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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..

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.

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.

1.CREATING VIRTUAL MACHINE

To start doing work on this project, 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”.

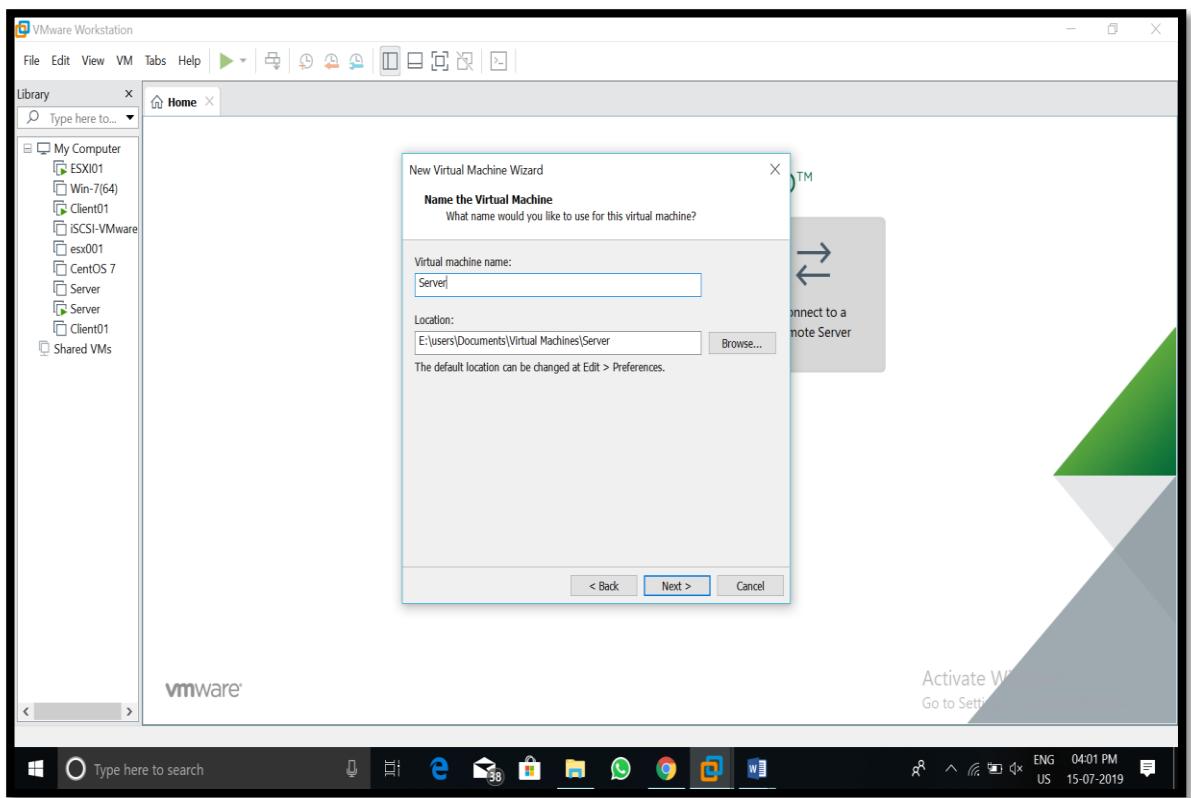


Figure 1

2. INSTALLING WINDOWS SERVER 2008.

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.

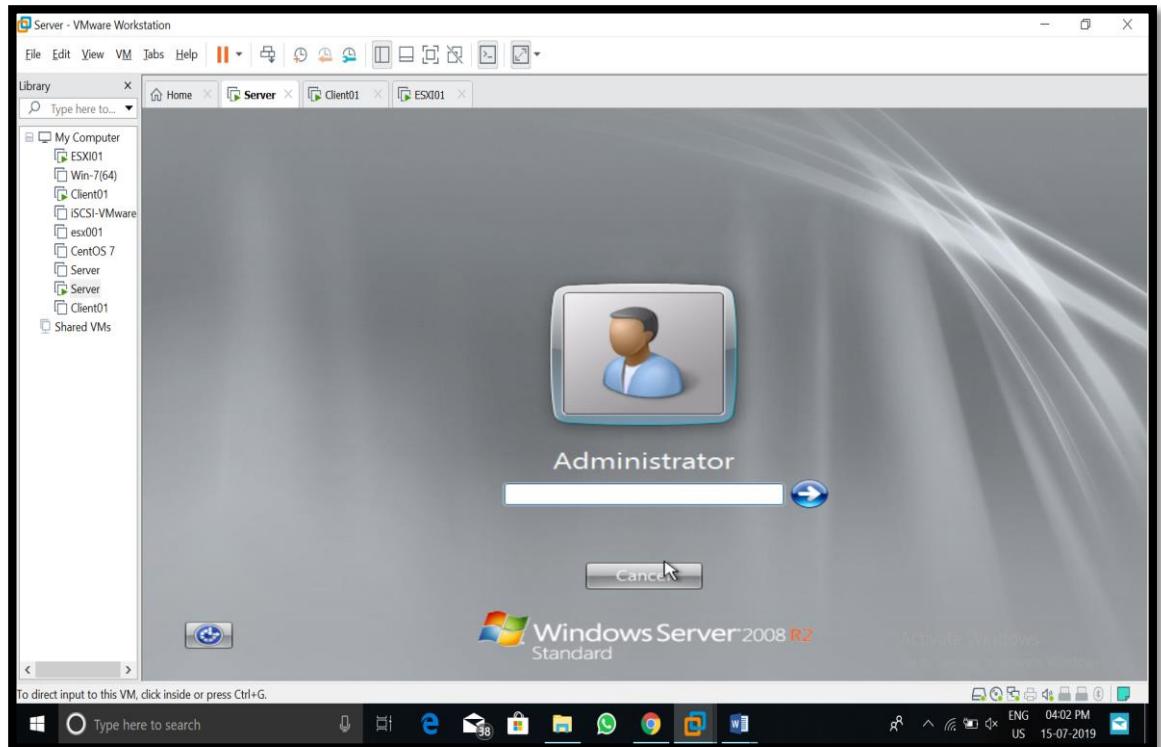


Figure 2

→ We set the password: 1234@abcde

3.INSTALLING 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 set its password : 1234@abcd.

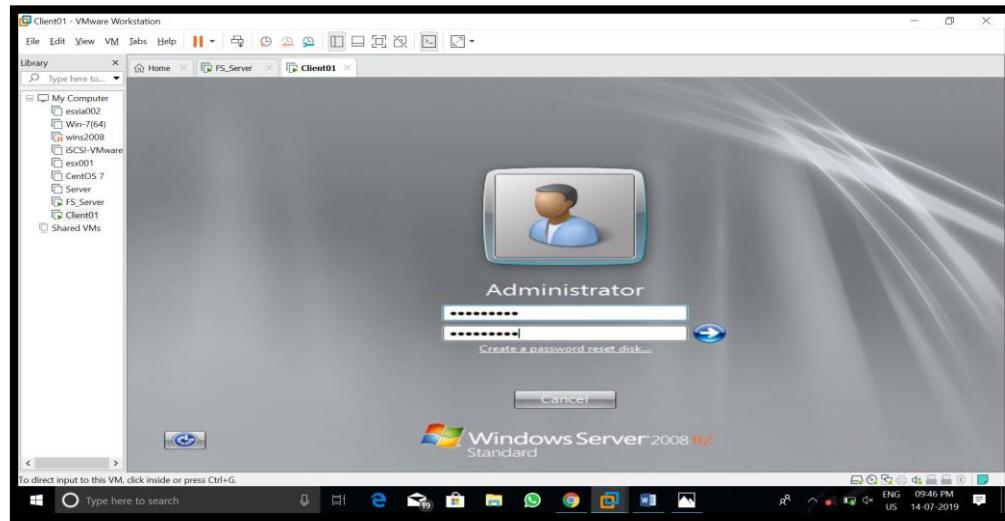


Figure 3

Now the Client01 machine is ready.

4.INSTALLING VMWARE VSPHERE CLIENT

Download the VMWare viclient from the official website of vmware in your host OS. Copy the viclient setup in the Client01 virtual machine and install it there.

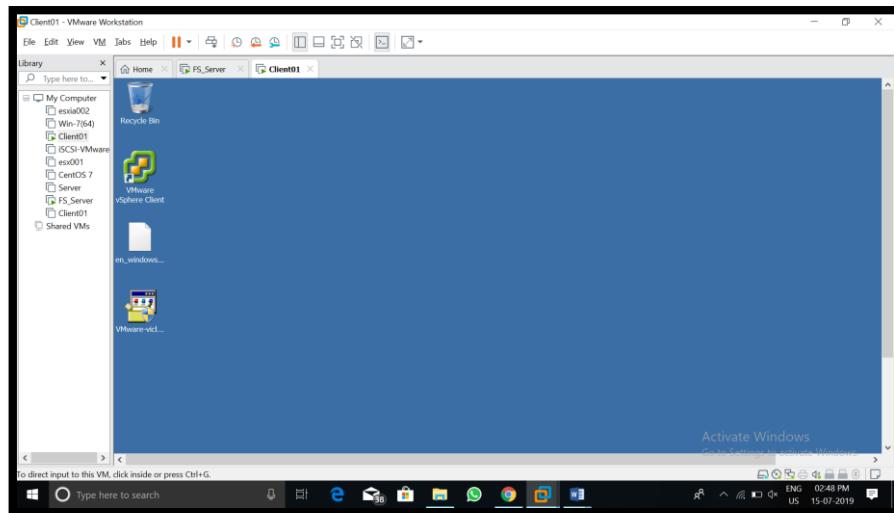


Figure 4

5.CREATING ESXI SERVER.

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)].

