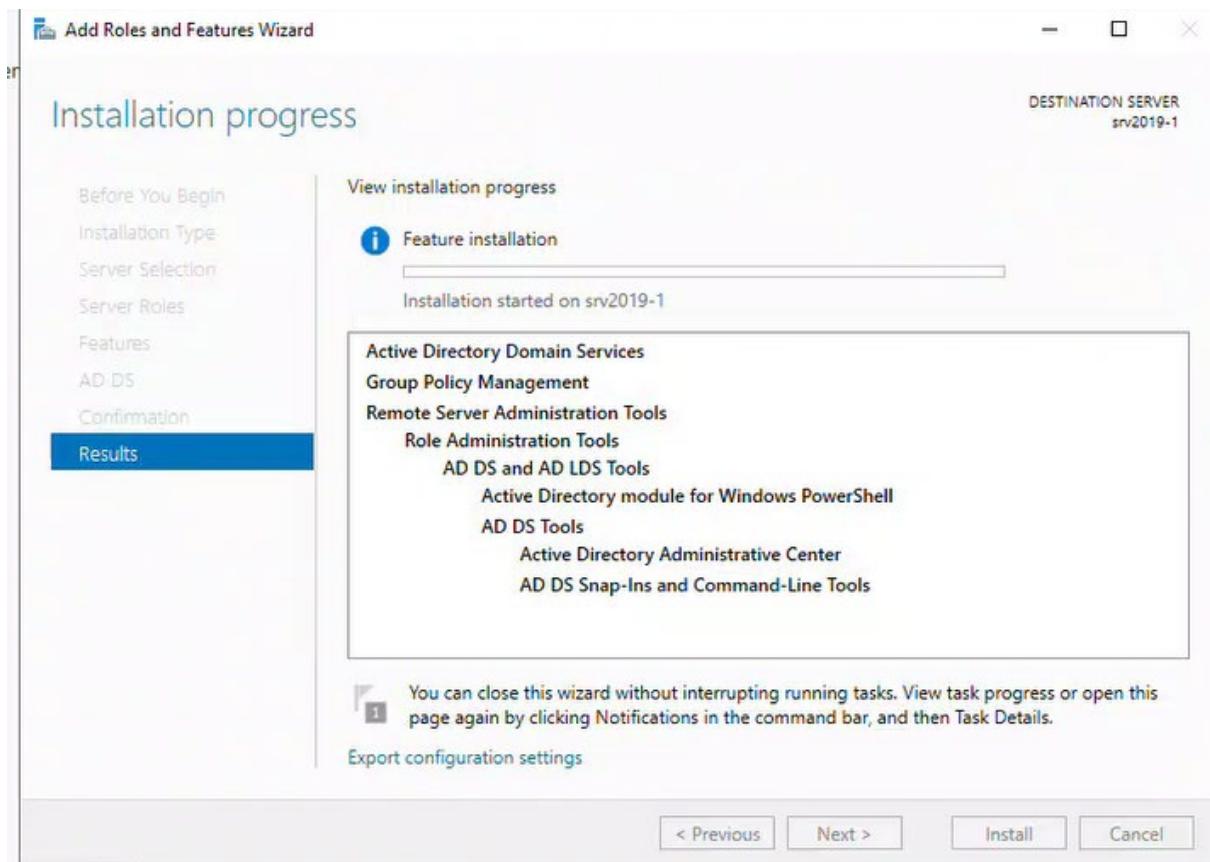
J) Active Directory domain Services windows appear Select Next

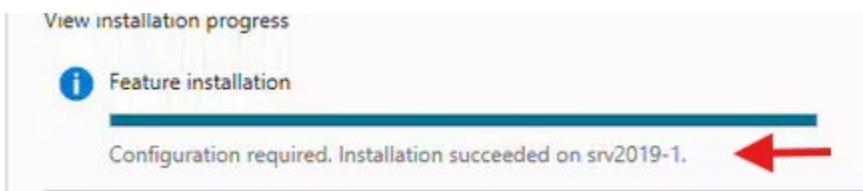


K) Confirm Installation: Review the summary and click Install



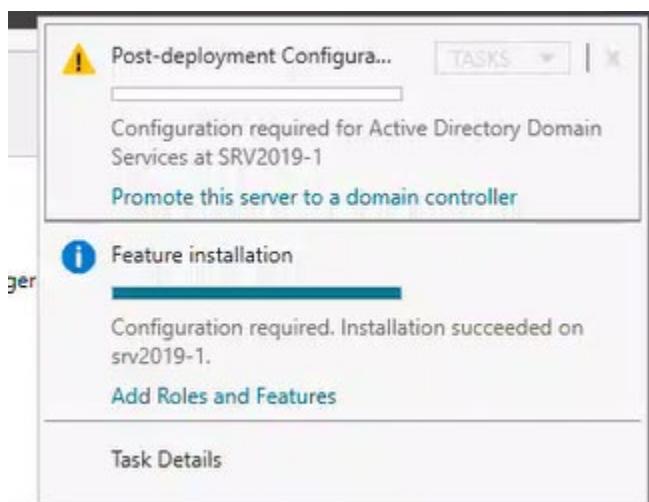
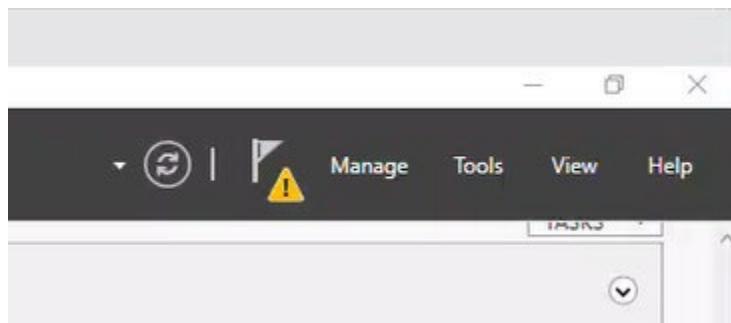
L) There we go we're starting to install Active Directory it's installing a whole bunch of other tools



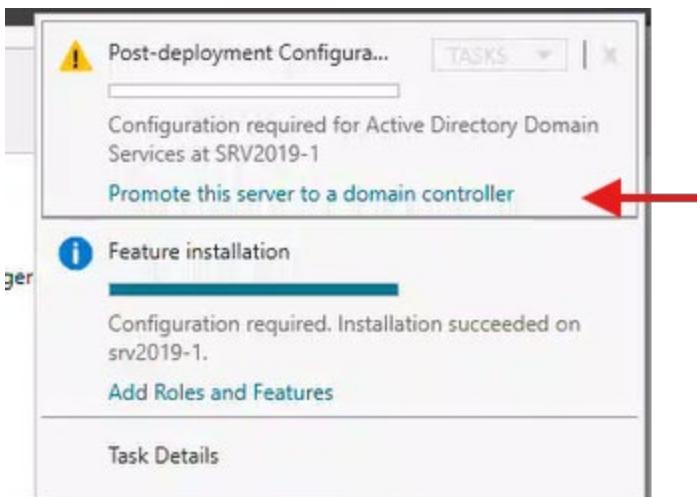


M) Open Server Manager: After installation, you'll see a notification in Server Manager. Top right

Promote to Domain Controller: Click the notification and select Promote this server to a domain controller

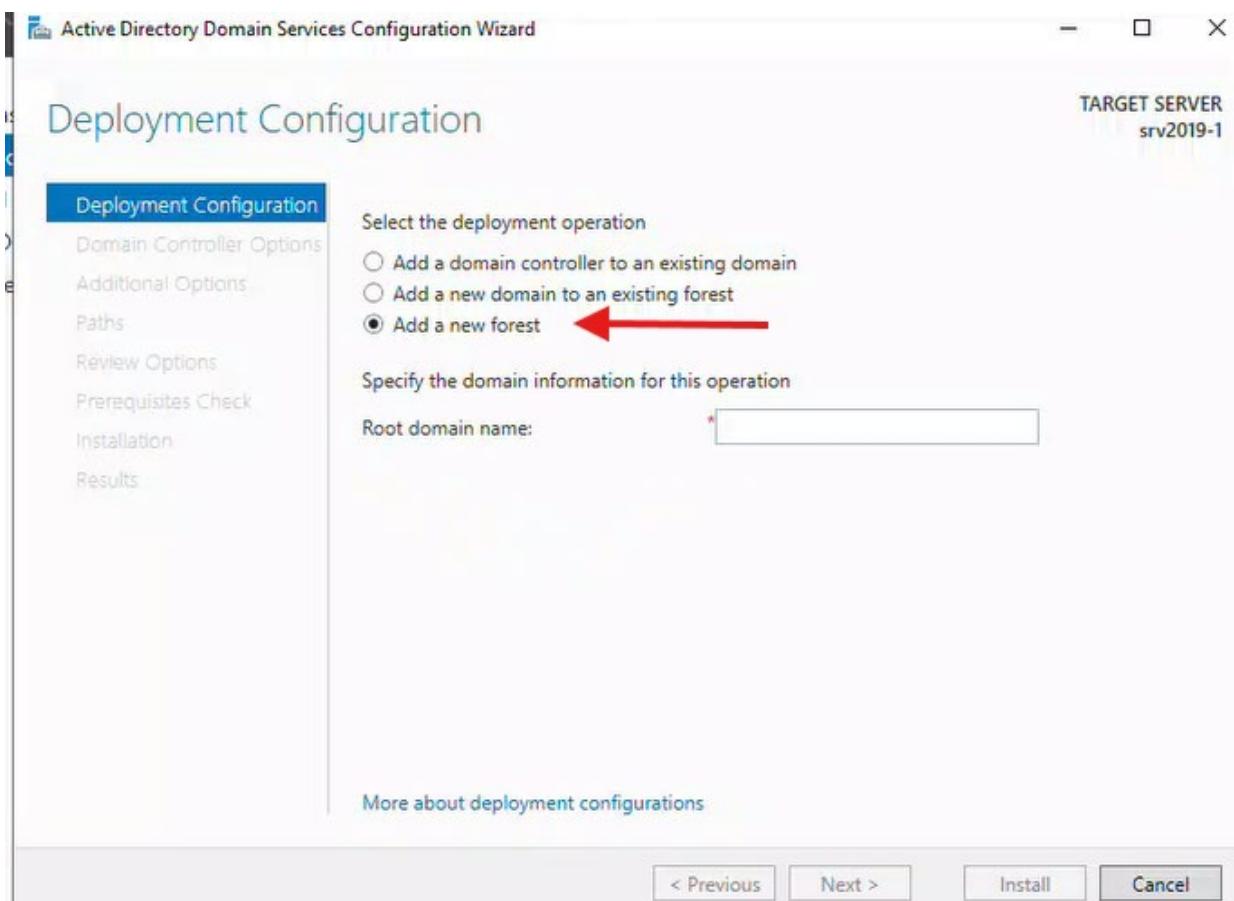


Warning says Promote the Server to a Domain Controller, click on it

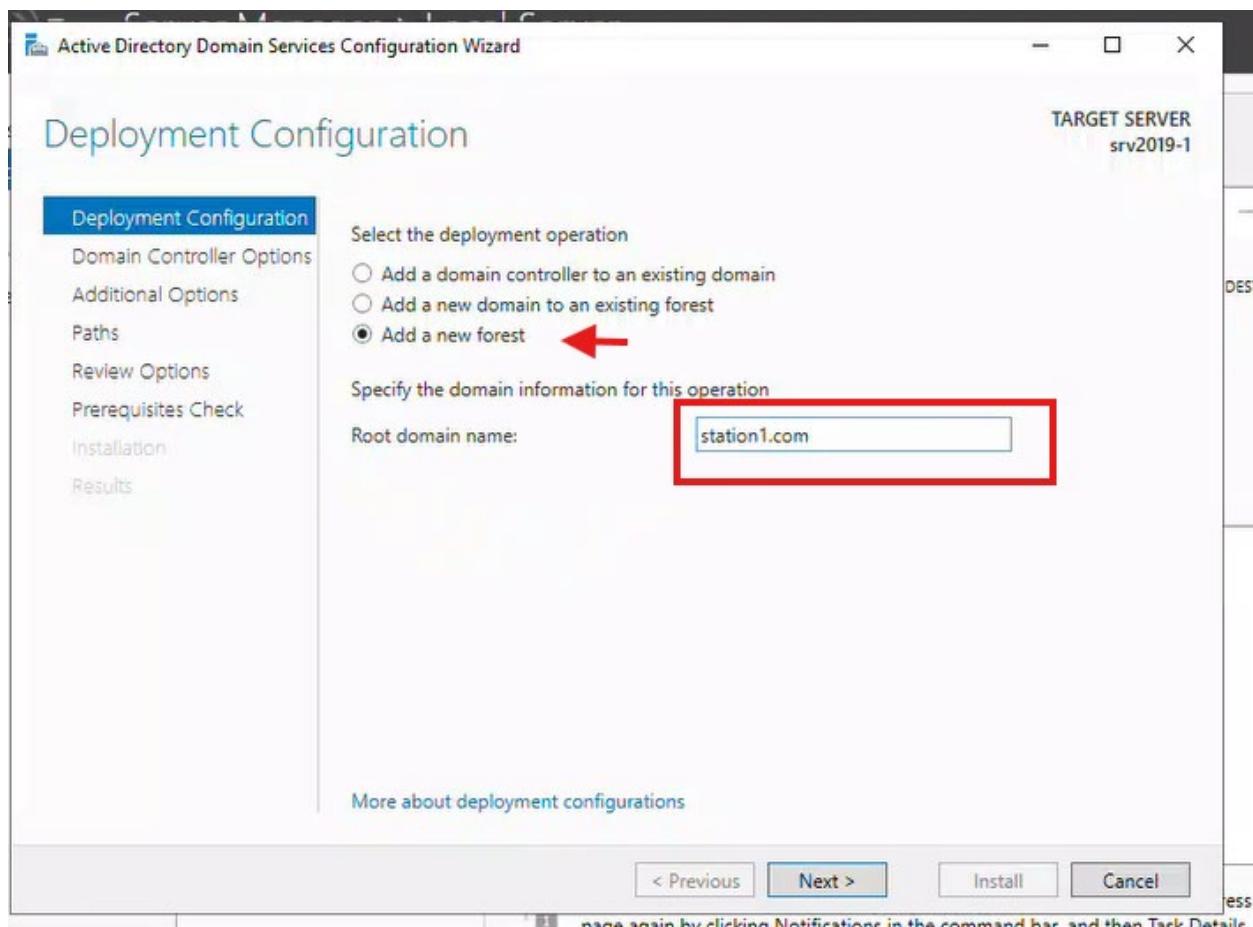


3.2.2 Promote the Server to a Domain Controller

- A) In Deployment Configuration: Choose Add a new forest



- B) Domain Name: Enter your organization's root domain name
station<mynumber>.com and click Next

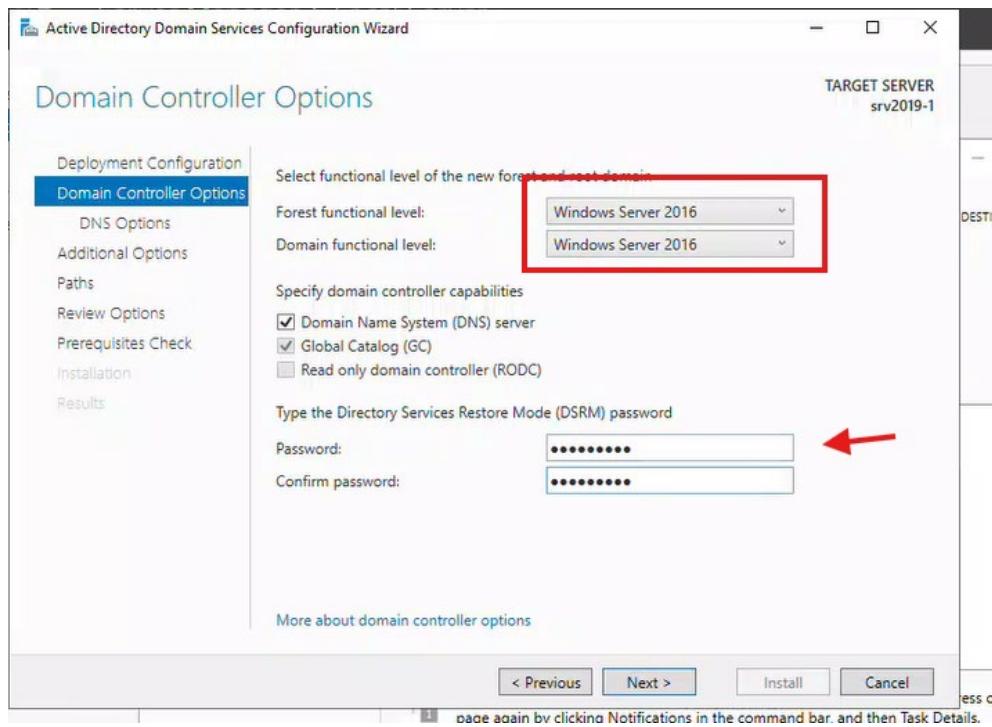


C) Domain Controller Options

Leave as Windows Server 2016 in Forest Functional Level and Domain Functional Level

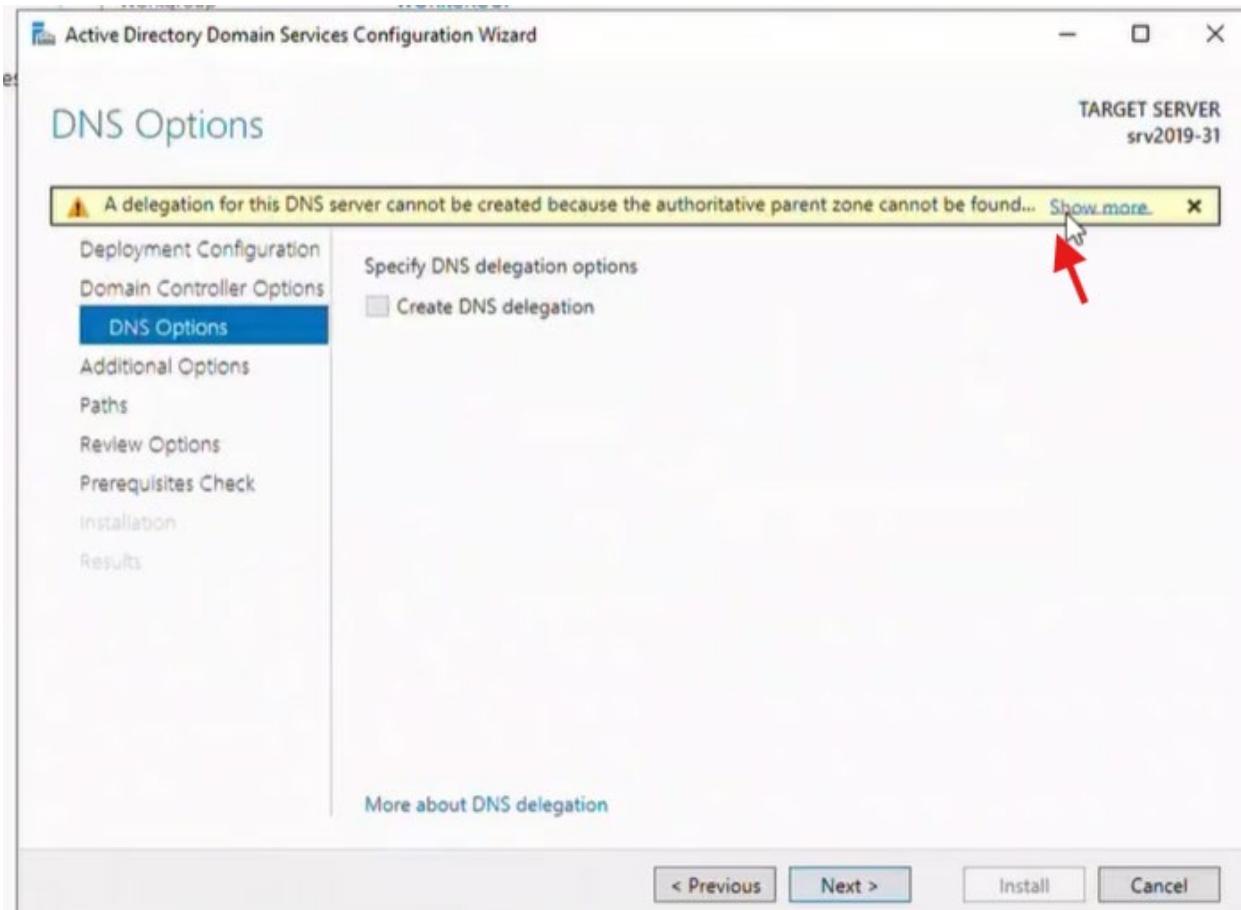
Set password for administrator@station<mynumber>.com as AMF123456

Click Next

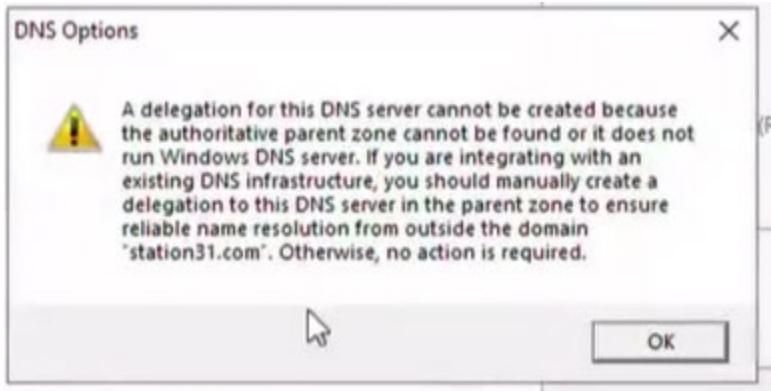


D) DNS options – Open and see the message

DNS server cannot be created because the authoritative parent zone cannot be found.. See more

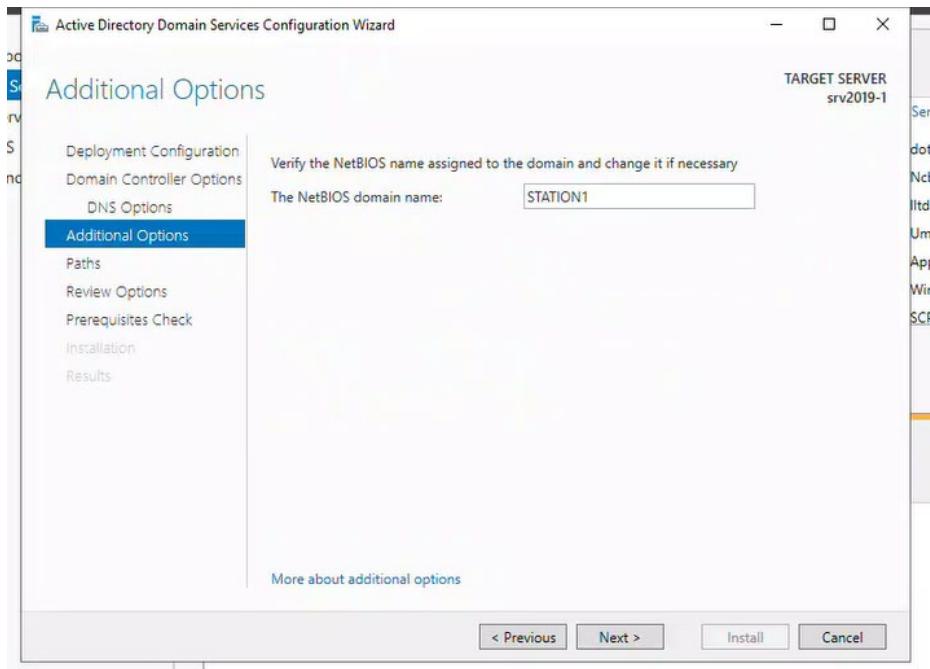


- E) Open and see the message, ignore and press ok

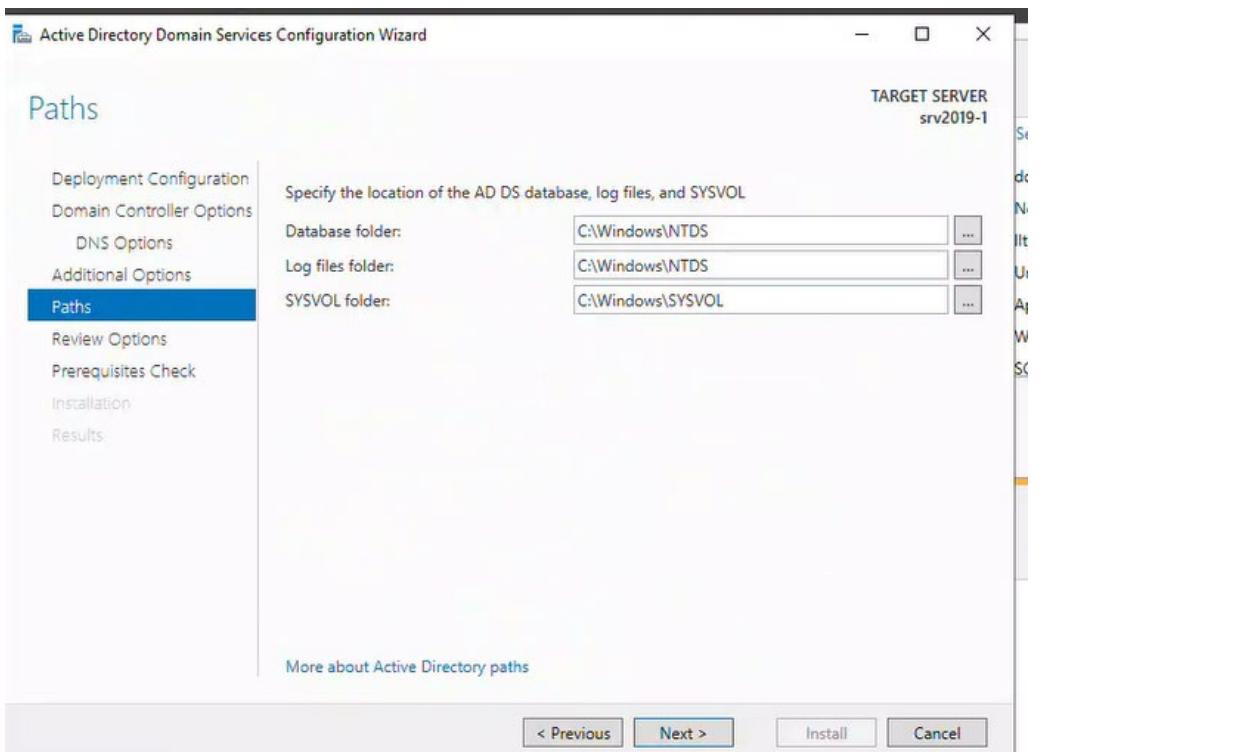


What it means I just went out on the Internet I checked to see if you own station 31.com and nobody else on the Internet knows about you or if they do you don't own the domain right because we didn't register this name anywhere on the Internet so it's basically checking on the Internet super allowed to use the name because we're doing this internally we can ignore this error OK but if we were doing this for real we would pay some money we would register this domainnamestationx.com add on the Internet and when we clicked on next it would check and it would say Yep go ahead you can use the name OK so we're just going to ignore this message because we know we don't own the name but we're using it internally or learning purposes

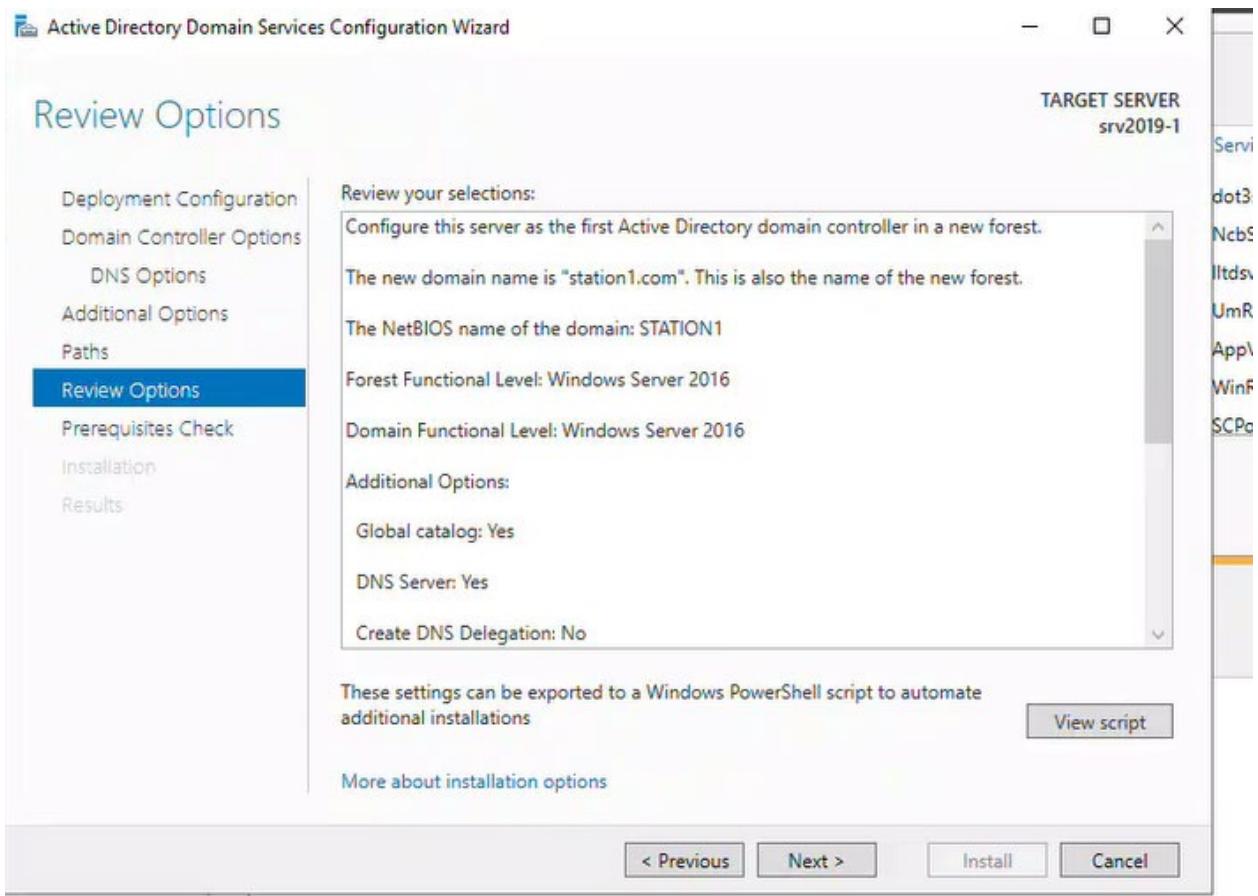
- F) For additional options The NetBios domain name put STATION1 for backwards compatibility for old windows



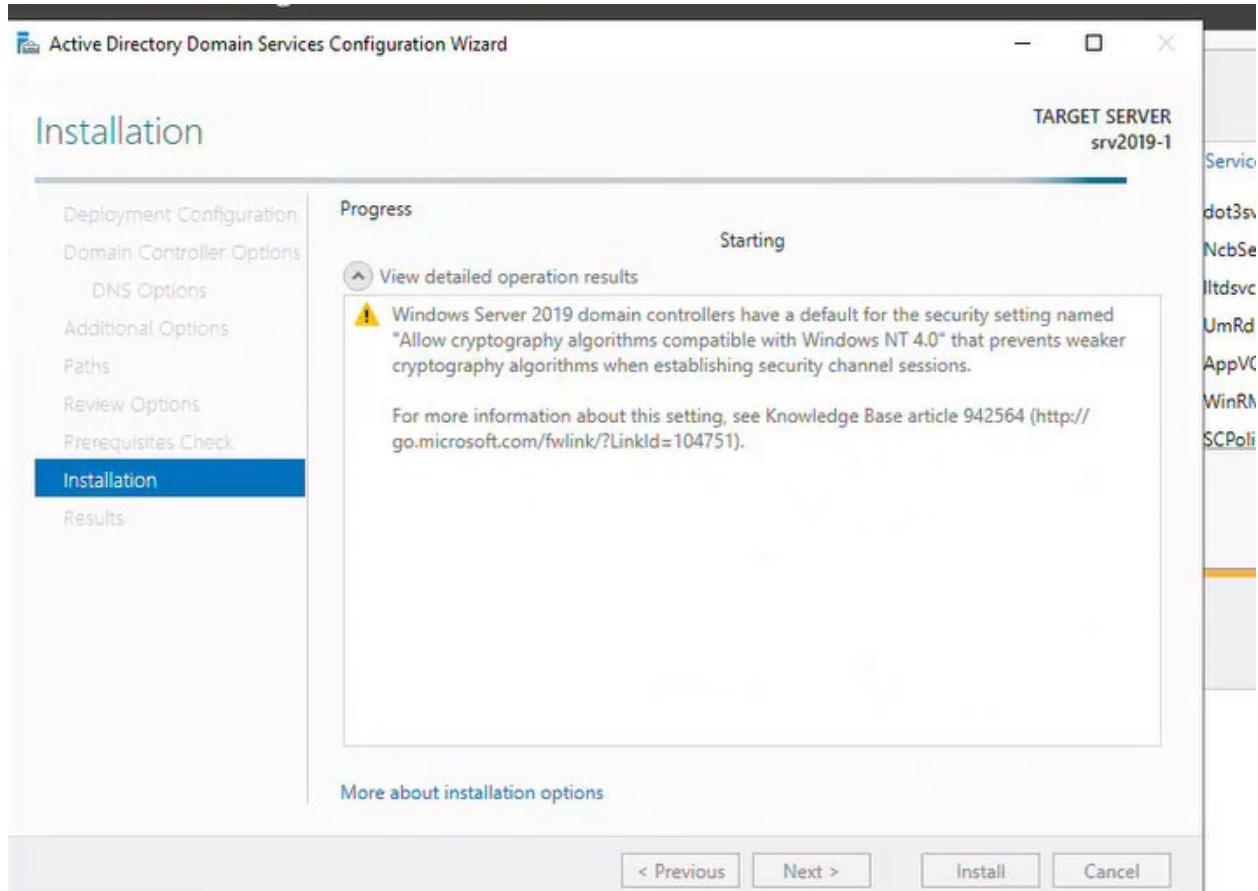
- G) In Paths specify the location where database is, Located under windows NTDS just click on Next
NTDS – New technology directory services



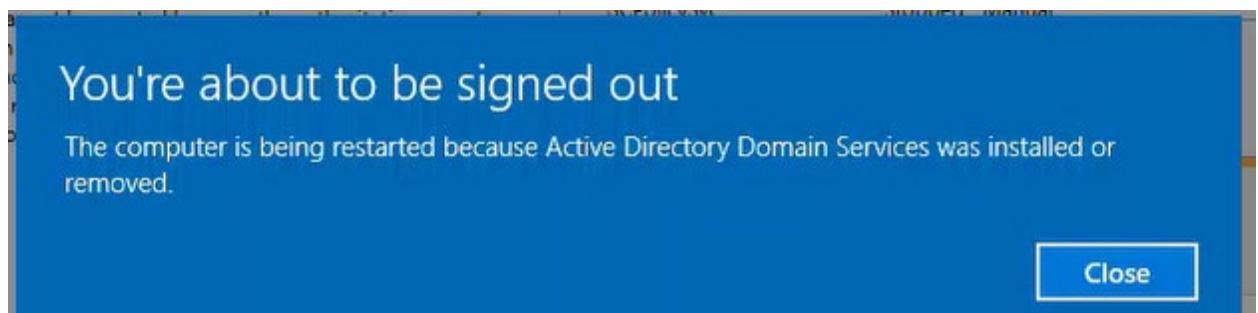
H) Review options, just let this go and continue



- I) Go to Installation page and click Install



- J) Restart indication



3.2.3 Verify Installation

- A) Wait for reboot to come back and Add screen shots for checks

When come back you will have the domain name/administrator. Login to the domain



B) Click on local server

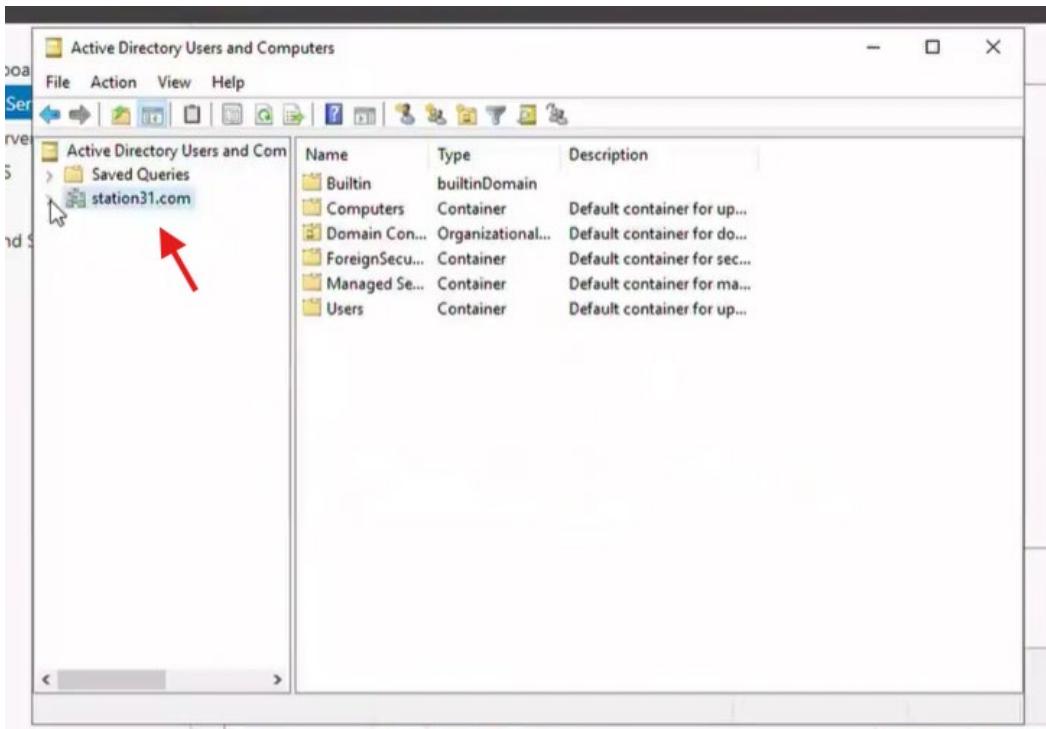
See domain name changed

The screenshot shows the 'PROPERTIES' window for a server named 'srv2019-31'. The 'Domain' field is highlighted with a red arrow and contains the value 'station31.com'. Other properties listed include Computer name (srv2019-31), Windows Defender Firewall (Private: Off), Remote management (Enabled), Remote Desktop (Disabled), NIC Teaming (Disabled), Ethernet0 (10.164.131.1, IPv6 enabled), Operating system version (Microsoft Windows Server 2019 Datacenter Evaluation), and Hardware information (VMware, Inc. VMware20,1).

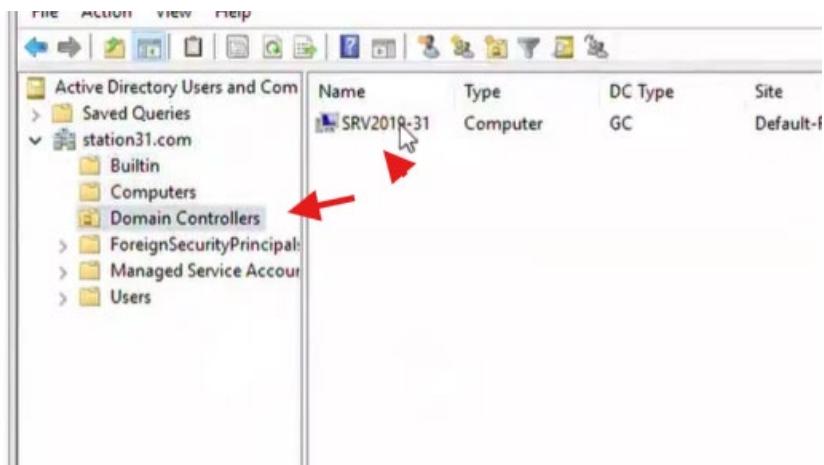
C) Under tools you will see tools for Active Domain , select Active Domain users and computers

The screenshot shows the 'Tools' menu in the Windows Server 2019 interface. The 'Tools' tab is selected. The menu items listed are: Active Directory Administrative Center, Active Directory Domains and Trusts, Active Directory Module for Windows PowerShell, Active Directory Sites and Services, Active Directory Users and Computers (which is highlighted with a red box and has a red arrow pointing to it), ADSI Edit, Component Services, Computer Management, Defragment and Optimize Drives, Disk Cleanup, DNS, Event Viewer, Group Policy Management, iSCSI Initiator, Local Security Policy, Microsoft Azure Services, ODBC Data Sources (32-bit), ODBC Data Sources (64-bit), Performance Monitor, and Print Management.

D) New domain will appear



E) See what appears under domain controllers

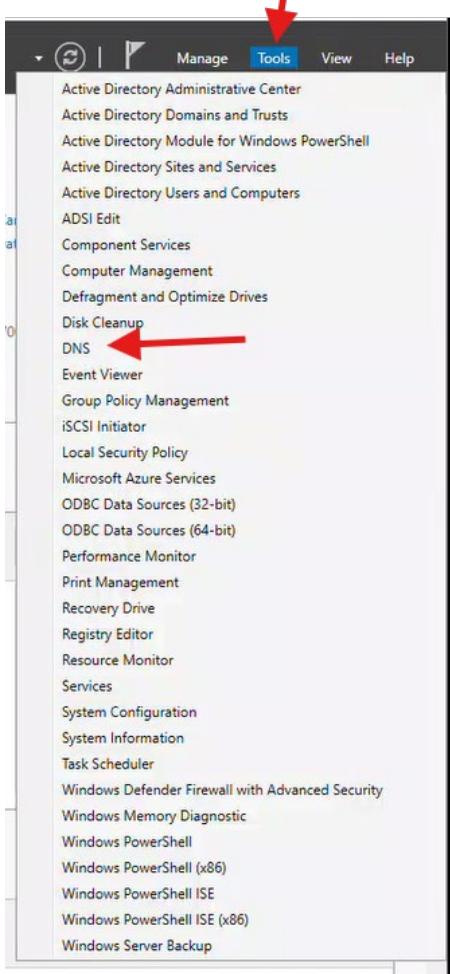


F) Under users you can see Administrator user

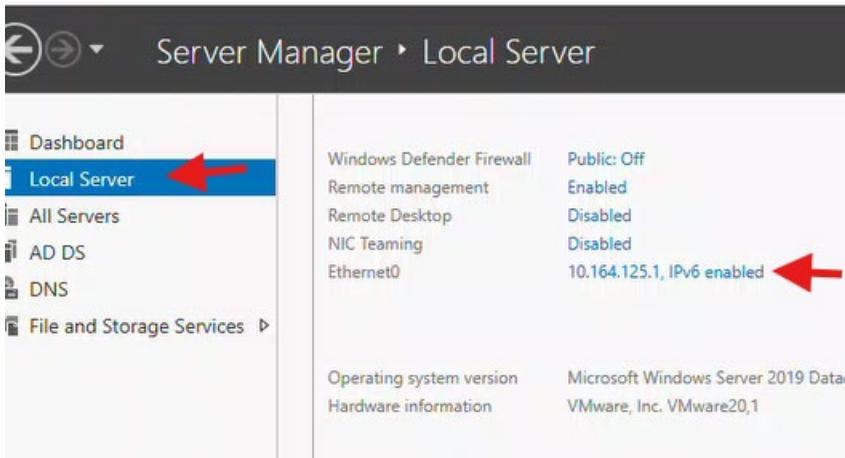
Name	Type	Description
Administrator	User	Built-in account for ad...
Allowed RO...	Security Group...	Members in this group c...
Cert Publish...	Security Group...	Members of this group ...
Cloneable D...	Security Group...	Members of this group t...
Denied ROD...	Security Group...	Members in this group c...
DnsAdmins	Security Group...	DNS Administrators Gro...
DnsUpdateP...	Security Group...	DNS clients who are per...
Domain Ad...	Security Group...	Designated administrato...
Domain Co...	Security Group...	All workstations and ser...
Domain Con...	Security Group...	All domain controllers i...
Domain Gue...	Security Group...	All domain guests
Domain Users	Security Group...	All domain users
Enterprise A...	Security Group...	Designated administrato...
Enterprise K...	Security Group...	Members of this group ...
Enterprise R...	Security Group...	Members of this group ...
Group Polic...	Security Group...	Members in this group c...
Guest	User	Built-in account for gue...
Key Admins	Security Group...	Members of this group ...
Protected Us...	Security Group...	Members of this group ...
RAS and IAS ...	Security Group...	Servers in this group can...
Read-only D...	Security Group...	Members of this group ...
Schema Ad...	Security Group...	Designated administrato...

3.2.4 Assign DNS server in Windows server 2019

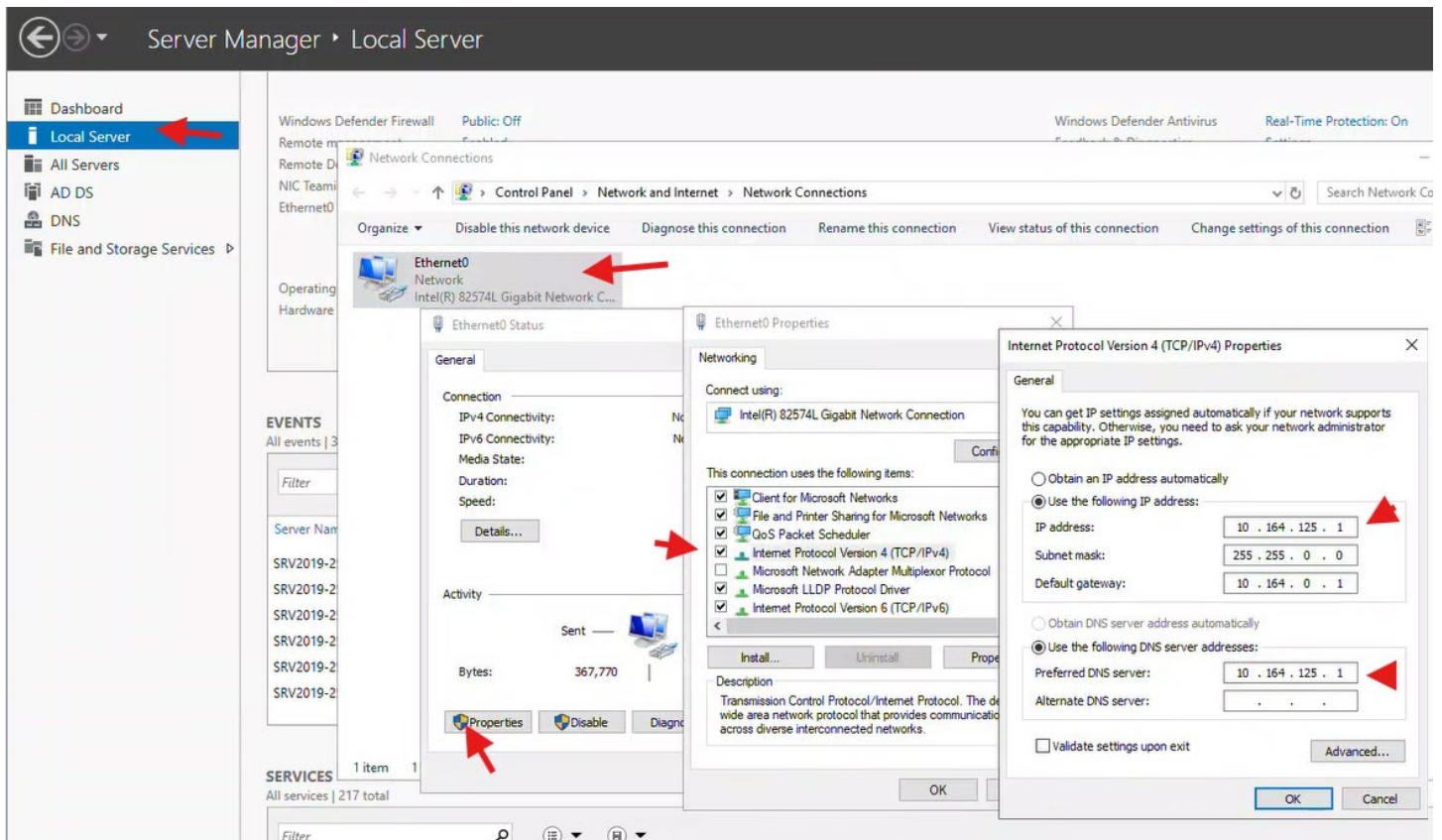
- A) Verify windows server 2019 is acting as DNS, from tools See DNS is installed



B) From Local Server select Ethernet0



C) Then select Ethernet0/Properties/IPV4 and change the DNS IP



D) Verify DNS server is changed from cmd, see DNS server is the same IP as Windows server

```
C:\Users\Administrator>ipconfig /all

Windows IP Configuration

Host Name . . . . . : srv2019-1
Primary Dns Suffix . . . . . : station1.com
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : station1.com

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-ED-9C-8C
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::2f27:593d:ad7a:83e%14(Preferred)
IPv4 Address. . . . . : 10.164.101.1(Preferred) ←
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-D1-6E-00-0C-29-ED-9C-8C
DNS Servers . . . . . : ::1 ←
                           10.164.101.1
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\Administrator>
```

Ping google.com

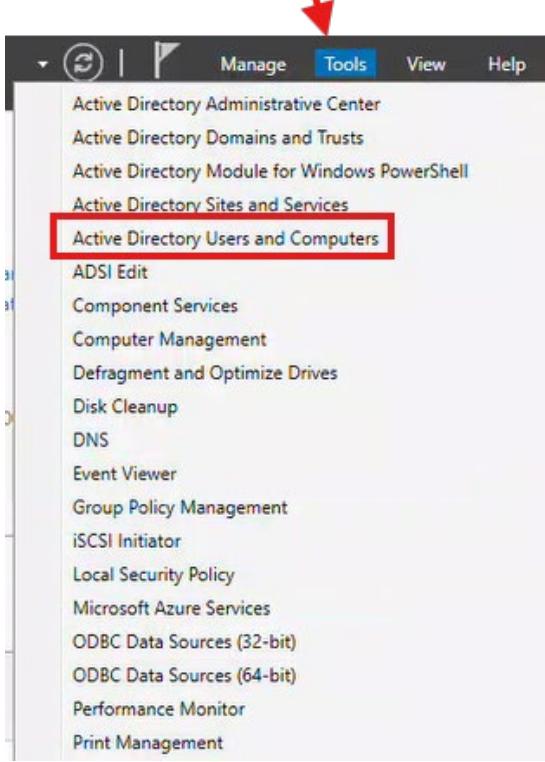
```
C:\Users\Administrator>
C:\Users\Administrator>ping google.com
Pinging google.com [142.250.69.142] with 32 bytes of data:
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
Reply from 142.250.69.142: bytes=32 time=2ms TTL=117
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
```

3.3 Join a Windows Client to the domain

3.3.1 Create a user within an organizational unit in windows server

3.3.1.1 Create an organizational unit

- A) Under Tools/ Active Directory users and computers



B) New windows open

A screenshot of the 'Active Directory Users and Computers' window. The title bar says 'Active Directory Users and Computers'. The left pane shows a navigation tree with 'Active Directory Users and Com' selected, followed by 'Saved Queries', 'station1.com' (with 'Builtin', 'Computers', 'Domain Controllers', 'ForeignSecurityPrincipals', 'Managed Service Accounts', and 'Users' children), and 'Users'. The right pane displays a table with three columns: 'Name', 'Type', and 'Description'. There is one entry: 'Saved Queries' (Type: Domain, Description: 'Folder to store your favo...').

Name	Type	Description
Saved Queries	Domain	Folder to store your favo...

C) There is a bunch of active directory objects, see Administrator is the only user that we have added

Active Directory Users and Computers

File Action View Help

Active Directory Users and Com

- > Saved Queries
- > station1.com
 - > Builtin
 - > Computers
 - > Domain Controllers
 - > ForeignSecurityPrincipals
 - > Managed Service Accounts
 - Users

Name	Type	Description
Administrator	User	Built-in account for ad...
Allowed RO...	Security Group...	Members in this group c...
Cert Publish...	Security Group...	Members of this group ...
Cloneable D...	Security Group...	Members of this group t...
Denied ROD...	Security Group...	Members in this group c...
DnsAdmins	Security Group...	DNS Administrators Gro...
DnsUpdateP...	Security Group...	DNS clients who are per...
Domain Adm...	Security Group...	Designated administrato...
Domain Co...	Security Group...	All workstations and ser...
Domain Con...	Security Group...	All domain controllers i...
Domain Gue...	Security Group...	All domain guests
Domain Users	Security Group...	All domain users
Enterprise A...	Security Group...	Designated administrato...
Enterprise K...	Security Group...	Members of this group ...
Enterprise R...	Security Group...	Members of this group ...
Group Polic...	Security Group...	Members in this group c...
Guest	User	Built-in account for gue...
Key Admins	Security Group...	Members of this group ...
Protected Us...	Security Group...	Members of this group ...
RAS and IAS ...	Security Group...	Servers in this group can...
Read-only D...	Security Group...	Members of this group ...

np	Name	Type	Description
	Administrator	User	Built-in account for adm...

D) Under station1.com Right click on New / Organizational unit

Active Directory Users and Computers

File Action View Help

Active Directory Users and Com

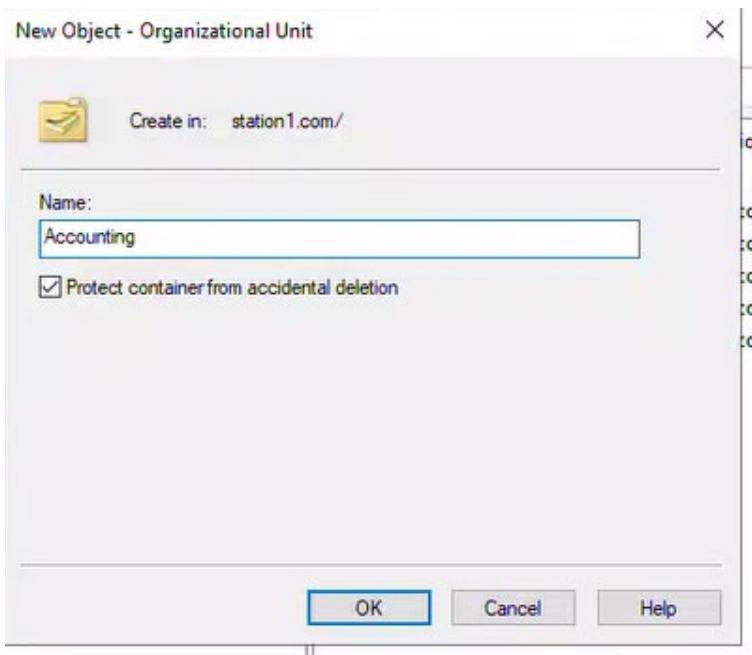
- > Saved Queries
- > station1.com
 - > Builtin
 - > Delegate Control...
 - > Find...
 - > Change Domain...
 - > Change Domain Controller...
 - > Raise domain functional level...
 - > Operations Masters...

New

- Computer
- Contact
- Group
- InetOrgPerson
- msDS-ShadowPrincipalContainer
- msImaging-PSPs
- MSMQ Queue Alias
- Organizational Unit
- Printer
- User
- Shared Folder

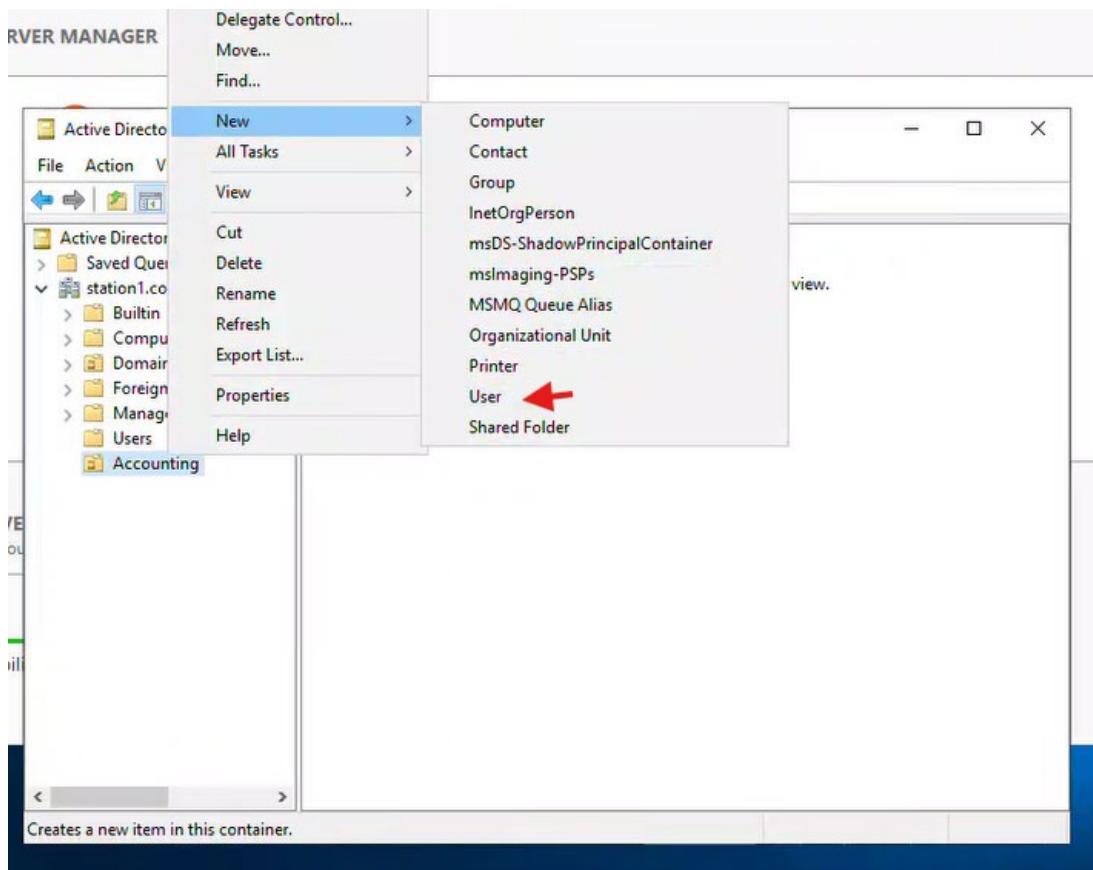
Creates a new item in this container.

E) window New object Organizational unit appears, add in name "Accounting" and press OK



3.3.1.2 Add user inside an organizational unit Accounting

A) inside folder “Accounting” right click on New/User



B) A window appear and create user With

Name Alan

Last name Smith

User logon name asmith

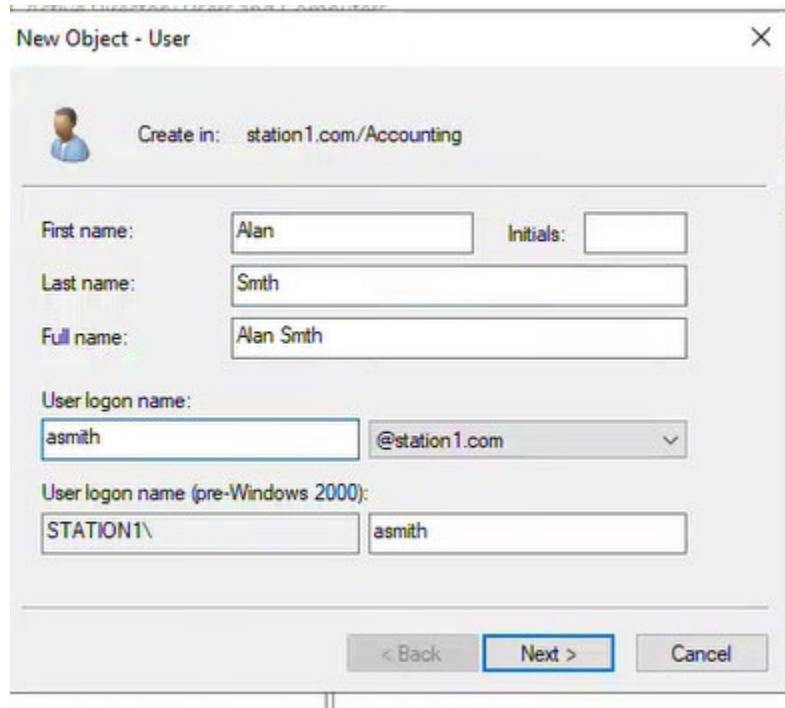
Click on Next

New Object - User

Create in: station1.com/Accounting

First name:	Alan	Initials:	<input type="text"/>
Last name:	Smth		
Full name:	Alan Smth		
User logon name:	asmith	@station1.com	<input type="button" value="▼"/>
User logon name (pre-Windows 2000):	STATION1\	asmith	<input type="text"/>

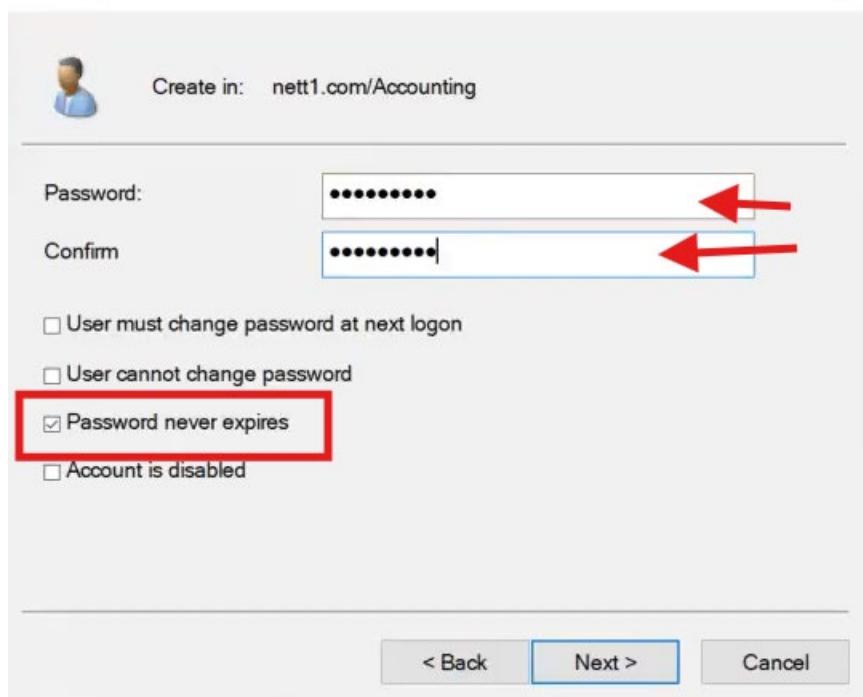
< Back **Next >** Cancel



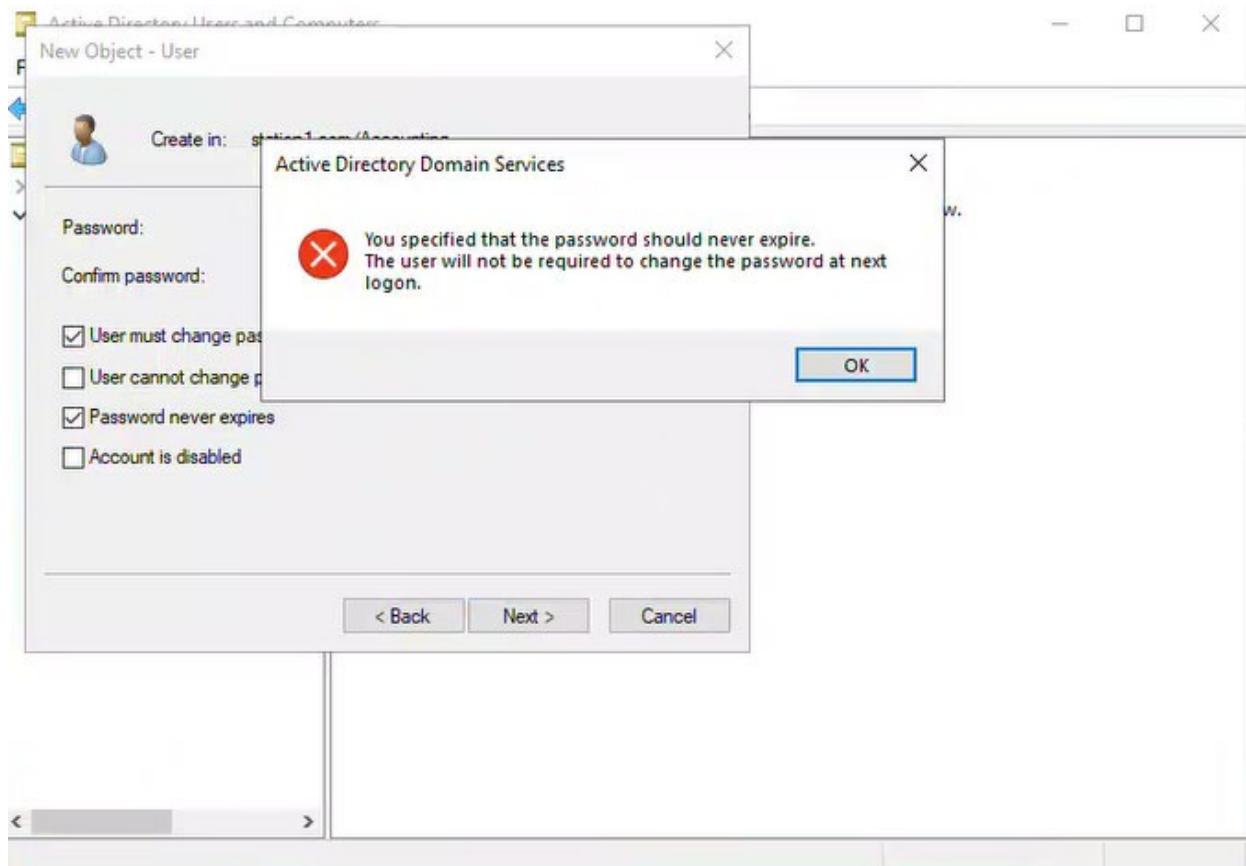
C) Give a password **Amf 654321** and confirm password

Only select “Select password never expires”

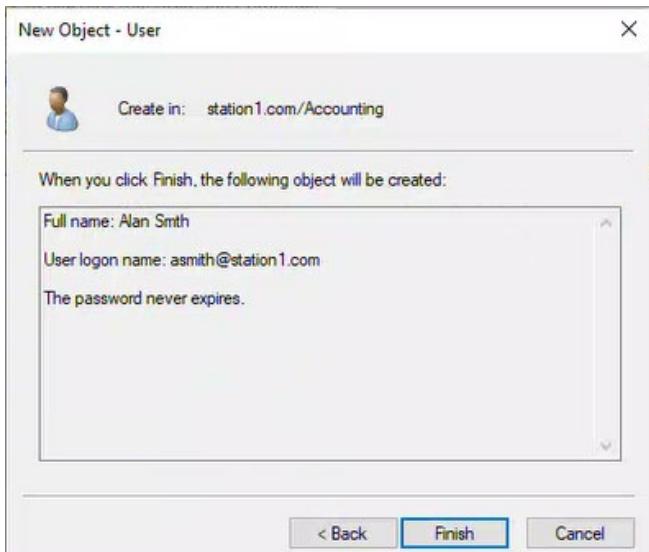
New Object - User



D) A warning will appear, press ok



E) User has been created, verify and click “Finish”



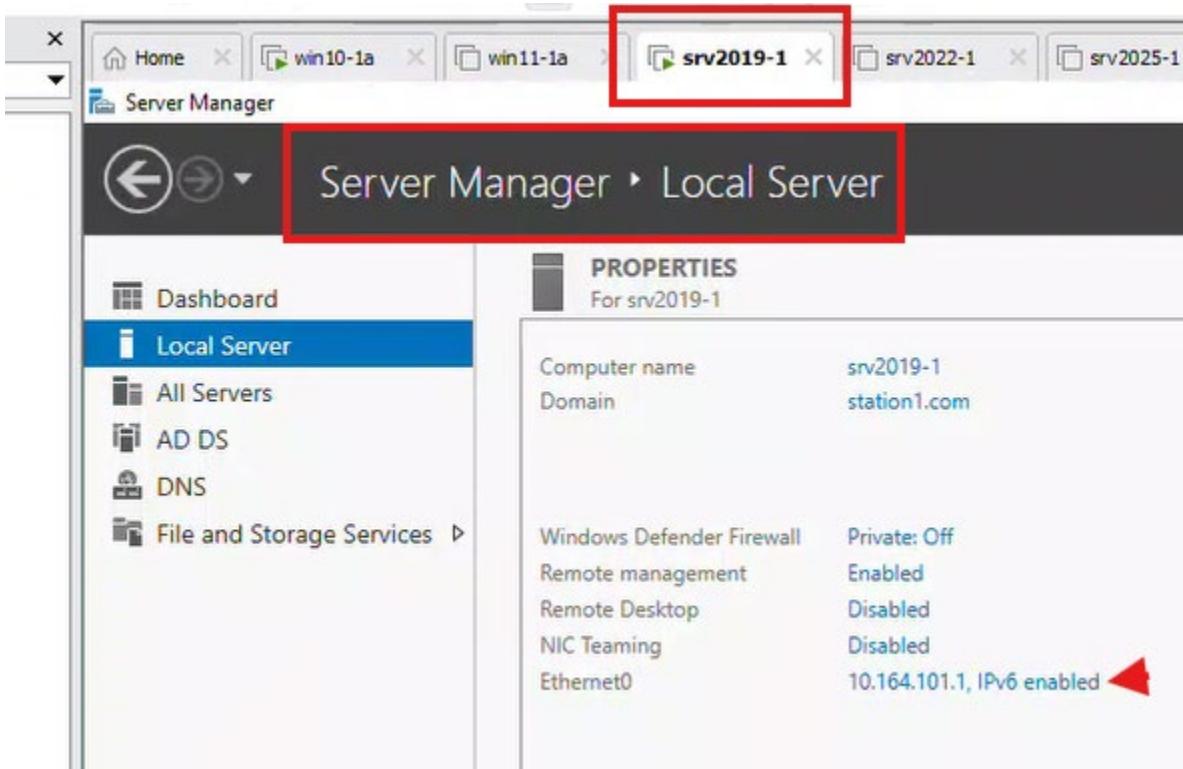
F) See under Accounting user has been created

The screenshot shows the 'Active Directory Users and Computers' window. The left pane shows the navigation tree with 'station1.com' expanded, showing 'Builtin', 'Computers', 'Domain Controllers', 'ForeignSecurityPrincipals', 'Managed Service Accounts', and 'Users'. The 'Users' folder is selected. The right pane is a table with columns 'Name', 'Type', and 'Description'. It contains one row for 'Alan Smth', which is listed as a 'User'. The status bar at the bottom shows '< >'.

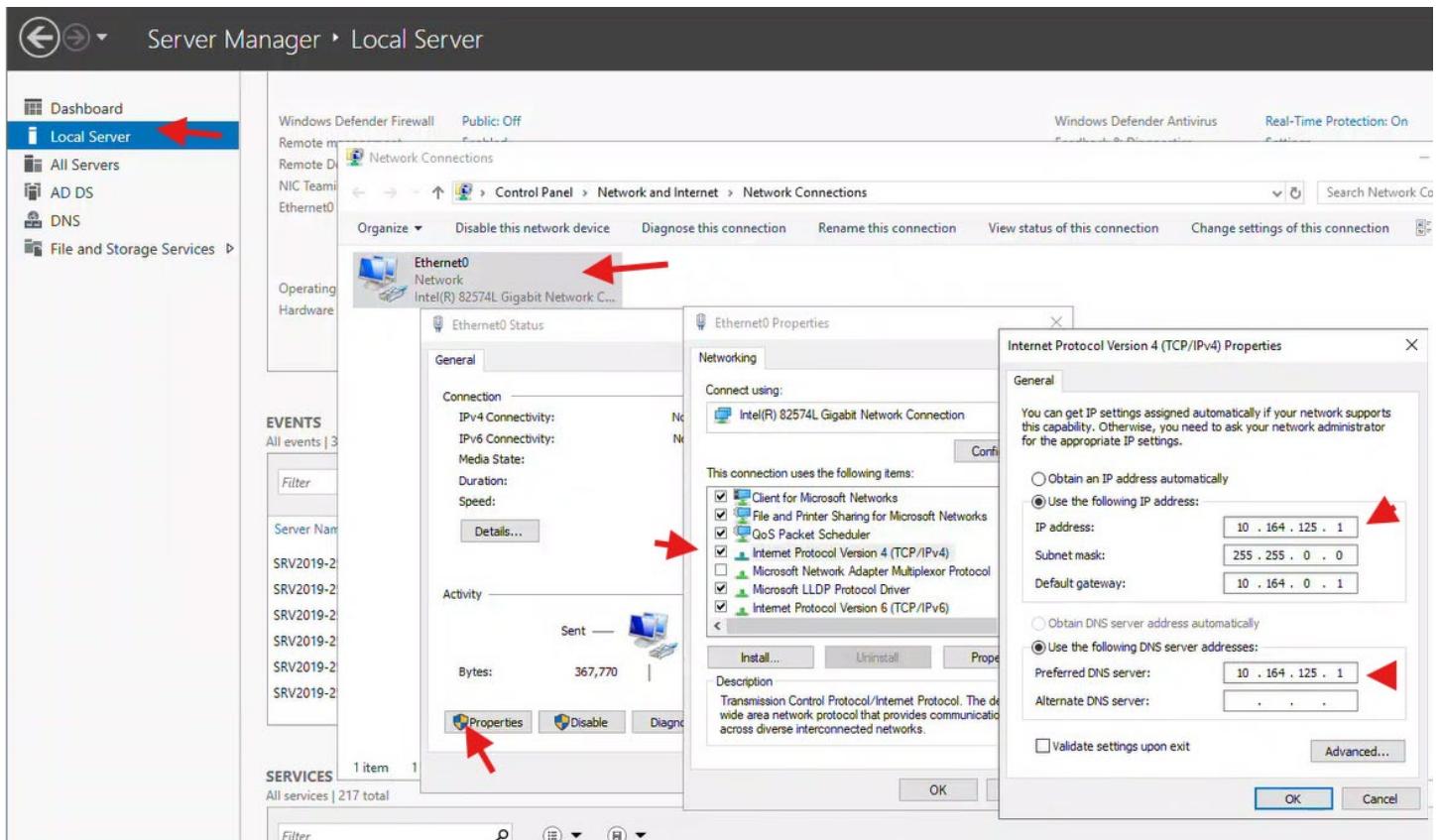
Name	Type	Description
Alan Smth	User	

3.3.2 Verify DNS is set in windows server

- A) From Local Server select Ethernet0



- B) Then select Ethernet0/Properties/IPV4 and verify DNS server is the same IP as the windows server. If it is not change it.



C) Verify DNS server works in Windows server

Ping google.com

```
C:\Users\Administrator>
C:\Users\Administrator>ping google.com

Pinging google.com [142.250.69.142] with 32 bytes of data:
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
Reply from 142.250.69.142: bytes=32 time=2ms TTL=117
Reply from 142.250.69.142: bytes=32 time=1ms TTL=117
```

3.3.3 Set DNS server in windows 10 client

3.3.3.1 Set DNS server in windows client

A) Power on windows 10 client box

B) Verify host name, ip address and DNS server with cmd

```
Microsoft Windows [Version 10.0.19045.5371]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>ipconfig /all

Windows IP Configuration

Host Name . . . . . : win10-1a
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-E3-6F-F2
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3d5f:eedd:957f:5947%9(Preferred)
IPv4 Address. . . . . : 10.164.101.11(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
DNS Servers . . . . . : 8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>hostname
win10-1a

C:\Users\student>hostname
win10-1a

C:\Users\student>
```

C) Ping the server manager

```
C:\Users\student>ping station1.com

Pinging station1.com [99.96.50.75] with 32 bytes of data:
Reply from 99.96.50.75: bytes=32 time=83ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108

Ping statistics for 99.96.50.75:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 81ms, Maximum = 83ms, Average = 81ms

C:\Users\student>
```

D) Look at the ip that com back, it does not correspond to the server manager

```
C:\Users\student>ping station1.com

Pinging station1.com [99.96.50.75] with 32 bytes of data:
Reply from 99.96.50.75: bytes=32 time=83ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108
Reply from 99.96.50.75: bytes=32 time=81ms TTL=108

Ping statistics for 99.96.50.75:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 81ms, Maximum = 83ms, Average = 81ms

C:\Users\student>
```

E) Look for the DNS in win10 cmd

```
Microsoft Windows [Version 10.0.19045.5371]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>ipconfig /all

Windows IP Configuration

Host Name . . . . . : win10-1a
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet0:

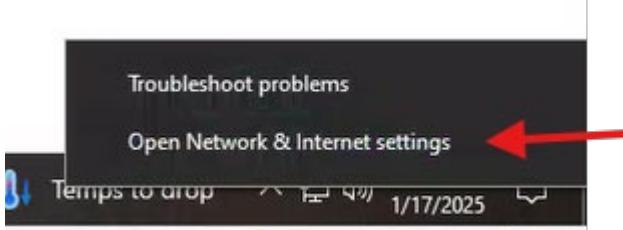
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-E3-6F-F2
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3d5f:eedd:957f:5947%9(Preferred)
IPv4 Address. . . . . : 10.164.101.11(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 10.164.0.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
DNS Servers . . . . . . . . . : 8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\student>hostname
win10-1a

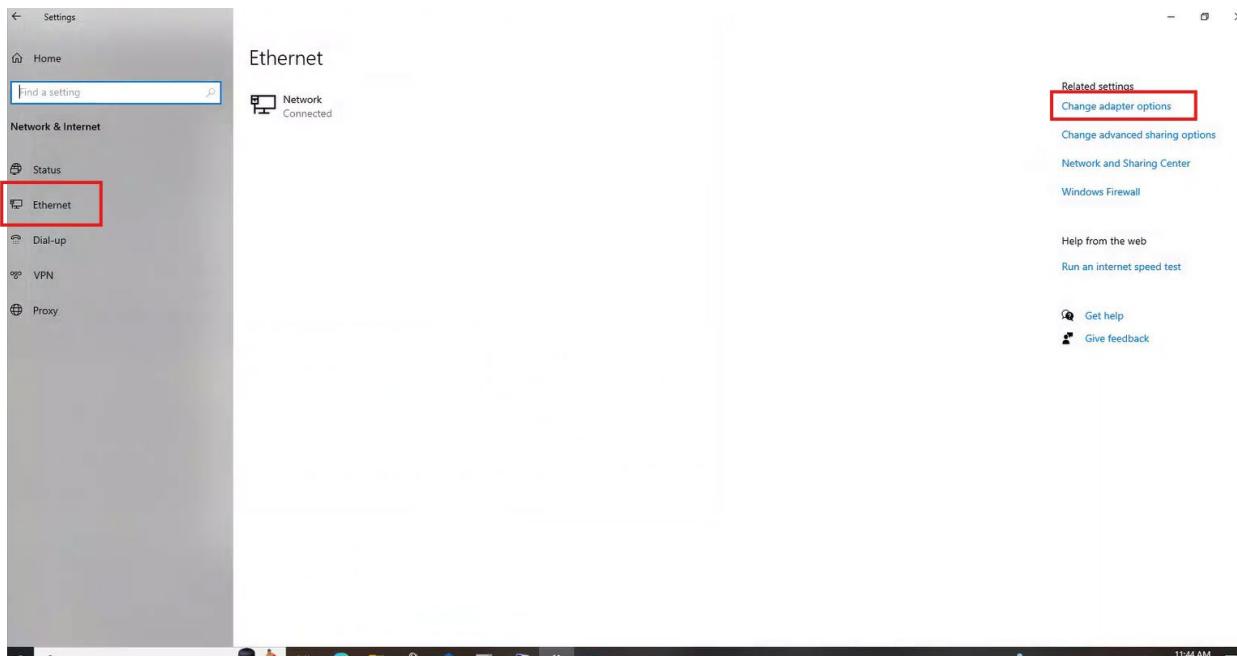
C:\Users\student>hostname
win10-1a

C:\Users\student>
```

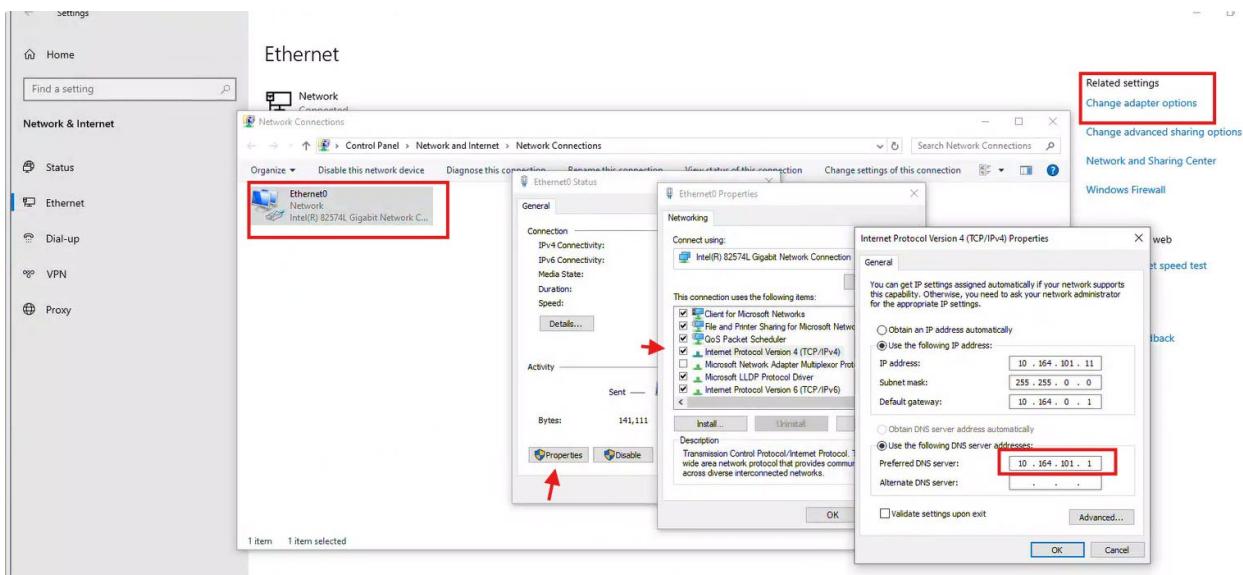
F) Change DNS to be win19-1 server, open Network & Internet settings



G) Select Ethernet/ Select Adapter options



H) In window general select Properties the IPV4, then Set the DNS to the windows 19 ip address gotten in previous step.



3.3.3.2 Test the change of DNS server

- A) Ping the Server by name

```
C:\Users\student>ping station1.com

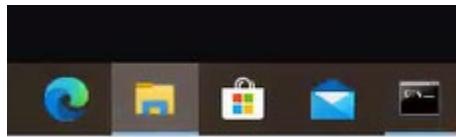
Pinging station1.com [10.164.101.1] with 32 bytes of data:
Reply from 10.164.101.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.164.101.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

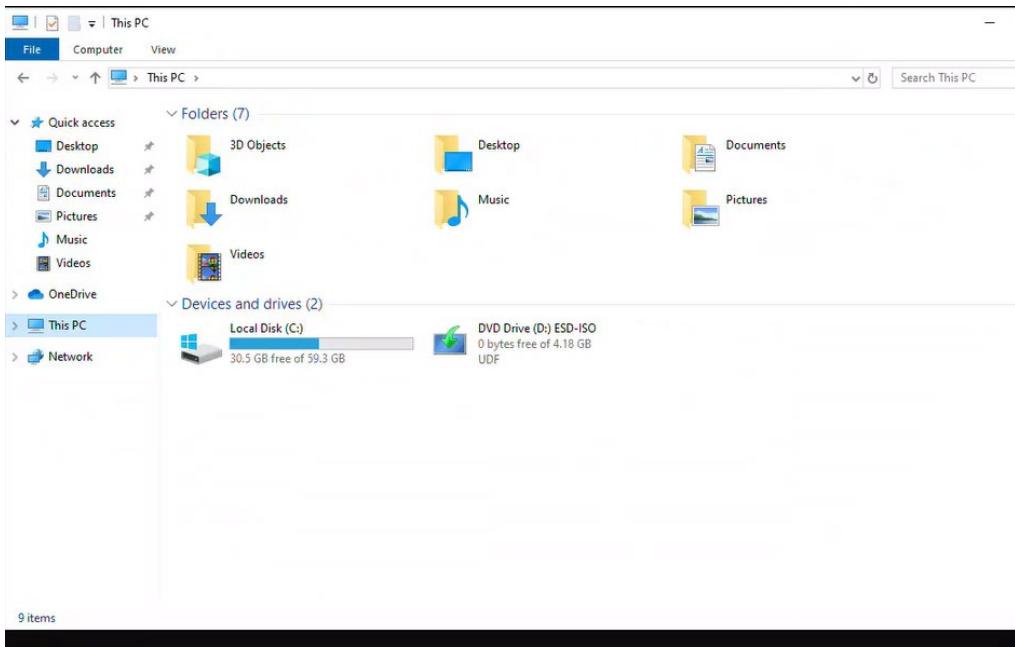
C:\Users\student>_
```

3.3.4 Add windows 10 computer to a windows domain

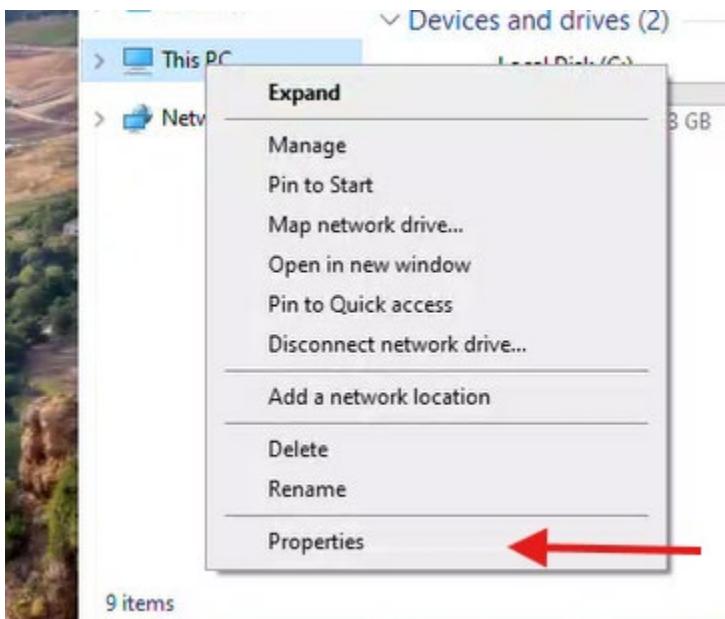
- A) Login to Windows 10 computer On win10-1 virtual machine open folder



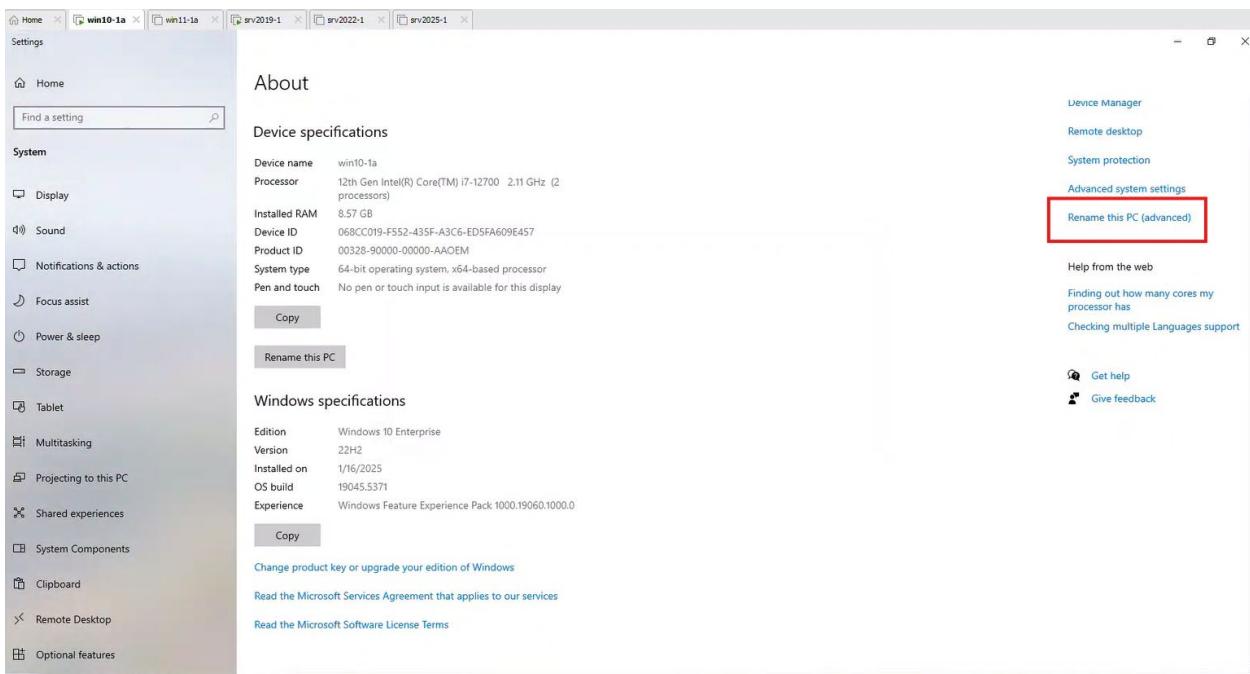
- B) Check on PC



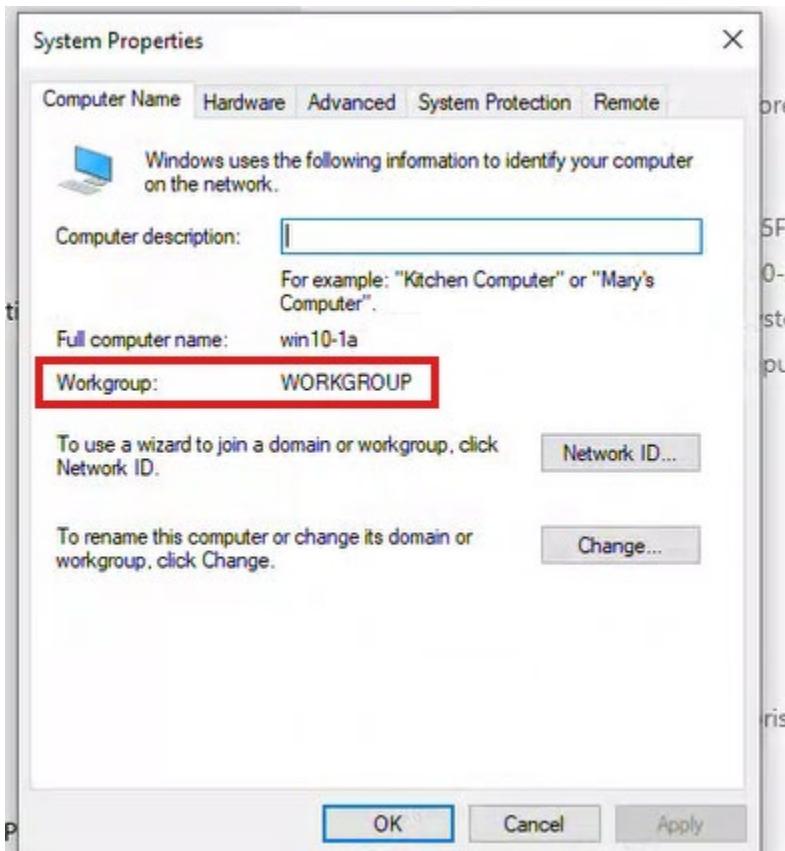
C) On PC right click to properties



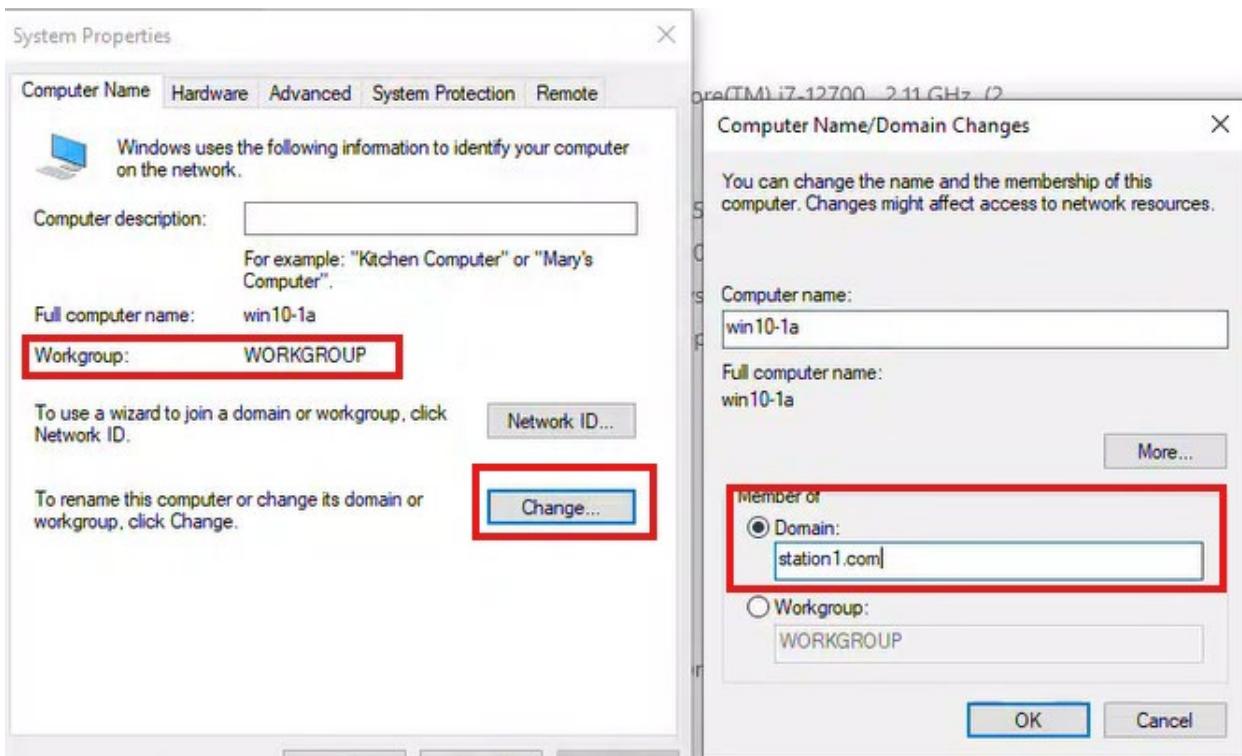
D) Select Rename this PC (advanced)



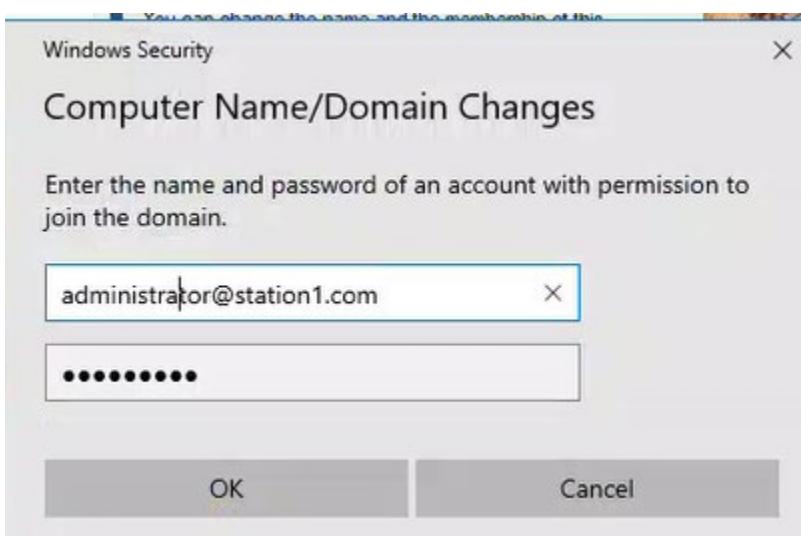
E) See computer is part of WORKGROUP



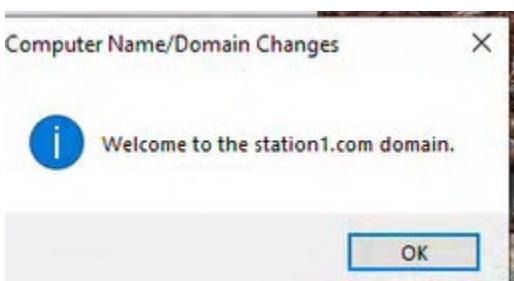
F) Select Change and put the name of the domain station1.com



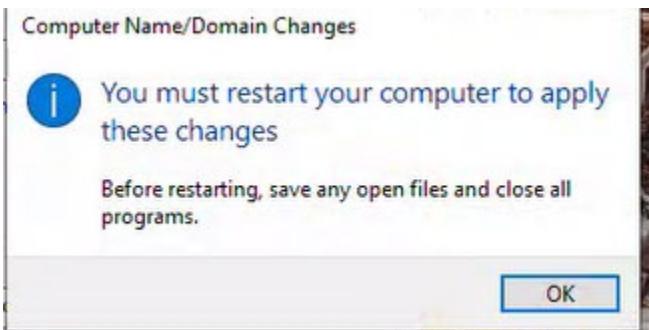
G) Set user as administartor@station1.com Give password and press ok



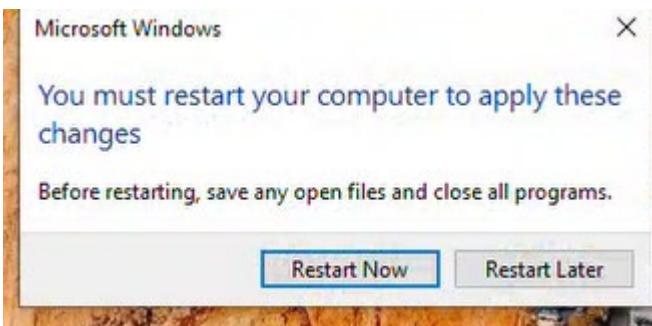
H) A windows confirming the connection to station1.com will appear



I) Restart will be required



J) Restart now

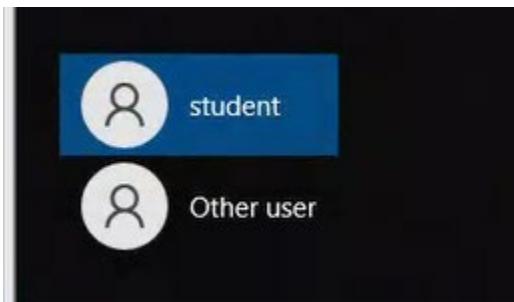


k) Computer will restart .

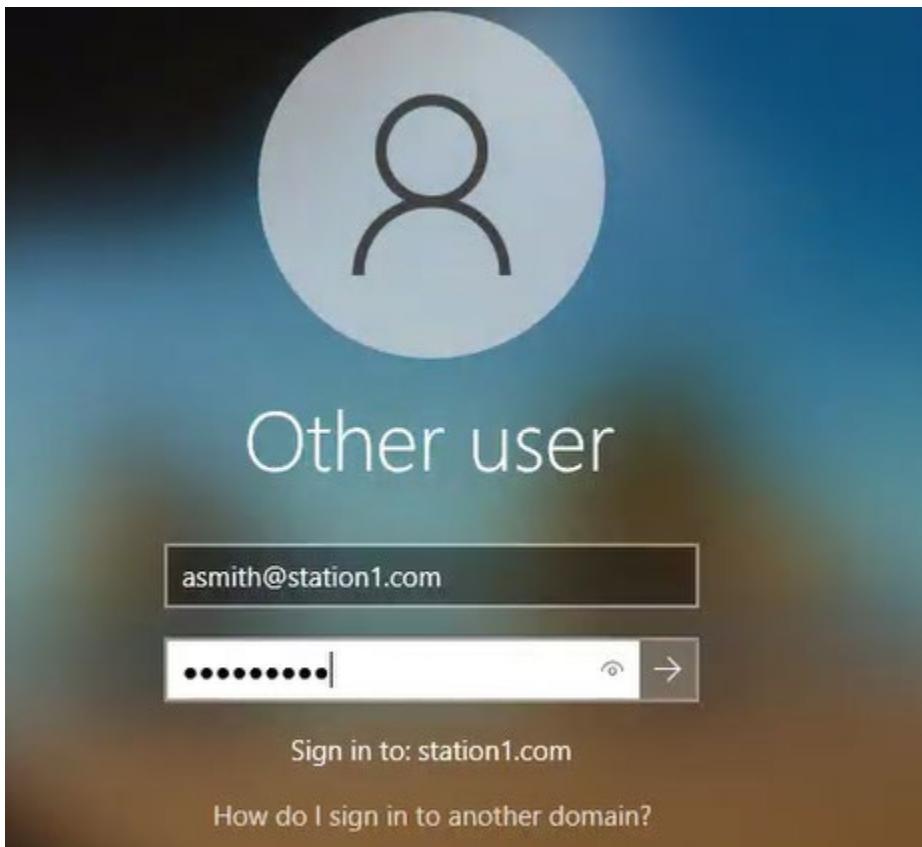
3.3.5 Confirm user has been added to domain

A) After rebooting you can see you can login as student but if I log into student that is just login in to the local computer

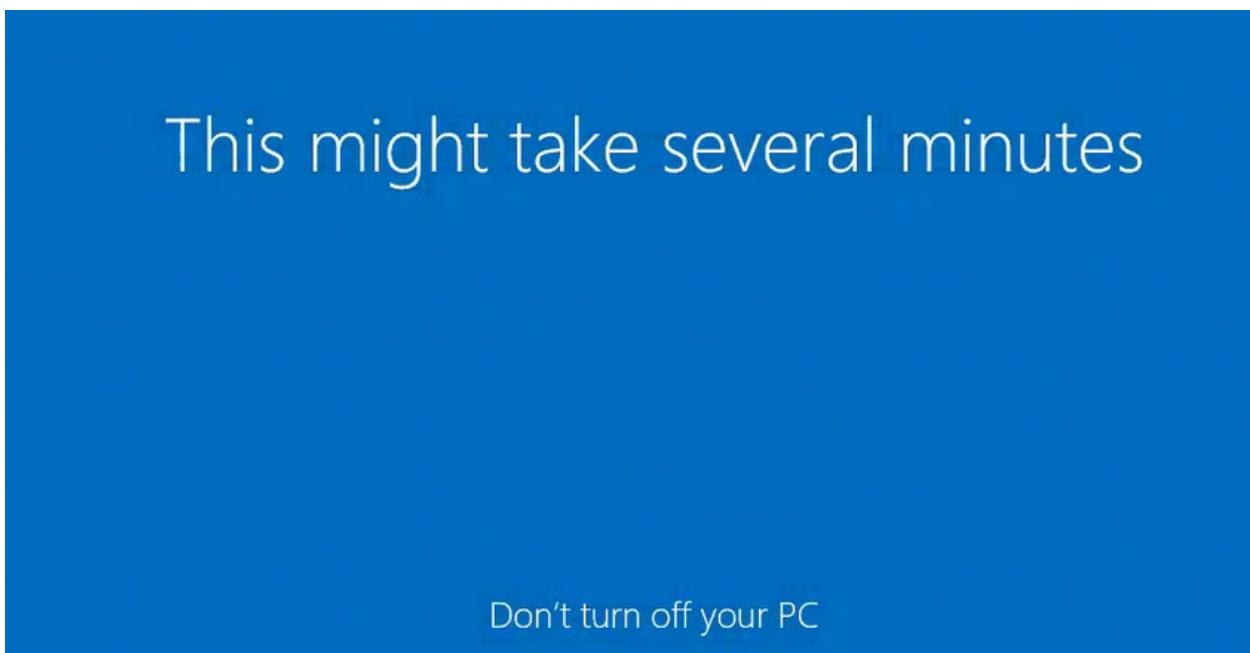
Select “Other use” to connect into another domain



B) Login as asmith@station1.com give password **Amf654321**



- C) Wait sometime while create a profile for the user asmith on the local computer



- D) Go to CMD and see this computer name is [win10-1a.station.com](#) as fully qualified domain (FQDN)

```
(C:\Windows\system32) All rights reserved.

C:\Users\asmith>ipconfig /all

Windows IP Configuration

    Host Name . . . . . : win10-1a ←
    Primary Dns Suffix . . . . . : station1.com ←
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No
    DNS Suffix Search List. . . . . : station1.com

Ethernet adapter Ethernet0:

    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Intel(R) 82574L Gigabit Network Connection
    Physical Address . . . . . : 00-0C-29-E3-6F-F2
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::3d5f:eedd:957f:5947%9(PREFERRED)
    IPv4 Address. . . . . : 10.164.101.11(PREFERRED)
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 10.164.0.1
    DHCPv6 IAID . . . . . : 100666409
    DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
    DNS Servers . . . . . : 10.164.101.1
    NetBIOS over Tcpip. . . . . : Enabled

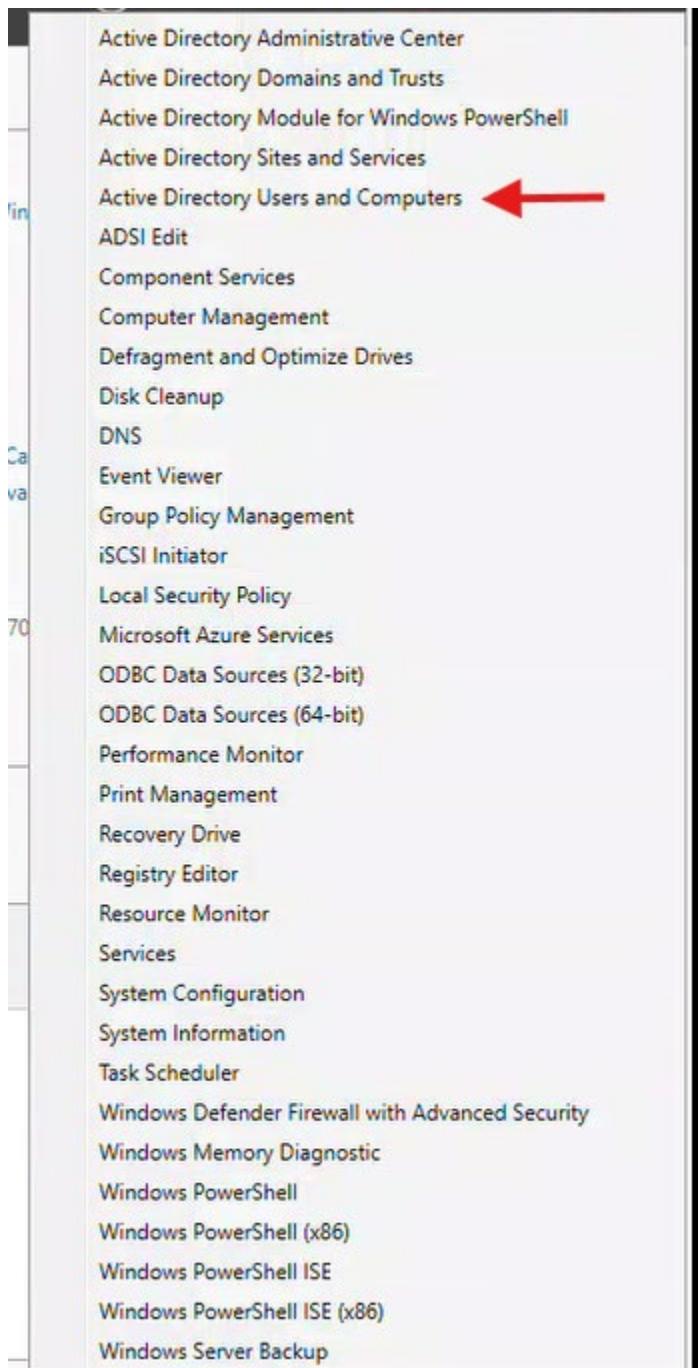
C:\Users\asmith>
```

3.3.6 Verify setup in windows 2019 server

- A) Login to the server



B) From tools select Active directory users and Computers



C) In the Folder select computers you will see win 10-1a

Active Directory Users and Computers

File Action View Help

Active Directory Users and Computers

Name	Type	Description
WIN10-1A	Computer	

Saved Queries

station1.com

- > Accounting
- > Builtin
- Computers**
- > Domain Controllers
- > ForeignSecurityPrincipal
- > Managed Service Account
- > Users

< >

This screenshot shows the Windows Active Directory Users and Computers management console. The left pane displays a tree view of the directory structure under 'station1.com', with 'Computers' selected. The right pane lists a single computer object, 'WIN10-1A', which is a 'Computer' type entry. The interface includes standard Windows navigation buttons at the top and bottom.

D) Under accounting you can see asmith user

Active Directory Users and Computers

File Action View Help

Active Directory Users and Computers

Name	Type	Description
Alan Smth	User	

Saved Queries

station1.com

- Accounting**
- > Builtin
- > Computers
- > Domain Controllers
- > ForeignSecurityPrincipal
- > Managed Service Account
- > Users

< >

This screenshot shows the same Active Directory Users and Computers interface as the previous one, but with a different focus. The 'Accounting' container is now selected in the left pane. In the right pane, a user object named 'Alan Smth' is listed as a 'User' type entry. The overall layout and controls are identical to the first screenshot.

3.4 Setup a shared home Folder and set permissions

Login to server

3.4.1 Create users

- A) Create users

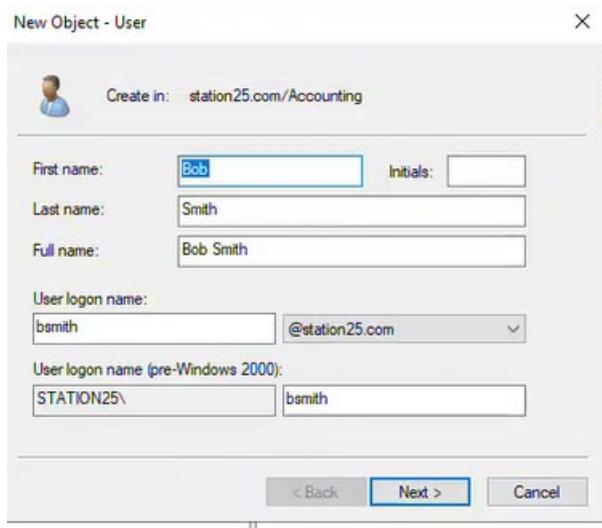
Bob smith

New Object - User

Create in: station25.com/Accounting

First name:	Bob	Initials:	
Last name:	Smith		
Full name:	Bob Smith		
User logon name:	bsmith	@station25.com	
User logon name (pre-Windows 2000):	STATION25\	bsmith	

< Back Next > Cancel



New Object - User

X



Create in: station25.com/Accounting

Password:

 [REDACTED]

Confirm password:

 [REDACTED]

User must change password at next logon

User cannot change password

Password never expires

Account is disabled

< Back

Next >

Cancel

New Object - User

X



Create in: station25.com/Accounting

When you click Finish, the following object will be created:

Full name: Bob Smith

User logon name: bsmith@station25.com

The password never expires.

< Back

Finish

Cancel

Chuck Smith

New Object - User



Create in: station25.com/Accounting

First name: Initials:
Last name:
Full name:

User logon name:

User logon name (pre-Windows 2000):

New Object - User

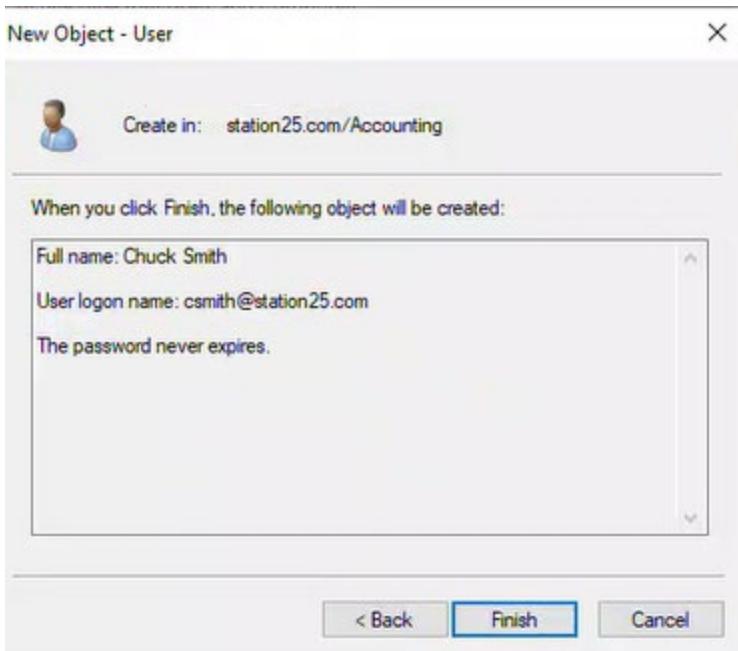


Create in: station25.com/Accounting

Password:

Confirm password:

User must change password at next logon
 User cannot change password
 Password never expires
 Account is disabled



Now we have three users

Active Directory Users and Computers

File Action View Help

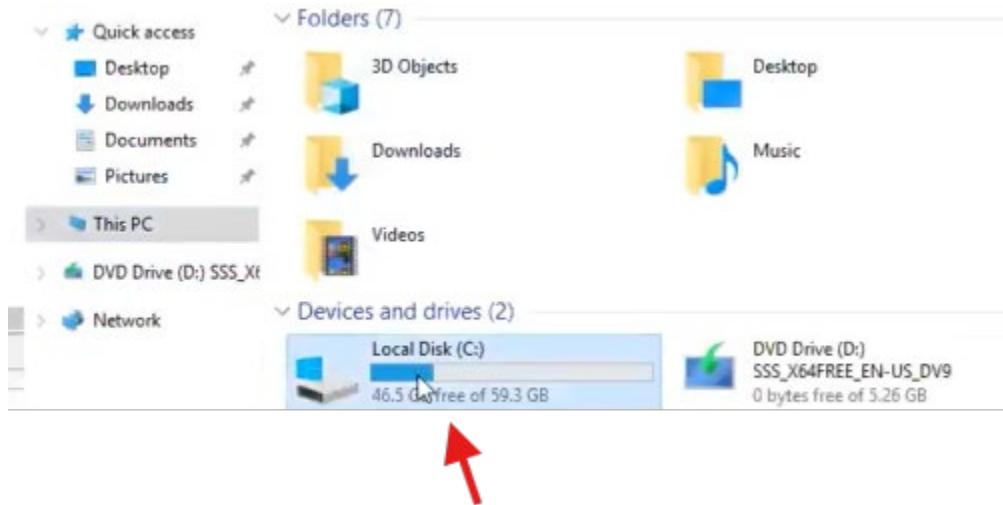
Name	Type	Description
Alan Smith	User	
Bob Smith	User	
Chuck Smith	User	

We do not want people saying the work on a computer

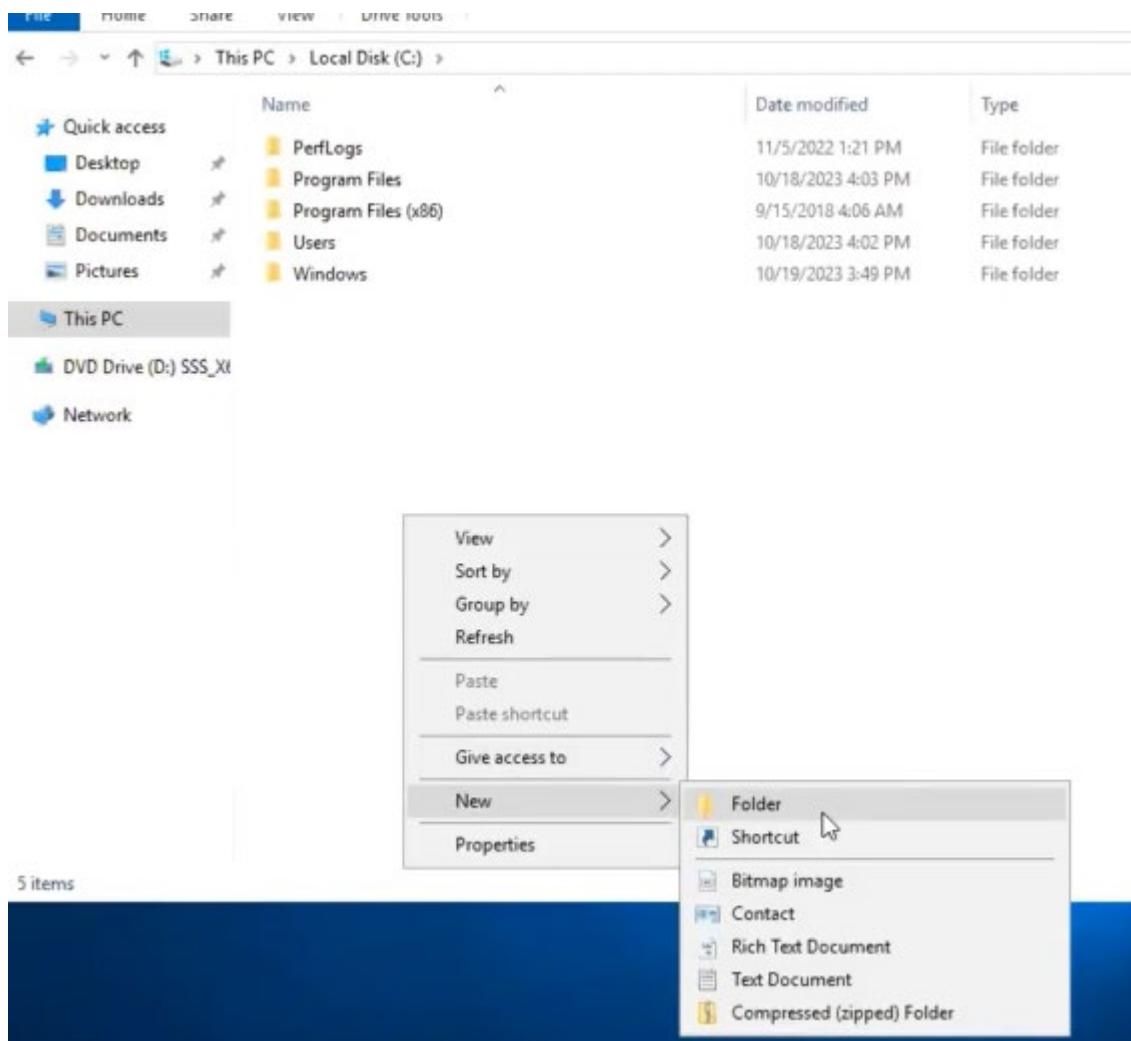
3.4.2 Create folder Home

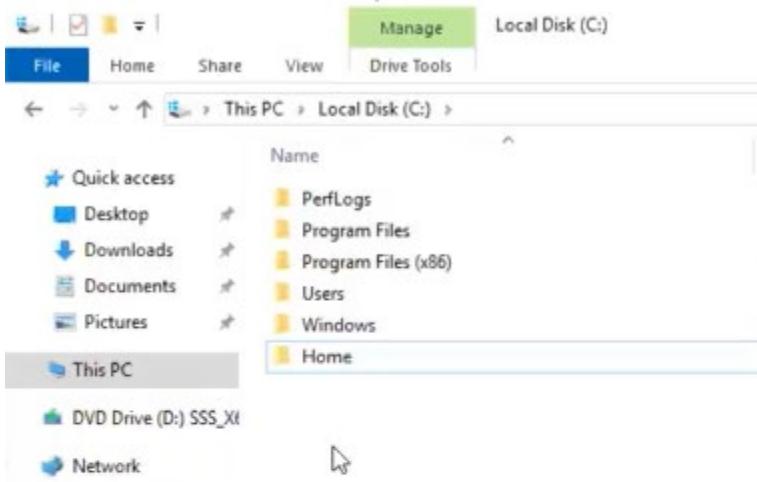
A) Create a folder for everyone in the company to be able to save their files

Open a C drive on server



B) Create a folder named Home

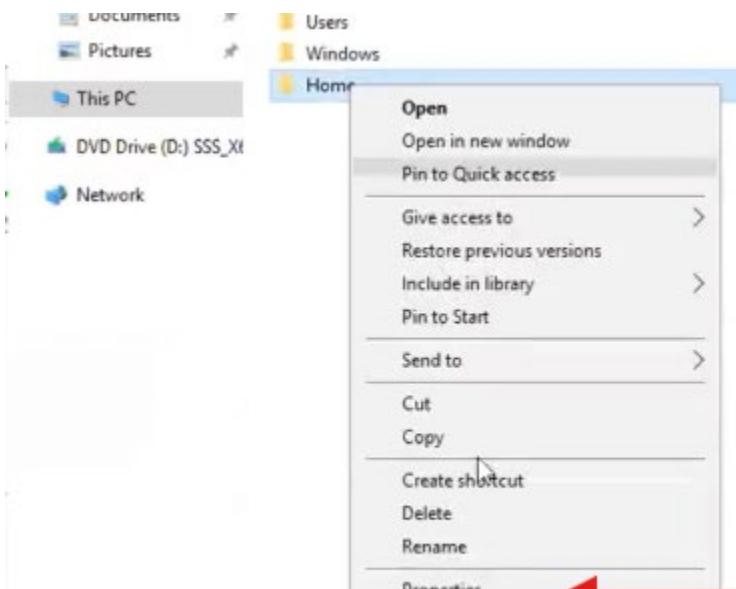




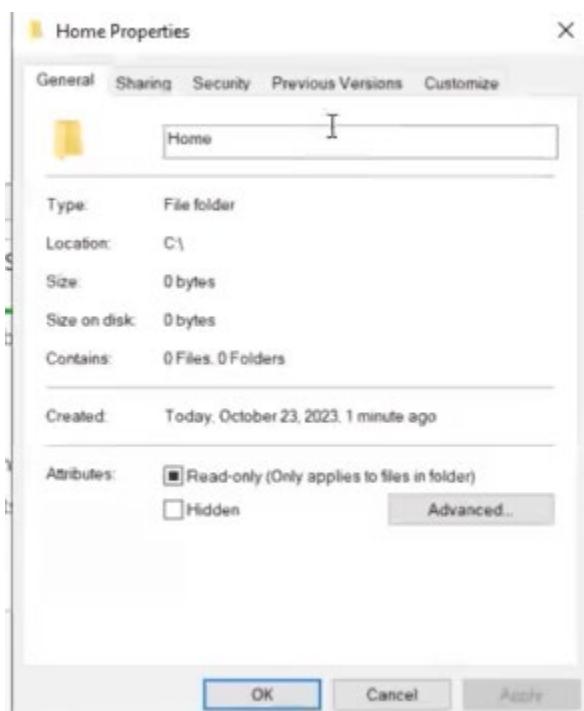
3.4.3 Set properties in Home folder

- A) We want this folder to anybody who joins to the windows domain

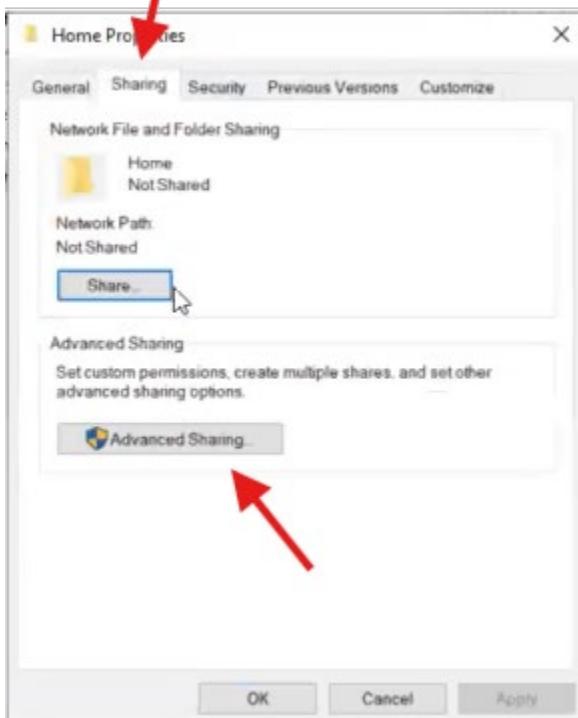
Click on home and the click on properties



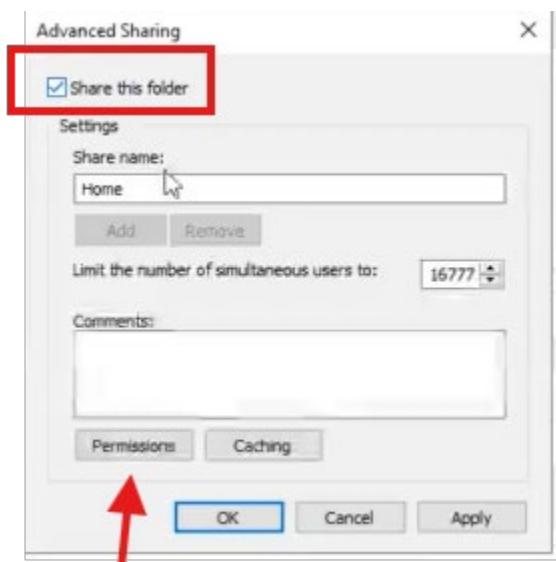
6 items 1 item selected



B) Click on sharing and then click on Advanced sharing

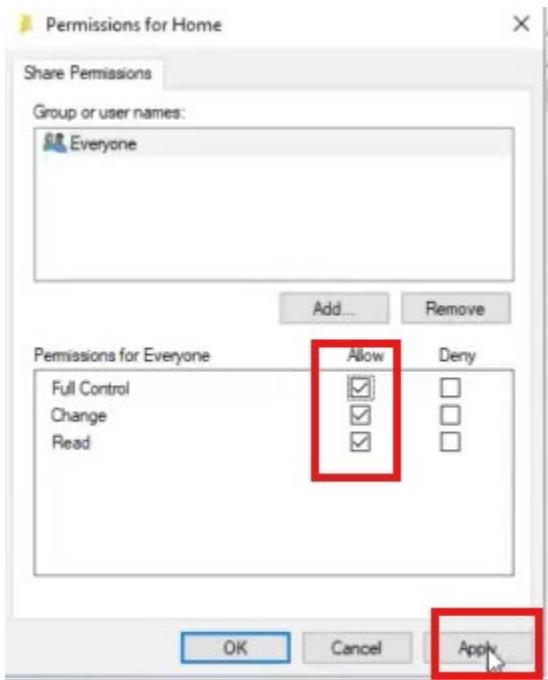


C) Select share the folder and click on permissions



D) We are going to give every one full control permissions, so they are able to create , modify and read the files and folders inside.

