

2019

CONFIGURING ACTIVE DIRECTORY

USING VMWARE WORKSTATION

SUBMITTED BY:

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ACKNOWLEDGEMENT

I would like to express our special thanks of gratitude to my trainer Mr. Binayak Prasad Gupta and GLA University, Mathura who gave us the opportunity to do this project on the topic Configuring Active Directory, which helped us understanding the working of VMware workstation and I am really thankful to them.

Secondly I would also like to thank my friends who helped me in completing this project.

INTRODUCTION

VIRTUALIZATION

Virtualization refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, storage devices, and computer network resources. Hardware virtualization or platform virtualization refers to the creation of a virtual machine that acts like a real computer with an operating system. Software executed on these virtual machines is separated from the underlying hardware resources.

VMWARE WORKSTATION

VMware Workstation is a hosted hypervisor that runs on x64 versions of Windows and Linux operating systems (an x86 version of earlier releases was available), it enables users to set up virtual machines (VMs) on a single physical machine, and use them simultaneously along with the actual machine. Each virtual machine can execute its own operating system, including versions of Microsoft Windows, Linux, BSD, and MS-DOS. There is a free-of-charge version, VMware Workstation supports bridging existing host network adapters and sharing physical disk drives and USB devices with a virtual machine. It can simulate disk drives; an ISO image file can be mounted as a virtual optical disc drive, and virtual hard disk drives are implemented as .vmdk files.

VIRTUAL MACHINES

A virtual machine (VM) is a software program or operating system that not only exhibits the behaviour of a separate computer, but is also capable of performing tasks such as running applications and programs like a separate computer. A virtual machine (VM) is an emulation of a computer system. Virtual machines are based on computer architectures and provide functionality of a physical computer. Their implementations may involve specialized hardware, software, or a combination. A virtual machine is defined as a computer file, typically called an image, which behaves like an actual computer.

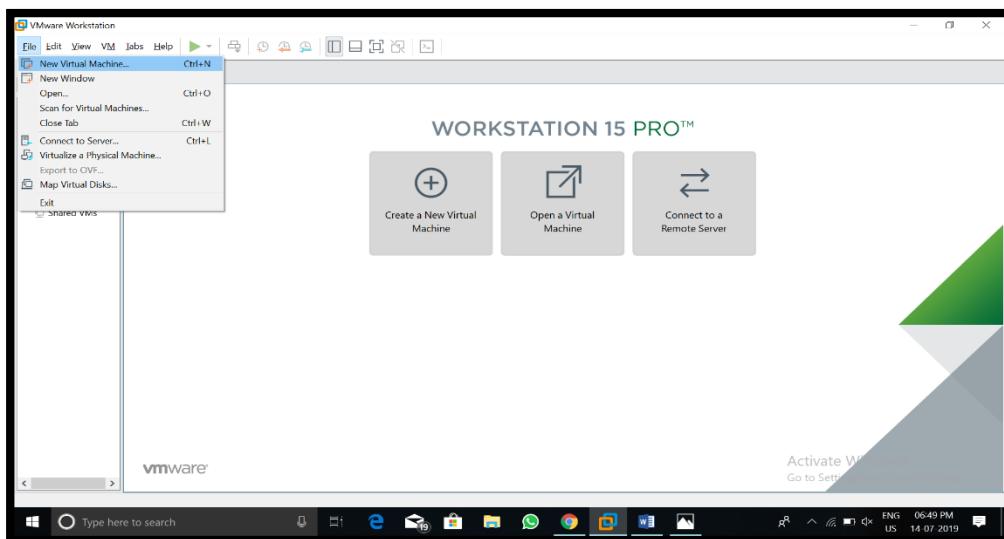
ACTIVE DIRECTORY

Active Directory (AD) is a directory service that Microsoft developed for the Windows domain networks. It is included in most Windows Server operating systems as a set of processes and services. A server running Active Directory Domain Service (AD DS) is called a domain controller. It authenticates and authorizes all users and computers in a Windows domain type network—assigning and enforcing security policies for all computers and installing or updating software.

NEED TO FOLLOW THE STEPS:

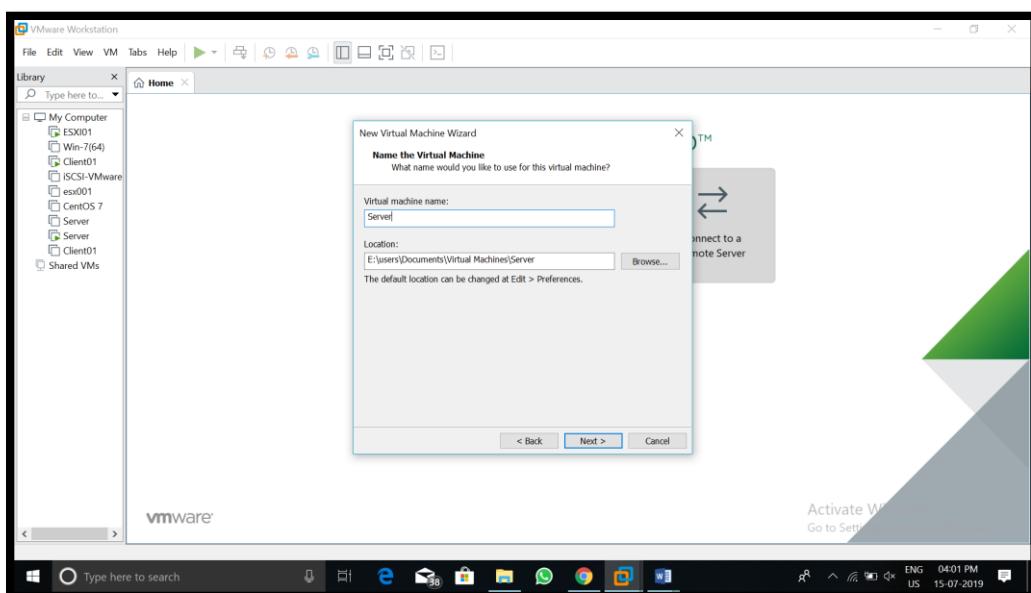
STEP1

Firstly we need a computer system (or laptop) to work upon, as we are doing virtualization on our device so we need to have basic requirement of 8 gb ram (or more). Open the system and install VMware workstation on the device from official website vmware.com. Download the latest version. After installing it, open the workstation application and click on file. **Create a new virtual machine.**



→ Then **choose the type of virtual machine**, also select the mode of installing the Operating System (by physical disc, or an iso image file), right now choose the option to install OS later, also configure the hardware resources to the machine like; **ram**, **hard disk**, **Network cards** etc.

Name the machine “**Server**”.

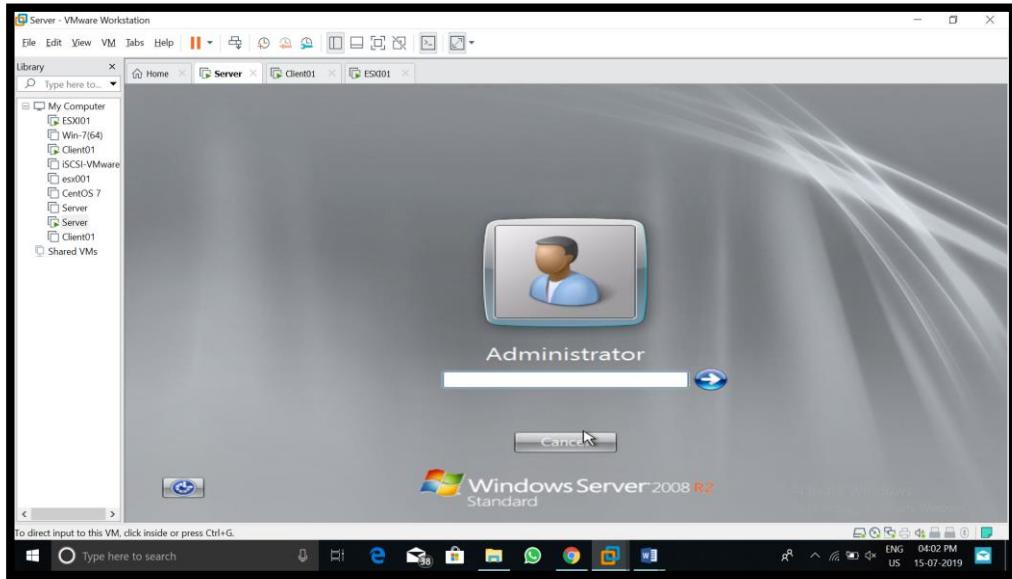


STEP 2

Installing the Operating System Windows Server 2008 in the virtual machine Server. Click on edit virtual machine settings, go to CD/DVD option and browse your windows server

2008 iso image there from the host OS (the Operating system on the physical machine). Save the changes and POWER ON the virtual machine.

Do the installation steps and then login as Administrator.



→We set the password: **1234@abcde**

STEP 3

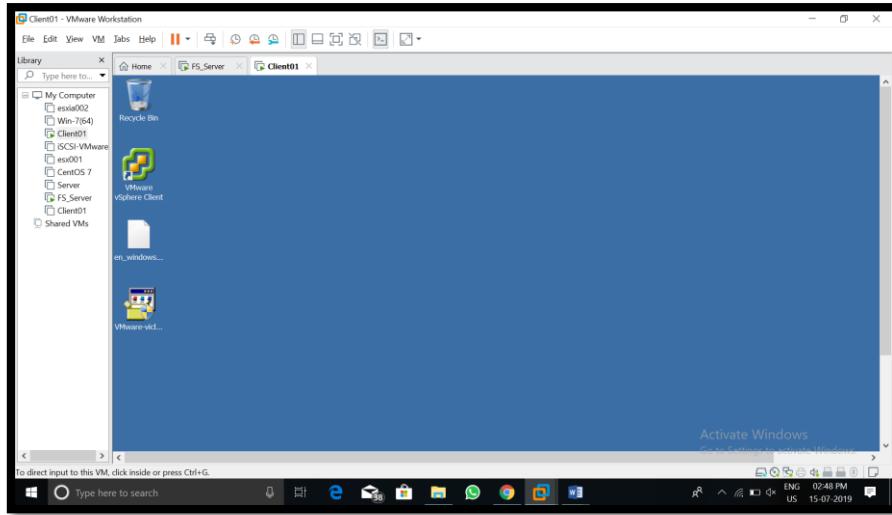
Create a client server. To create a vsphere client we need a server type Operating System like windows server 2008, So create another virtual machine of windows server 2008 (name it Client01) using above 2 steps and and set its password : **1234@abcd**



Now the Client01 machine is ready.

STEP 4

Installing VMware vSphere Client. Download the VMware vSphere Client from the official website of VMware in your host OS. Copy the vSphere Client setup in the Client01 virtual machine and install it there.

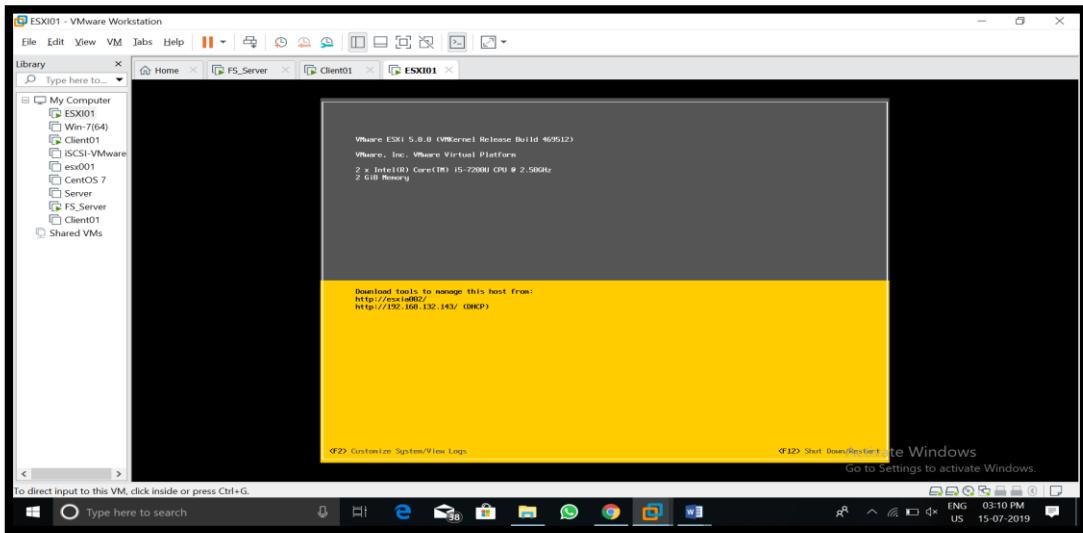


STEP 5

Create ESXI Server on workstation. VMware ESXi (formerly ESX) is an enterprise-class, type-1 hypervisor developed by VMware for deploying and serving virtual computers. We will use ESXi to create our users for the Active Directory Domain Controller. Go to File in the Workstation and create a new virtual machine, name it as ESXI01.

Download the ISO of VMware ESXi from the official website and browse that ISO image to the virtual machine of ESXI01. POWER ON the machine and install the ESXi setup by following the required steps.

After the installation following window will be displayed with black and yellow colour, and its showing its IP which is currently showing the status as DHCP [Dynamic Host Configuration Protocol (can vary anytime—not Static)].

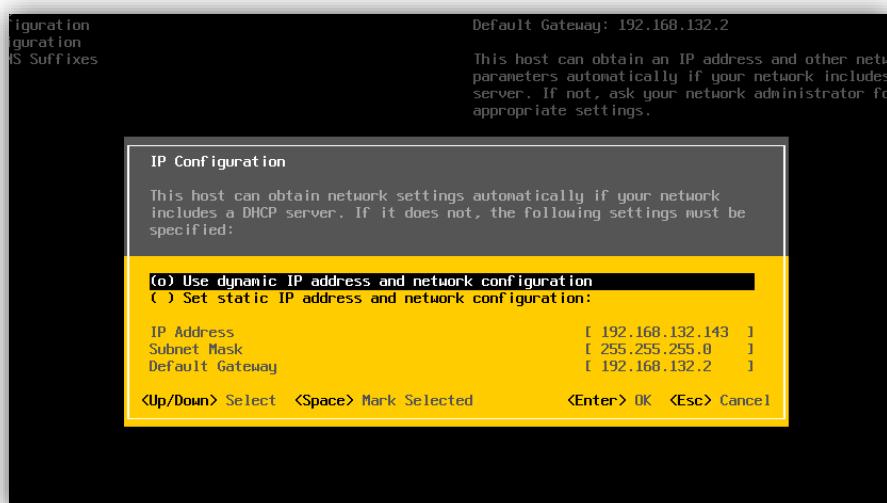


STEP 6

Make the IP address of ESXI static. Originally the IP is dynamic but to use its services we need to have a static IP address, so that we can access the server from other hosts by the help of a particular same IP which will be its static IP.

To make the IP static, press F2 and type the password we give during the time of installation (if you do not give the password can set it from pressing enter to the first option of configure password).

Now, go to Configure Management Network and press Enter, then go to IP Configuration and press Enter a box will appear with the IP address settings

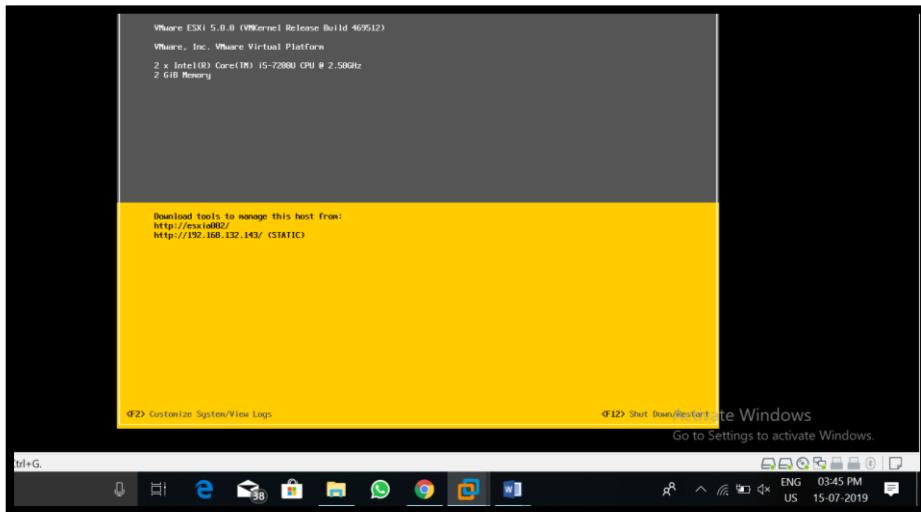


→Now go to the static IP option and press the space button, this will enable the static IP address, now set your IP address, subnet mask and Default gateway according to

your network and press enter to close this box. Giving the IP address 192.168.132.143.

And then it will ask you to save the settings. Press 'Y' and then Enter to save the settings.

Press esc to go back to previous page. And there we will see on the home page the IP address change its status from DHCP to static.

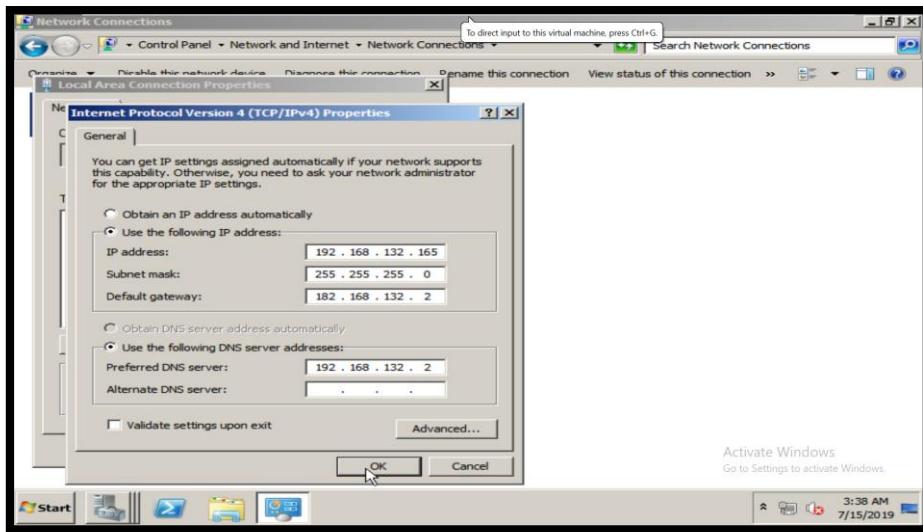


STEP 7

Set the Static IP address of the Server machine. Also we know that the IP address of every machine is by default Dynamic in nature that keeps changing and since we intend on making this machine a domain controller we need to make its IP address static so that clients can know the IP address of the Domain Controller to keep communicating.

To make it static, go to Network and Sharing Center, next click change adapter setting, next click Ethernet and next click details, now copy the IP address, mask, gateway and dns to paste in notepad as to use them as the static IP address.

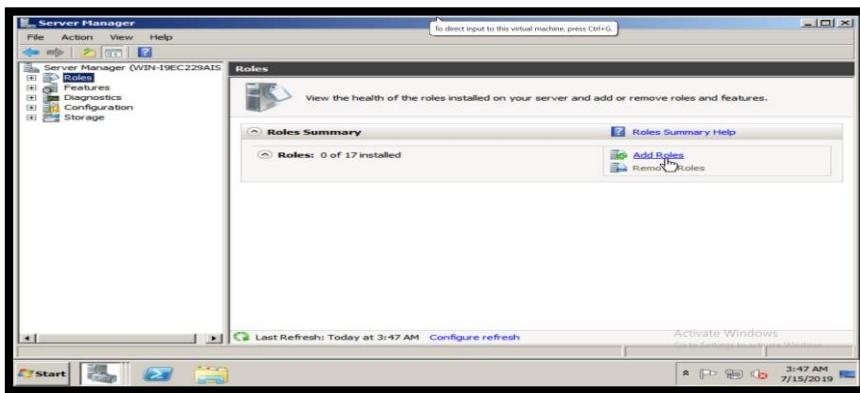
Go to properties of the Ethernet, uncheck unnecessary boxes and open ip protocol, now fill the IP, Mask, Gateway and DNS from the notepad to use the following that particular IP and DNS. Now click on OK.



STEP 8

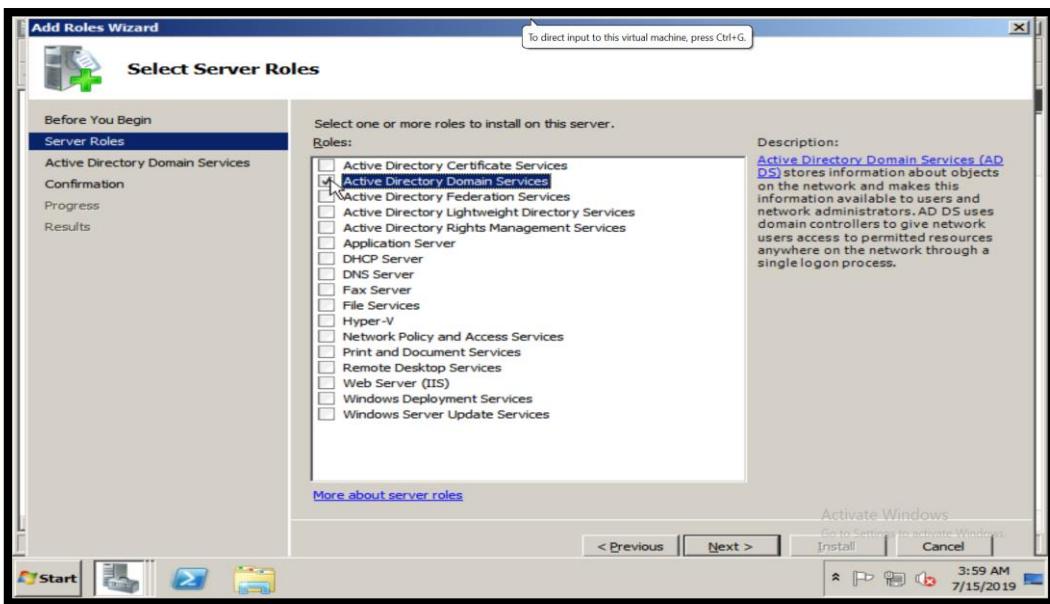
Adding the Active Directory Domain Services to the Server machine. Now, the next step is to configure Active Directory Domain Services to enable and use the Domain Controller on the Server machine. We need to install Active Directory for this and do some changes.

To do this first open Server Manager into your Server machine, you can open it from start->Administrative tools->Server Manager. Now, in the Server manager, there is an icon of roles, click on roles, then there is an option to add roles, click on add roles



Then it will ask before to begin page, click next, after that there will be a list of the servers on the panel, we can select one or more than one server roles to be implemented in the machine by just clicking on the checkbox provided, and then just completing the installation process.

Here, we are configuring **Active Directory Domain Services**, so we will check the checkbox of the second role in the list and then click Next.



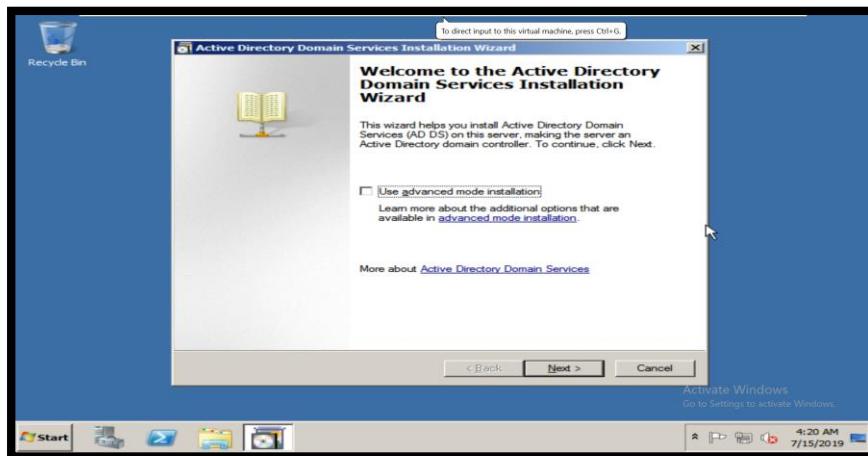
Then click next again saving the default settings and at last click on install to confirm the process of installation of AD-DS. It will take some time to get installed. You can also see on the screen what roles and services are getting installed during this process. It shows it is installing **Active Directory Domain Services and .NET Framework 3.5.1** features. Finally, it will be installed.

STEP 9

Launch the Active Directory Domain Services by dcpromo.

As far as till now the Domain Services are installed, but to make them fully functional we need to launch the Active Directory Domain Services Installation Wizard.

We will do this by following steps; first close the current wizard then go to run->type **dcpromo** in run, press OK. A new Active Directory Domain Services Installation Wizard get open.



Now, click next there comes the operating system compatibility window, just click next and we need to configure Domain Name System Client Settings.

For this click on the checkbox given on the screen. This will automatically install the DNS server services on this machine as we need to configure the IP settings with the DNS server for name resolution. If we check this box it will automatically do the installation of DNS services and will configure the IP to use this DNS server for name resolution, click next.

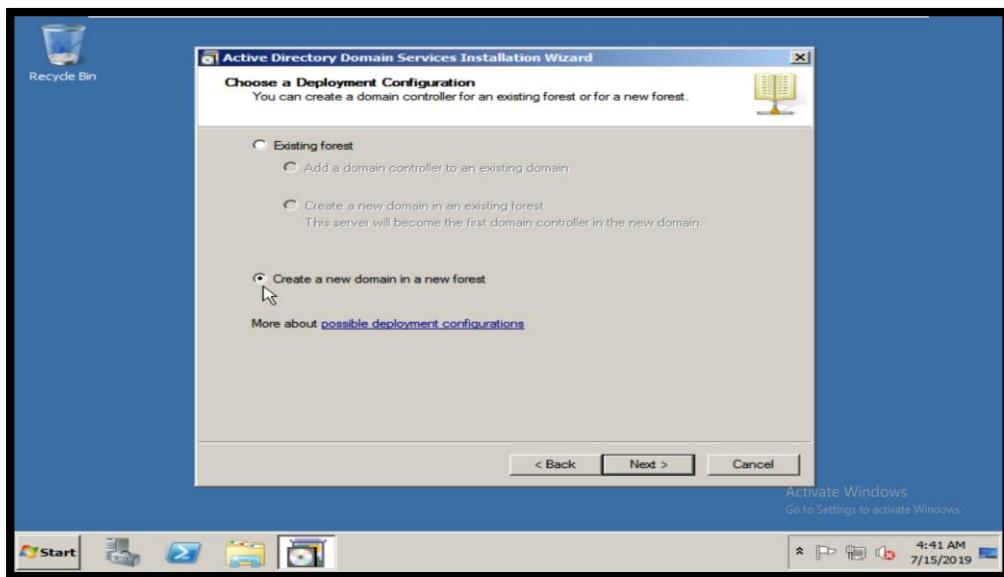
STEP 10

Create a domain or a forest.

