



CONESTOGA

Connect Life and Learning

Student Name:	Aagam Sanjay Shah
Deliverable:	Practical Assignment 2
Course Name:	NTWK8171-24F-Sec1-Virtualization with VMware Sphere

Date Assigned:	19/09/2024
Date Due:	10/10/2024
Rules:	<ul style="list-style-type: none">• Individual.• Cheating is not allowed.• Plagiarism counts as cheating!• That FAILURE to submit work in the course can result in a grade of 'F' or 'I' for failure to complete the course!

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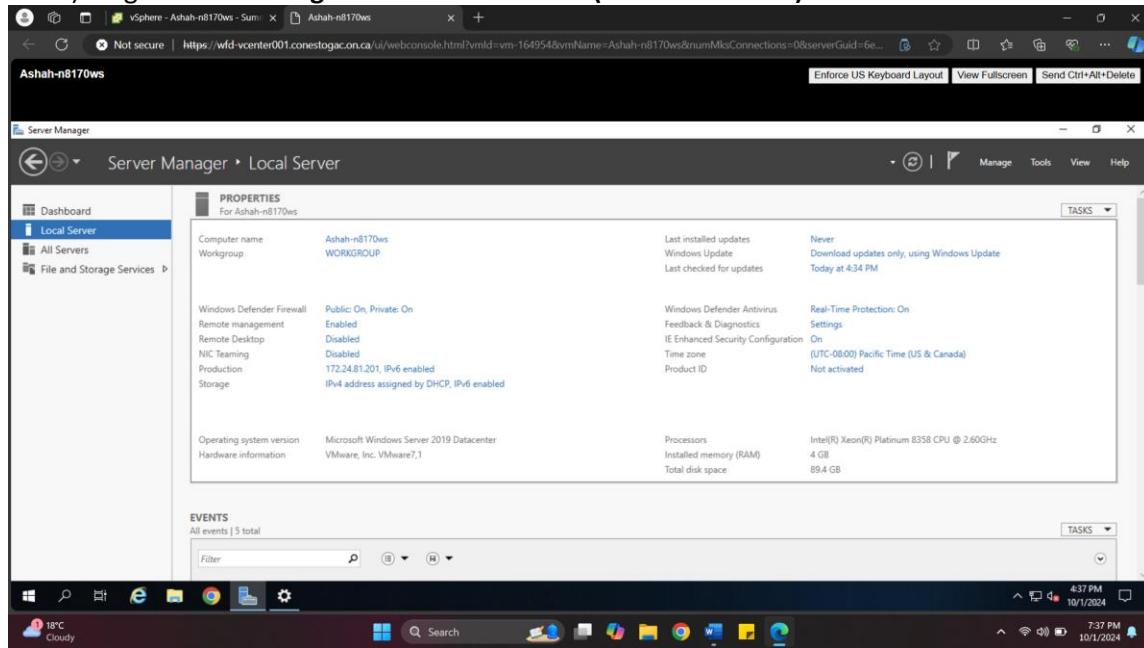
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Lab 3: Active Directory Environment Setup and ESXi domain setup

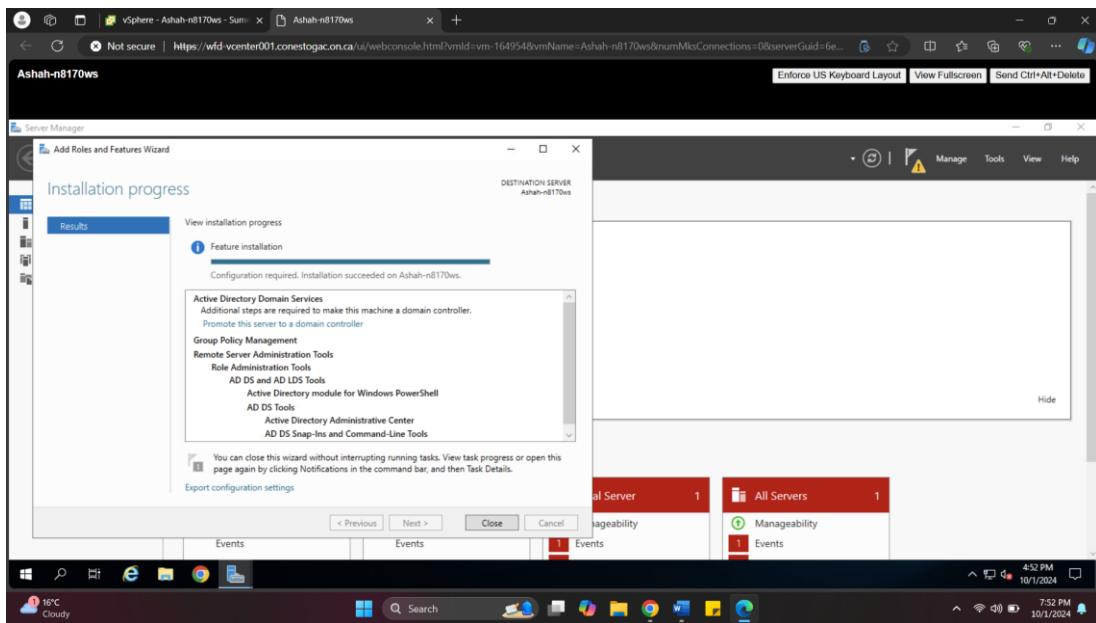
- 1) Promoting our **conestogausername-n8170ws** virtual machine to a domain controller in the **vclass.local** domain.
- 2) Creating DNS records for our two ESXi hosts and vCenter Server.
- 3) Adding our two ESXi hosts to Active Directory.

Section 1: Promote Windows VM to a domain controller in the **vclass.local** domain

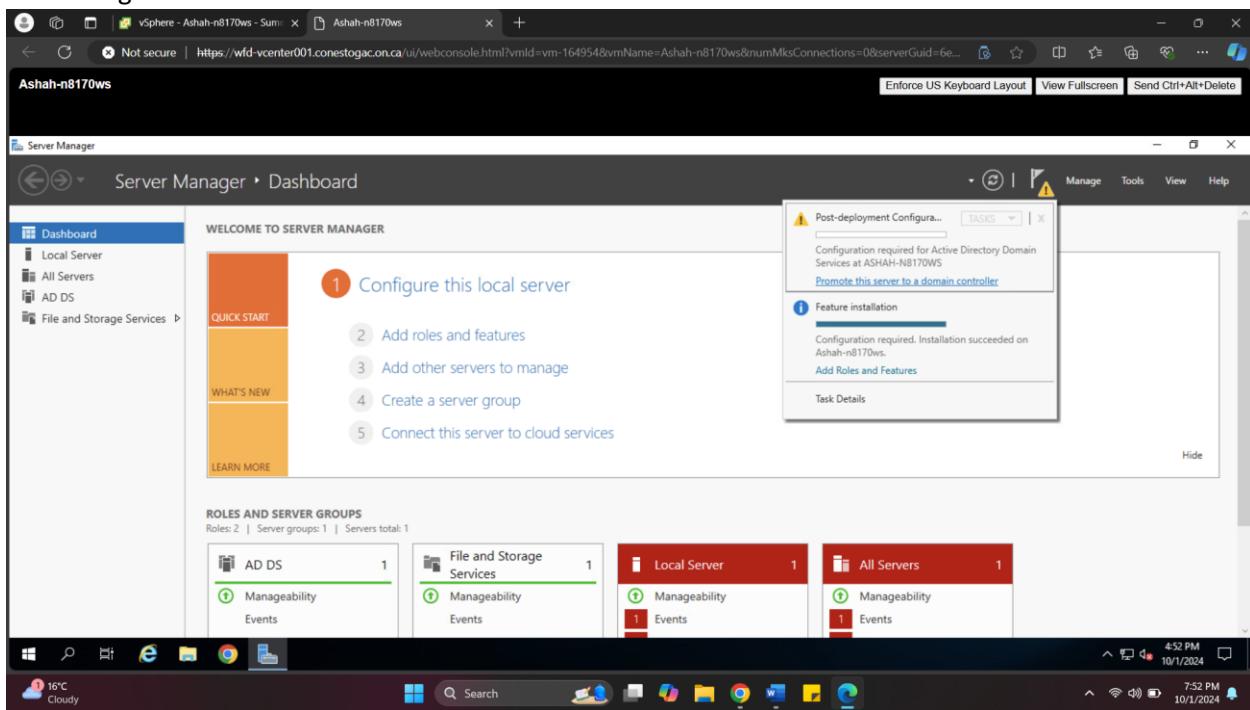
- 1) Sign into **conestogausername-n8170ws**. (**Ashah-n8170ws**)



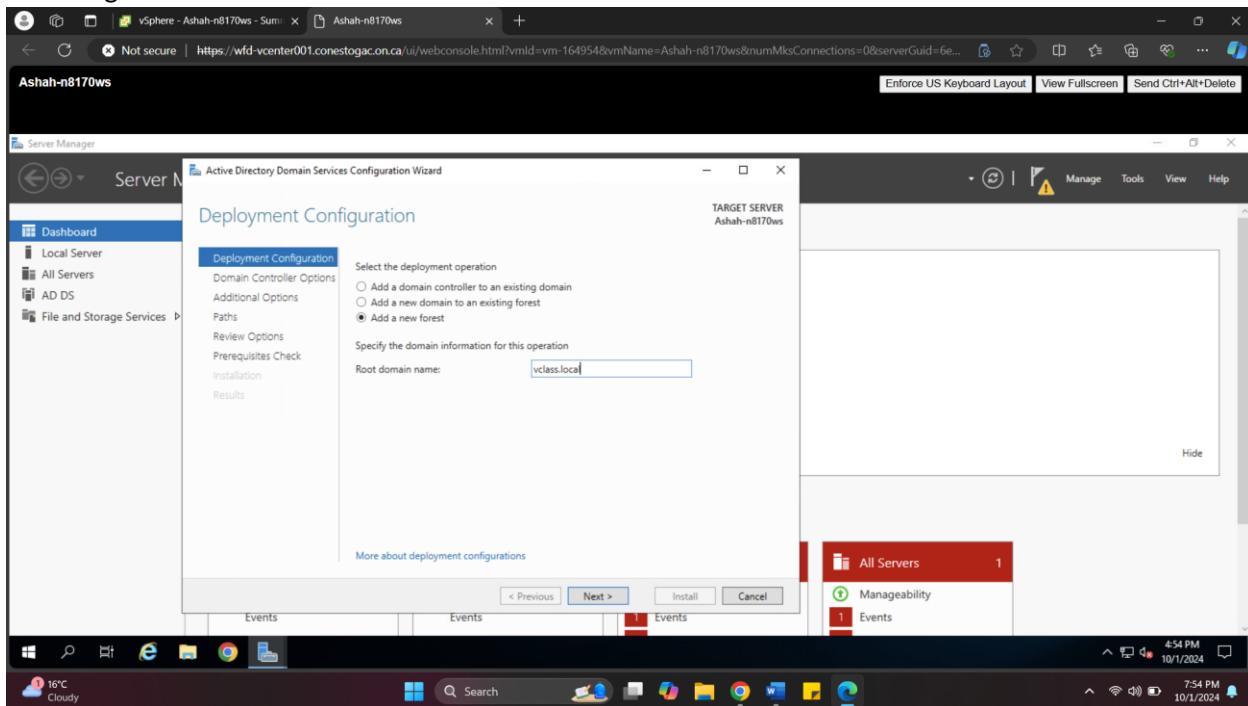
- 2) Promote **conestogausername-n8170ws** to a domain controller using domain name **vclass.local**.
Installing ADDS on server Ashah-n8170ws



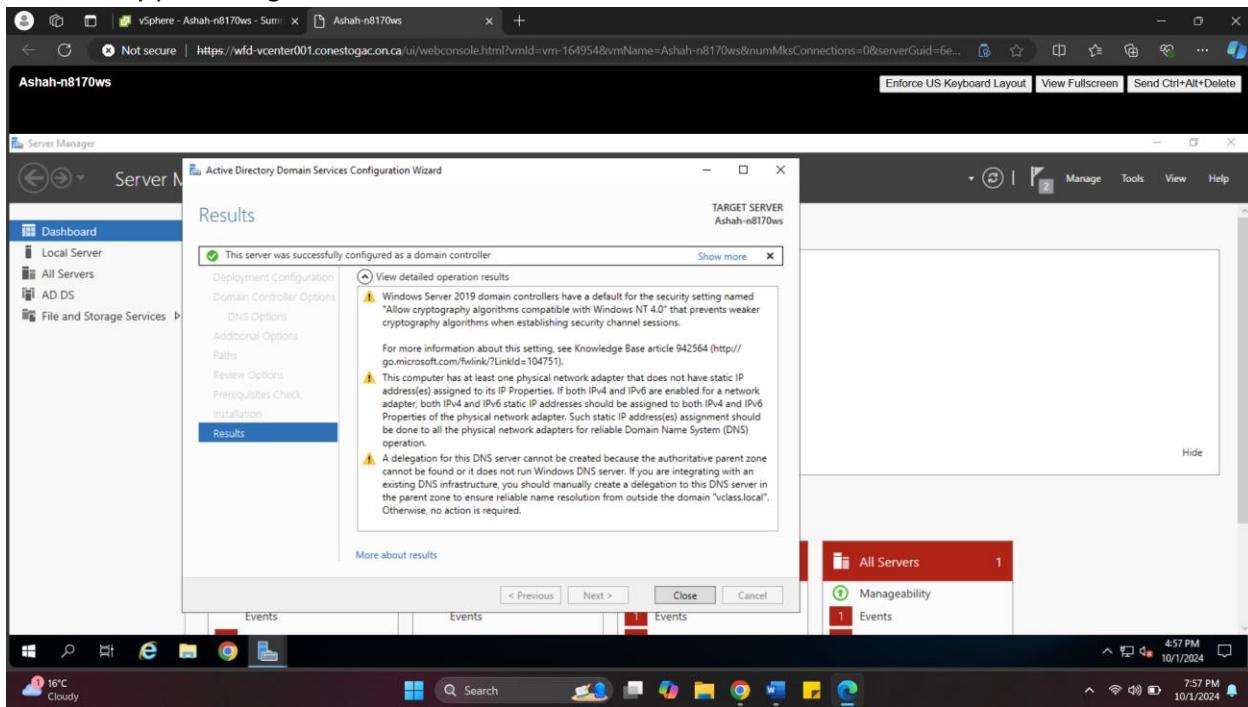
Promoting Server Ashah-n8170ws to Domain Controller



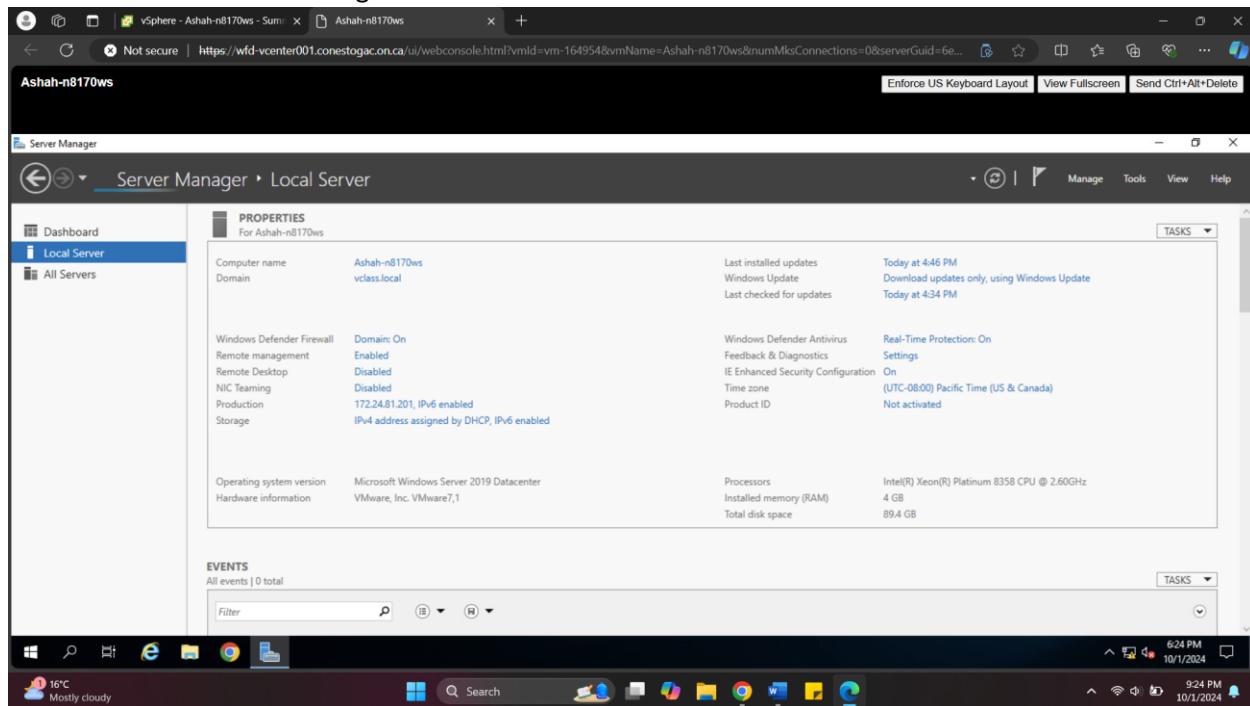
Providing Domain name as “vclass.local”



Successfully promoting Ashah-n8170ws to Domain Controller

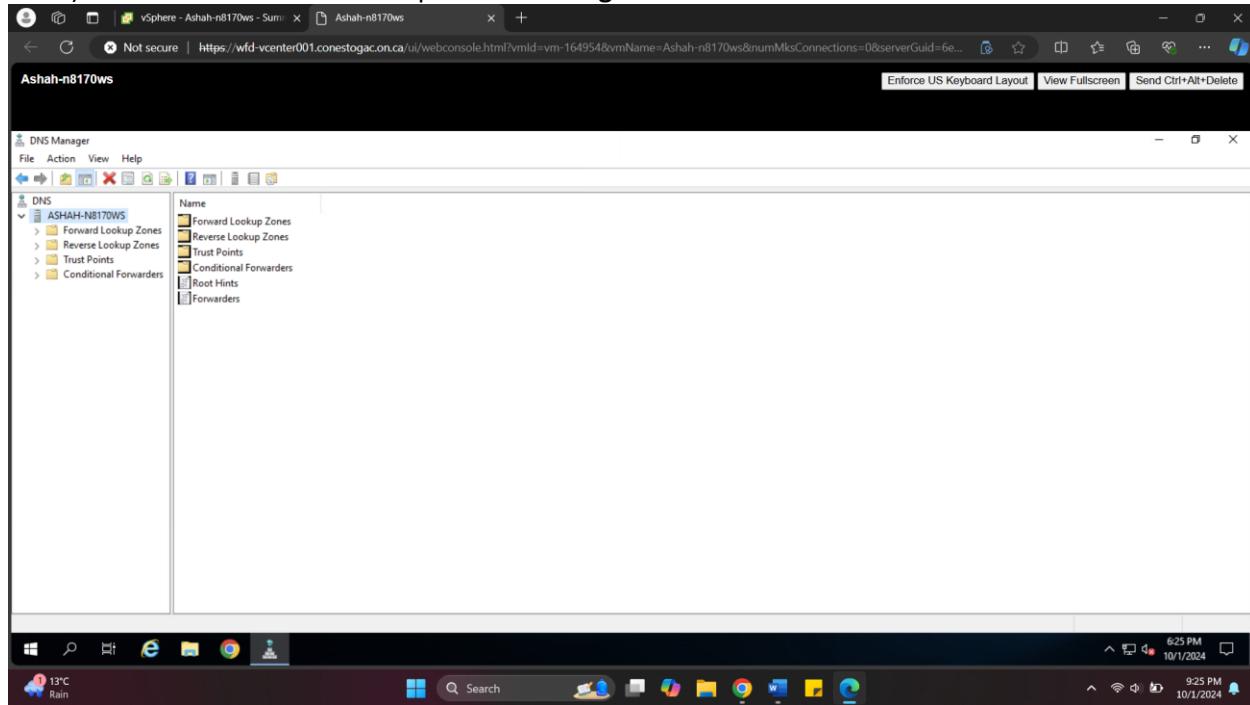


Domain Controller default Page

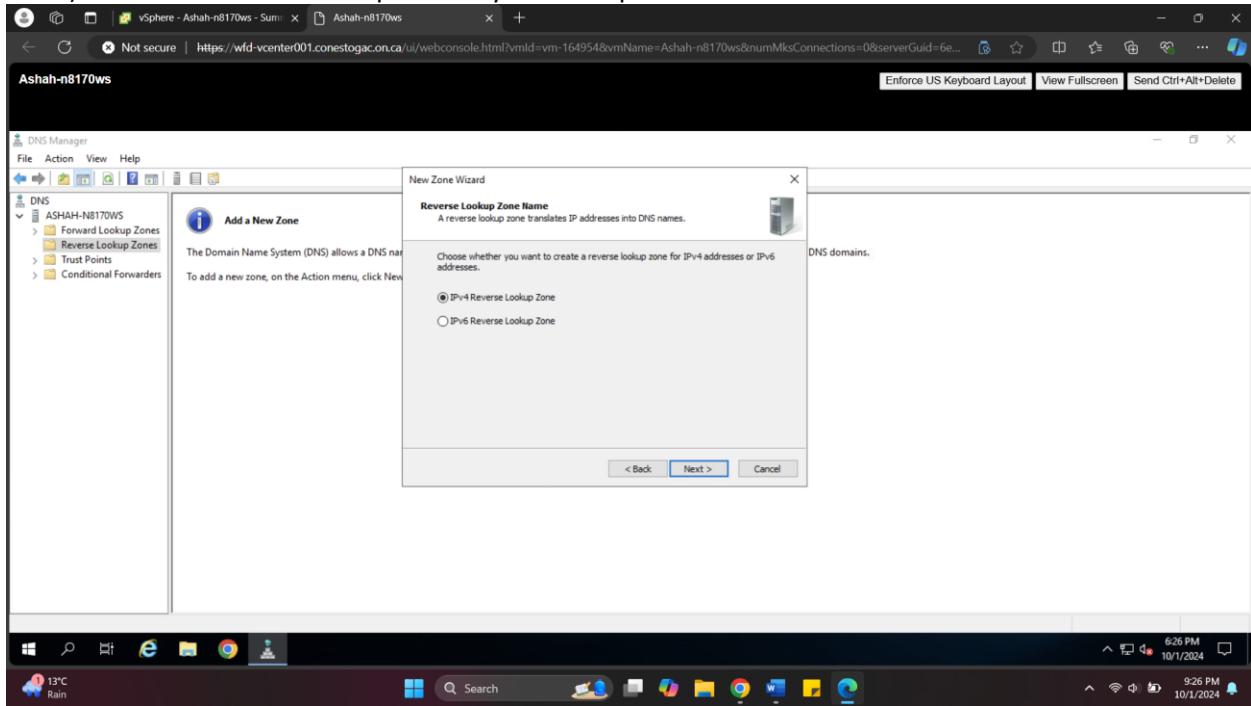


Section 2: Setting up the required DNS records

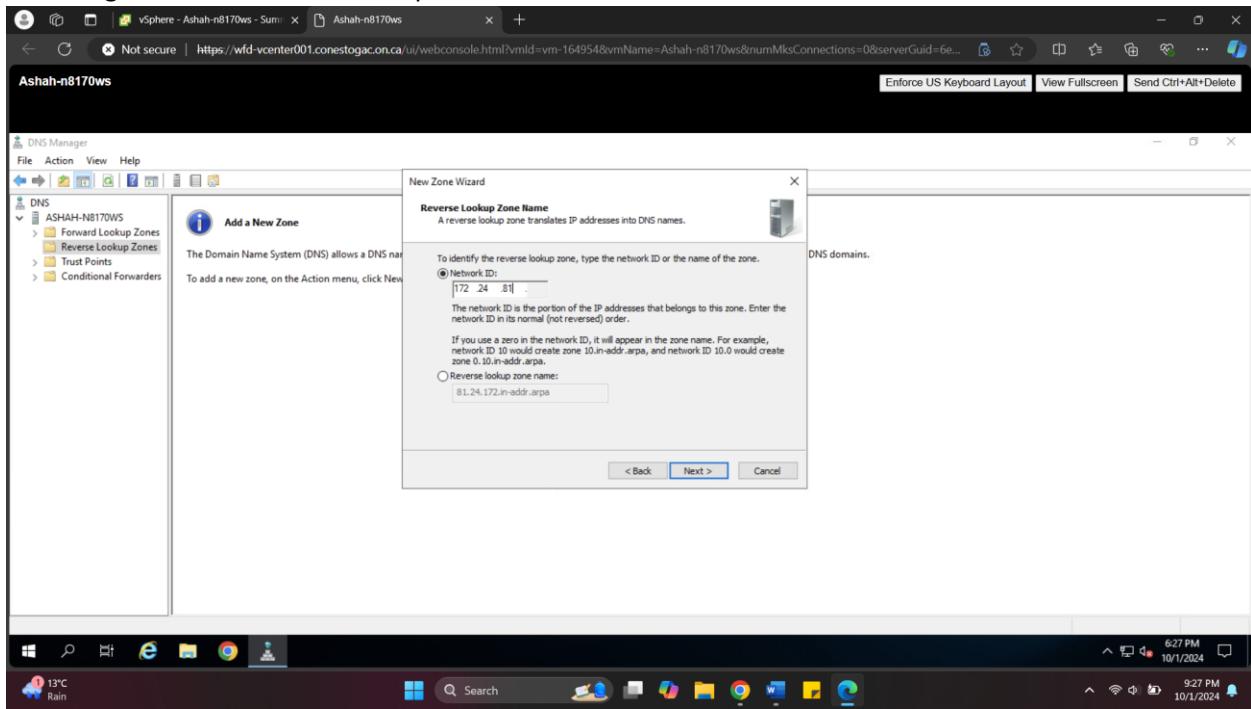
- Once our DC is restarted open DNS Manager.



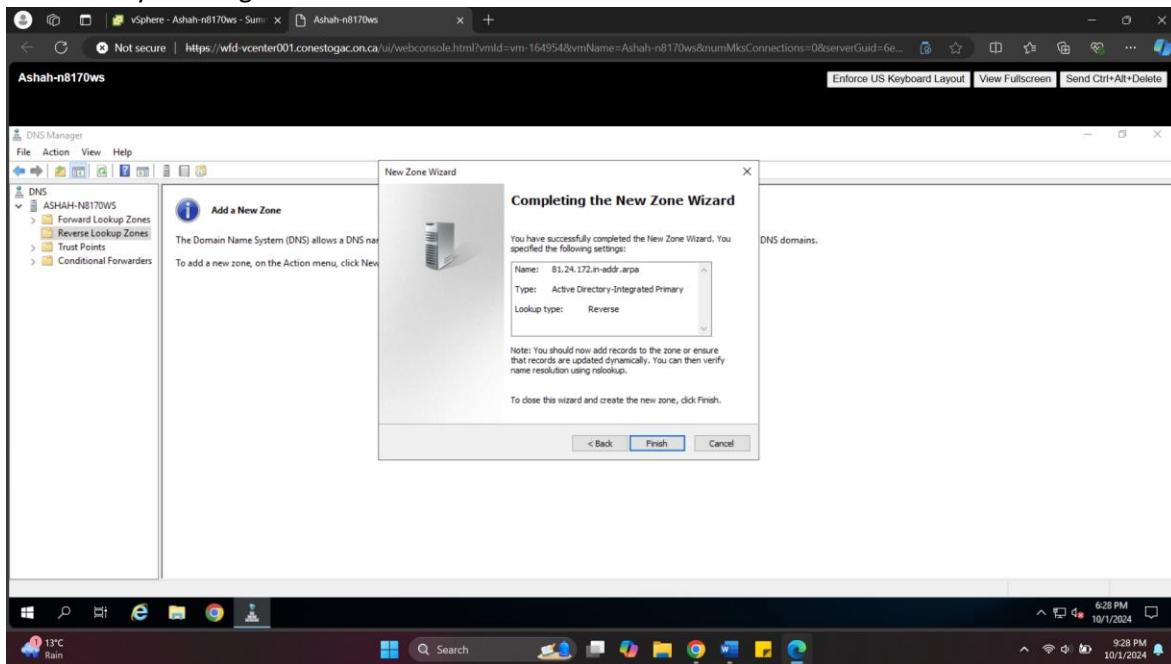
2) Create a Reverse lookup zone in your COM port network.



Providing IPv4 IP for reverse lookup zone : 172.24.81.



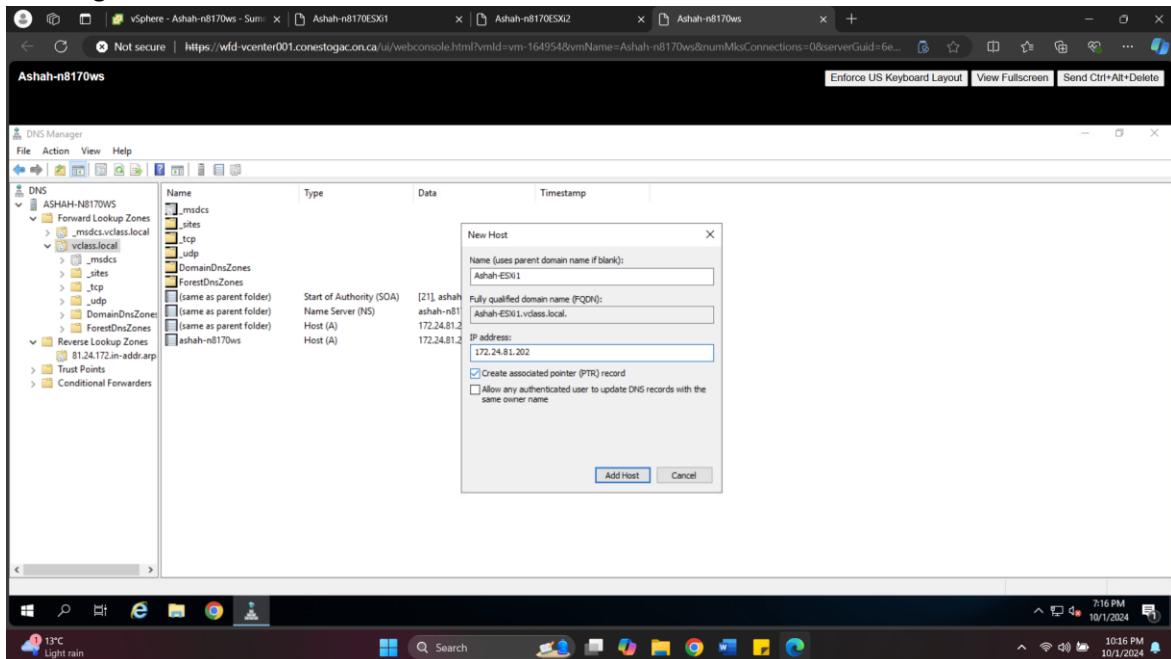
Successfully creating new zone



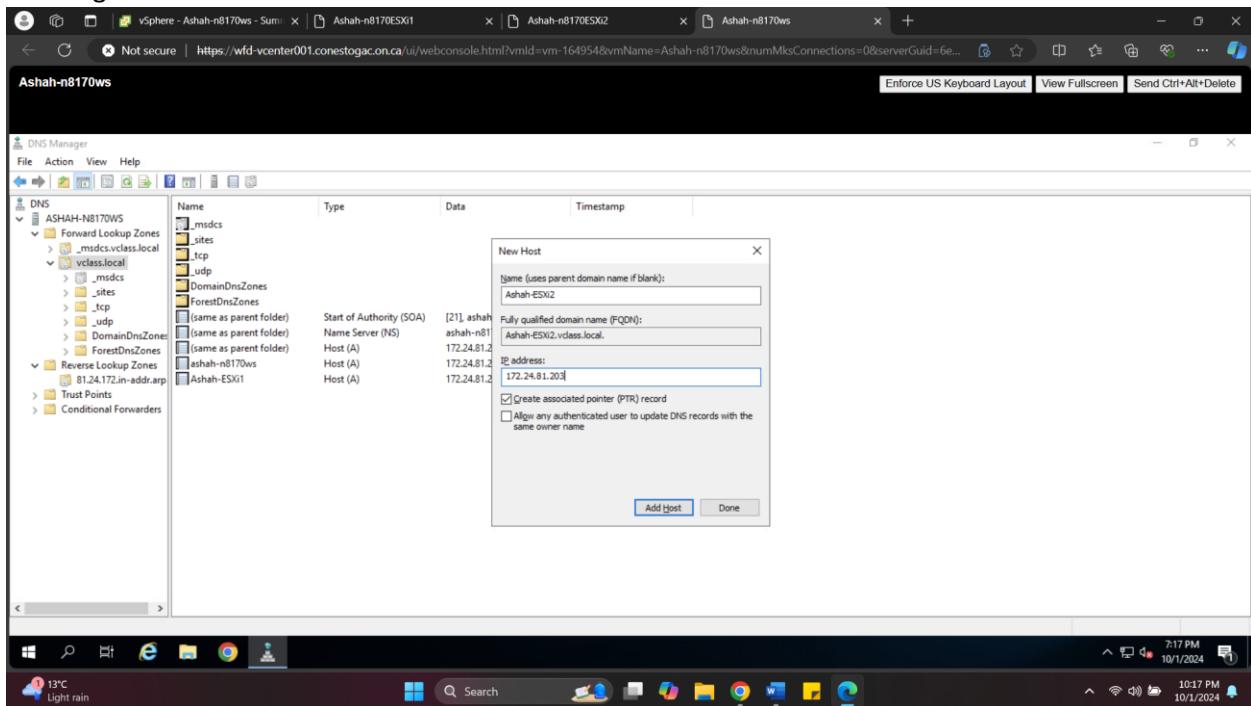
- 3) In the **vclass.local** Forward lookup zone create **3x Host A records** with the below information.
When creating the records Ensure Create associated pointer (PTR) record is selected.