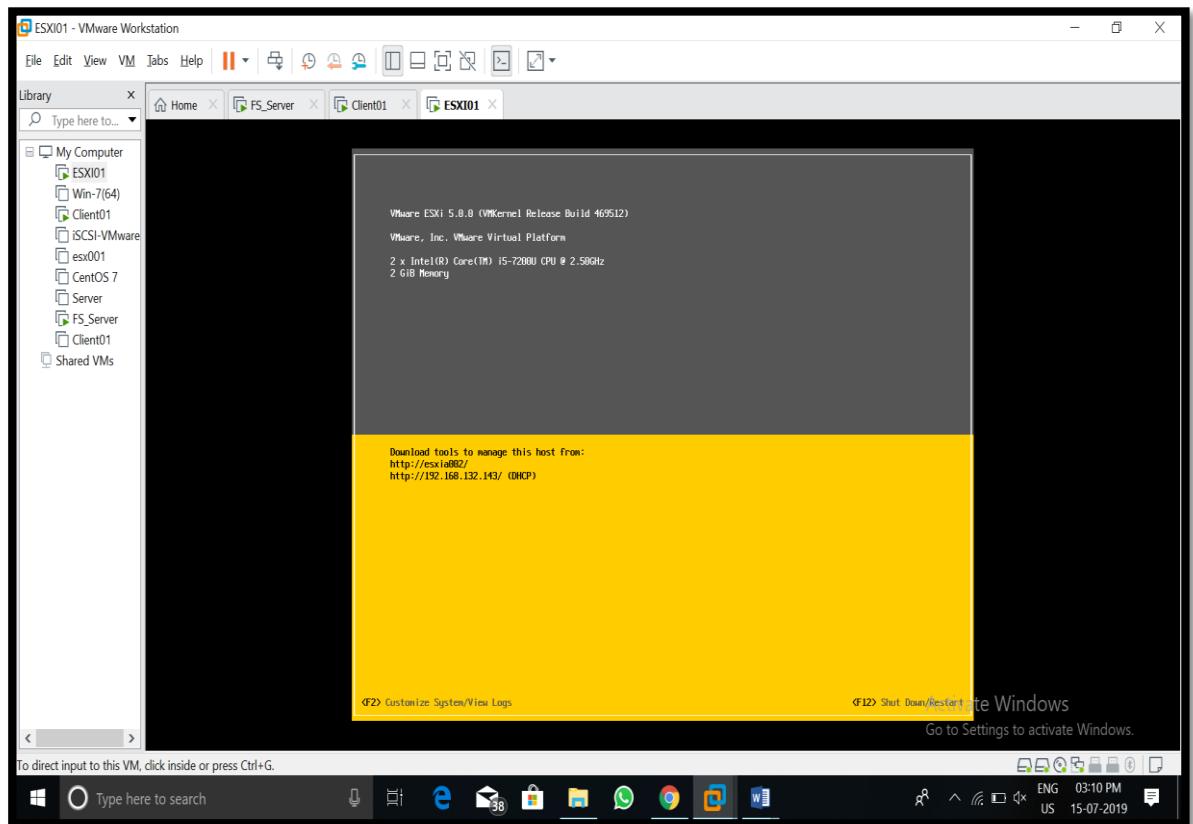


Figure 5

6 STATIC IP ADDRESS OF ESXI

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. 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

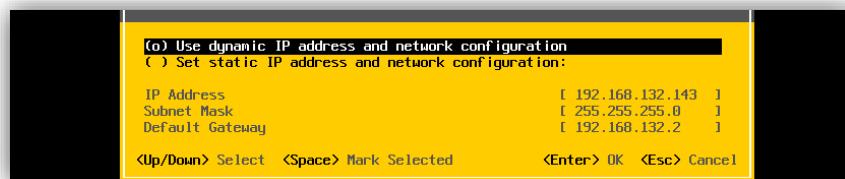


Figure 6

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.

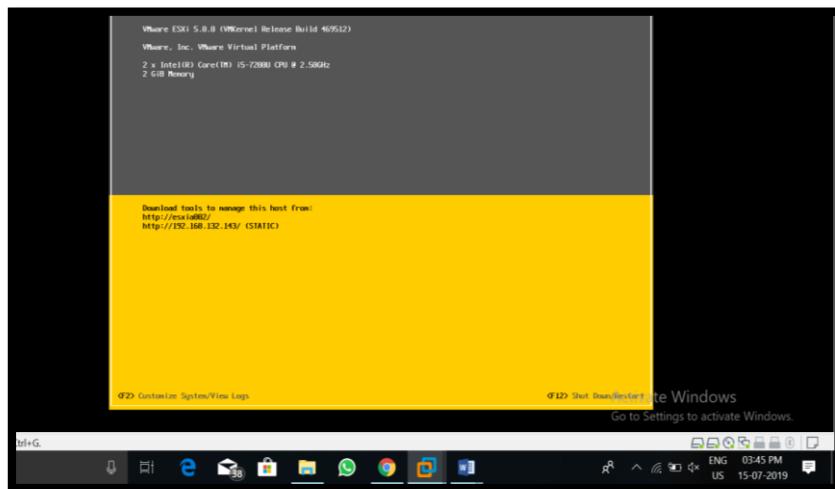


Figure 7

7.STATIC IP ADDRESS OF SERVER

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.

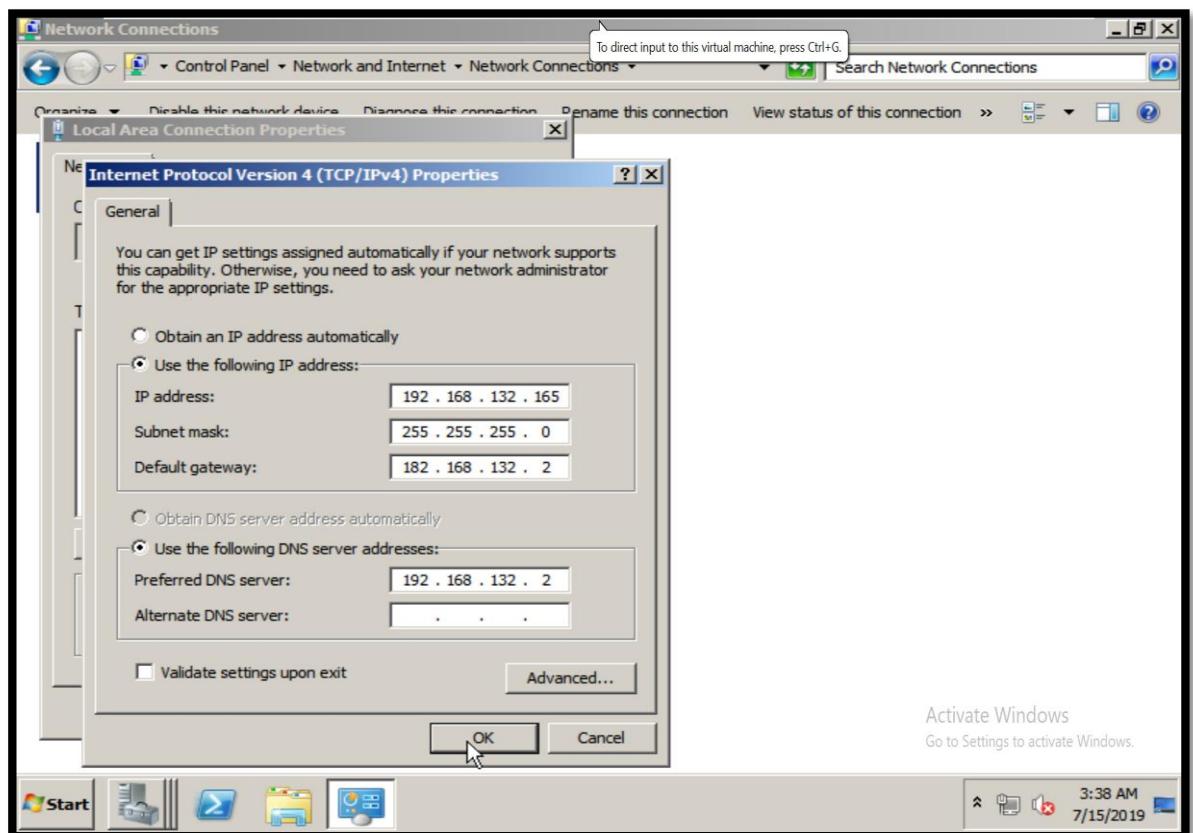


Figure 8

8.CREATING ACTIVE DIRECTORY SERVER

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.

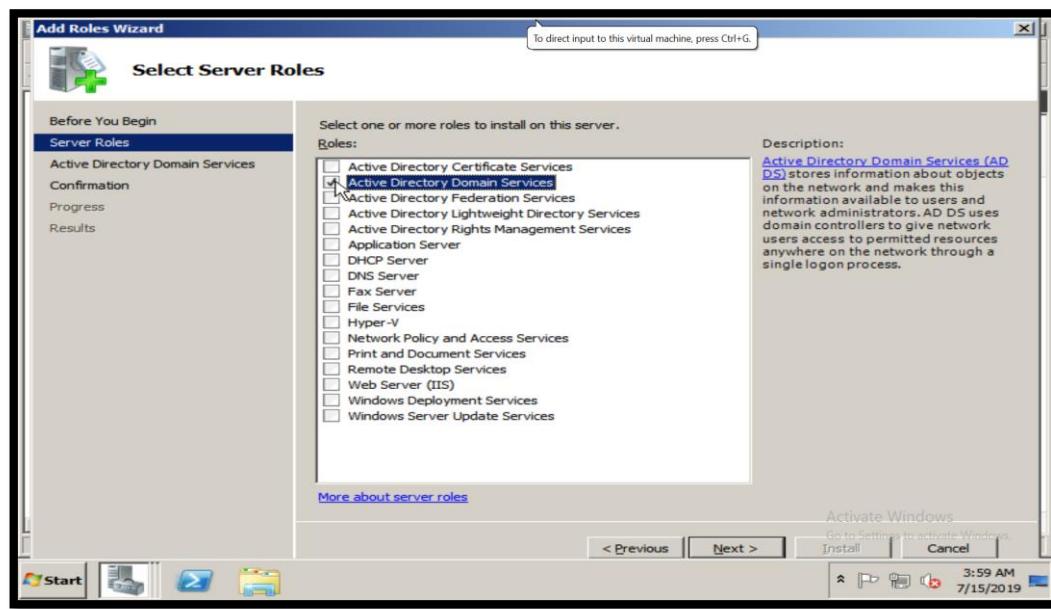


Figure 9

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.

9.LAUNCHING AD-DS 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.

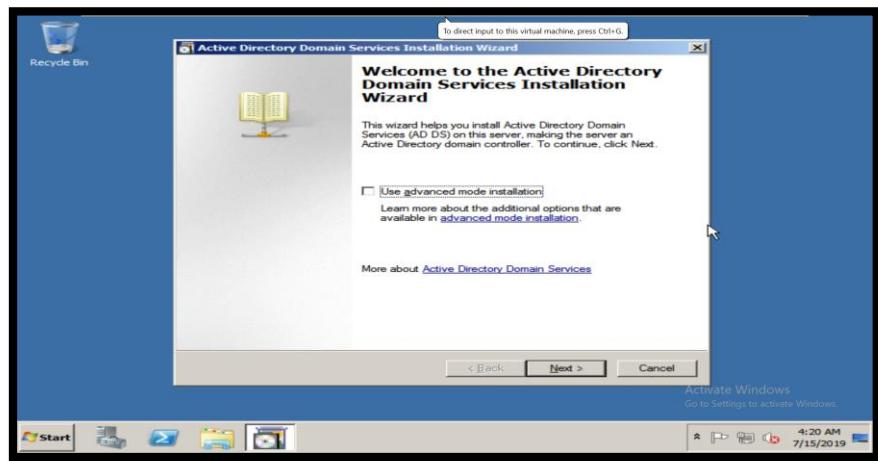


Figure 10

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.

10.CREATING DOMAIN (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.

