



**Practical Report
On
Cloud Management**

**SUBMITTED BY
SHAIKH MOHD SUFFIYAN
SEAT NO: 1312206**

in partial fulfilment of the requirements of

**MASTERS OF SCIENCE (INFORMATION TECHNOLOGY)
PART I – SEM II**

DEPARTMENT OF INFORMATION TECHNOLOGY

**COSMOPOLITAN'S
VALIA C.L. COLLEGE OF COMMERCE &
VALIA L.C. COLLEGE OF ARTS
(Affiliated to University of Mumbai)**

D.N. NAGAR, ANDHERI (WEST), MUMBAI 400 053

2023 – 2024

CLOUD MANAGEMENT

VALIA C.L. COLLEGE OF COMMERCE &

VALIA L.C. COLLEGE OF ARTS

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DEPARTMENT OF INFORMATION TECHNOLOGY



CERTIFICATE

This is to certify that the Journal of "**Cloud Management**", is Bonafede work of **SHAIKH MOHD SUFFIYAN** bearing Seat No: **1312206** submitted in partial fulfillment of the requirements for the award of P.G of **MASTERS OF SCIENCE IN INFORMATION TECHNOLOGY** from **University of Mumbai**.

Internal Guide

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External Examiner

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Co-Ordinator

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Date:

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Name: Gufran Qureshi

Name:

Name: Aarti Patkar

College Seal:

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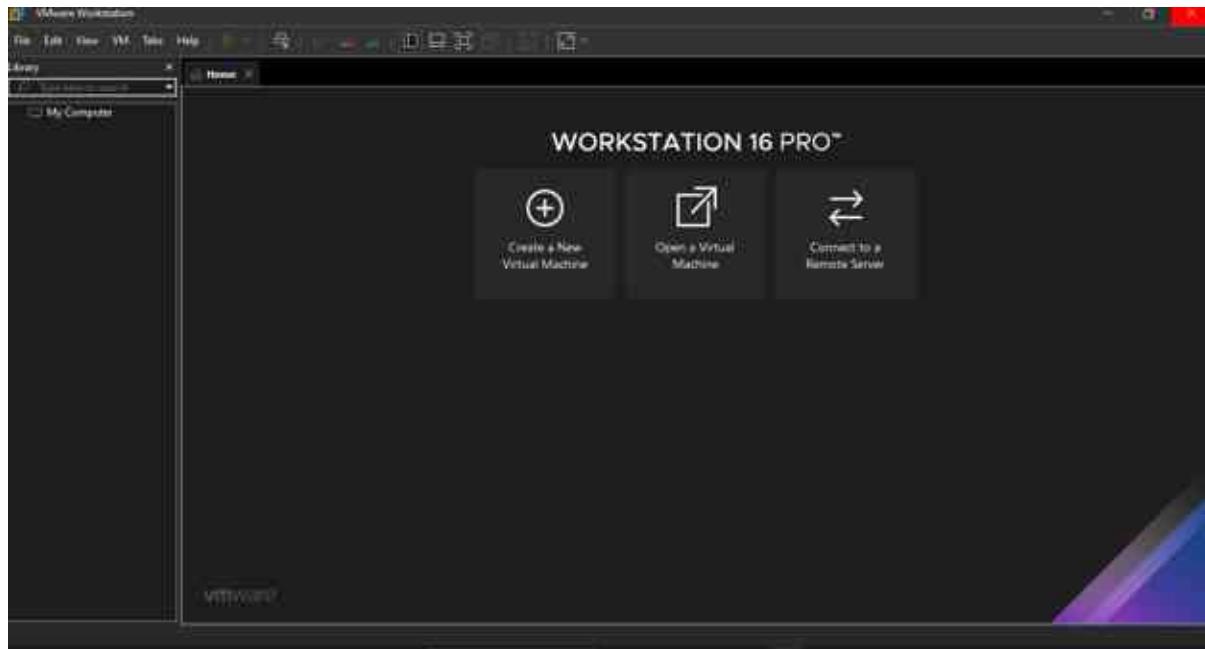
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Practical: 1

