A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green color. They are positioned diagonally, with the blue one in front of the green one.

Team Task: Server VM

By: Carlos Gerez Garcia, Christopher Ditto,
and Mark Riley Slik

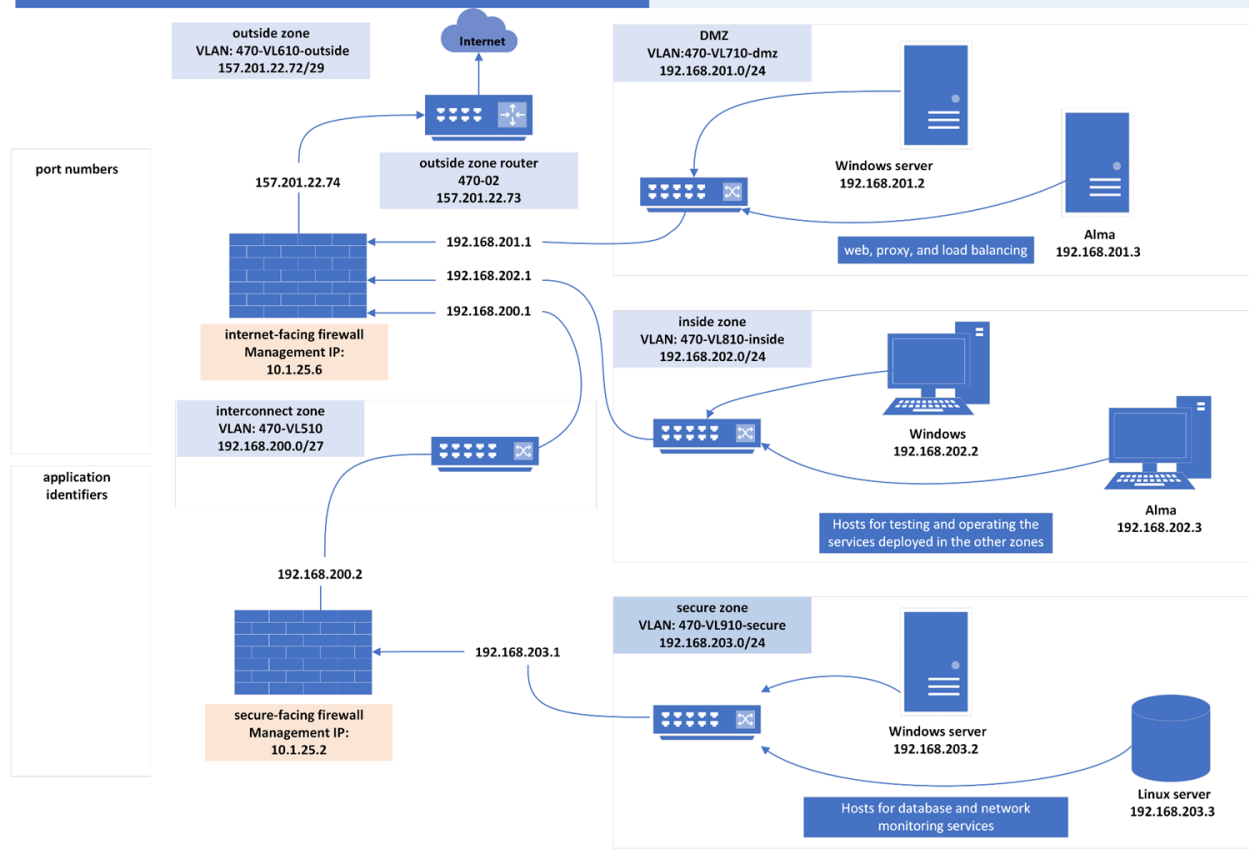
cit470

Task: Diagram

Team 10 Layer 3: outside zones' public IPv4 address assignments

public space (IPv4 subnet ID)	router	firewall (dynamic NAT)	static NAT	(broadcast)
157.201.22.72/29	157.201.22.73	157.201.22.74 470t10ra.cit.byui.edu	157.201.22.75- 157.201.22.78	157.201.22.79

Diagram Outline for Team 10





Zone Information



Secure Zone

Vlan: 470-VL910-secure

192.168.203.0/24

Gateway 192.168.203.1

Windows server 192.168.203.2

Linux server 192.168.203.3



Inside Zone

Vlan: 470-VL910-secure

192.168.202.0/24

Gateway 192.168.202.1

Windows server 192.168.202.2

Alma server 192.168.202.3



DMZ

Vlan: 470-VL910-dmz

192.168.201.0/24

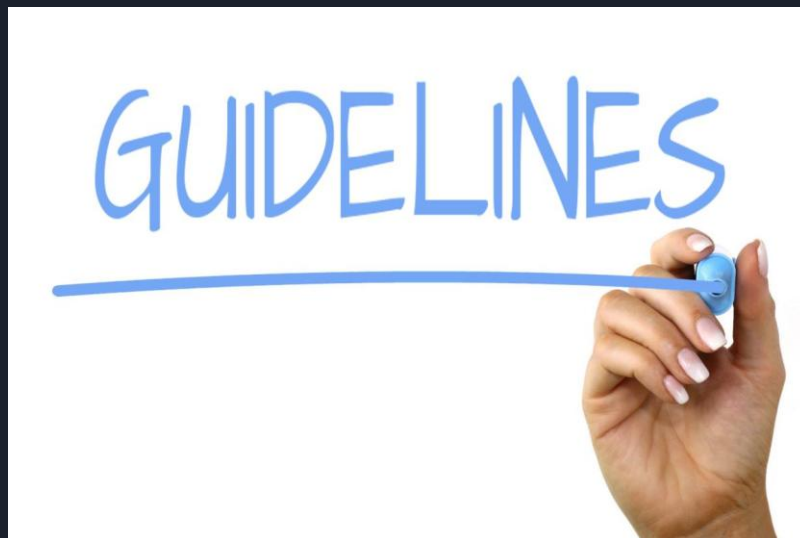
Gateway 192.168.201.1

Windows server 192.168.201.2

Alma server 192.168.201.3

Startup

The following instructions work for any zone, but in our examples we are setting up a Secure zone with the exception of the Alma server which is setup in a different zone. These instructions work for any zone you just need to add in your own info.

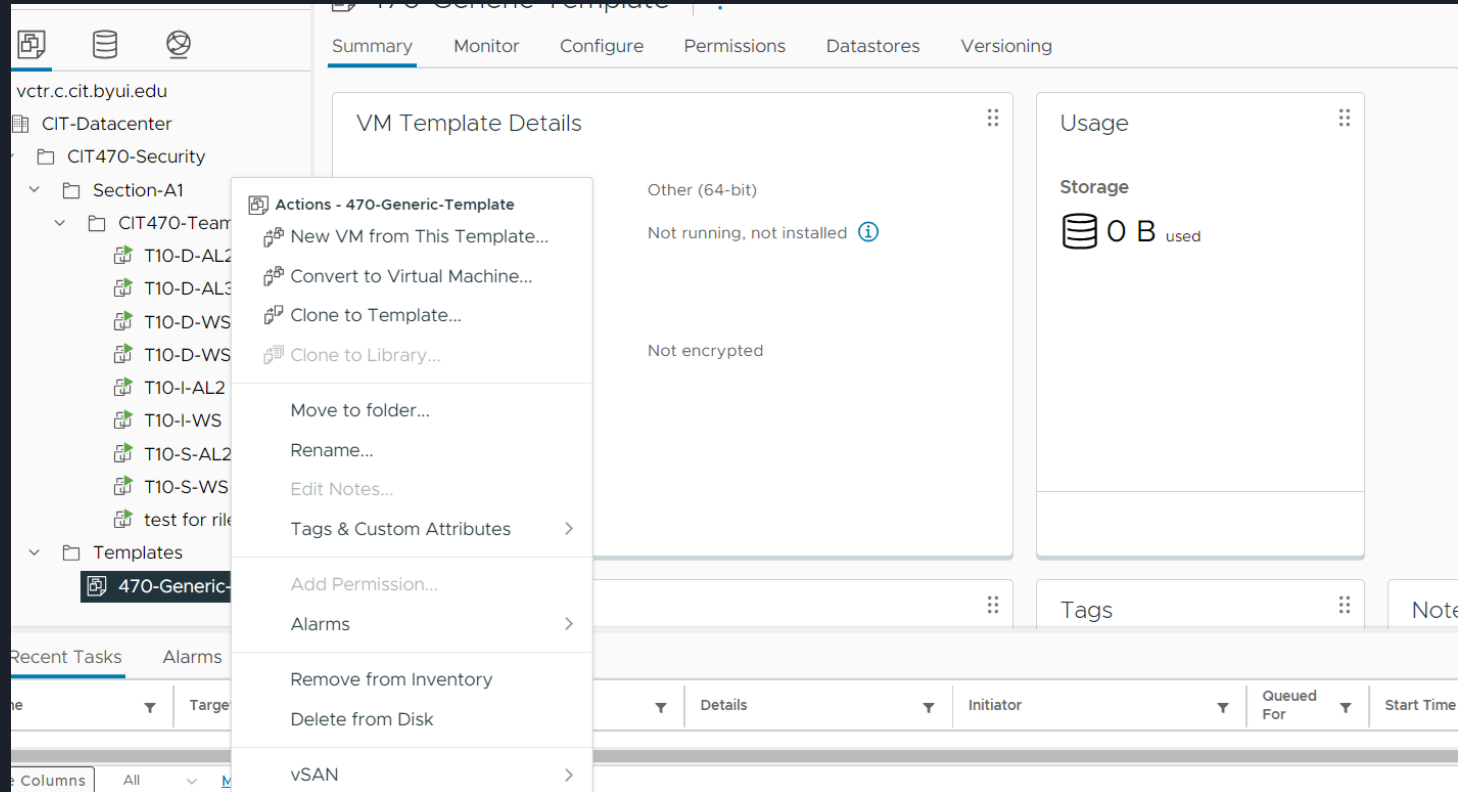


A decorative graphic on the left side of the slide. It consists of a blue parallelogram and a light green parallelogram, both tilted at an angle. The blue shape is in the foreground, and the green shape is partially behind it. They are set against a dark blue background with diagonal stripes.

How to Setup a Windows Server

Step 1. Startup select

Inside of Vsphere right click the 470-Generic-Template and choose new Vm from this Template



Step 2. Location and name

Choose your teams section inside of class of CIT 470. You must also name the VM as well make sure to agree with team before on a name scheme used for these server like T10-S-WS

470-Generic-Template - Deploy From Template

1 Select a name and folder

2 Select a compute resource

3 Select storage

4 Select clone options

5 Ready to complete

Select a name and folder

Specify a unique name and target location

Virtual machine name:

Select a location for the virtual machine.

▼

vctr.c.it.byui.edu

▼

▼

CIT-Datacenter

▼

▼

CIT470-Security

▼

▼

Section-A1

▼

▼

CIT470-Team10

▼

▼

Templates

CANCEL

NEXT

Target	Status	Details	Initiator	Queued	Start Time	Completion
--------	--------	---------	-----------	--------	------------	------------

Step 3.Resource Allocation

The next step is select where the VM will pull resources from. Please make sure to select your correct class.

470-Generic-Template - Deploy From Template

1 Select a name and folder

2 Select a compute resource

3 Select storage

4 Select clone options

5 Ready to complete

Select a compute resource

Select the destination compute resource for this operation

10.11.175.104

10.11.175.109

10.11.175.110

10.11.175.111

> Azure-Arc

> CIT-151

> CIT-225

> CIT-326

> CIT-353

> CIT-470

Compatibility

✓ Compatibility checks succeeded.

CANCEL

BACK

NEXT

Step 4. Clone options

In this step you need to select **Customize this virtual machines hardware** so we can ensure it has the proper settings.