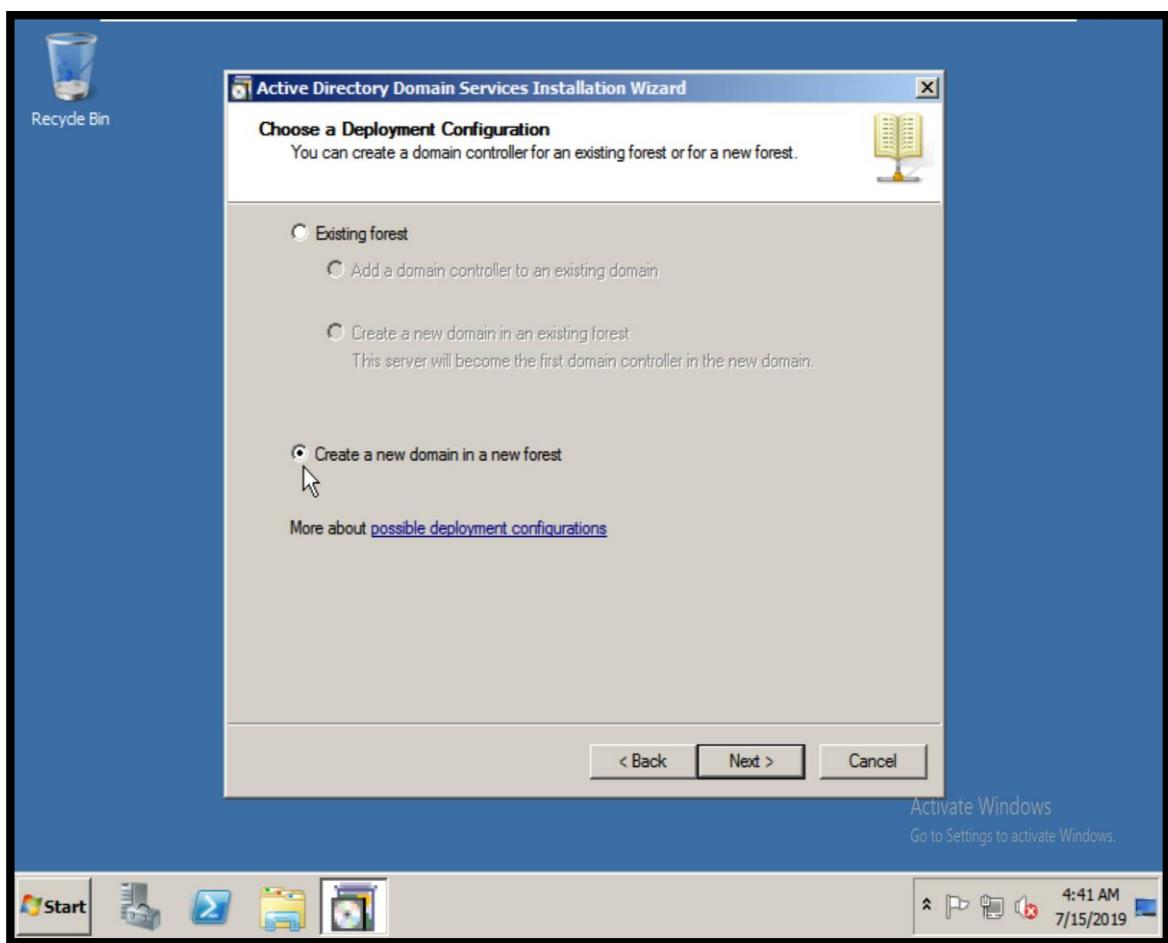


Figure 11

11. ASSIGNING 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. 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. We set the password as 12345@abcde (for a change). Click next and it will start configuring the Active Directory Domain Services. After rebooting this will be your Domain Administrator account.



Figure 12

12.ADDING VIM IN CLIENT01

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 To add VIM, turn off the virtual machine.

Go to edit settings, click on CD/DVD option, and 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.

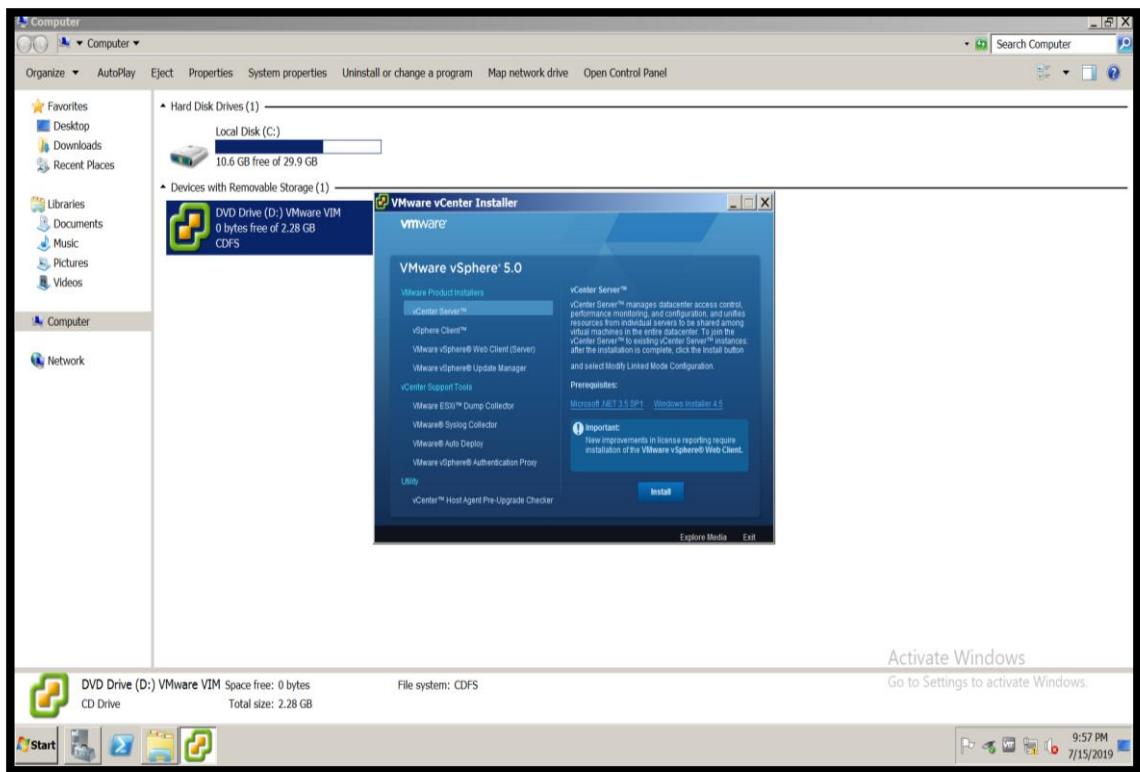


Figure 13

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

13. STATIC IP ADDRESS 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.

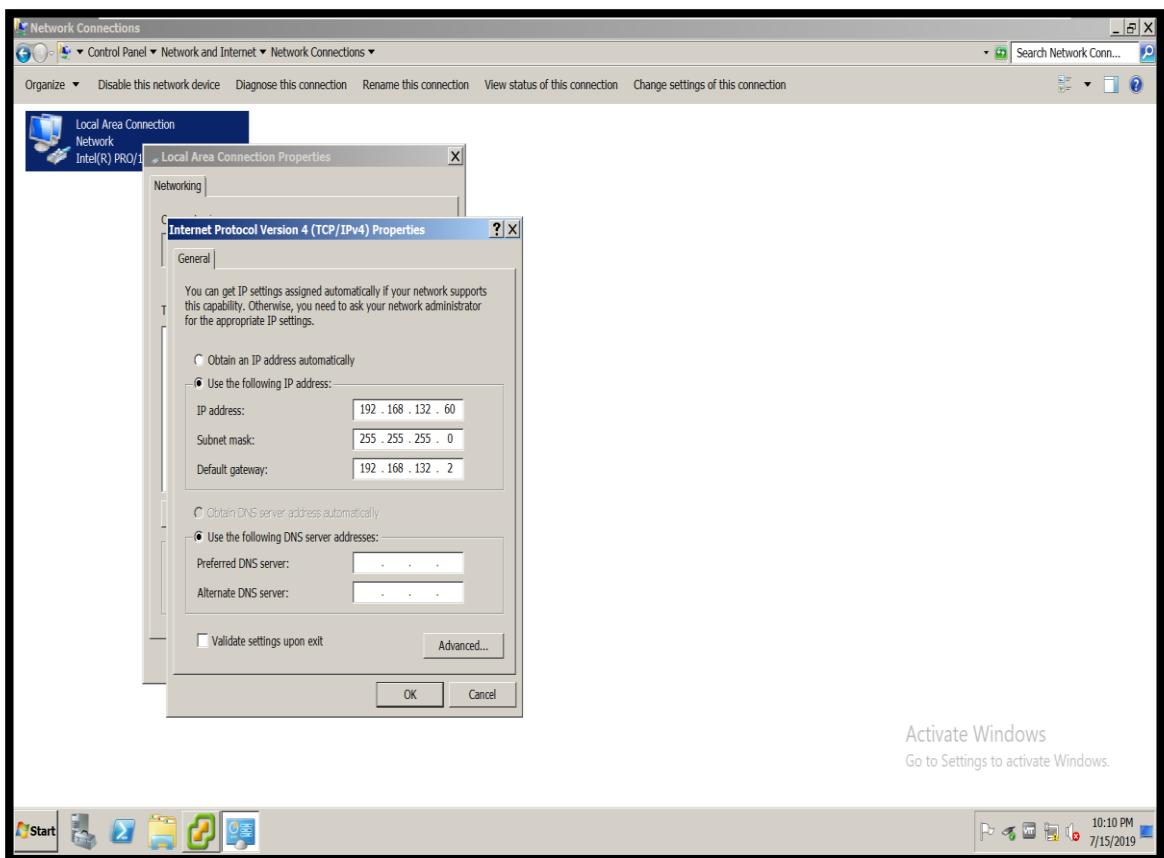


Figure 14

Click ok to save the settings.

14.LOGIN TO ESXI SERVER BY VSphere CLIENT

Open the VMware vSphere client, login with the IP address of Client01, type your username and password of the machine.