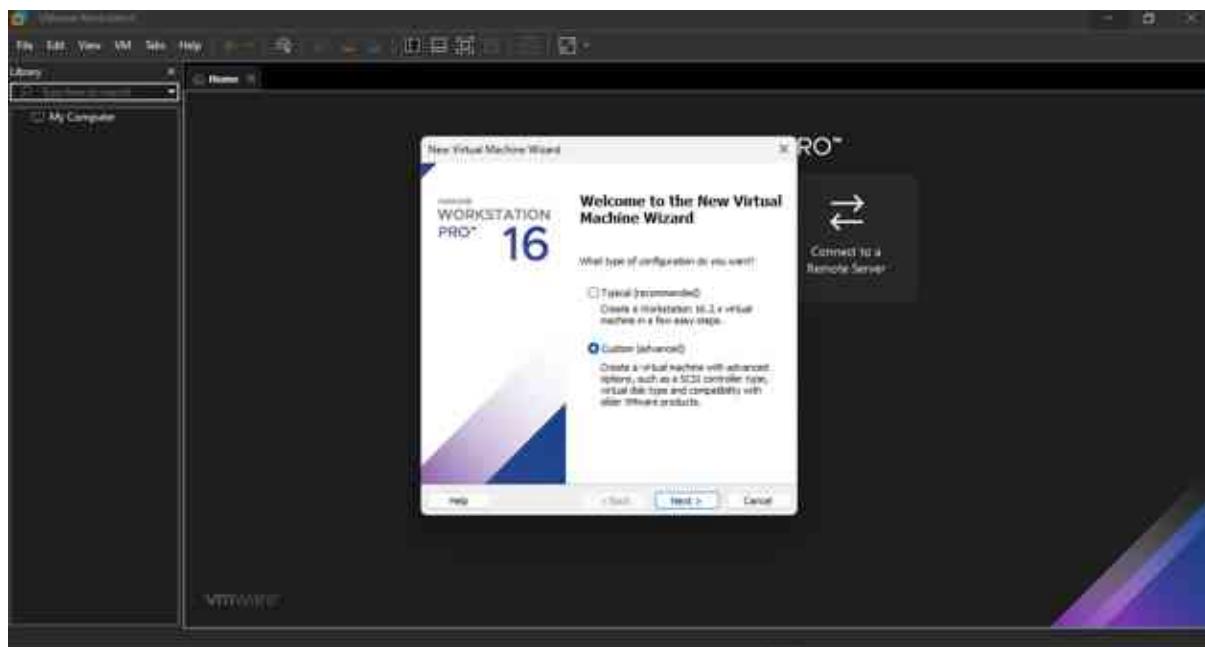
Aim: Managing Hyper-V Environment with SCVMM 2012

Step 1: Creation of Virtual Machine (Windows Server 2016)