The forest, tree, and domain are the logical divisions in an Active Directory network. Within a deployment, objects are grouped into domains. The objects for a single domain are stored in a single database (which can be replicated). Domains are identified by their DNS name structure, the namespace.

A domain is defined as a logical group of network objects (computers, users, devices) that share the same Active Directory database.

If you do have any existing forest than you can create a domain in it by clicking on first checkbox, but if you want to create a new forest (or a domain), click the second checkbox and hit Enter.



STEP 11

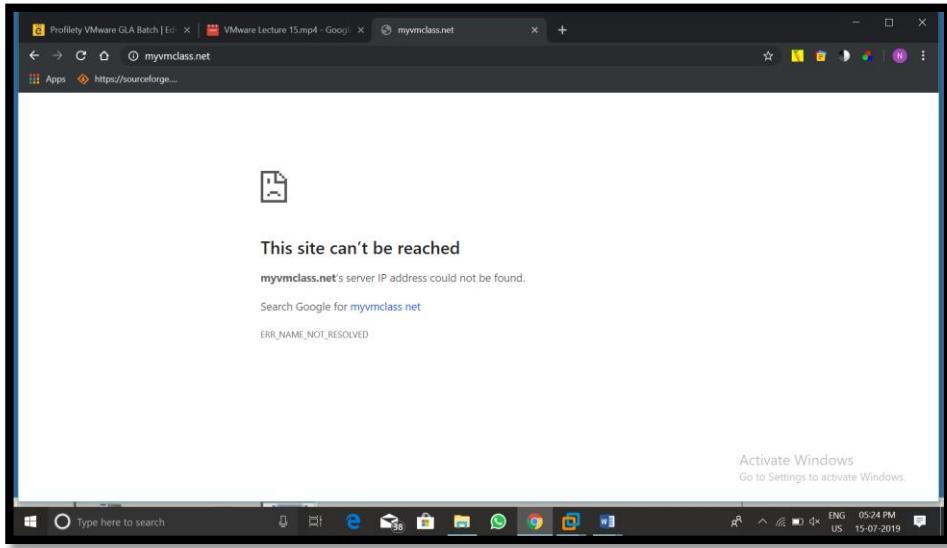
Assigning a Domain name. In the next step it will ask a FQDN----Fully Qualified Domain Name.

A fully qualified domain name (FQDN) is the complete domain name for a specific computer, or host, on the internet. The FQDN consists of two parts: the hostname and the domain name. *For example, an FQDN for a hypothetical mail server might be mymail.somecollege.edu. The hostname is mymail, and the host is located within the domain somecollege.edu.*

Here, we need to give the Domain name, we will give “[myvmclass.net](#)”. Before providing your domain name, we need to check if this name is not already in use by any other server. We can check this; go to any browser (eg. chrome) in your device where you have an internet connection, type the domain name you wish to give to your Domain Controller and hit Enter.

If it opens any actual website then you cannot use that domain.

Here, we will check the name of the domain that we gave i.e. “[myvmclass.net](#)” on the browser.

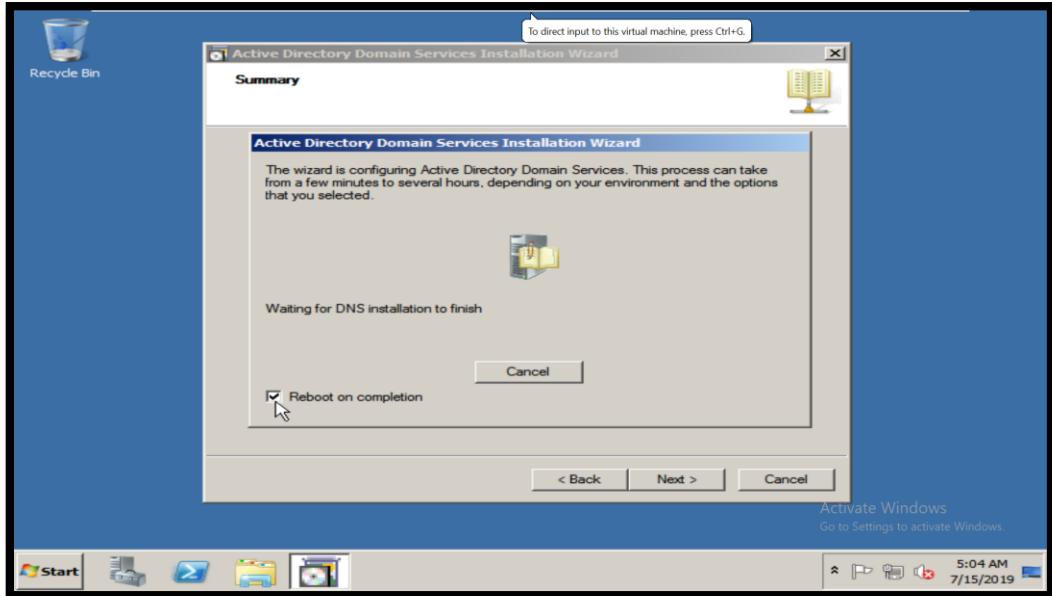


In my case it is showing “**This site can't be reached**”, it means the domain name is not in use, and we can use it this time. Click next and then it will check if it already exists, if all goes well it will redirect to set forest functional level.

Select [Windows Server 2003](#) for Forest and Domain Functional level and then hit next.

Then step forward with the default settings and locations and set a password for your Administrator account that will be created. We set the password as 12345@abcde (for a change).

Click next and it will start configuring the Active Directory Domain Services. Remember to check [the reboot](#) option to restart your machine after all installations.



After rebooting this will be your Domain Administrator account.



Step 12

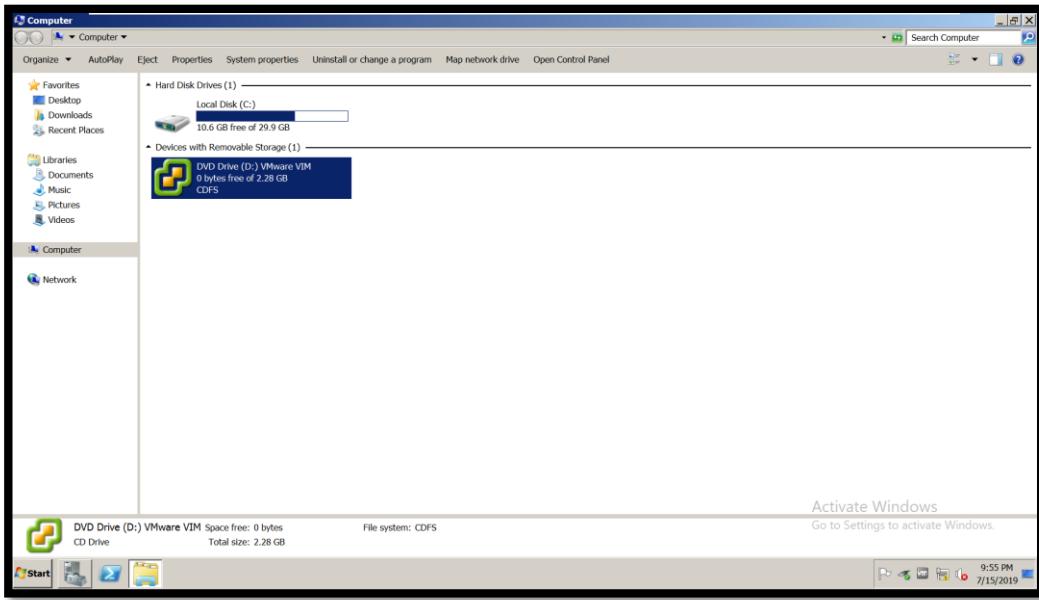
Adding VIM to the Client01 machine. VMware offers vSphere, a proprietary, yet market-proven VIM. VMware can utilize its VIM to help customers transform existing IT infrastructures into public or hybrid clouds.

To add VIM, turn off the virtual machine.

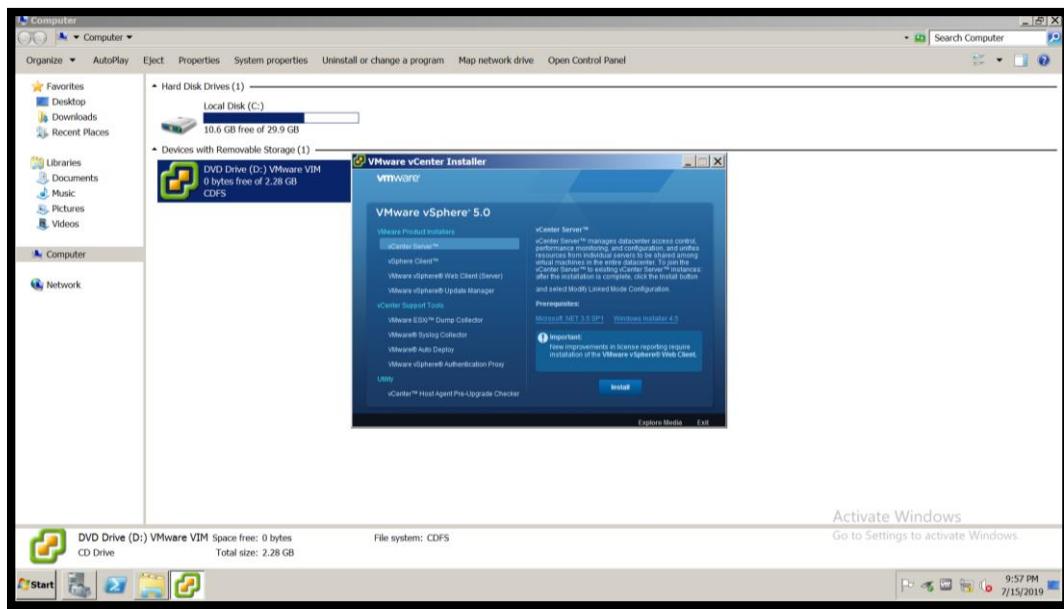
Go to edit settings, click on **CD/DVD** option, **browse the ISO image** of VIM

Then power on the machine.

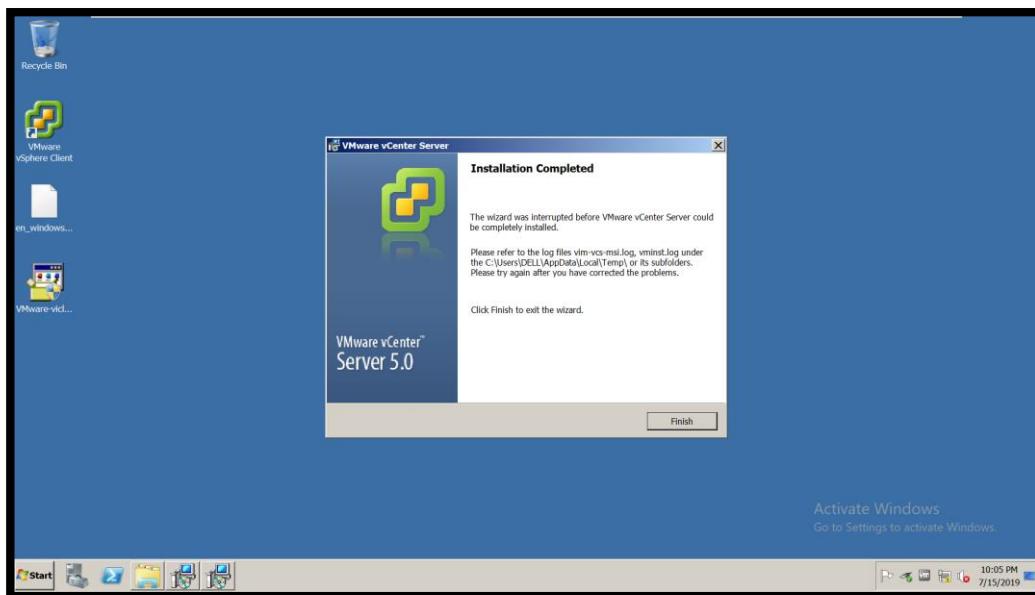
Now, go to computer, there will be a **DVD of VIM**, click on the DVD.



Click on the install button to install the **vCenter Server**



After the installation is in process, this window pop up, click Finish

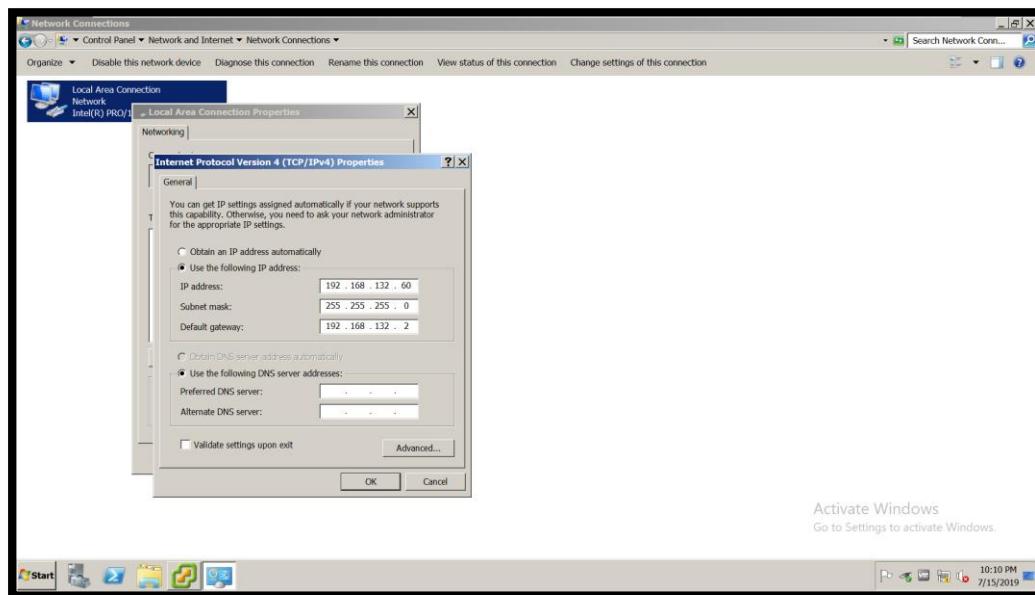


STEP 13

Making the IP address Static, of Client01. After installing the VIM setup, it is possible now to login with the IP of the Client01 itself by VMware vSphere client. So to enable this setting we need to configure a static IP address to the Client01.

For this, go to Network and sharing centre in Control Panel, click on Adapter Settings, next click on the local area network, next check the status and copy the IP address, Subnet, Default Gateway on notepad for later use.

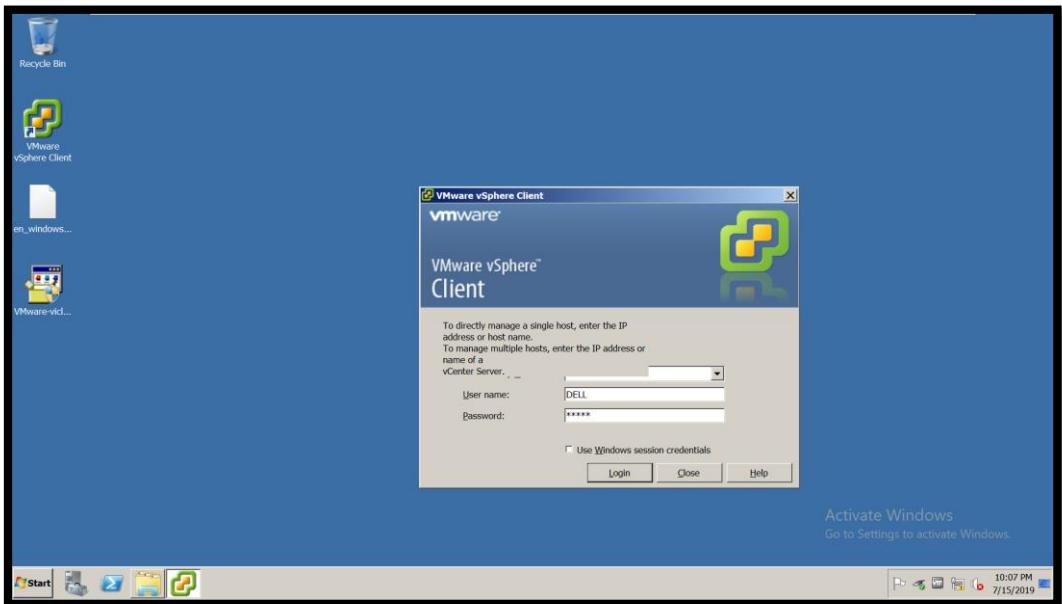
Now do right click on the local area network, disable the other unused IP and click on the properties and write the **IP address, Subnet mask and Default gateway** into this.



Click ok to save the settings.

STEP 14

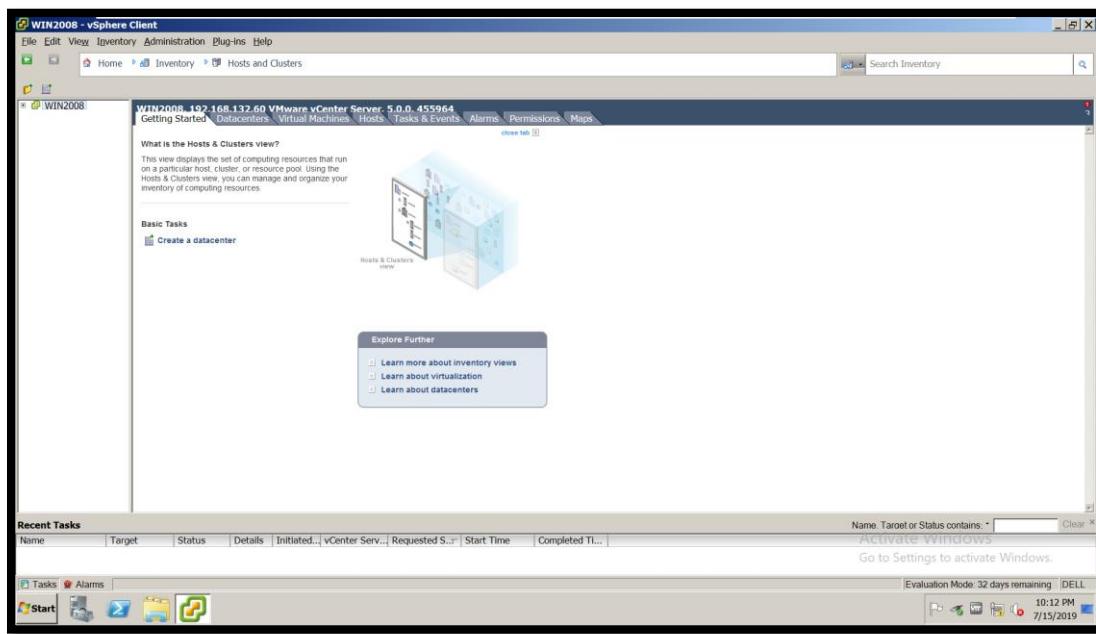
Login in ESXI Server using vSphere client. Open the VMware vSphere client, login with the IP address of **Client01**, type your username and password of the machine.



STEP 15

Creating Datacenter in WIN2008.

You will be directed to the following page.

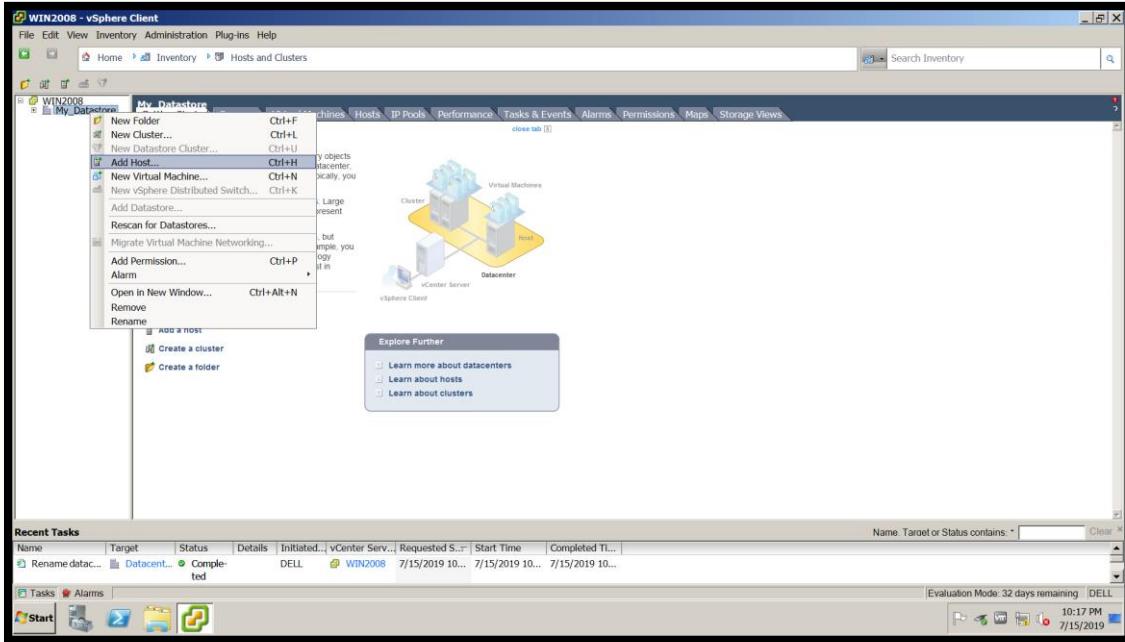


→ Now, right click on machine name WIN2008, click on New Datacenter. Rename the New Datacenter as My_Datastore.

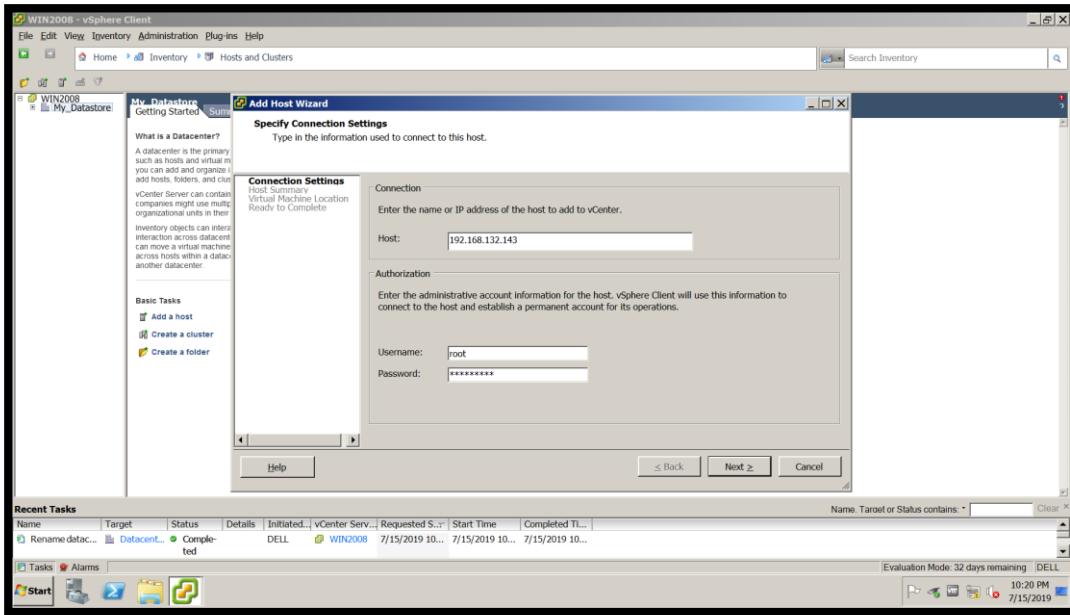
STEP 16

Creating a Host in Datacenter.

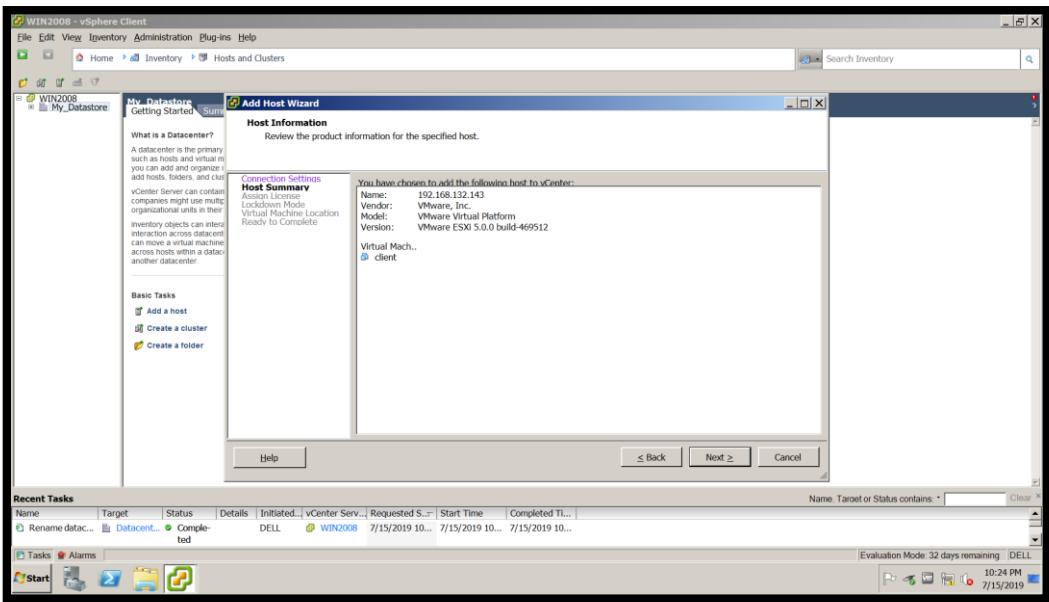
→ Right click on the **My_Datastore** and **Add Host**.