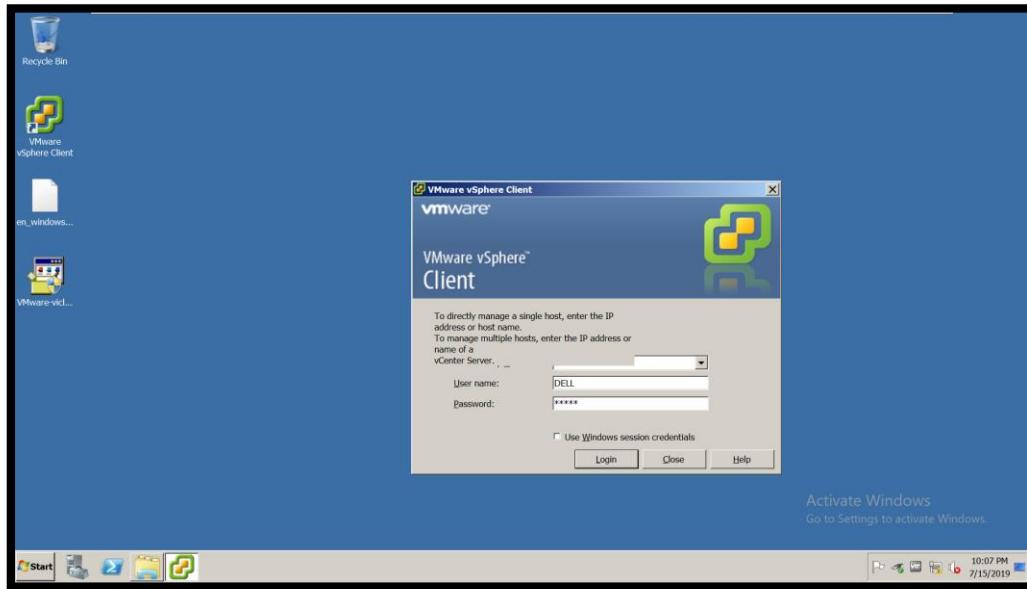


Figure 15

15.CREATING DATACENTER IN WIN2008

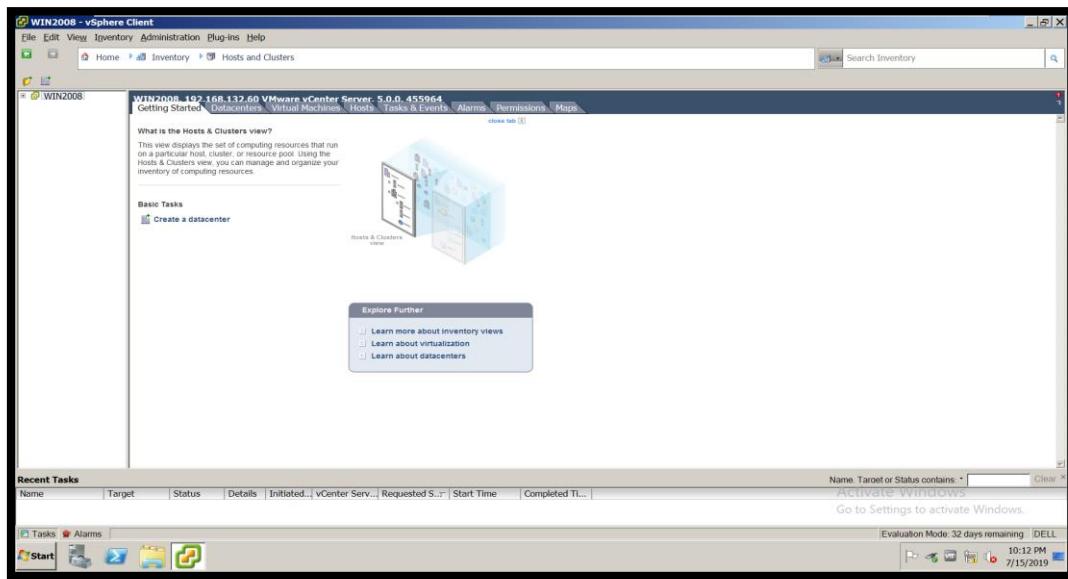


Figure 16

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

16.CREATING HOST IN DATACENTER

Right click on the My_Datastore and Add Host.

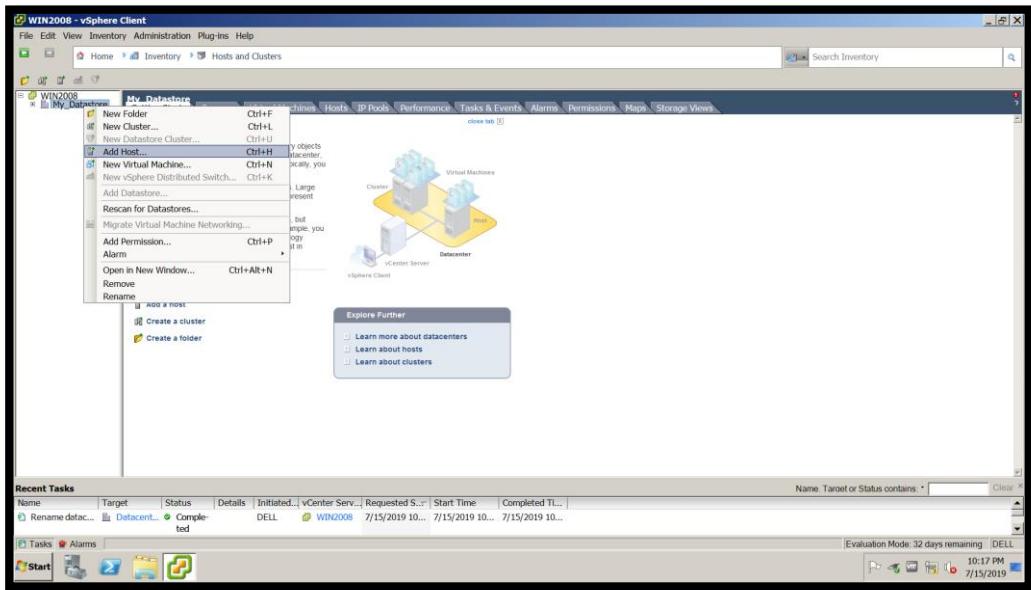


Figure 17

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

Now, you can see your Host in your Datacenter.

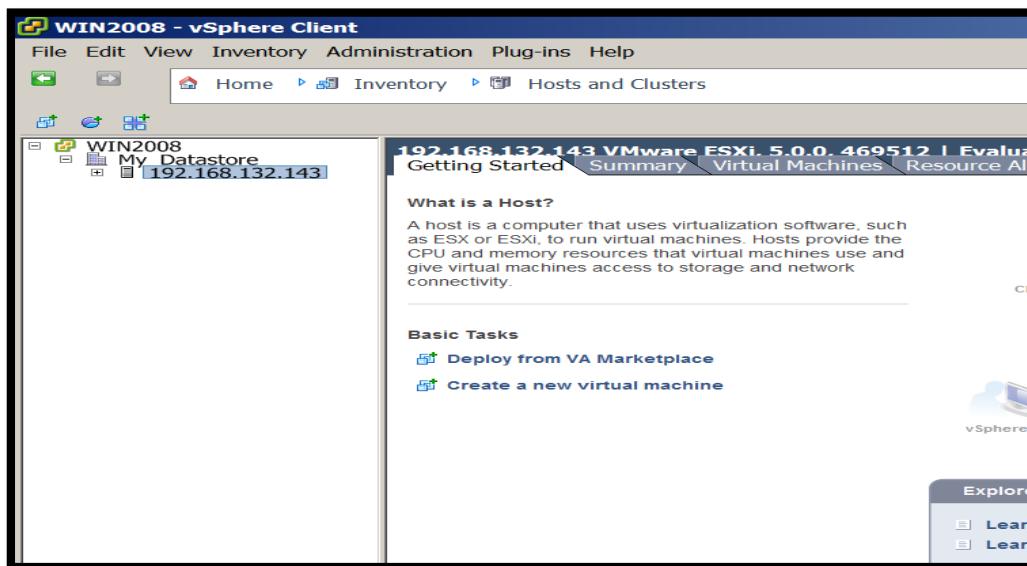


Figure 18

17.CREATING 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.

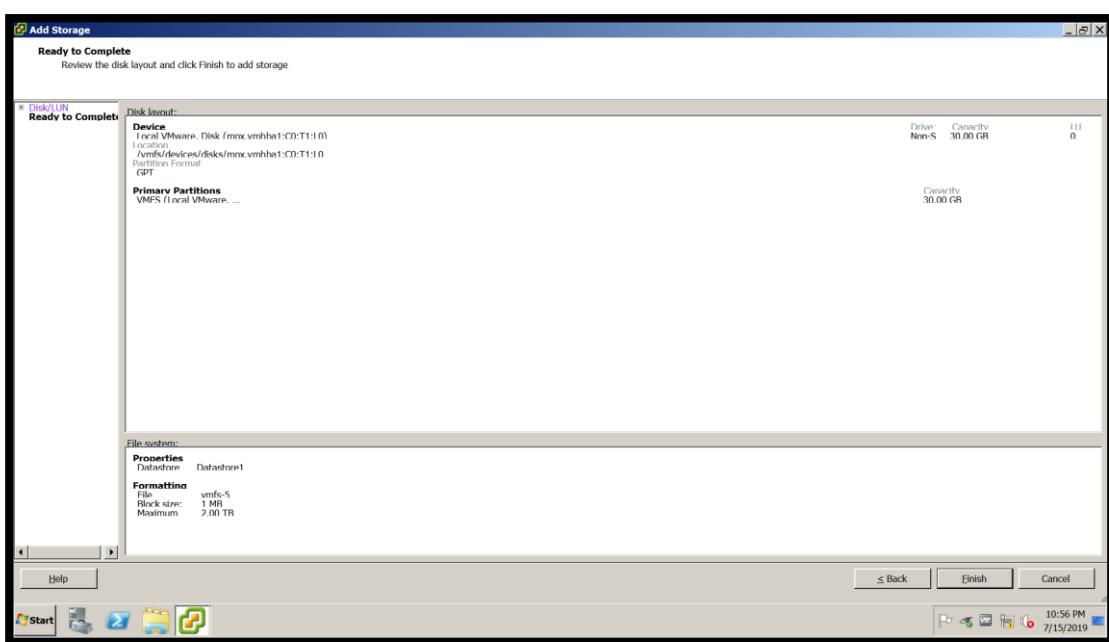


Figure 19

18.CREATING A VM 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.

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.