Host	IP address
conestogausername-ESXi1 (Ashah-ESXi1)	172.24.81.202
conestogausername-ESXi2 (Ashah-ESXi2)	172.24.81.203
Vcsa (Ashah-vcsa)	172.24.81.205

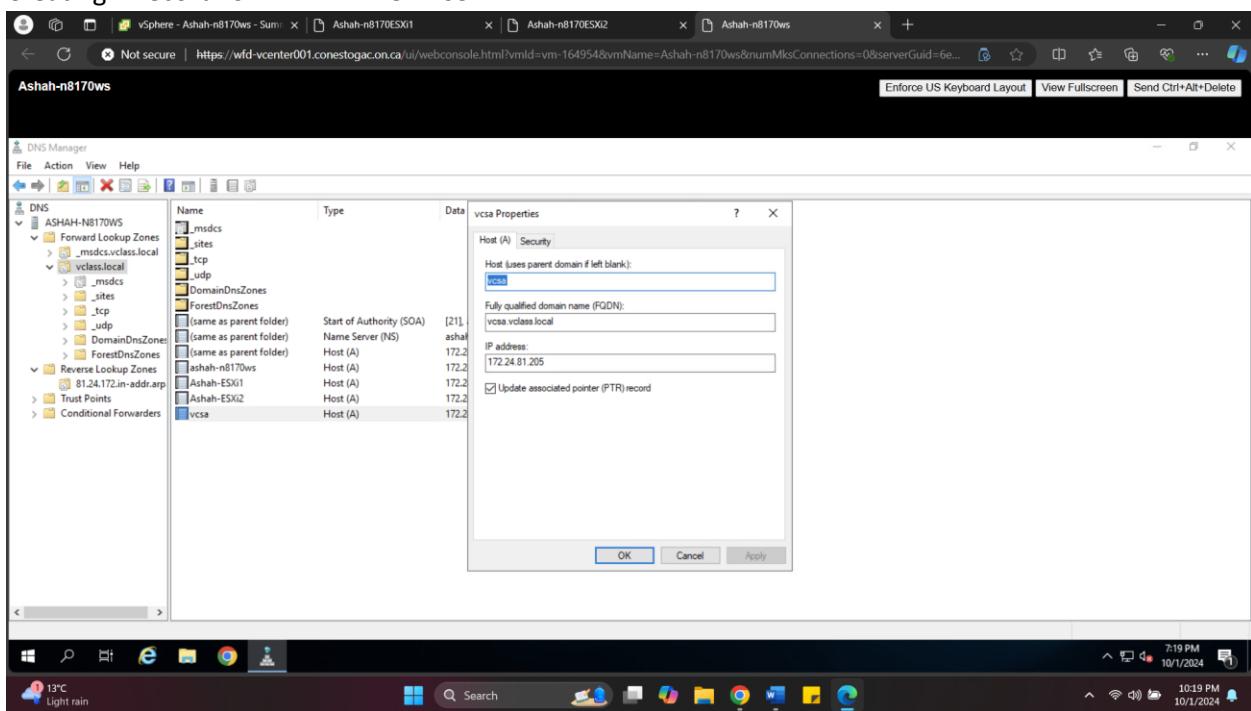
Creating A record for IP: 172.24.81.202



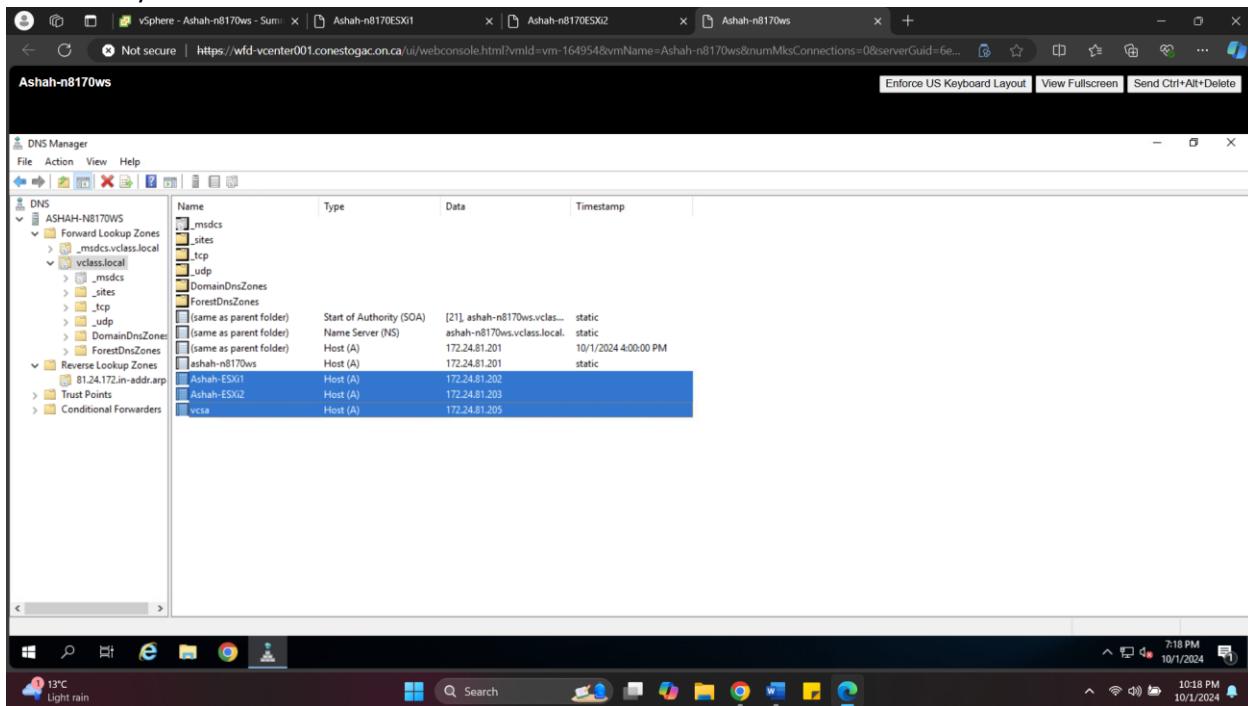
Creating A record for IP: 172.24.81.203



Creating A record for IP: 172.24.81.205



Successfully created 3 A records



4) Test DNS by using nslookup, pinging the Ashah-ESXi1.vclass.local of the ESXi servers

```

Administrator: Command Prompt
Pingng Ashah-ESXi1.vclass.local [172.24.81.202] with 32 bytes of data:
Reply from 172.24.81.202: bytes=32 time<1ms TTL=64

Ping statistics for 172.24.81.202:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>ping Ashah-ESXi2.vclass.local

Pingng Ashah-ESXi2.vclass.local [172.24.81.203] with 32 bytes of data:
Reply from 172.24.81.203: bytes=32 time<1ms TTL=64

Ping statistics for 172.24.81.203:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

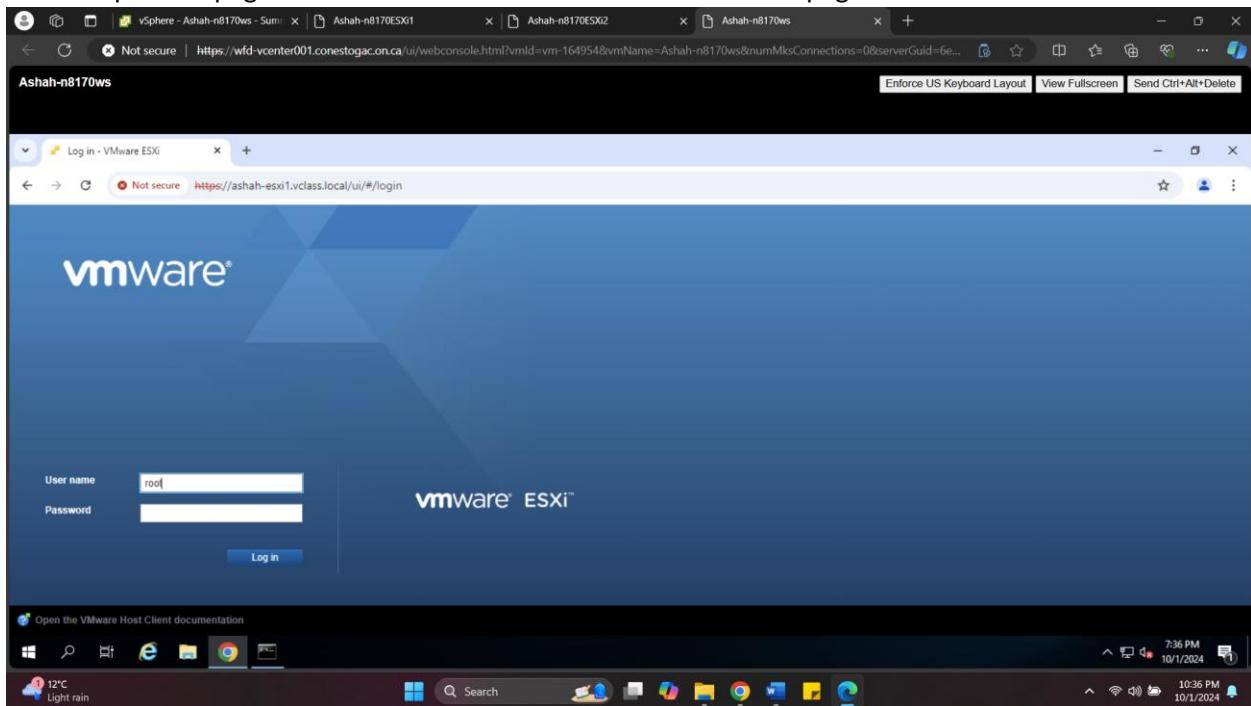
C:\Users\Administrator>ping vcsa.vclass.local

Pingng vcsa.vclass.local [172.24.81.205] with 32 bytes of data:
Reply from 172.24.81.201: Destination host unreachable.

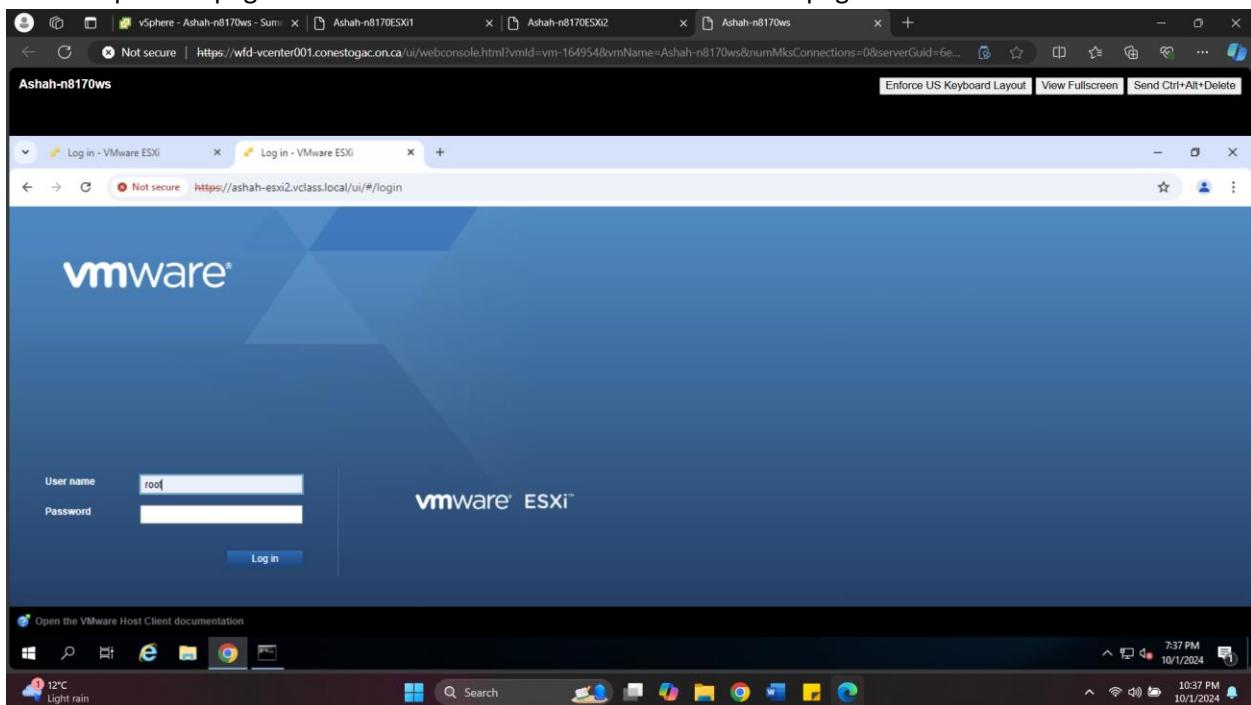
Ping statistics for 172.24.81.205:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

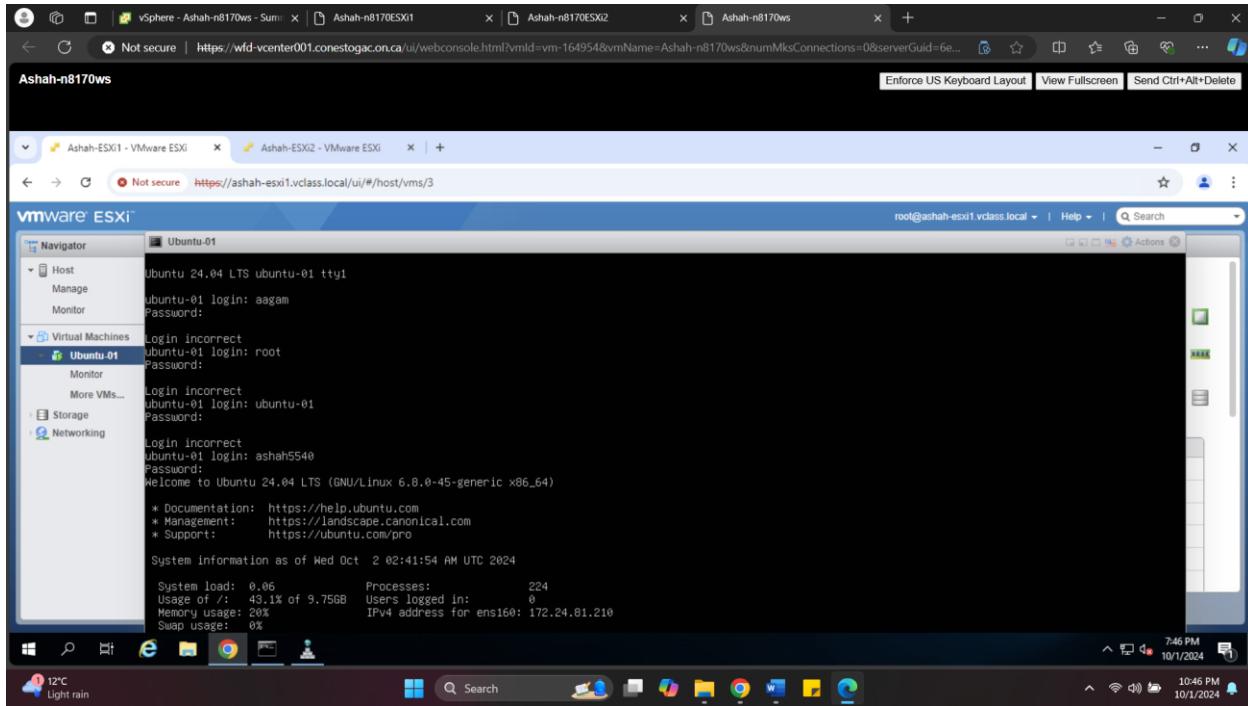
```

Able to open VM page Ashah-ESXi1.vclass.local 172.24.81.202 ESXi page from Ashah-n8170ws



Able to open VM page Ashah-ESXi2.vclass.local 172.24.81.203 ESXi page from Ashah-n8170ws



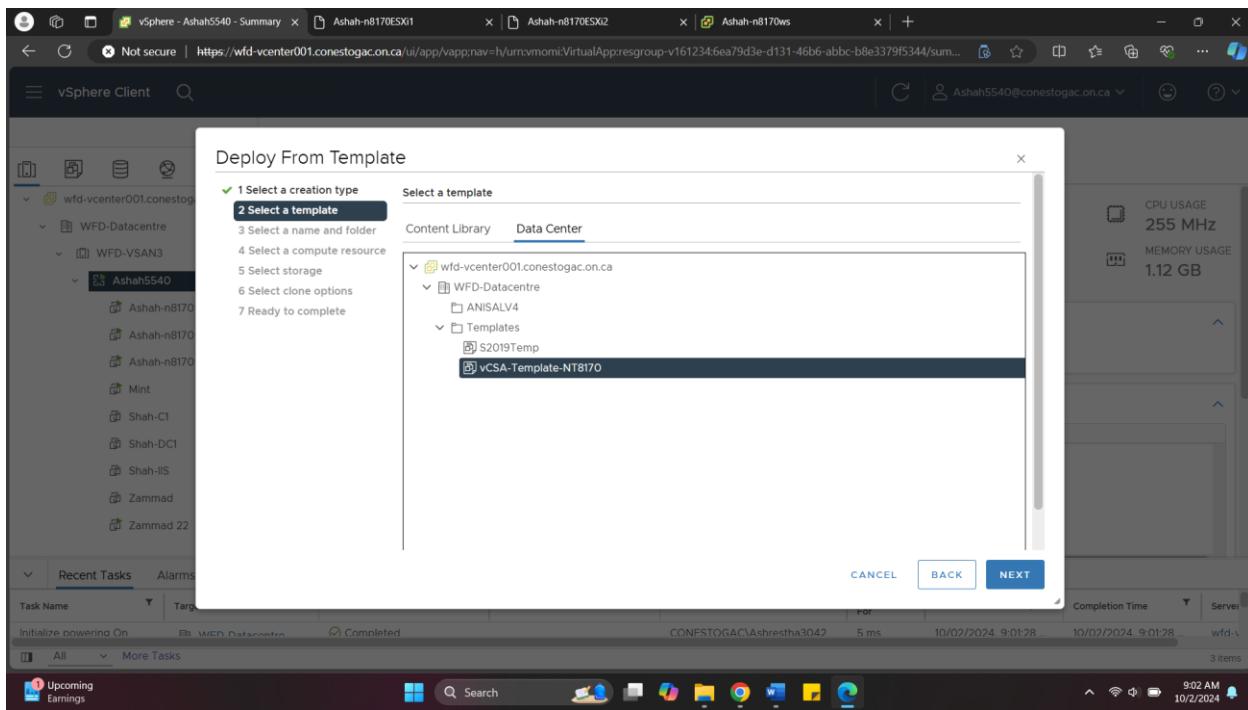


Lab 4: Deploying vCenter Server

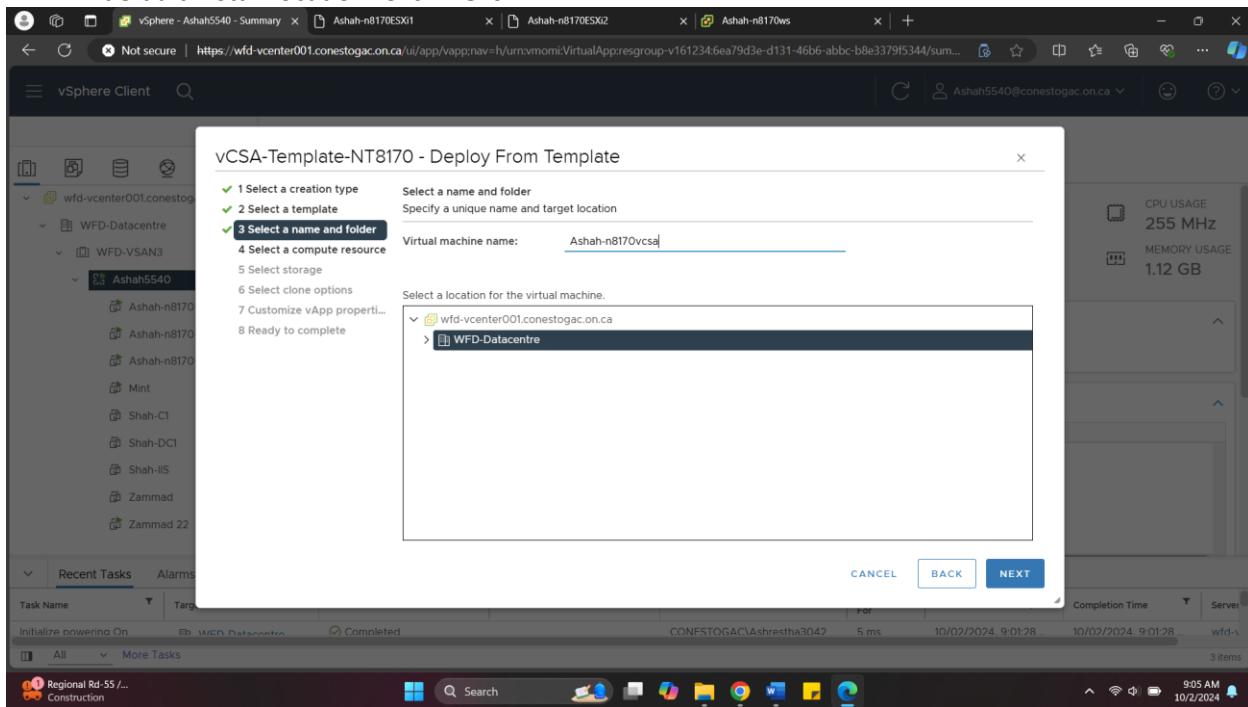
- 4) Deploy vCenter Server from a template.
- 5) Set an IP address and DNS server using VMware's VAMI scripts.
- 6) Sign into vCenter Server.

Section 1: Deploying vCenter Server from a template

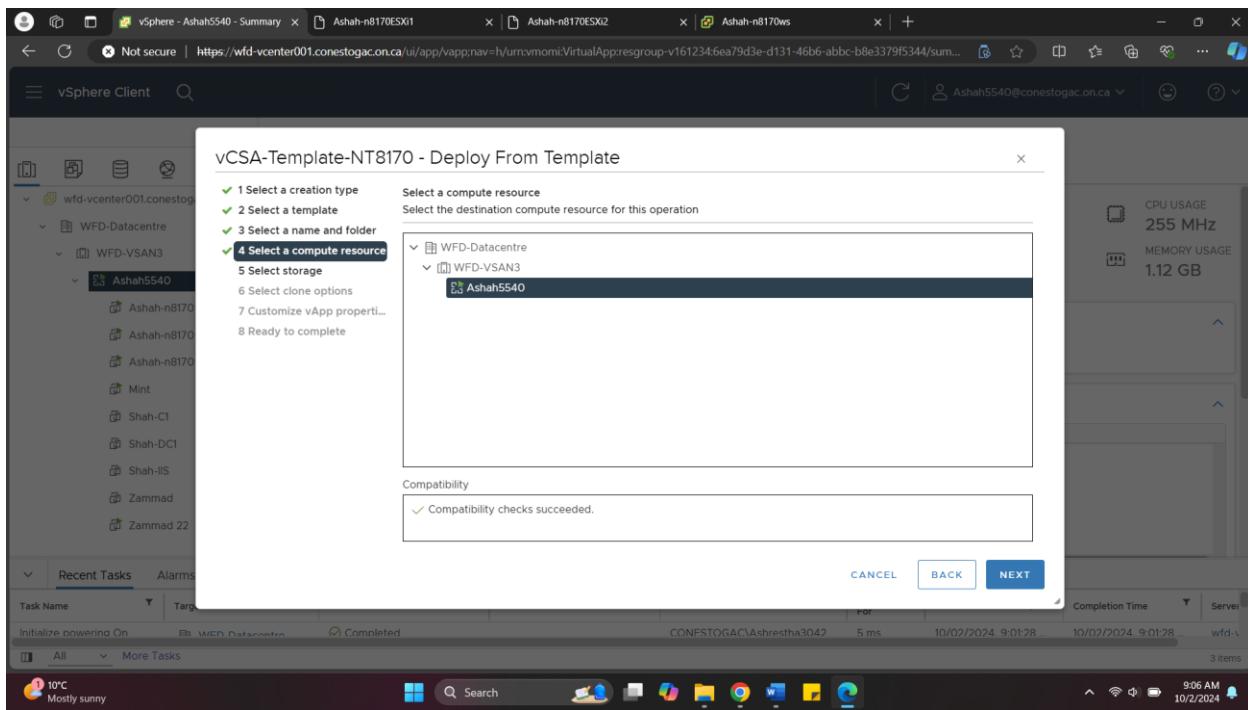
- 1) Right-Click your vApp and Select New Virtual Machine...
- 2) On Select a creation type Select Deploy from Template.
- 3) On Select a template Select Data Center >WFD-Datacentre>Templates>vCSA-Template-NT8170.



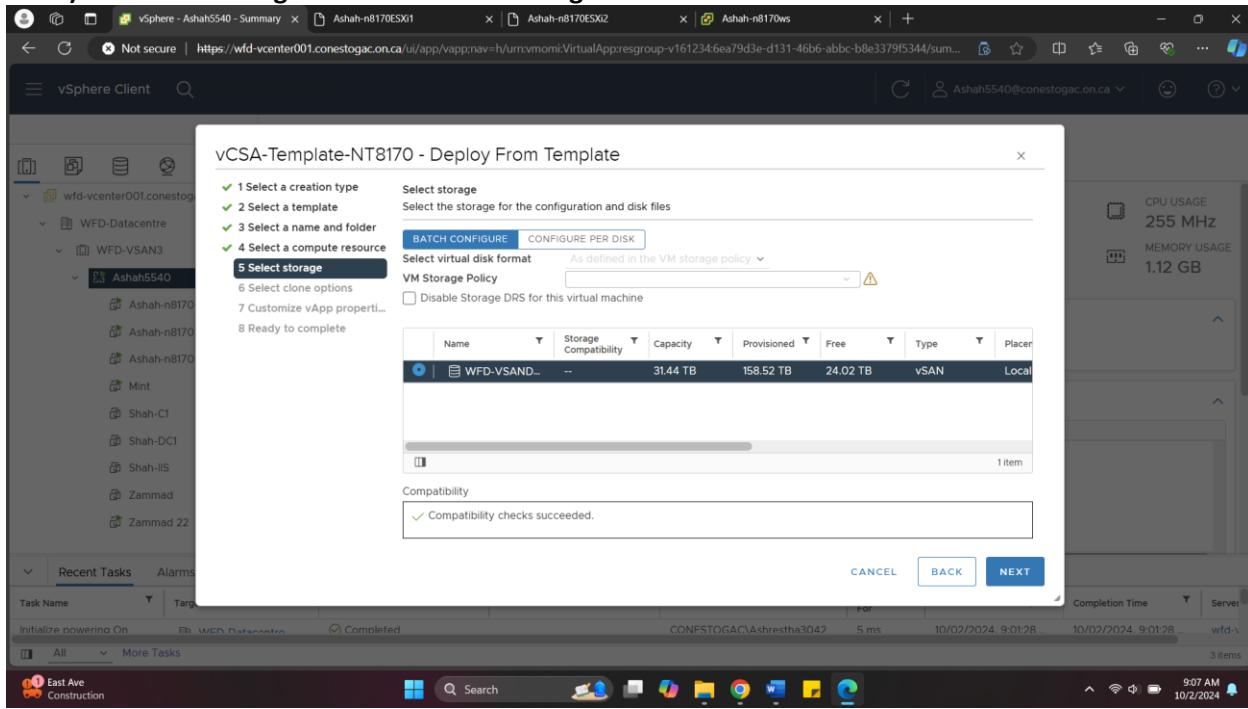
- 4) For **Virtual machine name** enter **conestogausername-n8170vcsa** (Ashah-n8170vcsa) leave the default install location. Click **Next**.



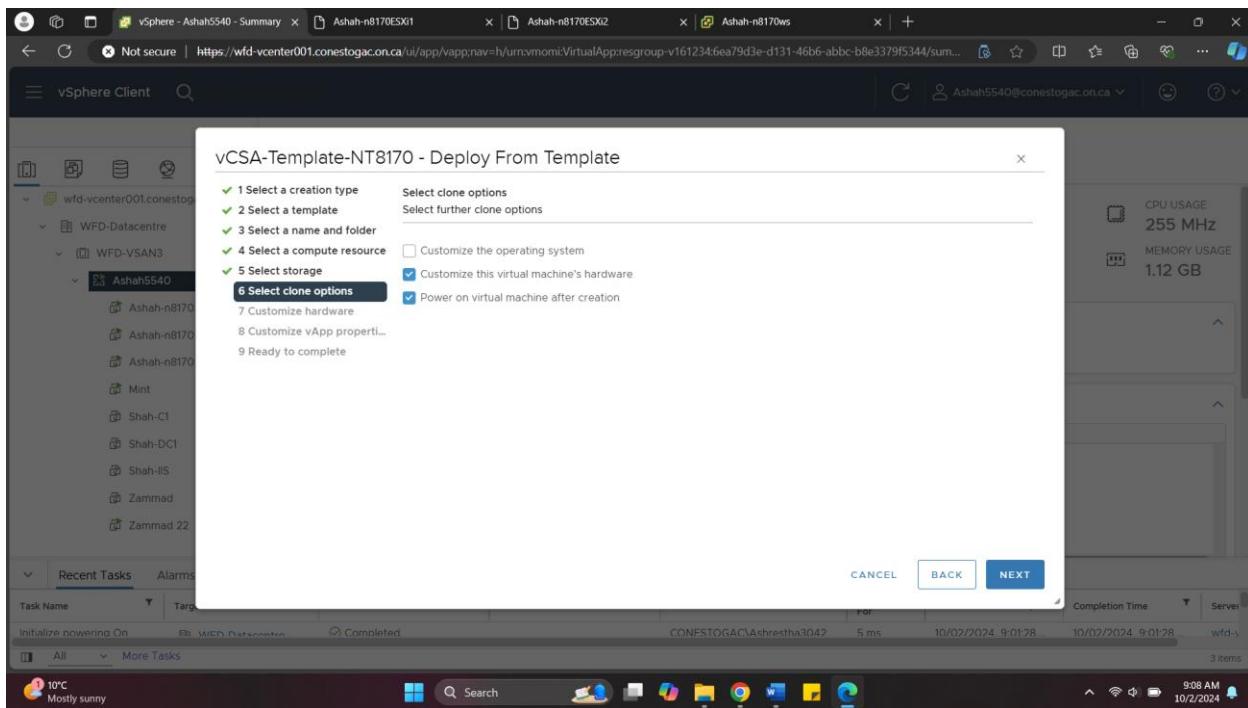
- 5) In **Select a compute resource** make sure your vApp is selected. Click **Next**.



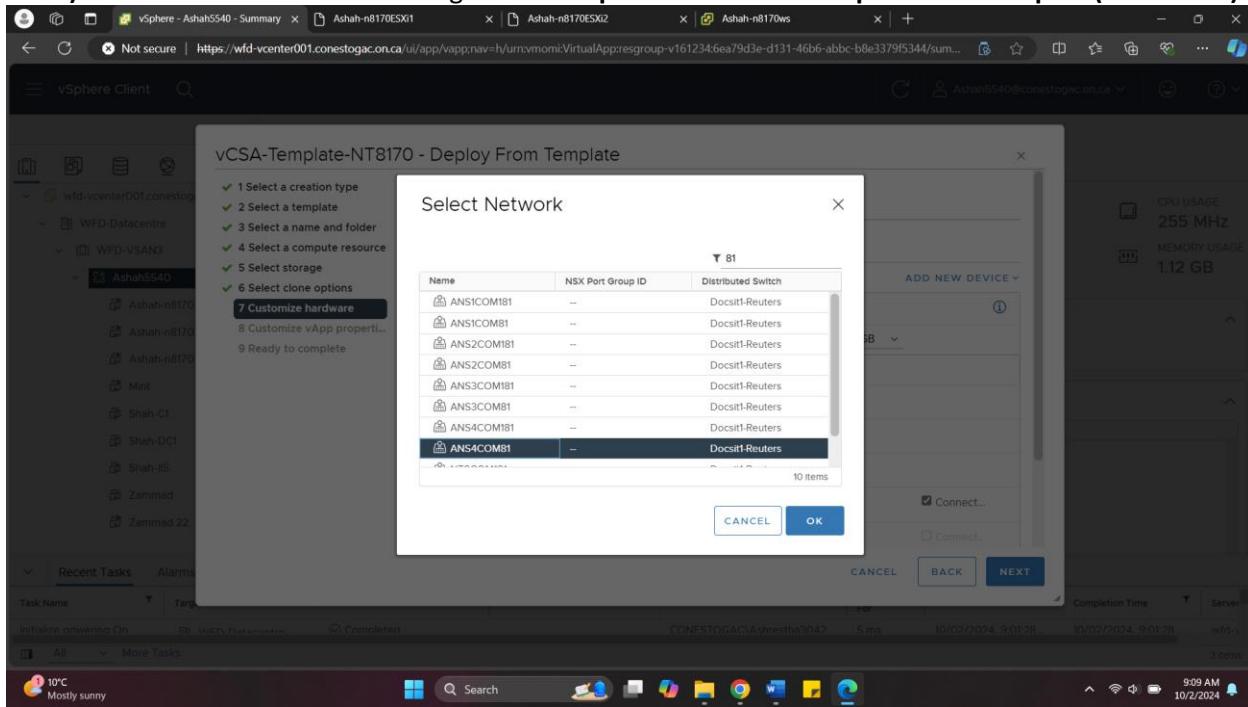
6) In Select storage select the VSAN storage. Click Next.



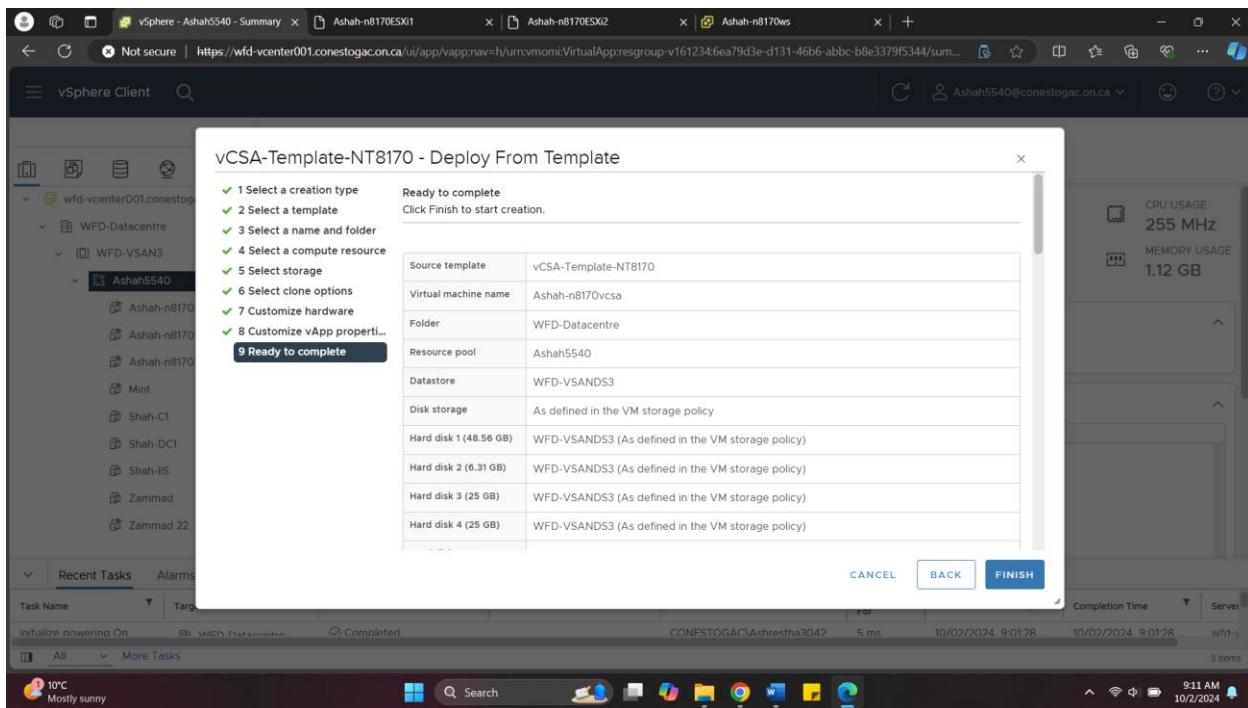
7) In Select clone options Select Customize this virtual machine's hardware and Power on the virtual machine after creation Click Next.



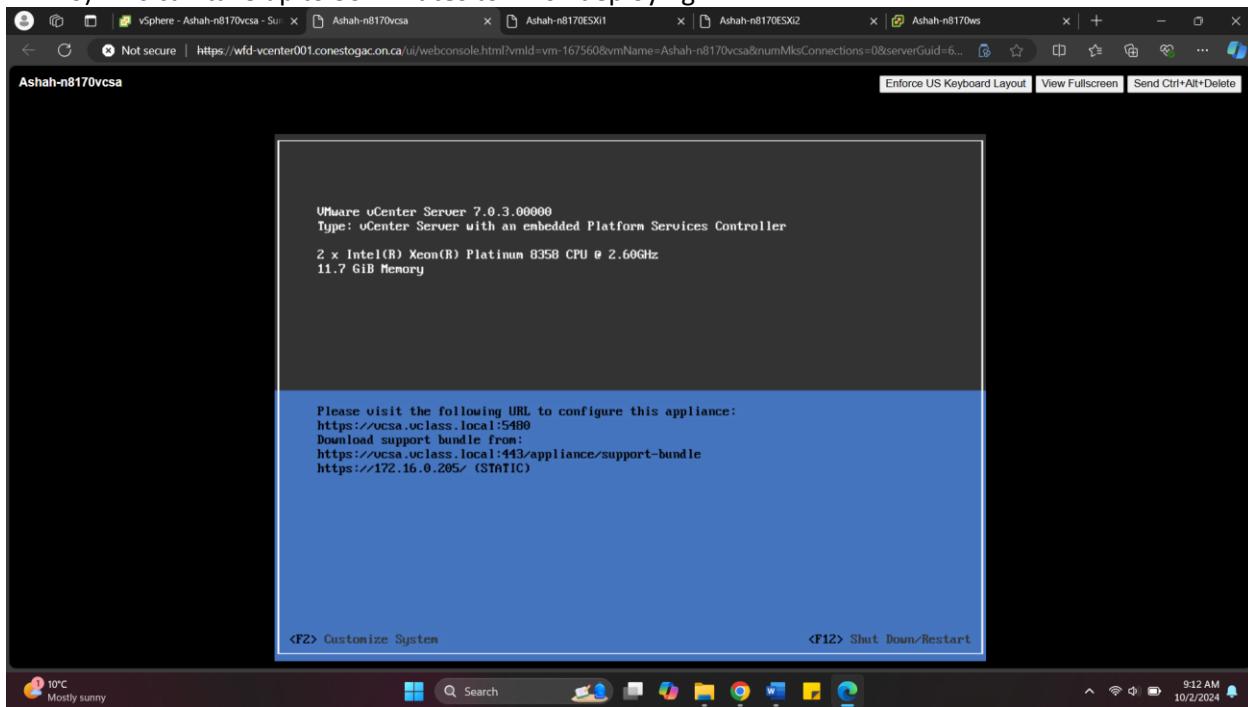
8) In Customize Hardware change the COM port on Network Adapter 1 to COM port (172.24.81.)



9) Click Finish on Ready to complete to start deploying the template.

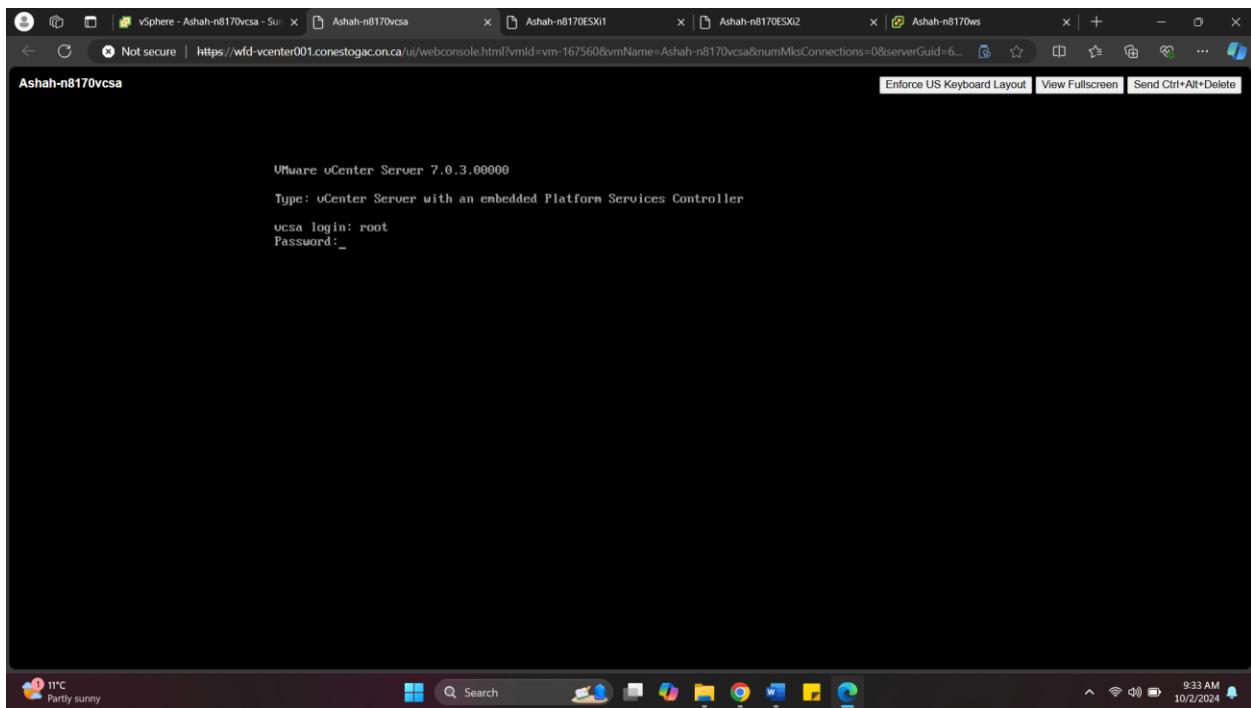


10) This can take up to **30 minutes** to finish deploying.

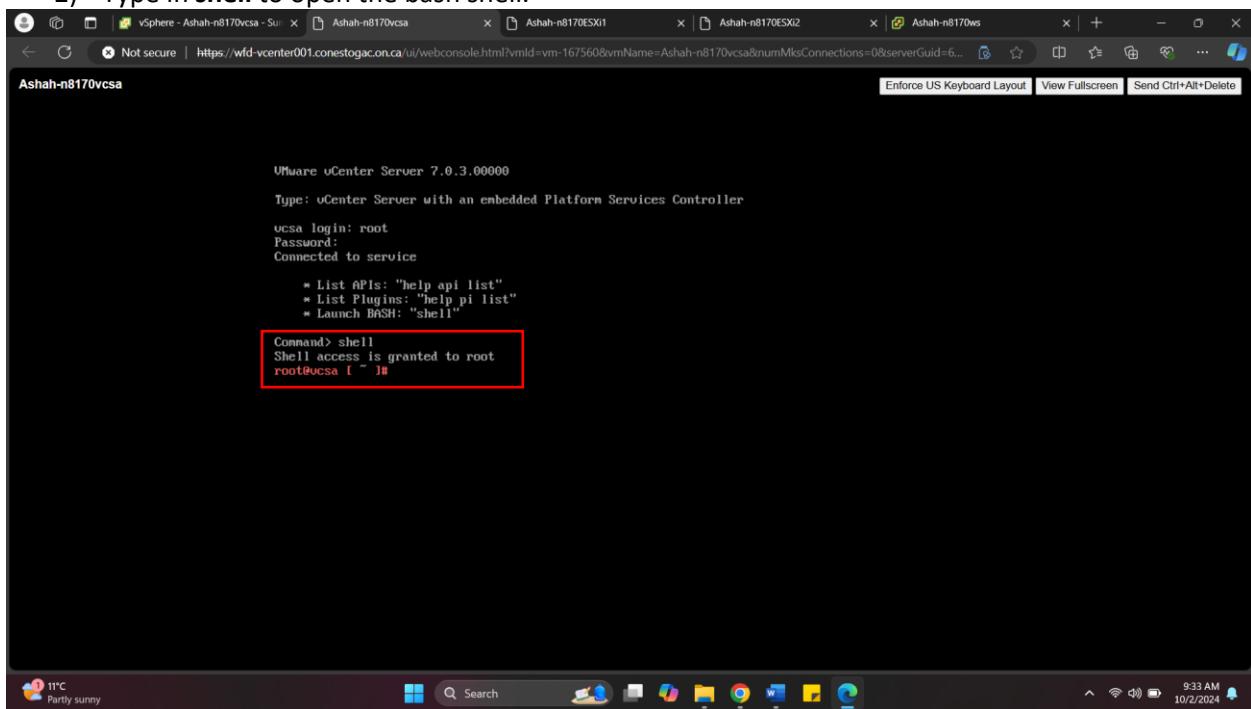


Section 2: Initial Configuration of the vcsa appliance using VMware's VAMI network script

- 1) Press **<ALT> <F1>** to open another terminal window, Sign in with username **root** and password **Vclass123\$**.