Give full access and press Apply



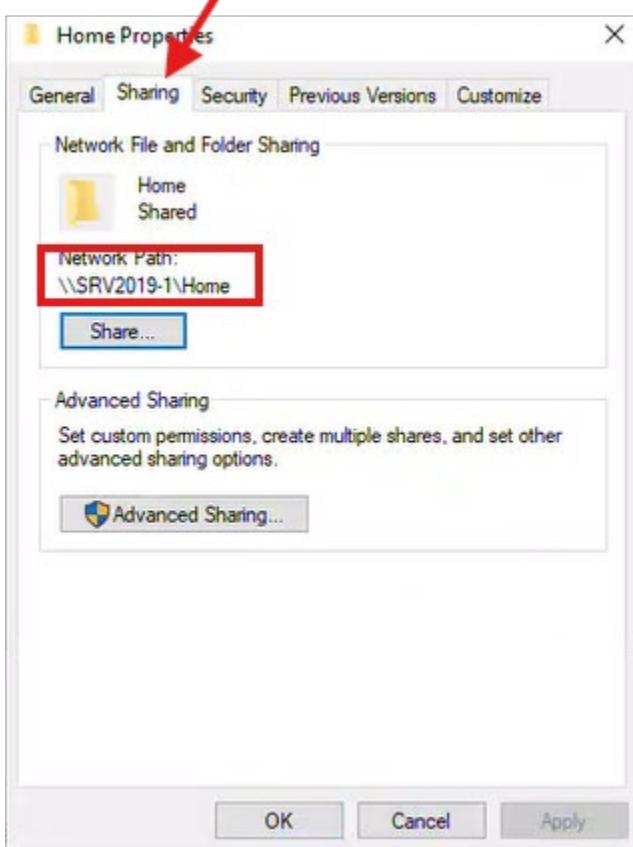
E) Go back and close the windows

3.4.4 Fine tune permissions on home

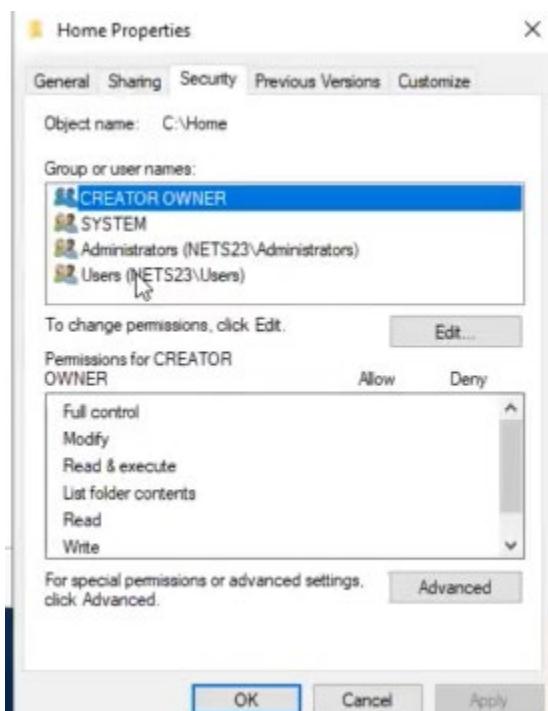
A) Click on C drive now click home and click on properties again

Inside sharing

Note the network path \\<name of the server>\Home and click on Security on the top

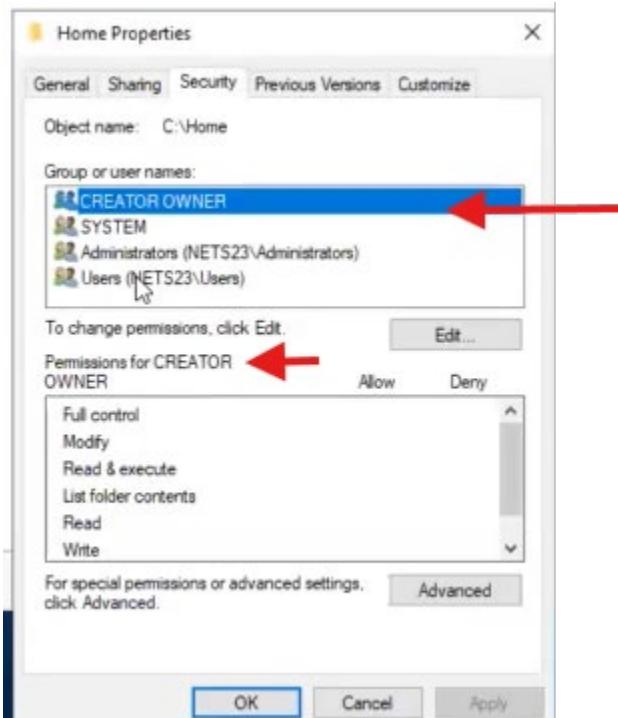


B) Inside security you will see the permissions

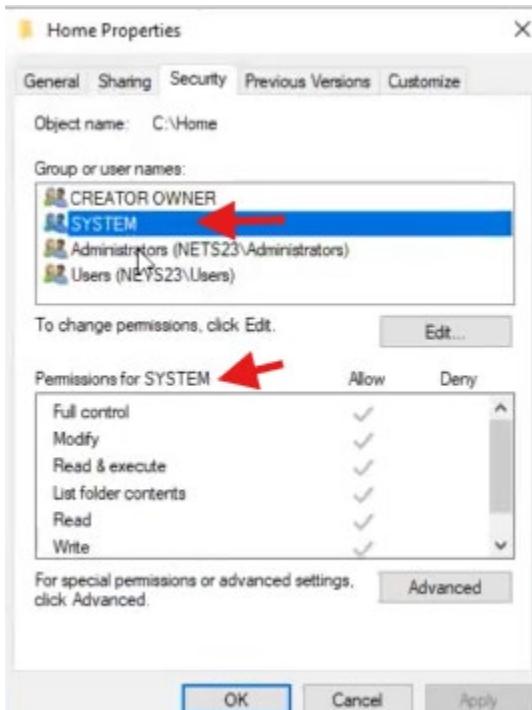


C) Inside security you will see the permissions by group or username

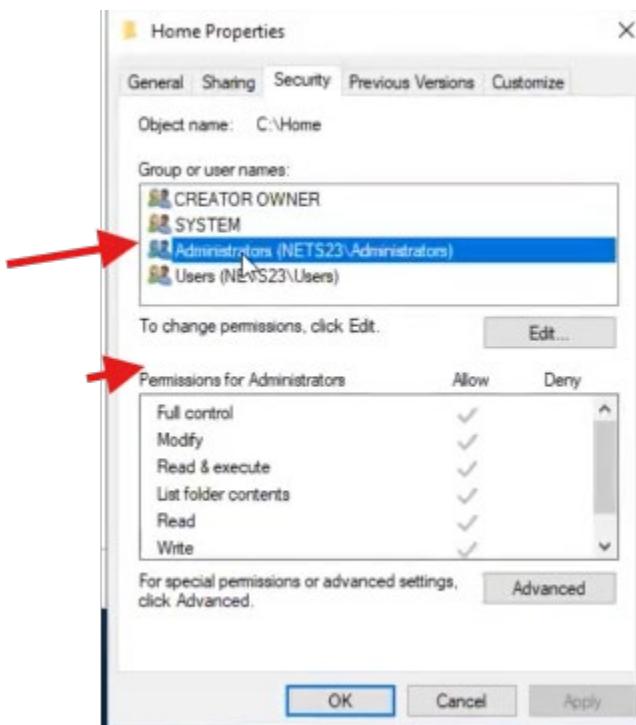
1. CREATOR OWNER



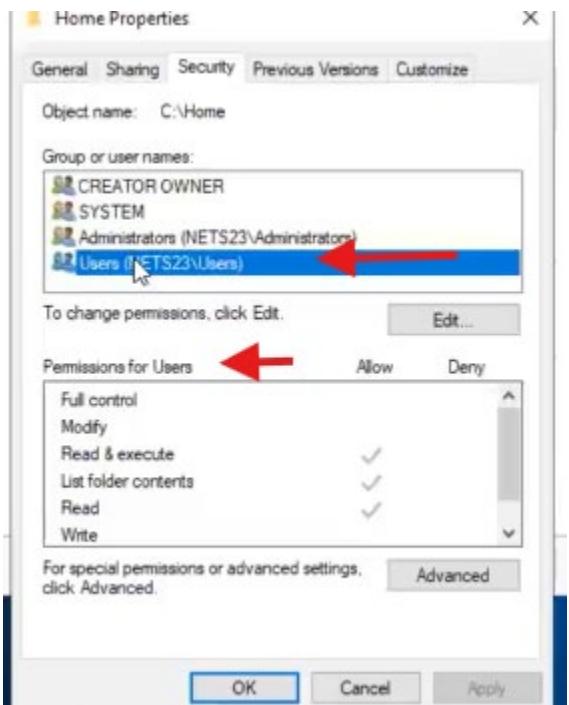
2. SYSTEM



3. Administrator



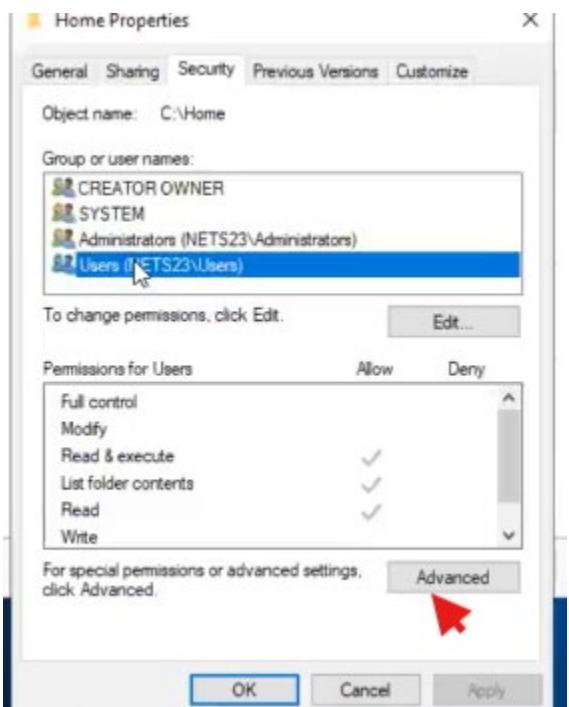
4. Users



3.4.5 Fine tune that each user has access to its stuff only

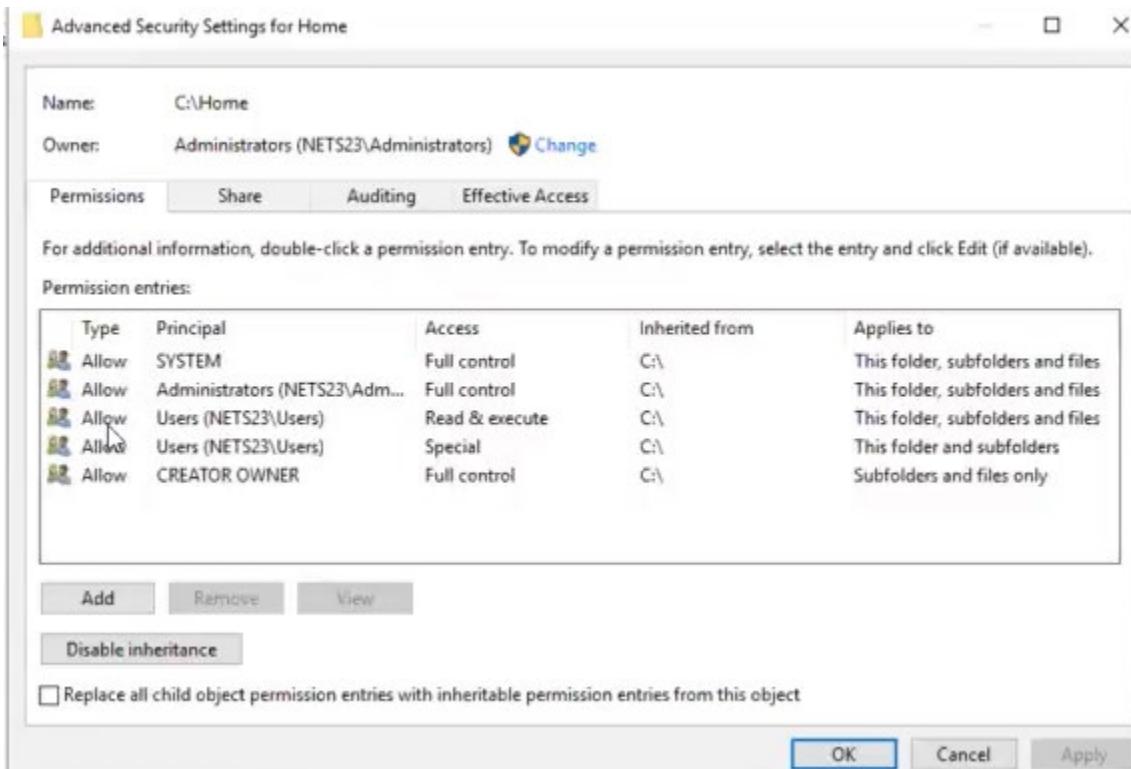
- A) Every user has access to read and execute files, but is not good because if there are folders for other users they should not access it

Click on Advance

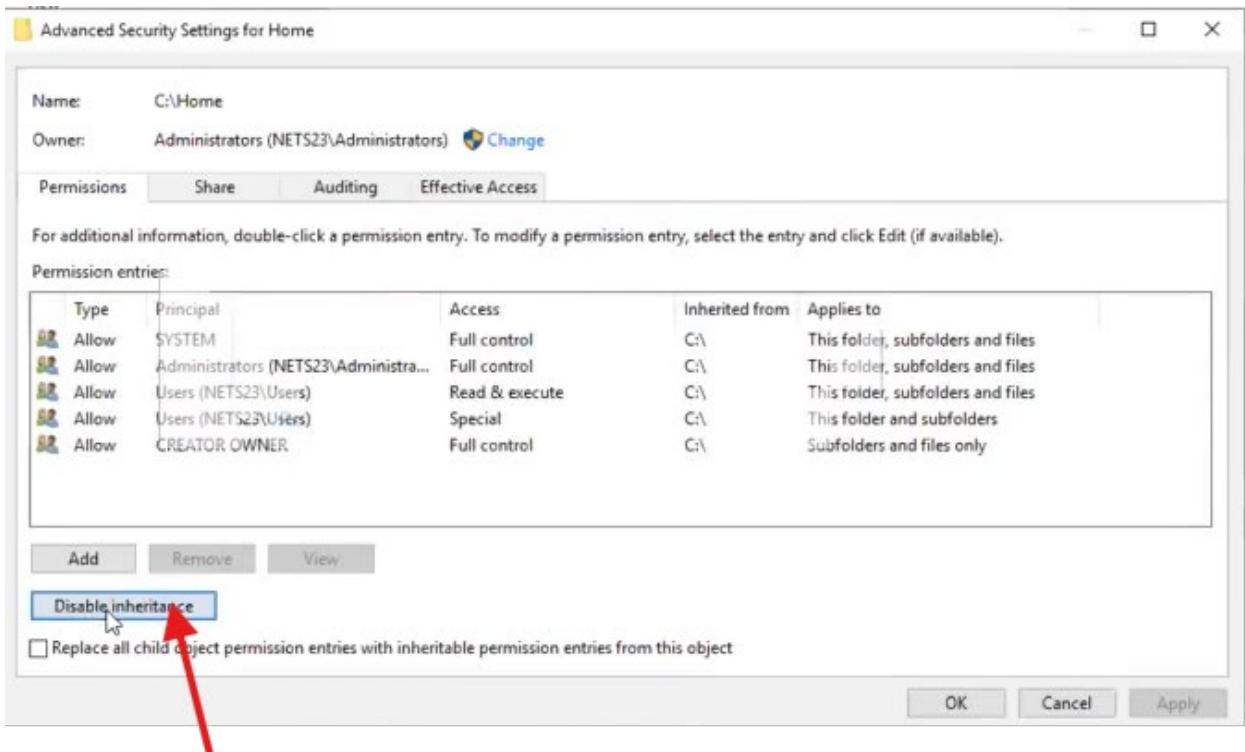


Advanced

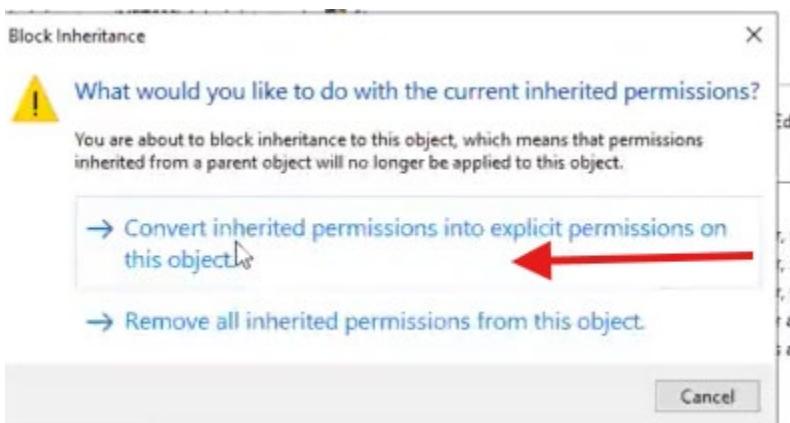
Whatever permissions that are on home are inherited inside home



B) Select disable inheritance



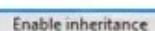
C) Click on Convert



D) Click on the first users

Advanced Security Settings for Home

Type	Principal	Access	Inherited from	Applies to
Allow	SYSTEM	Full control	None	This folder, subfolders and files
Allow	Administrators (NETS23\Administrators)	Full control	None	This folder, subfolders and files
Allow	Users (NETS23\Users) 	Read & execute	None	This folder, subfolders and files
Allow	Users (NETS23\Users)	Special	None	This folder and subfolders
Allow	CREATOR OWNER	Full control	None	Subfolders and files only

Add Remove View  Replace all child object permission entries with inheritable permission entries from this object

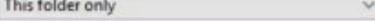
OK Cancel Apply

E) Change to this folder only and click ok

Permission Entry for Home

Principal: Users (NETS23\Users) [Select a principal](#)

Type: Allow 

Applies to: This folder only 

Basic permissions:

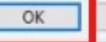
Full control
 Modify
 Read & execute
 List folder contents
 Read
 Write
 Special permissions

Only apply these permissions to objects and/or containers within this container [Clear all](#)

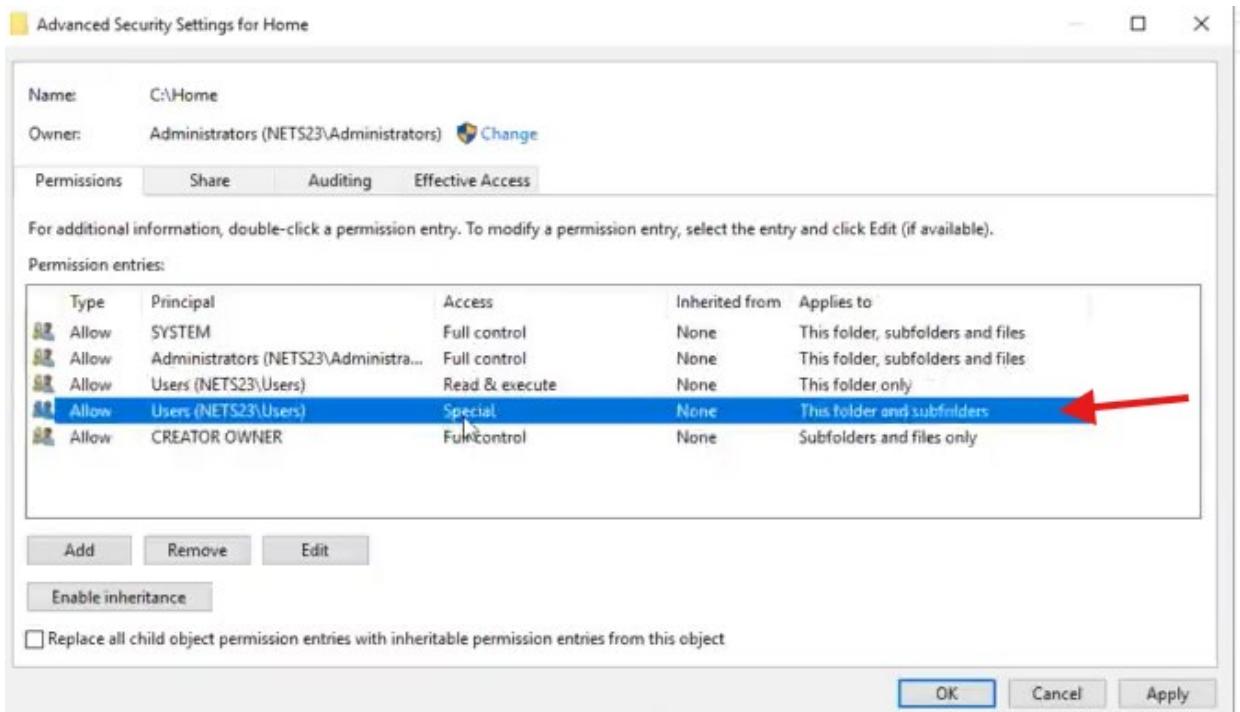
Show advanced permissions

Add a condition to limit access. The principal will be granted the specified permissions only if conditions are met.

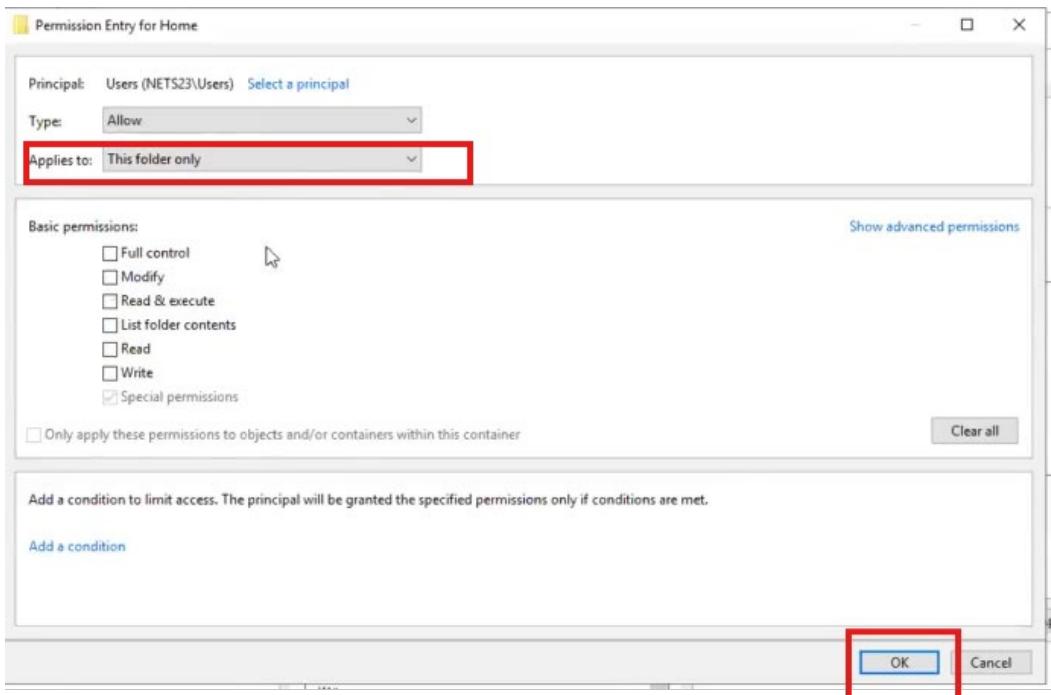
Add a condition

OK Cancel 

F) Click on second users



G) Change to this folder only and press ok



H) See only one users appears and says this folder only

Advanced Security Settings for Home

Name: C:\Home
Owner: Administrators (NETS23\Administrators) 

Permissions Share Auditing Effective Access

For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).

Permission entries:

Type	Principal	Access	Inherited from	Applies to
Allow	SYSTEM	Full control	None	This folder, subfolders and files
Allow	Administrators (NETS23\Administra...)	Full control	None	This folder, subfolders and files
Allow	Users (NETS23\Users)	Special	None	This folder only 
Allow	CREATOR OWNER	Full control	None	Subfolders and files only

Add Remove Edit

Enable inheritance

Replace all child object permission entries with inheritable permission entries from this object

Advanced Security Settings for Home

Name: C:\Home
Owner: Administrators (STATION1\Administrators) 

Permissions Share Auditing Effective Access

For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).

Permission entries:

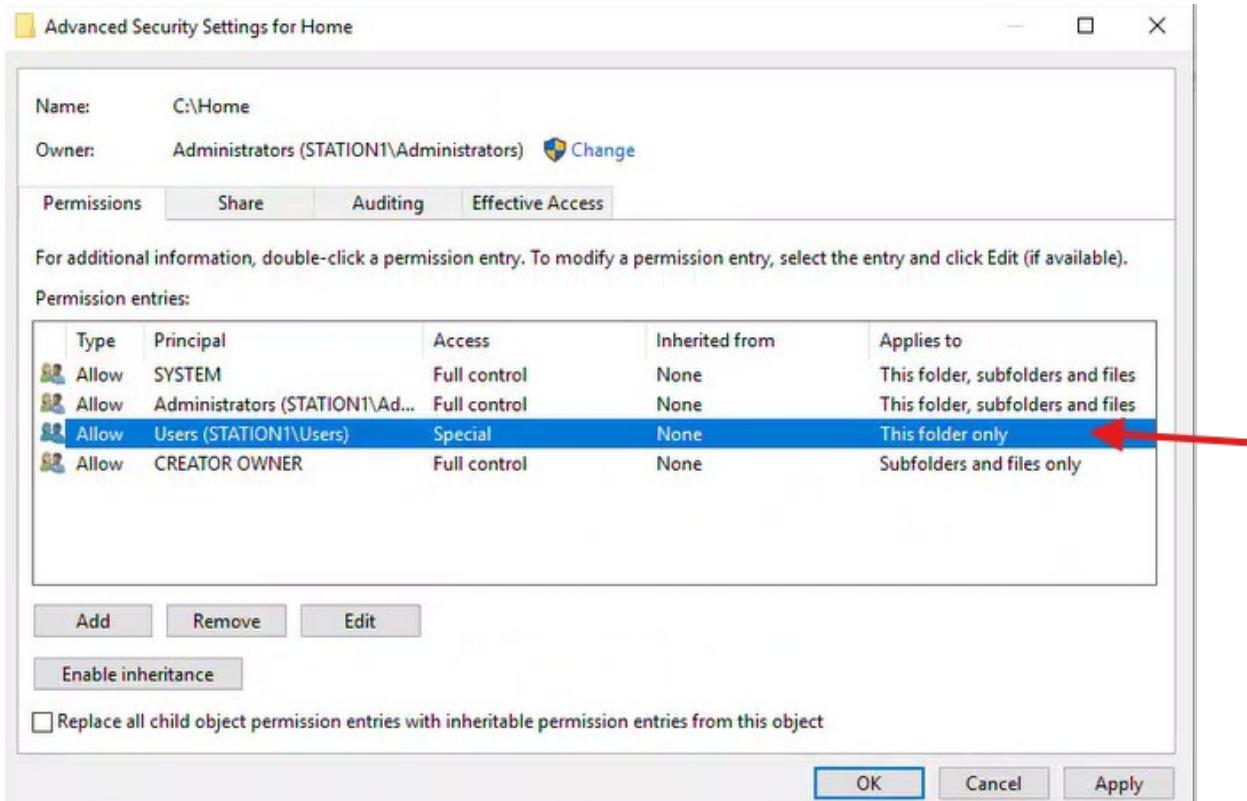
Type	Principal	Access	Inherited from	Applies to
Allow	SYSTEM	Full control	None	This folder, subfolders and files
Allow	Administrators (STATION1\Ad...)	Full control	None	This folder, subfolders and files
Allow	Users (STATION1\Users)	Special	None	This folder only 
Allow	CREATOR OWNER	Full control	None	Subfolders and files only

Add Remove Edit

Enable inheritance

Replace all child object permission entries with inheritable permission entries from this object

OK Cancel Apply

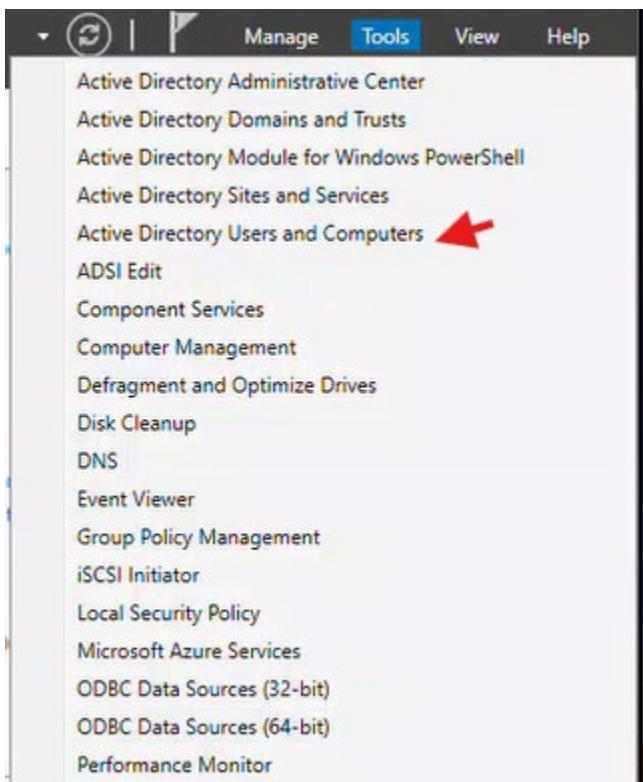


- I) Press ok and ok to go out

3.4.6 Create folders for users

- A) Go back into tools

Users and computers



B) Double click on asmith and select member of form the tabs

The screenshot shows the 'Alan Smith Properties' dialog box. The 'Member Of' tab is selected. The left pane shows the navigation tree for 'Active Directory Users and Computers' under 'NetS23.com'. The 'Members' tab is selected in the navigation pane.

File Action View Help

Active Directory Users and Computers

Active Directory Users and Computers

Saved Queries

NetS23.com

Accounting

Builtin

Computers

Domain Controllers

ForeignSecurityPrint

Managed Service Accounts

Users

Members

Alan Smith Properties

Member Of

Remote control Dial-in Environment Sessions

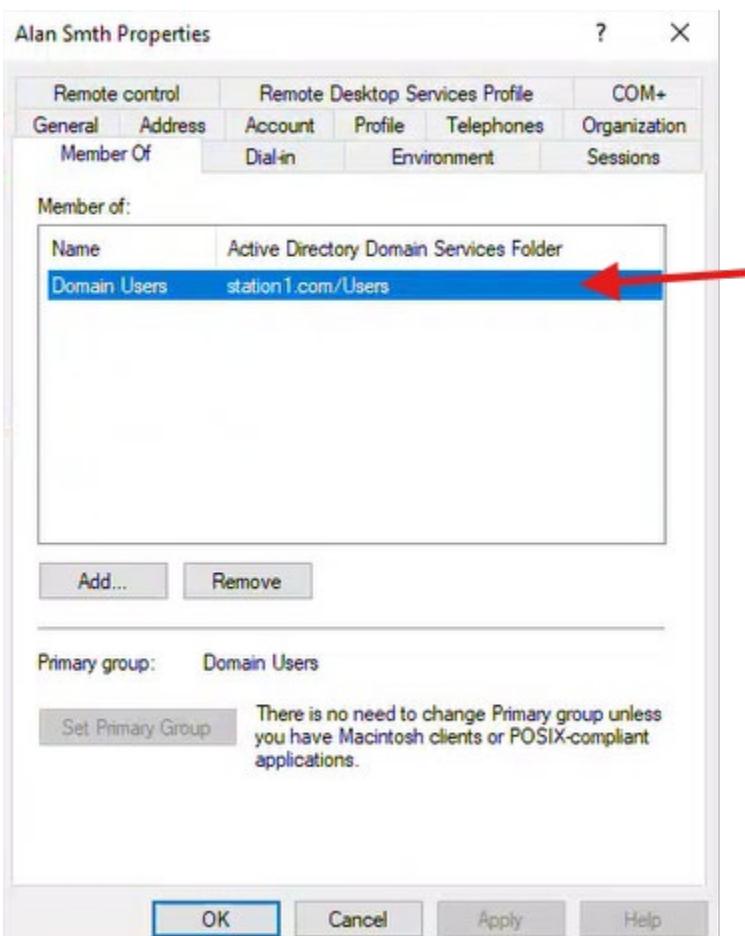
General Address Account Remote Desktop Services Profile COM+
Address Account Profile Telephones Organization

Alan Smith

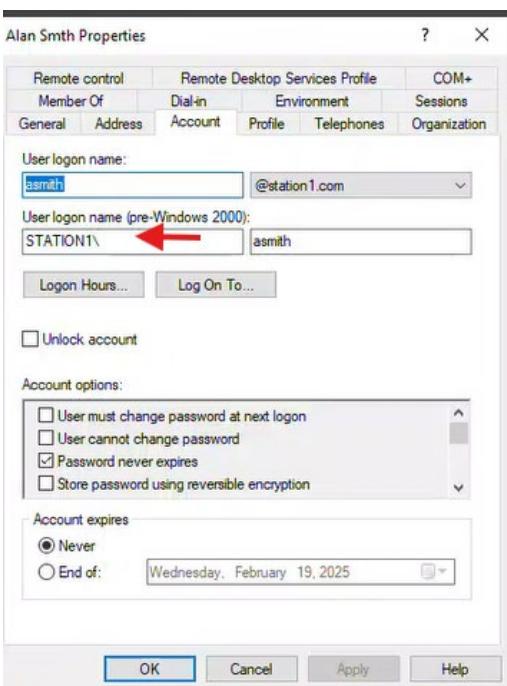
First name: Alan Initials:
Last name: Smith
Display name: Alan Smith
Description:
Office:
Telephone number: Other...
Email:
Web page: Other...

OK Cancel Apply Help

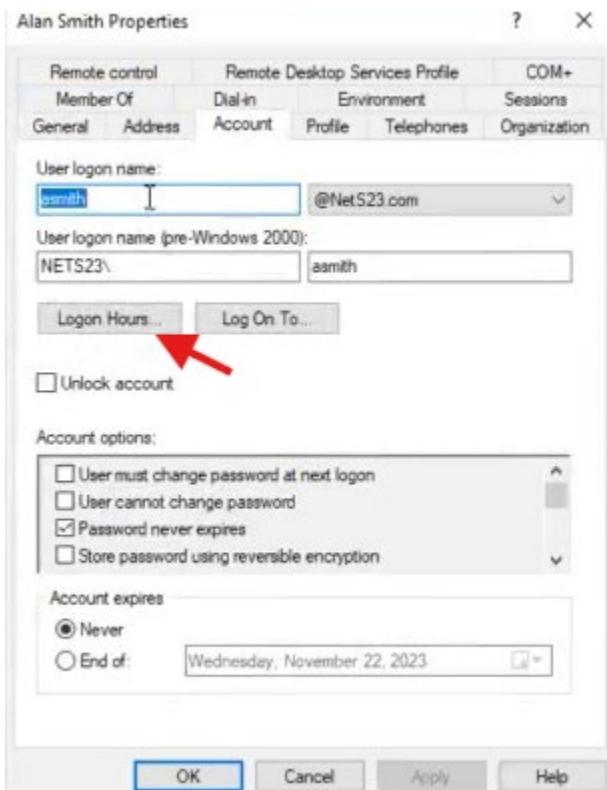
C) Note is member of domain users



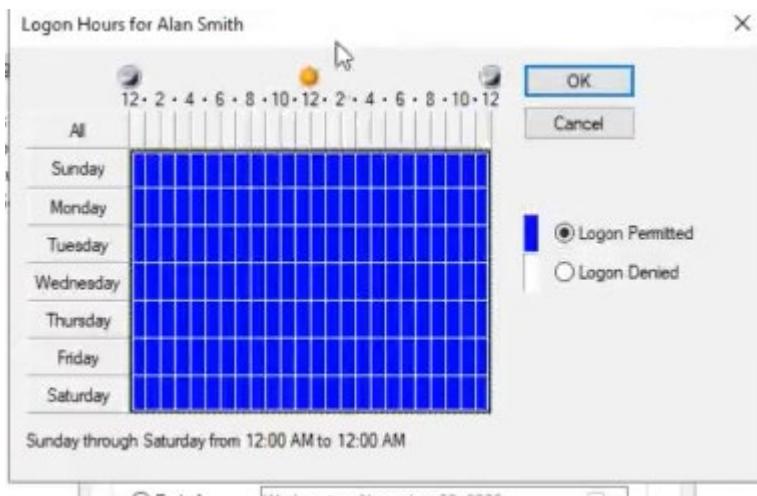
D) Next click on account



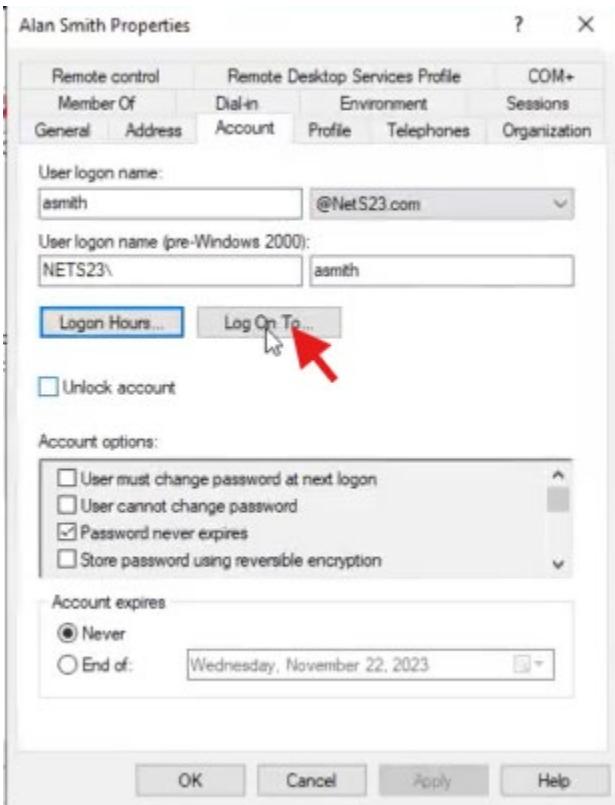
E) Click on logon hours



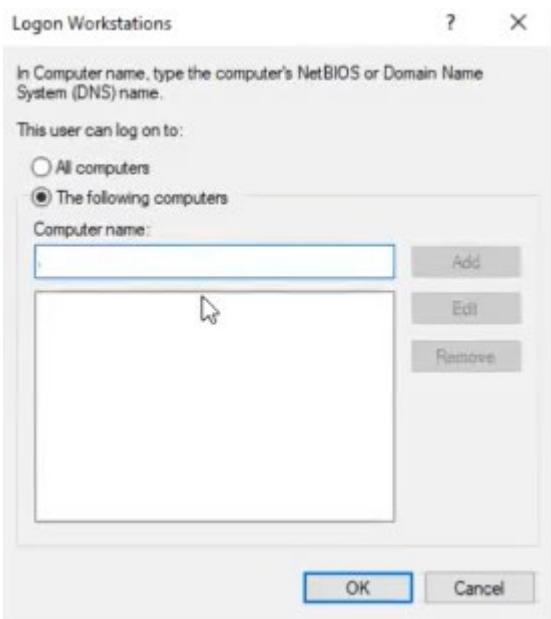
We can limit when the user is allowed to logon to the network / press cancel



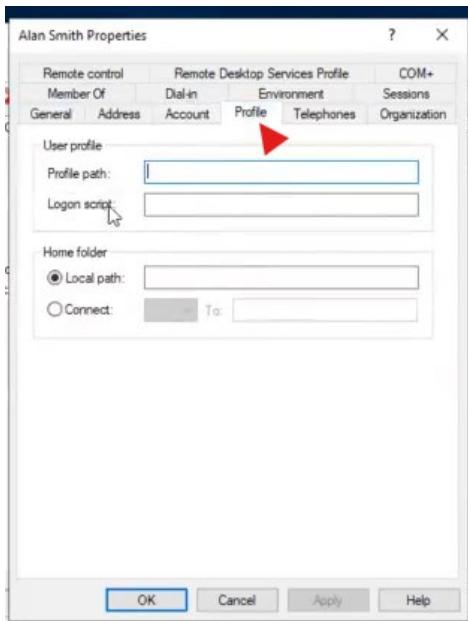
F) Select logon to



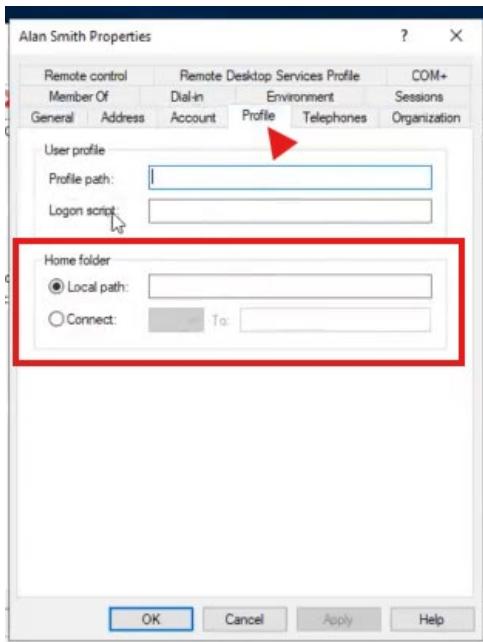
G) We are not going to modify but we can see how to do it press cancel



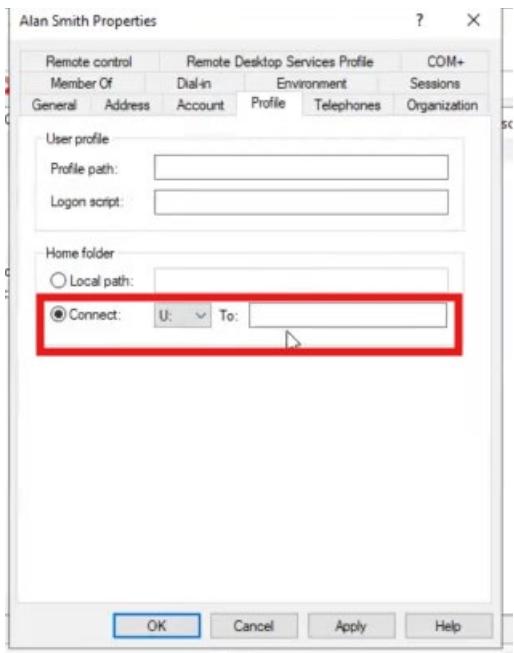
H) Click on Profile



I) See home folder – personal user folder



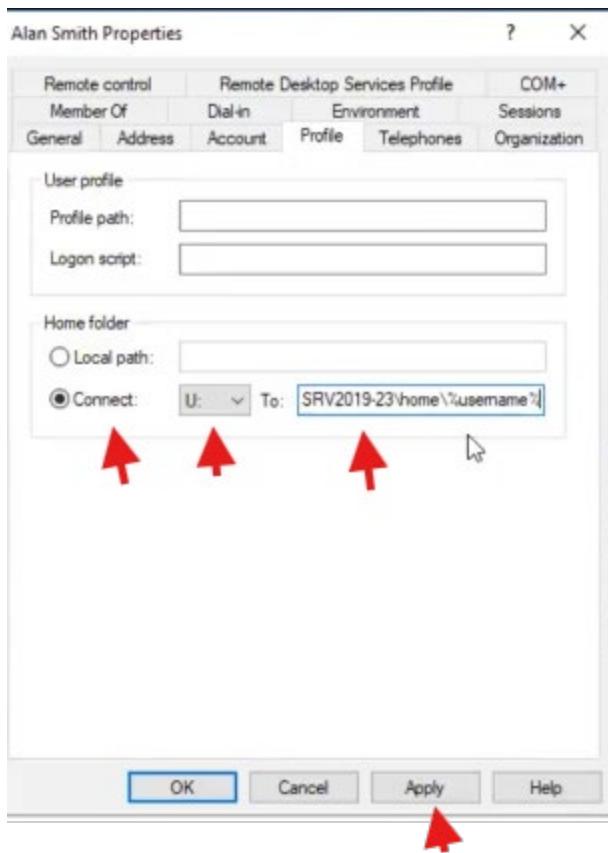
J) Click on connect and letter U



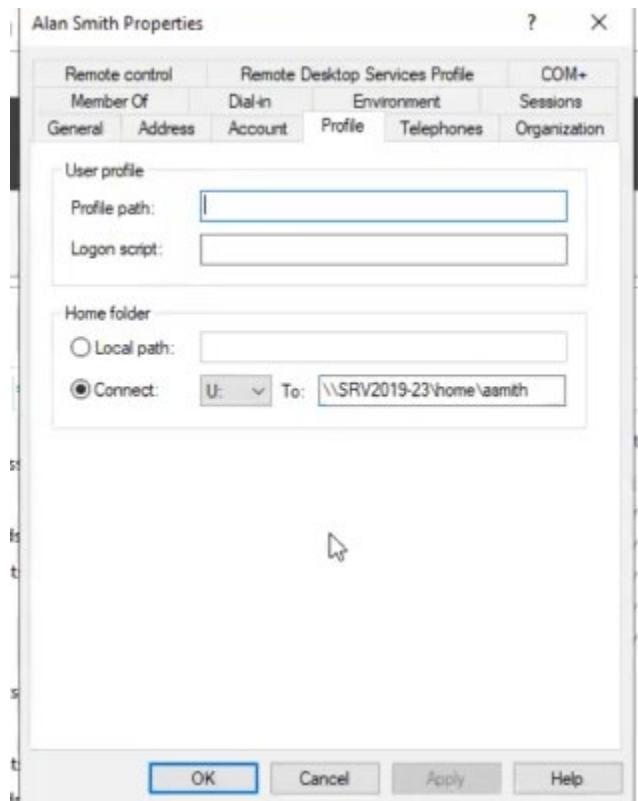
- 1) Share folder home
- 2) fine tune security
- 3) give a home folder

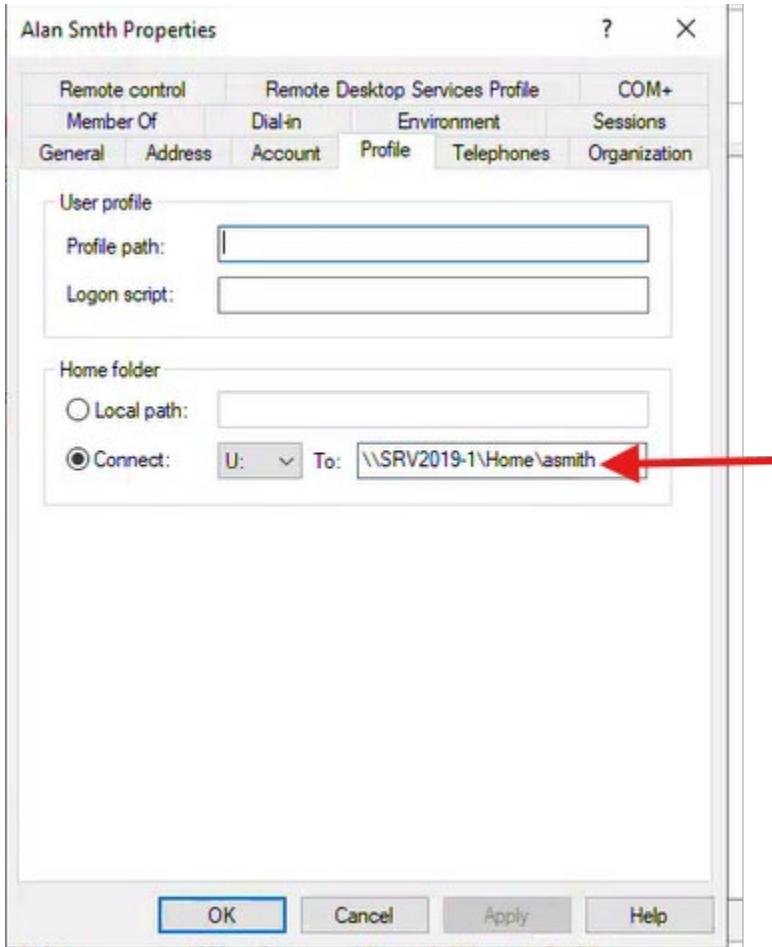
<\\SRV2019-1\\home\\%username%>

Press Apply



See %username% change to asmith after we press Apply

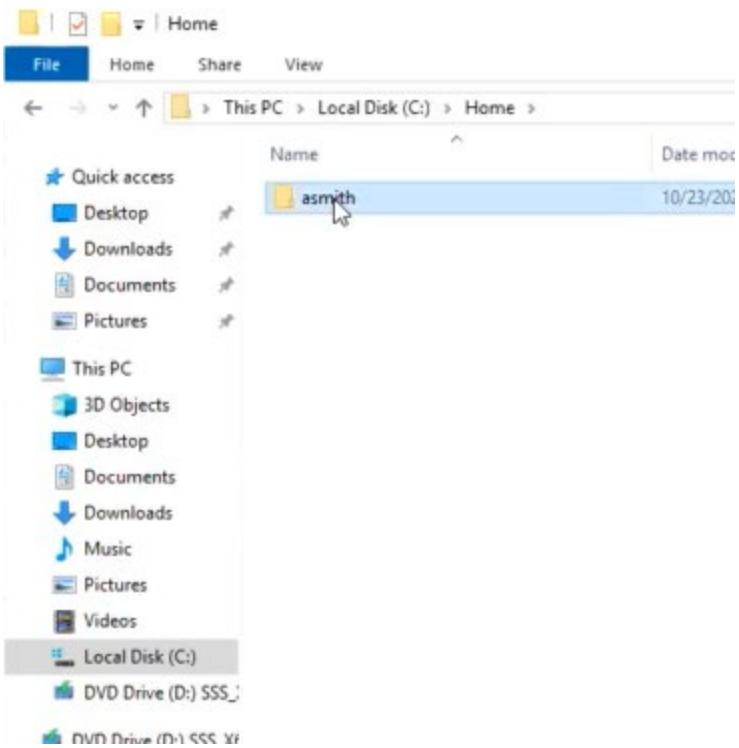




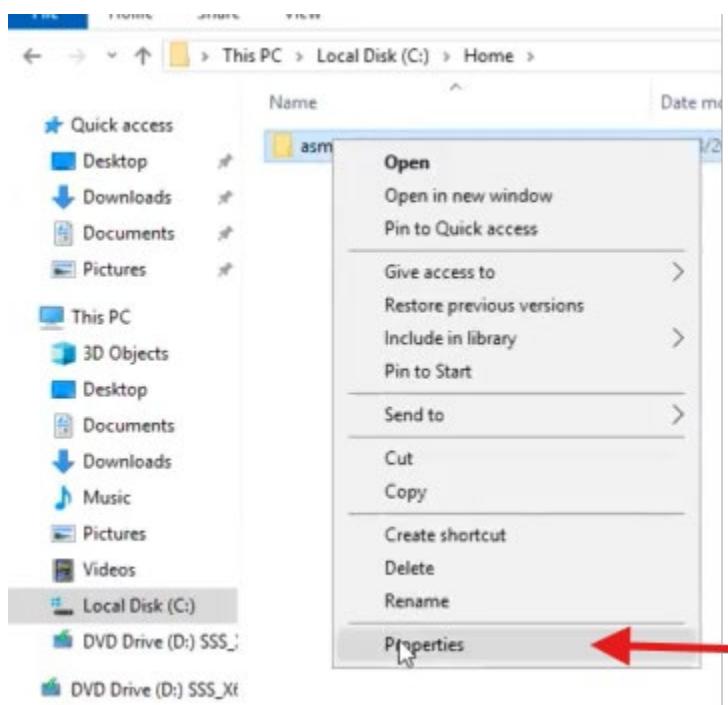
Press ok

Now Asmith has a home folder

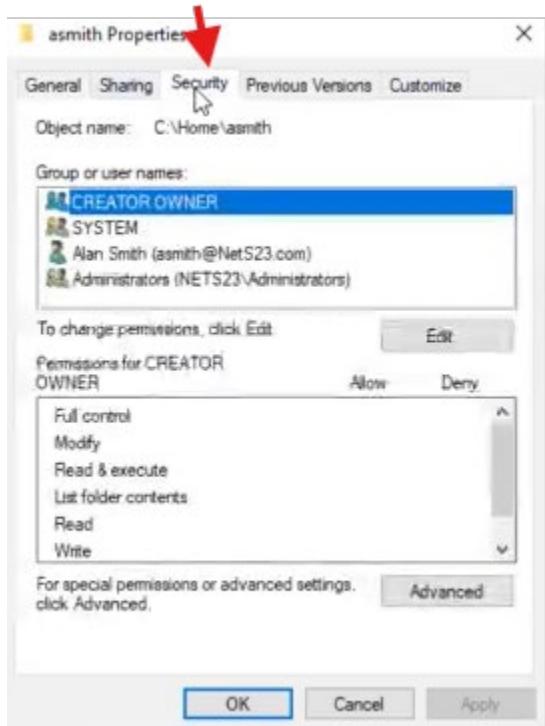
K) Open home in C drive and see asmith has a home folder



L) Right click on asmith and click on properties



M) Click on security, note only Asmith user has access

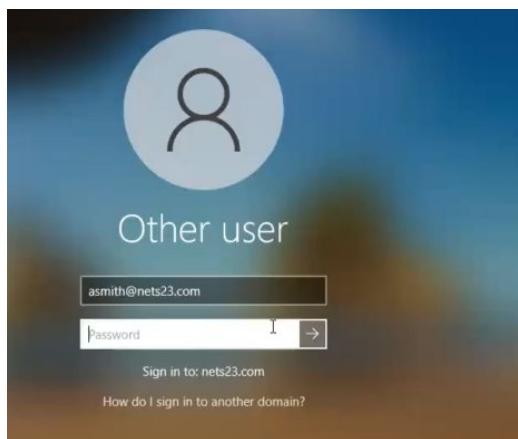


3.4.7 Test on client

A) Go to windows 10 client and login as asmith@domain.com

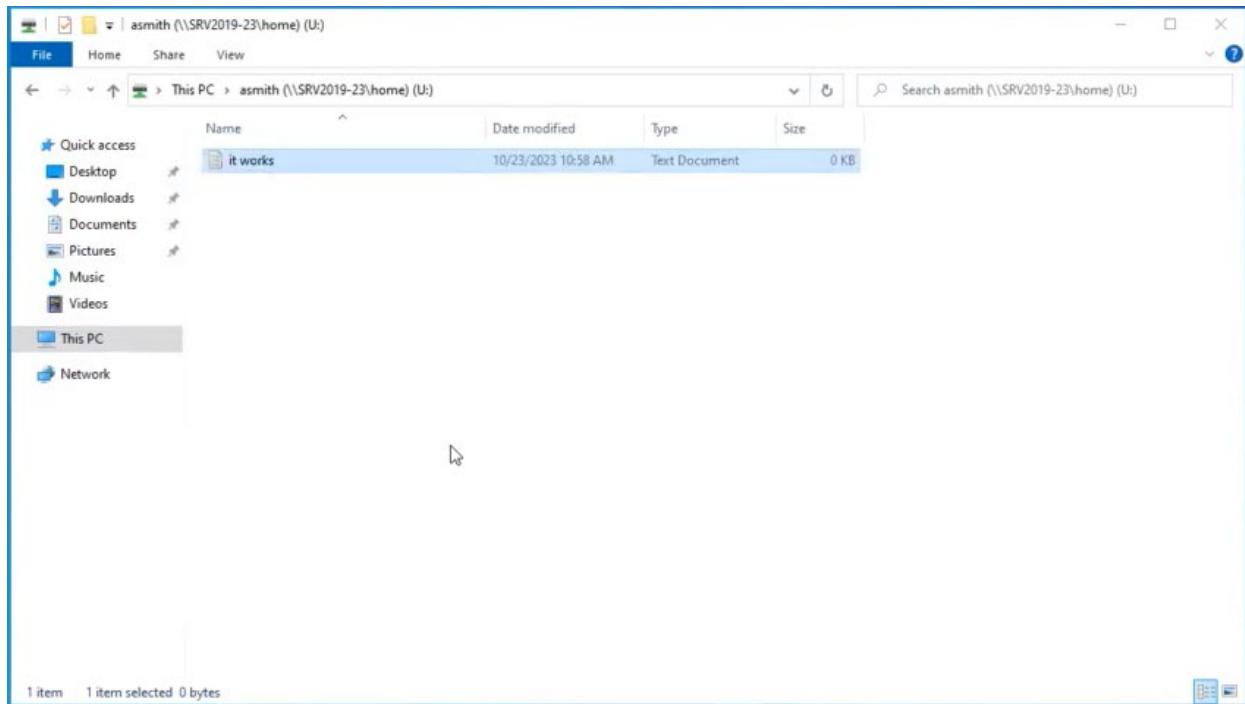
asmith@station25.com

give password



B) Open folder click on it, at the bottom you see the home folder

Open it and right click and create a new document

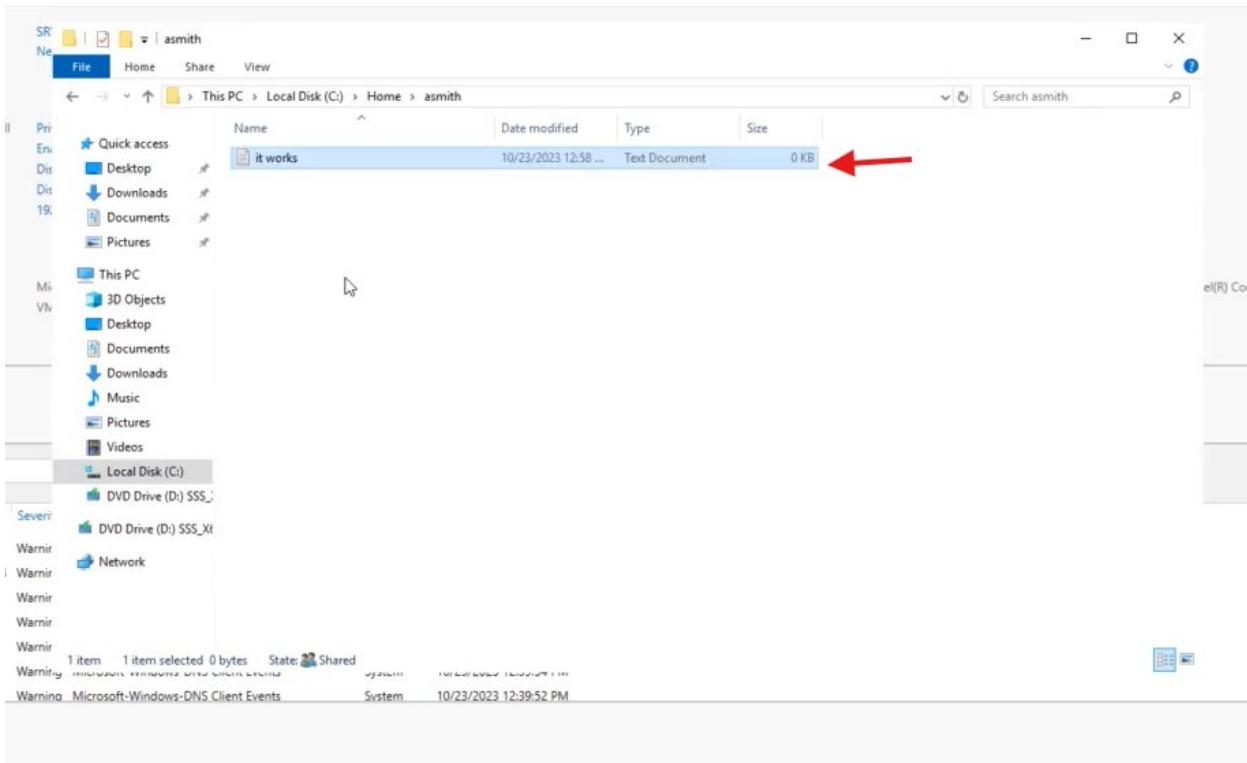


3.4.8 Test on the server

A) Go back to **server**

C drive home asmith

See your file



3.5 Lesson 5 Setup Department Folder

- A) Login to server as Administrator password Amf123456



3.5.1 Create users into Accounting Organizational Unit

- A) See section Create a user in windows server and follow instructions to create users into Organizational Unit Accounting:

User 1 – Ed Smith

Name Ed

Last name Smith

User logon name esmith

Password Amf654321

Password never expires

New Object - User

Create in: station1.com/Accounting

First name: Ed Initials: []

Last name: Smith

Full name: Ed Smith

User logon name: esmith @station1.com

User logon name (pre-Windows 2000): STATION1\esmith

< Back Next > Cancel

New Object - User

Create in: station1.com/Accounting

Password: [REDACTED]

Confirm password: [REDACTED]

User must change password at next logon

User cannot change password

Password never expires

Account is disabled

< Back Next > Cancel

New Object - User

Create in: station1.com/Accounting

When you click Finish, the following object will be created:

Full name: Ed Smith
User logon name: esmith@station1.com
The password never expires.

< Back Finish Cancel

User 2 - Frank Smith

Name Frank

Last name Smith

User logon name fsmith

Password Amf654321

Password never expires

New Object - User

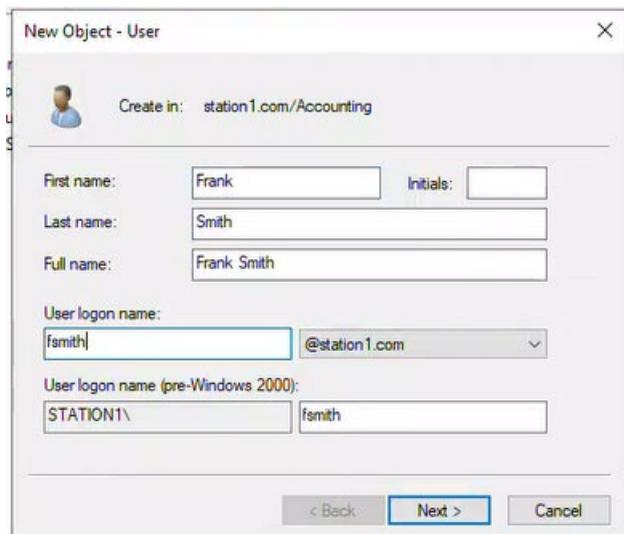
Create in: station1.com/Accounting

First name: Initials:
Last name:
Full name:

User logon name:

User logon name (pre-Windows 2000):

< Back Next > Cancel



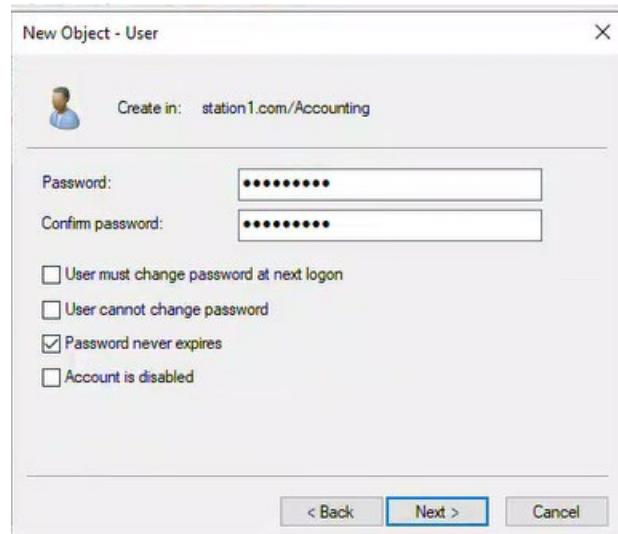
New Object - User

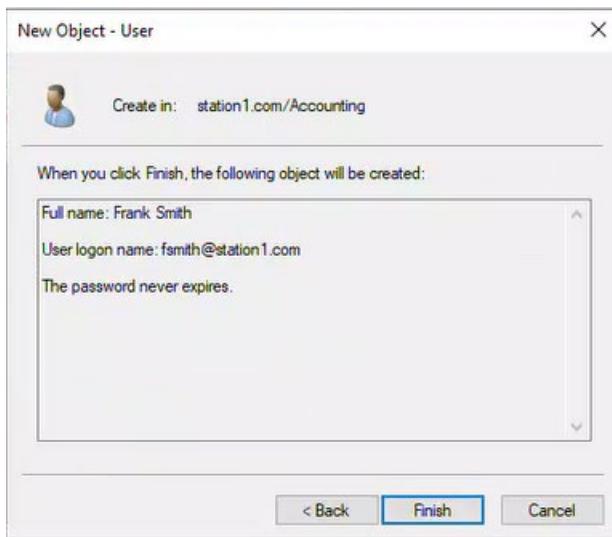
Create in: station1.com/Accounting

Password:
Confirm password:

User must change password at next logon
 User cannot change password
 Password never expires
 Account is disabled

< Back Next > Cancel





- B) Verify the users were created under “Accounting” organizational unit

Active Directory Users and Computers

File Action View Help

Active Directory Users and Com
Saved Queries
station1.com
Accounting (highlighted with red arrow)
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipal
Managed Service Accou
Users

Name	Type
Alan Smth	User
Bob Smith	User
Chuck Smith	User
Ed Smith	User
Frank Smith	User

3.5.2 Set up a personal network storage location for each user

- A) Open Active Directory Users and Computers and select newly created users Ed Smith & Franks Smith

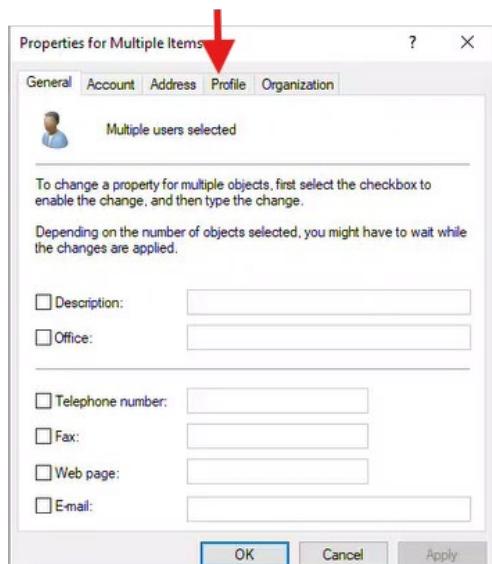
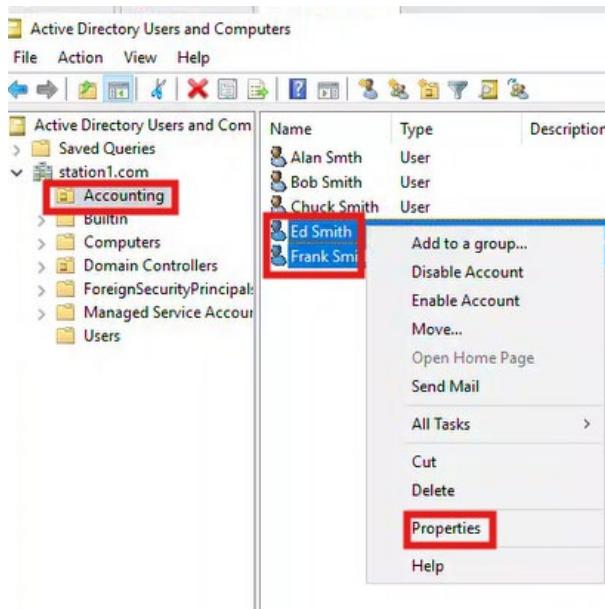
Active Directory Users and Computers

File Action View Help

Active Directory Users and Com
Saved Queries
station1.com
Accounting (highlighted with red arrow)
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipal
Managed Service Accou
Users

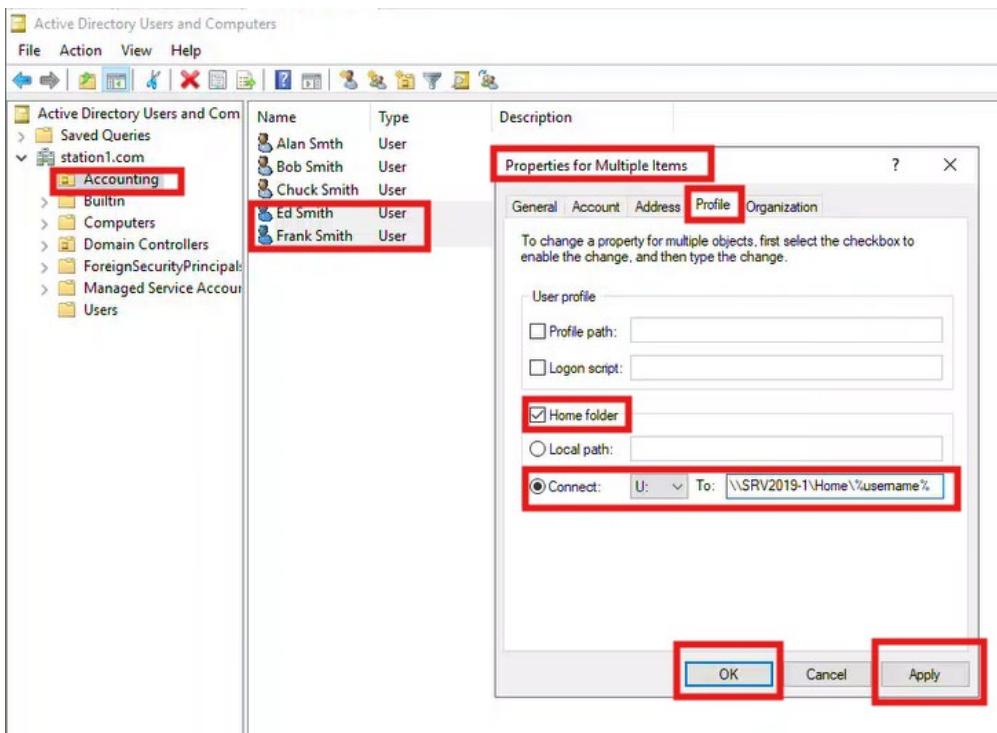
Name	Type	Description
Alan Smth	User	
Bob Smith	User	
Chuck Smith	User	
Ed Smith	User	
Frank Smith	User	

B) Go to the user's properties and navigate to the Profile tab.



C) Configure Home Folder

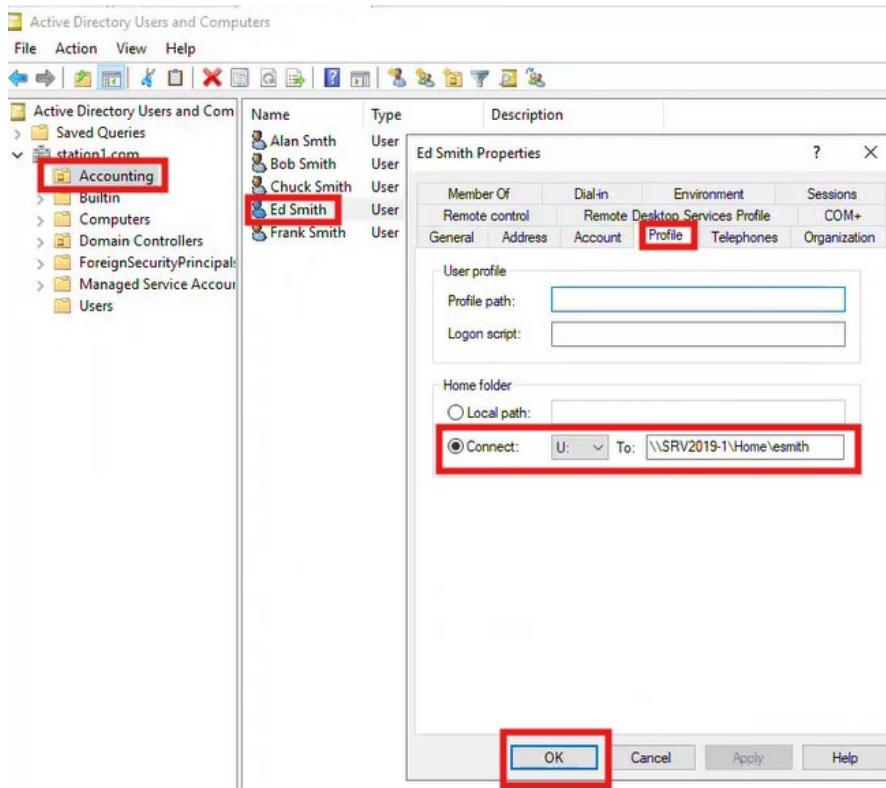
1. In the Home folder section, select the Connect radio button.
2. Assign Drive Letter: Choose a drive letter from the dropdown menu : **U**
3. Specify Network Path: Enter the network path to the user's home directory : **\SRV2019-1\Home\%username%**
4. Press Apply
5. Press Ok



D) Verify settings per user

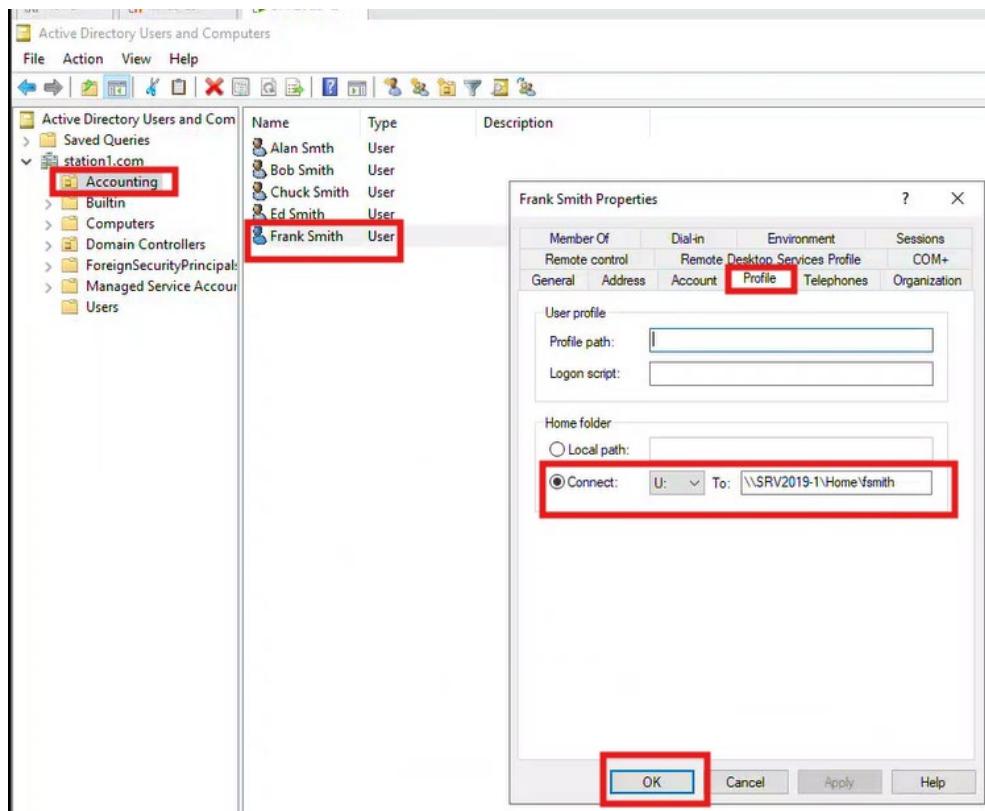
User 1 – Ed Smith

1. Select user Ed Smith / Properties / Profile
2. Check Connect section
3. Press Ok to close the window



User 2 – Frank Smith

1. Select user Frank Smith / Properties / Profile
2. Check Connect section
3. Press Ok to close the window

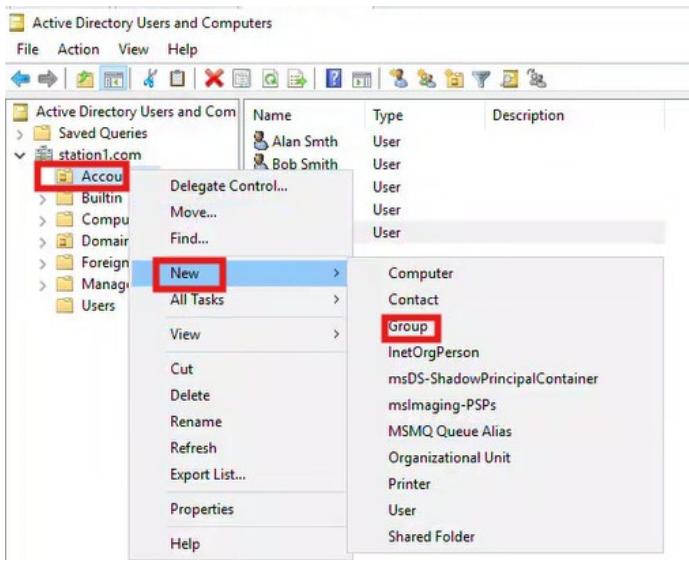


3.5.3 Create Senior Groups in Organizational Unit “Accounting”

3.5.3.1 Senior Global group

3.5.3.1.1 Global Group SrAcctGlobal

- A) In the Server Manager dashboard, go to Tools and select Active Directory Users and Computers
- B) Select Organizational Unit “Accounting”. Right-Click the Organizational Unit, select New, and then click Group



C) New Object – Group window

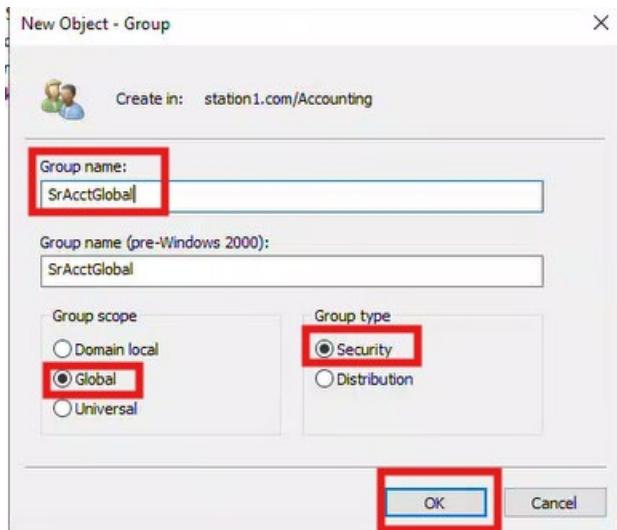
Create group name SrAcctGlobal

Group Name: SrAcctGlobal

Group Scope: Global

Group Type: Security

Click Ok to create the group



D) Verify new security group created under Organizational unit “Accounting”

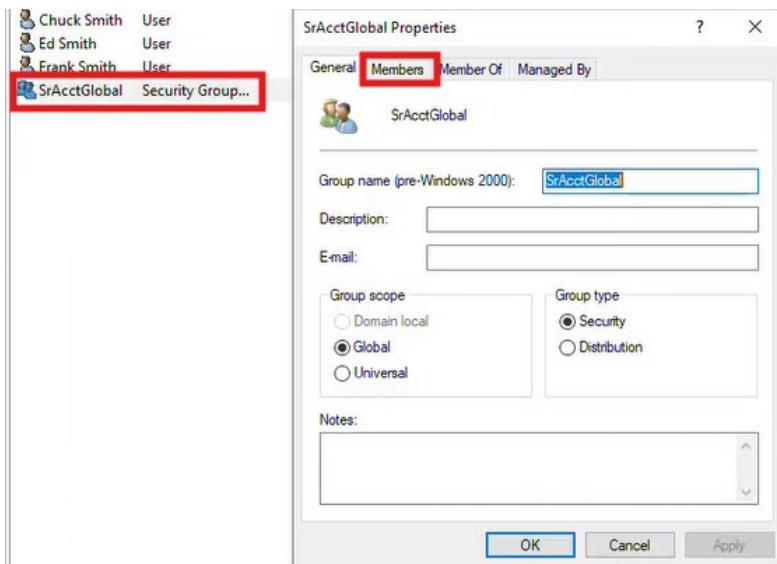
The screenshot shows the Windows Active Directory Users and Computers console. On the left, the navigation pane lists various objects like Saved Queries, station1.com, Accounting, Builtin, Computers, Domain Controllers, ForeignSecurityPrincipals, Managed Service Accounts, and Users. Under station1.com, the Accounting folder is expanded. On the right, a table displays user and group entries. One entry, 'SrAcctGlobal', is highlighted with a red arrow pointing to it. The table columns are Name, Type, and Desc.

Name	Type	Desc
Alan Smth	User	
Bob Smith	User	
Chuck Smith	User	
Ed Smith	User	
Frank Smith	User	
SrAcctGlobal	Security Group...	

3.5.3.1.2 Create a link between users (smith and bsmith) to the group “SrAcctGlobal”

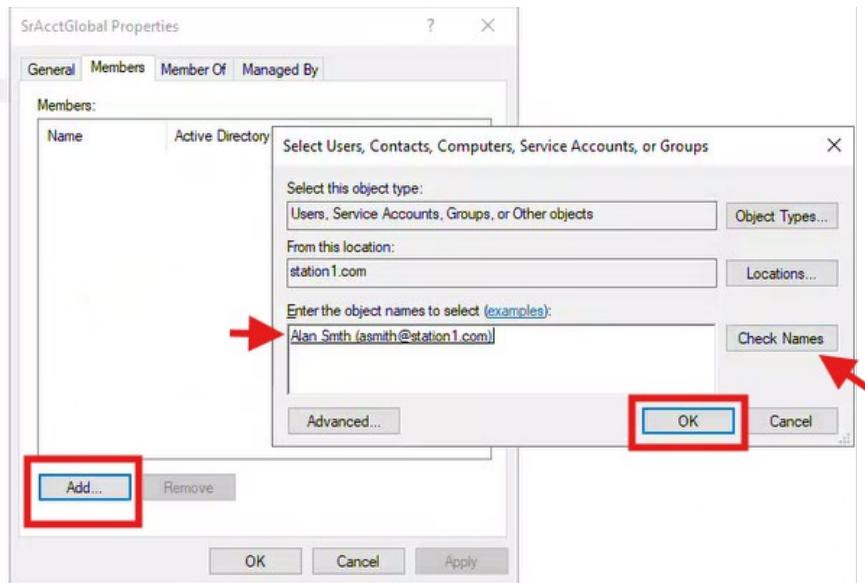
3.5.3.1.2.1 Add user asmith method 1 – add user to group

- Double-click the newly created group to open its properties.

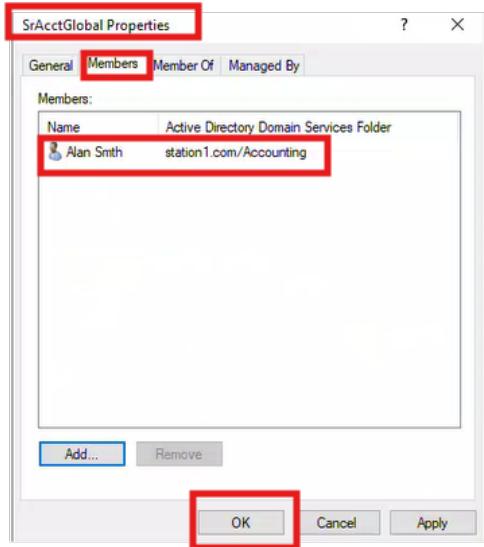


- Add Members

- Go to the Members tab, click Add, and enter the names of the users to add.
Note – you can look for specific users giving the first letters of user and click on Check Names.
- Verify data and click OK to save the changes.



- C) Verify you have successfully created group “SrAcctGlobal” within an Organizational Unit “Accounting”.



3.5.3.1.2.2 Add user bsmith to group SrAcctGlobal method 2 – add group to user

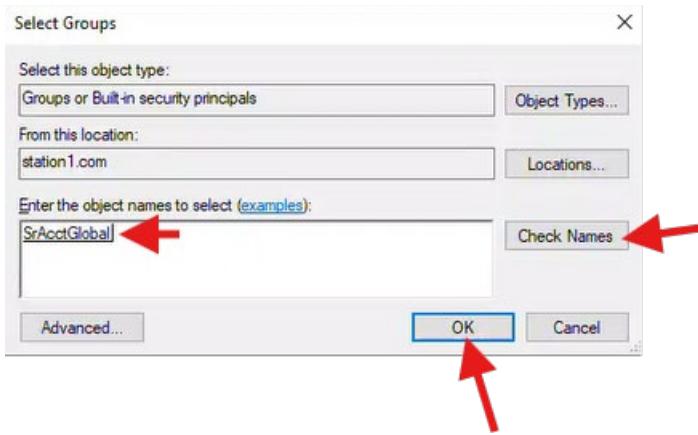
- A) In the Active Directory Users and Computers console, navigate to the Organizational Unit “Accounting” where the user is located. Locate the user account you want to add to a group.

A screenshot of the Active Directory Users and Computers interface. On the left, the navigation pane shows a tree structure with 'station1.com' expanded, revealing 'Accounting' (which is highlighted with a red box), 'Builtin', 'Computers', 'Domain Controllers', 'ForeignSecurityPrincipals', 'Managed Service Accounts', and 'Users'. The main pane displays a table of users and groups. A user named 'Bob Smith' is selected and highlighted with a blue box. The table columns are 'Name', 'Type', and 'Description'. Other entries include 'Alan Smith' (User), 'Chuck Smith' (User), 'Ed Smith' (User), 'Frank Smith' (User), and 'SrAcctGlobal' (Security Group...).

B) Right-click the user account “Bob Smith” and select Add to a group

A screenshot of the Active Directory Users and Computers interface. The 'Accounting' group is selected in the navigation pane. In the main pane, 'Bob Smith' is selected and a context menu is open. The menu items include 'Copy...', 'Add to a group...', 'Disable Account', 'Reset Password...', 'Move...', 'Open Home Page', 'Send Mail', 'All Tasks', 'Cut', 'Delete', 'Rename', 'Properties', and 'Help'. The 'Add to a group...' option is highlighted with a red box.

C) In the Select Groups window, type the name of the group you want to add the user to. Click Check Names to verify the group name. Click OK to add the user to the group.

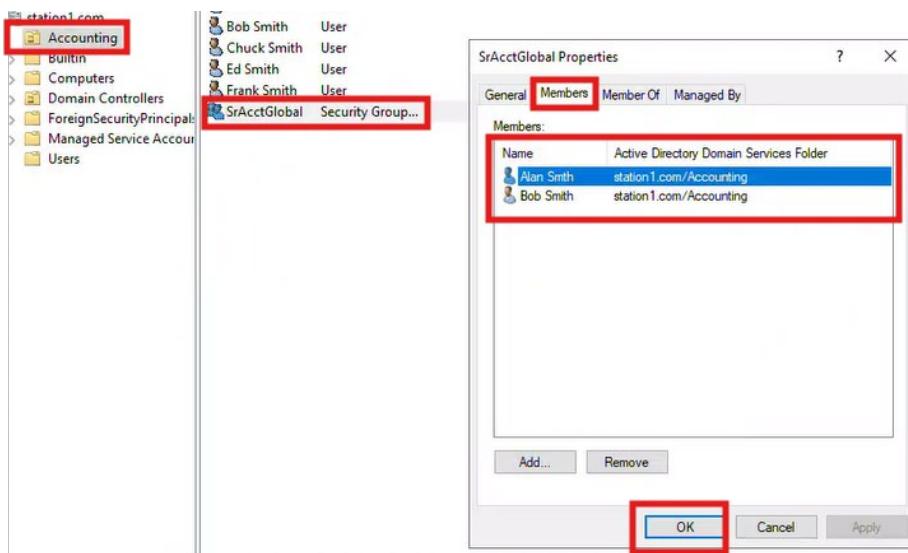


D) Confirmation is received the user has been added to the group



3.5.3.1.2.3 Verify users asmith and bsmith are in group SrAcctGlobal

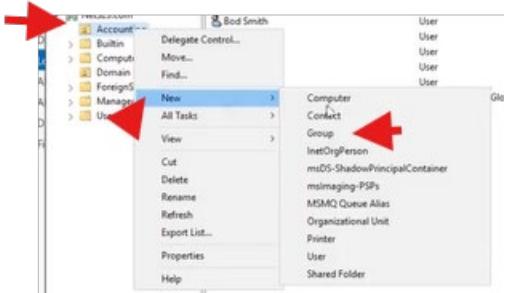
Double click on SrAcctGlobal user group, select Properties, and inside Properties select Members tab. Verify asmith and bsmith are part of the group. Select Ok to close the window



3.5.3.2 Senior Local group

3.5.3.2.1 Create Local Group SrAcctLocal

- Right click on Accounting / New / Group

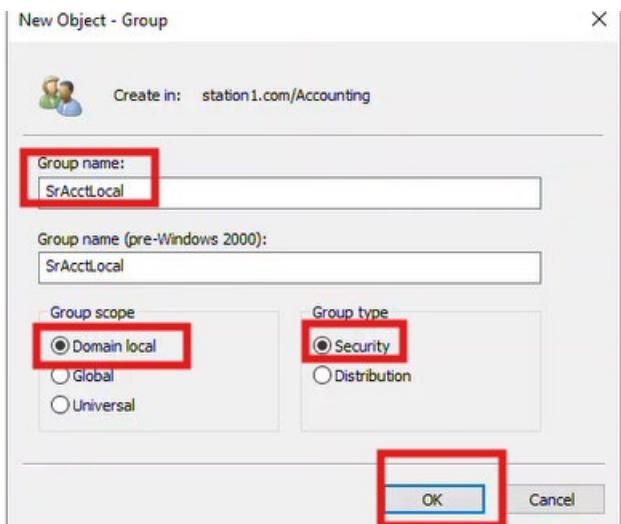


B) Create the domain Local Group

Group Name **SrAcctLocal**

Group scope Domain local

Select Ok



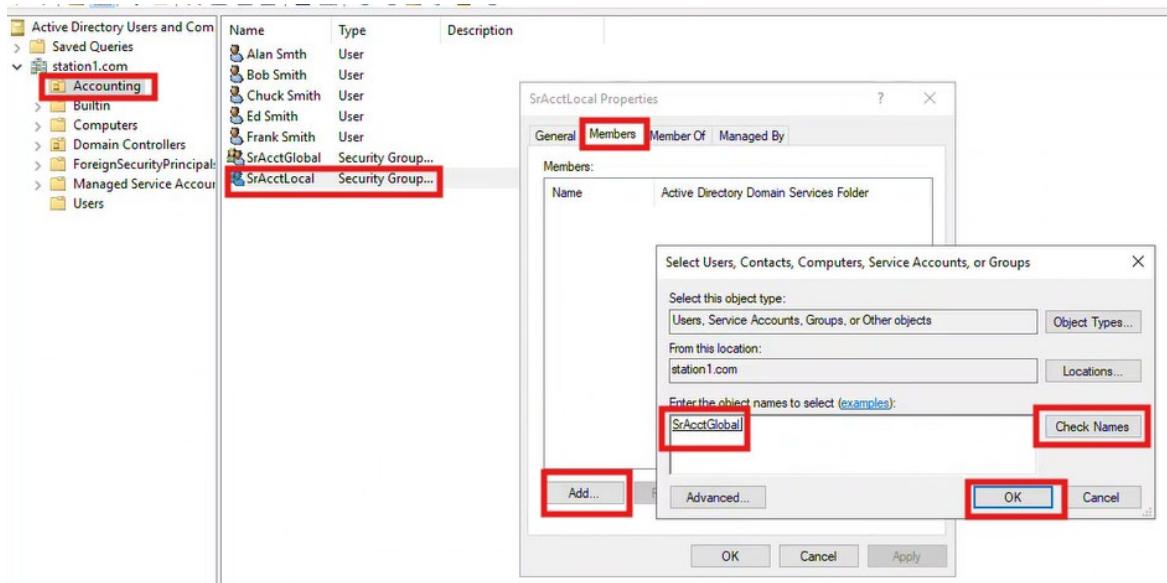
C) See group is created as a security Group

Name	Type	Description
Alan Smith	User	
Bob Smith	User	
Chuck Smith	User	
Ed Smith	User	
Frank Smith	User	
SrAcctGlobal	Security Group...	
SrAcctLocal	Security Group...	

3.5.3.3 Put global group SrAcctGlobal into local group SrAcctLocal

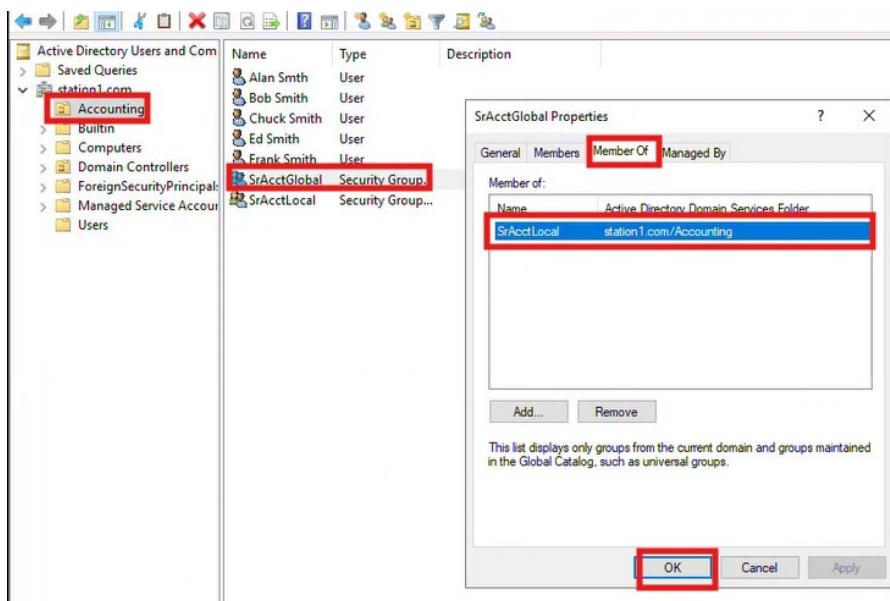
- A) Navigate to the domain local group under Accounting : **SrAcctLocal**, right-click it, and select Properties.
Go to the Members tab.

Click Add, type the name of the global group **SrAcctGlobal**, and click Check Names to verify. Click OK to add the global group to the domain local group.



B) Press Ok / Ok to go out of the menus

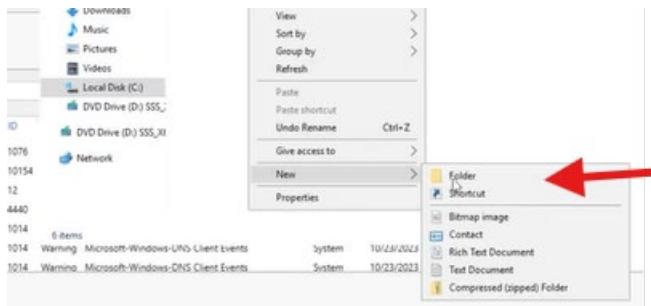
C) Verify that the global group **SrAcctGlobal**, is a member of the appropriate domain local group **SrAcctLocal** by checking its Member Of tab.



3.5.4 Create department folder “Acct”, set security and permissions

3.5.4.1 Create folder “Shared”

A) Open C drive/ New /Folder

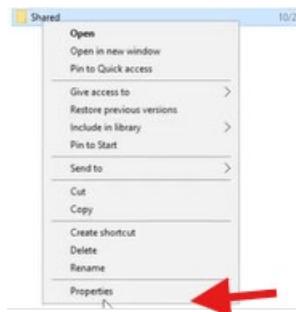


B) Add folder “Shared”



3.5.4.1.1 Fine tune permissions on the folder Shared

A) Select Folder Shared right click and select properties



B) Go to the Sharing tab.

Click Advanced Sharing.

Check the box to Share this folder.

Click Permissions

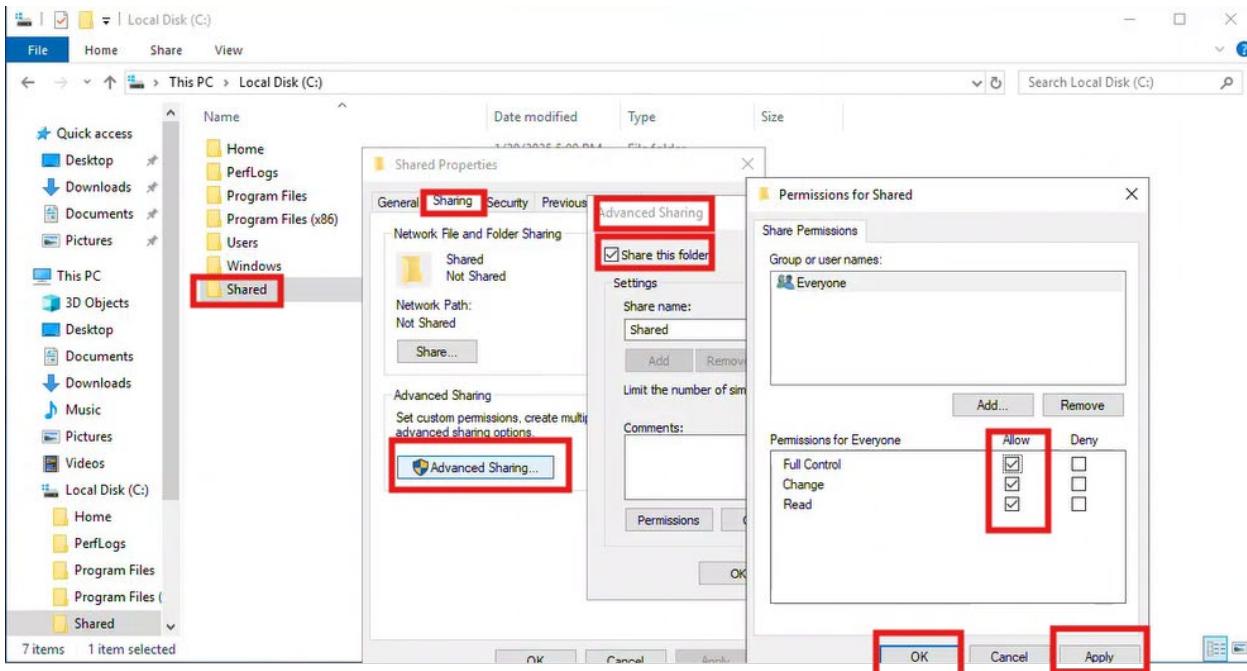
Give full control

Select Apply

Select OK

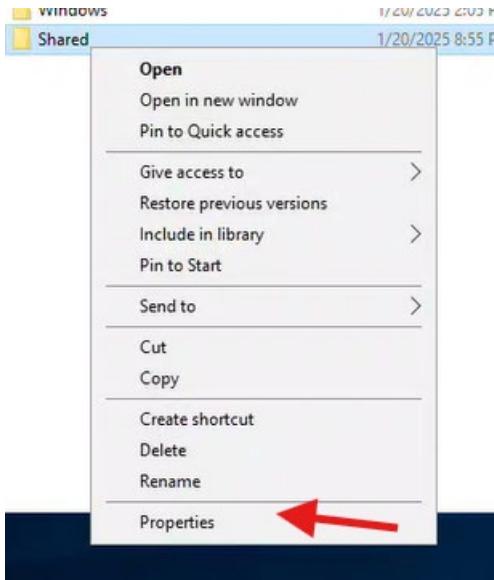
Select Ok

Select Close



3.5.4.1.2 Fine tune Security on the folder Shared

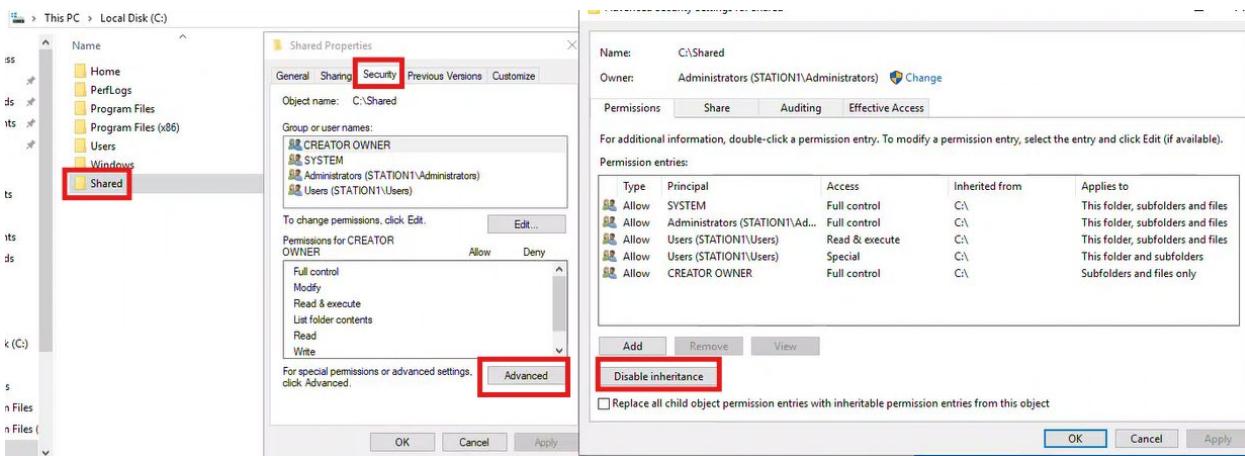
A) Right-click the folder and select Properties



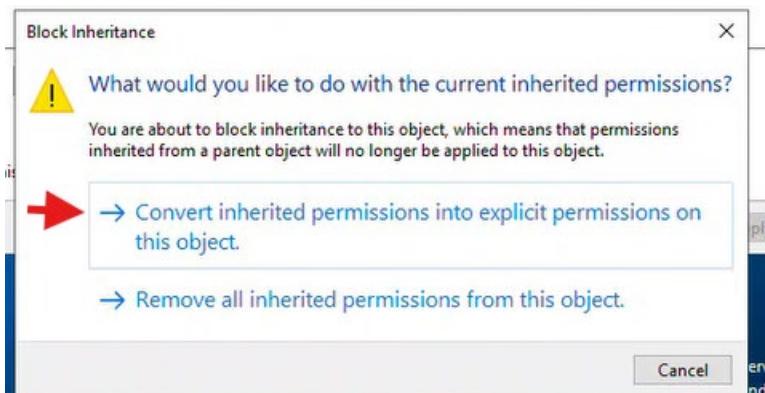
B) In the folder properties window, click on the Security tab

Advanced button to open the Advanced Security Settings window.

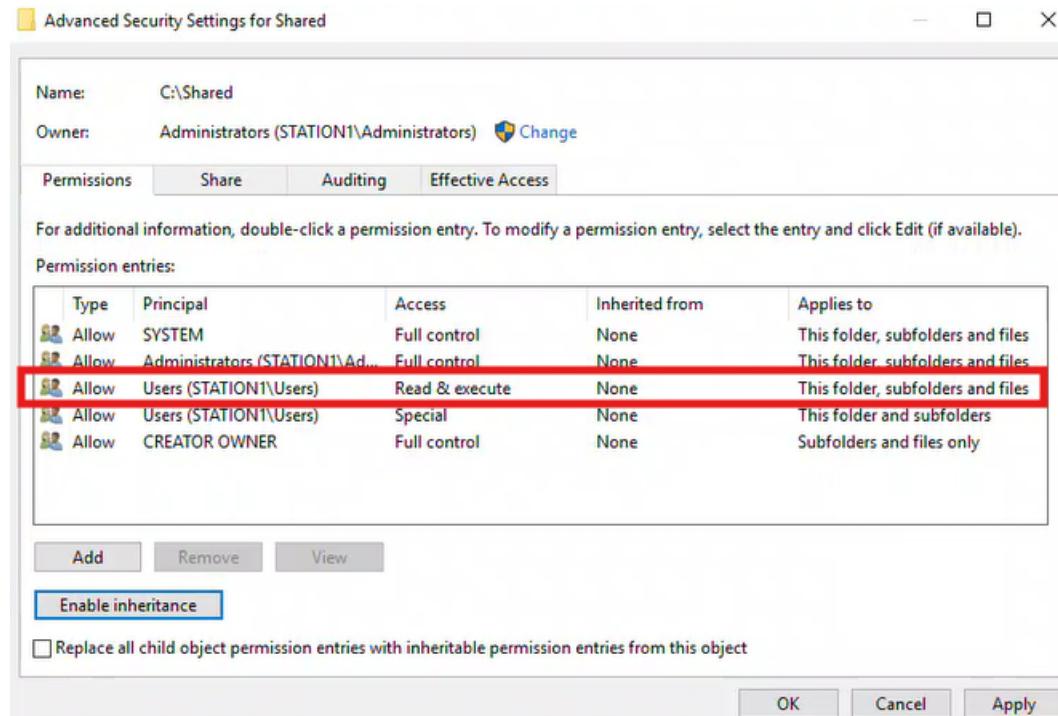
In Advanced Security Settings window select “Disable inheritance”



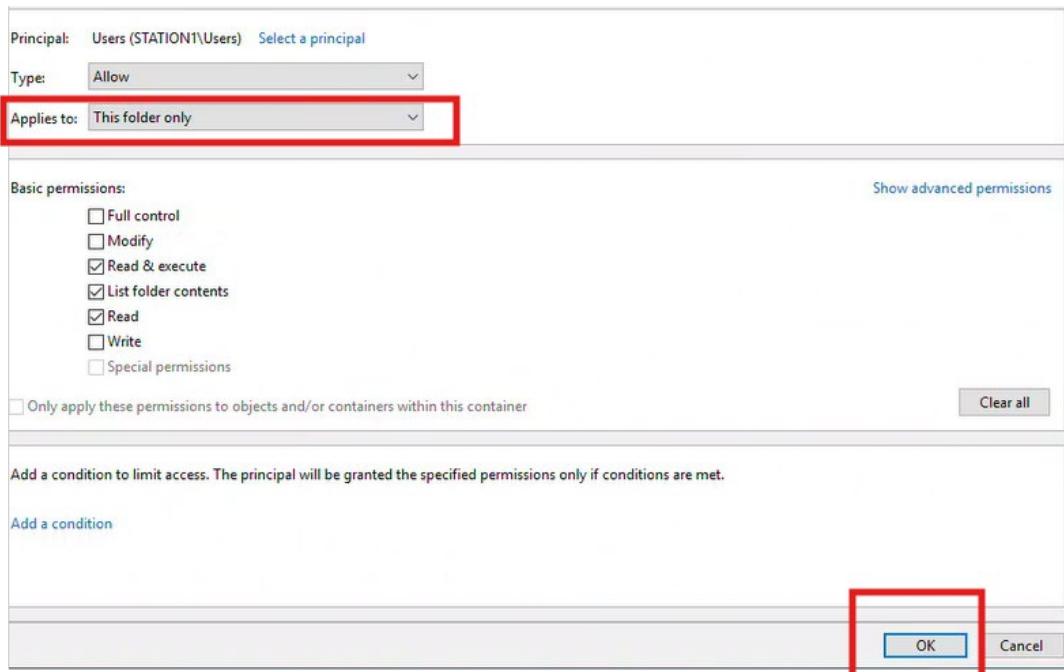
C) Select Convert inherited permissions into explicit permissions on this object.



D) Double click on the first users



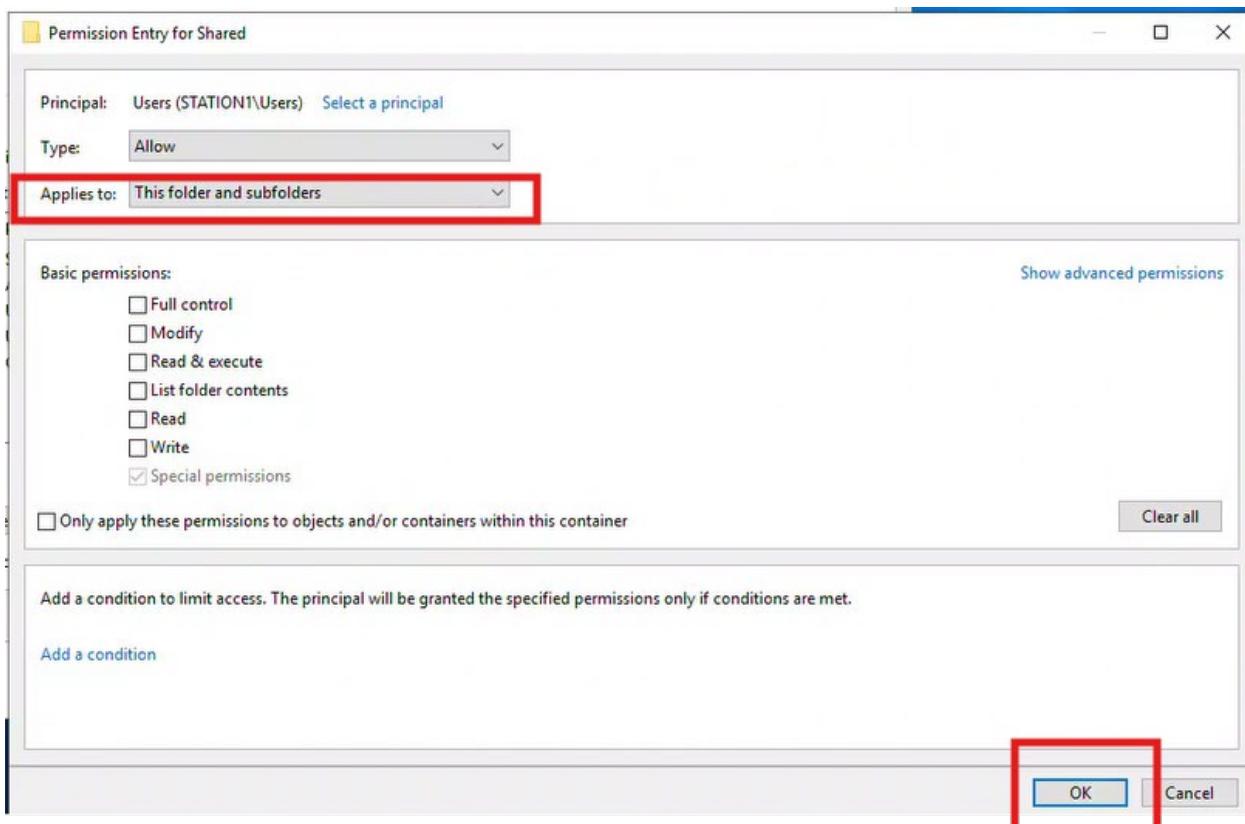
E) Select This folder Only and Press Ok to close the window



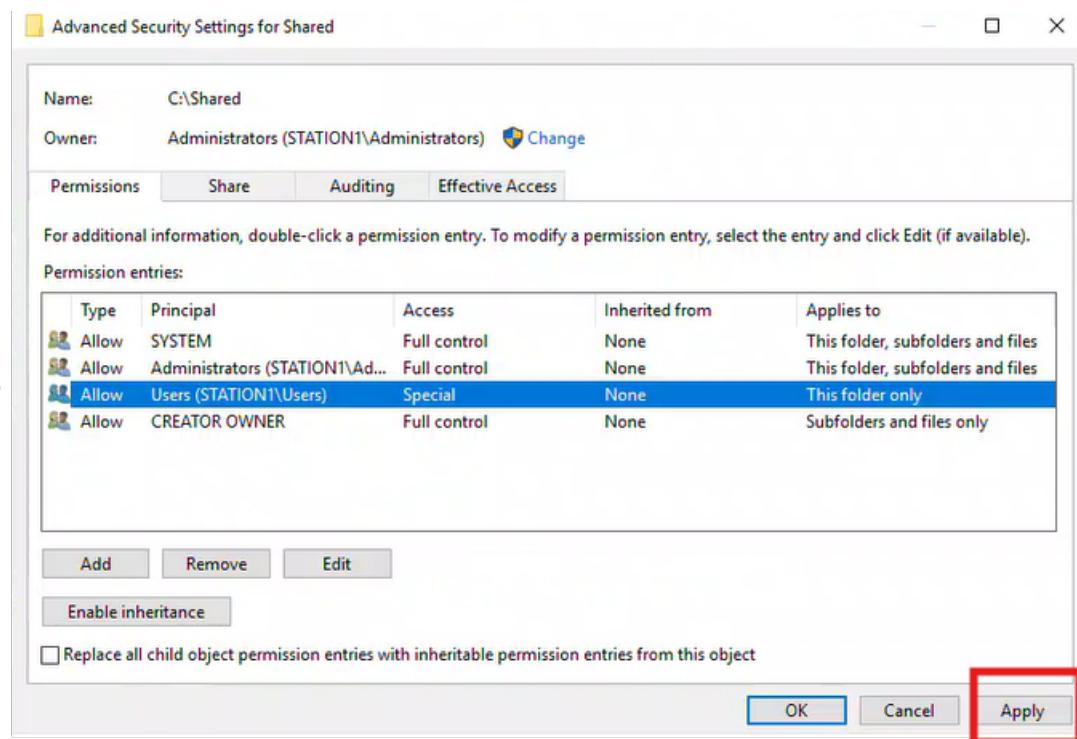
F) Select second user and double click on it

Type	Principal	Access	Inherited from	Applies to
Allow	SYSTEM	Full control	None	This folder, subfolders and files
Allow	Administrators (STATION1\Administrators)	Full control	None	This folder, subfolders and files
Allow	Users (STATION1\Users)	Read & execute	None	This folder only
Allow	Users (STATION1\Users)	Special	None	This folder and subfolders
Allow	CREATOR OWNER	Full control	None	Subfolders and files only

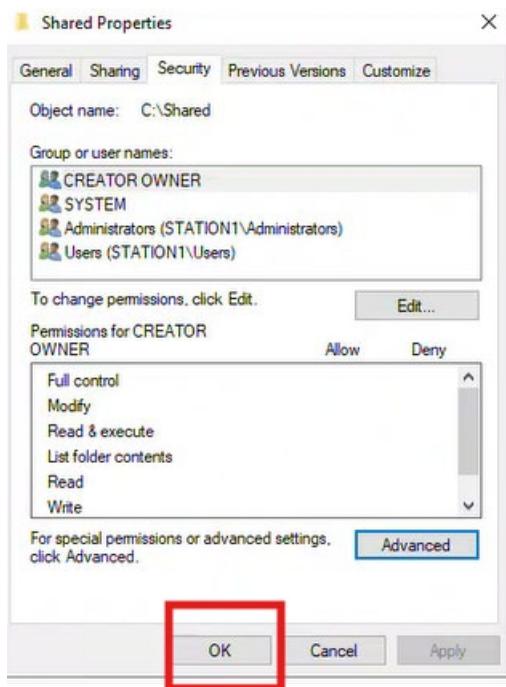
G) Select This folder only and press ok



H) Only one line for user will appear, select Apply and then Ok to close the window



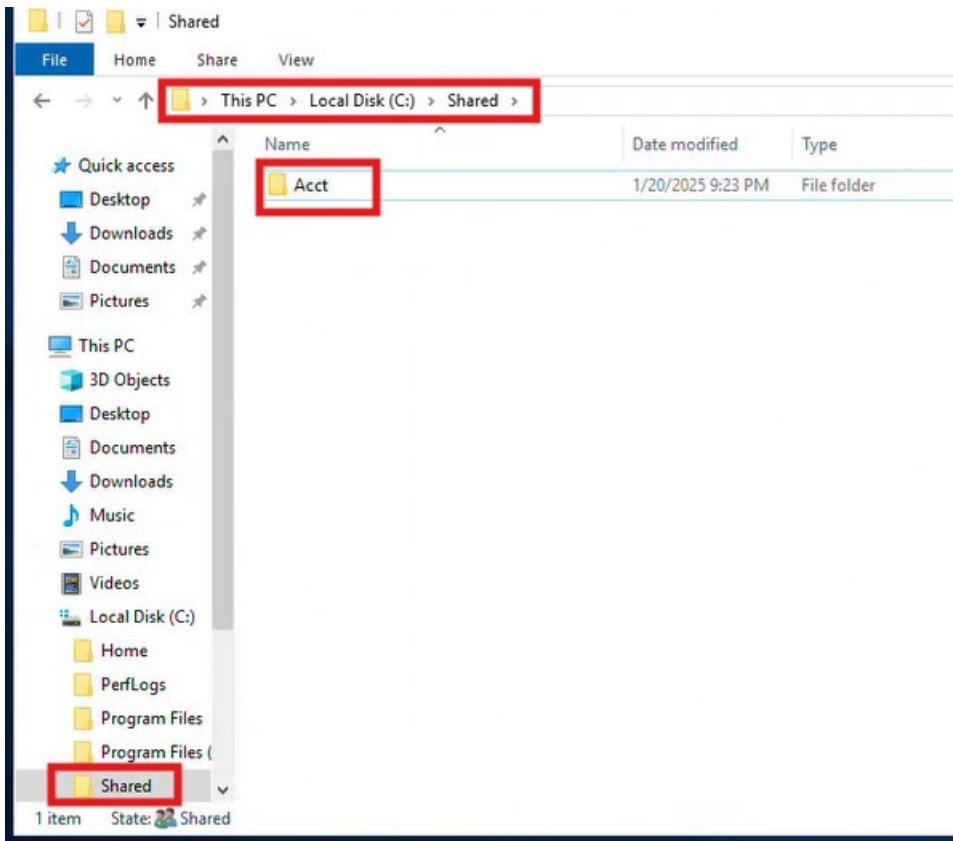
- I) Press ok In Shared properties after permissions were fine tuned to go out



3.5.4.2 Create folder for Department inside Shared folder and set security and permissions

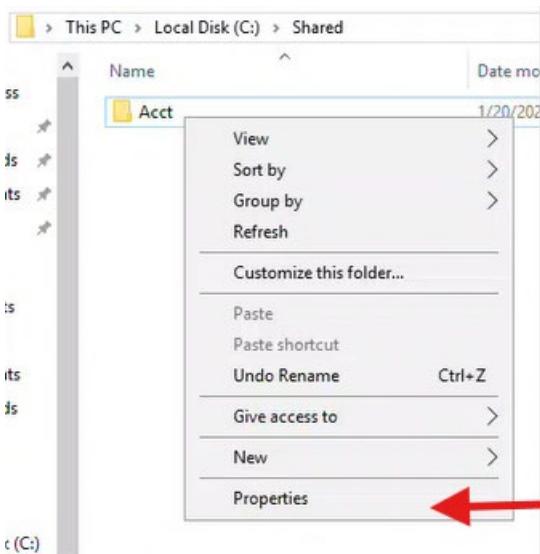
3.5.4.2.1 Create folder "Acct" for Accounting Department inside Shared folder

- A) Go to Local disk / Shared folder and create a folder named Acct



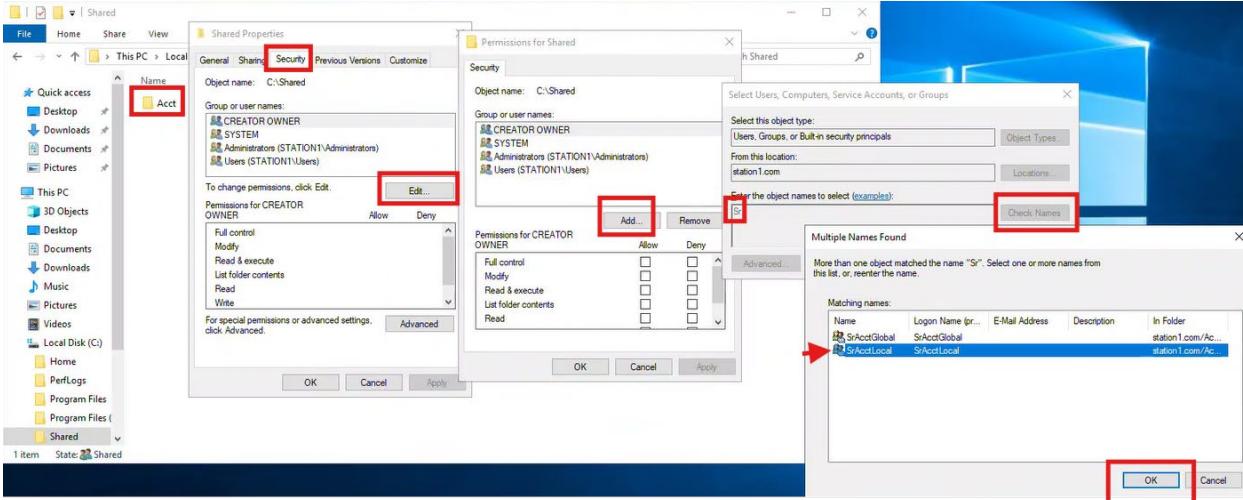
3.5.4.2.2 Fine tune security and permissions on the folder Acct

- A) Select folder Acct Right click for menu to appear and Right click on properties

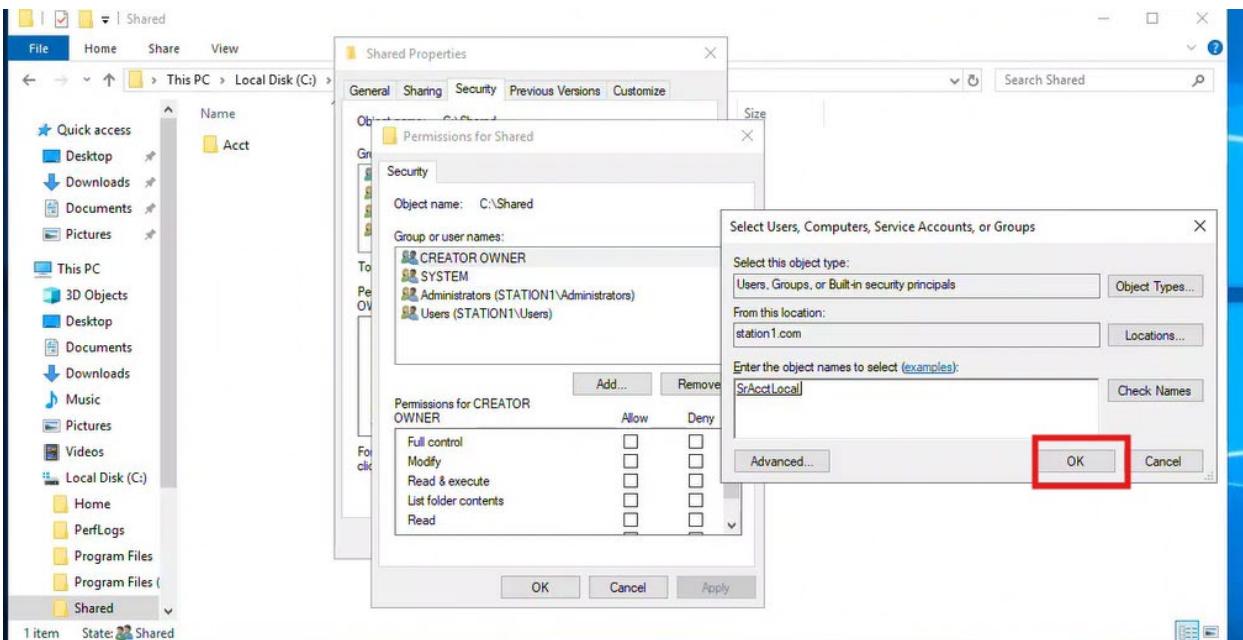


- B) Under security Tab select Edit
Under Edit click on Add
Type Sr check names

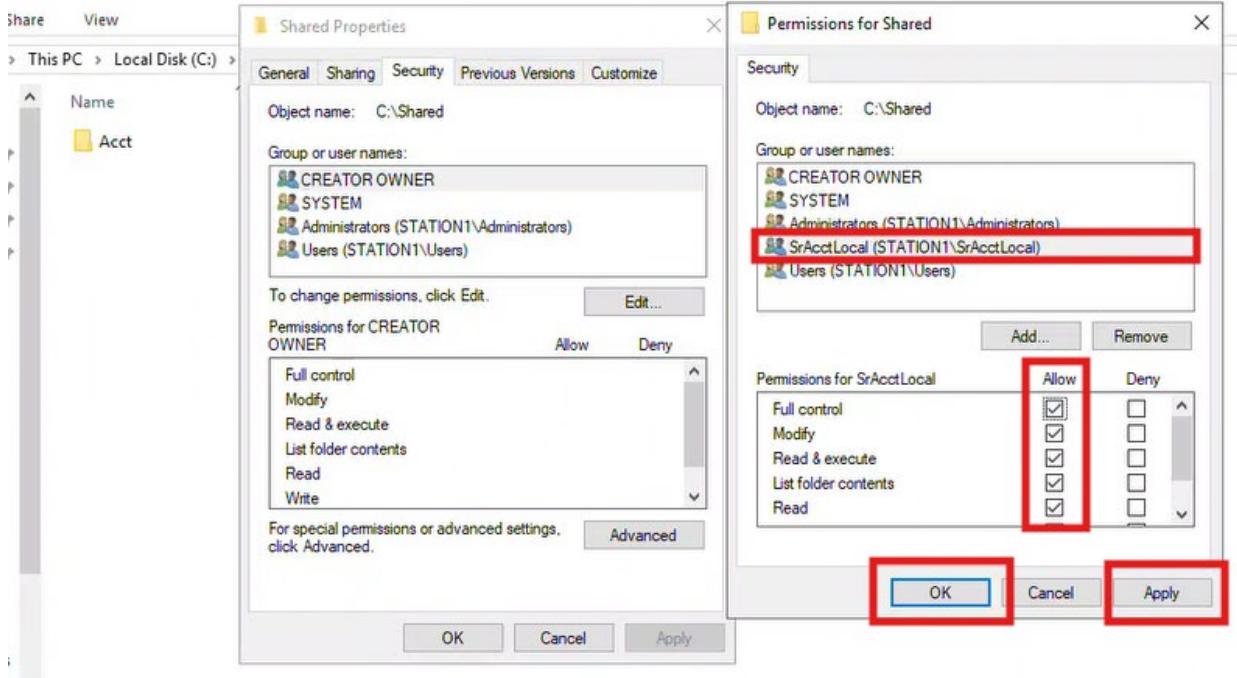
New window opens select SrAcctLocal



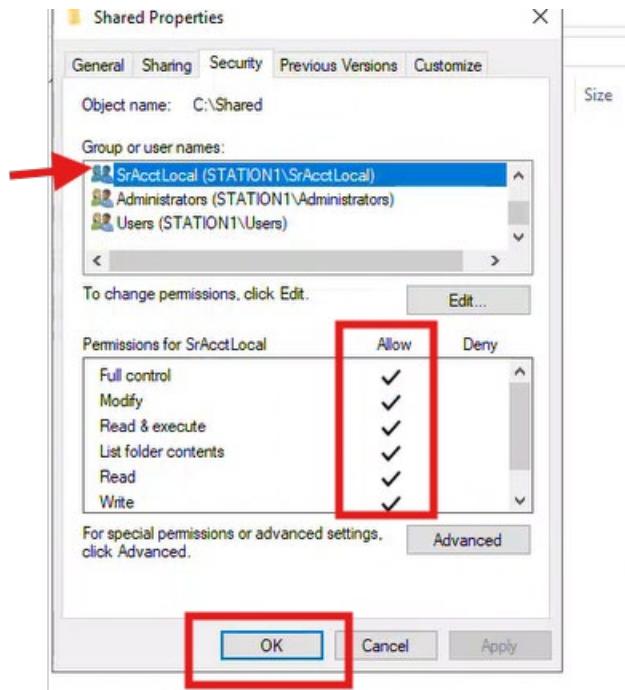
C) Select Ok to confirm SrAcctLocal



D) The group SrAcctLocal are Sr's guys they will have privileges. Give full control Apply and Ok



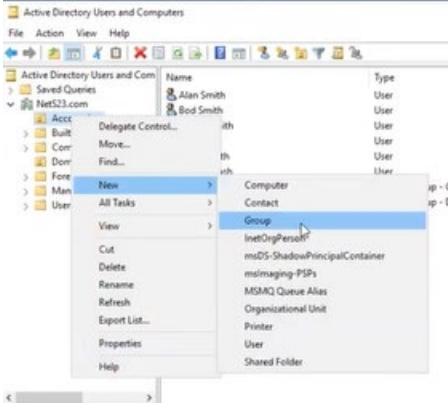
E) Verify SrAcctLocal has full control and press ok to exit



3.5.5 Create Junior Groups in Organizational Unit “Accounting”

3.5.5.1 Global group JrAcctGlobal

A) Right click on Accounting /New /Group



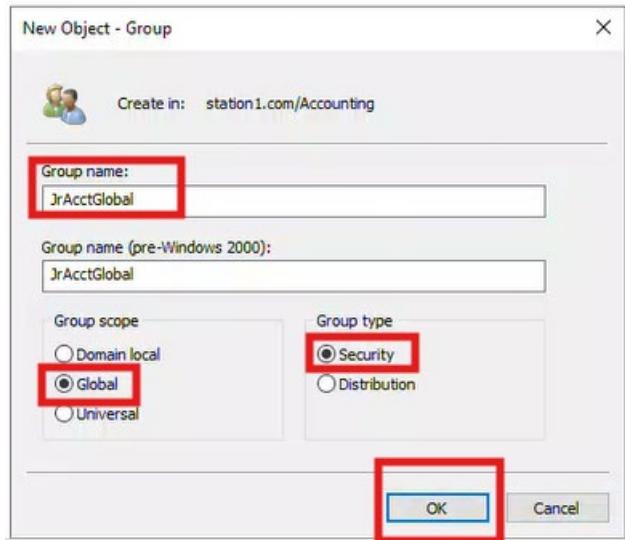
B) Create a new group for junior we will call JrAcct**Global**

Note – We always capitalize the first letter of each word

Group scope **Global**

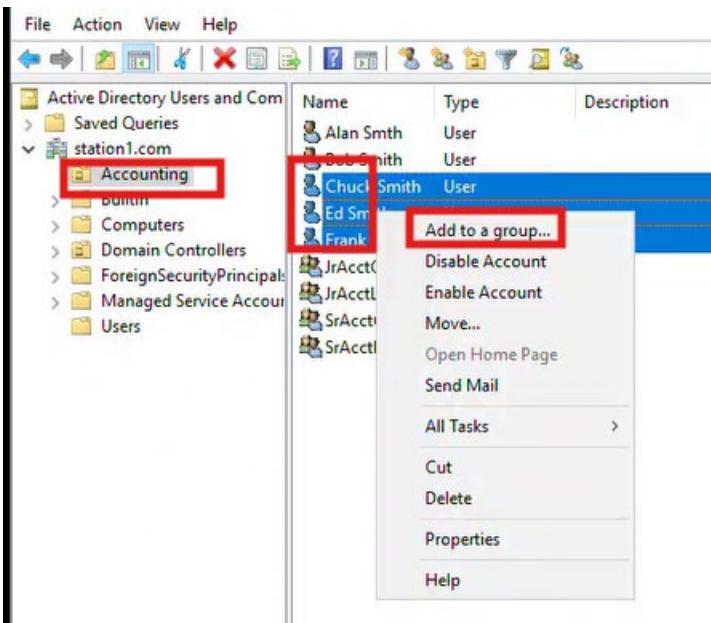
Group type Security

Press Ok

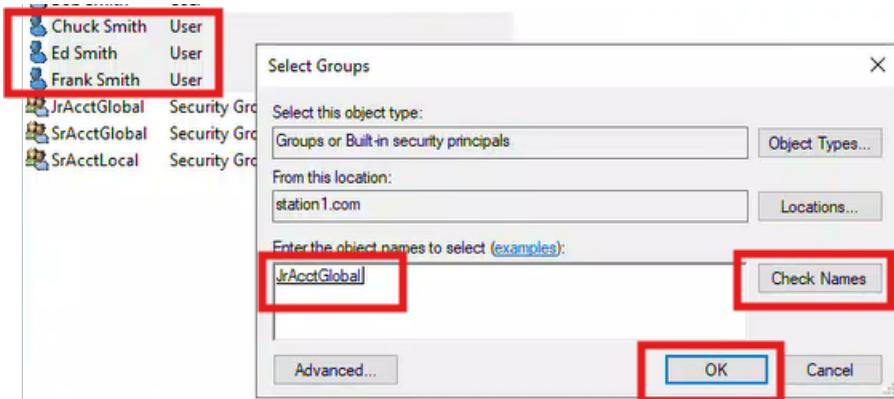


3.5.5.2 Add users to JrAcctGlobal group

A) Select users csmith, fsmith and edsmith Right click / Add to a group



- B) In windows Select Groups Add group name “JrAcctGlobal” Check names / Ok

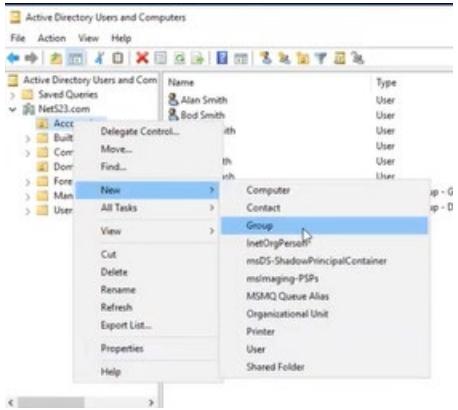


- C) User had been added press Ok

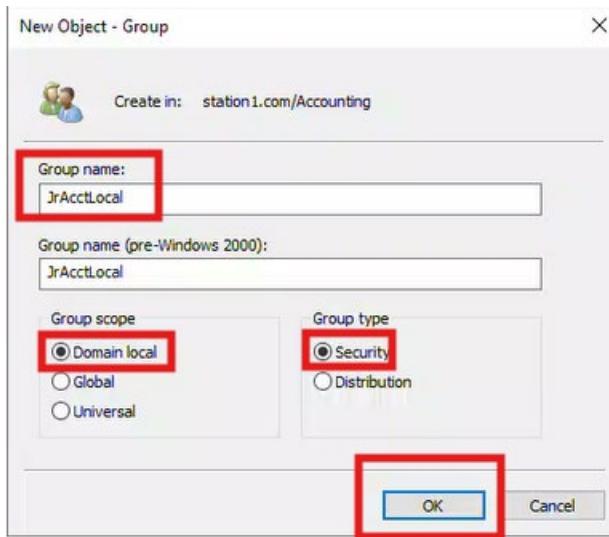


3.5.5.3 Junior local group JrAcctLocal

- A) On Active directory tool, create Group for junior account local
Right click on Accounting /New /Group