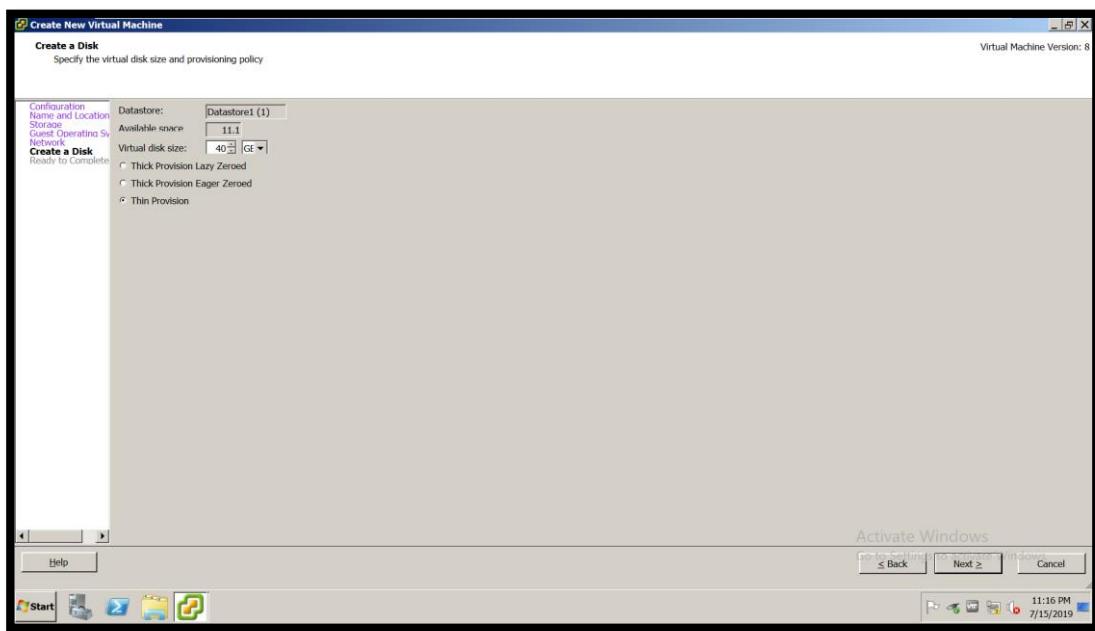


Figure 20

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.

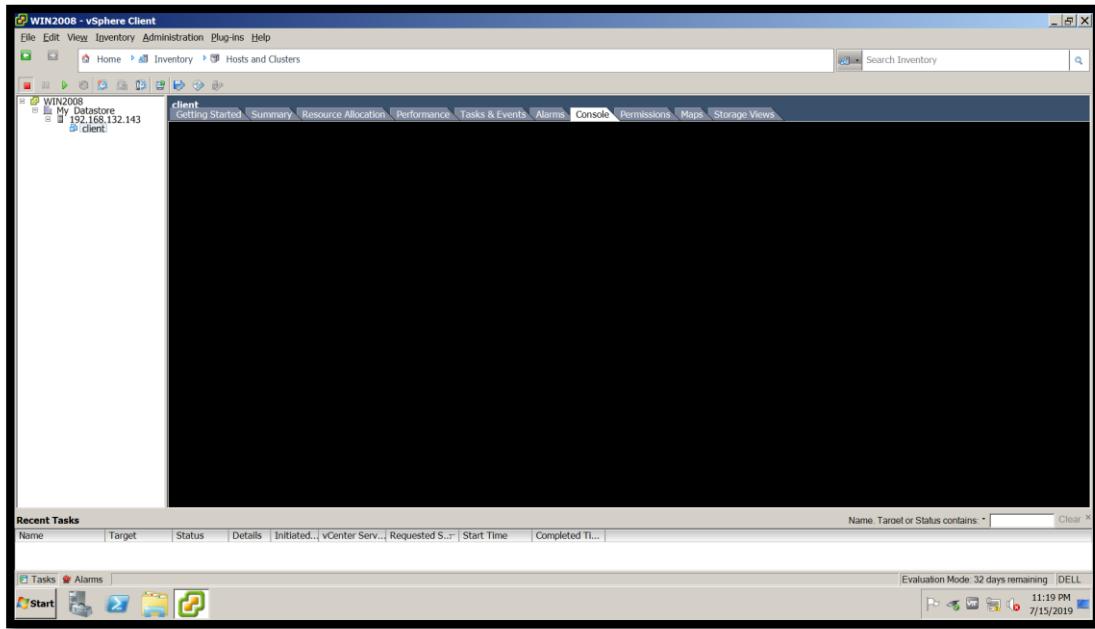


Figure 20

19.UPLOADING ISO IMAGE OF WINDOWS IN 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. Create a new folder in the datastore, name it ISO. Enter the ISO folder and upload ISO image from the desktop.

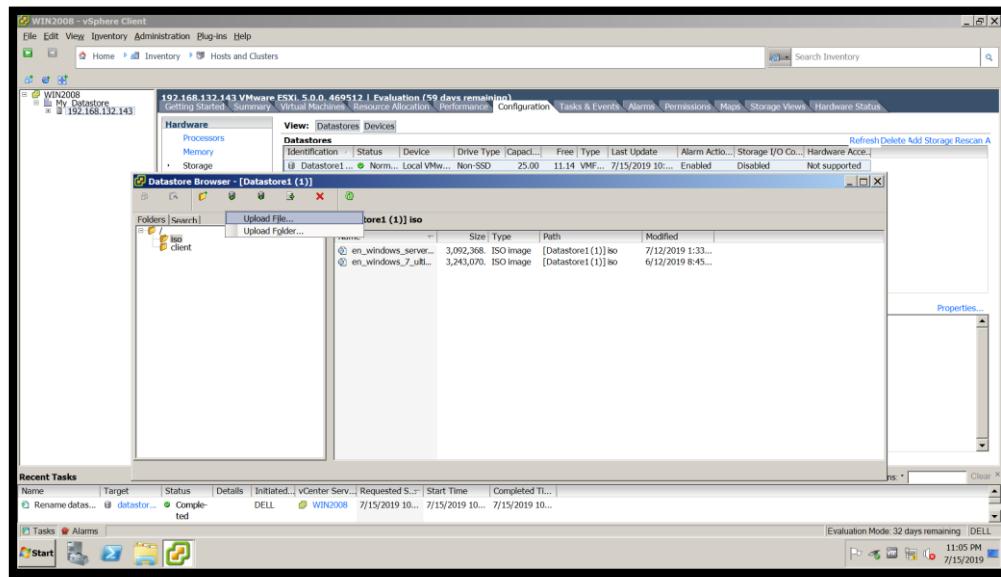


Figure 21

20.BROWSE ISO IN CLIENT & 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).

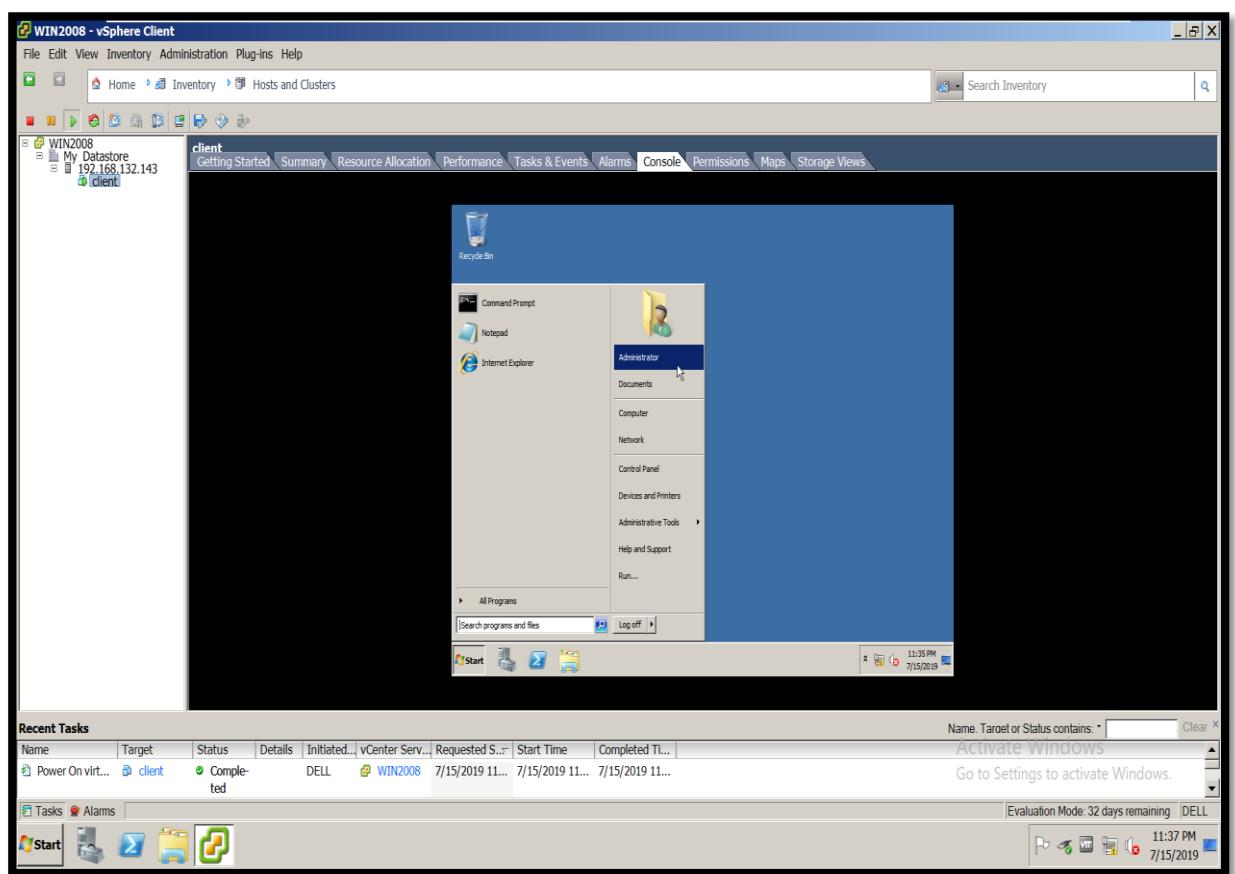


Figure 22

22.CONNECTING CLIENT AND 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**). 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 more 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

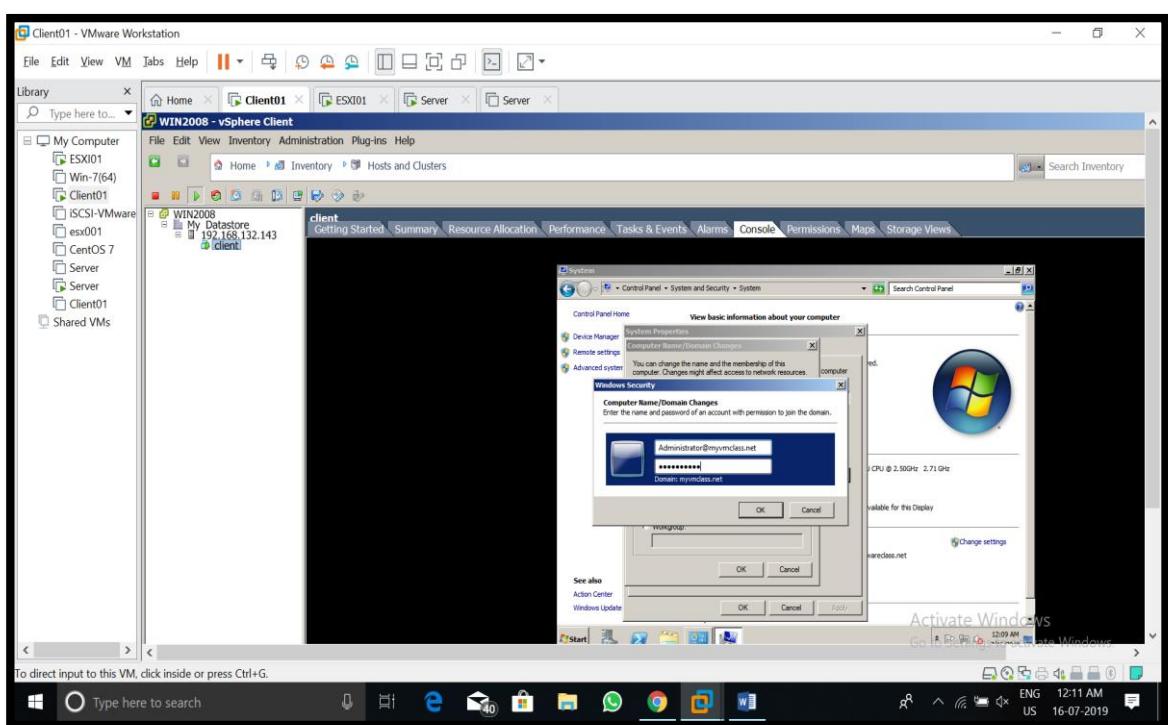


Figure 23

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.