2) Type in **shell** to open the bash shell.



3) Type in **/opt/vmware/share/vami/vami_config_net** to start configuring the network settings.

```

VMware vCenter Server 7.0.3.00000
Type: vCenter Server with an embedded Platform Services Controller
vcsa login: root
Password:
Connected to service
* List APIs: "help api list"
* List Plugins: "help pi list"
* Launch BASH: "shell"

Command> shell
Shell access is granted to root
root@vcsa [ ~ ]# /opt/VMware/share/vami/vami_config_net

Main Menu
0) Show Current Configuration (scroll with Shift-PgUp/PgDown)
1) Exit this program
2) Default Gateway
3) Hostname
4) DNS
5) Proxy Server
6) IP Address Allocation for eth0

Enter a menu number [0]:

```

- 4) Type 6 then <Enter> to set an IP address allocation for eth0, On **Configure an IPv6 address for eth0?** type n press <Enter>, On **Configure an IPv4 address for eth0?** type y press <Enter>.

```

VMware vCenter Server 7.0.3.00000
Type: vCenter Server with an embedded Platform Services Controller
vcsa login: root
Password:
Connected to service
* List APIs: "help api list"
* List Plugins: "help pi list"
* Launch BASH: "shell"

Command> shell
Shell access is granted to root
root@vcsa [ ~ ]# /opt/VMware/share/vami/vami_config_net

Main Menu
0) Show Current Configuration (scroll with Shift-PgUp/PgDown)
1) Exit this program
2) Default Gateway
3) Hostname
4) DNS
5) Proxy Server
6) IP Address Allocation for eth0

Enter a menu number [0]:
Type Ctrl-C to go back to the Main Menu

Configure an IPv6 address for eth0? y/n [n]: n
Configure an IPv4 address for eth0? y/n [n]: y_

```

- 5) On **Use a DHCPv4 Server instead of a static IPv4 address?** type n press <Enter>, On **IPv4 Address** type **172.24.81.205** press <Enter>. (x is your com port number), On **Netmask** [**255.255.255.0**] press <Enter>, On **Is this correct?** y/n enter y press <Enter>.

```

Main Menu
0) Show Current Configuration (scroll with Shift-PgUp/PgDown)
1) Exit this program
2) Default Gateway
3) Hostname
4) DNS
5) Proxy Server
6) IP Address Allocation for eth0
Enter a menu number [0]: 6
Type Ctrl-C to go back to the Main Menu

Configure an IPv6 address for eth0? y/n [n]: n
Configure an IPv4 address for eth0? y/n [n]: y
Use a DHCPv4 Server instead of a static IPv4 address? y/n [n]: n
IPv4 Address [172.16.0.205]: 172.24.81.205
Netmask [255.255.255.0]: 255.255.255.0
IPv4 Address: 172.24.81.205
Netmask: 255.255.255.0

Is this correct? y/n [y]: y
Reconfiguring eth0...
net.ipv6.conf.eth0.disable_ipv6 = 1
Network parameters successfully changed to requested values

```

- 6) Type 2 then <Enter> to set a new default gateway address, On **Choose the interface to associate with default gateway [0]** press <Enter>, On **IPv4 Default Gateway** type **172.24.81.1** press <Enter>, On **IPv6 Default Gateway** press <Enter>.

```

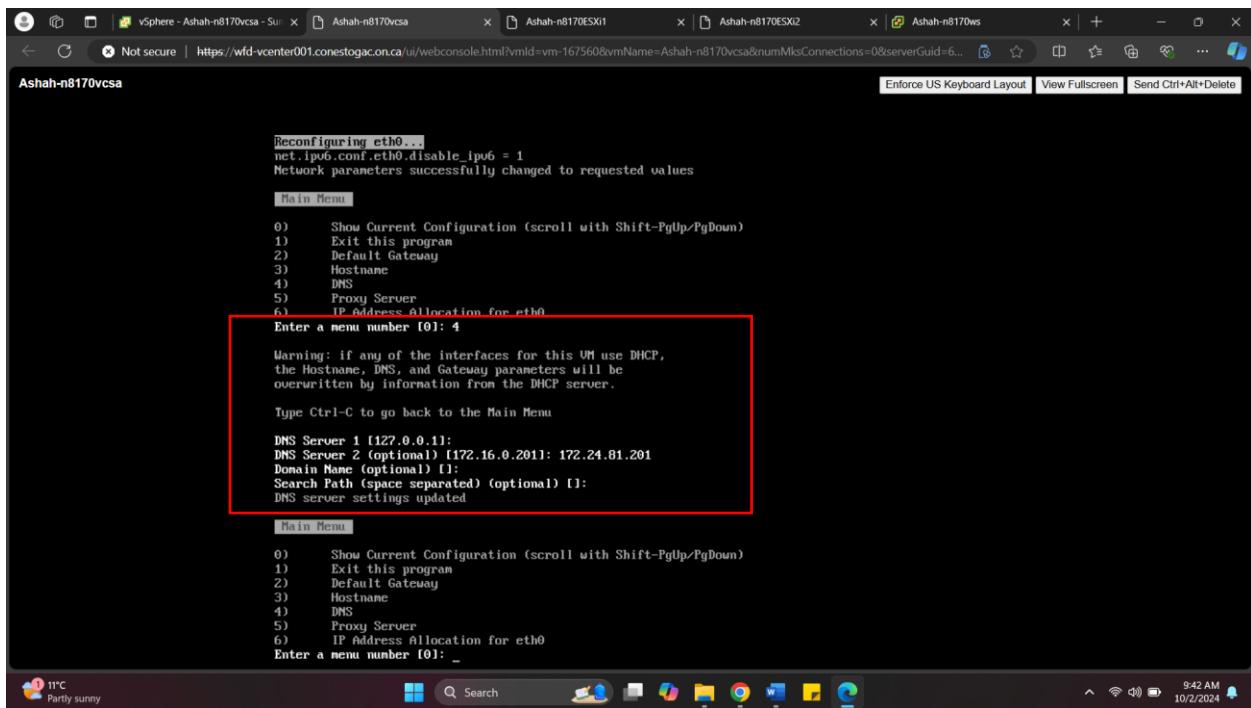
Main Menu
0) Show Current Configuration (scroll with Shift-PgUp/PgDown)
1) Exit this program
2) Default Gateway
3) Hostname
4) DNS
5) Proxy Server
6) IP Address Allocation for eth0
Enter a menu number [0]: 2
Warning: if any of the interfaces for this VM use DHCP,
the Hostname, DNS, and Gateway parameters will be
overwritten by information from the DHCP server.

Type Ctrl-C to go back to the Main Menu

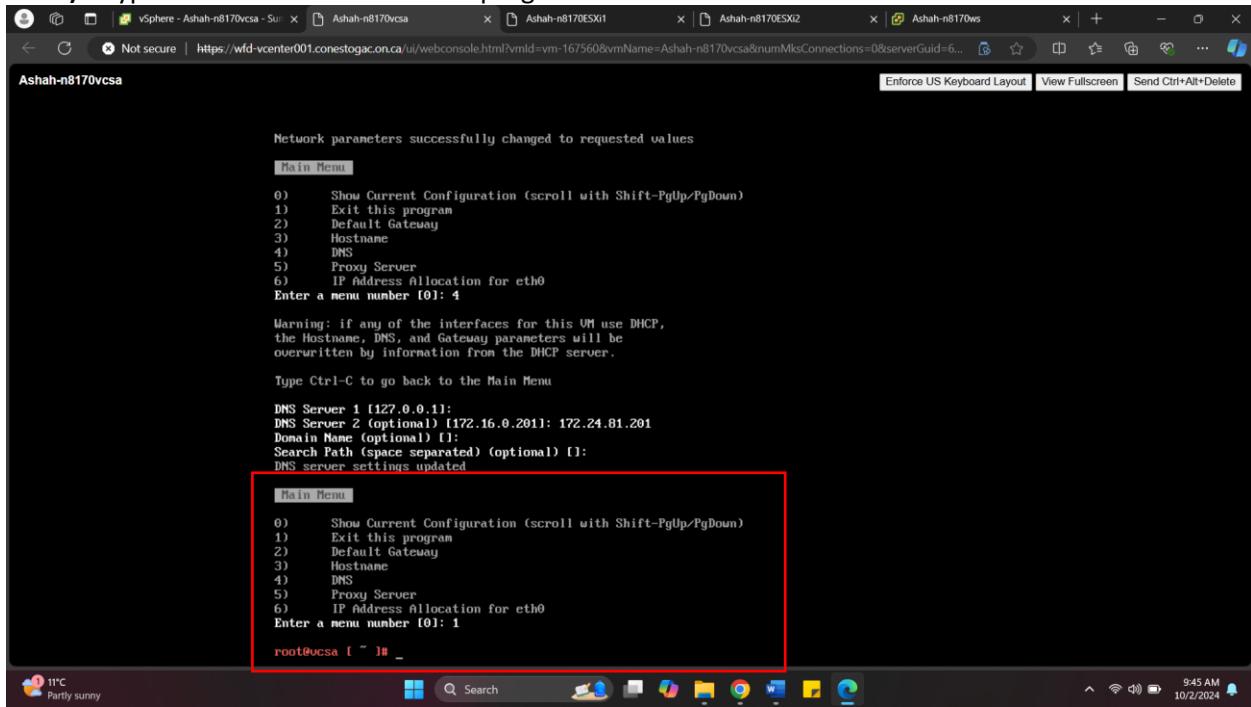
0) eth0
Choose the interface to associate with default gateway [0]:
Gateway will be associated with eth0
IPv4 Default Gateway []: 172.24.81.1
IPv6 Default Gateway []:
Reconfiguring eth0...
net.ipv6.conf.eth0.disable_ipv6 = 1
Network parameters successfully changed to requested values

```

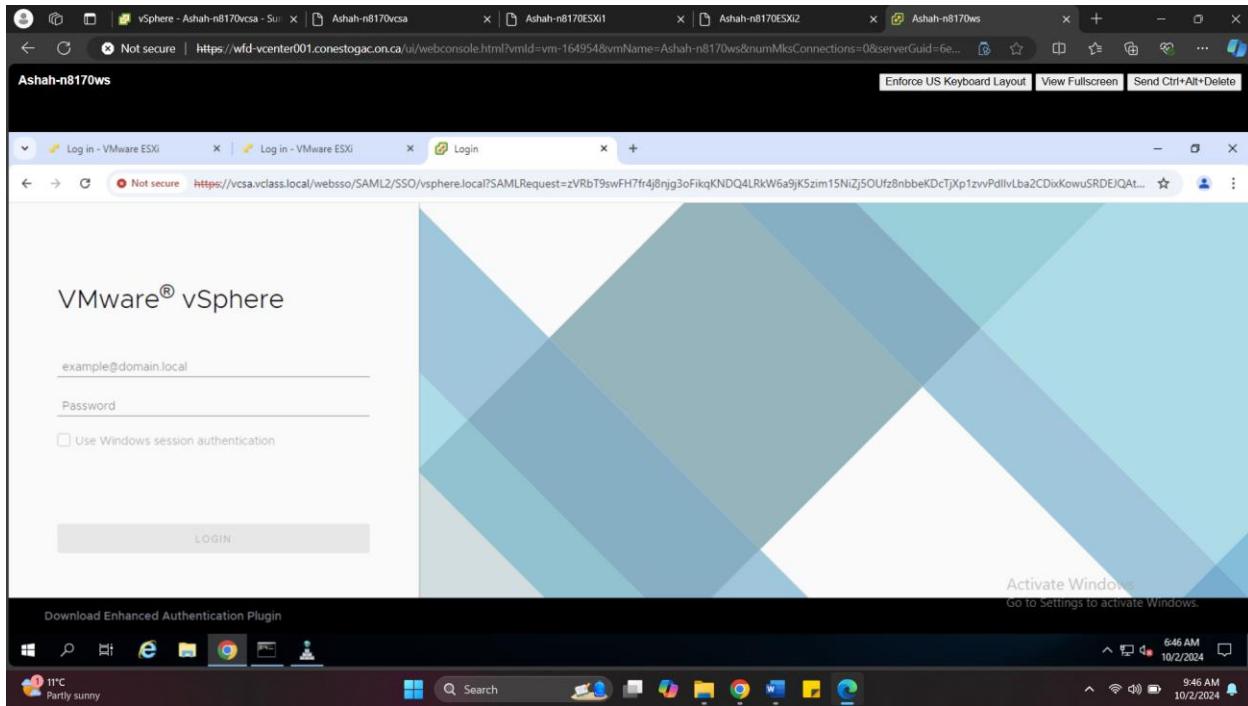
- 7) Type 4 then <Enter> to set a new DNS server address, On **DNS Server 1 [127.0.0.1]** press <Enter>, On **DNS Server 2** type **172.24.81.201** press <Enter>, On **Domain Name (optional)** press <Enter>, On **Search Path (space separated)** press <Enter>.



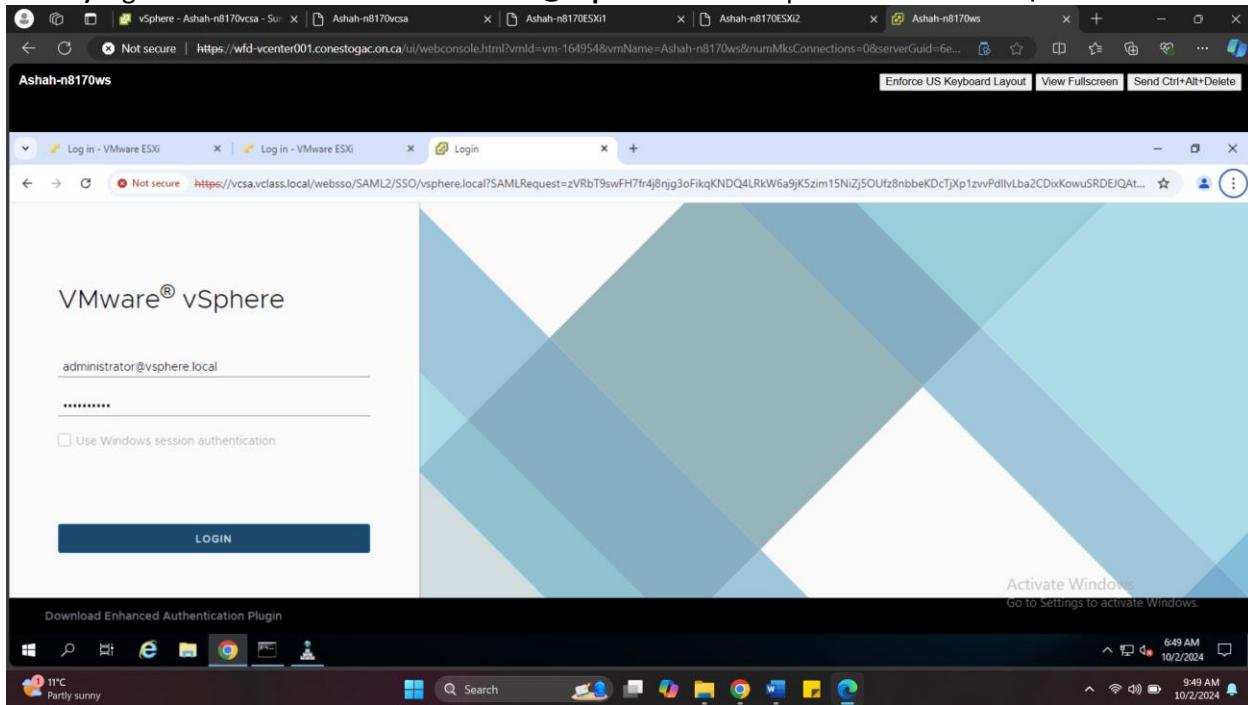
8) Type 1 then <Enter> to exit the program.



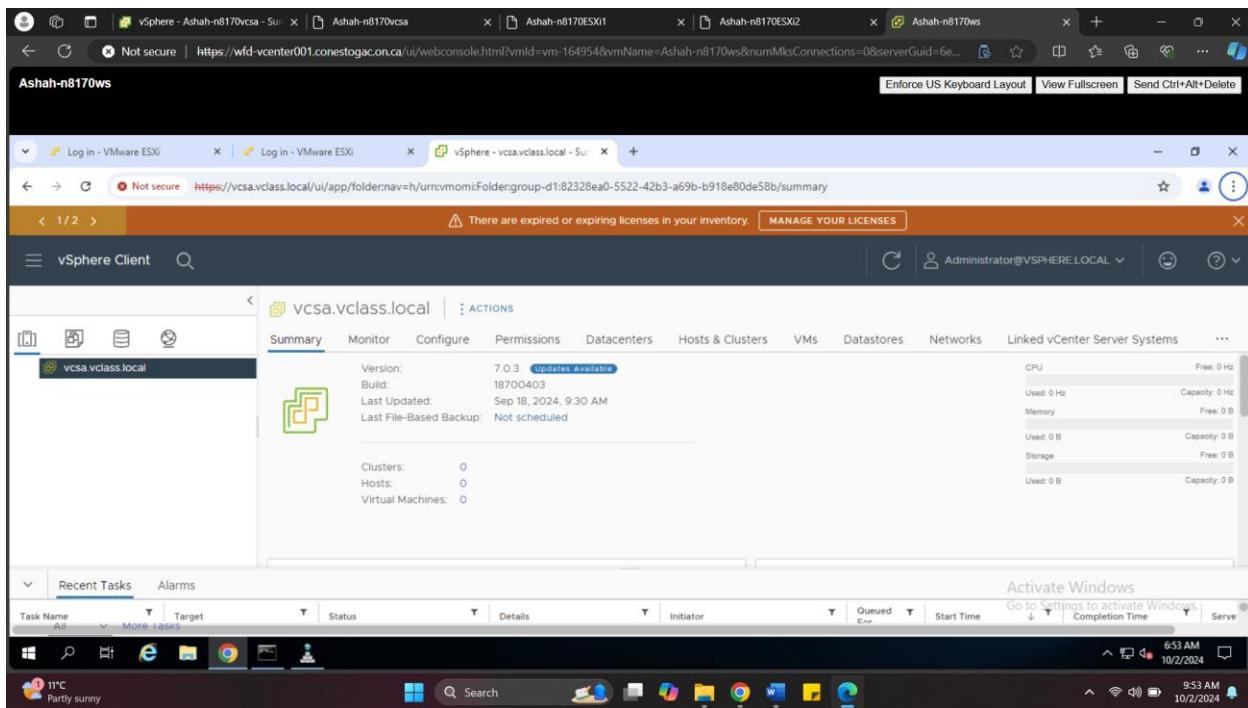
9) From your DC navigate to <https://vcsa.vclass.local>, Click **LAUNCH VSphere Client (HTML5)**.



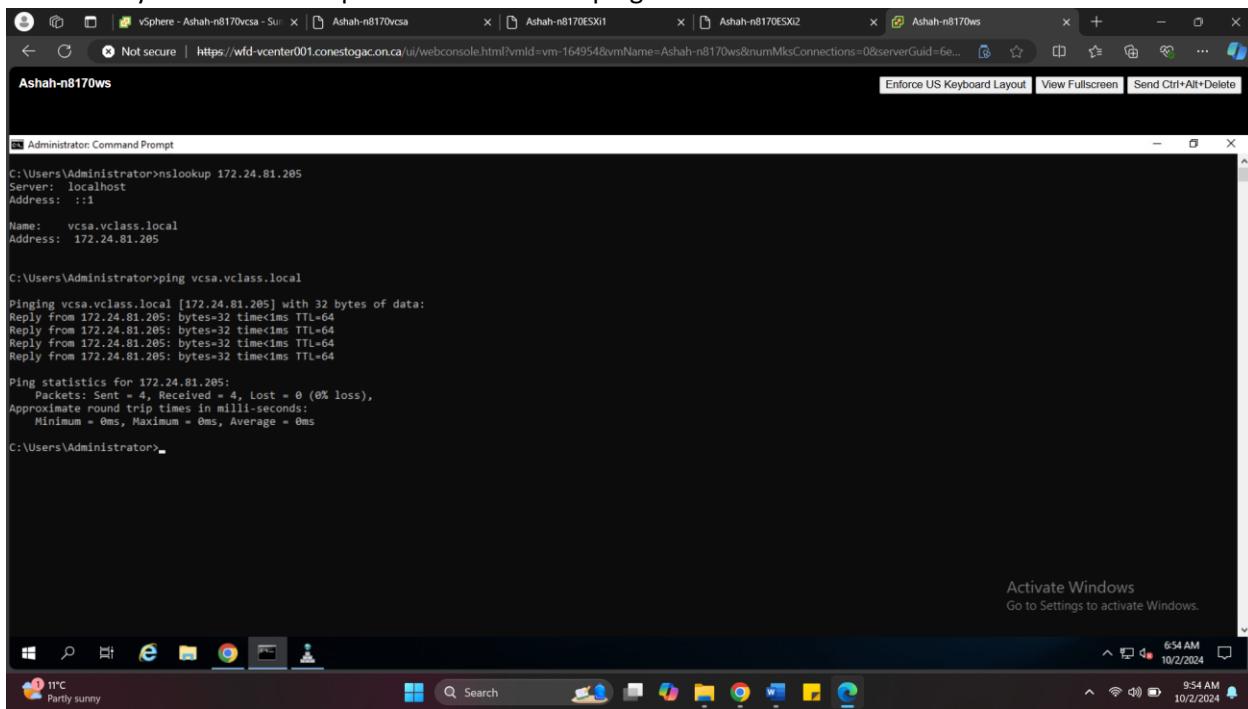
10) Sign in with username `administrator@vsphere.local` and password `Vclass123$`.



11) Explore the vCenter Interface once signed in.



Successfully able to Nslookup 172.24.81.205 and ping vcsa.vclass.local

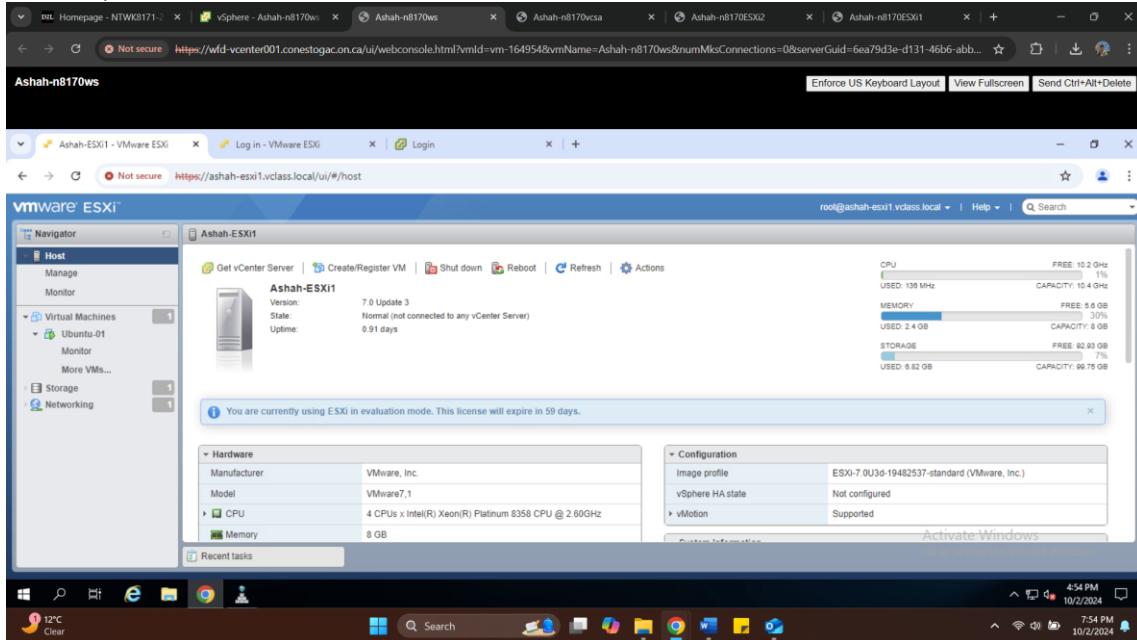


Lab 5: NTP and Time Setup

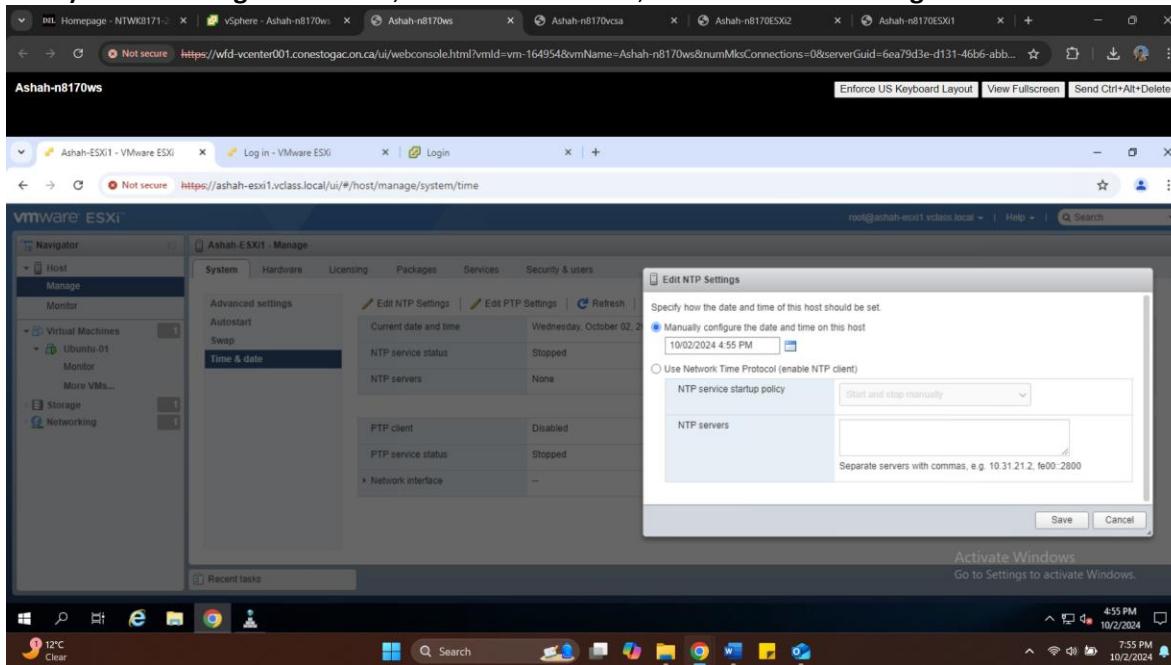
- 7) Configure NTP on both ESXi Hosts and vCenter Server.
- 8) Set the correct Time zone on our DC (Windows VM)

Section 1: NTP Setup on ESXi

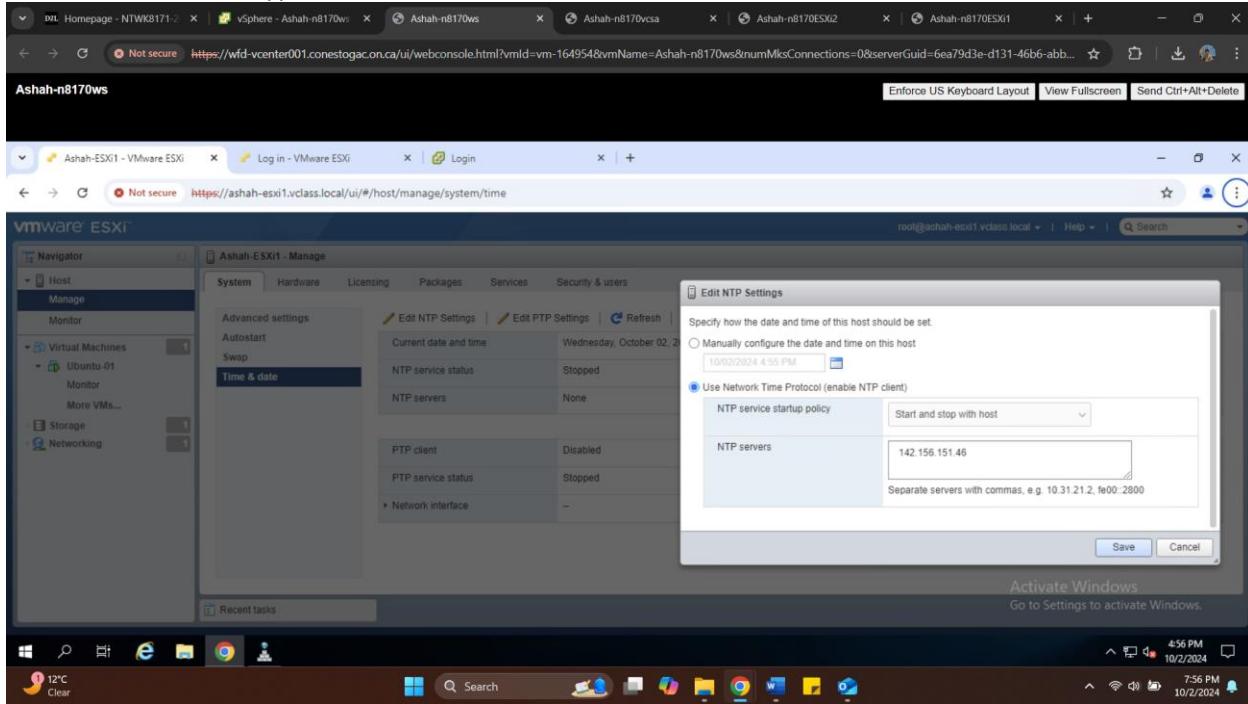
- 1) From your DC, Sign into **Ashah-ESXi1**. You can use the IP address or FQDN. Username **root** password **Vclass123\$**.



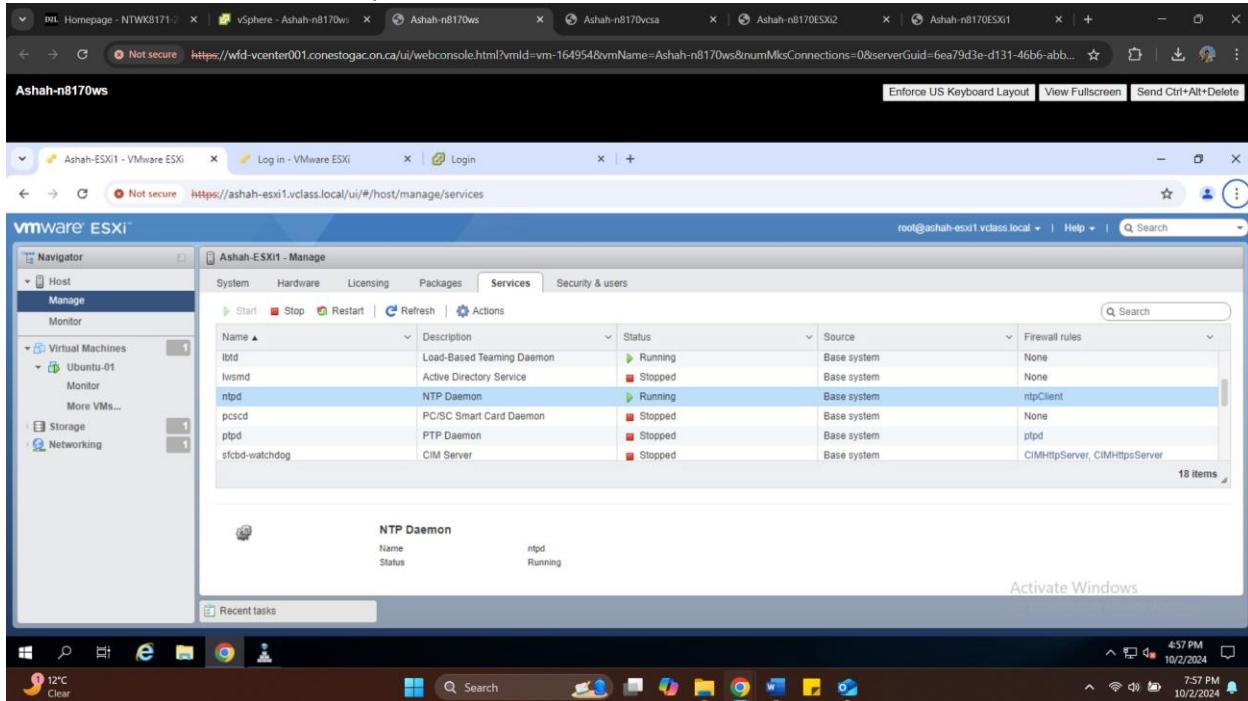
- 2) Click **Manage** on the left, Select **Time & Date**, Select **Edit NTP settings**.



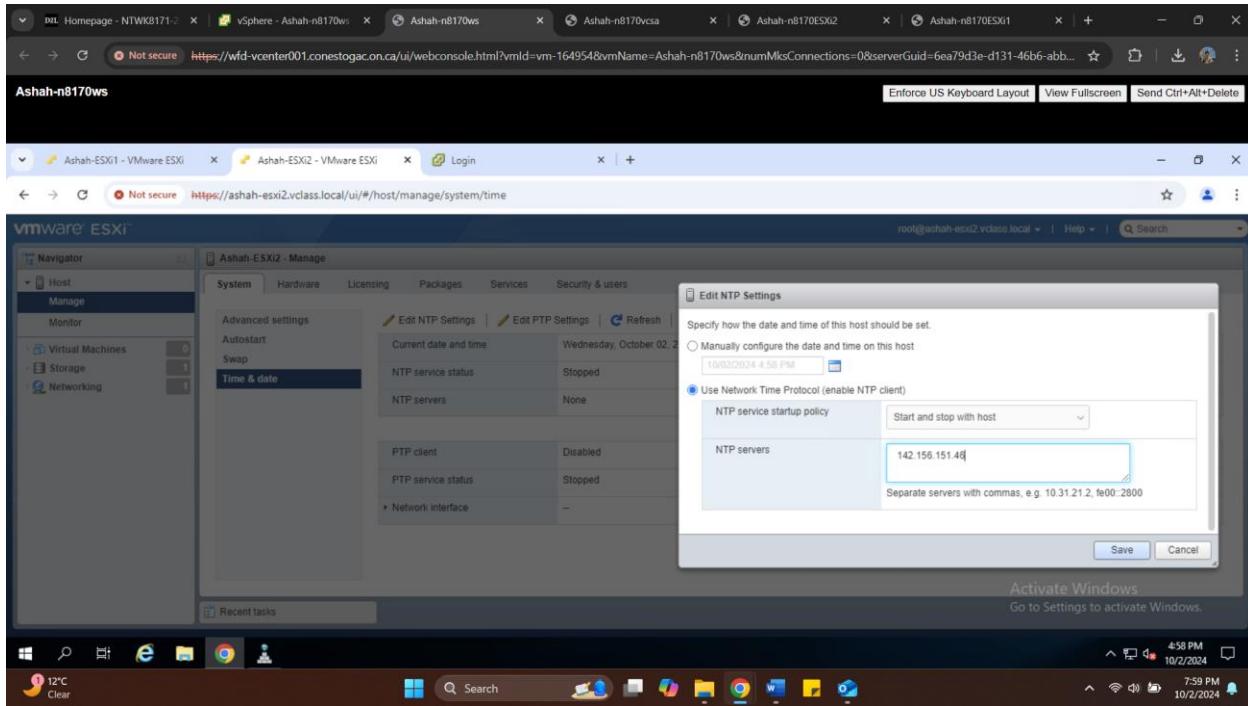
- 3) Select Use Network Time Protocol, For NTP startup policy Select Start and Stop with host, In NTP Servers type in 142.156.151.46. Click Save.**



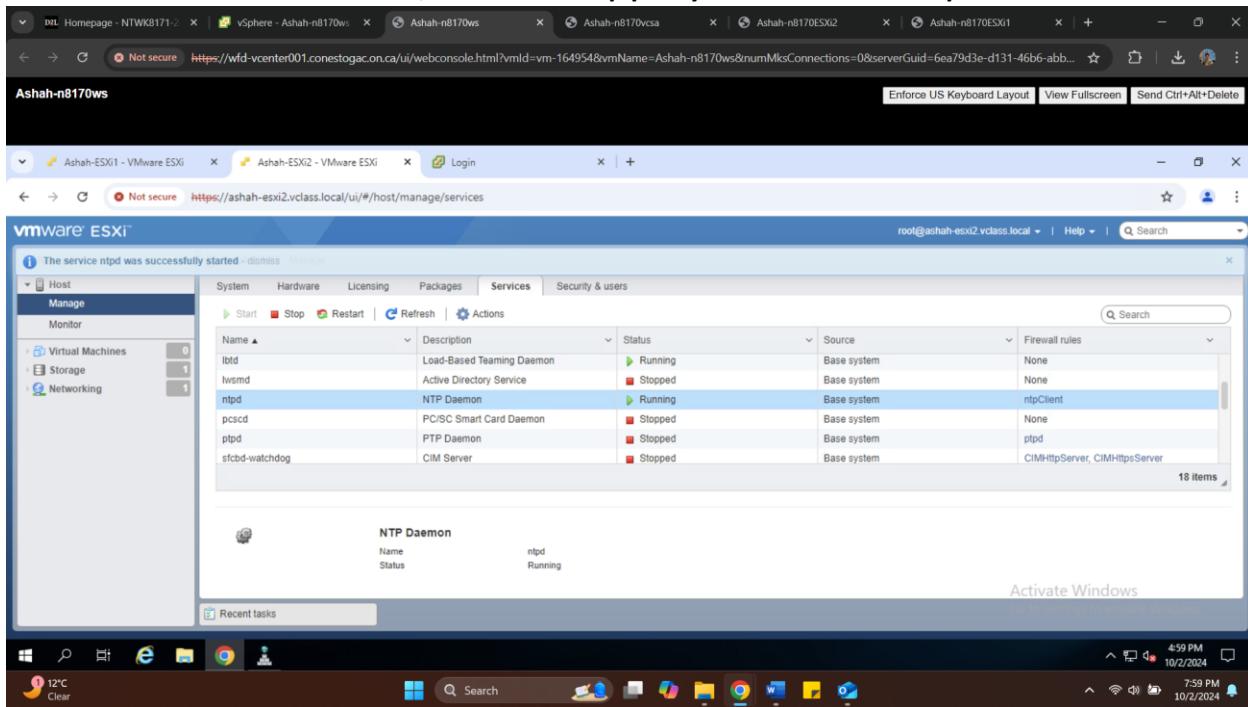
- 4) Click Services at the top, Select NTPD. Click Start to start the service.**



- 5) Complete these same steps on Ashah-ESXi2, From your DC, Sign into Ashah-ESXi2. You can use the IP address or FQDN. Username root password Vclass123\$, Click Manage on the left, Select Time & Date, Select Edit NTP settings, Select Use Network Time Protocol, For NTP startup policy Select Start and Stop with host, In NTP Servers type in 142.156.151.46. Click Save.**