470-Generic-Template - Deploy From Template

1 Select a name and folder

2 Select a compute resource

3 Select storage

4 Select clone options

5 Customize hardware

6 Ready to complete

Select clone options

Select further clone options

☐ Customize the operating system

☒ Customize this virtual machine's hardware

☐ Power on virtual machine after creation

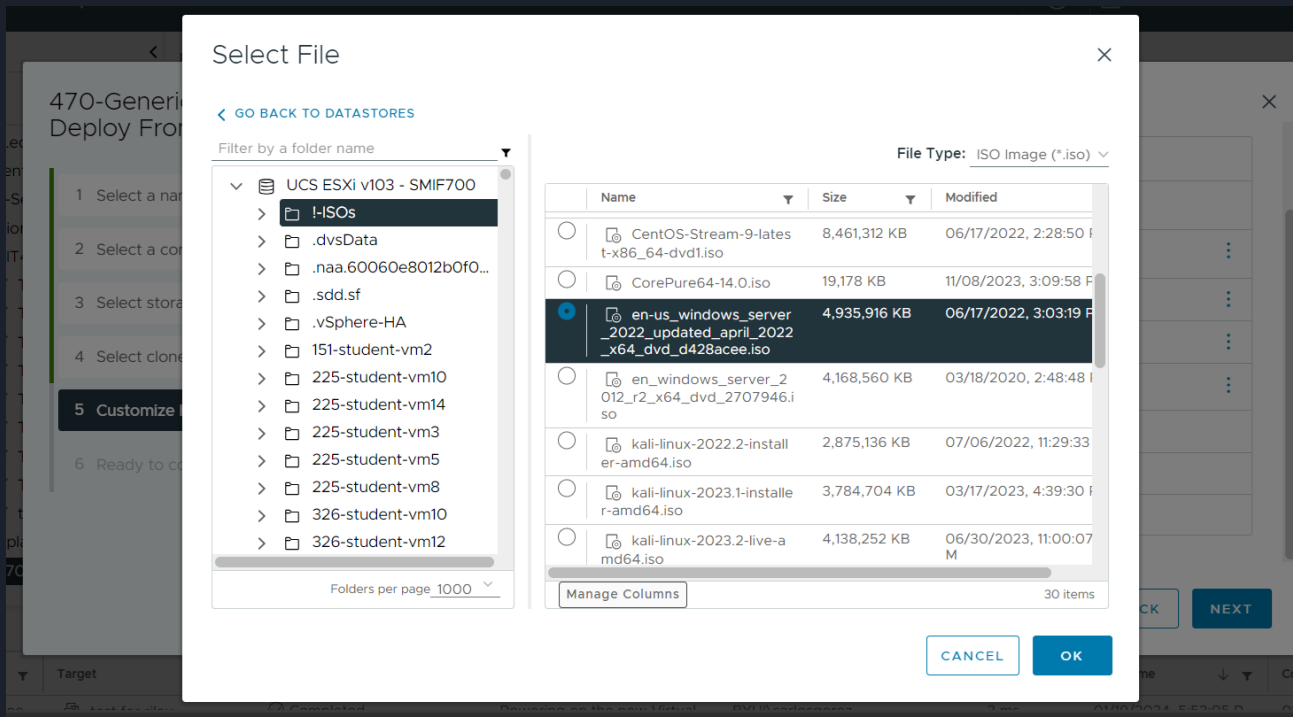
CANCEL

BACK

NEXT

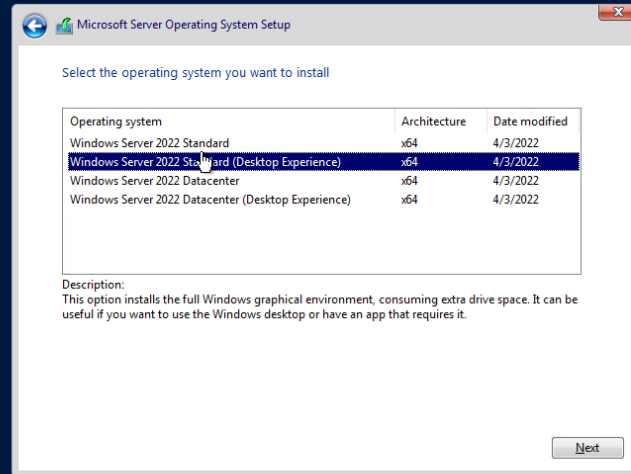
Step 5. ISO selection and other settings

After allowing the VM to be customized you will be shown screen with many different options. There are only three sections you need to worry about the SCSI controller needs to be selected as "LSI Logic SAS," the network adapter needs to be selected as "VMXNET3," and finally ISO for your machine, there are many options you can browse inside the CD/DVD media but in this example we select the 2022 windows server.



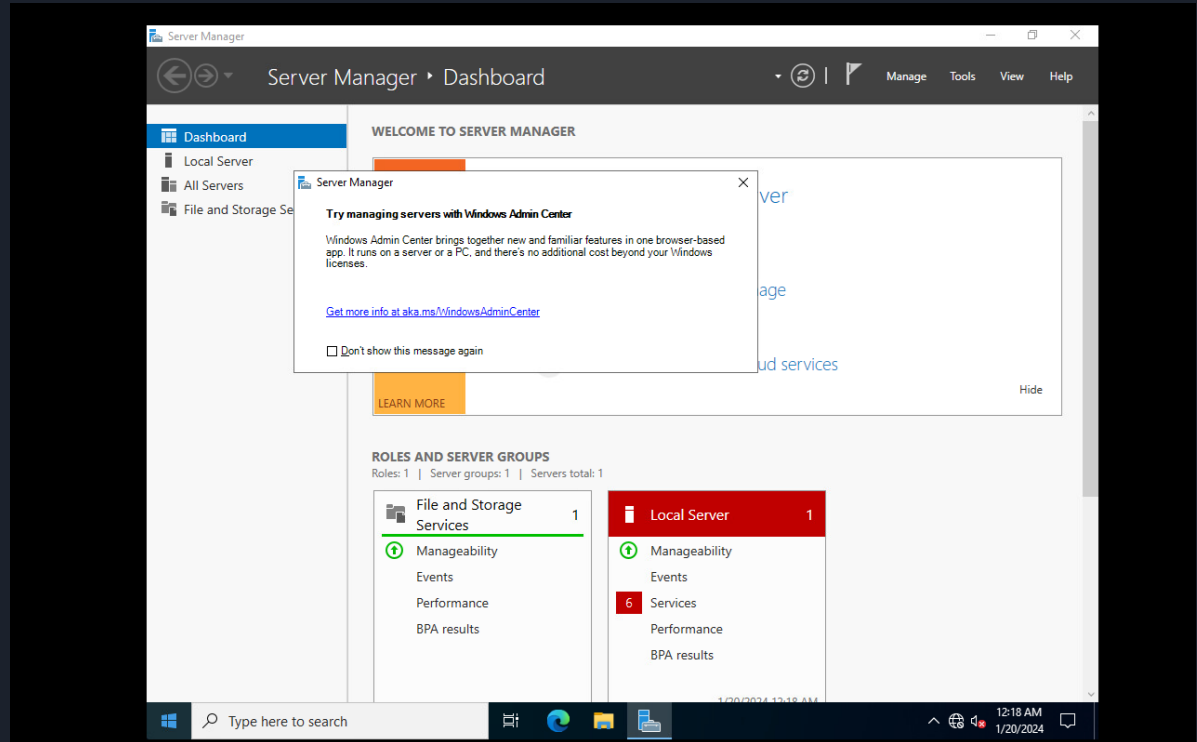
Step 6. Installing the OSI

Power on the newly made VM and start the install process. Follow the prompts until you get to the window asking for a product key, select I don't have a product key. This will take you too system setup window. You most choose which version of windows server 2022 you are going to install, select the standard desktop experience.



Step 7. Finish install

After choosing the version of windows server 2022 you need to accept the terms and condition and select custom install for how you wish to install this OSI. After all this you will finally be able to make an admin account and get into the OSI once you do you should locate the server manager.



Step 8A. Server Manager

Select Local Server and disable and enable these setting. Allow Remote connections but turn off network level authentication. Next disable IE enhanced security

The screenshot displays the Windows Server Manager interface. The left-hand navigation pane shows the 'Local Server' icon selected. The main area is titled 'PROPERTIES For WIN-JVP2MS9N77U'. It contains a list of system settings with their current status and links to manage them. Below this, the 'EVENTS' section shows a list of recent system events.

Setting	Current Status	Action Link
Computer name	WIN-JVP2MS9N77U	
Workgroup	WORKGROUP	
Microsoft Defender Firewall	Public: On	
Remote management	Enabled	
Remote Desktop	Disabled	
NIC Teaming	Disabled	
Ethernet0	IPv4 address assigned by DHCP, IPv6 enabled	
Microsoft Defender Antivirus	Real-Time Protection	Settings
Feedback & Diagnostics	On	
IE Enhanced Security Configuration	On	
Time zone	(UTC-08:00) Pacific	
Product ID	Not activated	
Operating system version	Microsoft Windows Server 2022 Standard	
Hardware information	VMware, Inc. VMware7,1	
Processors	Intel(R) Xeon(R) Co	
Installed memory (RAM)	4 GB	
Total disk space	95.36 GB	

Server Name	ID	Severity	Source	Log	Date and Time
WIN-JVP2MS9N77U	8198	Error	Microsoft-Windows-Security-SPP	Application	1/20/2024 12:18:37 AM
WIN-JVP2MS9N77U	10016	Warning	Microsoft-Windows-DistributedCOM	System	1/20/2024 12:18:37 AM
WIN-JVP2MS9N77U	7030	Error	Microsoft-Windows-Service Control Manager	System	1/20/2024 12:18:33 AM

Step 8B.

The screenshot shows the Windows Server Manager interface with the 'System Properties' dialog box open. The 'Remote' tab is selected, and the 'Remote Desktop' section is expanded. The 'Allow remote connections to this computer' radio button is selected, and the checkbox for 'Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)' is checked. The 'OK' button is highlighted.

System Properties - Remote Tab

Remote Assistance

☐ Allow Remote Assistance connections to this computer

Remote Desktop

Choose an option, and then specify who can connect.

☐ Don't allow remote connections to this computer

☒ Allow remote connections to this computer

☒ Allow connections only from computers running Remote Desktop with Network Level Authentication (recommended)

[Help me choose](#) [Select Users...](#)

Server Manager - Local Server

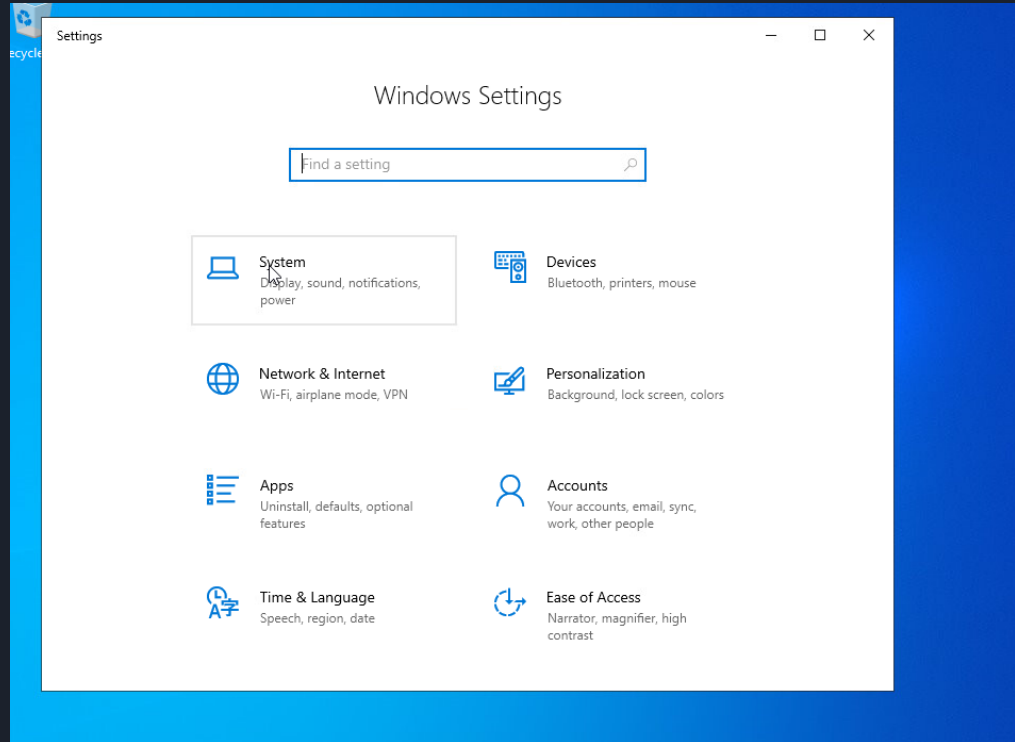
Tasks

Server Name	ID	Severity	Source	Log	Date and Time
WIN-JVP2MS9N77U	8198	Error	Microsoft-Windows-Security-SPP	Application	1/20/2024 12:18:37 AM
WIN-JVP2MS9N77U	10016	Warning	Microsoft-Windows-DistributedCOM	System	1/20/2024 12:18:37 AM
WIN-JVP2MS9N77U	7030	Error	Microsoft-Windows-Service Control Manager	System	1/20/2024 12:18:33 AM

12:21 AM 1/20/2024

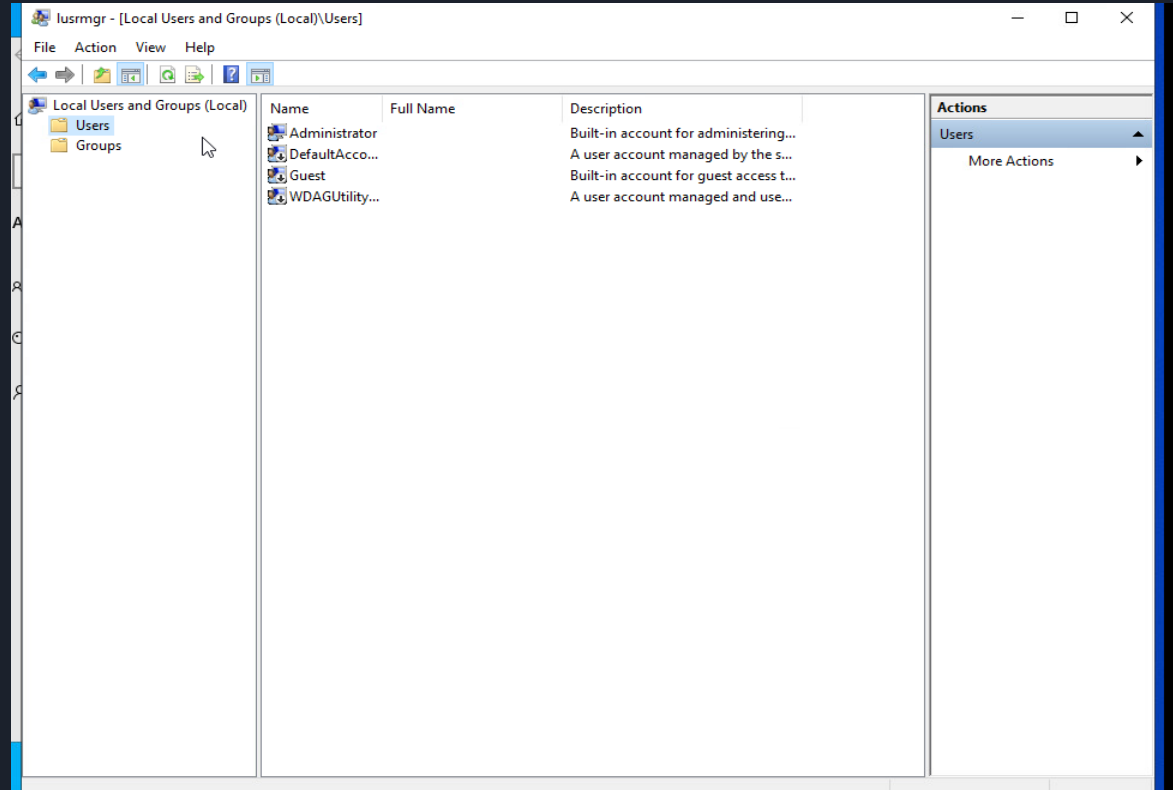
Step 9. Windows setting

The next step we going to change a few setting inside of windows setting. These changes will be made in System , Network & Internet, and Accounts. The first change will be in Accounts.