23.CHECKING USERS IN 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.

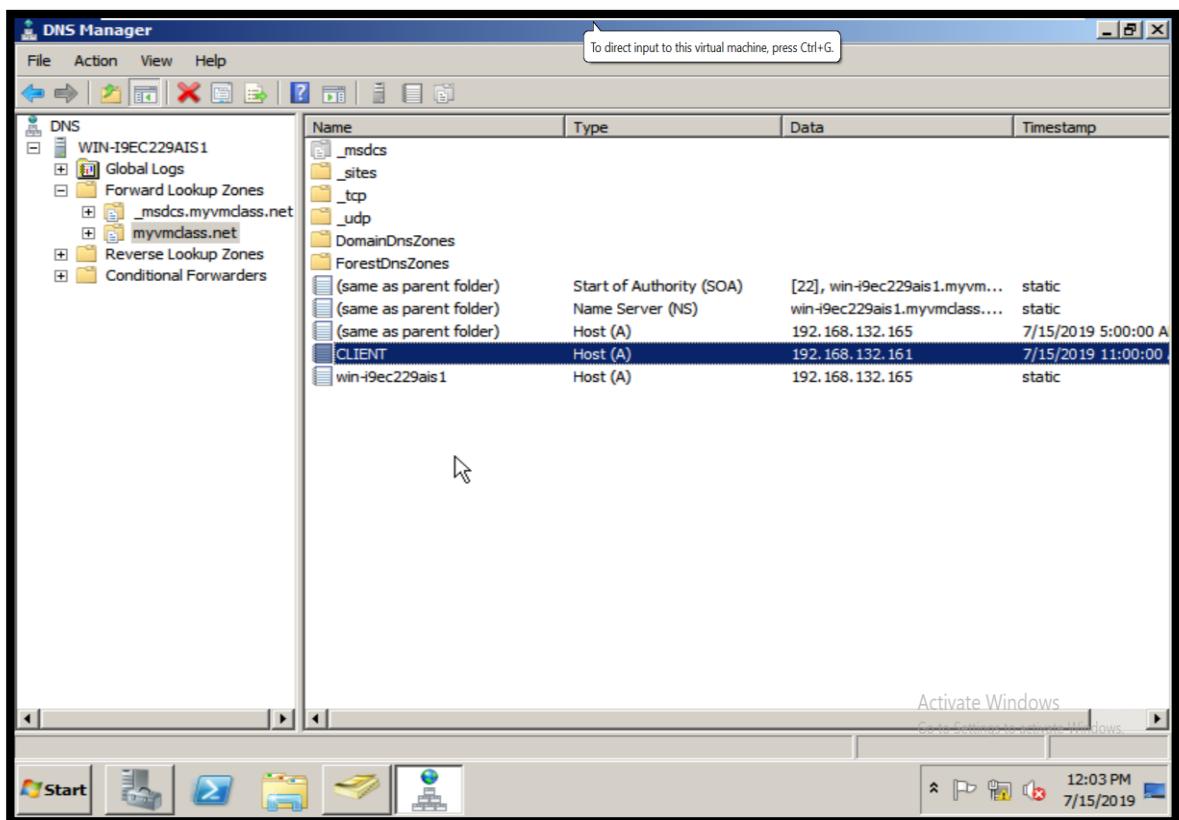


Figure 24

24.JOIN THE ESXI AS USER

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.

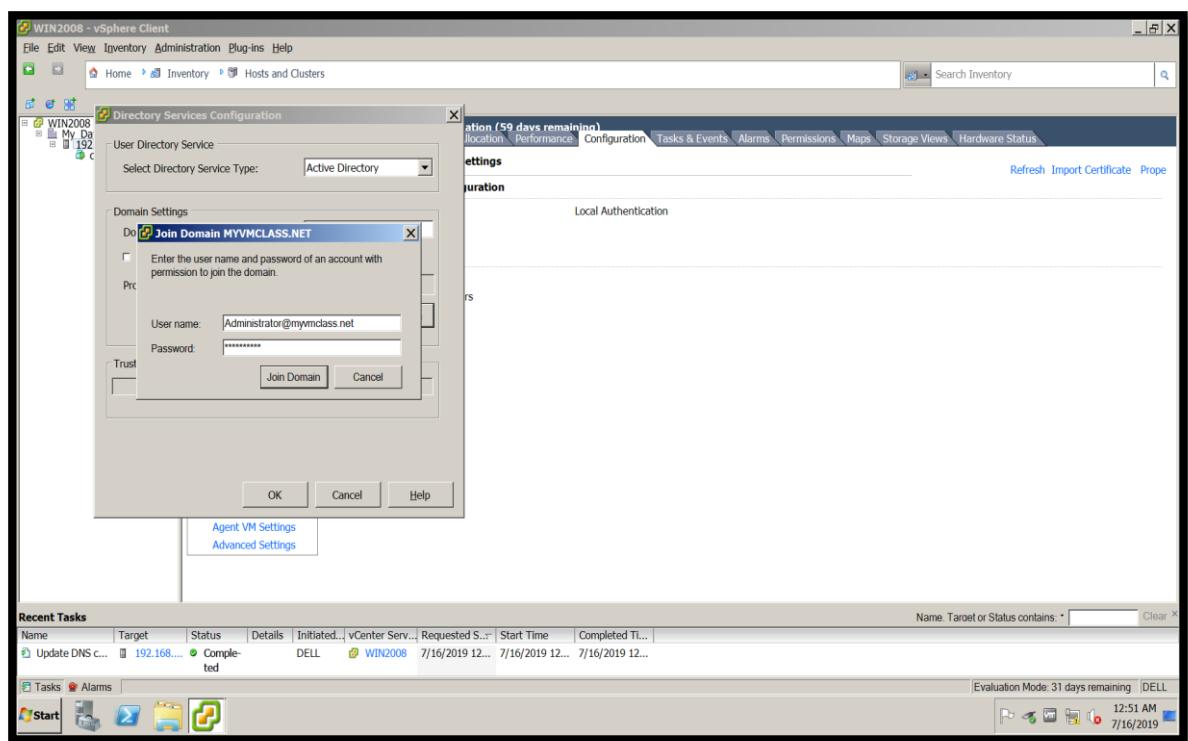


Figure 25

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

25.ADDING ESXI HOST

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.

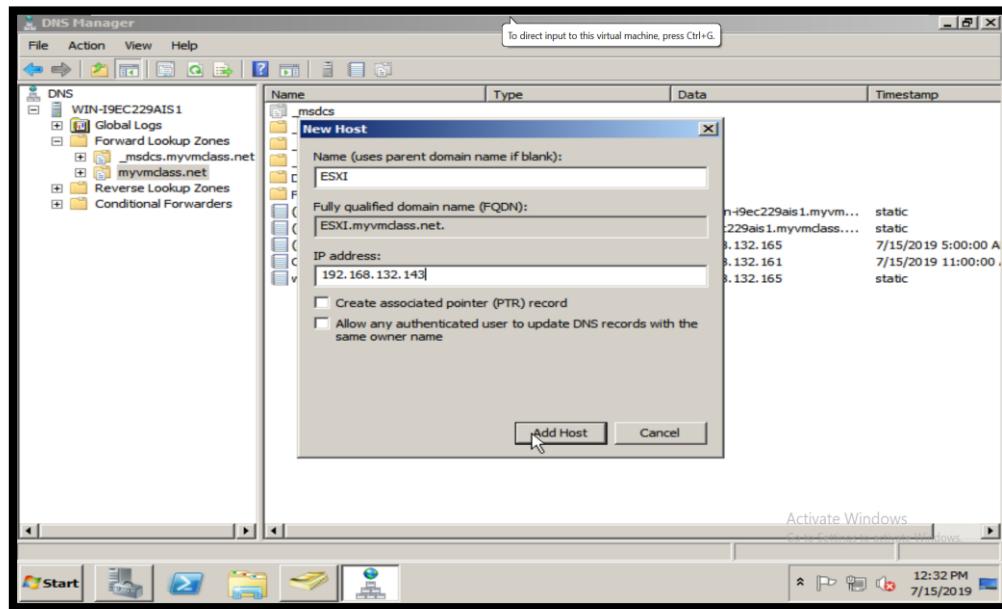


Figure 26

Host created successfully! The host can be now visible in the list.