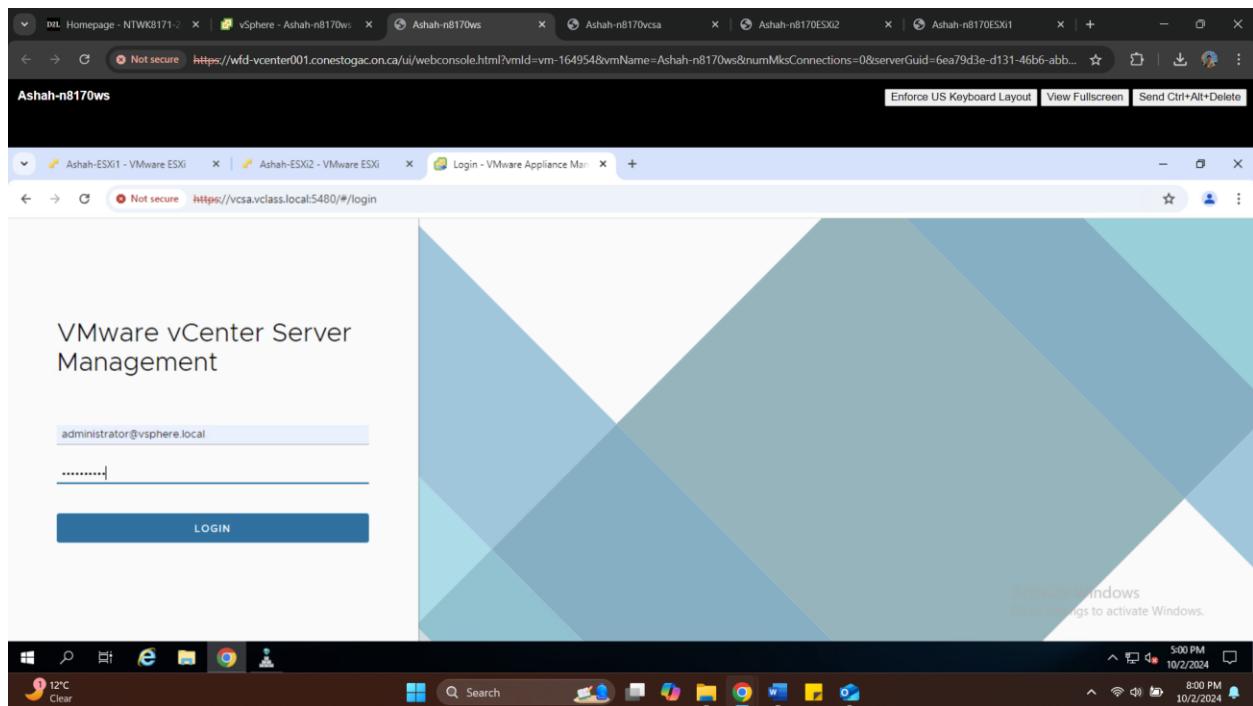


Select Use Network Time Protocol, For NTP startup policy Select Start and Stop with host



Section 2: NTP Setup on vCenter Server

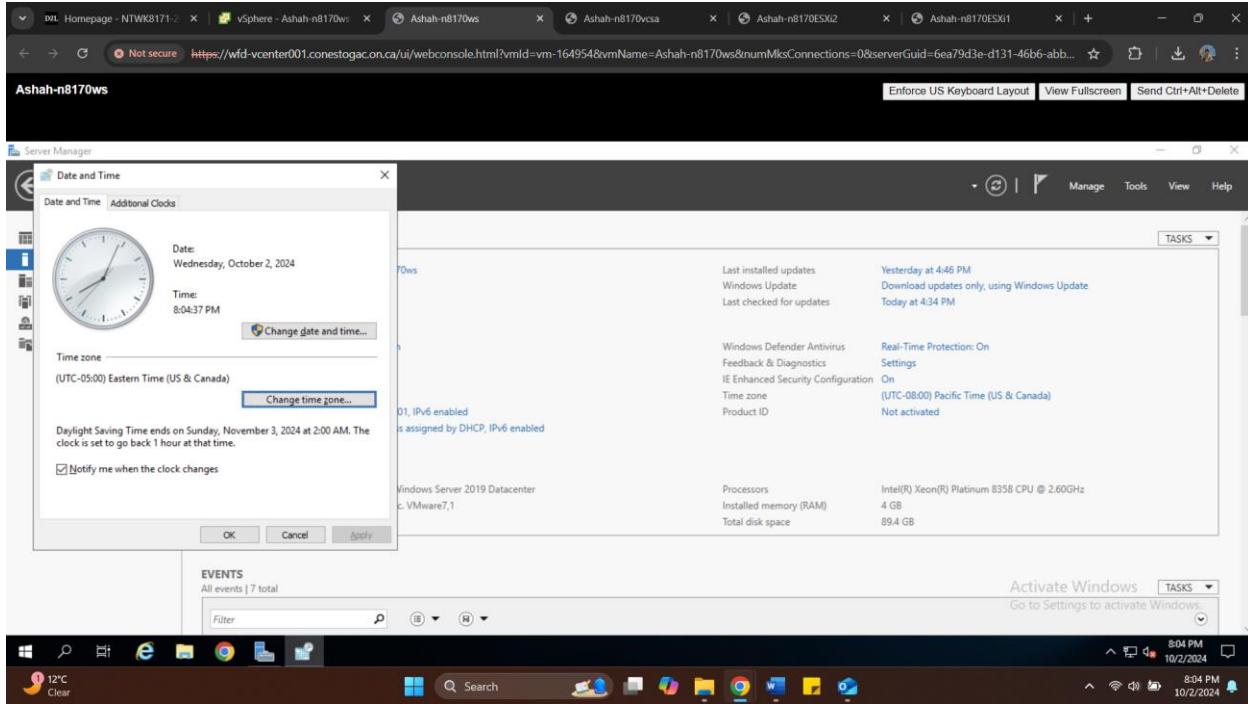
- From your DC, open your web browser and navigate to <https://vcsa.vclass.local:5480>, Login with user **administrator@vsphere.local** password **Vclass123\$**.



- 2) Click **Time** on the left, Click **EDIT** on **Timezone**. Select **Canada/Eastern**. Click **Save**, Click **EDIT** on **Time synchronization**. Change Mode to **NTP**, For Time Servers type in **142.156.151.46**. Click **Save**.

Section 3: Set Time zone Domain Controller

- 1) Sign into your DC with username administrator@vclass.local password **Vclass123\$**, Click the time in the bottom right of the screen on the taskbar and select Date and Time Settings, Set the Timezone to Eastern Time US & Canada.

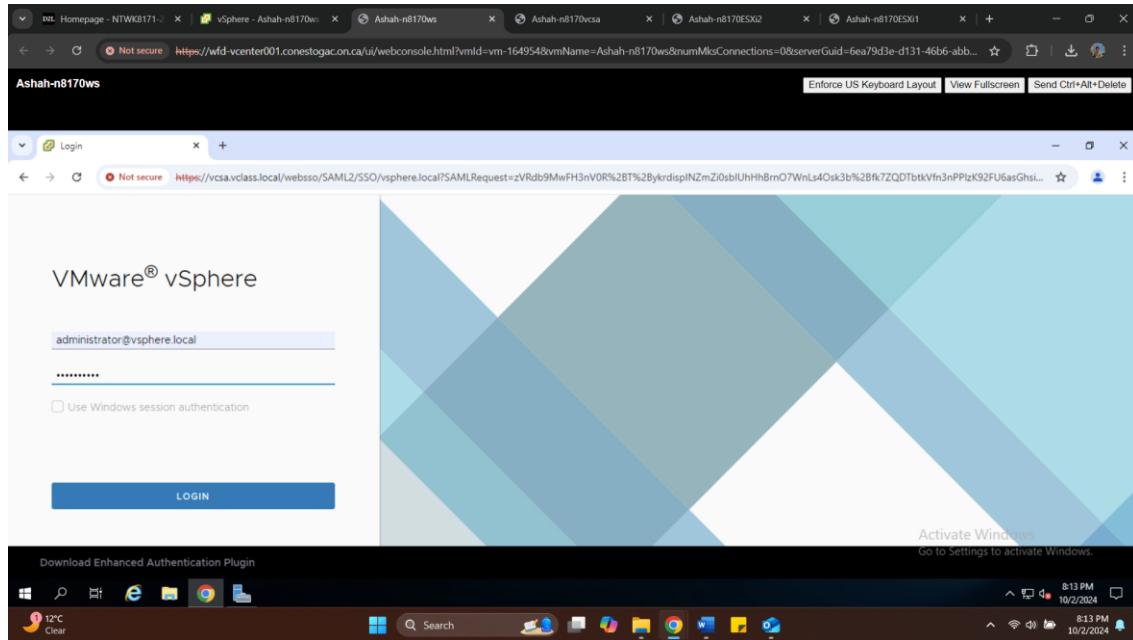


Lab 6: vCenter Server Configuration

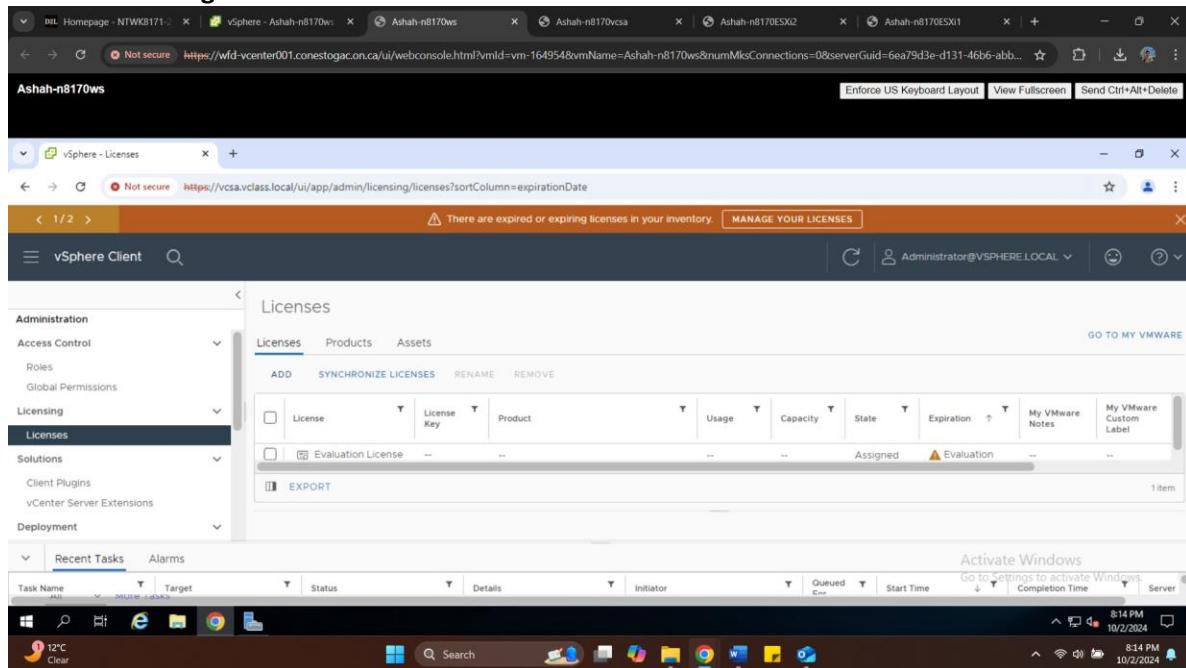
- 1) Install the Licenses for vCenter and ESXi.
- 2) Create our Data Center Object.
- 3) Add our two ESXi hosts to vCenter by FQDN.
- 4) Add the licenses to vCenter and the ESXi Hosts.

Section 1: Add Licenses to vCenter

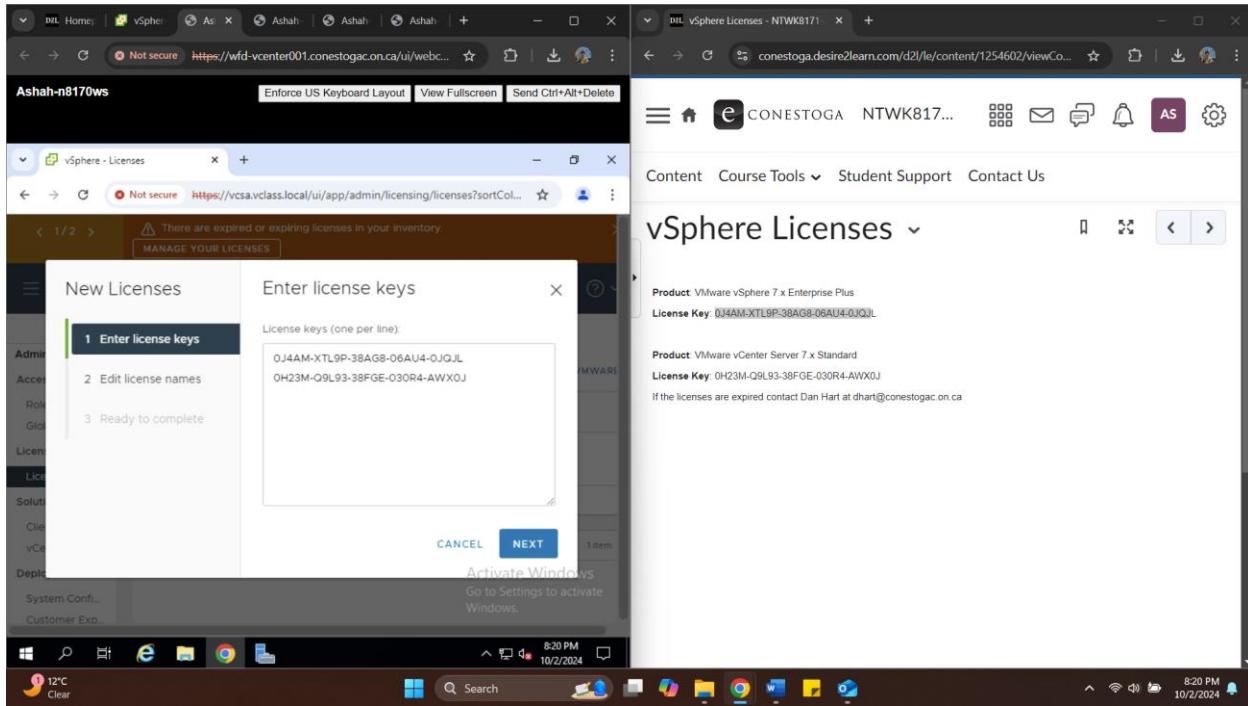
- 1) From your DC, Sign into <https://vcsa.vclass.local> with username **administrator@vsphere.local** and password **Vclass123\$**.



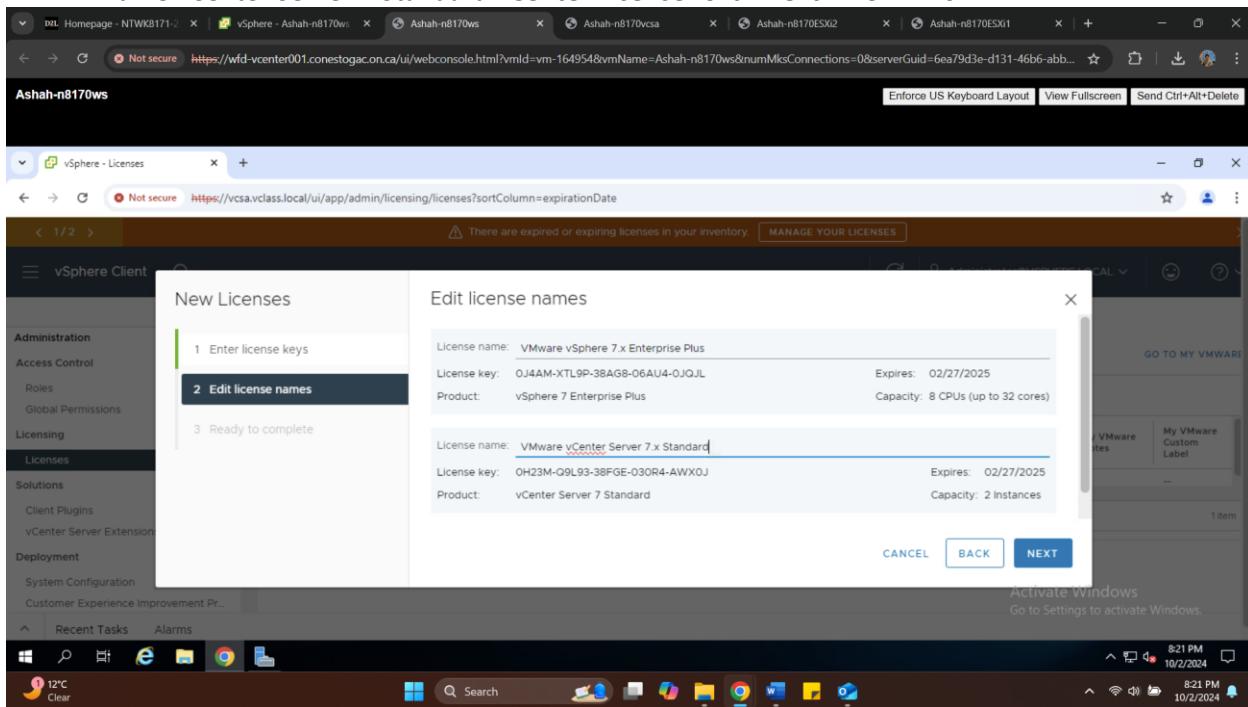
- 2) Click the **three lines** in the top left next to vSphere Client → Administration, On the left under Licensing select **Licenses**.



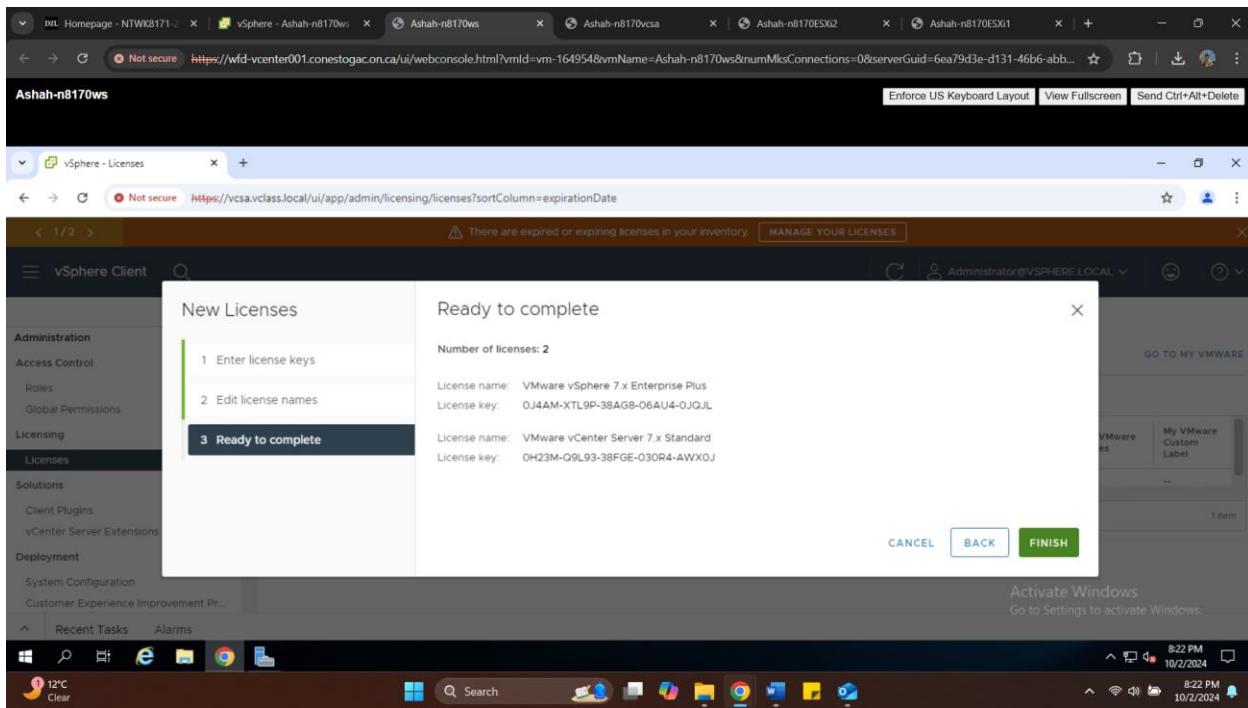
- 3) On the Licenses page. Click **Add**.



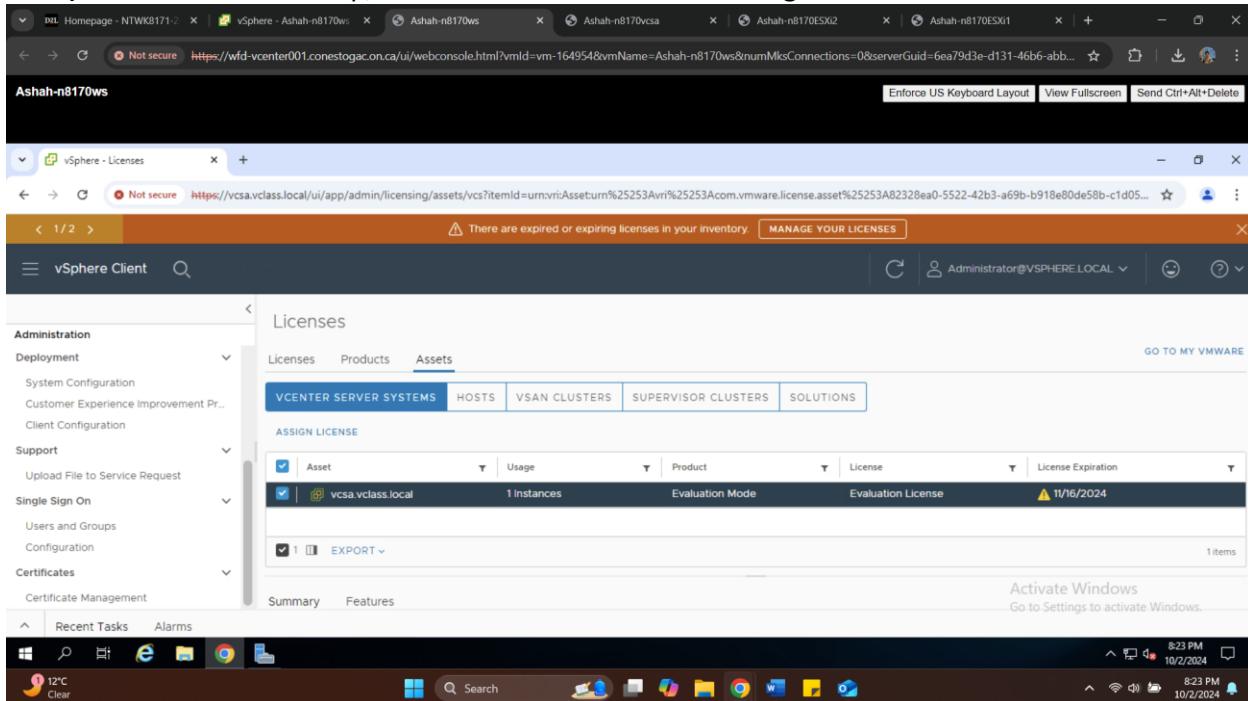
- 4) On **Edit License names** name each accordingly. Name **vSphere 7 Enterprise Plus ESXi Liceneses**, name **vCenter Server 7 Standard vCenter License**. Click **Next**. Then **Finish**.



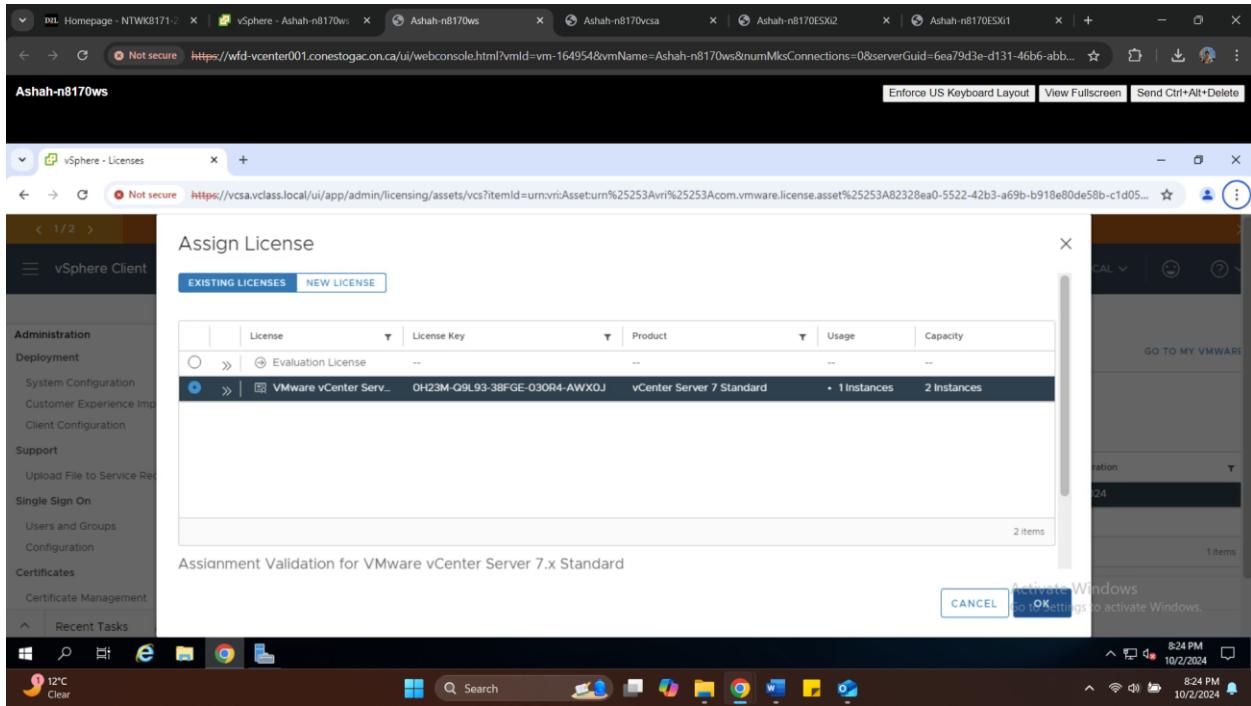
Click Finish to add license



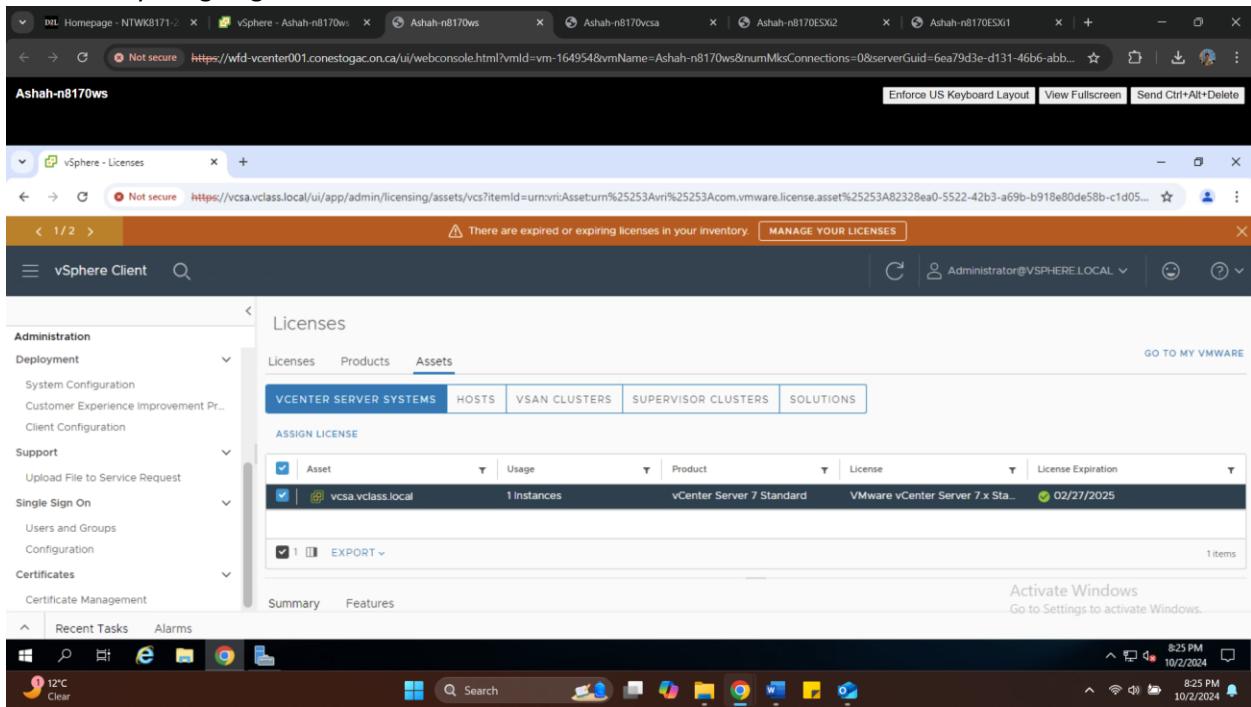
5) Click Assets at the top, Select **vcsa.vclass.local**. Then Assign License.



6) On Assign License under Existing Licenses Select **vCenter License**. Click Ok.

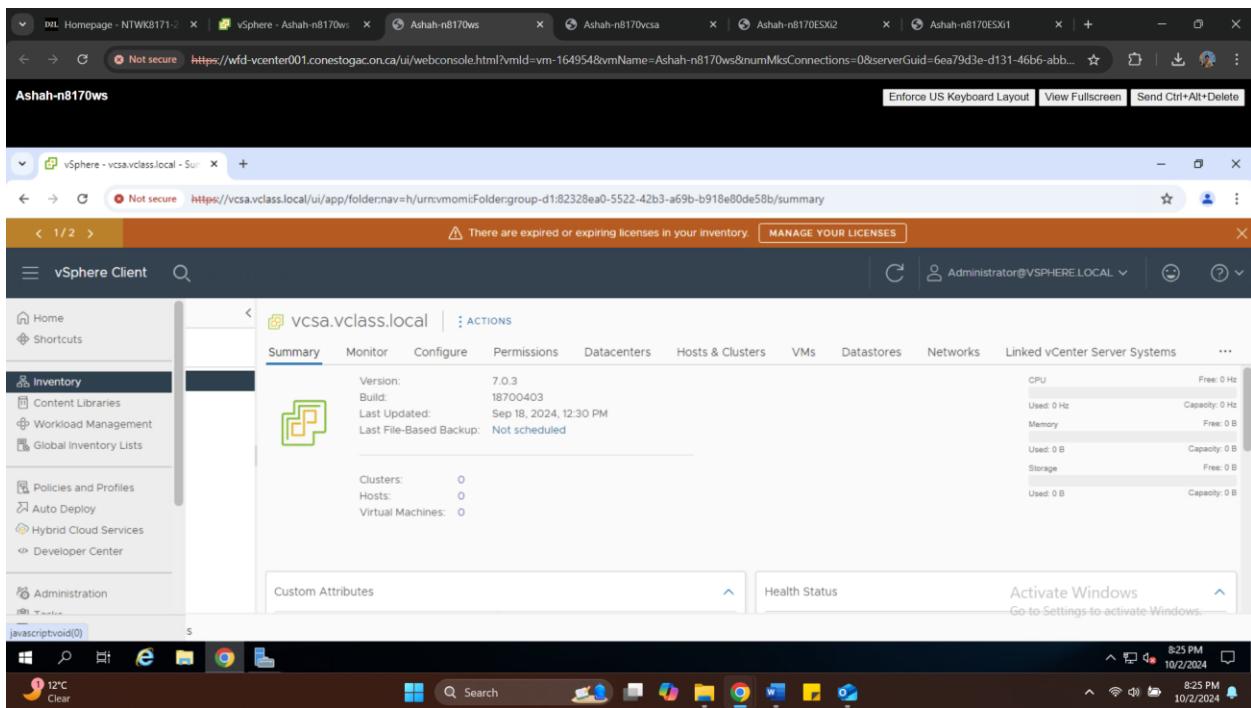


Successfully assigning license.

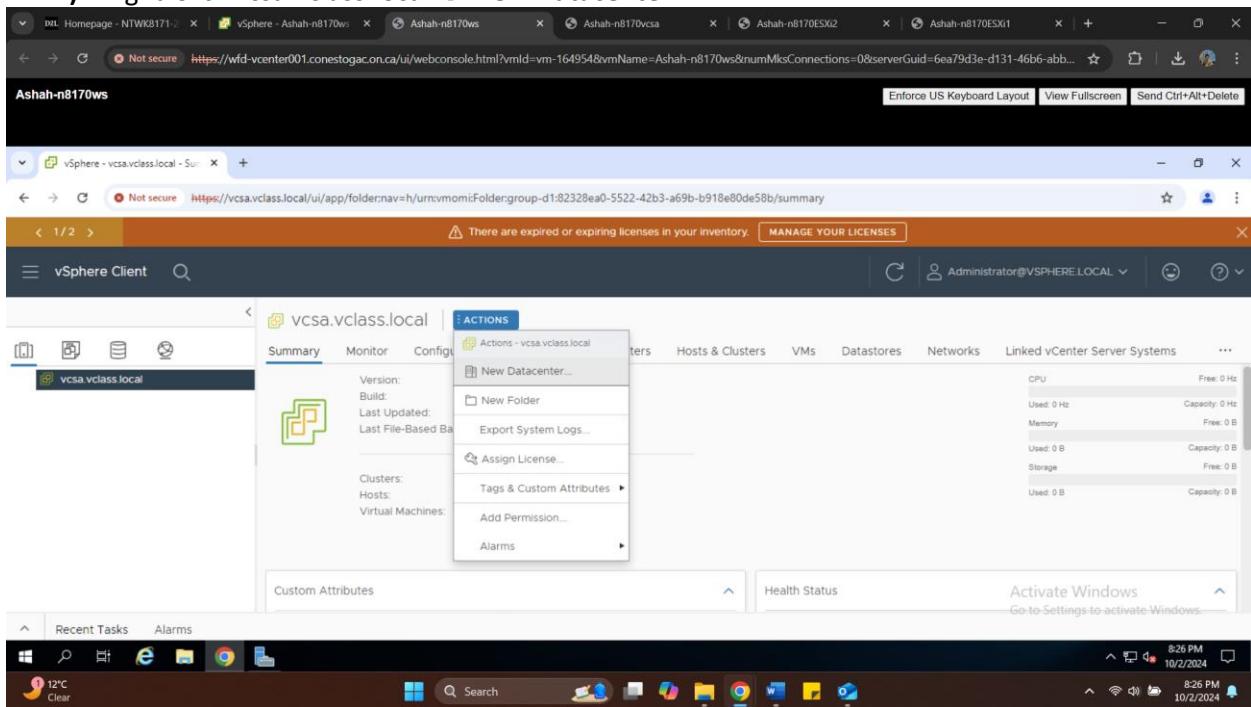


Section 2: Creating the Datacenter Object

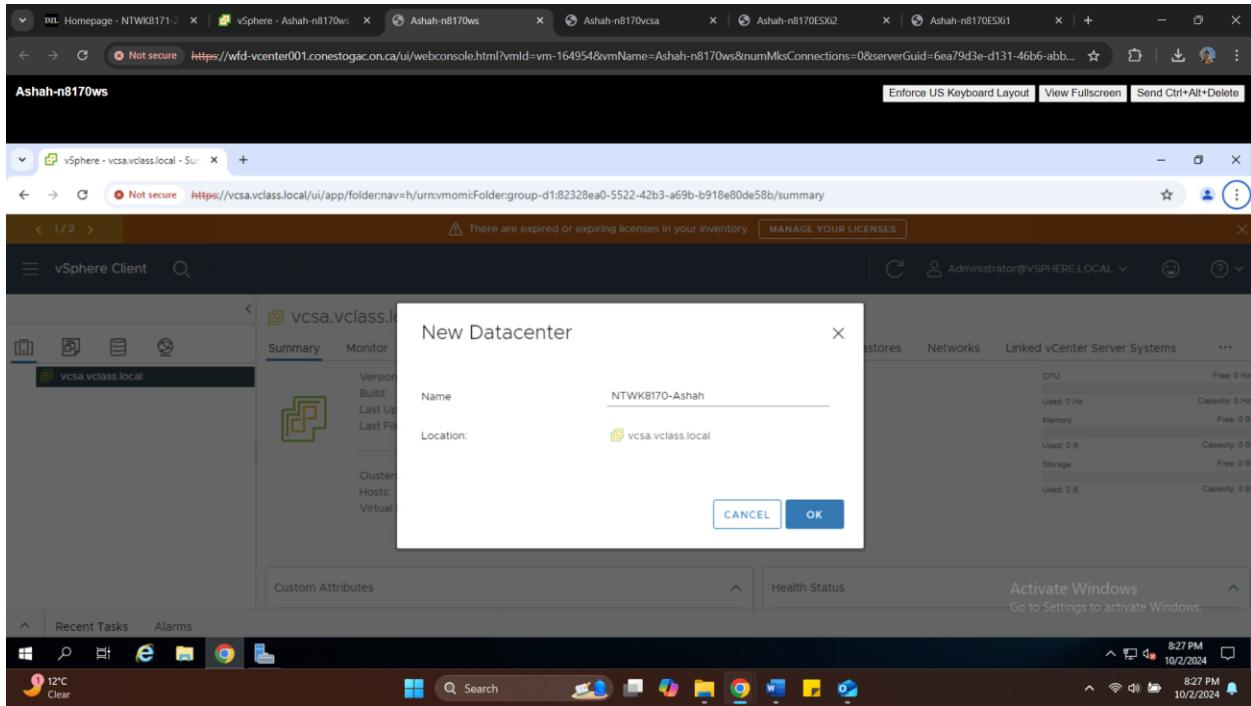
- 1) Click the **three lines** in the top left next to **vSphere Client** → **Inventory**.