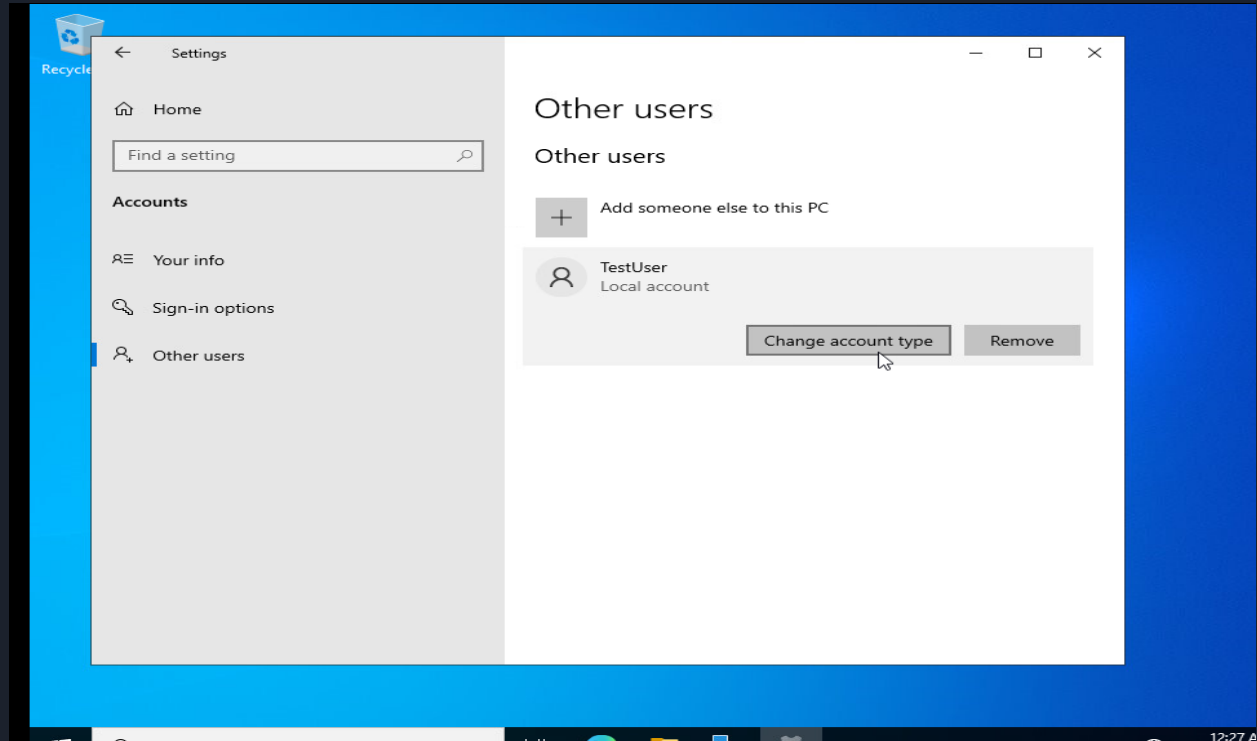
Step 10. Adding new users

Select Accounts and then other users. Inside of that window will be an option to add a new user. It will take you to new window with several options. In this window you need click on the actions tab and select create new user. Take this time to make a user for everyone in your group and set a password for the account.



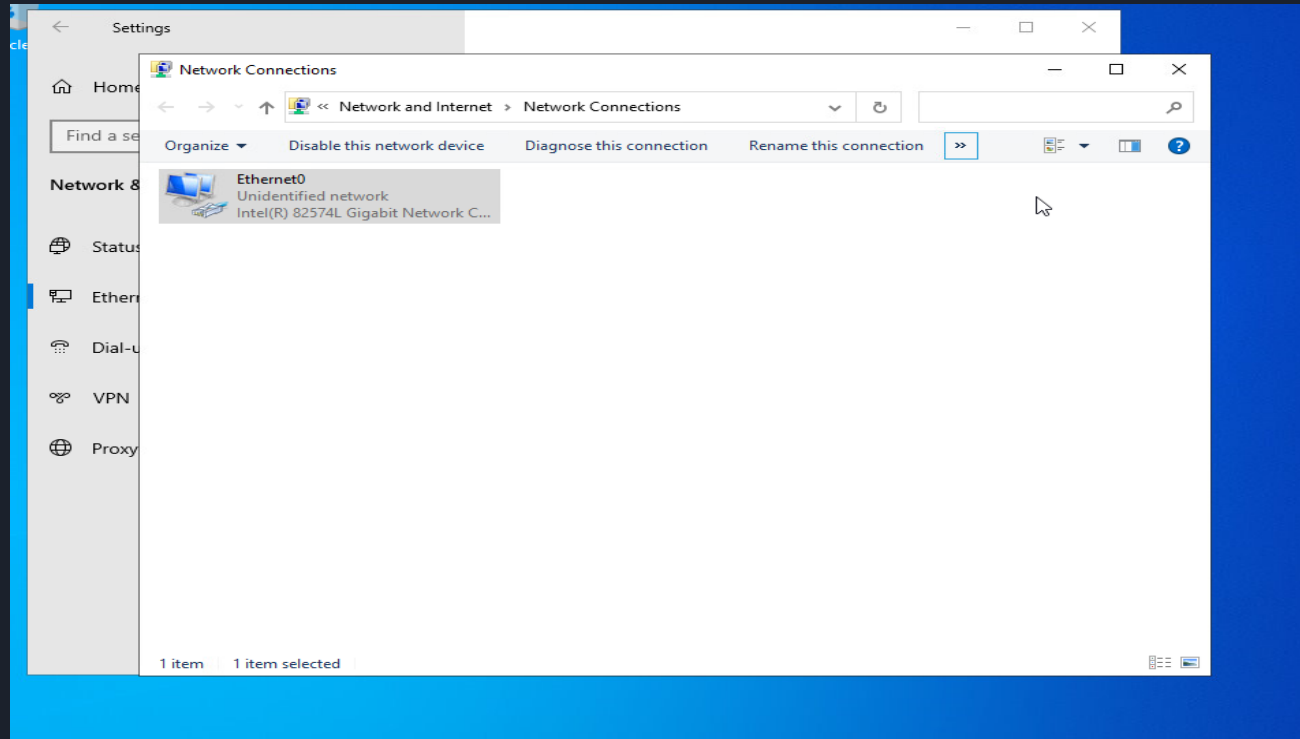
Step 11. Change Account Type

Back in the other windows in the accounts section you need to switch all the new user account types to Administrator so that you and your team can work on this machine as admins.



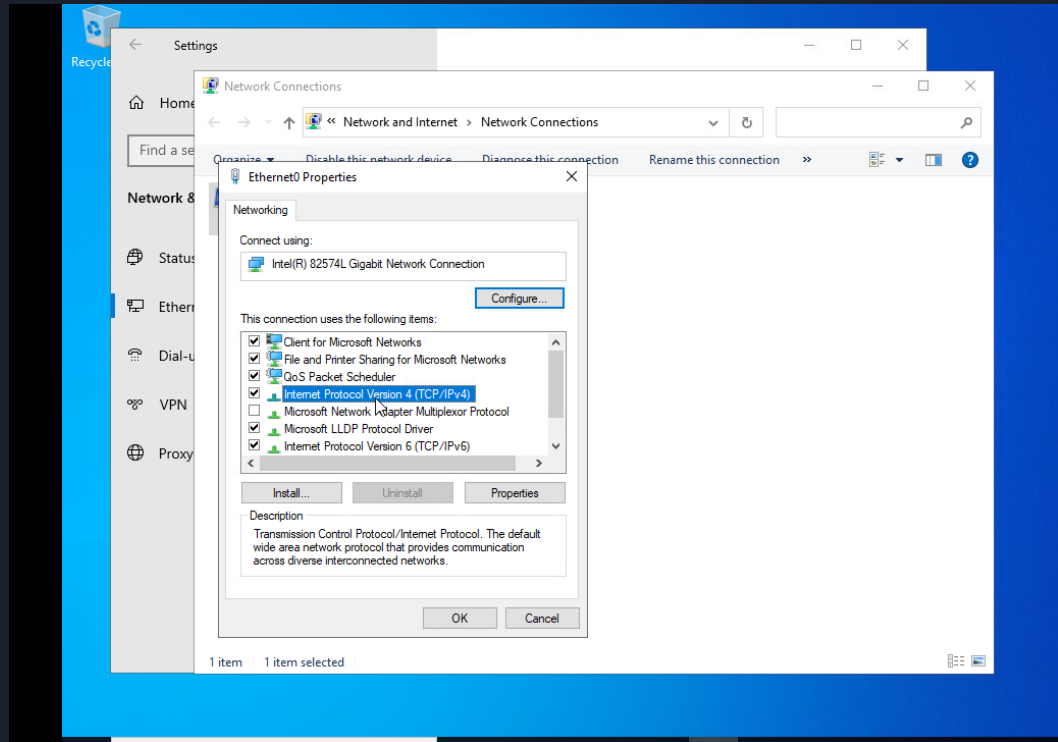
Step 12A. Ethernet and Internet settings

Now you need to back to window from step 9 and select the Ethernet and Internet option in there will be a section called Ethernet, click on it and look for the option highlighted in called Change Adapter options . It will take you too this window.



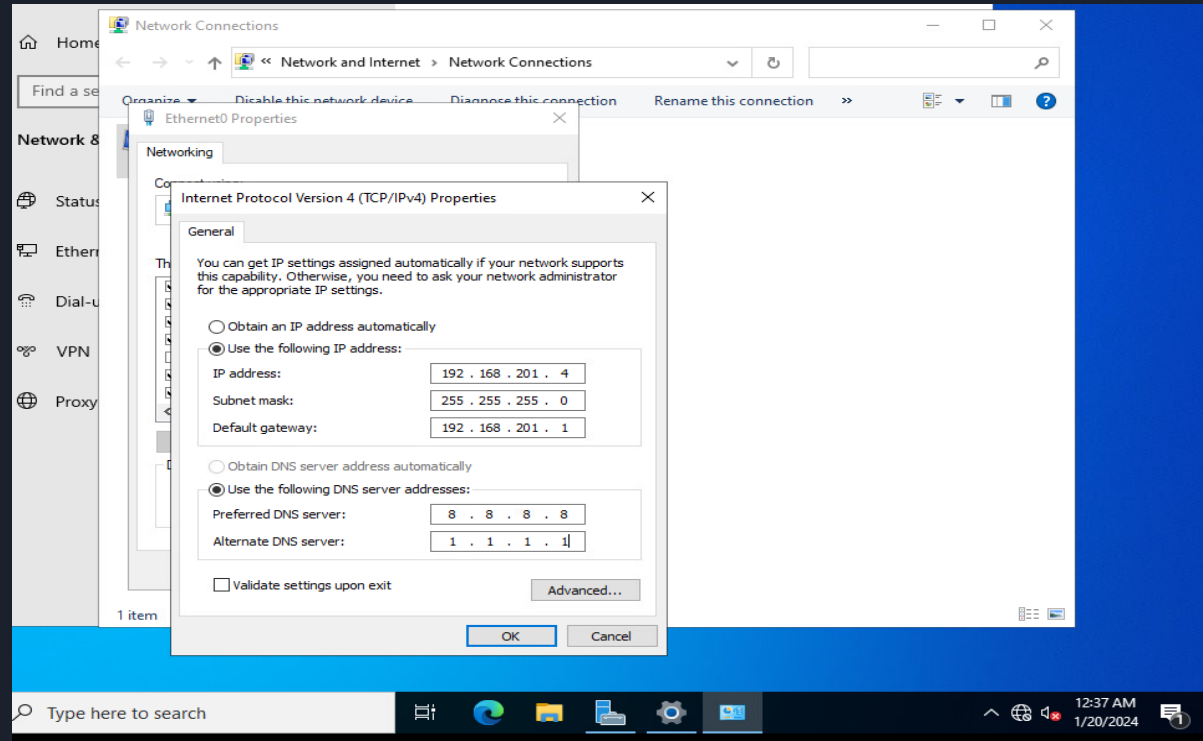
Step 12B. Changing Ipv4

In this window you need to click on the double arrows next to rename this connections. It will open a smaller window, in this smaller window you need to select Ipv4 and click on properties