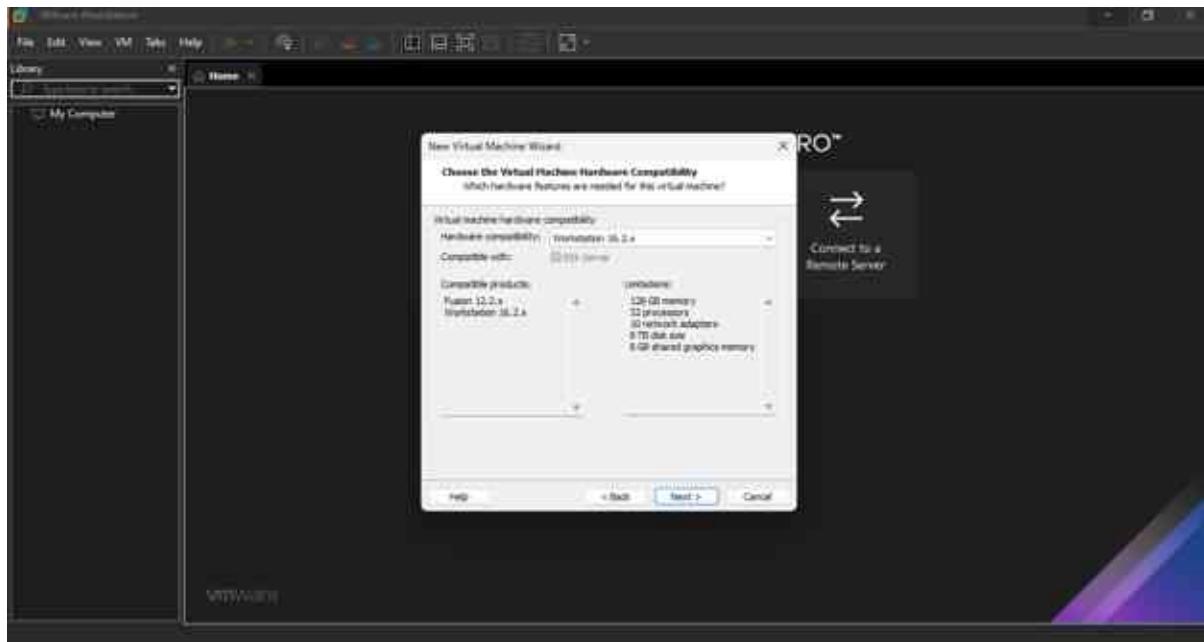
Open VMware Workstation Pro and Click on Create a New VM



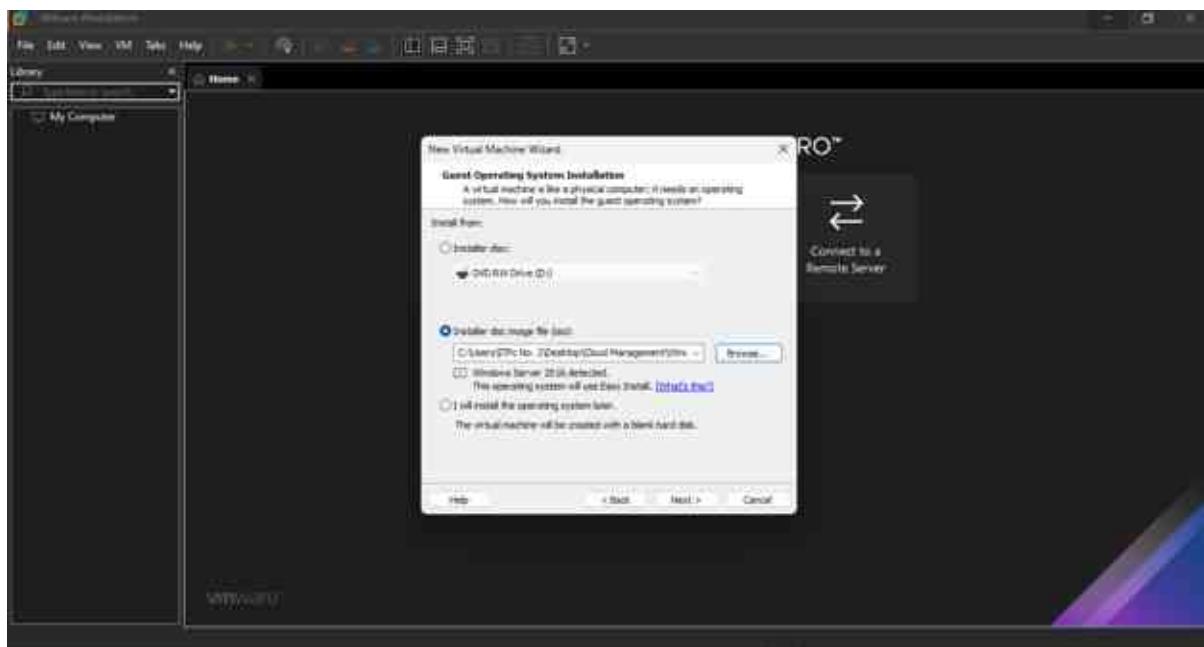
Step 2: Select Custom (advanced)