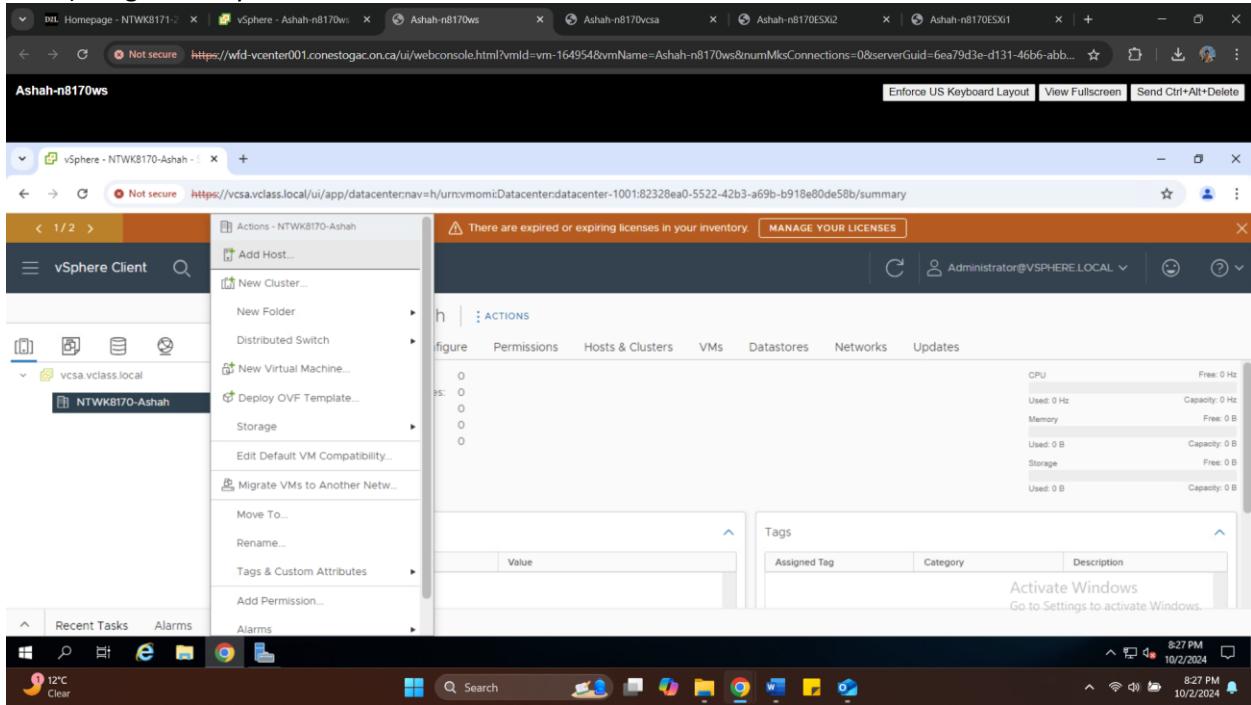
2) Right-Click vcsa.vclass.local → New Datacenter...



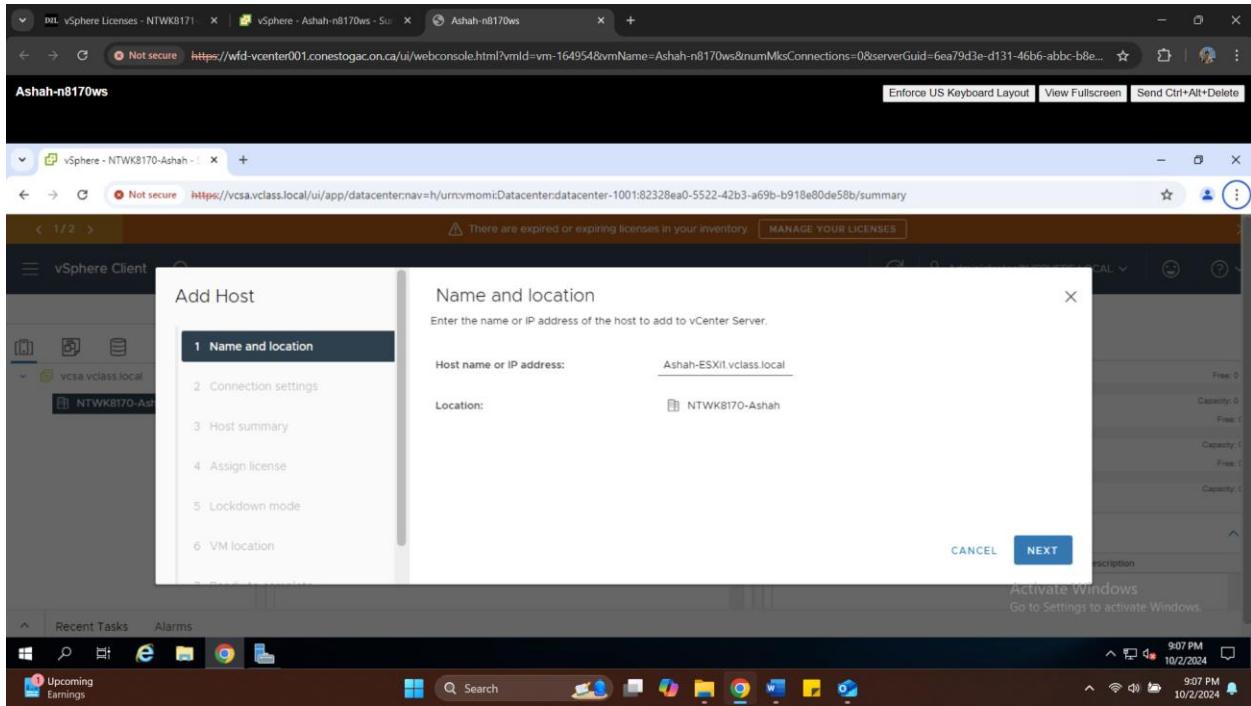
3) For Datacenter name enter NTWK8170-Ashah. Click OK.



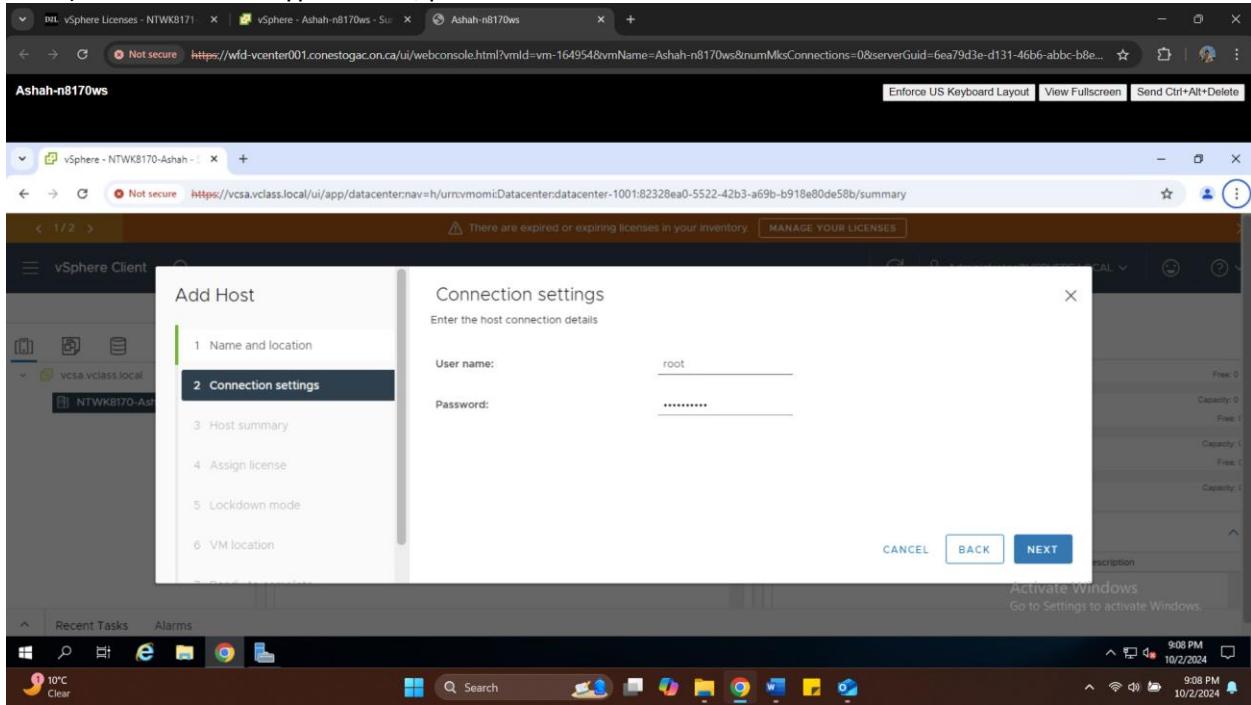
4) Right-Click your Datacenter → Add Host...



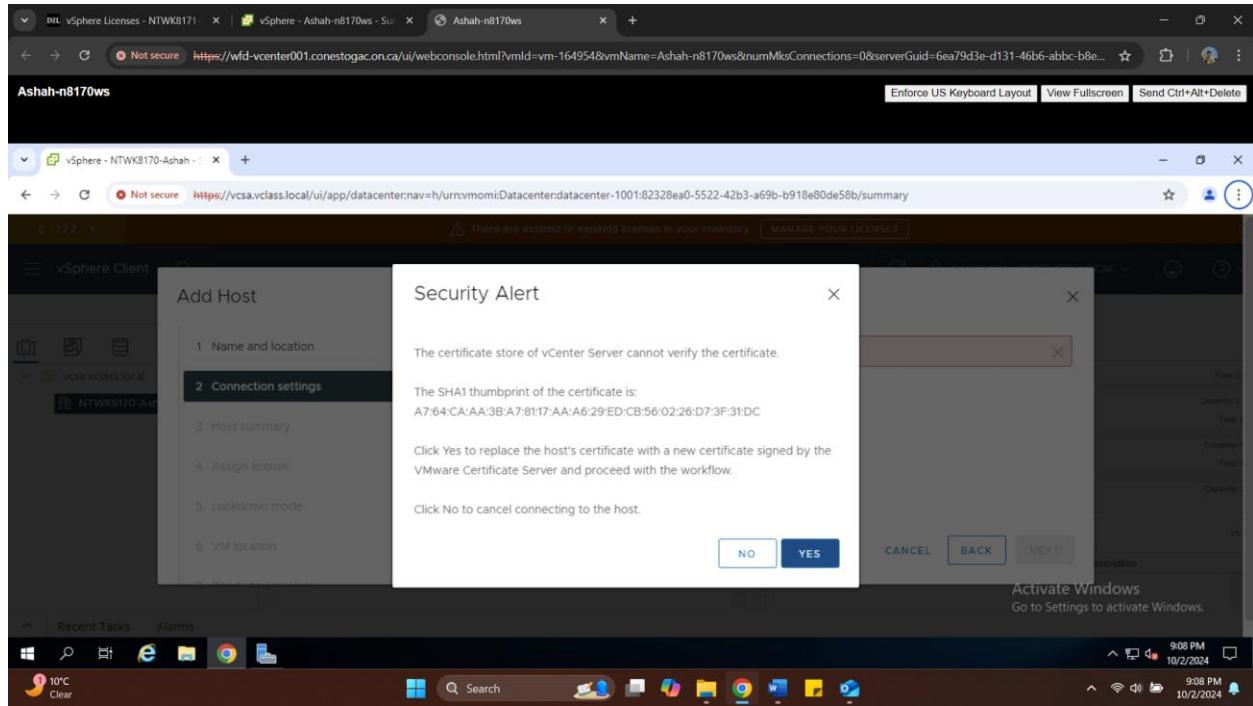
5) In name and location for host name or IP address type in **Ashah-ESXi1.vclass.local. Click Next.**



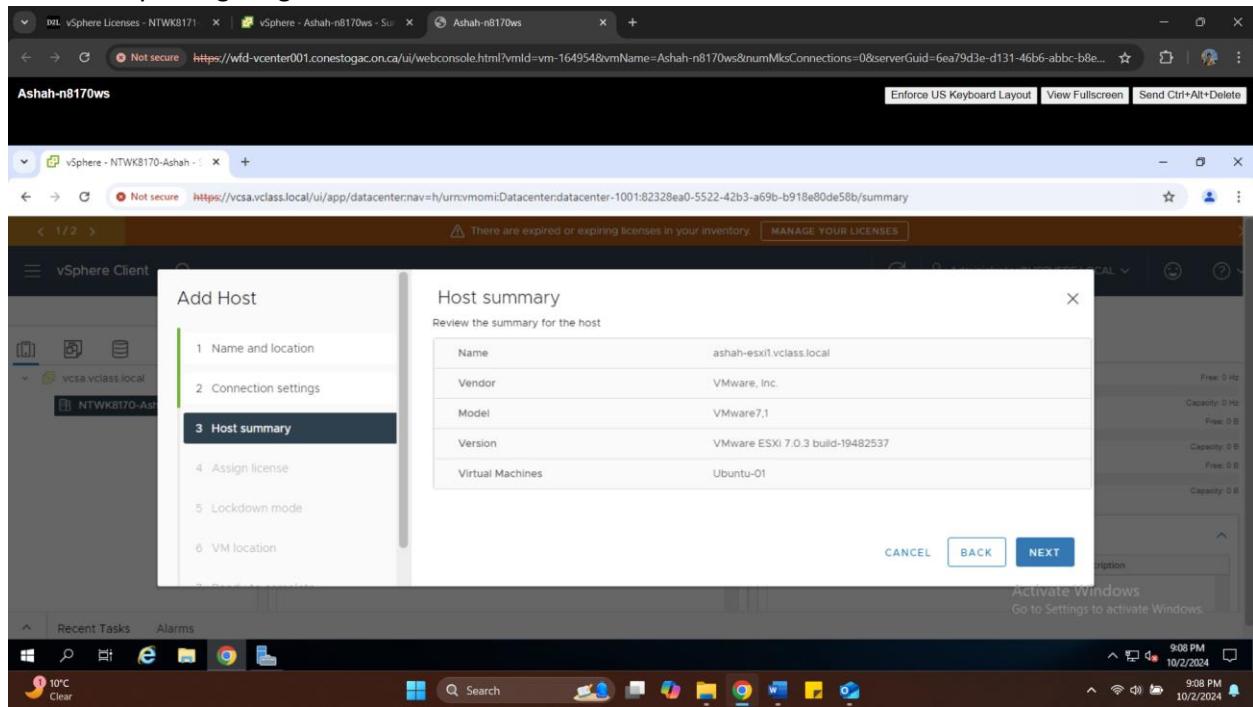
6) For username type in **root**, password **Vclass123\$**. Click **Next**.



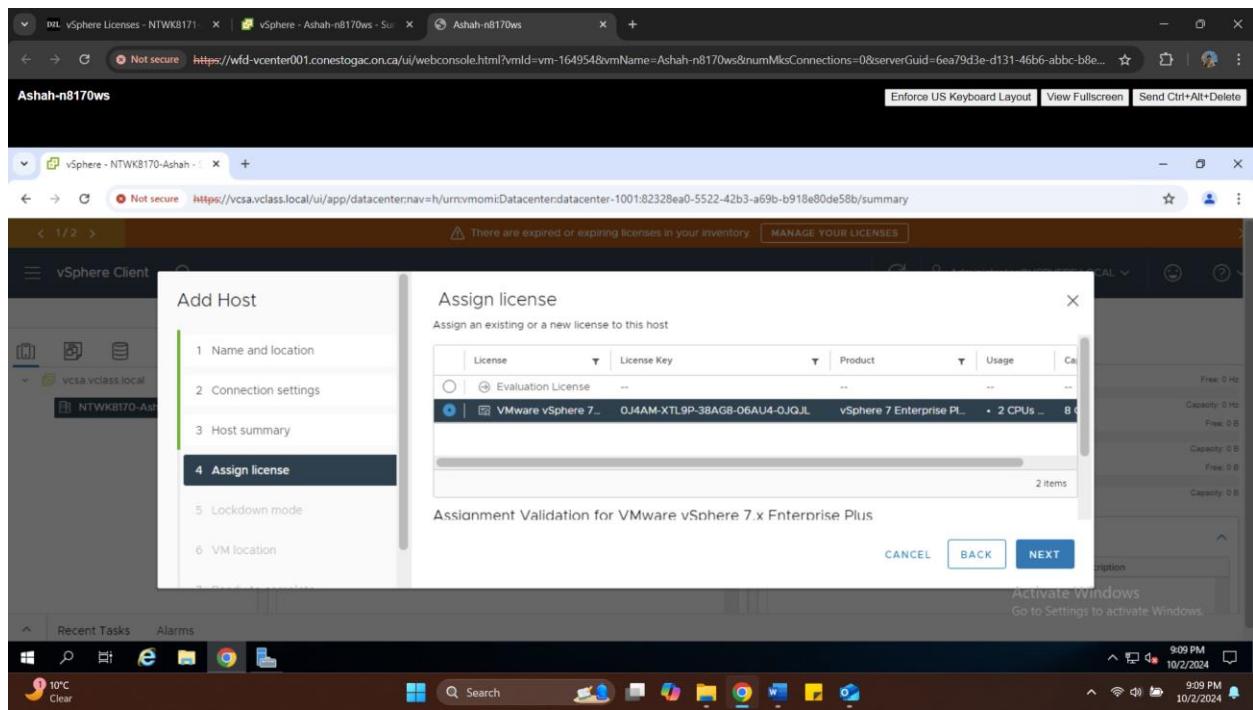
7) Click **Yes** on the **Security Alert**. Click **Next** on **Host Summary**.



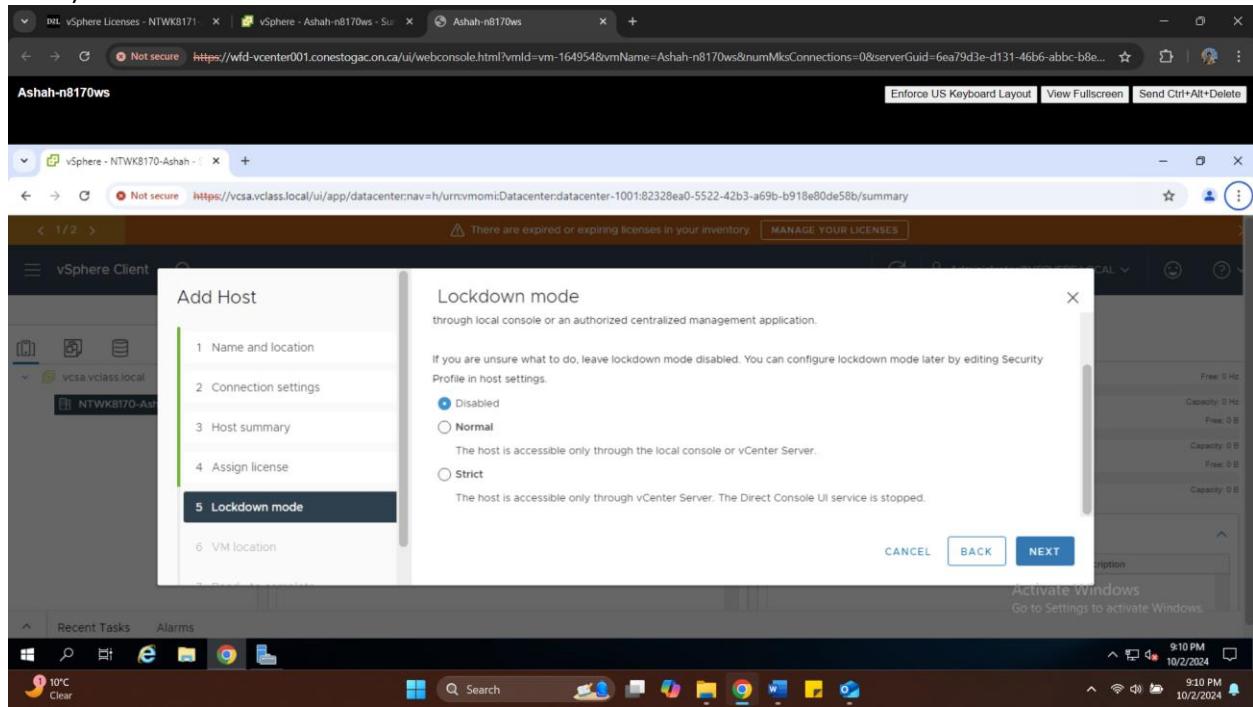
Successfully configuring Host Ashah-esxi1.vclass.local



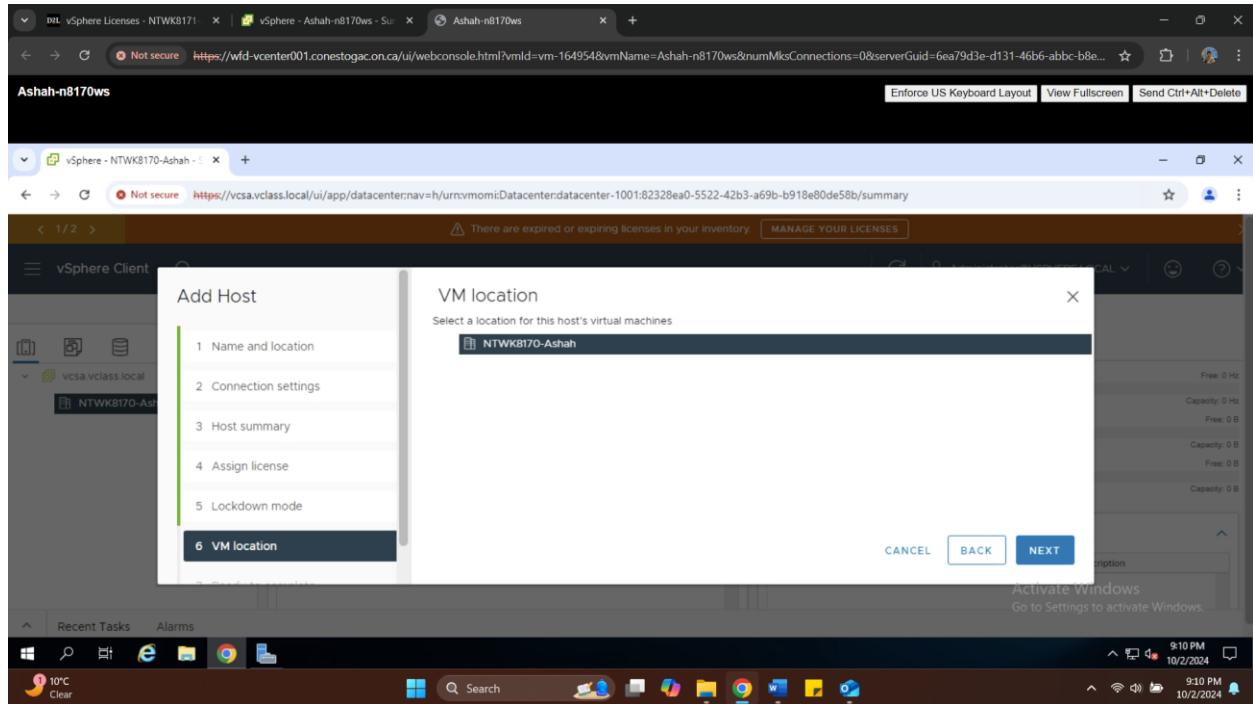
8) On Assign License Select ESXi Licence. Click Next.



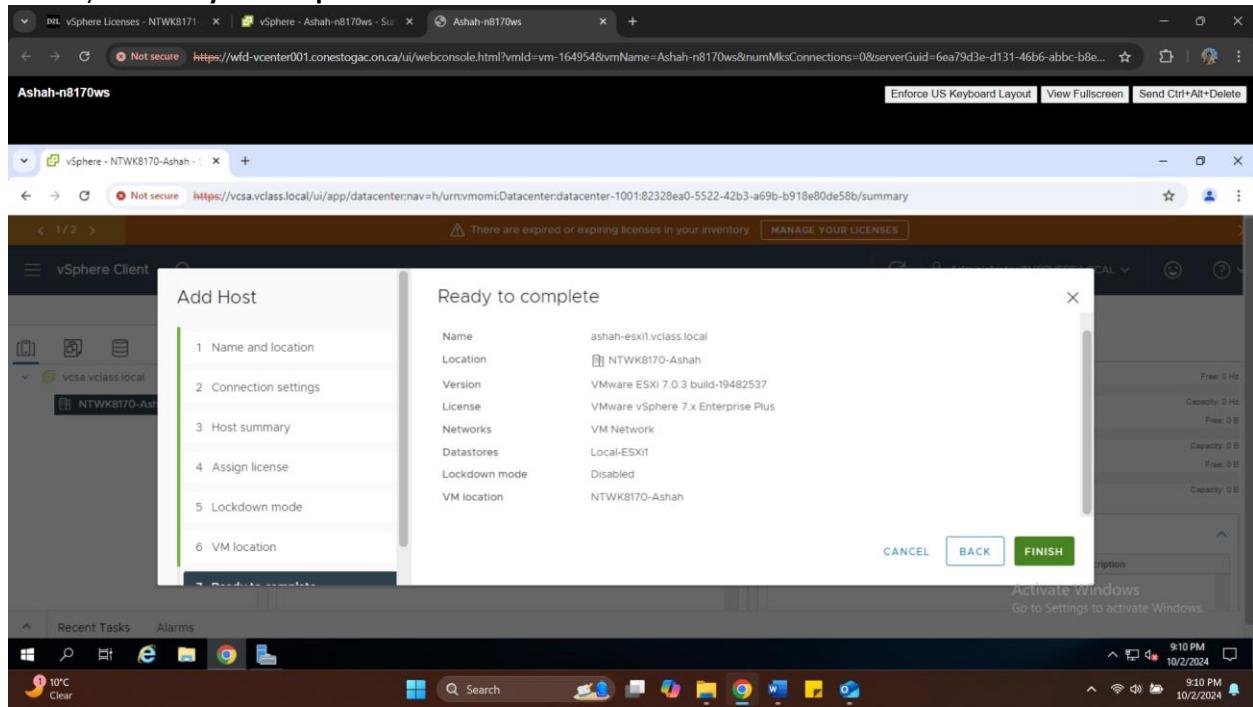
9) On Lockdown Mode leave it as disabled. Click Next.



10) On VM location Select your Datacenter. Click Next.

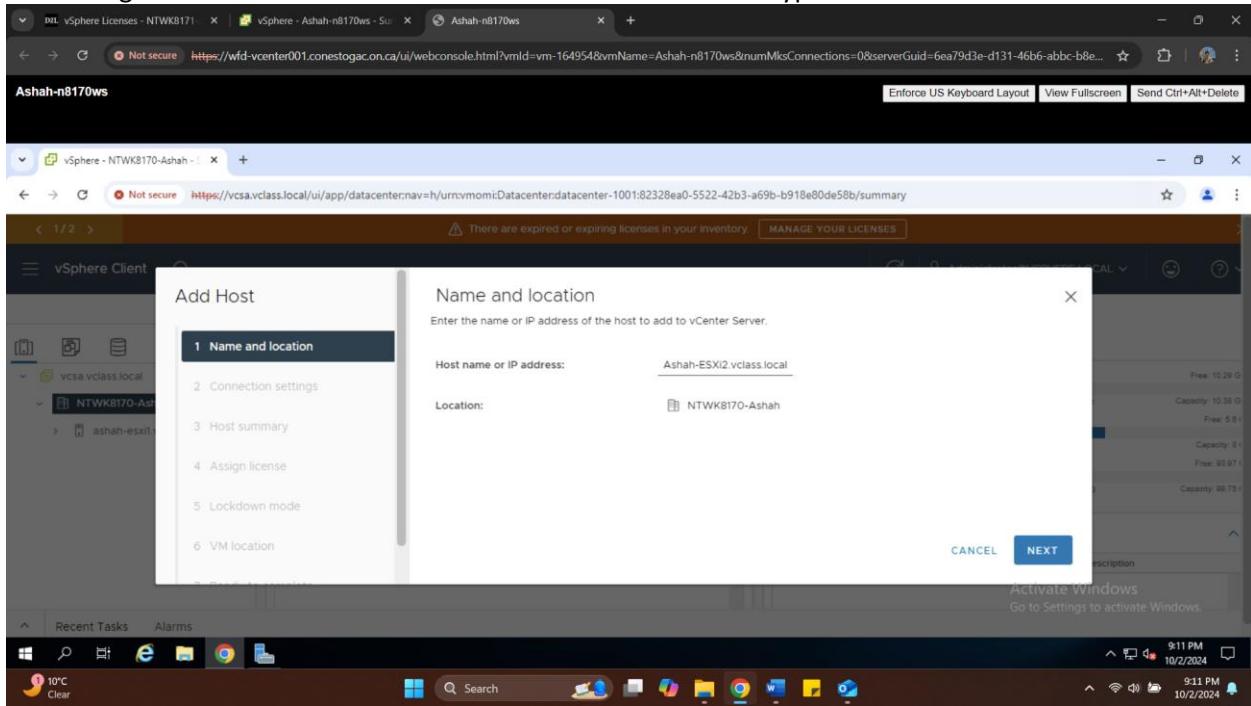


11) On Ready to Complete Click Finish.

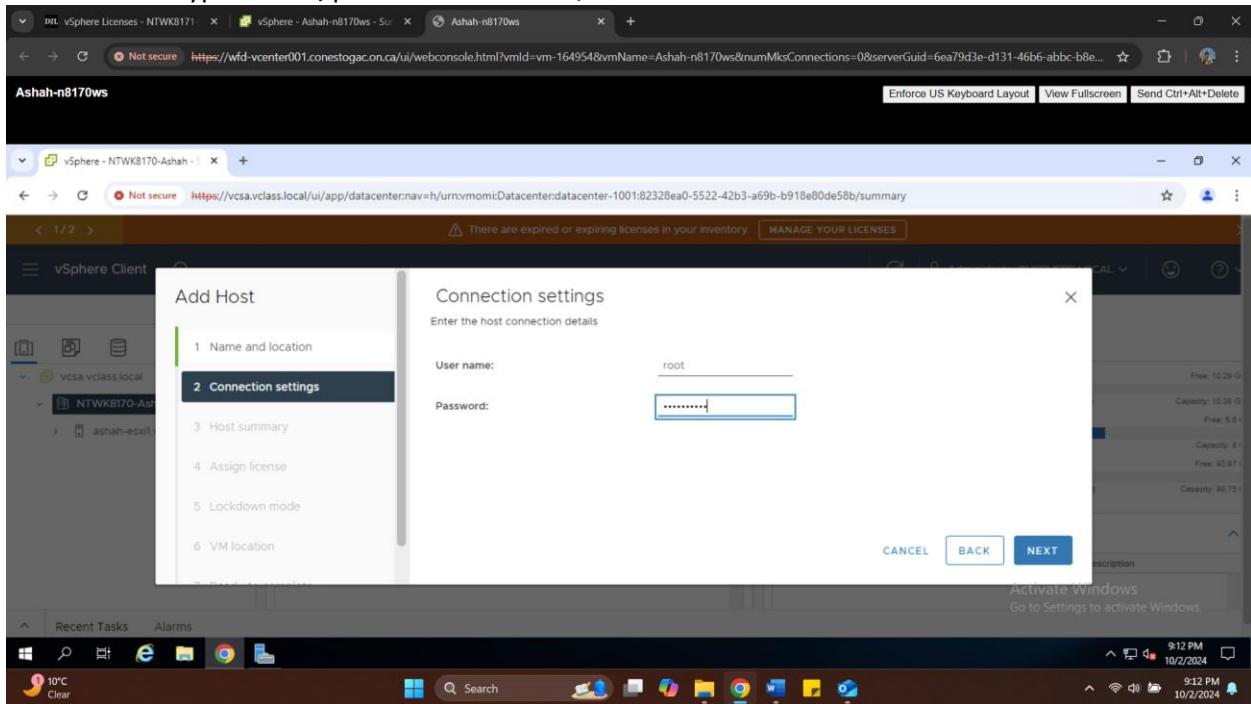


12) Follow the above steps to also add **Ashah-ESXi2**.

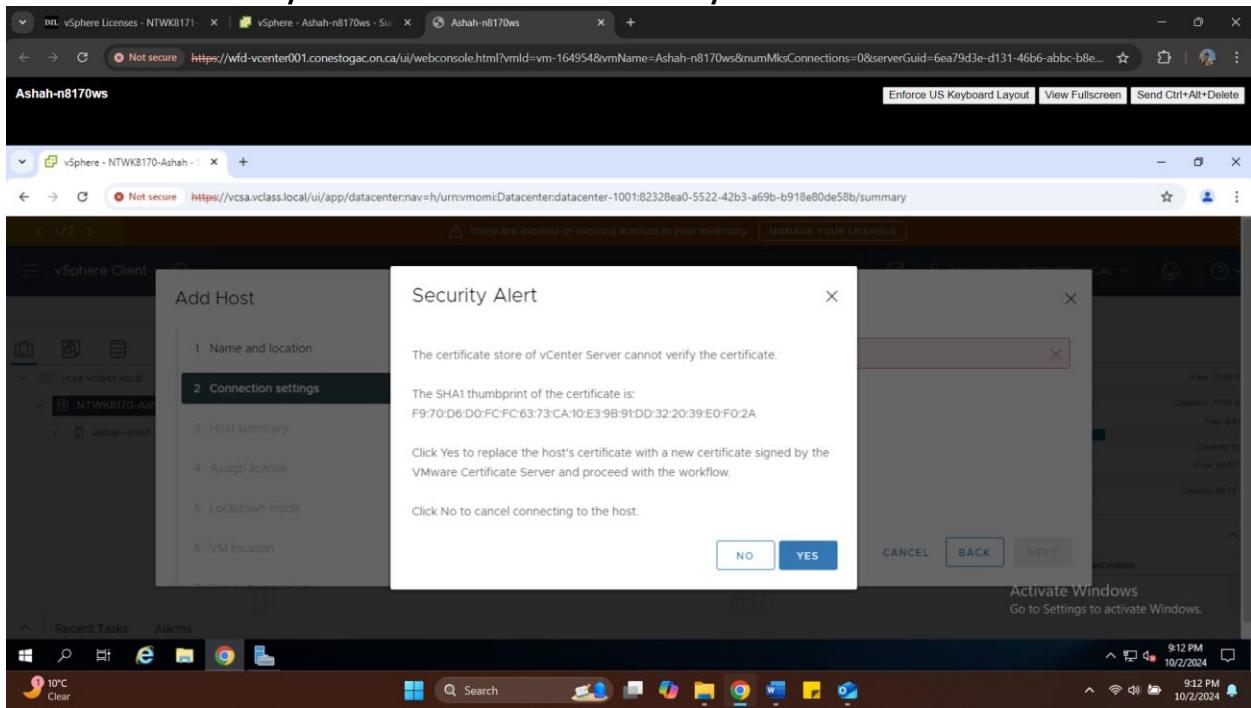
In creating new name and location for host name or IP address type in **Ashah-ESXi2.vclass.local**



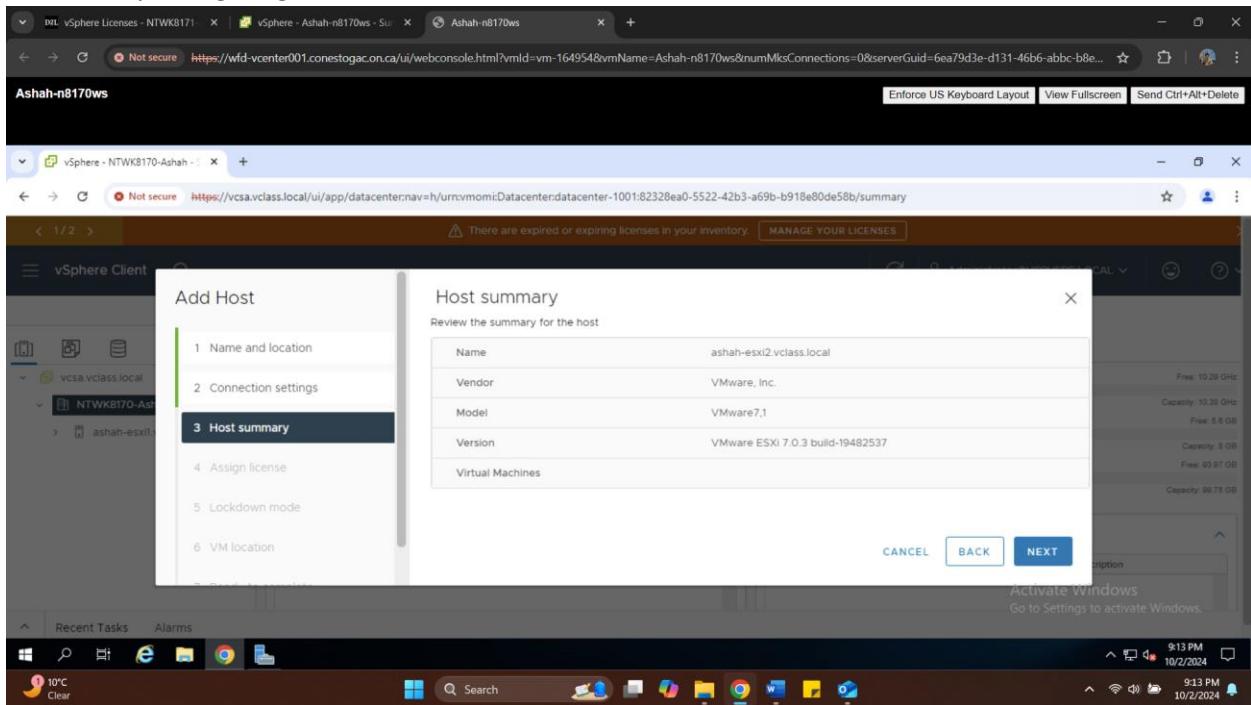
For username type in **root**, password **Vclass123\$**. Click **Next**.



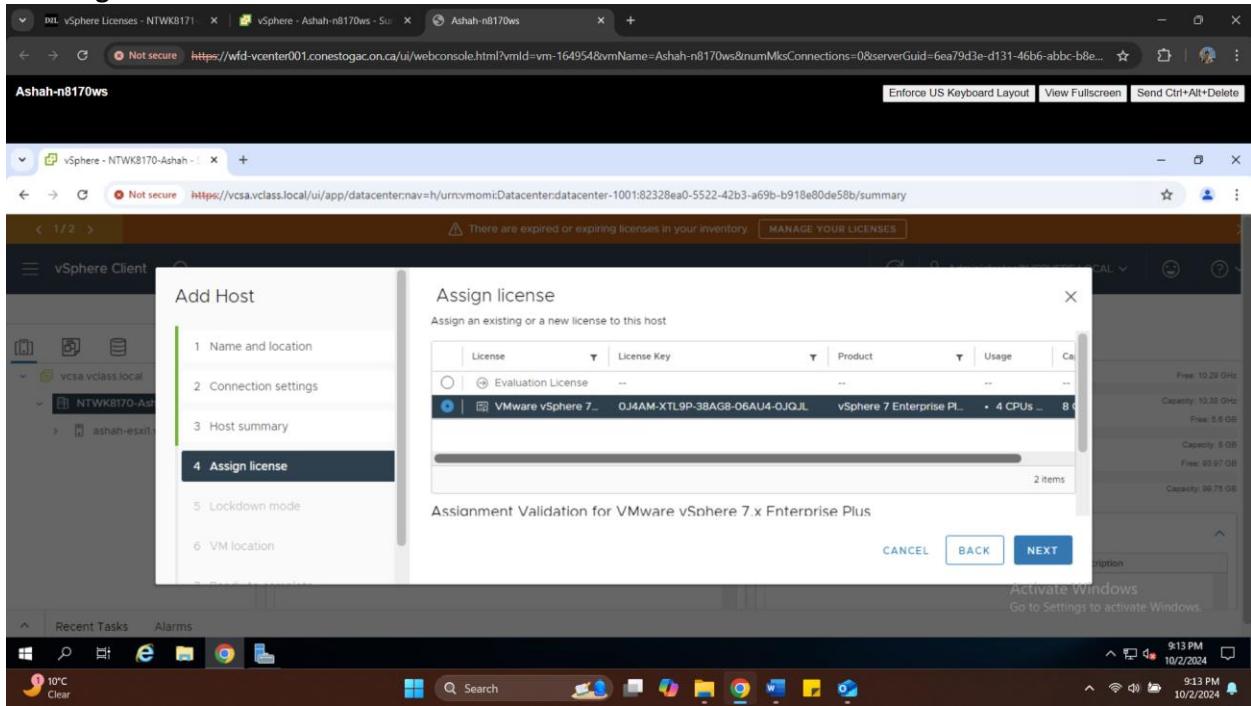
Click Yes on the Security Alert. Click Next on Host Summary.