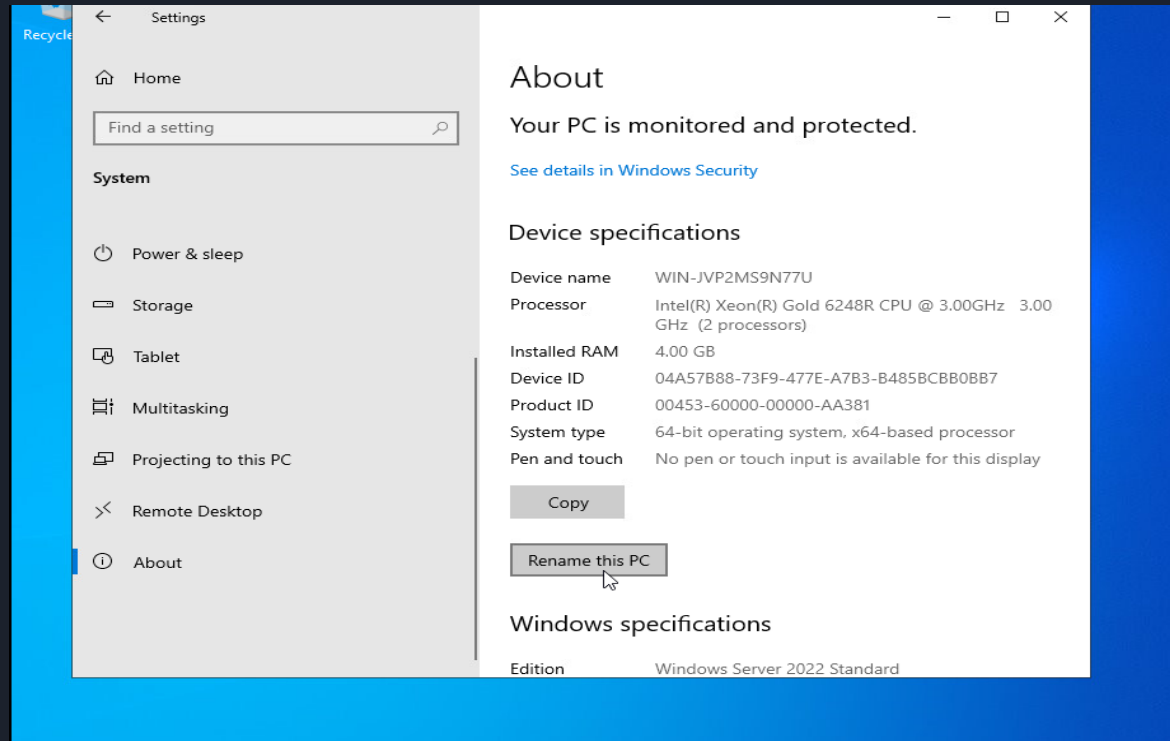
Step 12C. Setting Ip Address.

If you have follow the instructions you will see a new window that will give you the option to set this servers address. Fill out the Ip address that your team agreed upon before starting this assignment. Also fill out the subnet and default gateway from your teams diagram. You don't need to fill out the DNS right now but can choose to if you feel like it.



Step 13. Rename the device

Going back to step 9 click on the system icon and scroll down until you see the about page. Inside of here will be an option to rename the PC, you will need to rename this device to match what you called the VM , this will cause the VM to restart. This is last step you need to do for now but later you will need to ping this device.



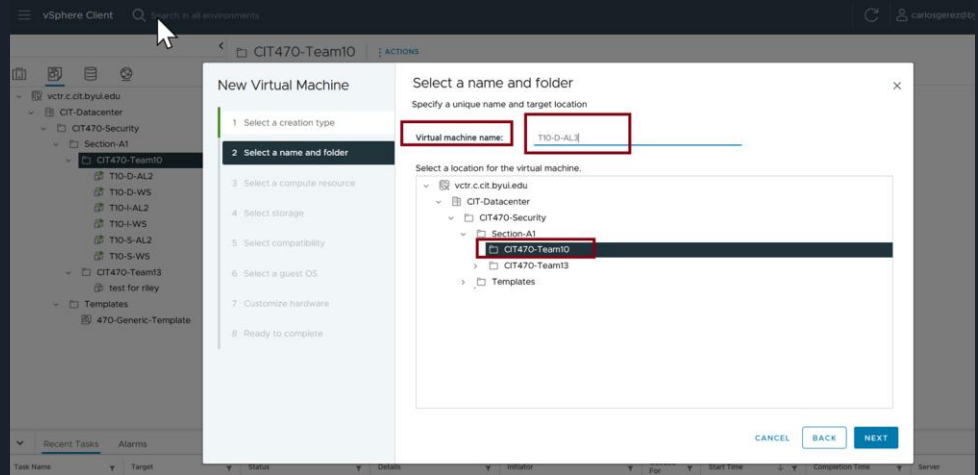
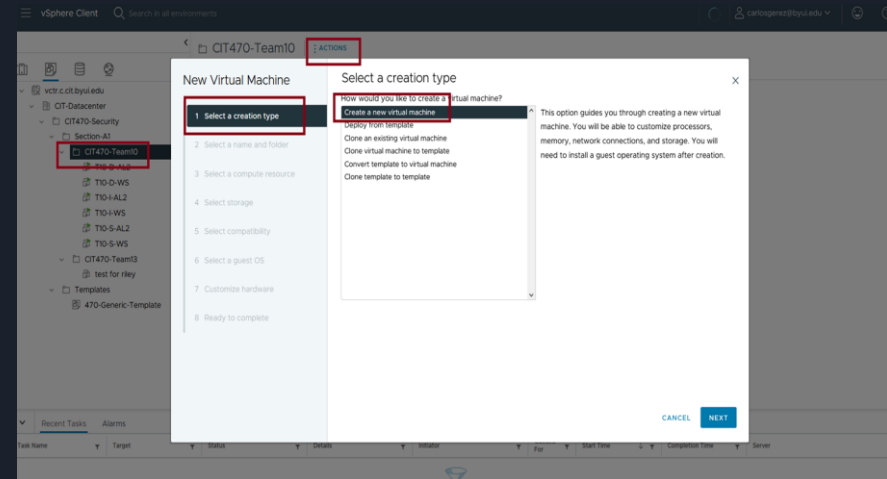


How to Setup an Alma Server

Step 1.

Click on Actions and select Create a new virtual machine

Give the new machine a name according to the teams chosen naming schematic. In this case it is T10-D-AL3



Step 2.

Select CIT-470 as the compute resource then select CIT as the storage area

New Virtual Machine

- 1 Select a creation type
- 2 Select a name and folder
- 3 Select a compute resource**
- 4 Select storage
- 5 Select compatibility
- 6 Select a guest OS
- 7 Customize hardware
- 8 Ready to complete

Select the destination compute resource for this operation

- 10.11.175.109
- 10.11.175.110
- 10.11.175.111
- > Azure-Arc
- > CIT-151
- > CIT-225
- > CIT-326
- > CIT-352
- > CIT-470**
- > CIT-Core
- > CIT-CSA
- > CIT-Instructors
- > CIT-VMs

Compatibility

✓ Compatibility checks succeeded.

New Virtual Machine

- 1 Select a creation type
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Select storage**
- 5 Select compatibility
- 6 Select a guest OS
- 7 Customize hardware
- 8 Ready to complete

Select the storage for the configuration and disk files

VM Storage Policy ⚠

☐ Disable Storage DRS for this virtual machine

Name	Storage Compatibility	Capacity	Provisioned	Free
CIT	--	64 TB	40.07 TB	23.92 TB

Manage Columns

Items per page: 10 1 item

Compatibility

✓ Compatibility checks succeeded.

CANCEL BACK NEXT

Step 3.

Select compatibility to ESXi 7.0 U2 and later

Select Linux as the guest OS Family and RedHat Enterprise Linux 8 (64-bit) as the Guest OS Version

New Virtual Machine

- 1 Select a creation type
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Select storage
- 5 Select compatibility**
- 6 Select a guest OS
- 7 Customize hardware
- 8 Ready to complete

Select compatibility

Select compatibility for this virtual machine depending on the hosts in your environment

The host or cluster supports more than one VMware virtual machine version. Select a compatibility for the virtual machine.

Compatible with: ESXi 7.0 U2 and later

Virtual machines using hardware version 19 are compatible with ESXi 7.0 U2 and later. Some virtual machine hardware features are unavailable with this option.

CANCEL BACK **NEXT**

New Virtual Machine

- 1 Select a creation type
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Select storage
- 5 Select compatibility
- 6 Select a guest OS**
- 7 Customize hardware
- 8 Ready to complete

Select a guest OS

Choose the guest OS that will be installed on the virtual machine

Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.

Guest OS Family: Linux

Guest OS Version: Red Hat Enterprise Linux 8 (64-bit)

Compatibility: ESXi 7.0 U2 and later (VM version 19)

CANCEL BACK **NEXT**

Step 4.

Customize hardware settings and check the Connect At Power On box

Select NEXT and then FINISH

New Virtual Machine

1 Select a creation type

2 Select a name and folder

3 Select a compute resource

4 Select storage

5 Select compatibility

6 Select a guest OS

7 **Customize hardware**

8 Ready to complete

Customize hardware

ADD NEW DEVICE

> CPU * 2

> Memory * 4 GB

> New Hard disk * 96 GB

> New SCSI controller * LSI Logic Parallel

> New Network * 470-VL710-dmz Connected

> New CD/DVD Drive * Datastore ISO File ☒ Connect At Power On

> Video card * Specify custom settings

> New SATA Controller * New SATA Controller

> Security Devices * Not Configured

> Other Additional Hardware

Compatibility: ESXi 7.0 U2 and later (VM version 19)

CANCEL BACK NEXT

T10-D-AL3

ACTIONS

Summary Monitor Configure Permissions Pres Networks Snapshots

Guest OS

Powered Off

LAUNCH REMOTE CONSOLE

LAUNCH WEB CONSOLE

Virtual Machine Details

Power Status Powered Off

Guest OS Red Hat Enterprise Linux 8 (64-bit)

VMware Tools Not running, not installed

DNS Name

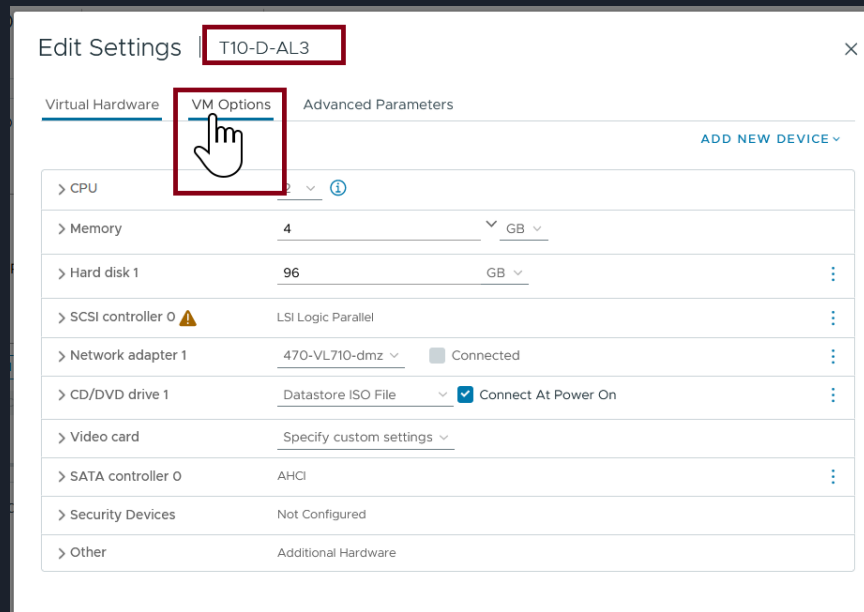
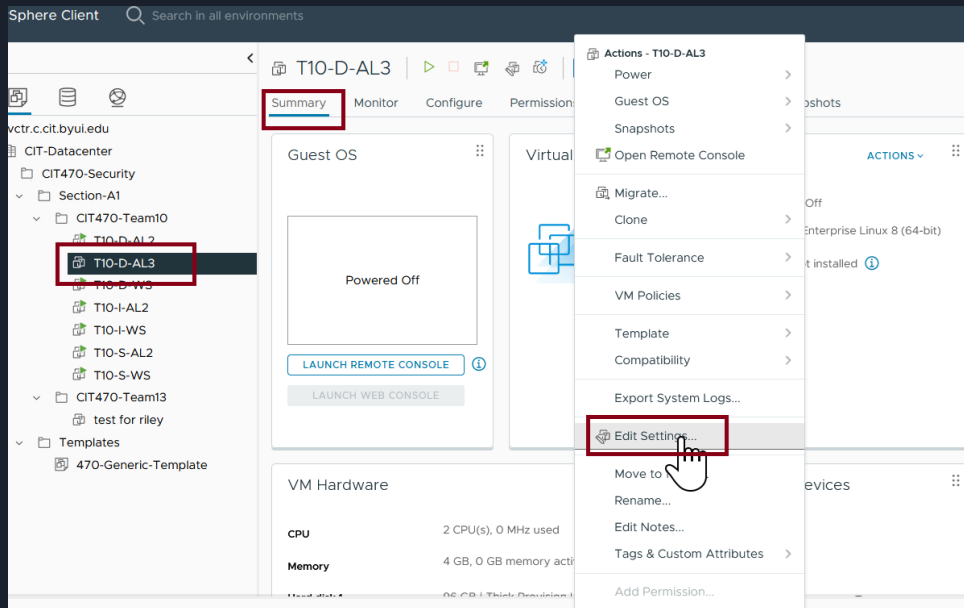
IP Addresses

Encryption Not encrypted

Step 5.