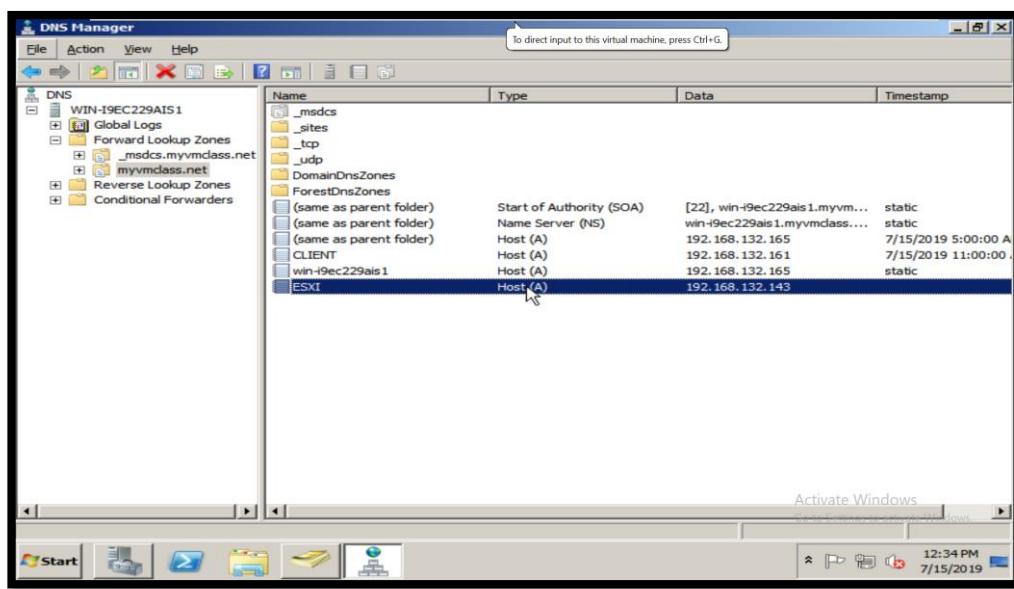


Figure 27

26.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

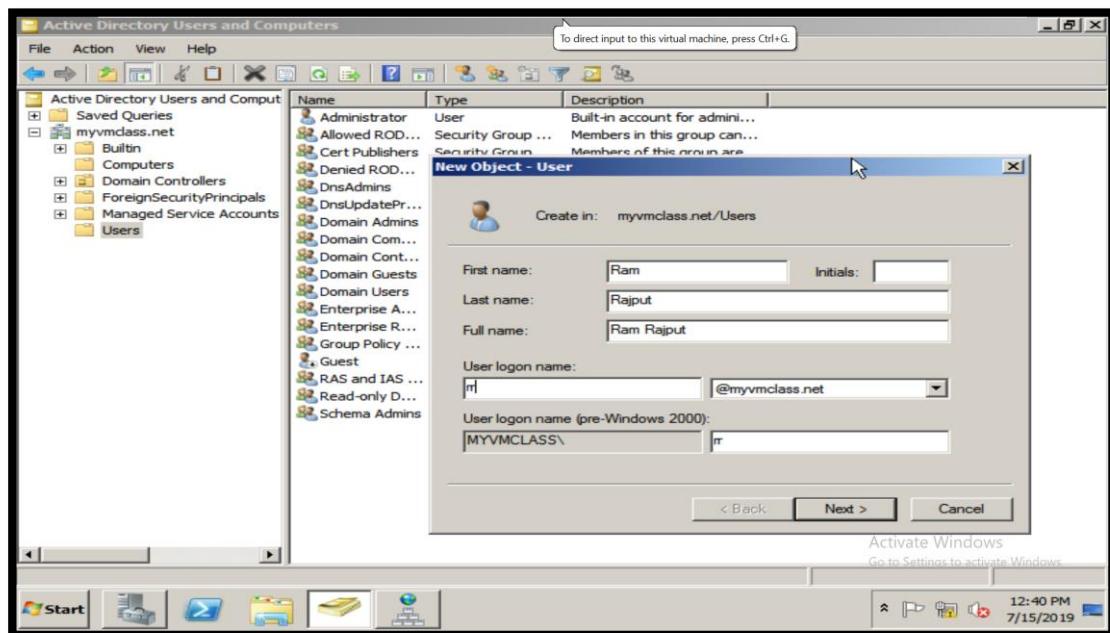


Figure 28

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

Now, the list contains the name of new user.

27.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.

Now, expand Group Policy Management, expand Forest: myvmclass.net, expand Domains and expand myvmclass.net. Then click on Default Domain Policy.

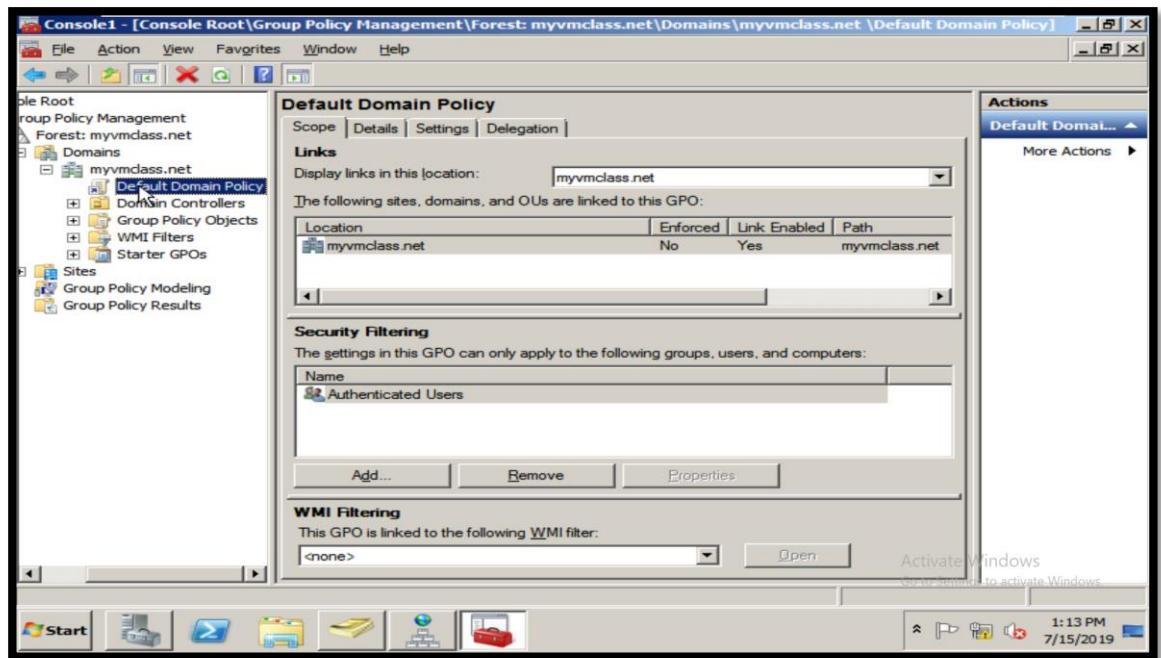


Figure 29

Then right click on Default Domain Policy, and select Edit. It leads to the Group Policy Management Editor. 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.

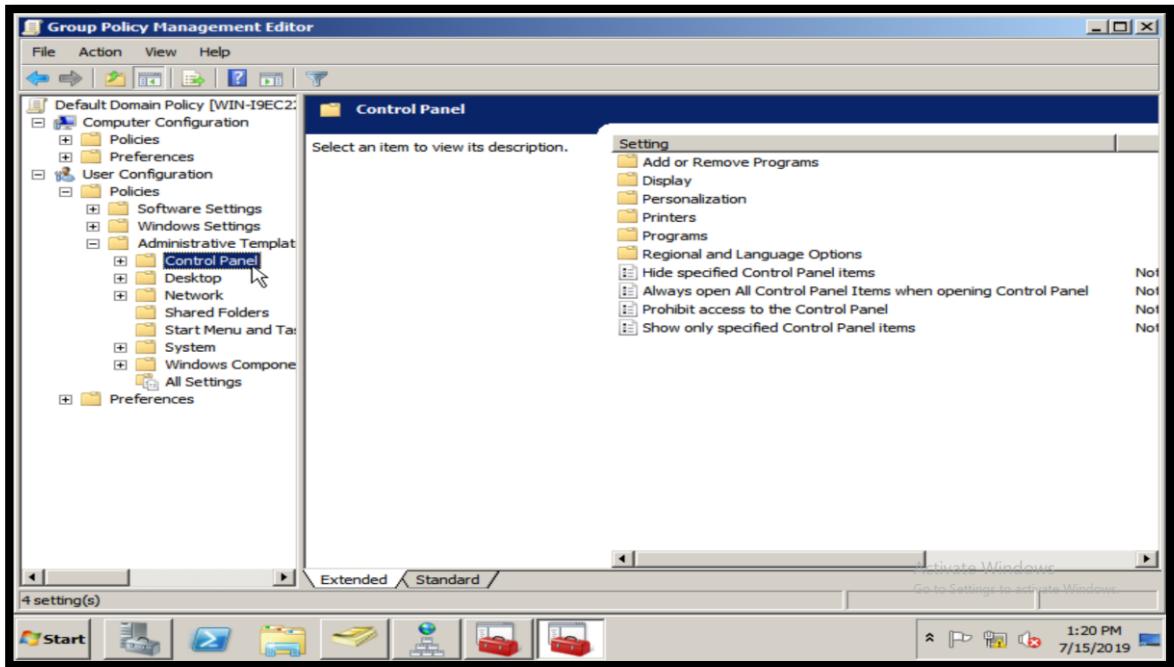


Figure 30

28.RUN GPUPDATE

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

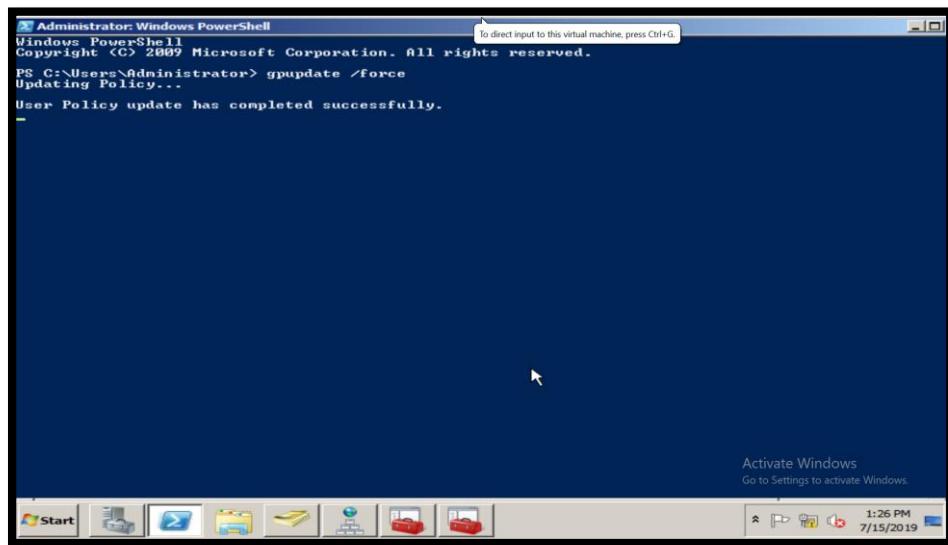


Figure 31

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.