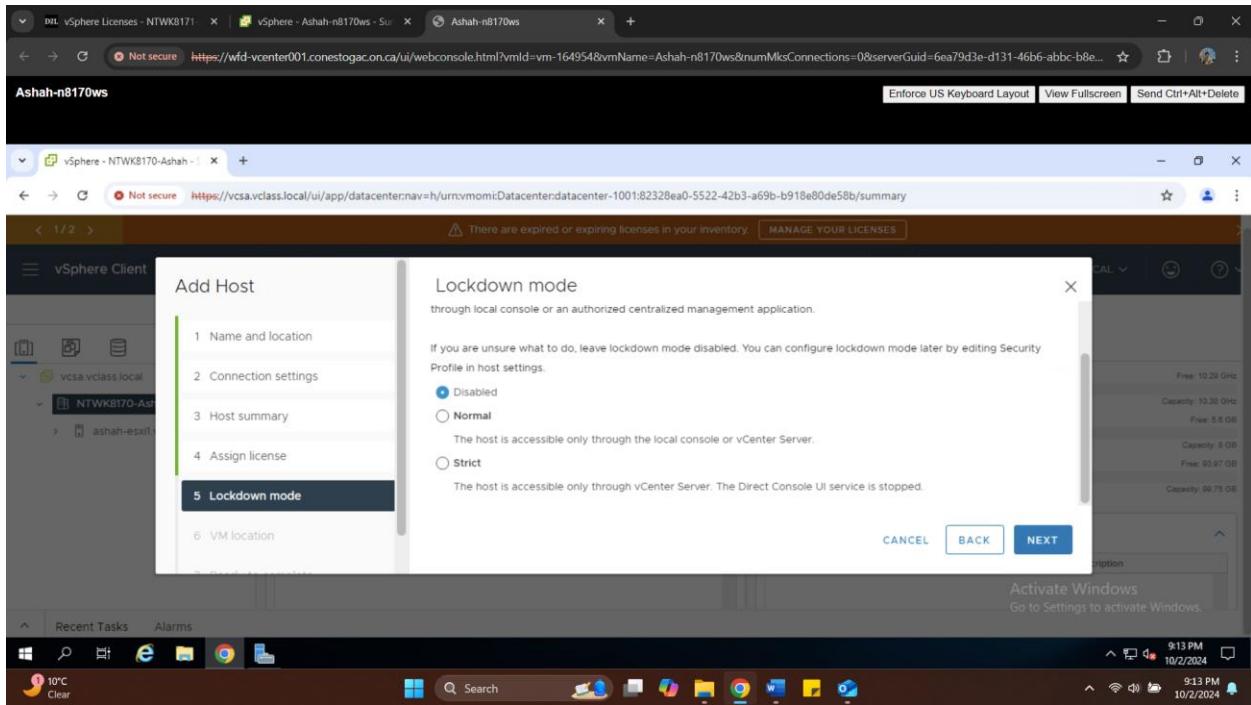
Successfully configuring Host Ashah-esxi2.vclass.local



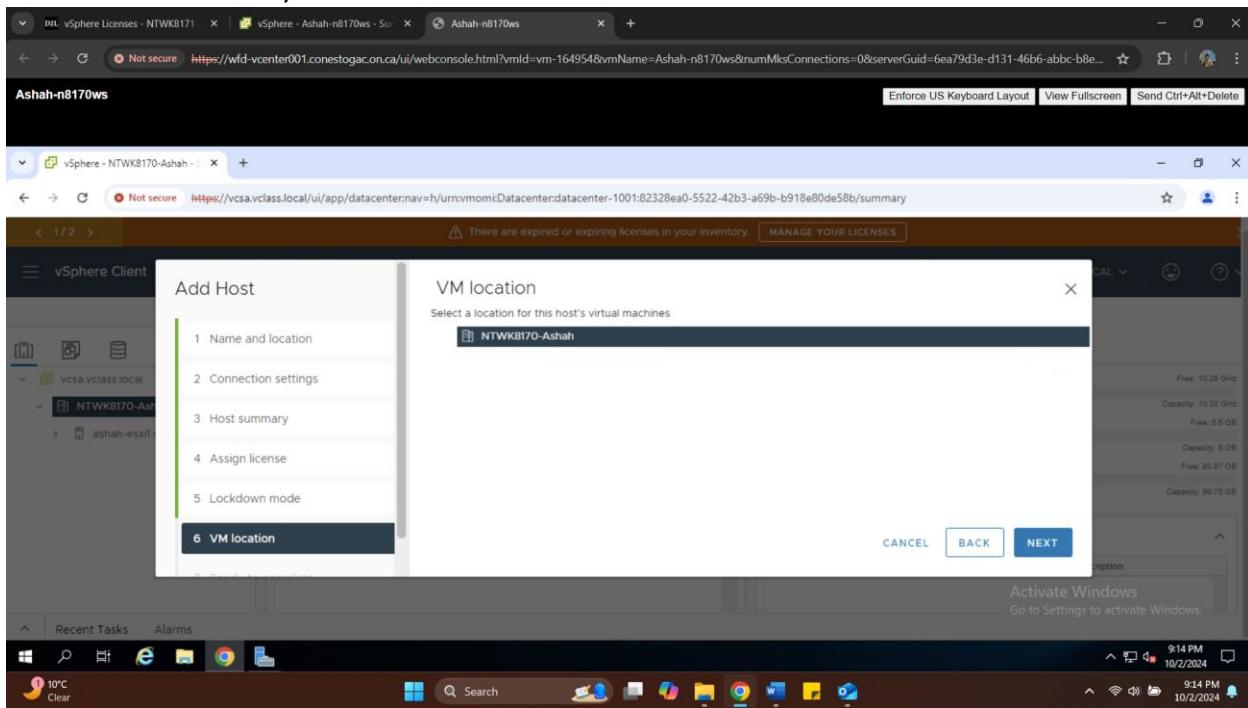
On Assign License Select ESXi Licence. Click Next.



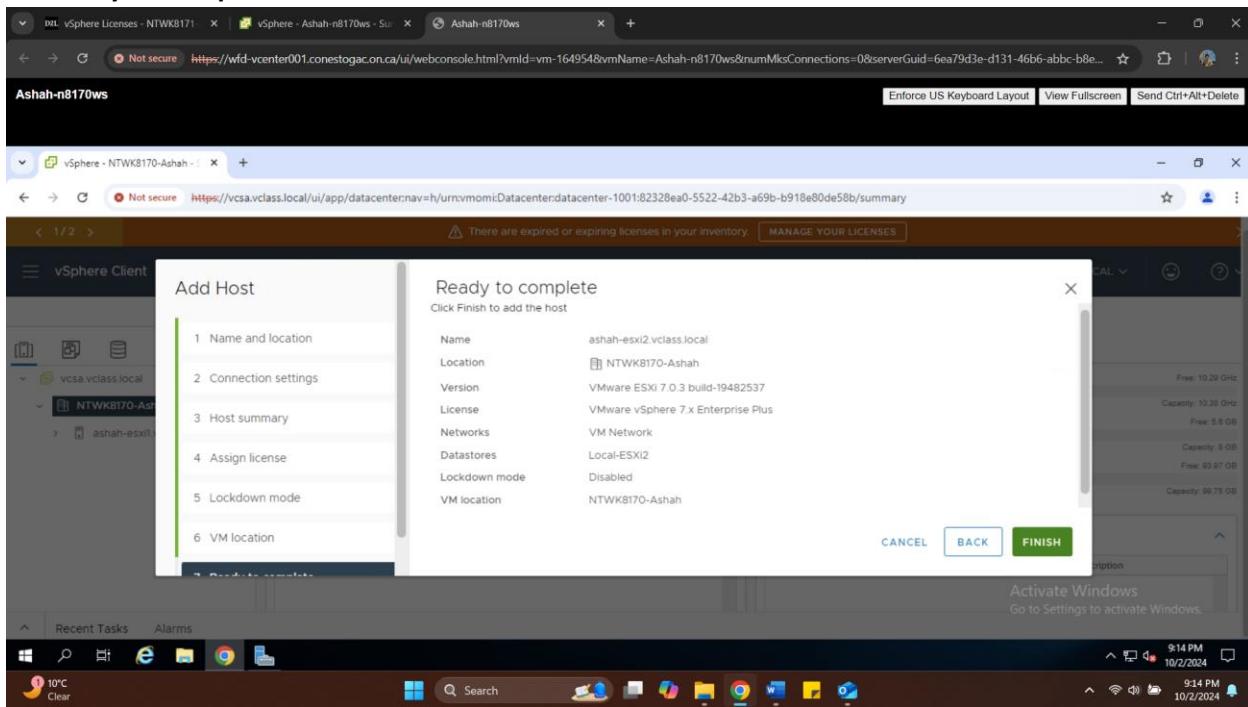
On Lockdown Mode leave it as disabled. Click Next.



On VM location Select your Datacenter. Click Next.



On Ready to Complete Click Finish.



Successfully configured Ashah-esxi1.vclass.local and Ashah-esxi2.vclass.local

The screenshot shows the vSphere Client interface. At the top, there are three tabs: 'vSphere Licenses - NTWK8171...', 'vSphere - Ashah-n8170ws - S...', and 'Ashah-n8170ws'. The middle tab is active. The title bar for the active window says 'Ashah-n8170ws'. The main pane displays the configuration for 'ashah-esxi2.vclass.local'. The left sidebar shows a tree structure with 'vcsa.vclass.local' expanded, showing 'NTWK8170-Ashah' and 'ashah-esxi1.vclass.local' under it. The right pane has tabs for 'Summary', 'Monitor', 'Configure', 'Permissions', 'VMS', 'Resource Pools', 'Datastores', 'Networks', and 'Updates'. The 'Summary' tab is selected, showing details like Hypervisor: VMware ESXi, 7.0.3, 19482537; Processor Type: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz; Logical Processors: 4; NICs: 4; Virtual Machines: 0; State: Connected; Uptime: 0 second. To the right of these details is a resource usage table:

CPU	Free: 10.38 GHz
Used: 0 Hz	Capacity: 10.38 GHz
Memory	Free: 8 GB
Used: 0 B	Capacity: 8 GB
Storage	Free: 88.34 GB
Used: 1.41 GB	Capacity: 99.75 GB

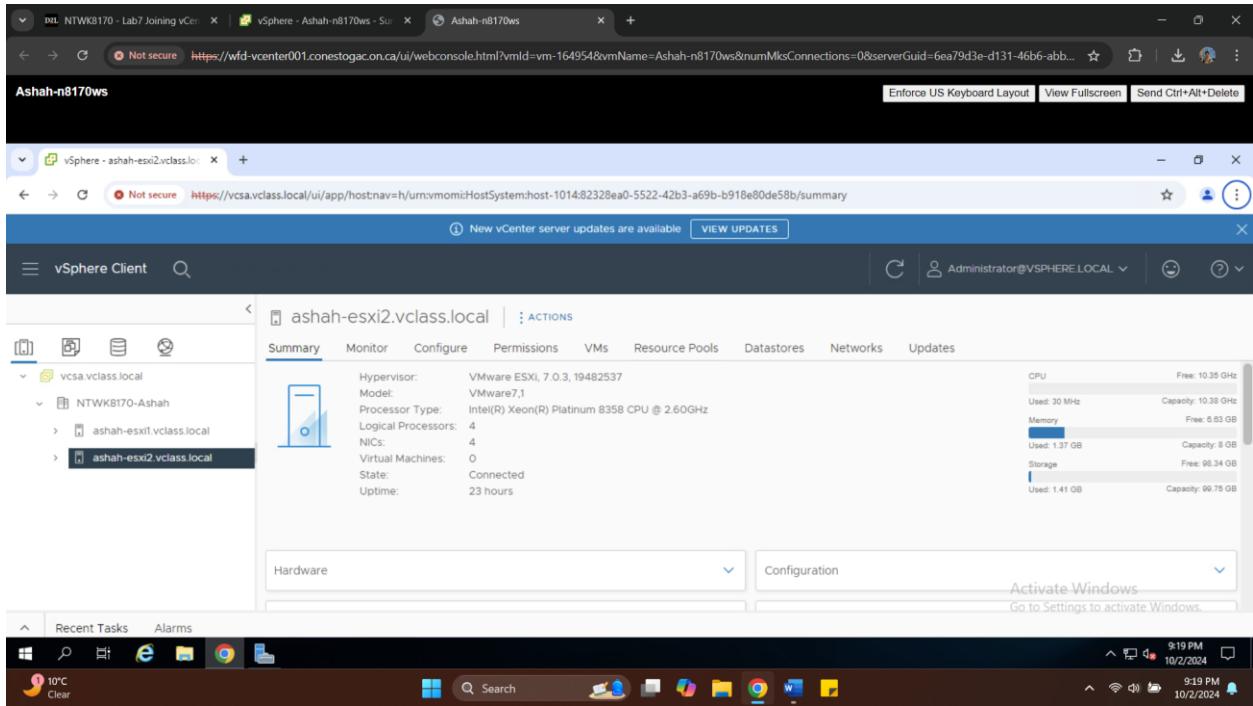
Below the summary table are two tabs: 'Hardware' and 'Configuration'. A message at the bottom right says 'Activate Windows' and 'Go to Settings to activate Windows.' The bottom of the screen shows a Windows taskbar with icons for Start, Search, Task View, File Explorer, Edge, and others, along with system status indicators.

Lab 7: Joining vCenter to Active Directory

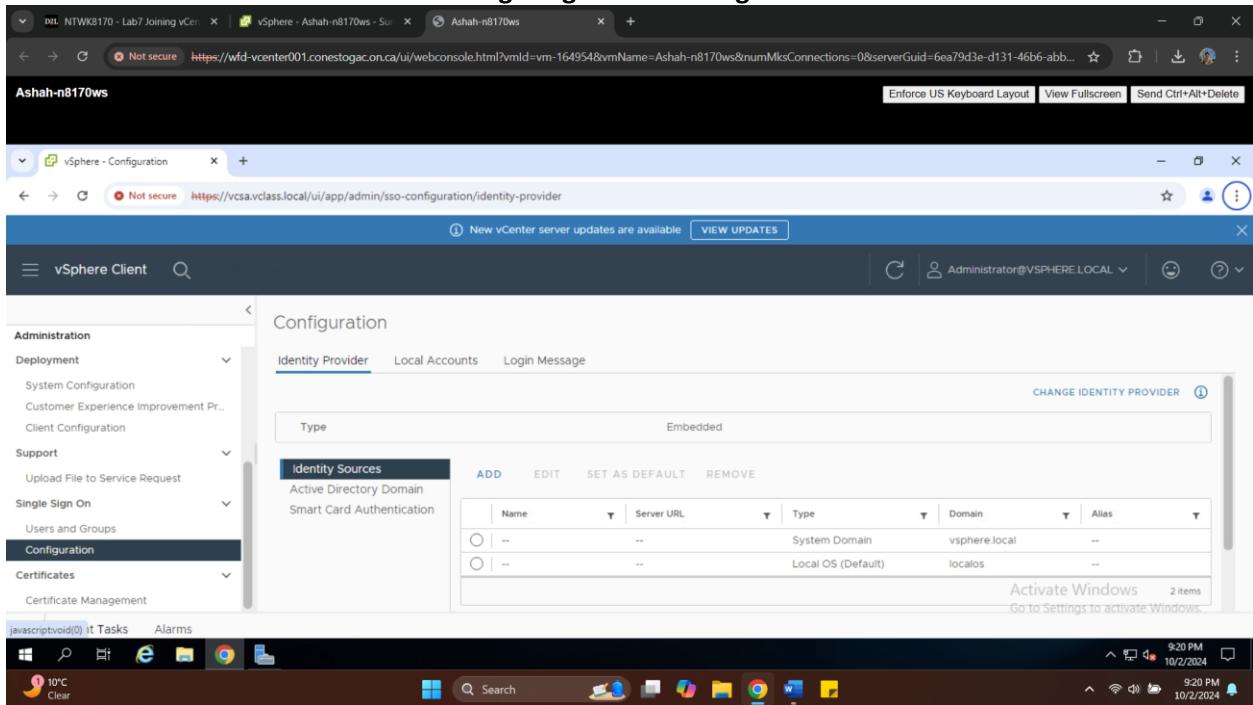
- 1) Join our vCenter Server to **Active Directory**.
- 2) Add **vclass.local** as an identity source.
- 3) Assign **administrator@vclass.local** as an administrator to our vCenter Server.
- 4) Sign in with **administrator@vclass.local**.

Section 1: Joining vCenter to Active Directory

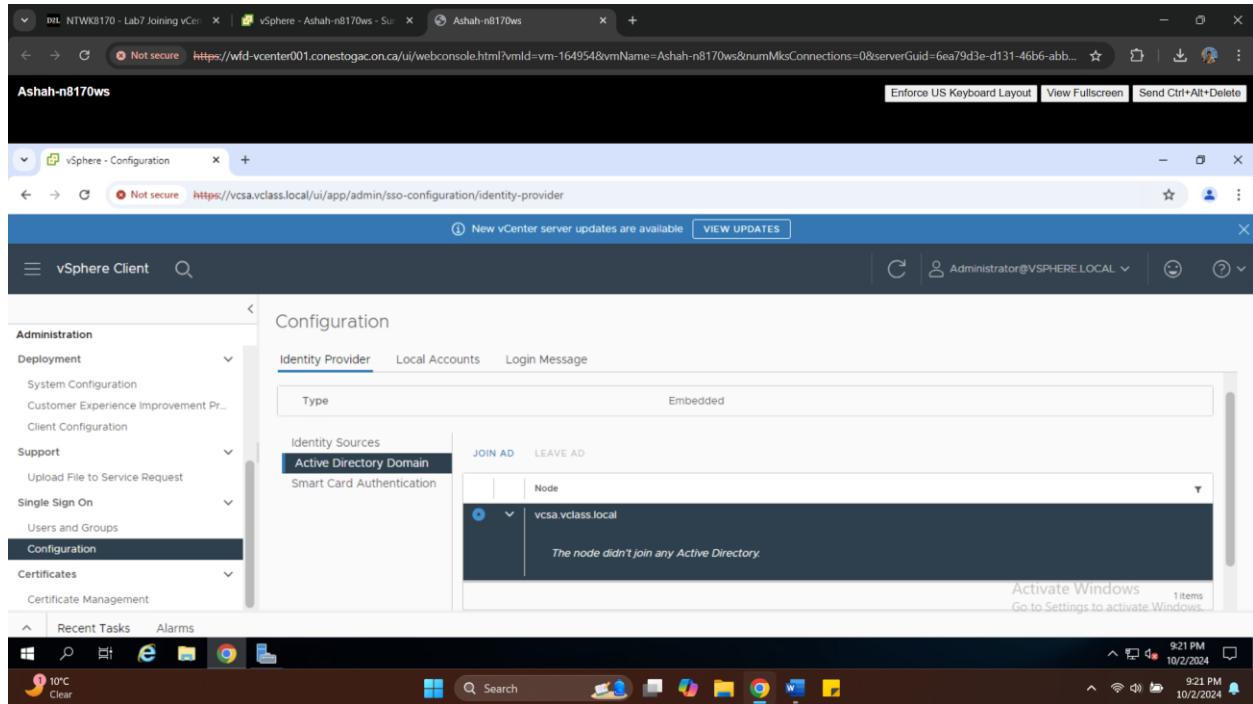
- 7) From your DC, Sign into <https://vcsa.vclass.local> with username **administrator@vsphere.local** and password **Vclass123\$**.



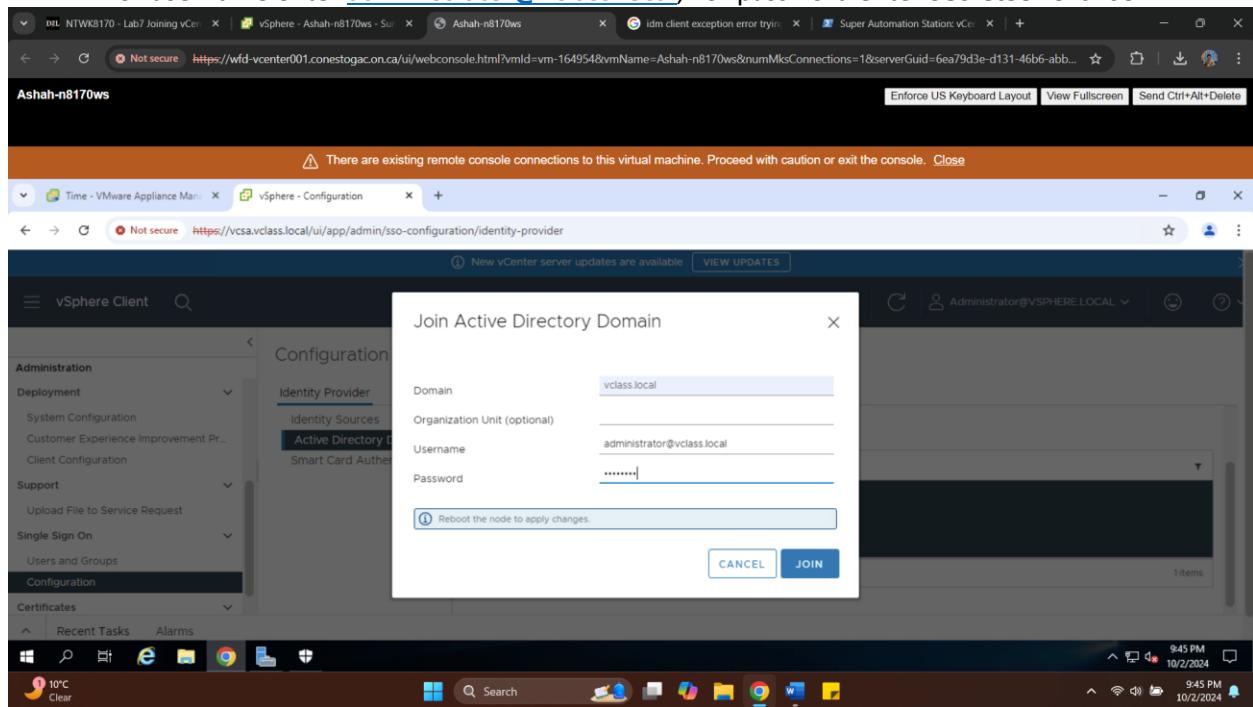
- 8) Click the **three lines** in the top left next to vSphere Client → Administration, Under Administration scroll down to **Single Sign on** → Configuration.



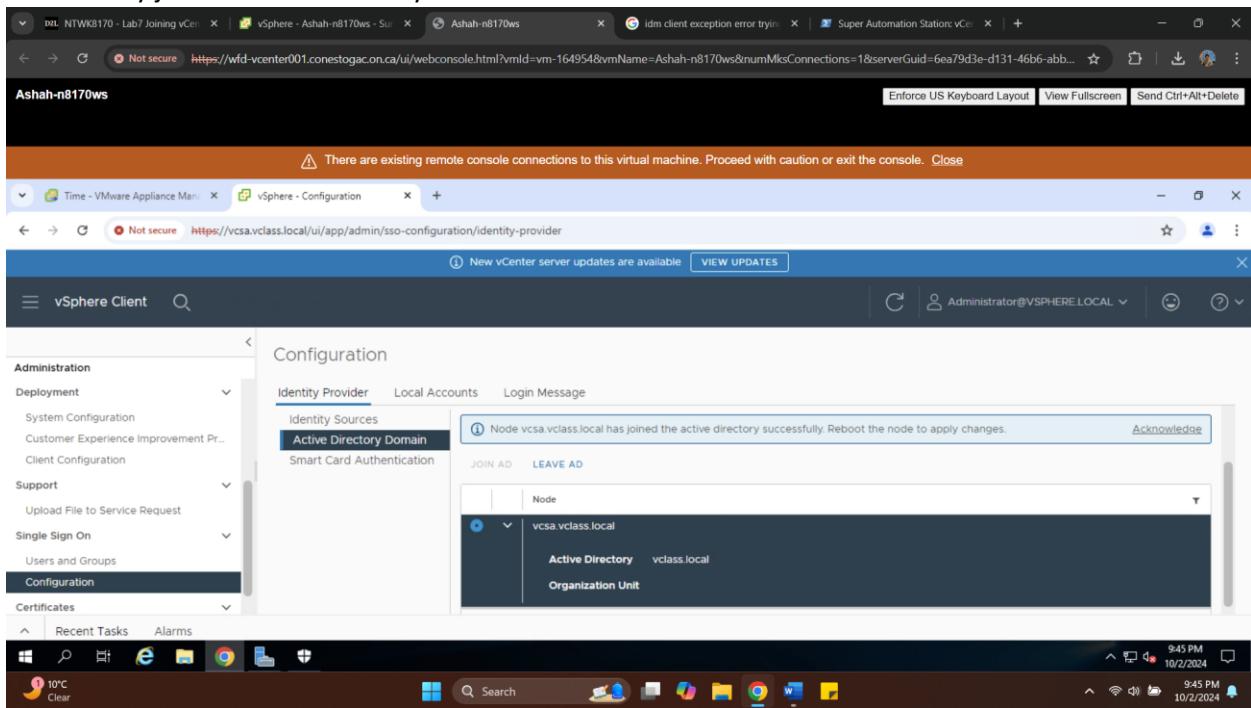
- 9) In Identity Provider Select Active Directory Domain. Select Join AD.



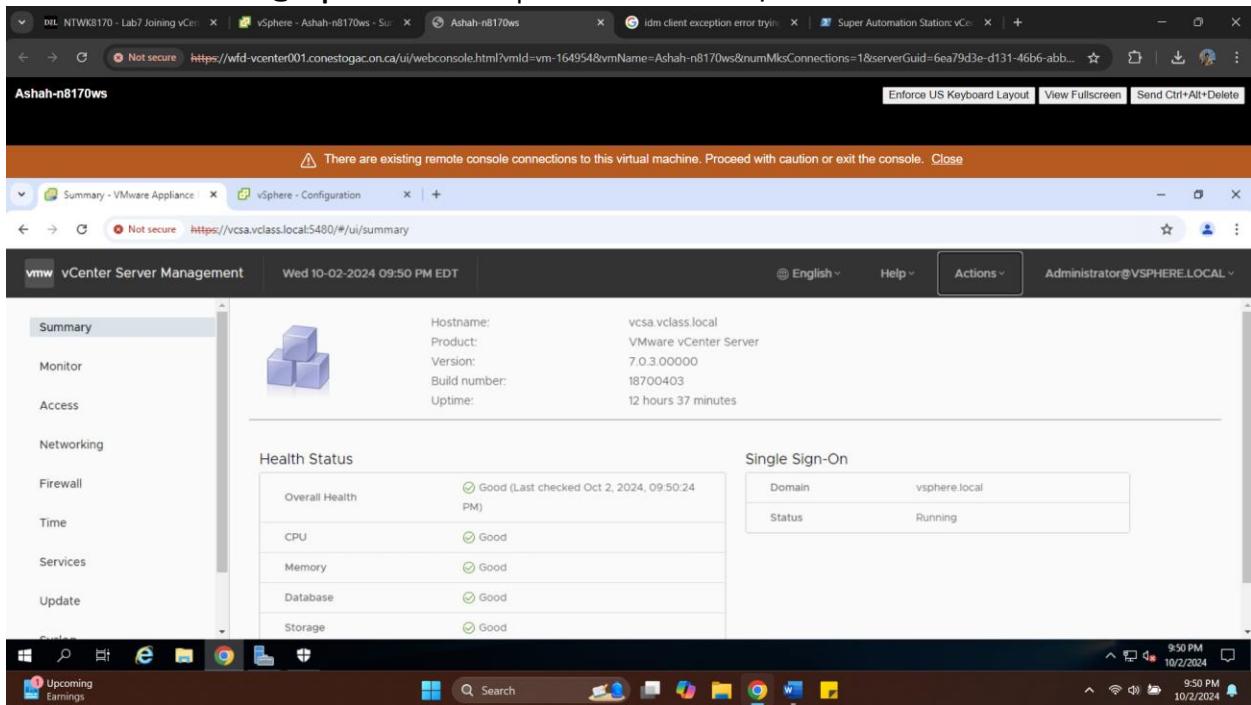
10) In Join Active Directory Domain for Domain type in vclass.local , Leave Organization Unit blank, For username enter administrator@vclass.local, For password enter Secret55. Click Join.



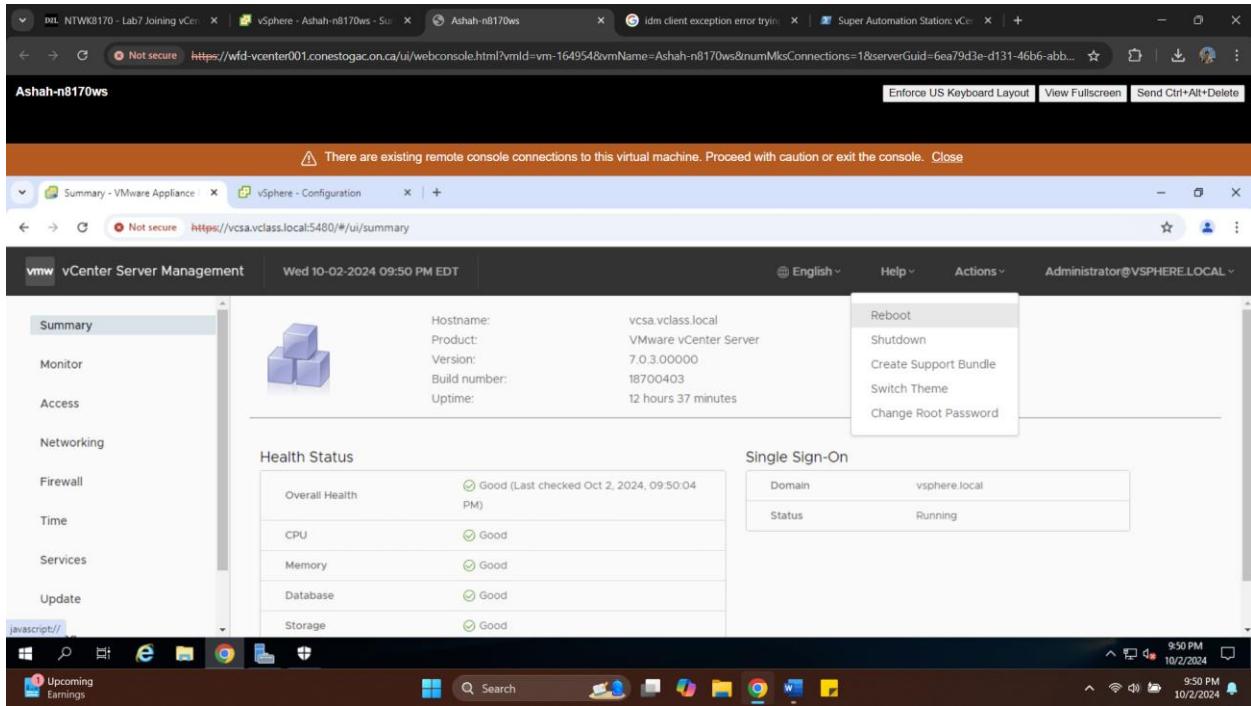
Successfully joined Active directory of vclass.local



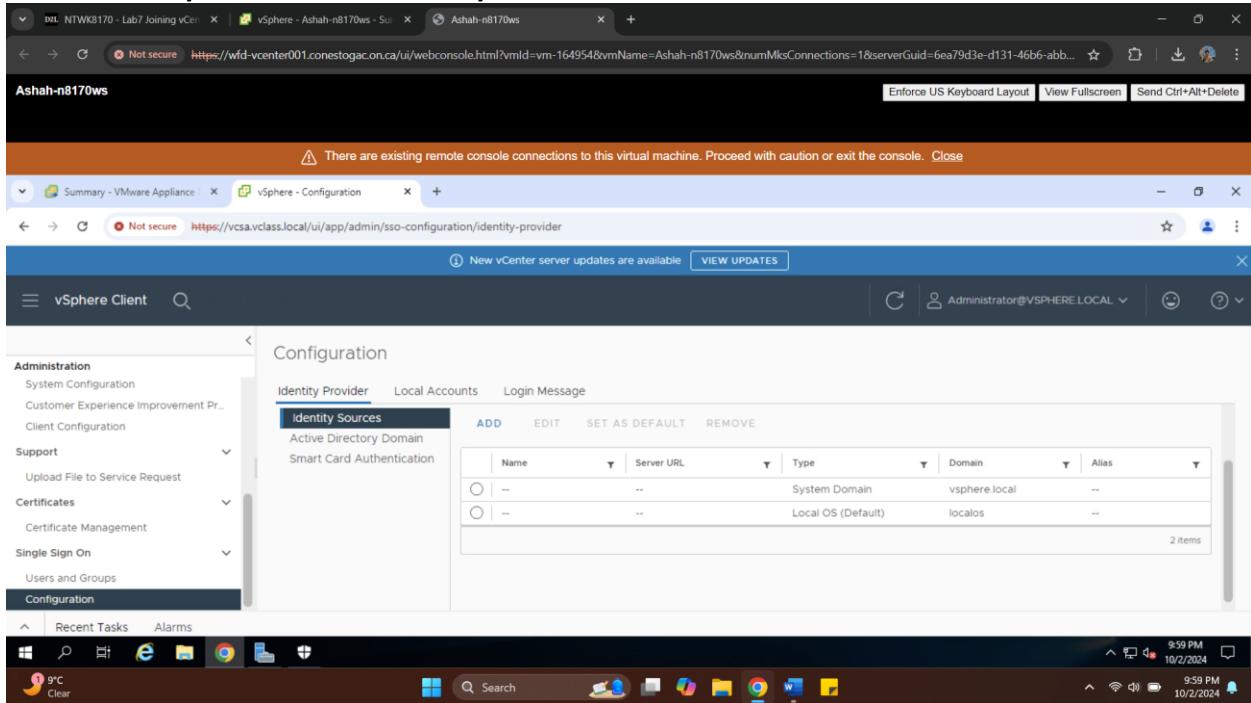
- 11) The next step is restarting the vCSA. Sign in to <https://vcsa.vclass.local:5480>. Use username **administrator@vsphere.local** and password **Vclass123\$**.



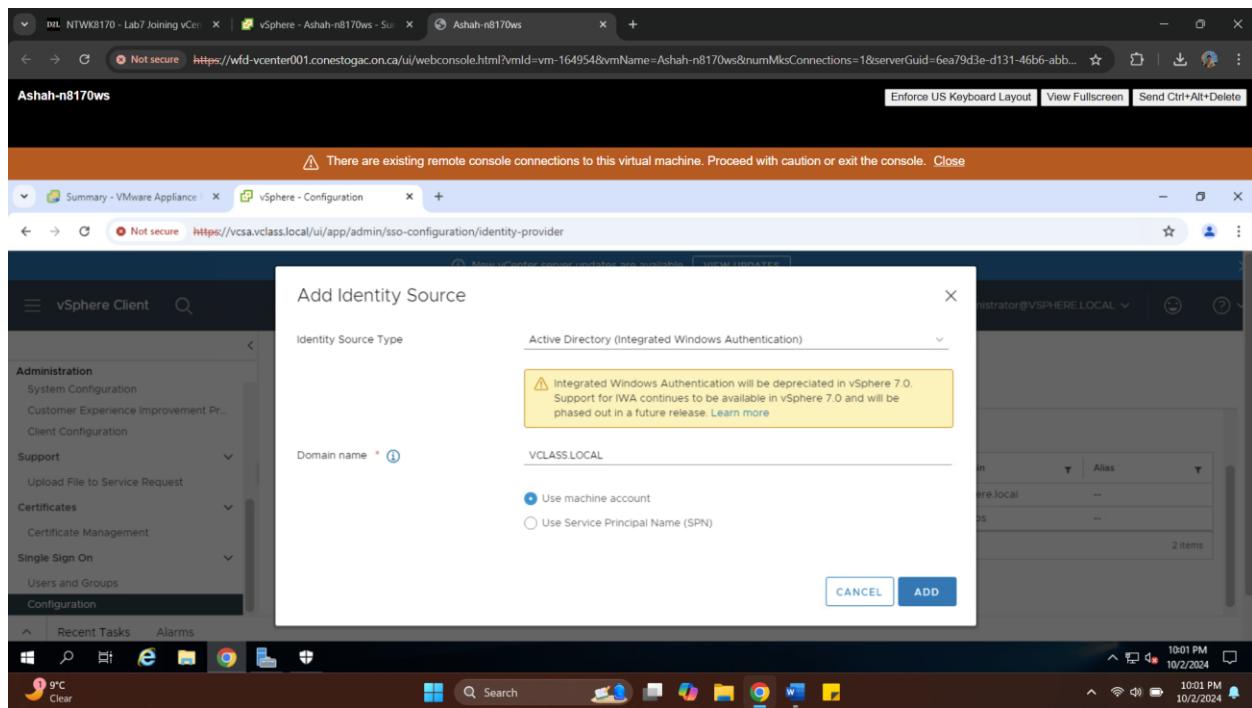
- 12) Once signed in click **Actions** at the top right of the screen, then **Reboot**. Click **Yes** to confirm the reboot.



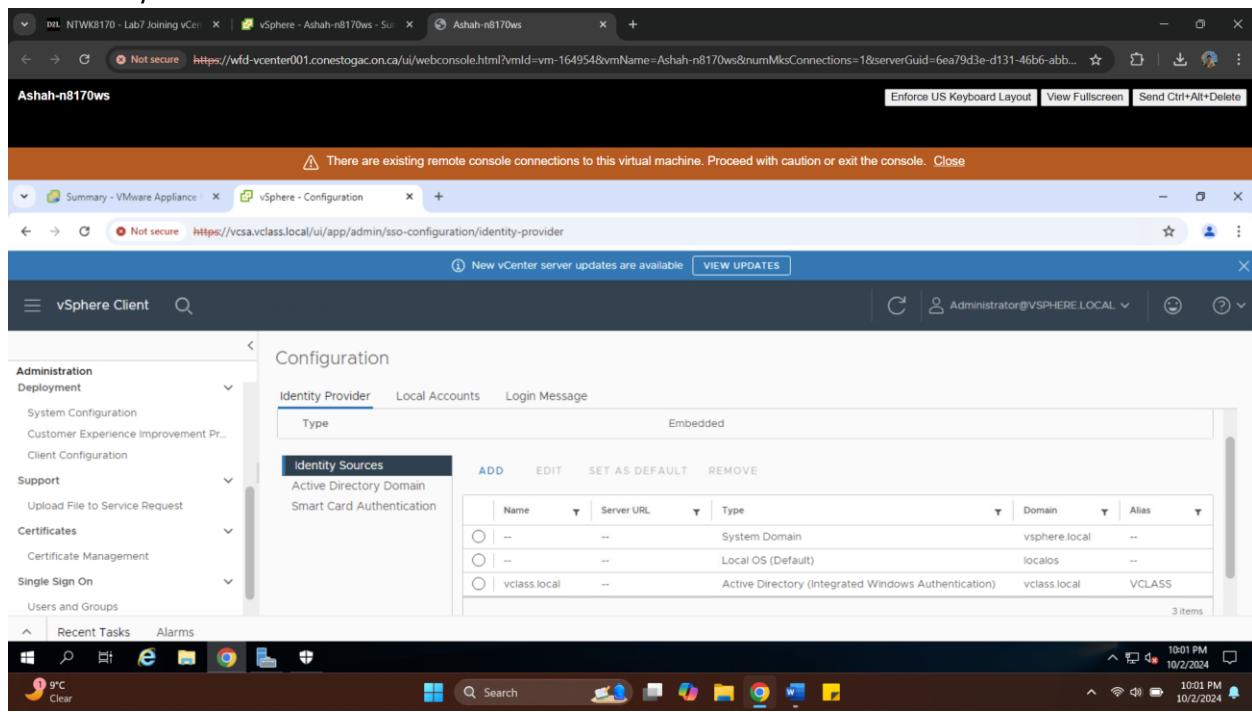
13) Once rebooted sign back in and head to Administration → Single Sign on → Configuration, In Identity Provider Select Identity Sources. Click Add.