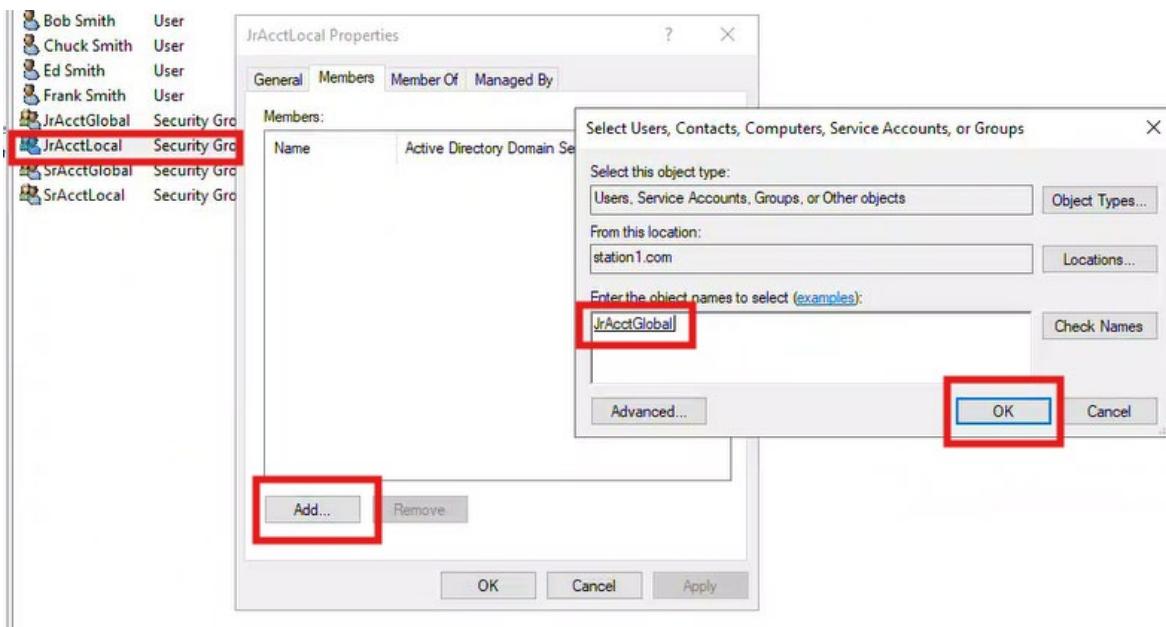


B) Create local group JrAcctLocal



3.5.5.4 Add Global group to the local group

A) Add Global group JrAccGlobal to the local group JrAccLocal



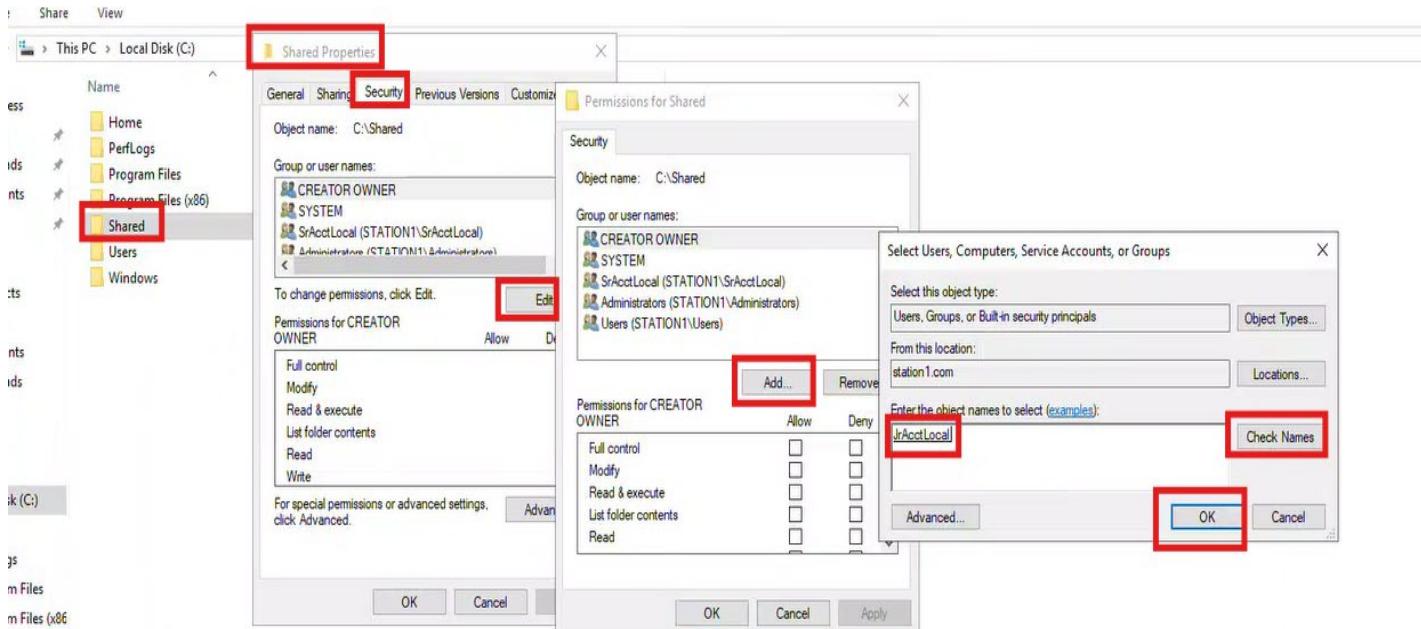
B) Confirm Global is member of Local

Name	Type	Description
Alan Smith	User	
Bob Smith	User	
Chuck Smith	User	
Ed Smith	User	
JrAcctGlobal	Security Group	
JrAcctLocal	Security Group	
SrAcctGlobal	Security Group	
SrAcctLocal	Security Group	

3.5.5.5 Set Security for department folder Shared

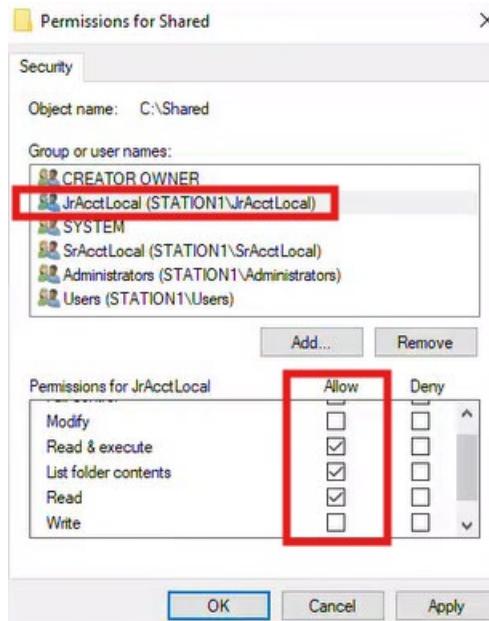
Give group access to the department folder Shared

Select folder Shared , right click to see Properties, Select Security in tab, Select Edit , Select Add. Look for **JrAcctLocal** Check name and press Ok



3.5.5.6 Set permissions to shared folder for group JrAcctLocal

Junior people they can see stuff, but they can not change stuff, so do nothing in permissions, just add the group to the folder do not change anything. Verify permissions of newly added group

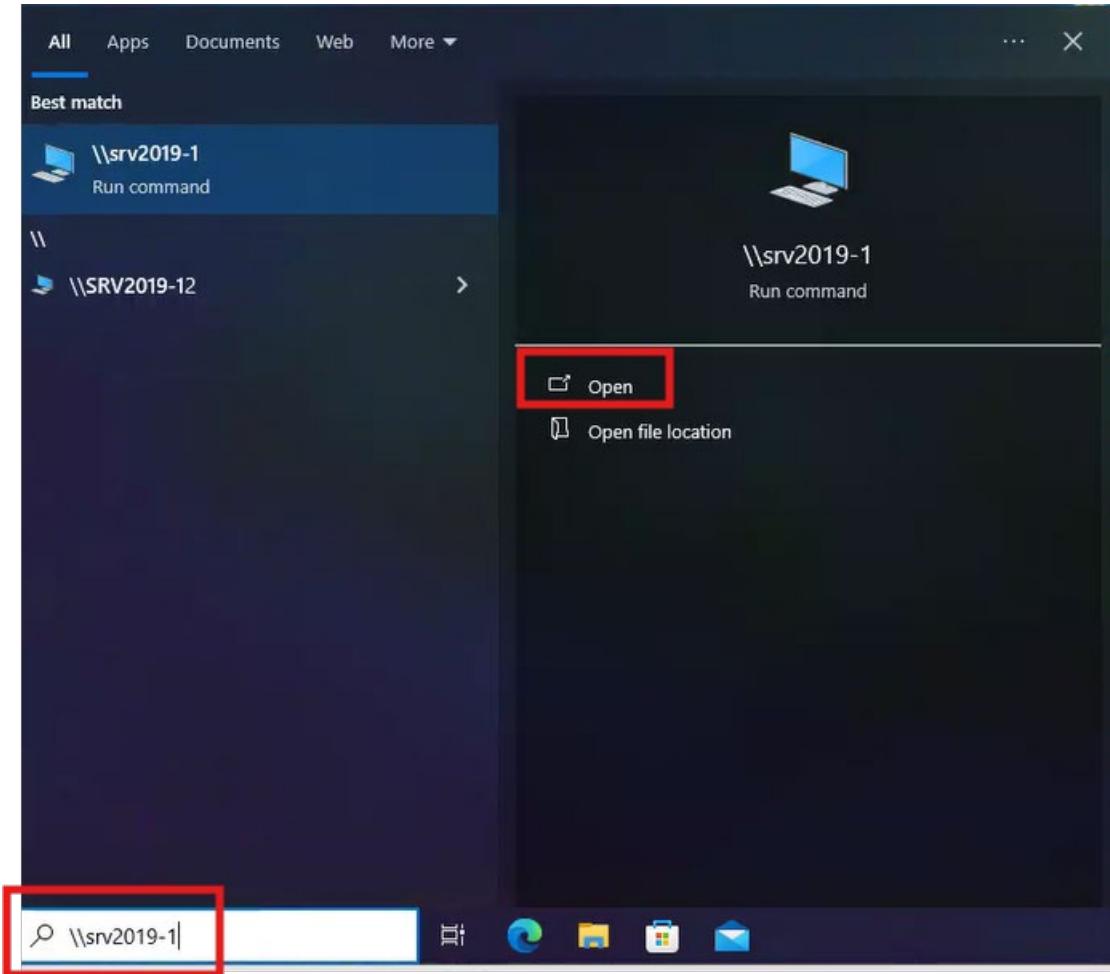


3.5.6 TEST

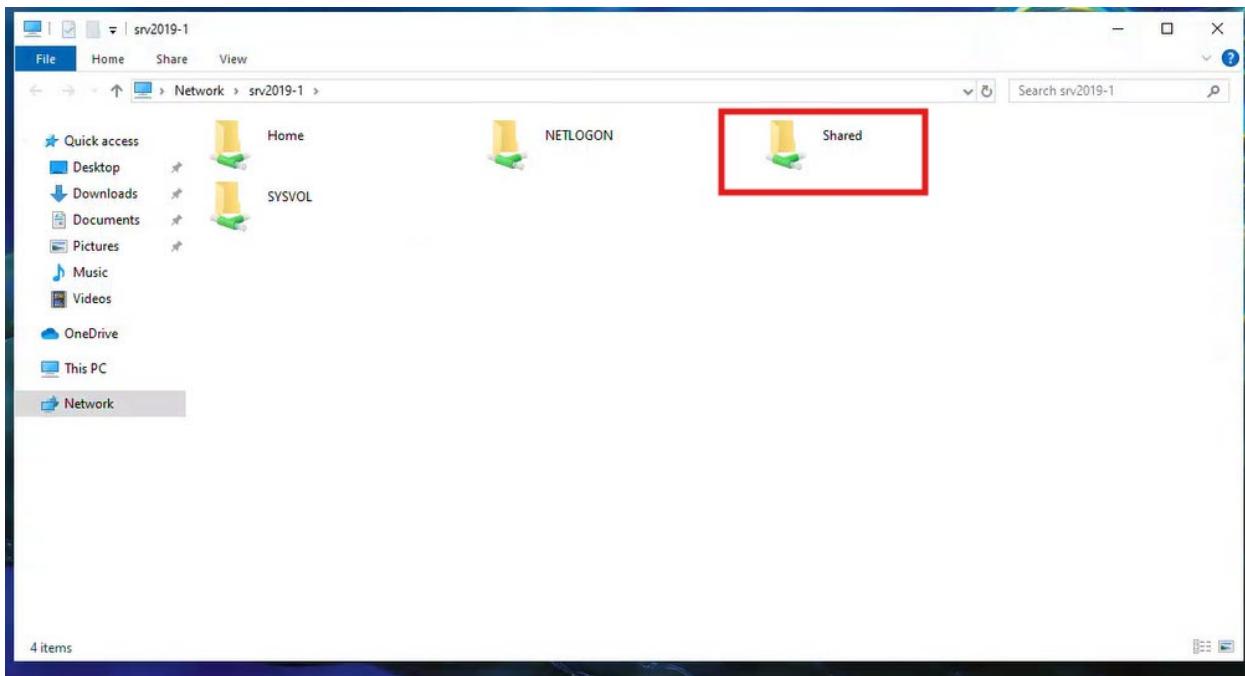
3.5.6.1 Test user in Senior group

Go to windows client box and login as asmith Alan Smith

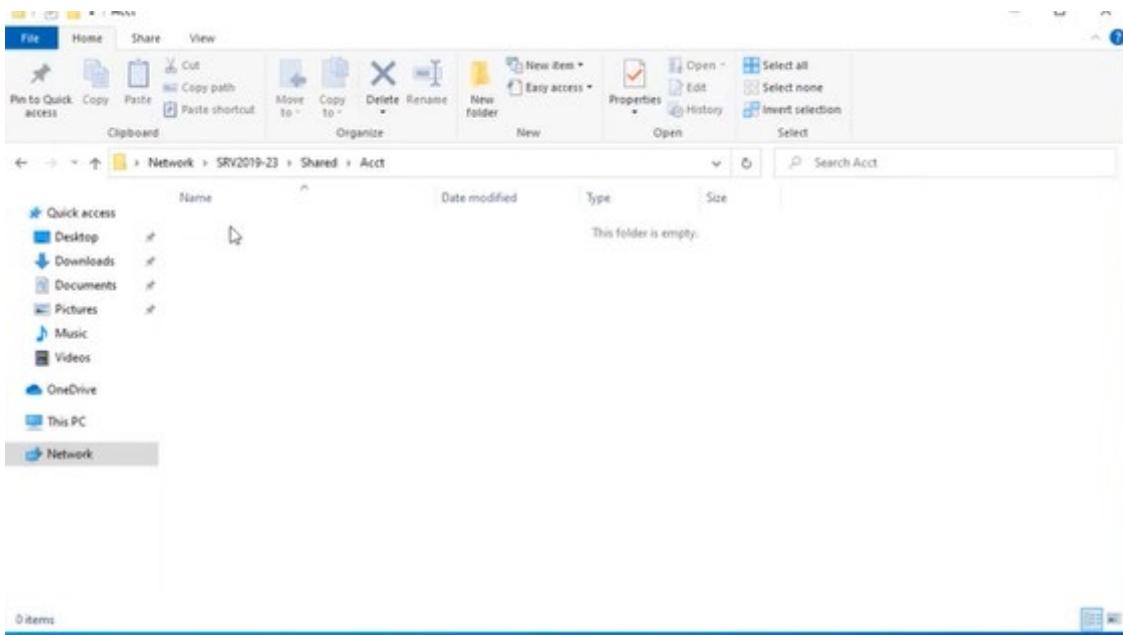
- A) In the search box type in <\\srv2019-1> Press enter, Open \\srv2019-1



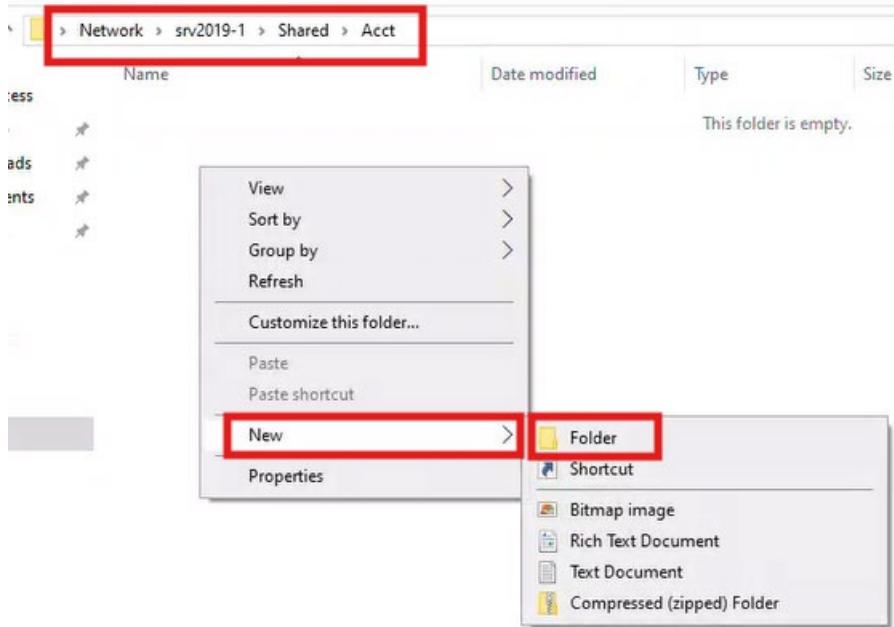
- B) Shared folder is shown , open up shared folder



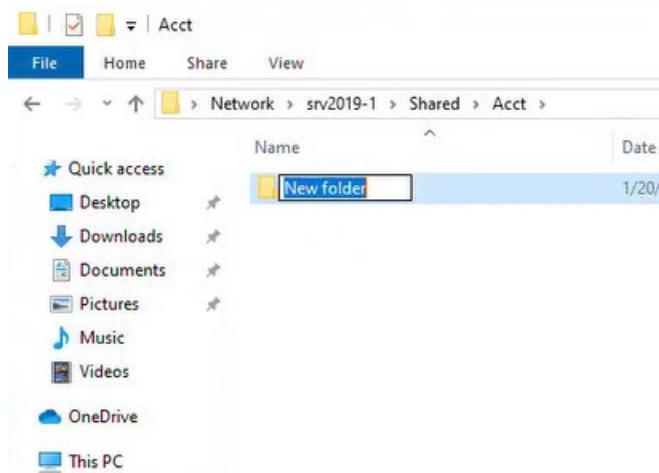
C) Open up acct



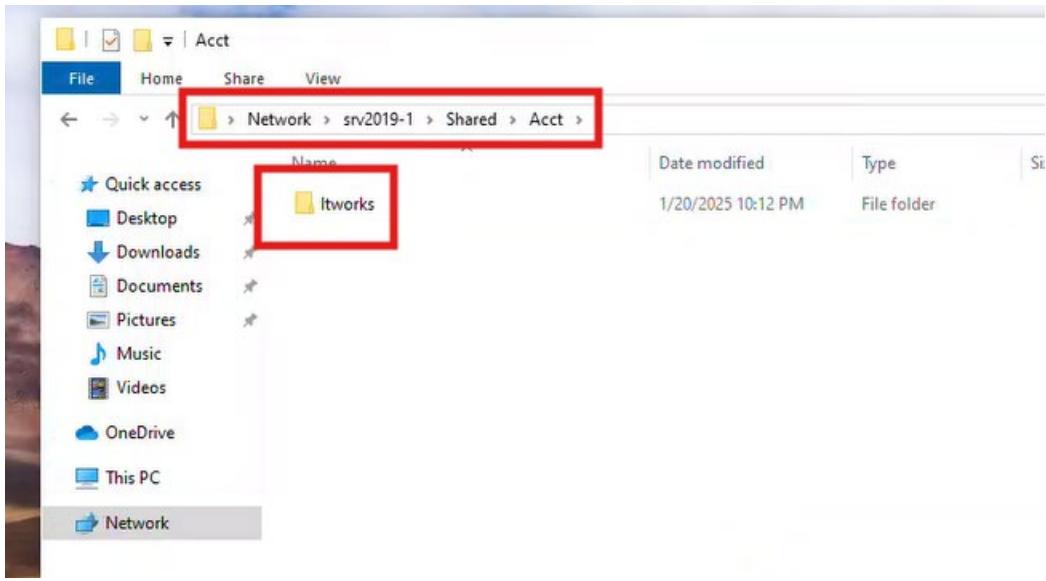
D) Since Asmith is a senior (assigned to Senior group), try to create a new folder. User asmith is able to do it



E) New folder is created



F) Name folder Itworks

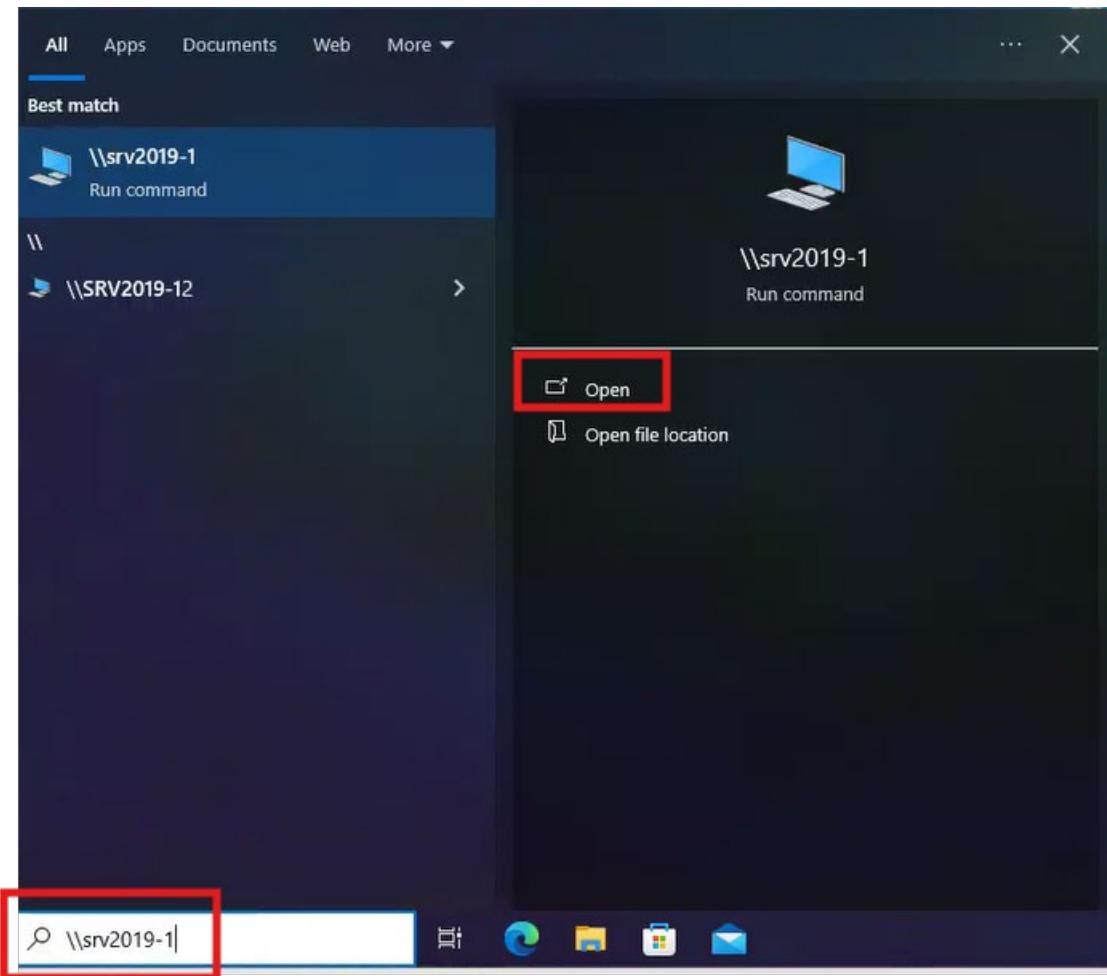


3.5.6.2 Test user in junior group

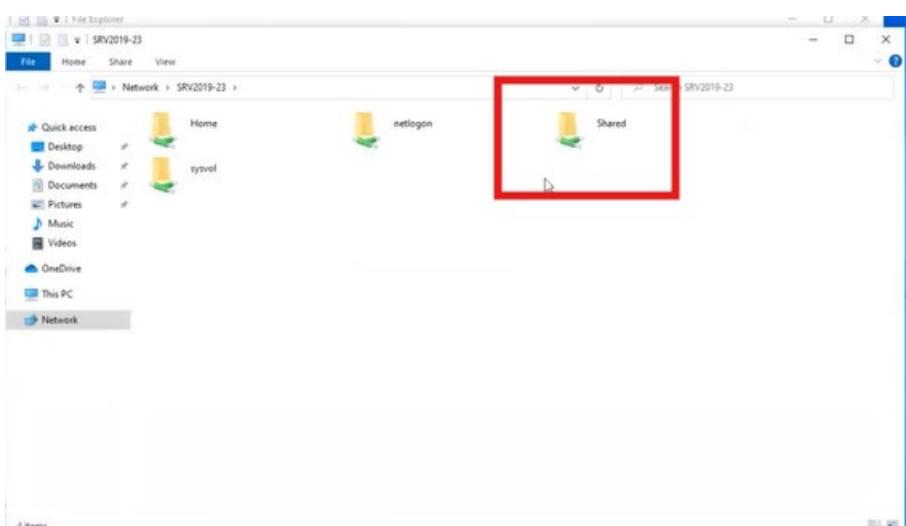
A) Log in as a junior user csmith Chuck smith



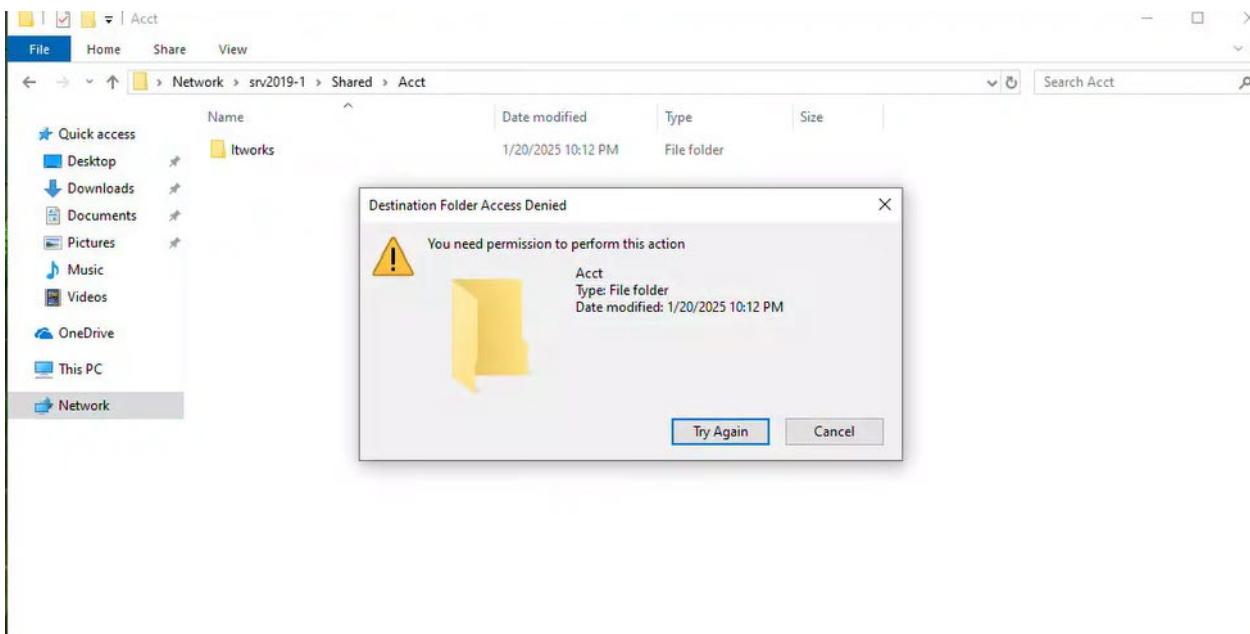
B) In search box Go to \\srv2019-1 press enter, open //srv2019-1



C) Go inside shared



D) Look inside Shared, recently created folder Itworks is visible. Try to create something and will not be able because we only gave right to see stuff.



3.6 Set GPO to map Drive for ACCT

Net 45 Set GPO to map Drive for ACCT

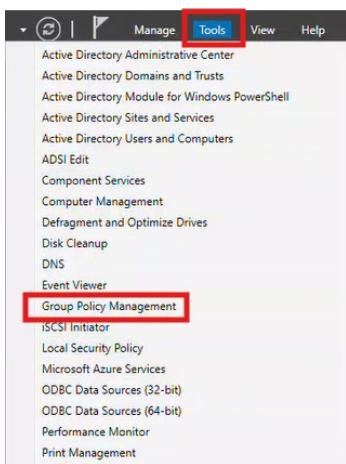
U drive for home folder

P drive for shared folder

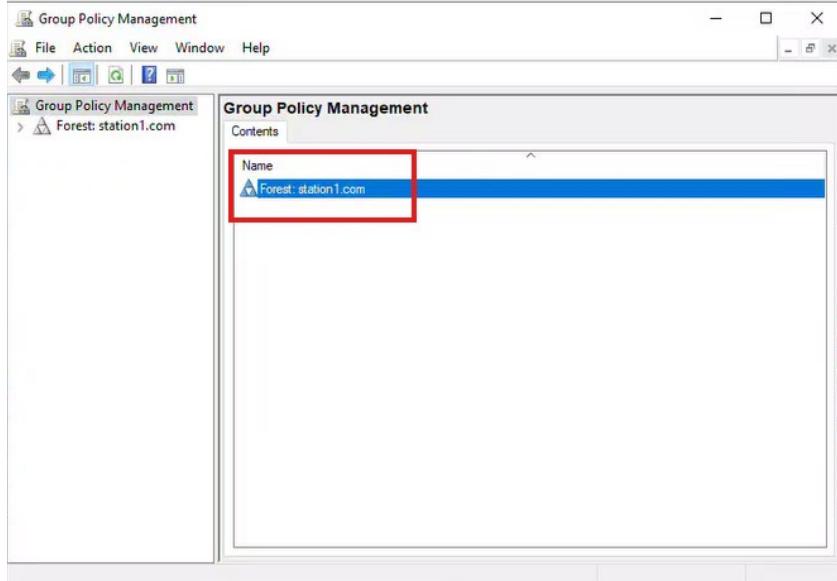
3.6.1 Open Group policy management

A) Login to Win2019-1 server.

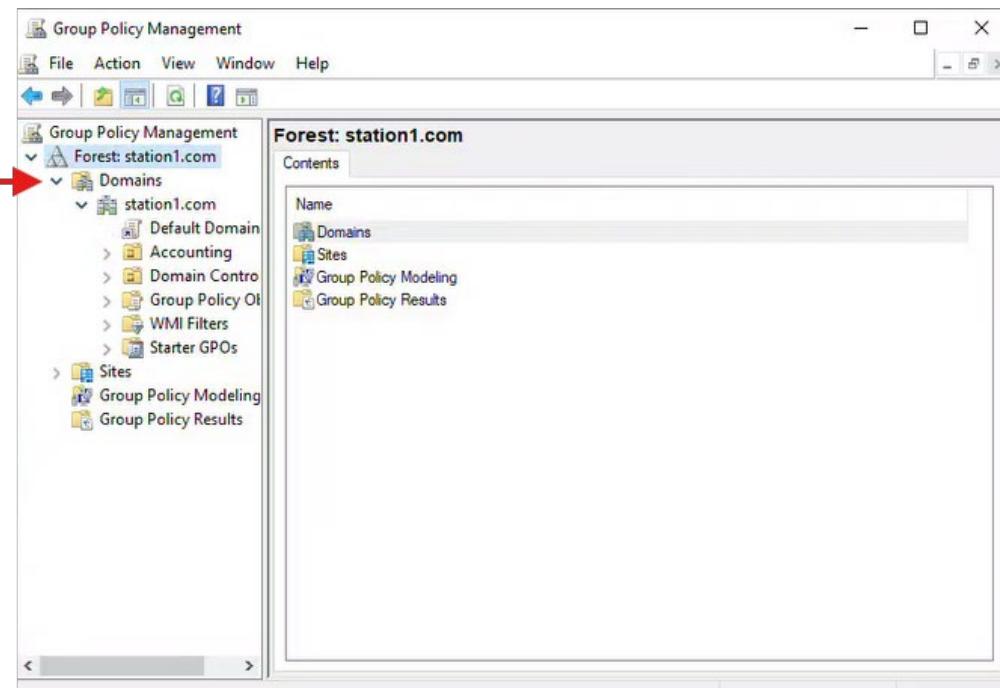
B) In the Server Manager dashboard, go to Tools and select Group Policy Management.

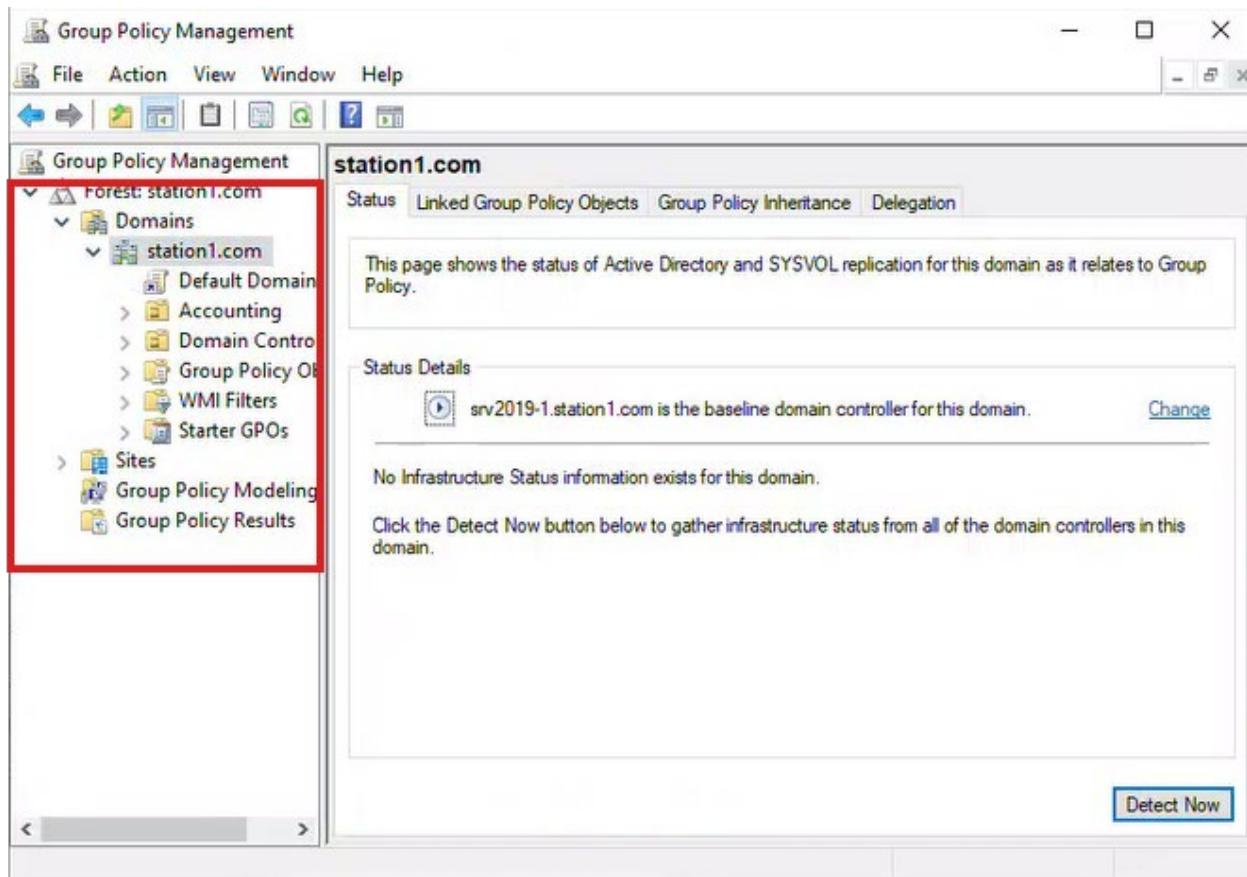


C) Open Group Policy Management and double click on Forest



D) Open up the domains and expand it





Group policy allow us to manage users, groups and computers in the organization

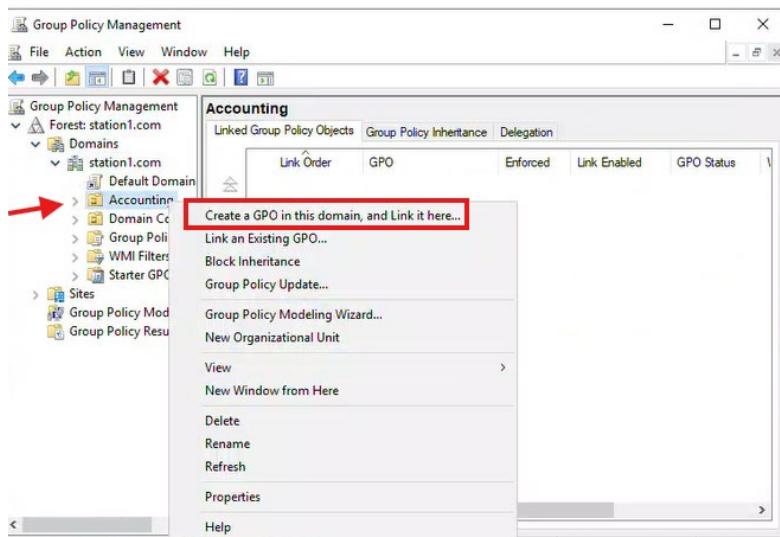
We can do for example install on 100 computers

We can fine tune security

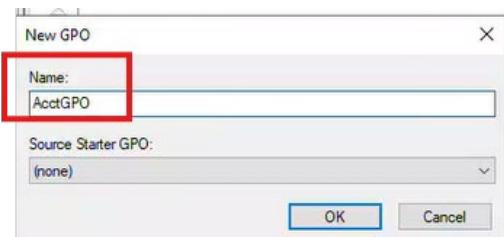
Map drive to the shared folder

3.6.2 Create a GPO

A) Right click on Accounting and select Create a GPO



- B) The GPO will be created and linked to the Accounting Organizational Unit (OU)
Name AcctGPO

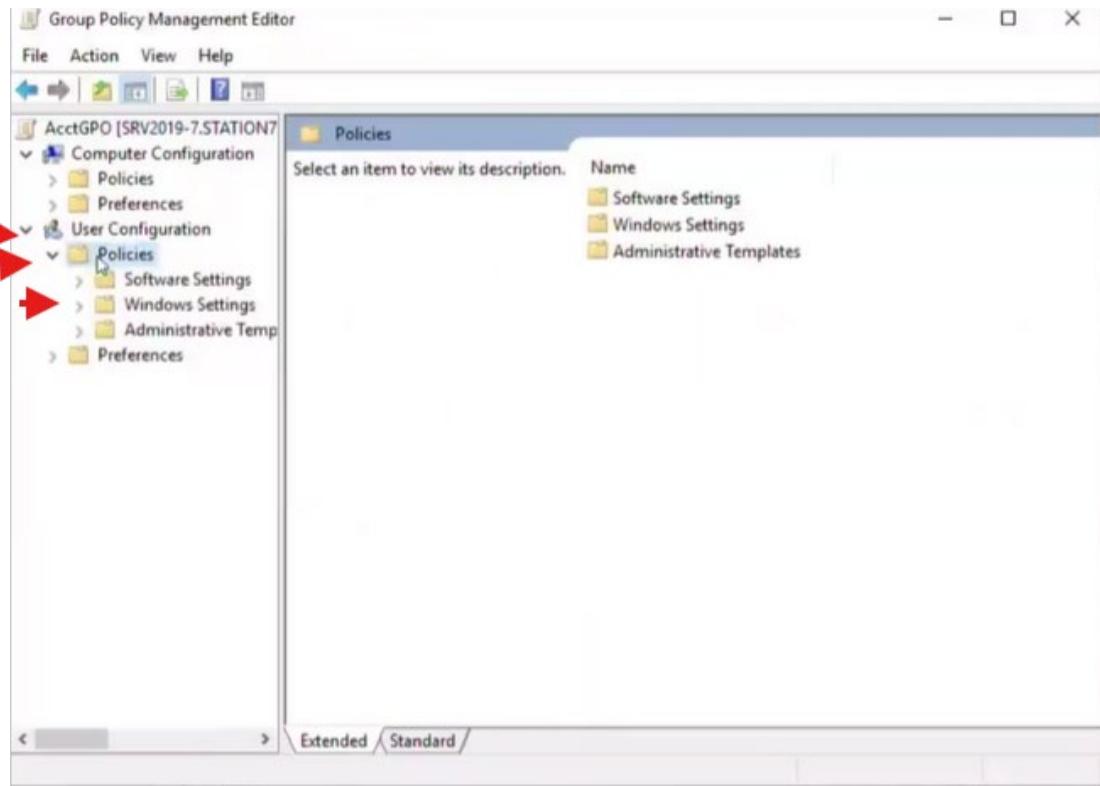


- C) Edit the policy into AcctGPO

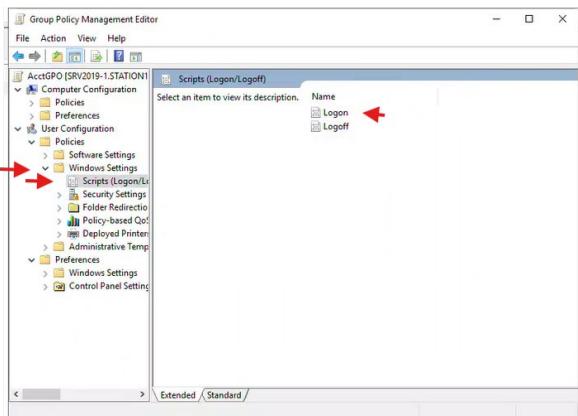
The screenshot shows the Group Policy Management console. The left pane shows the forest 'station1.com'. The main pane is titled 'Accounting' and displays a table of linked group policy objects. A context menu is open over the row for 'AcctGPO', with the 'Edit' option highlighted and a red arrow pointing to it. The table columns include Link Order, GPO, Enforced, Link Enabled, GPO Status, WMI Filter, Modified, and Domain.

Link Order	GPO	Enforced	Link Enabled	GPO Status	WMI Filter	Modified	Domain
1	AcctGPO	Enabled	None	1/21/202...	station1...		

- D) Under user configuration select Policies / Windows Settings

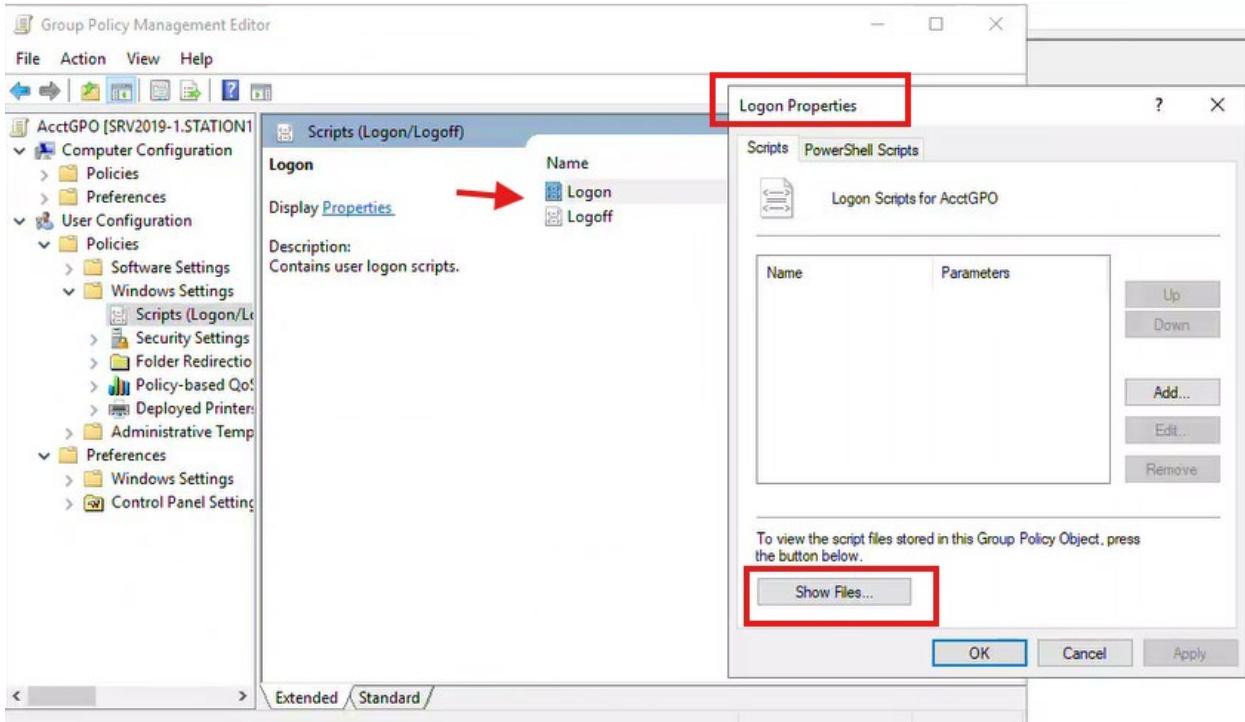


E) Click on Scripts Log on Log off. You can see there is a log on and a log off script

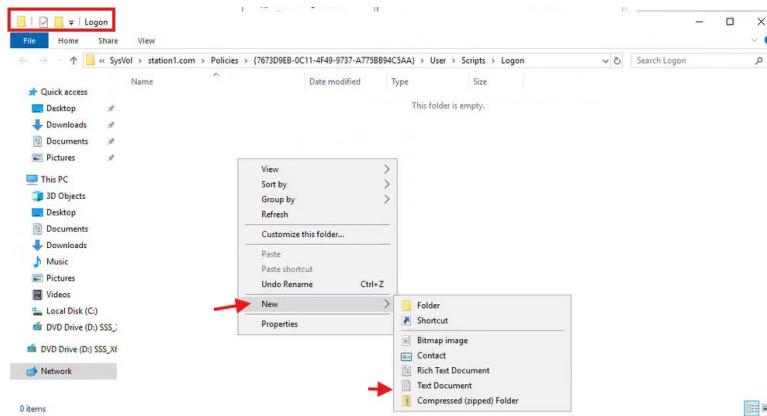


We are going to run a logon script so when user logs on is going to map a drive automatically to the user department folder for example accounting (folder Acct)

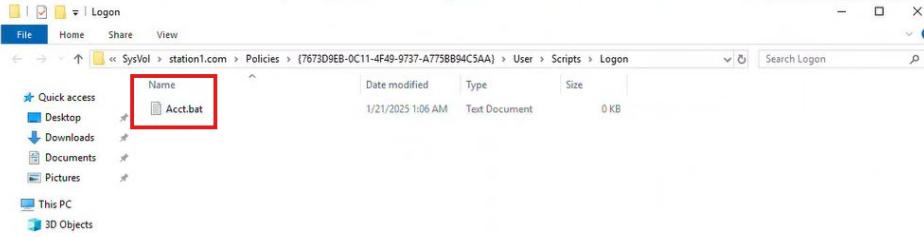
F) Double click on Log on and you can see nothing is listed here, click on show files



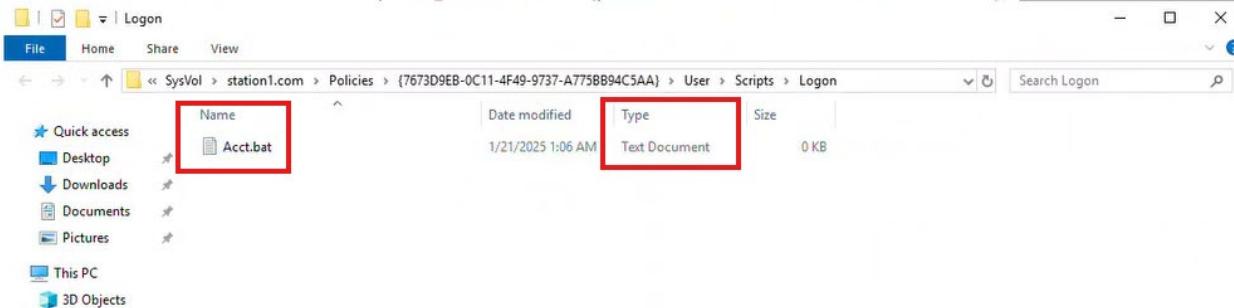
G) A window is opened, Right click select New/ Text Document



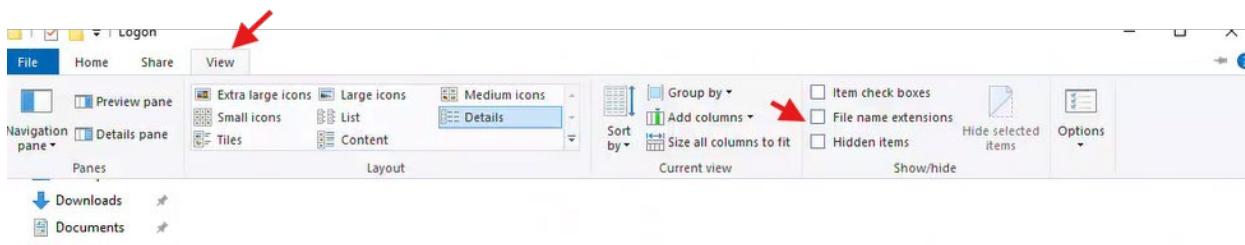
H) Create text document called Acct.bat



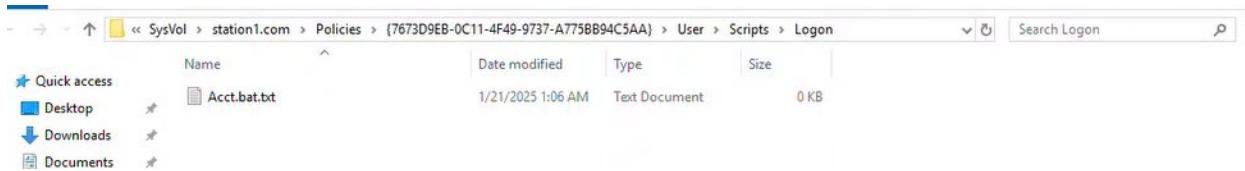
I) Notice type document is text



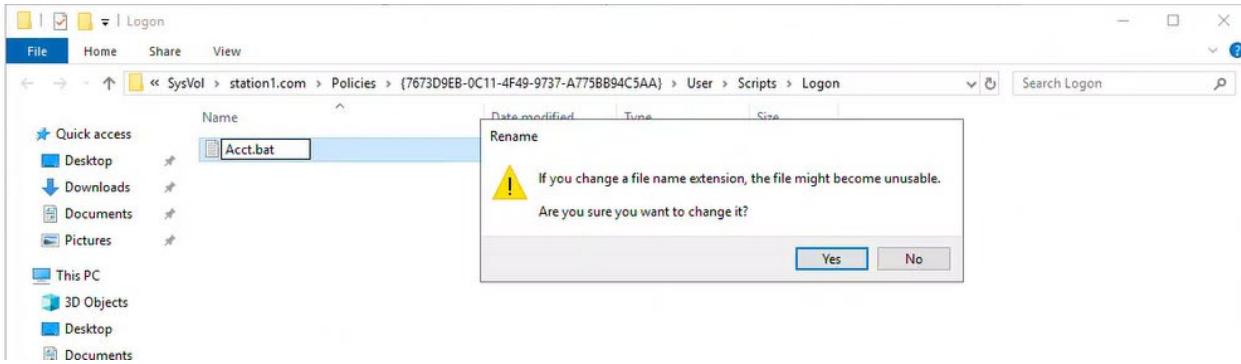
J) Select View/ File name extensions and click on it



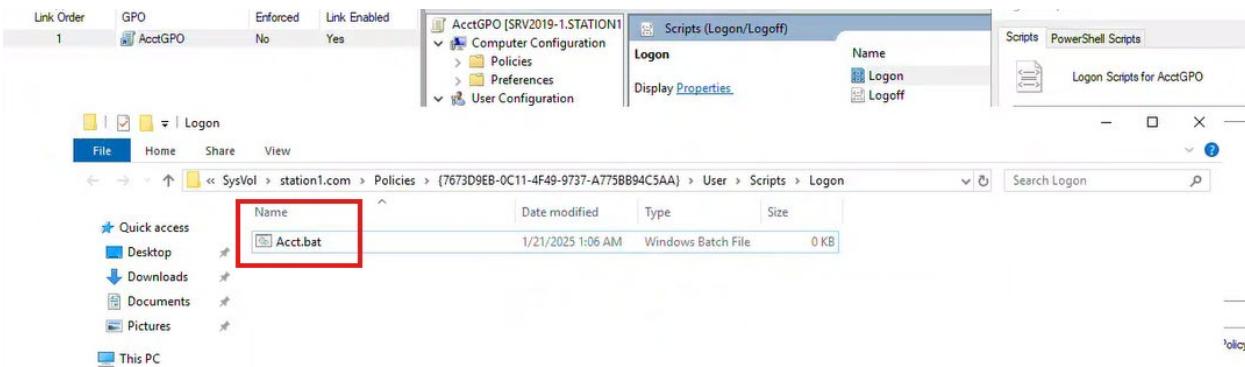
K) See name is Acct.bat.txt



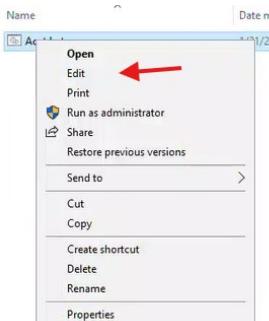
L) Rename the file to Acct.bat and say yes you want to change the file name to the Warning



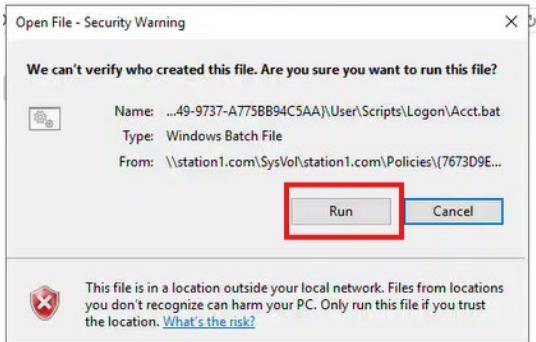
M) The icon change , now is a batch file



N) Right click on the file and Edit it

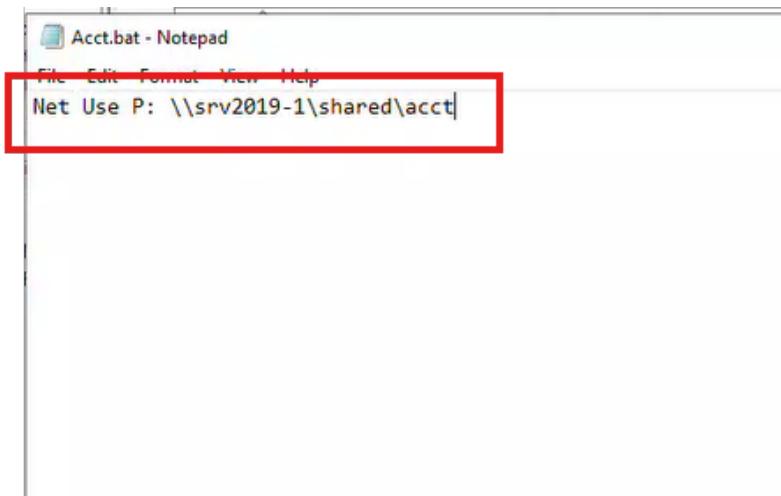


O) Click on run to open up the file

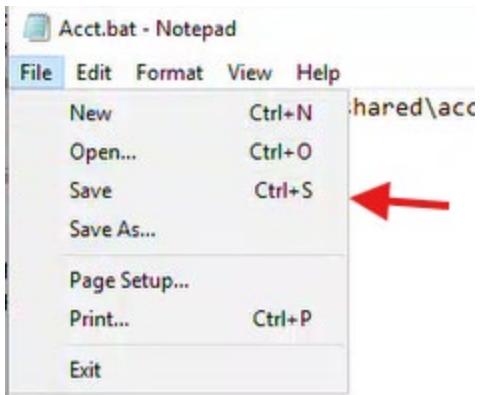


P) Write in the file

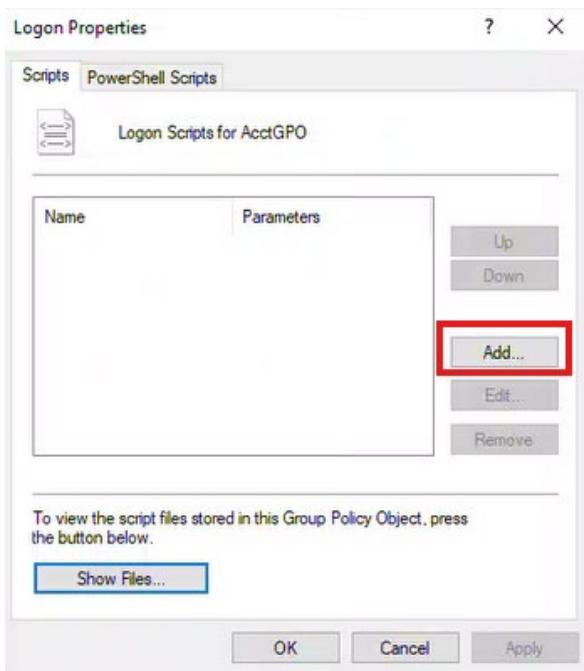
Net Use P: \\srv2019-1\shared\acct



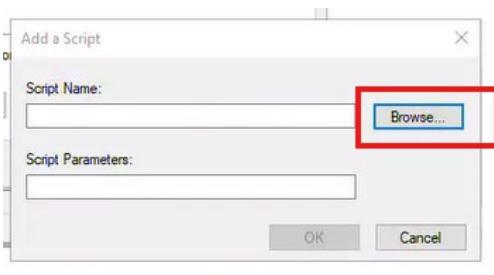
Q) Save the file and close it



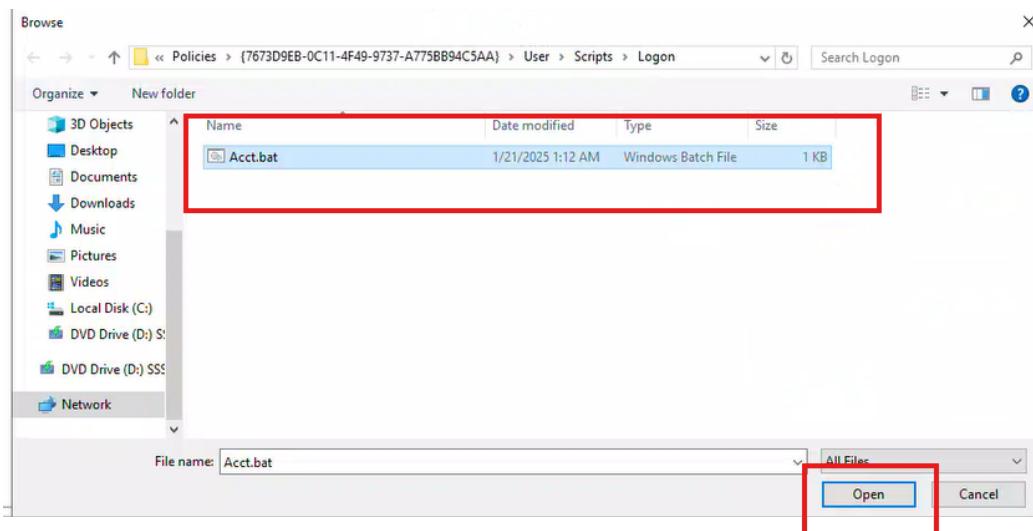
R) Go Back to Logon Properties window and click on Add



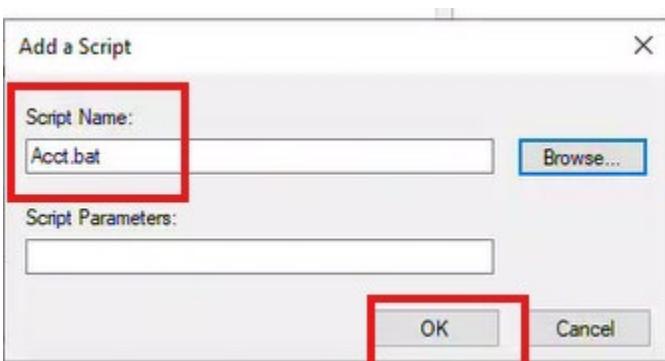
S) Browse



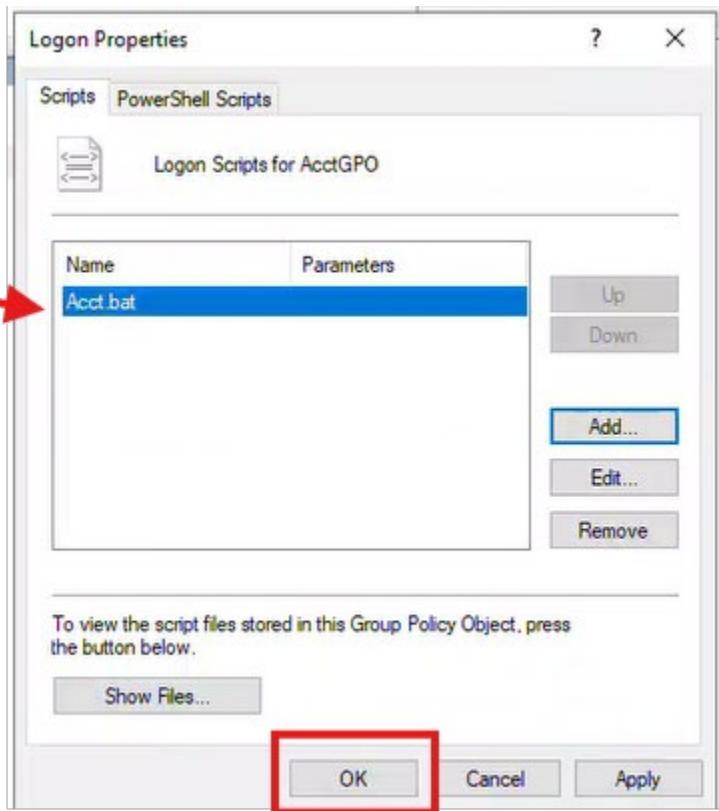
T) Choose the file and press OPEN



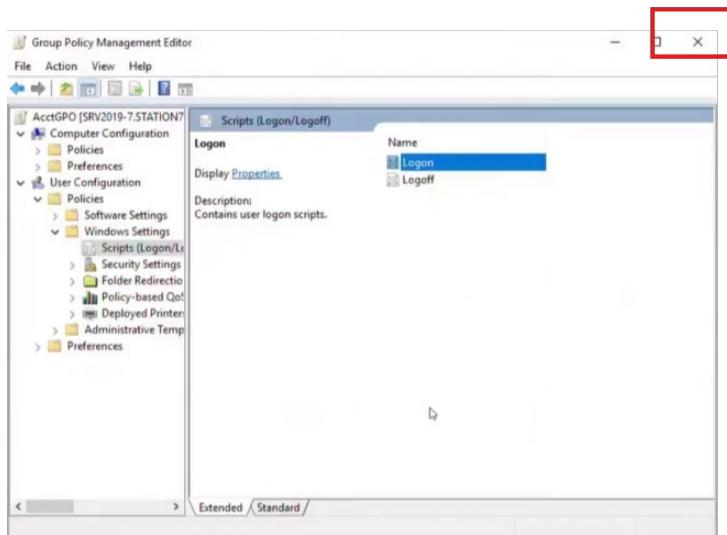
U) File is attached press ok



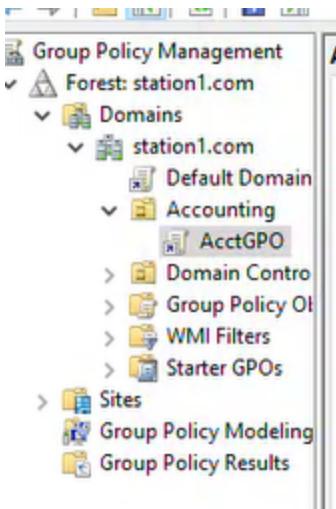
V) See the file is there and press OK



W) Close group policy Management Editor



X) Group policy is completed and added to Accounting



3.6.3 Update GPO

Lets go to command prompt and update in CMD

Force to update policy with command

```
gpupdate /force
```

Wait a little bit until message indicating policy has been updated appears

A screenshot of an 'Administrator: Command Prompt' window. The window title is 'Administrator: Command Prompt'. The text inside the window shows the command 'gpupdate /force' being run, followed by the message 'Updating policy...'. Below that, it says 'Computer Policy update has completed successfully.' and 'User Policy update has completed successfully.'. A red arrow points to the bottom right corner of the command prompt window.

3.6.4 Test GPO

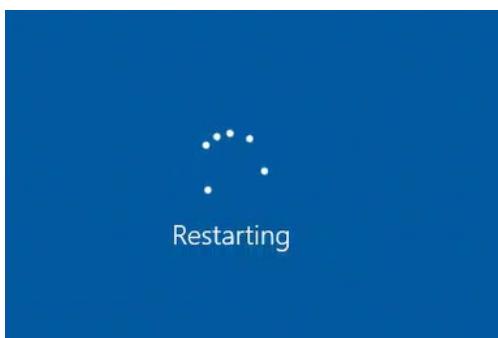
In Windows 10

- A) Login as Chuck Smith



B) Reboot

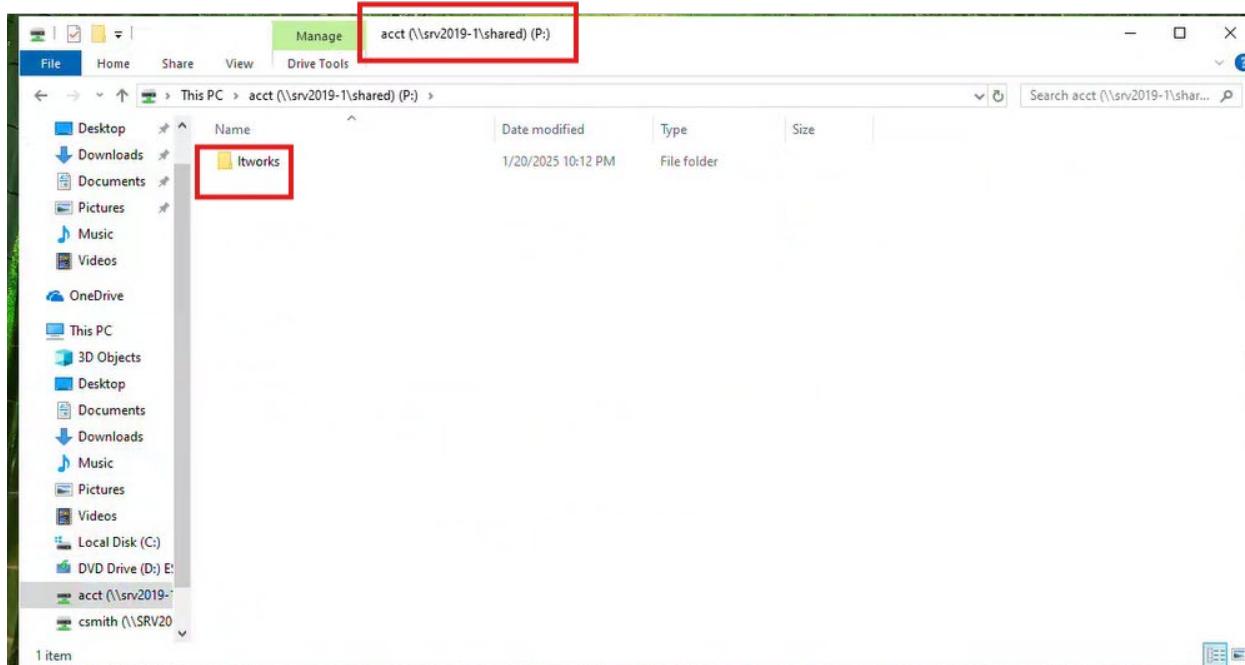
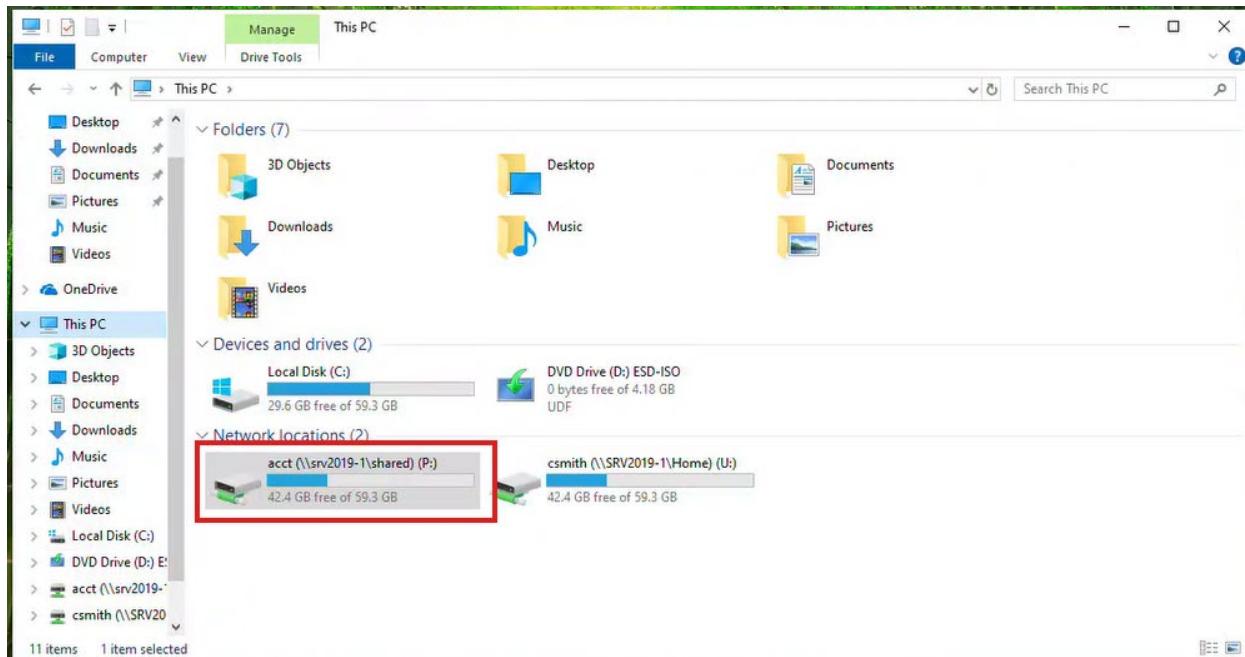
Reboot so group policy is updated in windows client



C) Login as Chuck Smith after reboot



D) Open up folders and folder is there

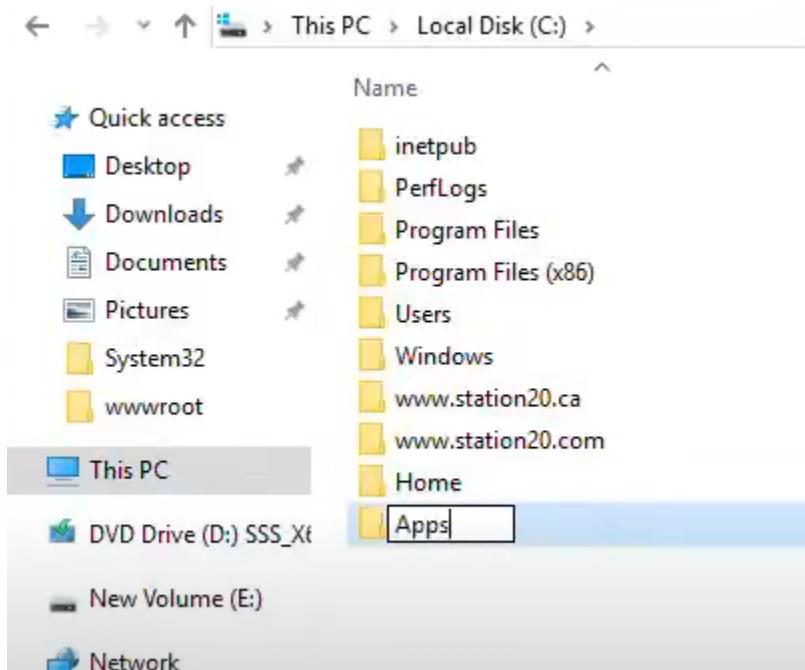


3.7 Map Apps Folder in Acct GPO and Test

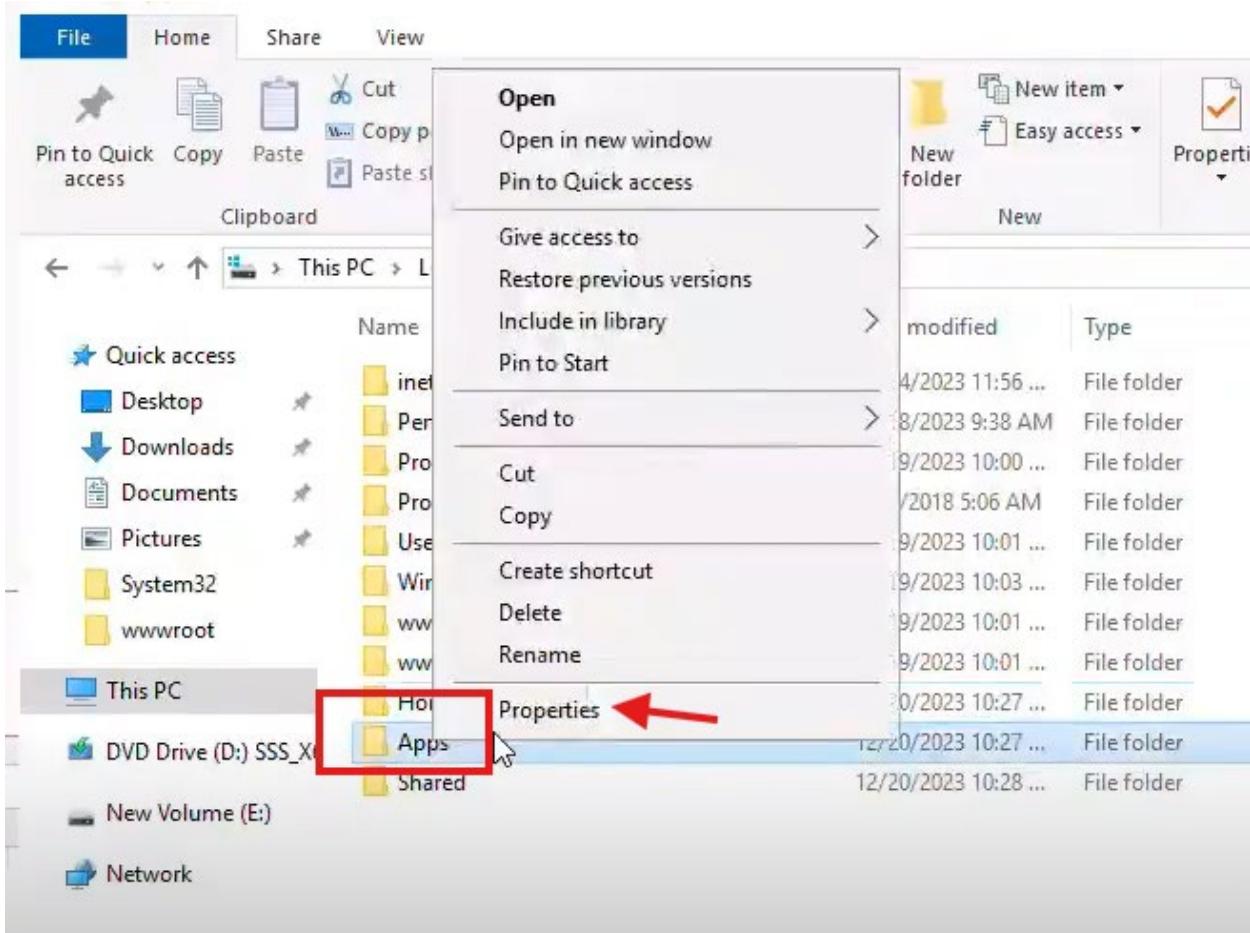
- A) Login to windows 2019 server

3.7.1 Create new folder Apps

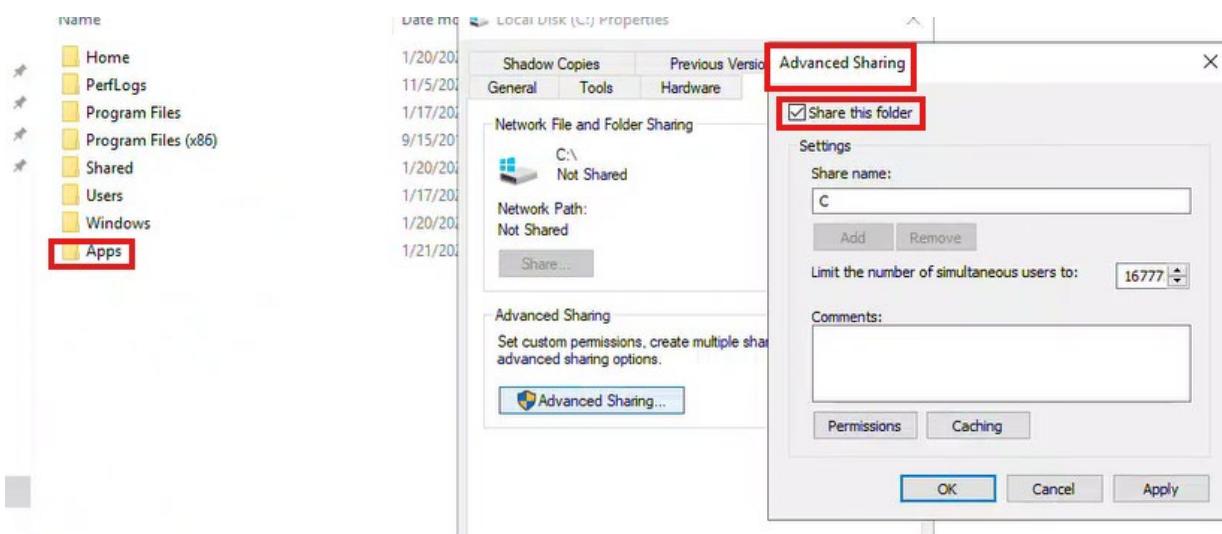
- A) Create new folder Apps

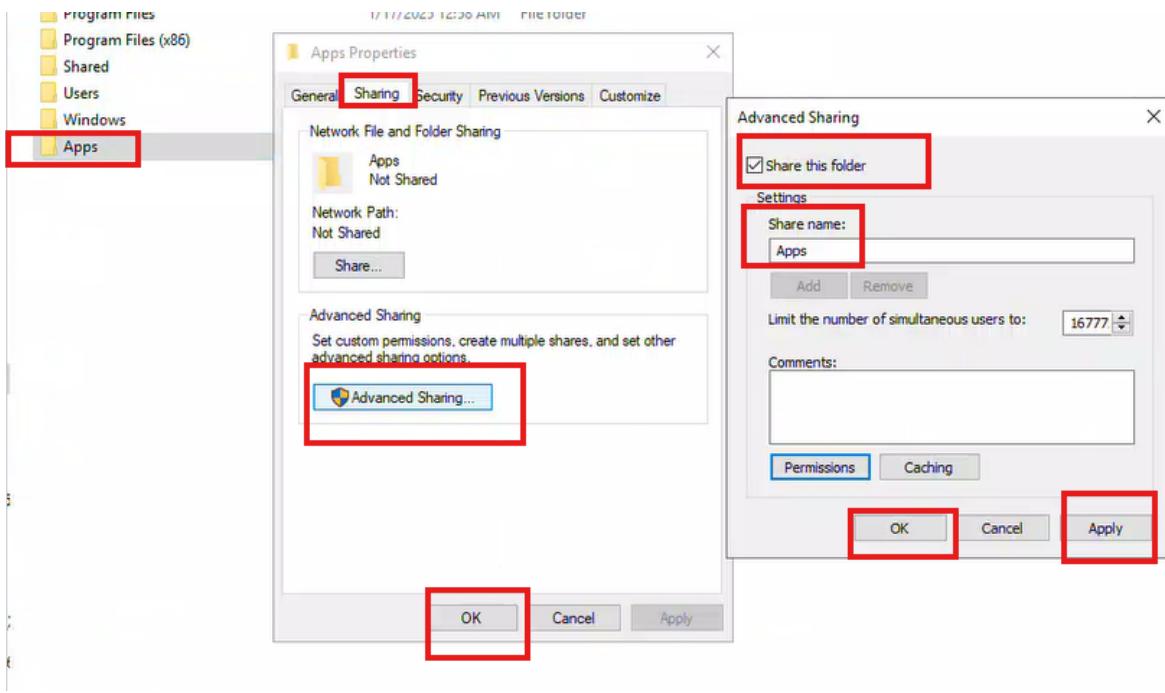


3.7.1.1 Change Apps permissions

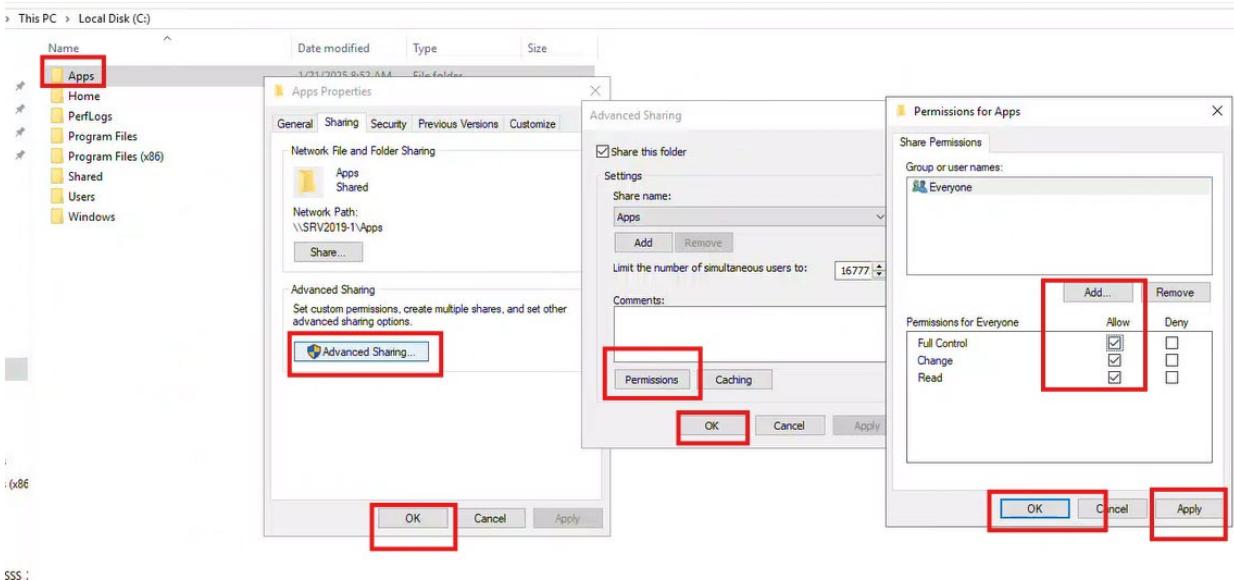


B) Sharing / Advance sharing Share this folder



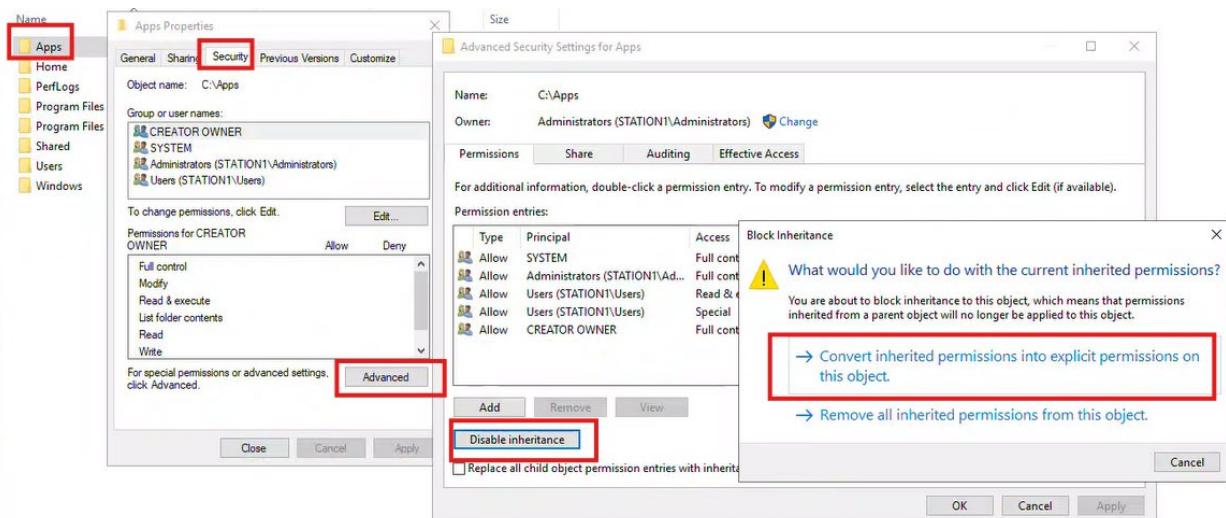


C) Sharing Advance Sharing / Permissions / full control



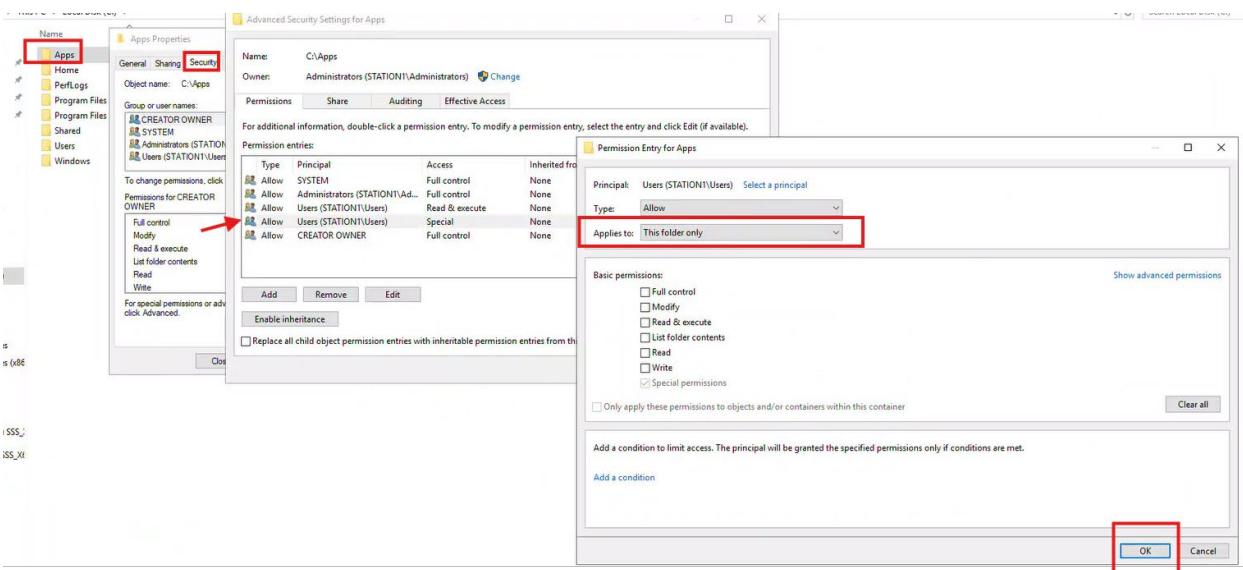
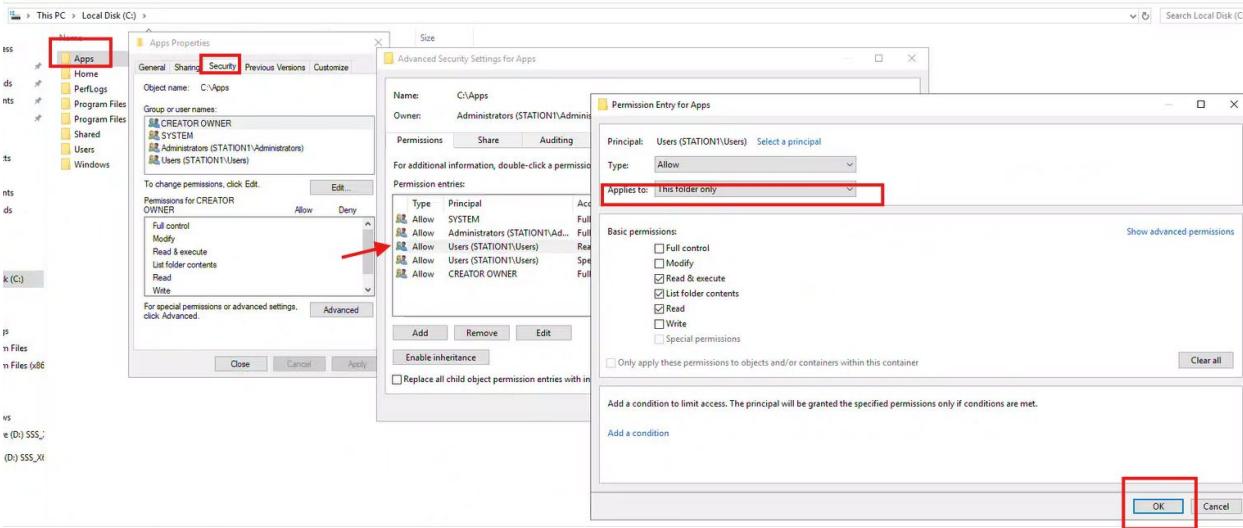
3.7.1.2 Security

Security Tab/ Advance security/Disable inheritance /convert



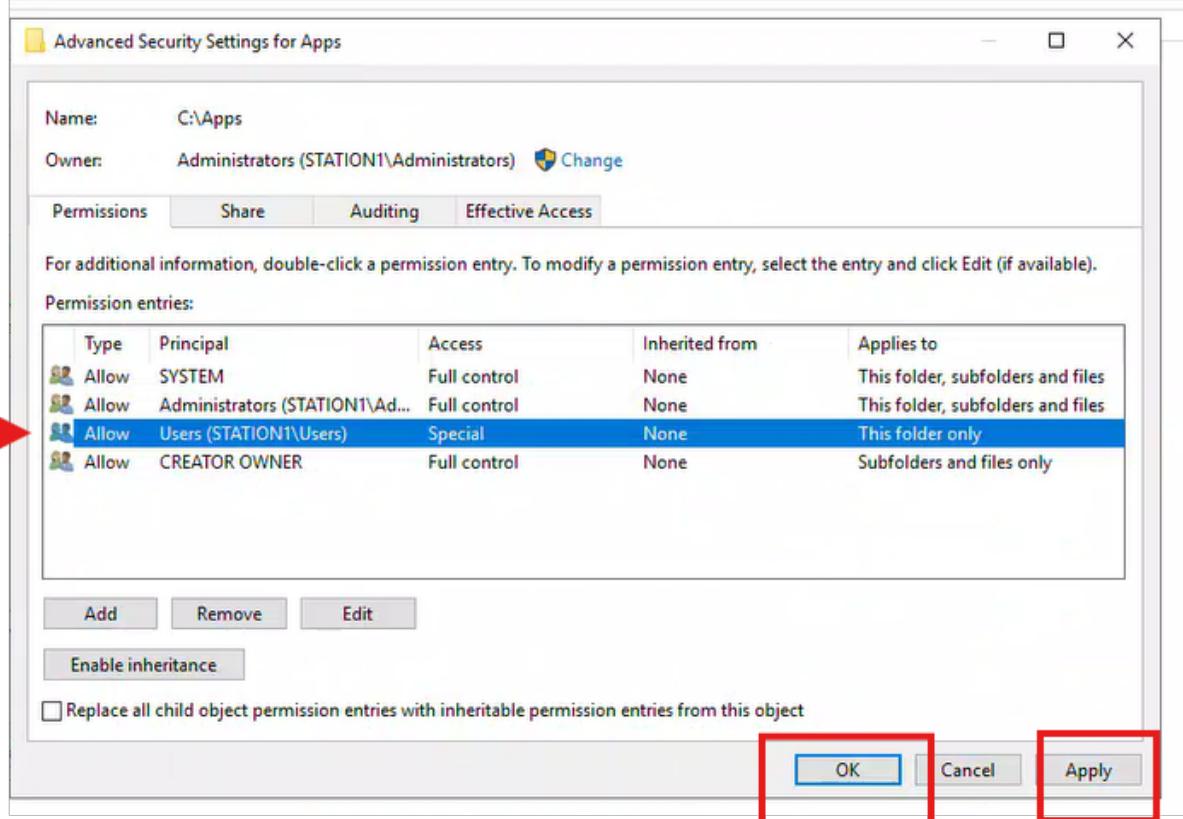
Type	Principal	Access	Inherited from	Applies to
Allow	SYSTEM	Full control	None	This folder, subfolders and files
Allow	Administrators (STATION1\Administrators)	Full control	None	This folder, subfolders and files
Allow	Users (STATION1\Users)	Read & execute	None	This folder, subfolders and files
Allow	Users (STATION1\Users)	Special	None	This folder and subfolders
Allow	CREATOR OWNER	Full control	None	Subfolders and files only

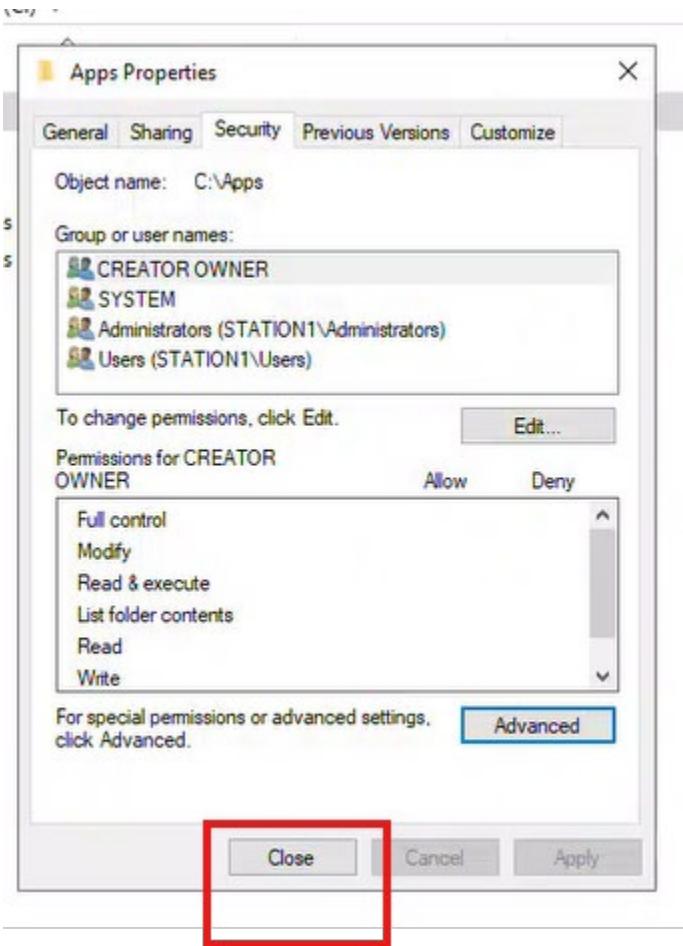
Modify user 1 – This folder only



Modify user 2 – this folder only

Apply Ok ok close





3.7.2 Mapping apps folder

Check permissions

Server manager Group policy management

Tools / Group policy manager

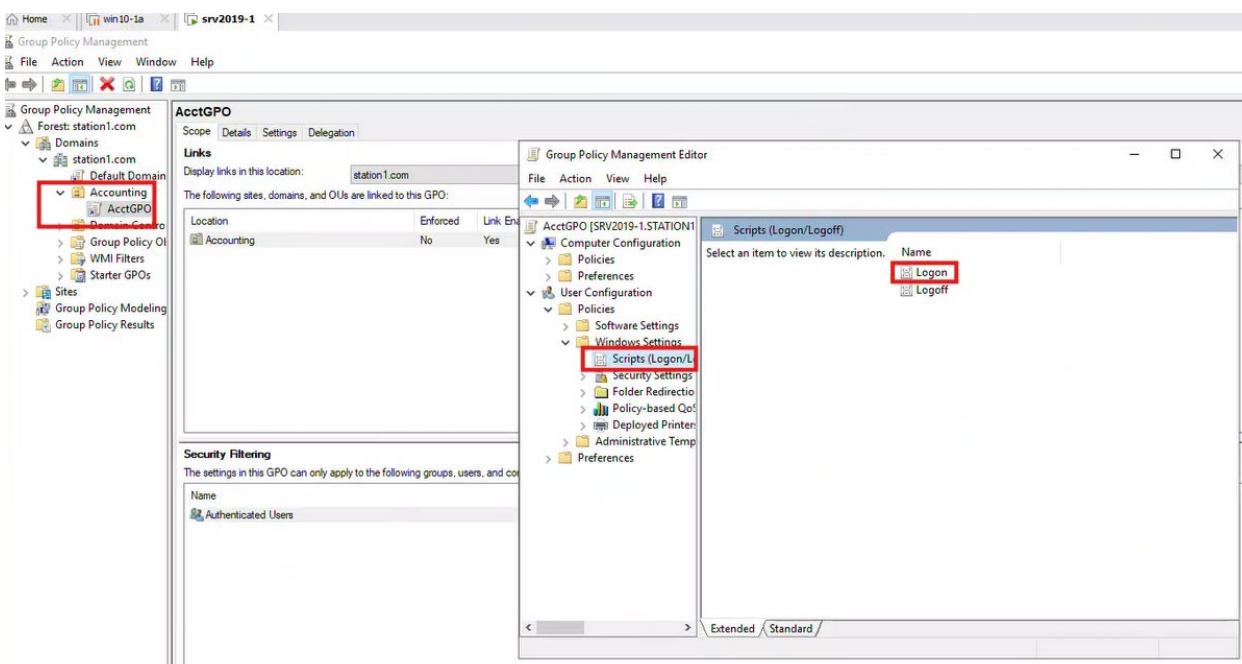
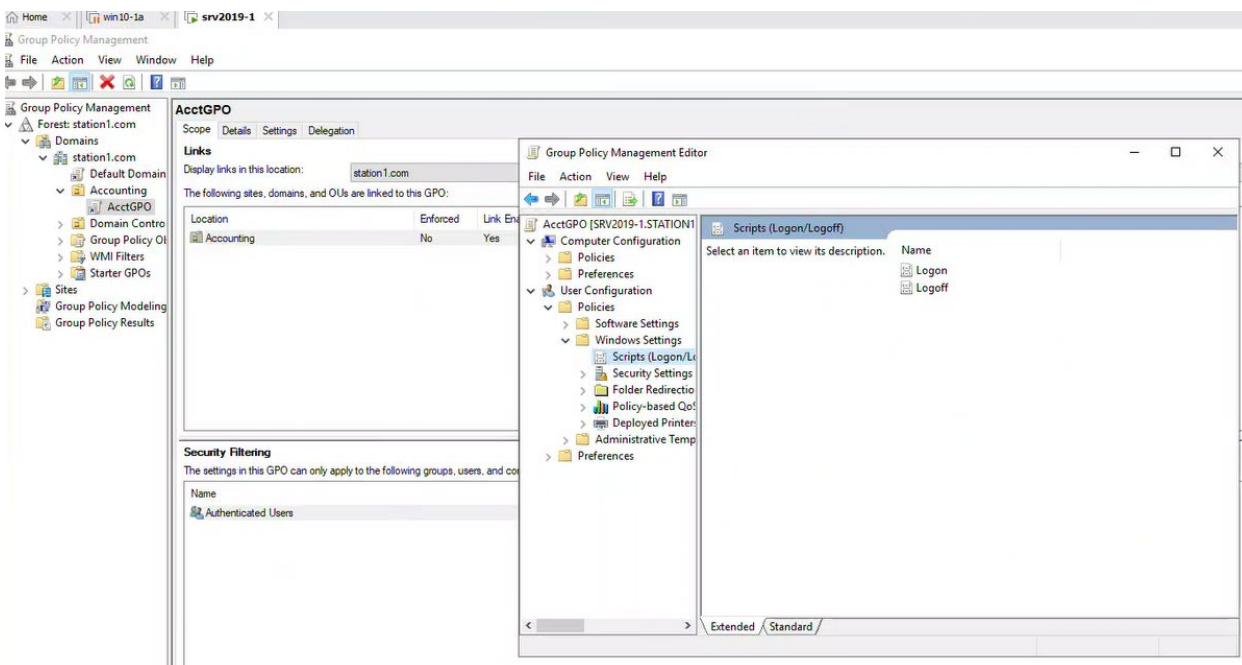
Edit GPO for accounting

User configuration log on log off

Click on logon

Show files

Edit accounting batch file



```
Acct.bat - Notepad
File Edit Format View Help
Net Use P: \\srv2019-1\shared\acct
Net Use L: \\srv2019-1\Apps
```

A red arrow points from the bottom-left towards the 'Acct.bat' file in the Notepad window.

GP update

```
C:\Users\Administrator>gpupdate /force
Updating policy...
Computer Policy update has completed successfully.
User Policy update has completed successfully.

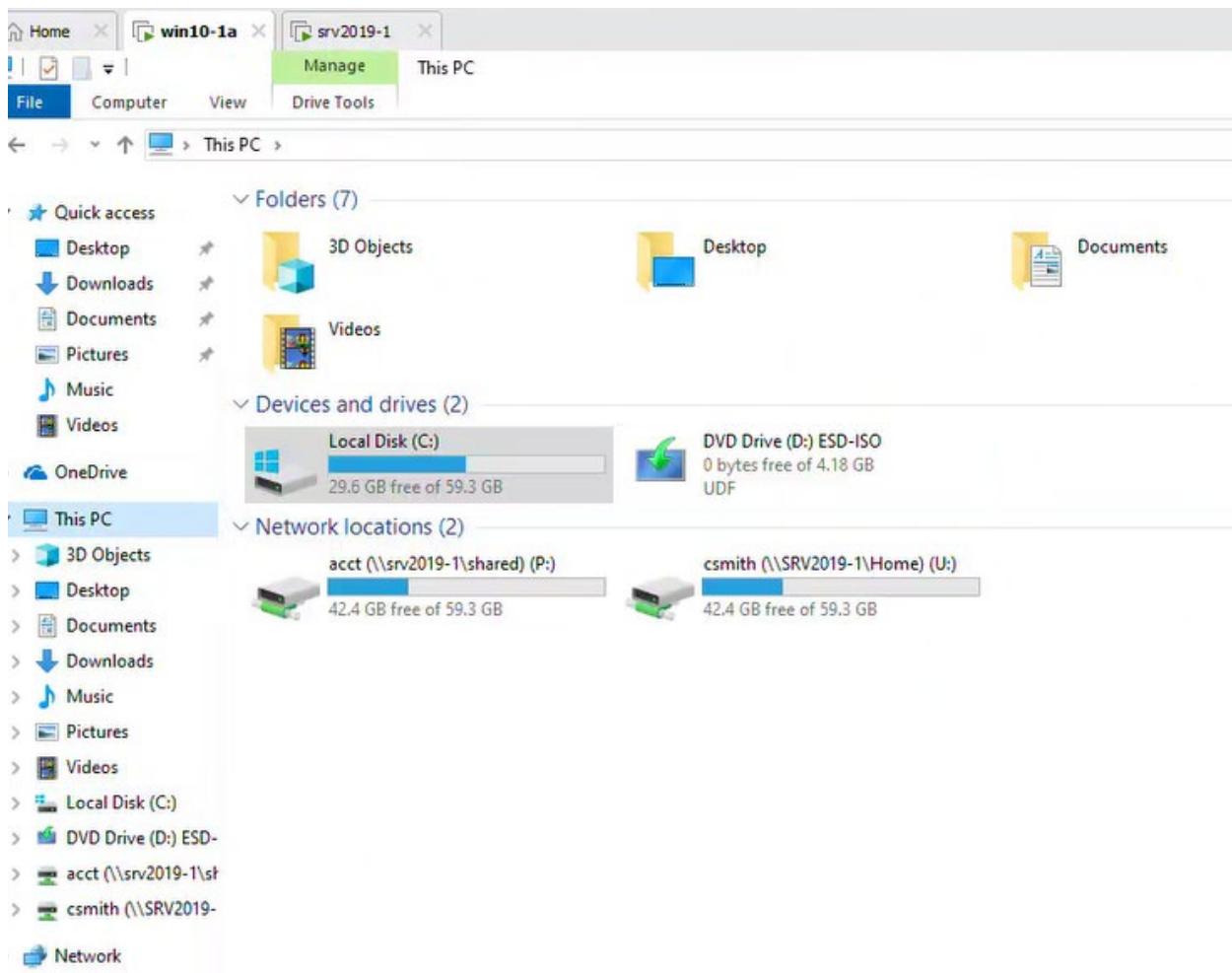
C:\Users\Administrator>_
```

3.7.3 Test

Login as user in Accounting



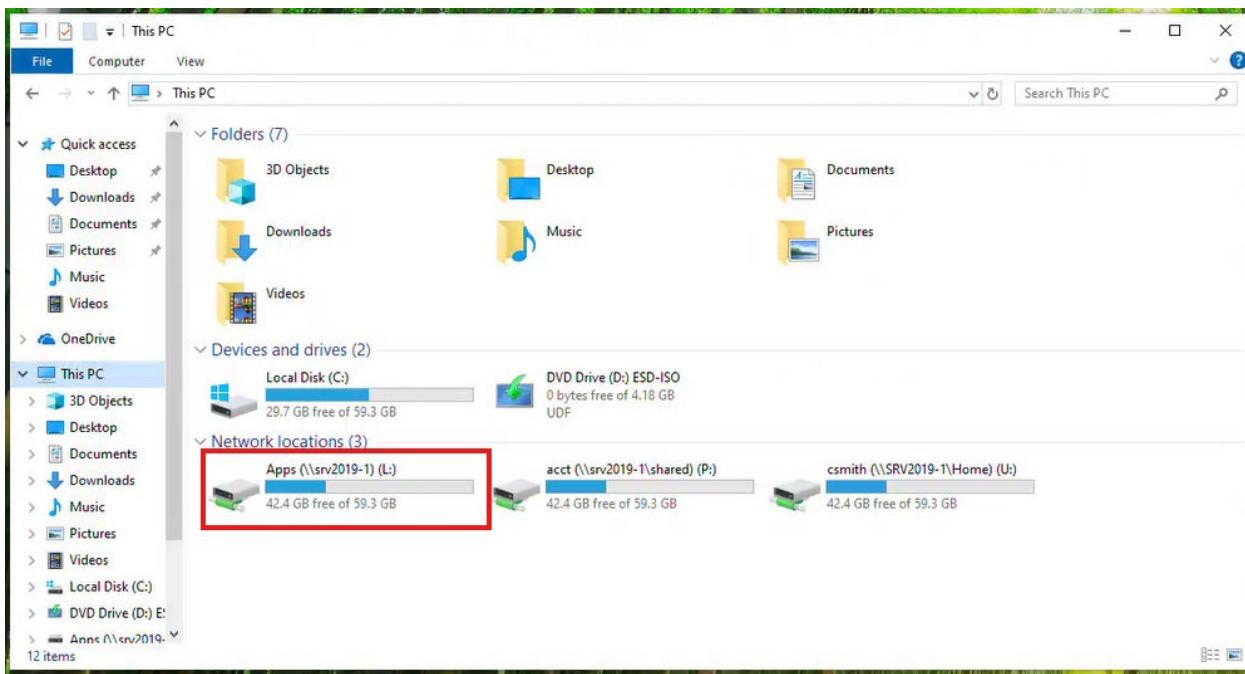
Does not whow



Do restart

Login again

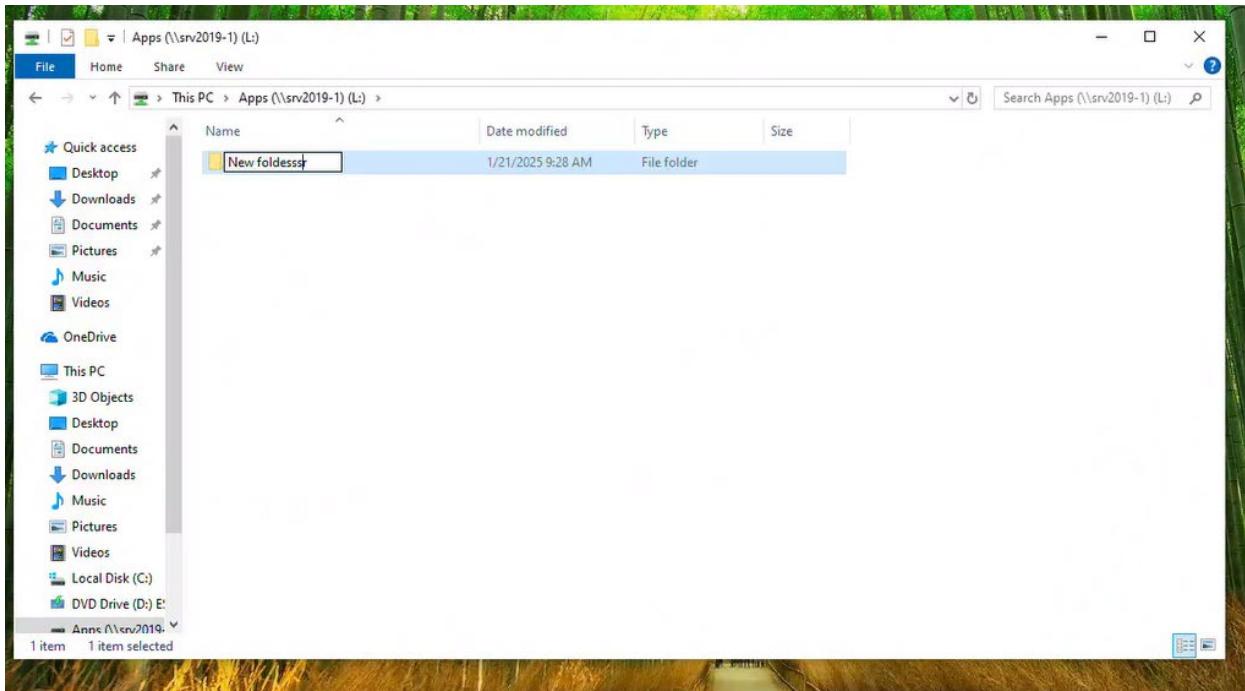
After reboot folder is seen



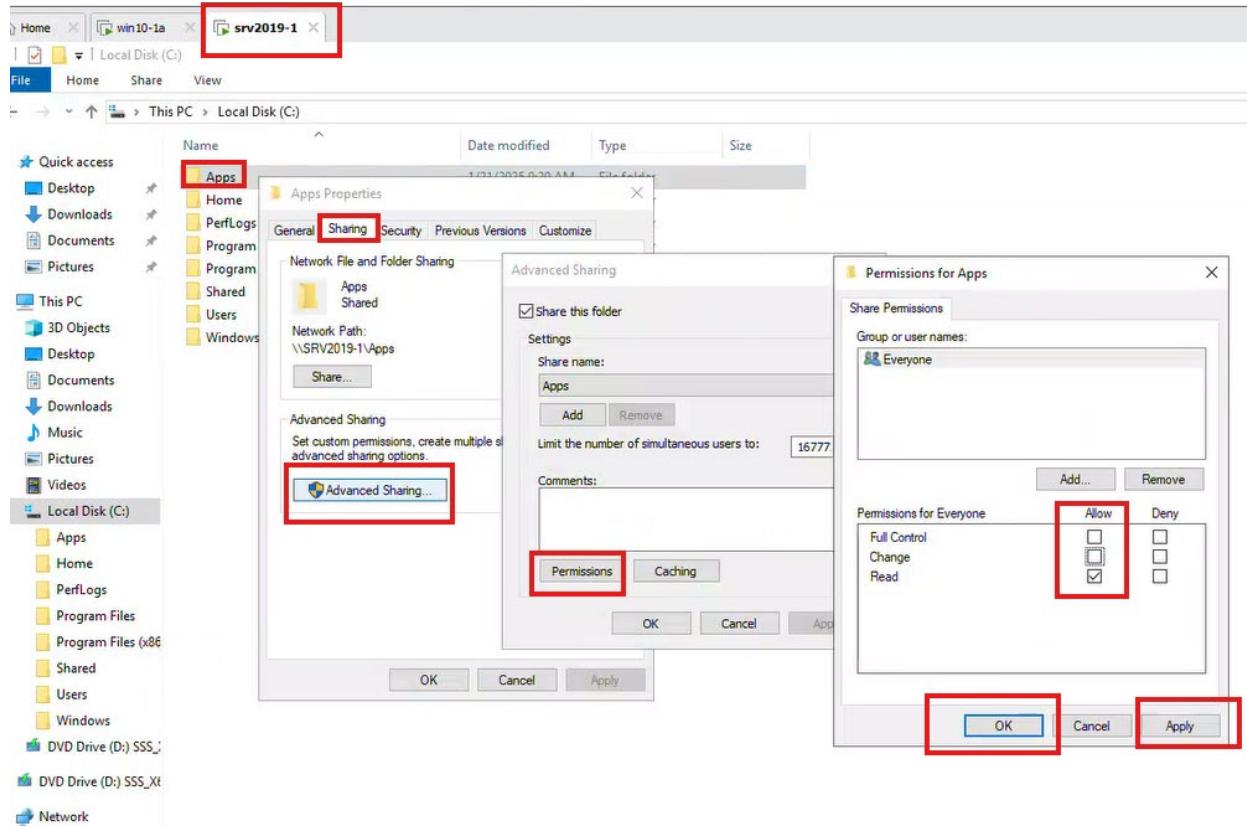
Go inside Apps

Try to create a folder

We are able

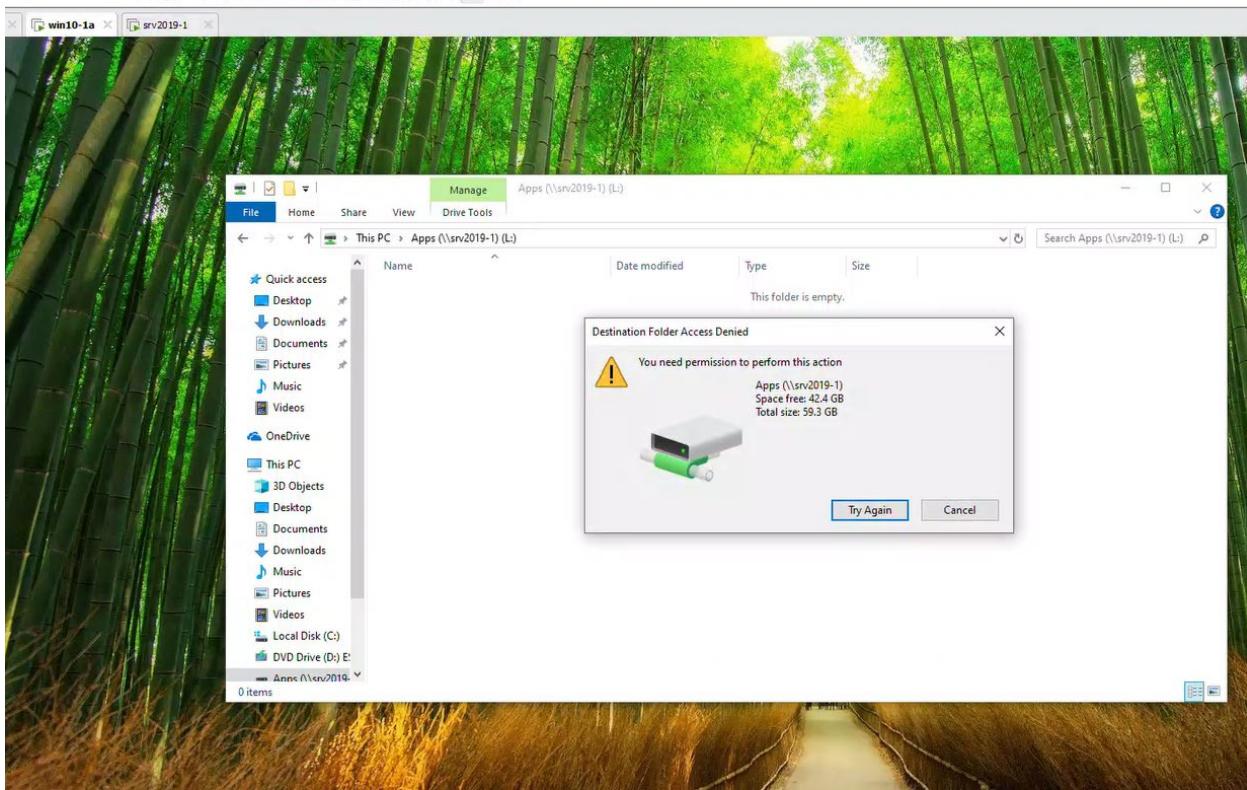


SERVER WIN2019



Go back to windows 10

Try to create a folder now you can not create it



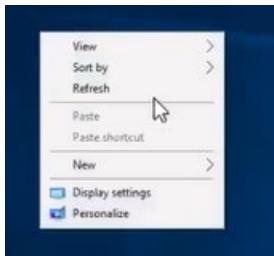
3.8 Folder redirection

3.8.1 Personalize desktop in client windows 10

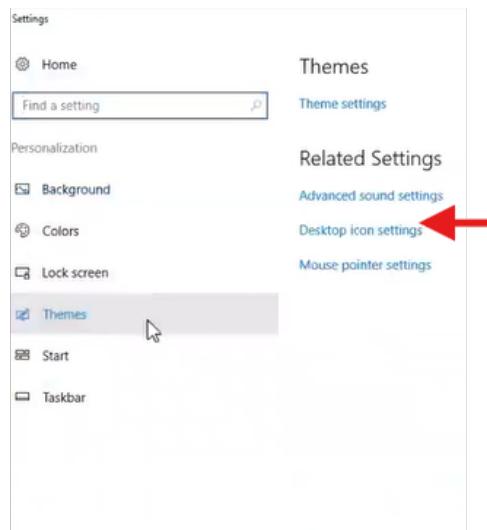
- A) Login to windows 10 Box



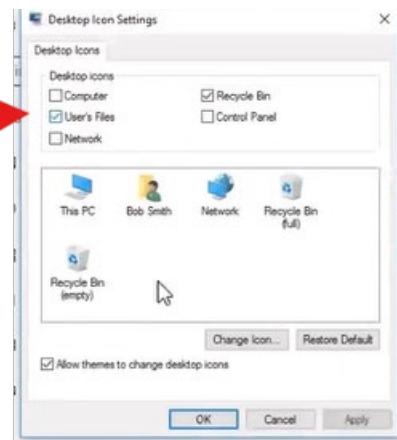
- B) On screen right click and select in the menu Personalize



C) Click on Themes/Desktop icons



D) Select the users file



E) Open user on Desktop

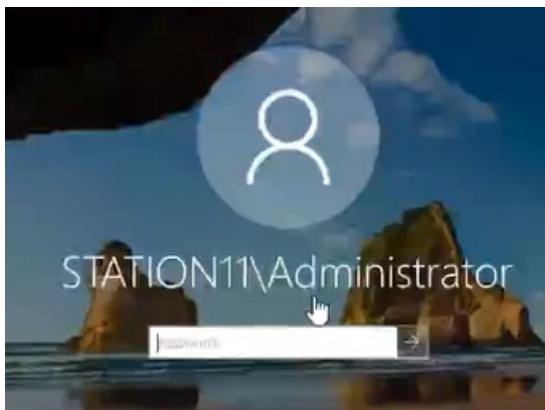


F) See user Desktop



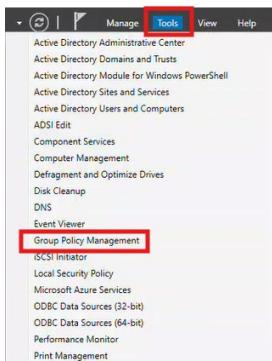
3.8.2 Set Group policy in Server

A) Login to server

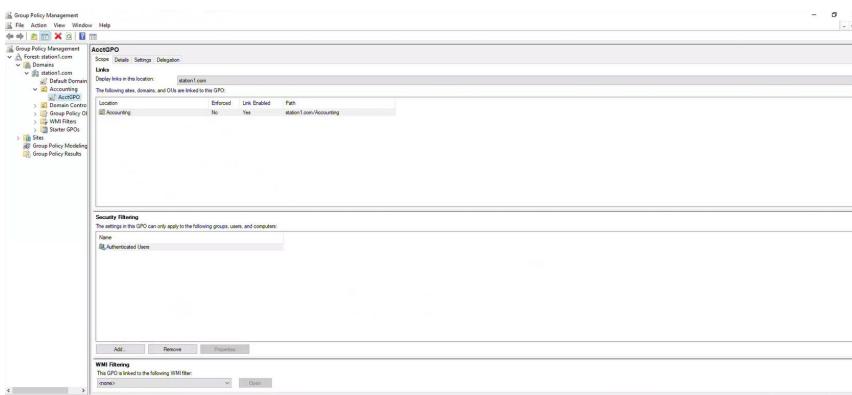


B) Open Group policy manager

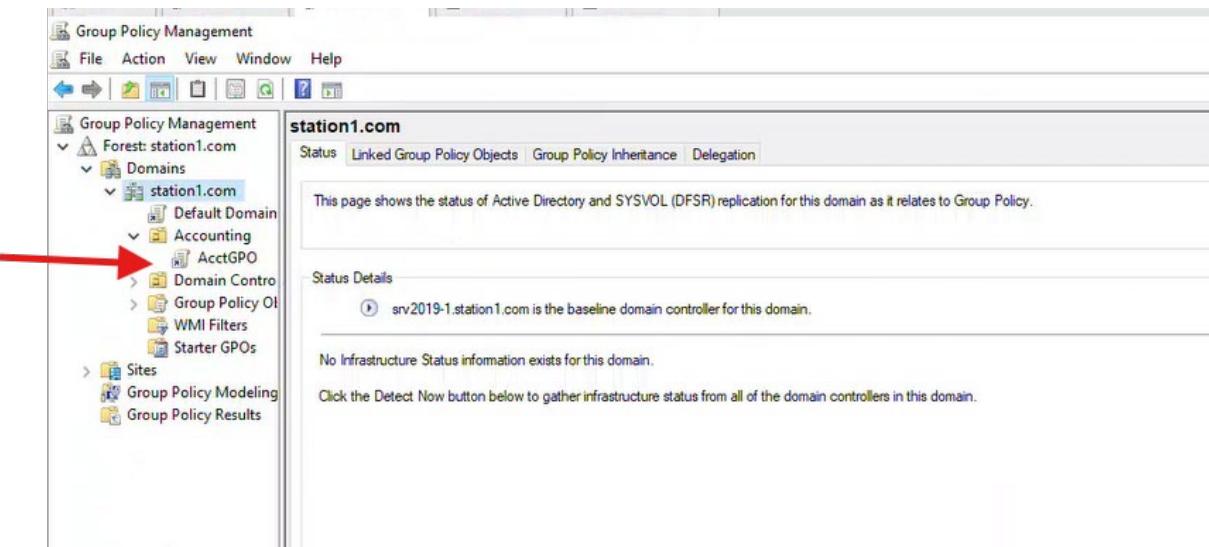
In the Server Manager dashboard, go to Tools and select Group Policy Management.