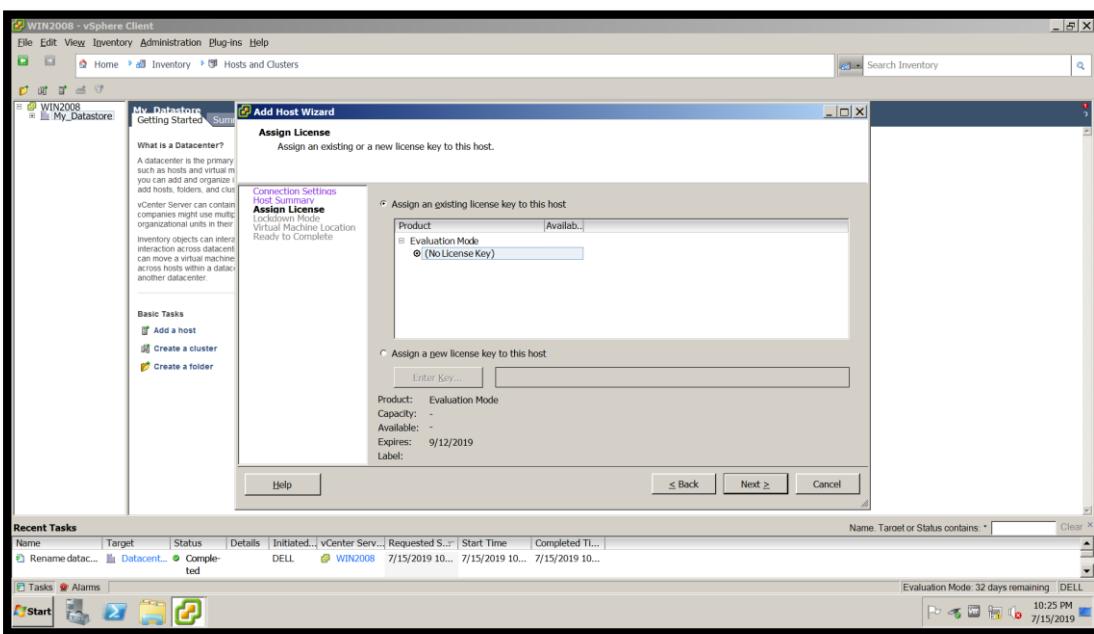
→ Fill the entries of the ESXI in the column of IP, user, password (**192.168.132.143**, **root**, **1234@abcd**).



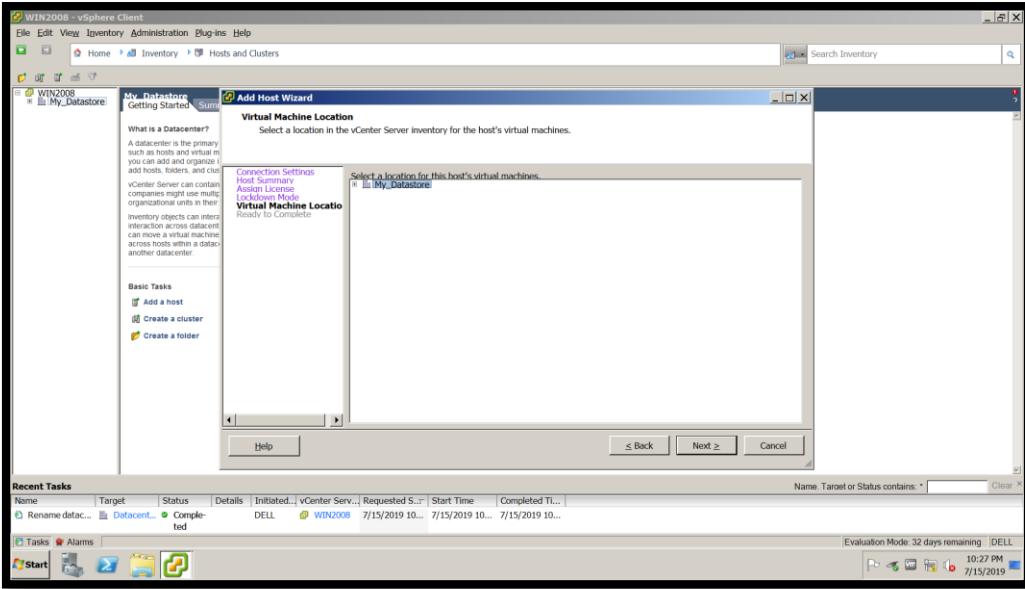
In Host Summary, click on next.



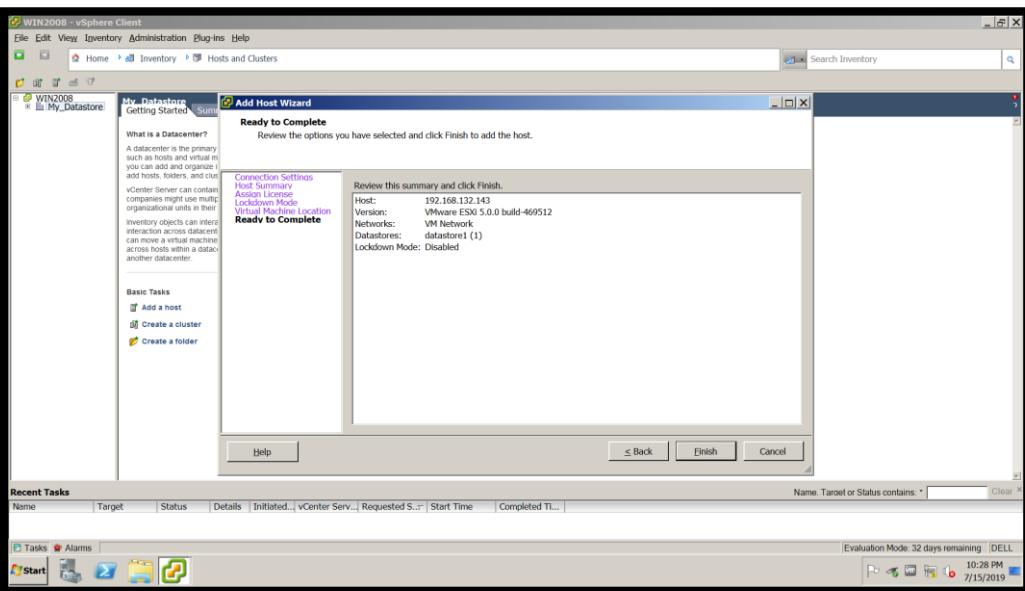
Assigning the license: Assigning **no license** and click next to proceed.



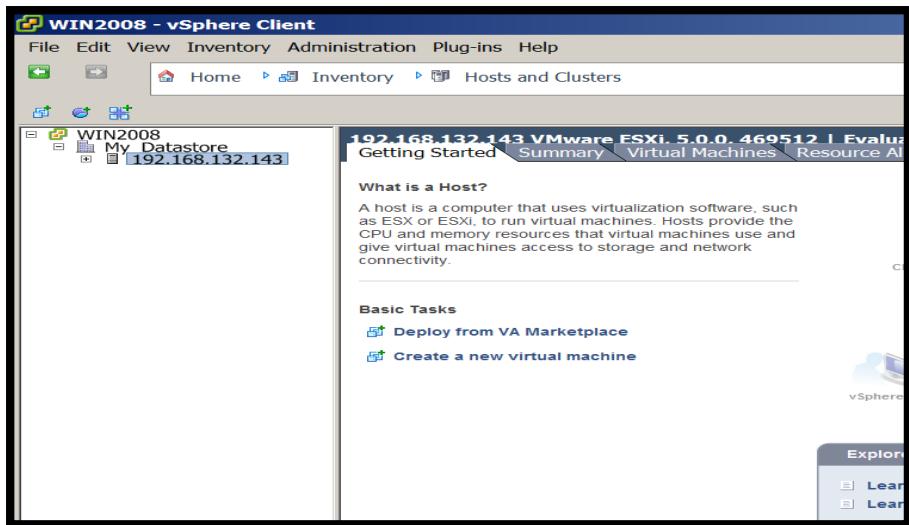
Select the Virtual Machine Location, click on **My_Datastore** and then click next.



Now, click finish to complete the configuration of the host.



Now, you can see your Host in your Datacenter.



STEP 17

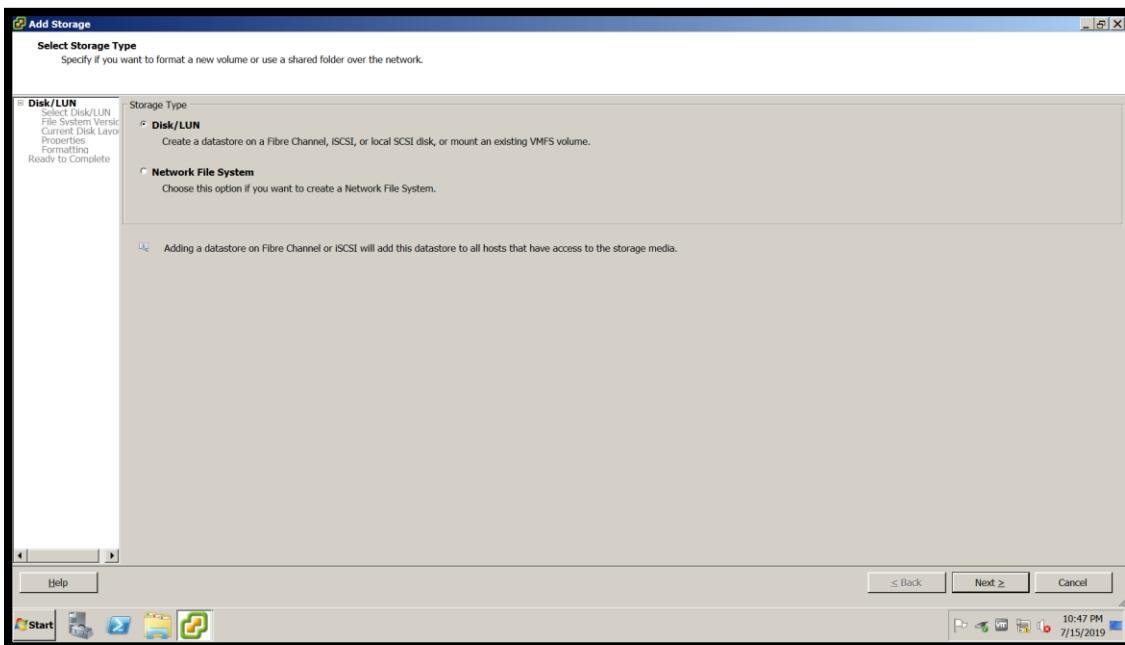
Create a Datastore in the Host. Add a datastore in the host so that all the machines and their files will be stored in the same datastore.

Click on the IP address of the Host, go to [Configuration](#) option in the list.

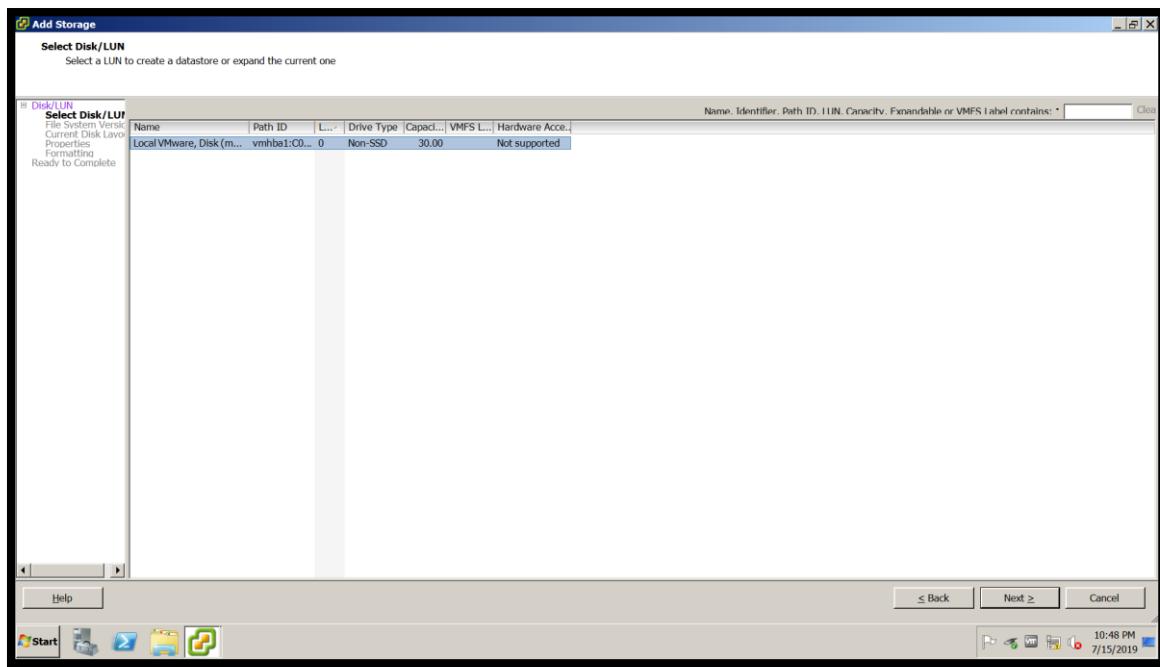
Then go to storage, click on [Add Storage](#).

Select [Disk/LUN](#) option.

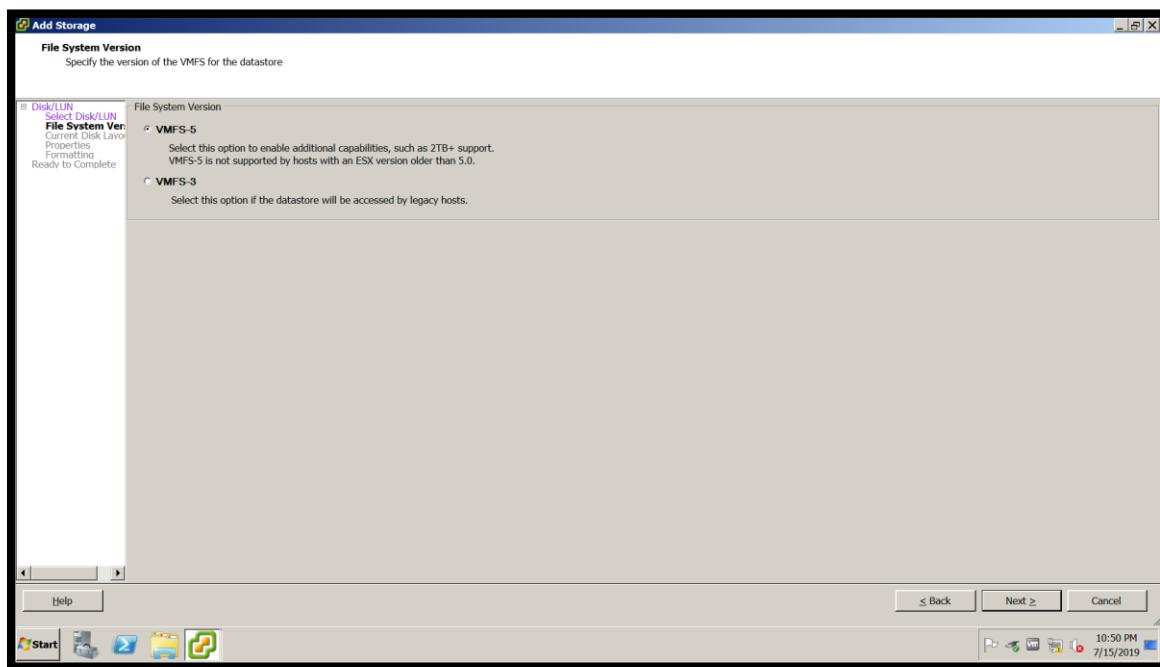
Click on next, and proceed.



Select the [Local VMware Disk](#) and press next.



In File System Version, Select **VMFS-5**, and click next to proceed.

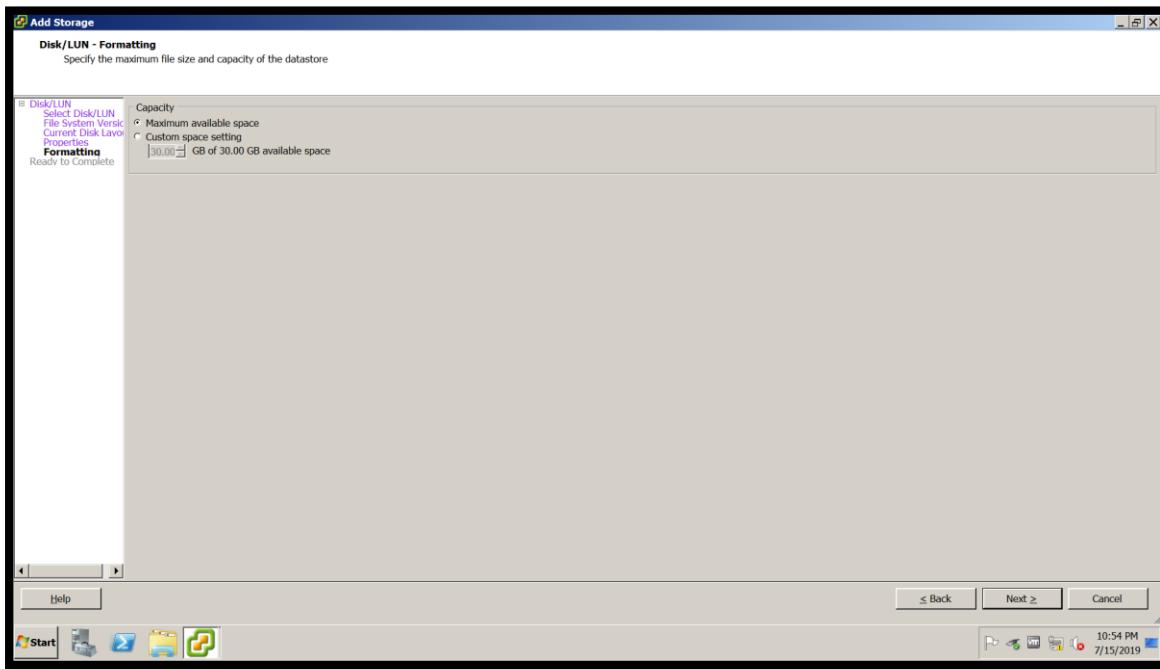


In properties, give a name to the datastore, we gave the name **Datastore1**. Click next.

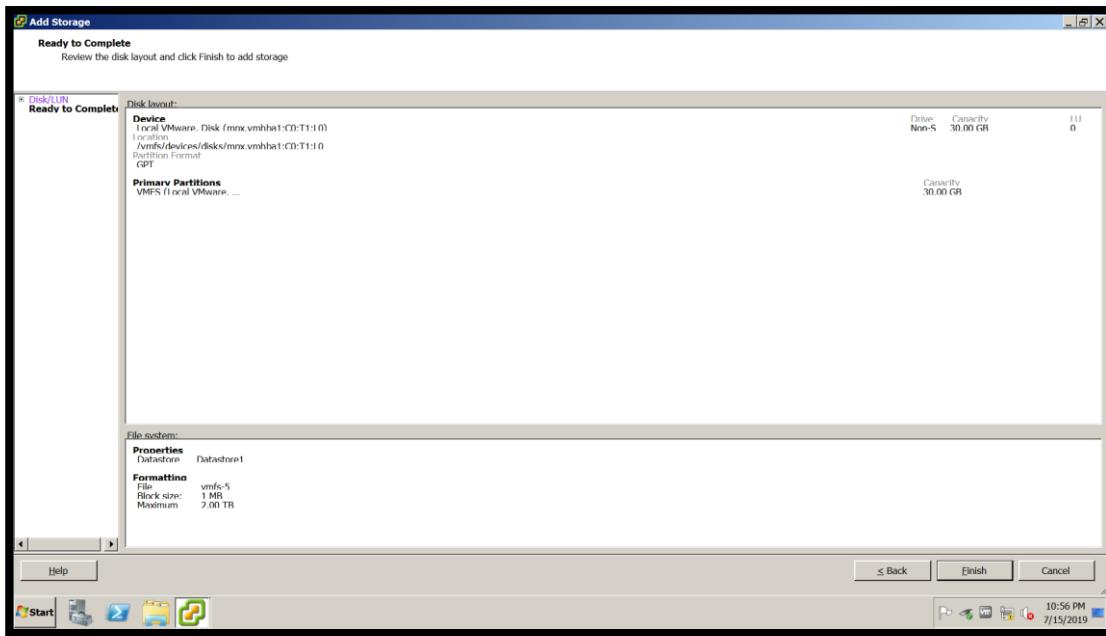


In the Formatting, we can choose the Maximum available space of the Disk or can customize it.

Here, we choose the Maximum Available space. And click next button.



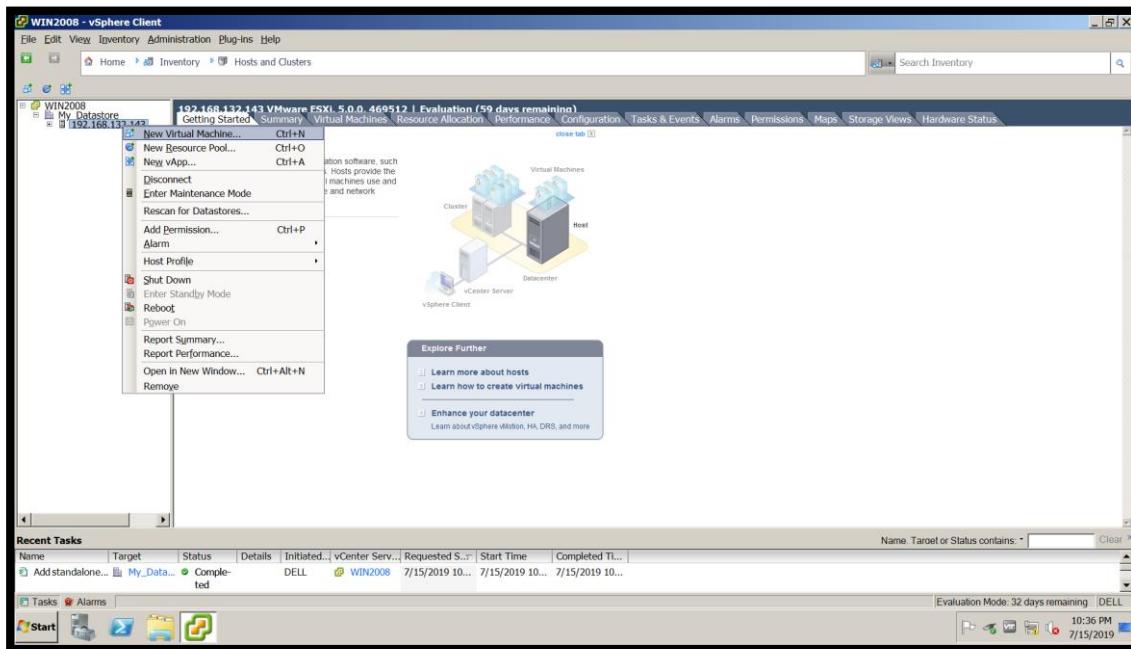
Now the 30 gb Disk is ready and click finish to use it in ESXI.



STEP 18

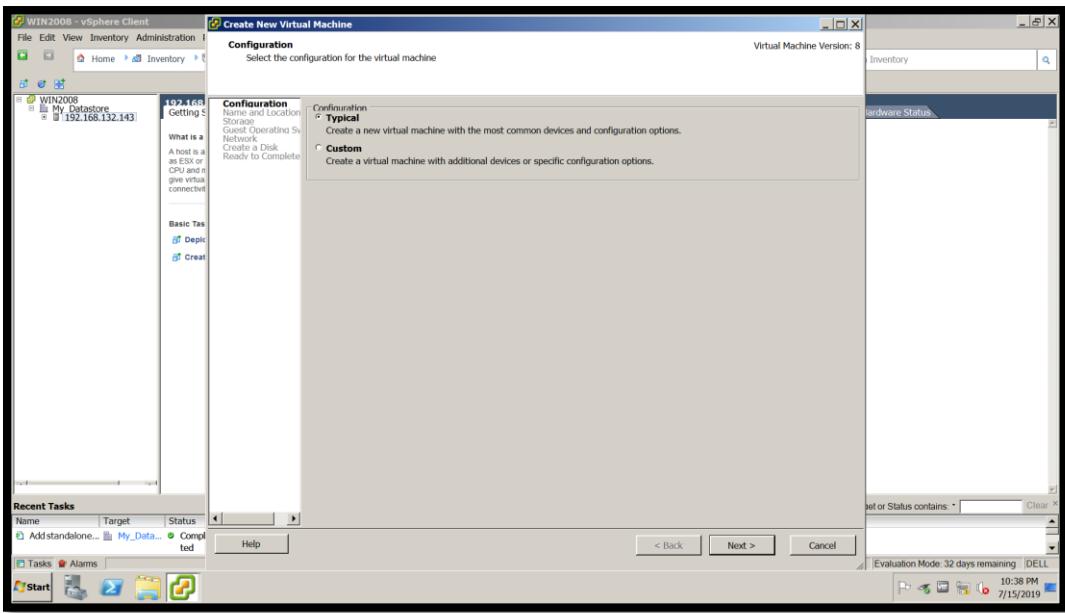
Creating a Virtual Machine in the Host (ESXI Server) (192.168.132.143).

Right click on the IP address of the host, and click New Virtual Machine.