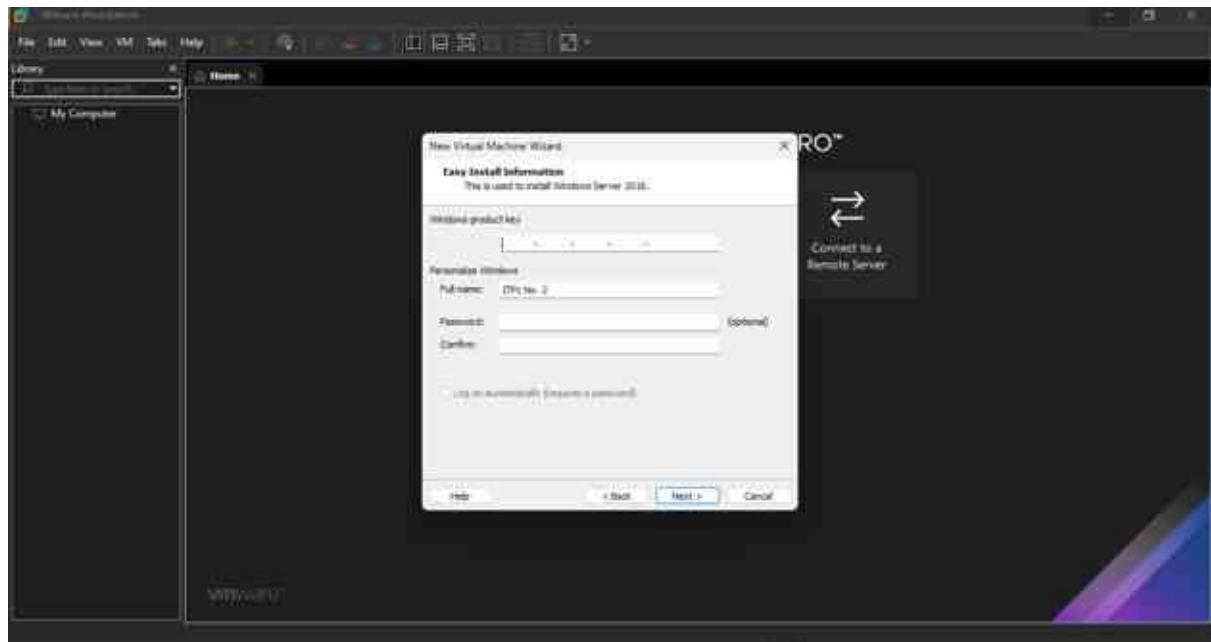
Step 3: Keep the Hardware Compatibility as default and click on Next