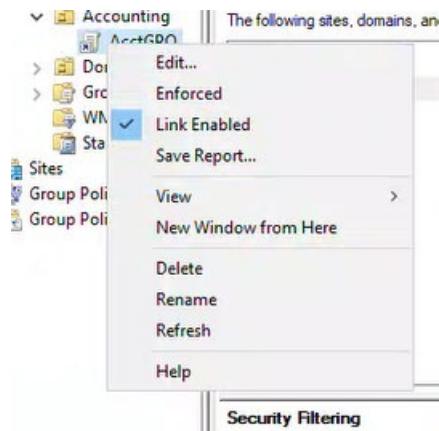
C) Group policy Management window opens



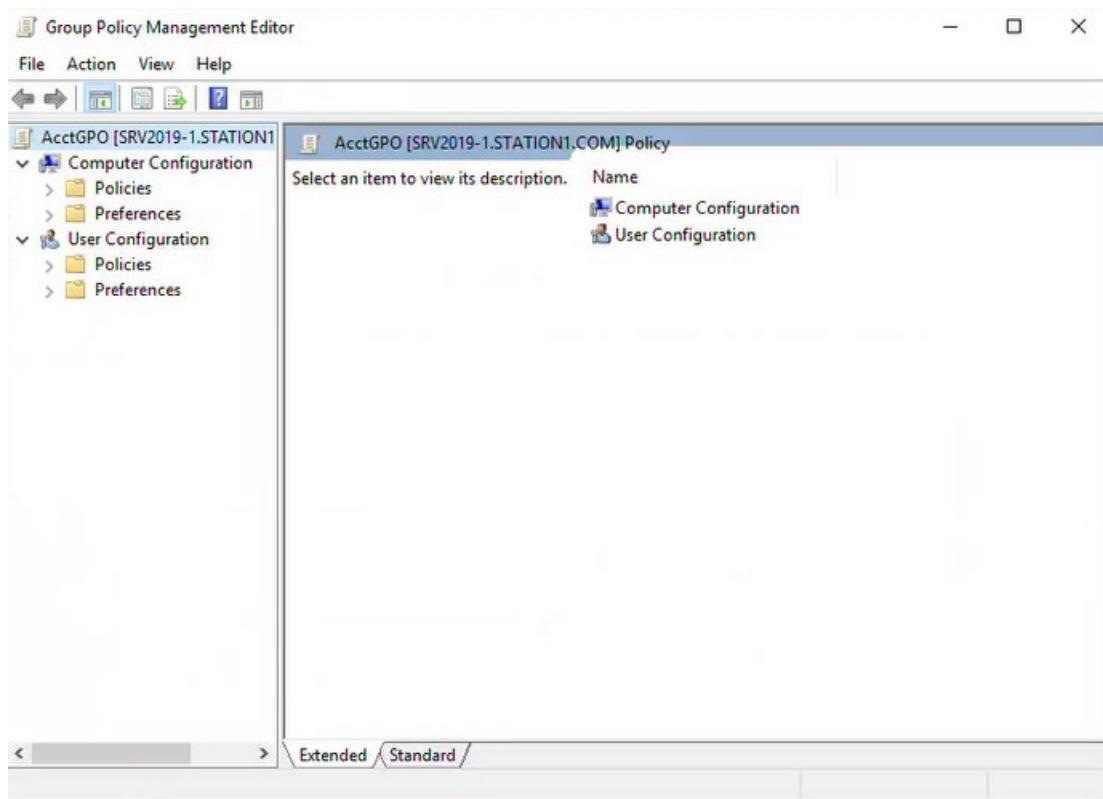
D) Select GPO



E) Click on Edit

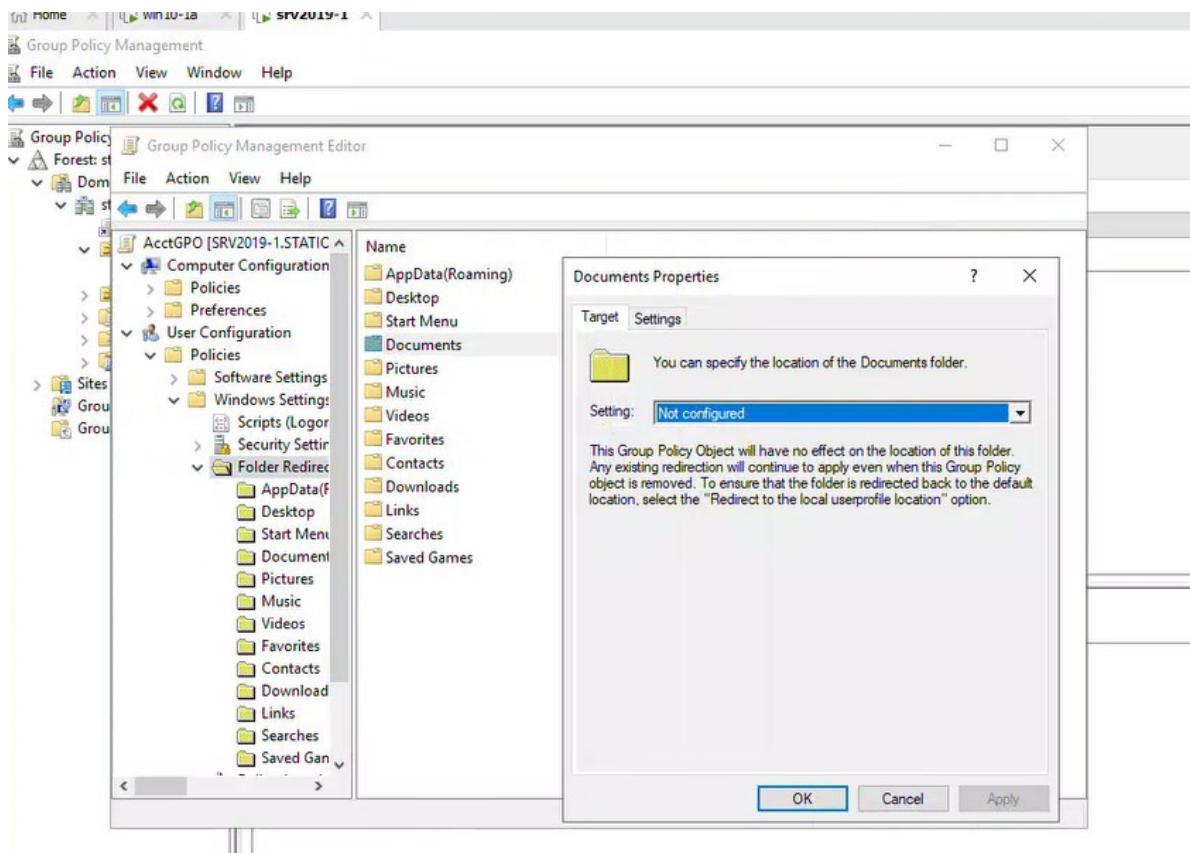


F) New windows open “Group Policy management Editor”



- G) In the console Expand user configuration , Policies, Windows settings, folder redirection
Select Documents folder and right click on properties

See is currently not configured

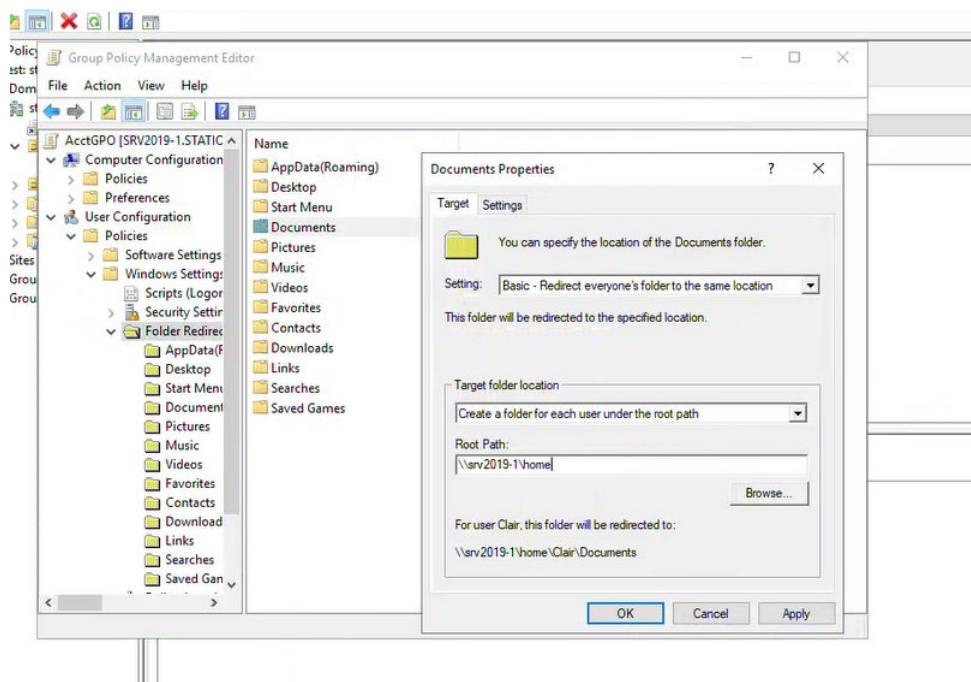


H) Pull this down and select

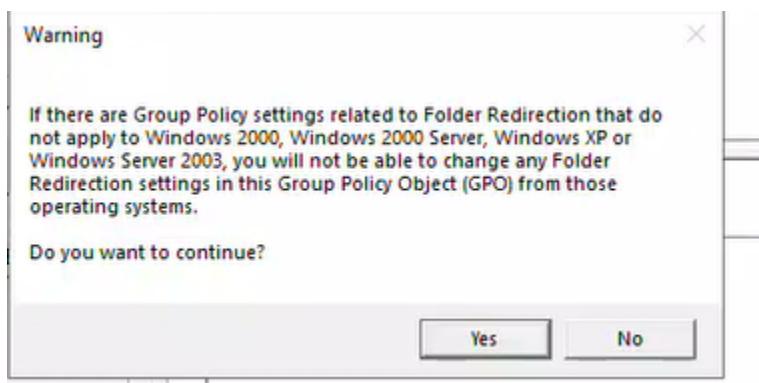
Basic – Redirect everyone's folder to the same location

Root Path - \\\sr\\2019-1\\home

Click OK



I) Warning about windows 200 appears, select YES



J) Update group policy via CMD

gpupdate /force

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

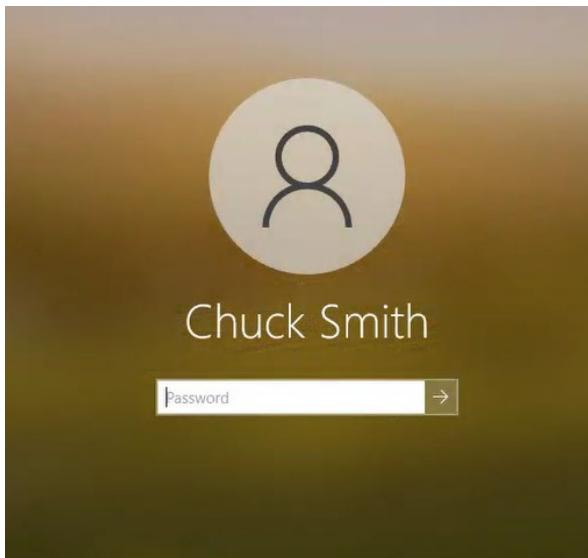
C:\Users\Administrator>gpupdate /force
updating policy...

Computer Policy update has completed successfully.
User Policy update has completed successfully.

C:\Users\Administrator>
```

3.8.3 Verify Policy on windows 10

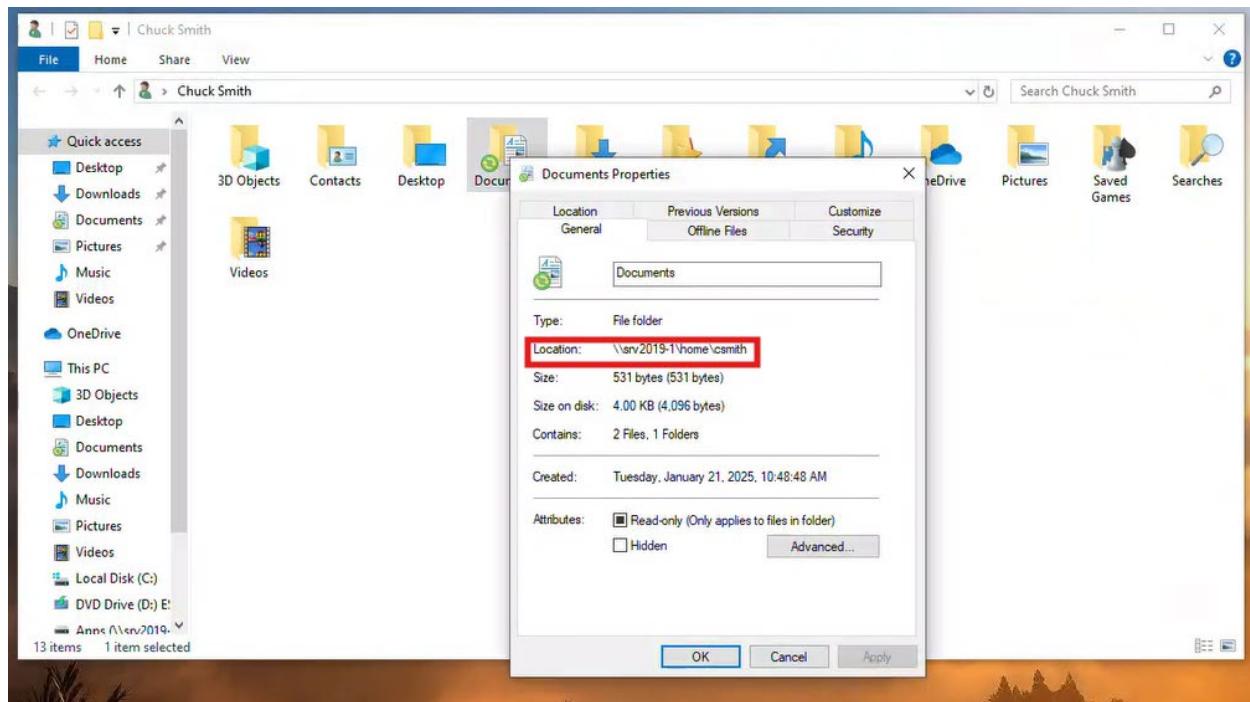
- A) Reboot Windows 10
- B) Login after reboot



- C) Check documents folder See it has a green circle

Right click on documents and Select Properties

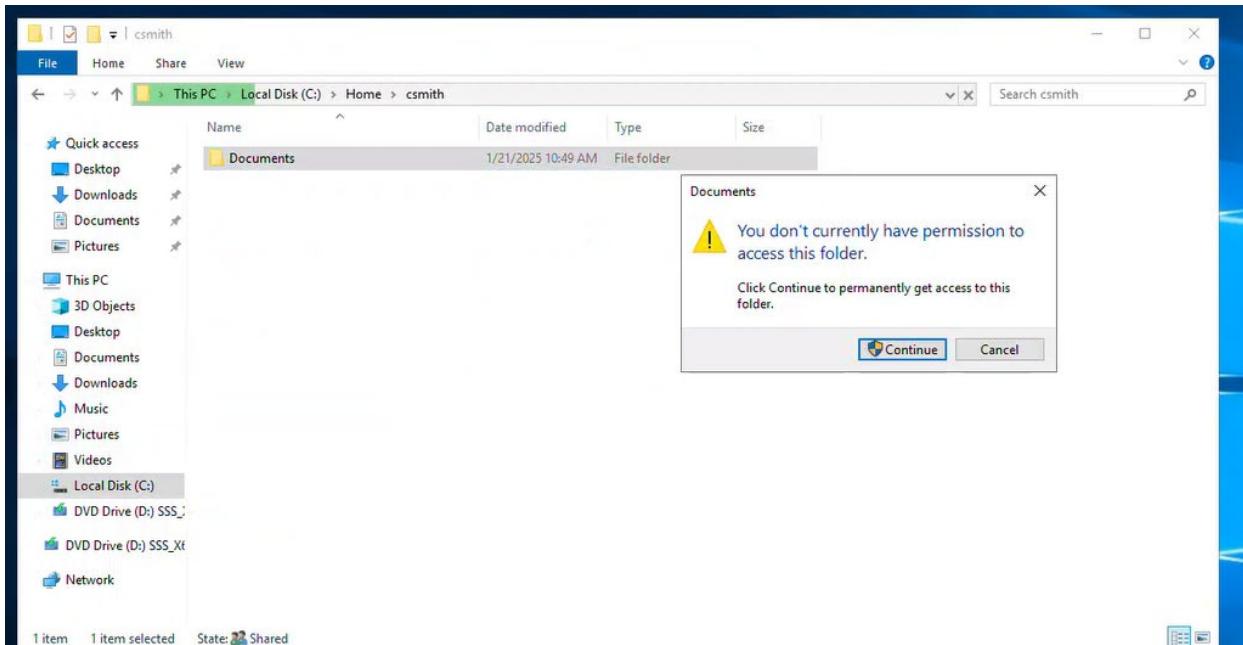
See location



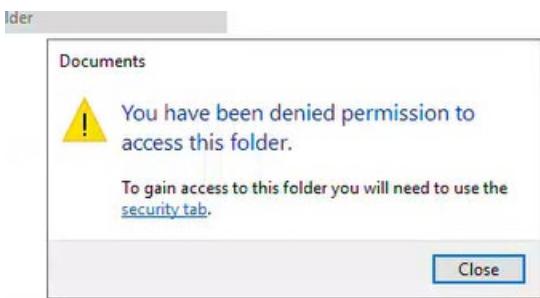
3.8.4 Verify Policy on Server

Login to Server

Administrator has access to anything but not the folder of the user



Click on Continue and a new window appears



When folder was created with folder redirection it only gave access to the user

3.9 Install DHCP

The next section specifies how to install DHCP on Internal Card. Installing DHCP , will allow us to give Ip addresses automatically from our server.

Please be aware that this needs to do this in a safe manner.

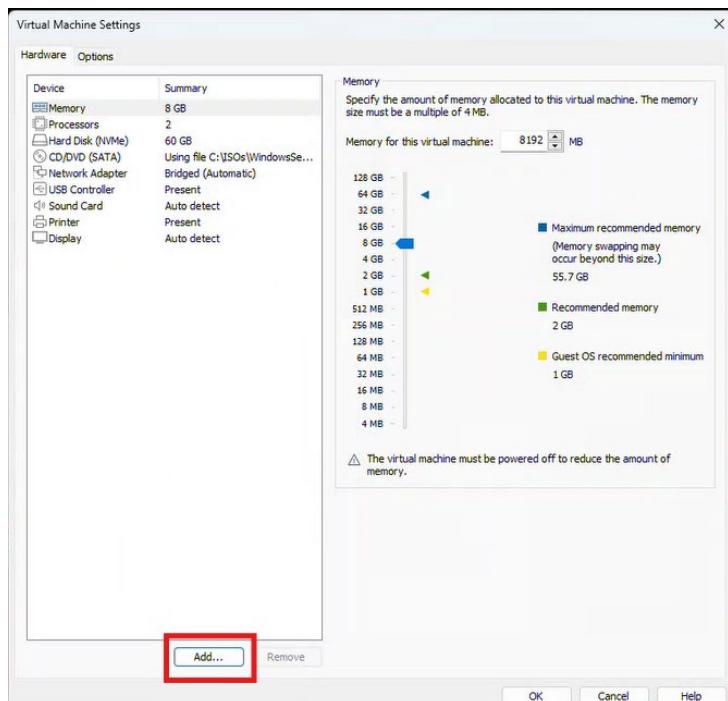
3.9.1 Preparation

Login to windows server

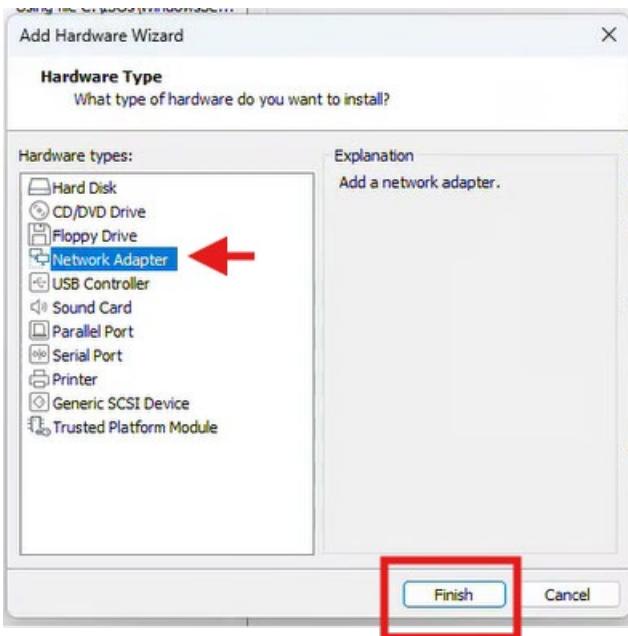


3.9.1.1 Modify VM to add a second network card

A) Click on VM /Settings, Click con Add

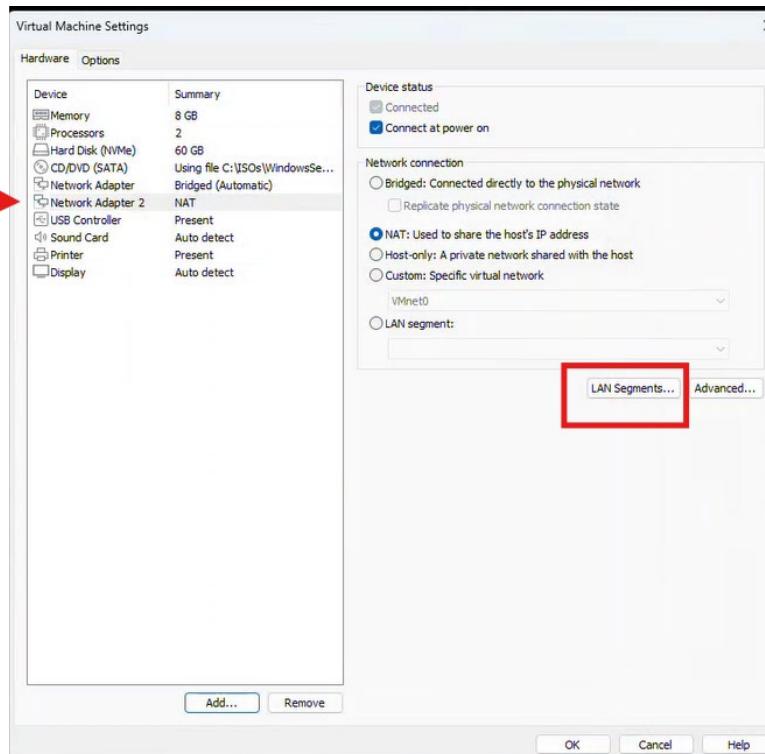


B) Choose network adapter and click on finish



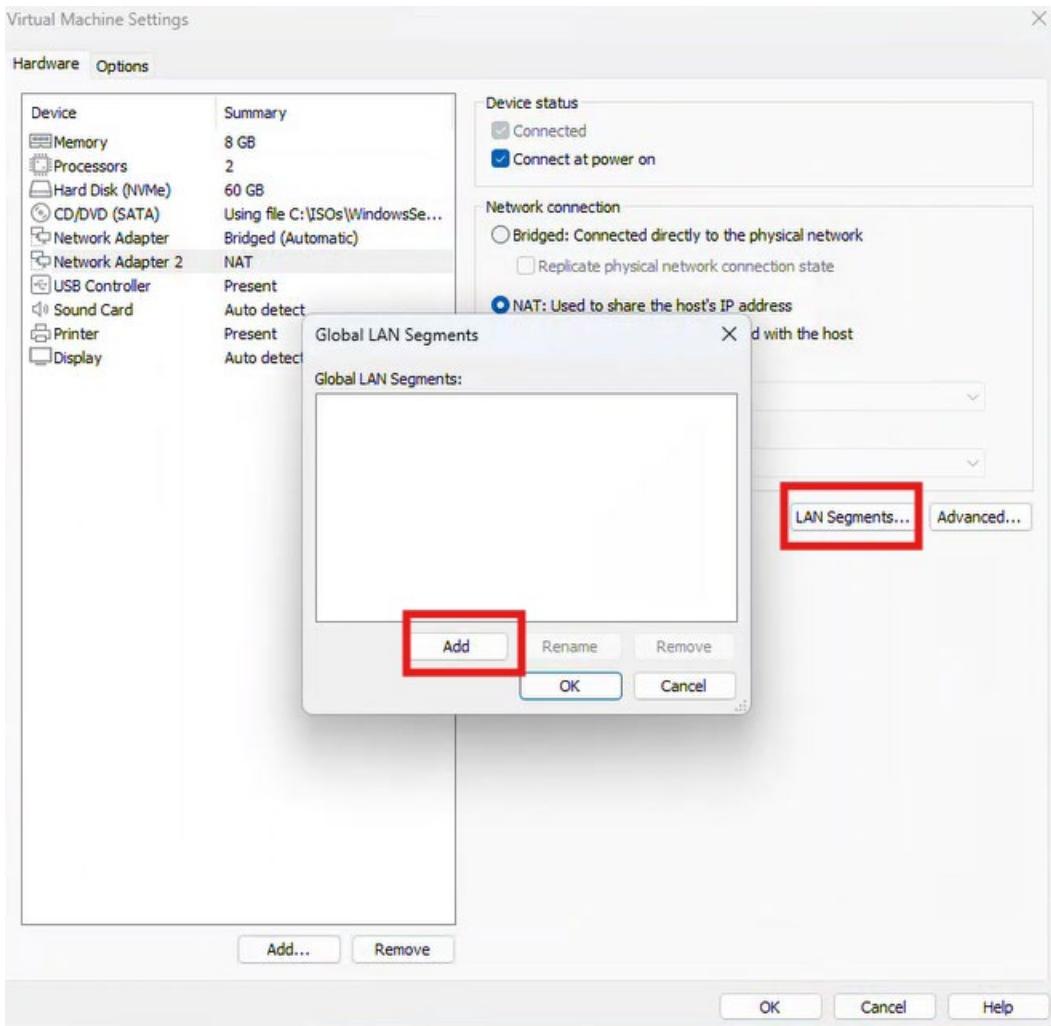
C) Now we have a second network adapter

Select LAN segments



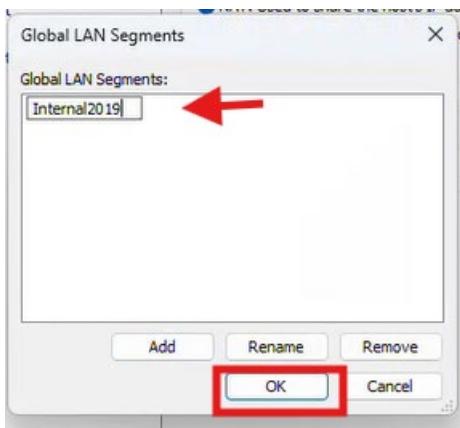
D) Verify if there are any LAN segments already listed

Click on LAN segments Add



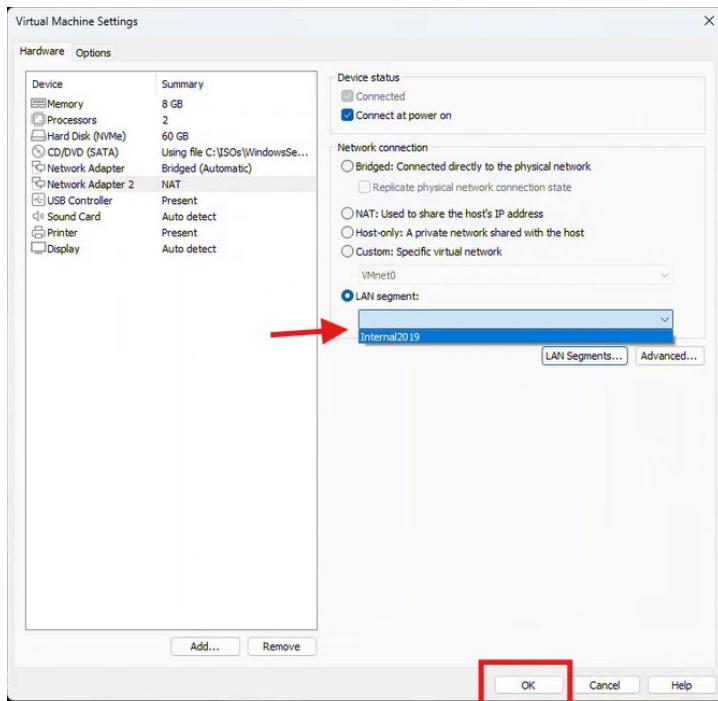
11:11 a.m.

E) Call this one Internal2019 and press OK

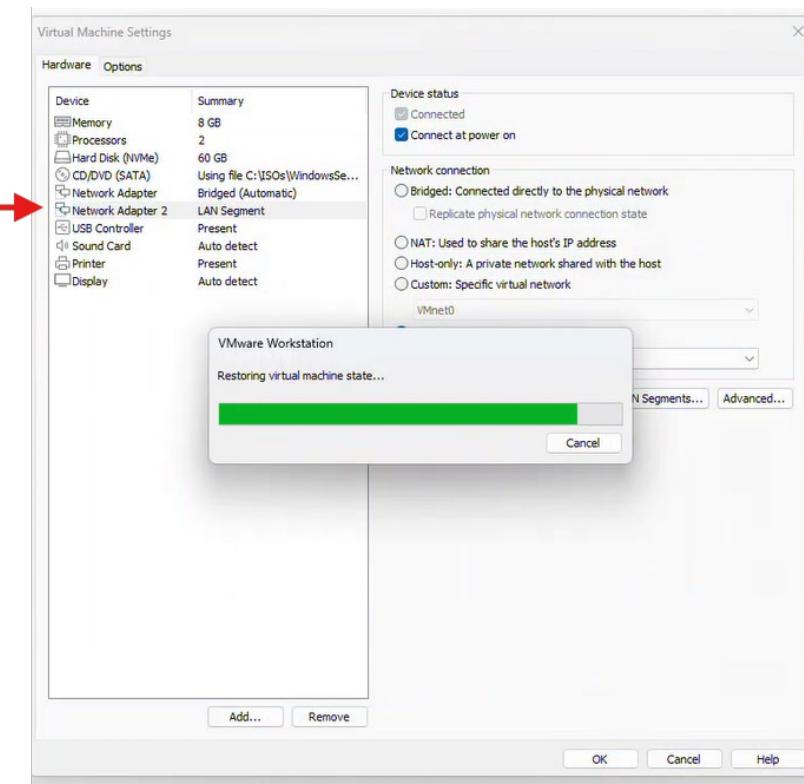


F) Pull down on LAN segments and chose 2019

Press ok and wait



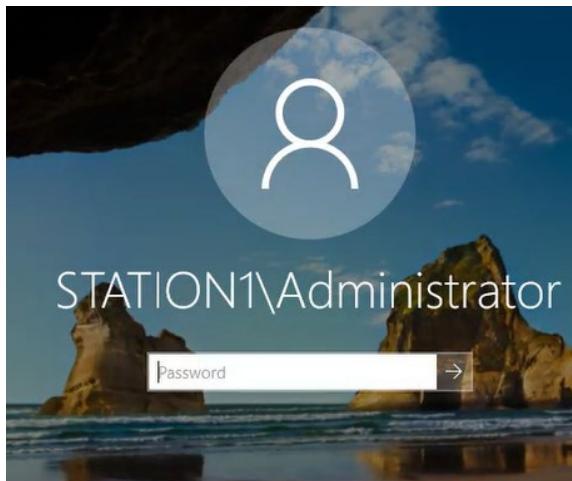
G) Note Network Adapter 2 changed to Lan segment and process to restore VM is ongoing.



3.9.1.2 Server Second Ethernet card setup

3.9.1.2.1 Rename cards

- Login to server



- Click on local server, note Ethernet 1 is added

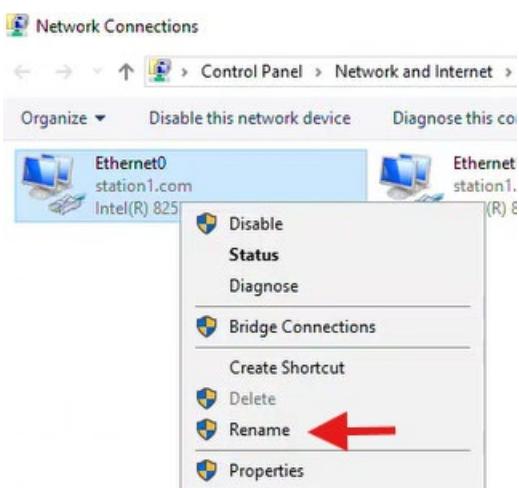
The screenshot shows the "PROPERTIES" window for a local server named "srv2019-1". The "Computer name" is listed as "srv2019-1" and the "Domain" is "station1.com". Under the "Network adapter" section, two network interfaces are listed: "Ethernet0" and "Ethernet1". An arrow points to the "Ethernet1" entry, which is described as having an "IPv4 address assigned by DHCP, IPv6 enabled". Other settings shown include "Windows Defender Firewall" (Domain: Off), "Remote management" (Enabled), "Remote Desktop" (Disabled), and "NIC Teaming" (Disabled). The operating system version is "Microsoft Windows Server 2019 Datacenter Evaluation" and the hardware information is "VMware, Inc. VMware20,1".

PROPERTIES	
For srv2019-1	
Computer name	srv2019-1
Domain	station1.com
Windows Defender Firewall	Domain: Off
Remote management	Enabled
Remote Desktop	Disabled
NIC Teaming	Disabled
Ethernet0	10.164.101.1, IPv6 enabled
Ethernet1	IPv4 address assigned by DHCP, IPv6 enabled
Operating system version	Microsoft Windows Server 2019 Datacenter Evaluation
Hardware information	VMware, Inc. VMware20,1

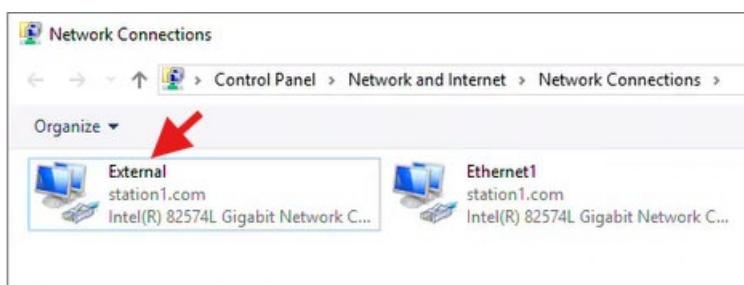
- Double click on Ethernet0 card, the Network connection opens, we can now see two cards



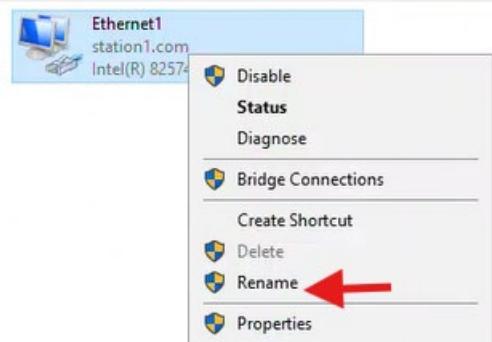
D) Right click where it says Ethernet0 to rename the card



E) Change name of card from “Ethernet0” to “External”



F) Rename the second card Internal



3.9.1.2.2 Setup Internal card

A) Double click on Internal Card. Go to properties IPV4

Select Use the following IP address

According to station number

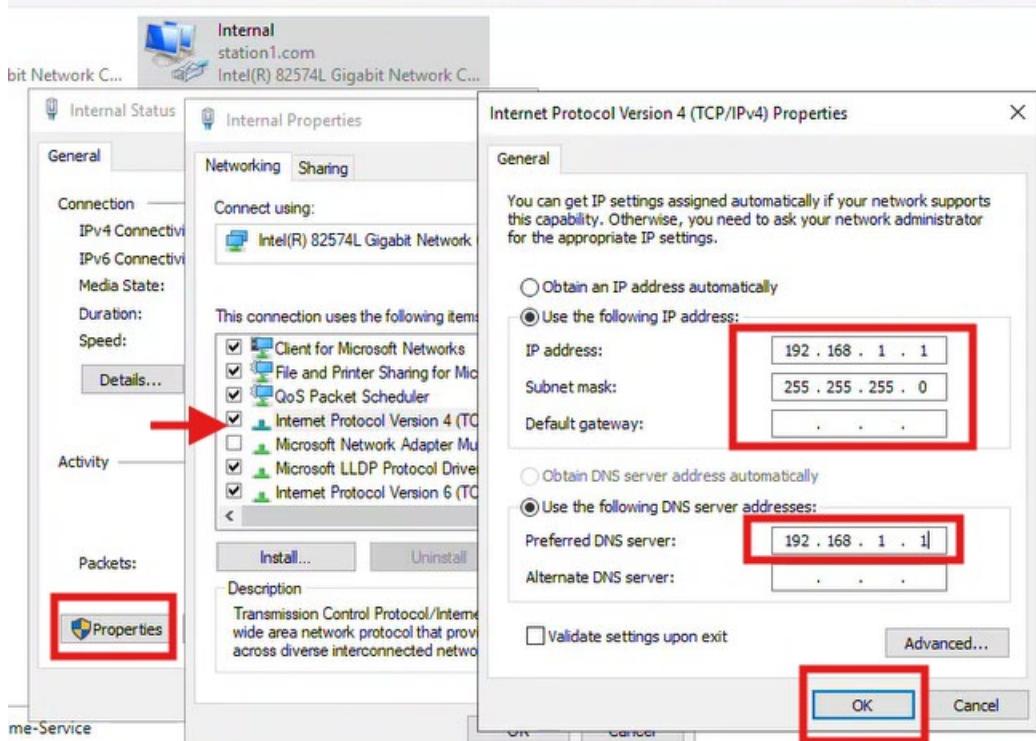
IP Address 192.168.**1**.1

Subnet mask 255.255.255.0

Leave gateway blank

DNS points to itself - 192.168.**1**.1

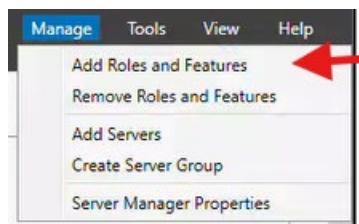
Press OK/OK and Close



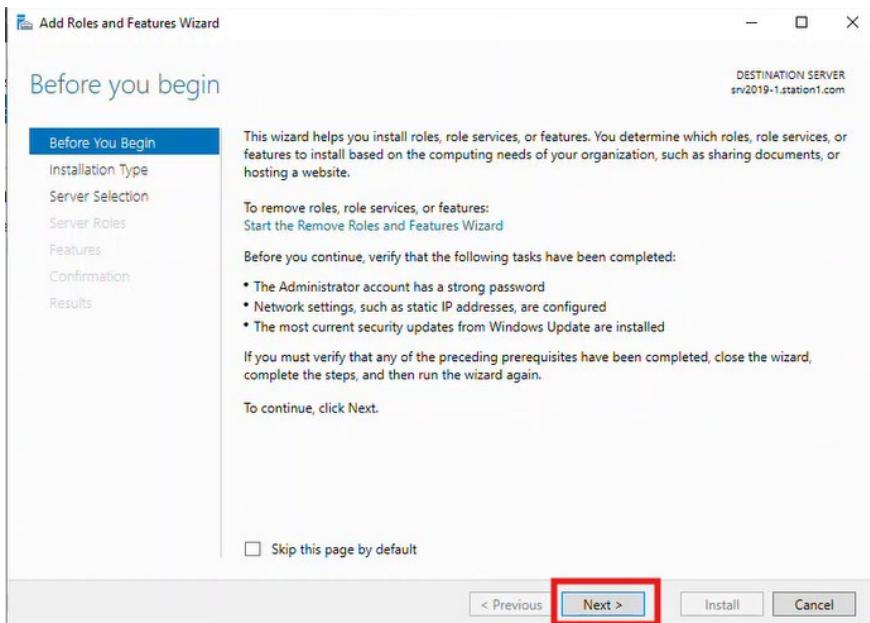
3.9.2 Install DHCP on server

We are going to setup DHCP on the server

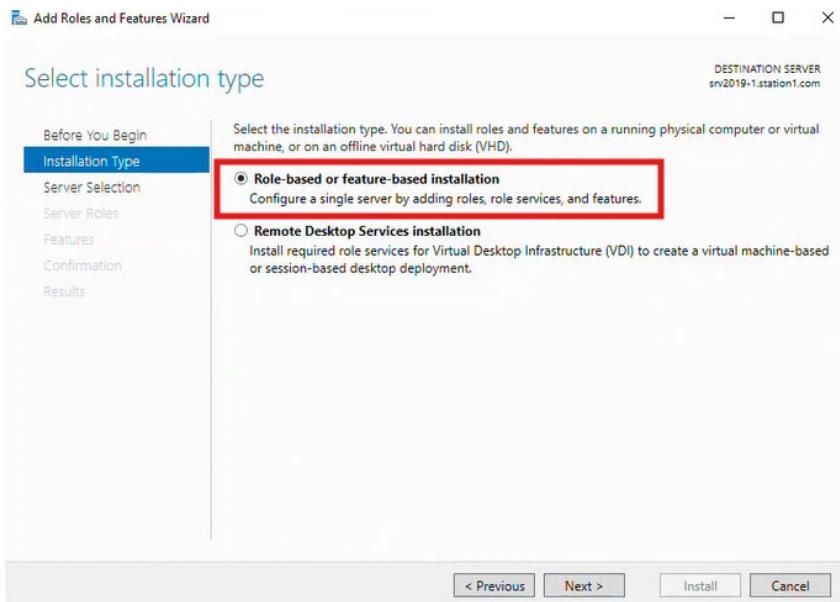
A) Got to Manage / Add Roles and Features



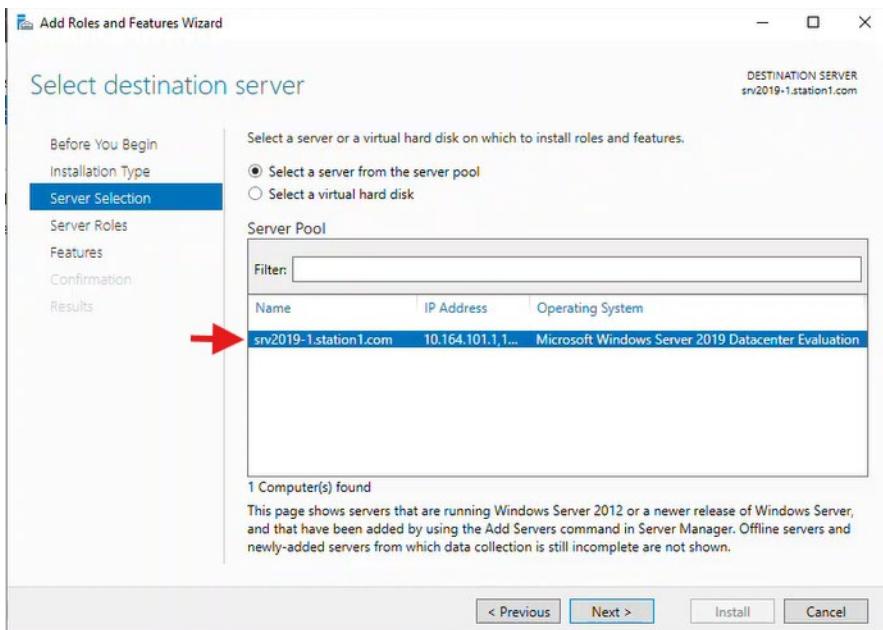
B) On in first page of the Wizard Click on Next



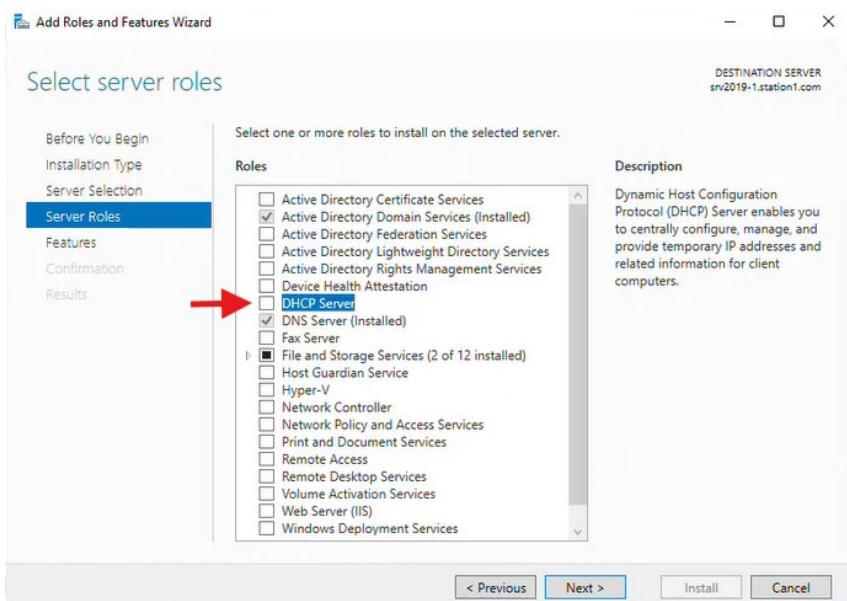
C) Select installation type Role Based is Good click on Next



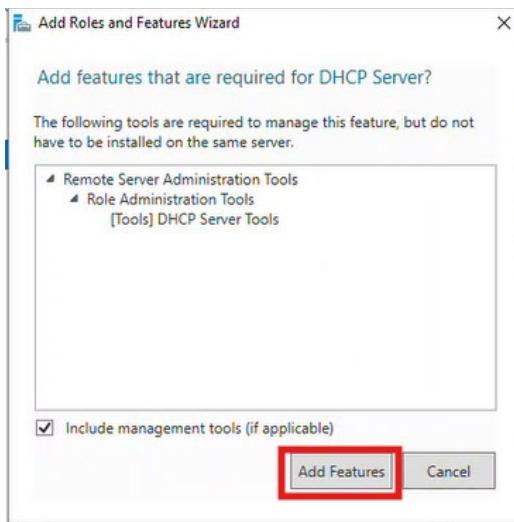
D) Select destination server, Select the server and click on Next



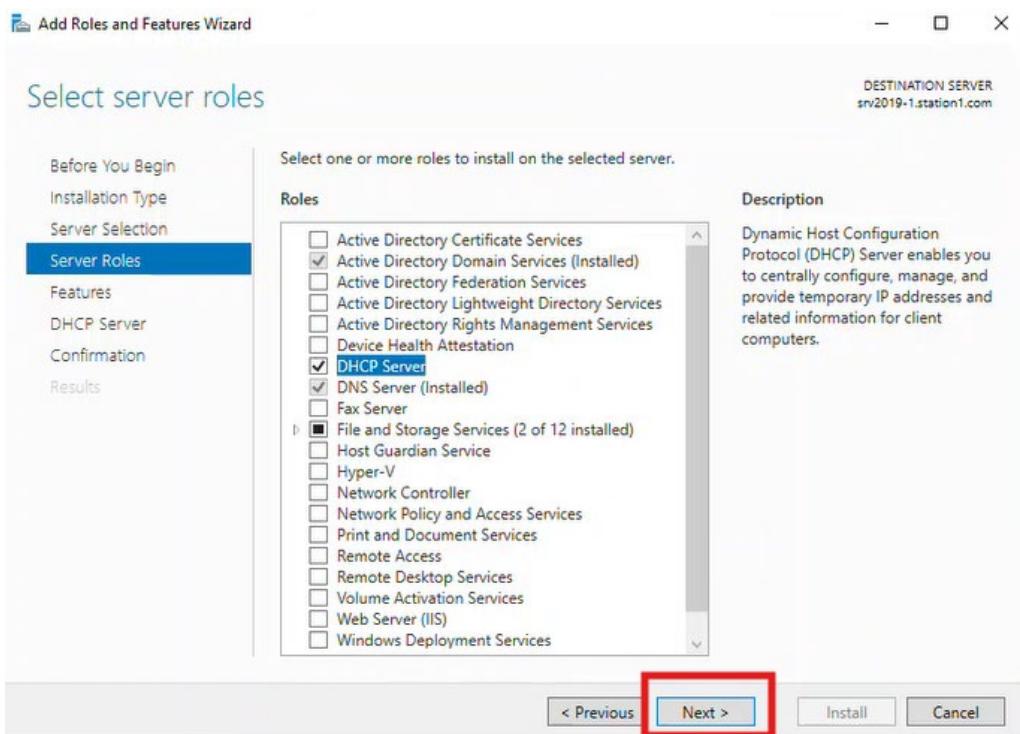
E) In Select server roles, Select DHCP server



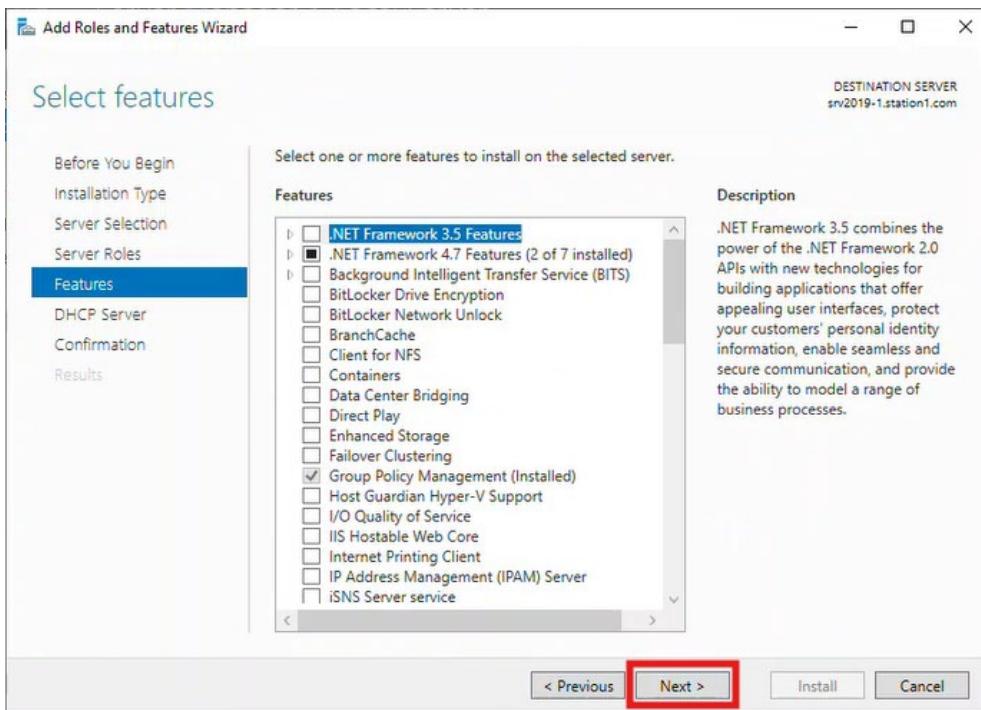
F) A window pop up, Select Add features



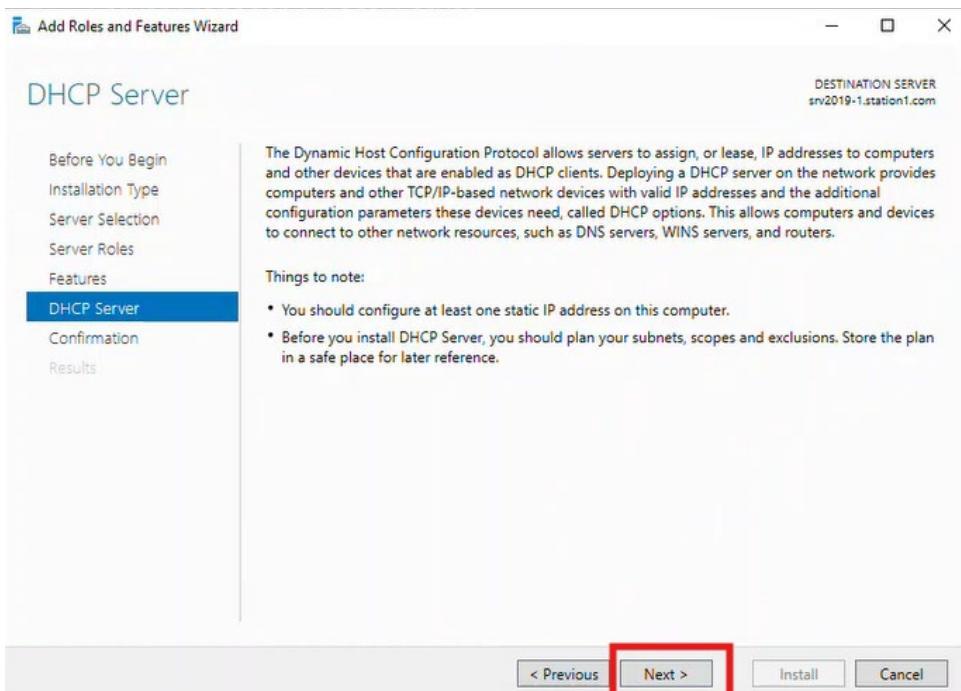
G) On Select Server Roles click Next



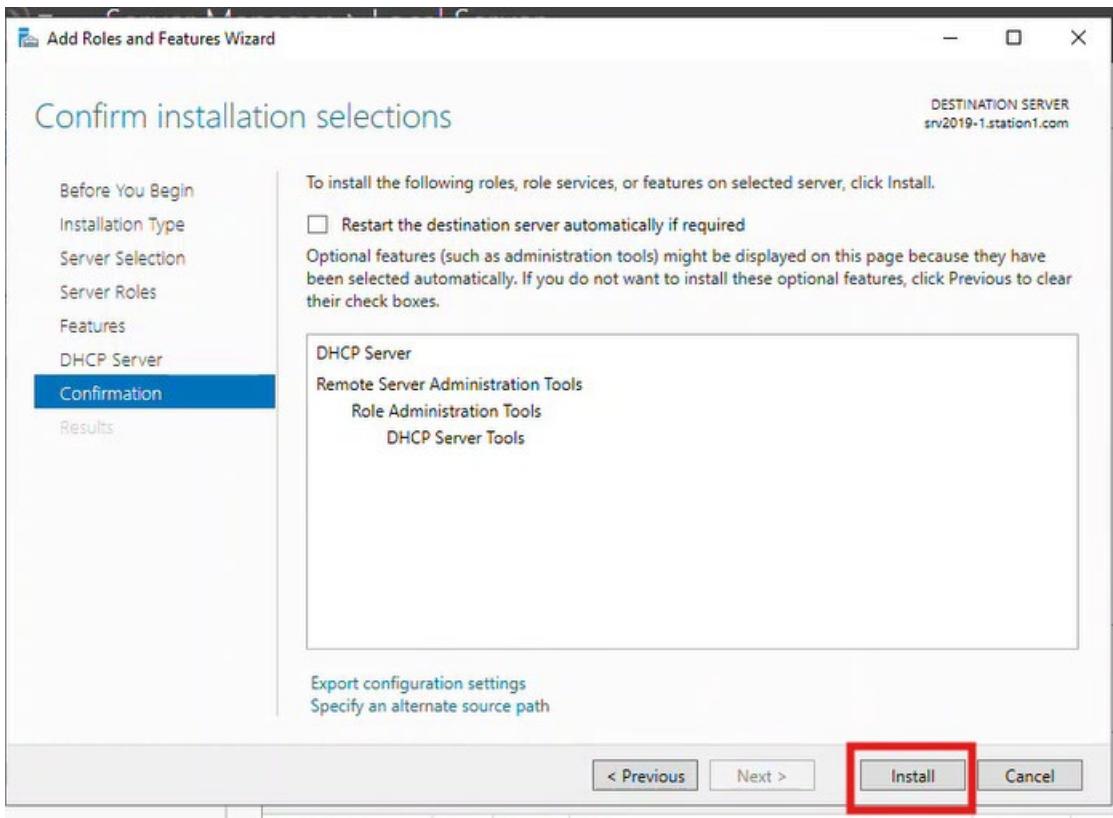
H) On Select Server Features click Next



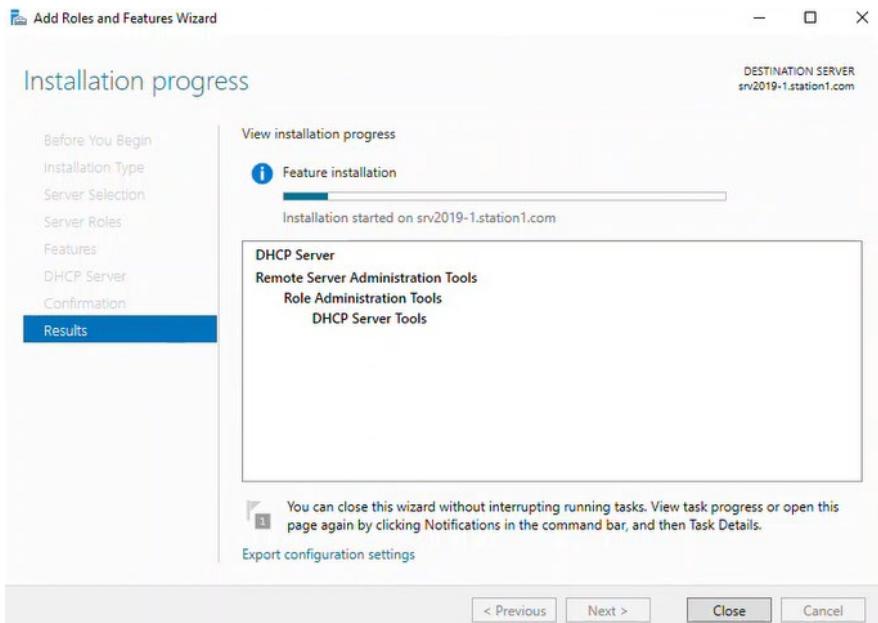
I) DHCP Server window tell us what DHCP is, click on Next



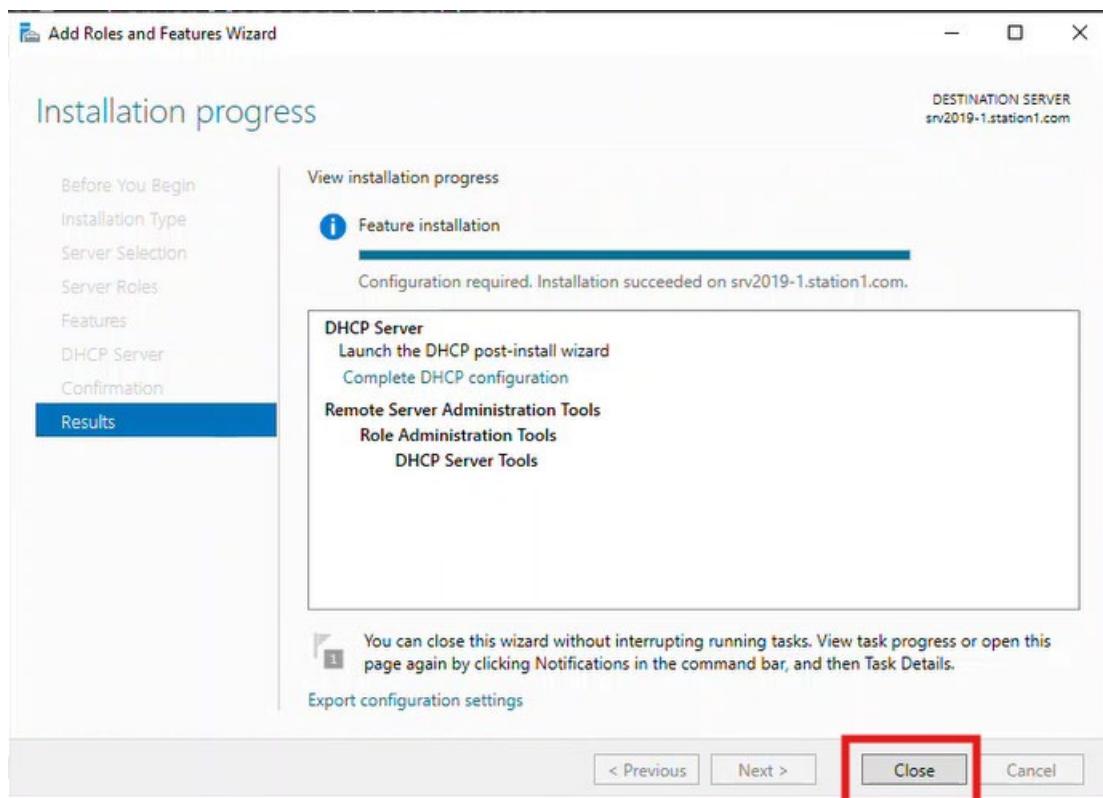
J) In next window start installation by clicking Install



K) Installation process starts, lets wait until that to finish



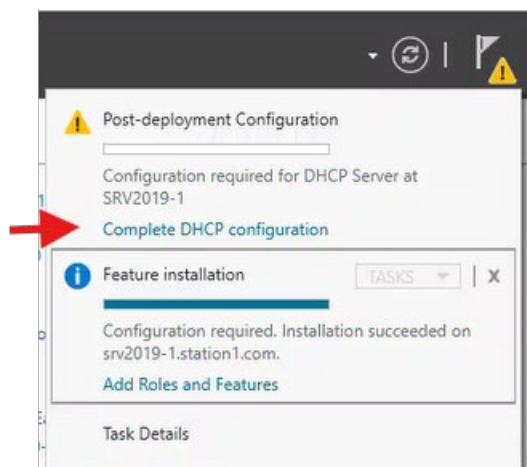
L) Installation has succeeded, click on Close



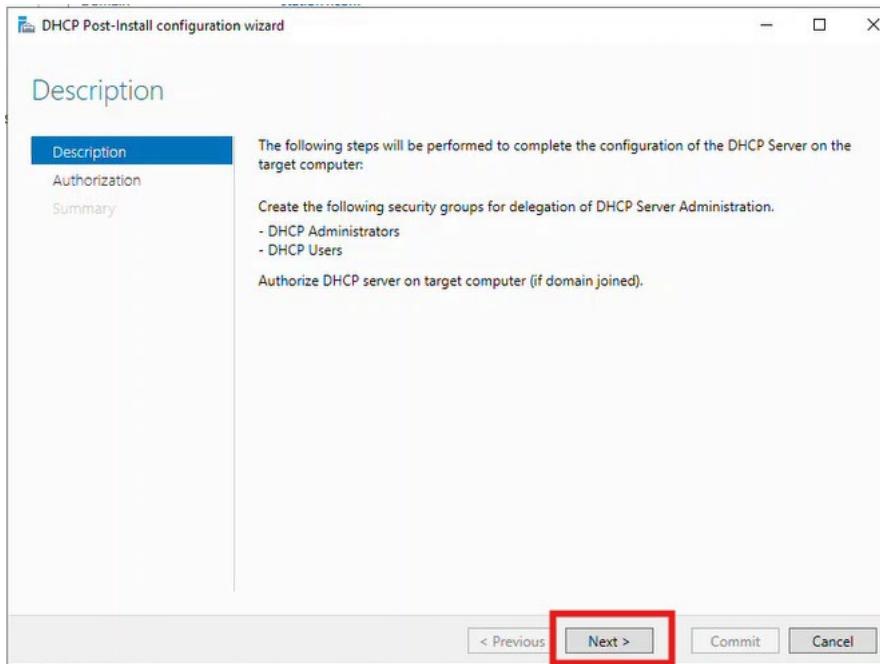
M) At the top see a warning



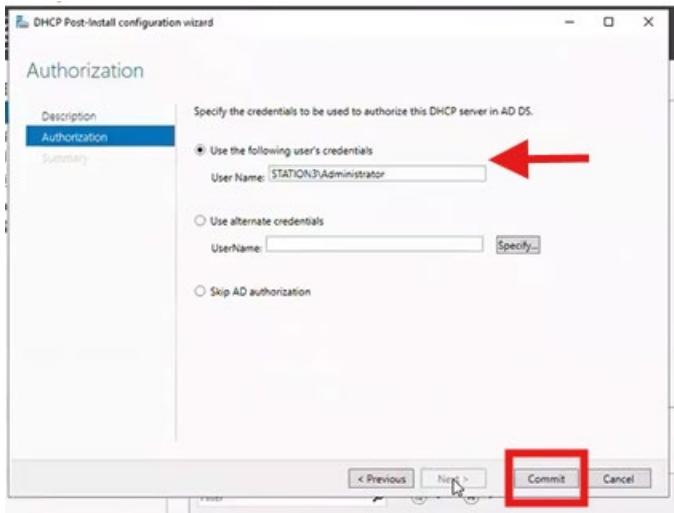
N) Open the warning and Click on Complete DHCP configuration



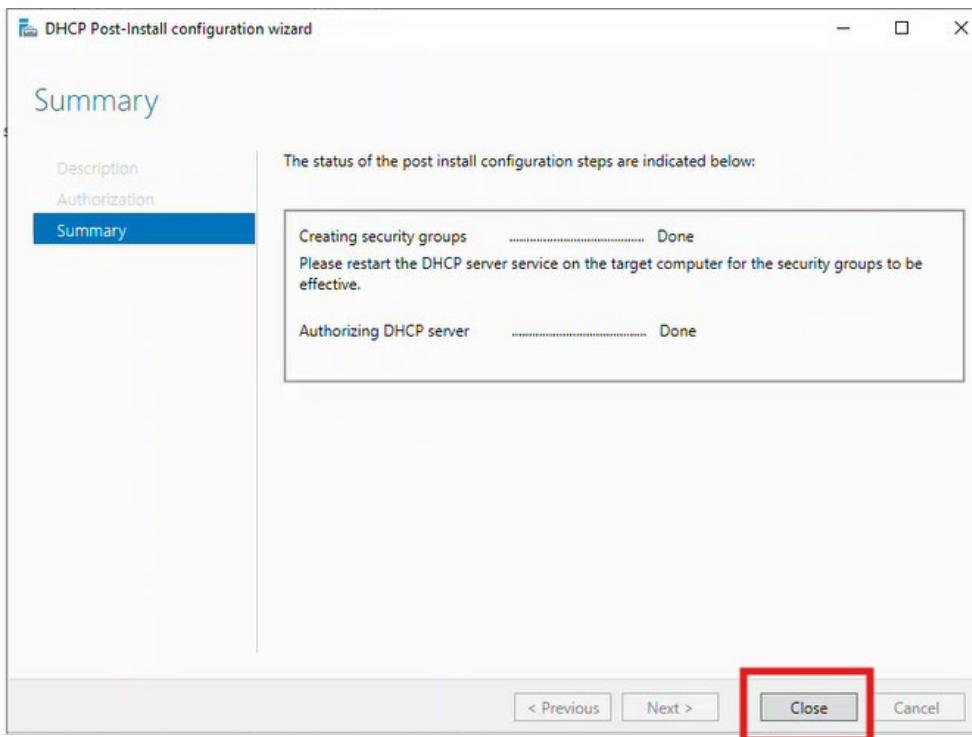
O) Click on Next on the Description



P) On Authorization window see the user must be done by Administrator, level it and press Commit



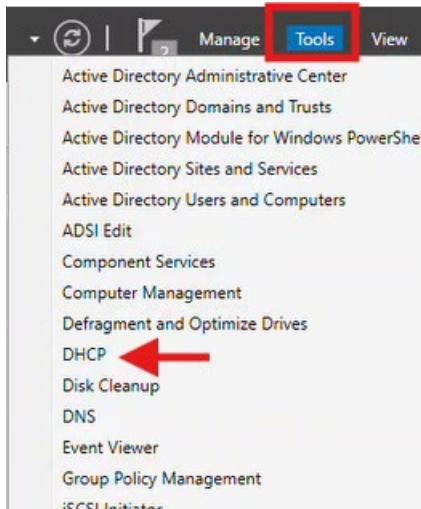
Q) Now the DHCP has been authorized, meaning that the active directory approves the server to give out IP addresses. Click on Close



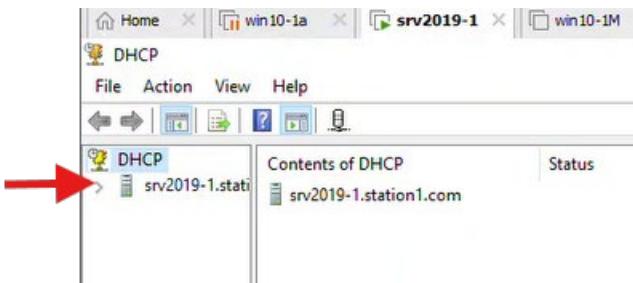
3.9.3 Configure DHCP

Now we need to configure DHCP to give out a range of IP addresses

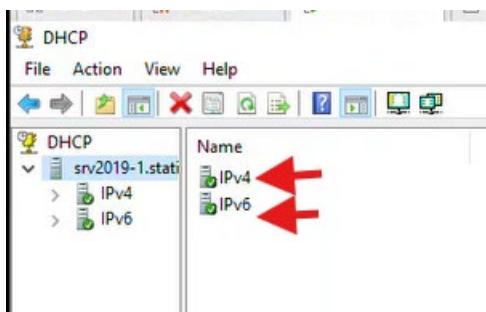
- A) Click on tools and select DHCP



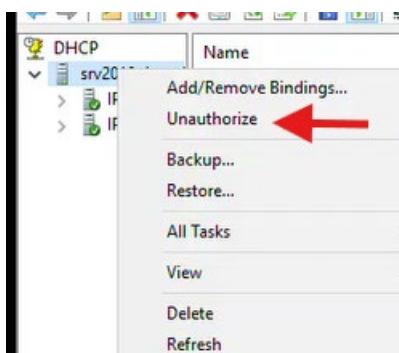
- B) Open up where it says server



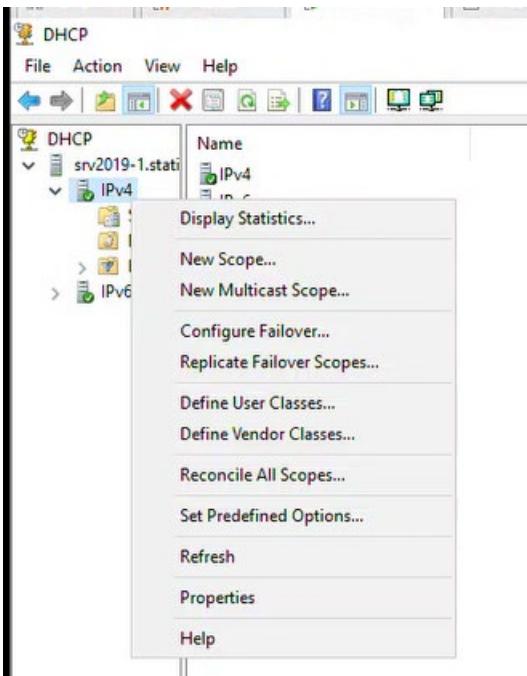
C) We can now see IPV4 and IPV6



D) Right Click on Server name, observe it has been Authorized because we have Unauthorized option.

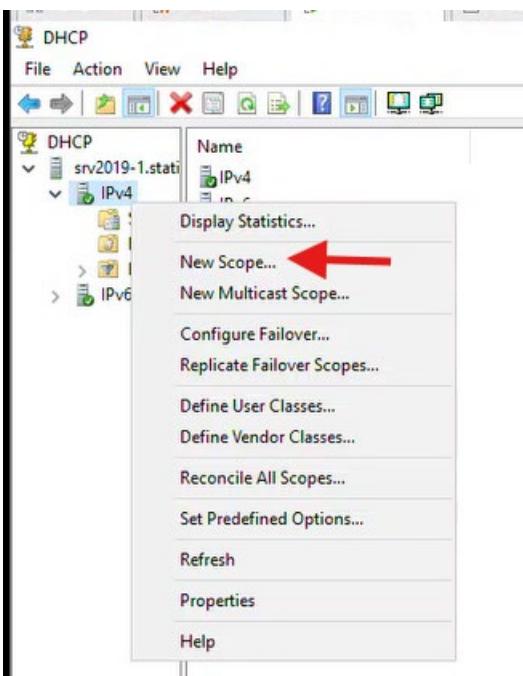


E) Go back and right click on IPV4 a submenu is displayed



F) Select New scope to create it

Scope is a range of Ip addresses to give out to devices.



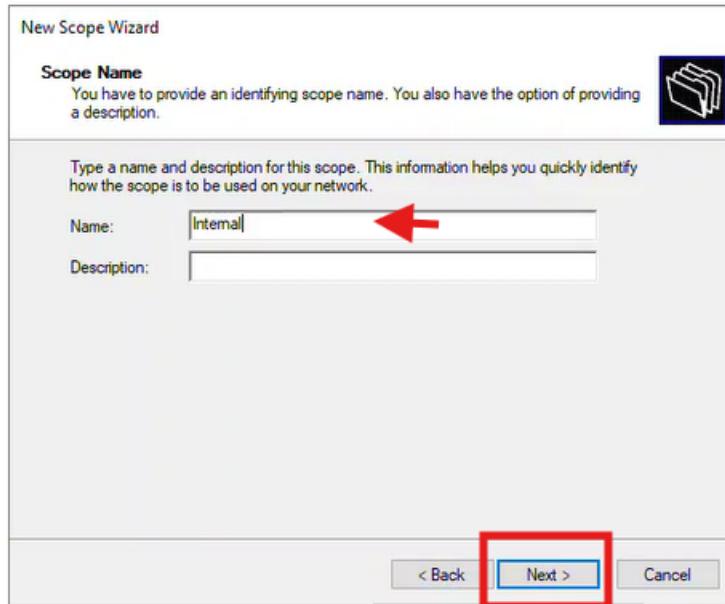
G) Click on Next



H) Give Name “Internal” and click on Next

Type a name and description
how the scope is to be used

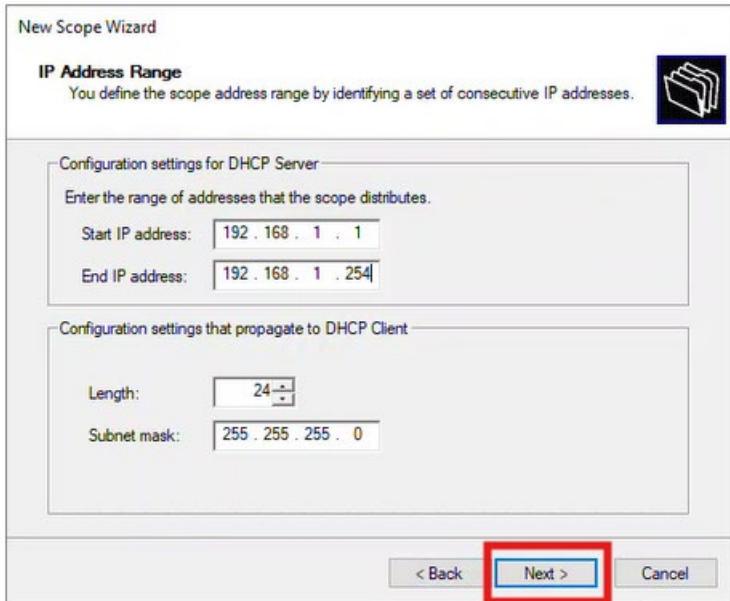
Name:



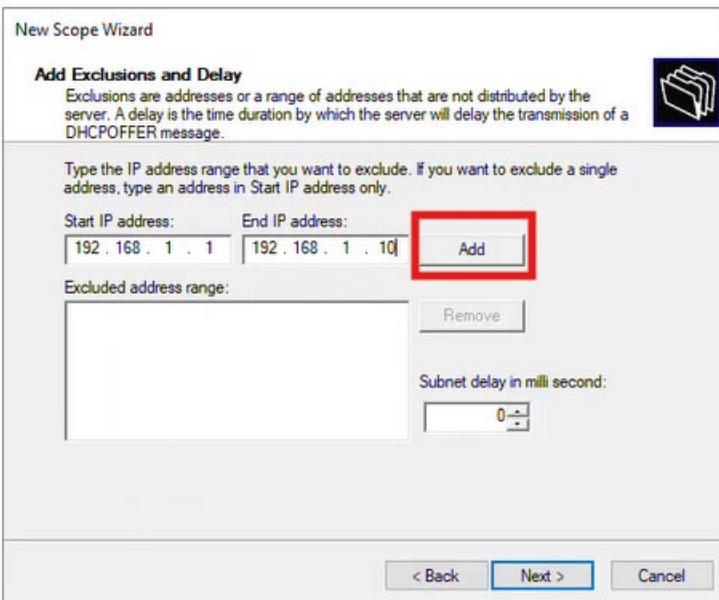
I) Give IP address range and click on Next

Start IP address 192.168.**1**.1

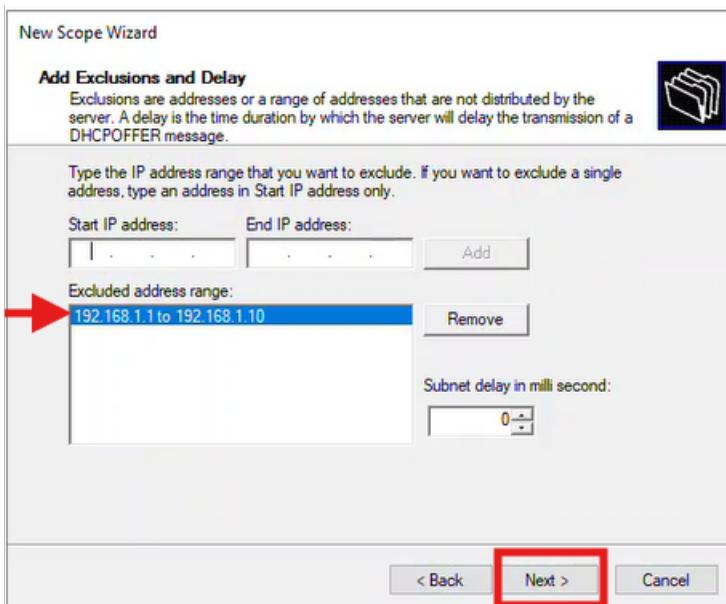
End IP Address 192.168.**1**.254



- J) We are going to create a range of IP addresses that we are not going to give out
Set Ip Addresses to be reserved, and click on Add and click on Next
Start IP Addresses 192.168.1.1
End IP Addresses 192.168.1.10



- K) Range has been assigned, click on Next

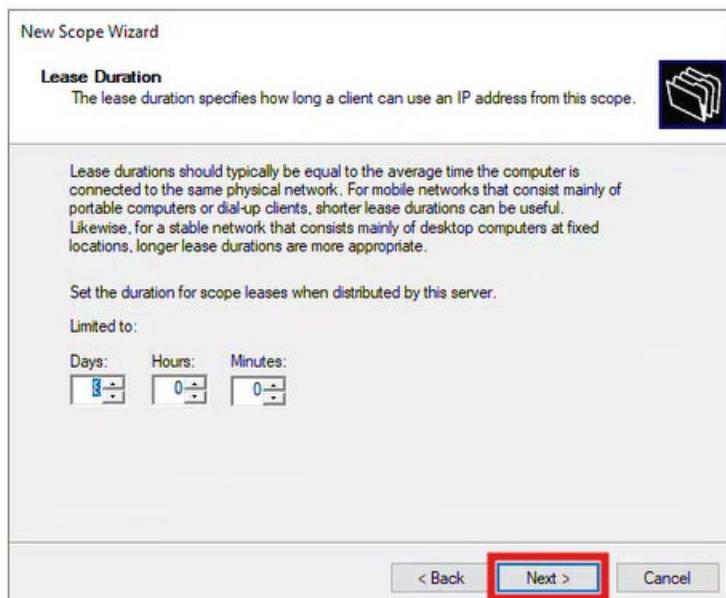


L) Set lease duration to 8 days, then click on next

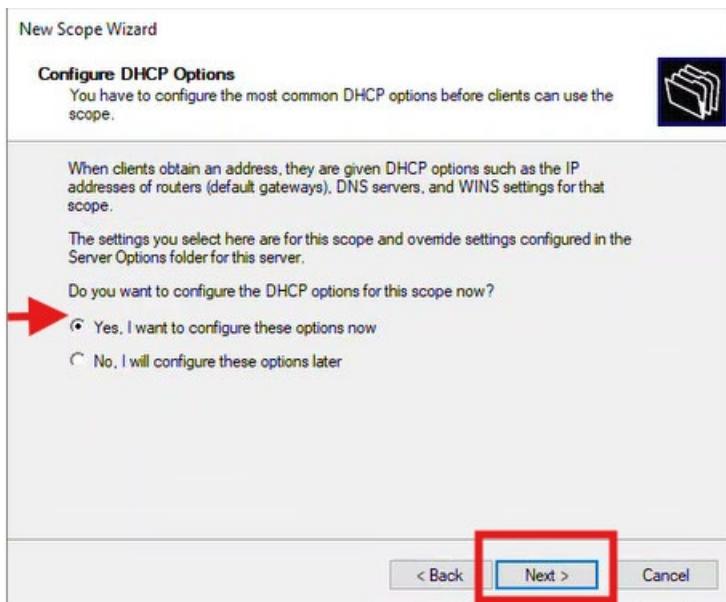
After 4 days you get a new lease for another 8 days

If server was down you will try on day 5, 6,7, and after day 8 you will lose your IP address

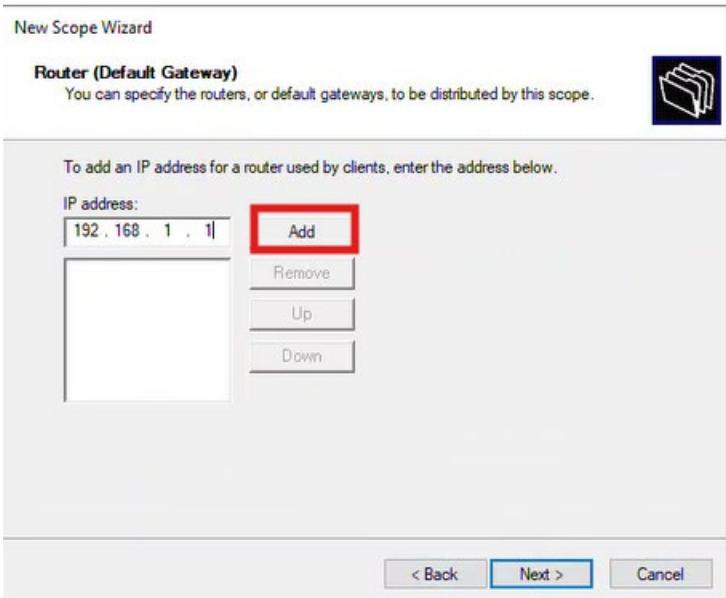
And you will be given an automatic private IP address in the 169.254.x.x range. This is known as an Automatic Private IP Addressing (APIPA) address. When a device is set to obtain an IP address automatically (using DHCP) and it can't find a DHCP server, it assigns itself an APIPA address to enable limited network communication within the local subnet.

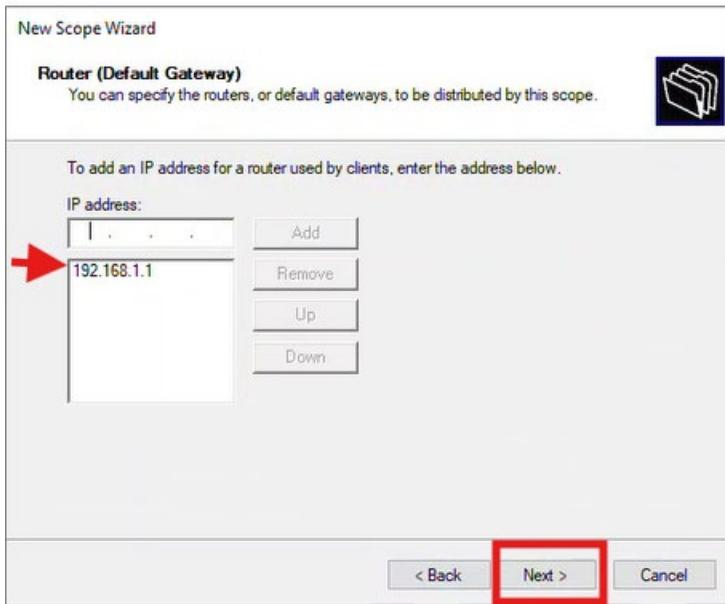


M) Set Yes I want to configure options and click on next



N) Give gateway 192.168.1.1 and click on Add





O) Domain name and DNS server

Verify Domain name station1.com

Type for DNS server 192.168.1.1 , then click Add, then click Next.

*** If there is another DNS remove it



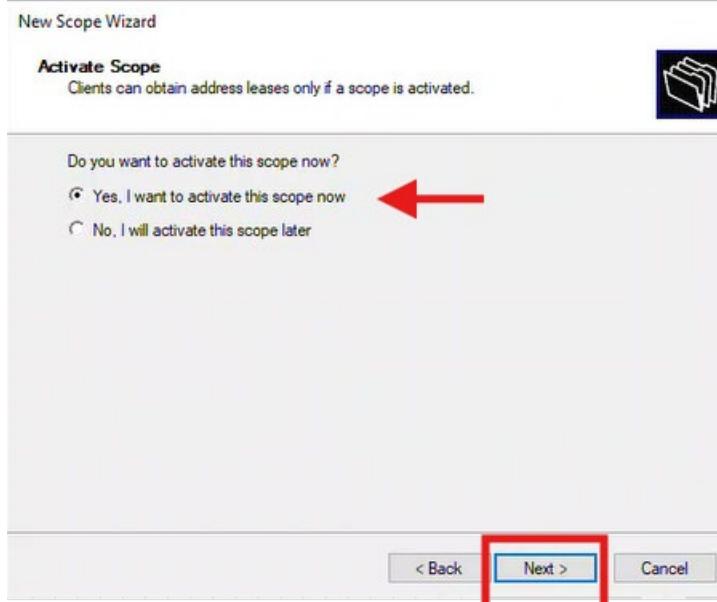
P) Click on Next

WINS server to cut up on the broadcast pre DNS days, we will not use it click on Next

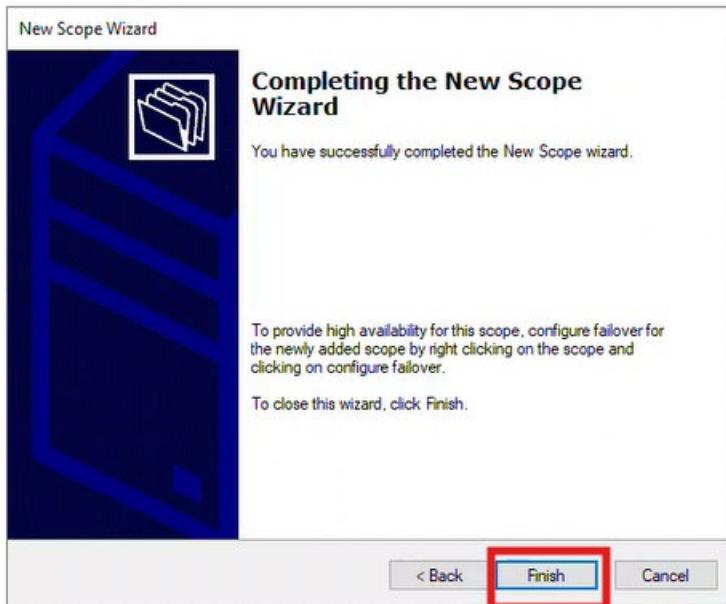
New Scope Wizard



Q) Activate the scope click on Next

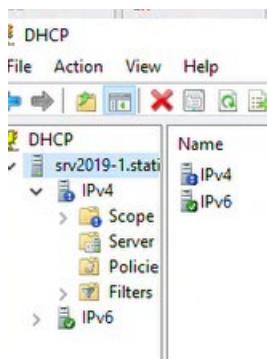


R) Click on finish



S) See if IPV4 turns green

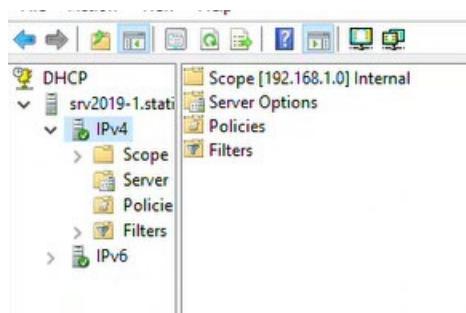
In this case appears a blue exclamation mark



Press refresh at the top Menu. Below Help

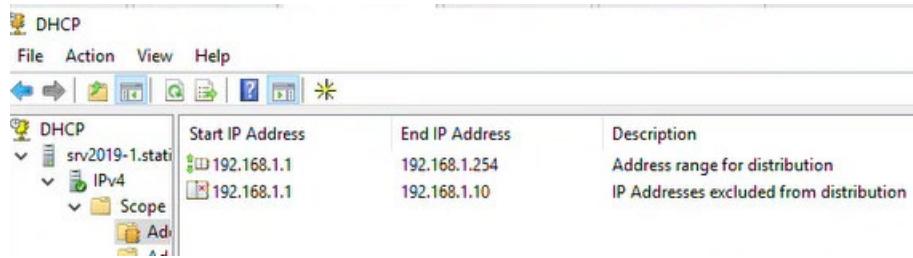
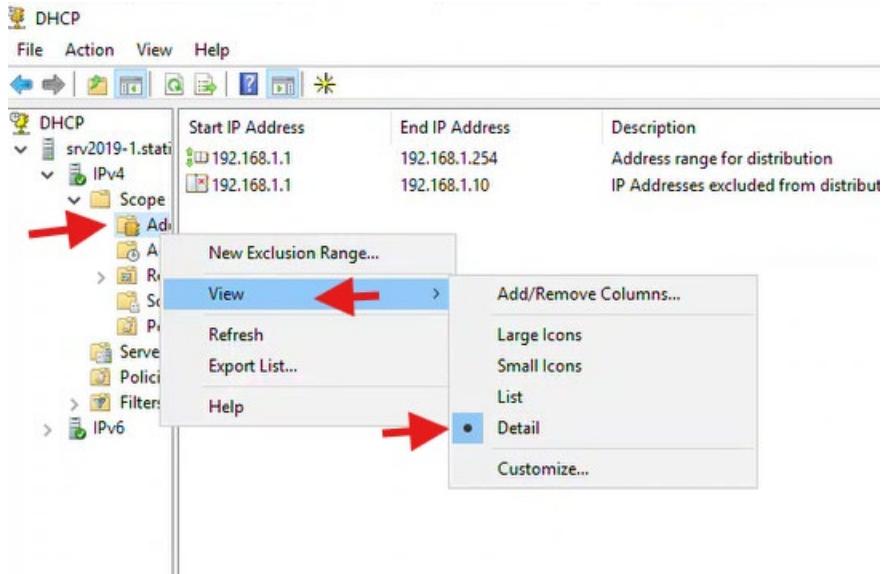


Now IPV4 is green

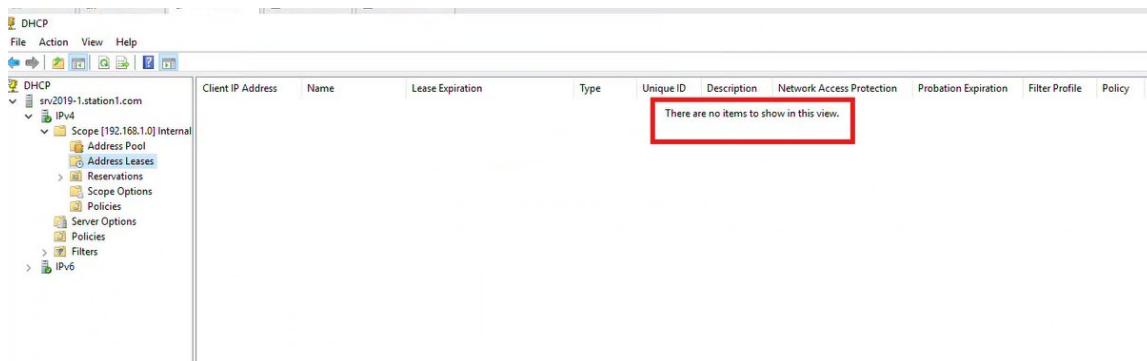


T) Verify Address pool

Select Address pool, Right click View/Detail



U) Select Address Lease and see no IP's are assigned yet



V) Inside Scope options verify if your details for Router (Default Gateway), DNS Server and

W) Domain Name

The screenshot shows the Windows Server 2019 DHCP Management console. On the left, the tree view shows 'DHCP' under 'srv2019-1.station1.com' and 'IPv4'. A red arrow points to the 'Scope Options' node under 'IPv4'. On the right, a table displays the configuration for a scope option:

Option Name	Vendor	Value	Policy Name
003 Router	Standard	192.168.1.1	None
006 DNS Servers	Standard	192.168.1.1	None
015 DNS Domain Name	Standard	station1.com	None

3.9.4 Set in Windows 10 box

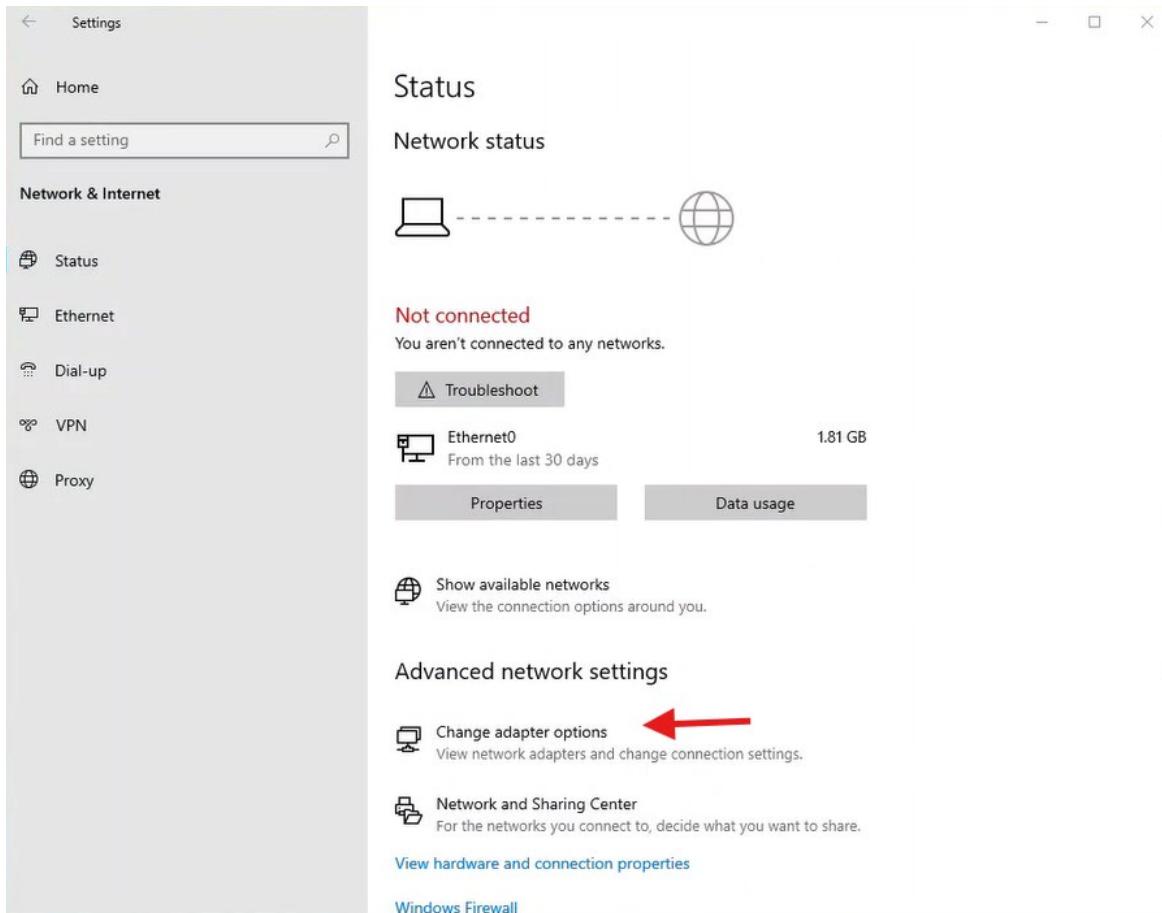
A) Open windows 10 box and login



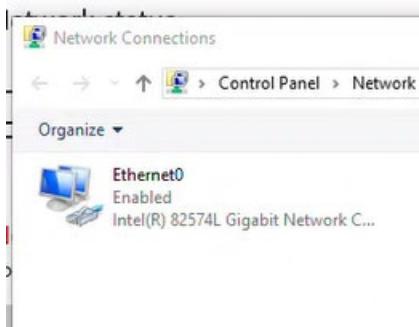
B) Go to ip settings on network card



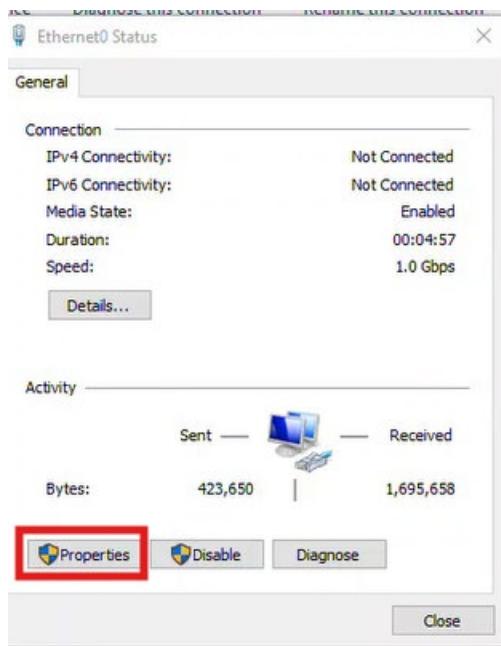
C) Click on Change adapter options



D) Double click on Ethernet 0

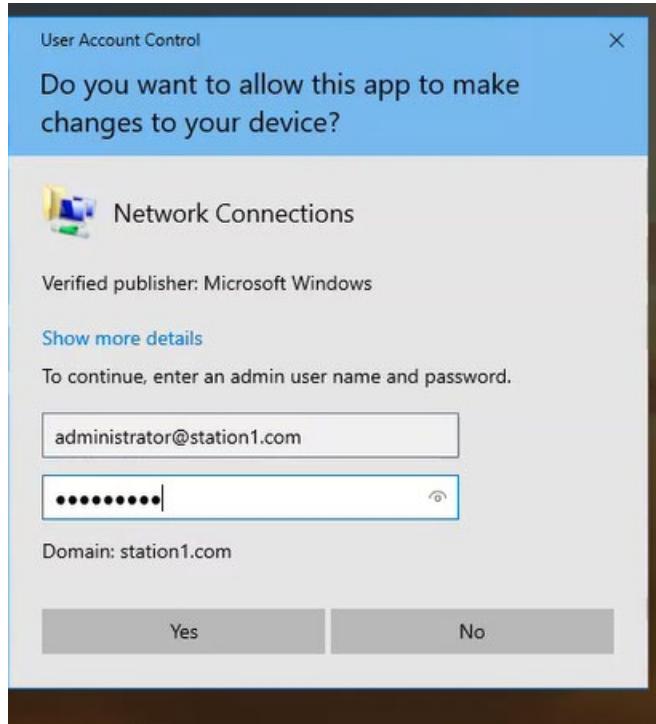


E) Click on properties

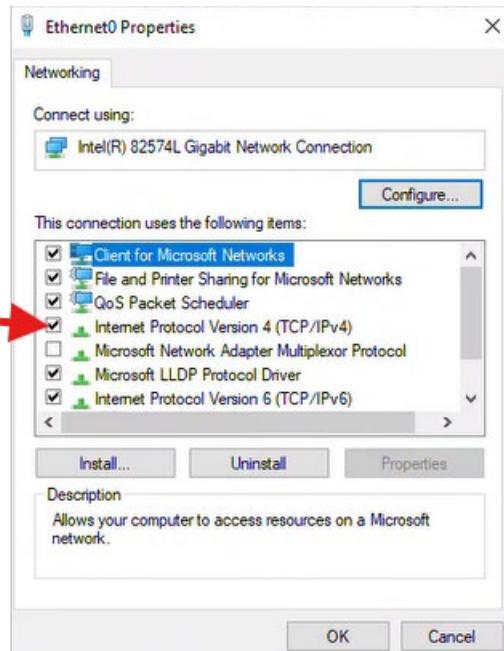


F) Login as administrator to make this changes

administrator@station1.com / password Amf123456

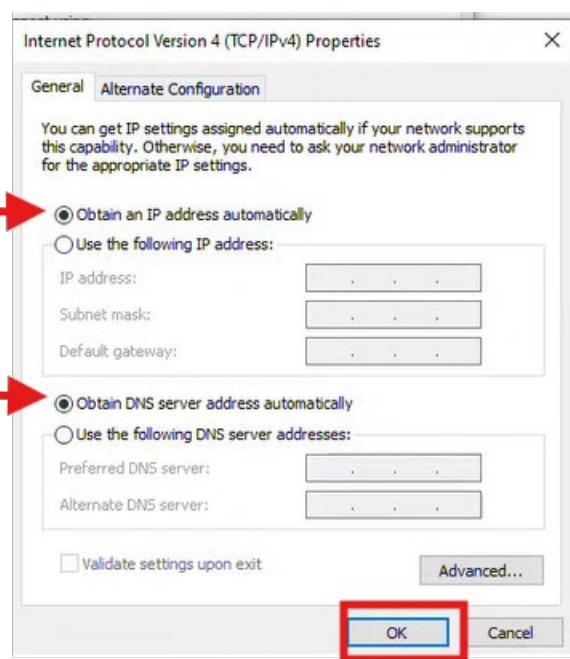


G) Select Properties/ IPV4



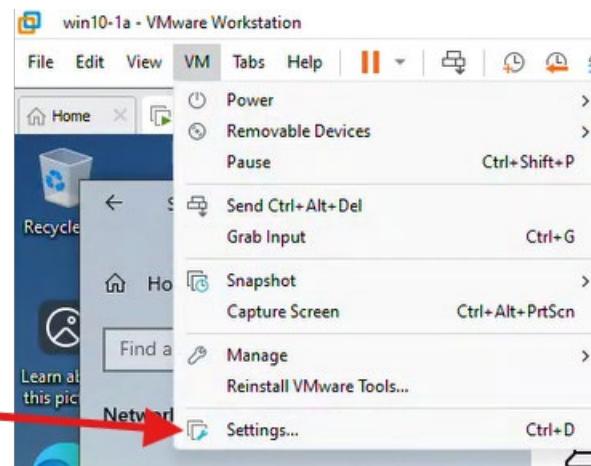
H) Change to automatic (DHCP) and press ok.

Then Ok / Close to close all the windows

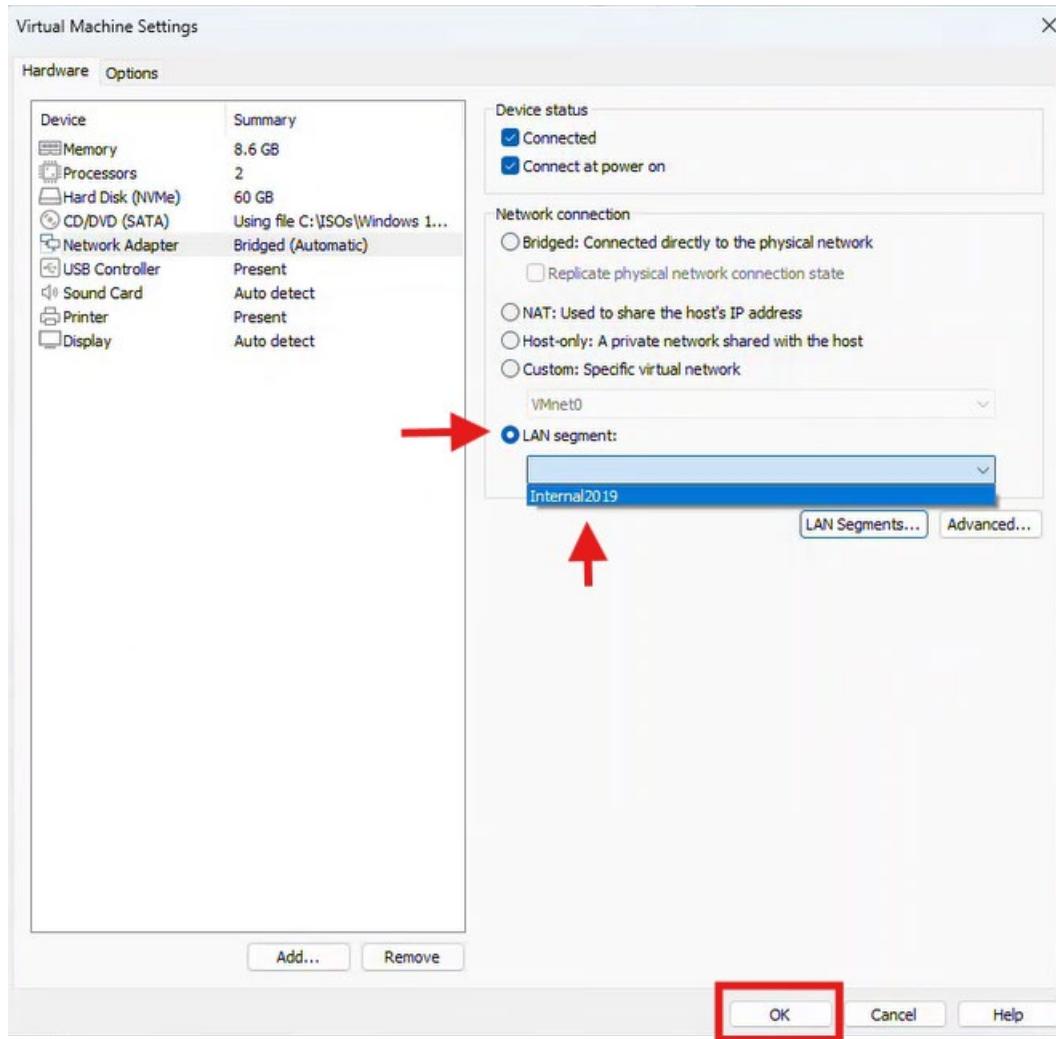


3.9.5 VM setting for Client Windows 10

A) Click on VM settings



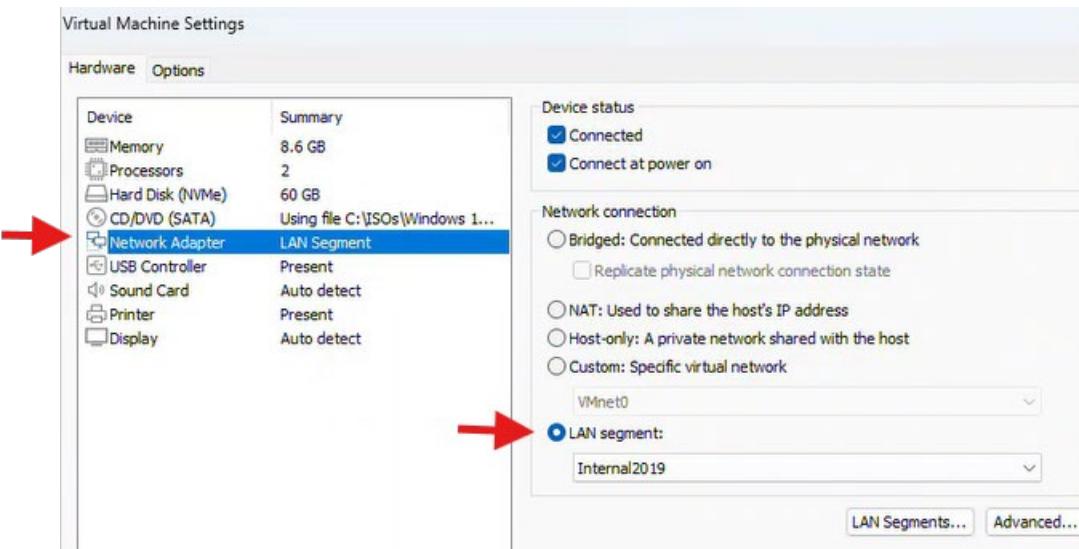
B) Go to network adapter. Select Lan segment and put it on Internal Lan Segment



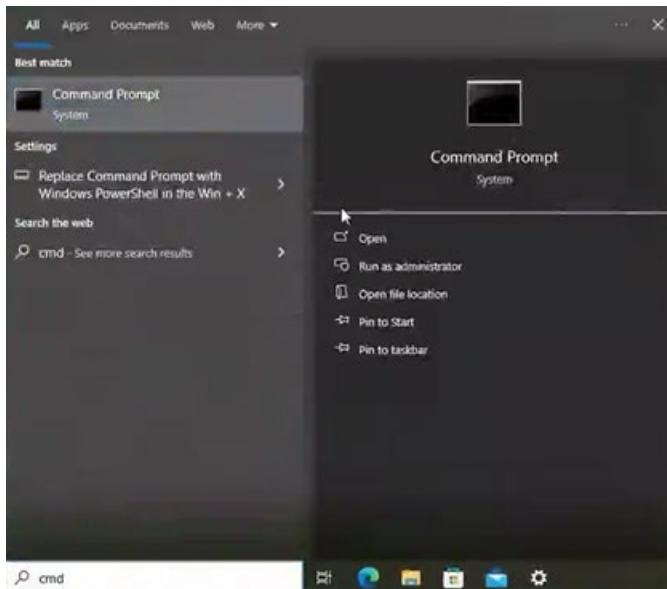
C) Note that Network adapter changed to Lan segment

Note Lan segment set to Internal2019

Press OK



D) On windows 10 box go to command prompt



E) Type In ipconfig /all

Verify Ip address, domain name, it has a gateway, gives you DHCP address and tell you how long the lease is.

```

U:\>ipconfig /all

Windows IP Configuration

Host Name . . . . . : win10-1a
Primary Dns Suffix . . . . . : station1.com
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : station1.com

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . : station1.com
Description . . . . . : Intel(R) 82574L Gigabit Network Connection
Physical Address. . . . . : 00-0C-29-E3-6F-F2
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3d5f:eedd:957f:5947%9(PREFERRED)
IPv4 Address. . . . . : 192.168.1.11(PREFERRED)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Thursday, January 23, 2025 12:37:50 AM
Lease Expires . . . . . : Friday, January 31, 2025 12:37:50 AM
Default Gateway . . . . . : 192.168.1.1
DHCP Server . . . . . : 192.168.1.1
DHCPv6 IAID . . . . . : 100666409
DHCPv6 Client DUID. . . . . : 00-01-00-01-2F-1B-71-18-00-0C-29-E3-6F-F2
DNS Servers . . . . . : 10.164.101.1
                           192.168.1.1
NetBIOS over Tcpip. . . . . : Enabled