Under Summary open the Actions menu and select Edit Settings

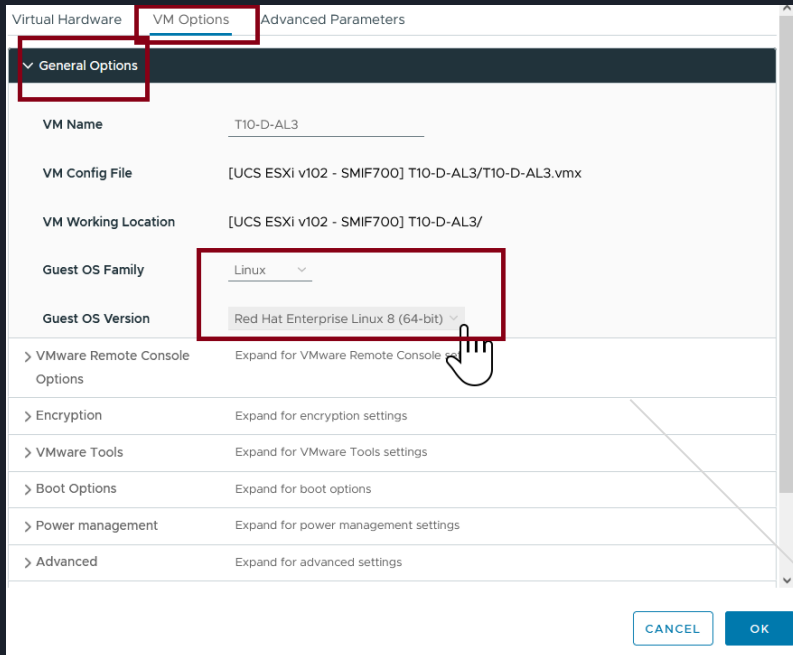
Select the VM options Tab



Step 6.

Under General Options, Select Guest OS family and select Linux then Under Guest OS Version select Red Hat Enterprise Linux 8 (64-Bit) Click OK

Under the Summary tab, scroll down to the notes section and click ADD



Virtual Hardware VM Options Advanced Parameters

General Options

VM Name T10-D-AL3

VM Config File [UCS ESXi v102 - SMIF700] T10-D-AL3/T10-D-AL3.vmx

VM Working Location [UCS ESXi v102 - SMIF700] T10-D-AL3/

Guest OS Family Linux

Guest OS Version Red Hat Enterprise Linux 8 (64-bit)

VMware Remote Console Options Expand for VMware Remote Console Options

Encryption Expand for encryption settings

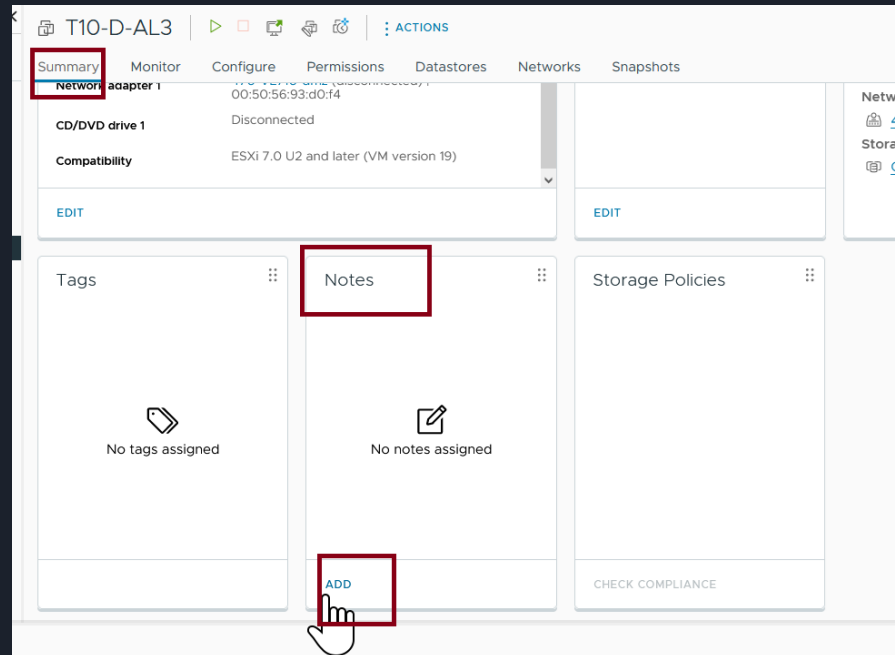
VMware Tools Expand for VMware Tools settings

Boot Options Expand for boot options

Power management Expand for power management settings

Advanced Expand for advanced settings

CANCEL OK



T10-D-AL3

Summary Monitor Configure Permissions Datastores Networks Snapshots

Network adapter 1 00:50:56:93:d0:f4

CD/DVD drive 1 Disconnected

Compatibility ESXi 7.0 U2 and later (VM version 19)

EDIT

Tags No tags assigned

Notes No notes assigned

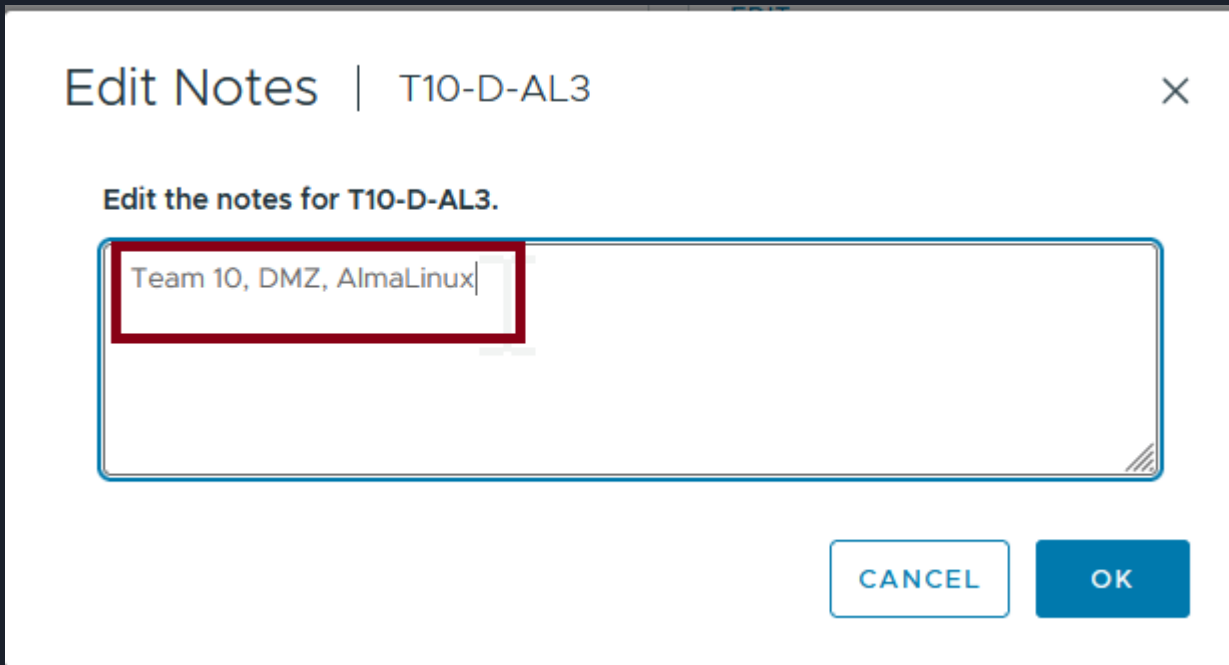
Storage Policies

CHECK COMPLIANCE

ADD

Step 7.

Enter the Team name, Zone, and OS



Edit Notes | T10-D-AL3 ×

Edit the notes for T10-D-AL3.

Team 10, DMZ, AlmaLinux

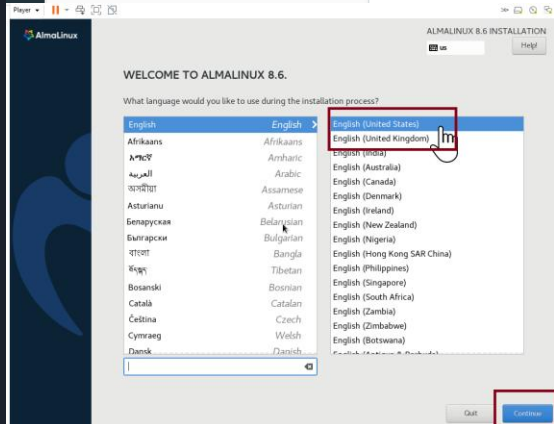
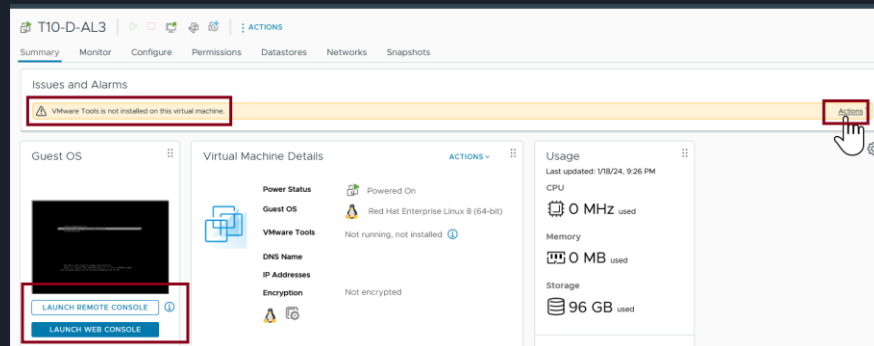
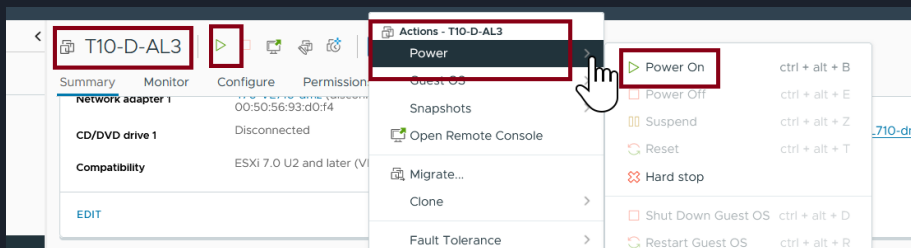
CANCEL OK

Step 8.

Power on the machine

When the vmWare tools is not installed warning pops up, click actions and then install vmware tools

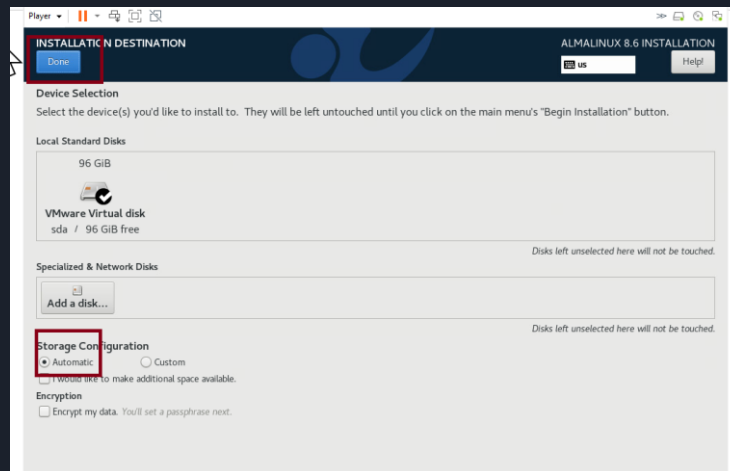
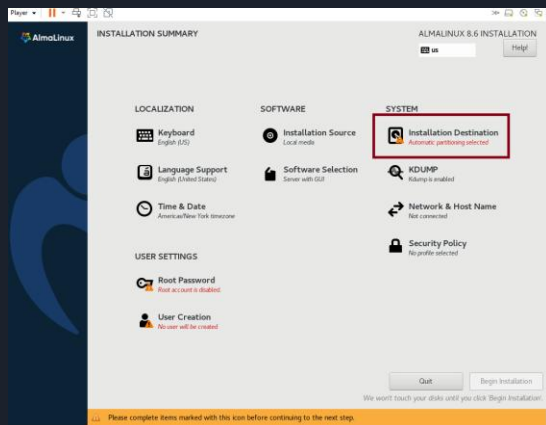
Choose a language and click next



Step 9.