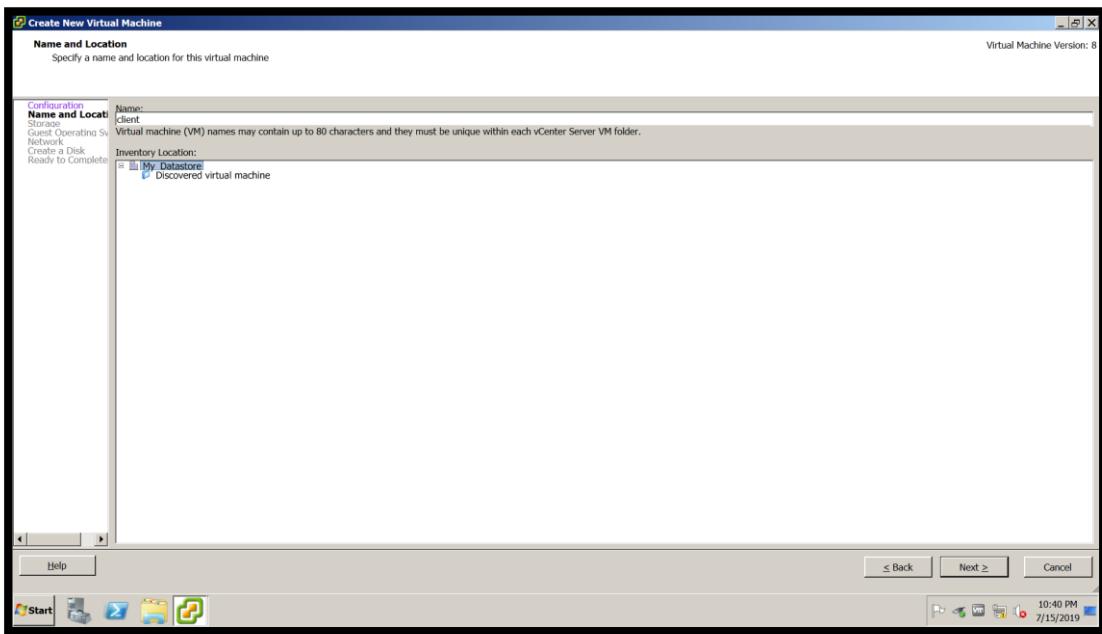
Select the type of Virtual machine. Select it Typical.

Click next after selecting.

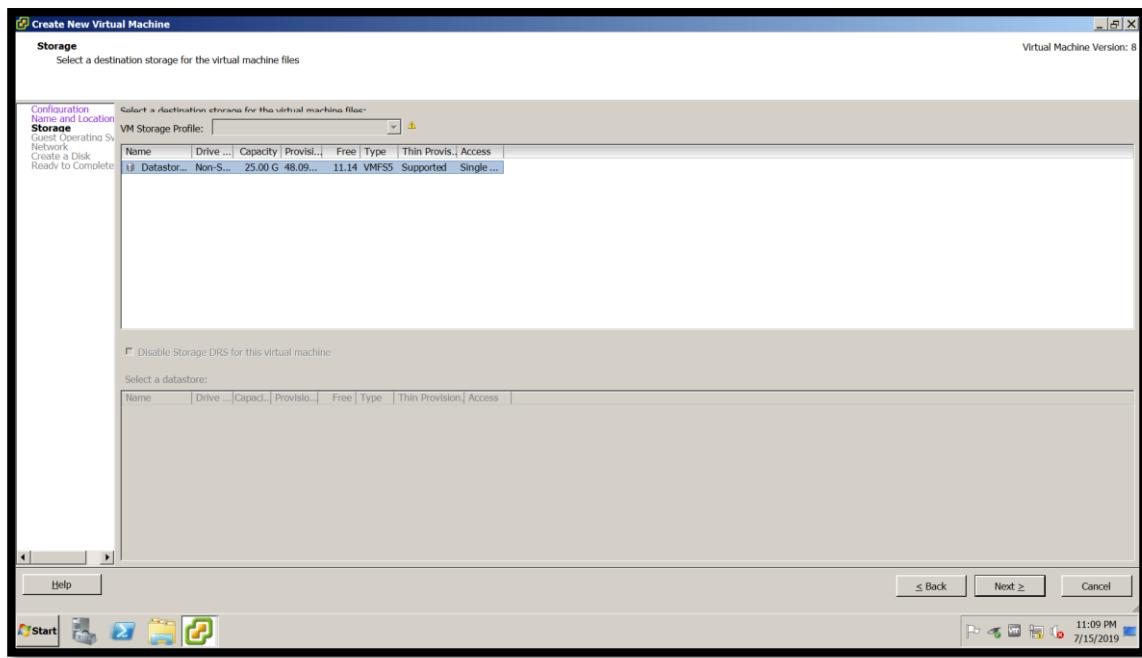


Now, give a specific name to the machine to recognize it, we are creating a client to the Active Directory, so we gave the name '**client**' to the virtual machine.

And click next.

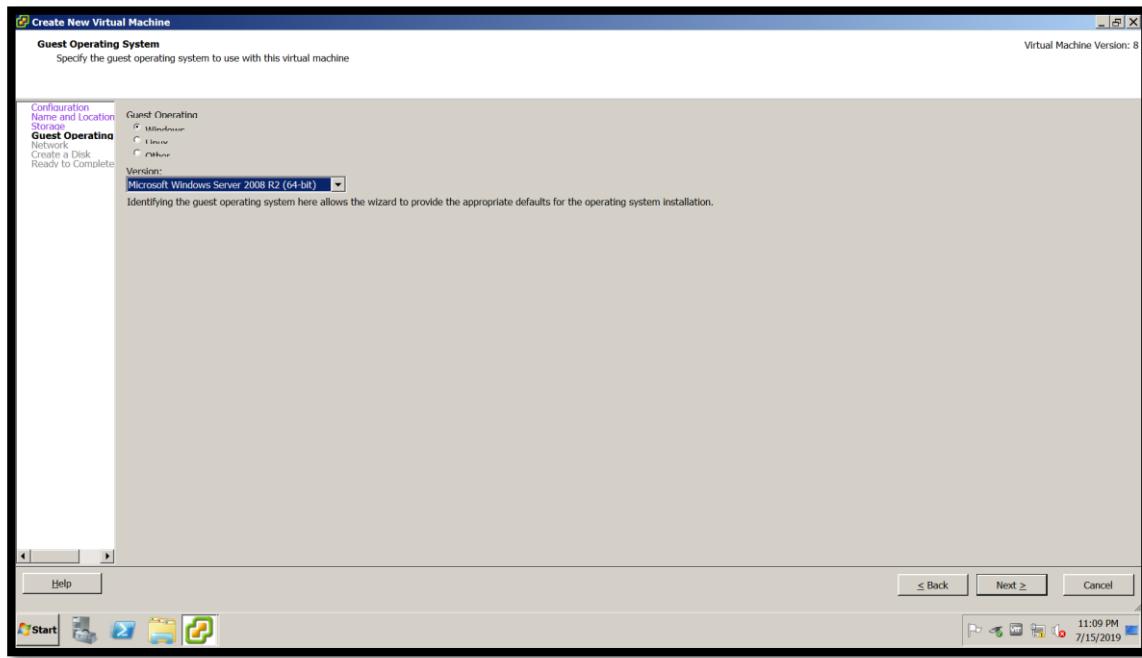


In the storage option, select the Datastore1 that we created in the Host. Click next then.

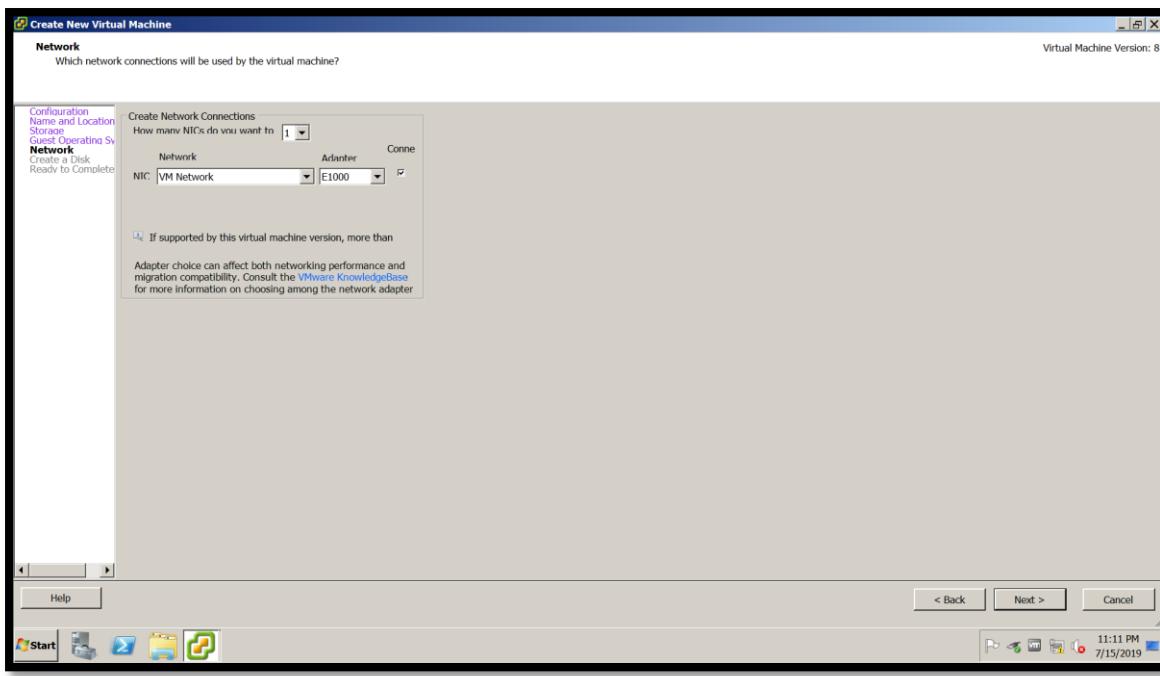


Select a Guest Operating System to install in the virtual machine.

We are creating a user in the virtual machine, so we will opt for windows server 2008, and then click on Next.



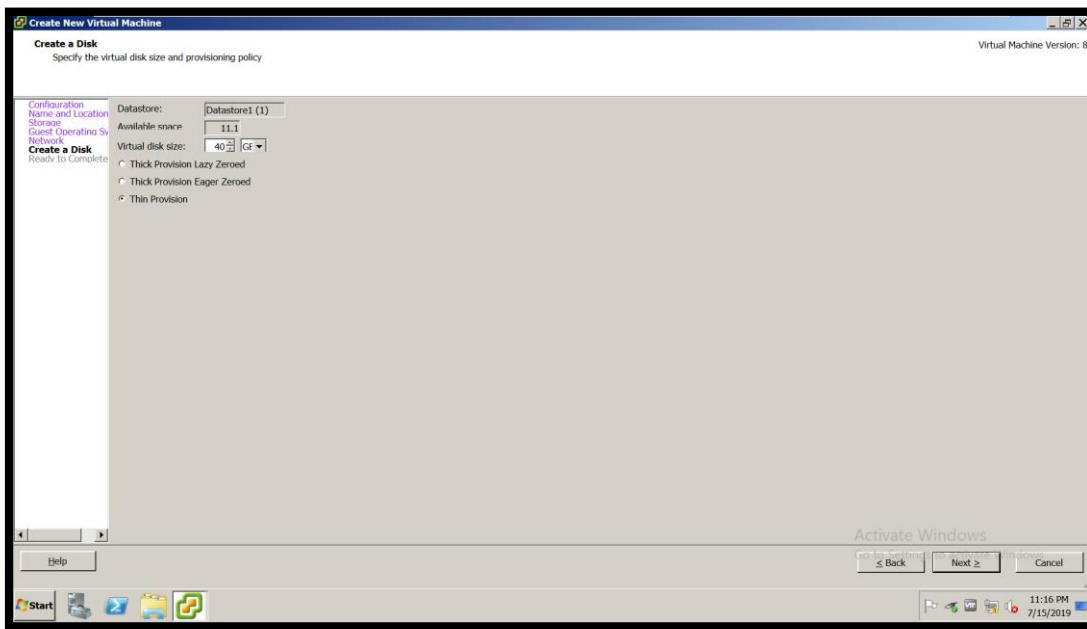
In the Network settings, we can select the NICs card we want to add in the virtual machine client, and can select the network of the cards respectively. Click next.



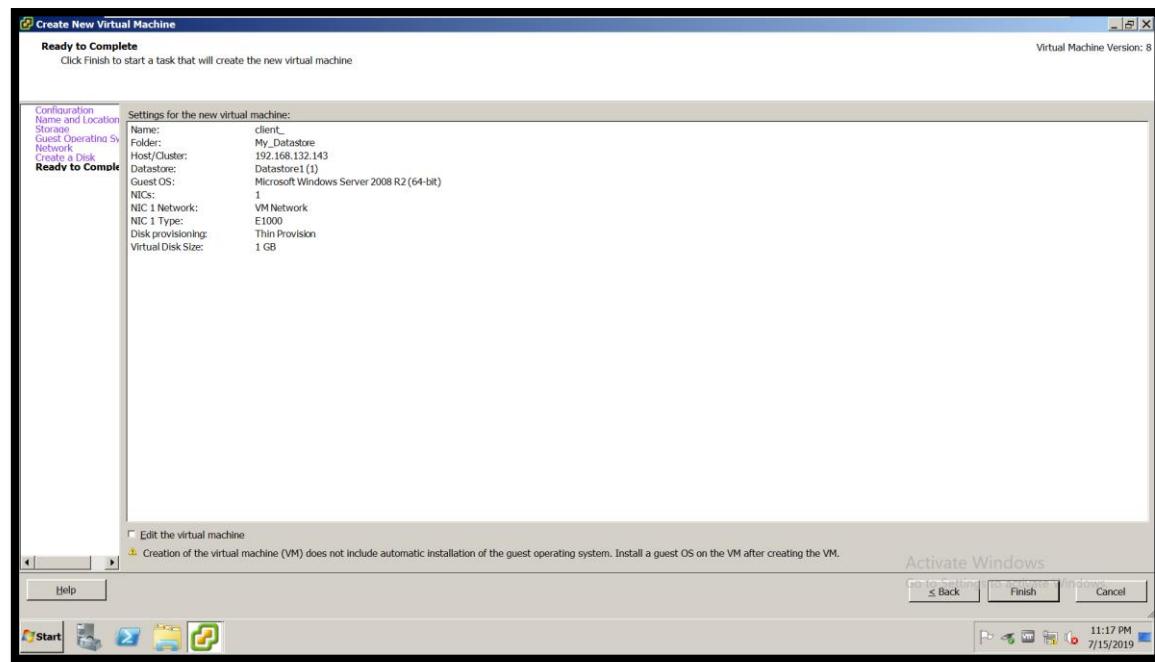
In the option of Create a Disk, specify the virtual disk size and provisioning policy.

Click on the radio button of THIN provisioning for better performance.

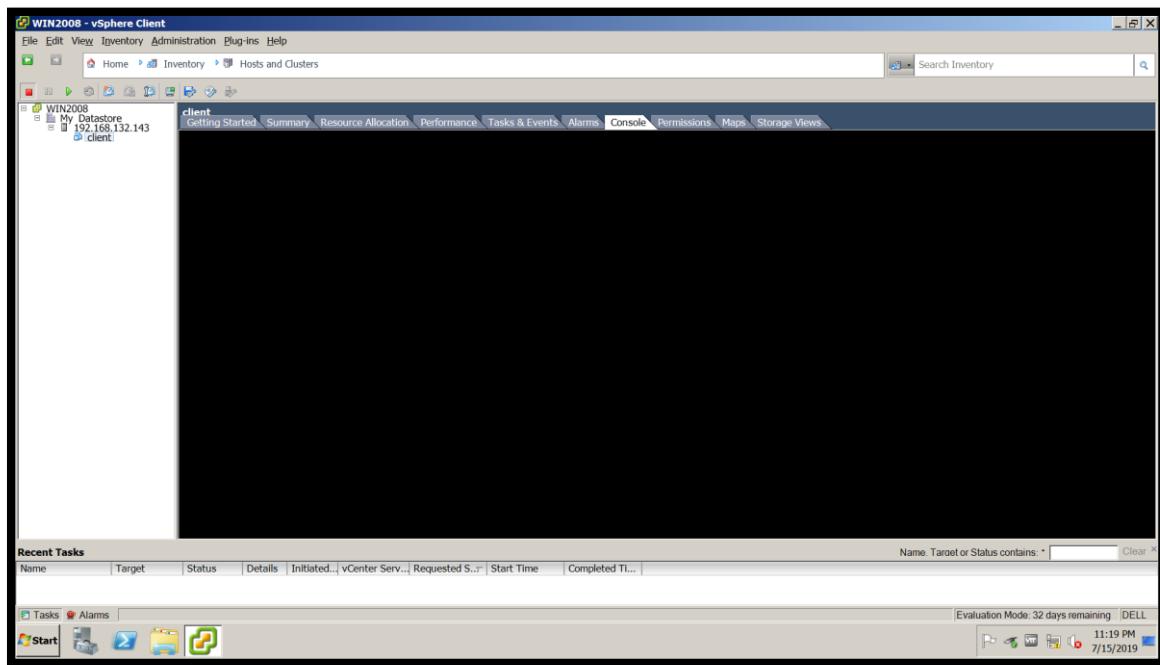
Then click next.



Now, click on finish to complete the configuration and create the virtual machine.



A bare machine is created, click on the client machine, and go to console.

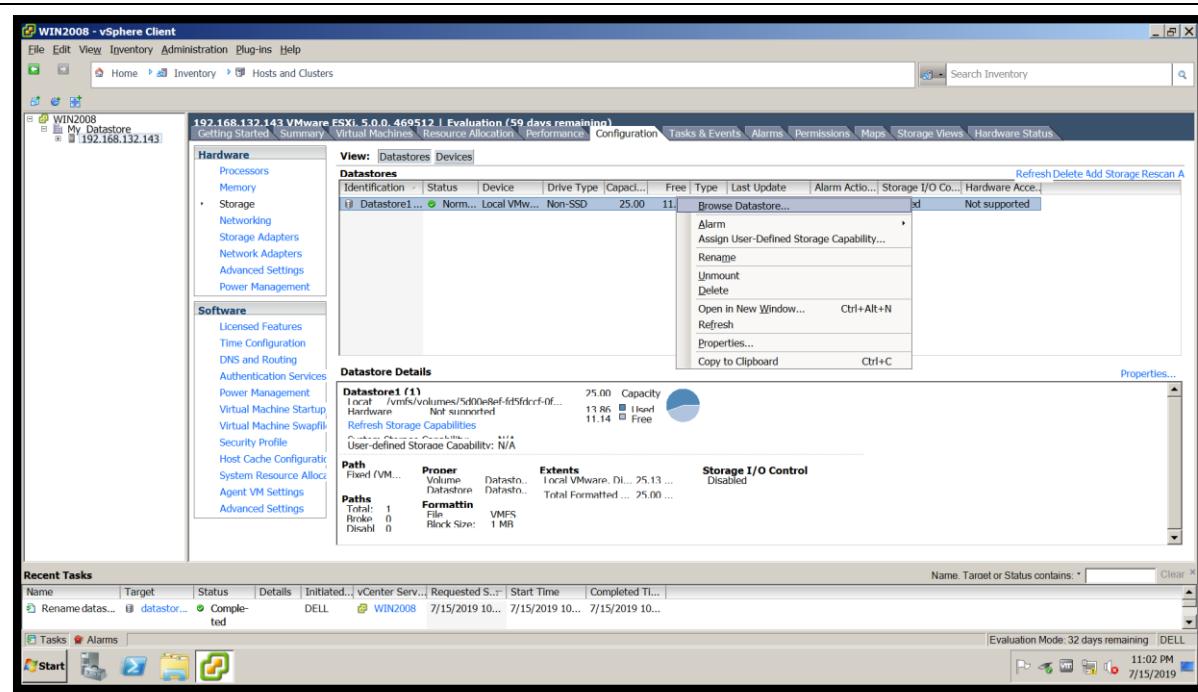


STEP 19

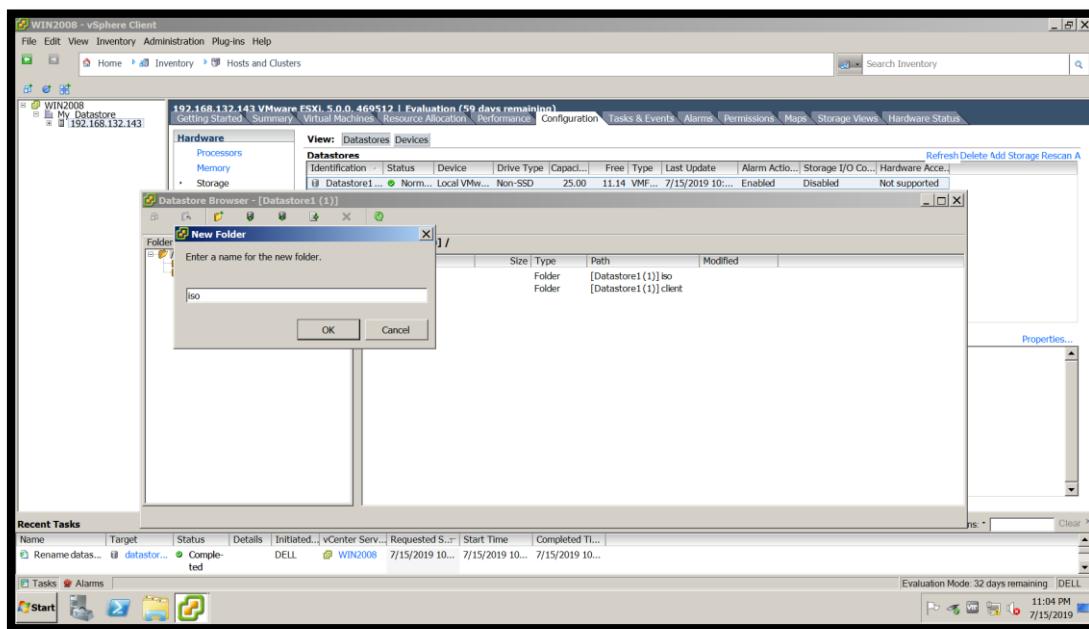
Uploading the ISO image of windows in the Datastore.

To create a virtual machine in the host we need an iso image in the host, so that we can browse the iso to the virtual machine.

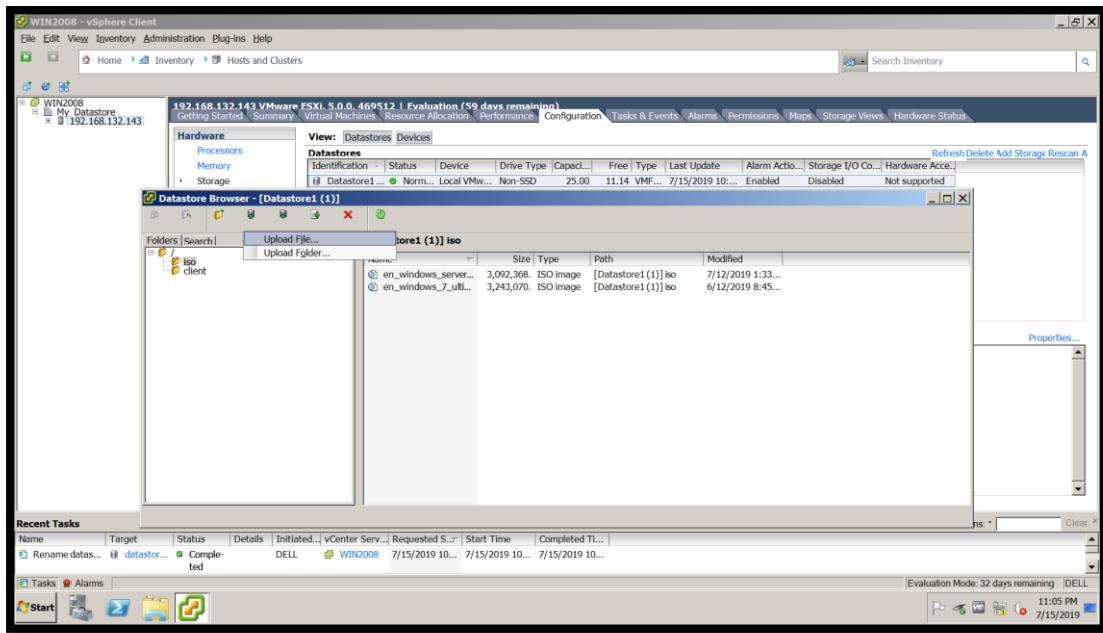
Go to the Configurations of the Host, click on the storage option in left, then right click on Datastore1, and click Browse Datastore.



Create a new folder in the datastore, name it iso. Click next.



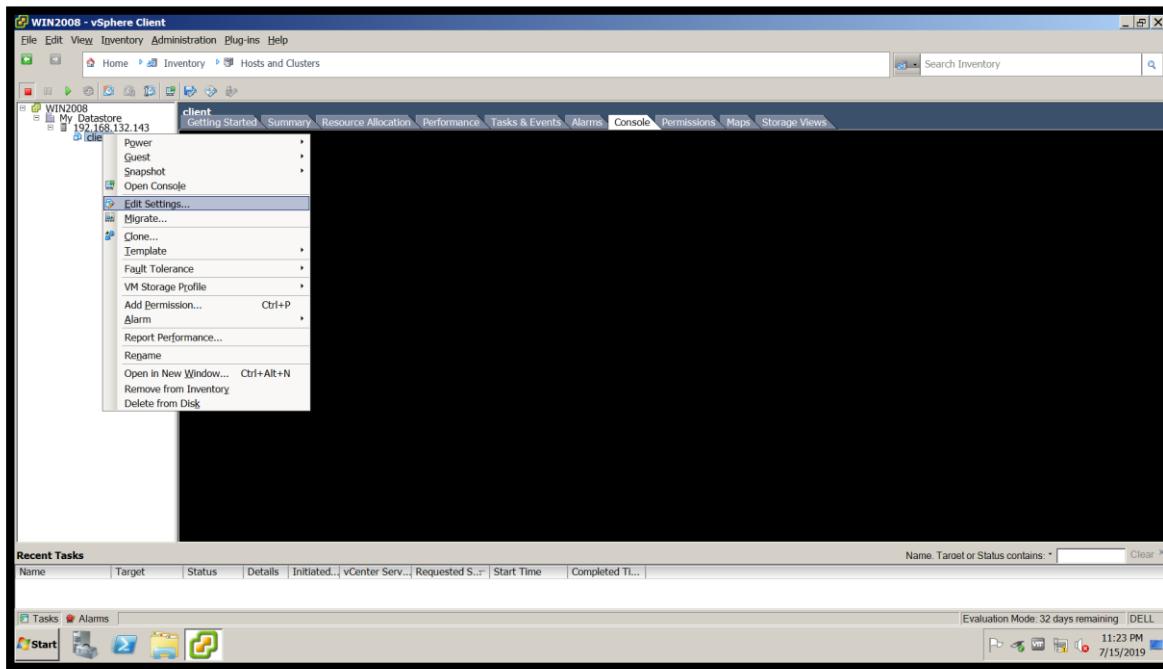
Enter the iso folder and upload the ISO image from the desktop.