U:\>

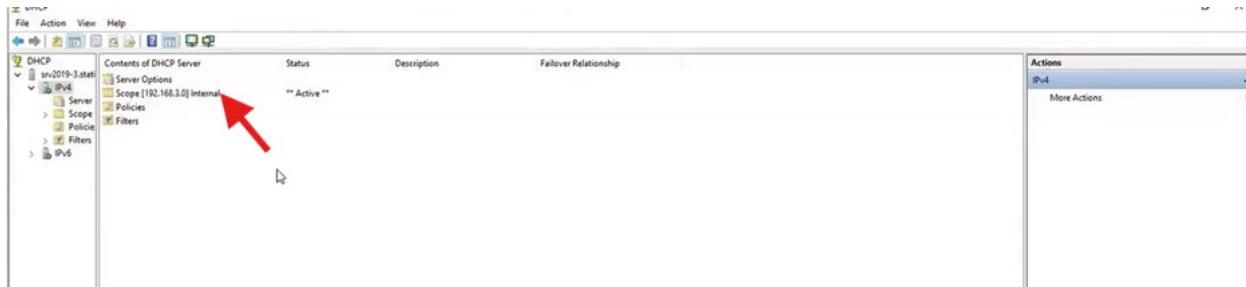
```

3.9.6 Test on server

- A) Go back to the windows server 2019

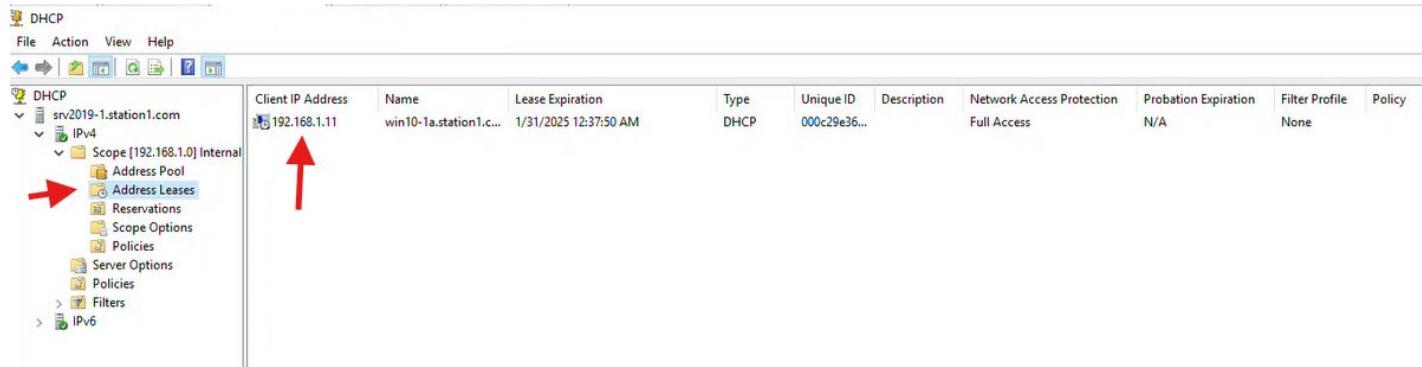
Press tools/ DHCP

DHCP windows appear open Scope



Click on address leases

There is IP Address name of computer and when the lease expires, it gets windows client MAC address



The screenshot shows the Windows Server DHCP Management Console. On the left, the navigation pane displays a tree structure under 'DHCP' for 'srv2019-1.station1.com'. A red arrow points to the 'IPv4' node. Another red arrow points to the 'Address Leases' node under the 'Scope [192.168.1.0] Internal' section. The main pane shows a table of client leases. One lease is highlighted with a blue selection bar. The table columns include Client IP Address, Name, Lease Expiration, Type, Unique ID, Description, Network Access Protection, Probation Expiration, Filter Profile, and Policy. The highlighted row shows the following details:

Client IP Address	Name	Lease Expiration	Type	Unique ID	Description	Network Access Protection	Probation Expiration	Filter Profile	Policy
192.168.1.11	win10-1a.station1.c...	1/31/2025 12:37:50 AM	DHCP	000c29e36...		Full Access	N/A		None

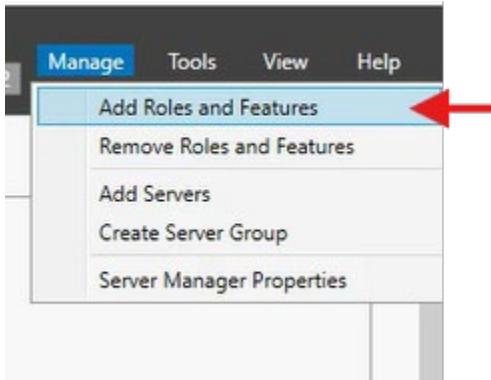
3.10 Routing and Remote Access

3.10.1 Install Routing and Remote Access

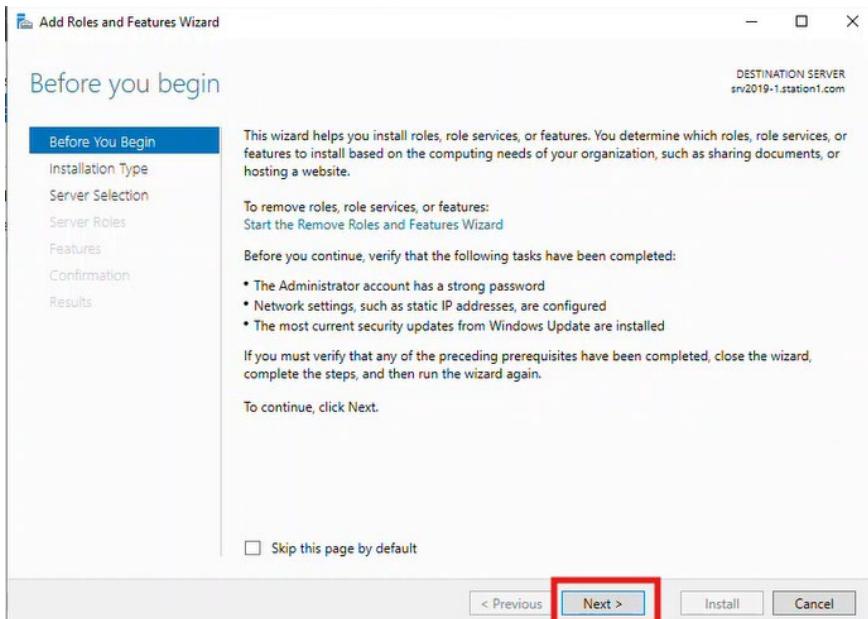
- Connect to windows server login as Administrator



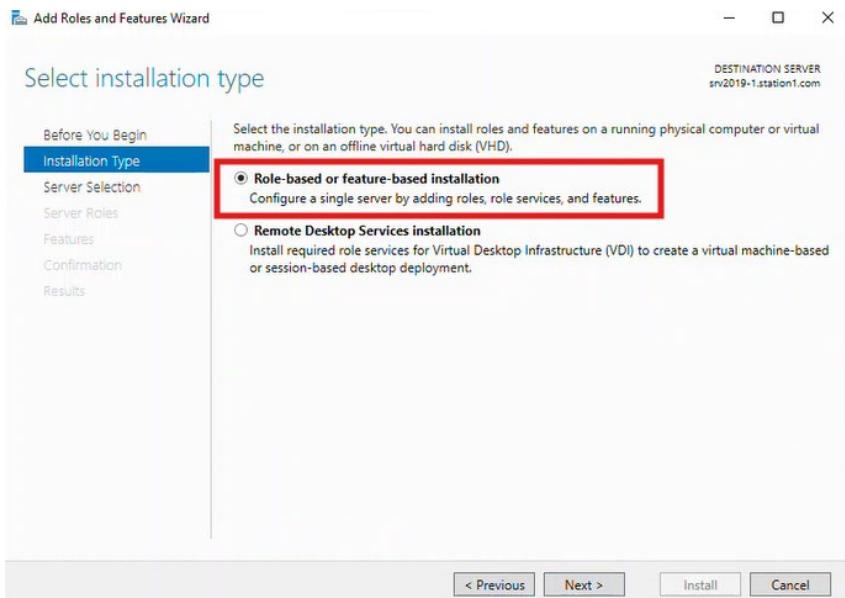
- Open Manage Add roles and features in window Server Manager



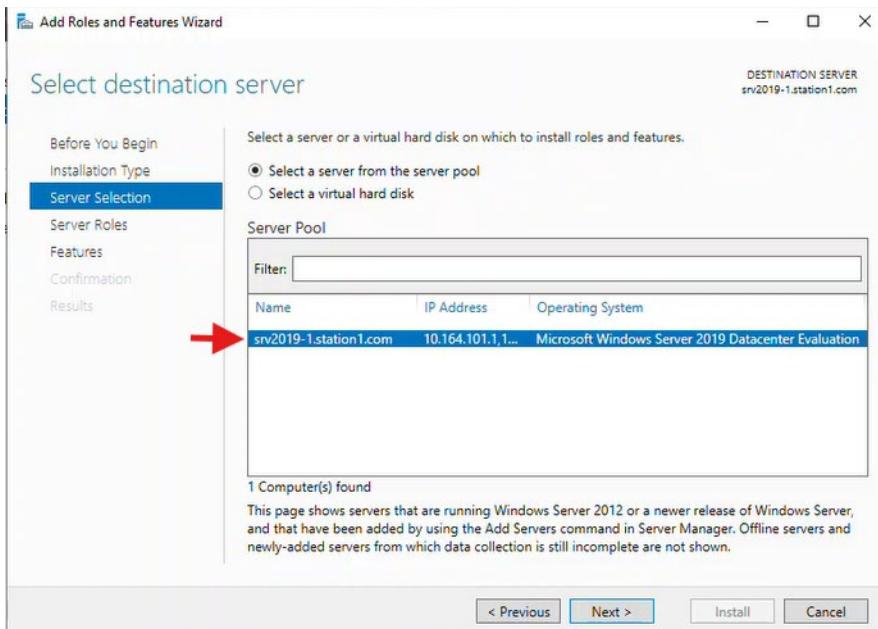
A) On in first page of the Wizard Click on Next



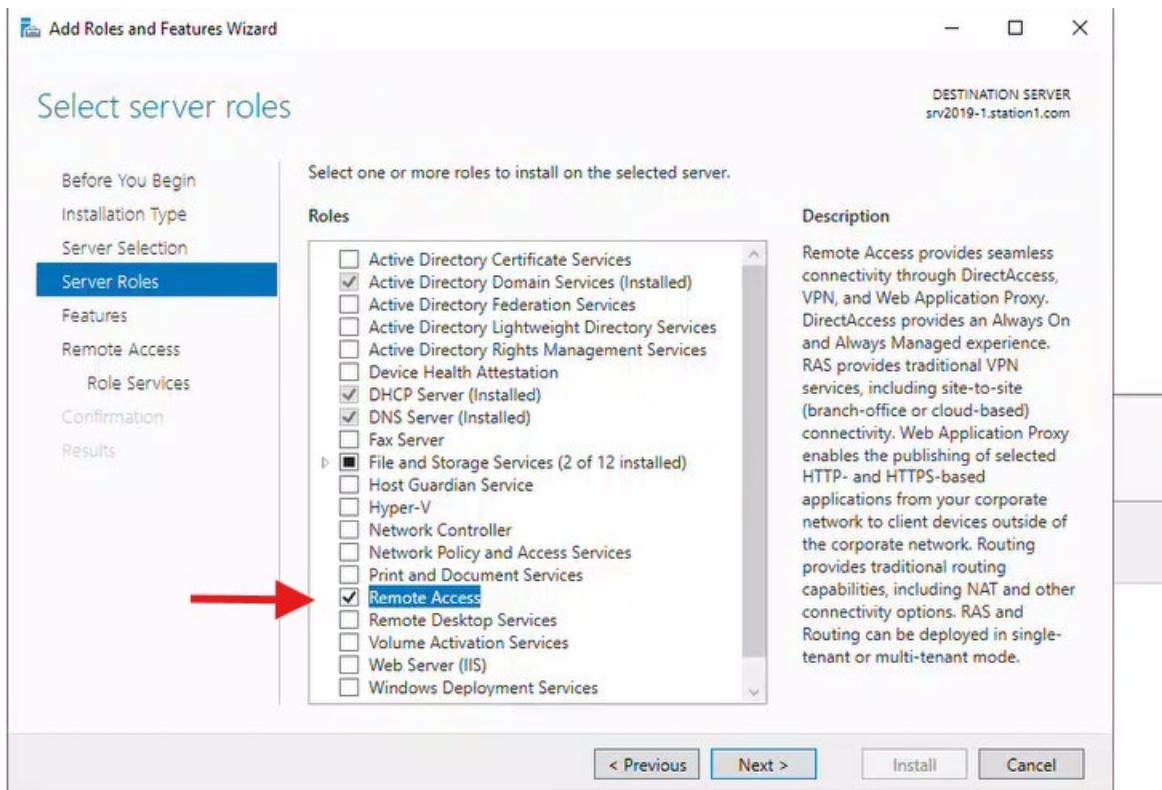
B) Select installation type Role Based is Good click on Next



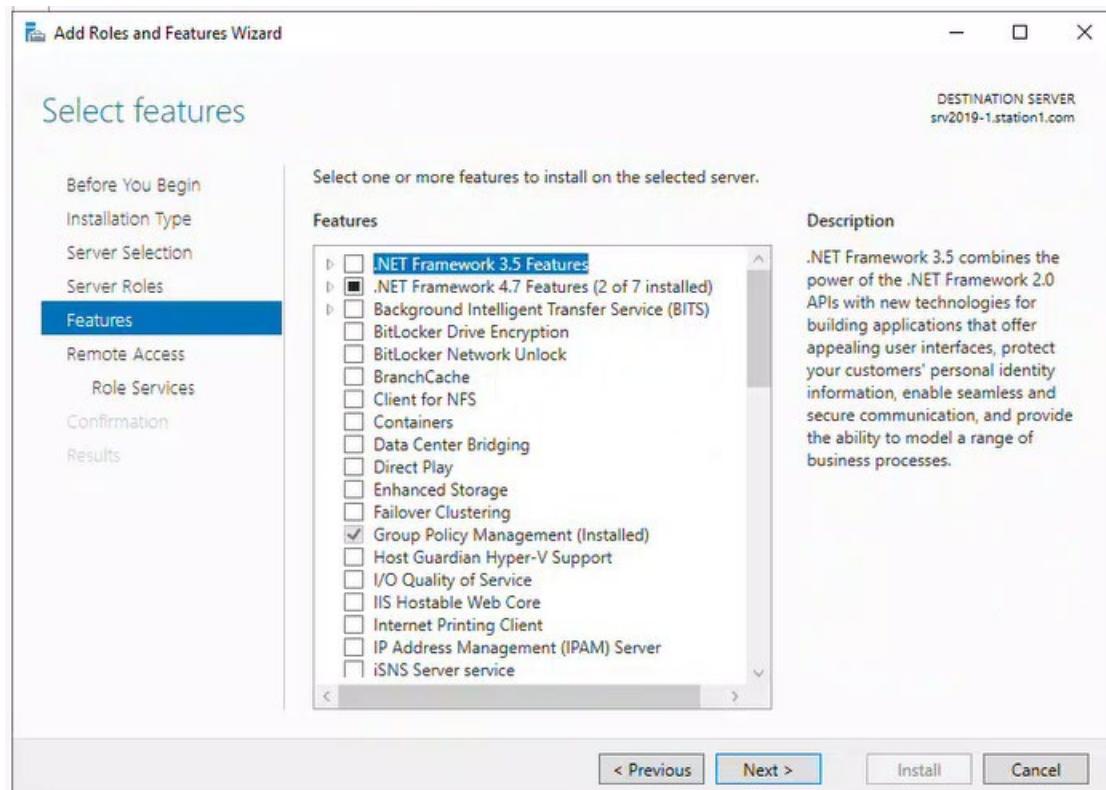
C) Select destination server, Select the server and click on Next



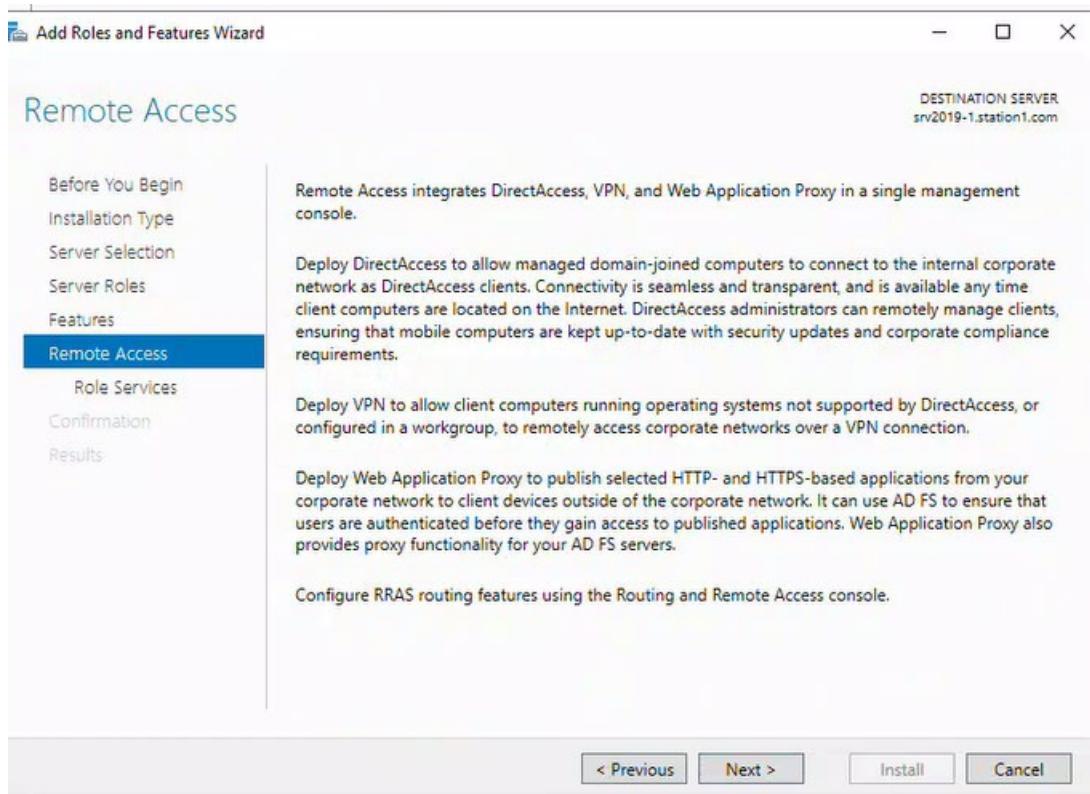
D) Select Remote Access



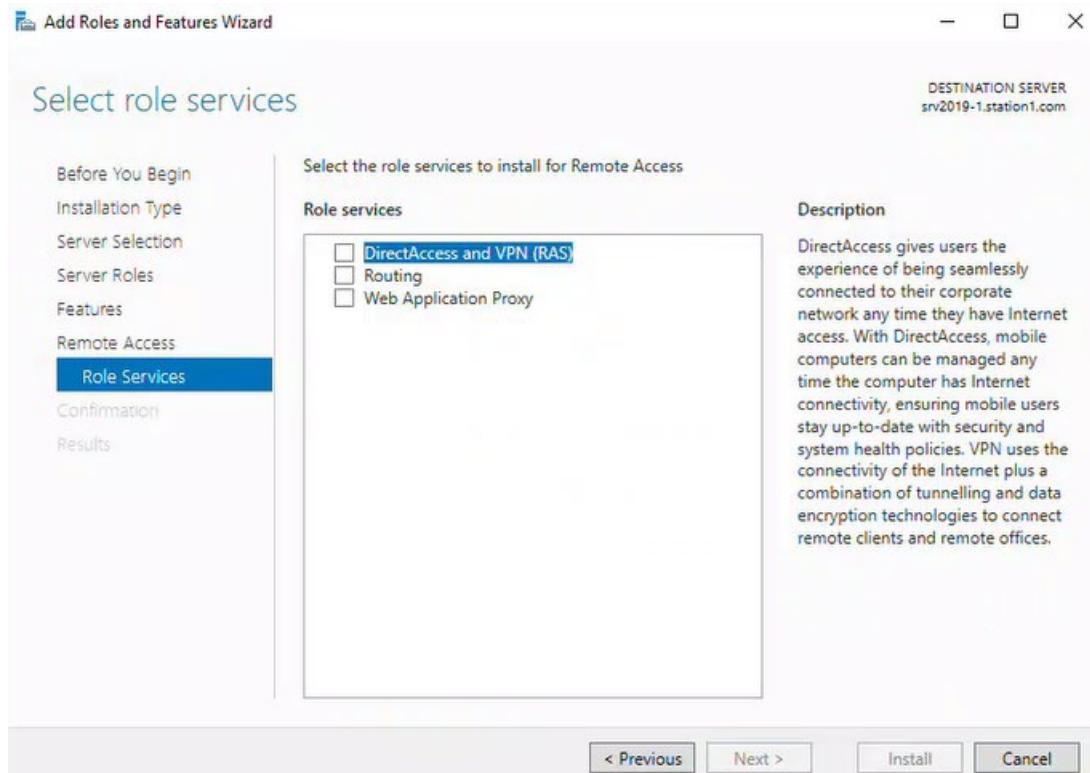
E) Select features click Next

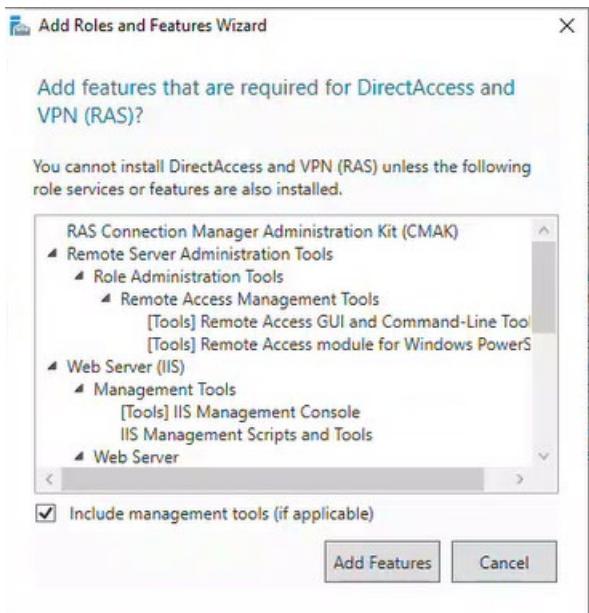


F) In windows Remote Access read description and select Next

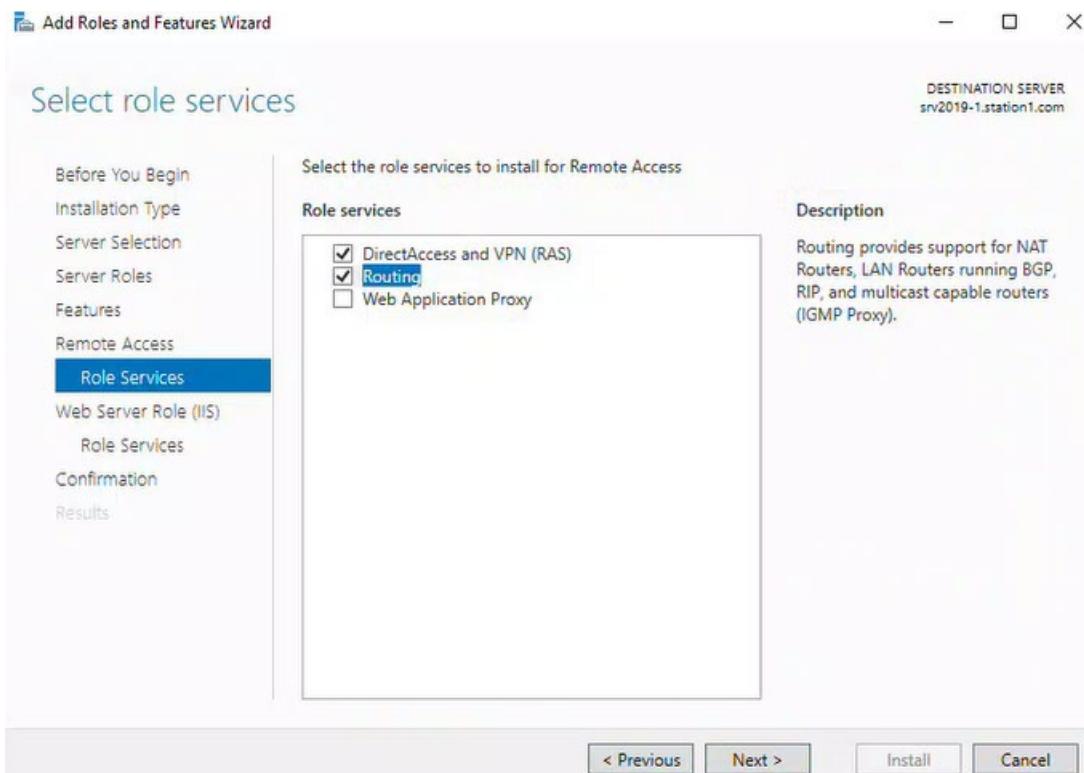


G) Choose direct access and routing, a windows will pop up indicating features , select Add features

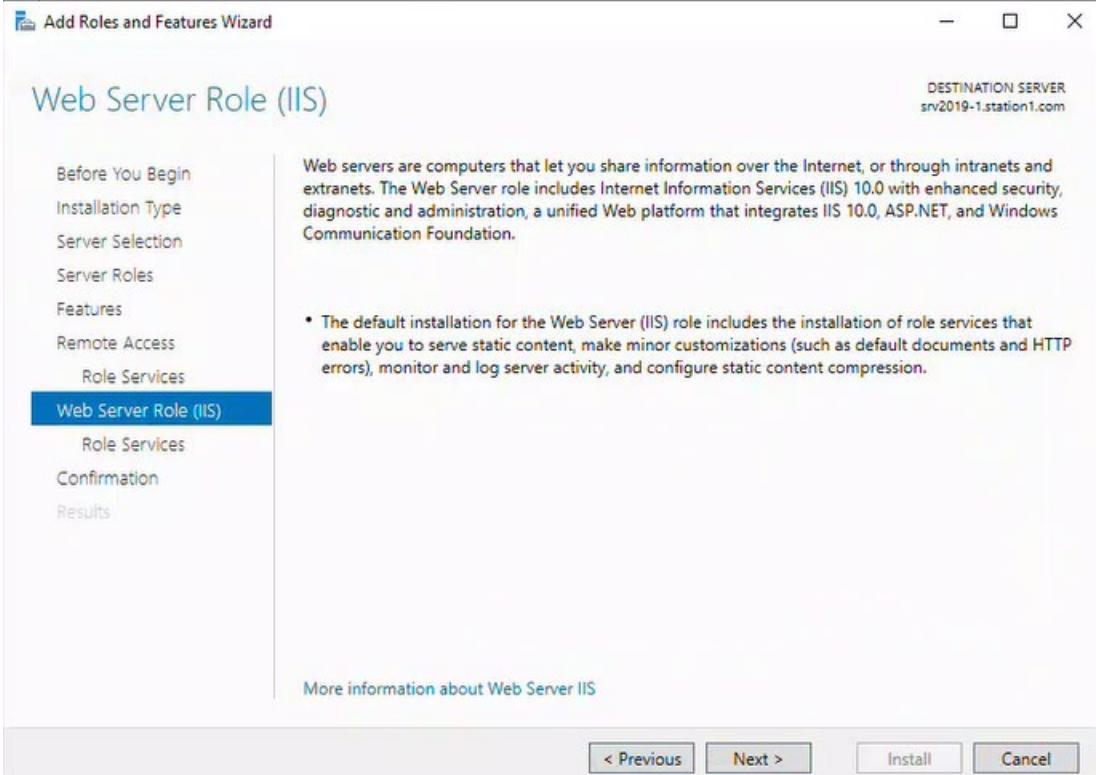




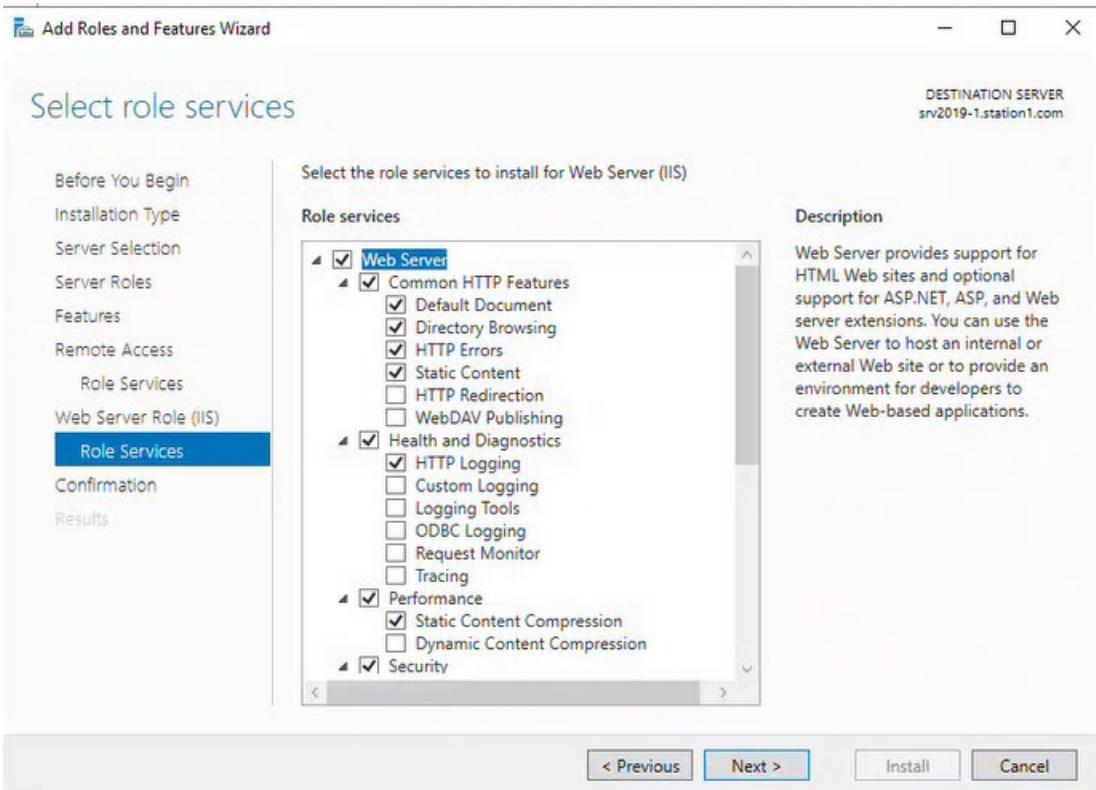
G) Both roles selected click Next



H) Click Next



I) Click Next



J) Confirm installation and press Install

Confirm installation selections

DESTINATION SERVER
srv2019-1.station1.com

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Remote Access

Role Services

Web Server Role (IIS)

Role Services

Confirmation

Results

To install the following roles, role services, or features on selected server, click Install.

 Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

RAS Connection Manager Administration Kit (CMAK)

Remote Access

DirectAccess and VPN (RAS)

Routing

Remote Server Administration Tools

Role Administration Tools

Remote Access Management Tools

Remote Access GUI and Command-Line Tools

Remote Access module for Windows PowerShell

Web Server (IIS)

Export configuration settings

Specify an alternate source path

< Previous

Next >

Install

Cancel

K) Installation process starts

Installation progress

DESTINATION SERVER
srv2019-1.station1.com

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Remote Access

Role Services

Web Server Role (IIS)

Role Services

Confirmation

Results

View installation progress

Feature installation

Installation started on srv2019-1.station1.com

RAS Connection Manager Administration Kit (CMAK)

Remote Access

DirectAccess and VPN (RAS)

Routing

Remote Server Administration Tools

Role Administration Tools

Remote Access Management Tools

Remote Access GUI and Command-Line Tools

Remote Access module for Windows PowerShell

Web Server (IIS)

Management Tools

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

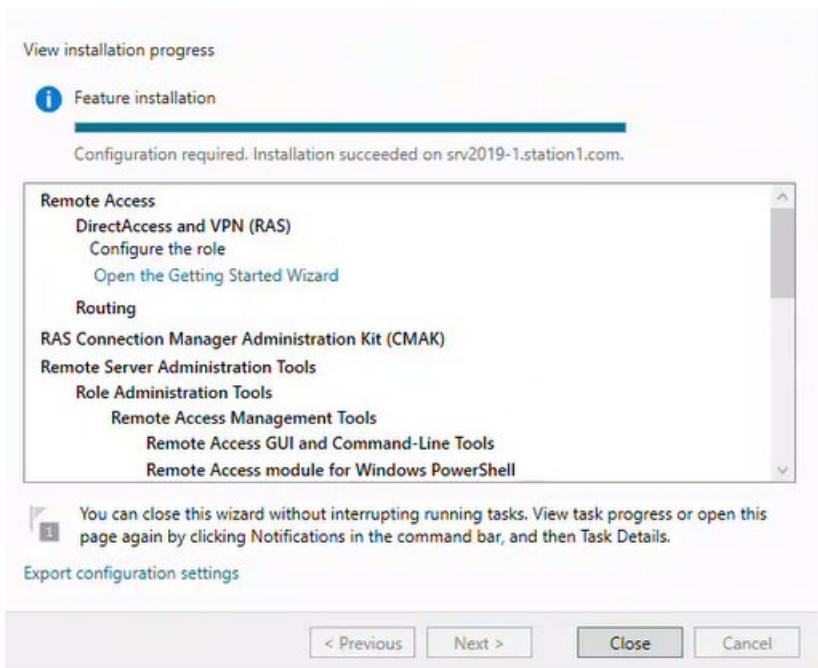
Export configuration settings

< Previous

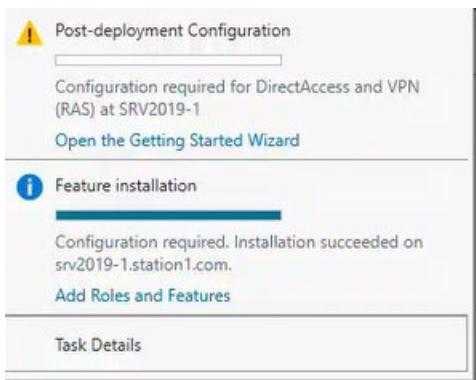
Next >

Close

Cancel

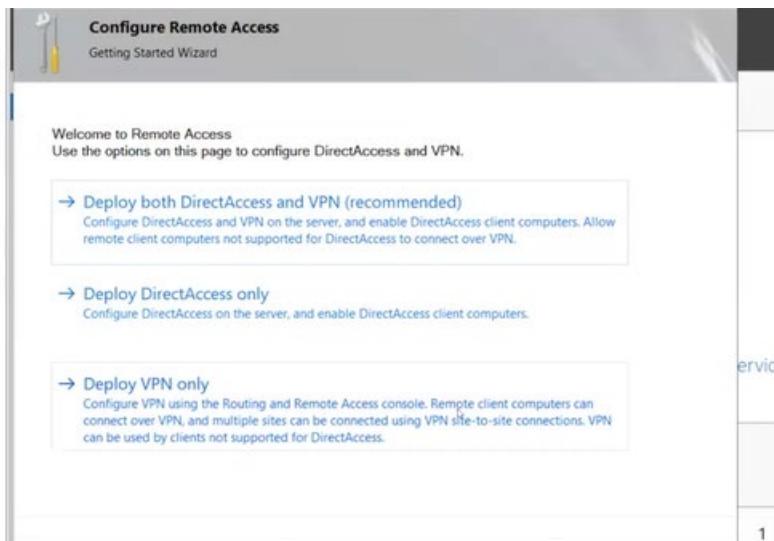


- L) After installation is finished , a warning appears open the warning and ignore, since this tool is not used close it.



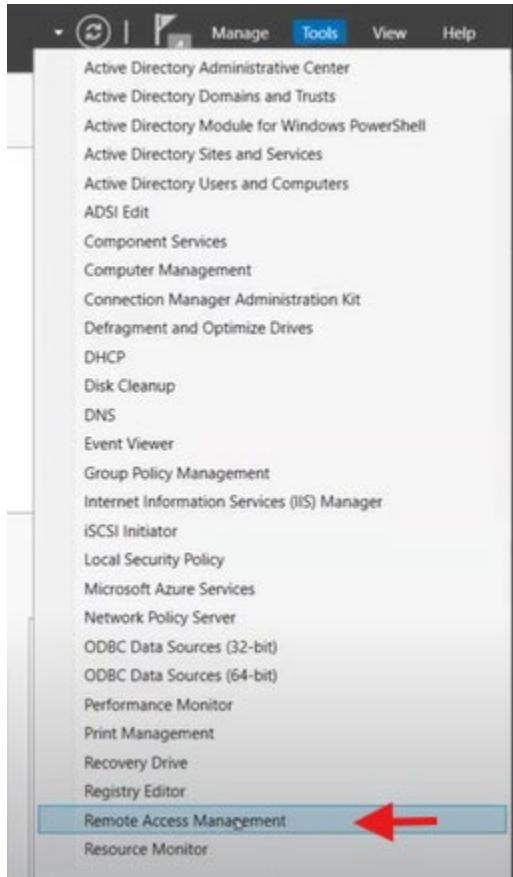
3.10.2 Configure Remote Access

- A) Close this Tool we will use another method to configure.

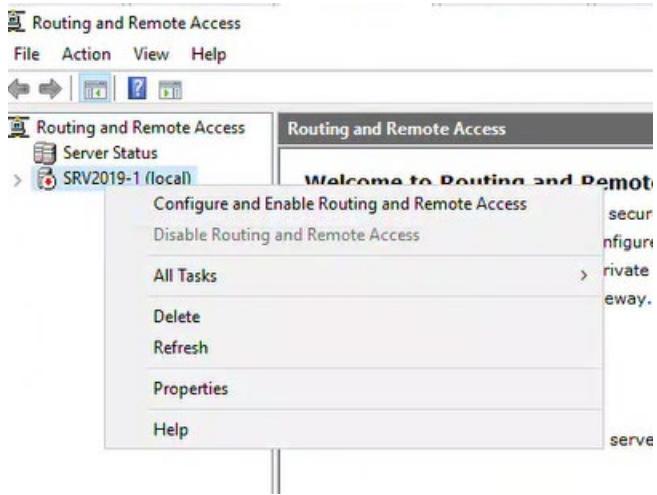


servic
1

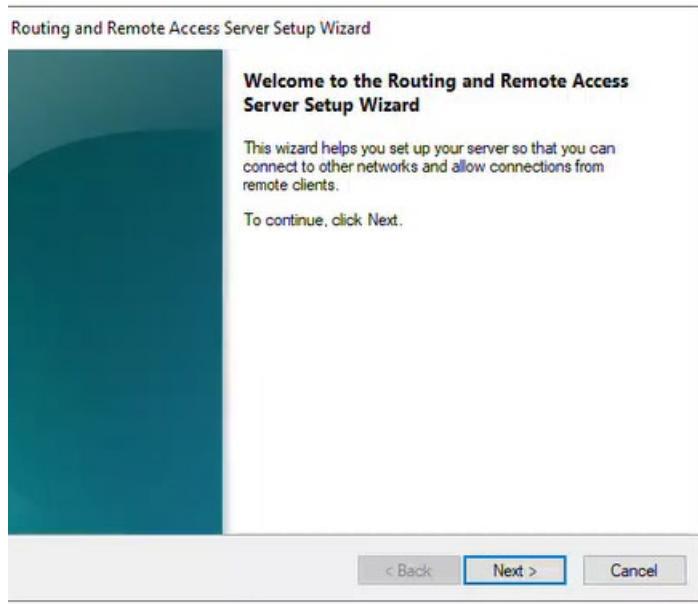
B) Select Tools / Remote Access Management



C) In Routing and remote access select server, right click and elect Configure and enable Routing Access



D) Click Next



E) Select VPN and NAT

Routing and Remote Access Server Setup Wizard

Configuration

You can enable any of the following combinations of services, or you can customize this server.

- Remote access (dial-up or VPN)
Allow remote clients to connect to this server through either a dial-up connection or a secure virtual private network (VPN) Internet connection.
- Network address translation (NAT)
Allow internal clients to connect to the Internet using one public IP address.
- Virtual private network (VPN) access and NAT
Allow remote clients to connect to this server through the Internet and local clients to connect to the Internet using a single public IP address.
- Secure connection between two private networks
Connect this network to a remote network, such as a branch office.
- Custom configuration
Select any combination of the features available in Routing and Remote Access.

< Back Next > Cancel



F) Select External as the network interface that connects the server to the Internet and click Next

Routing and Remote Access Server Setup Wizard

VPN Connection

To enable VPN clients to connect to this server, at least one network interface must be connected to the Internet.

Select the network interface that connects this server to the Internet.

Network interfaces:

Name	Description	IP Address
External	Intel(R) 82574L Gigabit ...	10.164.101.1
Internal	Intel(R) 82574L Gigabit ...	192.168.1.1

< Back Next > Cancel

G) IP Assignment Automatic select Next

Routing and Remote Access Server Setup Wizard

IP Address Assignment

You can select the method for assigning IP addresses to remote clients.

How do you want IP addresses to be assigned to remote clients?

Automatically

If you use a DHCP server to assign addresses, confirm that it is configured properly.
If you do not use a DHCP server, this server will generate the addresses.

From a specified range of addresses

< Back

Next >

Cancel

H) In window Managing Multiple Remote Access Servers , select NO

Routing and Remote Access Server Setup Wizard

Managing Multiple Remote Access Servers

Connection requests can be authenticated locally or forwarded to a Remote Authentication Dial-In User Service (RADIUS) server for authentication.

Although Routing and Remote Access can authenticate connection requests, large networks that include multiple remote access servers often use a RADIUS server for central authentication.

If you are using a RADIUS server on your network, you can set up this server to forward authentication requests to the RADIUS server.

Do you want to set up this server to work with a RADIUS server?

No, use Routing and Remote Access to authenticate connection requests

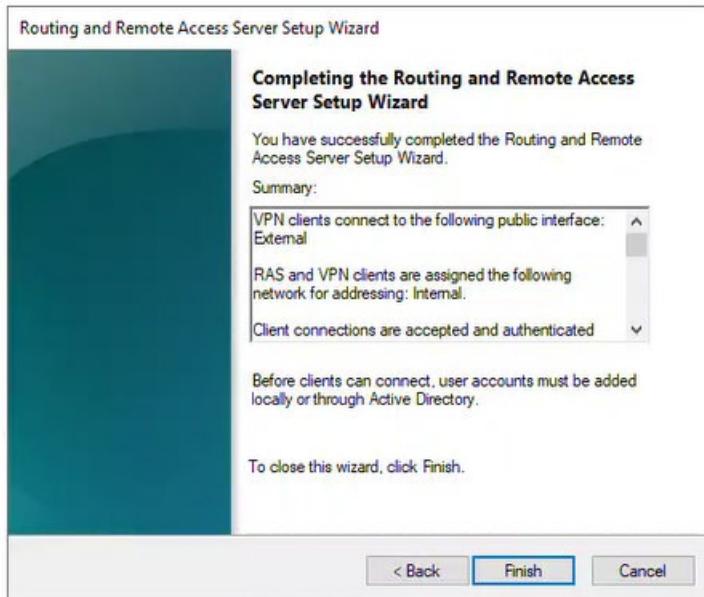
Yes, set up this server to work with a RADIUS server

< Back

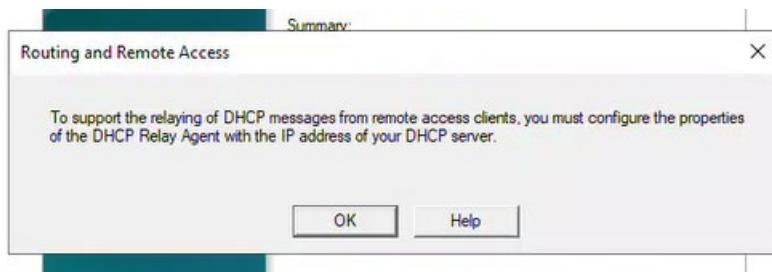
Next >

Cancel

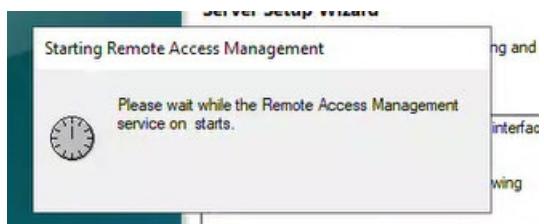
I) Click on Finish



J) Select Ok

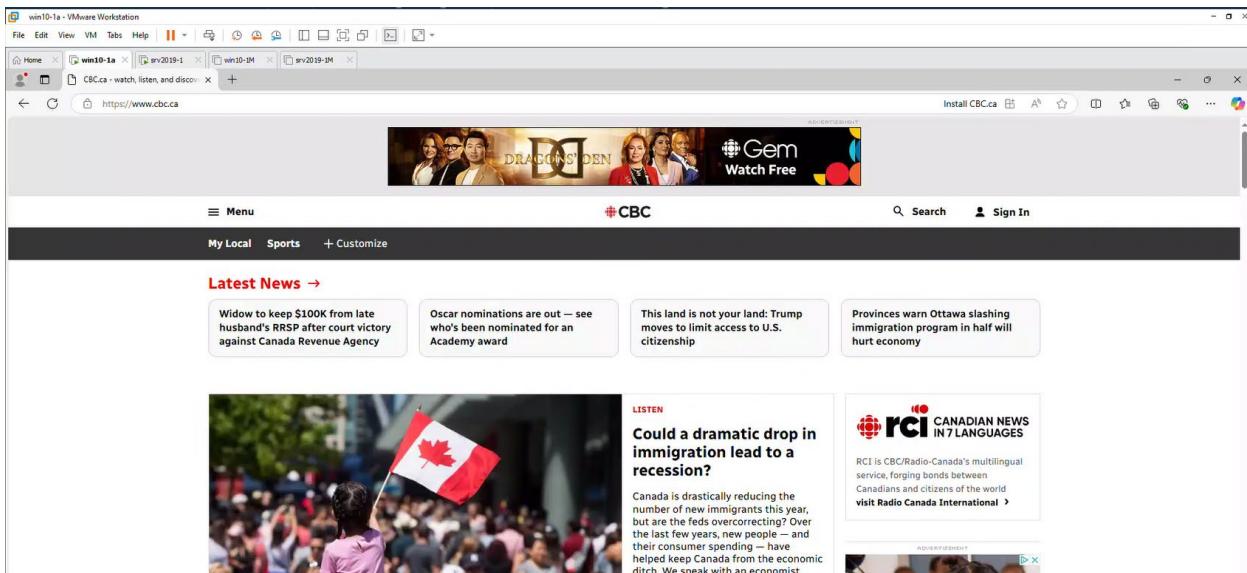


K) Wait



3.10.3 Test

Login to Win10 and verify connection to internet



3.11 WDS Windows Deployment service

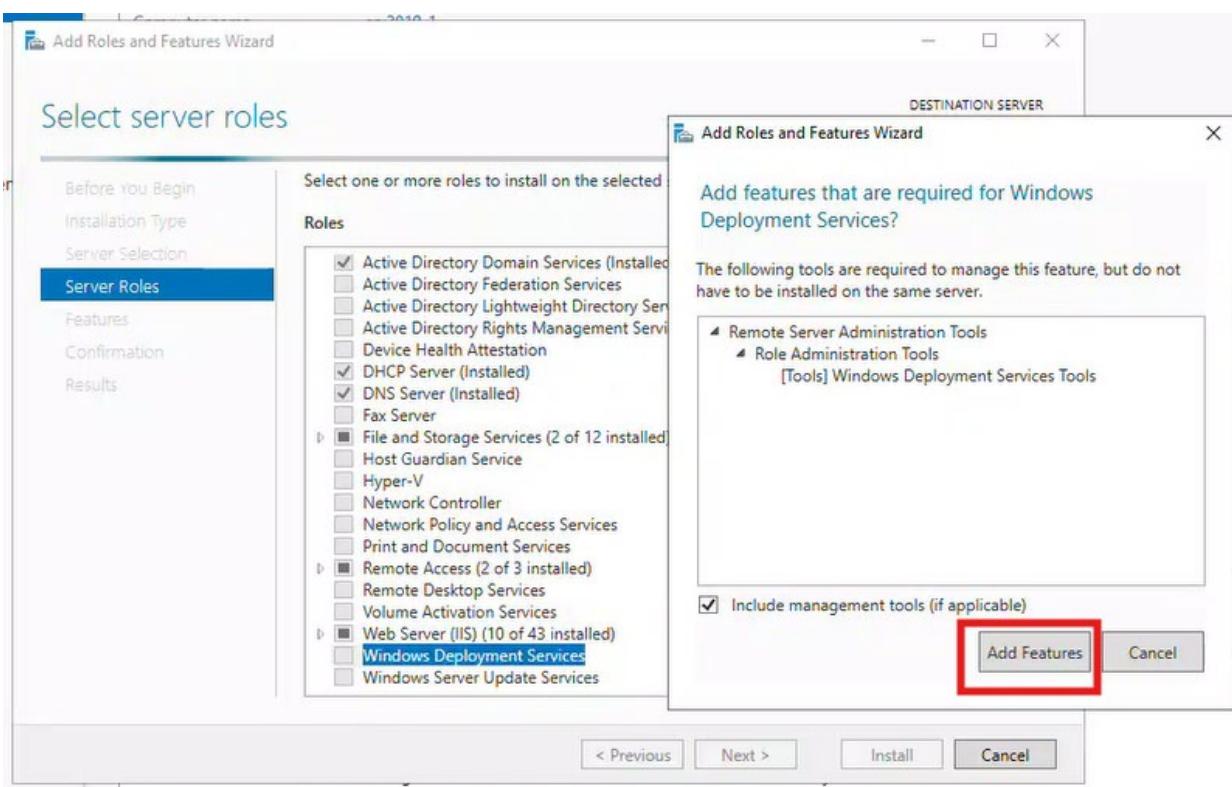
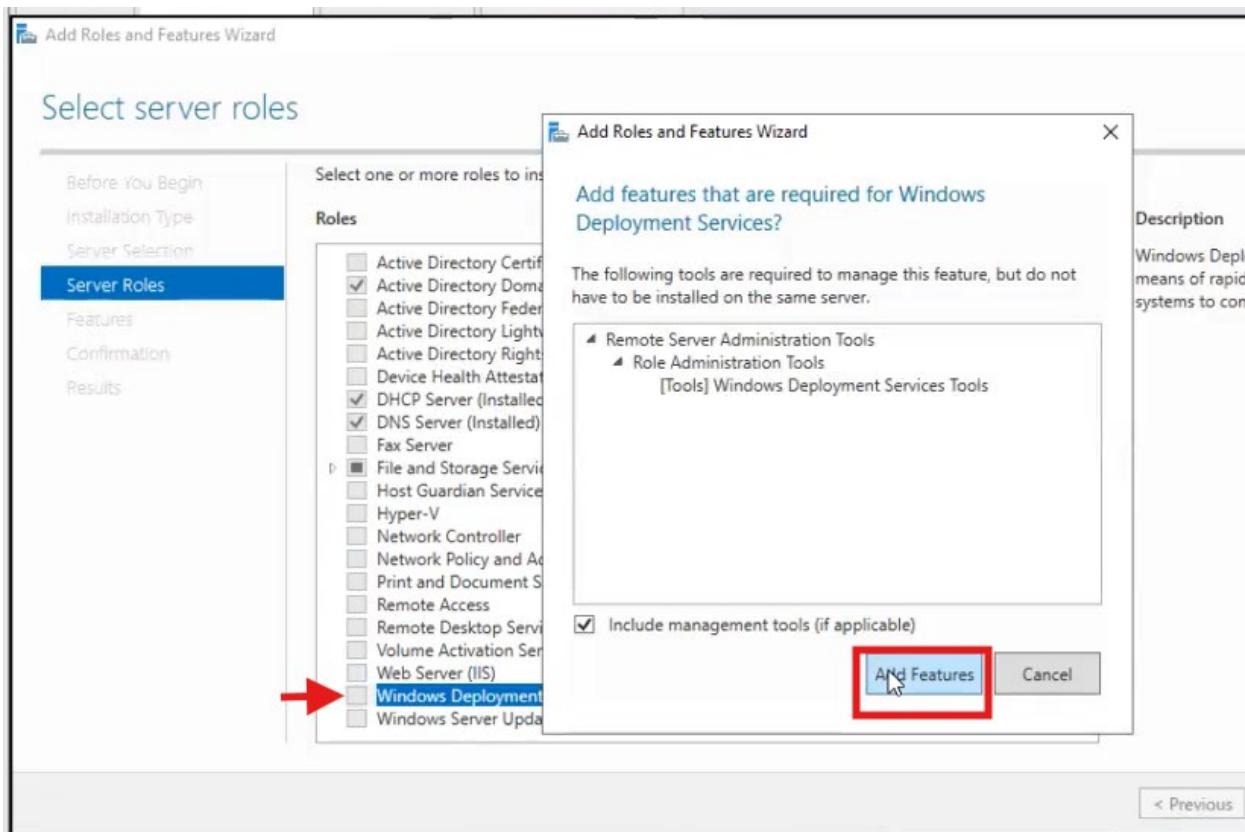
3.11.1 Install WDS Server and Extract install.wim file

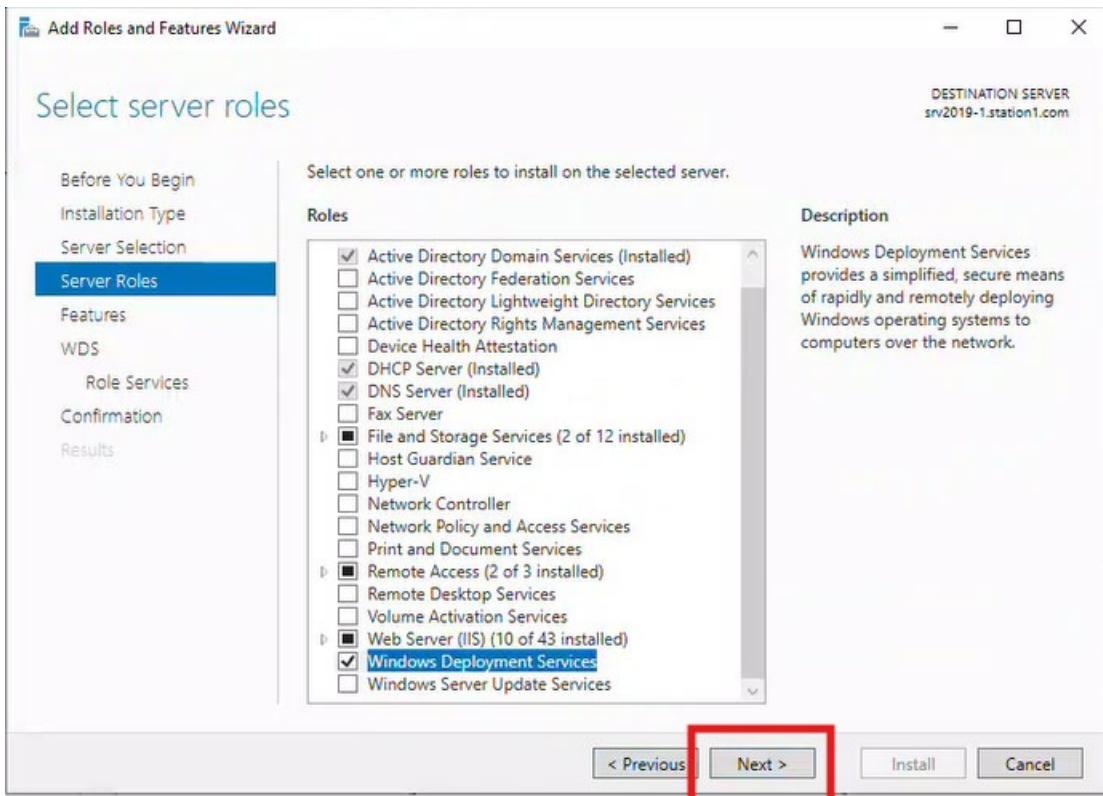
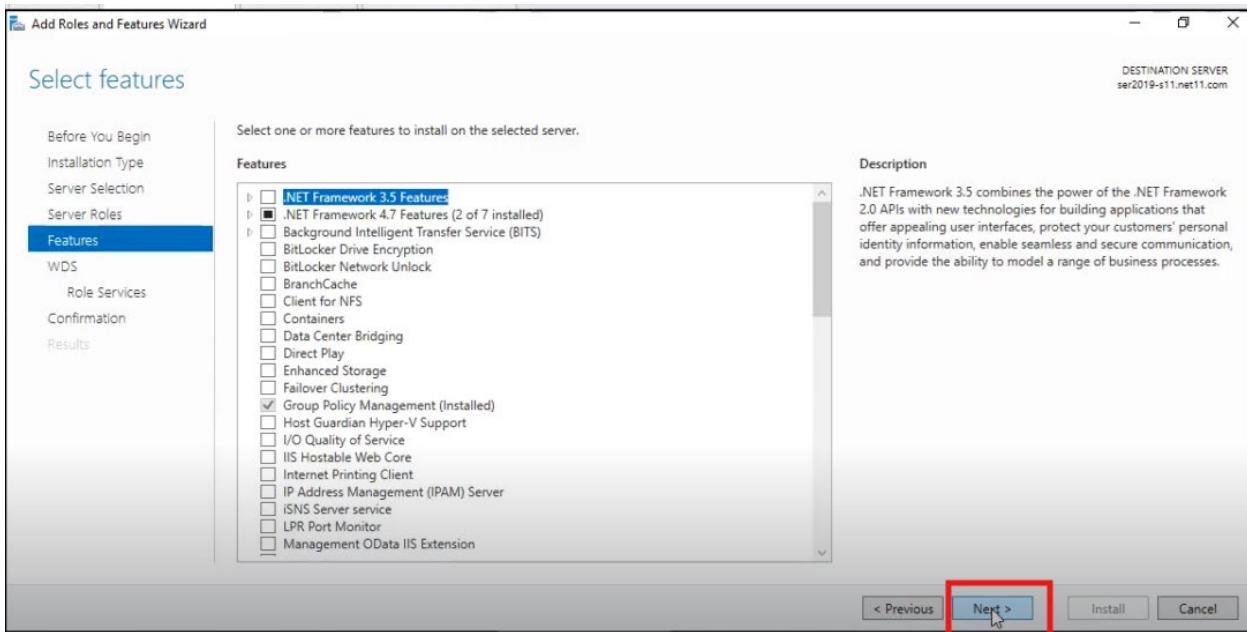
A) Login to server

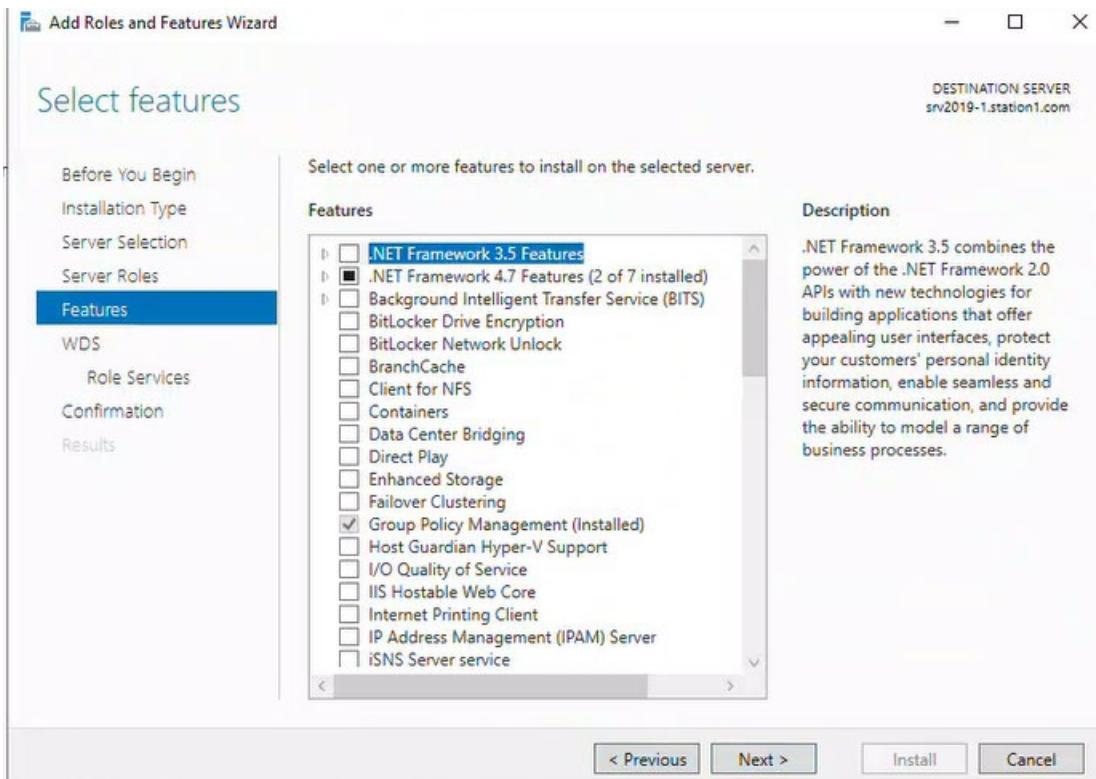
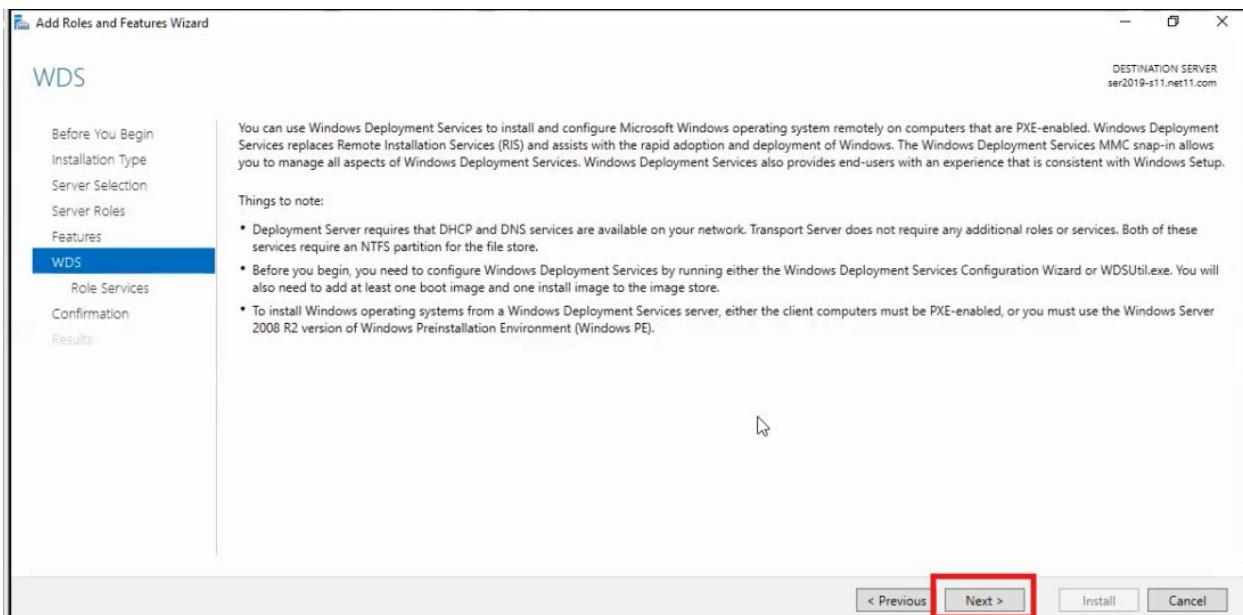
B) Manage Add roles

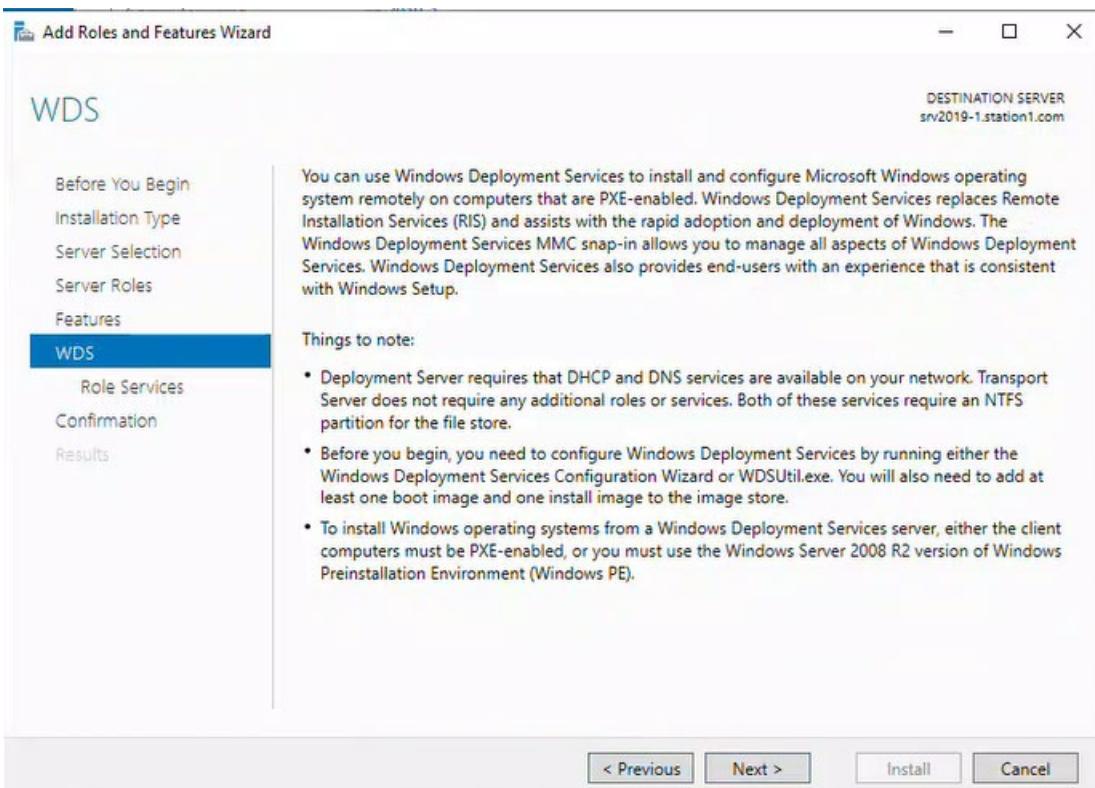
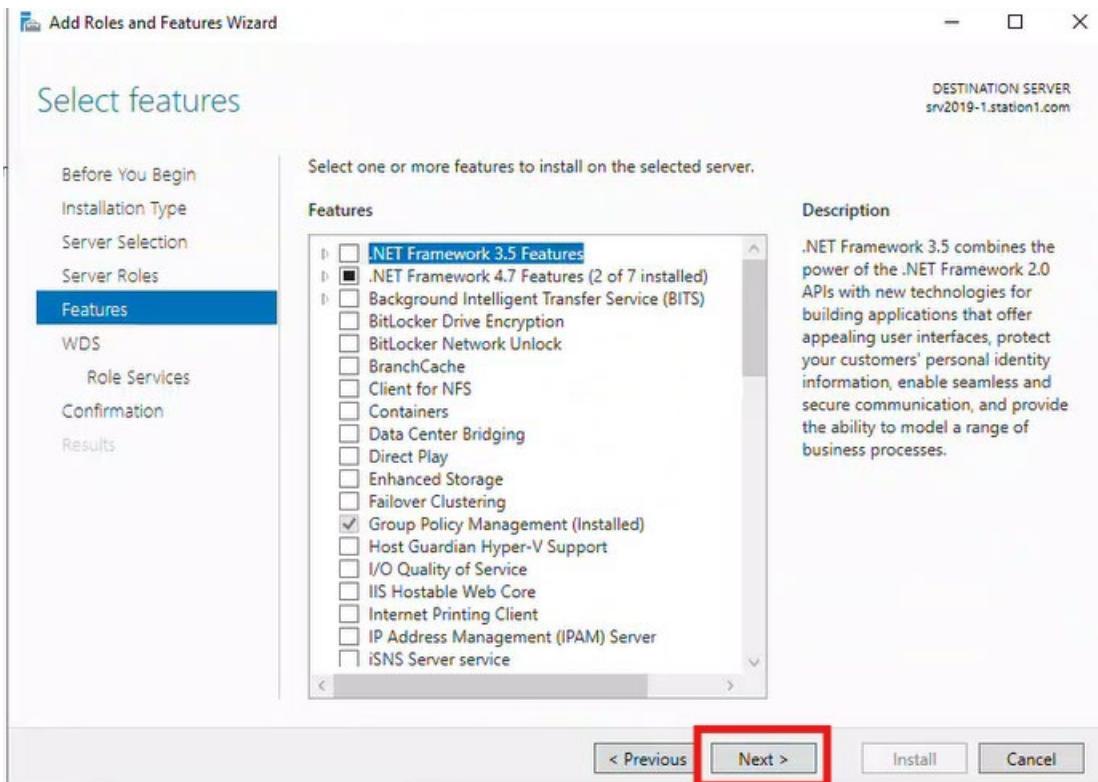
Role based

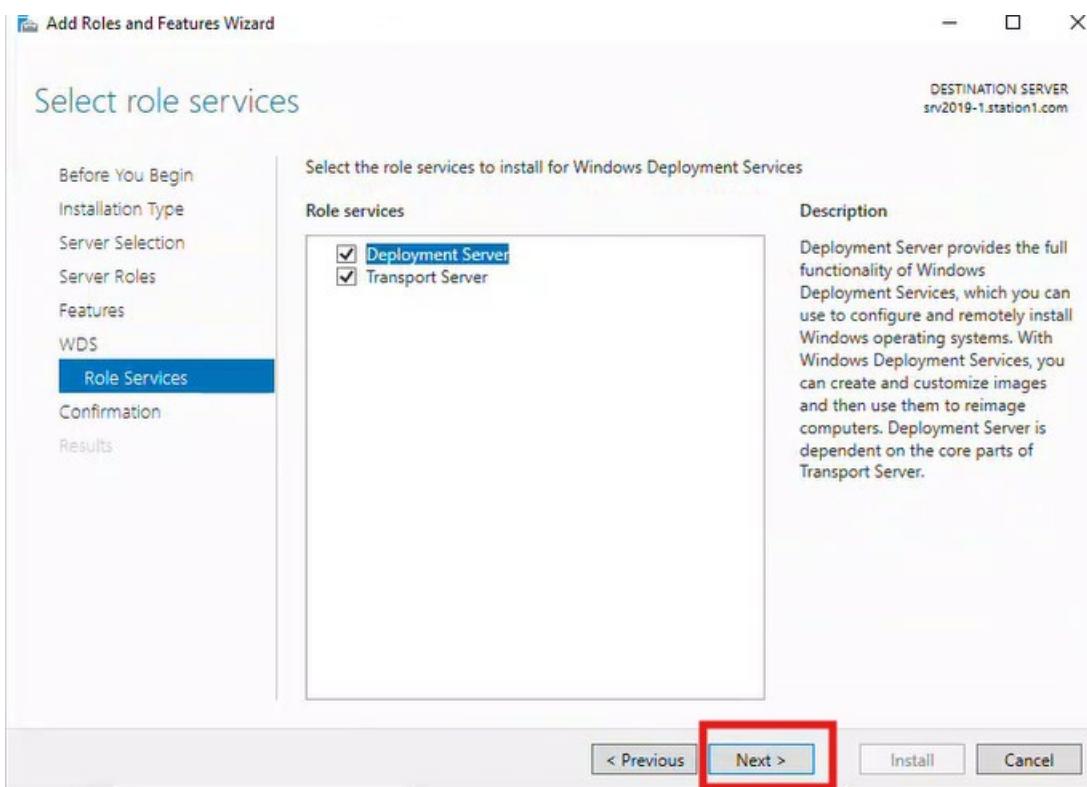
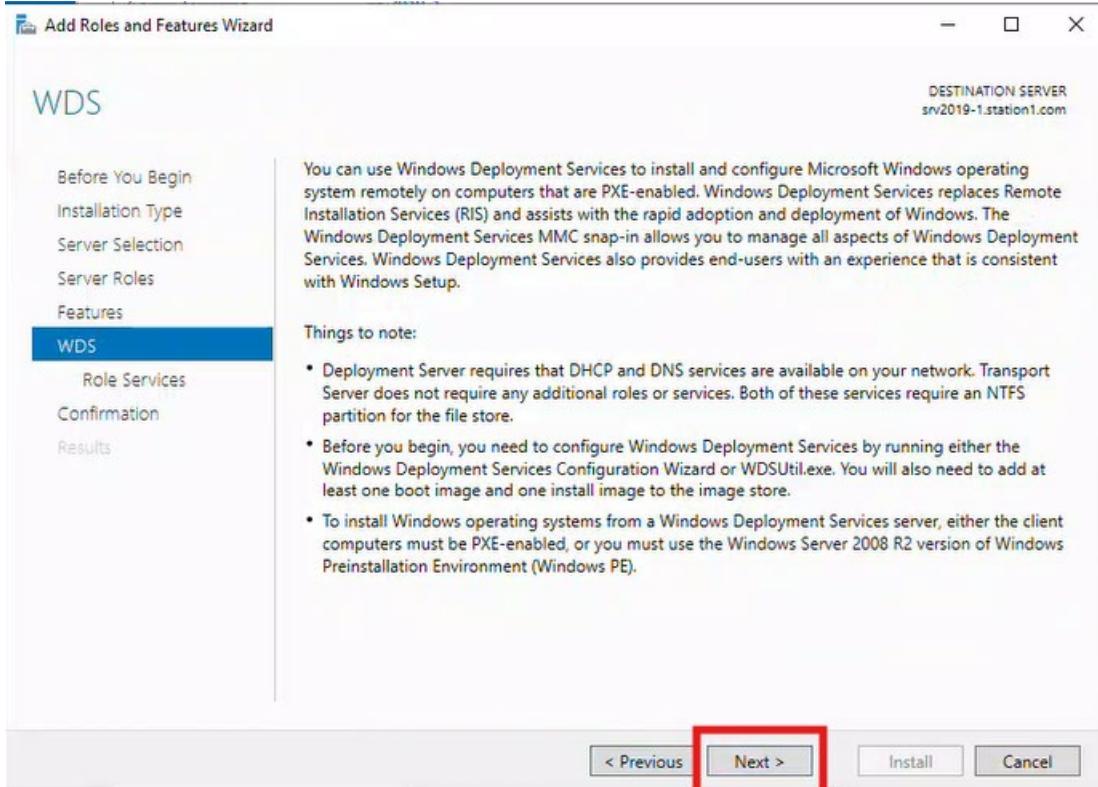
Select server

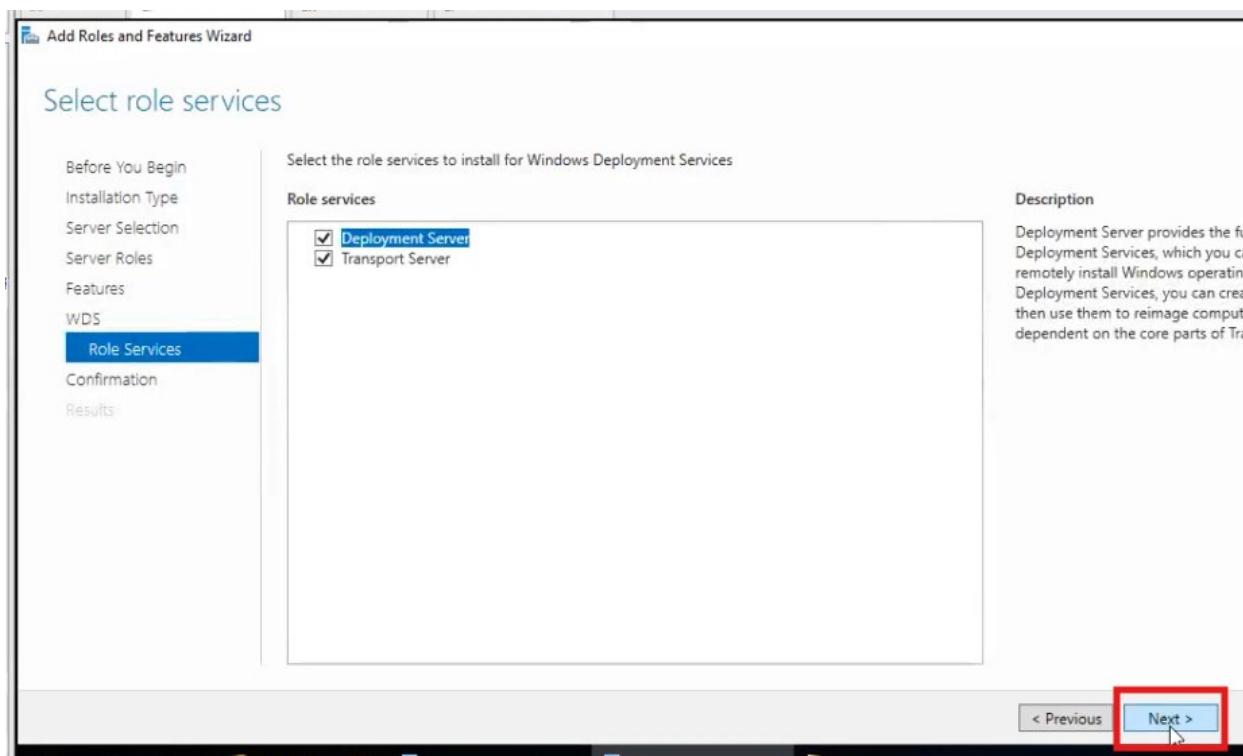
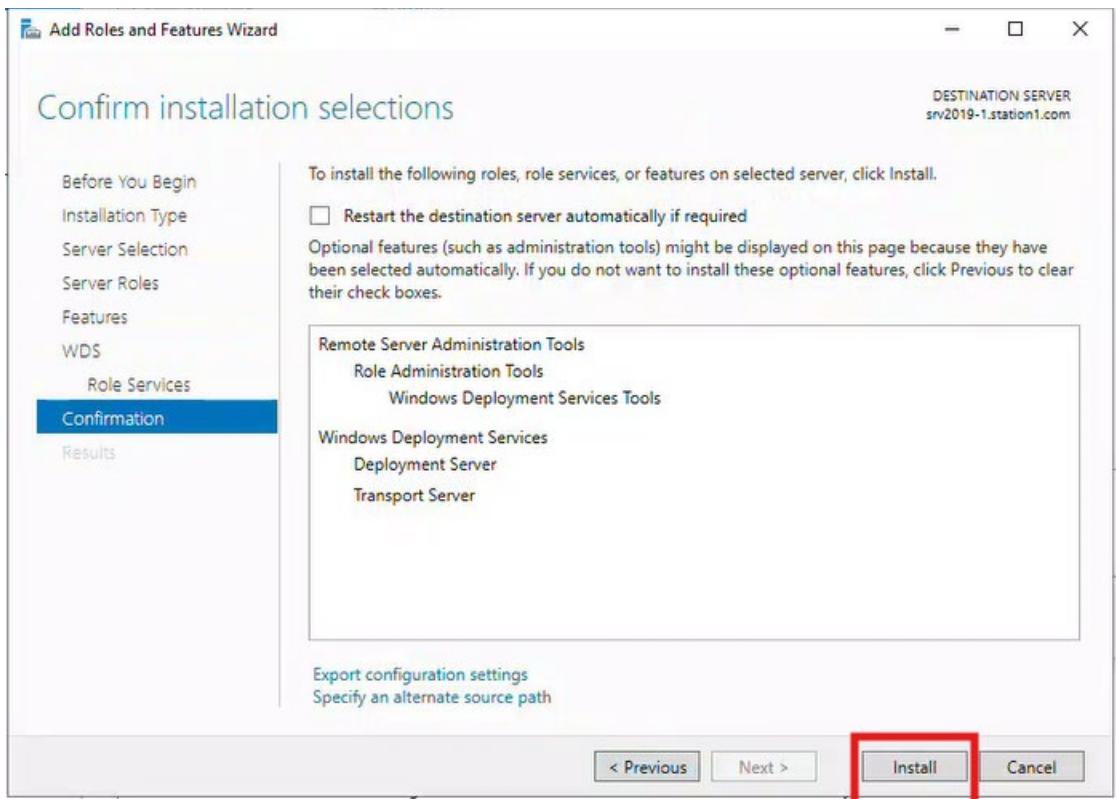


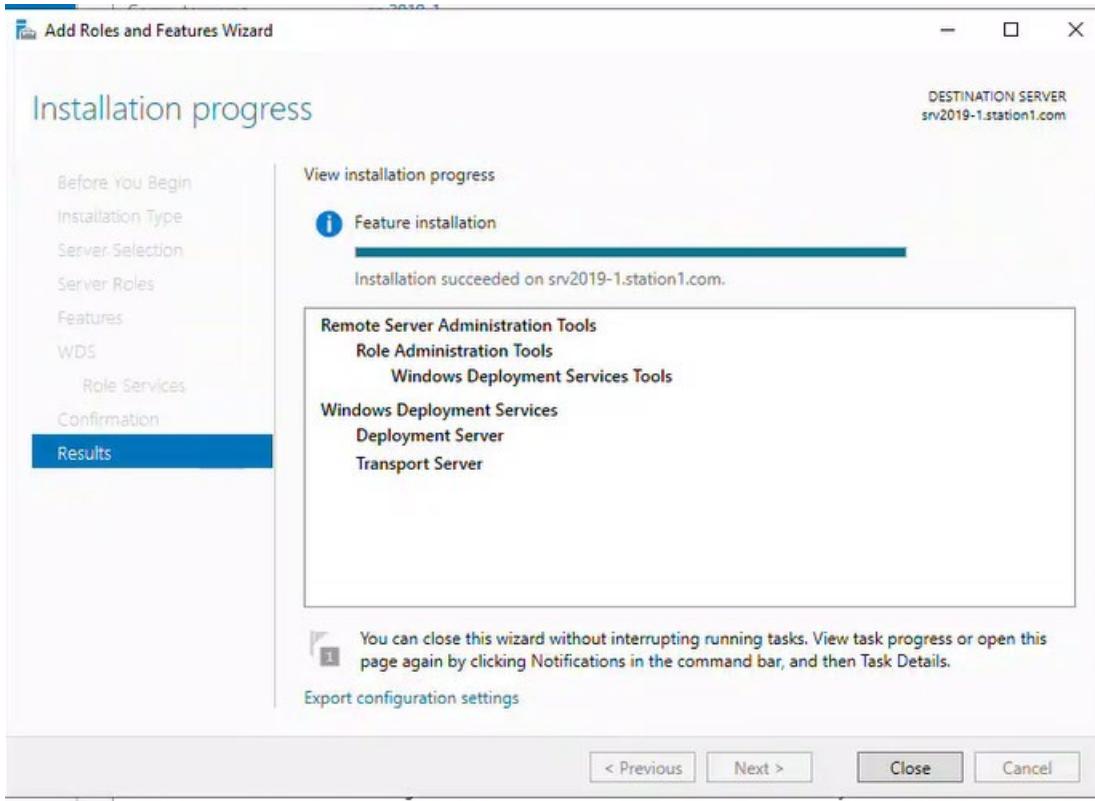
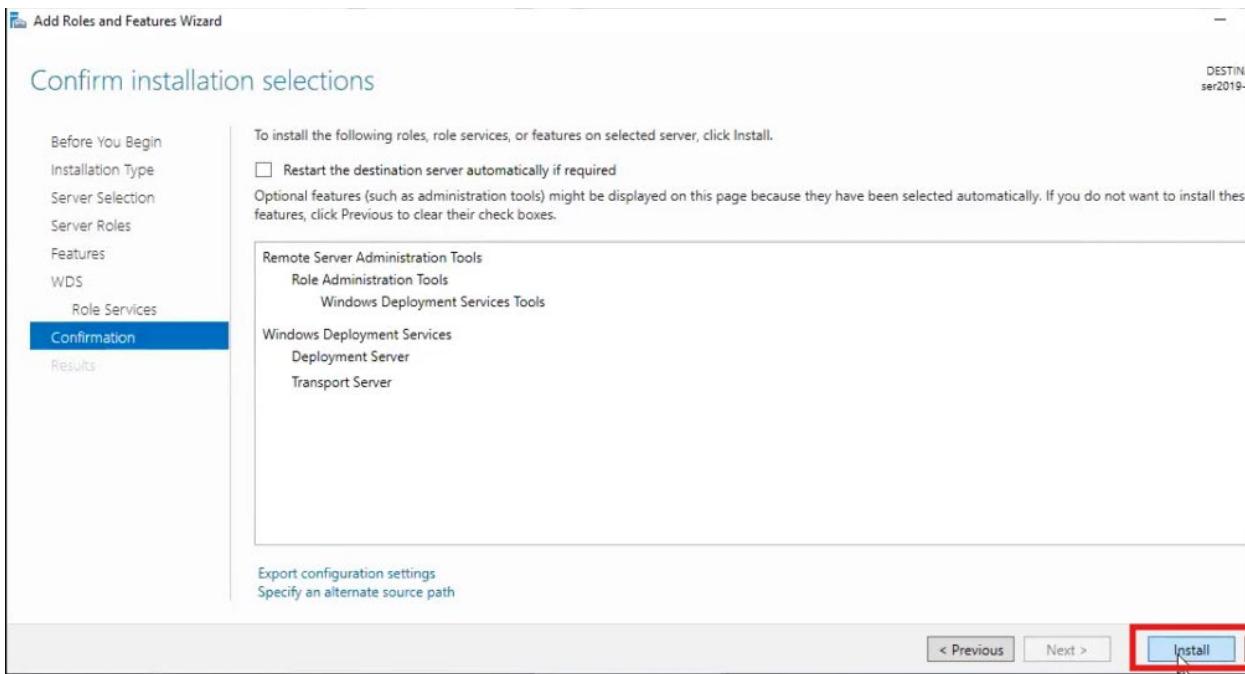


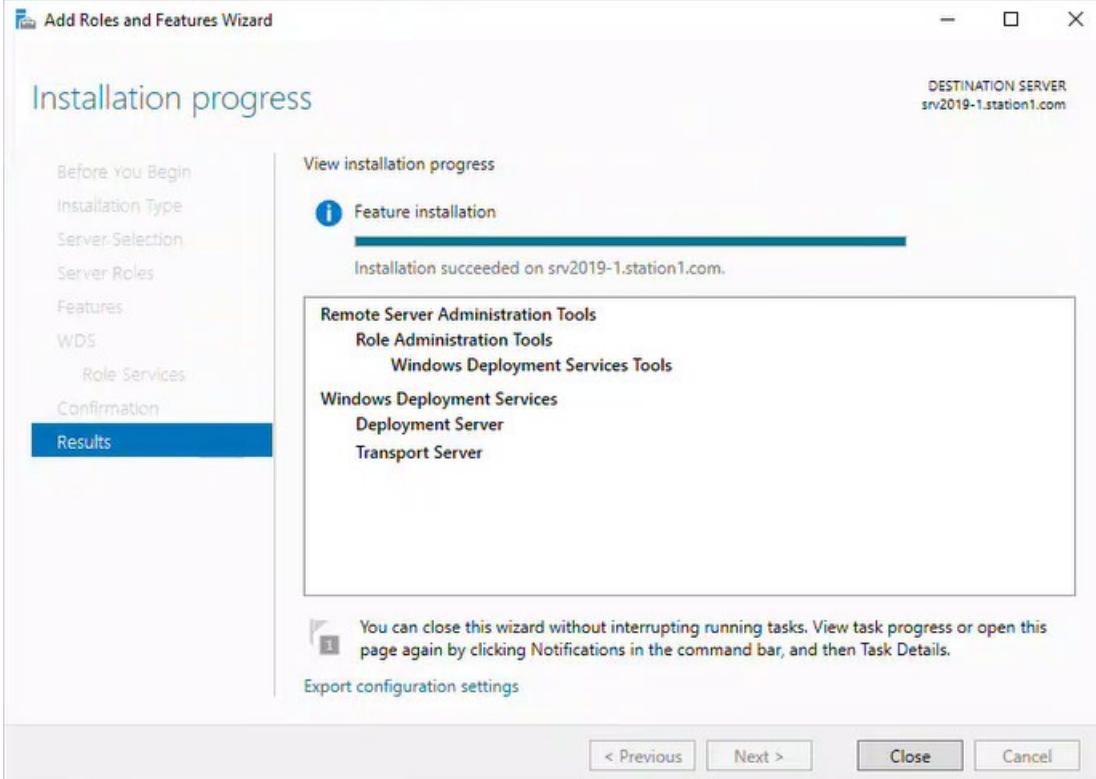












Virtual Machine Settings

Hardware Options

Device	Summary
Memory	8 GB
Processors	2
Hard Disk (NVMe)	60 GB
CD/DVD (SATA)	Using file C:\ISOs\WindowsSe...
Network Adapter	Bridged (Automatic)
Network Adapter 2	LAN Segment
USB Controller	Present
Sound Card	Auto detect
Printer	Present
Display	Auto detect

Device status

Connected
 Connect at power on

Connection

Use physical drive:
Auto detect

Use ISO image file:
C:\ISOs\Windows 10\win10latest\Windows 10 Enter

Add... Remove

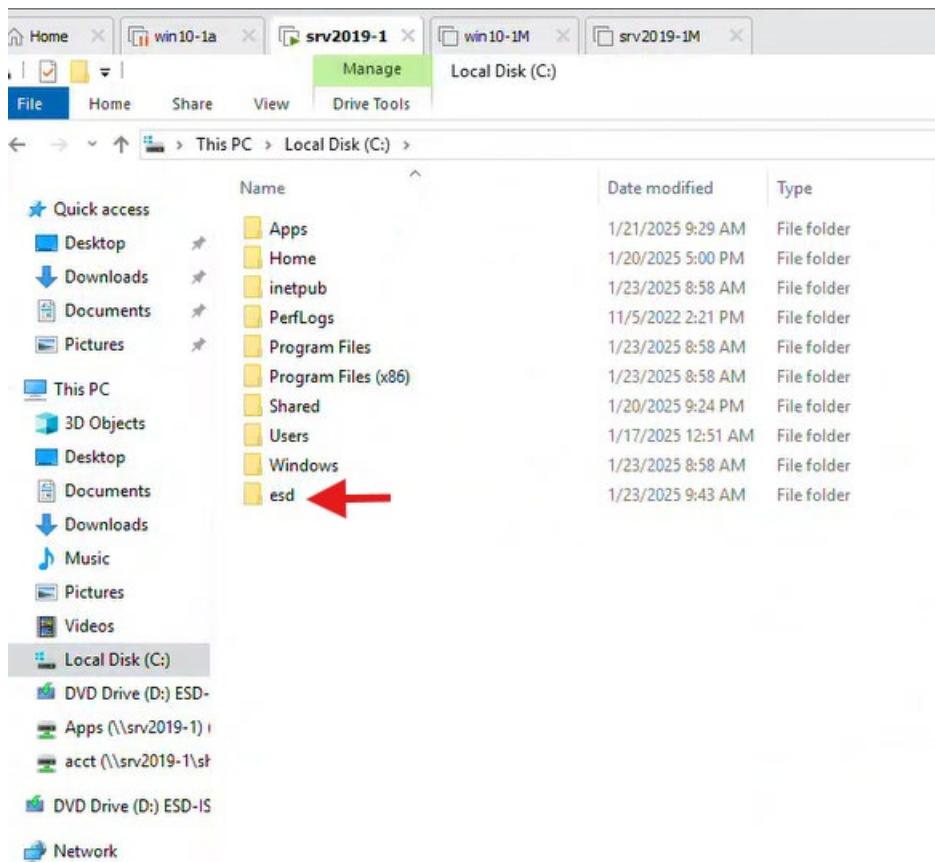
OK Cancel Help

sources

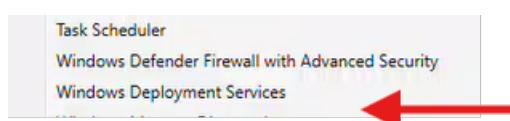
File Home Share View

← → ↑ This PC > DVD Drive (D:) ESD-ISO > sources >

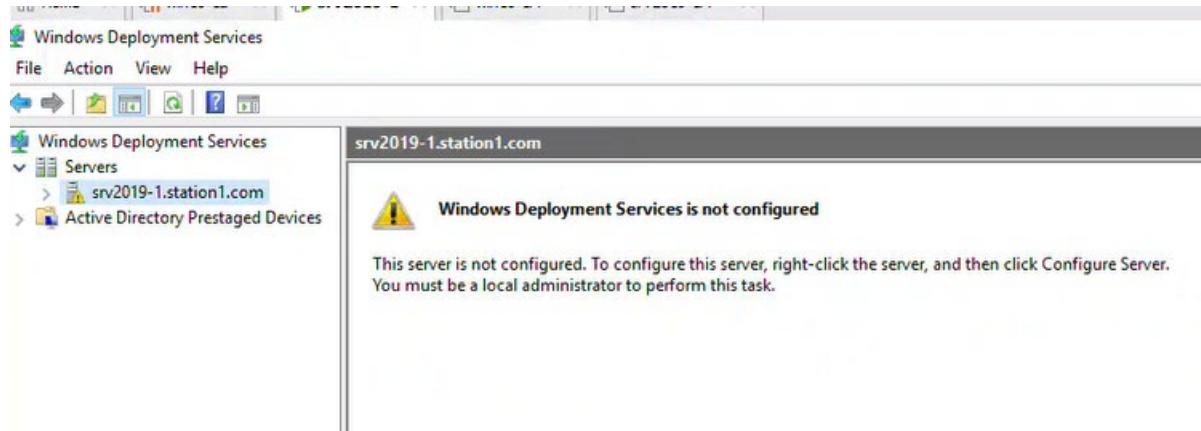
	Name	Date modified	Type	Size
Quick access	facilitator.dll	10/6/2021 3:56 PM	Application extens...	972 KB
Desktop	folderprovider.dll	10/6/2021 3:56 PM	Application extens...	61 KB
Downloads	gatherosstate.exe	10/6/2021 3:56 PM	Application	1,468 KB
Documents	generaltel.dll	10/6/2021 3:56 PM	Application extens...	810 KB
Pictures	hwcompat.dll	10/6/2021 3:56 PM	Application extens...	204 KB
This PC	hwcompat.txt	10/6/2021 3:56 PM	Text Document	735 KB
3D Objects	hwcompatPE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Desktop	hwexclude.txt	10/6/2021 3:56 PM	Text Document	1 KB
Documents	hwexcludePE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Downloads	hypervcomplcheck.dll	10/6/2021 3:56 PM	Application extens...	183 KB
Music	iasmigplugin.dll	10/6/2021 3:56 PM	Application extens...	681 KB
Pictures	idwbinfo.txt	10/6/2021 3:56 PM	Text Document	1 KB
Videos	iiscomp.dll	10/6/2021 3:56 PM	Application extens...	24 KB
Local Disk (C:)	imagingprovider.dll	10/6/2021 3:56 PM	Application extens...	218 KB
DVD Drive (D:) ESD-	install.esd	2/7/2022 11:47 AM	ESD File	3,706,193 KB
	itgtupg.dll	10/6/2021 3:56 PM	Application extens...	84 KB
	lang.ini	10/6/2021 3:56 PM	Configuration sett...	1 KB
	locale.nls	10/6/2021 3:56 PM	NLS File	801 KB
	logprovider.dll	10/6/2021 3:56 PM	Application extens...	149 KB
	mediasetupuimgr.dll	10/6/2021 3:56 PM	Application extens...	13,705 KB
	migapp.xml	10/6/2021 3:56 PM	XML Document	640 KB
	migcore.dll	10/6/2021 3:56 PM	Application extens...	8,845 KB
	mighost.exe	10/6/2021 3:56 PM	Application	254 KB
	migisol.dll	10/6/2021 3:56 PM	Application extens...	142 KB
	migres.dll	10/6/2021 3:56 PM	Application extens...	16 KB
	migstore.dll	10/6/2021 3:56 PM	Application extens...	1,209 KB



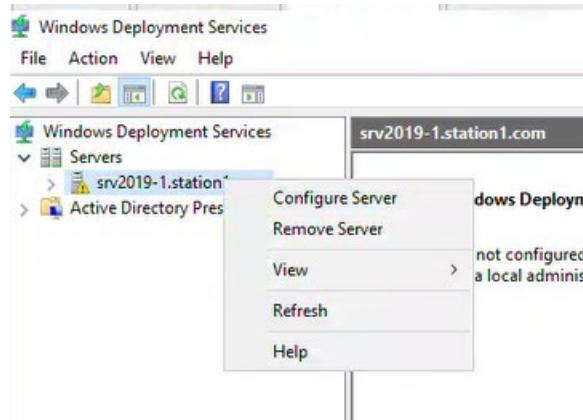
Tools

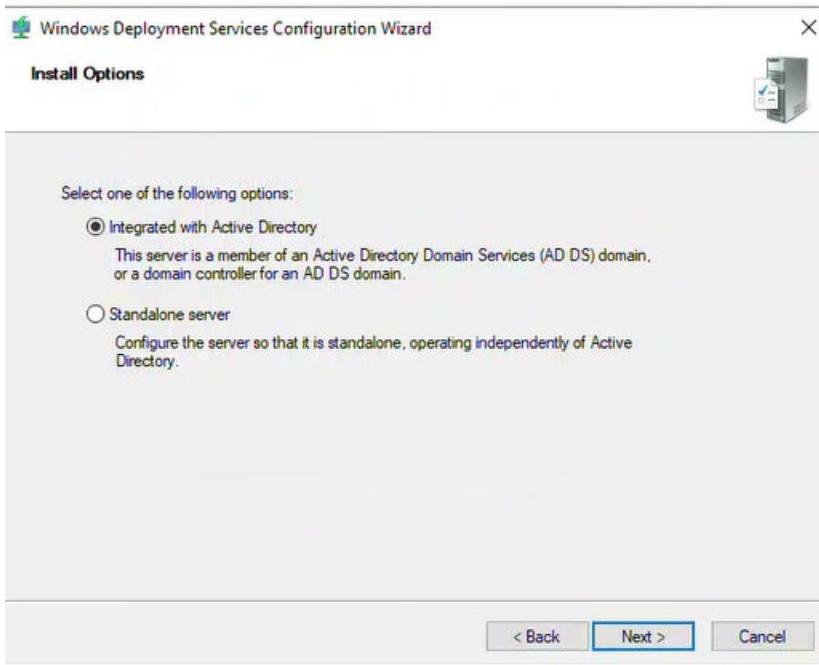
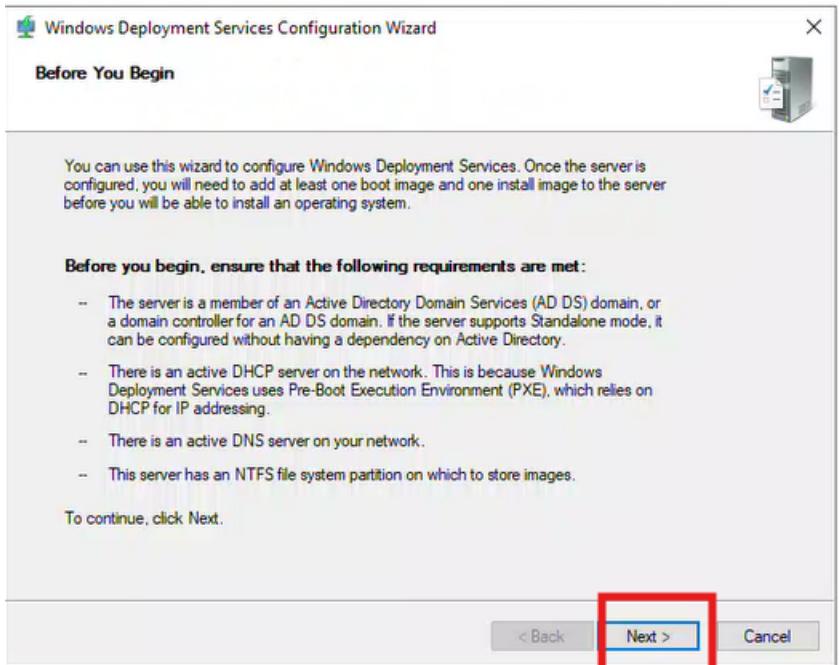


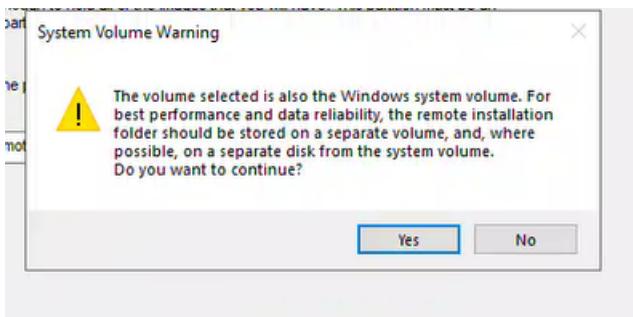
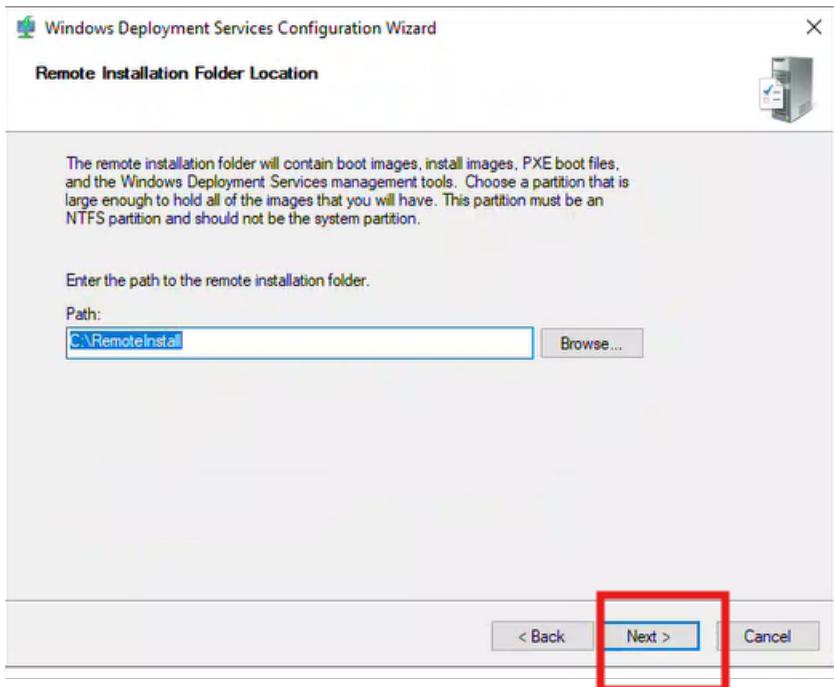
Select server

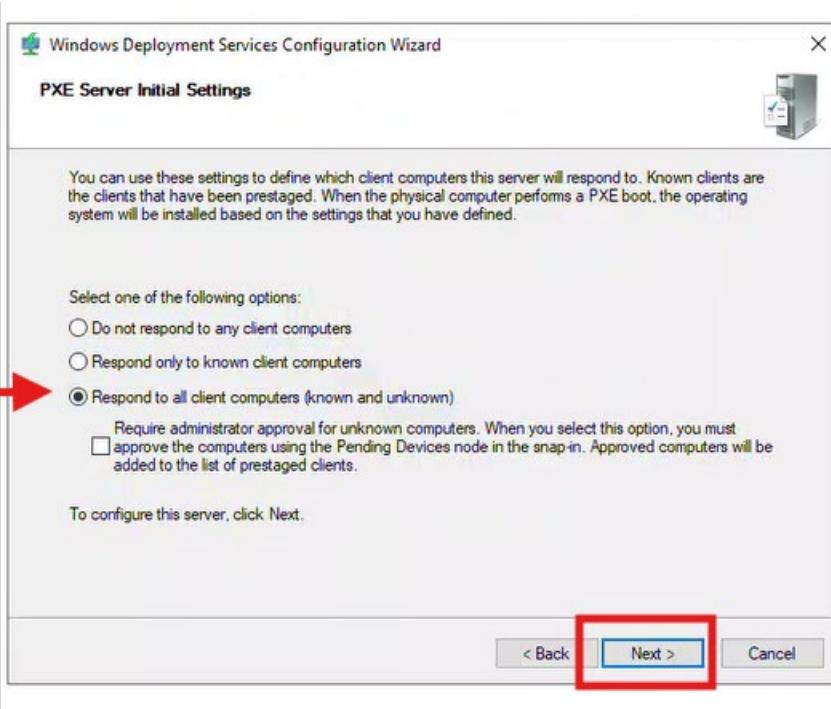
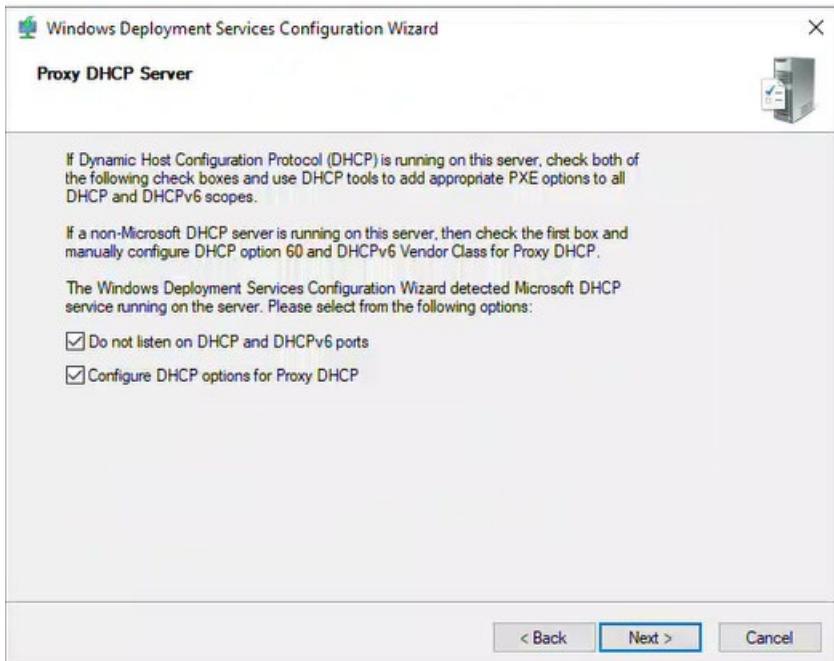


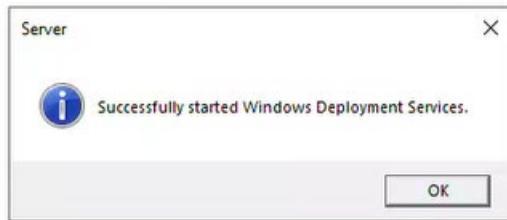
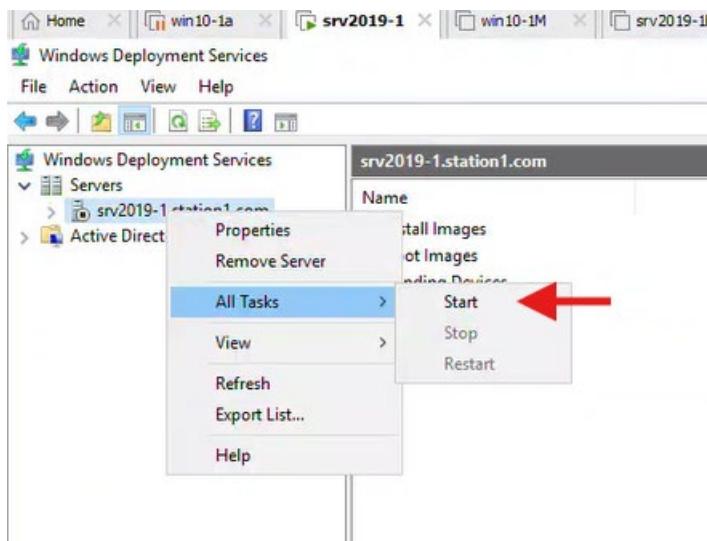
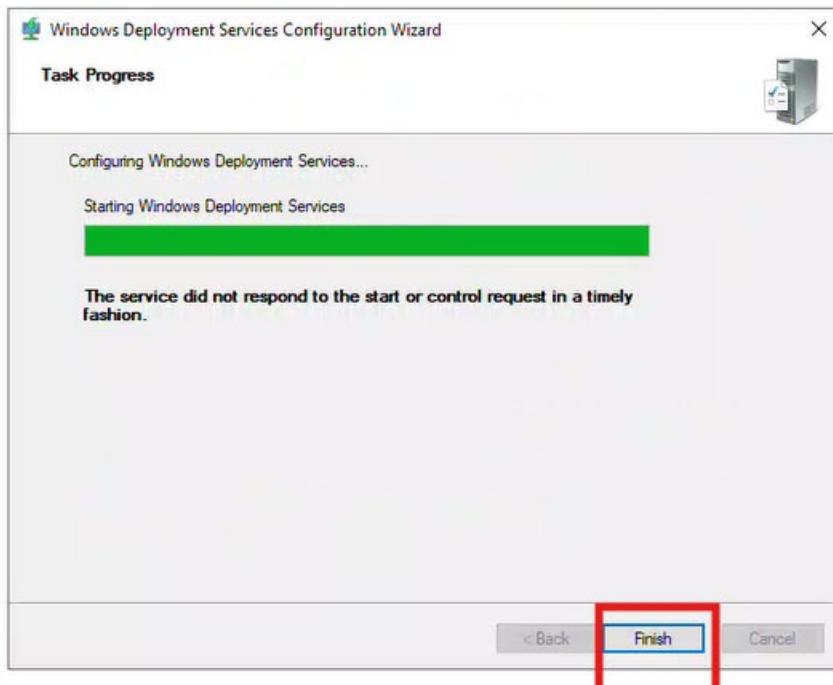
Select configure server



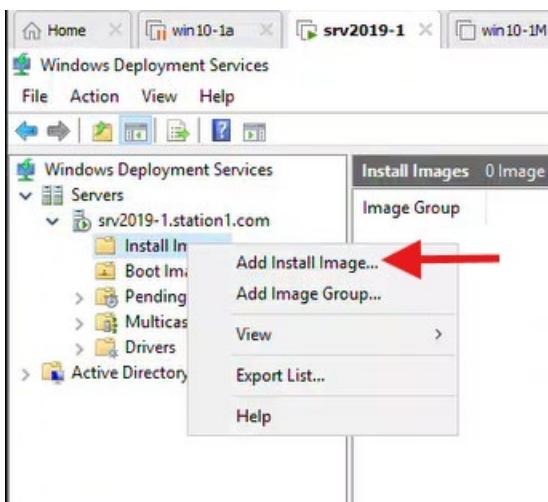
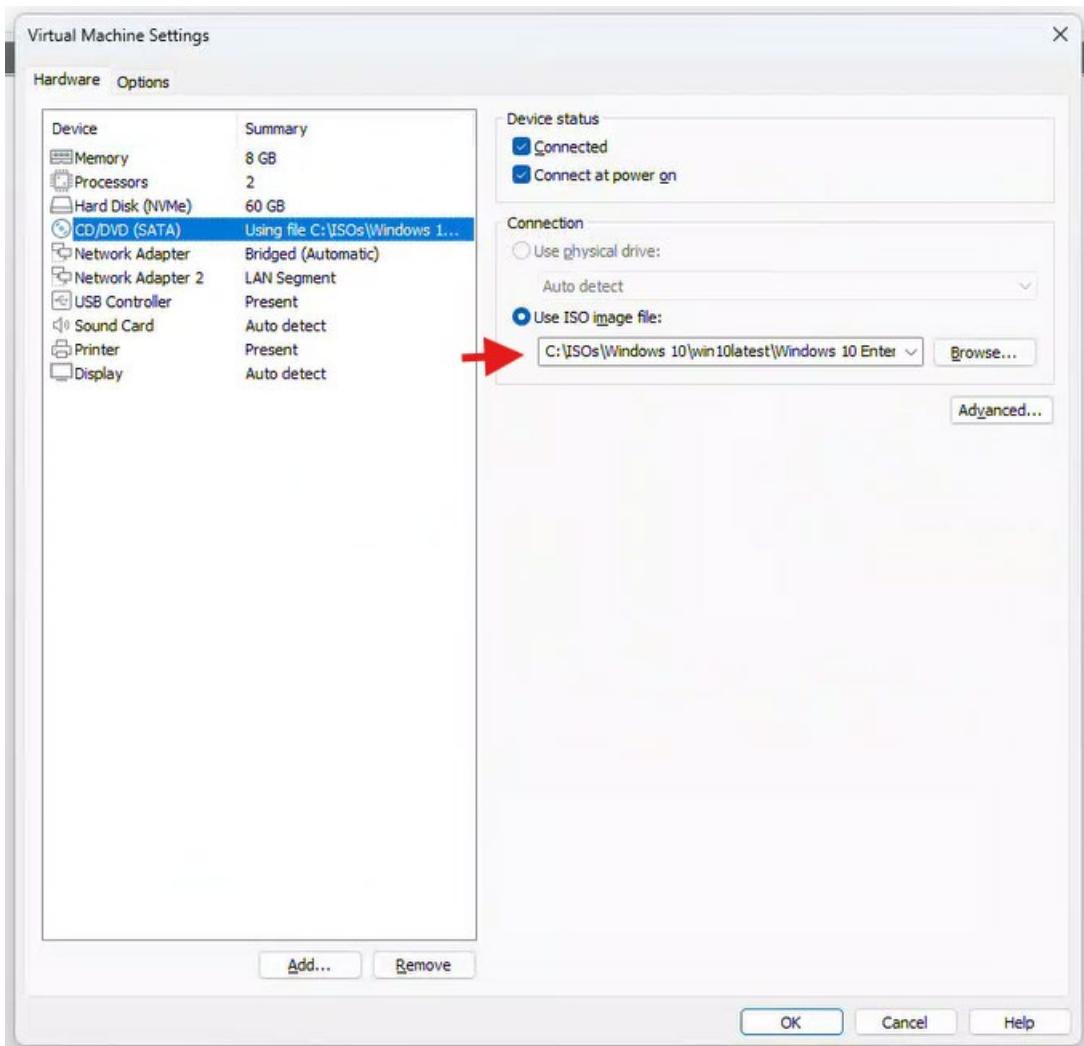


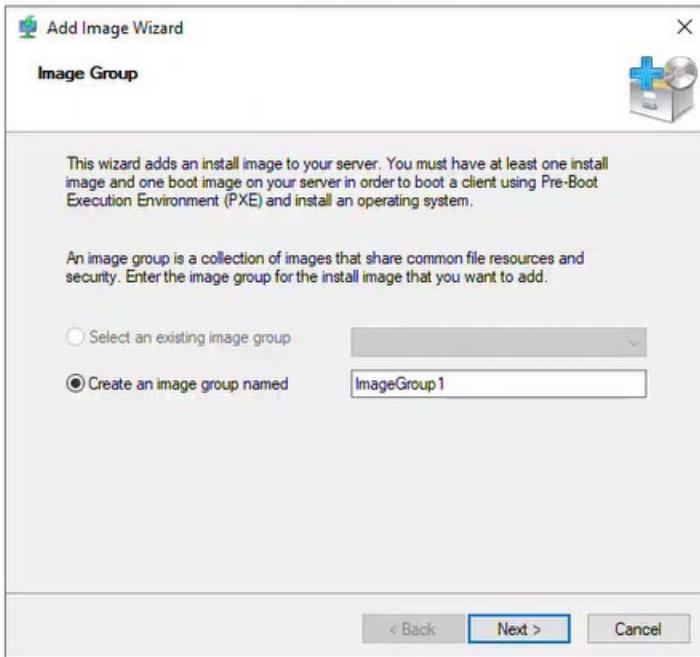






VM setup Install a DVD



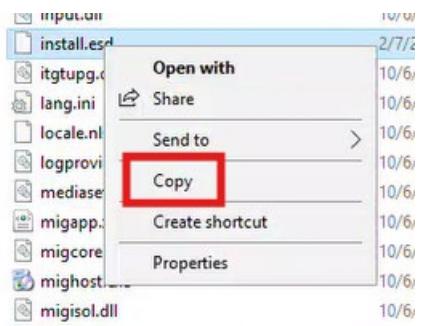


3.11.2 Image conversion from .esd to .wim file

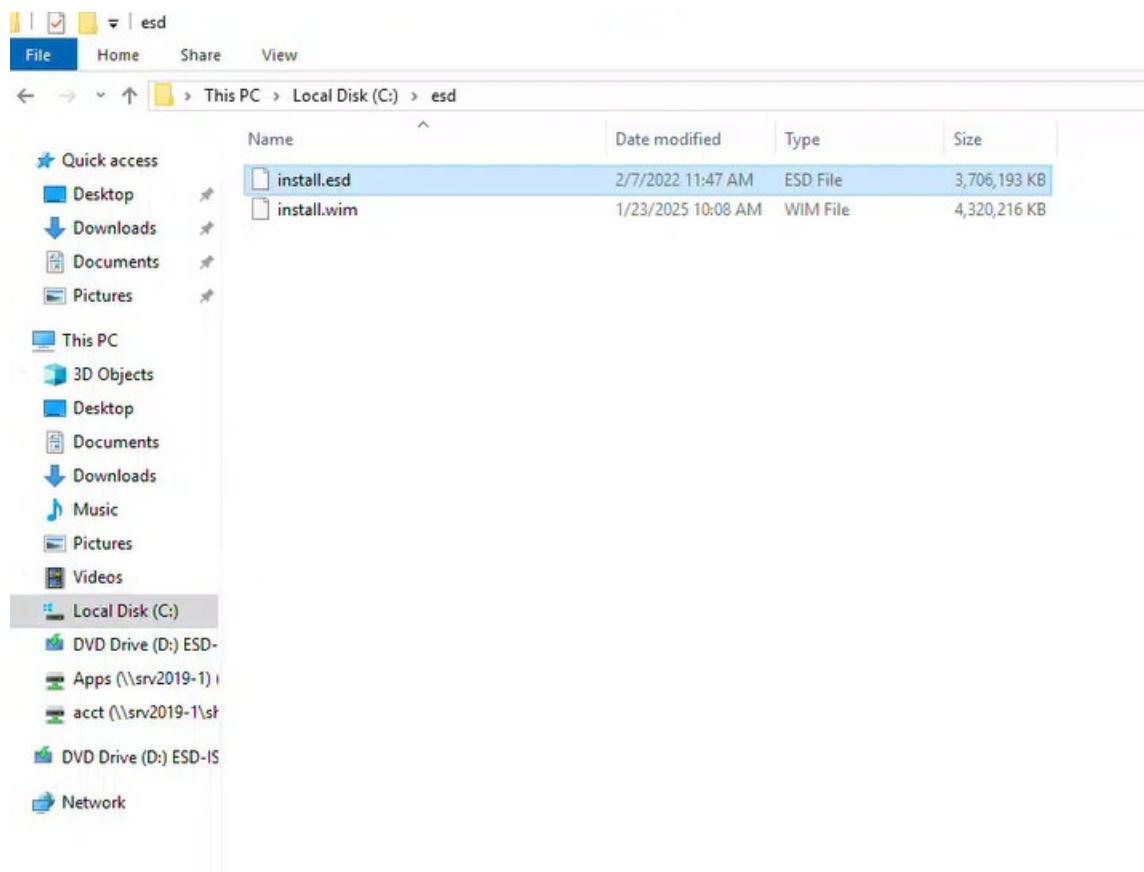
File DVD sources

File Explorer showing the contents of the 'sources' folder on the 'DVD Drive (D:) ESD-' volume. An arrow points to the 'install.esd' file.

	Name	Date modified	Type	Size
Quick access	dismcore.dll	10/6/2021 3:56 PM	Application extens...	396 KB
Desktop	dismcoreps.dll	10/6/2021 3:56 PM	Application extens...	184 KB
Downloads	dismprov.dll	10/6/2021 3:56 PM	Application extens...	254 KB
Documents	du.dll	10/6/2021 3:56 PM	Application extens...	153 KB
Pictures	EI.CFG	10/6/2021 3:56 PM	CFG File	1 KB
This PC	facilitator.dll	10/6/2021 3:56 PM	Application extens...	972 KB
3D Objects	folderprovider.dll	10/6/2021 3:56 PM	Application extens...	61 KB
Desktop	gatherosstate.exe	10/6/2021 3:56 PM	Application	1,468 KB
Downloads	generaltel.dll	10/6/2021 3:56 PM	Application extens...	810 KB
Documents	hwcompat.dll	10/6/2021 3:56 PM	Application extens...	204 KB
Downloads	hwcompat.txt	10/6/2021 3:56 PM	Text Document	735 KB
Music	hwcompatPE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Pictures	hwexclude.txt	10/6/2021 3:56 PM	Text Document	1 KB
Videos	hwexcludePE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Local Disk (C:)	hypervcompicheck.dll	10/6/2021 3:56 PM	Application extens...	183 KB
DVD Drive (D:) ESD-	iasmigplugin.dll	10/6/2021 3:56 PM	Application extens...	681 KB
DVD Drive (D:) ESD-IS	idwbinfo.txt	10/6/2021 3:56 PM	Text Document	1 KB
Network	iiscomp.dll	10/6/2021 3:56 PM	Application extens...	24 KB
	imagingprovider.dll	10/6/2021 3:56 PM	Application extens...	218 KB
	input.dll	10/6/2021 3:56 PM	Application extens...	370 KB
	install.esd	2/7/2022 11:47 AM	ESD File	3,706,193 KB
	itgtupg.dll	10/6/2021 3:56 PM	Application extens...	84 KB
	lang.ini	10/6/2021 3:56 PM	Configuration sett...	1 KB
	locale.nls	10/6/2021 3:56 PM	NLS File	801 KB
	logprovider.dll	10/6/2021 3:56 PM	Application extens...	149 KB
	mediasetupuimgr.dll	10/6/2021 3:56 PM	Application extens...	13,705 KB
	migapp.xml	10/6/2021 3:56 PM	XML Document	640 KB
	migcore.dll	10/6/2021 3:56 PM	Application extens...	8,845 KB
	mighost.exe	10/6/2021 3:56 PM	Application	254 KB



Create a directory on c drive of VM and copy the file inside a directory named esd



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.6775]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>cd \

C:\>dir
Volume in drive C has no label.
Volume Serial Number is B4A0-9C6E

Directory of C:\

01/21/2025  09:29 AM    <DIR>        Apps
01/23/2025  09:43 AM    <DIR>        esd
01/20/2025  05:00 PM    <DIR>        Home
01/23/2025  08:58 AM    <DIR>        inetpub
11/05/2022  01:21 PM    <DIR>        PerfLogs
01/23/2025  08:58 AM    <DIR>        Program Files
01/23/2025  08:58 AM    <DIR>        Program Files (x86)
01/20/2025  09:24 PM    <DIR>        Shared
01/17/2025  12:51 AM    <DIR>        Users
01/23/2025  08:58 AM    <DIR>        Windows
      0 File(s)           0 bytes
     10 Dir(s)  41,705,439,232 bytes free

C:\>
```

```
          0 bytes
10 Dir(s)  41,705,439,232 bytes free

C:\>cd esd

C:\esd>dir
Volume in drive C has no label.
Volume Serial Number is B4A0-9C6E

Directory of C:\esd

01/23/2025  09:43 AM    <DIR>        .
01/23/2025  09:43 AM    <DIR>        ..
02/07/2022  11:47 AM    3,795,141,098 install.esd
      1 File(s)  3,795,141,098 bytes
      2 Dir(s)  41,705,439,232 bytes free

C:\esd>
```

```
C:\esd>DISM /Get-WimInfo /WimFile:install.esd
Deployment Image Servicing and Management tool
Version: 10.0.17763.5830

Details for image : install.esd

Index : 1
Name : Windows 10 Education
Description : Windows 10 Education
Size : 15,074,717,775 bytes

Index : 2
Name : Windows 10 Education N
Description : Windows 10 Education N
Size : 14,311,771,183 bytes

Index : 3
Name : Windows 10 Enterprise
Description : Windows 10 Enterprise
Size : 15,074,871,770 bytes

Index : 4
Name : Windows 10 Enterprise N
Description : Windows 10 Enterprise N
Size : 14,311,677,460 bytes

Index : 5
Name : Windows 10 Pro
Description : Windows 10 Pro
Size : 15,071,917,946 bytes

Index : 6
Name : Windows 10 Pro N
Description : Windows 10 Pro N
Size : 14,308,856,803 bytes

The operation completed successfully.

C:\esd>
```

DISM /Get-WimInfo /WimFile:install.esd

```
C:\esd>DISM /Get-WimInfo /WimFile:install.esd
Deployment Image Servicing and Management tool
Version: 10.0.17763.5830

Details for image : install.esd

Index : 1
Name : Windows 10 Education
Description : Windows 10 Education
Size : 15,074,717,775 bytes

Index : 2
Name : Windows 10 Education N
Description : Windows 10 Education N
Size : 14,311,771,183 bytes

Index : 3
Name : Windows 10 Enterprise
Description : Windows 10 Enterprise
Size : 15,074,871,770 bytes

Index : 4
Name : Windows 10 Enterprise N
Description : Windows 10 Enterprise N
Size : 14,311,677,460 bytes

Index : 5
Name : Windows 10 Pro
Description : Windows 10 Pro
Size : 15,071,917,946 bytes
[red box highlights this line]
Index : 6
Name : Windows 10 Pro N
Description : Windows 10 Pro N
Size : 14,308,856,803 bytes

The operation completed successfully.

C:\esd>
```

Please note the following command uses the number of the Windows Pro We checked before

```
dism /export-image /SourceImageFile:install.esd /SourceIndex:5 /DestinationImageFile:install.wim
/Compress:max /CheckIntegrity
```

Image format conversion is a quite resource-intensive task. Depending on your computer hardware, it takes about 10-30 minutes to complete.

```
C:\esd>dism /export-image /SourceImageFile:install.esd /SourceIndex:5 /DestinationImageFile:install.wim /Compress:max /CheckIntegrity
Deployment Image Servicing and Management tool
Version: 10.0.17763.5830
Exporting image
[   ] -
```

Wait until the message appears:

“Exporting image. The operation completed successfully.”

```
C:\esd>dism /export-image /SourceImageFile:install.esd /SourceIndex:5 /DestinationImageFile:install.wim /Compress:max /CheckIntegrity
Deployment Image Servicing and Management tool
Version: 10.0.17763.5830

Exporting image
[=====100.0%=====]
The operation completed successfully. ←

C:\esd>
```

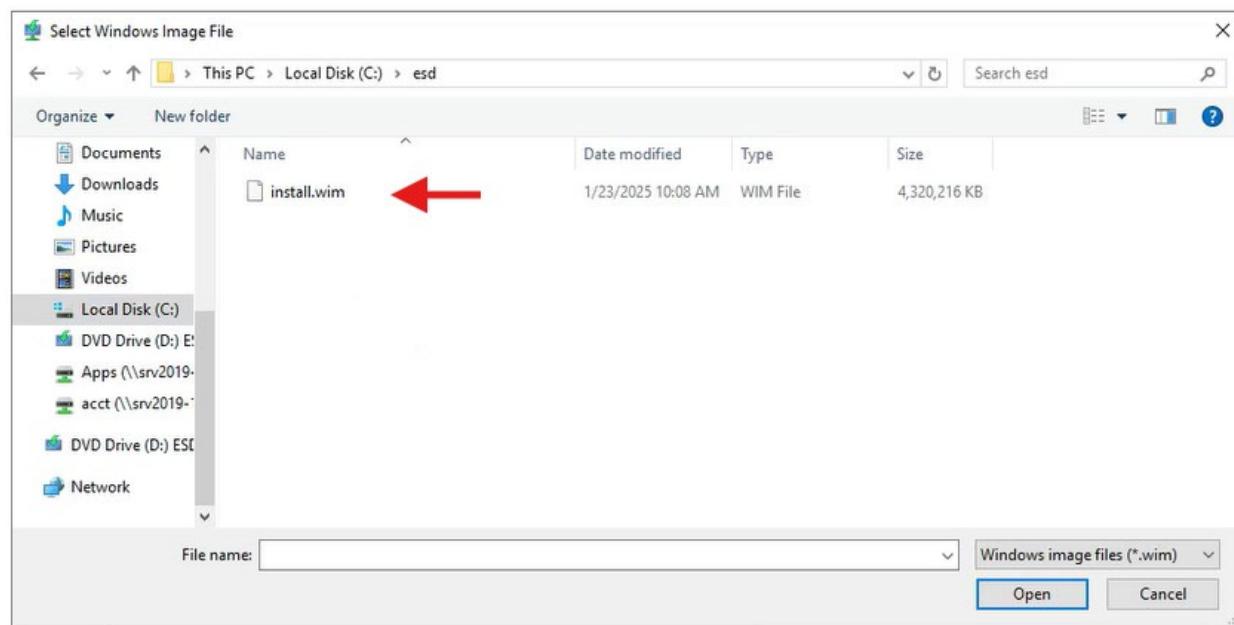
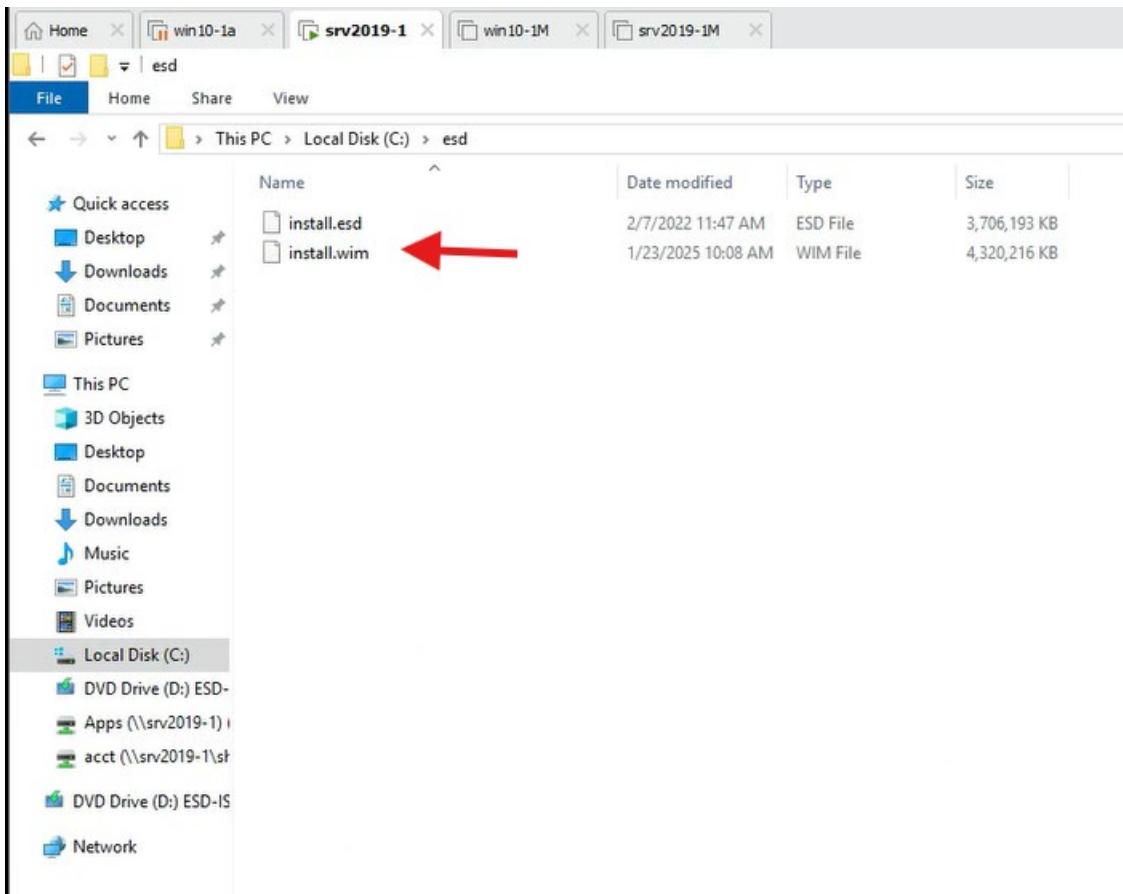
```
C:\esd>dir
Volume in drive C has no label.
Volume Serial Number is B4A0-9C6E

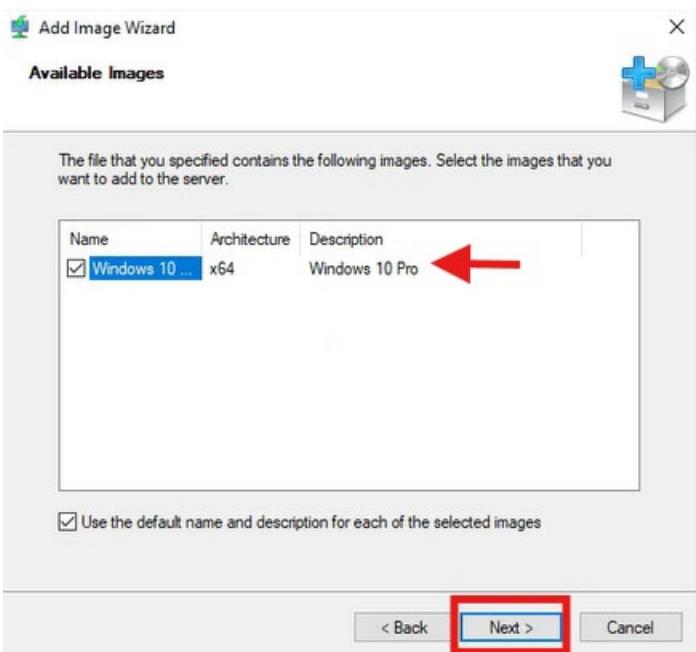
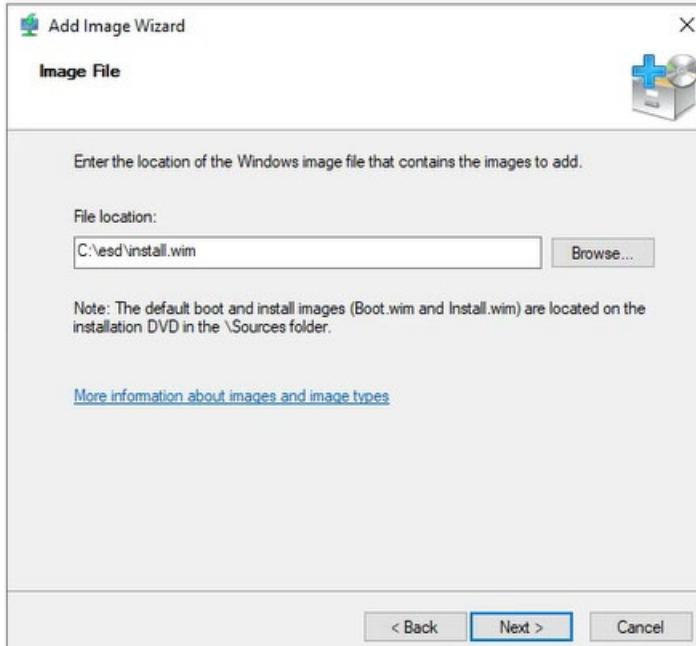
Directory of C:\esd

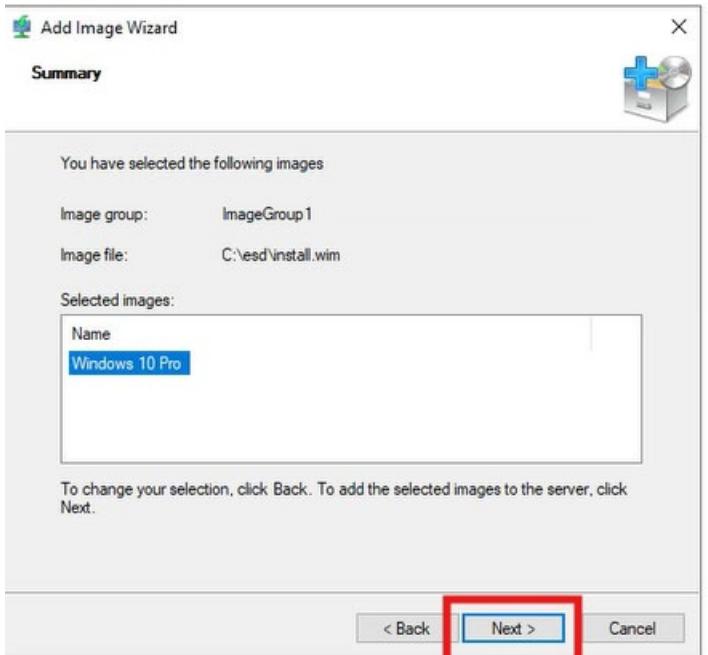
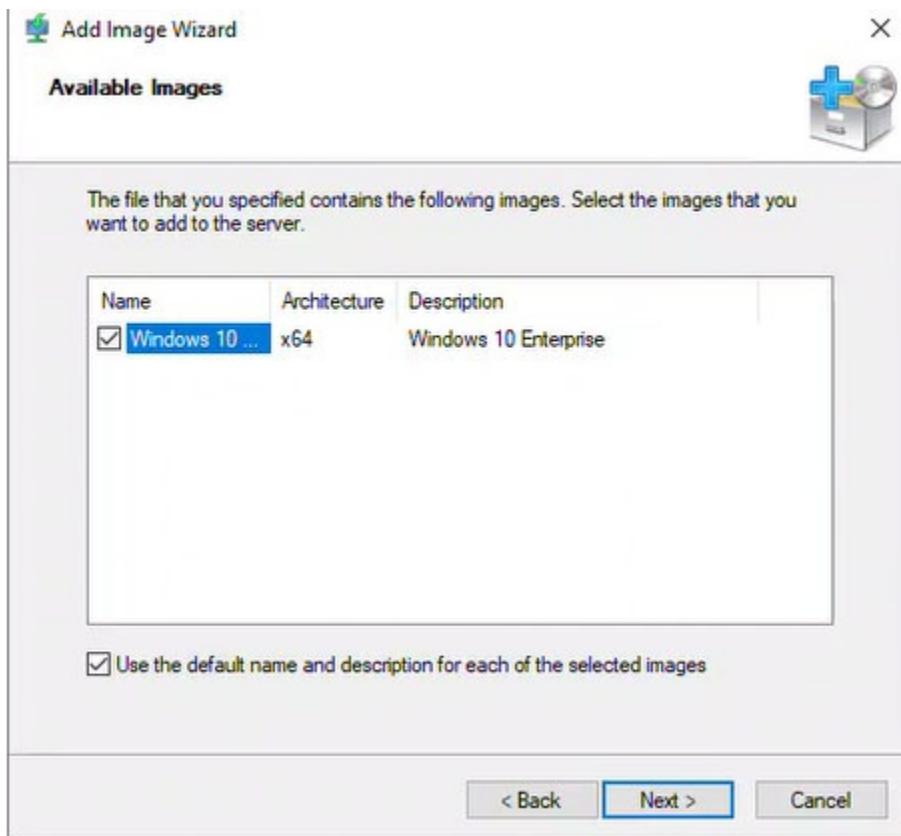
01/23/2025  09:54 AM    <DIR>      .
01/23/2025  09:54 AM    <DIR>      ..
02/07/2022  11:47 AM  3,795,141,098 install.esd
01/23/2025  10:08 AM  4,423,900,369 install.wim
              2 File(s)   8,219,041,467 bytes
              2 Dir(s)  37,073,731,584 bytes free

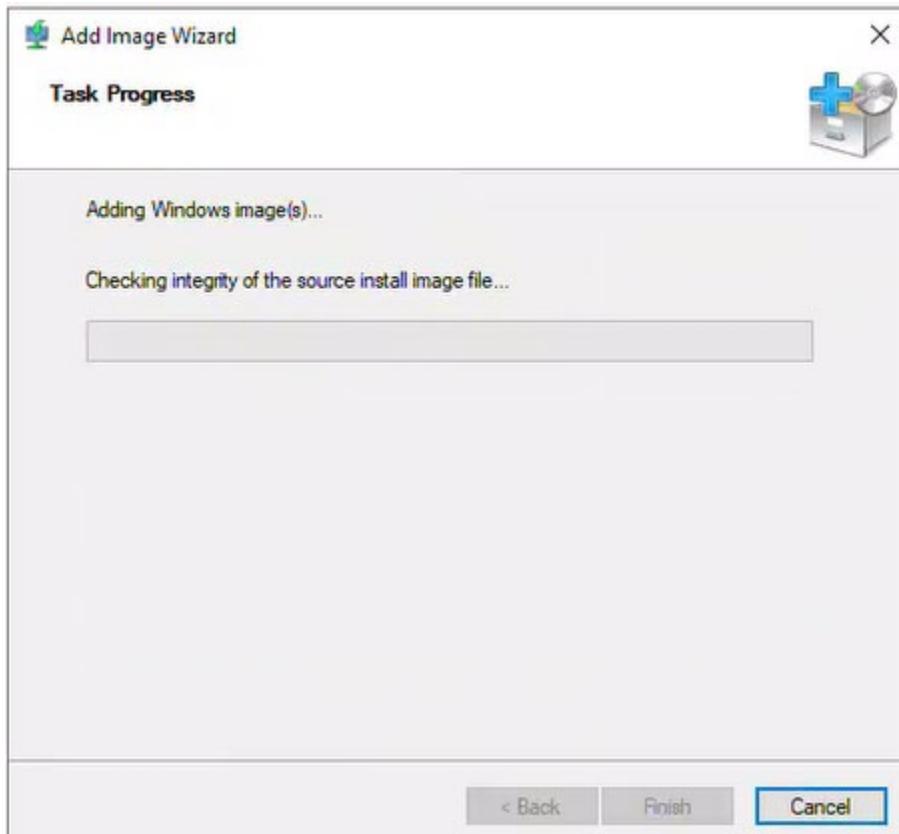
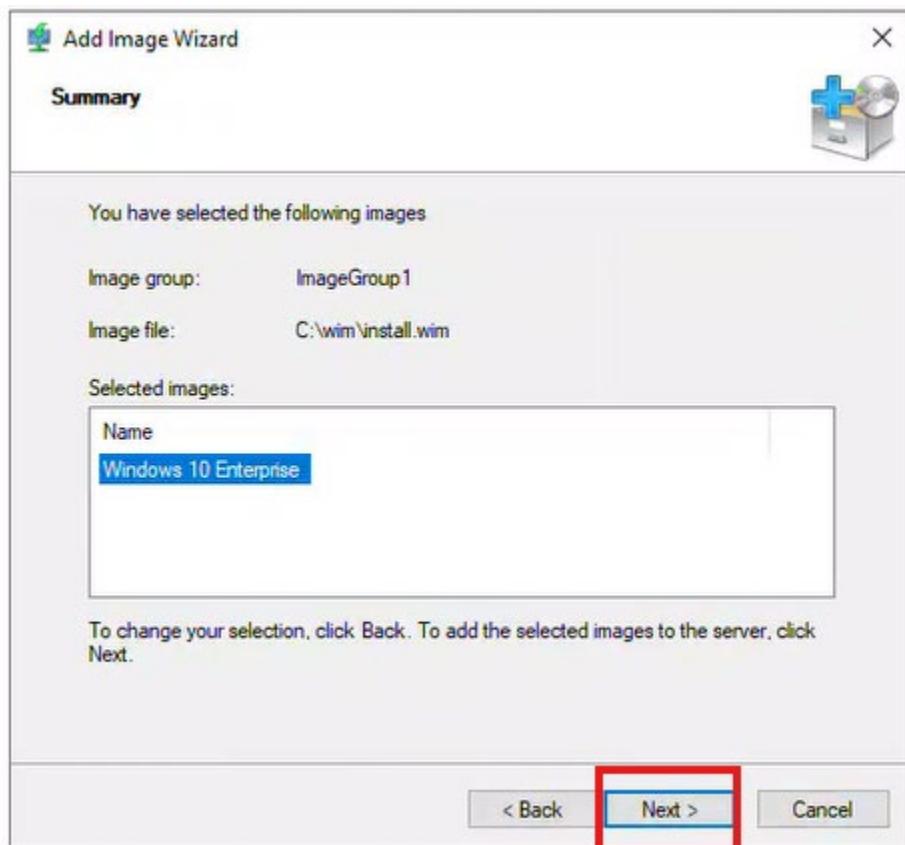
C:\esd>
```

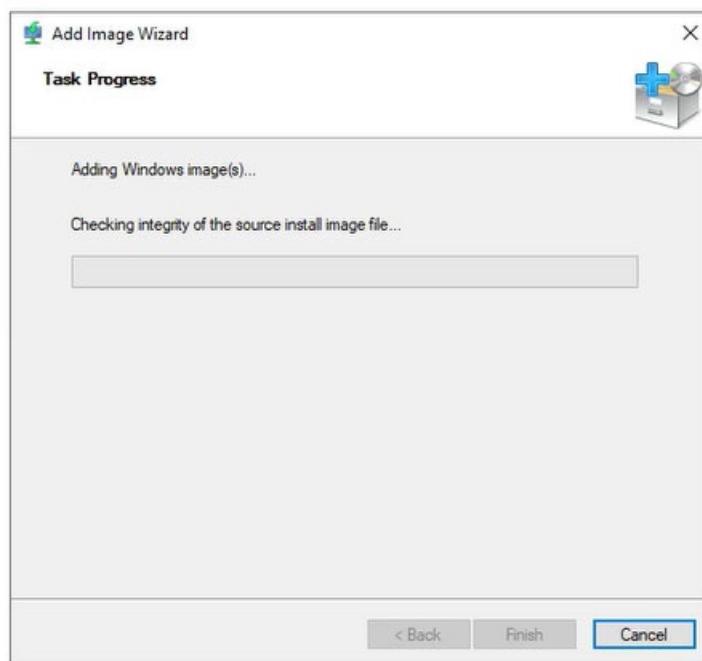
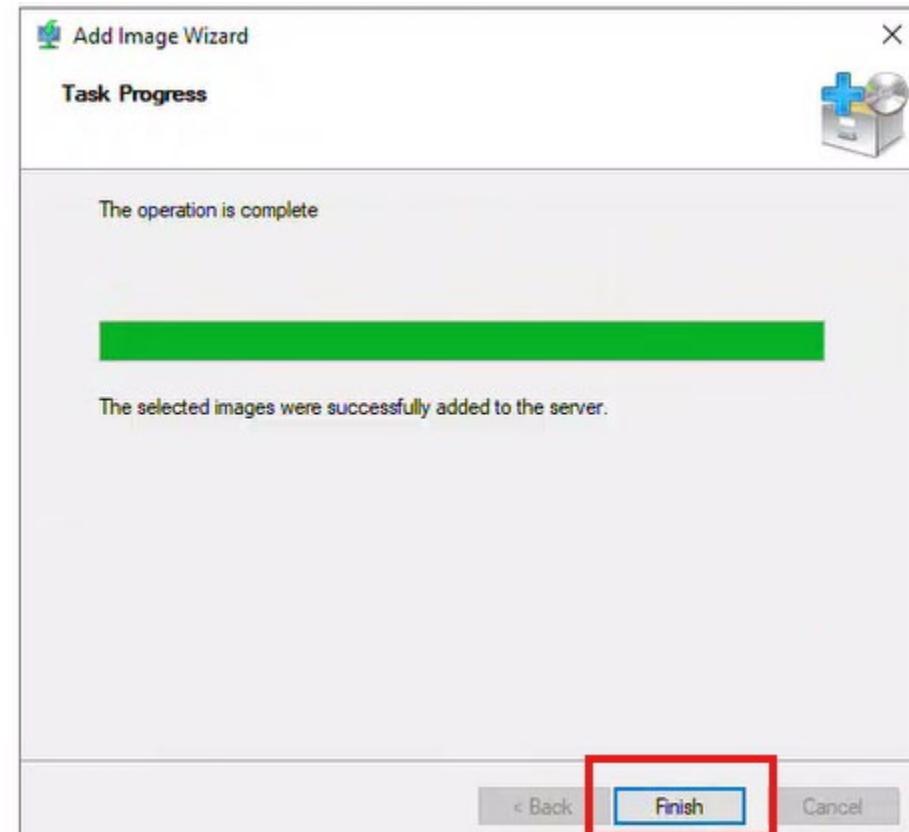
3.11.3 Add Boot and Install Image and test WDS Deployment to install Windows 10 Pro

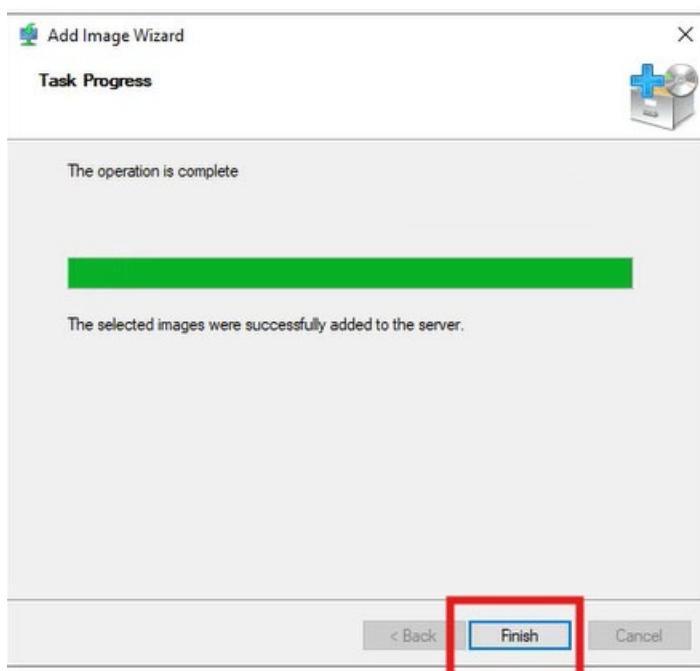
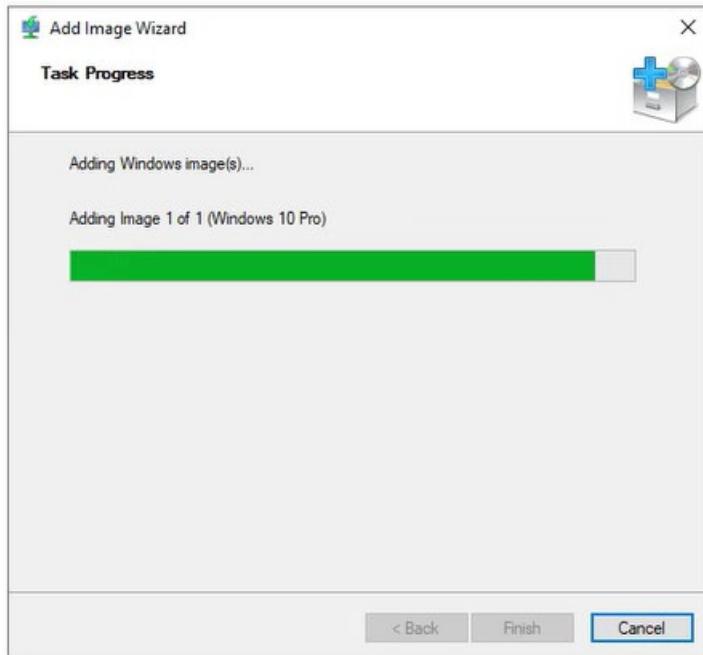