Click on Installation Destination

Set Storage Configuration to Automatic and click done

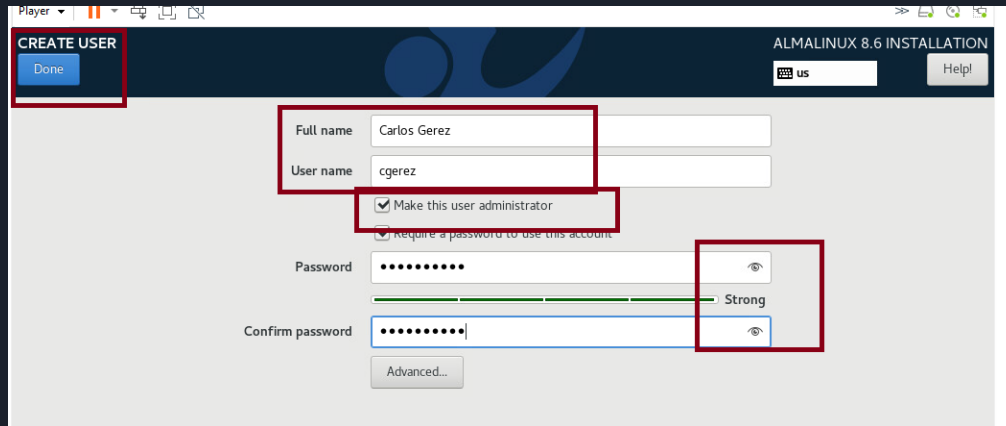


Step 10.

Select Time Zone

Create a user by filling in the needed information and checking the make Administrator box.

Make sure to create a strong password

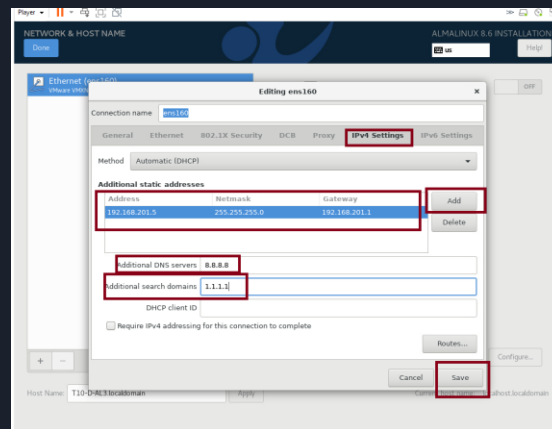
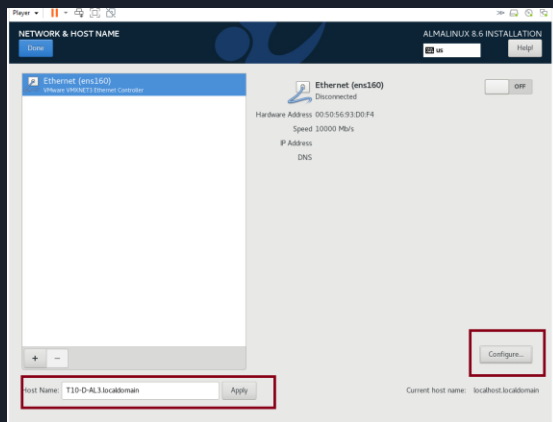
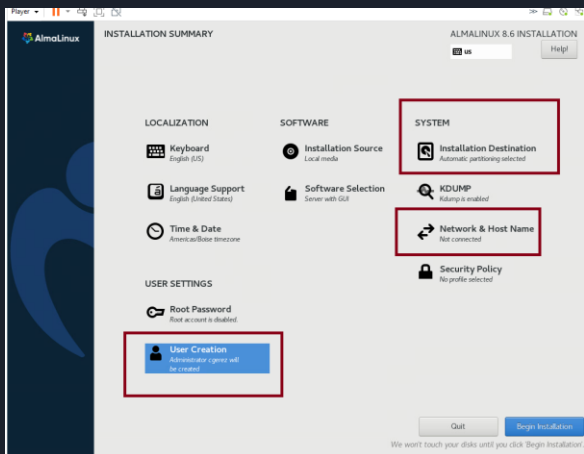


Step 11.

Click on Network & Hostname add the (machine name).localdomain to the host name field, click apply, and then click on Configure

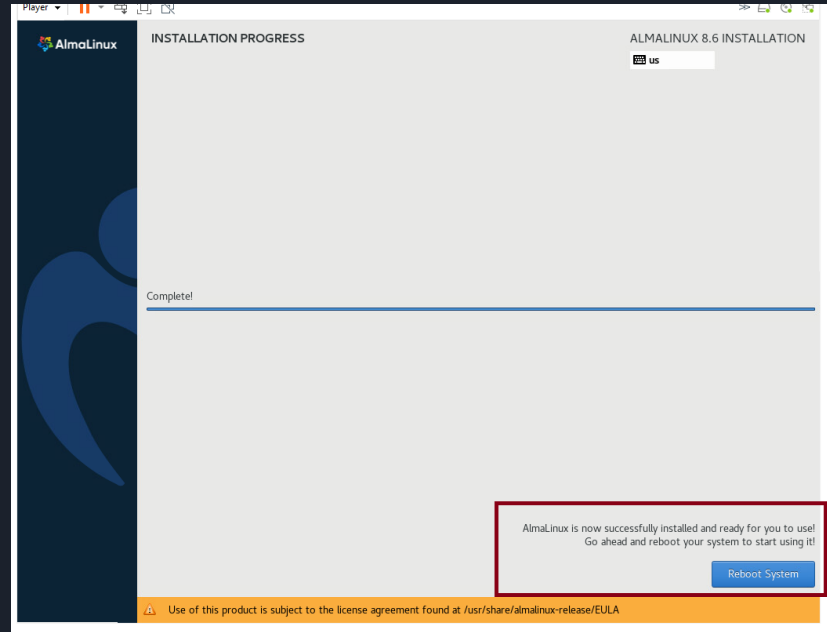
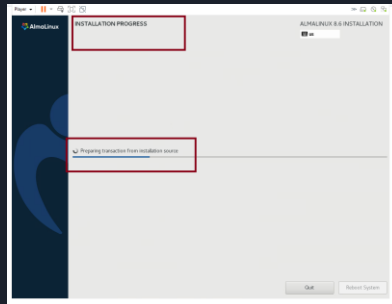
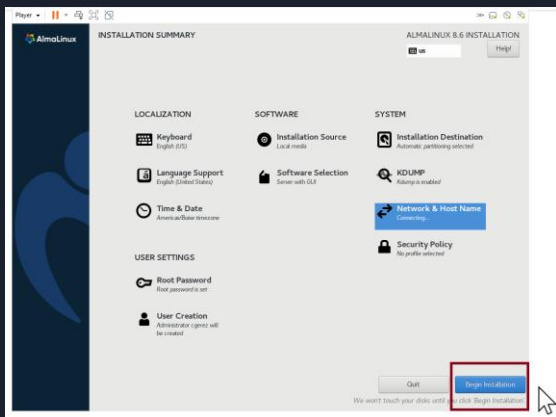
Select IPv4 setting and add ip address, netmask, gateway then click Add

Add DNS addresses then click next



Step 12.

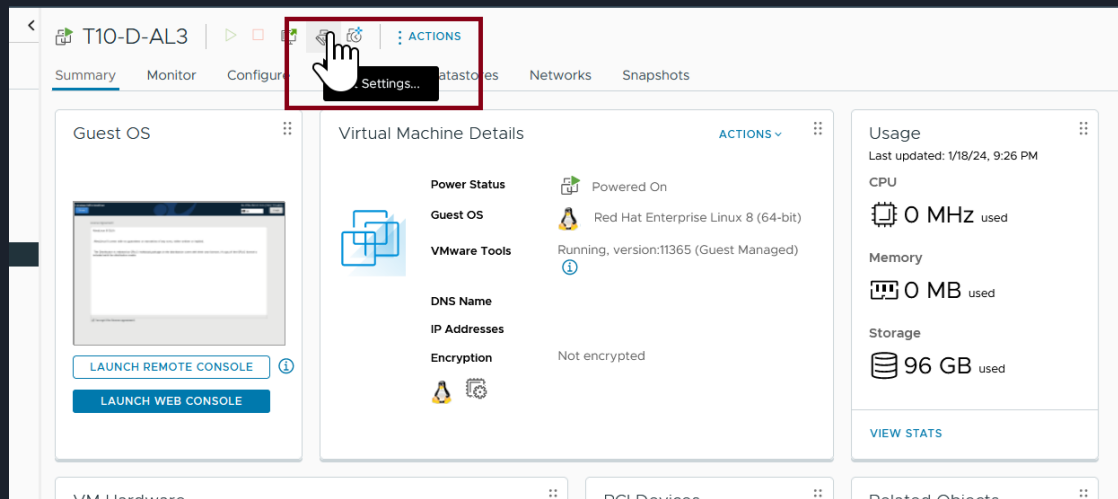
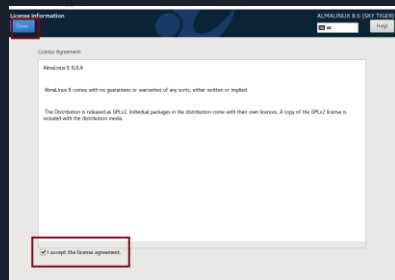
Select Begin Installation Process, wait for completion, and then reboot the system



Step 13.

Accept the licensing agreement

Go Back to vSphere Client and select the Settings icon

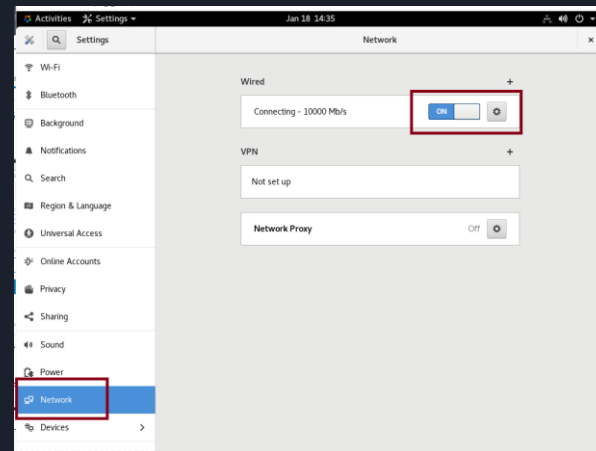
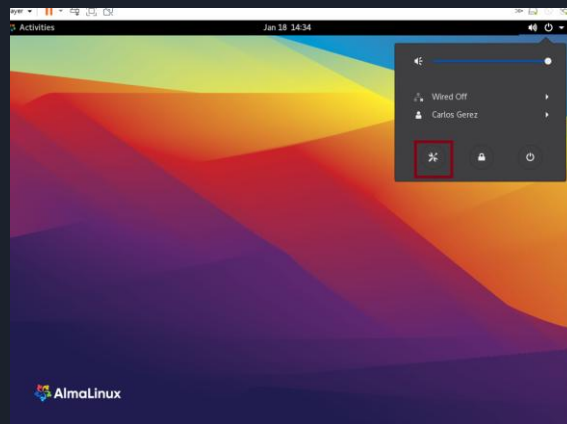
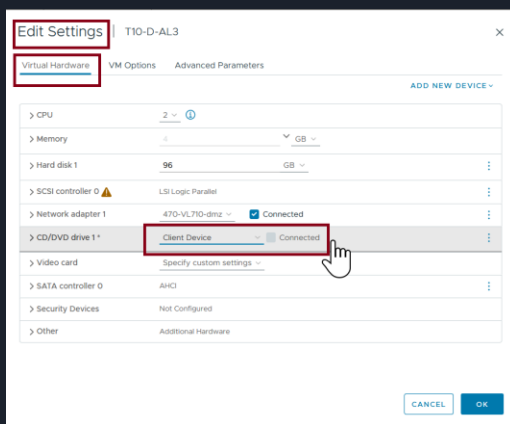


Step 14.