14) For Identity Source Type Select Active Directory (Integrated Windows Authentication), Leave the domain name as VCLASS.LOCAL , Leave Use Machine Account selected. Click Add.

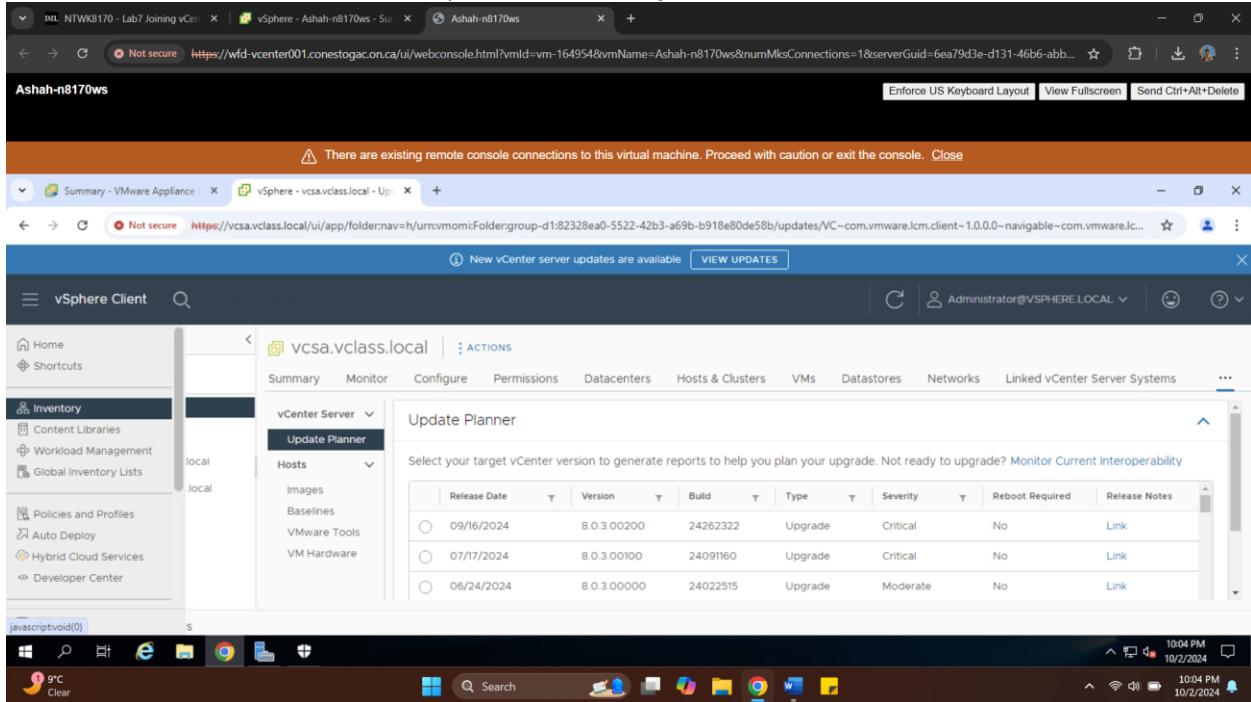


Successfully created vclass.local

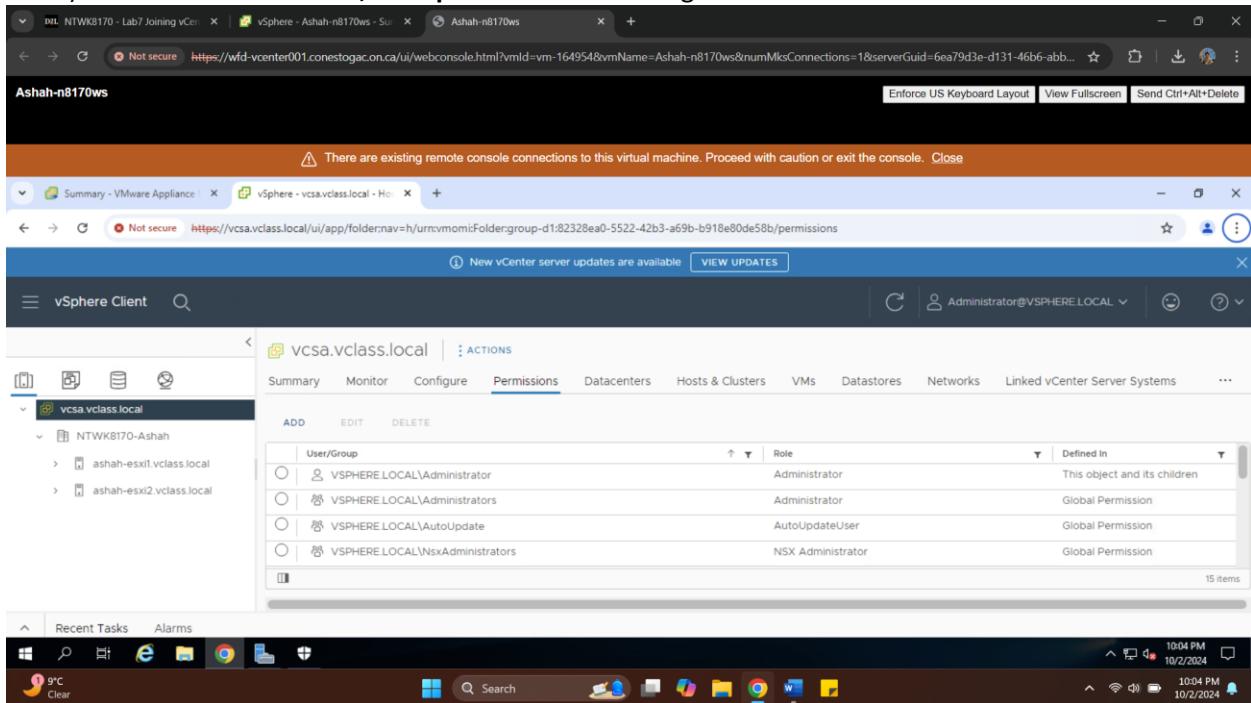


Section 2: Assigning permission to AD user administrator@vclass.local

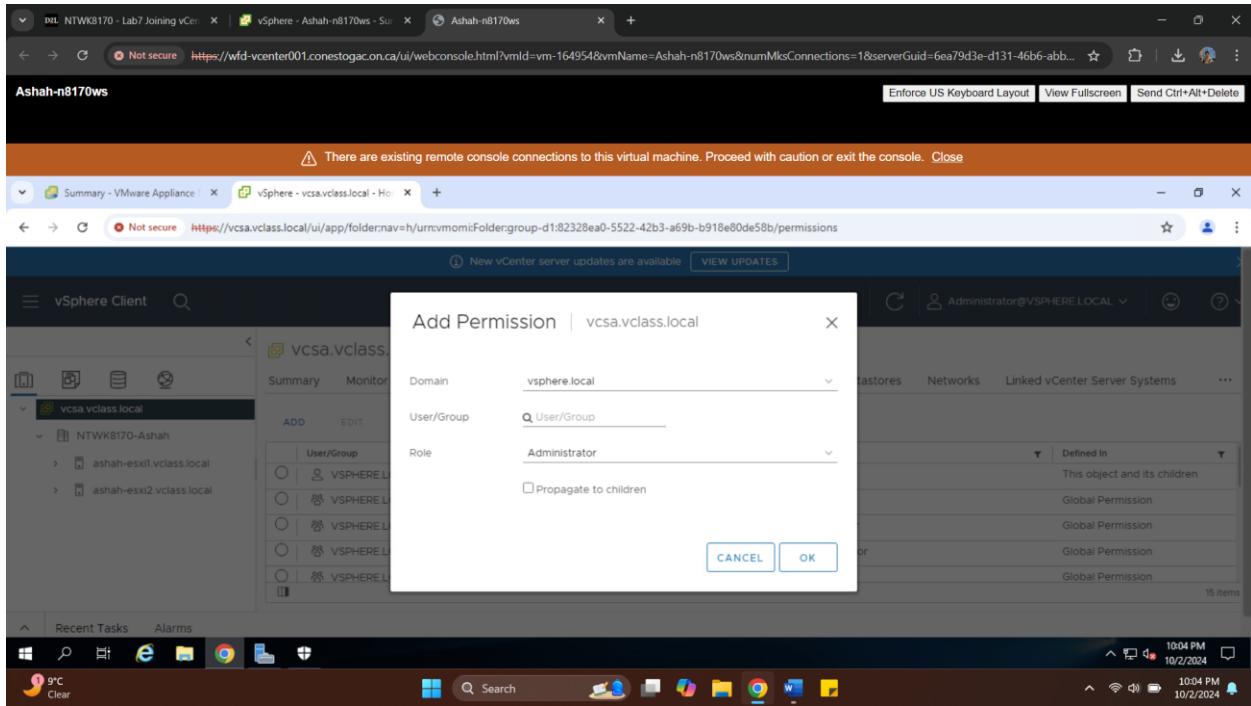
- 1) Click the three lines in the top left → Inventory.



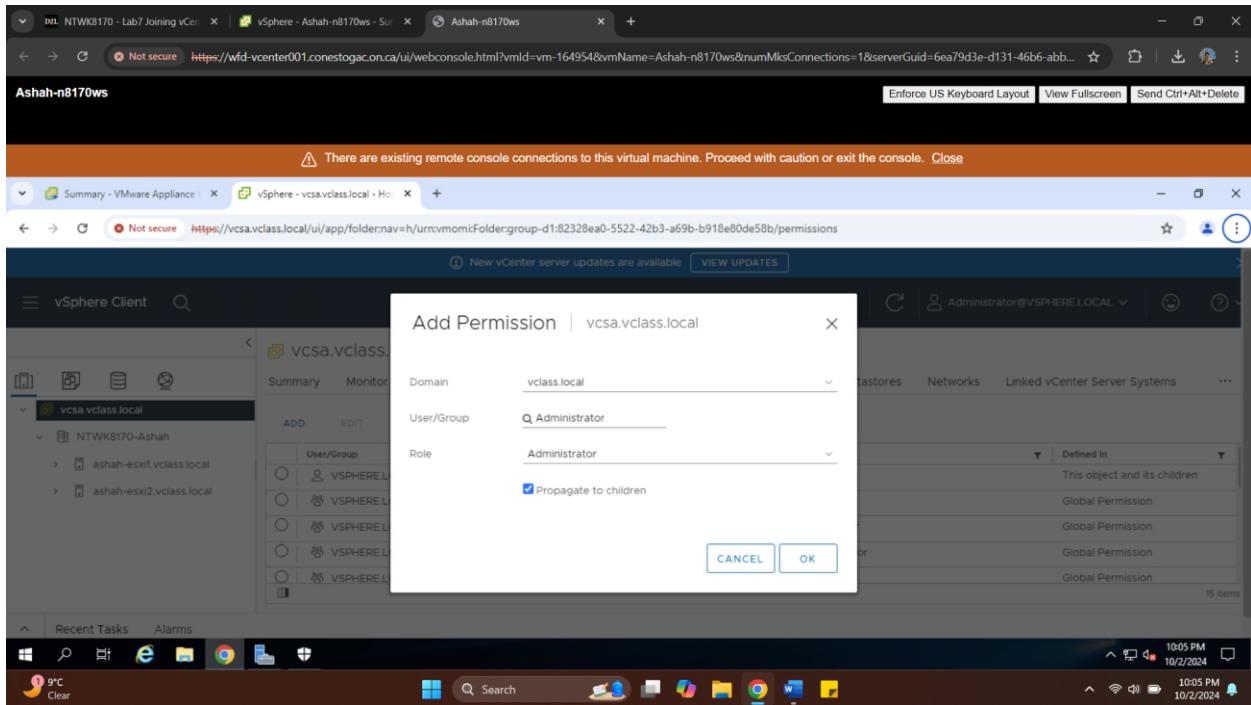
- 2) Click **vcsa.vclass.local**, then **permissions** in the right menu.



- 3) Click **Add**, In Add Permission change the domain to **vclass.local**.



- 4) On User/Group type in **Administrator** , Leave Role as **Administrator** , Check **Propagate to Children**. Click Ok.



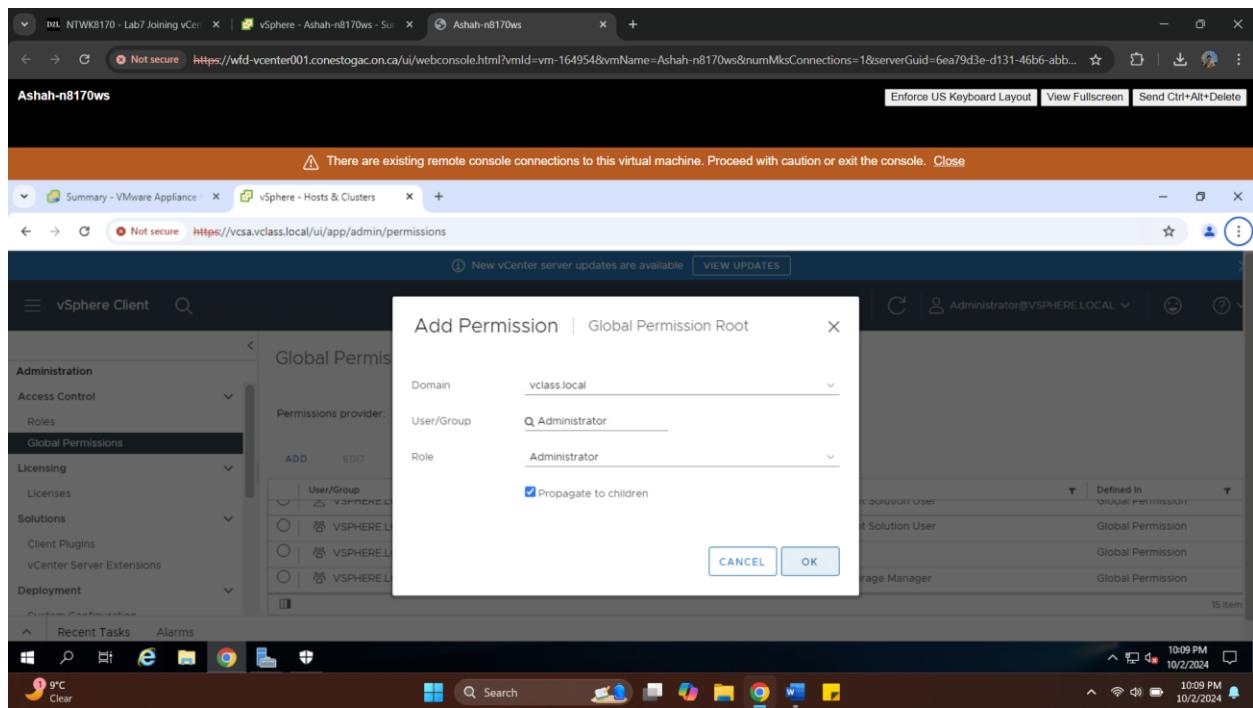
Permissions configured for vclass.local

User/Group	Role	Defined In
VCLASS\Administrator	Administrator	This object and its children
VSPPHERE LOCAL\Administrator	Administrator	This object and its children
VSPPHERE LOCAL\Administrators	Administrator	Global Permission
VSPPHERE LOCAL\AutoUpdate	AutoUpdateUser	Global Permission

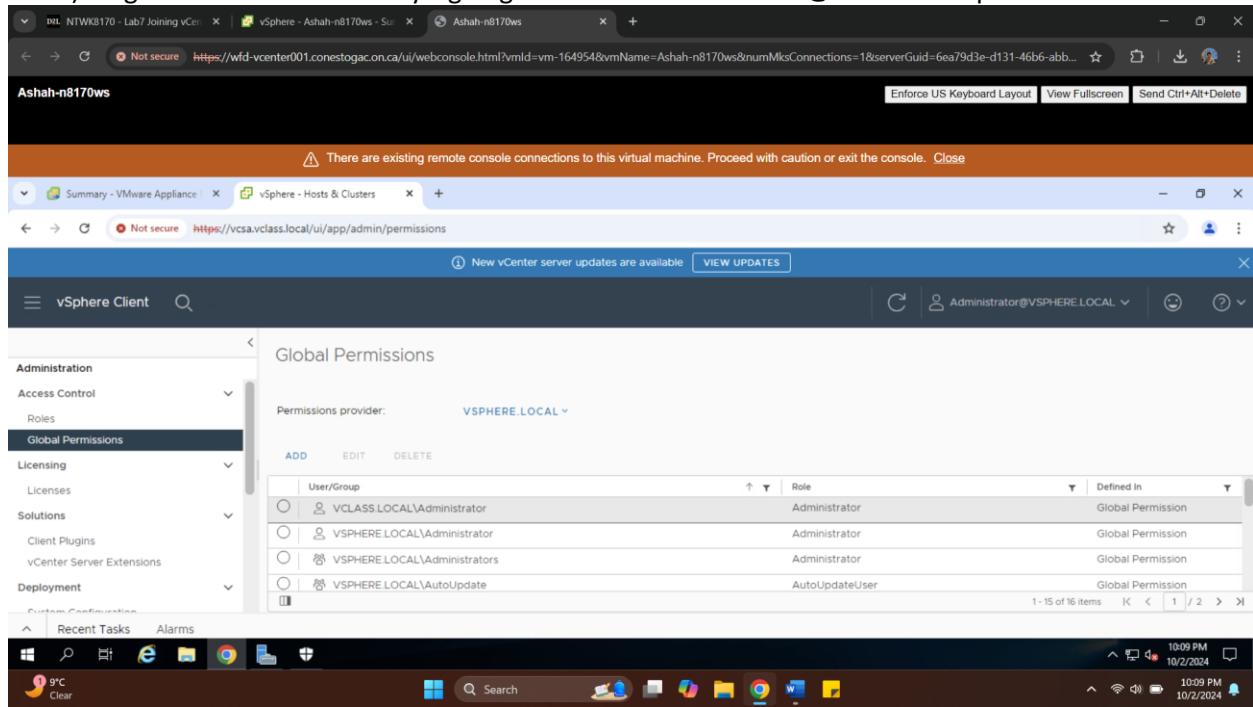
- 5) Click the **three lines** in the top left next to vSphere Client → **Administration**, Under **Access Control** Select **Global Permissions**. Click **Add**.

User/Group	Role	Defined In
VSPPHERE LOCAL\VsphereClientSolutionUsers	vSphere Client Solution User	Global Permission
VSPPHERE LOCAL\vStatsGroup	vStatsAdmin	Global Permission
VSPPHERE LOCAL\WorkloadStorage	Workload Storage Manager	Global Permission

- 6) In Add Permission change the domain to **vclass.local**, On **User/Group** type in **Administrator**.
 7) Leave **Role** as **Administrator**, Check **Propagate to Children**. Click **Ok**.



8) Sign out of vCenter and try signing in as user **administrator@vclass.local** password **Secret55**.

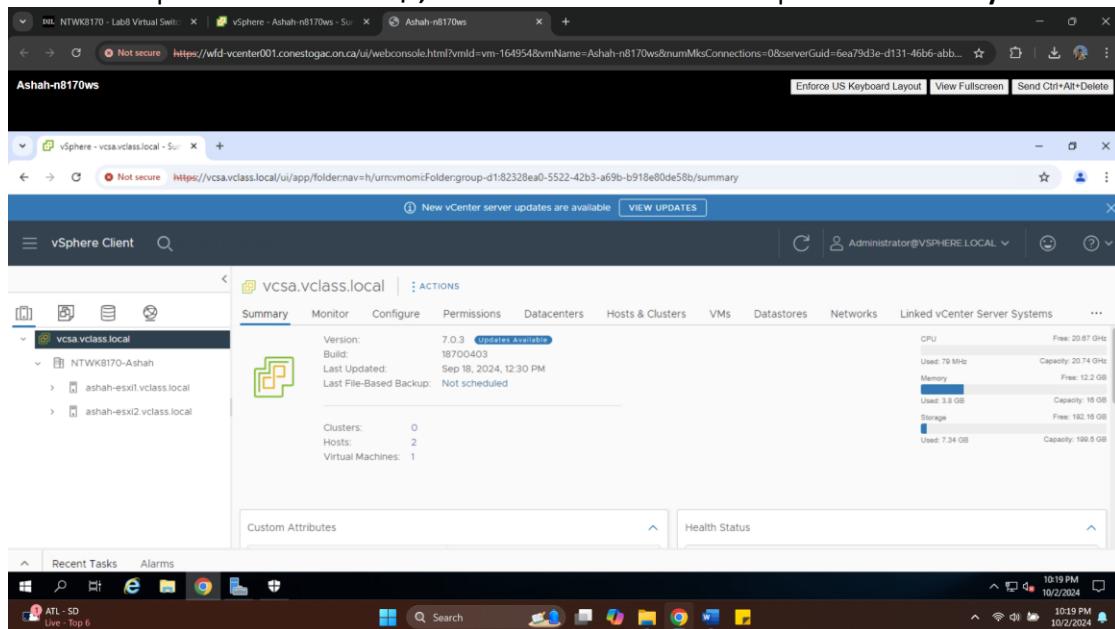


Lab 8: Virtual Switches

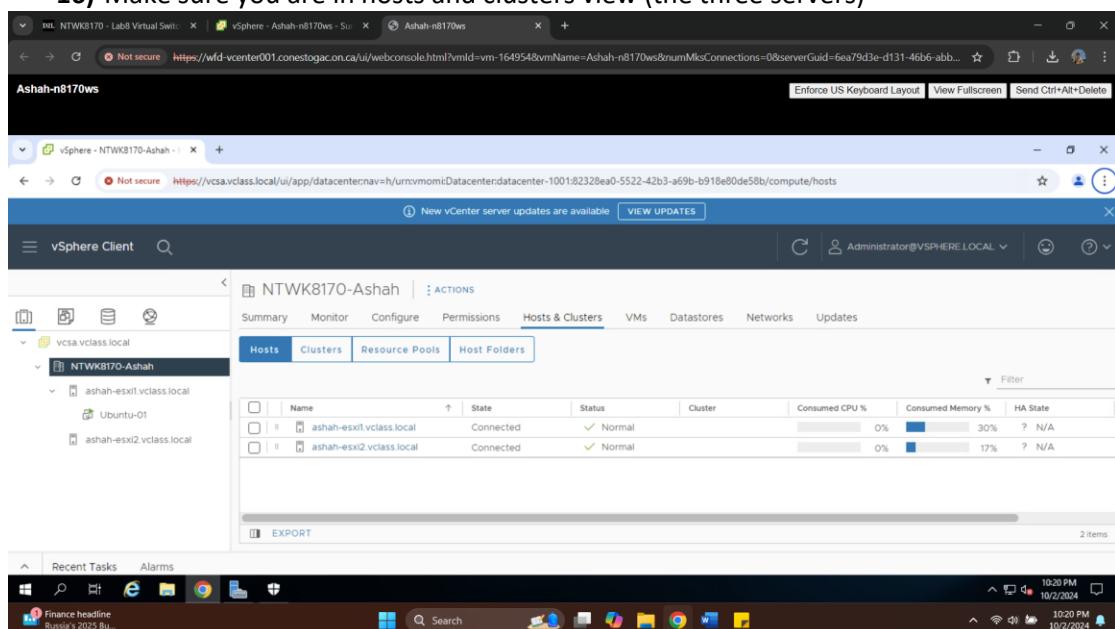
- 5) Create a virtual switch for VM traffic.
- 6) Assign an uplink to the new virtual switch.

Section 1: Creating a virtual switch for VM traffic on ESXi1 and ESXi2

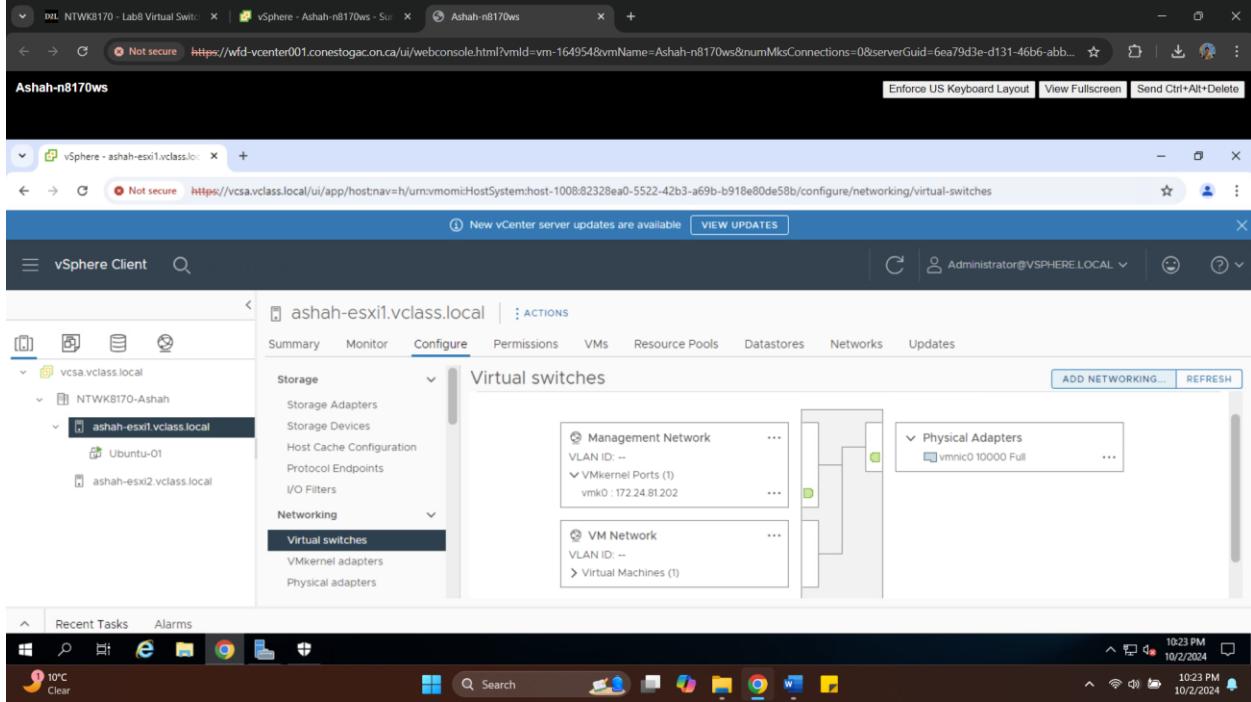
- 15) From your DC, Sign into <https://vcsa.vclass.local> with username **administrator@vsphere.local** and password **Vclass123\$**, Click the three lines in the top left → Inventory.



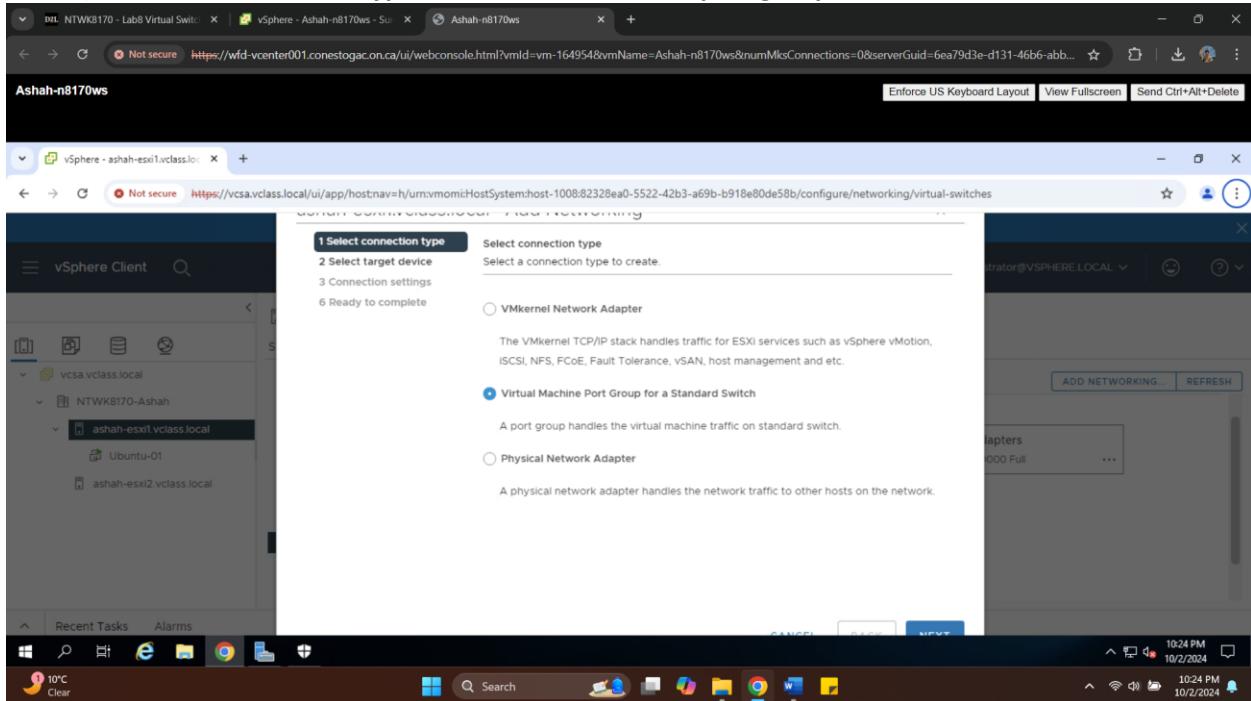
- 16) Make sure you are in hosts and clusters view (the three servers)



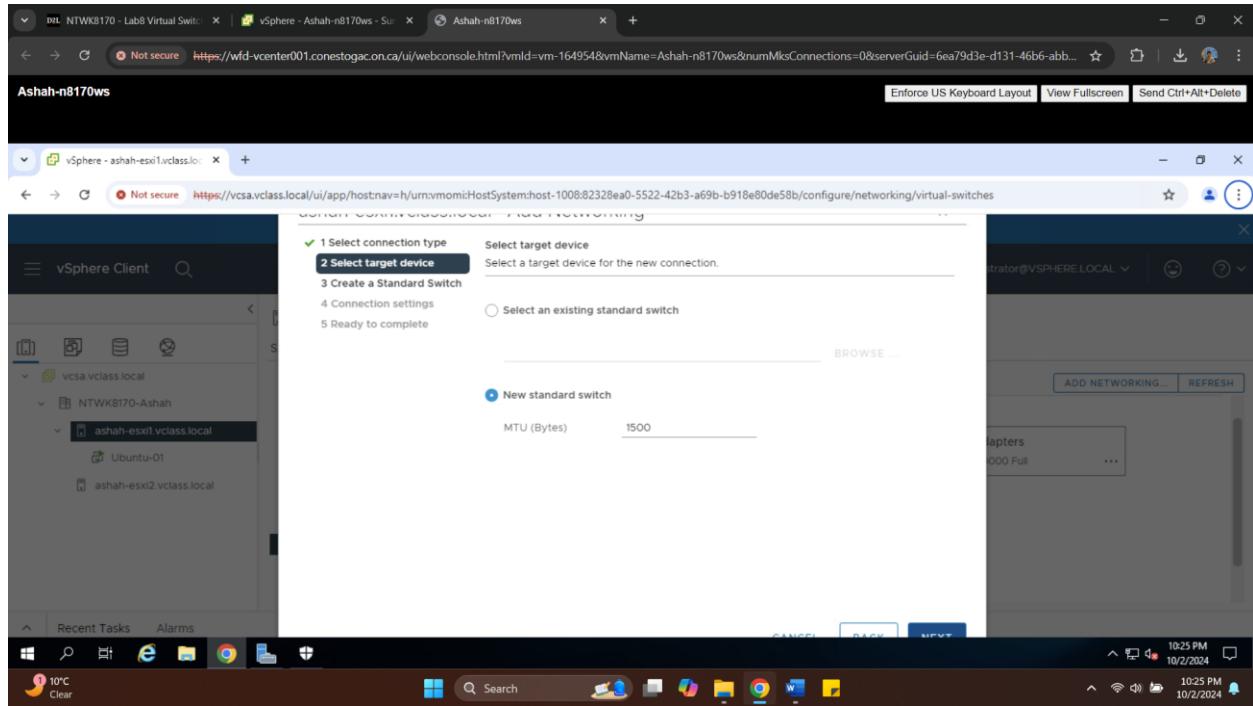
17) Click on ESXi1 → Configure → Networking → Virtual Switches , At the current moment we have one Virtual Switch vSwitch0 that is used for Management and VM traffic. ,Click Add Networking...



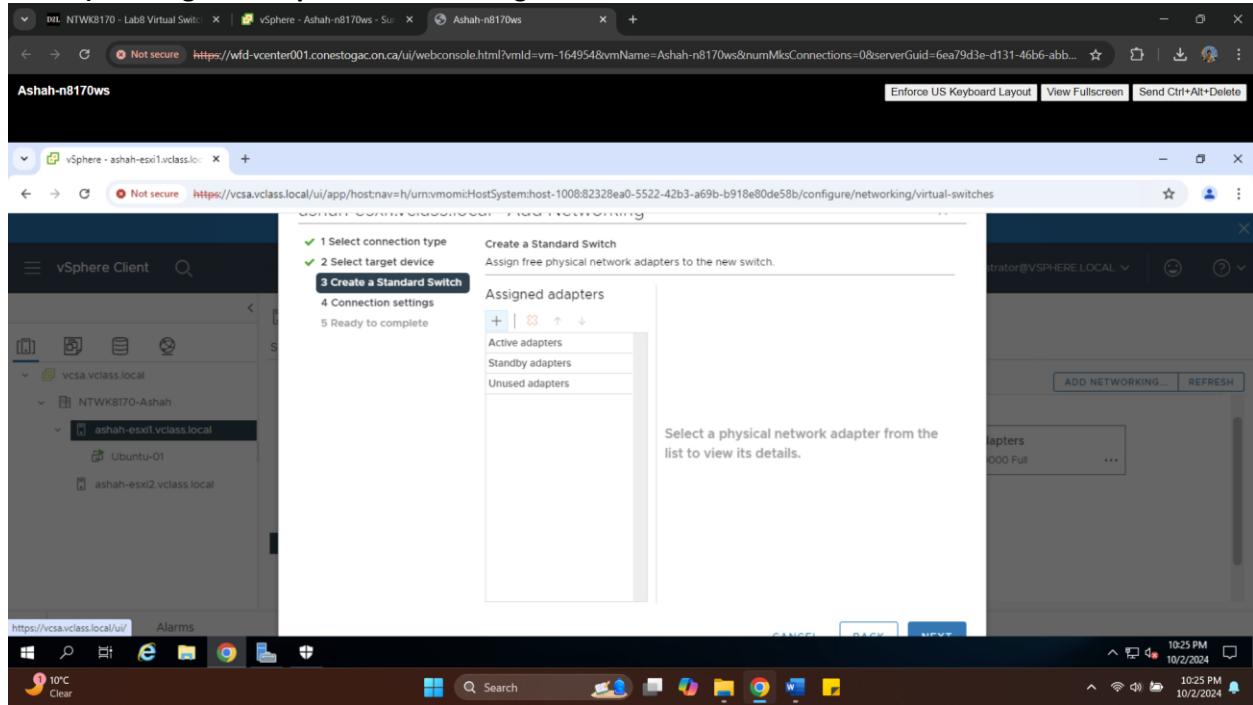
18) In Select Connection Type Select Virtual machine port group for a standard switch. Click Next.



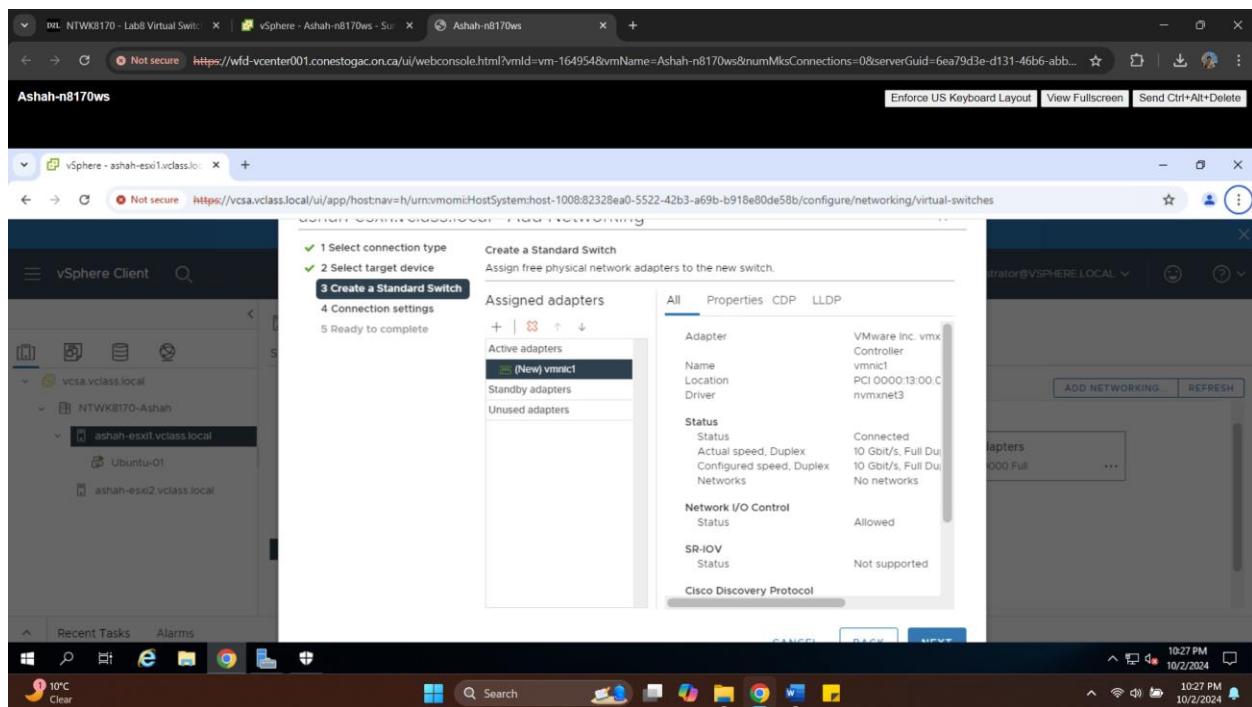
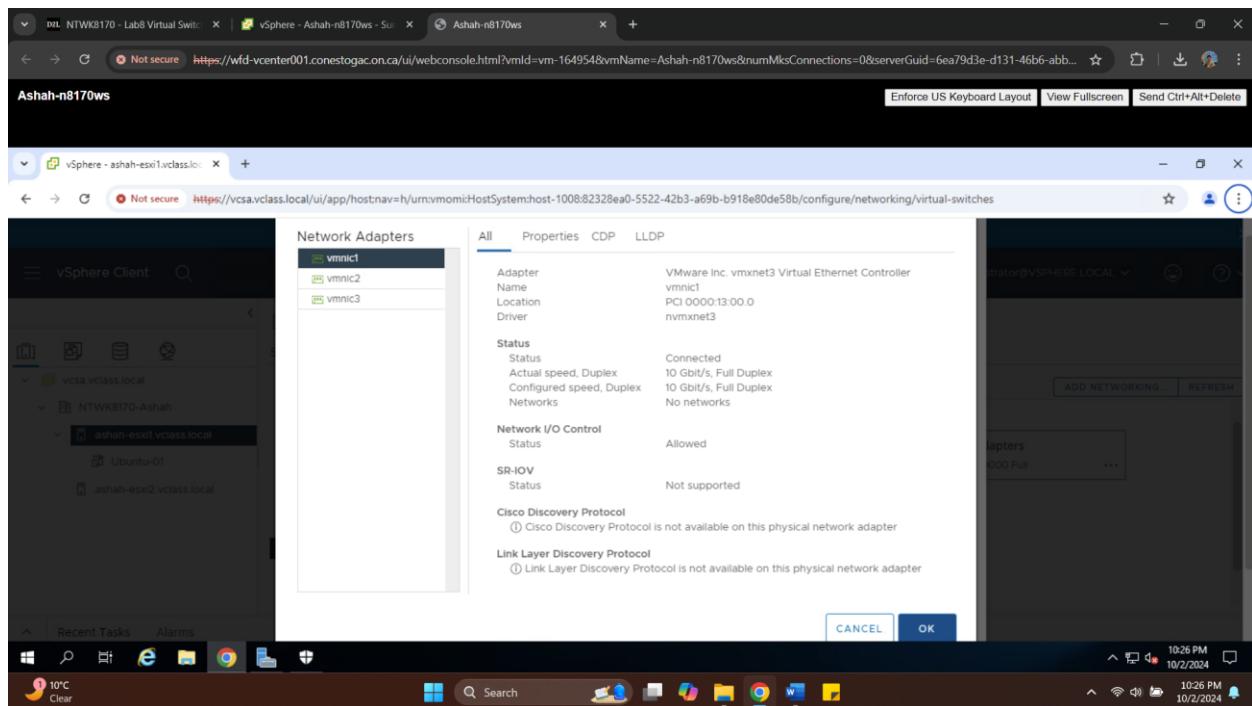
19) In Select target device Select New standard switch. Click Next.