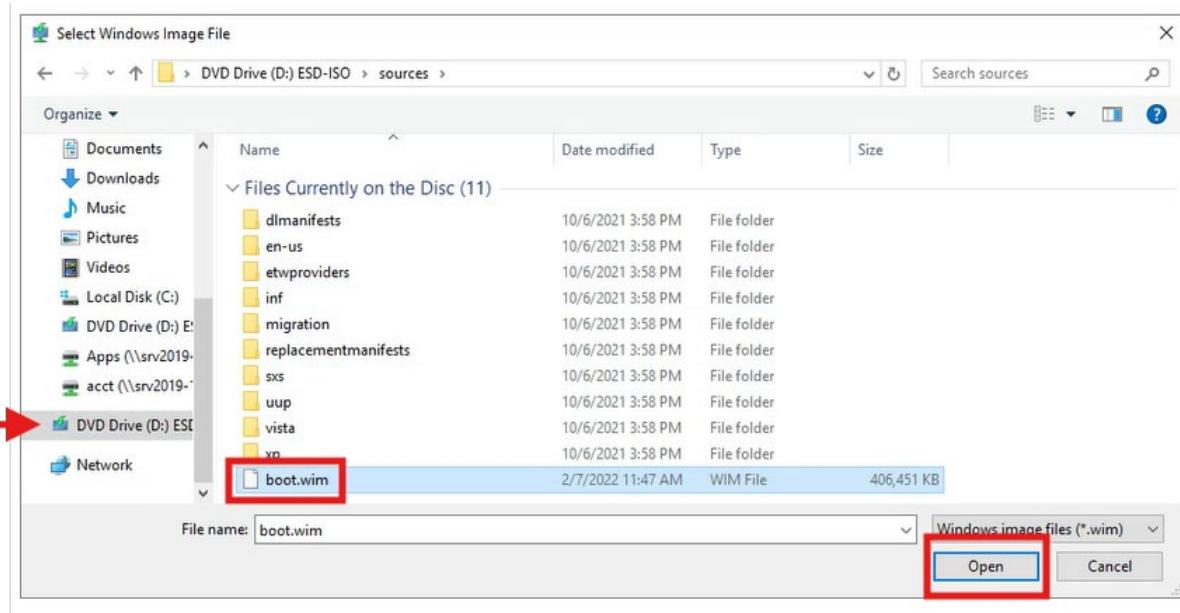
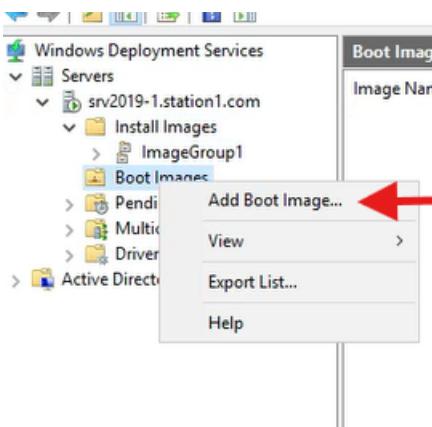


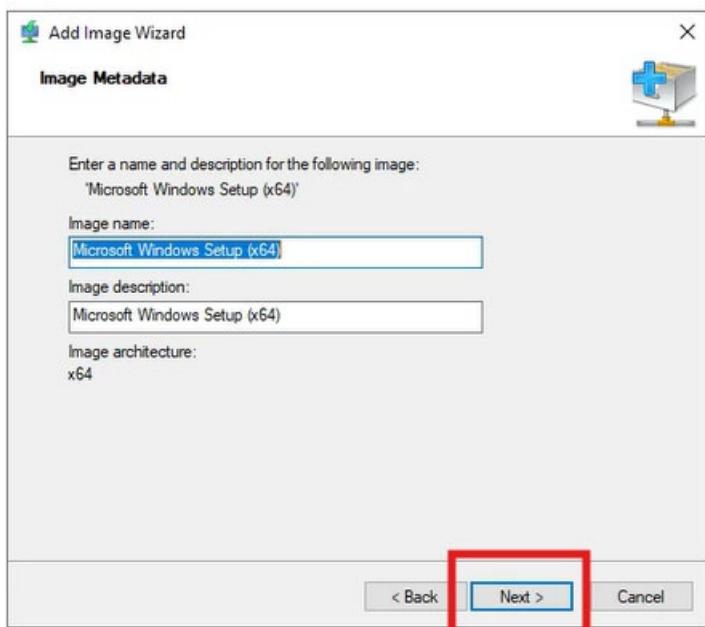
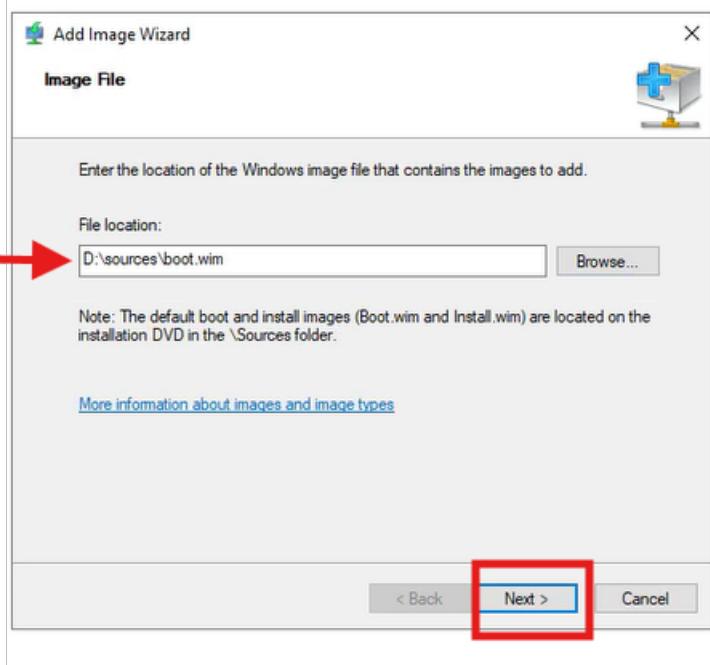


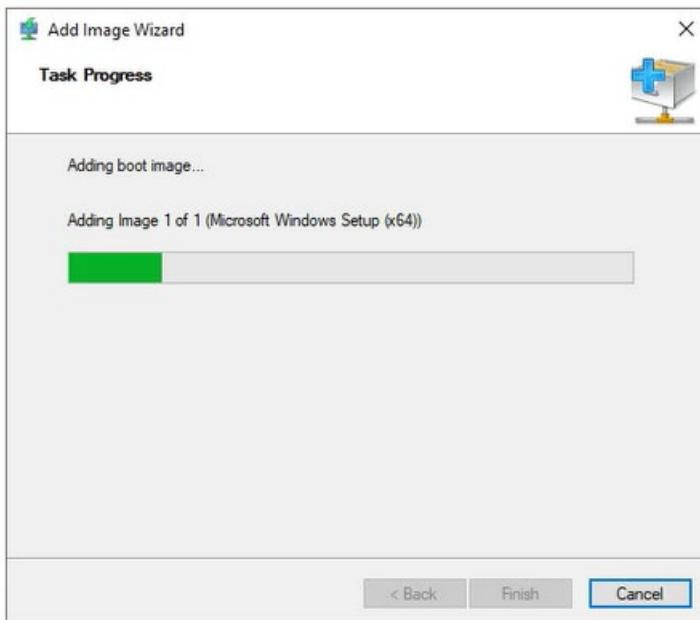
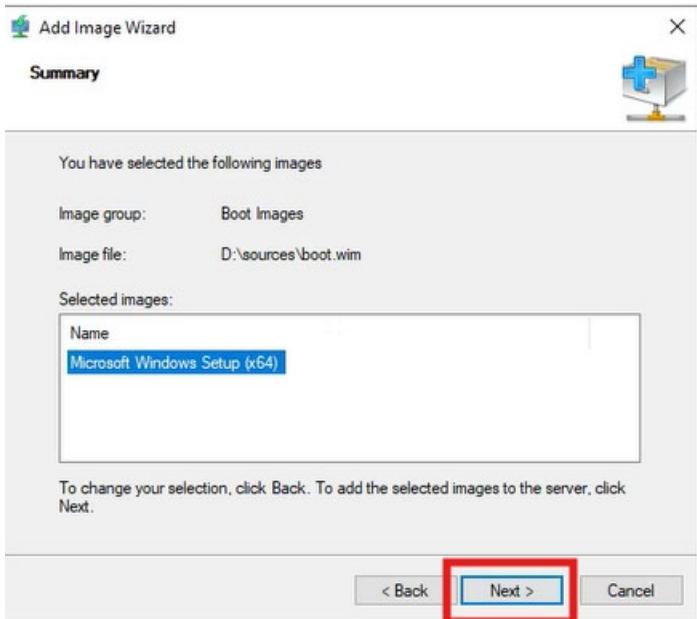


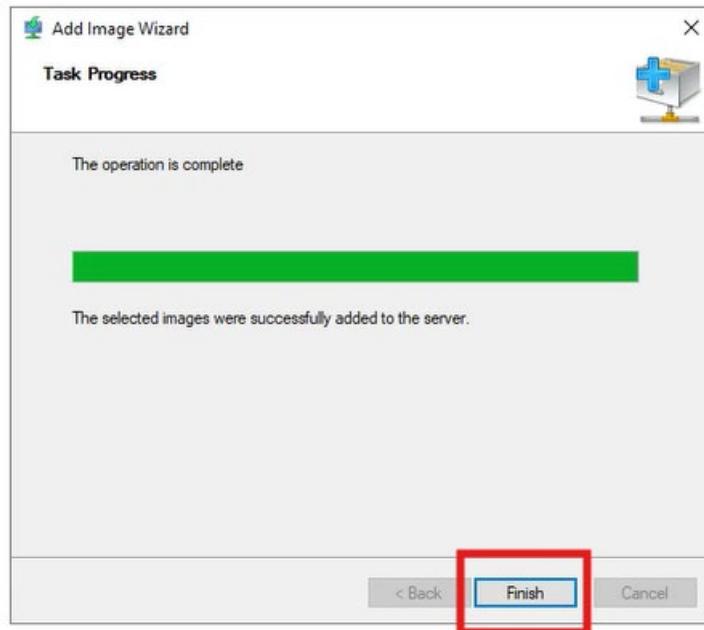


Add boot image



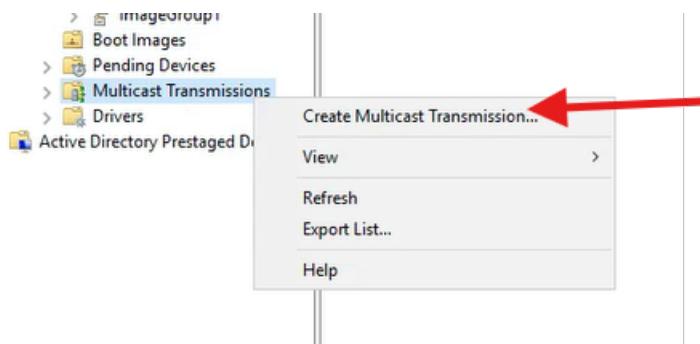


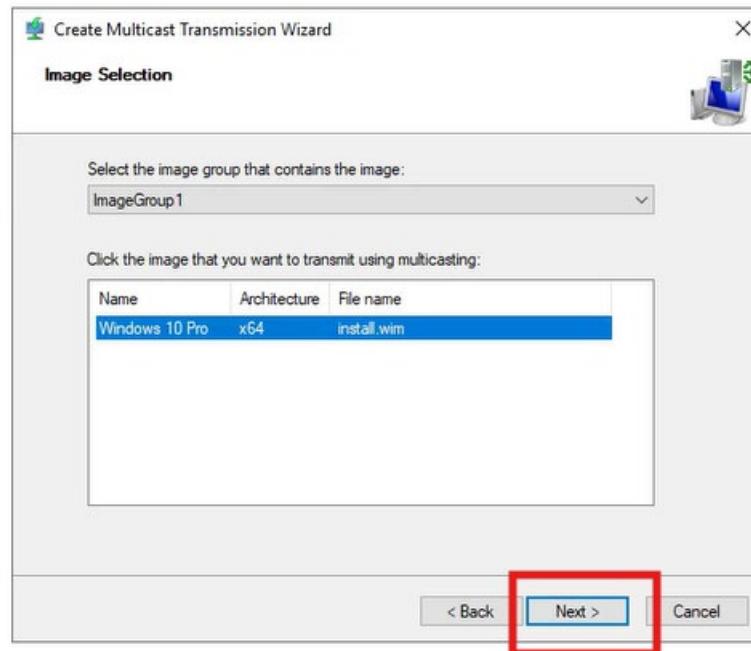
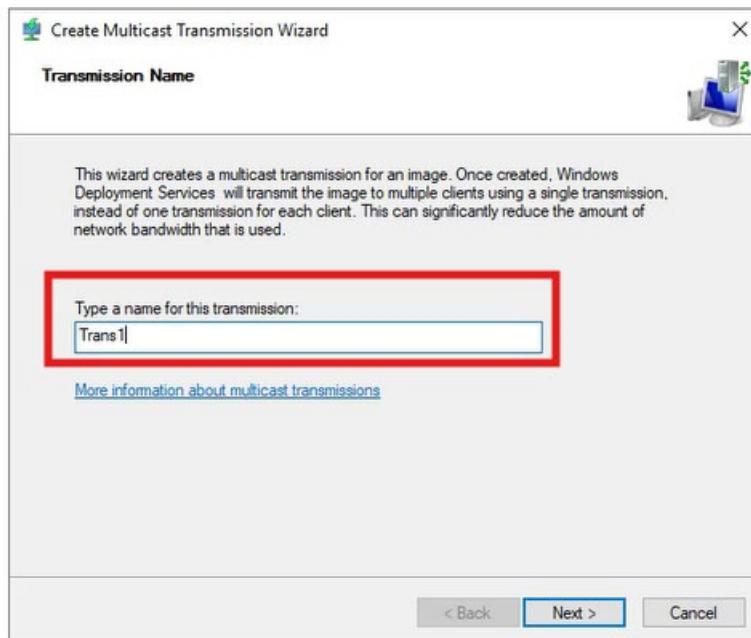


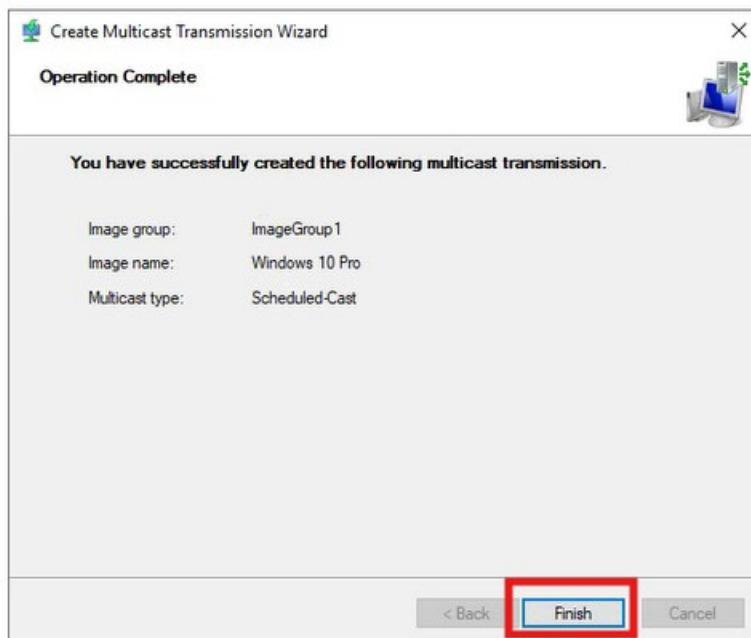
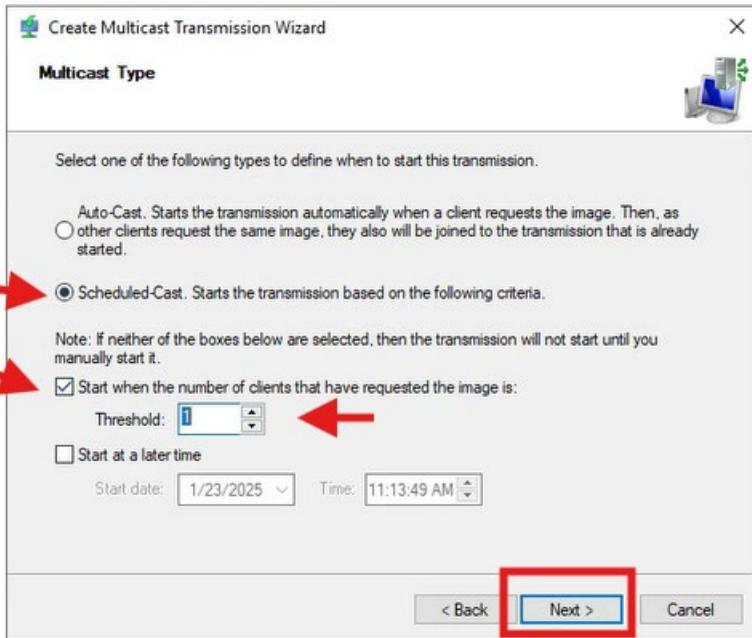


3.11.4 Test

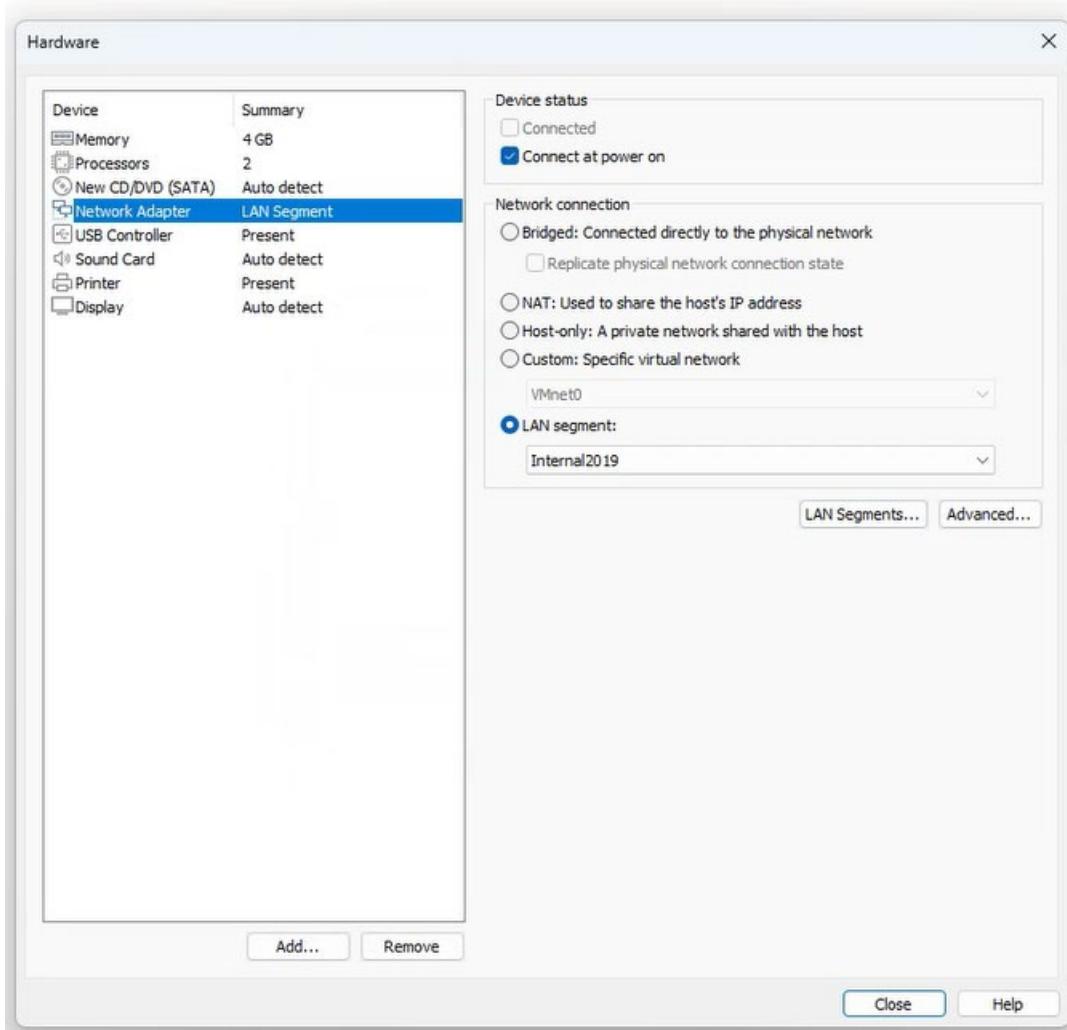
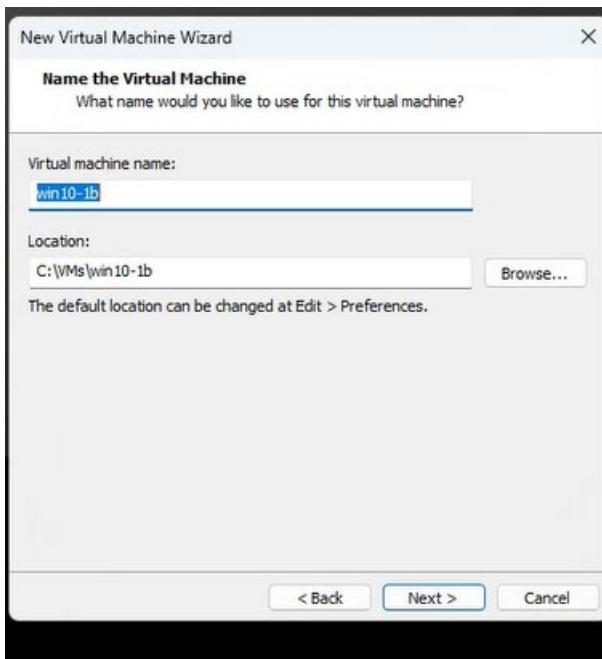
3.11.4.1 Create a Multicast transmission





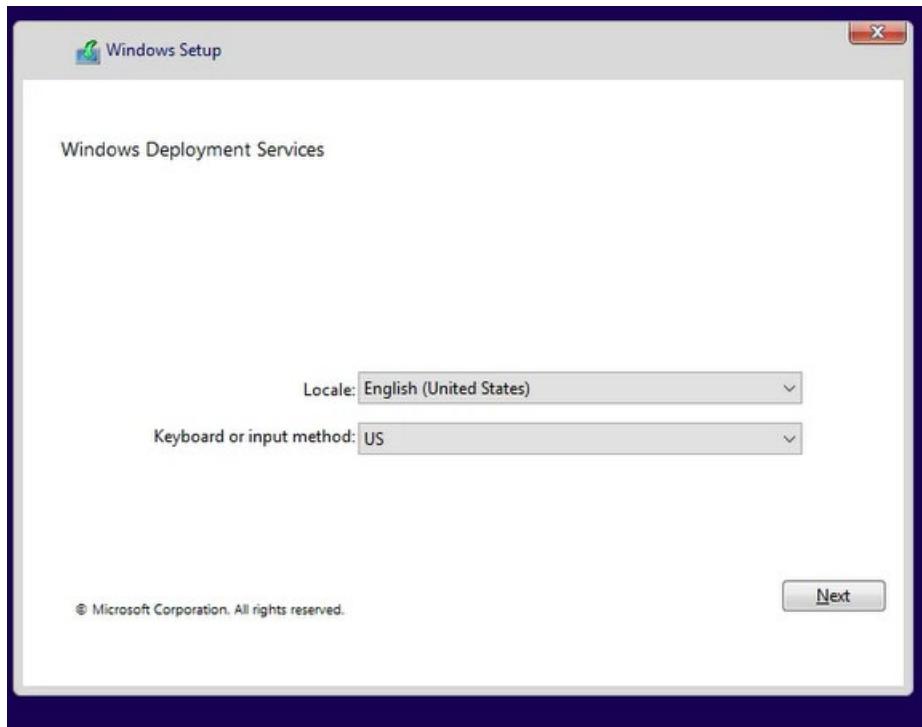


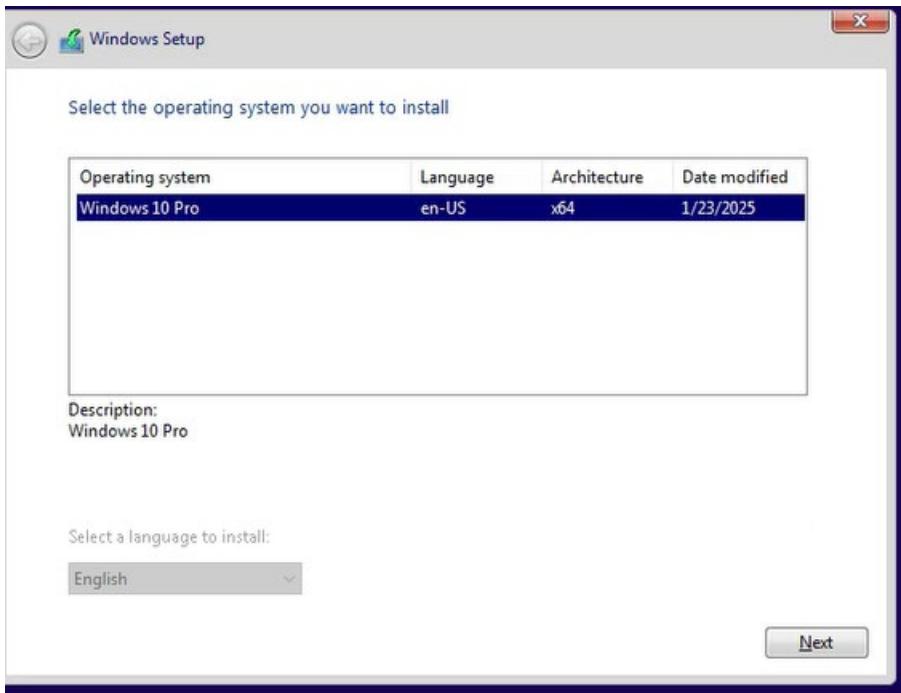
3.11.4.2 Create new VM



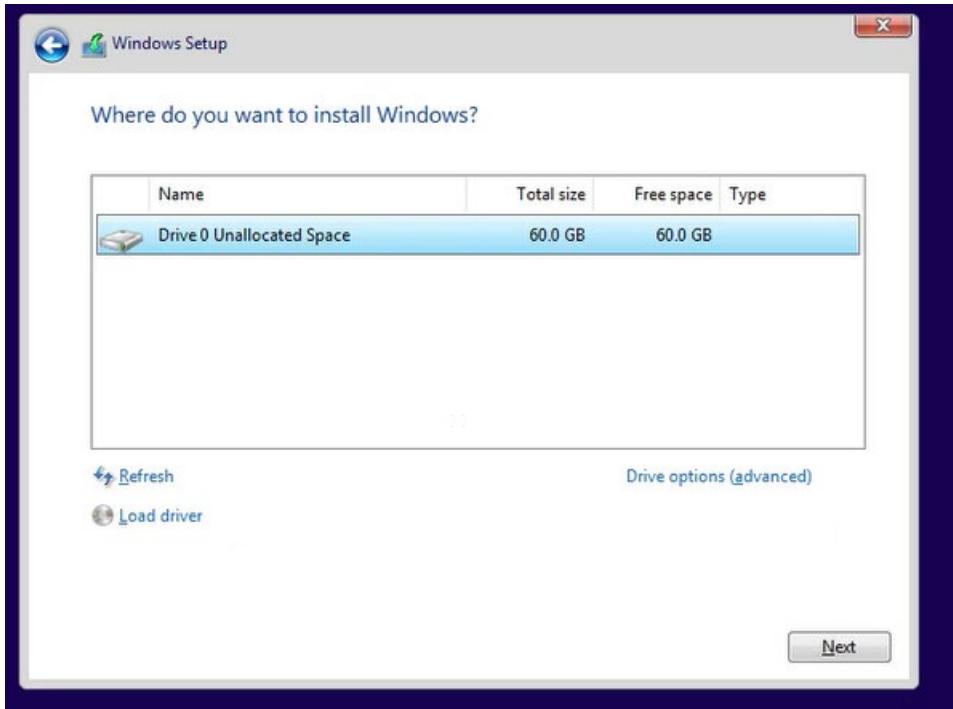
3.11.4.3 Power on machine and initiate installation procedure

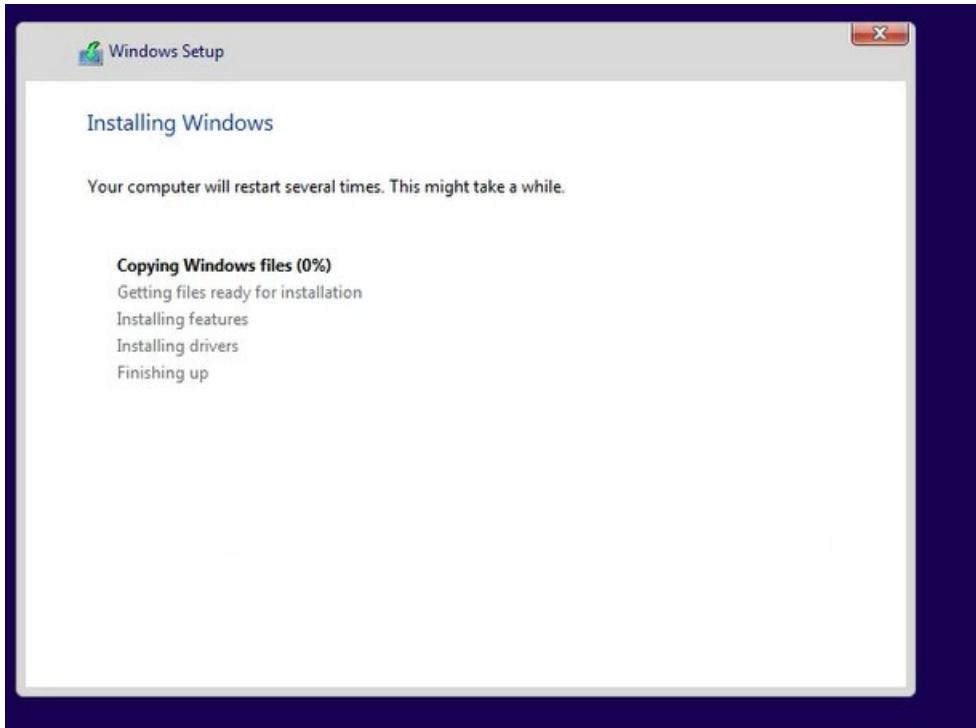
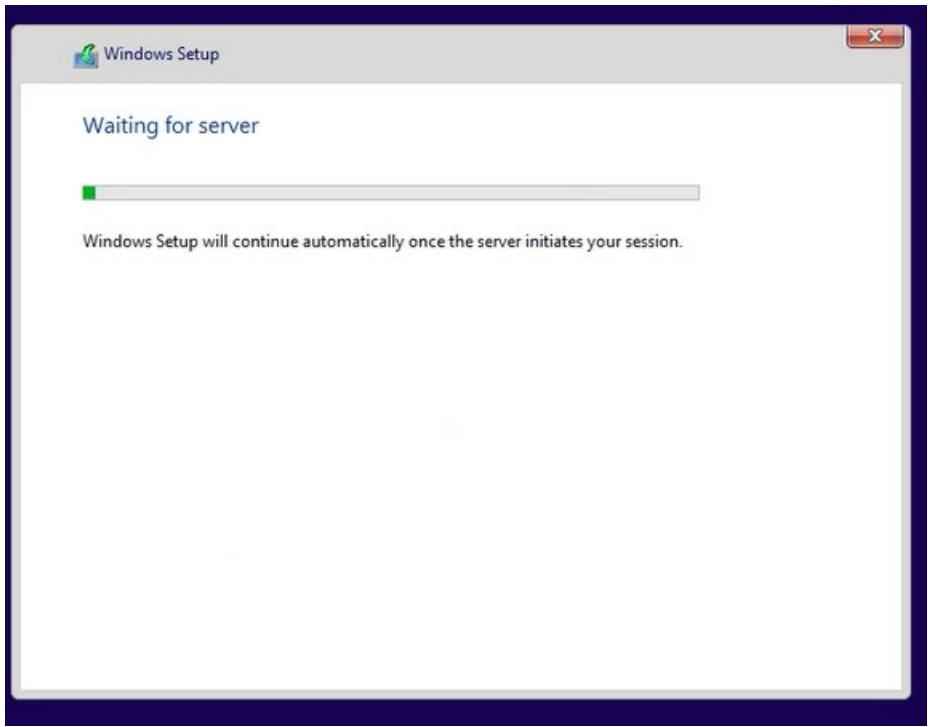
Power On created VM, automatic installation process will initiate. A series of screens asking for values to setup Windows 10 Pro will appear. Please answer the questions until process is finished

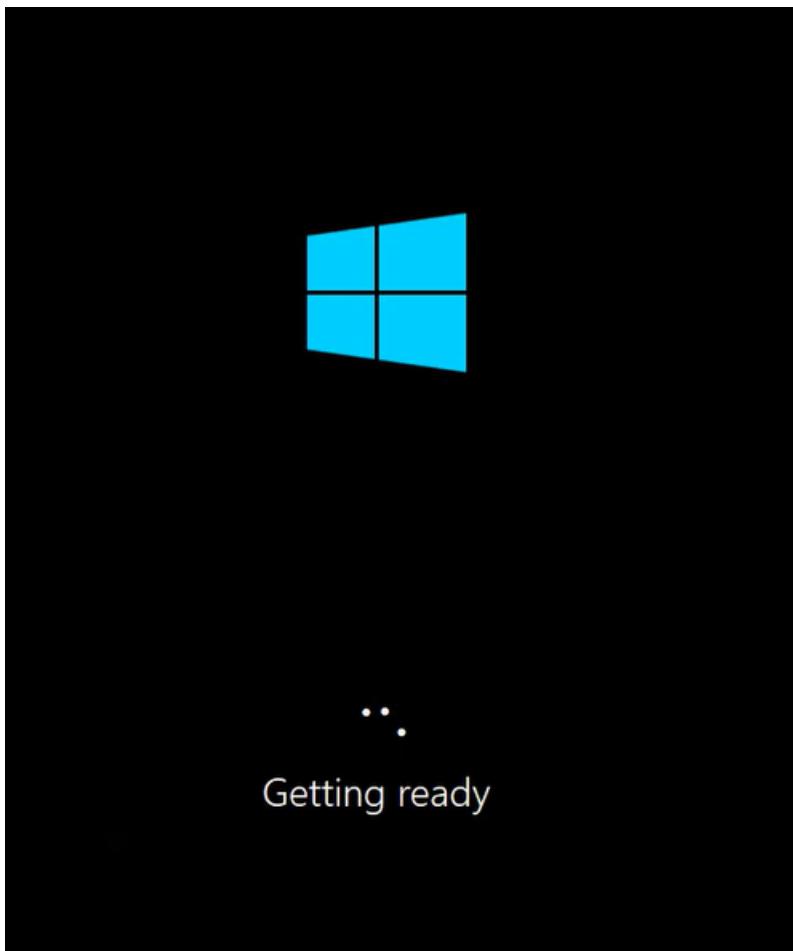




No dvd click on next







Let's start with region. Is this right?

- U.S. Minor Outlying Islands
- U.S. Virgin Islands
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States**

Yes

Is this the right keyboard layout?

If you also use another keyboard layout, you can add that next.

US

Canadian Multilingual Standard

English (India)

Irish

Scottish Gaelic

United Kingdom

United States-Dvorak

Yes

Windows 10 License Agreement

Your use of this software is subject to the terms and conditions of the license agreement by which you acquired this software. If you are a volume license customer, use of this software is subject to your volume license agreement. You may not use this software if you have not validly acquired a license for the software from Microsoft or its licensed distributors.

Accept

Services

Choose privacy settings for your device

Microsoft puts you in control of your privacy. Choose your settings, then select 'Accept' to save them. You can change these settings at any time.

You won't be able to get location-based experiences like directions and weather or enjoy other services that require your location to work.

No

Windows won't be able to help you keep track of your device if you lose it.

No

Inking & typing

Don't use my diagnostic data to help improve the language recognition and suggestion capabilities of apps and services running on Windows.

No

Diagnostic data

Send only info about your device, its settings and capabilities, and whether it is performing properly. Diagnostic data is used to help keep Windows secure and up to date, troubleshoot problems, and make product improvements.

Send Required diagnostic data

Tailored experiences

The tips, ads, and recommendations you see will be more generic and may be less relevant to you.

No

Select 'Learn more' for info on the above settings, how Microsoft Defender SmartScreen works, and the related data transfers and uses.

Advertising ID

The number of ads you see won't change, but they may be less relevant to you.

No

Learn more

Accept



Services

Let's customize your experience

Select all the ways you plan to use your device to get personalized tips, ads, and recommendations during device setup and your welcome experience.

**Entertainment**

Watch videos, browse the web, connect on social media

**Creativity**

Bring your ideas to life with photos and videos

**Gaming**

Play and discover games, keep up with new releases

**Business**

Track expenses, manage your business, chat with customers

**School**

Take notes, write essays, collaborate on projects

**Family**

Connect with family members, edit safety settings, give everyone their own profile on this device

[Learn more](#)[Skip](#)[Accept](#)



Services

Let Cortana help you get things done

To do this, Cortana needs access to some of your personal information



To let Cortana provide personalized experiences and relevant suggestions, Microsoft collects and uses information including your location and location history, contacts, voice input, speech and handwriting patterns, typing history, search history, calendar details, content and communication history from Microsoft services, messages and apps. In Microsoft Edge, Cortana uses your browsing history. You can always change these choices in the Notebook and disable Cortana in Microsoft Edge.

Learn more

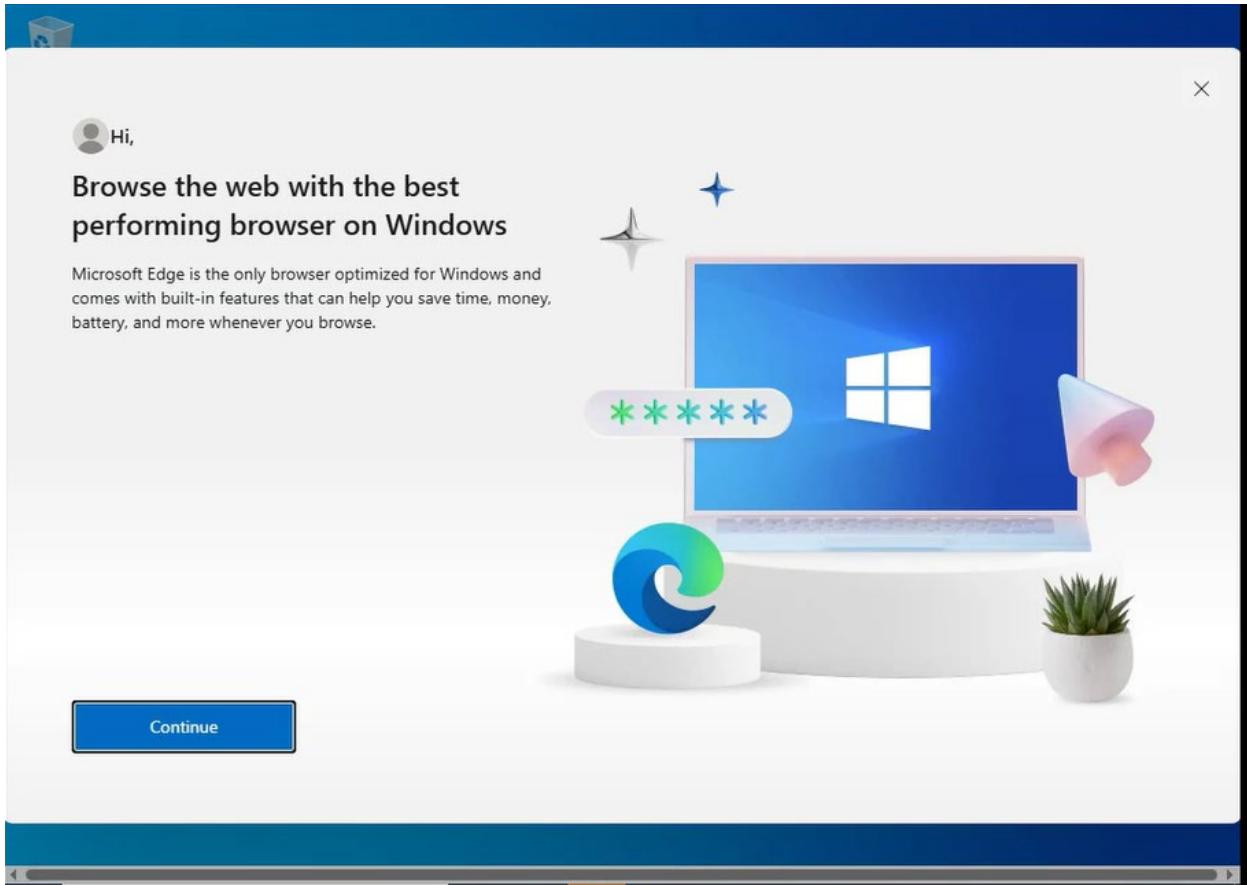
Not now

Accept

Services

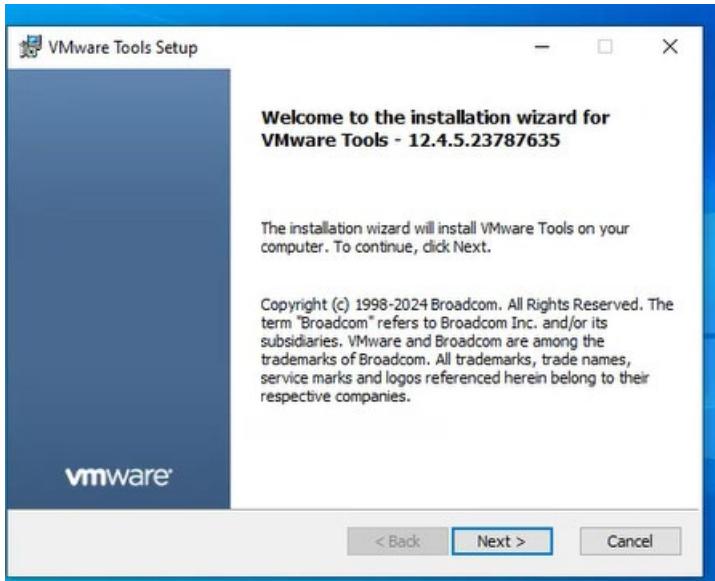
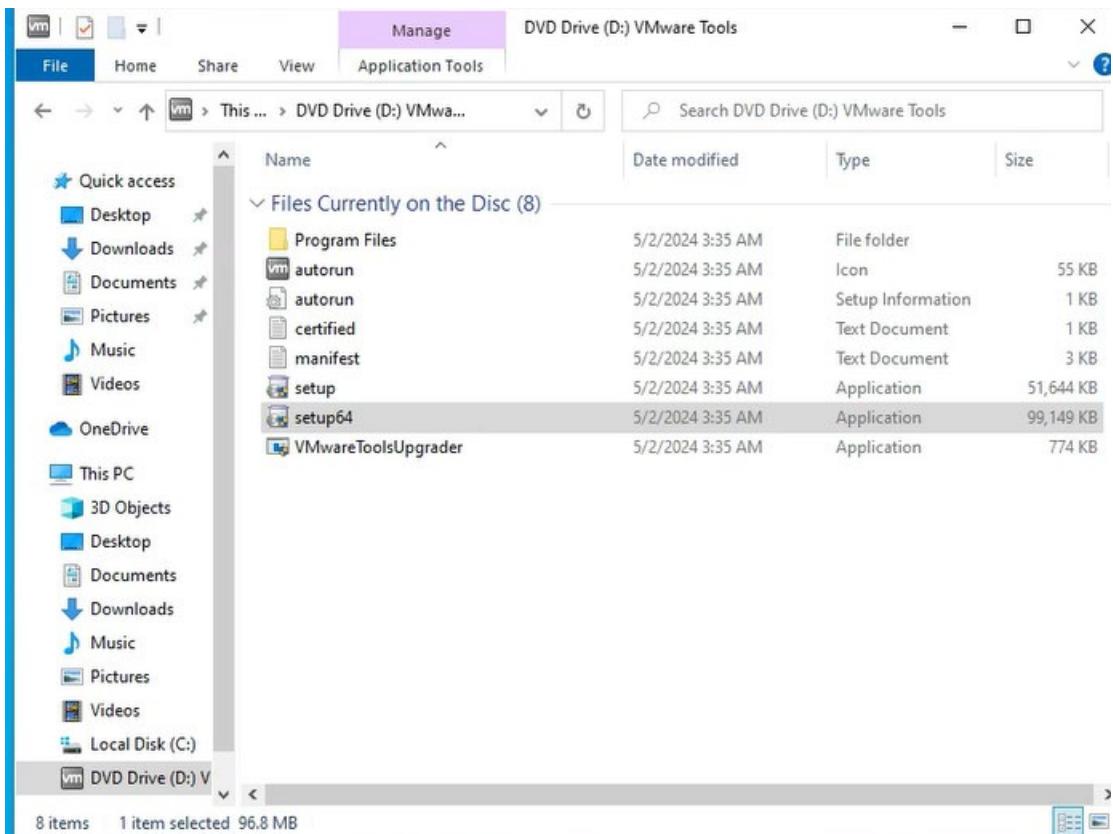


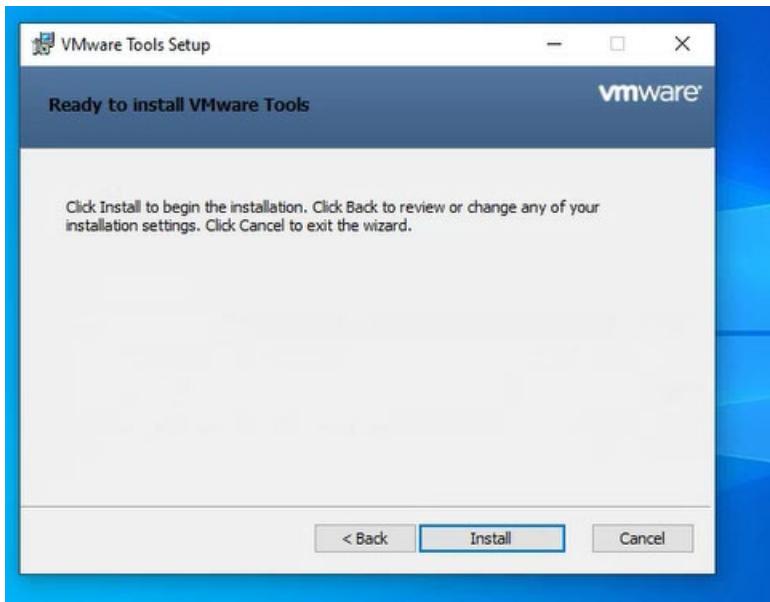
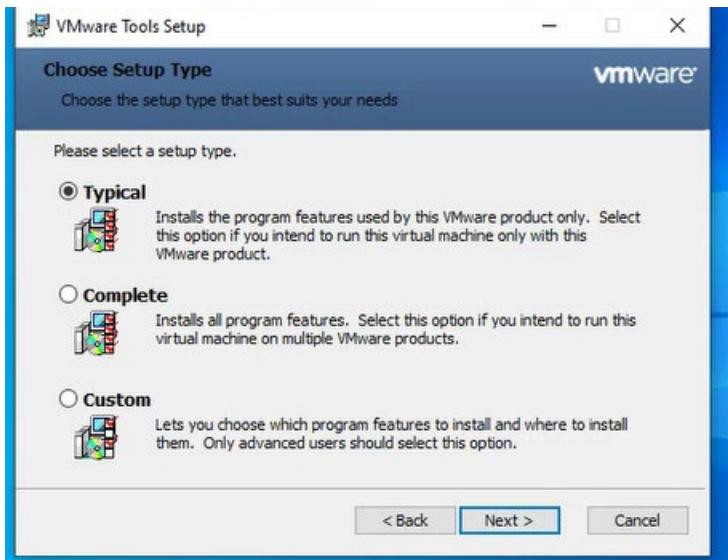
Now let's see what's new from Windows.



3.11.4.4 Post installation activities

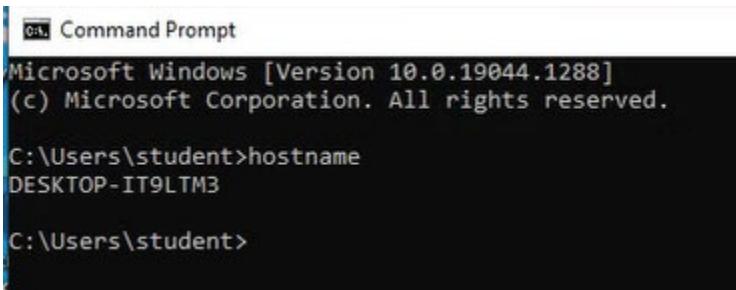
Install VM tools





Chage name of windowsws10pro

1. From command line verify current computer name

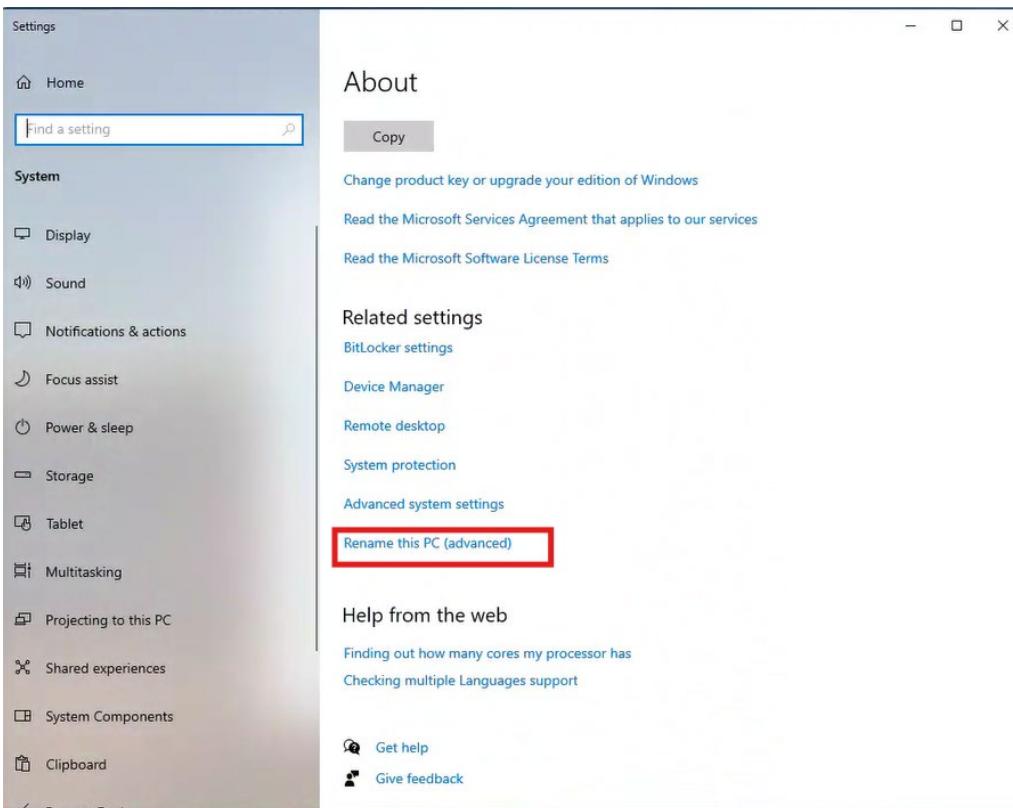


```
Command Prompt
Microsoft Windows [Version 10.0.19044.1288]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>hostname
DESKTOP-IT9LTM3

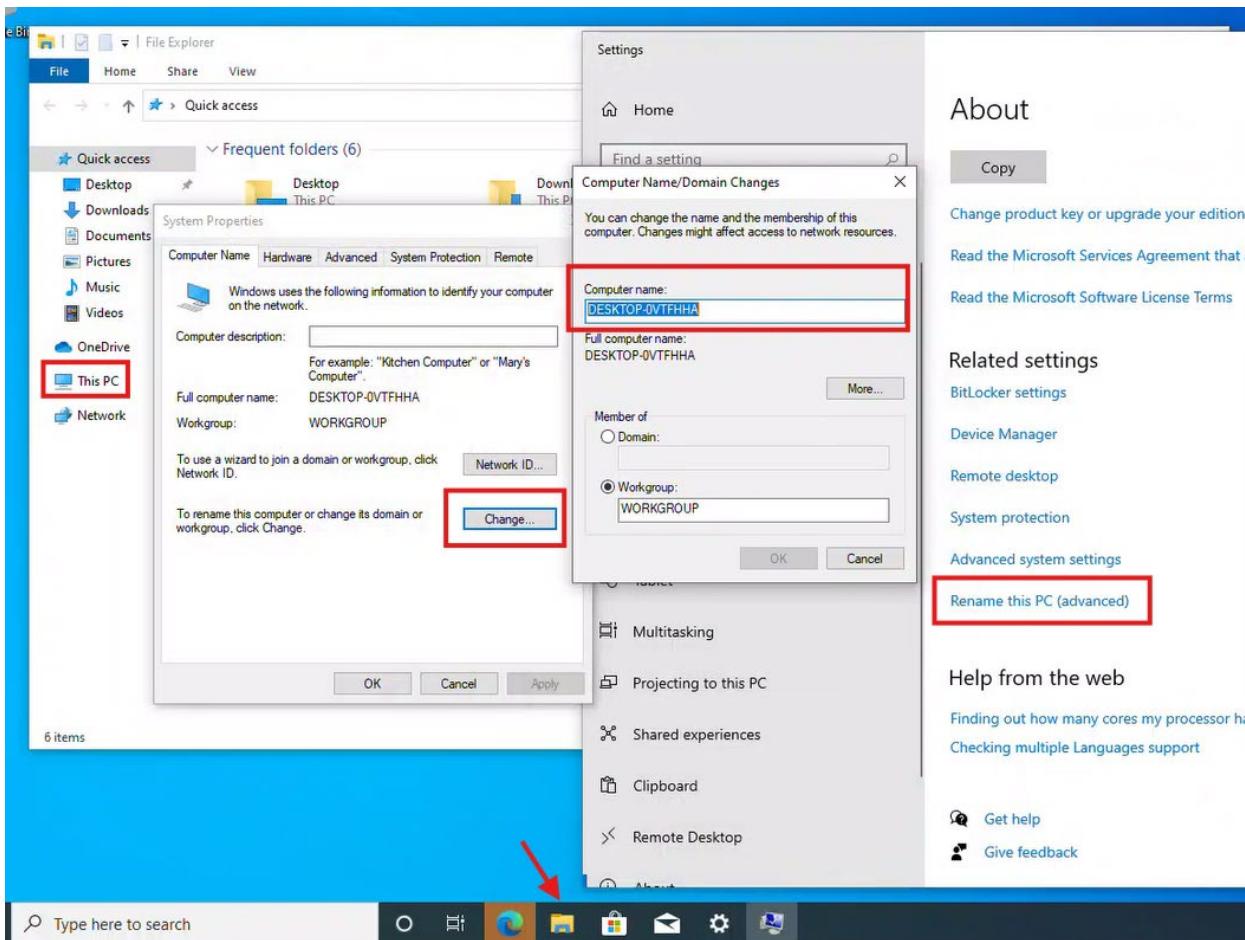
C:\Users\student>
```

2. Open This PC properties, select Rename this PC (Advanced)



3. Open the following windows to change the name

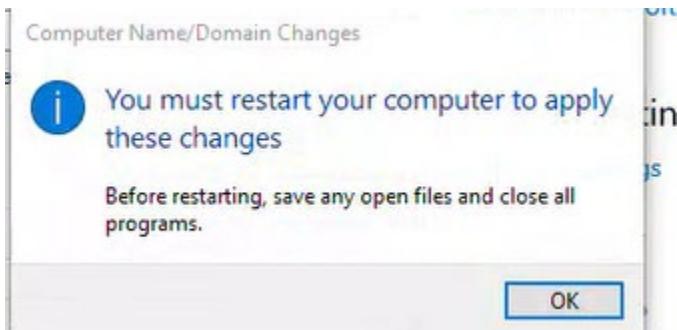
In system properties select change. Window Computer Name/domain change opens, give computer name win10-1a. Press Ok and ok to close windows. Close Settings window too.



Set the name as win10-1b



Reboot



When come back the computer name is set correctly

```
Command Prompt
Microsoft Windows [Version 10.0.19044.1288]
(c) Microsoft Corporation. All rights reserved.

C:\Users\student>hostname
win10-1b

C:\Users\student>
```

3.12 ADK

3.12.1 Install ADK

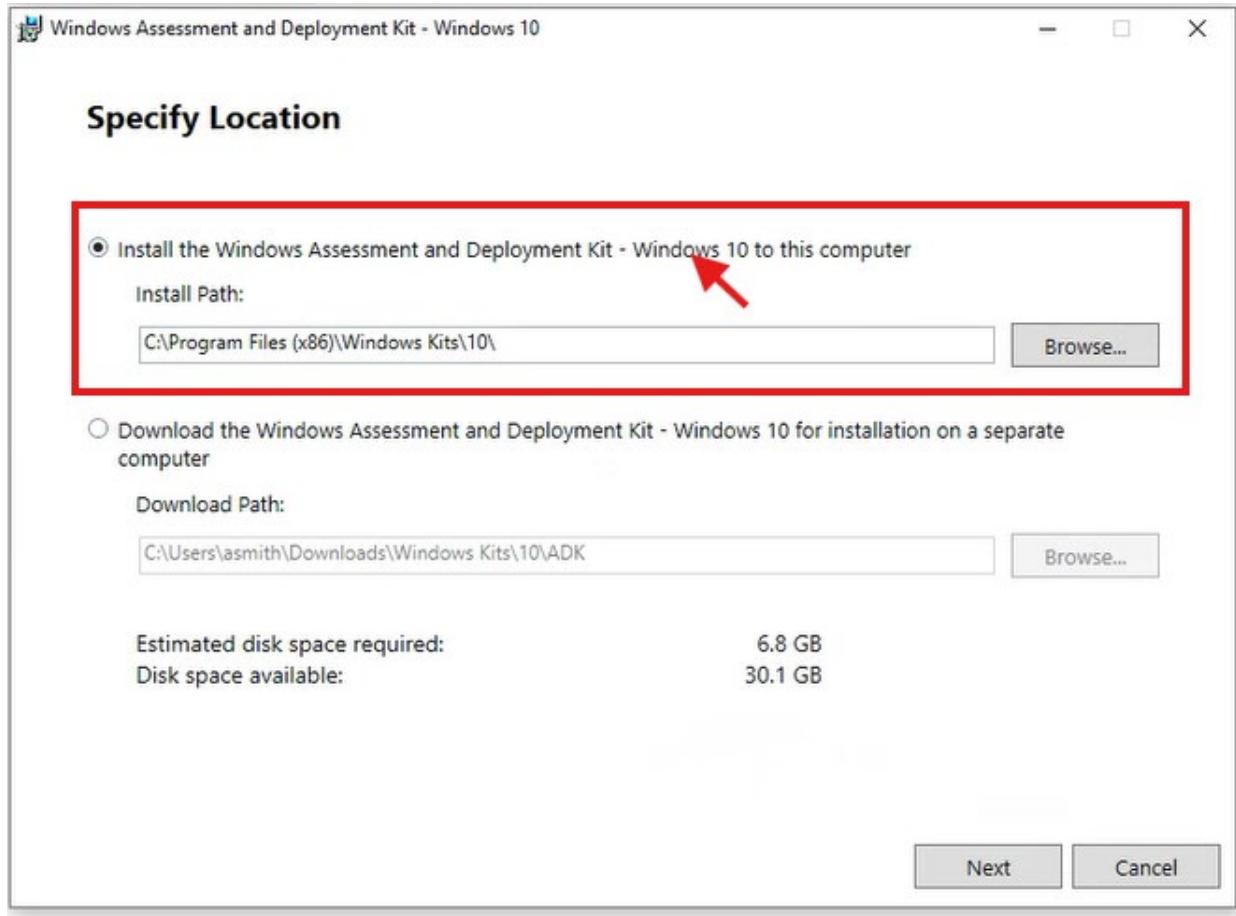
Install ADK

<https://learn.microsoft.com/en-us/windows-hardware/get-started/adk-install>

✓ Today (1)

 adksetup 1/24/2025 10:21 AM Application 1,858 KB

File description: Windows Assessment and Deployment Kit - Windows 10
Company: Microsoft Corporation
File version: 10.1.17134.1
Date created: 1/24/2025 10:21 AM
Size: 1.81 MB



Windows Kits Privacy

Windows 10 Kits collect and send anonymous usage data to Microsoft about how our customers use Microsoft programs and about some of the problems they encounter. Microsoft uses this information to improve the products and features. Participation in the program is voluntary, and the end results are software improvements to better meet the needs of our customers. No code or software produced by you will be collected.

[Tell me more about the Windows 10 program.](#)

Send anonymous usage data to Microsoft for the Windows 10 Kits?

- Yes
- No 

* Participation applies to all Windows Kits installed on this computer.

[Privacy Statement](#)

Back

Next

Cancel

License Agreement

You must accept the terms of this agreement to continue. If you do not accept the Microsoft Software License Terms, click Decline.

using it. Microsoft gives no express warranties, guarantees or conditions. You may have additional consumer rights or statutory guarantees under your local laws which this agreement cannot change. To the extent permitted under your local laws, Microsoft excludes the implied warranties of merchantability, fitness for a particular purpose and non-infringement.

FOR AUSTRALIA – You have statutory guarantees under the Australian Consumer Law and nothing in these terms is intended to affect those rights.

15. **LIMITATION ON AND EXCLUSION OF REMEDIES AND DAMAGES.** You can recover from Microsoft and its suppliers only direct damages up to U.S. \$5.00. You cannot recover any other damages, including consequential, lost profits, special, indirect or incidental damages.

- a. This limitation applies to

- i. anything related to the software, services, content (including code) on third party Internet sites, or third party programs; and
- ii. claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence, or other tort to the extent permitted by applicable law.

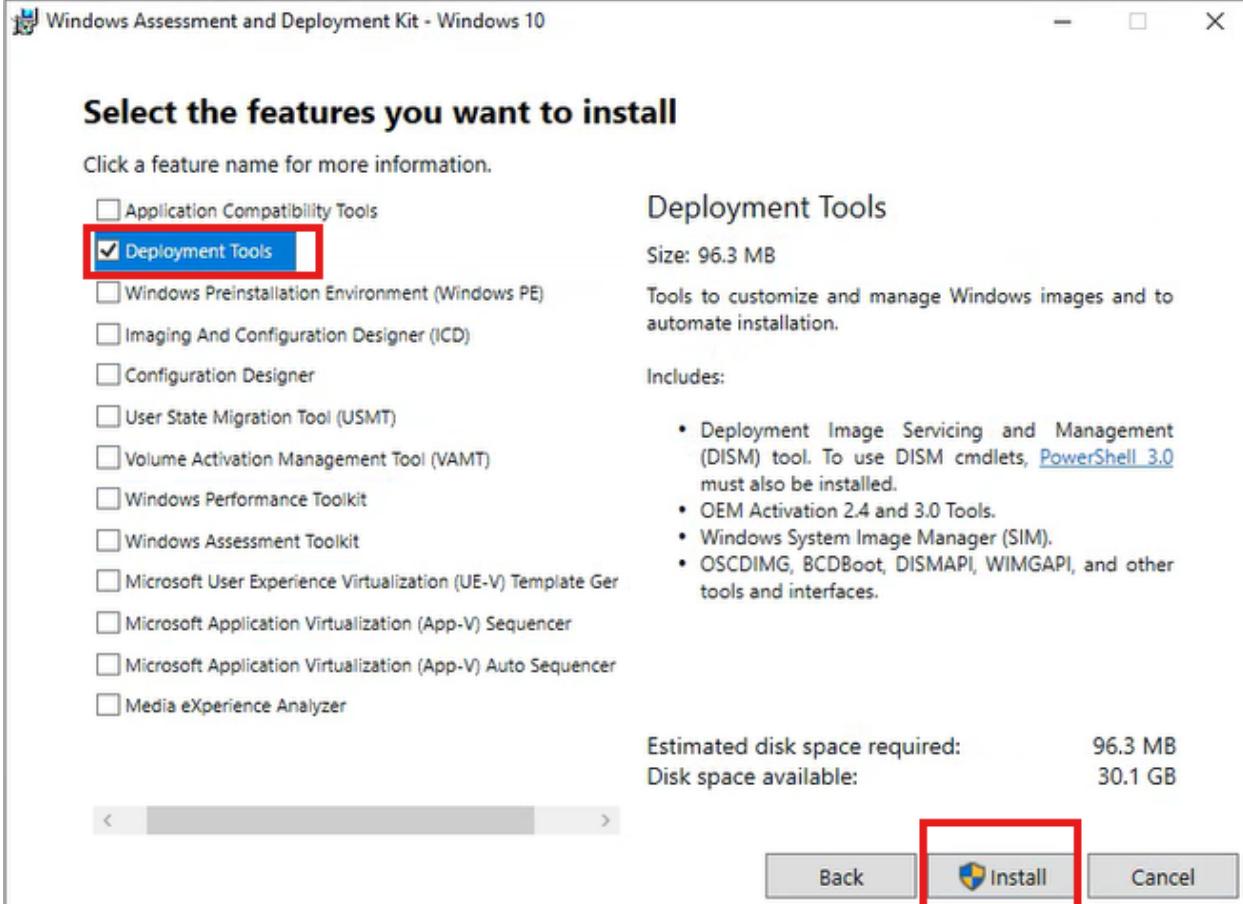
It also applies even if Microsoft knew or should have known about the possibility of the damages. The above limitation or exclusion may not apply to you because your country may not allow the exclusion or limitation of incidental, consequential or other damages.

Back

Accept

Decline

Uncheck all options except for Deployment Tools and click Install.



Login as administrator

User Account Control

X

Do you want to allow this app to make changes to your device?



Microsoft Windows

Verified publisher: Microsoft Corporation

File origin: Hard drive on this computer

[Show more details](#)

To continue, enter an admin user name and password.

administrator

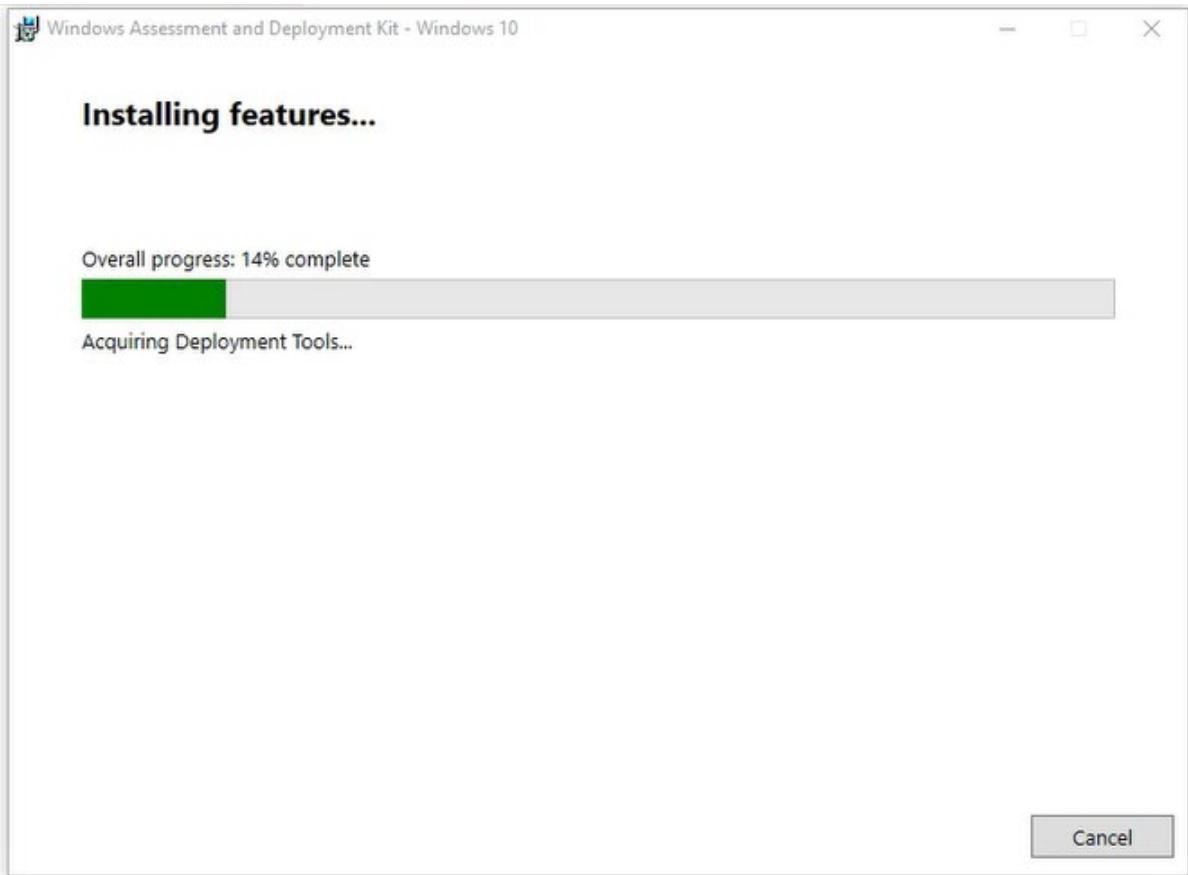
••••••••|



Domain: STATION1

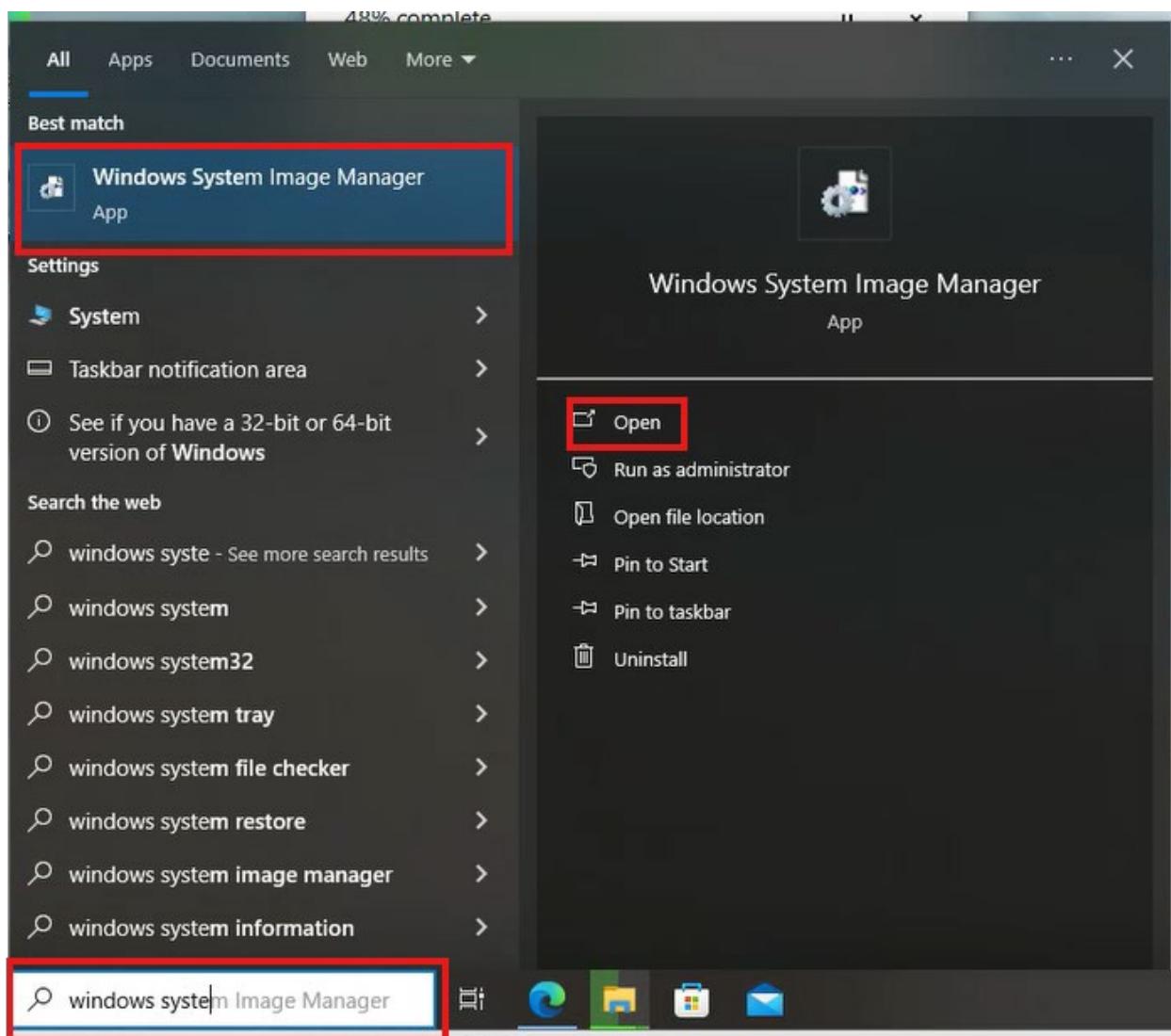
Yes

No

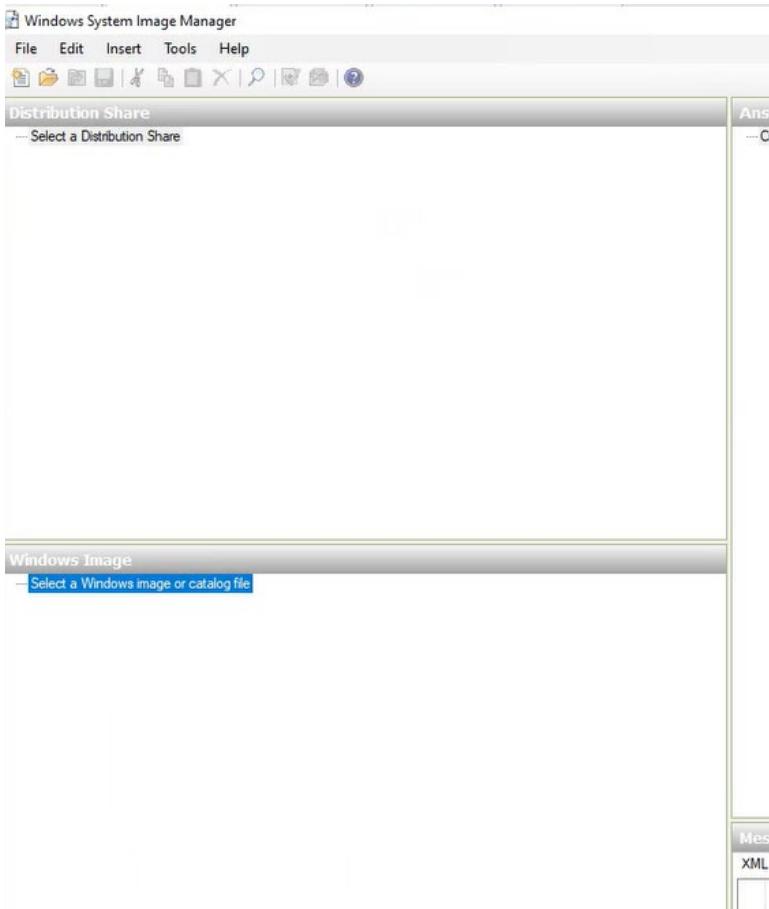


Install.wim file

Open Windows system Image manager

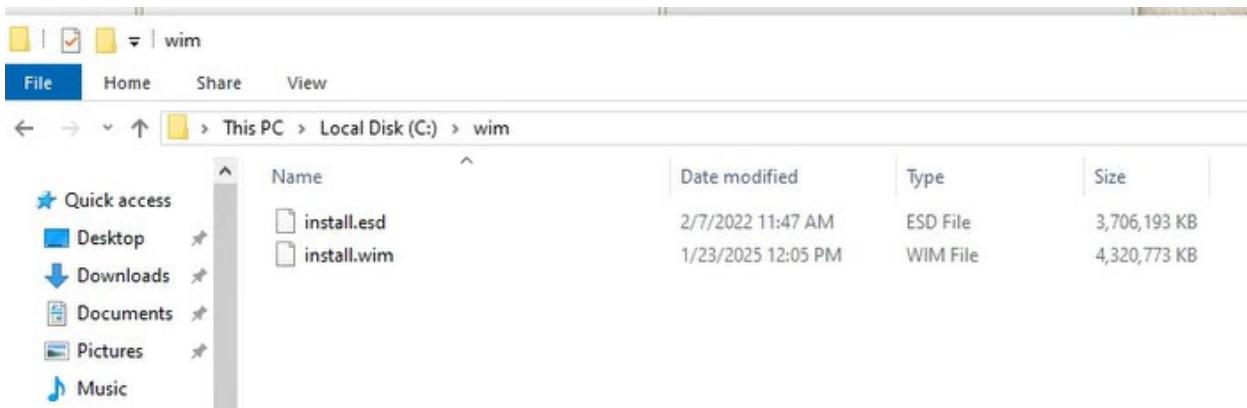


Window image system manager

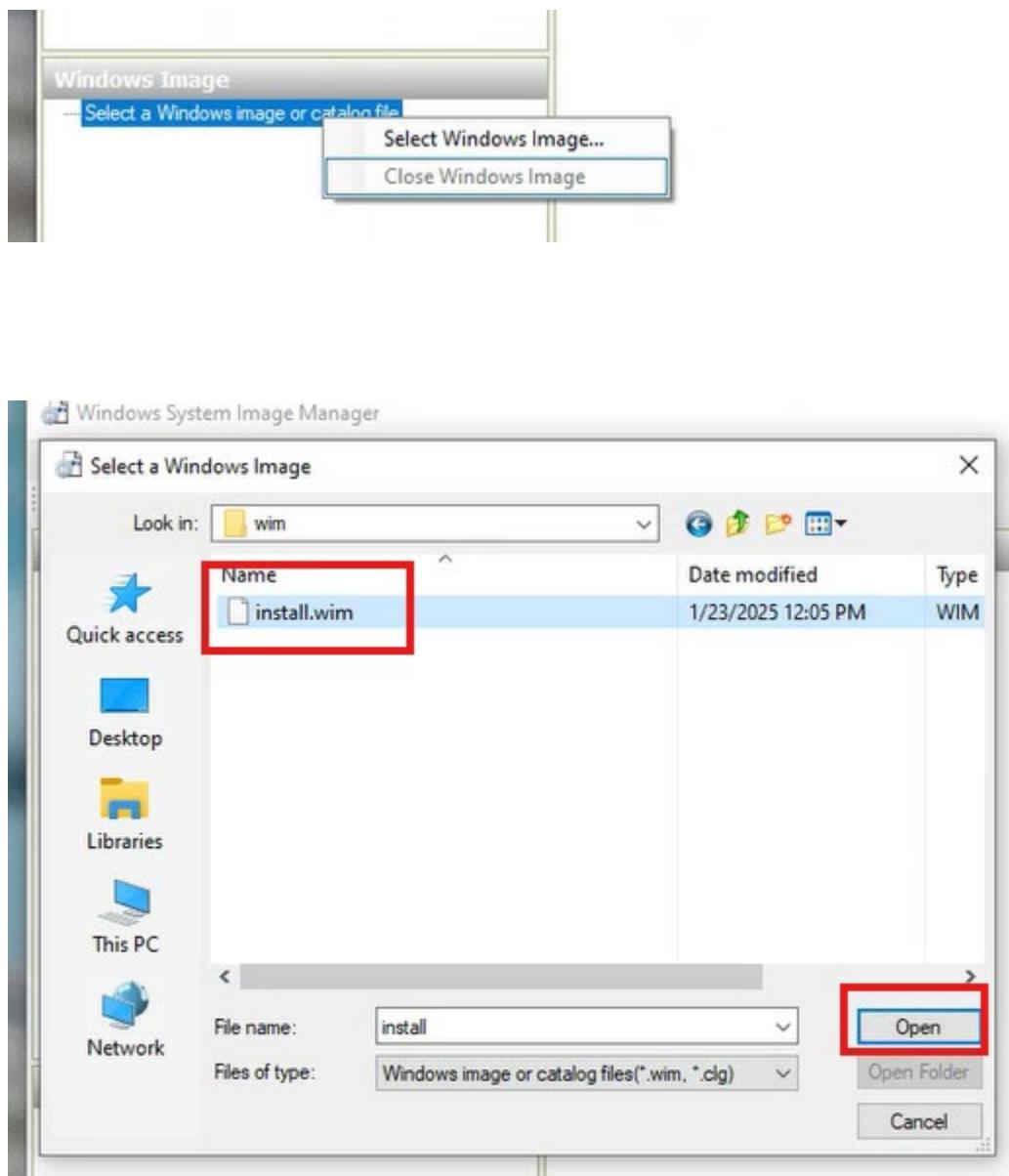


Make sure you have the wim file for Windows 10 enterprise ready and available

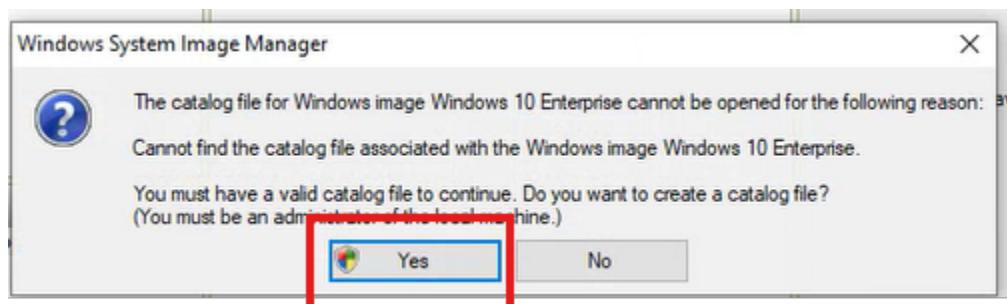
(previously prepared from install.esd file)

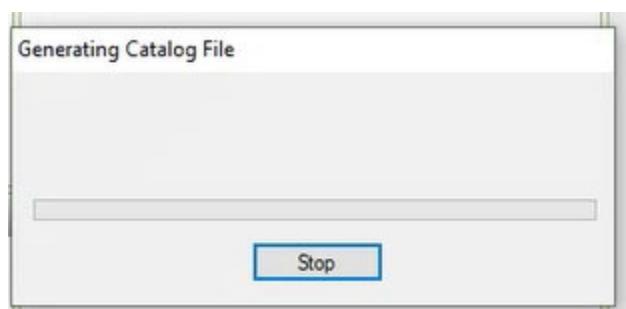
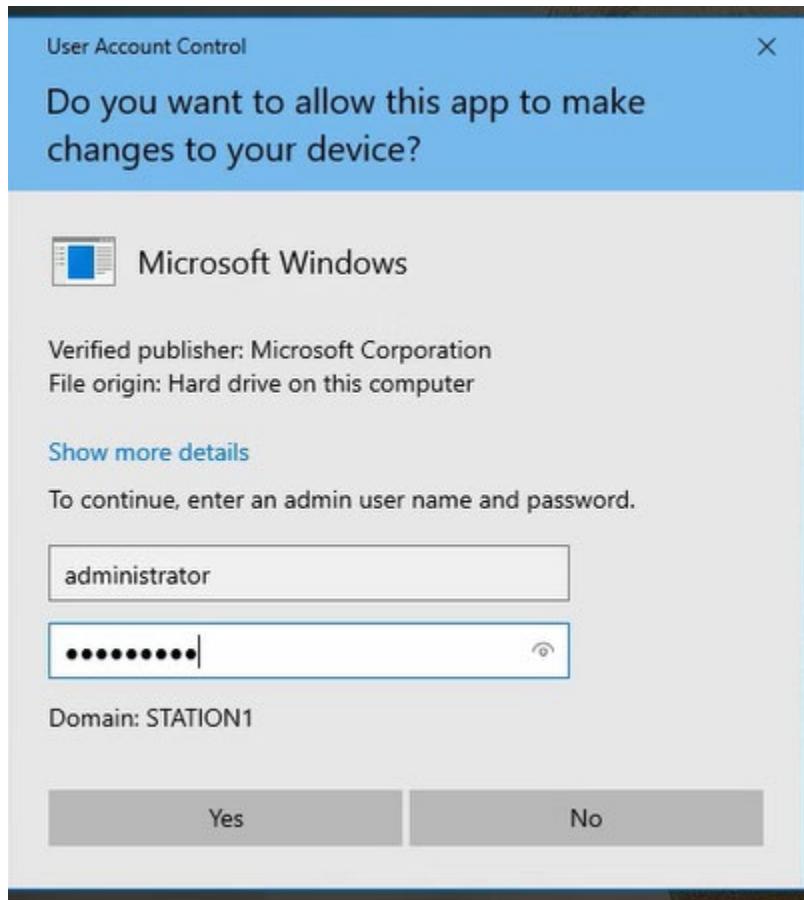


Locate to the folder to which you copied the contents of the Windows 10 ISO file and open it. Then open the sources folder and locate Windows Installation Media file for Windows enterprise (install.wim). Select it and press open.

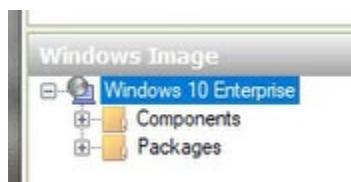


You will be prompted to create a catalog file. Click Yes and wait, it could take some time. This file is required.





Catalog file has been generated



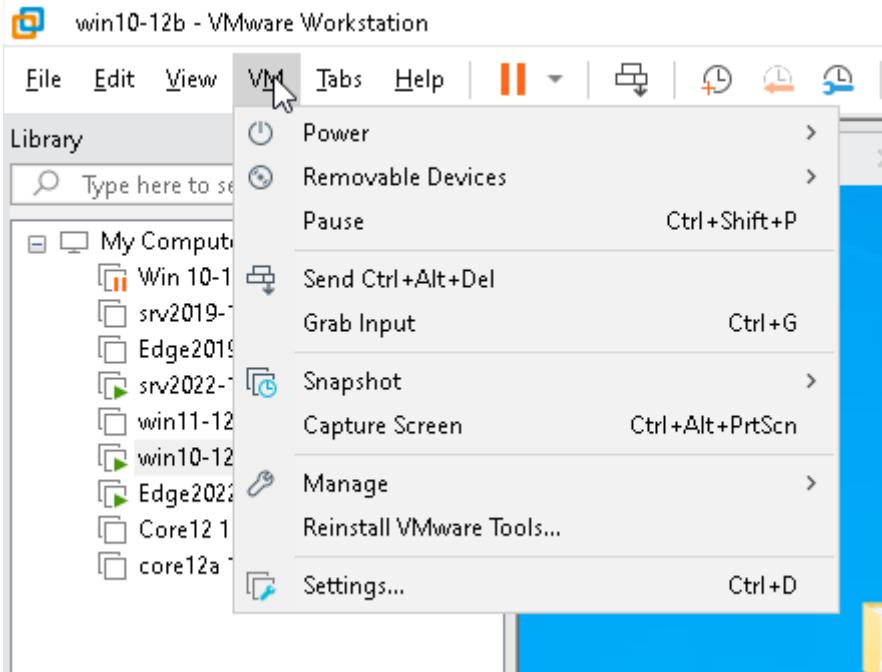
Components and package files are used for customizing and automating Windows deployments. They help define how Windows is installed, configured, and managed on target systems.

3.12.2 Extract WIM file and Create VM

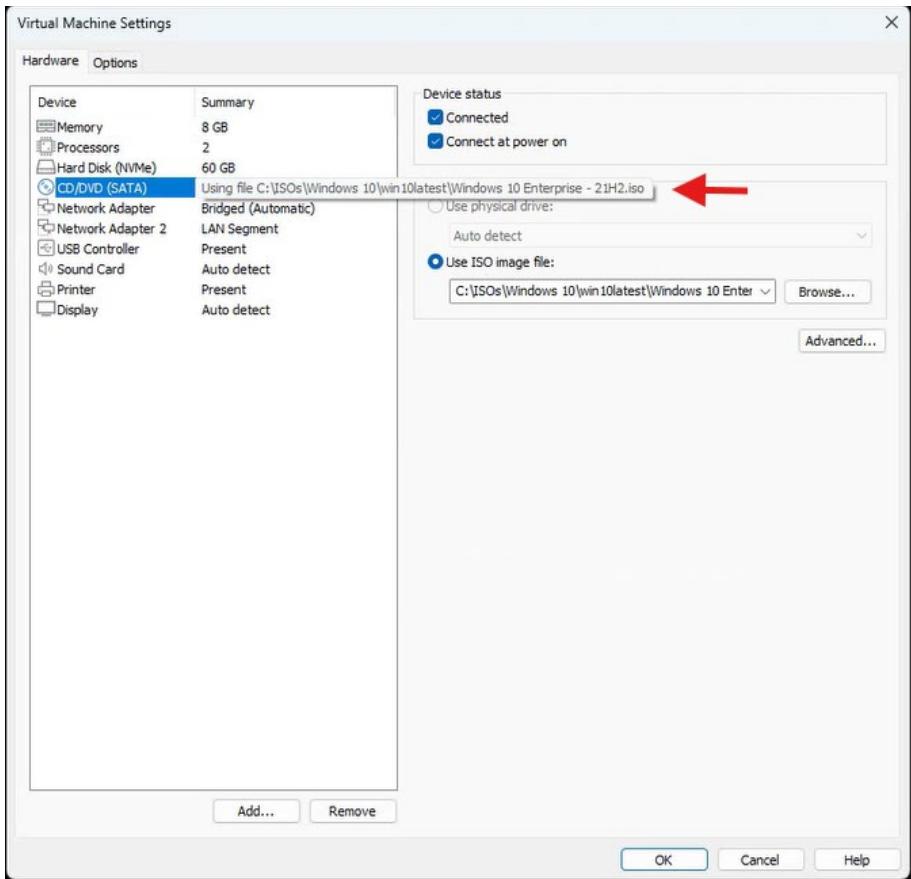
3.12.2.1 Get esd file from DVD for windows 10 enterprise

In windows server Load the DVD for windows 10 enterprise to get esd file

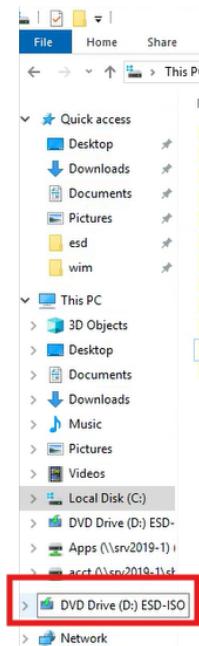
A) Enter your vm Settings



B) Insert a Windows 10 Iso in your cd/DVD drive and press ok



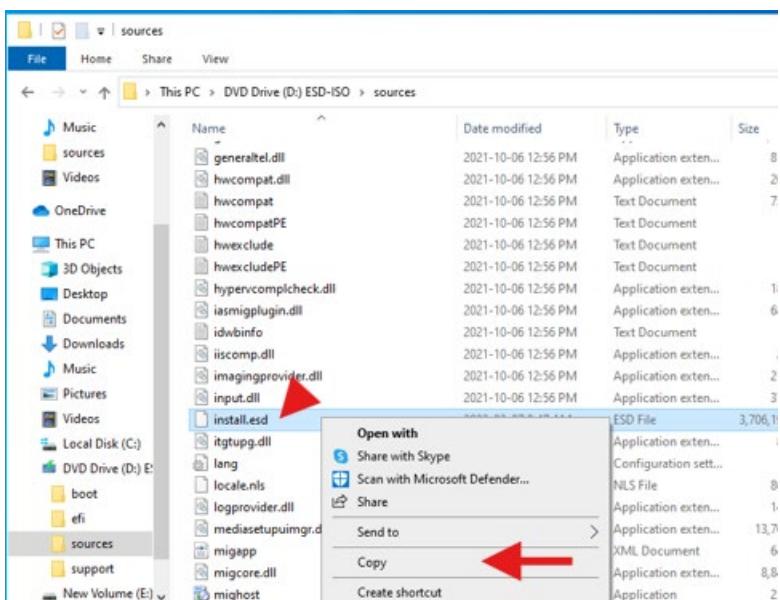
C) Head into your File explorer and click on the DVD Drive



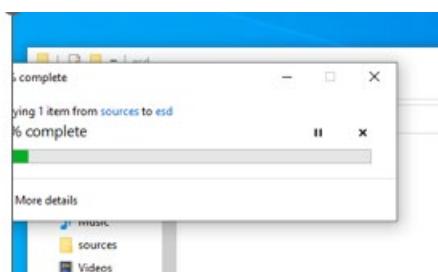
D) Go into your Sources folder and find the install.esd

	Name	Date modified	Type	Size
Quick access	hwcompatPE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Desktop	hwexclude.txt	10/6/2021 3:56 PM	Text Document	1 KB
Downloads	hwexcludePE.txt	10/6/2021 3:56 PM	Text Document	1 KB
Documents	hypervcompcheck.dll	10/6/2021 3:56 PM	Application extens...	183 KB
Pictures	iasmigplugin.dll	10/6/2021 3:56 PM	Application extens...	681 KB
esd	idwbinfo.txt	10/6/2021 3:56 PM	Text Document	1 KB
wim	iiscomp.dll	10/6/2021 3:56 PM	Application extens...	24 KB
This PC	imagingprovider.dll	10/6/2021 3:56 PM	Application extens...	218 KB
DVD Drive (D:) ESD-IS	install.esd	2/7/2022 11:47 AM	ESD File	3,706,193 KB
Network	itgtupg.dll	10/6/2021 3:56 PM	Application extens...	84 KB
	lang.ini	10/6/2021 3:56 PM	Configuration sett...	1 KB
	locale.nls	10/6/2021 3:56 PM	NLS File	801 KB

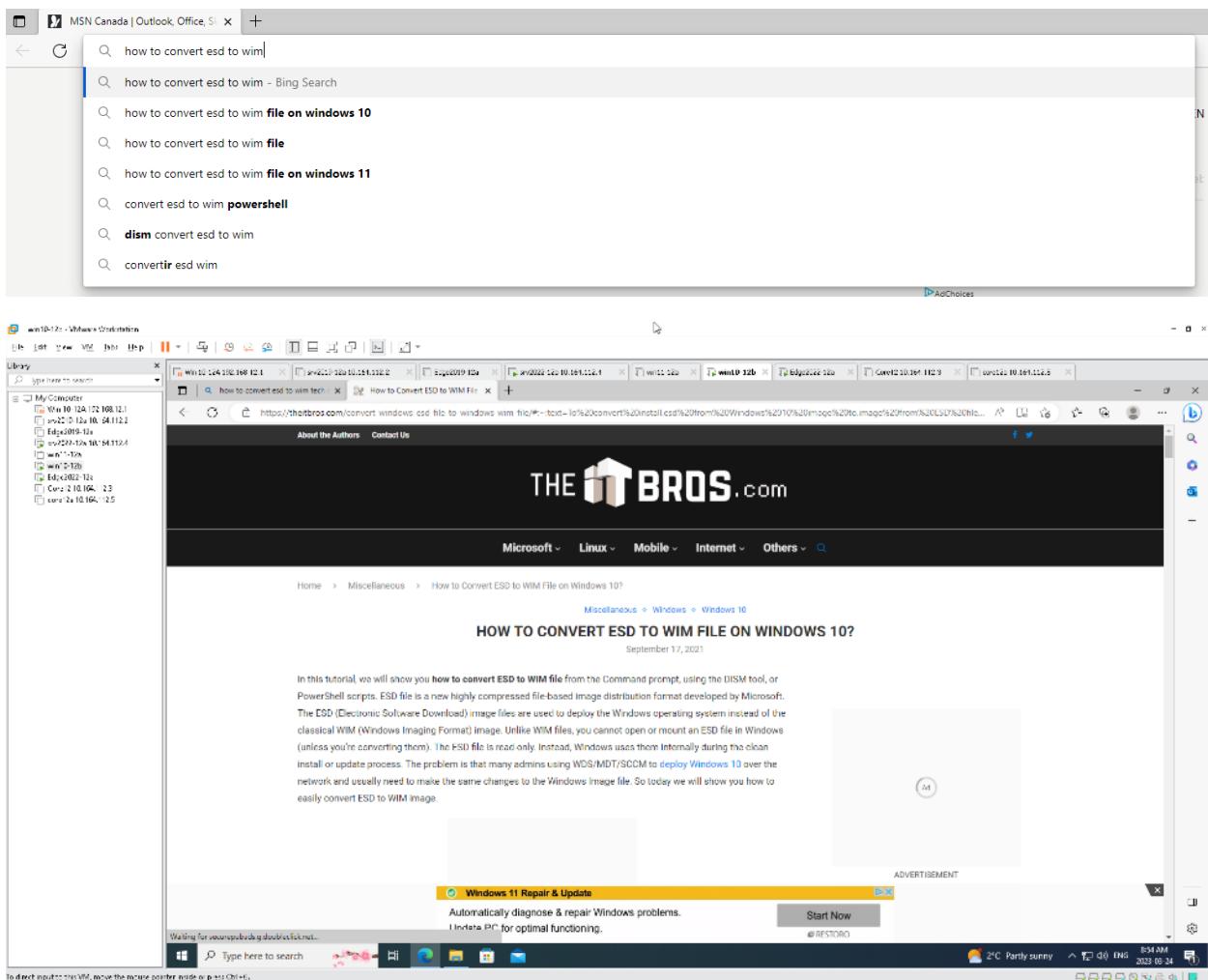
E) Right click on install.esd and select copy



F) Go to your local disk and create a folder named vim then paste the install.esd into your vim folder by right clicking inside it and selecting Paste and wait

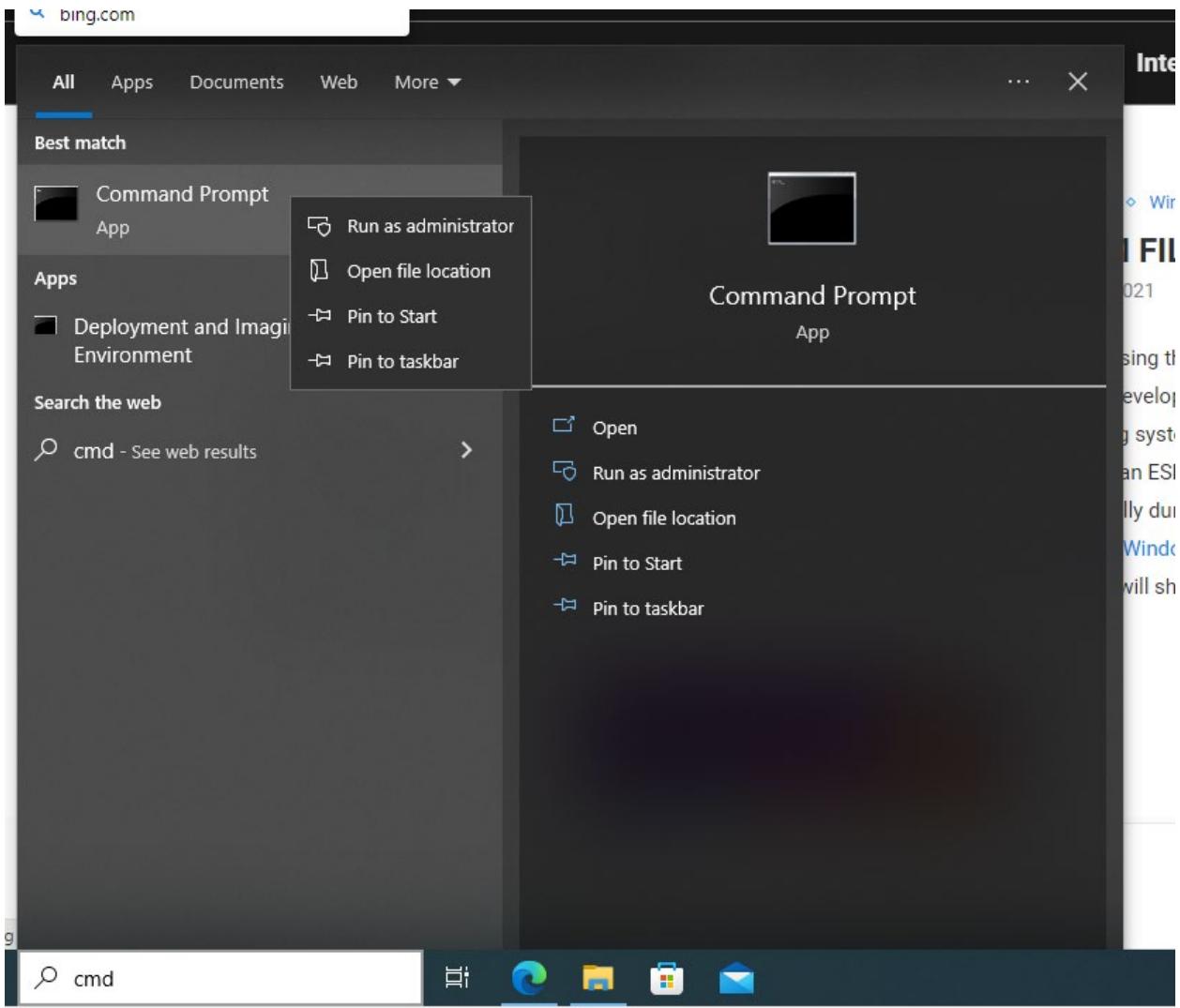


- G) it might be a good to go to the IT Bros.com page on How to Convert ESD To Wim File on Windows 10



3.12.2.2 Convert ESD To Wim File on Windows 10

- A) Go to your command prompt and run as administrator



B) input command cd \ to get to the root, then list the directory contents. See the directory vim is there

```
cd \
```

```
dir
```

```
C:\Users\Administrator>cd /  
C:\>dir  
Volume in drive C has no label.  
Volume Serial Number is B4A0-9C6E  
  
Directory of C:\  
  
01/21/2025 09:29 AM <DIR> Apps  
01/23/2025 09:54 AM <DIR> esd  
01/20/2025 05:00 PM <DIR> Home  
01/23/2025 08:58 AM <DIR> inetpub  
11/05/2022 01:21 PM <DIR> PerfLogs  
01/23/2025 08:58 AM <DIR> Program Files  
01/23/2025 08:58 AM <DIR> Program Files (x86)  
01/23/2025 10:36 AM <DIR> RemoteInstall  
01/20/2025 09:24 PM <DIR> Shared  
01/17/2025 12:51 AM <DIR> Users  
01/23/2025 11:45 AM <DIR> vim  
01/23/2025 08:58 AM <DIR> Windows  
          0 File(s)           0 bytes  
         12 Dir(s) 23,808,249,856 bytes free  
  
C:\>
```

C) Input dir to see that the install.esd file is in the folder

```
cd \wim
```

```
dir
```

```
C:\wim>dir
Volume in drive C has no label.
Volume Serial Number is B4A0-9C6E

Directory of C:\wim

01/23/2025  11:45 AM    <DIR>      .
01/23/2025  11:45 AM    <DIR>      ..
02/07/2022  11:47 AM  3,795,141,098 install.esd
```



E) Input the command dism /Get-WimInfo /WimFile:install.esd to find see which versions of windows 10 there are

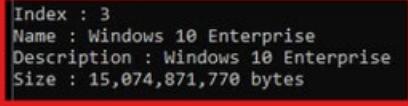
Notice that windows 10 Enterprise is number 3 so we will

```
C:\esd>DISM /Get-WimInfo /WimFile:install.esd
Deployment Image Servicing and Management tool
Version: 10.0.17763.5830

Details for image : install.esd

Index : 1
Name : Windows 10 Education
Description : Windows 10 Education
Size : 15,074,717,775 bytes

Index : 2
Name : Windows 10 Education N
Description : Windows 10 Education N
Size : 14,311,771,183 bytes

Index : 3
Name : Windows 10 Enterprise
Description : Windows 10 Enterprise
Size : 15,074,871,770 bytes
The entry for Windows 10 Enterprise is highlighted with a red box.

Index : 4
Name : Windows 10 Enterprise N
Description : Windows 10 Enterprise N
Size : 14,311,677,460 bytes

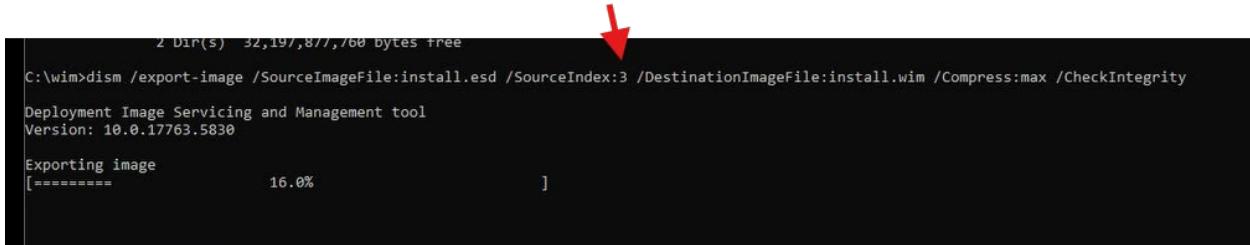
Index : 5
Name : Windows 10 Pro
Description : Windows 10 Pro
Size : 15,071,917,946 bytes

Index : 6
Name : Windows 10 Pro N
Description : Windows 10 Pro N
Size : 14,308,856,803 bytes

The operation completed successfully.
```

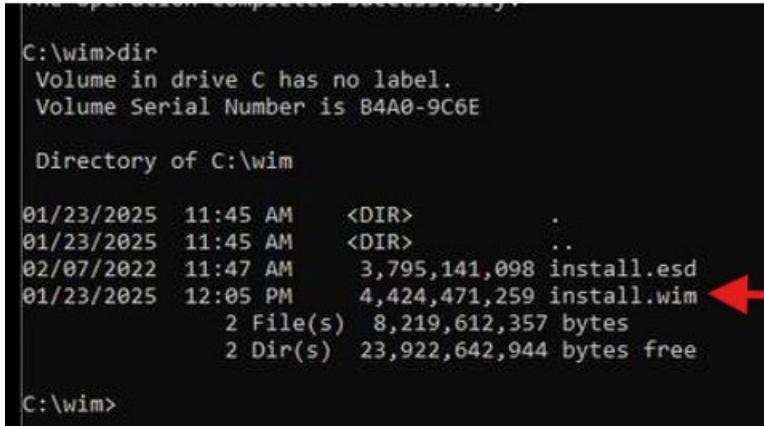
F) Input the command

```
dism /export-image /SourceImageFile:install.esd /SourceIndex:3  
/DestinationImageFile:install.wim /Compress:max /CheckIntegrity
```



```
2 Dir(s) 32,197,877,760 bytes free  
C:\wim>dism /export-image /SourceImageFile:install.esd /SourceIndex:3 /DestinationImageFile:install.wim /Compress:max /CheckIntegrity  
Deployment Image Servicing and Management tool  
Version: 10.0.17763.5830  
Exporting image  
[=====] 16.0% ]
```

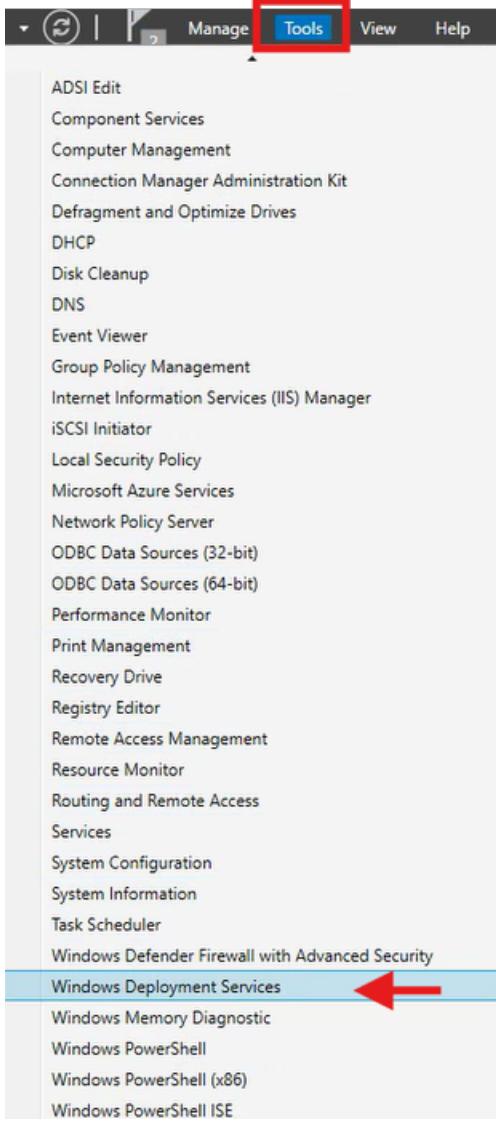
G) Verify install.wim file has been created



```
C:\wim>dir  
Volume in drive C has no label.  
Volume Serial Number is 84A0-9C6E  
  
Directory of C:\wim  
01/23/2025 11:45 AM <DIR> .  
01/23/2025 11:45 AM <DIR> ..  
02/07/2022 11:47 AM 3,795,141,098 install.esd  
01/23/2025 12:05 PM 4,424,471,259 install.wim ←  
2 File(s) 8,219,612,357 bytes  
2 Dir(s) 23,922,642,944 bytes free  
  
C:\wim>
```

3.12.2.3 Add windows enterprise image to WDS

- Inside Server Manager / Local Server open tools and select Windows Deployment Service.



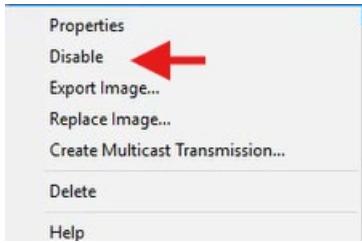
3.12.2.4 Disable Image (optional)

Disable ISO Image if another one already present

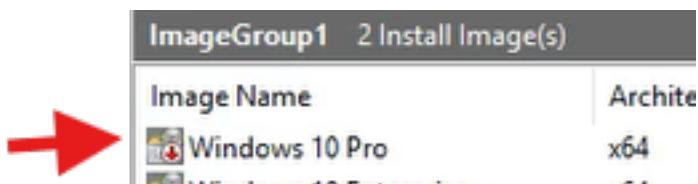
- A) Disable ISO image that is present

In our case image for Windows 10 pro was already there, we need to disable

To disable Select Image to be disabled, then right click, menu appears select Disable

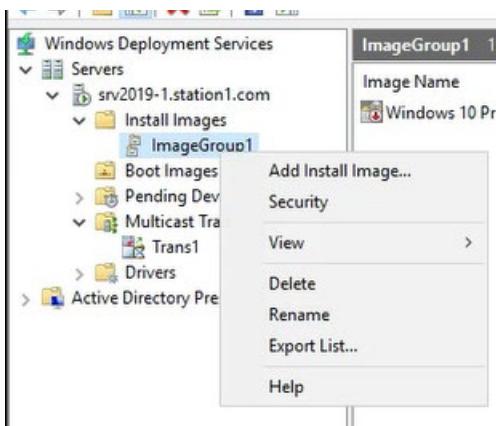


- B) Verify the image for Windows 10 Pro is disabled a red arrow pointing down will appear for disabled images

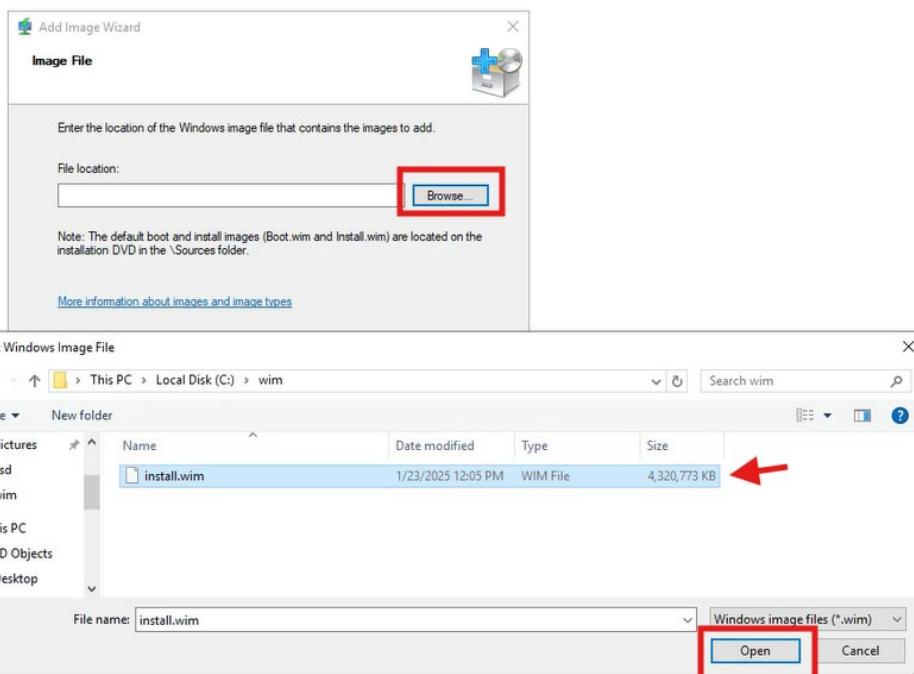


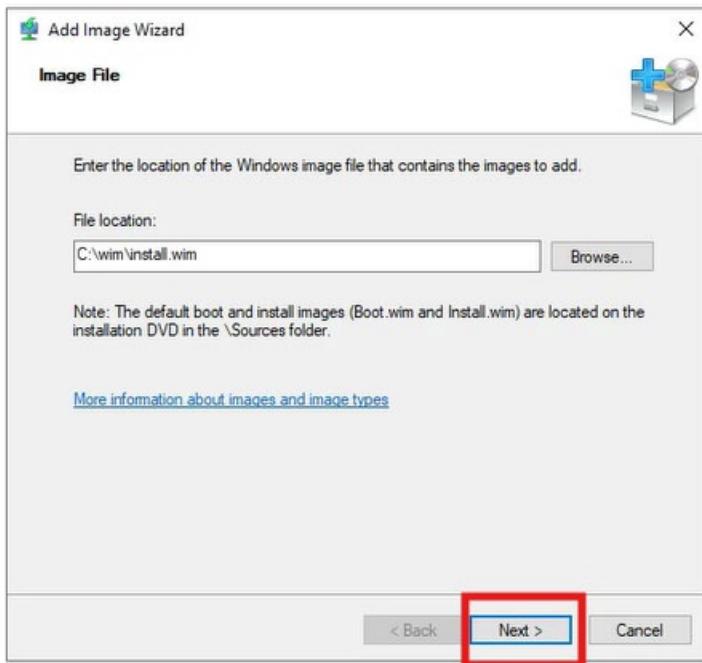
3.12.2.5 Install Image

- A) Select the server, Open Install Images, a group is already there ImageGroup1
Select ImageGroup1, right click and select n menu Add Install Image

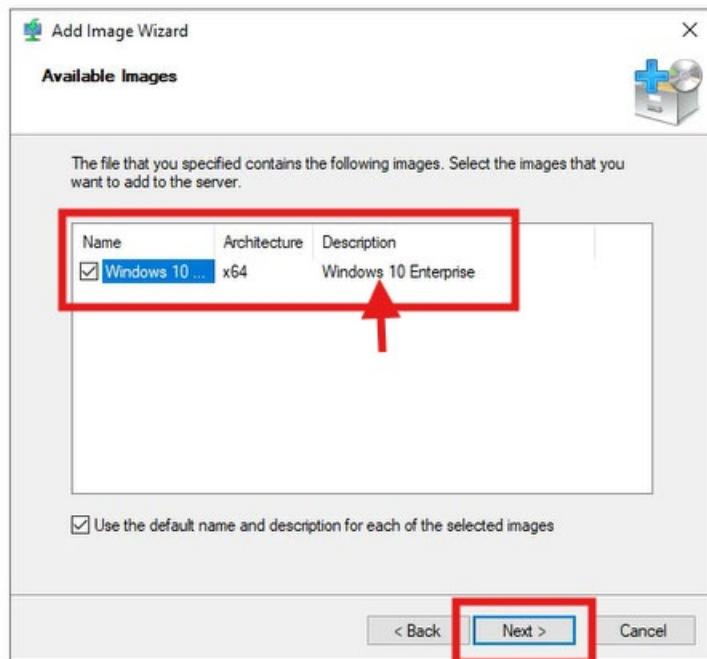


- B) Select file install.vim

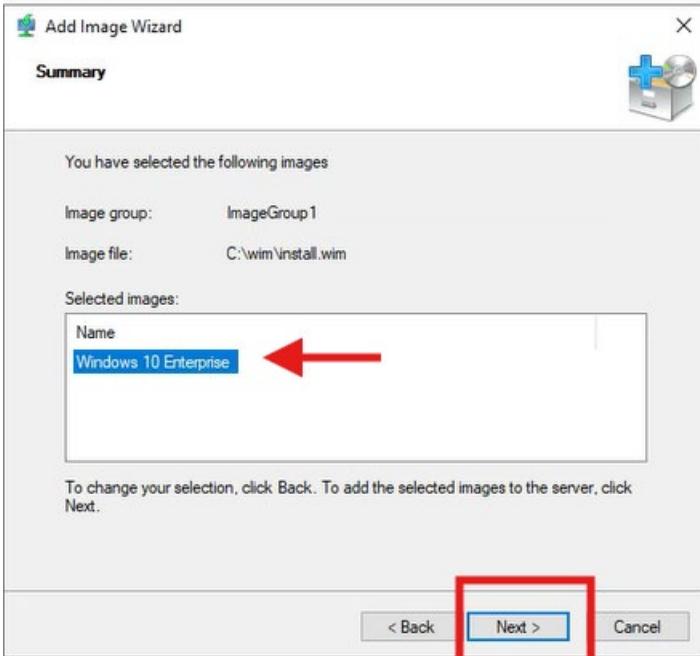




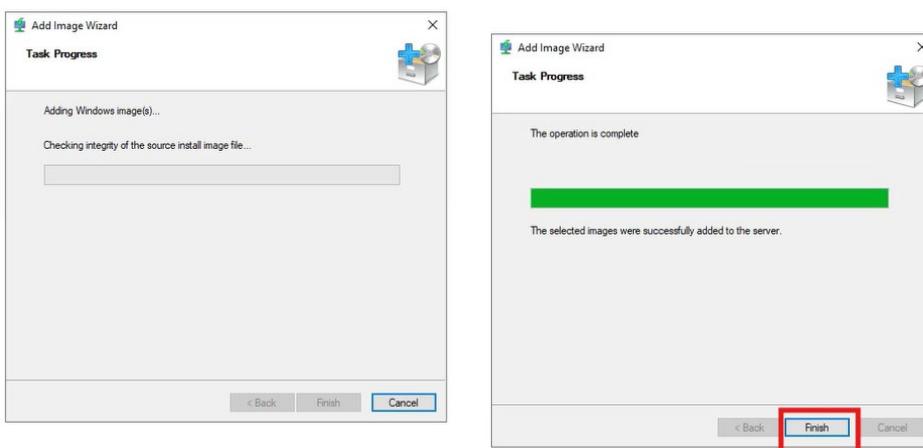
C) Next window note Windows 10 enterprise and click Next



D) In Next window Summary Click Next

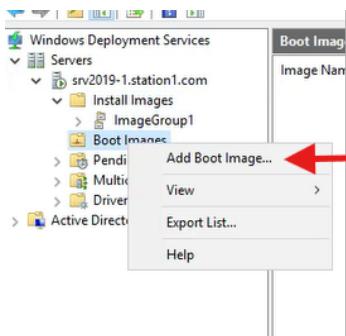


E) Load image starts, wait until completed and click on Finish



3.12.2.6 Add boot image in WSD

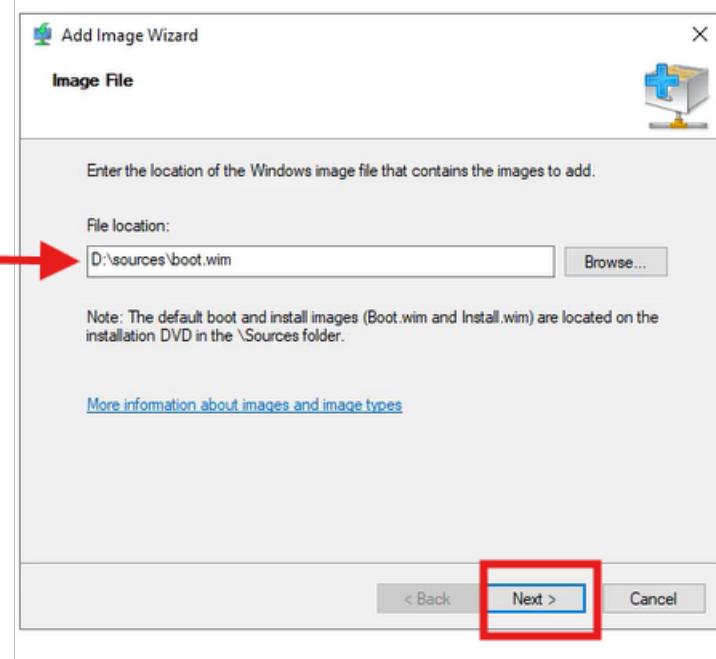
A) Select Boot Image, right click and Select Add Boot Image

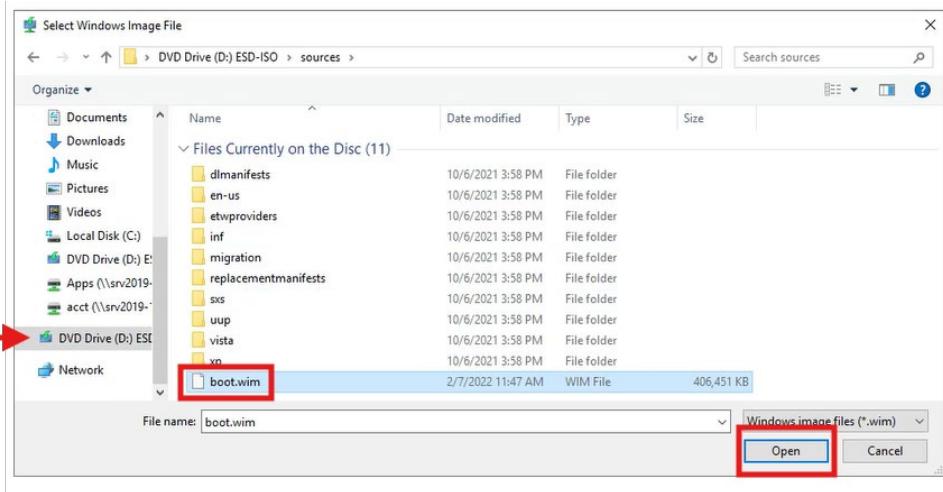


B) Click on Browse, in windows Image File

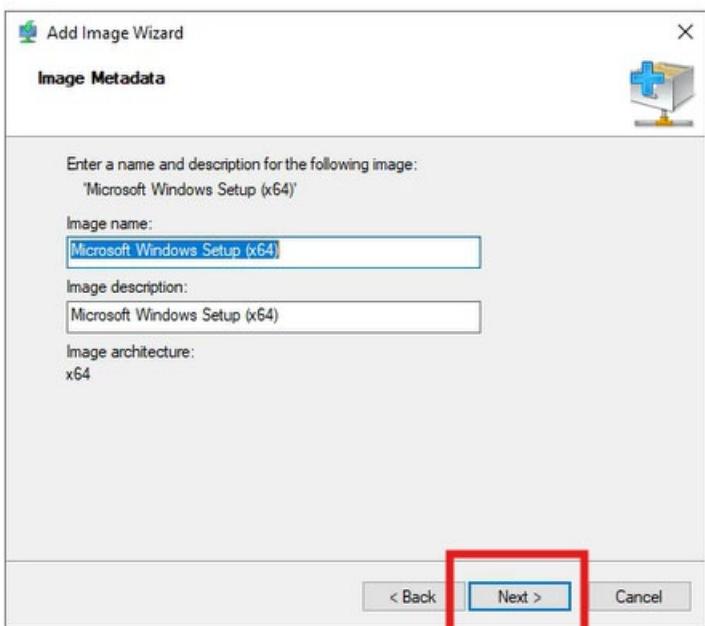
Locate boot.wim file in DVD directory sources , select file and click Open

Once file path is given click on Next

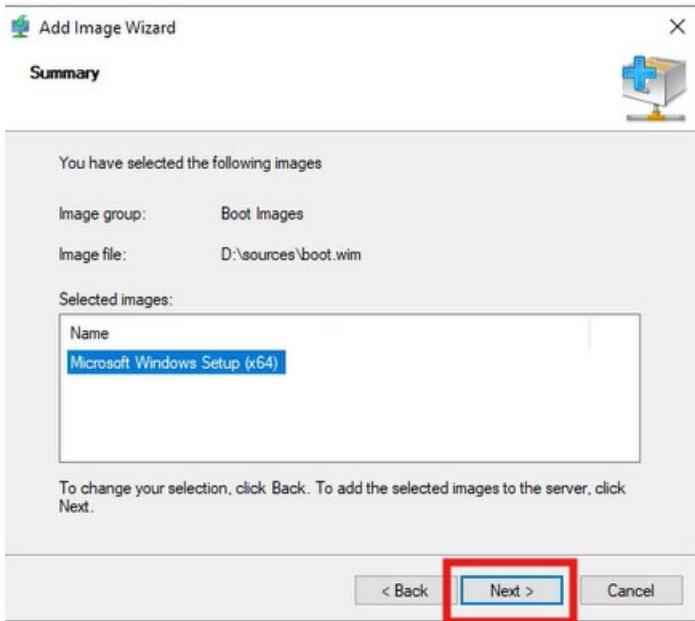




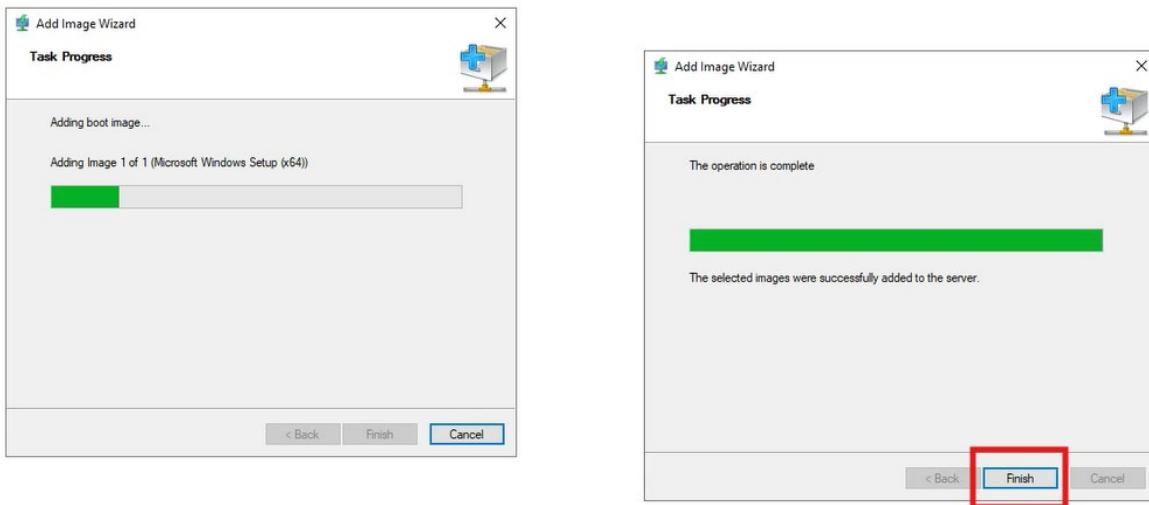
C) Click on Next in Window Image Metadata



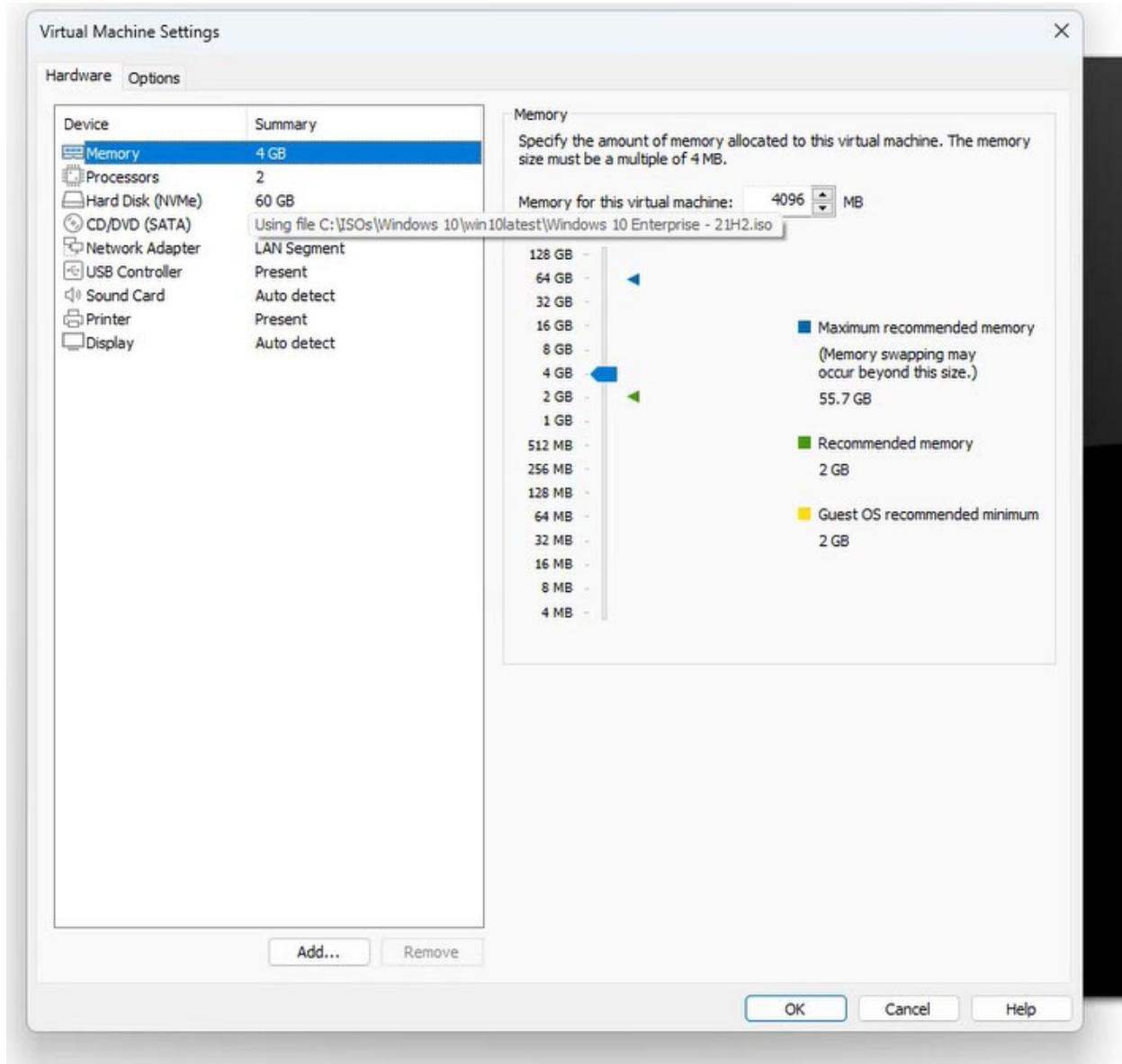
D) Click Next on windows Summary



E) Boot.wim file starts loading, wait until finishes and press Finish



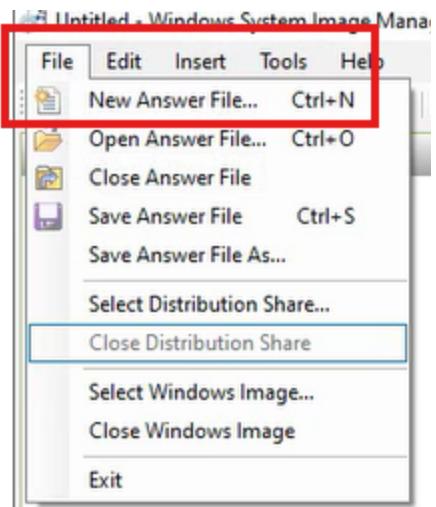
3.12.3 Create VM for windows 10 enterprise



3.12.4 Creating the answer files

You will be creating two answer files, one that is used to do the initial setup of the operating system including things like system language and partitions, and another that is used for other settings such as user accounts, etc.