Under the Virtual Hardware tab > CD/DVD drive 1 use the dropdown arrow to remove the iso image and select Client Device

Go to the Alma Linux workstation and select settings from the dropdown then select network

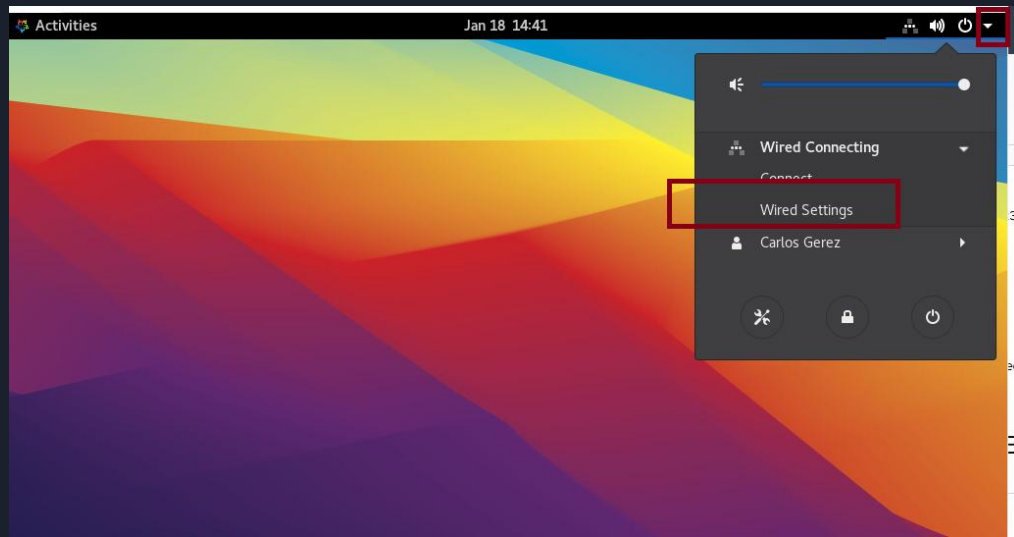
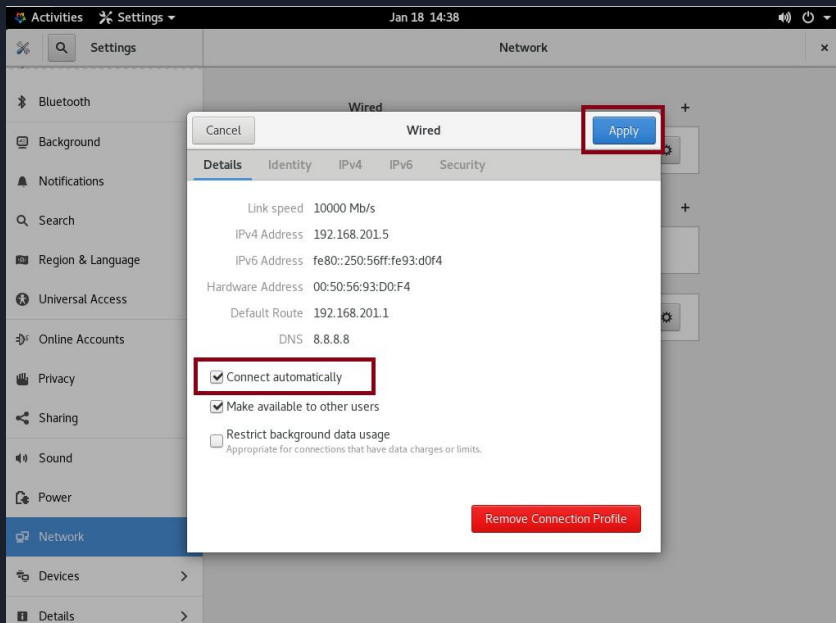
Switch the Wired Selection on then click on the settings gear icon



Step 15.

Check the Connect Automatically box and click Apply

Click on the Network Icon and go to Wired Settings

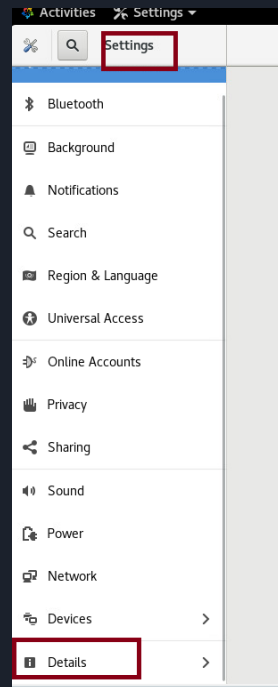
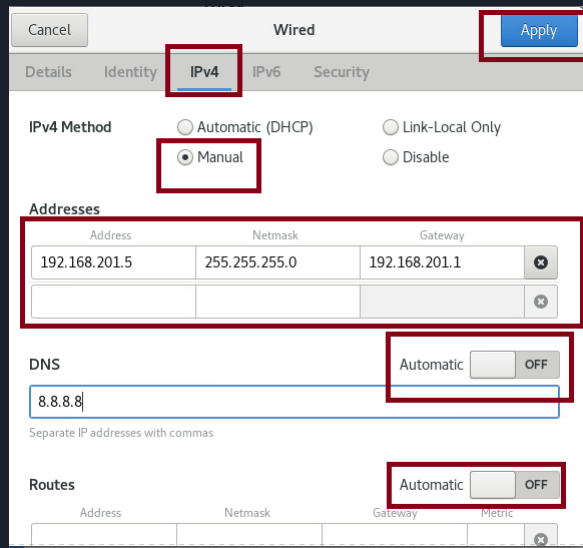
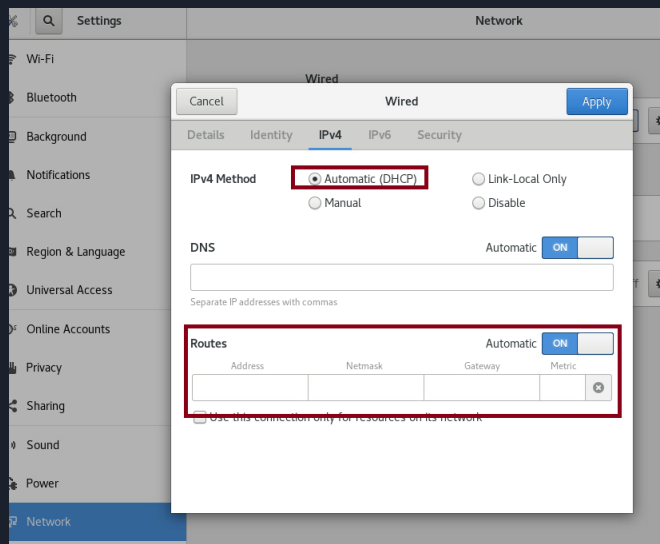


Step 16.

Under IPv4 settings change from Automatic (DHCP) to Manual

Make sure IP and DNS addressing is correct and click apply

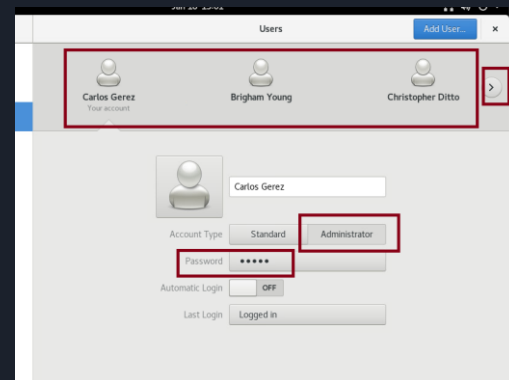
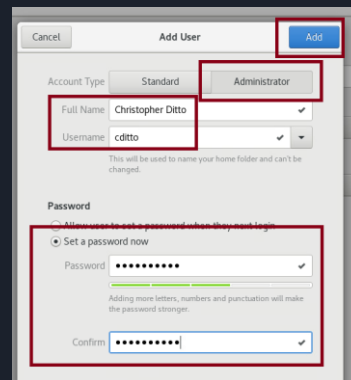
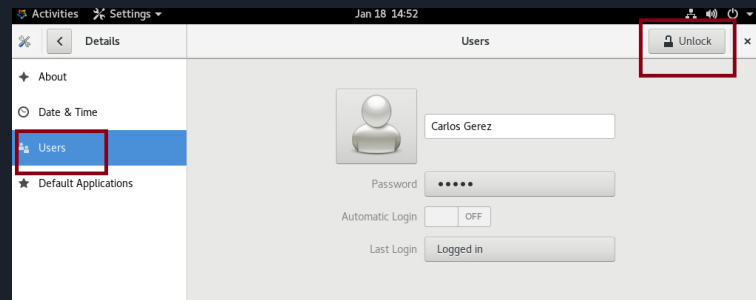
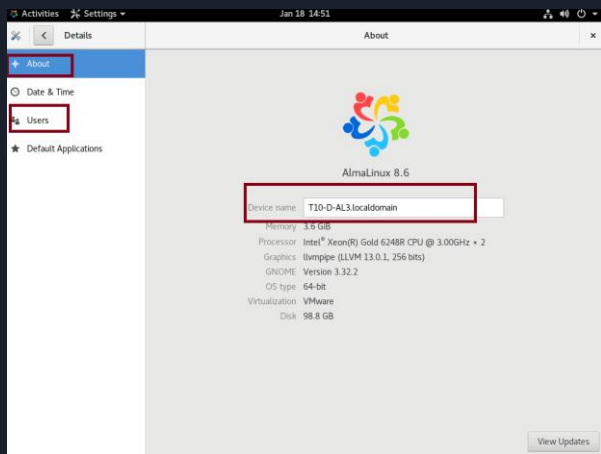
Click on Settings and select Details



Step 17.

Click About and enter (machine name).localdomain to the Device Name Field

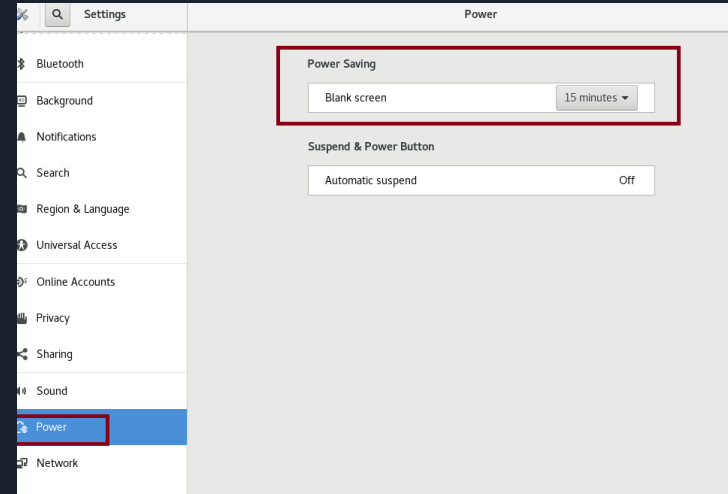
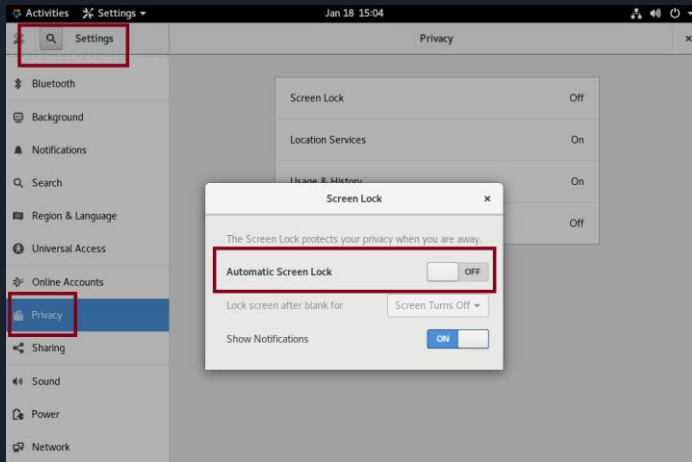
Click on Users Create a user with administrative authority for each team member and then one for The BYUI instructor using the username youngb and Name: Brigham Young



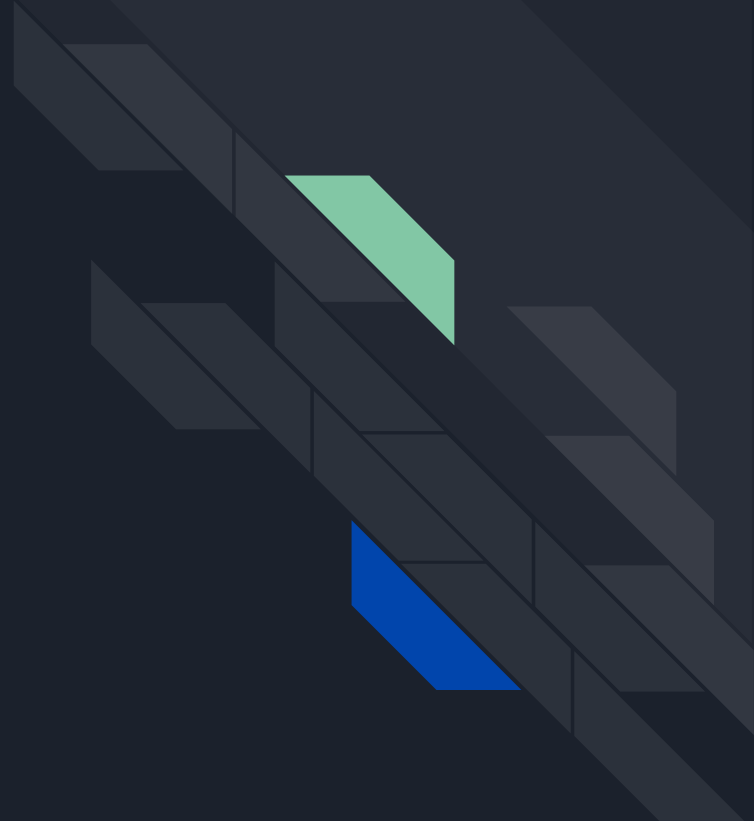
Step 18.