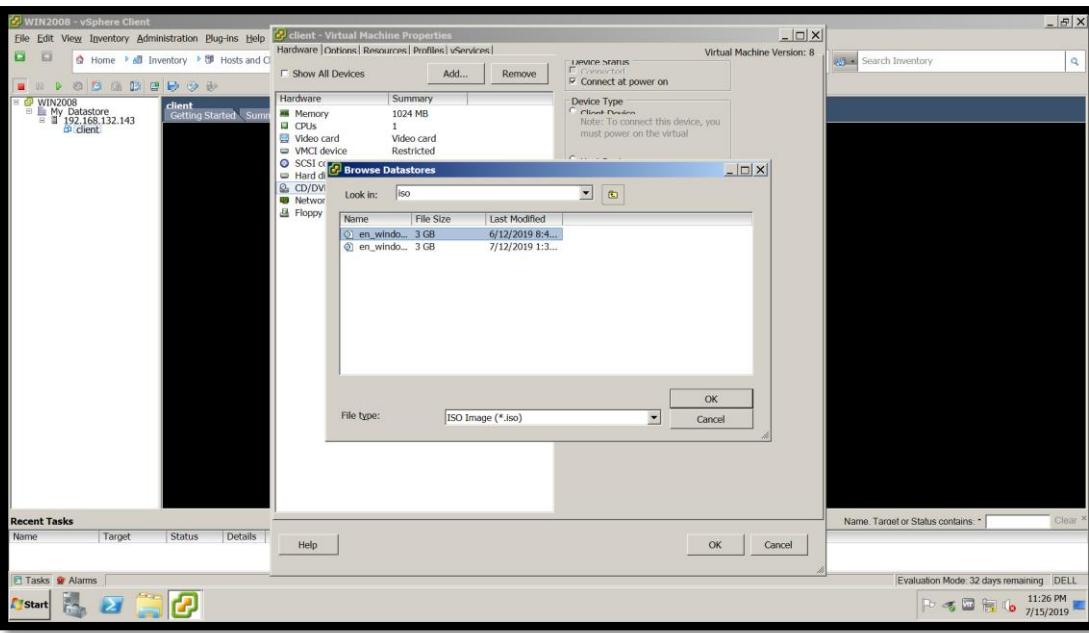
STEP 20

Browse the ISO in client and install OS in client.

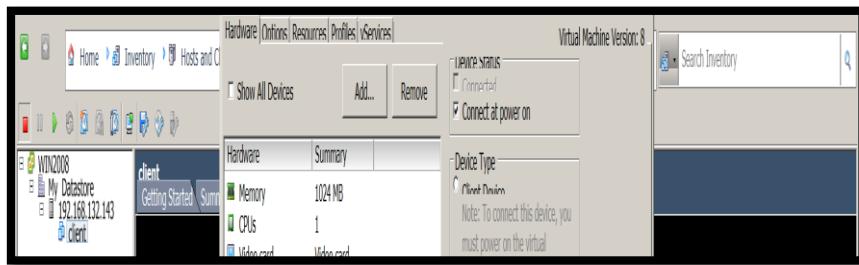
Now, we have the ISO in the datastore, so right click the client machine and go to edit settings



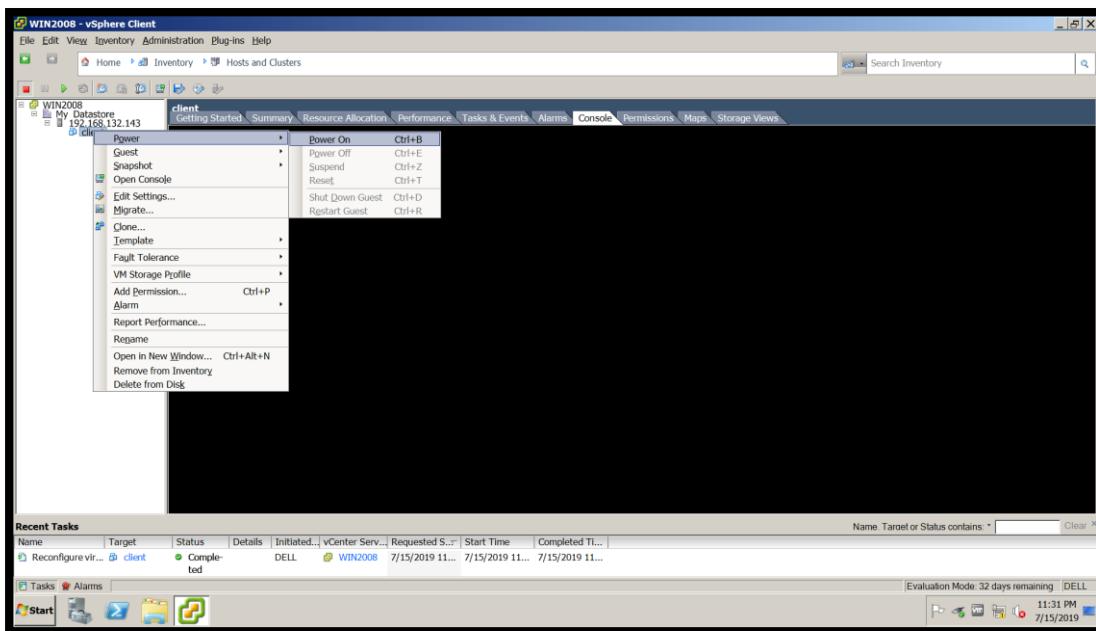
In the settings, go to CD/DVD option, browse the ISO image from datastore->iso folder->iso image of windows server 2008, and click OK.



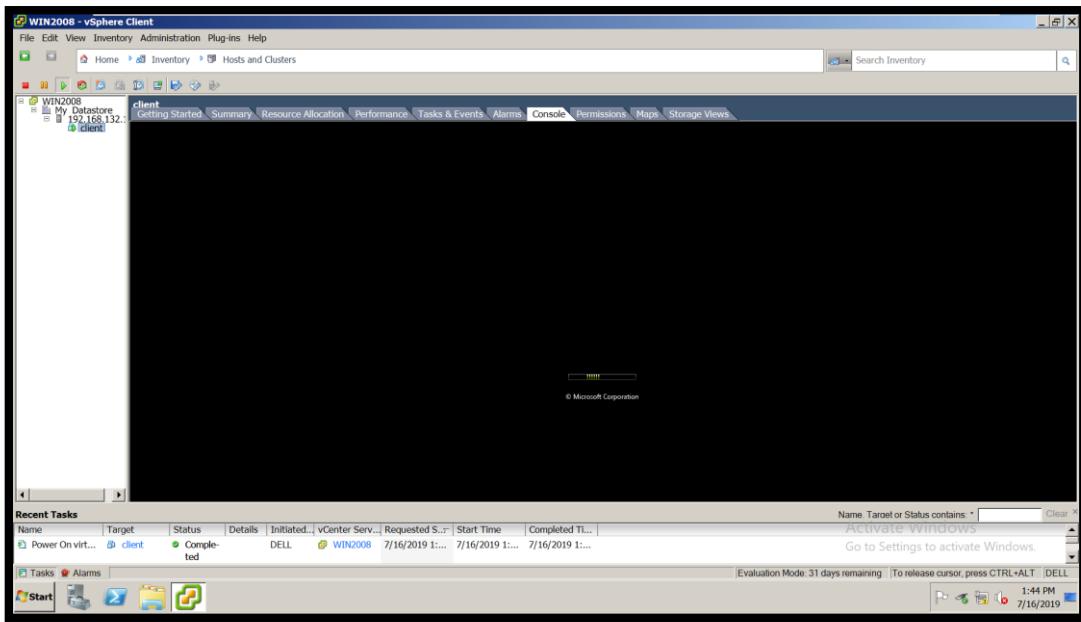
Remember to fill the radio button of connect at power on.



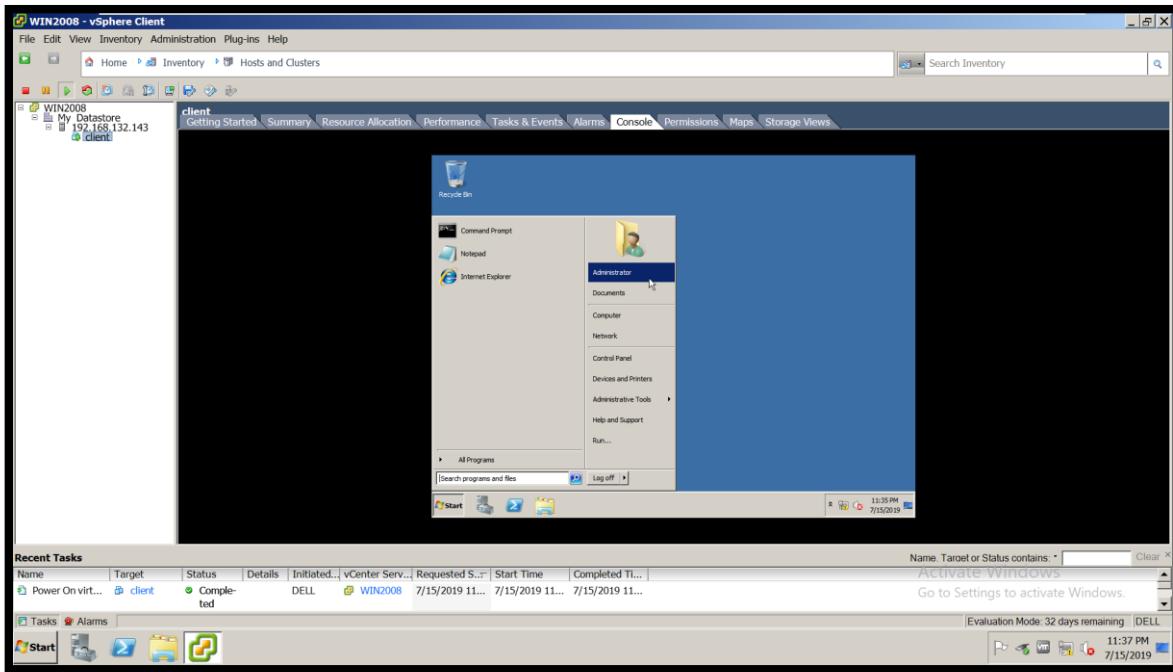
Now, right click on the machine client and power ON the machine.



The client is getting started in the vSphere client.



We login to the client as Administrator. Set the password as 1234@abcd (It should be different from the password of Server)



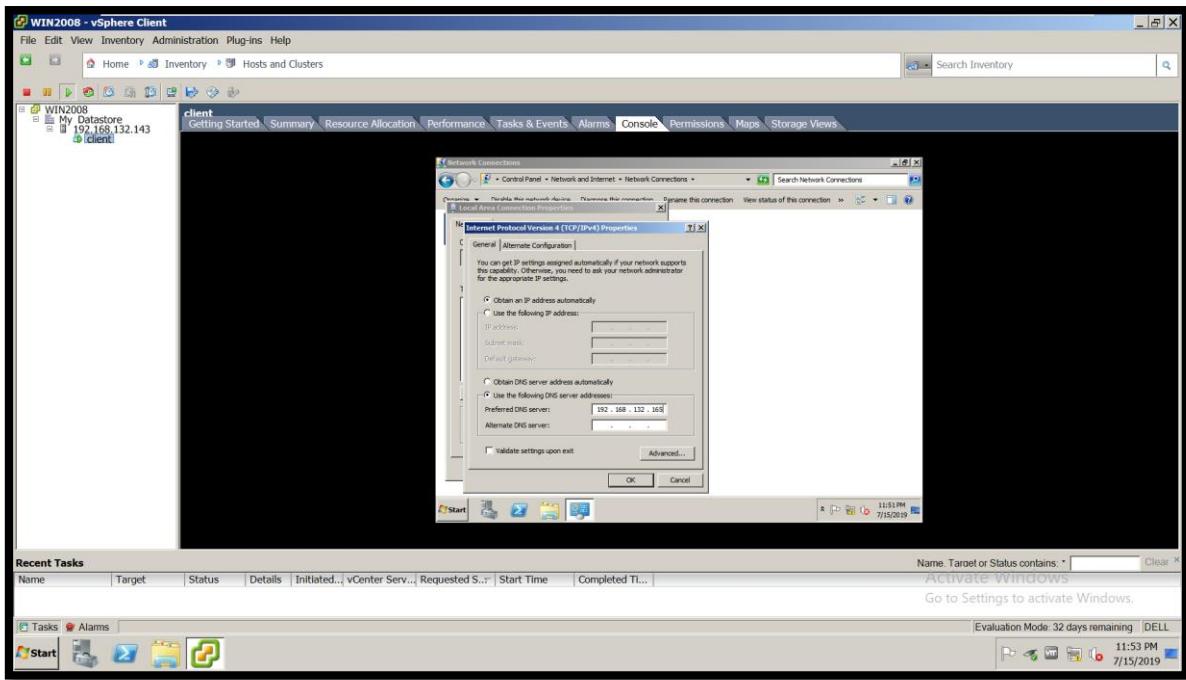
STEP 21

Connect the Client with the Server.

To connect the client to the DNS Domain Controller, firstly we set the IP address of DNS server in the client.

For this, go to [Network and sharing center](#), then in the [adapter settings](#), do right click on the [Local area Connection](#) and change the [properties of IPv4](#).

Set the DNS IP to the IP of Server (**192.168.132.165**).

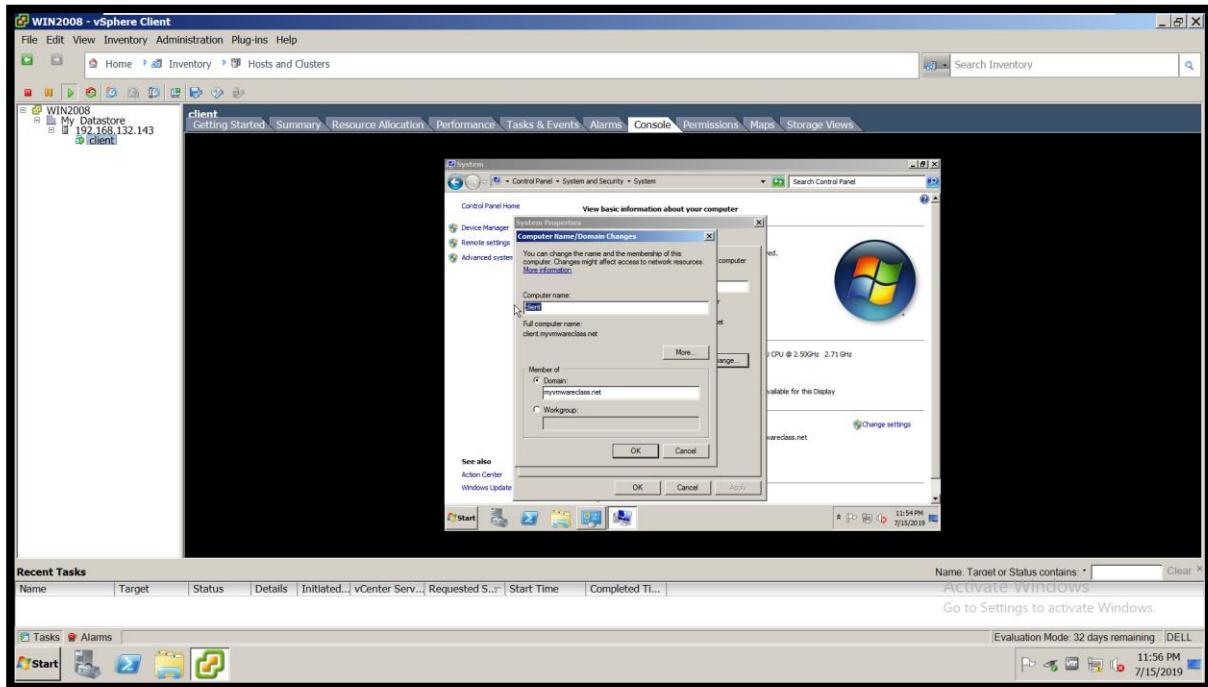


Then click on OK button and close this panel.

After setting the IP go to computer, and click on system properties.

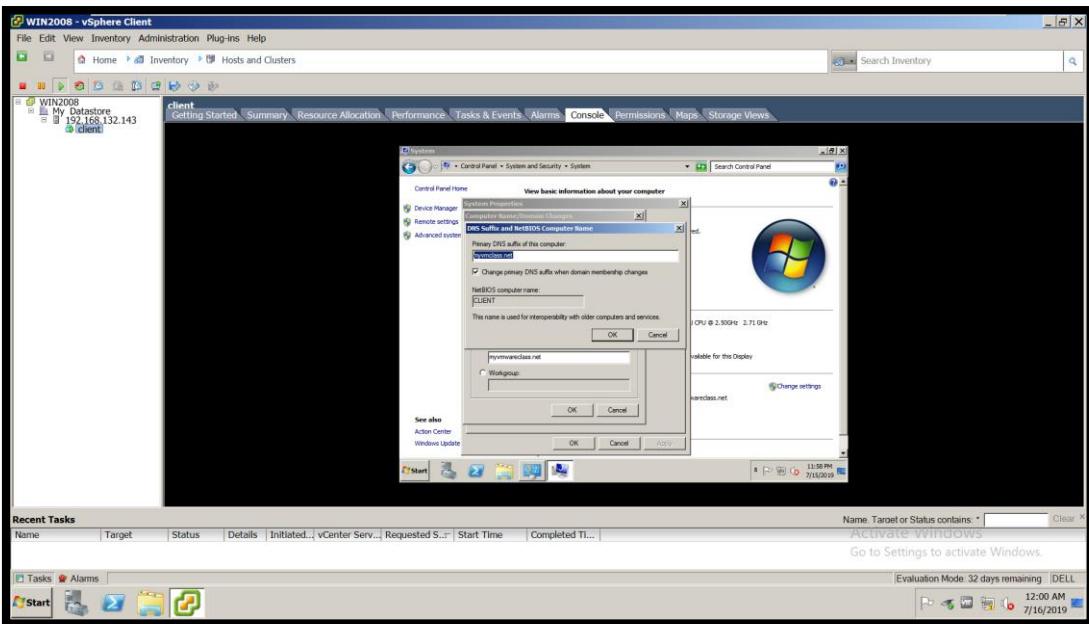
Click on change settings, go to change.

Then change the name of computer to client.



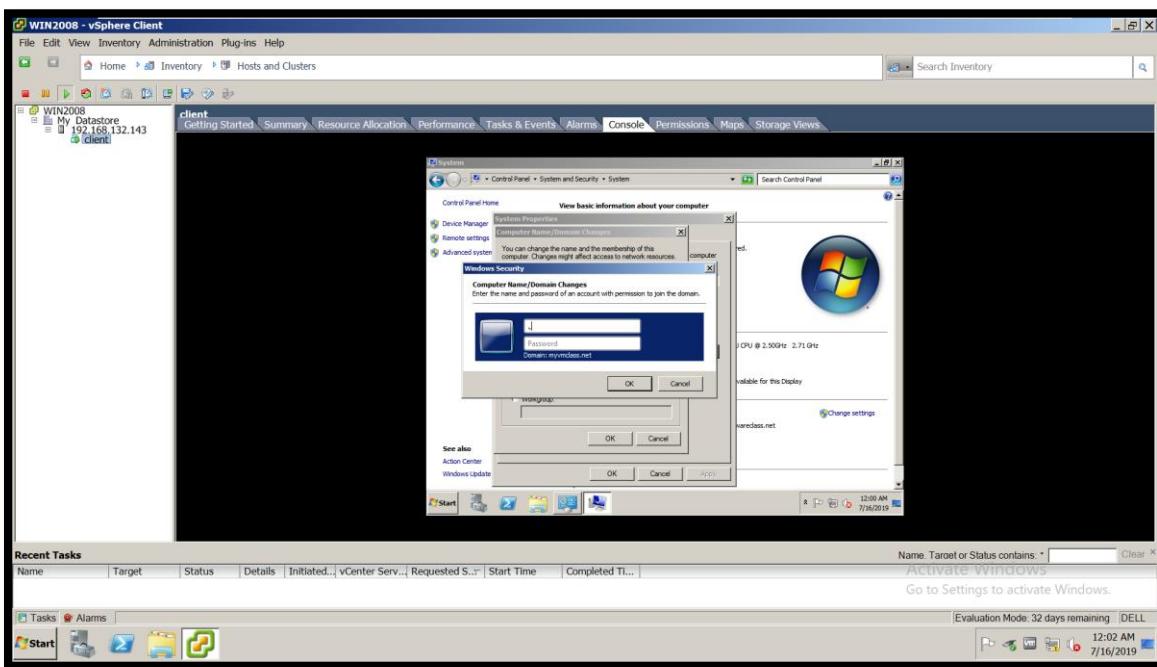
Click on mote option and then we need to write the DNS suffix to connect with Domain Controller.

Type the Domain here: **myvmclass.net** and click on OK.



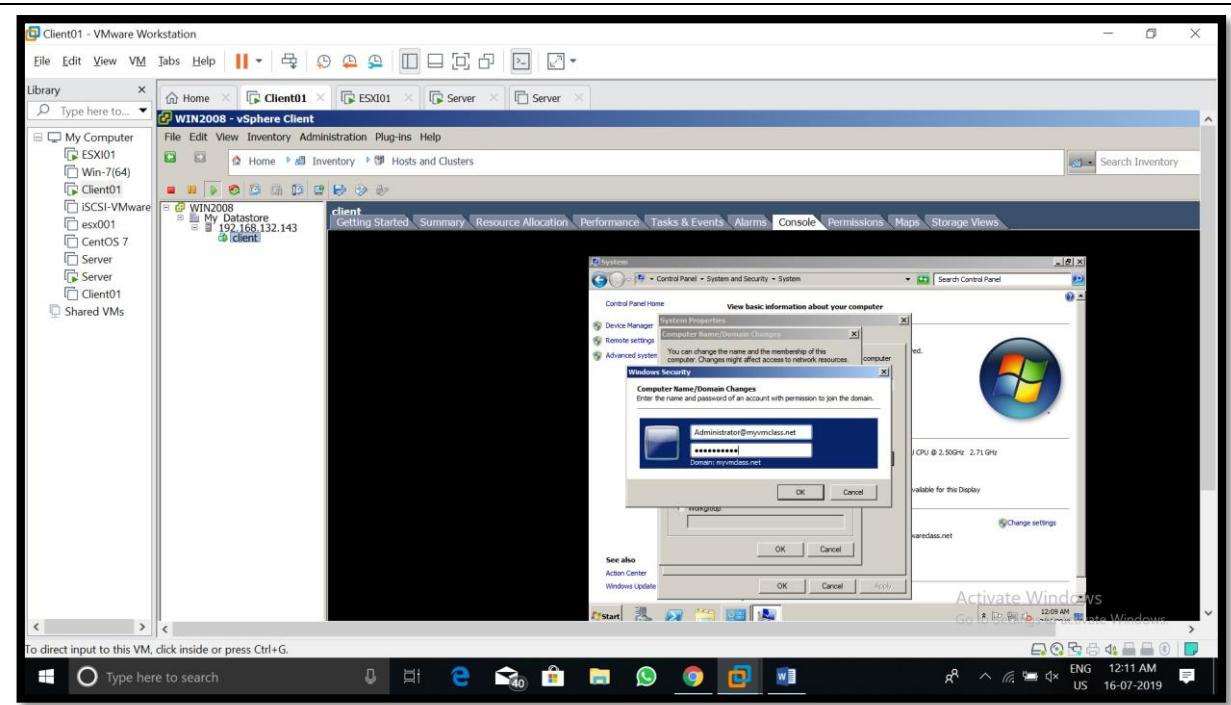
Also give the same Domain name in the Domain block below the computer name.

After giving the domain name it will ask the login password to confirm and configure the Domain Server.