3.12.4.1 Create new answer file for WDS



See it created; things will be added as we work on it

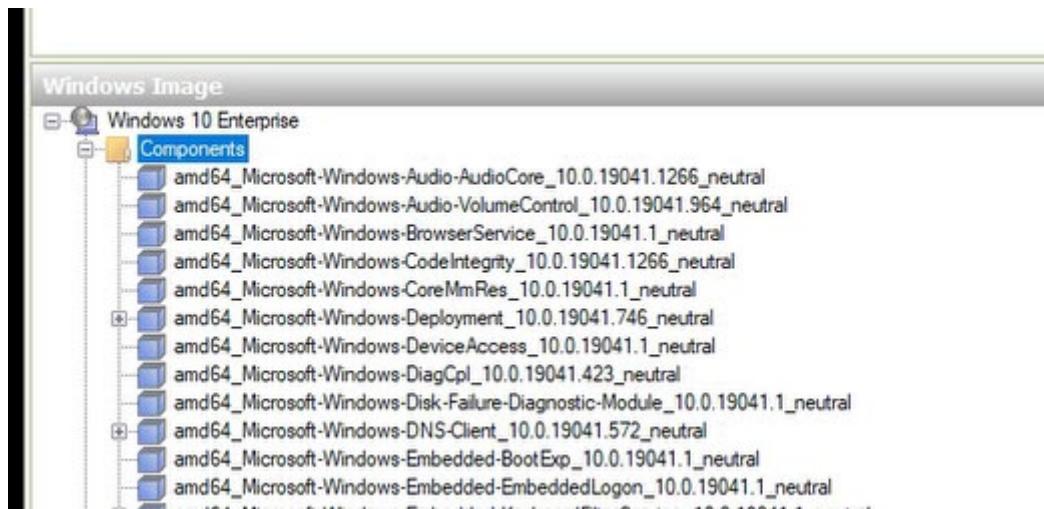


3.12.4.1.1 Create template WDS file

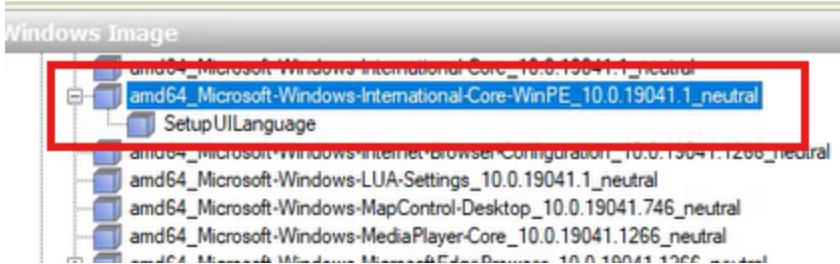
Microsoft-Windows-International-Core-WinPE

- In the Windows Image box to the bottom left, expand components and navigate to the Microsoft-Windows-International-Core-WinPE object, expand that.

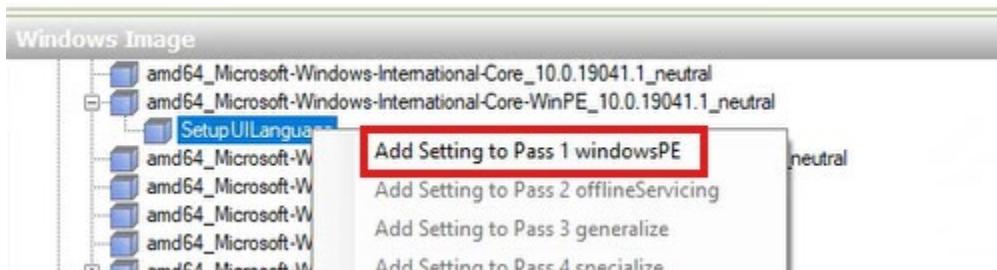
Windows Preinstallation Environment (WinPE)



- Expand it

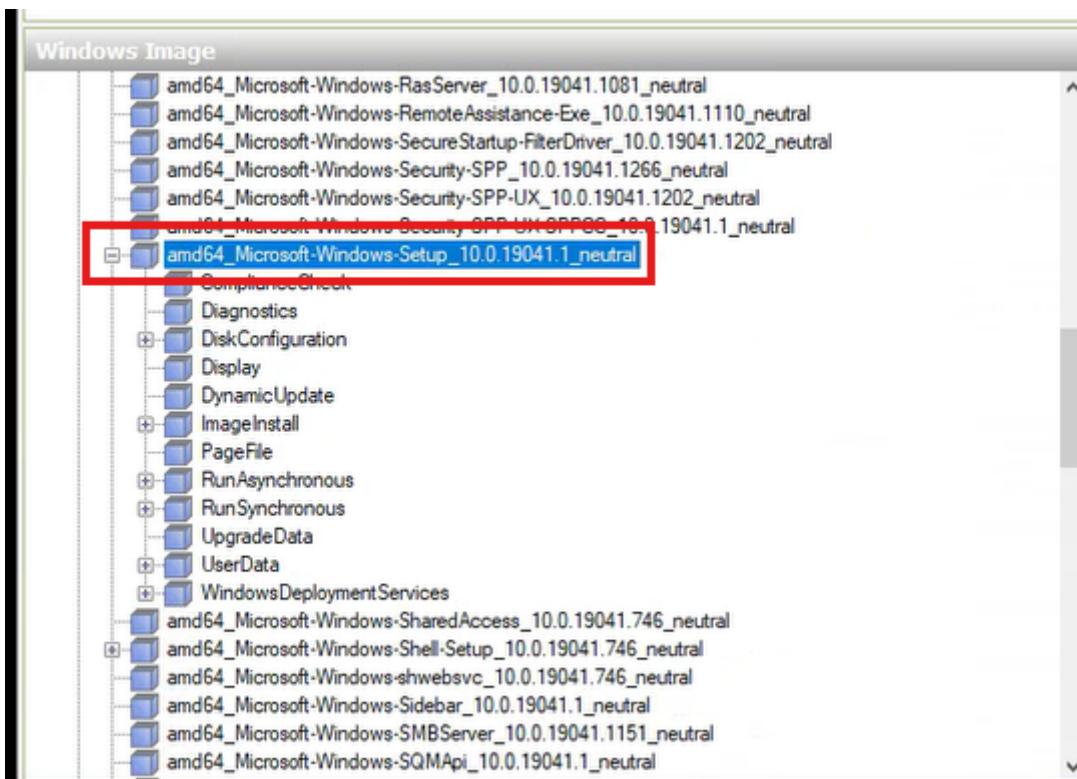


C) Right click SetupUILanguage and select Add Setting to Pass 1 windowsPE

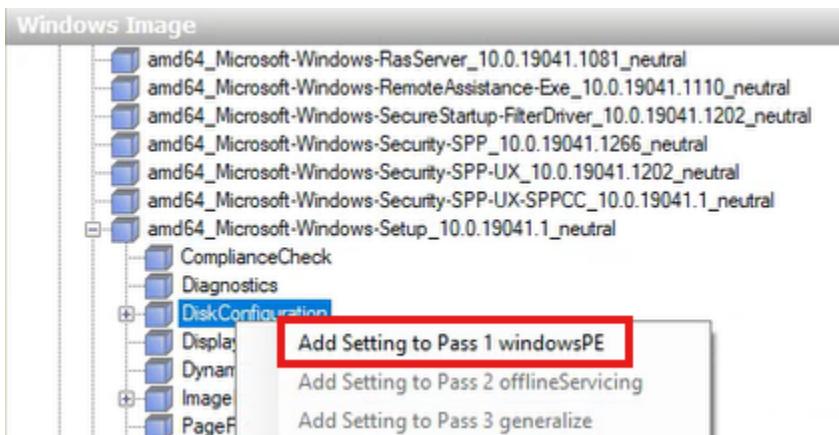


Microsoft-Windows-Setup

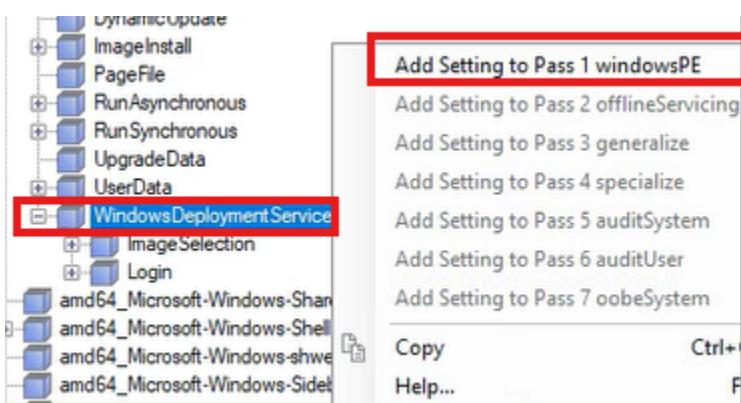
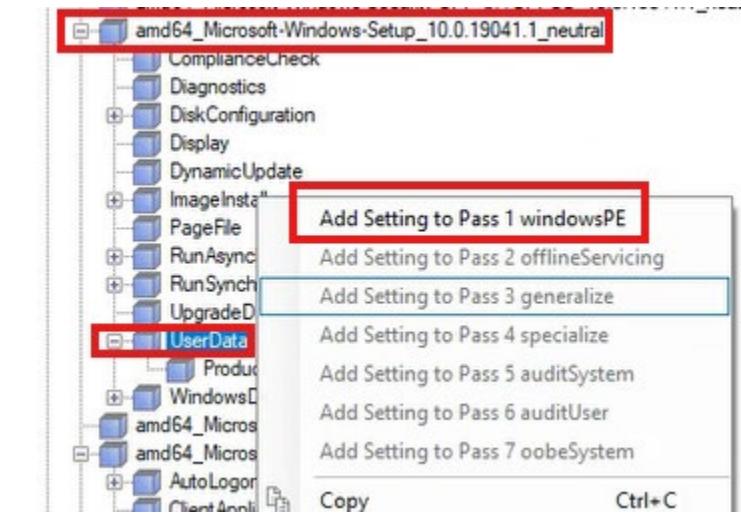
A) Locate Microsoft-Windows-Setup



B) Expand Microsoft-Windows-Setup > Right click DiskConfiguration and click Add Setting to Pass 1 windowsPE



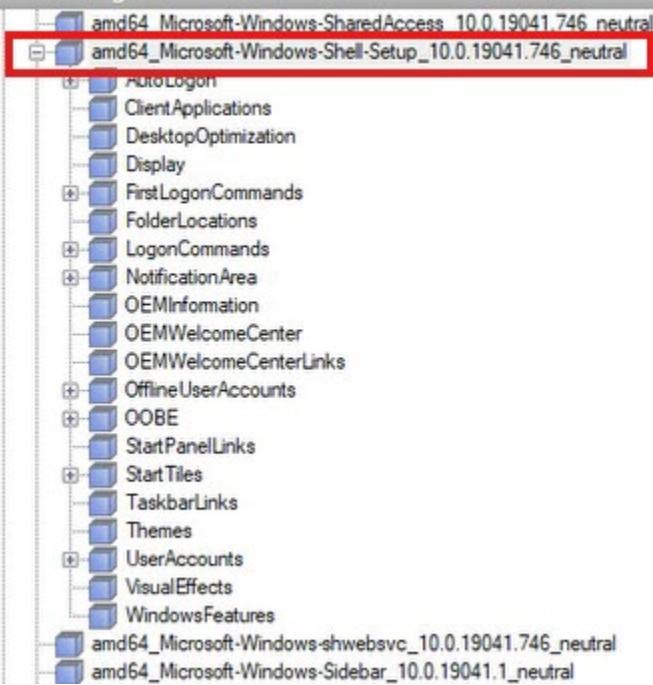
- C) Within Microsoft-Windows-Setup, on both UserData and WindowsDeploymentServices, right click and select Add Setting to Pass 1 windowsPE



Microsoft-Windows-Shell-Setup

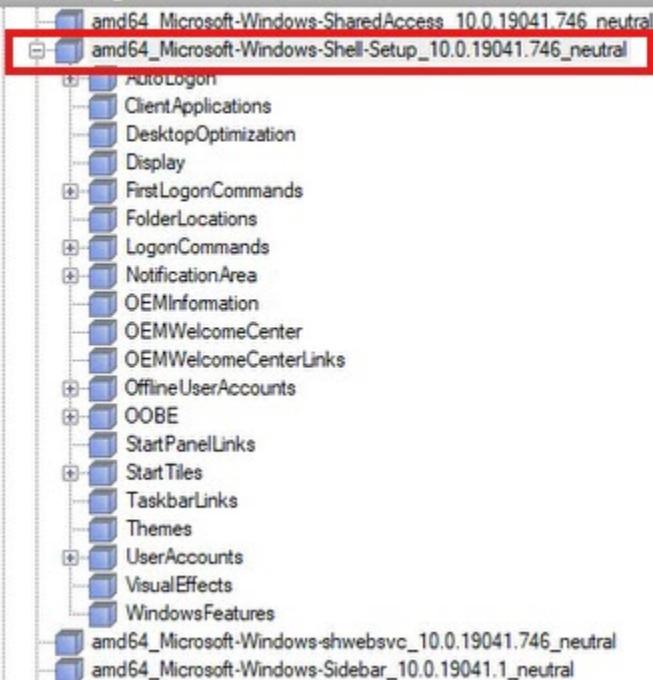
- A) Locate Microsoft-Windows-Shell-Setup

Windows Image

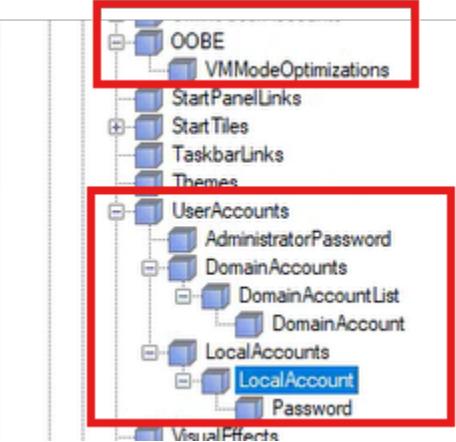


- B) Microsoft-Windows-Shell-Setup > right click OEMInformation > Select Add Setting to Pass 4 Specialize.

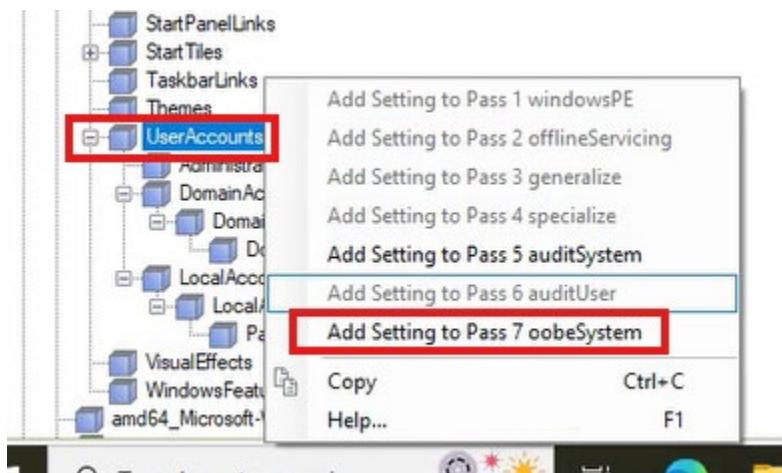
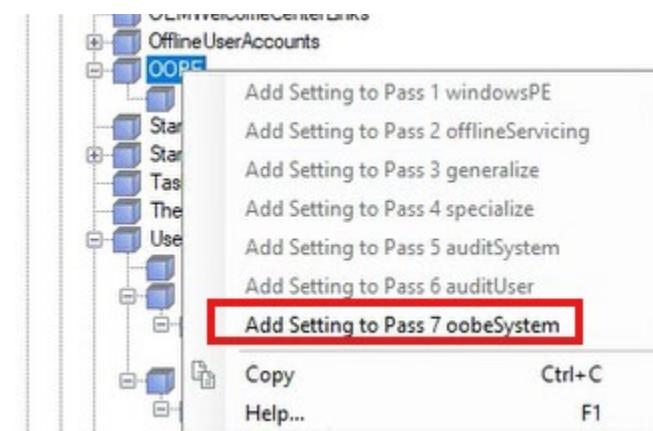
Windows Image



- C) Locate both OOBE and UserAccounts

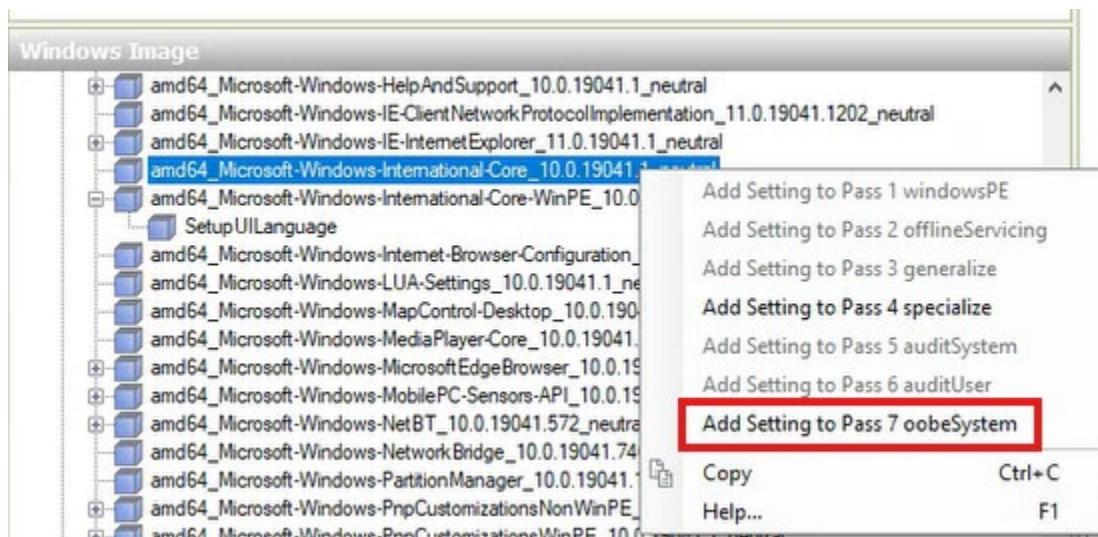
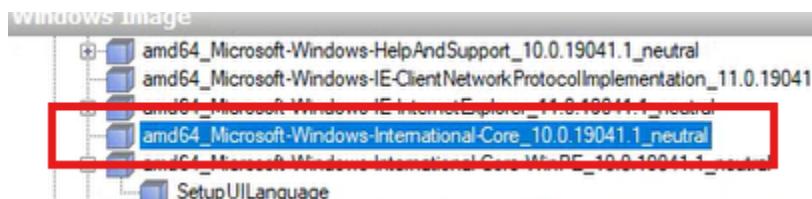


D) Right click both of these and for both, select Add Setting to Pass 7 oobeSystem.



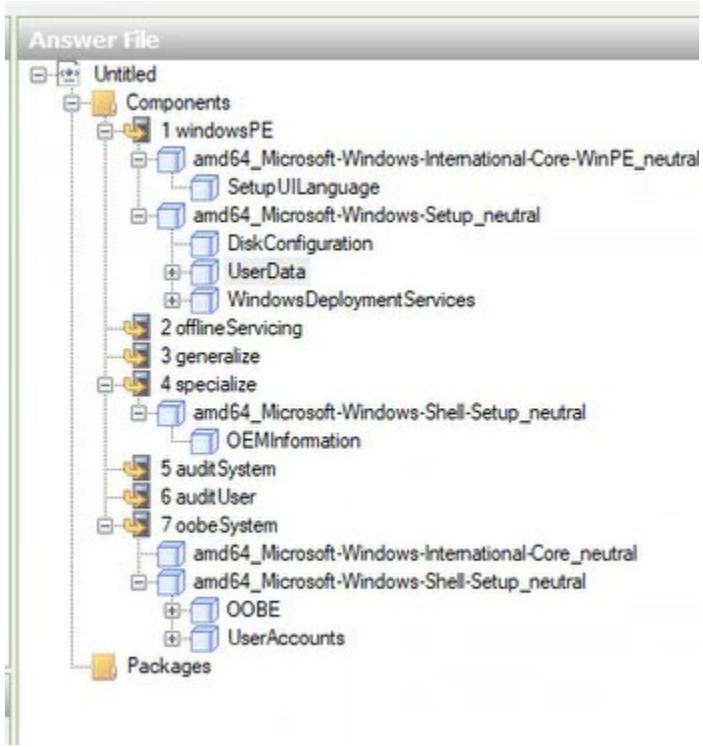
Microsoft-International-Core

Locate and right click Microsoft-International-Core, and select Add Setting to Pass 7 oobeSystem



3.12.4.1.2 Fill WDS file

A) Your Answer File window should look exactly like this:



- B) Select Microsoft-Windows-International-Core-WinPE in the Answer File window
In the settings to the right, set all to 'en-US':

InputLocale
SystemLocale USLanguage
UILanguageFallback,
UserLocale.

Answer File

Untitled

- Components
 - 1 windowsPE
 - amd64_Microsoft-Windows-International-Core-WinPE_neutral
 - SetupUILanguage
 - amd64_Microsoft-Windows-Setup_neutral
 - DiskConfiguration
 - UserData
 - WindowsDeploymentServices
 - 2 offline Servicing
 - 3 generalize
 - 4 specialize
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - OEMInformation
 - 5 audit System
 - 6 audit User
 - 7 oobeSystem
 - amd64_Microsoft-Windows-International-Core_neutral
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - OOBE
 - UserAccounts
- Packages

Microsoft-Windows-International-Core-WinPE Properties

Properties	AppliedConfigurationPass	1 windowsPE
Enabled	True	
> Id	amd64_Microsoft-Windows-International-	
Settings		
InputLocale	en-US	
LayeredDriver		
SystemLocale	en-US	
UILanguage	en-US	
UILanguageFallback	en-US	
UserLocale	en-US	

C) Within International-Core-WinPE select SetupUILanguage and set UILanguage to 'en-US'

The screenshot shows the WinPE Answer File Editor interface. On the left, the tree view shows a node labeled 'SetupUILanguage' under '1 windowsPE'. On the right, the 'SetupUILanguage Properties' window is open, showing the 'Properties' and 'Settings' tabs. The 'Settings' tab has a row for 'UILanguage' set to 'en-US'. A red box highlights the 'UILanguage' row.

D) Under Microsoft-Windows-Setup select DiskConfiguration and set WillShowUI to 'OnError'.

The screenshot shows the WinPE Answer File Editor interface. On the left, the tree view shows a node labeled 'DiskConfiguration' under '1 windowsPE'. On the right, the 'DiskConfiguration Properties' window is open, showing the 'Properties' and 'Settings' tabs. The 'Settings' tab has a row for 'WillShowUI' set to 'OnError'. A red arrow points from the 'DiskConfiguration' node in the tree view to the 'DiskConfiguration Properties' window.

E) Right click DiskConfiguration and select Insert New Disk



F) Disk has been inserted

The screenshot shows the WinPE Answer File Editor interface. On the left, the tree view shows a new node labeled 'Disk' under 'DiskConfiguration'. A red arrow points to this newly inserted 'Disk' node.

G) Select your new disk and set DiskID to the number '0' and WillWipeDisk to 'true'. Note, the name of the Disk will change to 'Disk[DiskID="0"]' once you make these changes.

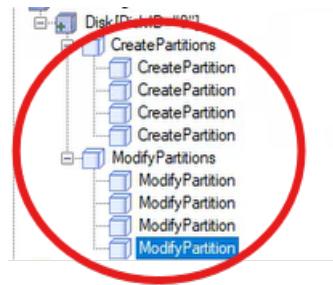
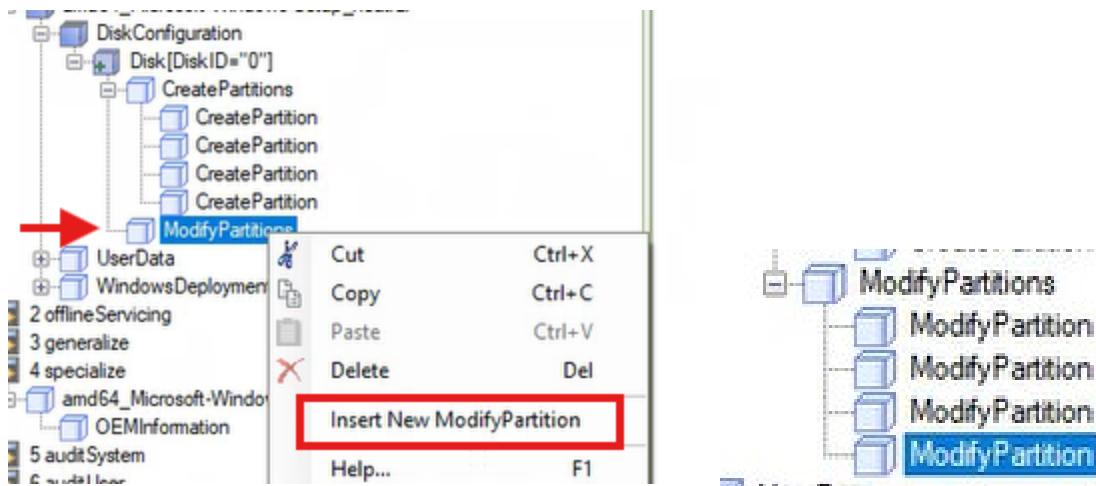
H) Expand your disk and you will see two objects: CreatePartitions and ModifyPartitions.

I) Partitions

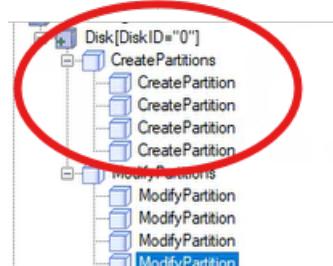
a. Right click CreatePartitions and select Insert New CreatePartition.

b. Repeat this step 3 more times until you have 4 CreatePartition objects.

J) Right click ModifyPartitions and select Insert New ModifyPartition. As with step 15, repeat this 3 more times until you have 4 ModifyPartitions.



K) Now you will go through each **blank** CreatePartition object and set the settings as shown below.



Path	DiskConfiguration/Disk[Dis	Path	DiskConfiguration/
Settings		Settings	
Action	AddListItem	Action	AddListItem
Extend	false	Extend	false
Order	1	Order	2
Size	450	Size	100
Type	Primary	Type	EFI

Settings	
Action	AddList Item
Extend	false
Order	3
Size	16
Type	MSR

Settings	
Action	AddList Item
Extend	true
Order	4
Size	
Type	Primary

L) Complete a similar process for each of your ModifyPartitions, setting each object as shown below.

The TypeID for the first ModifyPartition is DE94BBA4-06D1-4D40-A16A-BFD50179D6AC.

Settings	
Action	AddList Item
Active	
Extend	
Format	NTFS
Label	WinRE
Letter	
Order	1
PartitionID	1
TypeID	DE94BBA4-06D1-4D40-A16A-BFD50179D6AC

Settings	
Action	AddList Item
Active	
Extend	
Format	FAT32
Label	System
Letter	
Order	2
PartitionID	2
TypeID	

Settings	
Action	AddList Item
Active	
Extend	
Format	
Label	
Letter	
Order	3
PartitionID	3
TypeID	

Settings	
Action	AddList Item
Active	
Extend	
Format	NTFS
Label	WINDOWS
Letter	C
Order	4
PartitionID	4
TypeID	

M) Under Windows-Setup select UserData and set AcceptEula to ‘true’ and set the Organization to ‘Station1’.

Answer File

- Untitled
 - Components
 - 1 windowsPE
 - amd64_Microsoft-Windows-International-Core-v
 - amd64_Microsoft-Windows-Setup_neutral
 - DiskConfiguration
 - UserData
 - ProductKey
 - WindowsDeploymentServices

UserData Properties

Properties	
AppliedConfigurationPass	1 windowsPE
Component	Microsoft-Windows-Setup
Path	UserData

Settings	
AcceptEula	true
FullName	
Organization	Station1

N) Expand UserData, select ProductKey, and enter ‘NPPR9-FWDCX-D2C8J-H872K-2YT43’ into the Key setting.

ProductKey Properties

- Properties**
 - AppliedConfigurationPass: 1 windowsPE
 - Component: Microsoft-Windows-Setup
 - Path: WindowsDeploymentServices/Components/1 windowsPE/WindowsDeploymentServices/ProductKey
- Settings**
 - Key: NPPR9-FWDCX-D2C8J-H872K-2YT43
 - WillShowUI: true

- O) Expand WindowsDeploymentServices, expand ImageSelection and select InstallImage. Set Filename to 'install.wim', ImageGroup to 'ImageGroup1', and ImageName to 'Windows 10 Enterprise'.

Note, these must match the server you've set up with Windows Deployment Service.

InstallImage Properties

- Properties**
 - AppliedConfigurationPass: 1 windowsPE
 - Component: Microsoft-Windows-Setup
 - Path: WindowsDeploymentServices/Components/1 windowsPE/WindowsDeploymentServices/ImageSelection/InstallImage
- Settings**
 - Filename: install.wim
 - ImageGroup: ImageGroup1
 - ImageName: Windows 10 Enterprise

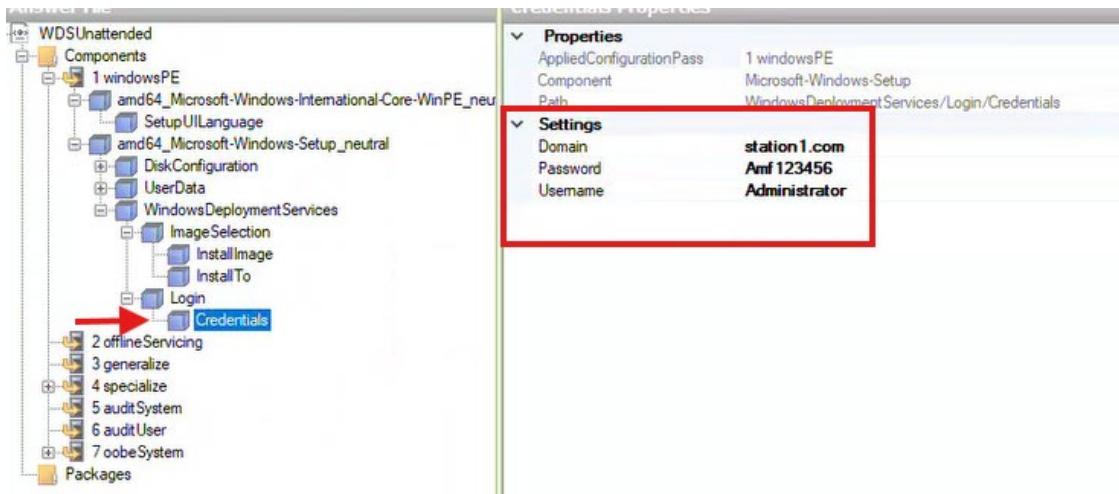
- P) Select InstallTo, and set DiskID to '0', and PartitionID to '4'.

InstallTo Properties

- Properties**
 - AppliedConfigurationPass: 1 windowsPE
 - Component: Microsoft-Windows-Setup
 - Path: WindowsDeploymentServices/Components/1 windowsPE/WindowsDeploymentServices/InstallTo
- Settings**
 - DiskID: 0
 - PartitionID: 4

- Q) Expand Login and select Credentials. Set Domain to 'station1.com', Password to 'Amf123456', and Username to 'Administrator'.

This is the admin logon information for your domain, so ensure you're entering the correct logon information.



- R) Expand 4 specialize, then select Windows-Shell-Setup. Set ComputerName to ‘WorkPC’, CopyProfile to ‘true’, RegisteredOrganization to ‘Station1’, RegisteredOwner to ‘Station1.com’, and TimeZone to ‘Eastern Standard Time’. These options will differ based on your organization and location.

Properties	
AppliedConfigurationPass	4 specialize
Enabled	True
> Id	amd64_Microsoft-Windows-Shell-Setup__neutral_31bf3856ad364e35_nonSxS

Settings	
AppIconInTouchImprovement	
BluetoothTaskbarIconEnabled	
ComputerName	WorkPC
ConvertibleSlateModePromptPreference	
CopyProfile	true
DisableAutoDaylightTimeSet	
DoNotCleanTaskBar	
EnableStartMenu	
FileExplorerInTouchImprovement	
OEMName	
ProductKey	
RegisteredOrganization	station1
RegisteredOwner	station1.com
SearchBoxVisibleInTouchImprovement	
ShowPowerButtonOnStartScreen	
ShowWindowsLive	
SignInMode	
TimeZone	Eastern Standard Time

- S) Select OEMInformation and set Manufacturer to ‘HP’ and Model to ‘Prodesk’. These options will differ based on your PC.

Answer File

Properties	
AppliedConfigurationPass	4 specialize
Component	Microsoft.Windows.Shell.Setup
Path	OEMInformation

Settings	
HelpCustomized	
Logo	
Manufacturer	HP
Model	ProDesk
SupportAppURL	
SupportHours	
SupportPhone	
SupportProvider	
SupportURL	

- T) Expand 7 oobeSystem and select Windows-International-Core. Set InputLocale, SystemLocale, UILanguage, and UserLocale to all be ‘en-US’.

Properties	
AppliedConfigurationPass	7 oobeSystem
Enabled	True
Id	amd64_Microsoft.Windows.International.Core_neutral_31bf3856ad364e35_nonSx\$

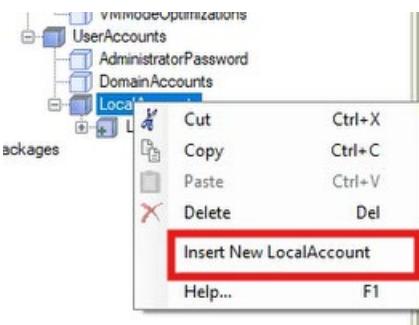
Settings	
InputLocale	en-US
SystemLocale	en-US
UILanguage	en-US
UILanguageFallback	
UserLocale	en-US

- U) Expand Windows-Shell-Setup and select OOBEx. Set HideEULAPage to ‘true’, HideOEMRegistrationScreen to ‘true’, HideOnlineAccountScreens to ‘true’, HideWirelessSetupInOOBE to ‘true’, and set ProtectYourPC to ‘1’.

Properties	
AppliedConfigurationPass	7 oobeSystem
Enabled	True
Id	amd64_Microsoft.Windows.International.Core_neutral_31bf3856ad364e35_nonSx\$

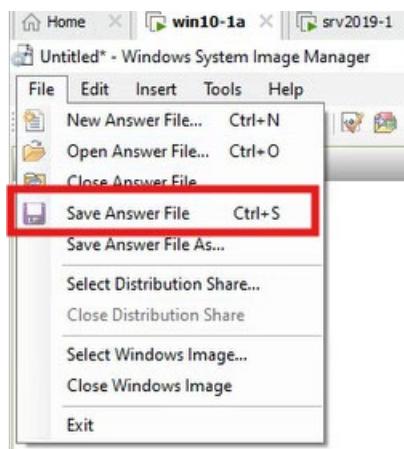
Settings	
HideEULAPage	true
HideLocalAccountScr	
HideOEMRegistrationS	true
HideOnlineAccountScr	true
HideWirelessSetupInO	true
NetworkLocation	
OEMAppId	
ProtectYourPC	1
SkipMachineOOBE	
SkipUserOOBE	
UnattendEnableRetail	

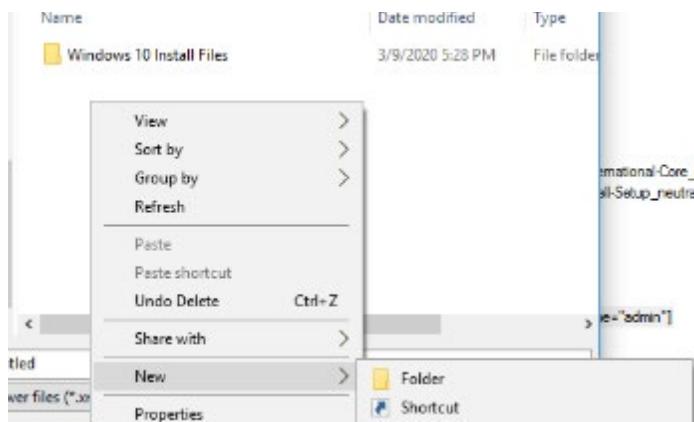
- V) Expand UserAccounts, right click LocalAccounts and select Insert New LocalAccount. Select this new account and give it a description, set the DisplayName to ‘admin’, Group to ‘Administrators’, and Name to ‘admin’.



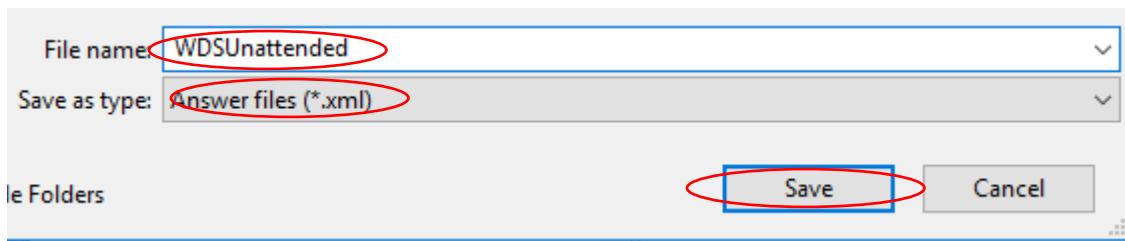
Settings	
Action	AddList Item
Description	The local admin account
DisplayName	admin
Group	Administrators
Name	admin

- W) With this complete, go to File > Save Answer File, right click in the window and select New > Folder. Call this new folder ‘Answer Files’.





- X) Name your answer file 'WDSUnattended'. Ensure the filetype is .xml, and then press save. This finishes creating your first answer file.



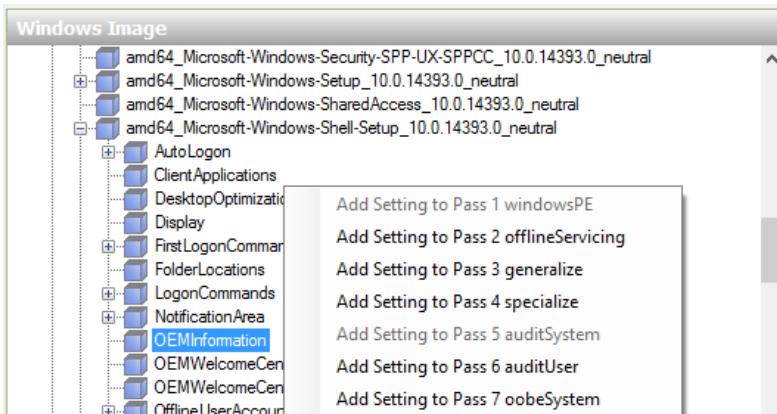
3.12.4.2 Autounattended

3.12.4.2.1 Answer file skeleton

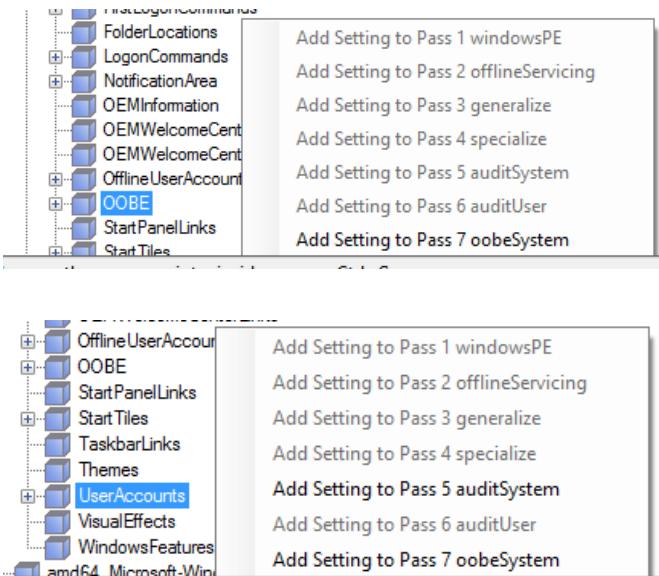
- A) In Windows System Image Manager go to File > New Answer File.



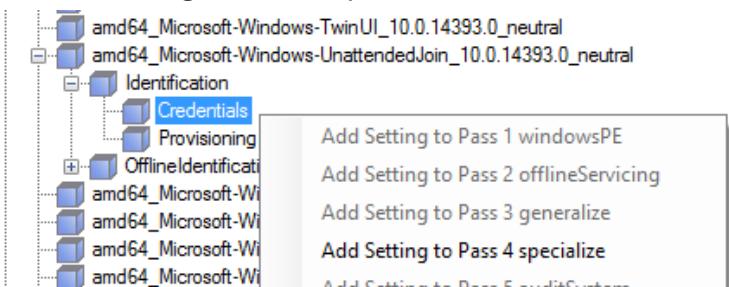
- B) In the Windows Image window, expand the Windows-Shell-Setup object, right click OEMInformation and select Add Setting to Pass 4 specialize.



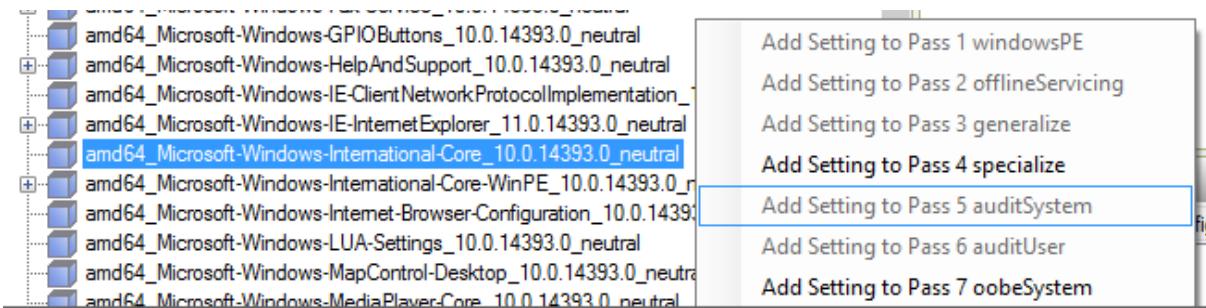
- C) Within the same Windows-Shell-Setup object, locate both OOBEx and UserAccounts. Right click both and for each, select Add Setting to Pass 7 oobeSystem.



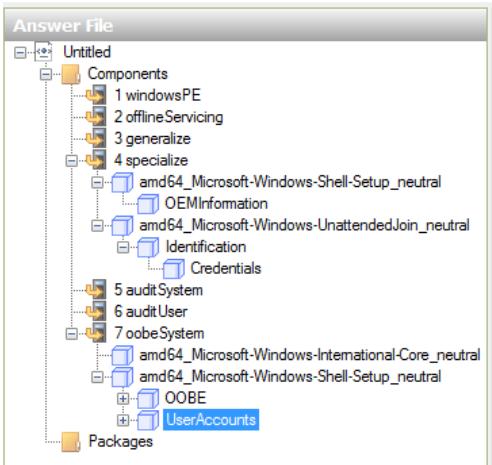
- D) Expand Windows-UnattendedJoin, expand Identification, right click Credentials and select Add Setting to Pass 4 specialize.



- E) Right click on Windows-International-Core and select Add Setting to Pass 7 oobeSystem.



F) Your Answer File window should now look like this.



3.12.4.2.2 Fill Answer file Autotune

- A) Under 4 specialize, select Windows-Shell-Setup and set ComputerName to 'WorkPC', CopyProfile to 'true', ProductKey to 'NPPR9-FWDCX-D2C8J-H872K-2YT43', RegisteredOrganization to 'Station1', RegisteredOwner to 'Station1.com', and TimeZone to 'Eastern Standard Time'.

Microsoft-Windows-Shell-Setup Properties	
Properties	AppliedConfigurationPass: 4 specialize Enabled: True
Settings	AppIconInTouchImprovement BluetoothTaskbarIconEnabled ComputerName: WorkPC ConvertibleSlateModePromptPi CopyProfile: true DisableAutoDaylightTimeSet DoNotCleanTaskBar EnableStartMenu FileExplorerInTouchImprovement OEMName ProductKey: NPPR9-FWDCX-D2C8J-H872K-2YT43 RegisteredOrganization: Station1 RegisteredOwner: Station1.com SearchBoxVisibleInTouchImpr ShowPowerButtonOnStartScre ShowWindowsLive SignInMode TimeZone: Eastern Standard Time

- B) Select OEMInformation and set Manufacturer to 'HP', and Model to 'Prodesk'.

Answer File

- Untitled
 - Components
 - 1 windowsPE
 - 2 offlineServicing
 - 3 generalize
 - 4 specialize
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - OEMInformation
 - amd64_Microsoft-Windows-UnattendedJoin_neutral
 - Identification

OEMInformation Properties

Properties	
AppliedConfigurationPass	4 specialize
Component	Microsoft-Windows-Shell-Setup
Path	OEMInformation
Settings	
HelpCustomized	
Logo	
Manufacturer	HP
Model	Prodesk
SupportAppURL	

- C) Under Windows-UnattendedJoin, set JoinDomain to ‘station1.com’, JoinWorkgroup to ‘workgroup’, and UnsecureJoin to ‘true’.

Answer File

- Untitled
 - Components
 - 1 windowsPE
 - 2 offlineServicing
 - 3 generalize
 - 4 specialize
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - OEMInformation
 - amd64_Microsoft-Windows-UnattendedJoin_neutral
 - Identification
 - Credentials
 - 5 auditSystem
 - 6 auditUser
 - 7 oobeSystem

Identification Properties

Properties	
AppliedConfigurationPass	4 specialize
Component	Microsoft-Windows-UnattendedJoin
Path	Identification
Settings	
DebugJoin	false
DebugJoinOnlyOnThisError	0
JoinDomain	station1.com
JoinWorkgroup	workgroup
MachineObjectOU	
MachinePassword	
TimeoutPeriodInMinutes	0
UnsecureJoin	true

- D) Select Credentials and set Domain to ‘station1.com’, Password to ‘Amf123456’, and Username to ‘Administrator’.

Answer File

- Untitled
 - Components
 - 1 windowsPE
 - 2 offlineServicing
 - 3 generalize
 - 4 specialize
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - amd64_Microsoft-Windows-UnattendedJoin_neutral
 - Identification
 - Credentials
 - 5 auditSystem

Credentials Properties

Properties	
AppliedConfigurationPass	4 specialize
Component	Microsoft-Windows-UnattendedJoin
Path	Identification/Credentials
Settings	
Domain	station1.com
Password	Amf123456
Username	Administrator

- E) Expand 7 oobeSystem and select Windows-International-Core. Set InputLocale, SystemLocale, UILanguage, and UserLocale all to ‘en-US’.

Answer File

- Untitled
 - Components
 - 1 windowsPE
 - 2 offlineServicing
 - 3 generalize
 - 4 specialize
 - amd64_Microsoft-Windows-Shell-Setup_neutral
 - amd64_Microsoft-Windows-UnattendedJoin_neutral
 - Identification
 - Credentials
 - 5 auditSystem

Microsoft-Windows-International-Core Properties

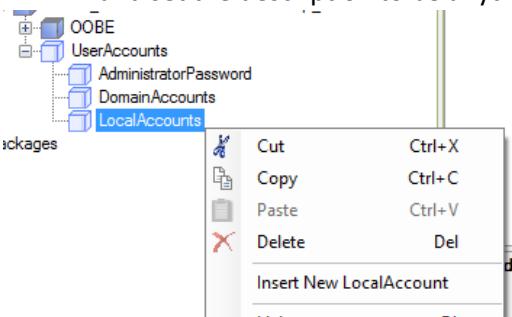
Properties	
AppliedConfigurationPass	7 oobeSystem
Enabled	True
> Id	amd64_Microsoft-Windows-International-Core_neutral_31bf3856ad364e35_nonSxS
Settings	
InputLocale	en-US
SystemLocale	en-US
UILanguage	en-US
UILanguageFallback	
UserLocale	en-US

- F) Select OOBE and set HideEULAPage to ‘true’, HideOEMRegistrationScreen to ‘true’, HideOnlineAccountScreens to ‘true’, HideWirelessSetupinOOBE to ‘true’, NetworkLocation to ‘Work’, and ProtectYourPC to ‘1’.

The screenshot shows the Windows Deployment Toolkit's Answer File Editor. The left pane displays a hierarchical tree of configuration components, including 3 generalize, 4 specialize, 5 auditSystem, 6 auditUser, and 7 oobeSystem. Under 7 oobeSystem, there are amd64_Microsoft-Windows-Shell-Setup_neutral, OOBESettings, and UserAccounts. The right pane shows a table titled "Settings" with the following rows:

	Settings
HideEULAPage	true
HideLocalAccountScreen	
HideOEMRegistrationScreen	true
HideOnlineAccountScreens	true
HideWirelessSetupInOOBE	true
NetworkLocation	Work
OEMApId	
ProtectYourPC	1
SkipMachineOOBE	
SkipUserOOBE	
UnattendEnableRetailDemo	

G) Expand UserAccounts, right click LocalACcoutns and select Insert New LocalAccount. Select this new account and set the description to be anything, DisplayName to 'admin', Group to 'Administrators', and Name to 'admin'.

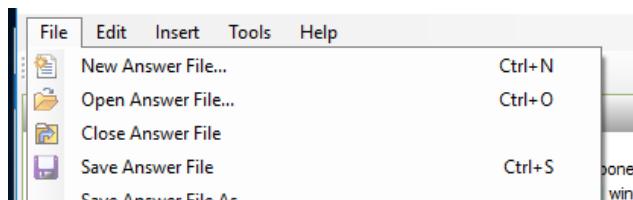


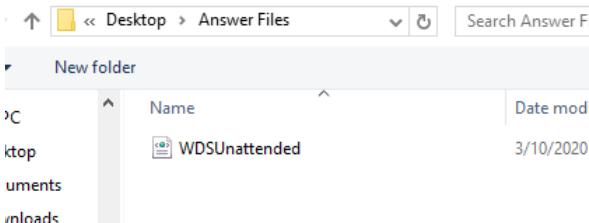
The screenshot shows the Windows Deployment Toolkit's Answer File Editor. The left pane displays the same tree structure as before, but now includes a "LocalAccount[Name='admin']" node under the LocalAccounts folder. The right pane shows the "LocalAccount[Name='admin'] Properties" dialog, which contains two sections: "Properties" and "Settings".

Properties	
AppliedConfigurationPass	7_oobeSystem
Component	Microsoft-Windows-Shell-Setup
KeyName	
Path	UserAccounts/LocalAccounts/LocalAccount[Name="admin"]

Settings	
Action	AddList Item
Description	Local administrator
DisplayName	admin
Group	Administrators
Name	admin

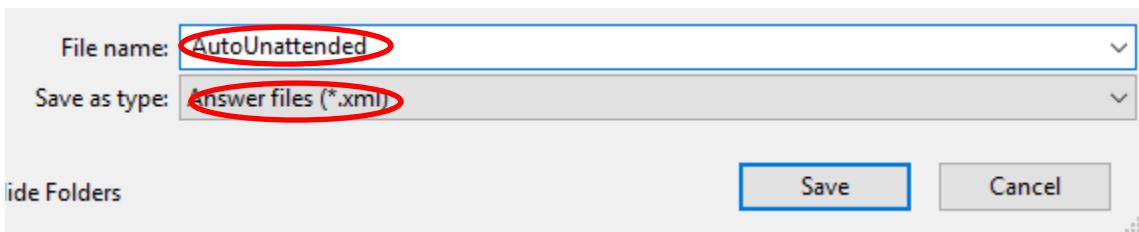
H) Go to File > Save Answer File and navigate to the folder which contains the WDSUnattended answer file we created earlier.



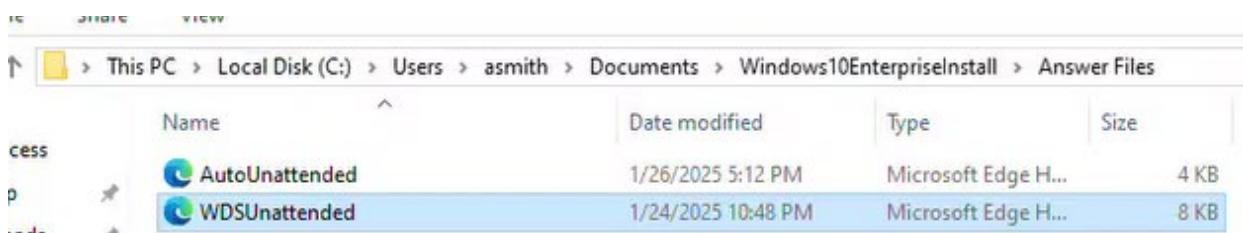


I) Name the file AutoUnattended, ensure it is a .xml filetype, and press save.

To test that these files work correct, go to the server which contains the Windows Deployment Service.



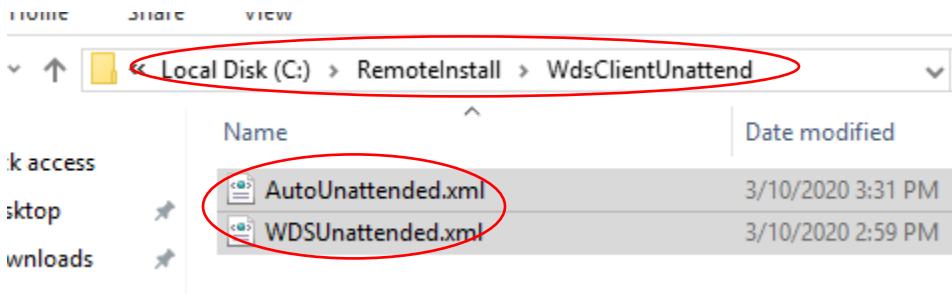
3.12.5 Using the answer files to automate a remote installation of Windows 10



SERVER

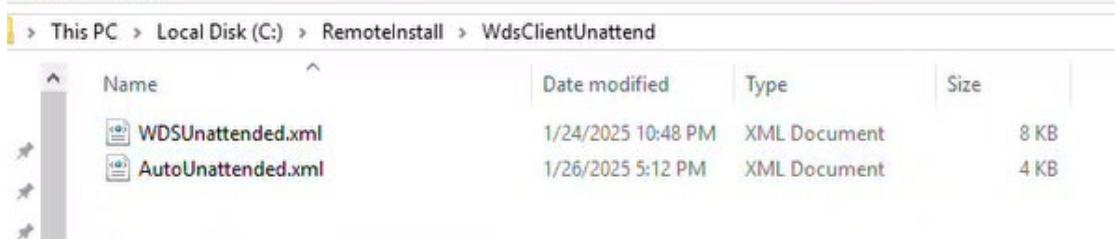
To test that these files work correct, go to the server which contains the Windows Deployment Service.

3.12.6 WDS - Using the answer files to automate a remote installation of Windows 10 – Server

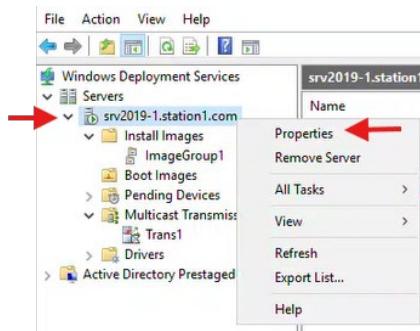


SERVER

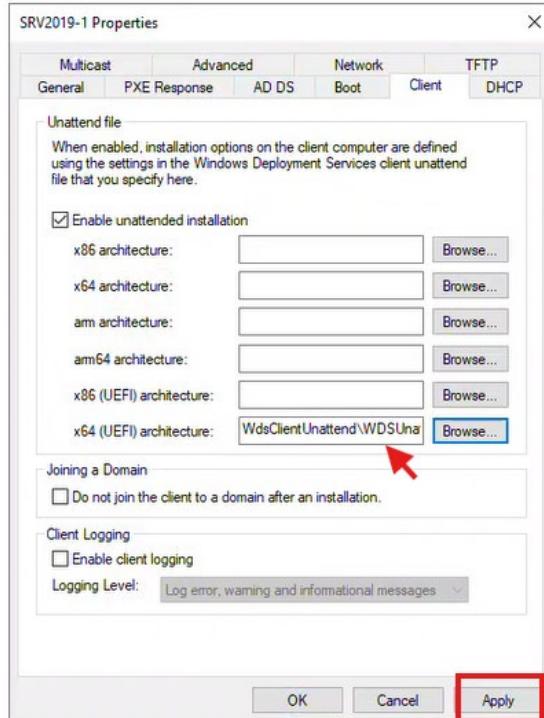
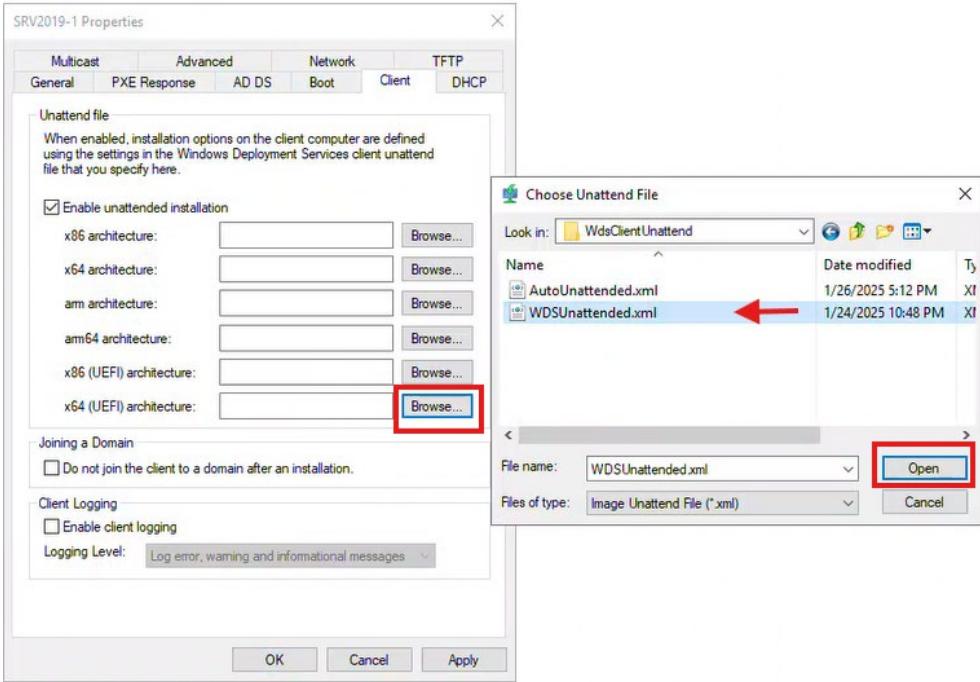
- A) On your server, navigate to C:\RemoteInstall\WdsClientUnattend and copy the two answer files you created earlier to this folder.



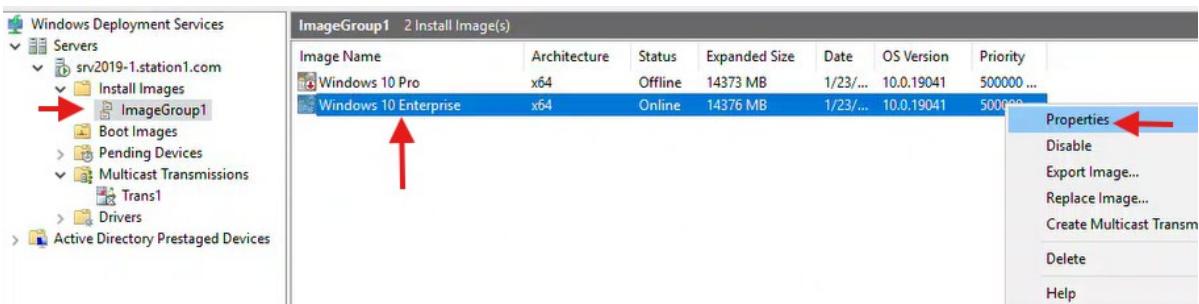
- B) Open Windows Deployment Services, expand Servers, right click your server and select Properties.



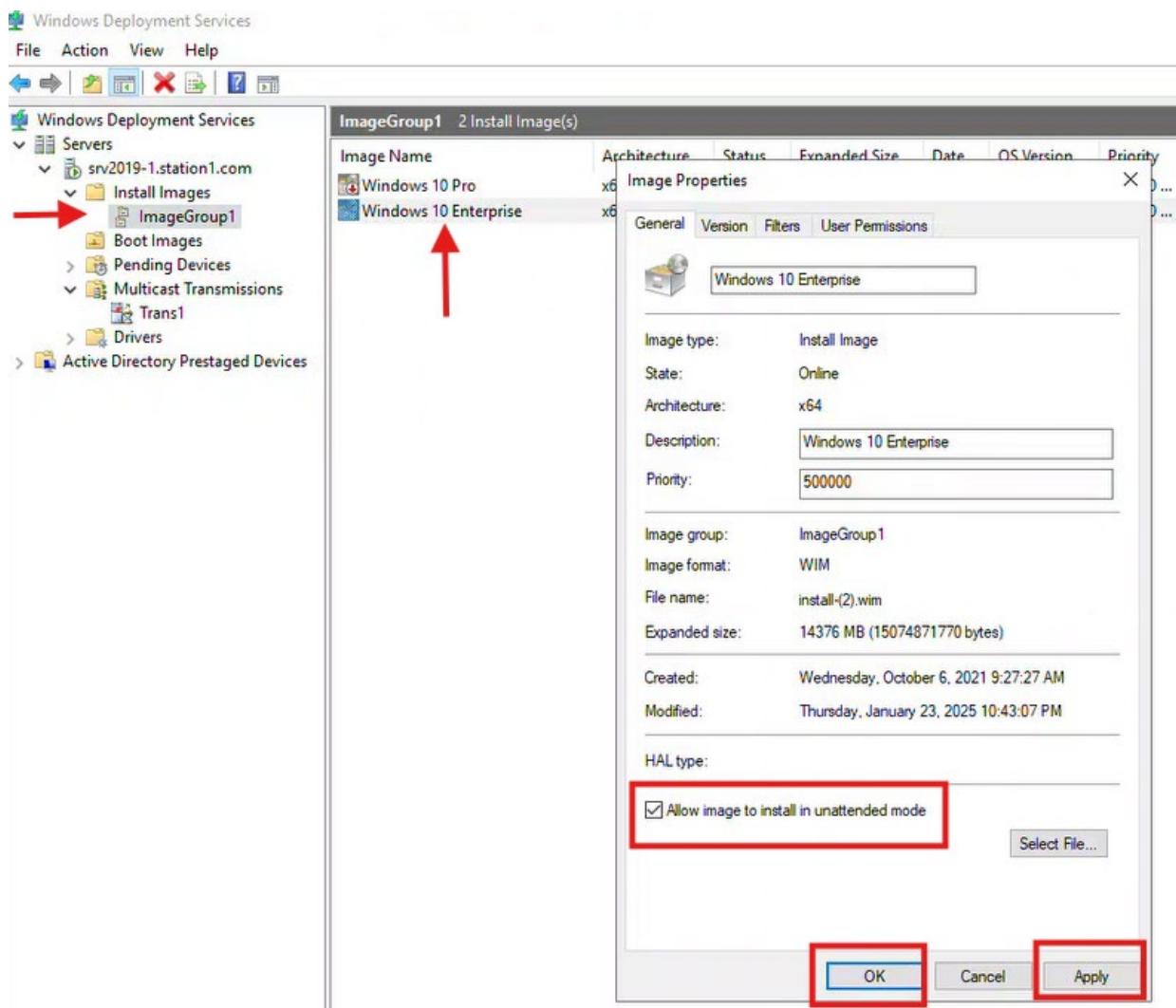
- C) In the properties window go to the Client tab, tick Enable unattended installation and click Browse beside x64 (UEFI) architecture (you may require a different one depending on your architecture). Locate the WDSUnattended answer file inside C:\RemoteInstall\WdsClientUnattend, select it and click Open. Then in the Properties window click Apply and then OK.



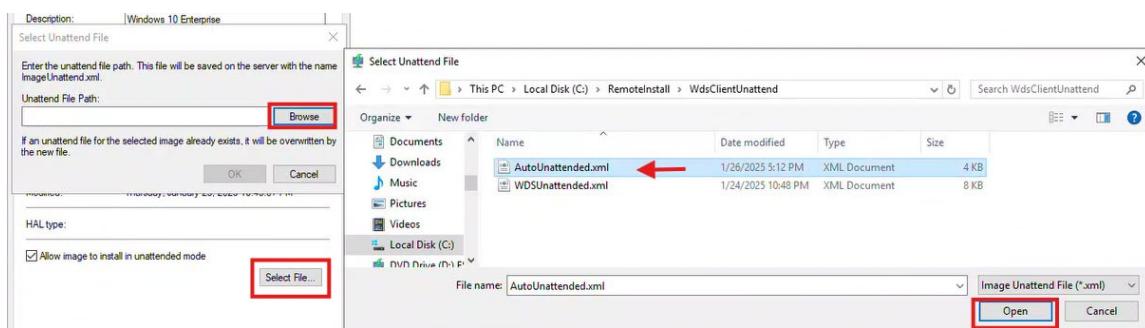
D) Back in WDS, expand Install Images, click ImageGroup1, right click Windows 10 Enterprise Evaluation, and select Properties.



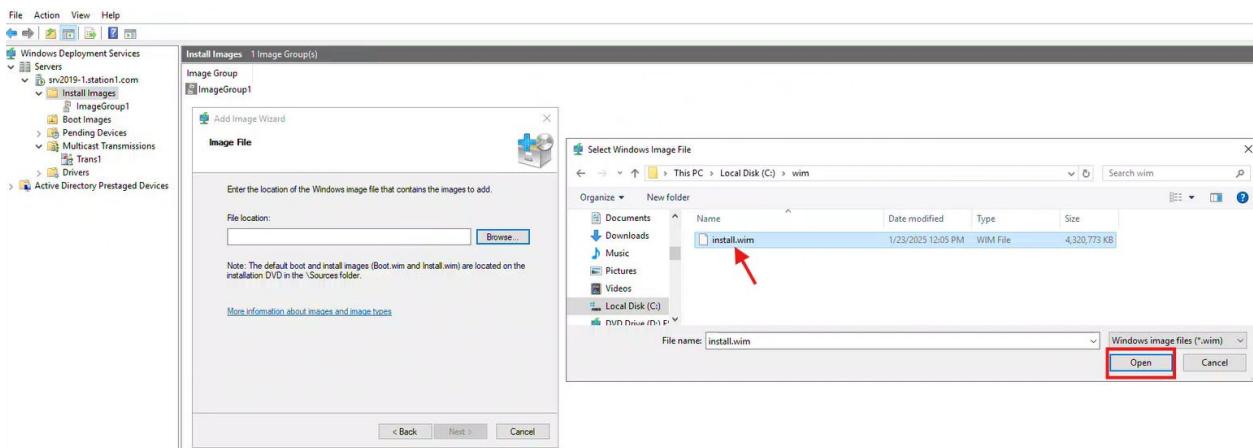
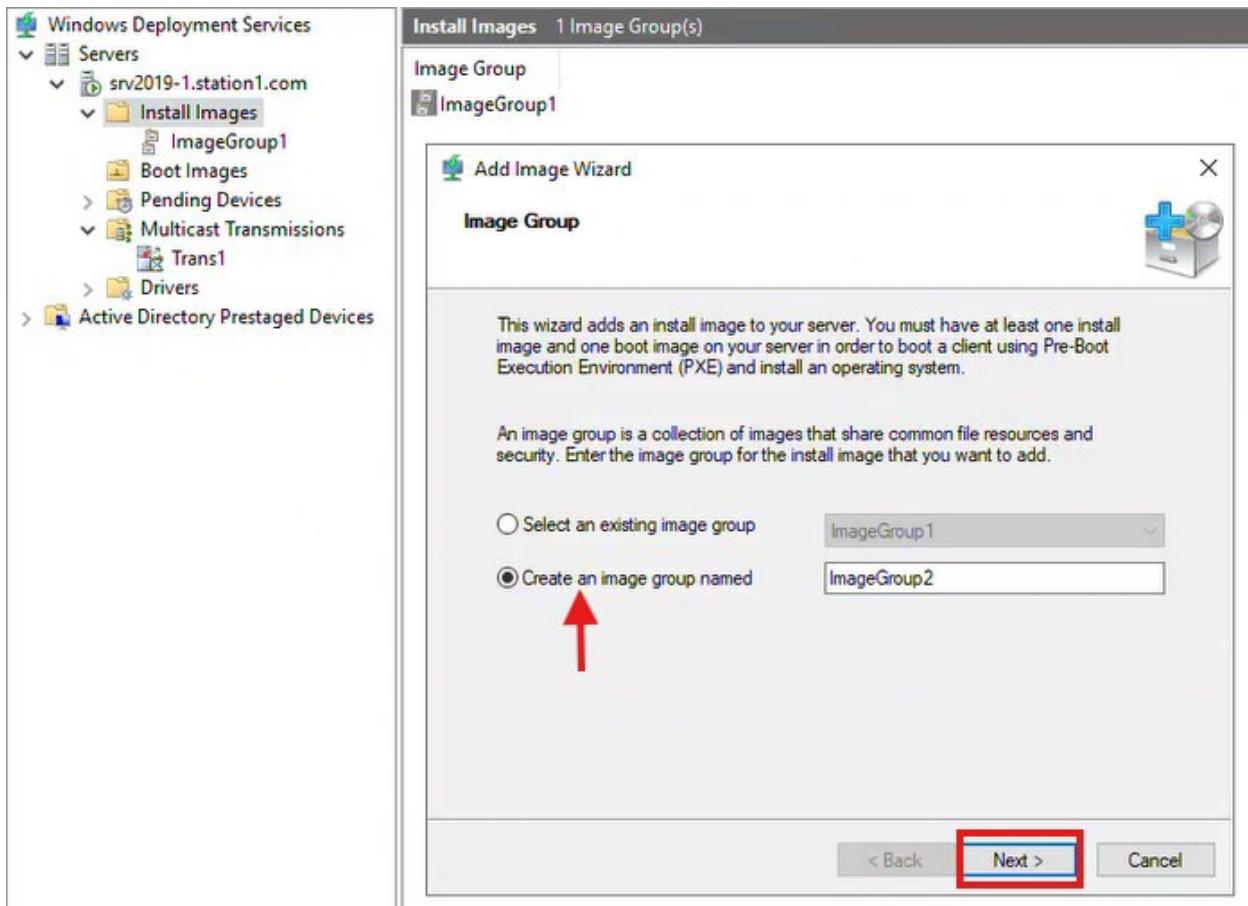
- E) Check the box beside Allow image to install in unattended mode and click Select File.



- F) In the window that pops up select Browse. Navigate to C:\RemoteInstall\WdsClientUnattend, select AutoUnattended and click Open. Press OK > Apply > OK.



Create a new image group



G) Create a new Multicast Transmission by right clicking Multicast Transmission and selecting Create. Give it a name and complete the wizard with default settings.

Windows Deployment Services

- Servers
 - srv2019-1.station1.com
 - Install Images
 - ImageGroup1
 - Boot Images
 - Pending Devices
 - Multicast Transmissions
 - Trans1
 - Drivers
 - Active Directory Prestaged Dev

Multicast Transmissions 1 Transmission(s)

Name	Transmission Type	Status	Ir
Trans1	Scheduled-Cast	Waiting	Ir

Create Multicast Transmission...

- View
- Refresh
- Export List...
- Help

Add Image Wizard

Image File

Enter the location of the Windows image file that contains the images to add.

File location:

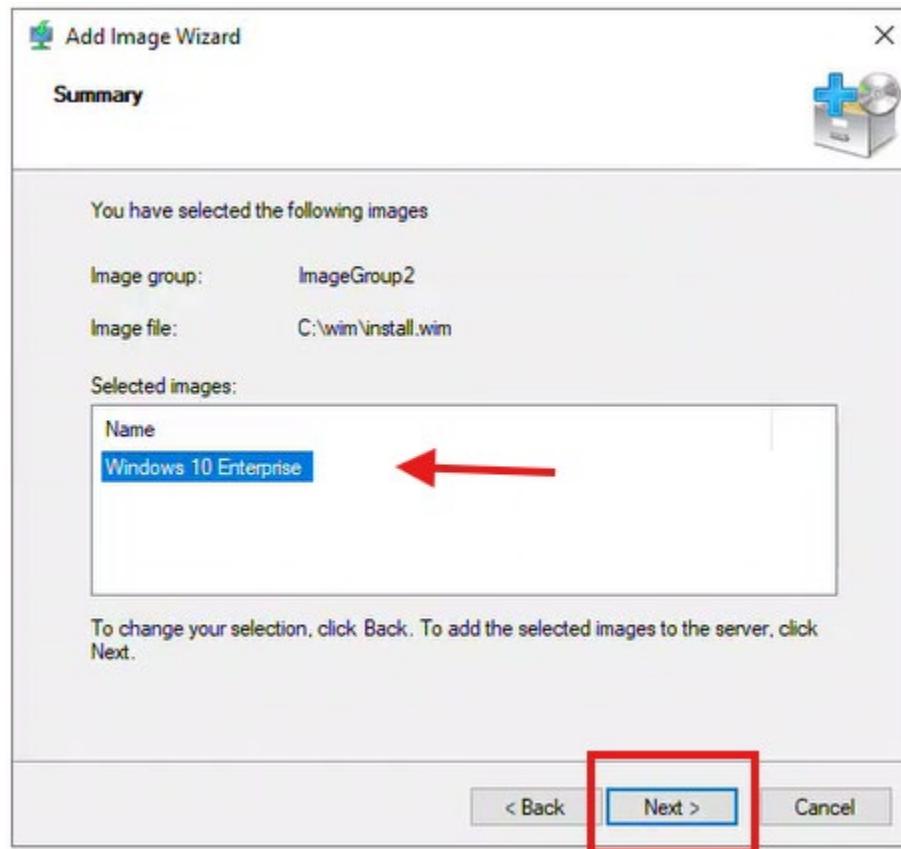
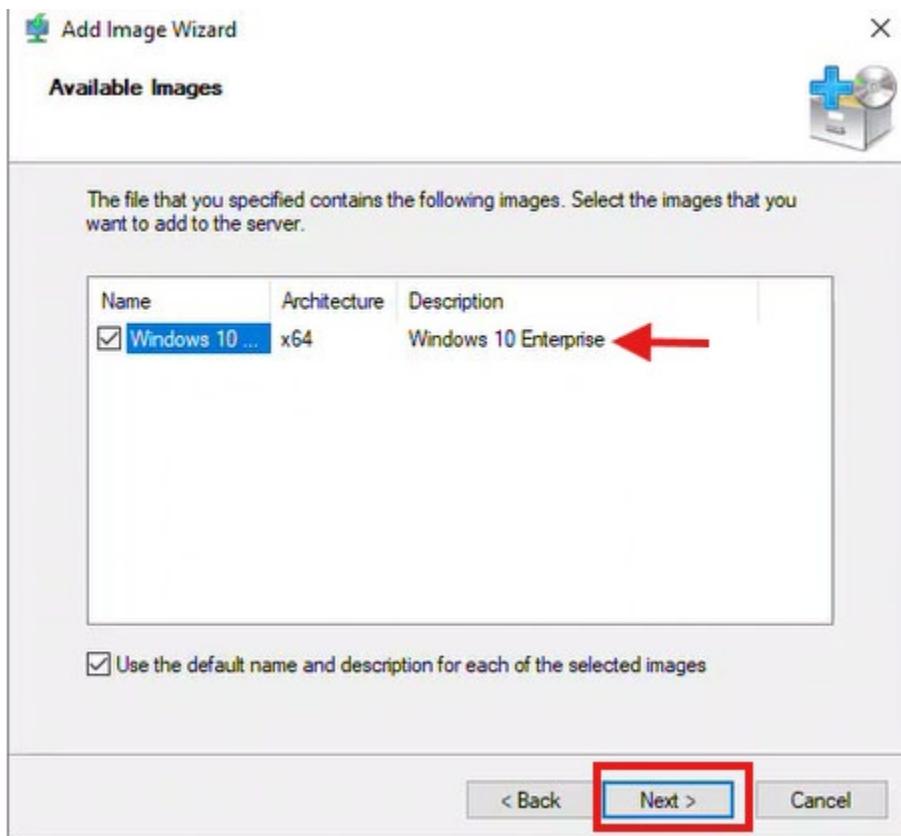
C:\wim\install.wim

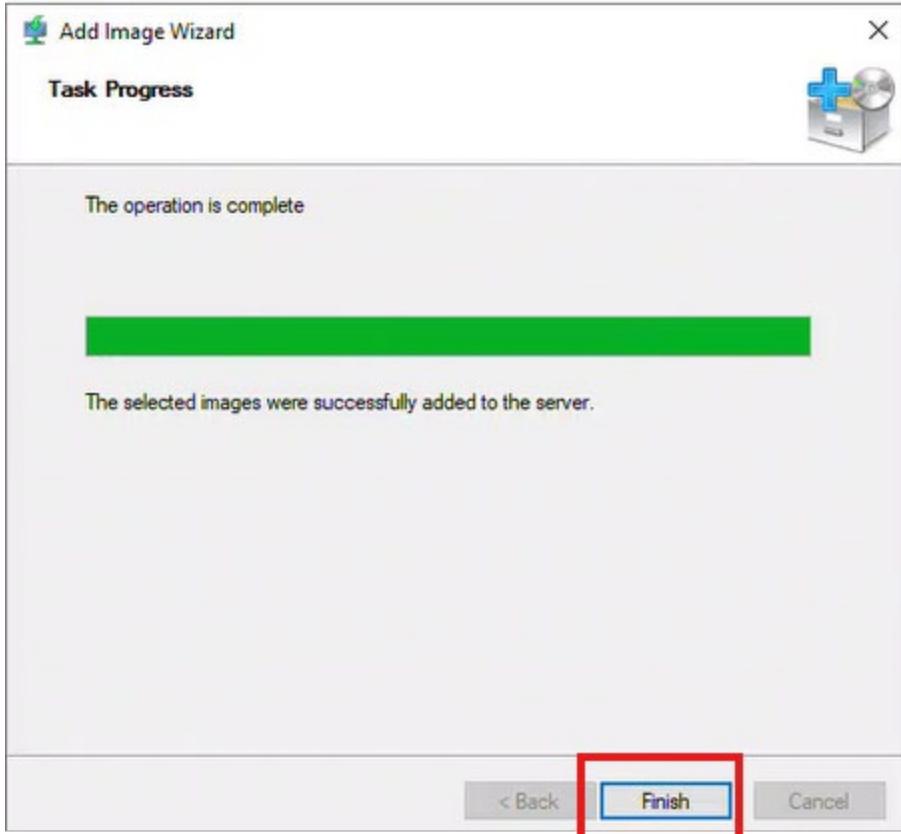
Browse...

Note: The default boot and install images (Boot.wim and Install.wim) are located on the installation DVD in the \Sources folder.

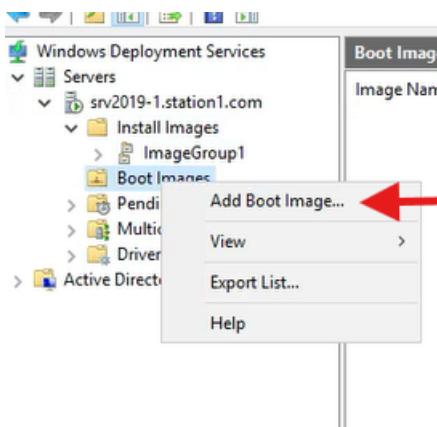
[More information about images and image types](#)

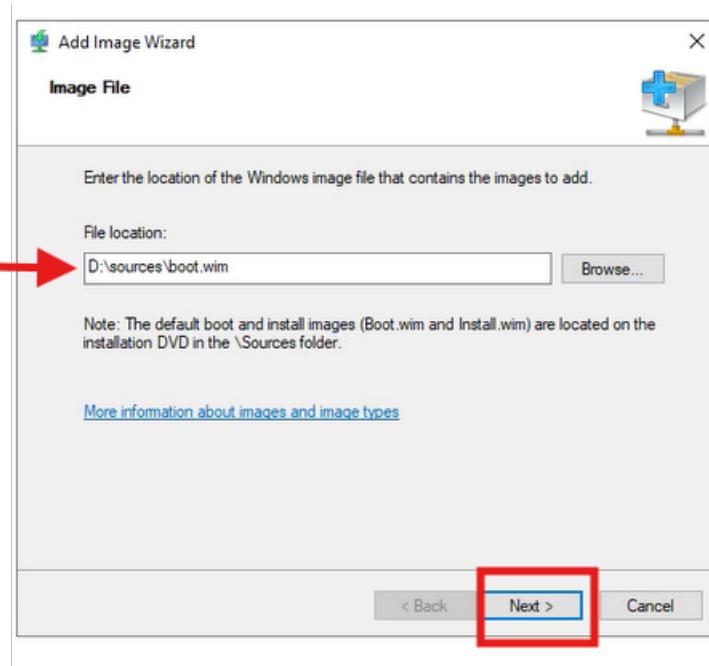
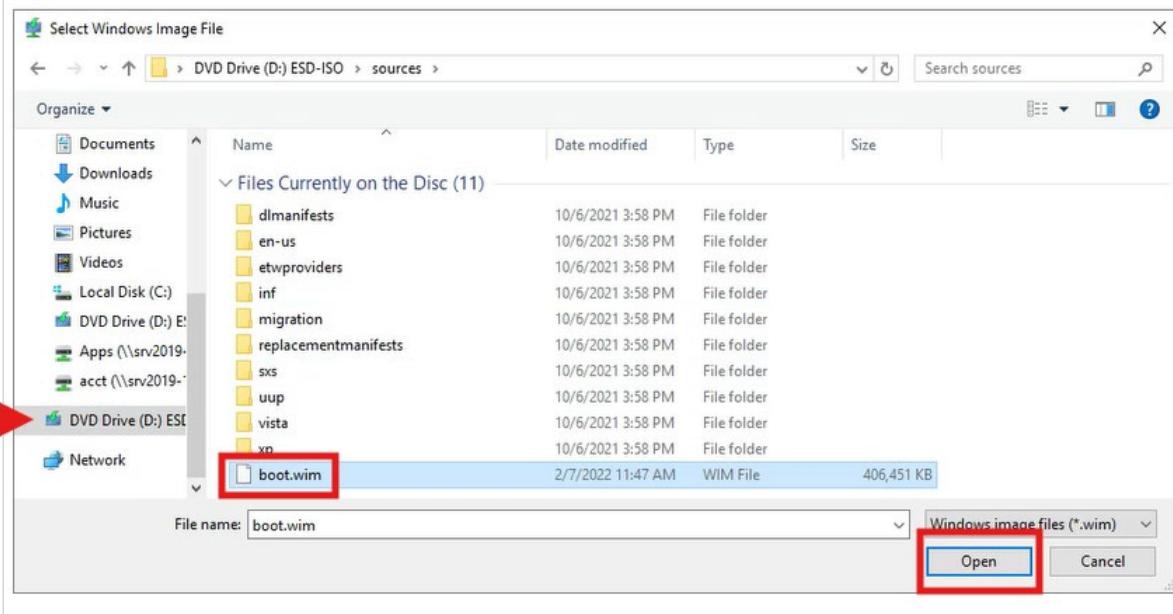
< Back Next > Cancel

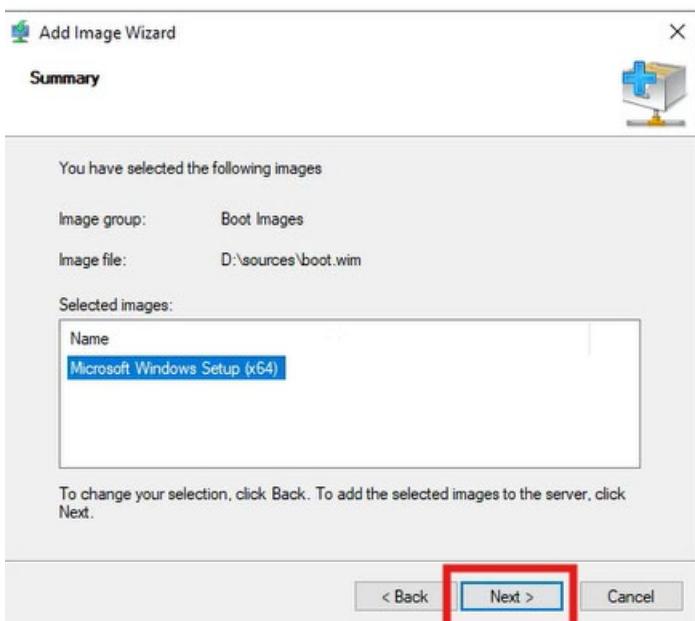
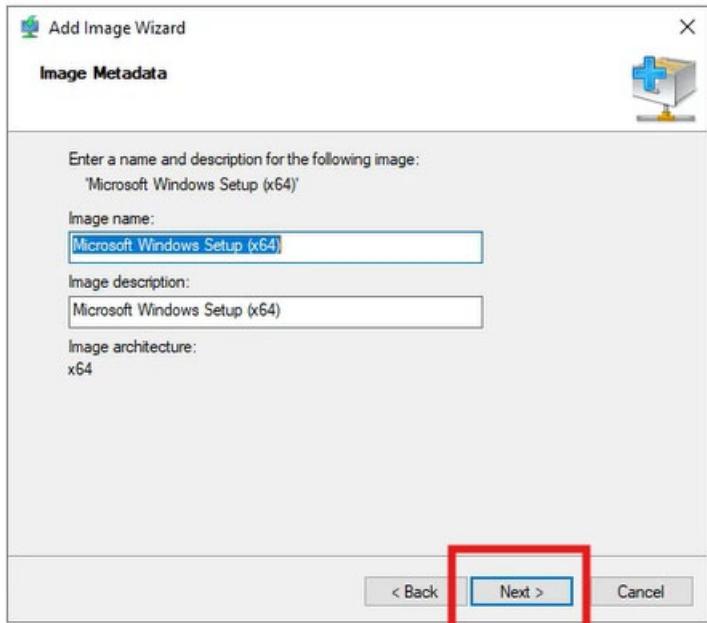


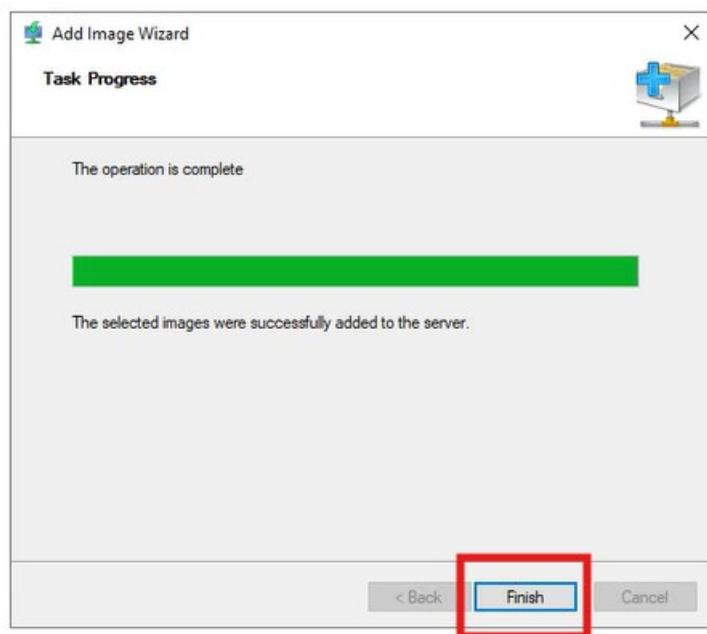
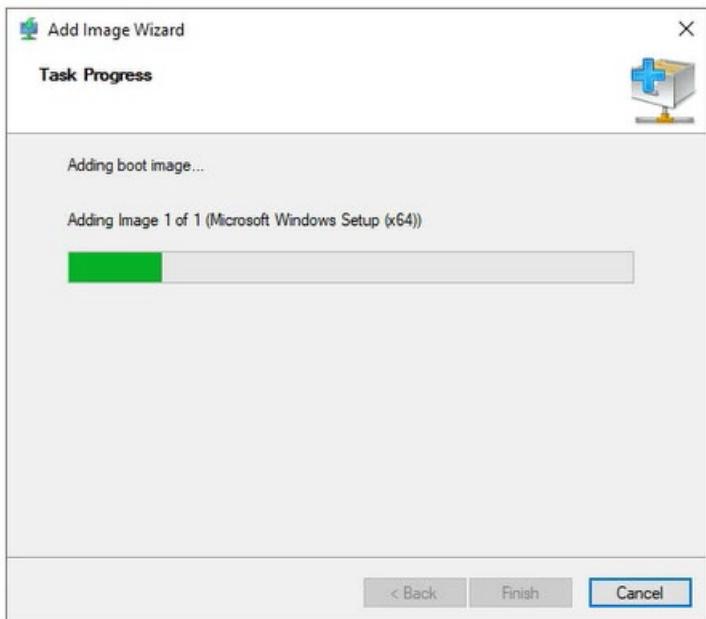


Add boot image









The screenshot shows the Windows Deployment Services console. On the left, the navigation pane displays the following structure:

- Windows Deployment Services
- Servers
 - srv2019-1.station1.com
 - Install Images
 - ImageGroup1
 - ImageGroup2
 - Boot Images
 - Pending Devices
 - Multicast Transmissions
 - Trans1
 - Drivers
 - Active Directory Prestaged Devices

A red arrow points to the 'ImageGroup2' node under 'Install Images'. Another red arrow points to the 'Windows 10 Enterprise' row in the 'ImageGroup2' list.

Image Name	Architecture	Status	Expanded Size	Date	OS Version	Priority
Windows 10 Enterprise	x64	Online	14376 MB	1/26/...	10.0.19041	500000 ...

Transmission

The screenshot shows the 'Create Multicast Transmission Wizard' dialog box. The title bar reads 'Create Multicast Transmission Wizard'.

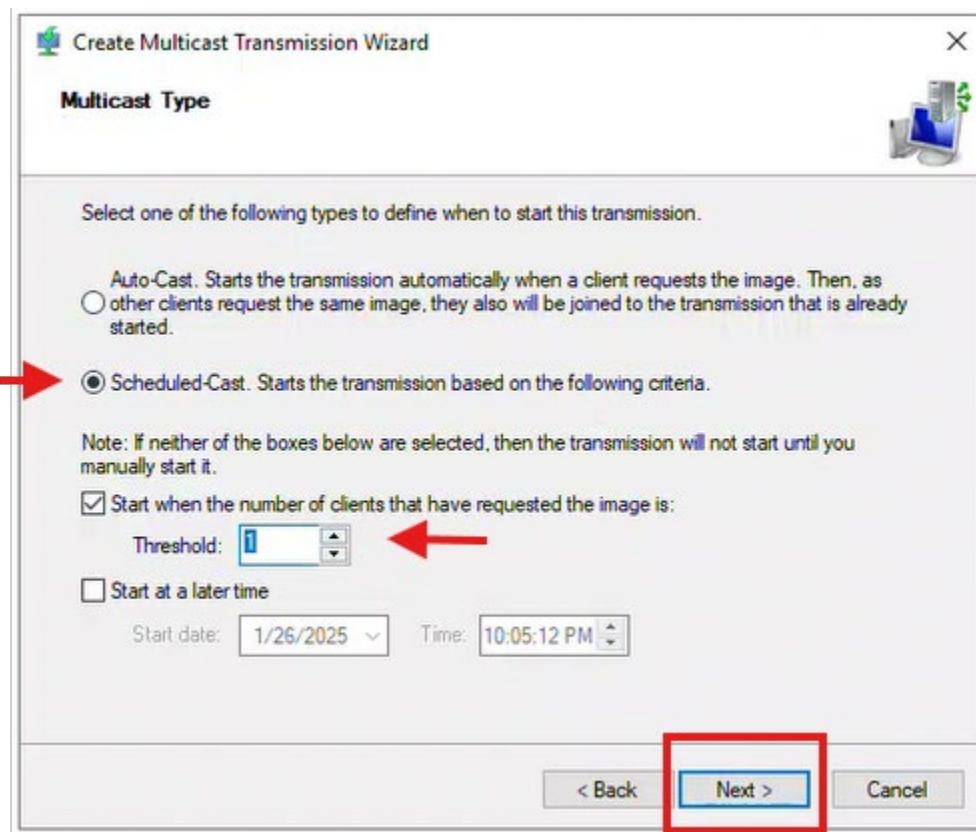
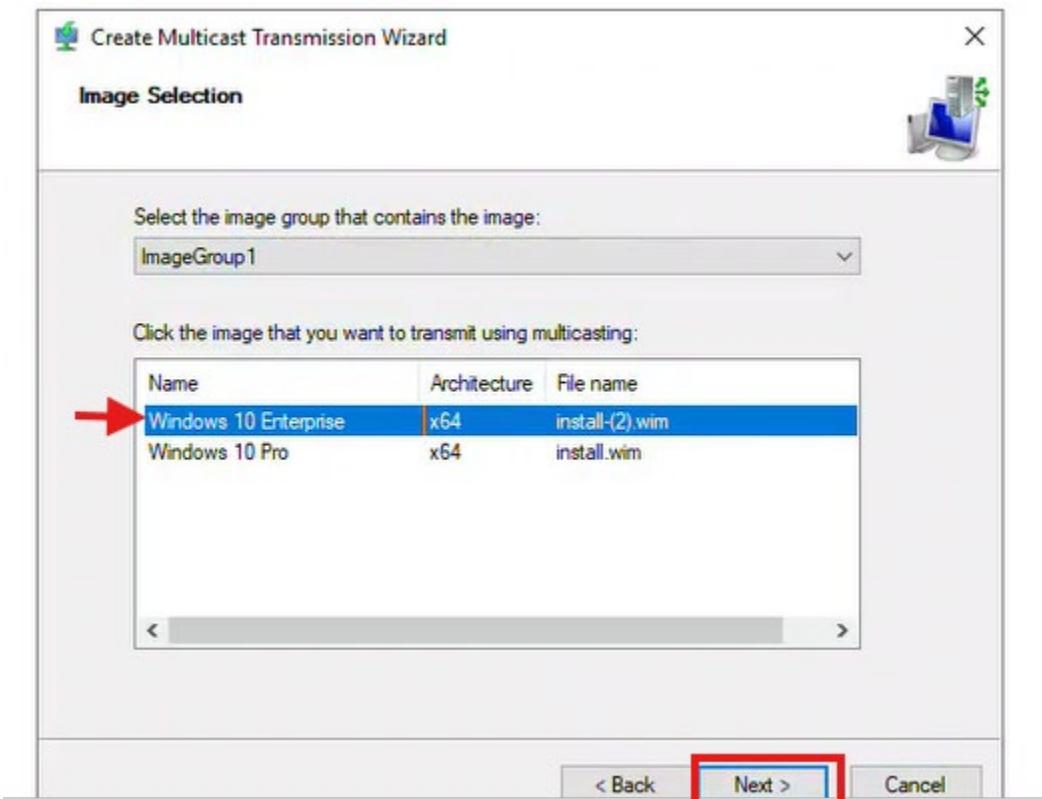
Transmission Name

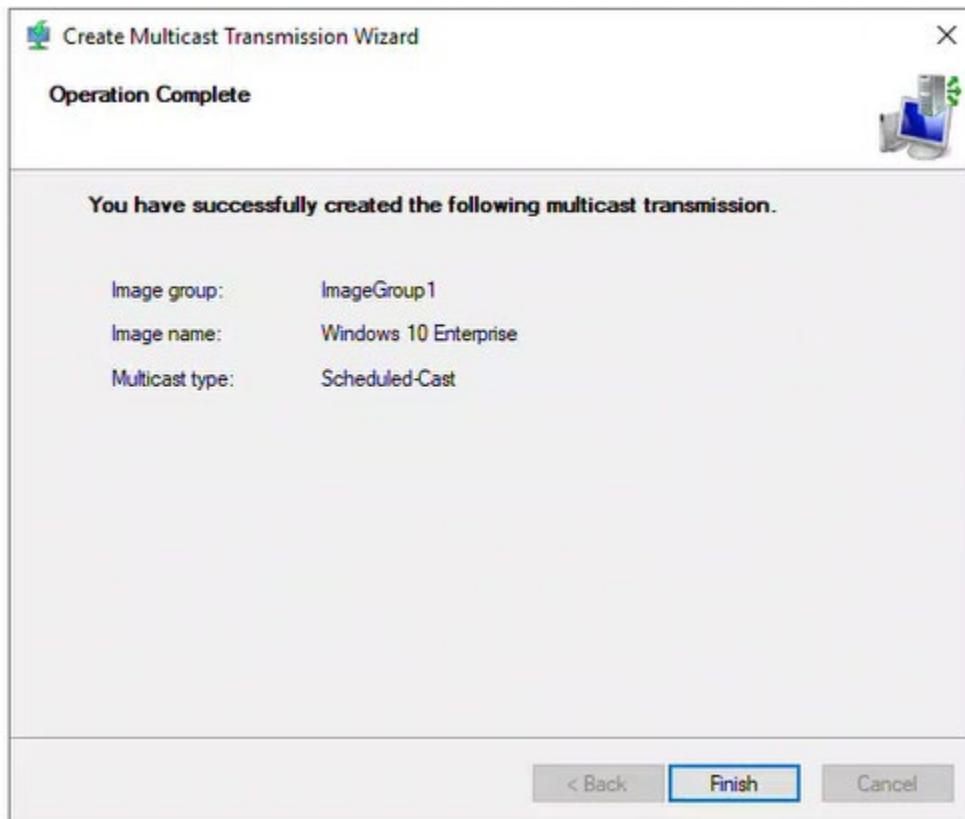
This wizard creates a multicast transmission for an image. Once created, Windows Deployment Services will transmit the image to multiple clients using a single transmission, instead of one transmission for each client. This can significantly reduce the amount of network bandwidth that is used.

Type a name for this transmission:
Trans2

[More information about multicast transmissions](#)

Buttons at the bottom: < Back, **Next >** (highlighted with a red box), Cancel





Windows Deployment Services

Servers

- srv2019-1.station1.com
 - Install Images
 - ImageGroup1
 - ImageGroup2
 - Boot Images
 - Pending Devices
 - Multicast Transmissions
 - Trans1
 - Trans2
 - Drivers
 - Active Directory Prestaged Devices

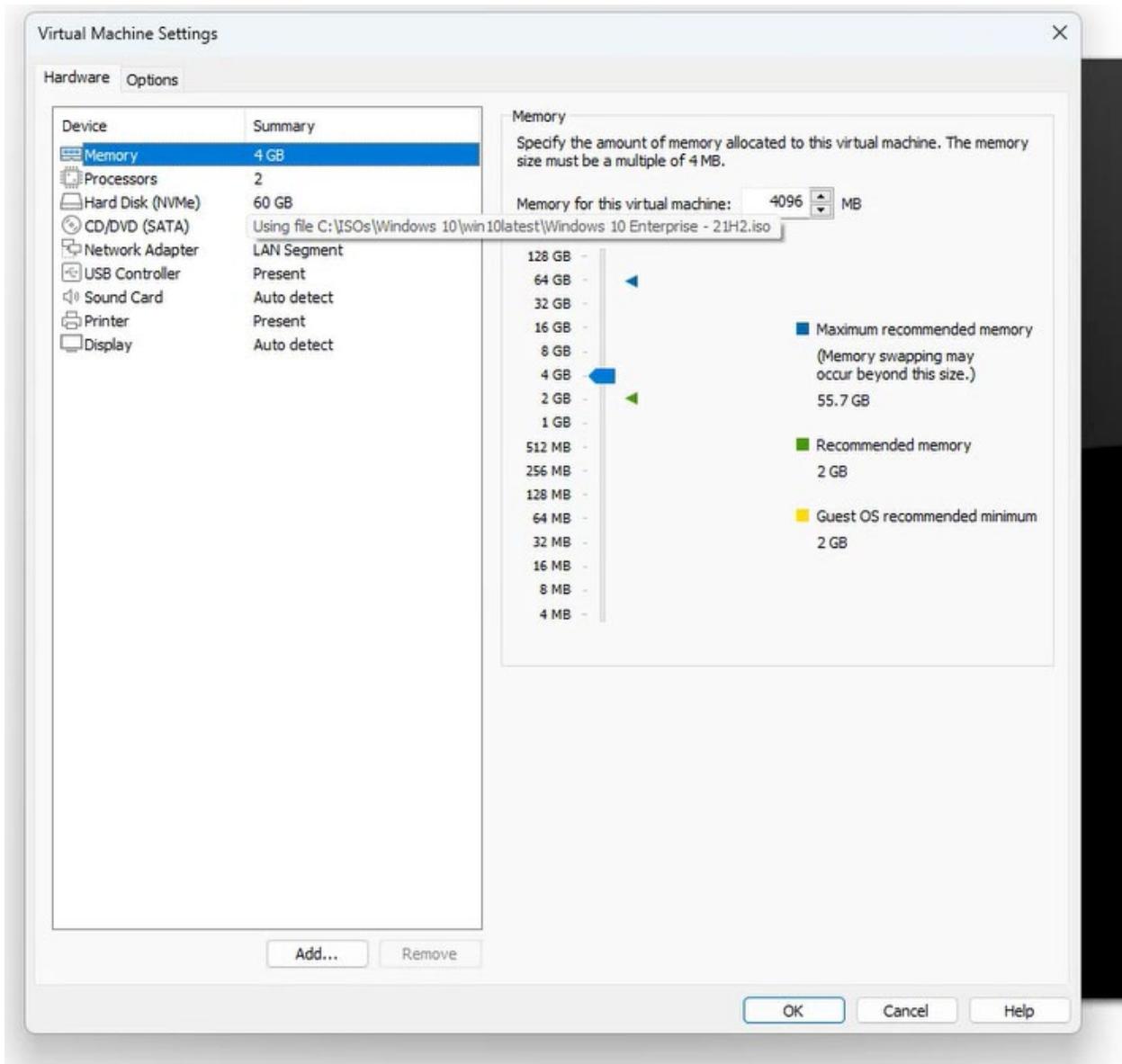
Multicast Transmissions 2 Transmission(s)

Name	Transmission Type	Status	Image Type
Trans1	Scheduled-Cast	Waiting	Install
Trans2	Scheduled-Cast	Waiting	Install

3.13 Deploy automatically windows 10

3.13.1 Create a VM

Create a VM with following characteristics:



3.13.2 Power on the VM

- A) When machine is powered ON a series of screens appear to initiate automatic installation of Windows 10 Enterprise.
If disk is present the next screen appears, Press enter
If Disk is not inserted the procedure initiate automatically.

WDS Boot Manager version 0800
Client IP: 192.168.1.13
Server IP: 192.168.1.1
Server Name: srv2019-1.station1.com

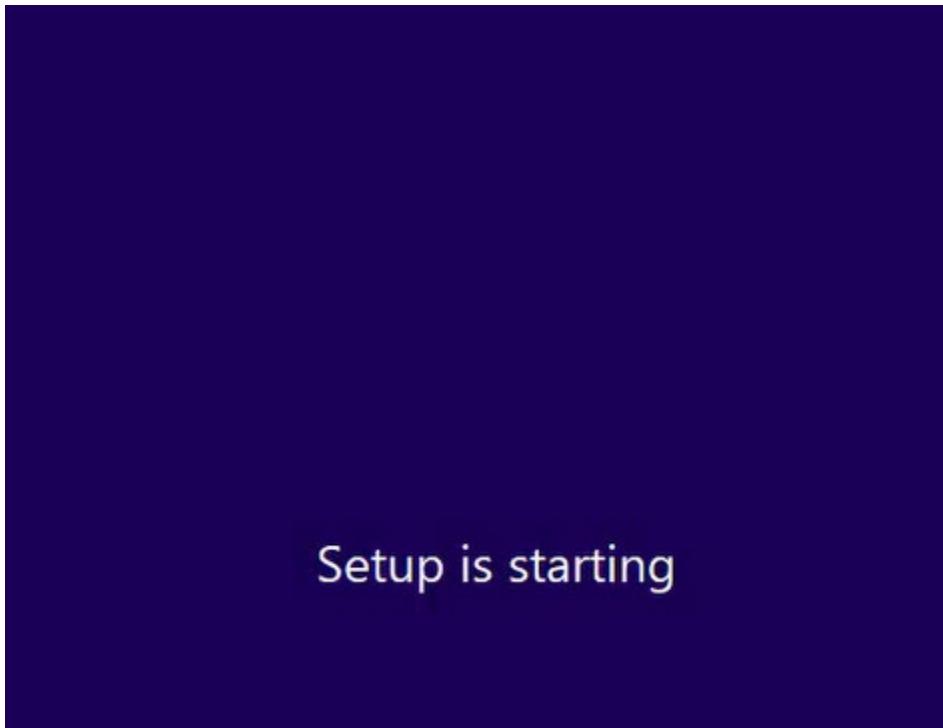
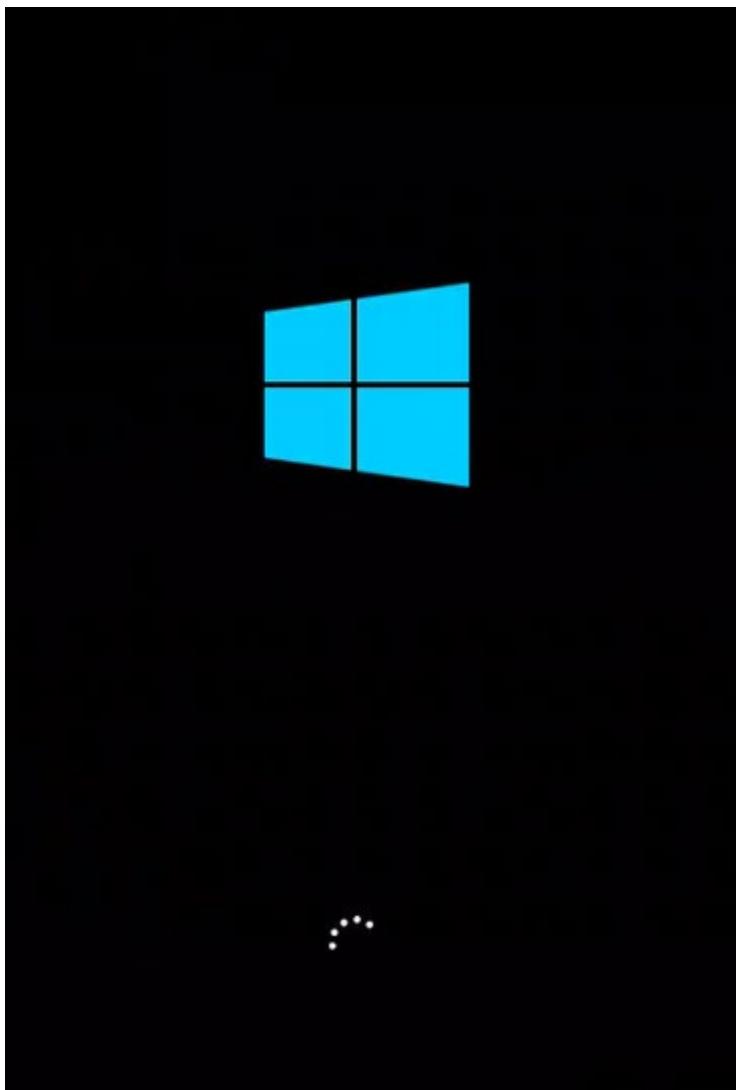
Press ENTER for network boot service.

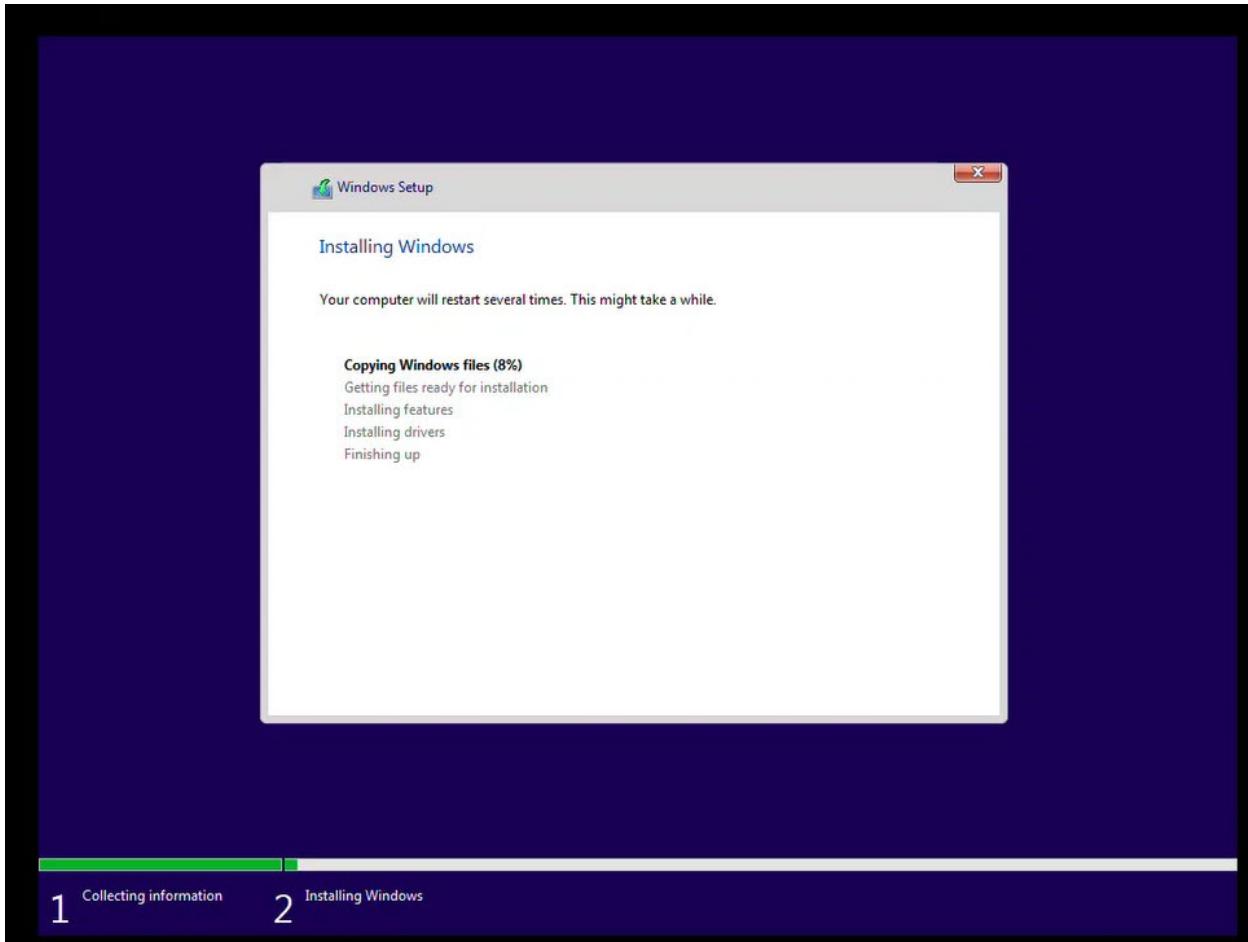
Loading files...

IP: 192.168.1.1, File: \Boot\x64\Images\boot.wim

Loading files...

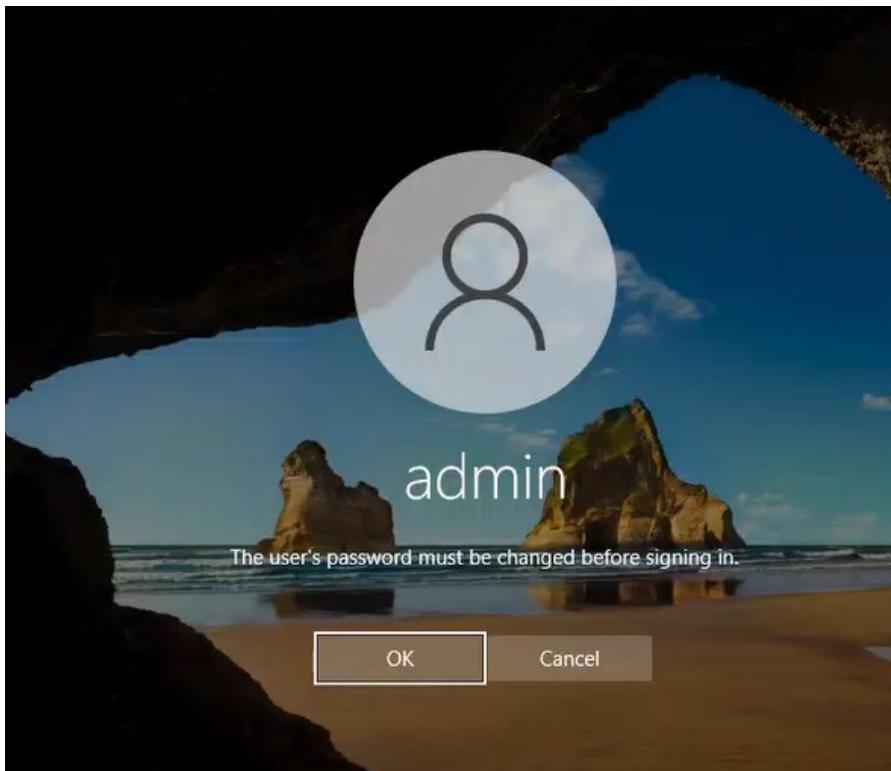
IP: 192.168.1.1, File: \Boot\x64\Images\boot.wim



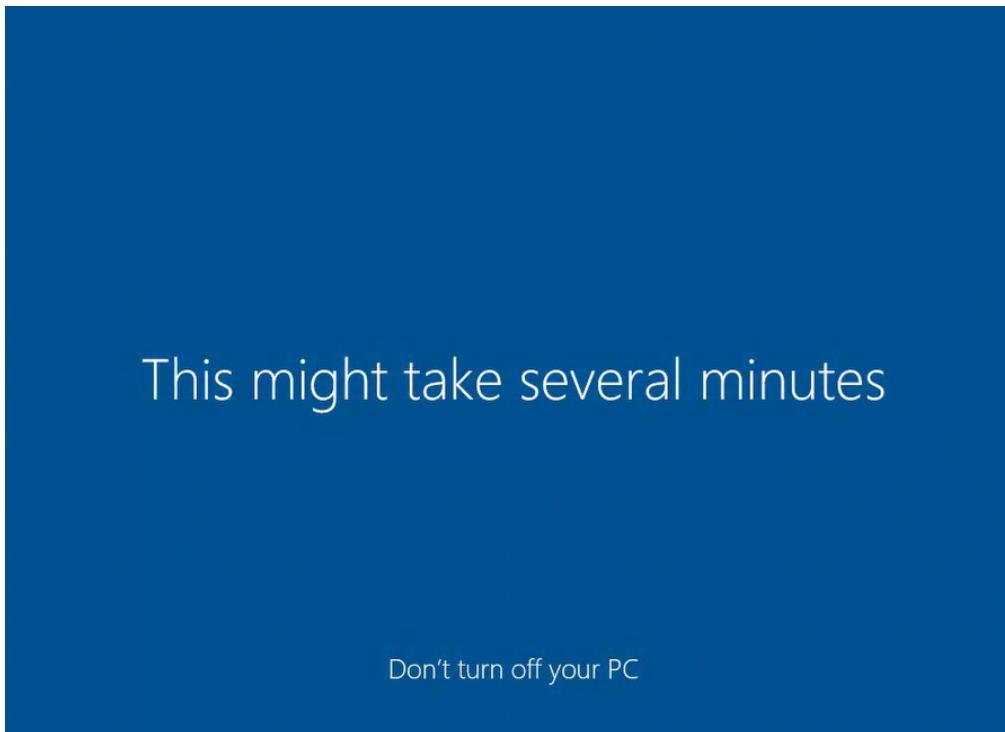


Login to installed VM

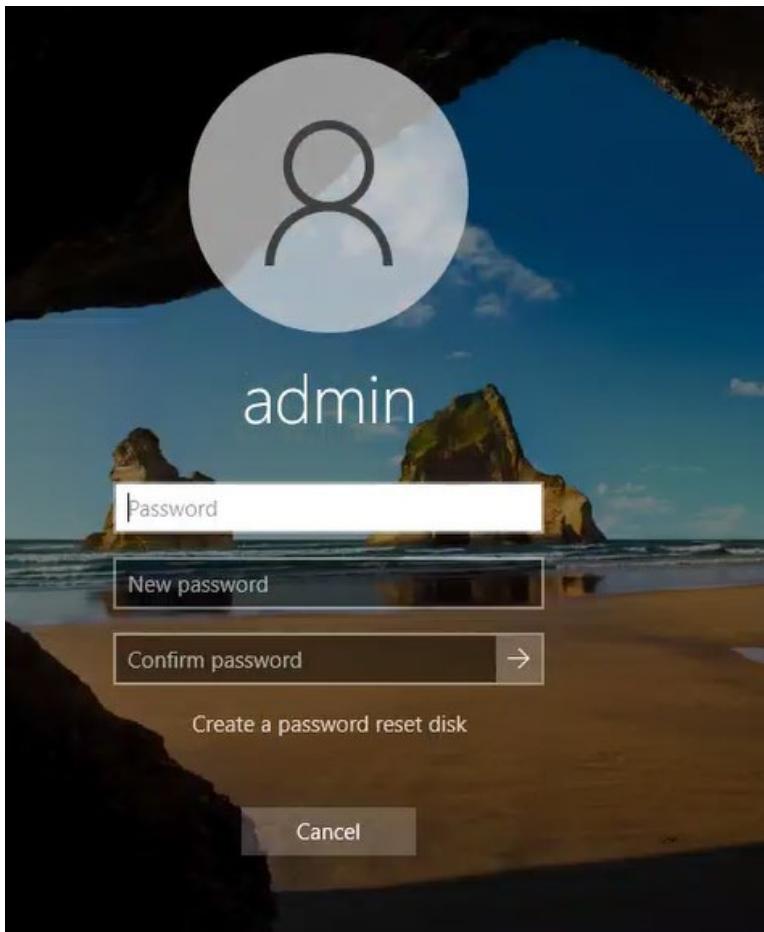
- A) Once Installation is finished the login window appears, The user and the password we set in the automatic installation files (answer files). Login as admin giving the Password as Amf123456



B) Profile is created it takes time



Set password as Amf123456



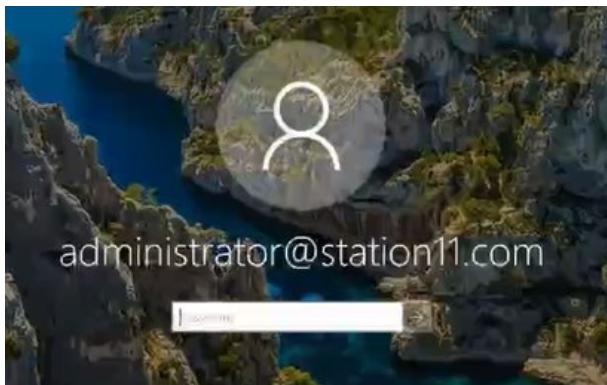
3.14 Disk Partitions

3.14.1 Add HD to VM -Compare GPT/MBR NTFS/EXfat Simple/Spanned Drives

This section covers basic disk management within a virtual environment, focusing on adding hardware, initializing disks, understanding partition types, and managing volumes and file systems.

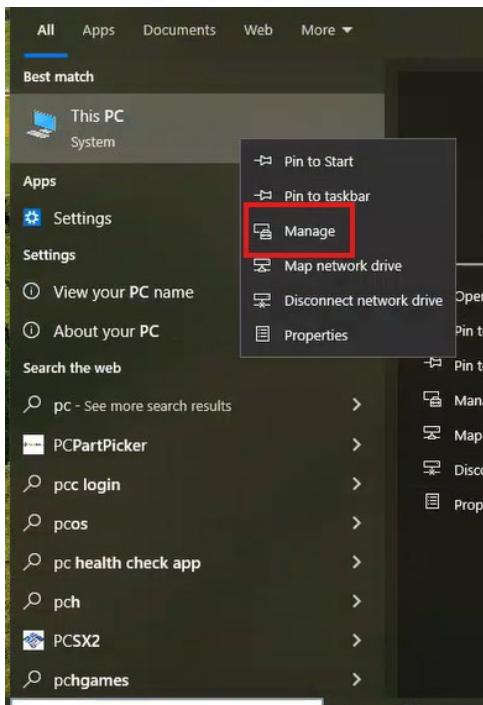
3.14.1.1 Add HD to VM

- A) Login as administrator



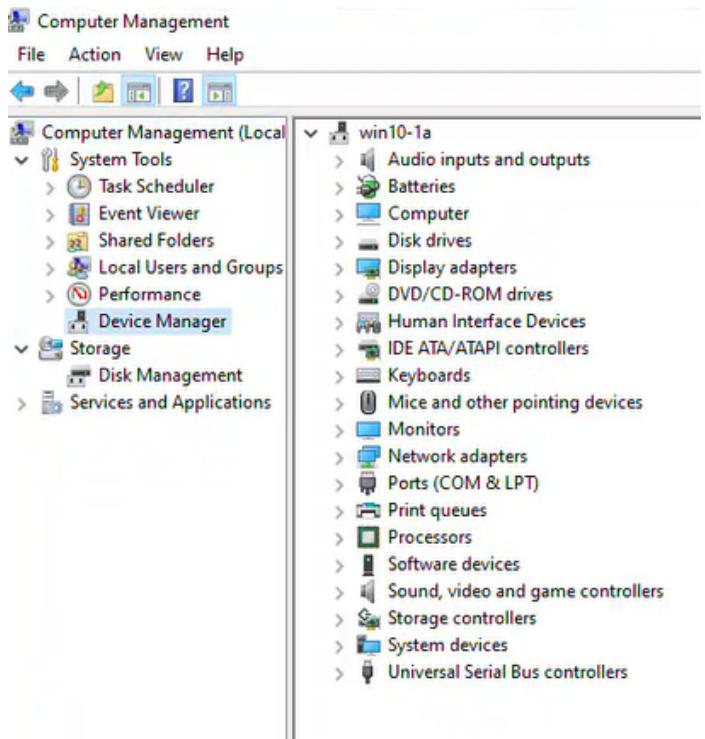
B) Open "My PC" and Manage

Right-clicking on "My PC" (or "This PC" in newer versions of Windows) and selecting Manage opens the Computer Management console, where you can oversee storage, device management, and other system settings.

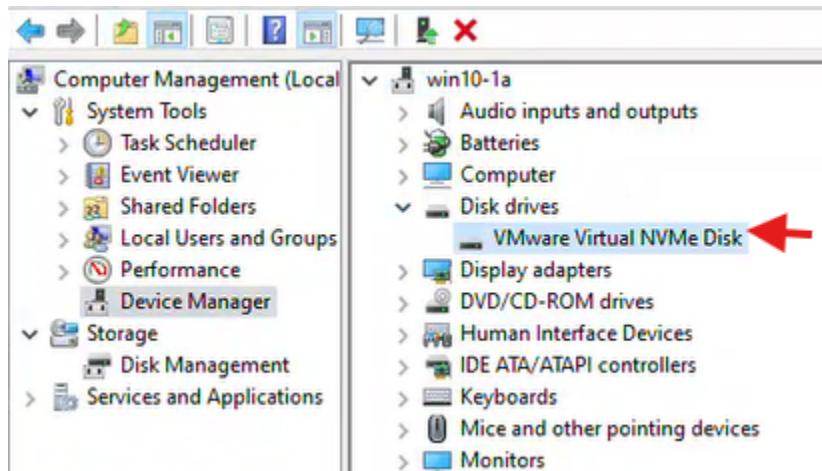


C) Check Installed Hardware

Under Device Manager or Disk Management, you can check the currently installed storage devices, including physical and virtual hard drives.

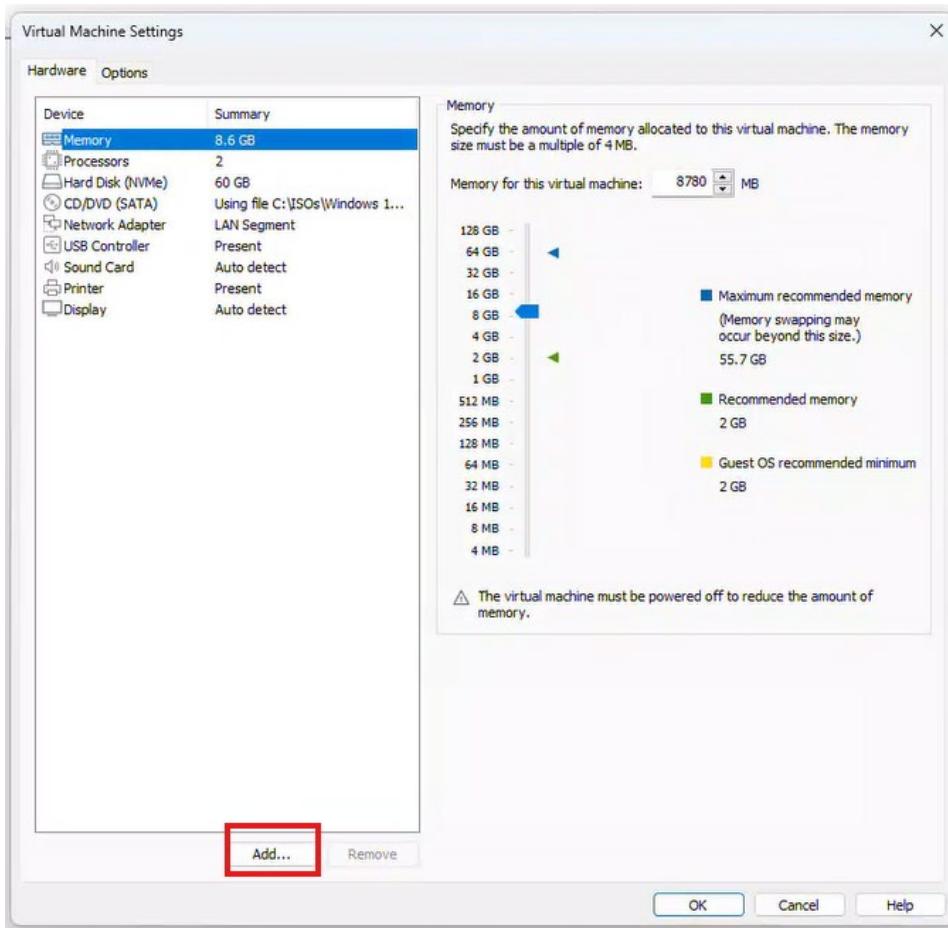


D) There is only one disk drive



3.14.1.2 Adding Hardware to VMs

- A) You can add hardware like hard drives to existing virtual machines in VMware Workstation by going to VM settings, selecting "Add", and choosing a new disk.