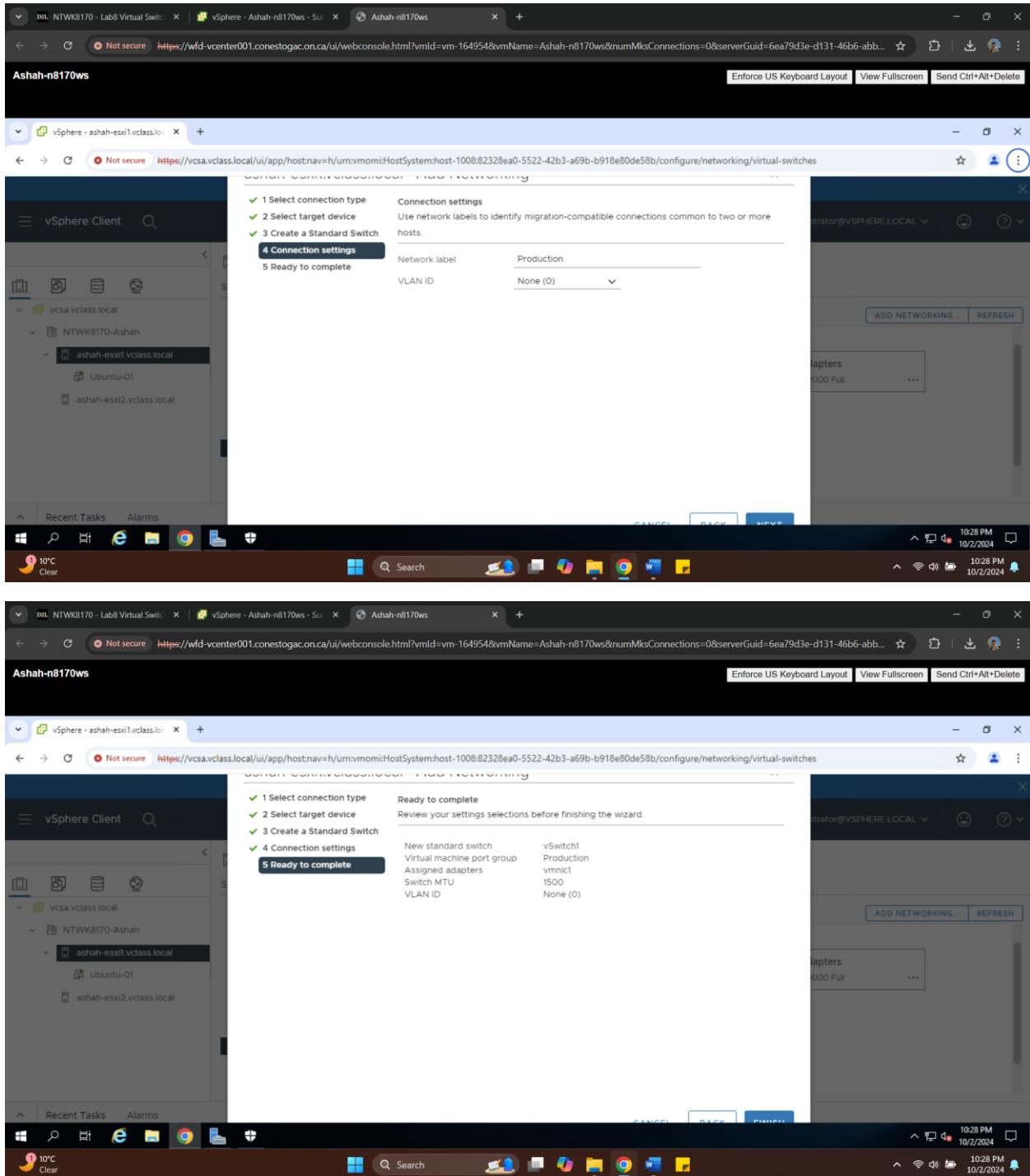
20) In Assigned Adapters Click the + sign.



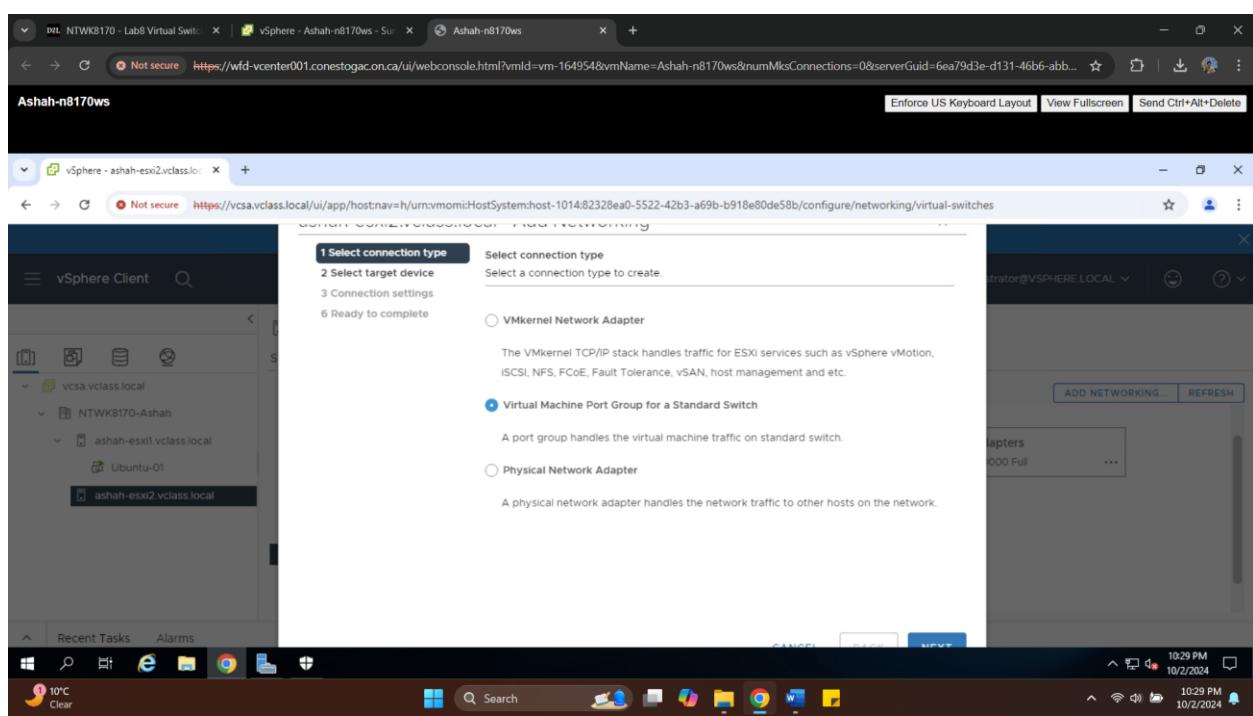
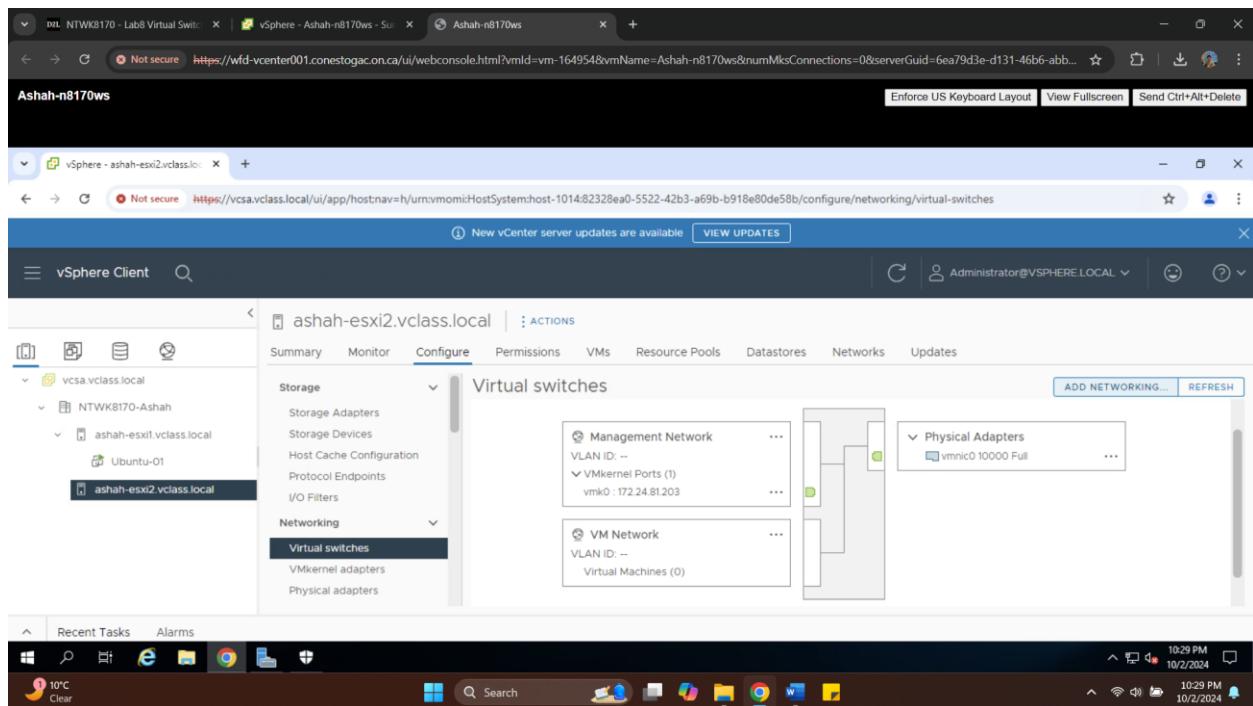
21) Select vmnic1 , Click Ok. Click Next.

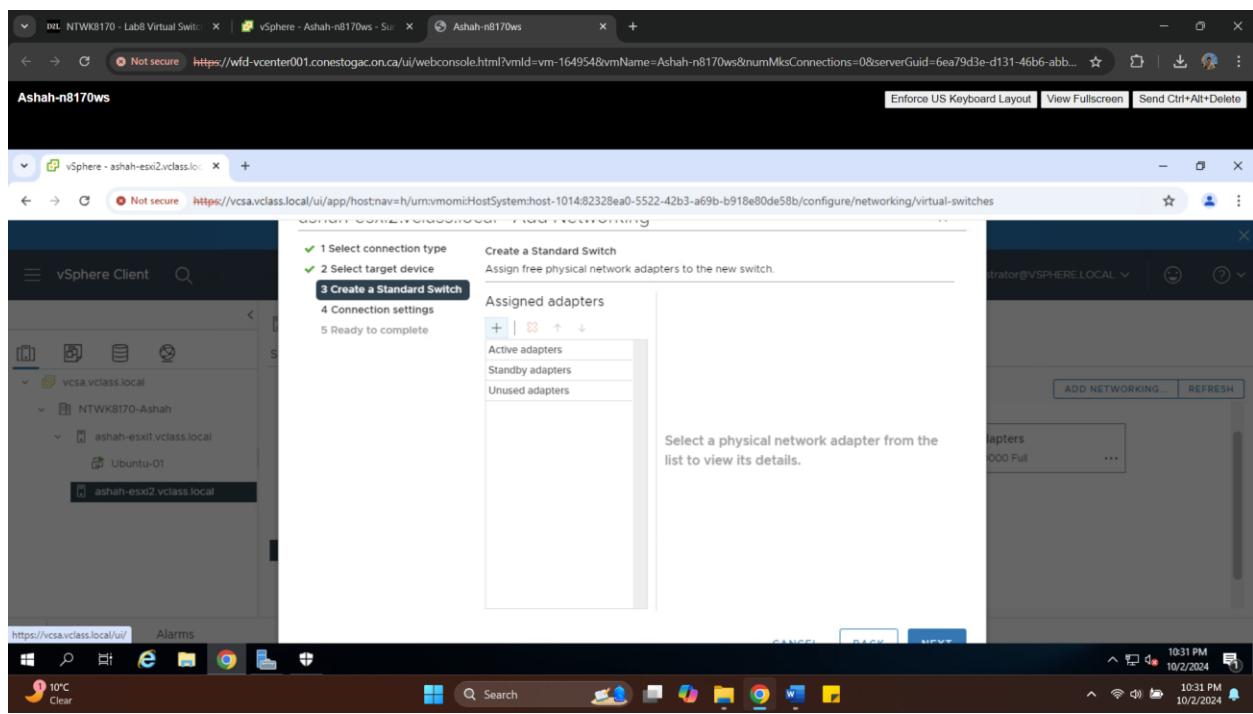
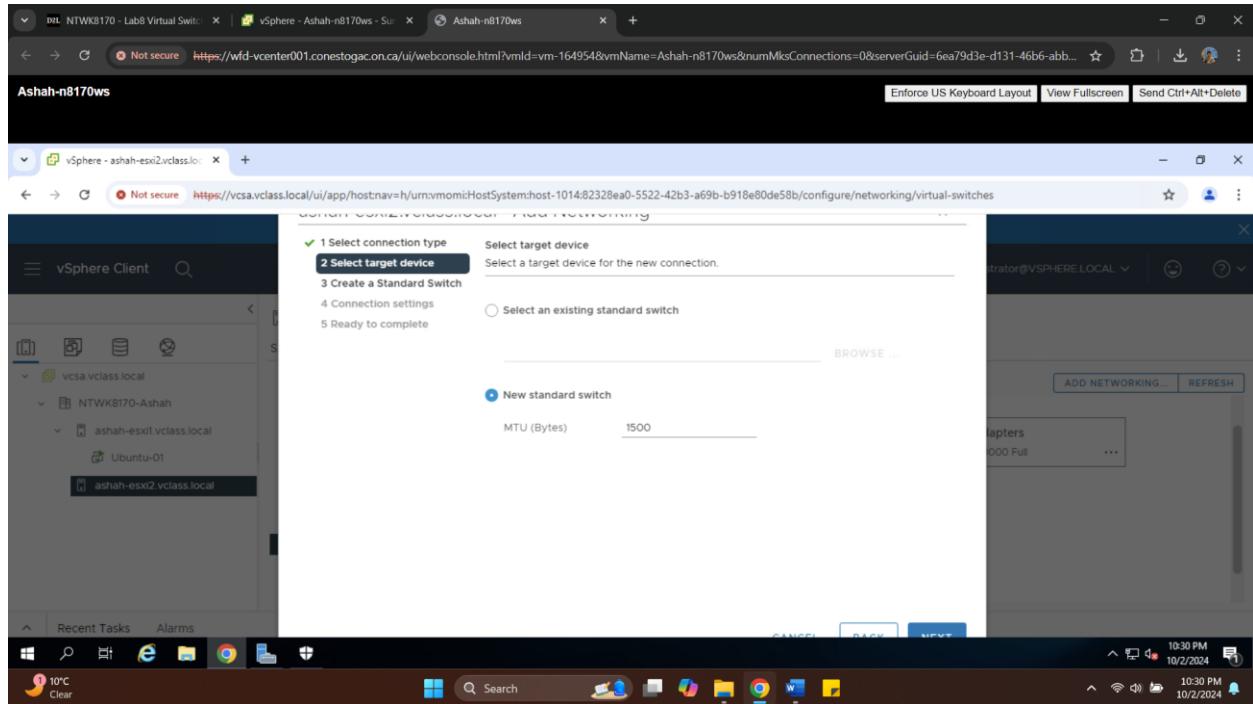


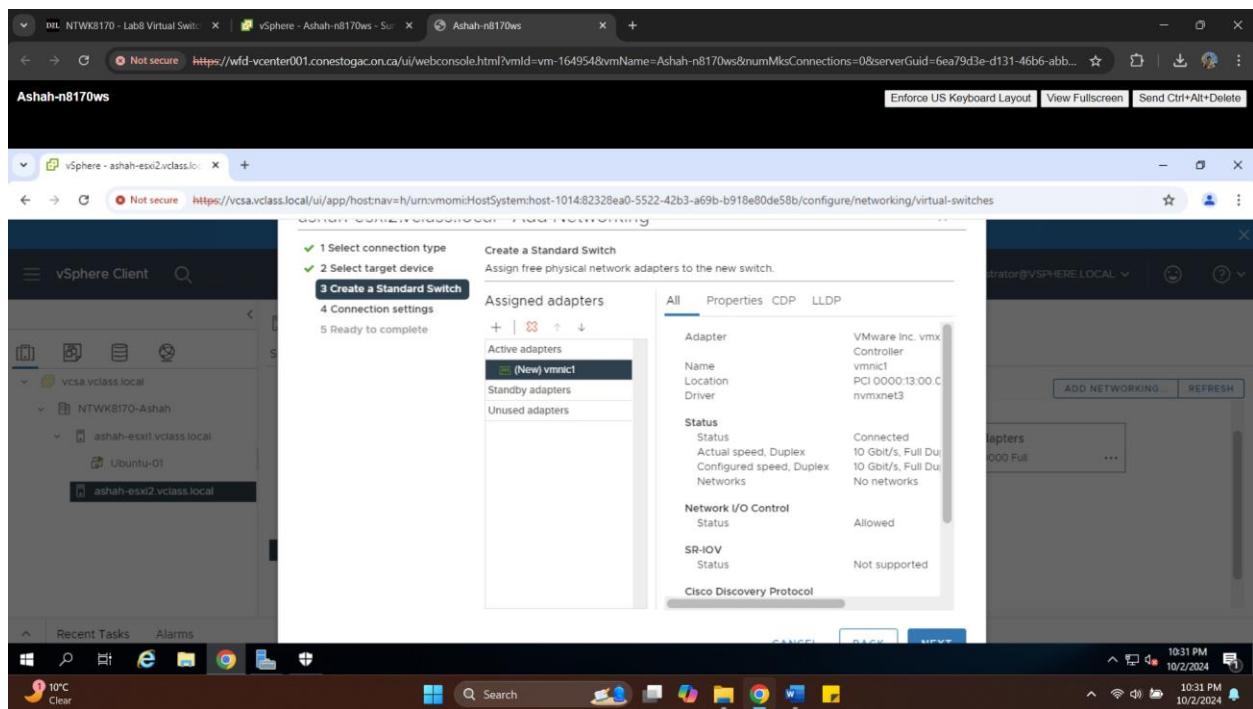
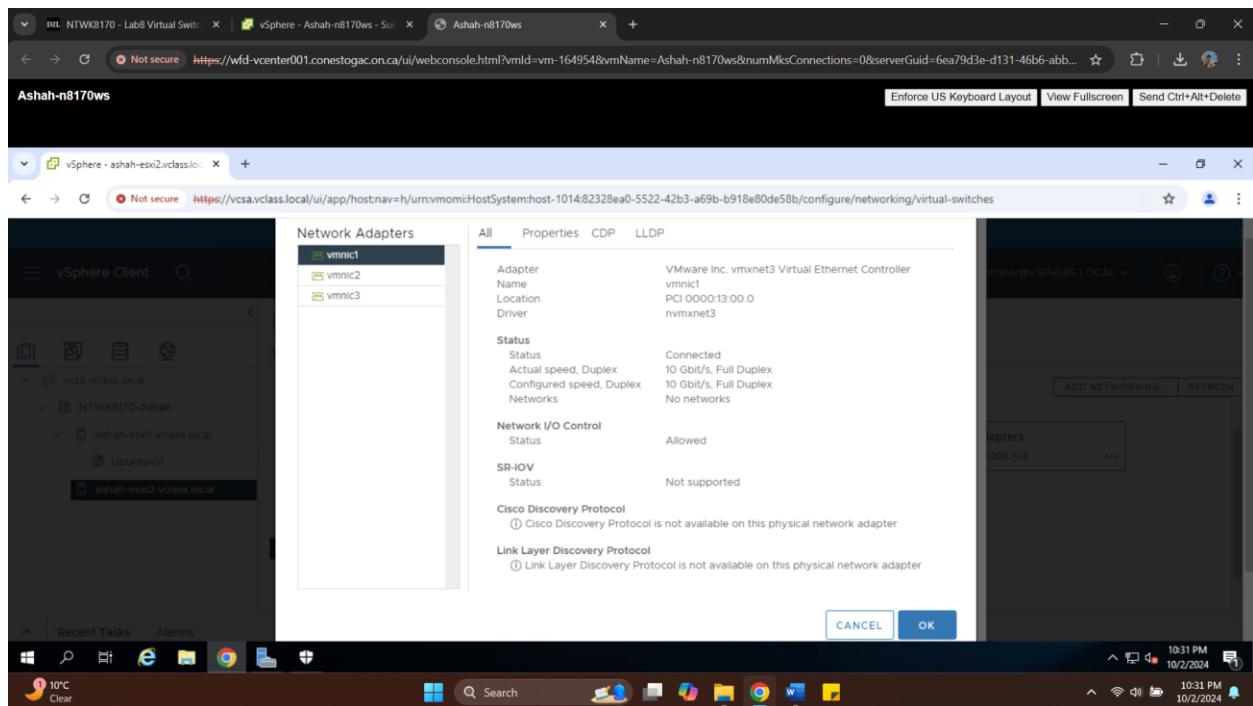
22) In Connection Settings on Network Label type in Production. Click Next. Click Finish to create the virtual switch and port group Production.

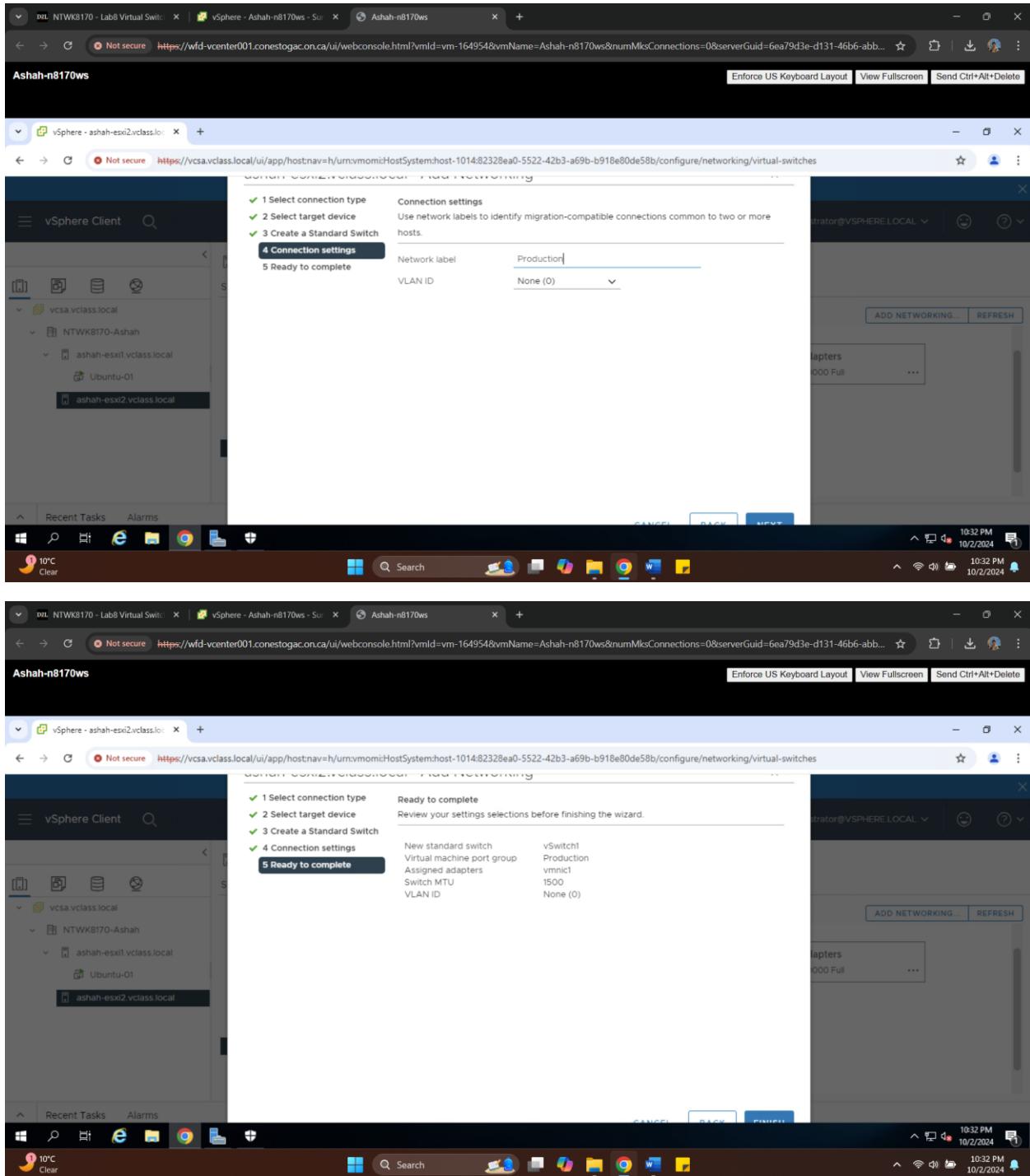


23) Complete Steps 1-11 on ESXi2.



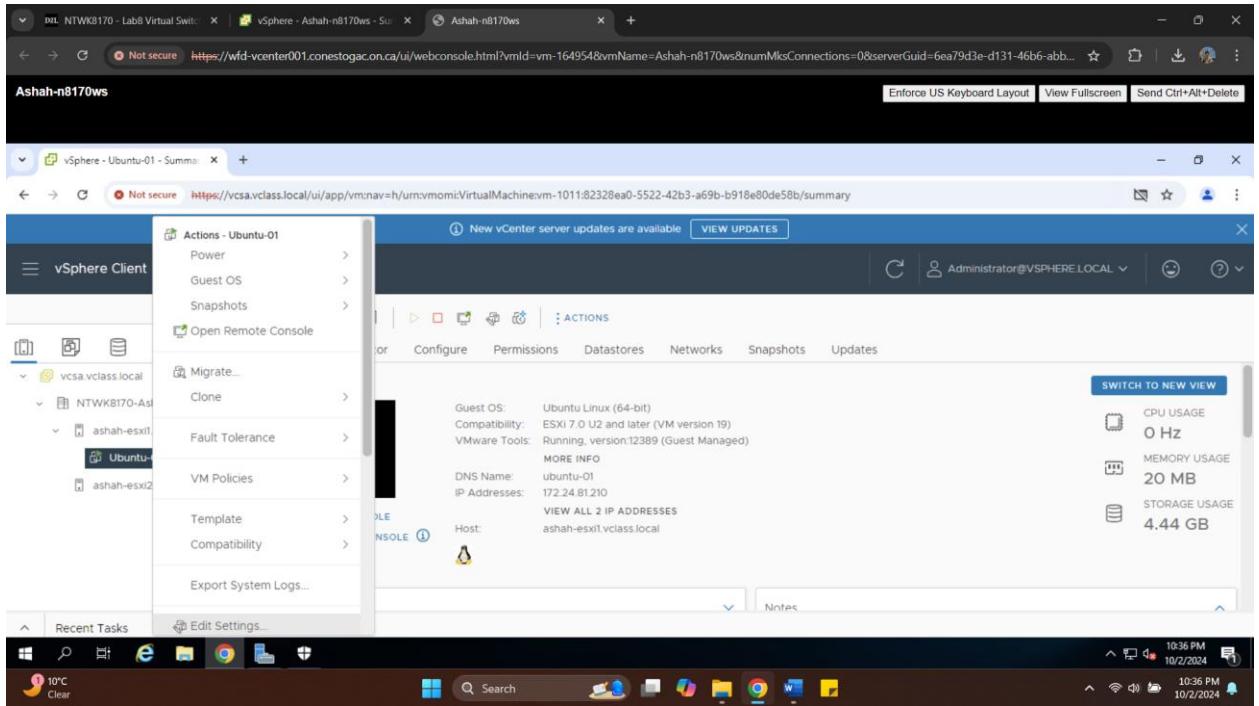




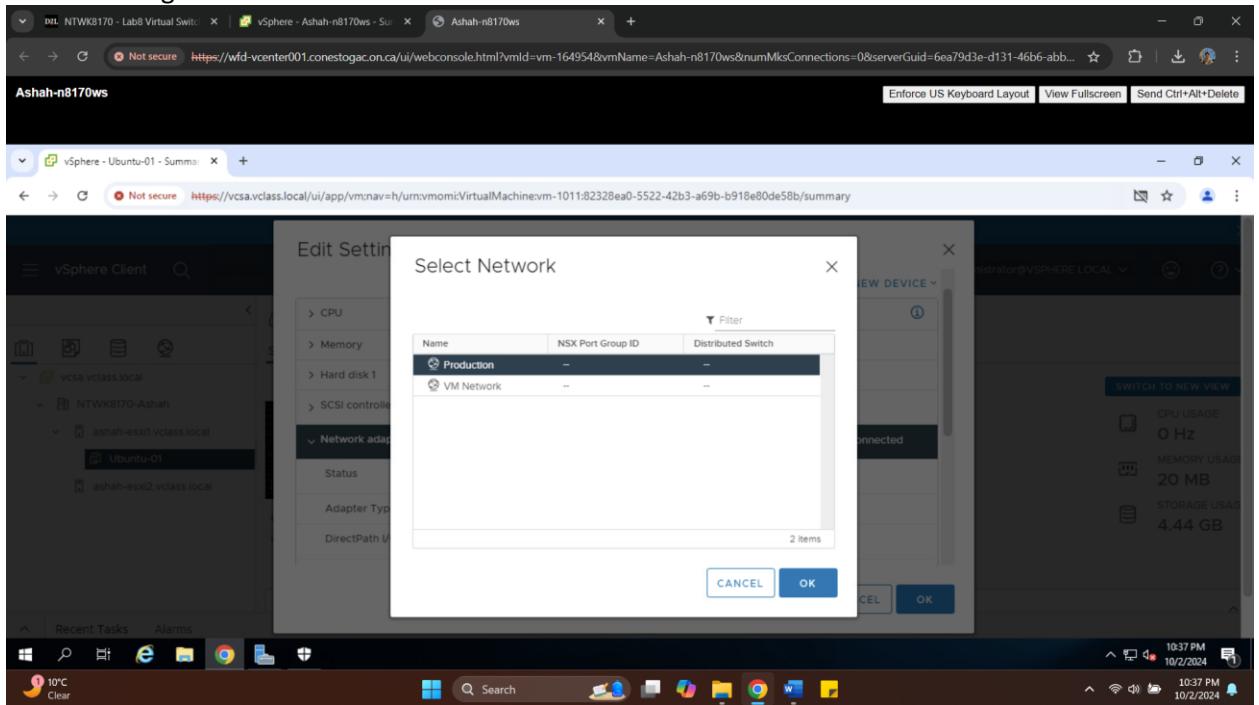


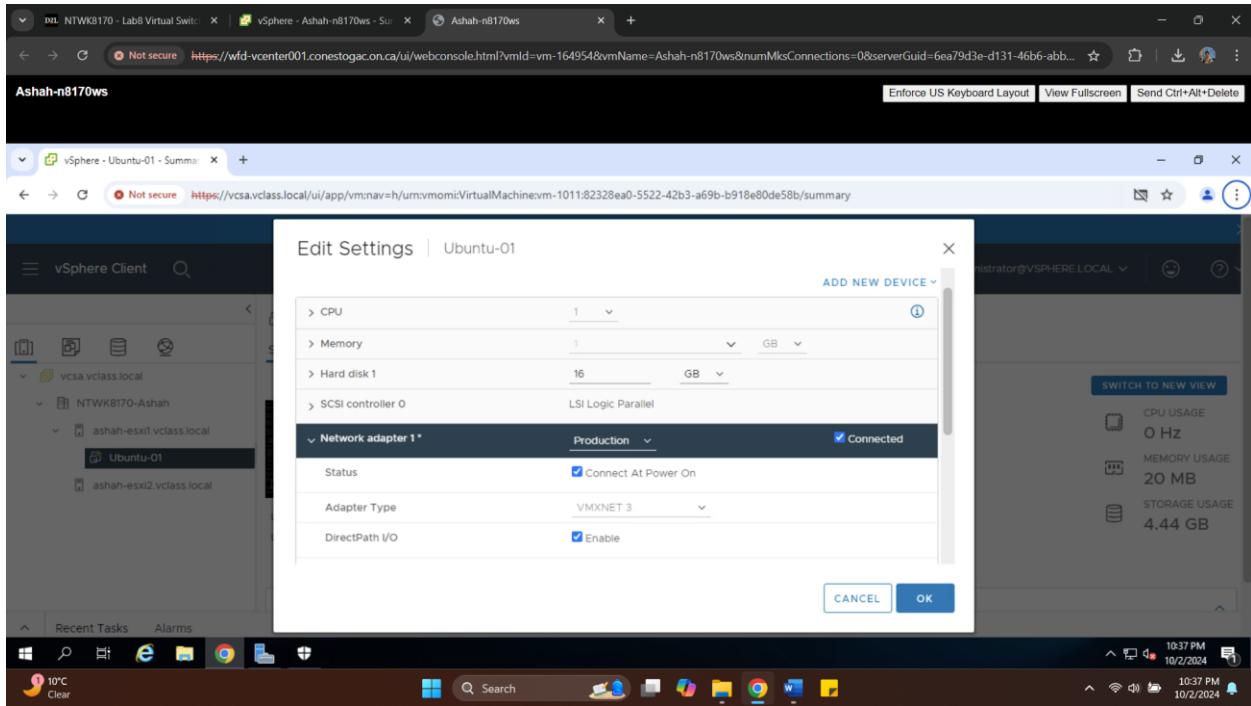
Section 2: Assigning a VM (ubuntu-01) to the production port group on ESXi1

- 1) Since ubuntu-01 is on ESXi1 we will assign it to the production port group, In **Hosts and Clusters** view click the arrow to the left of ESXi1 to show the VMs on **ESXi1**, Right-Click **ubuntu-01** → **Edit Settings...**

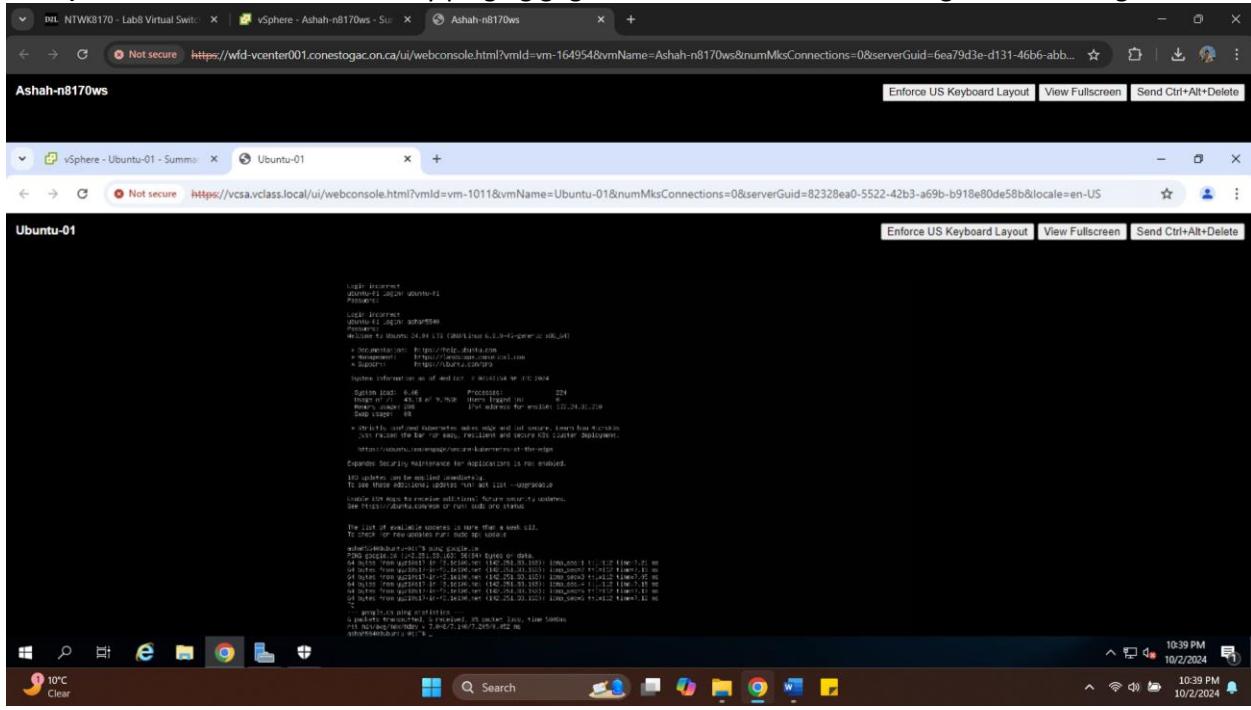


- 2) Click the dropdown next to **Network adapter 1** and select **Production**. Click **Ok** to apply the configuration.





3) PowerOn **ubuntu-01** and try pinging gogole.ca to show that networking is still working.



4) You can also go to **ESXi1 → Configure → Networking → Virtual Switches** to see that the VM is on the other virtual switch in our new production port group.