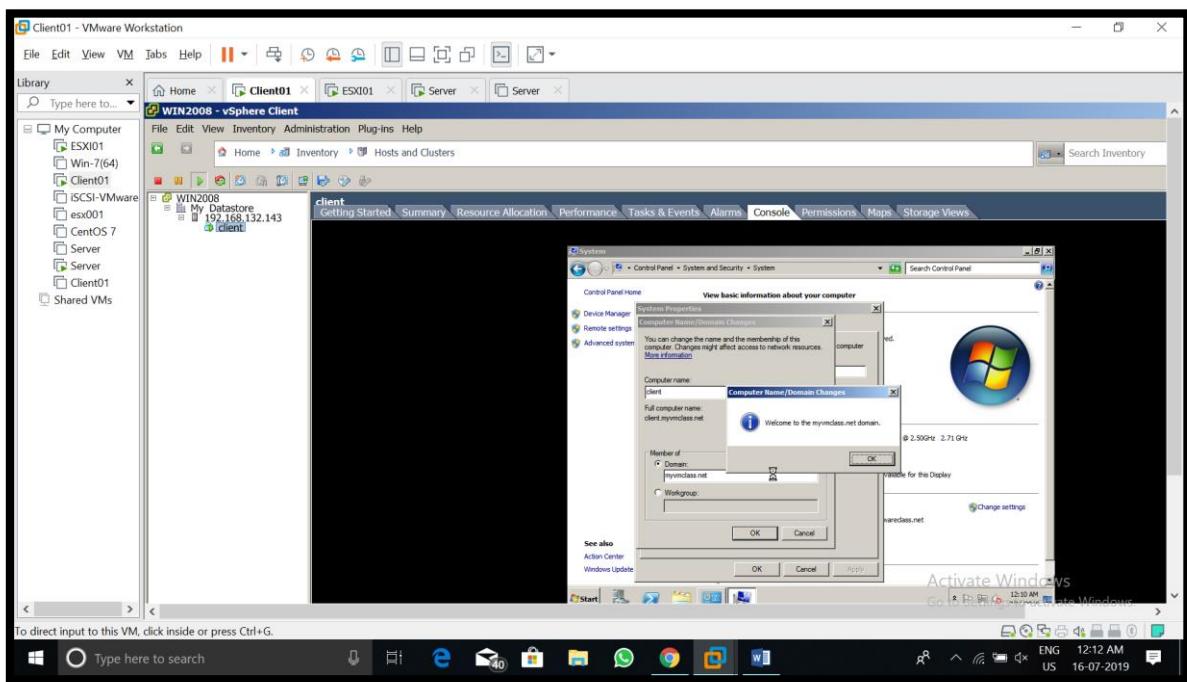


Give the username: Administrator@myvmclass.net

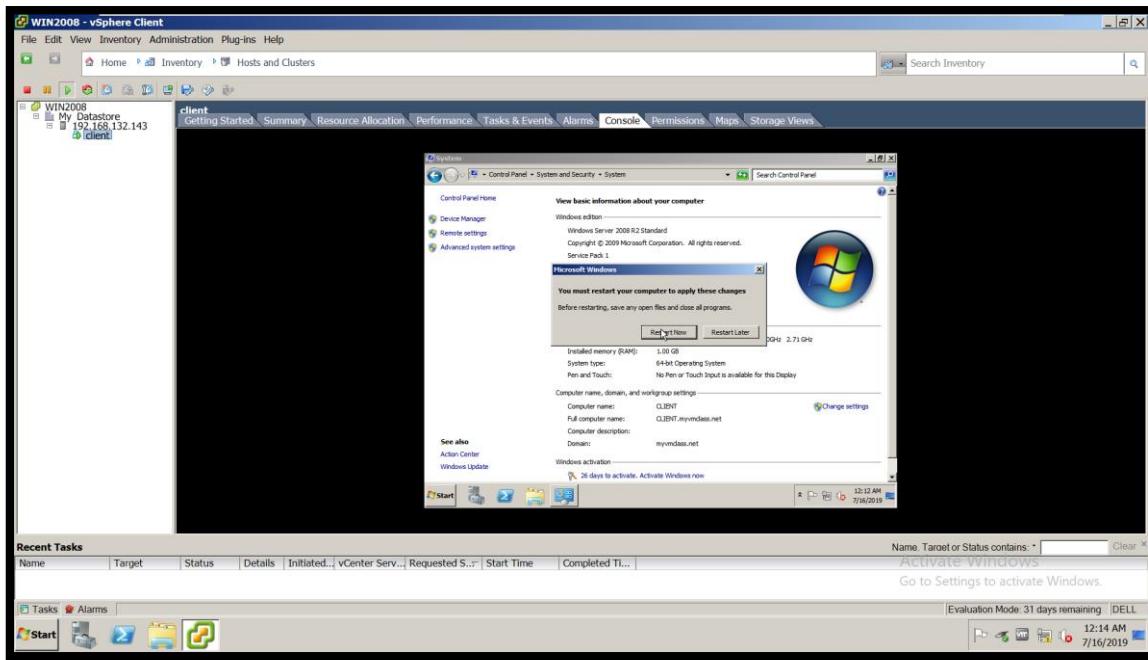
And password:1234@abcde



Client is now connected with the Server Domain myvmclass.net, showing the confirmation box.



After then restart the system, click the restart button to save the changes.

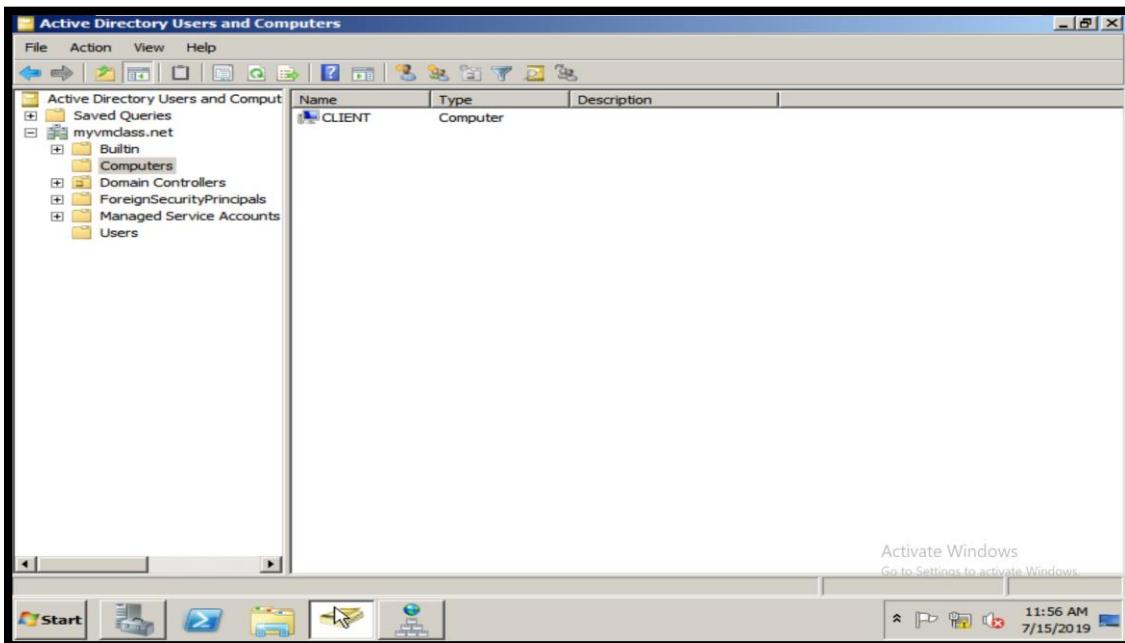


Step 22

Checking the client as user in the Domain Controller Server.

To check the client is a user in the Active Directory, we need to go to our Server machine, inside it go to start, then click on Administrative tools, there find the Active Directory Users and Computers.

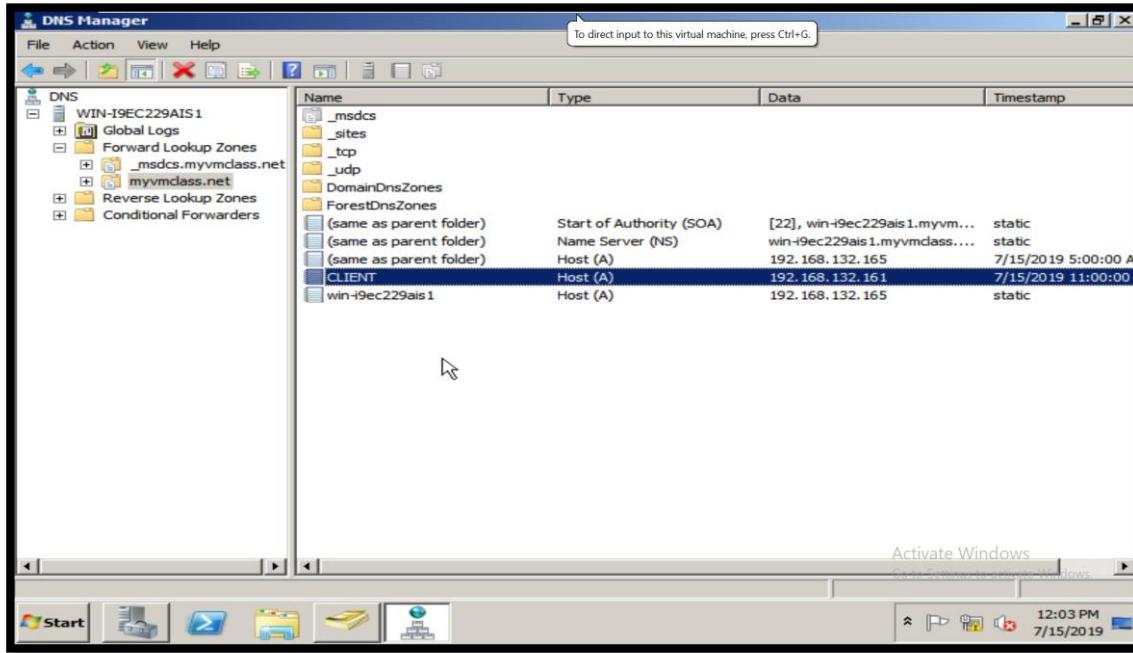
We have added the computer 'client' in the DNS domain, so, in Active Directory Users and Computers, expand myvmclass.net, then click on computers, there we will find the client name.



Also, we can check the client is now a DNS user.

Go to start, then click on Administrative tools, click on DNS.

In DNS, expand the machine name, expand Forward Lookup Zones, then click on myvmclass.net, You will find the host 'client' is added in the list.



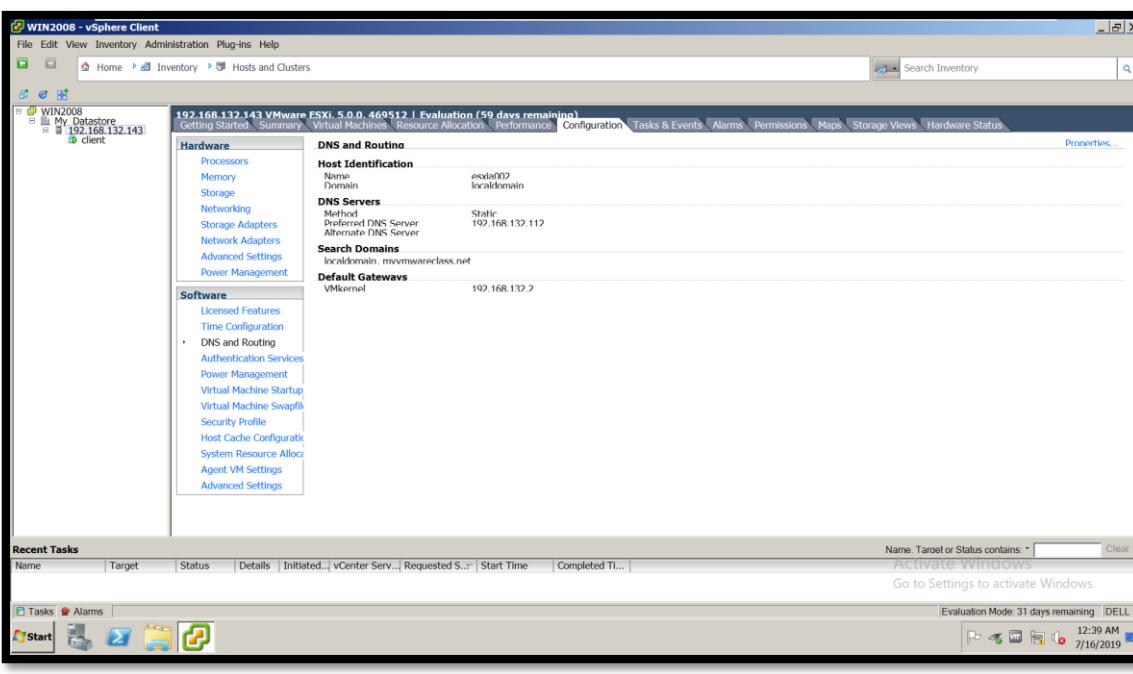
STEP 23

Join the ESXI as user in the DNS

For this, go to the vSphere Client in the machine Client01

Login to the Host and click on the Host IP of ESXI.

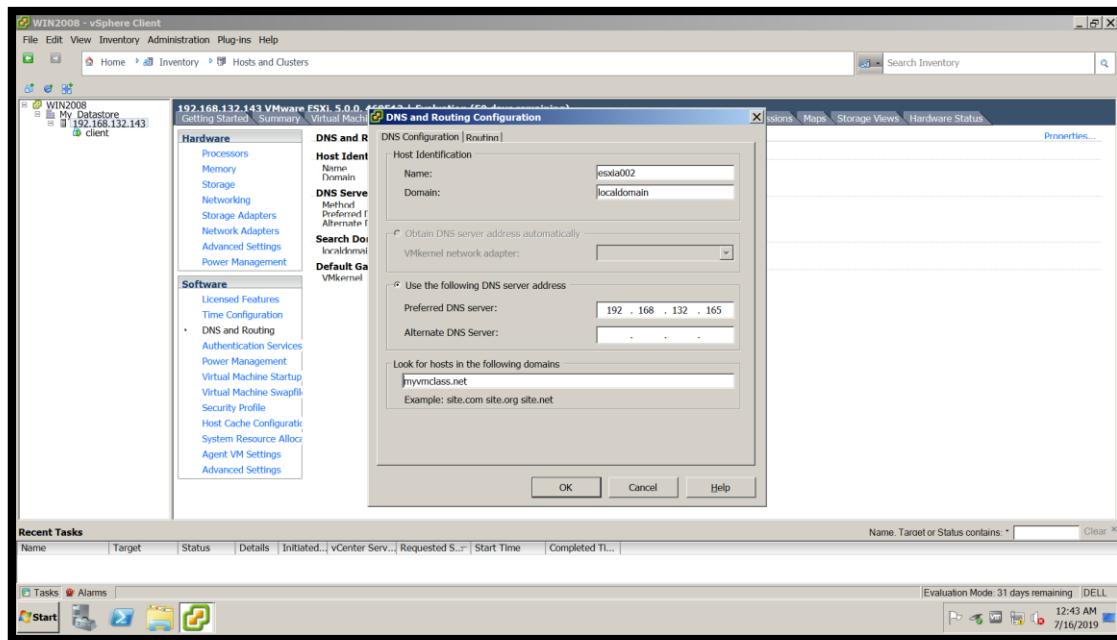
Go to the Configuration → DNS and Routing → Properties



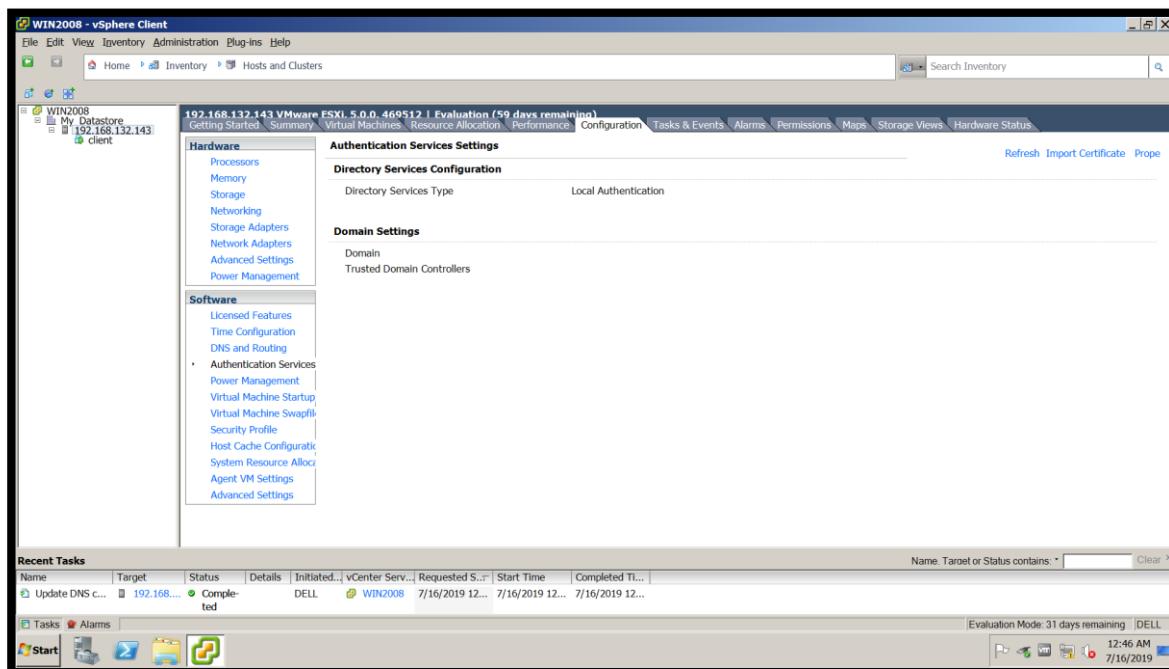
Now, set the preferred DNS server to the IP of Domain controller Server (192.168.132.165).

Also change the domain to myvmclass.net.

Click OK to save these changes.

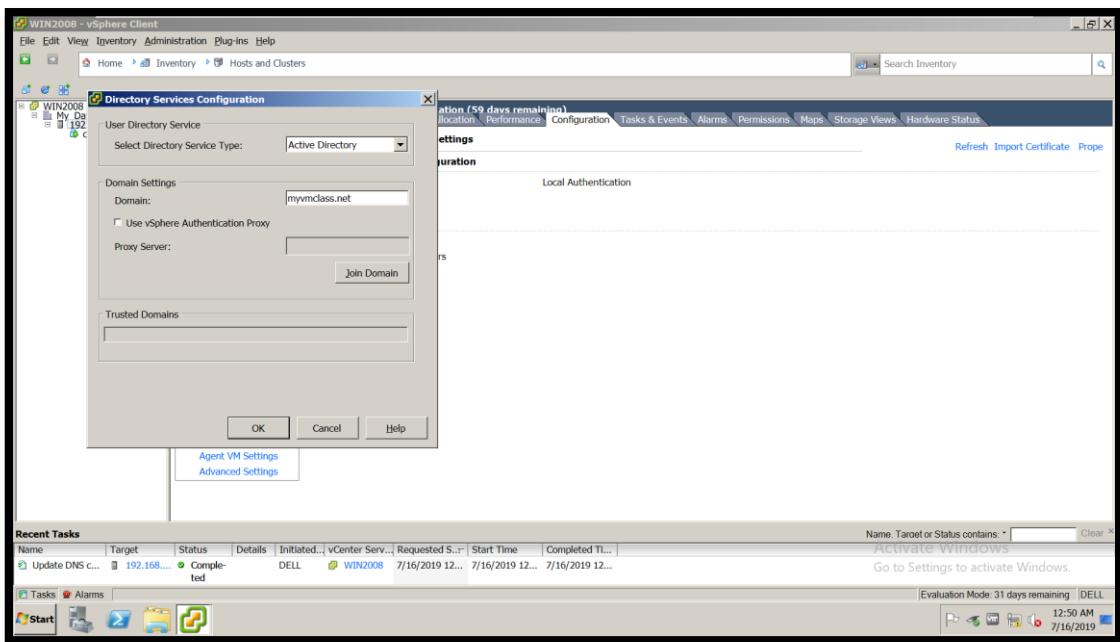


Now go to Authentication Services (below DNS and Routing) → Properties.



Set Active Directory in Directory Service Type (from drop down).

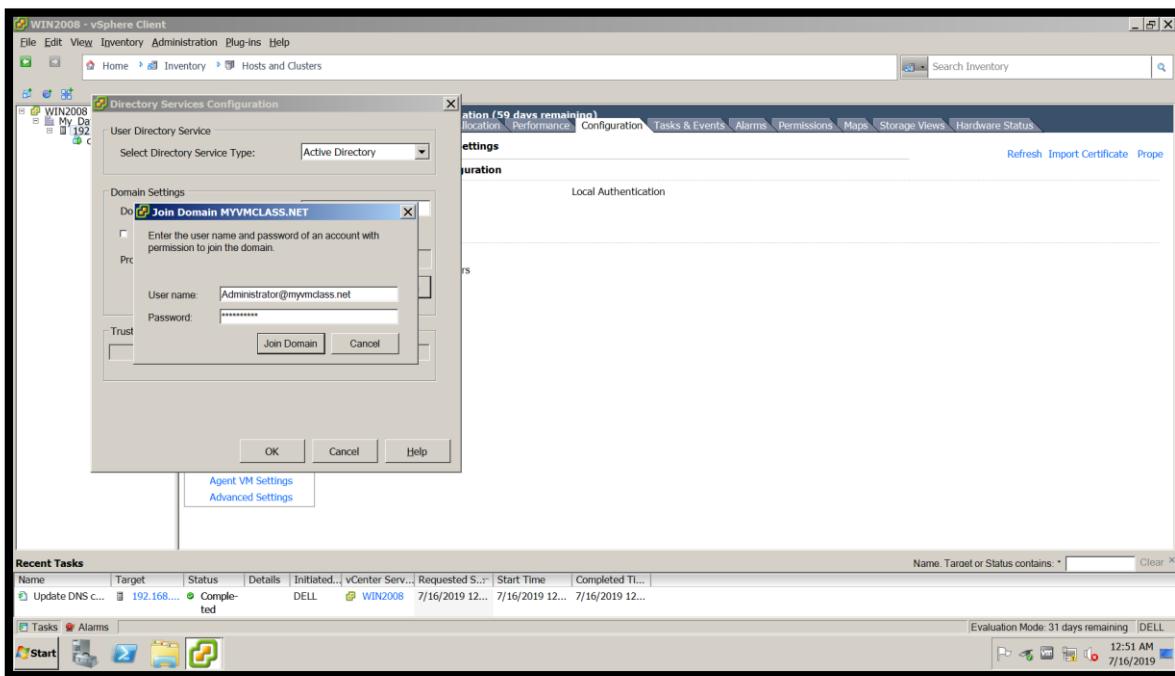
Give the Domain name: myvmclass.net, and click on Join Domain.



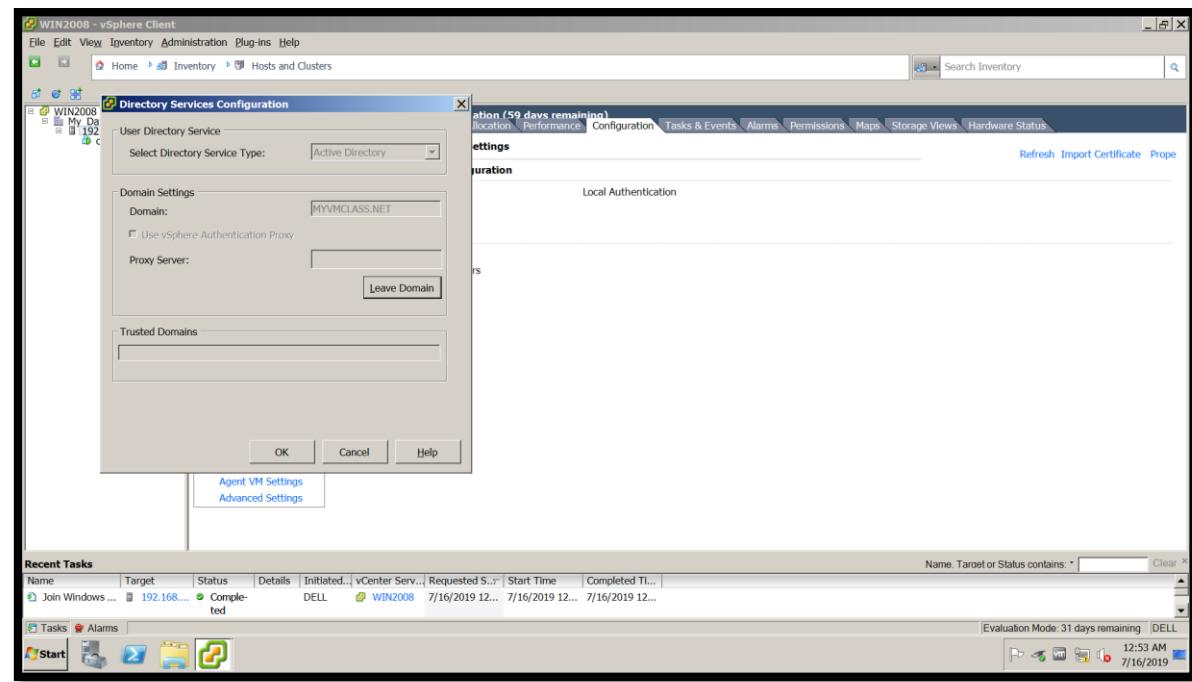
It will ask the details of DNS Server.

Give username: Administrator@myvmclass.net

Password: 1234@abcde and click on Join Domain.



It will automatically set your domain, click OK to save the changes.



STEP 24

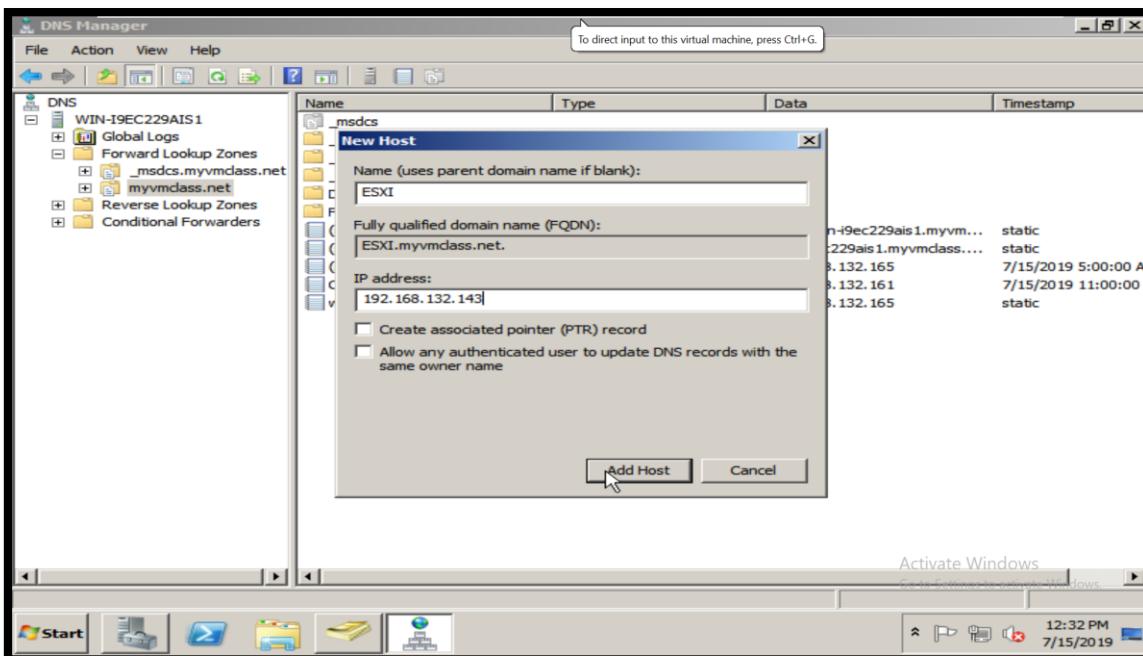
Adding ESXI Host as the user of DNS manually.