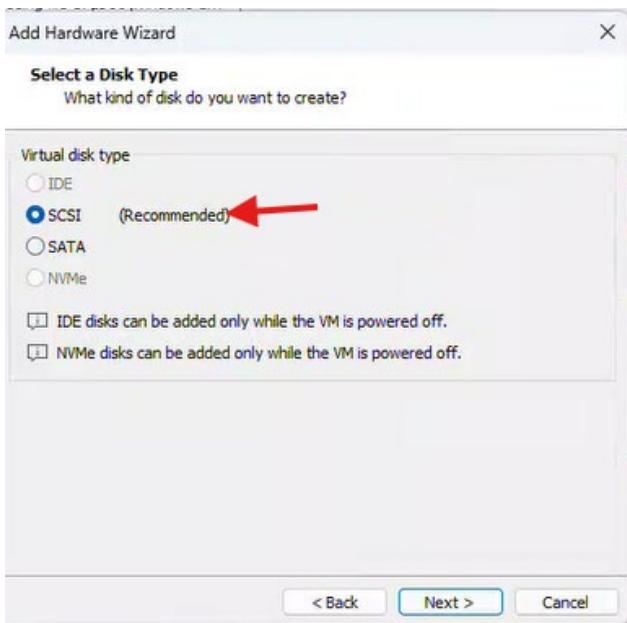


B) Add hard disk drive

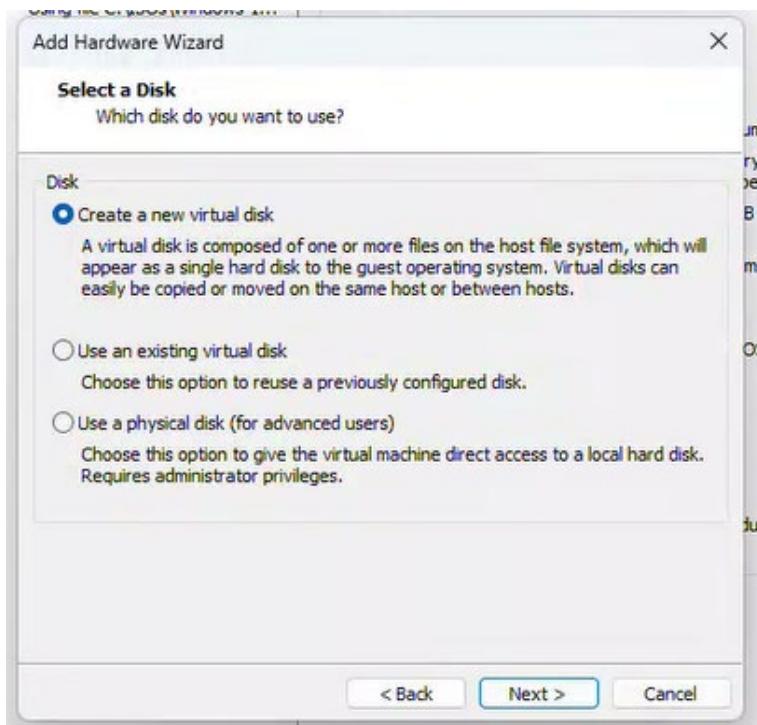


C) Options include IDE or SCSI disks, with SCSI being recommended.

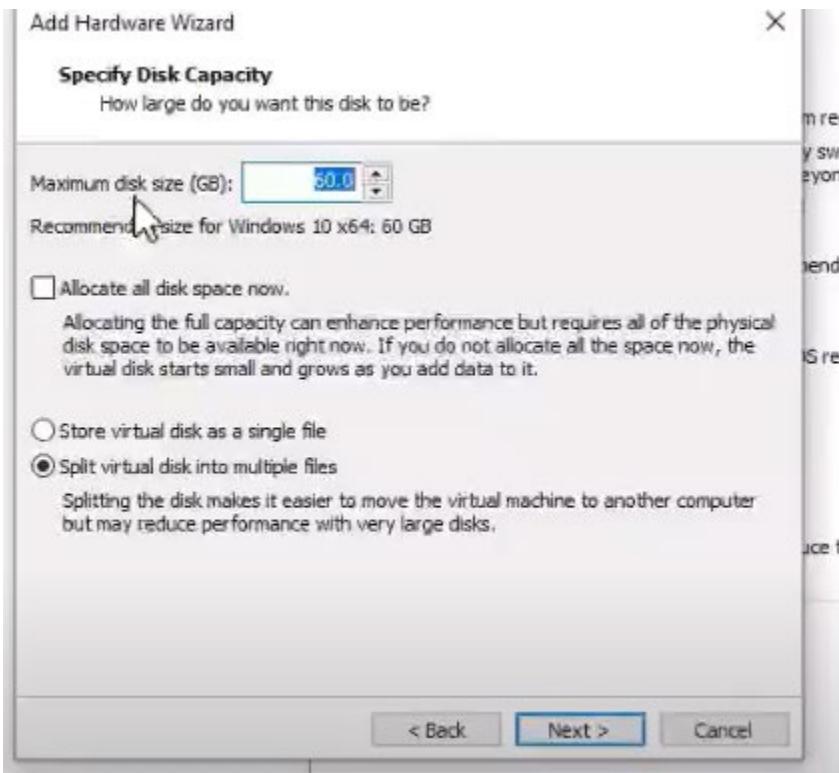
Add SCSI (Small Computer System Interface)



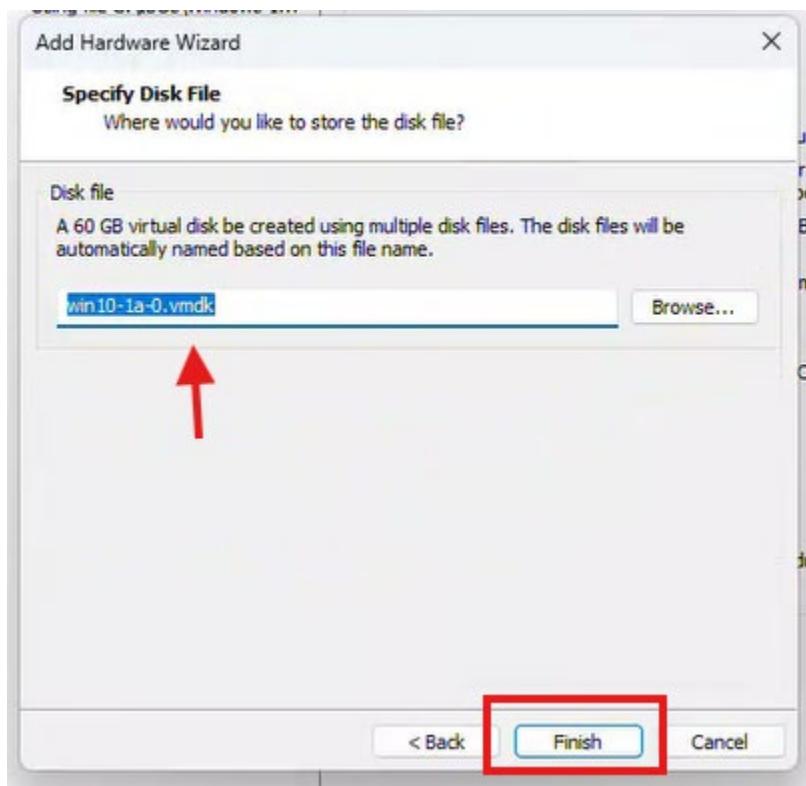
D) Create a New Virtual Disk



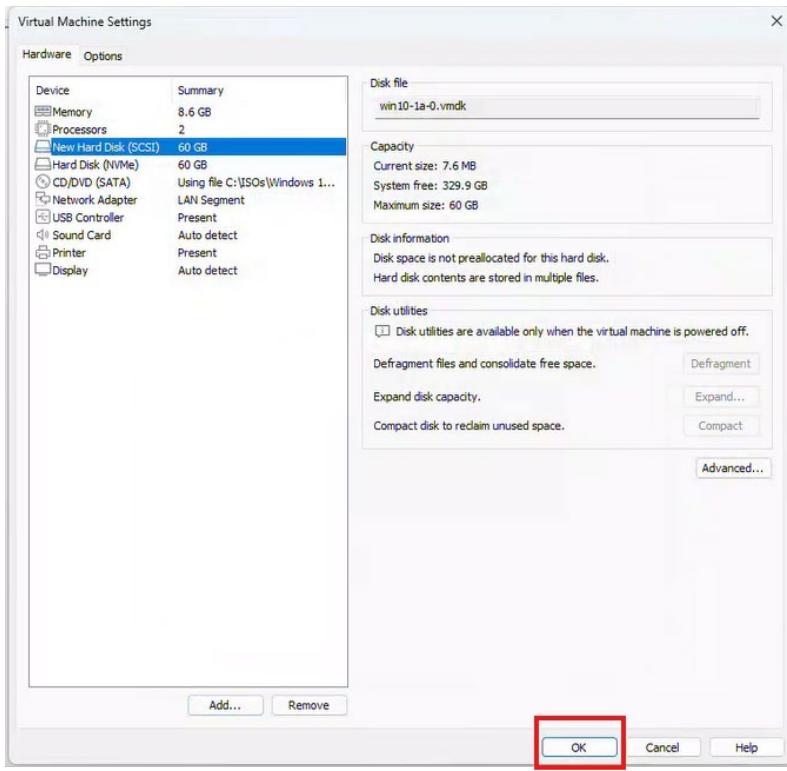
E) Specify Disk Capacity



F) Specify Disk file

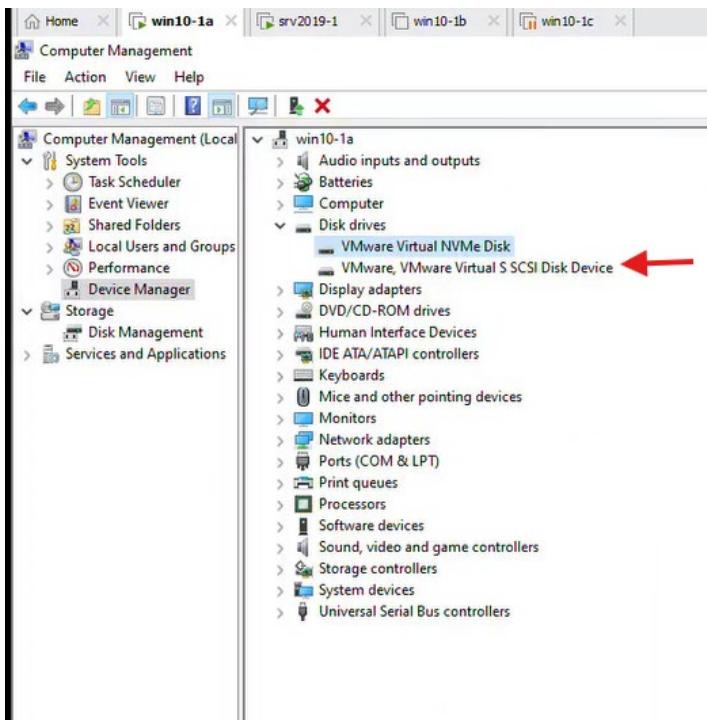


G) Confirms the creation of the new virtual hard disk. Press OK

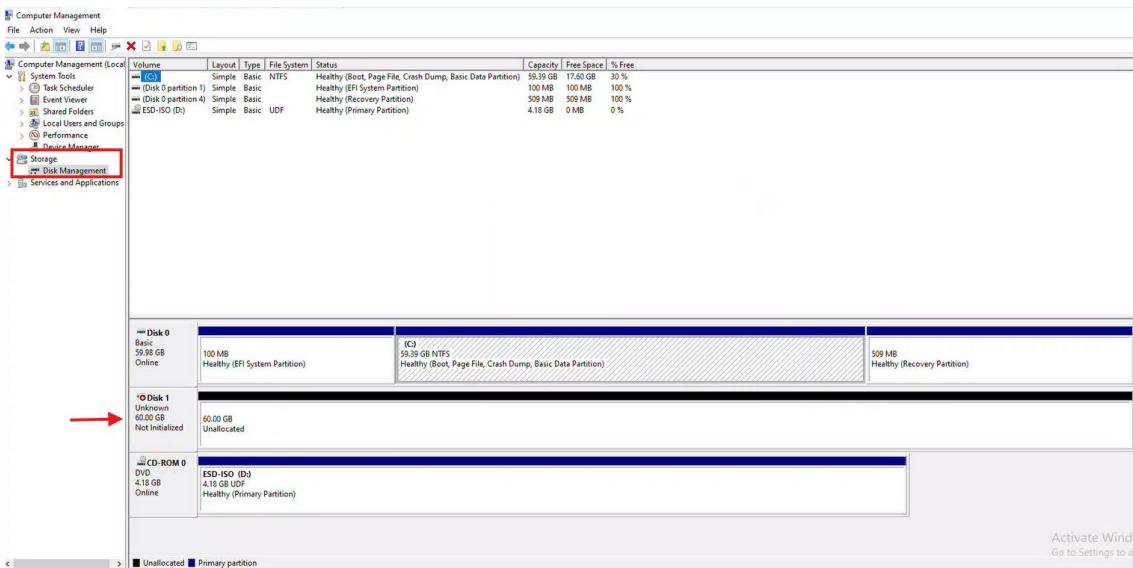


3.14.1.3 Disk Initialization

- A) Go to computer Management , when a new virtual disk is added, the virtual machine might briefly pause as it processes the new hardware. And hard disk appears.



- B) Go to Manage and See the New Hard Drive - Returning to the Disk Management console allows you to verify that the newly added disk appears in the system.



- C) Initialize Disk - Newly added disks need to be initialized before they can be used. This step prepares the disk for partitioning.



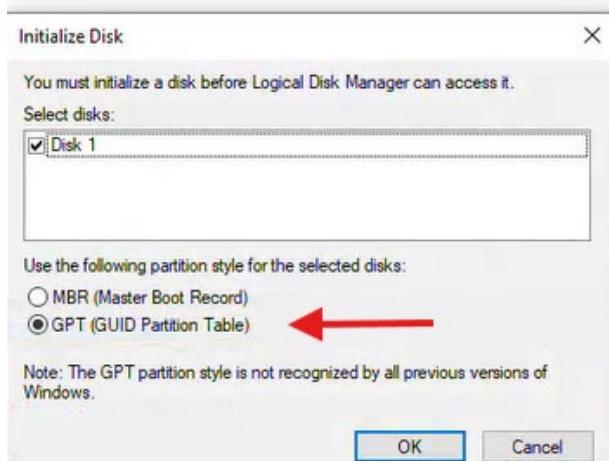
- D) New disks appear as "unknown" and need initialization. The choice is between MBR and GPT.
1. GPT (GUID Partition Table) is a modern partitioning scheme that supports larger disk sizes (beyond 2TB) and more partitions than MBR (Master Boot Record).

GPT is more reliable because it uses CRC checks (Cyclic Redundancy Checks) to ensure that your data is OK. If something happens to your data, GPT can attempt to recover the damaged data from another location on the disk.
 2. If using older systems, MBR might be needed instead.

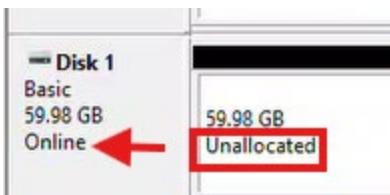
With the master boot record (MBR) method, there's no way of knowing if the data is corrupted until your operating system fails to load properly.

Older PCs only support MBR due to their outdated BIOS. Modern PCs, however, support UEFI

Select GPT



- E) Disk Appears as Online but Unallocated
- The system recognizes the disk, but it doesn't yet have any partitions or file systems.

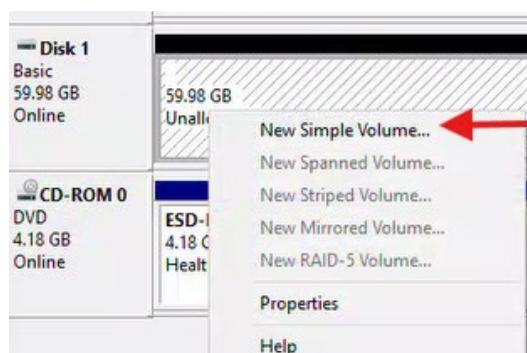


F) Create a New Simple Volume

A simple volume uses the entire disk space, typically on a single disk. A new volume (partition) is created using available space on the disk. This involves:

- Assigning a drive letter
- Choosing a file system (NTFS, exFAT, or FAT32)
- Formatting the partition

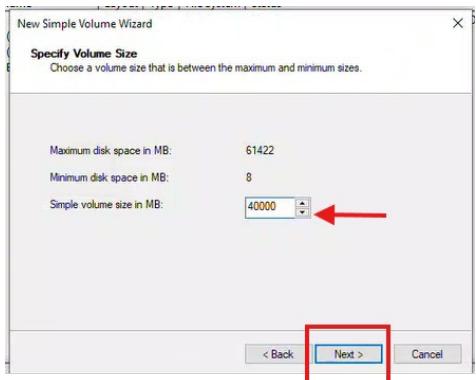
1. Select New single volume



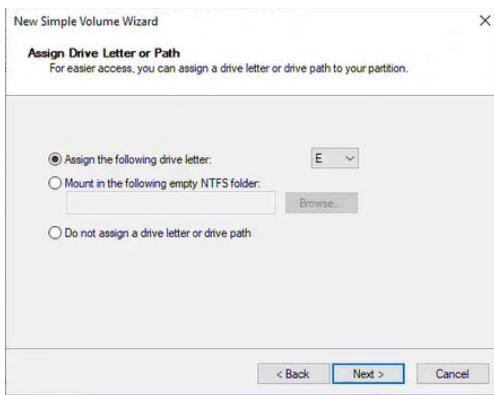
2. New simple Volume Wizard appears



3. Specify volume size, if the disk has 60 GB, you could allocate 40,000 MB (40 GB).



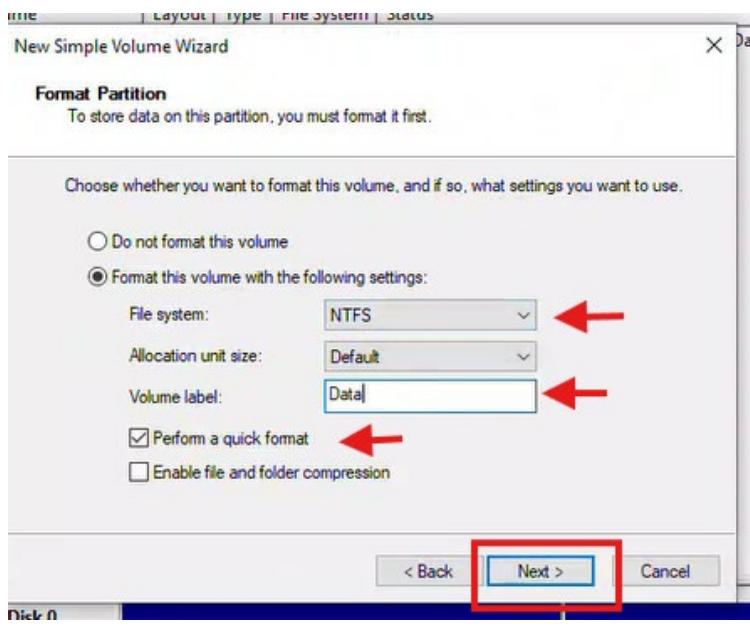
4. Now you are prompted to assign a drive letter. Assign E, once selected, click "Next"



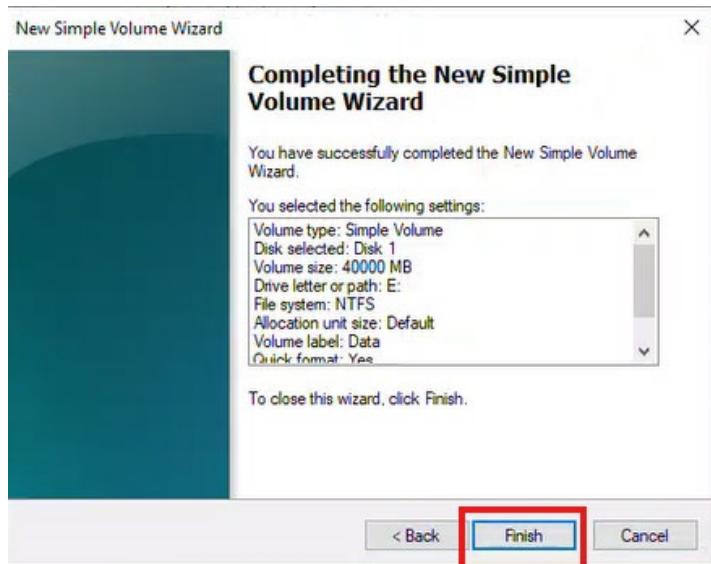
5. When formatting, there are two main options: NTFS and exFAT.

- NTFS: Stands for "New Technology File System." It is ideal for internal drives and allows you to set up security permissions (e.g., restricting file access to certain users).
- exFAT: Often used for flash drives, it doesn't have the file size or partition limits of FAT32.

For this exercise, chose NTFS and assigned a volume label (an identifier for the drive). Enabling "Quick Format" speeds up the process, but skipping it writes all necessary disk information

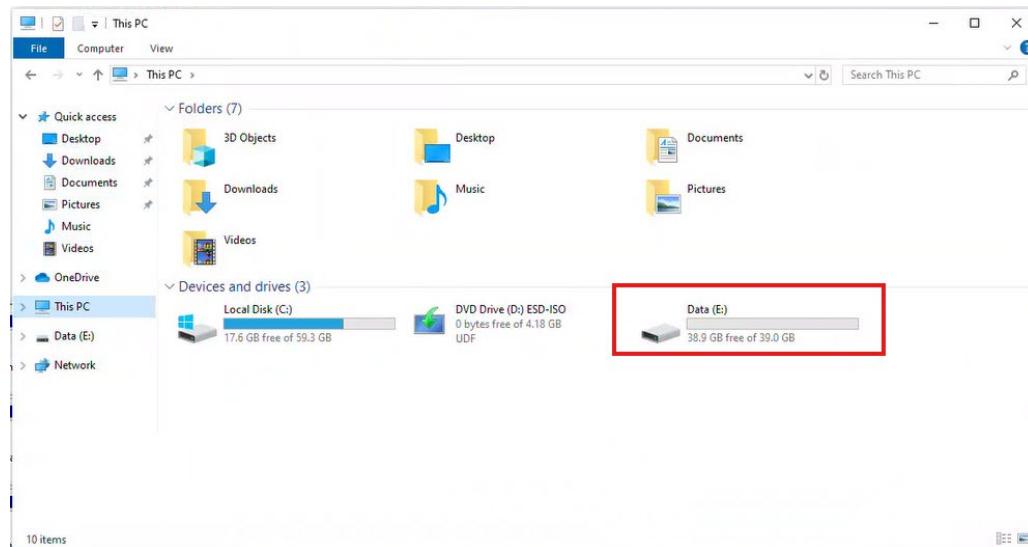


6. Verify the summary and select Finish



G) New Hard Drive Appears

After formatting, the drive becomes available for use in the File Explorer.



3.14.1.4 Extending and Shrinking Volumes

If you run out of space on the drive, you can extend the volume into an unallocated partition.

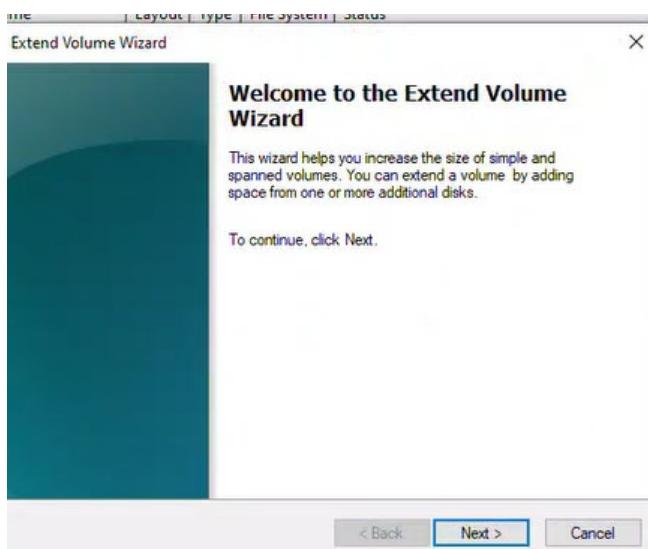
When volume is extended, the volume now includes the extra space.

Similarly, you can shrink a volume to reduce its size and create unallocated space.

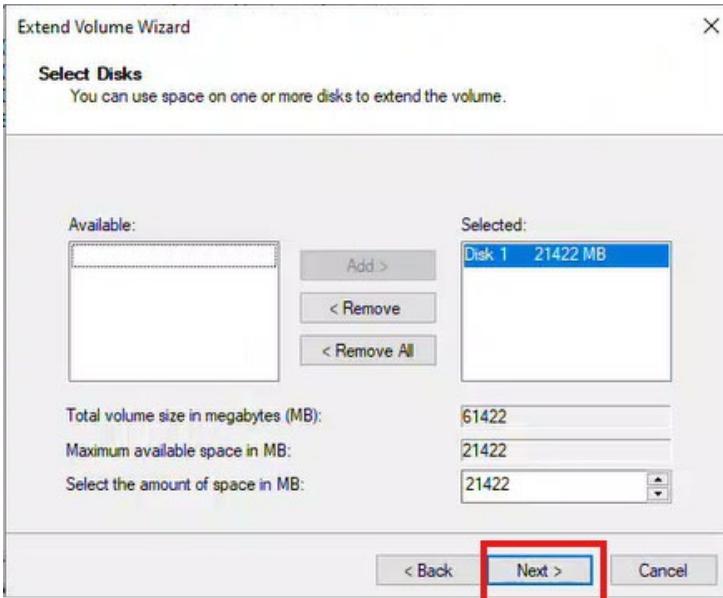
A) Extend Volume

- This command allows you to increase the size of an existing volume using unallocated space.
- Useful when additional space is needed on an existing partition.

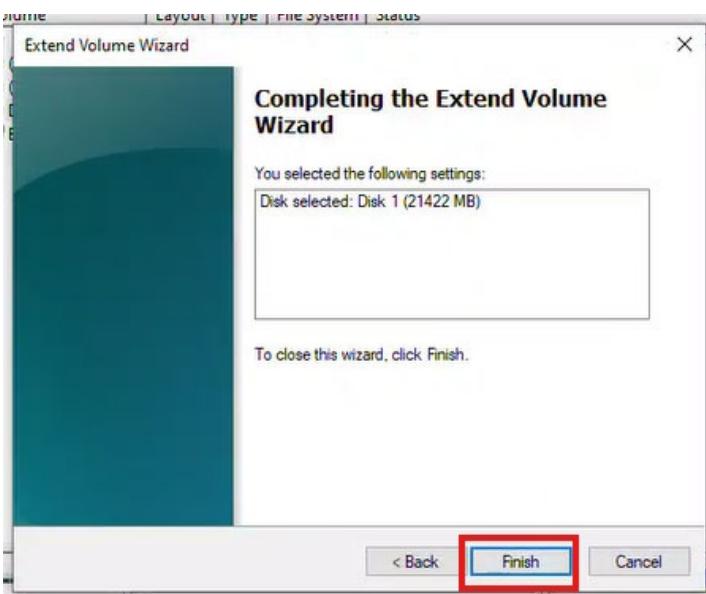
1. Select "Extend Volume," wizard appears



2. Choose the desired additional space,



3. Review the summary and click Finish



3.14.1.5 Add disk

A) Add 2 more disks

Refer to section Create hard disk

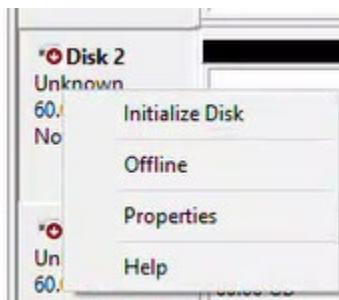
To add another disk:

1. Open VM settings and add a SCSI disk (e.g., 6 GB).
2. Initialize the disk by right-clicking on it. For this exercise, we'll use GPT.
3. Once initialized, create a new simple volume.

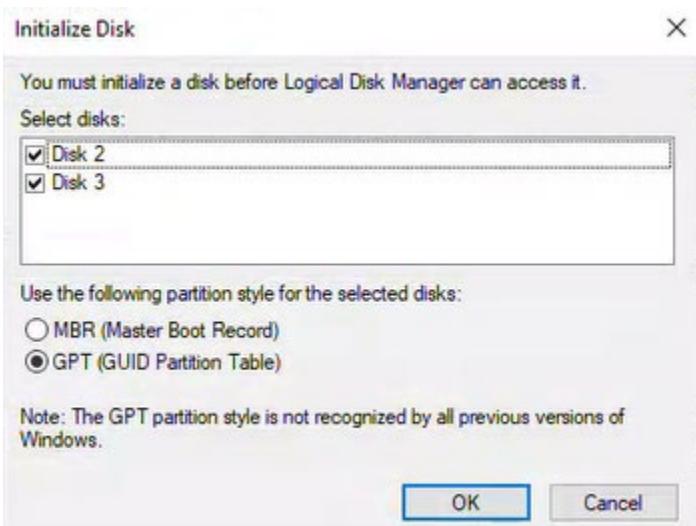
B) After disks are created , now we have 3 disks

Disk 1	Data (E) 59.98 GB NTFS Healthy (Basic Data Partition)
* Disk 2 Unknown 60.00 GB Not Initialized	60.00 GB Unallocated
* Disk 3 Unknown 60.00 GB Not Initialized	60.00 GB Unallocated
CD-ROM 0 DVD 4.18 GB Unallocated	ESD-ISO (D): 4.18 GB UDF Primary partition

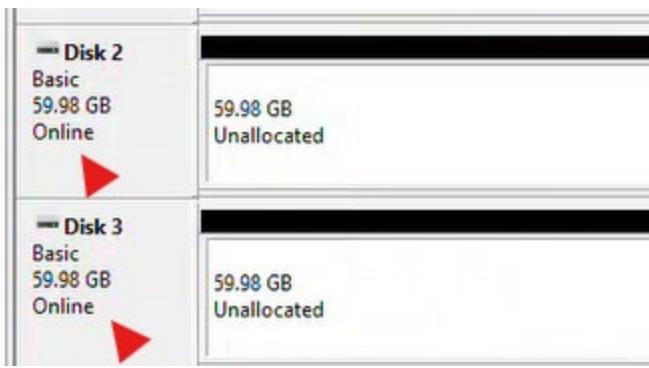
C) Initialize



D) Both disk are displayed



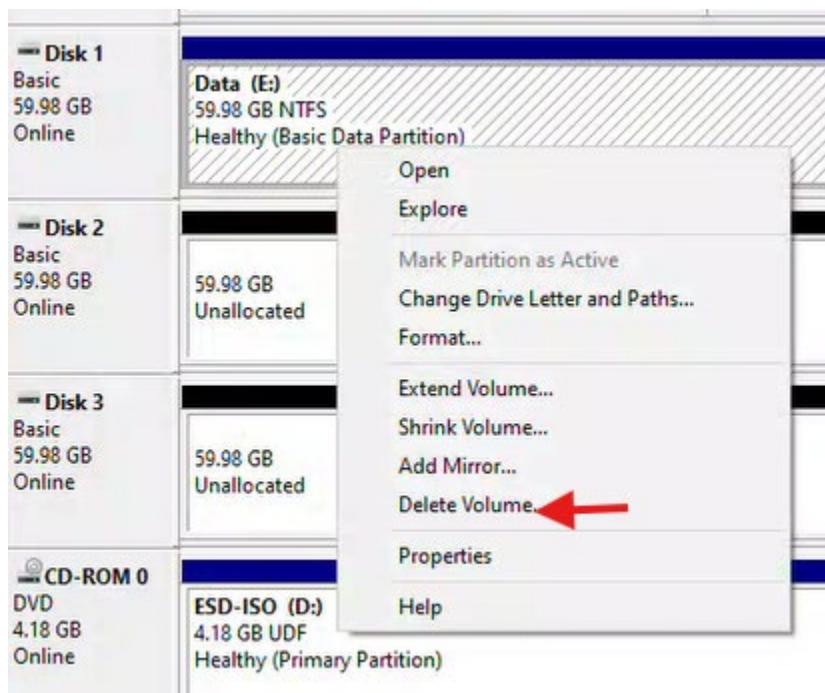
E) They are online



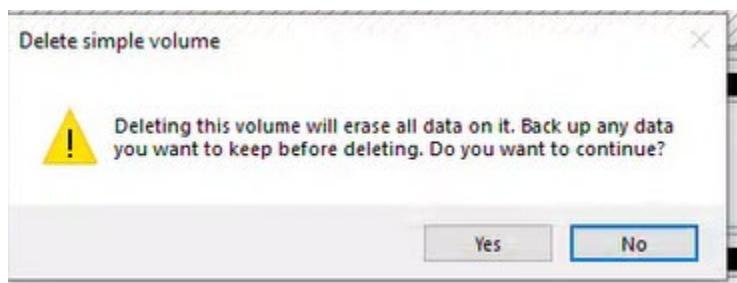
3.14.1.6 Delete volume

Used to remove an existing partition from a disk, making space available for a new configuration.

A) Select Delete Volume



B) Deleting a volume erases all data on it.

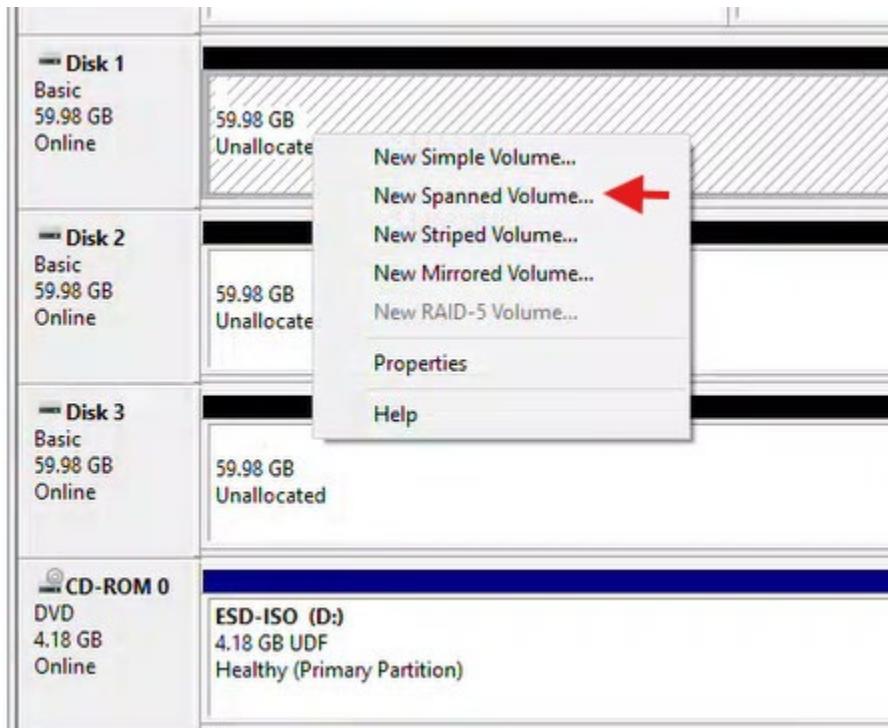


3.14.1.7 Spanned volume

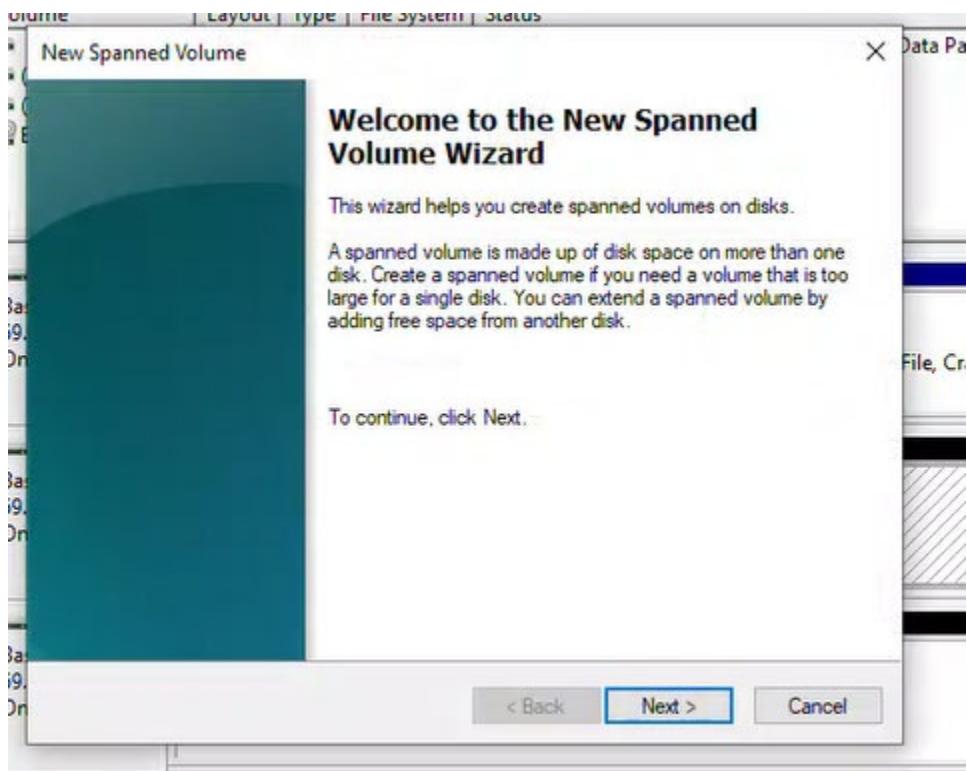
Spanned Volume – Combines multiple disks into one large volume.

When converting the disks to dynamic, Windows warns you that dynamic disks are unsuitable for installing operating systems. However, this is fine if you're using the disks for data storage only. After formatting, the spanned volume will appear as a single drive (e.g., Drive E).

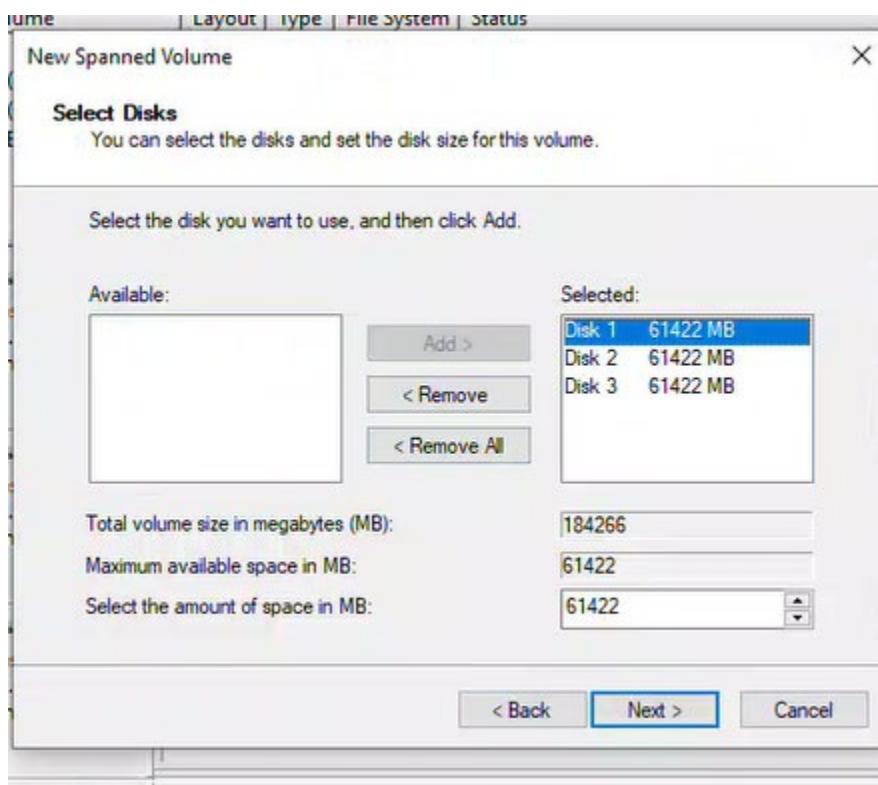
- A) Right-click the first disk and select "New Spanned Volume."

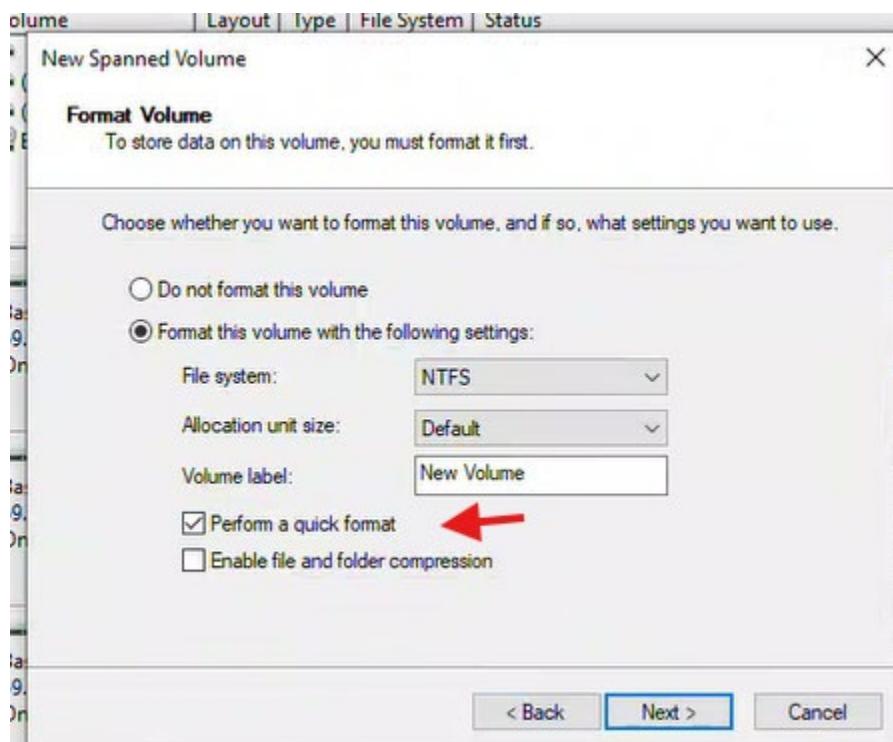
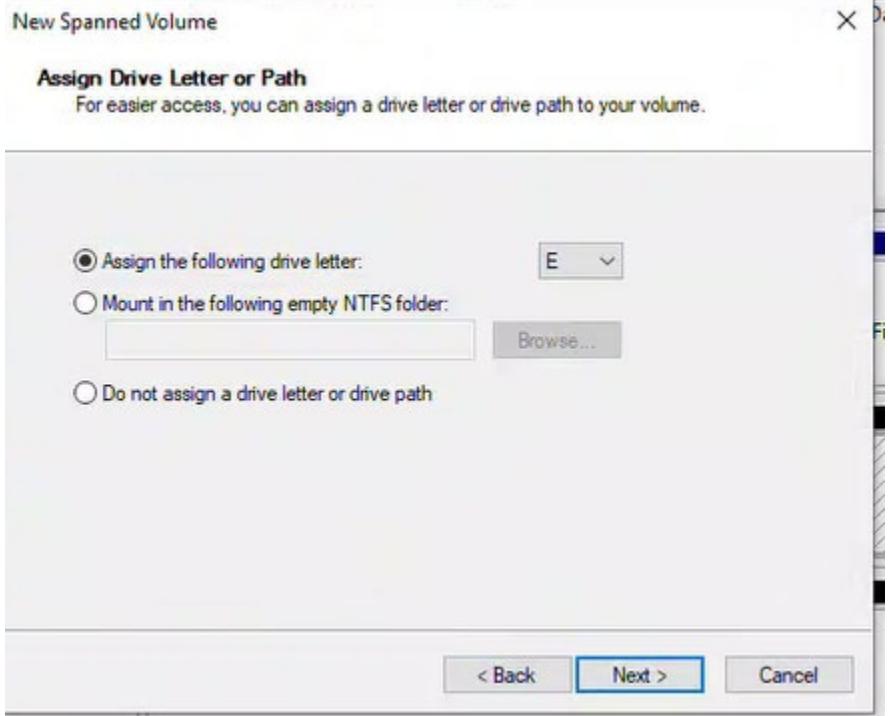


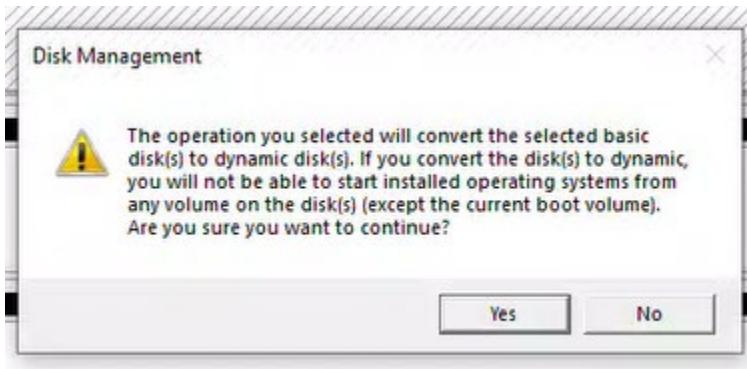
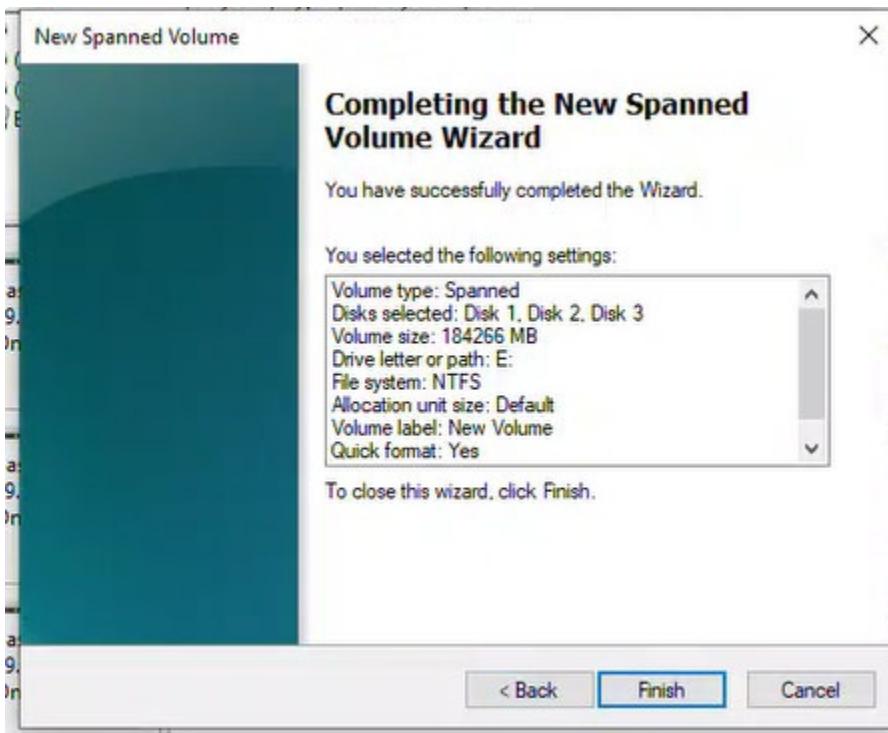
- B) Add additional disks to the spanned volume, then format and assign a drive letter.



Add all three and combine them





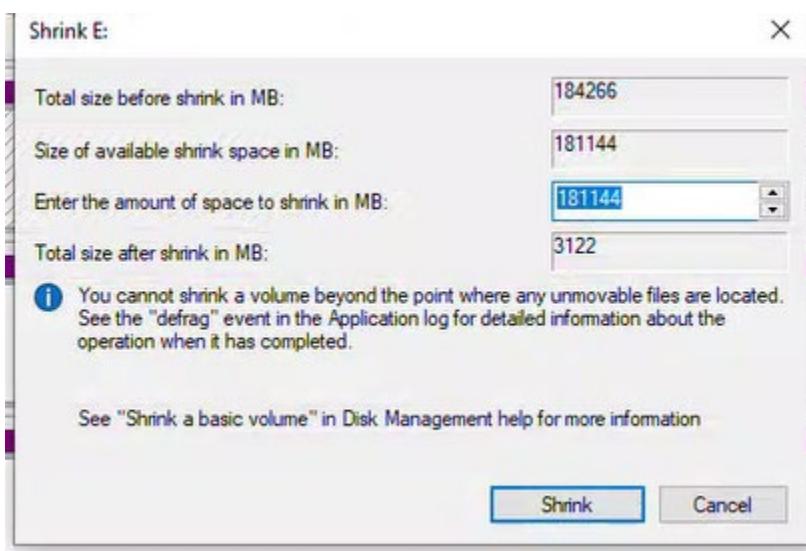
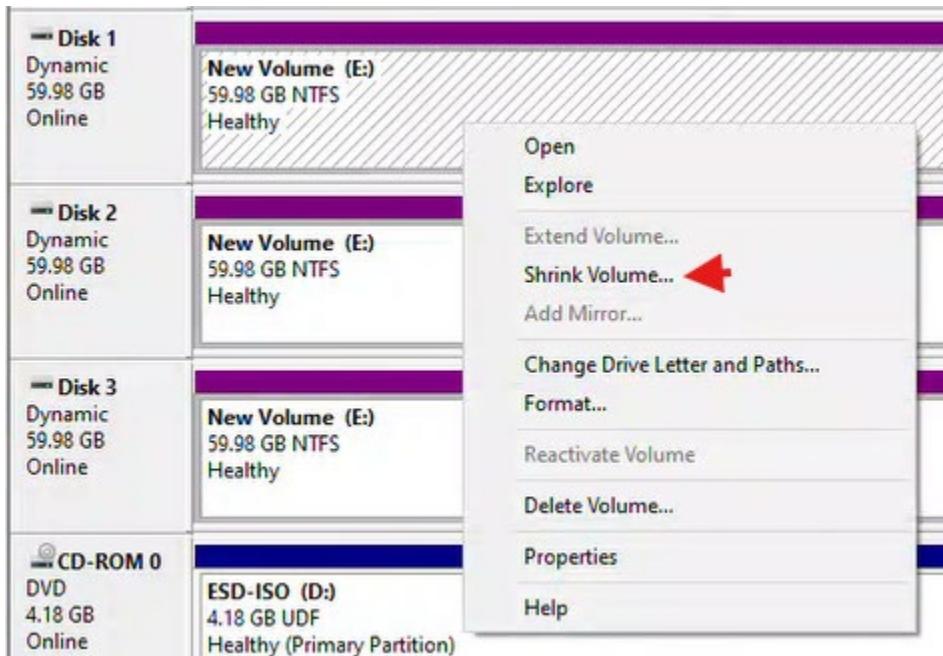


Disk 1 Dynamic 59.98 GB Online	New Volume (E:) 59.98 GB NTFS Healthy
Disk 2 Dynamic 59.98 GB Online	New Volume (E:) 59.98 GB NTFS Healthy
Disk 3 Dynamic 59.98 GB Online	New Volume (E:) 59.98 GB NTFS Healthy

Devices and drives (3)

 Local Disk (C:) 17.6 GB free of 59.3 GB	 DVD Drive (D:) ESD-ISO 0 bytes free of 4.18 GB UDF	 New Volume (E:) 179 GB free of 179 GB
---------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

3.14.1.8 Shrink volume



Disk 1	New Volume (E: 3.05 GB NTFS Healthy)	56.94 GB Unallocated
--------	--------------------------------------------	-------------------------

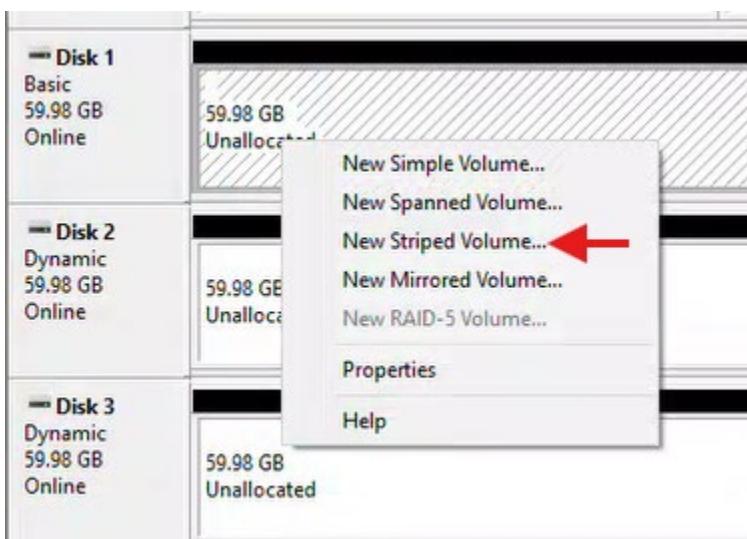
3.14.2 Simple Spanned Striped Mirrored and Raid 5 Volumes

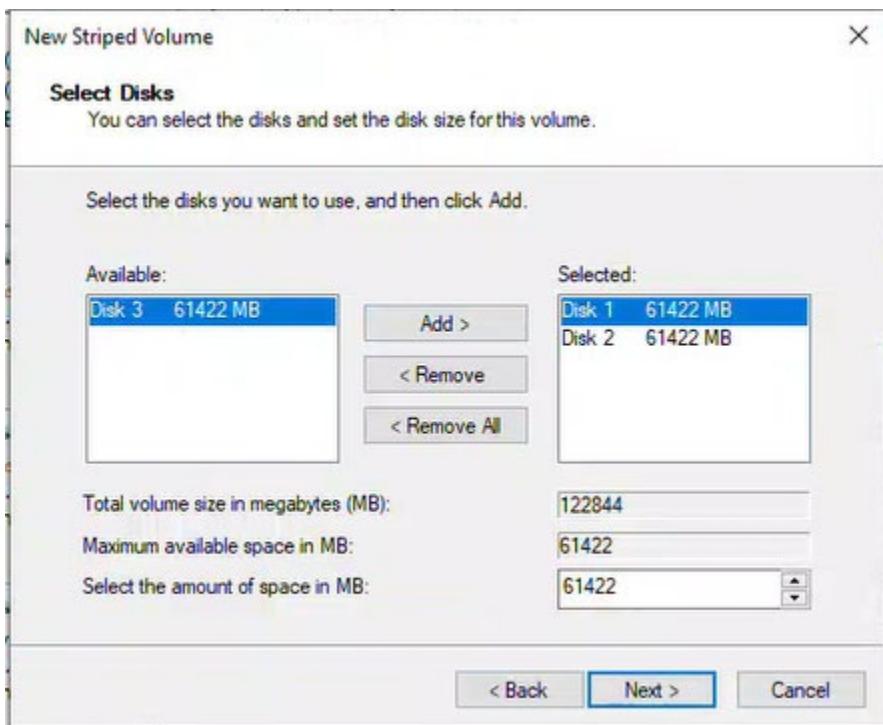
Various disk volume types and RAID configurations available in Windows, highlighting their features, use cases, and limitations.

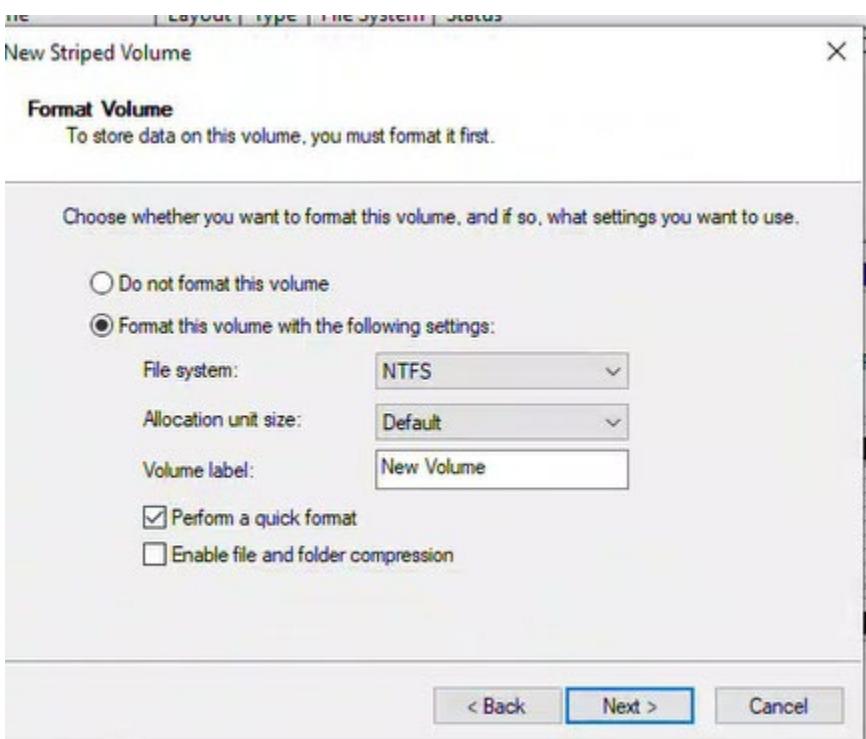
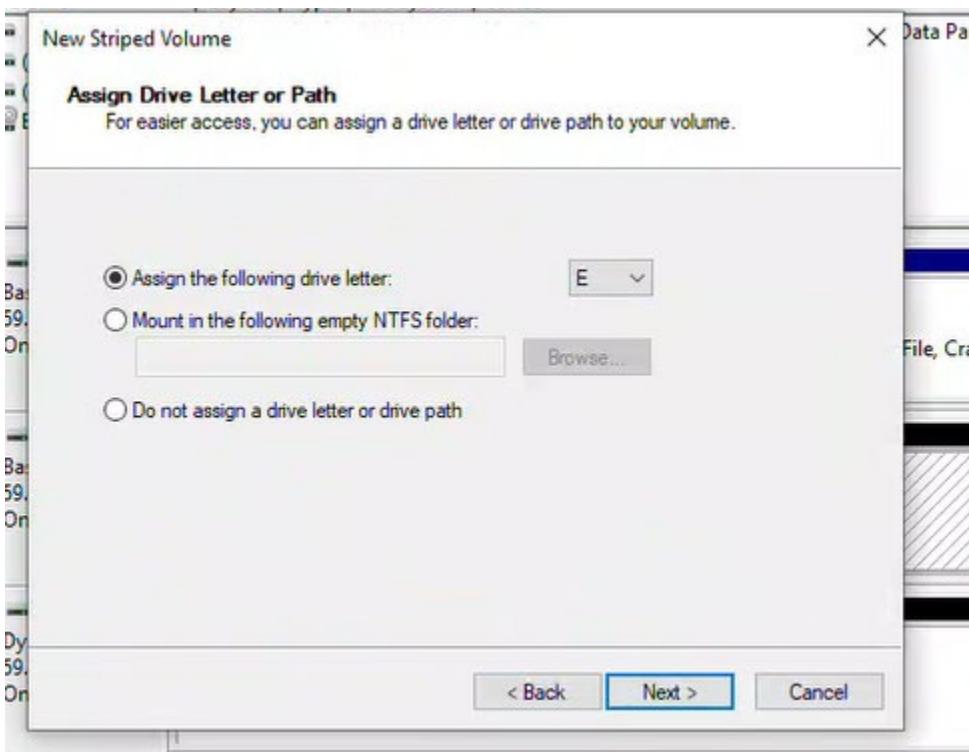
1. **Simple Volume:** A basic partition on a single disk without redundancy or expandability.
2. **Spanned Volume:** Combines multiple disks into one logical drive to expand storage but lacks fault tolerance.
3. **Striped Volume (RAID 0):** Distributes data across multiple disks to improve speed, ideal for large files. However, it offers no data redundancy, making it vulnerable to data loss if a disk fails.
4. **Mirrored Volume (RAID 1):** Duplicates data across two disks, providing redundancy and ensuring data recovery in case of a single disk failure.
5. **RAID 5:** A combination of striping and parity, requiring at least three disks. It offers fault tolerance by allowing data recovery if one disk fails, commonly used in servers but unavailable in Windows 10.
6. **Modern Solutions:** Traditional RAID is being replaced by storage area networks (SANs) and cloud-based replication systems for improved scalability and redundancy.

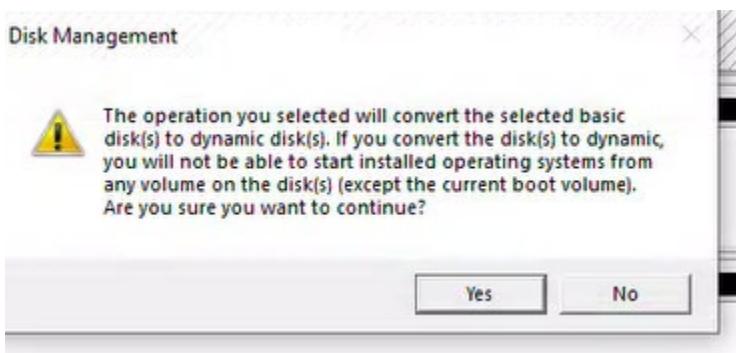
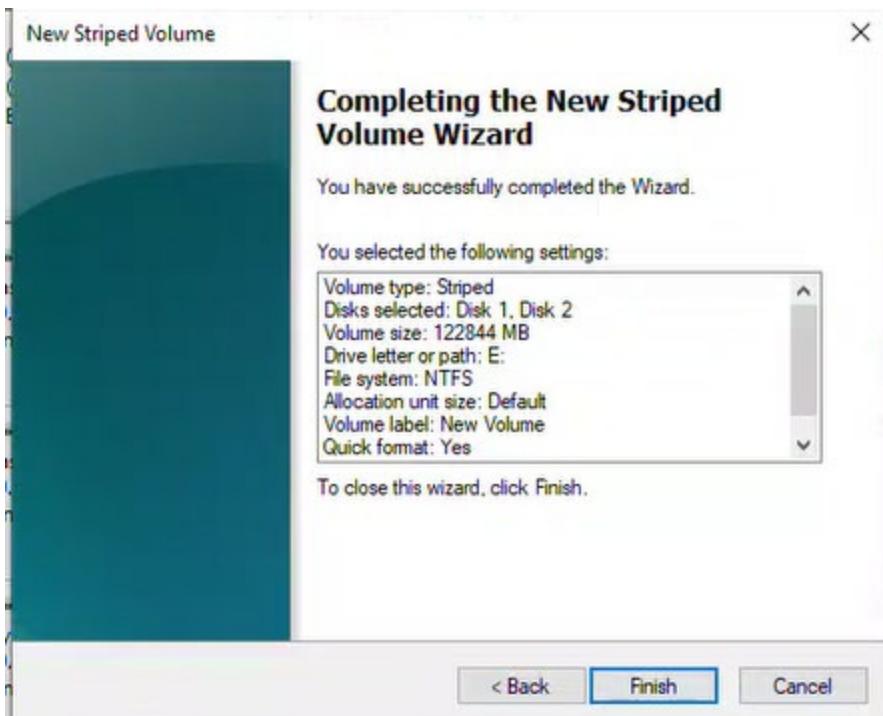
Overall, each volume type and RAID configuration is suited to specific needs, from speed and storage expansion to data redundancy and fault tolerance.

3.14.2.1 Simple Spanned Striped (Raid 0)







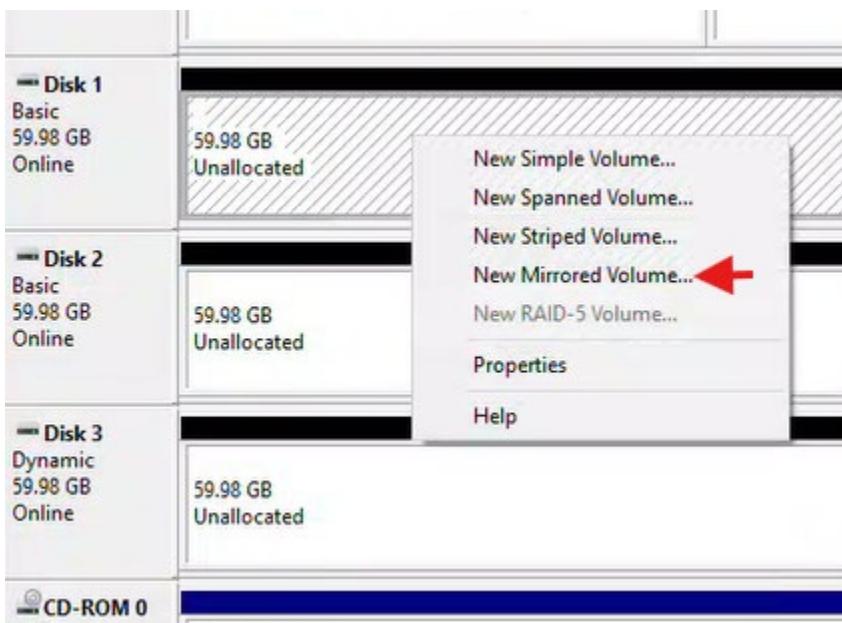


Disk 1 Dynamic 59.98 GB Online	New Volume (E:) 59.98 GB NTFS Healthy
Disk 2 Dynamic 59.98 GB Online	New Volume (E:) 59.98 GB NTFS Healthy
Disk 3 Dynamic 59.98 GB Online	59.98 GB Unallocated

The stripped is also known as Raid0

3.14.2.2 RAID 1 Mirrored

Mirror a drive



Welcome to the New Mirrored Volume Wizard

This wizard helps you create mirrored volumes on disks.

A mirrored volume duplicates your data on two disks. Create a mirrored volume if you want to keep two separate copies of all your information to prevent data loss.

To continue, click Next.

< Back

Next >

Cancel

Select Disks

You can select the disks and set the disk size for this volume.

Select the disks you want to use, and then click Add.

Available:

Disk 3	61422 MB
--------	----------

Add >

< Remove

< Remove All

Selected:

Disk 1	61422 MB
Disk 2	61422 MB

Total volume size in megabytes (MB):

61422

Maximum available space in MB:

61422

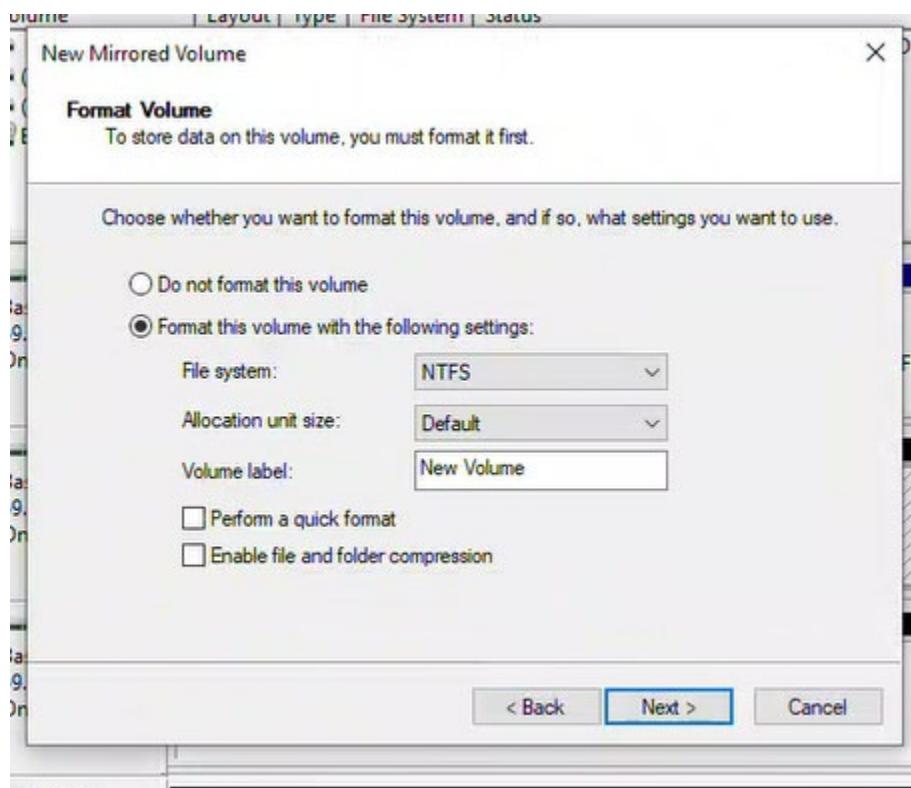
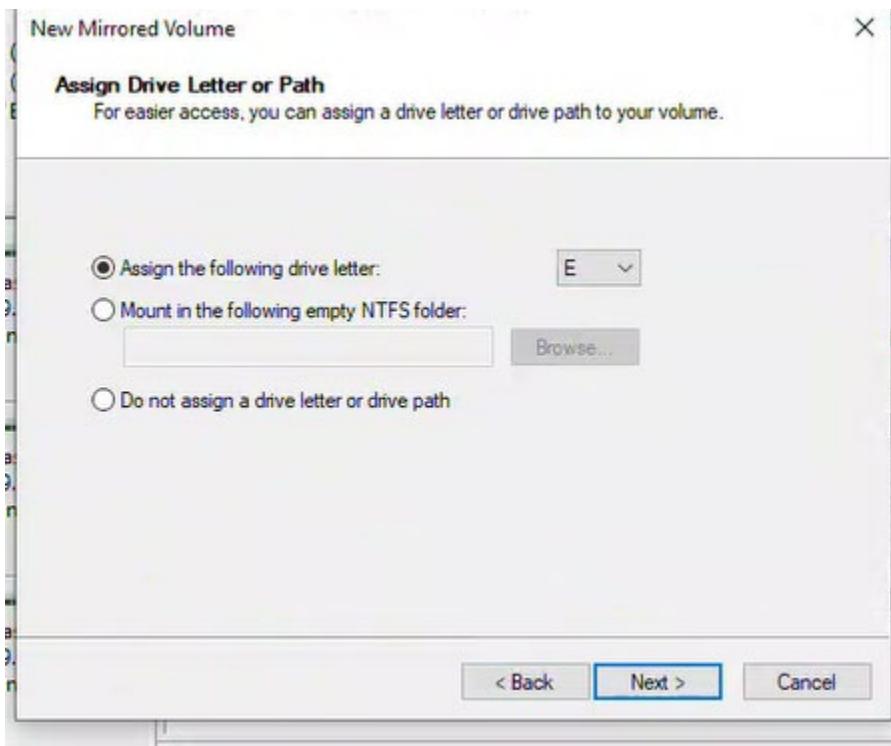
Select the amount of space in MB:

61422

< Back

Next >

Cancel



New Mirrored Volume

X

Completing the New Mirrored Volume Wizard

You have successfully completed the Wizard.

You selected the following settings:

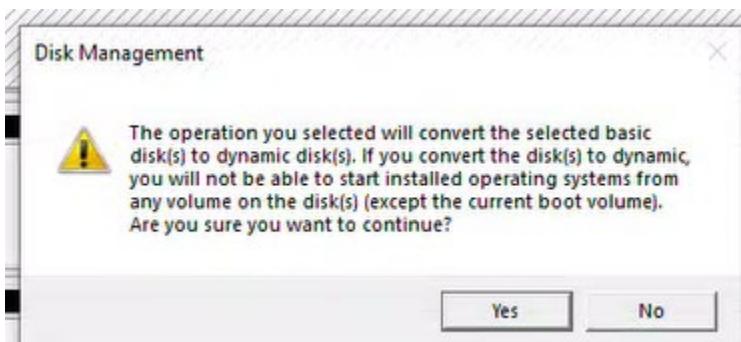
Volume type: Mirror
Disks selected: Disk 1, Disk 2
Volume size: 61422 MB
Drive letter or path: E:
File system: NTFS
Allocation unit size: Default
Volume label: New Volume
Quick format: No

To close this wizard, click Finish.

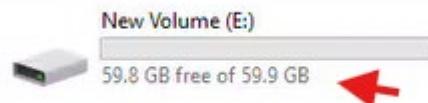
< Back

Finish

Cancel



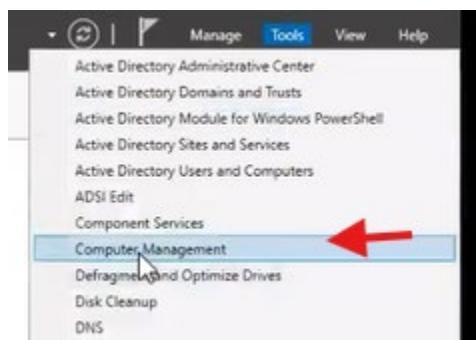
Disk 1	New Volume (E:) 59.98 GB NTFS Healthy
Disk 2	New Volume (E:) 59.98 GB NTFS Healthy
Disk 3	59.98 GB Unallocated



3.14.2.3 RAID 5

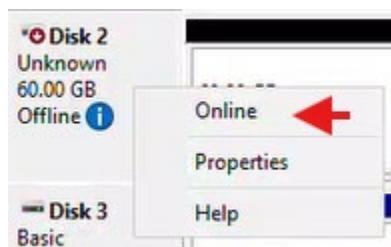
Only for server

Go to Tools / Computer Management

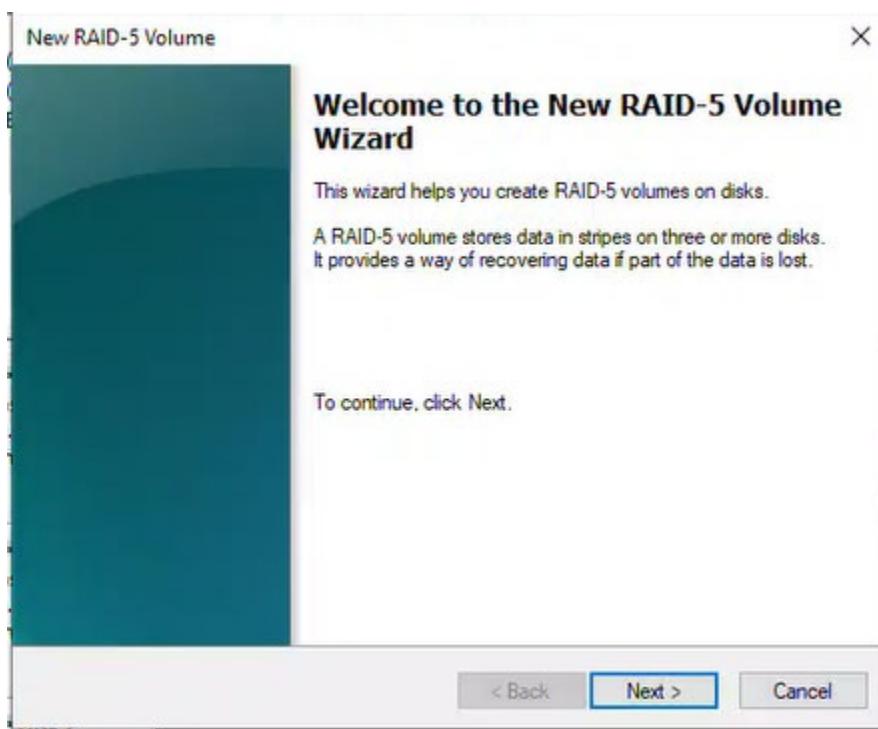
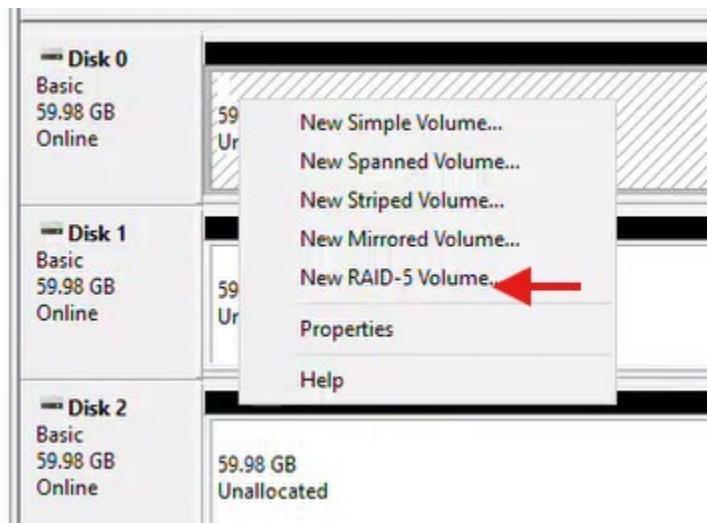


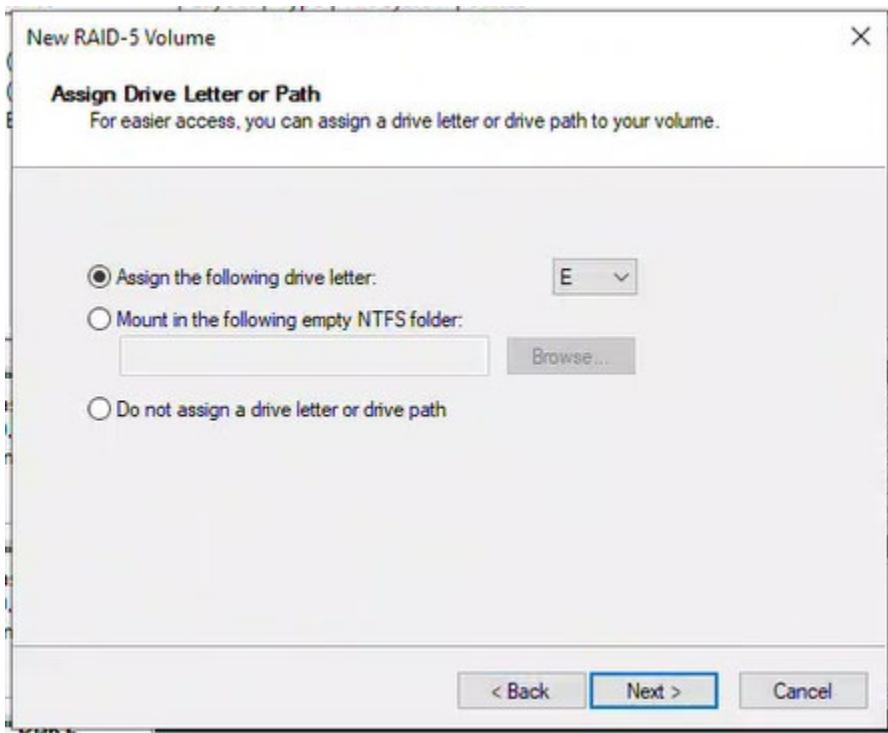
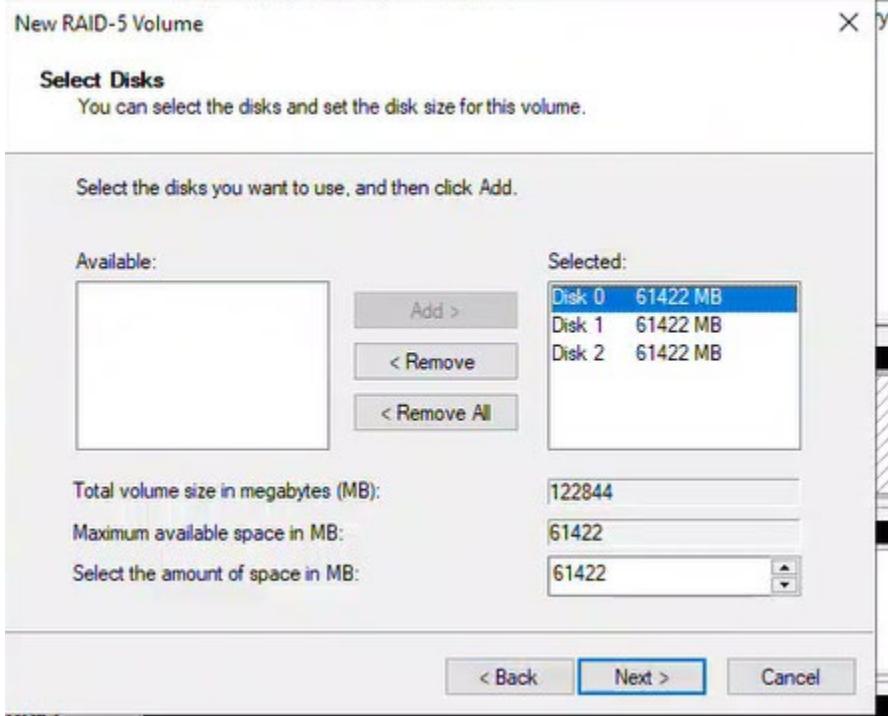
Put disk on line

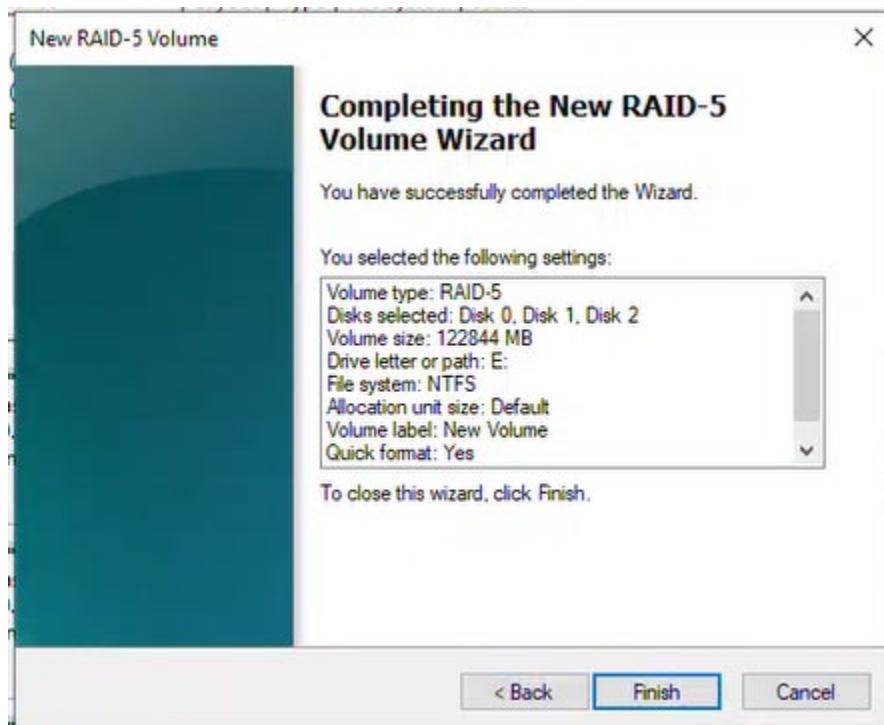
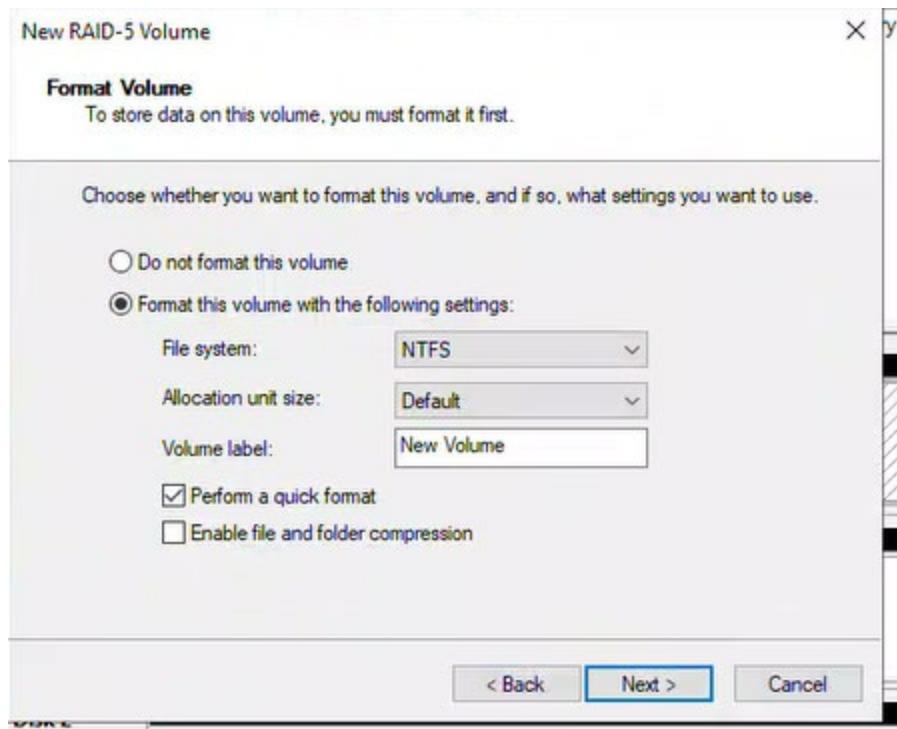
Initialize disk

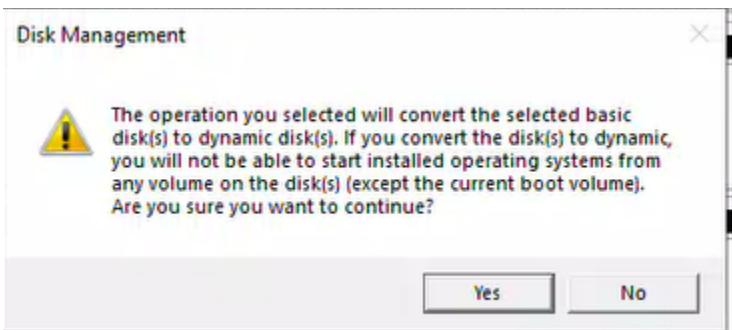


Click on Raid 5









Disk 0 Dynamic 59.98 GB Online	New Volume (E: 59.98 GB NTFS Resyncing : (4%)		
Disk 1 Dynamic 59.98 GB Online	New Volume (E: 59.98 GB NTFS Resyncing : (4%)		
Disk 2 Dynamic 59.98 GB Online	New Volume (E: 59.98 GB NTFS Resyncing : (4%)		
Disk 3 Basic 59.98 GB Online	499 MB Healthy (Recovery Partition)	99 MB Healthy (EFI System Partition)	(C) 59.40 GB NTFS Healthy (Boot, Page File, Crash Dump, Primary Partition)
CD-ROM 0 DVD 4.18 GB Online	ESD-ISO (D: 4.18 GB UDF Healthy (Primary Partition)		

Add All Three and Combine Them

This step involves merging multiple disks using methods such as:

- Spanned Volume – Combines multiple disks into one large volume.
- Striped Volume (RAID 0) – Spreads data across multiple disks for performance.
- Mirrored Volume (RAID 1) – Duplicates data across two disks for redundancy.
- RAID 5/10 (if using dynamic disks) – Provides both redundancy and performance.

3.14.3 CLI - Select Disk create partitions and format

The process involves using Command Prompt to manage disk partitions.

- A) Start by opening diskpart, selecting the target disk and creating a primary partition.
- B) Then, format the partition (format fs=ntfs) and assign a drive letter.
- C) For extended partitions, use create partition extended and create logical partitions inside it.
- D) Format and assign drive letters to logical partitions as needed.

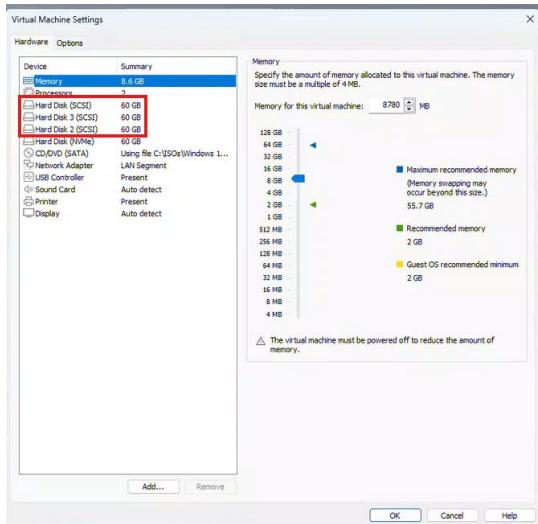
E) Finally, verify the changes in Disk Management.

The following commands are to be used

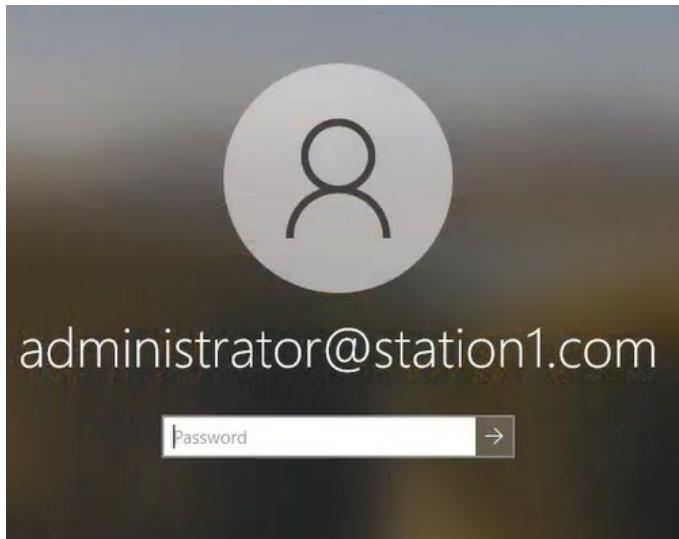
```
help
list disk
select disk #
create partition primary size =#####
list partition
format fs=ntfs
assign letter=g
create partition extended
create partition logical size=##
format fs=ntfs
assign letter=h
```

3.14.3.1 Open diskpart

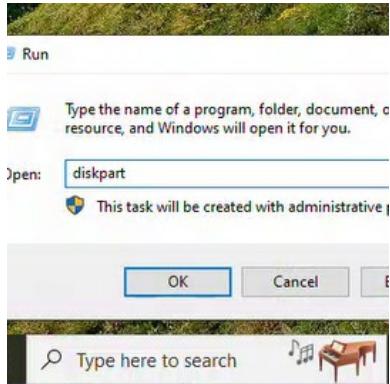
A) Make sure you have 3 disks are created on the VM, if disk do not exit create them



B) Login as administrator in windows 10 machine



- C) On your keyboard, hit the “windows” key, then hit “r” to open the Windows Run, then type in “diskpart”, then click “OK”. You can also access Diskpart by opening the Command Prompt app,



3.14.3.2 Help command

- A) In the disk part exec window type

help

```

Select C:\Windows\system32\diskpart.exe
Copyright (C) Microsoft Corporation.
On computer: WIN10-1A

DISKPART> help

Microsoft DiskPart version 10.0.19041.3636

ACTIVE      - Mark the selected partition as active.
ADD         - Add a mirror to a simple volume.
ASSIGN      - Assign a drive letter or mount point to the selected volume.
ATTRIBUTES   - Manipulate volume or disk attributes.
ATTACH      - Attaches a virtual disk file.
AUTOMOUNT   - Enable and disable automatic mounting of basic volumes.
BREAK       - Break a mirror set.
CLEAN       - Clear the configuration information, or all information, off the
              disk.
COMPACT     - Attempts to reduce the physical size of the file.
CONVERT     - Convert between different disk formats.
CREATE      - Create a volume, partition or virtual disk.
DELETE      - Delete an object.
DETAIL      - Provide details about an object.
DETACH      - Detaches a virtual disk file.
EXIT        - Exit DiskPart.
EXTEND      - Extend a volume.
EXPAND      - Expands the maximum size available on a virtual disk.
FILESYSTEMS - Display current and supported file systems on the volume.
FORMAT      - Format the volume or partition.
GPT         - Assign attributes to the selected GPT partition.
HELP        - Display a list of commands.
IMPORT      - Import a disk group.
INACTIVE    - Mark the selected partition as inactive.
LIST        - Display a list of objects.
MERGE       - Merges a child disk with its parents.
ONLINE      - Online an object that is currently marked as offline.
OFFLINE     - Offline an object that is currently marked as online.
RECOVER     - Refreshes the state of all disks in the selected pack.
              Attempts recovery on disks in the invalid pack, and
              resynchronizes mirrored volumes and RAID5 volumes
              that have stale plex or parity data.
REM         - Does nothing. This is used to comment scripts.
REMOVE     - Remove a drive letter or mount point assignment.
REPAIR      - Repair a RAID-5 volume with a failed member.
RESCAN      - Rescan the computer looking for disks and volumes.
RETAIN     - Place a retained partition under a simple volume.
SAN         - Display or set the SAN policy for the currently booted OS.
SELECT      - Shift the focus to an object.
SETID       - Change the partition type.
SHRINK     - Reduce the size of the selected volume.
UNIQUEID   - Displays or sets the GUID partition table (GPT) identifier or
              master boot record (MBR) signature of a disk.

DISKPART>

```

3.14.3.3 Selecting a Disk

- A) Use the command to see the available disks

list disk

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	60 GB	1024 KB		*
Disk 1	Online	60 GB	59 GB		*
Disk 2	Online	60 GB	59 GB		*
Disk 3	Online	60 GB	59 GB	*	*

- B) See from printout we have 4 disk , one disk previously existed for OS and Three equal size disks created for the exercise.
Use the command **select disk 1** to choose the first disk for the exercise

```
DISKPART> select disk 1  
Disk 1 is now the selected disk.
```

- C) Type **list disk** again to confirm the selected disk (it should have a star next to it).

```
DISKPART> list disk  
  
Disk ### Status Size Free Dyn Gpt  
-----  
* Disk 0 Online 60 GB 1024 KB *  
* Disk 1 Online 60 GB 59 GB *  
Disk 2 Online 60 GB 59 GB *  
Disk 3 Online 60 GB 59 GB * *
```



3.14.3.4 Creating partitions

- A) Creating Partitions:

To create a partition, type **create partition primary size=6000**

```
DISKPART> create partition primary size=6000  
DiskPart succeeded in creating the specified partition.
```

- B) Type **list partition** to confirm the new partition was created.

```
DISKPART> list partition  
  
Partition ### Type Size Offset  
-----  
Partition 1 Reserved 15 MB 17 KB  
* Partition 2 Primary 6000 MB 16 MB
```

- C) Open Disk Management:

- a. Click on the Start button, type “PC”, then search for “This PC”.
 - b. Right-click “This PC” and choose “Manage” to open Disk Management.
 - c. Verify partition is created in disk 1.
- Partition 1: Reserved (15 MB)

- Partition 2: Primary (6000 MB)



- D) Partition 2 is selected for formatting or other operations.

`select partition 2`

```
DISKPART> select partition 2
Partition 2 is now the selected partition.
```

3.14.3.5 Formatting the Partition

- A) Formatting the Partition:

To format the partition, use `format fs=ntfs` (this formats the partition as NTFS).

```
DISKPART> format fs=ntfs
100 percent completed
DiskPart successfully formatted the volume.
```

- B) Assign a drive letter with `assign letter=G` (or another letter if needed).

allowing it to be accessed in the file system.

```
DISKPART> assign letter=G
DiskPart successfully assigned the drive letter or mount point.
```

3.14.3.6 Creating Extended Partitions failed

- A) An attempt to create an extended partition with command `create partition extended` on Disk 1, partition 1, fails (*) because GPT disks do not support extended or logical partitions.

```
DISKPART> select partition 1
Partition 1 is now the selected partition.
DISKPART> create partition extended
Logical and extended partitions cannot be created on a GPT disk.
Instead create primary partitions on a GPT disk.
```

- B) The `clean` command wipes the disk, removing all partitions and data. Disk 1 is now unallocated.

```
DISKPART> select disk 1
Disk 1 is now the selected disk.

DISKPART> clean
DiskPart succeeded in cleaning the disk.

DISKPART> list partition
There are no partitions on this disk to show.
```

3.14.3.7 Create Extended Partition

- A) After cleaning disk, create partition again

- List disk to see what disk is selected

```
list disk
```

1. Disk 0: Online, 60 GB, ~1 MB free
2. Disk 1: Online, 60 GB, ~59 GB free
3. Disk 2: Online, 60 GB, ~59 GB free
4. Disk 3: Online, 60 GB, ~59 GB free

```
DISKPART> list disk
```

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	60 GB	1024 KB	*	
*	Disk 1	Online	60 GB	60 GB	
	Disk 2	Online	60 GB	59 GB	*
	Disk 3	Online	60 GB	59 GB	*

- Creating Partitions:

```
create partition primary size=6000.
```

- Formatting the Partition:

```
format fs=ntfs
```

```
assign letter=G
```

- Verify the partition is created.

```
list partition
```

```
DISKPART> create partition primary size=6000
DiskPart succeeded in creating the specified partition.

DISKPART> format fs=ntfs
100 percent completed

DiskPart successfully formatted the volume.

DISKPART> assign letter=G
DiskPart successfully assigned the drive letter or mount point.

DISKPART> list partition
Partition ###  Type          Size      Offset
-----  -----
* Partition 1  Primary       6000 MB  1024 KB
```

- B) To create an extended partition, type `create partition extended`

```
DISKPART> create partition extended
DiskPart succeeded in creating the specified partition.
```

- C) Use `list partition` to confirm the extended partition appears.

```
DISKPART> list partition
Partition ###  Type          Size      Offset
-----  -----
Partition 1  Primary       6000 MB  1024 KB
* Partition 0  Extended     54 GB   6001 MB
```

3.14.3.8 Create Logical Partition (inside extended partition)

- A) Now, create logical partitions inside the extended partition, format and assign letter by typing the commands:

```
create partition logical size=5000
format fs=nfts
assign letter H
```

```

DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.

DISKPART> format fs=ntfs
    100 percent completed

DiskPart successfully formatted the volume.

DISKPART> assign letter=H
DiskPart successfully assigned the drive letter or mount point.

DISKPART>

```

C) Verify partition is created

`list partition`

```

DISKPART> list partition

  Partition ###  Type          Size      Offset
  -----  -----
  Partition 1  Primary        6000 MB  1024 KB
  Partition 0  Extended       54 GB   6001 MB
* Partition 2  Logical        5000 MB  6002 MB

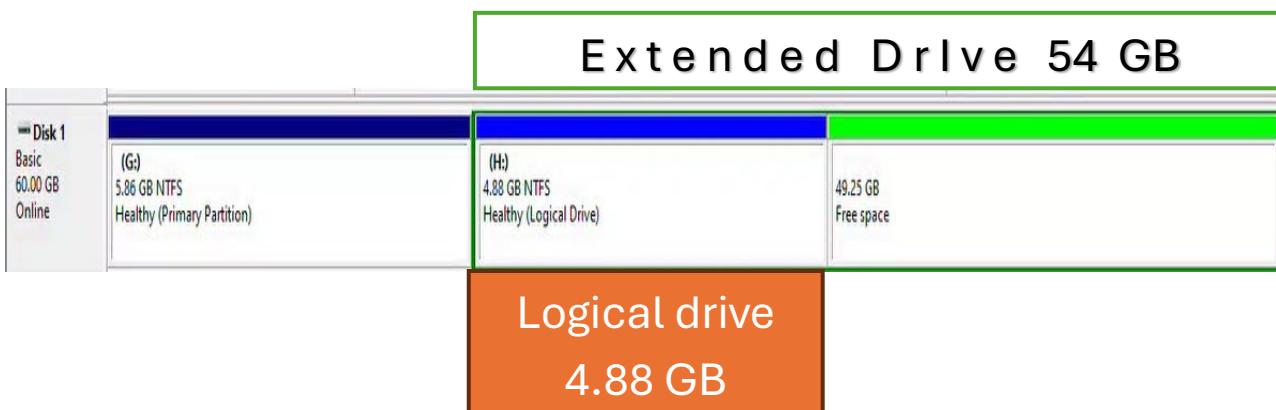
DISKPART> -

```

D) Verify the partition is visible in Disk Management.



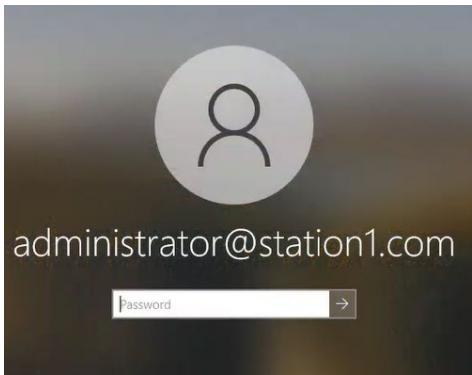
Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free
(C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Basic Data Partition)	59.39 GB	17.60 GB	30 %
(G:)	Simple	Basic	NTFS	Healthy (Primary Partition)	5.86 GB	5.84 GB	100 %
(H:)	Simple	Basic	NTFS	Healthy (Logical Drive)	4.88 GB	4.86 GB	100 %
(Disk 0 partition 1)	Simple	Basic		Healthy (EFI System Partition)	100 MB	100 MB	100 %
(Disk 0 partition 4)	Simple	Basic		Healthy (Recovery Partition)	509 MB	509 MB	100 %
ESD-ISO (D:)	Simple	Basic	UDF	Healthy (Primary Partition)	4.18 GB	0 MB	0 %



3.14.4 CLI - Create Fat32 Partitions and Delete partition

3.14.4.1 Preparation

- A) Login as Administrator in windows 10

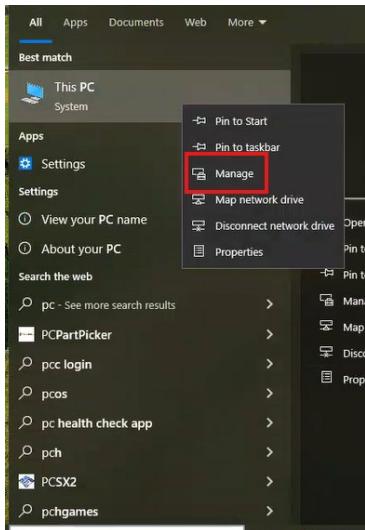


- B) Checking the System and Existing Configuration

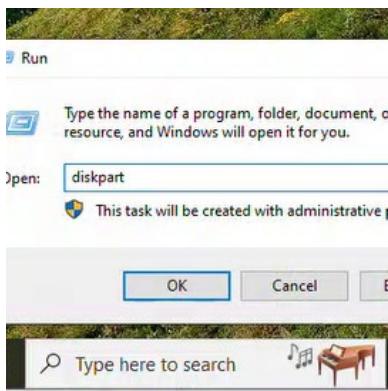
Accesses the "Manage" tool in Windows, which includes the Disk Management Verifies the existing hardware setup, identifying that there is currently only one disk drive available.

- C) Open "My PC" and Manage

Right-clicking on "My PC" (or "This PC" in newer versions of Windows) and selecting Manage opens the Computer Management console, where you can oversee storage, device management, and other system settings.



- D) Open diskpart



3.14.4.2 Commands

Command	Action/Command	Description
List Disks	<i>list disk</i>	Displays all connected disks and their properties.
Select Disk	<i>select disk <disk_number></i>	Selects the disk to work with (e.g., select disk 0).
Create Partition	<i>create partition primary size=<size_in_MB></i>	Creates a primary partition with a specified size.
Format Partition	<i>format fs=ntfs</i> or <i>format fs=fat32</i>	Formats the partition with NTFS or FAT32 file system.
Assign Drive Letter	<i>assign letter=<letter></i>	Assigns a letter (e.g., G) to the partition.
Create Extended Partition	<i>create partition extended</i>	Creates an extended partition if needed.
Create Logical Partition	<i>create partition logical size=<size_in_MB></i>	Creates logical partitions inside the extended partition.
View Partitions	<i>list partition</i>	Lists partitions on the selected disk.
Take Disk Offline	<i>offline disk</i>	Takes the disk offline for maintenance or repair.
Bring Disk Online	<i>online disk</i>	Brings the disk back online after taking it offline.
Delete Partition	<i>delete partition</i>	Deletes the specified partition.
Check Disk Status	<i>list disk</i> or <i>list volume</i>	Verifies the current disk or volume status (e.g., dynamic disk).
Create Simple Volume	<i>create volume simple size=<size_in_MB></i>	Creates a simple volume from the available space.
Format Volume	<i>format fs=ntfs quick</i>	Formats the selected volume with NTFS file system.
Convert to dynamic	<i>convert dynamic</i>	Converts the selected disk to dynamic state.
Create a simple volume	<i>create volume simple size=<size></i>	Creates a simple volume of specified size in MB.
Launch DiskPart	<i>diskpart</i>	Opens DiskPart command-line interface.
Create RAID 5 volume	<i>create volume raid disk=<disks></i>	Creates a RAID 5 volume with specified disks.
Monitor resynchronization	<i>list volume</i>	Lists volumes to monitor RAID 5 resync status.

Format the volume	<code>format quick fs=ntfs label=<label></code>	Formats the volume with NTFS and specified label.
Repair RAID 5 array	<code>repair disk=<disk_number></code>	Repairs the RAID 5 array with the new disk.
Help	<code>help</code>	Displays help

3.14.4.2.1 Selecting and Preparing the Disk

1. Identifying the target disk.
2. Attempting to create a primary partition.
3. Formatting the partition with the NTFS file system.

A) Give the commands described in DISKPART>

DISKPART> list disk

```
DISKPART> list disk

Disk ### Status      Size     Free     Dyn  Gpt
----- -----
Disk 0  Online       60 GB   1024 KB   *    
Disk 1  Online       60 GB   59 GB    *    
Disk 2  Online       60 GB   59 GB    *    
Disk 3  Online       60 GB   59 GB    *    *
```

DISKPART> select disk 1

```
DISKPART> select disk 1

Disk 1 is now the selected disk.

DISKPART> list disk

Disk ### Status      Size     Free     Dyn  Gpt
----- -----
Disk 0  Online       60 GB   1024 KB   *    
* Disk 1  Online       60 GB   59 GB    *    
Disk 2  Online       60 GB   59 GB    *    
Disk 3  Online       60 GB   59 GB    *    *
```

DISKPART> create partition primary size=6000

```
DISKPART> create partition primary size=6000

DiskPart succeeded in creating the specified partition.
```

DISKPART>format fs=ntfs

```
DISKPART> format fs=ntfs
100 percent completed
DiskPart successfully formatted the volume.
```

DISKPART> assign letter=G

```
DISKPART> assign letter=G
DiskPart successfully assigned the drive letter or mount point.
```

DISKPART> list disk

```
DISKPART> list disk
Disk ### Status Size Free Dyn Gpt
----- -----
Disk 0 Online 60 GB 1024 KB * 
* Disk 1 Online 60 GB 54 GB * 
Disk 2 Online 60 GB 59 GB * 
Disk 3 Online 60 GB 59 GB * *
```

DISKPART> create partition extended

```
DISKPART> create partition extended
DiskPart succeeded in creating the specified partition.
```

DISKPART> list partition

```
DISKPART> list partition
Partition ### Type Size Offset
----- -----
Partition 1 Primary 6000 MB 1024 KB
* Partition 0 Extended 54 GB 6001 MB
```

DISKPART> create partition logical size=5000

```
DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.
```

DISKPART> format fs=ntfs

```
DISKPART> format fs=ntfs
100 percent completed
DiskPart successfully formatted the volume.
```

DISKPART> assign letter=H

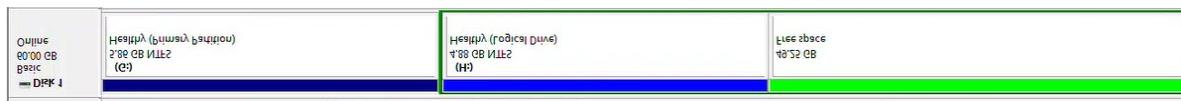
```
DISKPART> assign letter=H
DiskPart successfully assigned the drive letter or mount point.
```

DISKPART> list disk

```
DISKPART> list disk

  Disk ###  Status       Size     Free     Dyn  Gpt
  -----  -----
  Disk 0    Online      60 GB   1024 KB   * 
* Disk 1    Online      60 GB    49 GB
  Disk 2    Online      60 GB    60 GB
  Disk 3    Online      60 GB    60 GB
```

See how disk 1 looks like



3.14.4.2.2 Deleting and Reinitializing:

DISK 2

DISKPART> select disk 2

```
DISKPART> select disk 2  
Disk 2 is now the selected disk.
```

DISKPART> create partition primary

```
DISKPART> create partition primary  
DiskPart succeeded in creating the specified partition.  
DISKPART>
```

DISKPART> format fs=ntfs

```
DISKPART> format fs=ntfs  
100 percent completed  
DiskPart successfully formatted the volume.
```

DISKPART> list partition

```
DISKPART> list partition  
Partition ###  Type          Size     Offset  
-----  -----  
* Partition 1  Primary       59 GB   1024 KB  
DISKPART>
```



Deleting the existing partition.

DISKPART> delete partition

```
DISKPART> delete partition  
DiskPart successfully deleted the selected partition.  
DISKPART>
```

DISKPART> list disk

```
DISKPART> list disk

Disk ### Status Size Free Dyn Gpt
----- -----
Disk 0 Online 60 GB 1024 KB *
Disk 1 Online 60 GB 49 GB
* Disk 2 Online 60 GB 59 GB
Disk 3 Online 60 GB 60 GB

DISKPART>
```

Taking the disk offline and then bringing it back online.

```
DISKPART> offline disk
```

```
DISKPART> offline disk

DiskPart successfully offlined the selected disk.
```

```
DISKPART> list disk
```

```
DISKPART> list disk

Disk ### Status Size Free Dyn Gpt
----- -----
Disk 0 Online 60 GB 1024 KB *
Disk 1 Online 60 GB 49 GB
* Disk 2 Offline 60 GB 59 GB
Disk 3 Online 60 GB 60 GB

DISKPART>
```

```
DISKPART> online disk
```

```
DISKPART> online disk

DiskPart successfully onlined the selected disk.

DISKPART>
```

```
DISKPART> list disk
```

```
DISKPART> list disk

Disk ### Status Size Free Dyn Gpt
----- -----
Disk 0 Online 60 GB 1024 KB *
Disk 1 Online 60 GB 49 GB
* Disk 2 Online 60 GB 59 GB
Disk 3 Online 60 GB 60 GB

DISKPART>
```

```
DISKPART> list partition
```

```
DISKPART> list partition  
There are no partitions on this disk to show.  
DISKPART> _
```



3.14.4.2.3 Creating primary and extended

Creating primary and extended partitions

```
DISKPART> create partition primary size=10000
```

```
DISKPART> create partition primary size=1000  
DiskPart succeeded in creating the specified partition.  
DISKPART> _
```

```
DISKPART> format fs=ntfs
```

```
DISKPART> format fs=ntfs  
100 percent completed  
DiskPart successfully formatted the volume.
```

```
DISKPART> assign letter=I
```

```
DISKPART> assign letter I  
DiskPart successfully assigned the drive letter or mount point.  
DISKPART> _
```

```
DISKPART> create partition extended
```

```
DISKPART> create partition extended  
DiskPart succeeded in creating the specified partition.  
DISKPART> _
```

Creating logical partitions

DISKPART> create partition logical size=5000

```
DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.
DISKPART> _
```

DISKPART> format fs=ntfs

```
DISKPART> format fs=ntfs
100 percent completed
DiskPart successfully formatted the volume.
DISKPART> _
```

DISKPART> assign letter=J

```
DISKPART> assign letter=J
DiskPart successfully assigned the drive letter or mount point.
DISKPART> _
```

DISKPART> create partition logical size=5000

```
DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.
DISKPART> _
```

DISKPART> format fs=fat32

```
DISKPART> format fs=fat32
100 percent completed
DiskPart successfully formatted the volume.
DISKPART> _
```

DISKPART> assign letter=K

```
ISKPART> assign letter K
iskPart successfully assigned the drive letter or mount point
ISKPART> -
```

DISKPART> list partition

```
DISKPART> list partition

Partition ###  Type          Size      Offset
-----  -----
Partition 1   Primary       1000 MB  1024 KB
Partition 0   Extended      59 GB   1001 MB
Partition 2   Logical       5000 MB  1002 MB
* Partition 3  Logical       5000 MB  6003 MB

DISKPART> -
```

DISKPART> create partition logical size=5000

```
DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.
DISKPART> -
```

DISKPART> format fs=ntfs label="5gb ntfs" quick

```
DISKPART> create partition logical size=5000
DiskPart succeeded in creating the specified partition.
DISKPART> format fs=ntfs label="5g ntfs" quick
    100 percent completed
DiskPart successfully formatted the volume.
DISKPART> -
```

DISKPART> assign letter=L

```
DISKPART> assign letter L
DiskPart successfully assigned the drive letter or mount point.
DISKPART> -
```

DISKPART> list partition

```
DISKPART> list partition

  Partition ###  Type          Size     Offset
  -----
  Partition 1   Primary       1000 MB  1024 KB
  Partition 0   Extended      59 GB    1001 MB
  Partition 2   Logical       5000 MB  1002 MB
  Partition 3   Logical       5000 MB  6003 MB
* Partition 4   Logical       5000 MB  10 GB

DISKPART>
```

DISKPART> select partition 0

```
DISKPART> select partition 0

Partition 0 is now the selected partition.
```

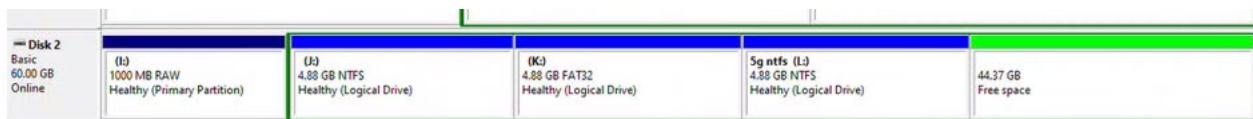
DISKPART> list partition

```
DISKPART> list partition

  Partition ###  Type          Size     Offset
  -----
  Partition 1   Primary       1000 MB  1024 KB
* Partition 0   Extended      59 GB    1001 MB
  Partition 2   Logical       5000 MB  1002 MB
  Partition 3   Logical       5000 MB  6003 MB
  Partition 4   Logical       5000 MB  10 GB

DISKPART>
```

The disk 2 and partitions look like this



Disk 1 and disk 2



3.14.4.2.4 Delete extended partition (logical partitions need to be deleted first)

All logical partitions within an extended partition needs to be deleted before deleting the extended partition itself.

DISKPART> delete partition

```
DISKPART> delete partition  
Virtual Disk Service error:  
The extended partition is not empty.  
  
DISKPART> -
```

DISKPART> select partition 4

```
DISKPART> select partition 4  
Partition 4 is now the selected partition.
```

DISKPART> delete partition

```
DISKPART> delete partition  
DiskPart successfully deleted the selected partition.
```

DISKPART> select partition 3

```
DISKPART> select partition 3  
Partition 3 is now the selected partition.
```

DISKPART> delete partition

```
DISKPART> delete partition  
DiskPart successfully deleted the selected partition.
```

DISKPART> select partition 2

```
DISKPART> select partition 2  
Partition 2 is now the selected partition.
```

DISKPART> delete partition

```
DISKPART> delete partition  
DiskPart successfully deleted the selected partition.
```

DISKPART> select partition 0

```
DISKPART> select partition 0  
Partition 0 is now the selected partition.
```

DISKPART> delete partition

```
DISKPART> delete partition  
DiskPart successfully deleted the selected partition.
```

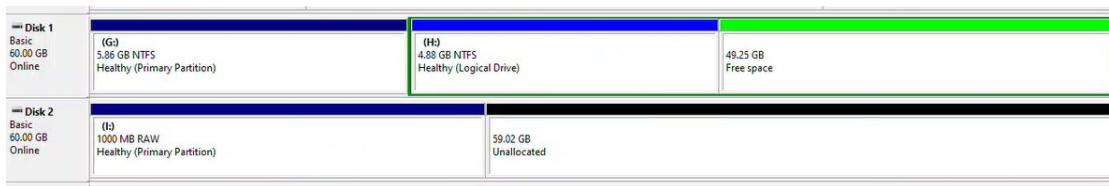
DISKPART> list partition

```
DISKPART> list partition  


| Partition # | Type    | Size    | Offset  |
|-------------|---------|---------|---------|
| Partition 1 | Primary | 1000 MB | 1024 KB |

  
DISKPART>
```

See now only primary partition exist for disk 2



3.14.5 CLI - Raid 1 Select volume and format drive assign Drive Letter

RAID 1 utilizes disk mirroring, which creates copies of the same file for storage. In RAID 1, the original file is stored on one disk drive, and identical copies of the file are stored on the other disk drives in the array. As a result, RAID 1 produces disk drives that are mirrored copies of each other.

A) Type the command to list all disks:

```
DISKPART> list disk
```

We notice disks 0, 1, and 2. We're going to work with one of them.

```
DISKPART> list disk  


| Disk #   | Status | Size  | Free    | Dyn | Gpt |
|----------|--------|-------|---------|-----|-----|
| Disk 0   | Online | 60 GB | 1024 KB |     | *   |
| Disk 1   | Online | 60 GB | 60 GB   |     |     |
| Disk 2   | Online | 60 GB | 60 GB   |     |     |
| * Disk 3 | Online | 60 GB | 60 GB   |     |     |


```

B) Select disk 2, which should be currently in a dynamic state.

```
DISKPART> select disk 2
```

```
| DISKPART> select disk 2  
| Disk 2 is now the selected disk.
```

If disk not in dynamic state convert it to dynamic

```
DISKPART> convert to dynamic
```

```
| DISKPART> convert dynamic  
| Selected disk is already a dynamic disk.
```

C) Select Volume: Now, let's try selecting volume 1:

```
DISKPART> select volume 1
```

However, there is no volume selected yet, so we need to create one.

D) Create a Simple Volume: Create a simple volume with a size of 100 MB by typing:

```
DISKPART> select disk 2
```

```
| Please specify a dynamic disk and try again.  
|  
| DISKPART> select disk 2  
| Disk 2 is now the selected disk.
```

```
DISKPART> create volume simple size=100
```

```
| DISKPART> create volume simple size=100  
| DiskPart successfully created the volume.
```

E) List Volumes: To see the new volume, type:

Now you can see the volume listed. We can select it if needed (although it's already selected).

```
DISKPART> list volume
```

```
| DISKPART> list volume  
  
|   Volume ###  Ltr  Label          Fs      Type        Size    Status     Info  
|   -----  ---  -----  -----  -----  -----  -----  
|   Volume 0    D    ESD-ISO      UDF    DVD-ROM    4285 MB  Healthy  
|   Volume 1    C            NTFS    Partition    59 GB  Healthy  Boot  
|   Volume 2          FAT32    Partition    100 MB  Healthy  System  
|   Volume 3          NTFS    Partition    509 MB  Healthy  Hidden  
| * Volume 4          RAW     Simple     100 MB  Healthy
```

F) Check Dynamic Disk Status: To confirm the disk is dynamic, type and check that it lists as "dynamic."

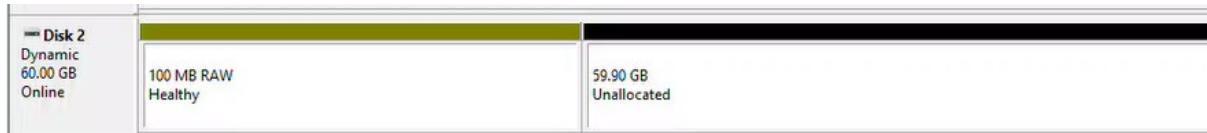
DISKPART> list disk

```
DISKPART> list disk

  Disk ###  Status       Size     Free   Dyn  Gpt
  -----  -----
  Disk 0    Online      60 GB   1024 KB   *
  Disk 1    Online      60 GB   60 GB
* Disk 2    Online      60 GB   59 GB   *
  Disk 3    Online      60 GB   60 GB

DISKPART>
```

G) Check in GUI: Open the GUI to verify the volume. You'll see a "Healthy Mirrored Volume."



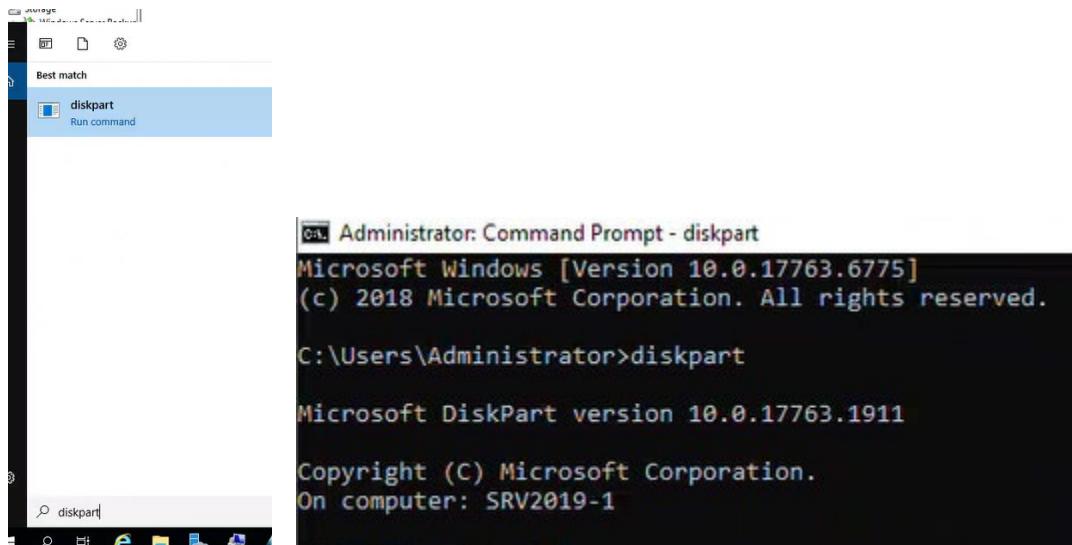
3.14.6 CLI - RAID 5 and Disk Striping

SERVER

3.14.6.1 RAID 5

A) Launch DiskPart

- Open the command prompt or Run dialog.
- Type `diskpart` and press **Enter**.
- The DiskPart command-line interface will appear with the `DISKPART>` prompt.

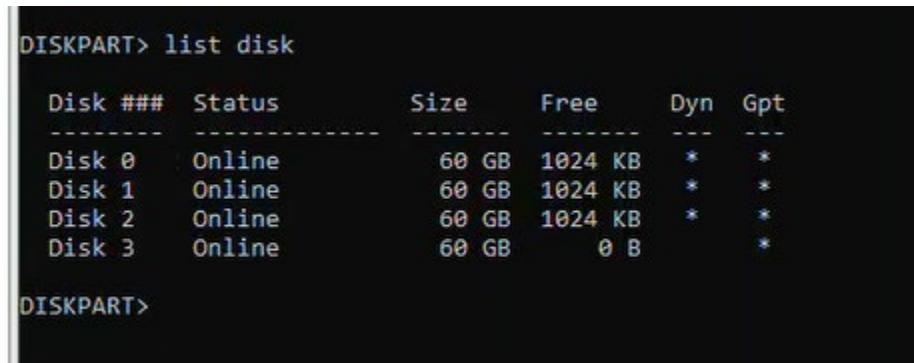


H) List Available Disks

Use the `list disk` command to display all attached disks.

```
DISKPART> list disk
```

Example output:



```
DISKPART> list disk

  Disk ###  Status     Size      Free      Dyn  Gpt
  -----  -----  -----  -----  -----  -----
  Disk 0  Online    60 GB  1024 KB   *    *
  Disk 1  Online    60 GB  1024 KB   *    *
  Disk 2  Online    60 GB  1024 KB   *    *
  Disk 3  Online    60 GB      0 B    *    *

DISKPART>
```

Identify the disks to be used for the RAID 5 configuration (e.g., Disk 0, Disk 1, Disk 2).

I) Convert Disks to Dynamic

- Each disk must be converted to a **dynamic disk** to support RAID 5.
- Select and convert each disk individually:

```
DISKPART> select disk 0
DISKPART> convert dynamic
```

Repeat for Disk 1 and Disk 2:

```
DISKPART> select disk 1
DISKPART> convert dynamic
```

```
DISKPART> select disk 2
DISKPART> convert dynamic
```

DiskPart will confirm successful conversion for each disk.

```
DISKPART> select disk 0
Disk 0 is now the selected disk.

DISKPART> convert dynamic
DiskPart successfully converted the selected disk to dynamic format.

DISKPART> select disk 1
Disk 1 is now the selected disk.

DISKPART> convert dynamic
DiskPart successfully converted the selected disk to dynamic format.

DISKPART> select disk 2
Disk 2 is now the selected disk.

DISKPART> convert dynamic
DiskPart successfully converted the selected disk to dynamic format.

DISKPART>
```

J) Create RAID 5 Volume

- Use the `create volume raid` command to build the RAID 5 array.
- Specify the disks to include in the array:

```
DISKPART> create volume raid disk=0,1,2
```

DiskPart will create the RAID 5 volume and display a success message.

```
DISKPART> create volume raid disk=0,1,2
DiskPart successfully created the volume.

DISKPART> -
```

K) Monitor Resynchronization

- After creation, the RAID 5 volume begins a resync process.
- Use `list volume` to monitor its status:

```
DISKPART> list volume
```

Example output during resync:

Wait for the status to change to **Healthy** once the resync completes.

```

DISKPART> list volume

  Volume ###  Ltr  Label        Fs     Type      Size    Status     Info
  -----  ---  ----        --     --       --     --     --
* Volume 0          RAW   RAID-5     119 GB  Healthy
Volume 1          D    ESD-ISO    UDF   DVD-ROM   4285 MB  Healthy
Volume 2          C    Recovery    NTFS  Partition  59 GB   Healthy  Boot
Volume 3          Recovery    NTFS  Partition  499 MB   Healthy  Hidden
Volume 4          FAT32 Partition  99 MB   Healthy  System

DISKPART>

```

L) Format the Volume

Format the RAID 5 volume using NTFS and assign a label:

```
DISKPART> format quick fs=ntfs label="RAID 5 Vol"
```

To speed up formatting, use:

```
DISKPART> format quick
```

```

DISKPART> format fs=ntfs label "RAID 5 Vol"
  - 1 percent completed

```

```

DISKPART> format fs=ntfs label "RAID 5 Vol"
  100 percent completed
DiskPart successfully formatted the volume.

DISKPART>

```

M) List volume

```

DISKPART> list volume

  Volume ###  Ltr  Label        Fs     Type      Size    Status     Info
  -----  ---  ----        --     --       --     --     --
* Volume 0          RAID 5 Vol  NTFS  RAID-5     119 GB  Healthy
Volume 1          D    ESD-ISO    UDF   DVD-ROM   4285 MB  Healthy
Volume 2          C    Recovery    NTFS  Partition  59 GB   Healthy  Boot
Volume 3          Recovery    NTFS  Partition  499 MB   Healthy  Hidden
Volume 4          FAT32 Partition  99 MB   Healthy  System

DISKPART> -

```

Disk 0 Dynamic 60.00 GB Online	60.00 GB Formatting : (96%)		
Disk 1 Dynamic 60.00 GB Online	60.00 GB Formatting : (96%)		
Disk 2 Dynamic 60.00 GB Online	60.00 GB Formatting : (96%)		
Disk 3 Basic 59.98 GB Online	499 MB Healthy (Recovery Partition)	99 MB Healthy (EFI System Partition)	(C) 59.40 GB NTFS Healthy (Boot,
@see notes			

Disk 0 Dynamic 60.00 GB Online	RAID 5 Vol 60.00 GB NTFS Healthy
Disk 1 Dynamic 60.00 GB Online	RAID 5 Vol 60.00 GB NTFS Healthy
Disk 2 Dynamic 60.00 GB Online	RAID 5 Vol 60.00 GB NTFS Healthy

N) Assign a drive letter

DISKPART> assign letter=E

```
DISKPART> assign letter E
DiskPart successfully assigned the drive letter or mount point.
```

The volume is now ready for use.

Disk 0 Dynamic 60.00 GB Online	RAID 5 Vol (E:) 60.00 GB NTFS Healthy
Disk 1 Dynamic 60.00 GB Online	RAID 5 Vol (E:) 60.00 GB NTFS Healthy
Disk 2 Dynamic 60.00 GB Online	RAID 5 Vol (E:) 60.00 GB NTFS Healthy

NOTE Replacing a Failed Disk in RAID 5

If a disk in the RAID 5 array fails:

1. Replace the failed disk with a new one of equal or greater capacity.
2. Convert the new disk to dynamic:

```
DISKPART> select disk 2
DISKPART> convert dynamic
```

3. Repair the RAID 5 array by adding the new disk:

```
DISKPART> repair disk=2
```

The RAID 5 volume status will display **Regenerating** during reconstruction. Once complete, the status will change to **Healthy**.

3.14.6.2 Stripping

The commands below demonstrate the process of creating a striped volume using three disks in DiskPart. This involves converting the disks to dynamic, creating the striped volume, and then formatting and assigning a drive letter to the volume.

Striped volumes improve performance but can be less fault-tolerant than other dynamic volume types. If one of the disks fails, data on the entire striped volume can become inaccessible.

It's crucial to back up data before performing any disk operations, as they can potentially lead to data loss.

- A) List disk

```
DISKPART> list disk
```

```
DISKPART> list disk
```

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	60 GB	60 GB		
Disk 1	Online	60 GB	60 GB		
* Disk 2	Online	60 GB	60 GB		
Disk 3	Online	60 GB	0 B		*

B) Selecting and Converting Disks to Dynamic

```
DISKPART> select disk 0
```

```
DISKPART> convert dynamic
```

```
DISKPART> select disk 0
Disk 0 is now the selected disk.

DISKPART> convert dynamic
DiskPart successfully converted the selected disk to dynamic format.

DISKPART> select disk 2
```

```
DISKPART> select disk 1
```

```
DISKPART> convert dynamic
```

```
DISKPART> select disk 1
Disk 1 is now the selected disk.
```

```
DISKPART> convert dynamic
```

```
DiskPart successfully converted the selected disk to dynamic format.
```

```
DISKPART> select disk 2
```

```
DISKPART> convert dynamic
```

```
DISKPART> select disk 2
```

```
Disk 2 is now the selected disk.
```

```
DISKPART> convert dynamic
```

```
DiskPart successfully converted the selected disk to dynamic format.
```

C) List disk

```
DISKPART> list disk
```

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	60 GB	0 B	*	
Disk 1	Online	60 GB	0 B	*	
* Disk 2	Online	60 GB	0 B	*	
Disk 3	Online	60 GB	0 B		*

D) Create a striped volume using disks 0, 1, and 2.

Striped volumes distribute data across multiple disks, improving performance by allowing reads and writes to happen in parallel.

```
DISKPART> create volume stripe disk=0,1,2
```

```
DISKPART> create volume stripe disk=0,1,2
```

```
DiskPart successfully created the volume.
```

E) List disk

```
DISKPART> list disk
```

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	60 GB	0 B	*	
Disk 1	Online	60 GB	0 B	*	
* Disk 2	Online	60 GB	0 B	*	
Disk 3	Online	60 GB	0 B		*

F) Format

```
DISKPART> format fs=ntfs quick
```

```
DISKPART> format fs=ntfs quick
```

```
100 percent completed
```

```
DiskPart successfully formatted the volume.
```

G) Assign the drive letter "E" to the striped volume, making it accessible in Windows Explorer.

```
DISKPART> assign letter=E
```

```
DISKPART> assign letter E
```

```
DiskPart successfully assigned the drive letter or mount point.
```

```
DISKPART> -
```

H) See disk Management showing stripped disk

Disk 0 Dynamic 60.00 GB Online	(E) 60.00 GB NTFS Healthy
Disk 1 Dynamic 60.00 GB Online	(E) 60.00 GB NTFS Healthy
Disk 2 Dynamic 60.00 GB Online	(E) 60.00 GB NTFS Healthy