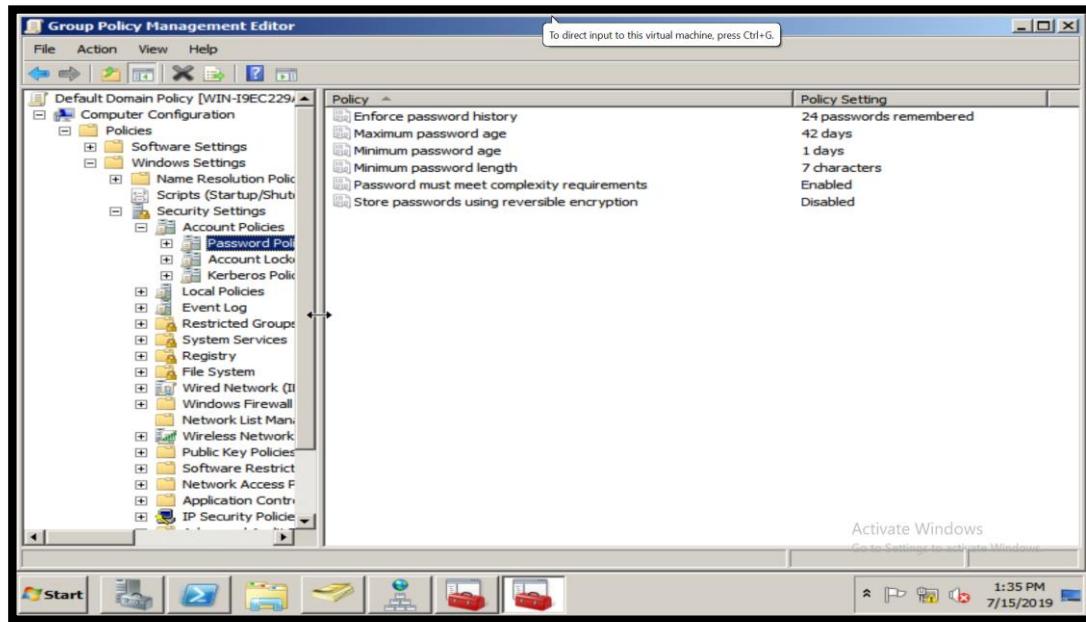


Figure 32

Set the min length of password: 5. Restricting password length on User

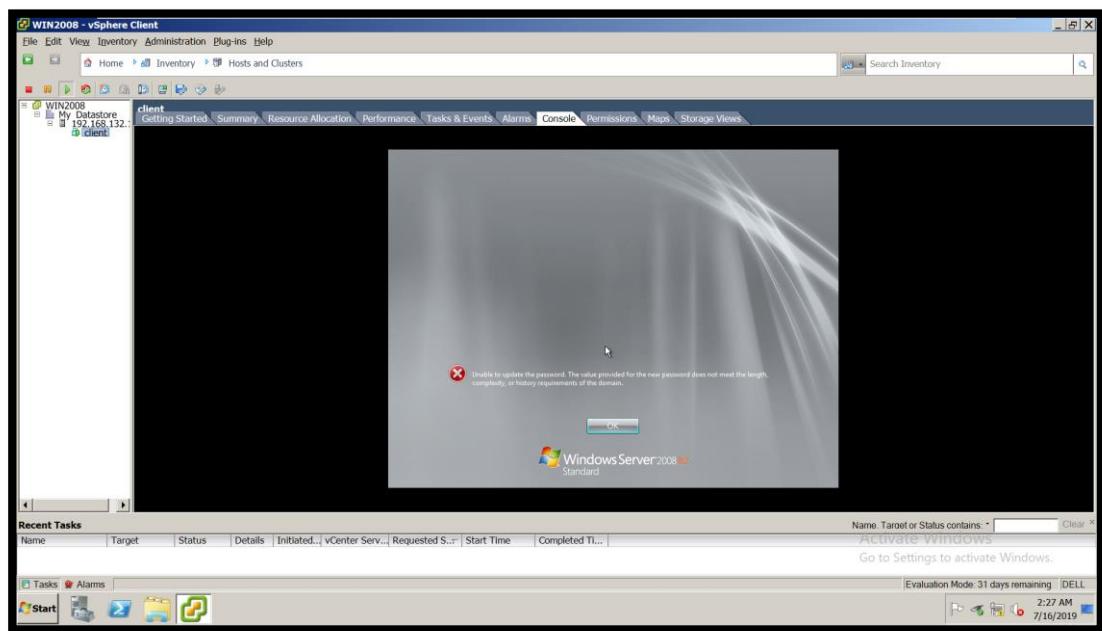


Figure 33

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.

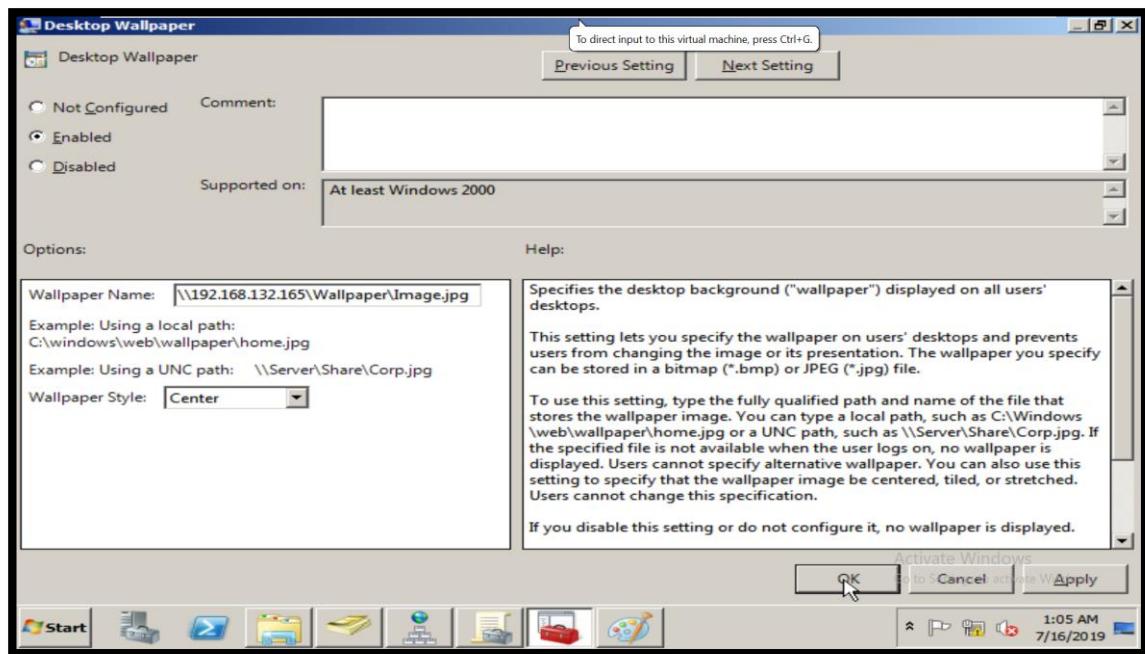


Figure 34

Restart all the users.

Desktop changed in the Server.

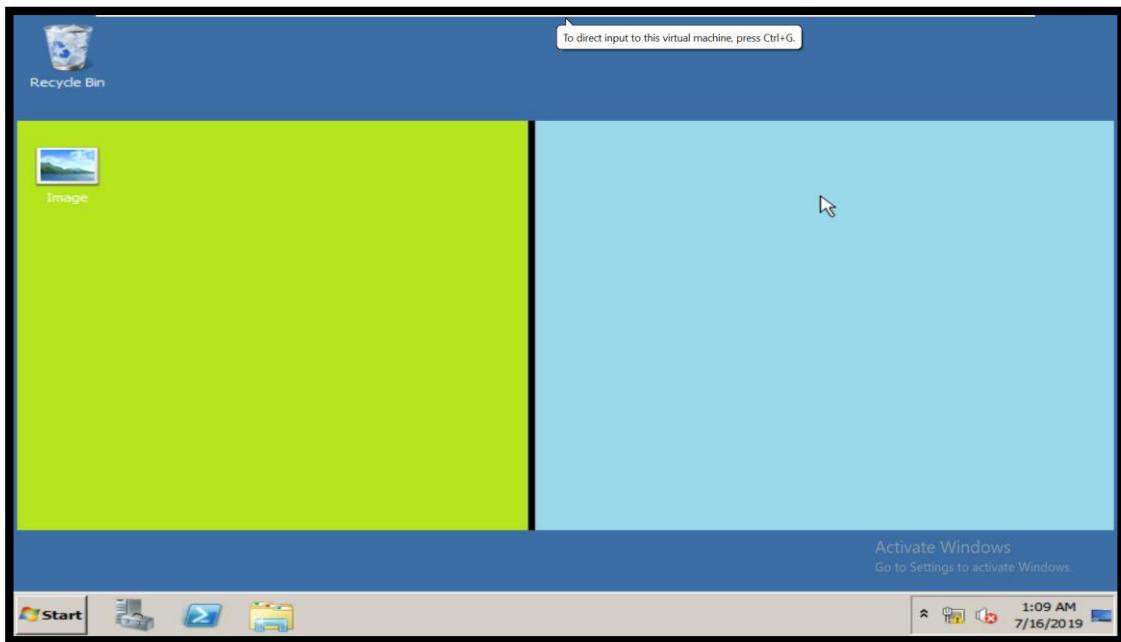


Figure 35

The Desktop of User Ram Rajput also changes.

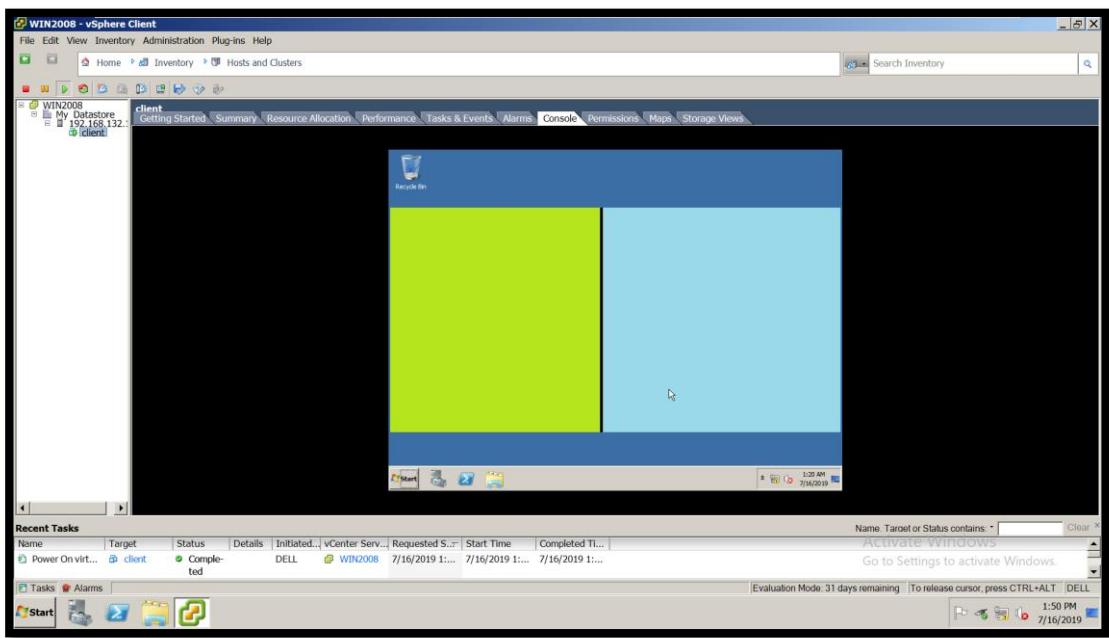


Figure 36

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