The ESXI does not add automatically to the DNS user like the client.

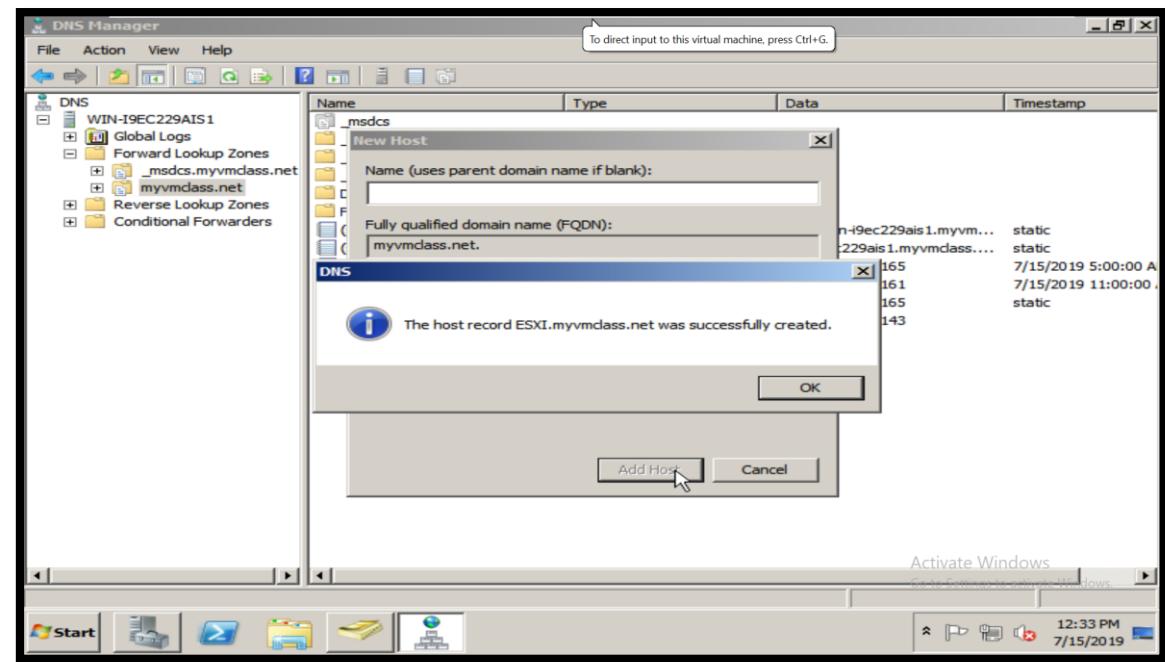
We need to add it manually. For this go to the Server, open the DNS Manager.

Click on myvmclass.net, right click on the screen and select New Host.

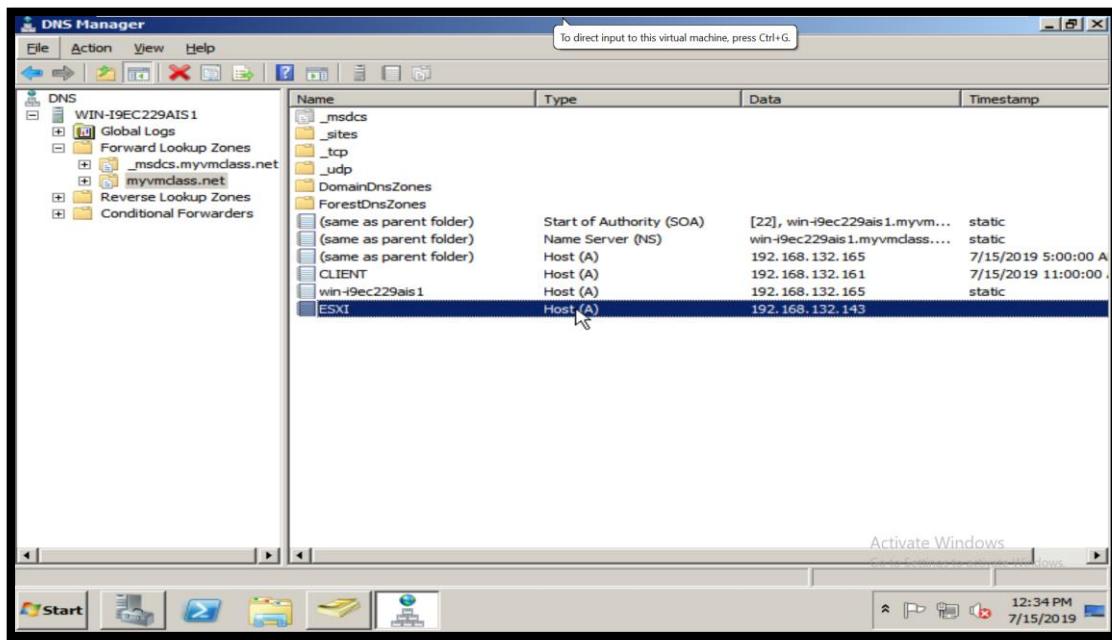
Enter the details of the record of ESXI user.



Host created Successfully!



The host can be now visible in the list.



STEP 25

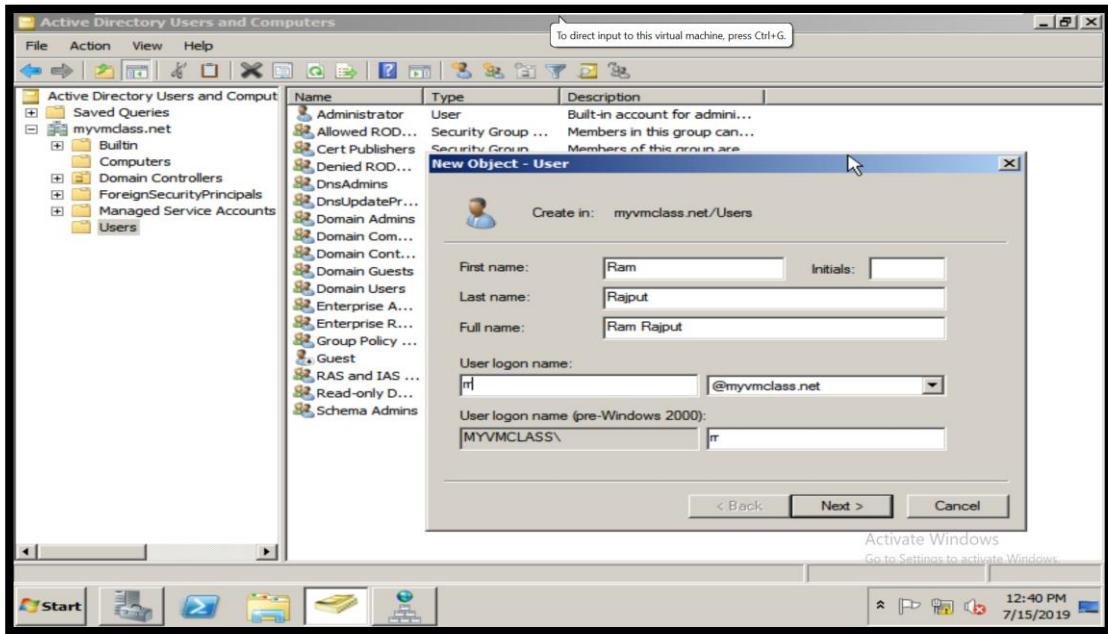
Creating New User in Server.

To create a new user, go to Start → Administrative Tools → Active Directory Users and Computers → myvmclass.net → Users.

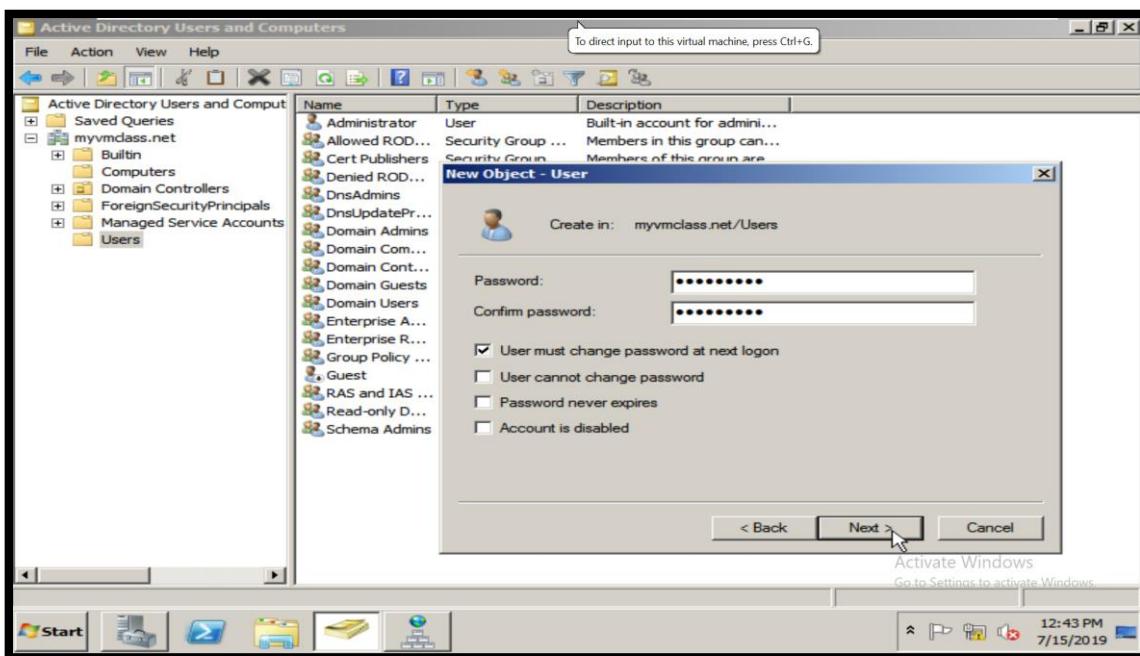
Right click on users, select New → User.

Fill the entries of the new user, here we take user Ram Rajput, username rr@myvmclass.net

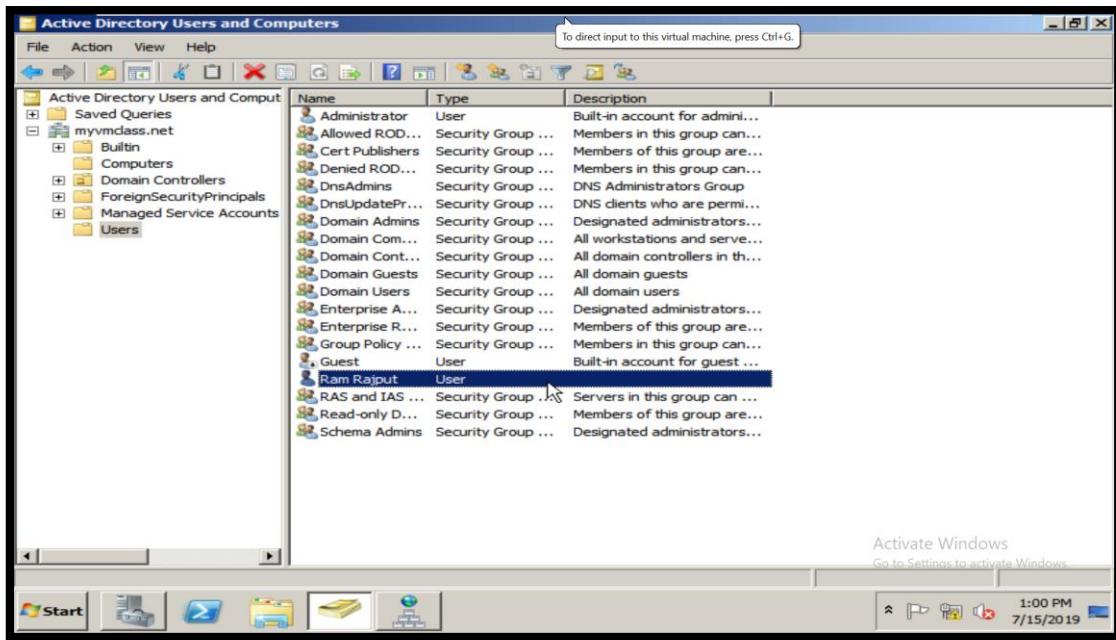
Then click Next.



Setting a password, and enabling that user must change password at first login.



Now, the list contains the name of new user.



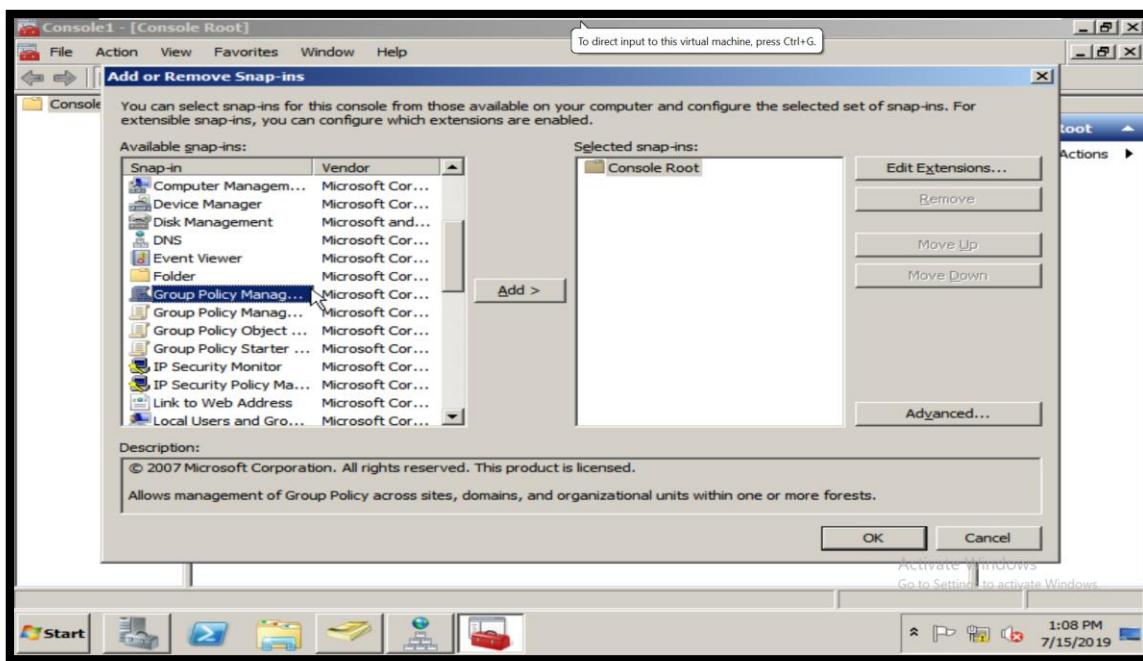
STEP 26

Adding Group Policy Manager.

Group Policy is a feature of the Microsoft Windows NT family of operating systems that controls the working environment of user accounts and computer accounts. Group Policy provides centralized management and configuration of operating systems, applications, and users' settings in an Active Directory environment.

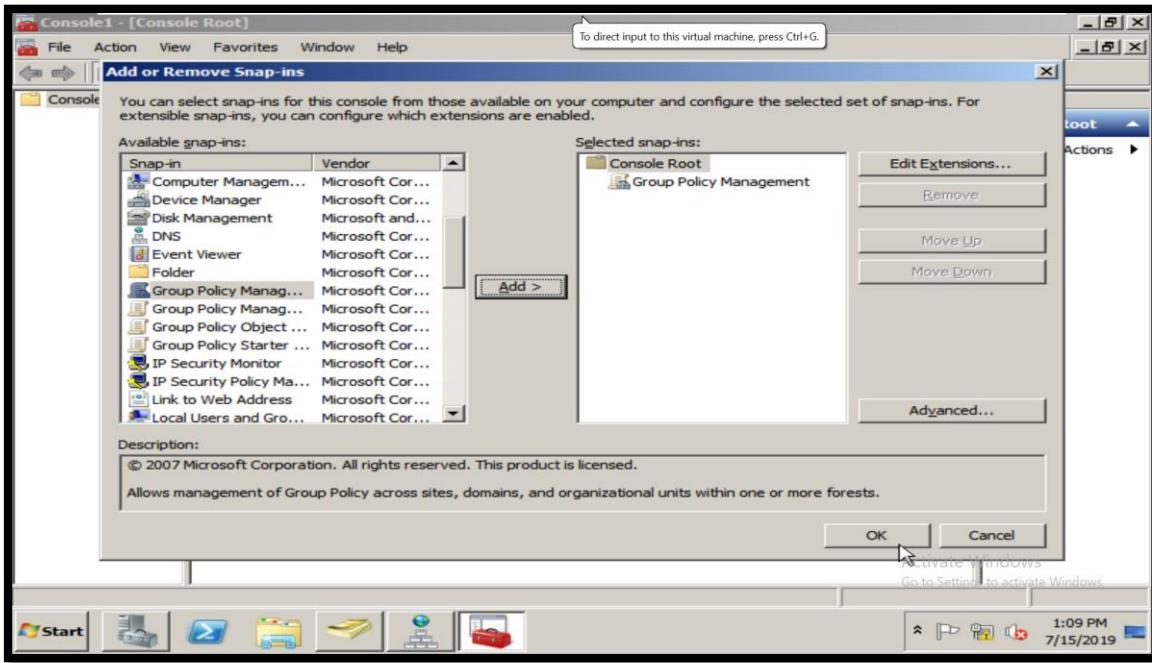
To add group policy, [go to start → run → type mmc → click OK →Console 1.](#)

Inside **Console Manager** click on **File → Add/Remove Snap-in...**



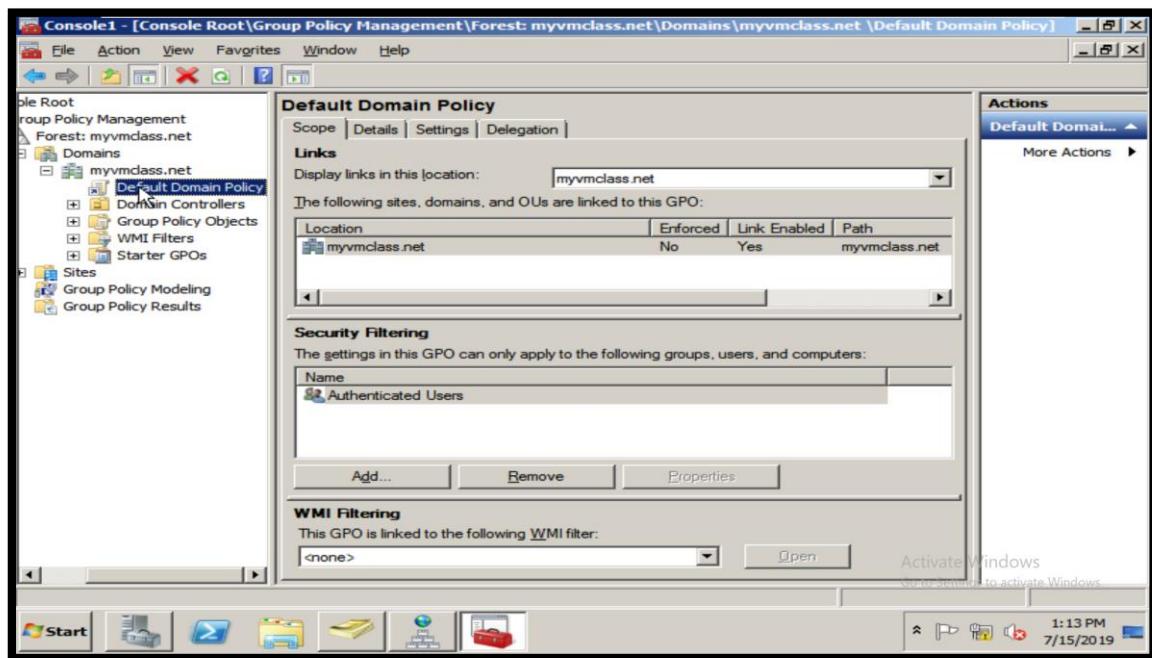
Now, click on Group Policy Management, click Add button.

Click on OK.



Now, expand **Group Policy Management**, expand **Forest: myvmclass.net**, expand **Domains** and expand **myvmclass.net**.

Then click on Default Domain Policy.



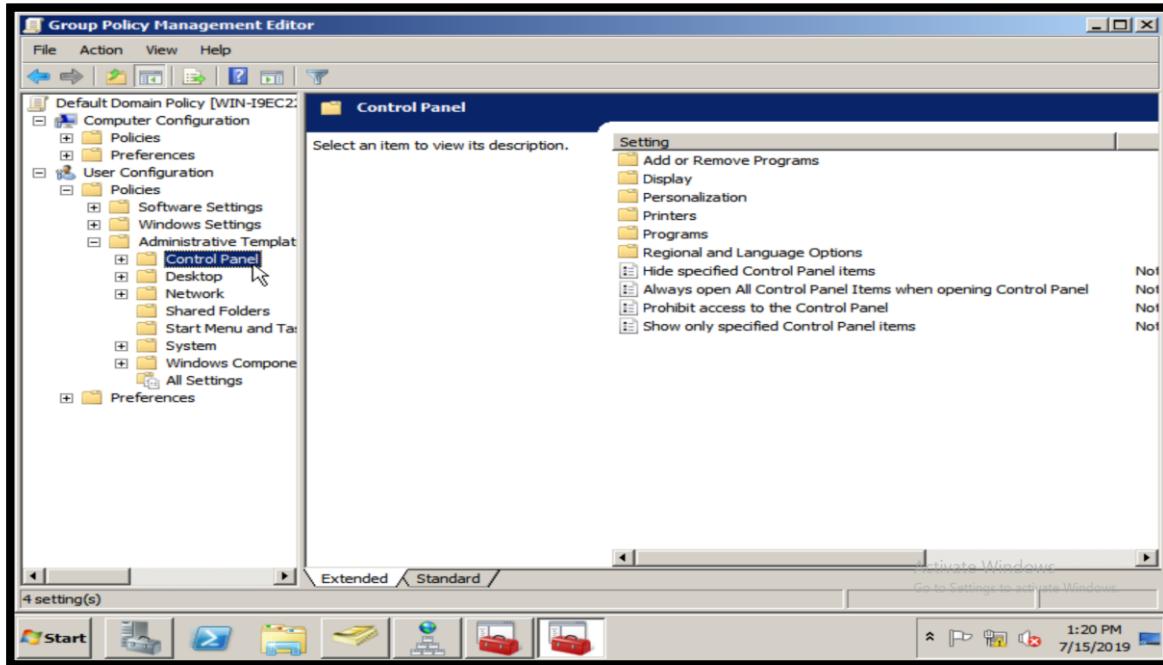
Then right click on Default Domain Policy, and select Edit.

It leads to the Group Policy Management Editor

STEP 27

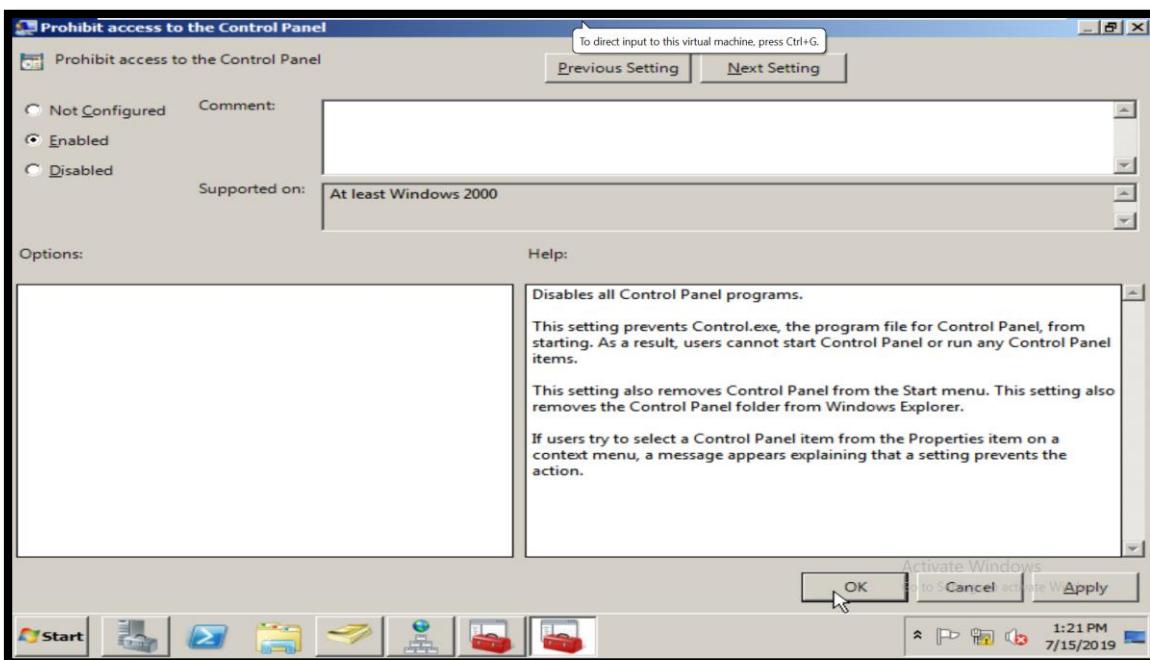
Our first task is to **Prohibit access of Control Panel**

For this, open **Group Policy Management Editor** → come to User Configuration → expand Policies → expand Administrative Template → click on Control Panel.



Click on the option → Prohibit access to the Control Panel, in the left.