Under Settings Click on Settings>Privacy turn off Automatic Screen Lock

Under Settings>Power adjust Power Saving to desired specification

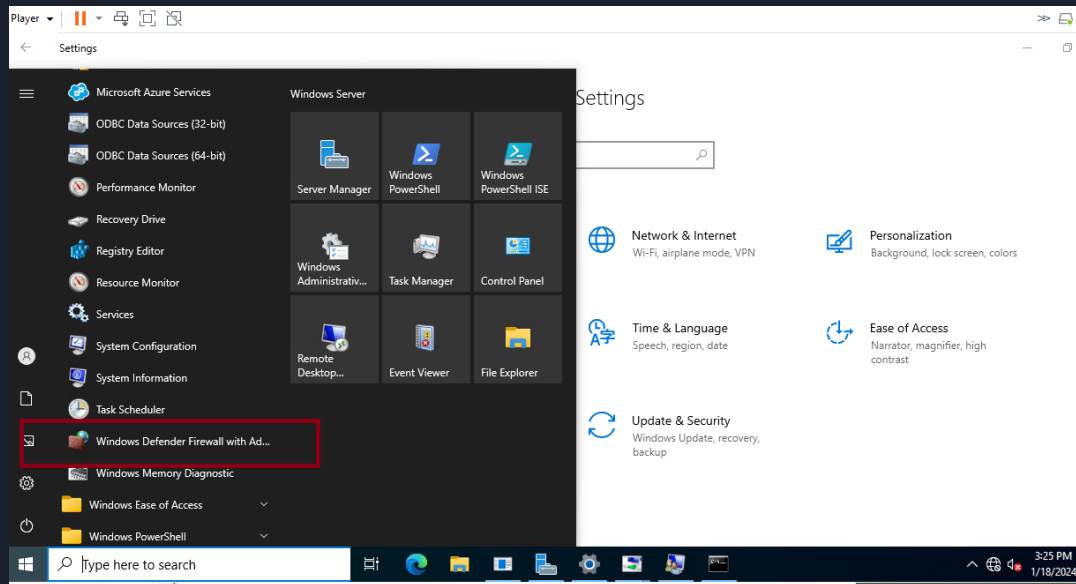


Challenges we faced



Inbound rule for Windows to accept ping requests.

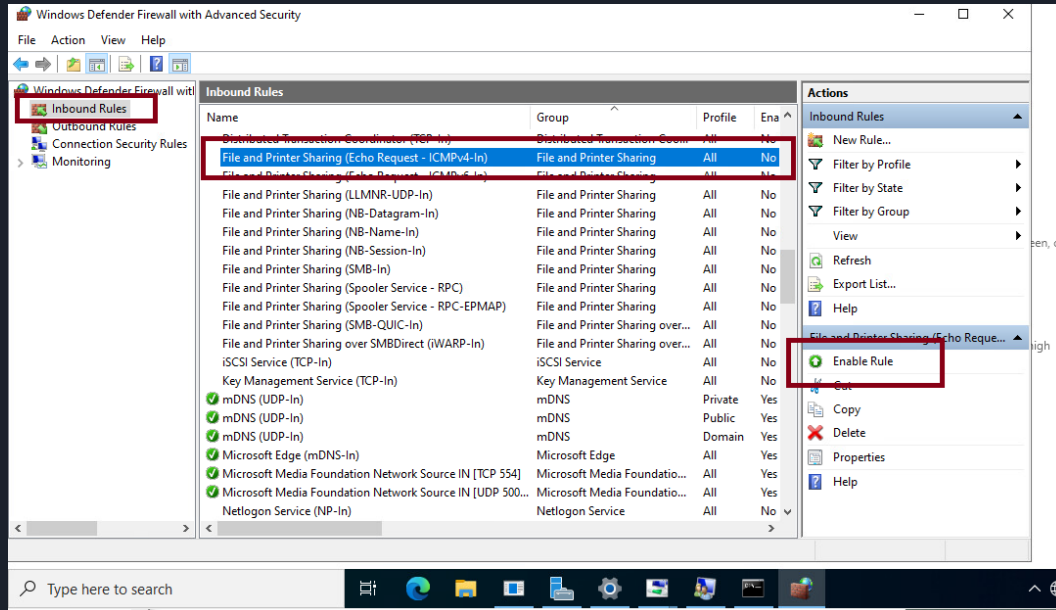
Open Windows Defender Firewall



Inbound rule for Windows to accept ping requests.

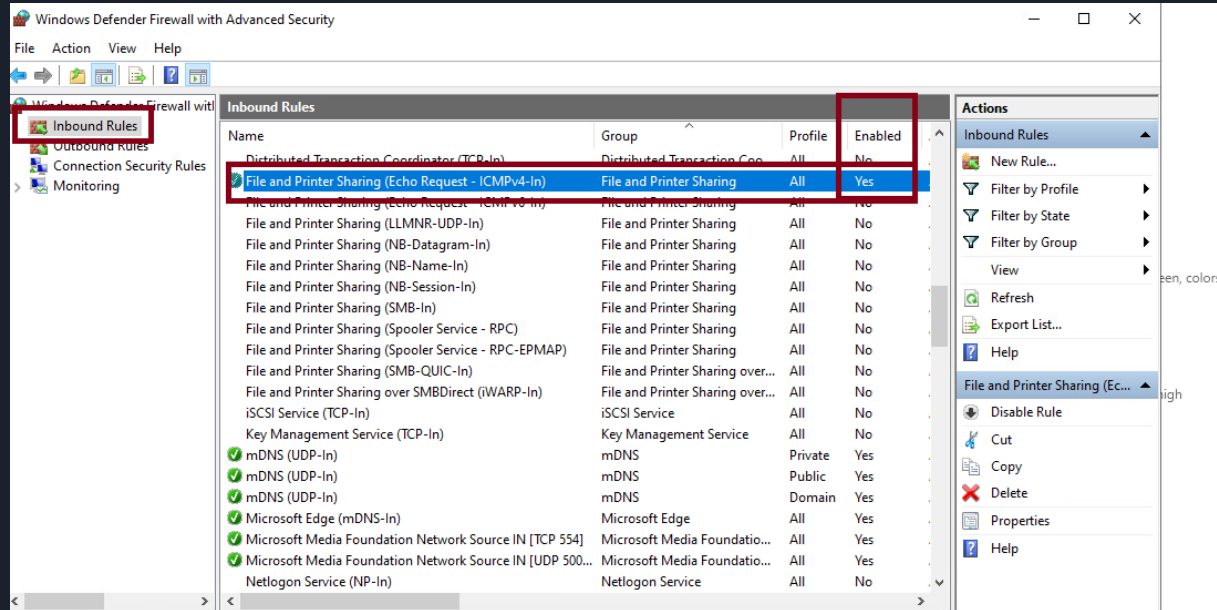
Click on Inbound Rules then select File and Printer Sharing(Echo Request - ICMPv4 in)

Select Enable Rule




Inbound rule for Windows to accept ping requests.

The rule is now showing Enabled




Ping from machines inside DMZ successful.



```
cgerez@T10-D-AL3:~$ ping 192.168.201.3
PING 192.168.201.3 (192.168.201.3) 56(84) bytes of data:
64 bytes from 192.168.201.3: icmp_seq=1 ttl=64 time=0.438 ms
64 bytes from 192.168.201.3: icmp_seq=2 ttl=64 time=0.338 ms
64 bytes from 192.168.201.3: icmp_seq=3 ttl=64 time=0.328 ms
64 bytes from 192.168.201.3: icmp_seq=4 ttl=64 time=0.298 ms
64 bytes from 192.168.201.3: icmp_seq=5 ttl=64 time=0.244 ms
^C
--- 192.168.201.3 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4076ms
rtt min/avg/max/mdev = 0.244/0.329/0.438/0.064 ms
[cgerez@T10-D-AL3 ~]$ ping 192.168.201.2
PING 192.168.201.2 (192.168.201.2) 56(84) bytes of data:
64 bytes from 192.168.201.2: icmp_seq=1 ttl=128 time=0.486 ms
64 bytes from 192.168.201.2: icmp_seq=2 ttl=128 time=0.368 ms
64 bytes from 192.168.201.2: icmp_seq=3 ttl=128 time=0.372 ms
64 bytes from 192.168.201.2: icmp_seq=4 ttl=128 time=0.286 ms
^C
--- 192.168.201.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3102ms
rtt min/avg/max/mdev = 0.286/0.378/0.486/0.071 ms
[cgerez@T10-D-AL3 ~]$
```

Ping from T10-D-AL3 to T10-D-AL2 and T10-D-WS



```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Administrator> ping 192.168.201.3

Pinging 192.168.201.3 with 32 bytes of data:
Reply from 192.168.201.3: bytes=32 time<1ms TTL=64
Reply from 192.168.201.3: bytes=32 time<1ms TTL=64
Reply from 192.168.201.3: bytes=32 time<1ms TTL=64
Reply from 192.168.201.3: bytes=32 time<1ms TTL=64

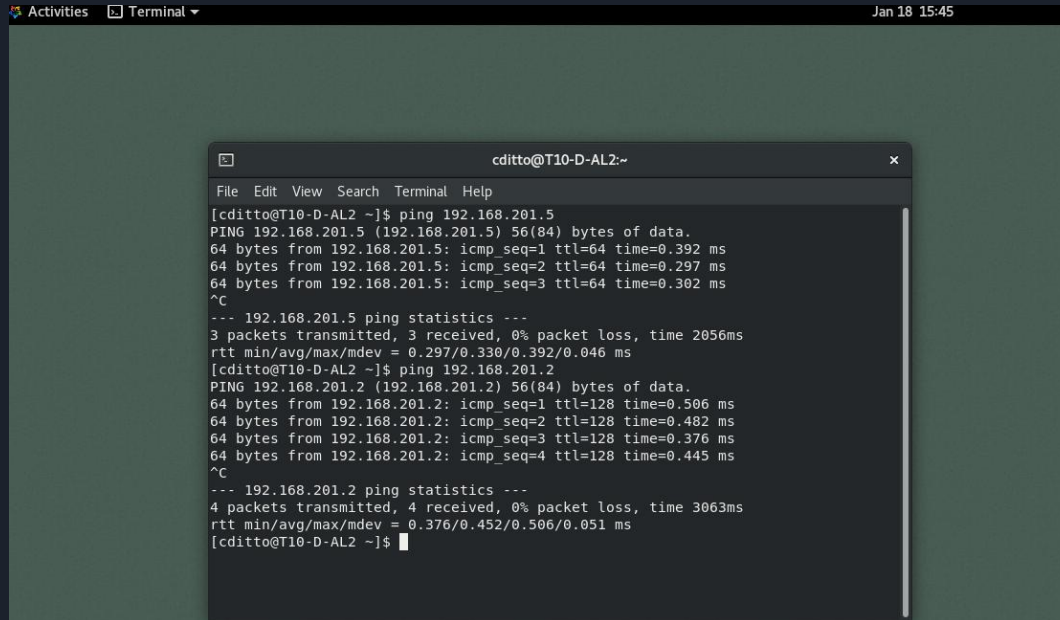
Ping statistics for 192.168.201.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
PS C:\Users\Administrator> ping 192.168.201.5

Pinging 192.168.201.5 with 32 bytes of data:
Reply from 192.168.201.5: bytes=32 time<1ms TTL=64
Reply from 192.168.201.5: bytes=32 time<1ms TTL=64
Reply from 192.168.201.5: bytes=32 time<1ms TTL=64
Reply from 192.168.201.5: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.201.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
PS C:\Users\Administrator>
```

Ping from T10-D-WS to T10-D-AL2 and T10-D-AL3

Ping from machines inside DMZ successful.



The screenshot shows a terminal window titled "cditto@T10-D-AL2:~" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal output shows two successful ping operations. The first is to 192.168.201.5, showing 3 successful packets with 0% loss. The second is to 192.168.201.2, showing 4 successful packets with 0% loss. The prompt "cditto@T10-D-AL2 ~\$" is visible at the bottom.

```
cditto@T10-D-AL2 ~$ ping 192.168.201.5
PING 192.168.201.5 (192.168.201.5) 56(84) bytes of data.
64 bytes from 192.168.201.5: icmp_seq=1 ttl=64 time=0.392 ms
64 bytes from 192.168.201.5: icmp_seq=2 ttl=64 time=0.297 ms
64 bytes from 192.168.201.5: icmp_seq=3 ttl=64 time=0.302 ms
^C
--- 192.168.201.5 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2056ms
rtt min/avg/max/mdev = 0.297/0.330/0.392/0.046 ms
cditto@T10-D-AL2 ~$ ping 192.168.201.2
PING 192.168.201.2 (192.168.201.2) 56(84) bytes of data.
64 bytes from 192.168.201.2: icmp_seq=1 ttl=128 time=0.506 ms
64 bytes from 192.168.201.2: icmp_seq=2 ttl=128 time=0.482 ms
64 bytes from 192.168.201.2: icmp_seq=3 ttl=128 time=0.376 ms
64 bytes from 192.168.201.2: icmp_seq=4 ttl=128 time=0.445 ms
^C
--- 192.168.201.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3063ms
rtt min/avg/max/mdev = 0.376/0.452/0.506/0.051 ms
cditto@T10-D-AL2 ~$
```

Ping from T10-D-AL2 to T10-D-AL3 and T10-D-WS



Useful links for sharing passwords databases:

1. This is a video about how to sync KeePass using Google Drive in Android and Windows devices.
<https://www.youtube.com/watch?v=-txzWZhZm9c&t=450s>
1. Documentation about Google Drive synchronization between devices.
<https://support.google.com/drive/answer/10838124?hl=en#zipppy=%2Csync-a-folder-with-google-drive-or-google-photos%2Cdownload-drive-for-desktop>