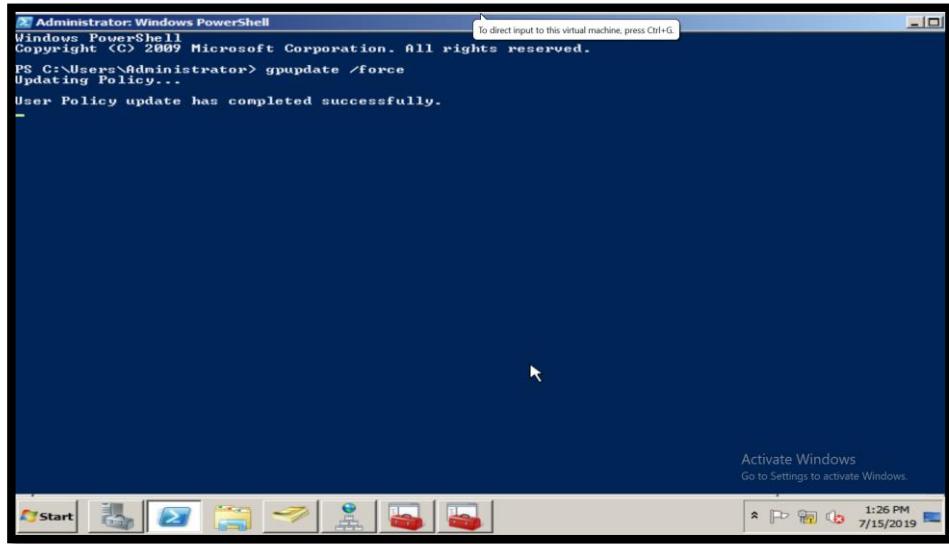
Enable this setting and click on Apply then OK.



STEP 28

Run GPUPDATE.

To enable group policy in the user, we need to run the command gpupdate /force on every user.



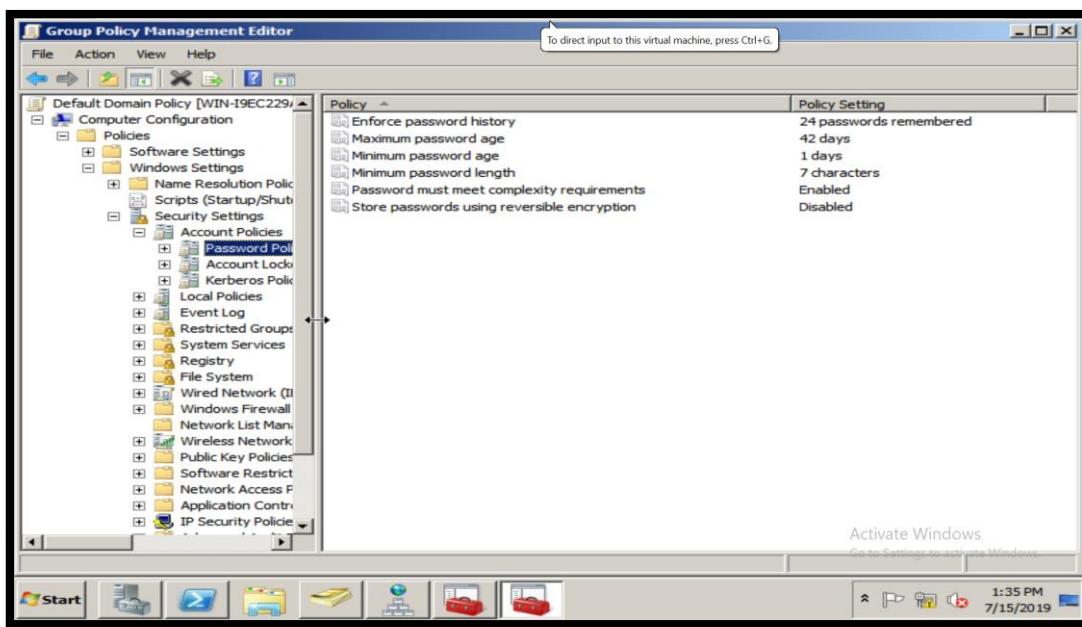
```
Administrator: Windows PowerShell
Windows PowerShell
Copyright © 2009 Microsoft Corporation. All rights reserved.

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

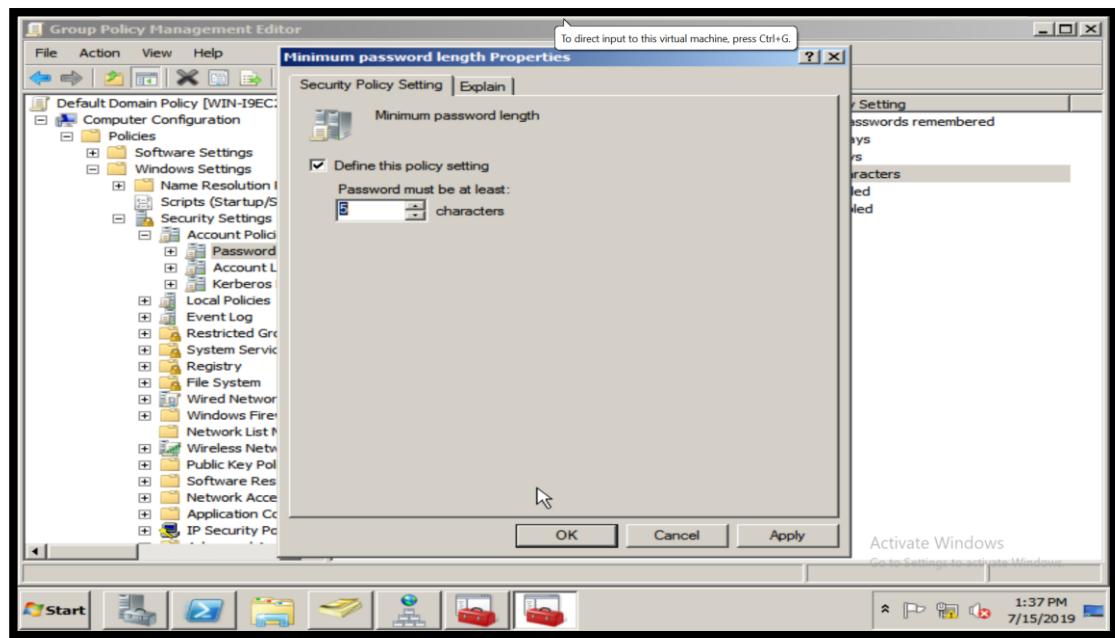
STEP 29

Configure Password Policy.

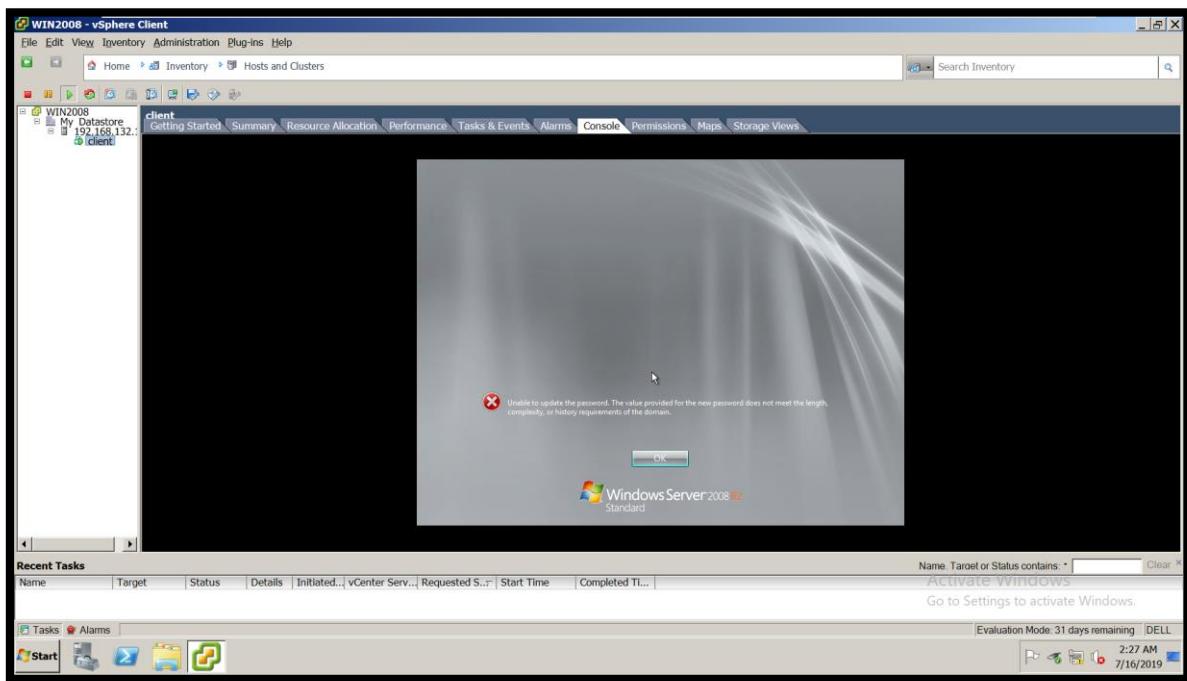
To customize the password policies, open the **Group Policy Management Editor** → come to **Computer Configuration** → **Windows Settings** → **Security Settings** → **Account Policies** → **Password Policy**.



Set the min length of password: 5



Restricting password length on User

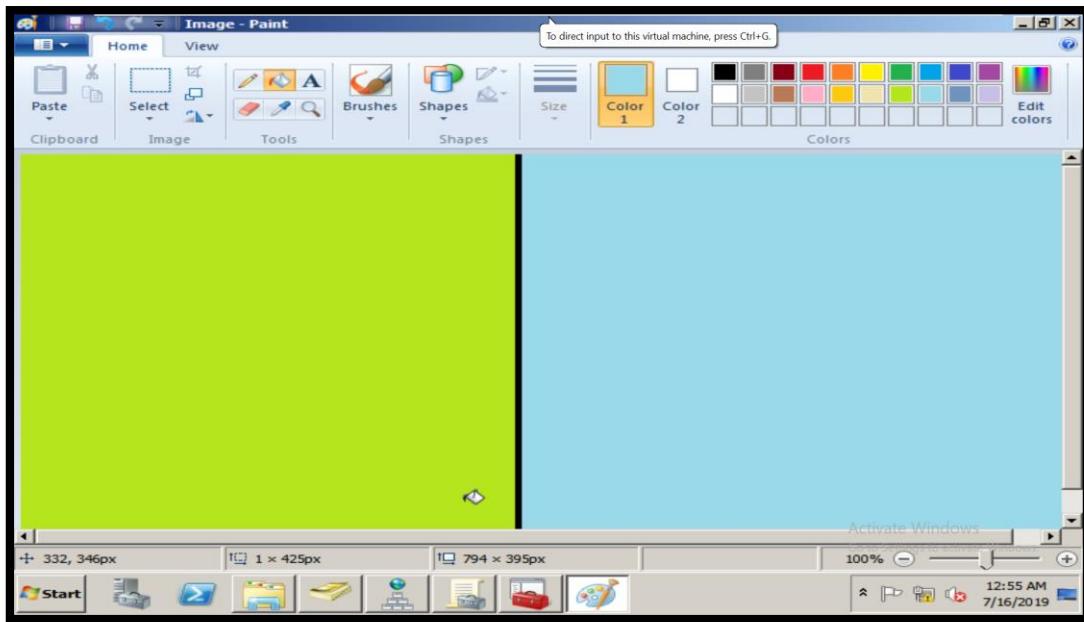


STEP 30

Desktop Policy

We will make the Changes in the Desktop of all the users of the Active Directory Domain.

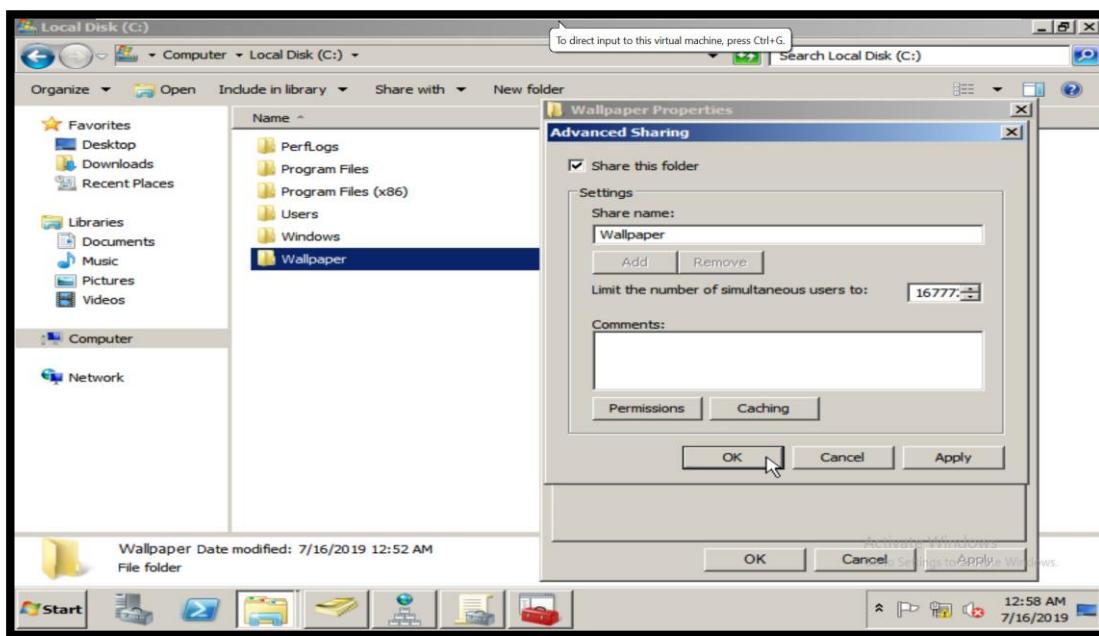
First we create a Wallpaper.



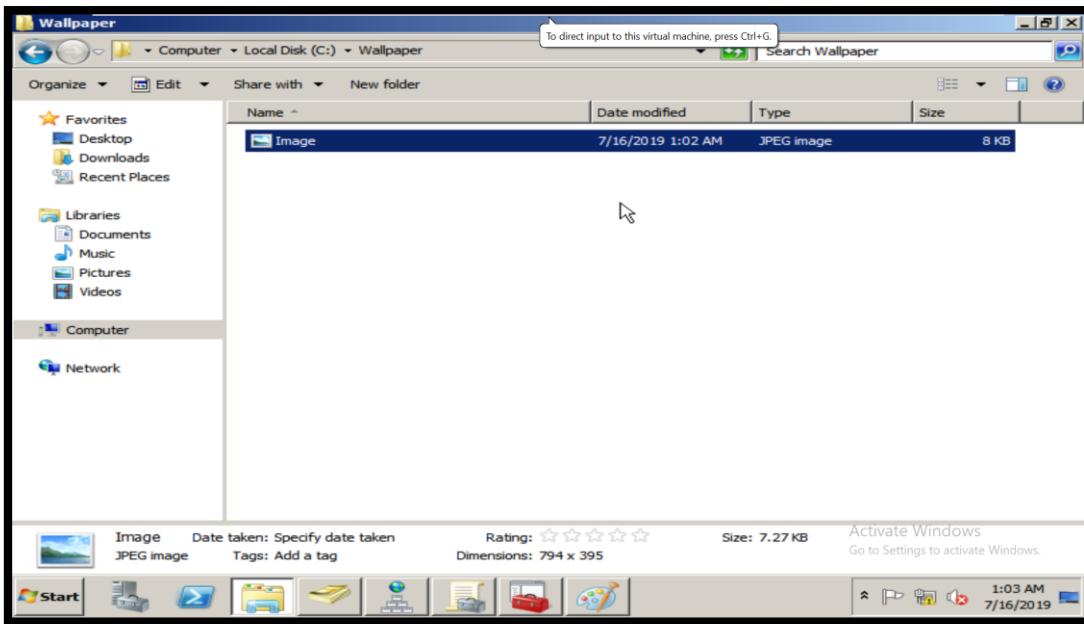
Then save it on Desktop.

Create a folder in any of the drive inside the computer named **Wallpaper**, right click on the folder and go to properties, click on sharing.

Click Advanced sharing. Click the share option and click on OK.



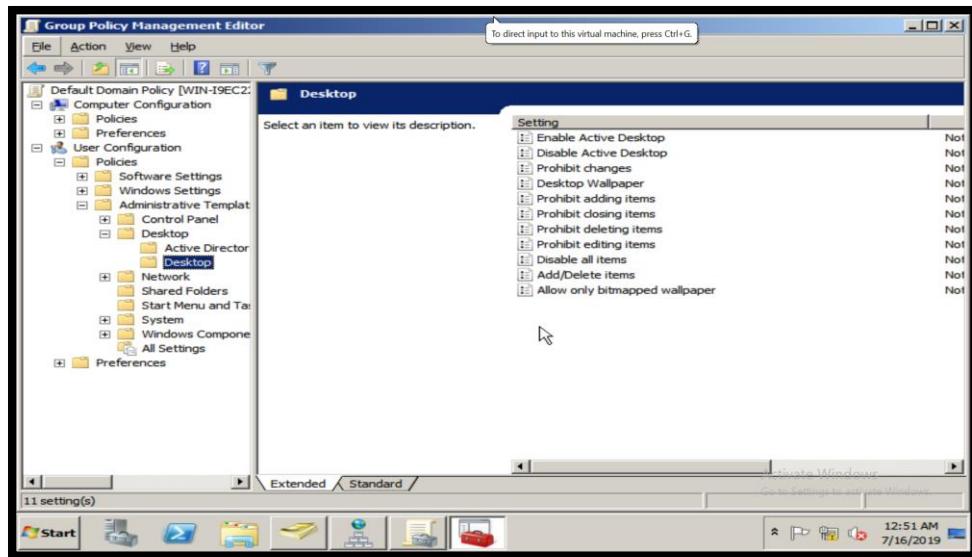
Copy the **Image** file you created in this **Wallpaper** folder.



And copy the path of this image in your notepad.

→\\192.168.132.165\Wallpaper\Image.jpg.

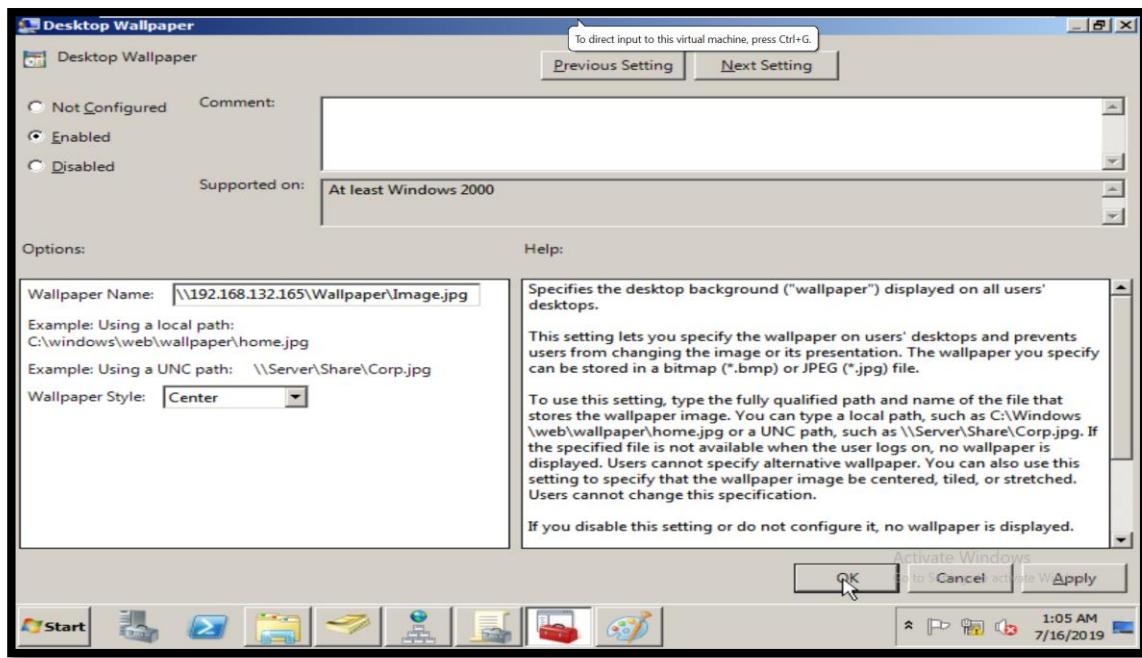
→Go to **Group Policy Management Editor**, come to **User Configuration** → Expand **Administrative Template** → Expand **Desktop** → Click on **Desktop Folder**.



Double click on **Desktop Wallpaper**,

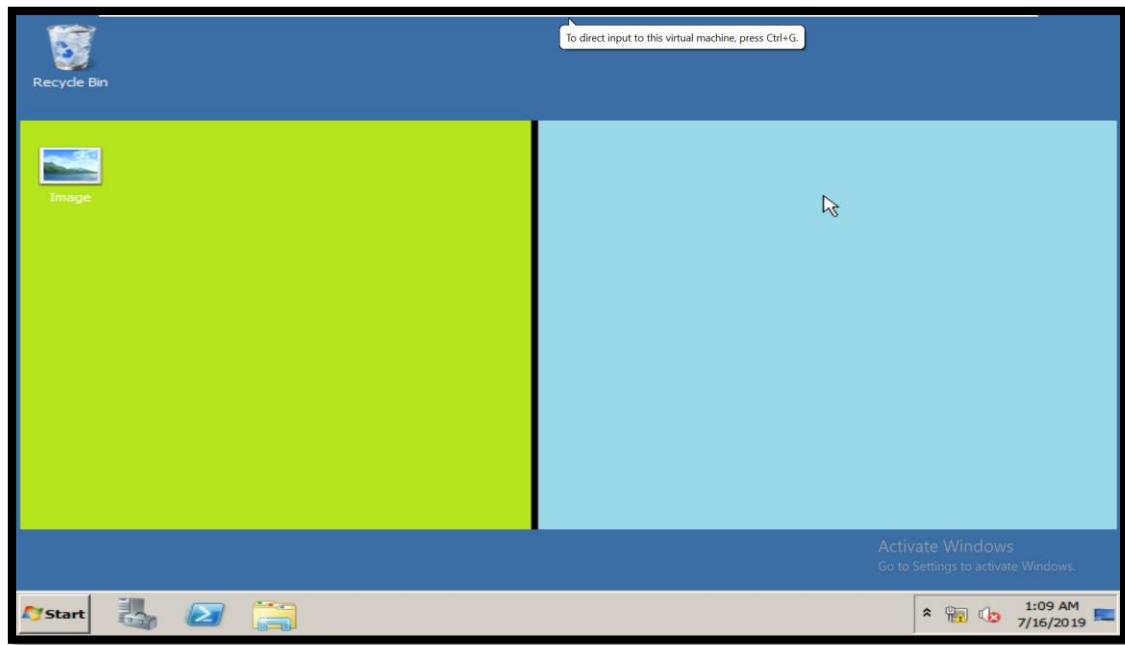
Enabled the setting, and give the path to the image which we copied in Notepad.

And click **Apply** then **OK**.

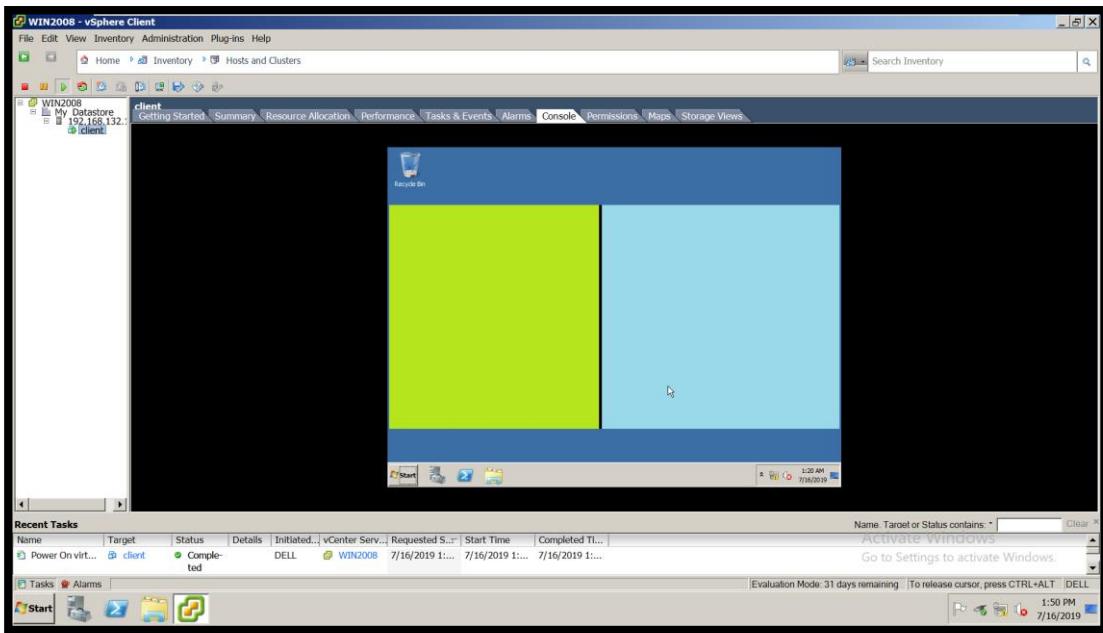


Restart all the users.

Desktop changed in the Server.



The Desktop of User **Ram Rajput** also changes.



Working of the project:

Now, we have created the Active Directory Domain Controller in the VMwrae Workstation, As every machine is a concept of file we can migrate this virtual machine file and can use on any compatible hardware. We can now create number of users in the Administrator Account and can manage them and give restrictions by putting them into same group of users. We don't need to configure the changes by going into every machine.

We can set passwords, can define various Group Policies to the Users.

Conclusion:

The Project is all about Virtualization. It is an application of running multiple machines on same hardware. It defines about, the utilization of resources, manageability of the hardware resources and also about the virtual machines which we can create on any device and can then migrate them to any other device in the world.

It shows the Configuration of Active Directory Domain Services and Domain Name System, which can provide a Domain name to the server and we can connect as many as users we want with the Server.