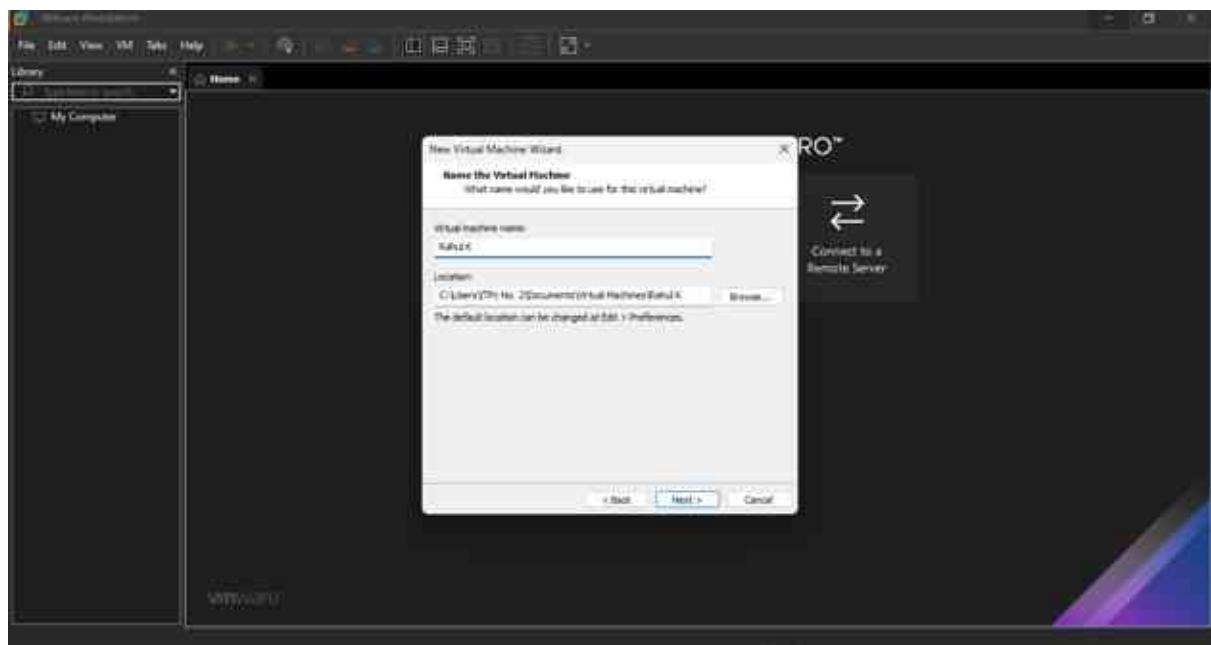
Step 4: Click on the Browser and select the Windows Server iso file from the directory.



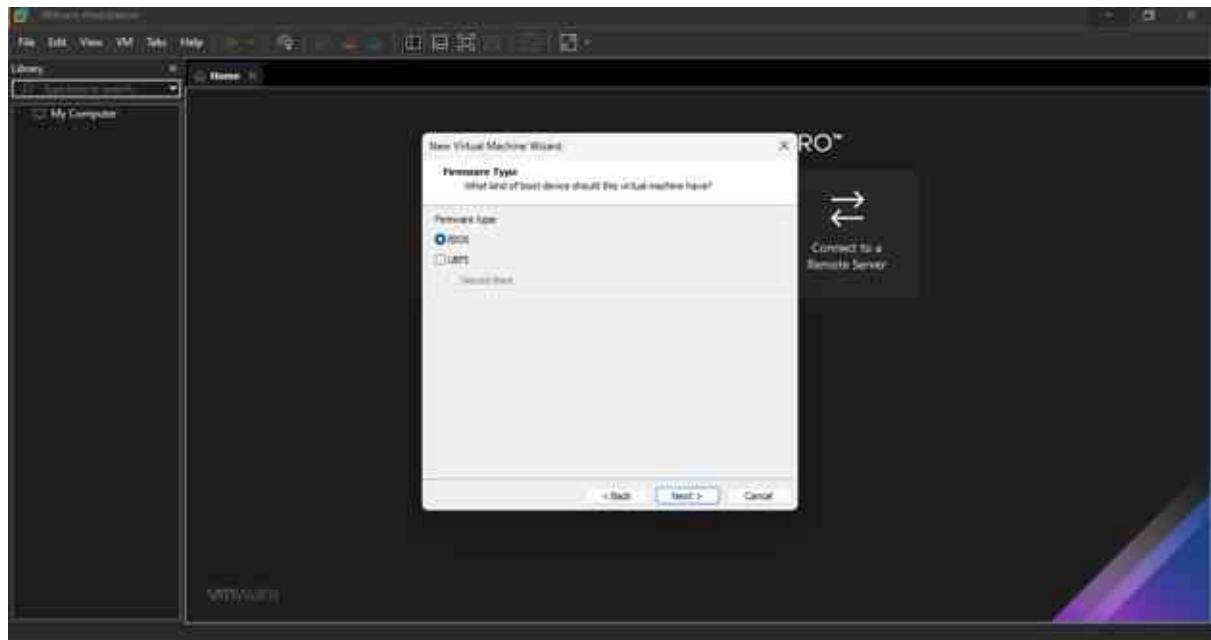
Step 5: Leave this Windows Server as default pop-up open click on ok and click Next.



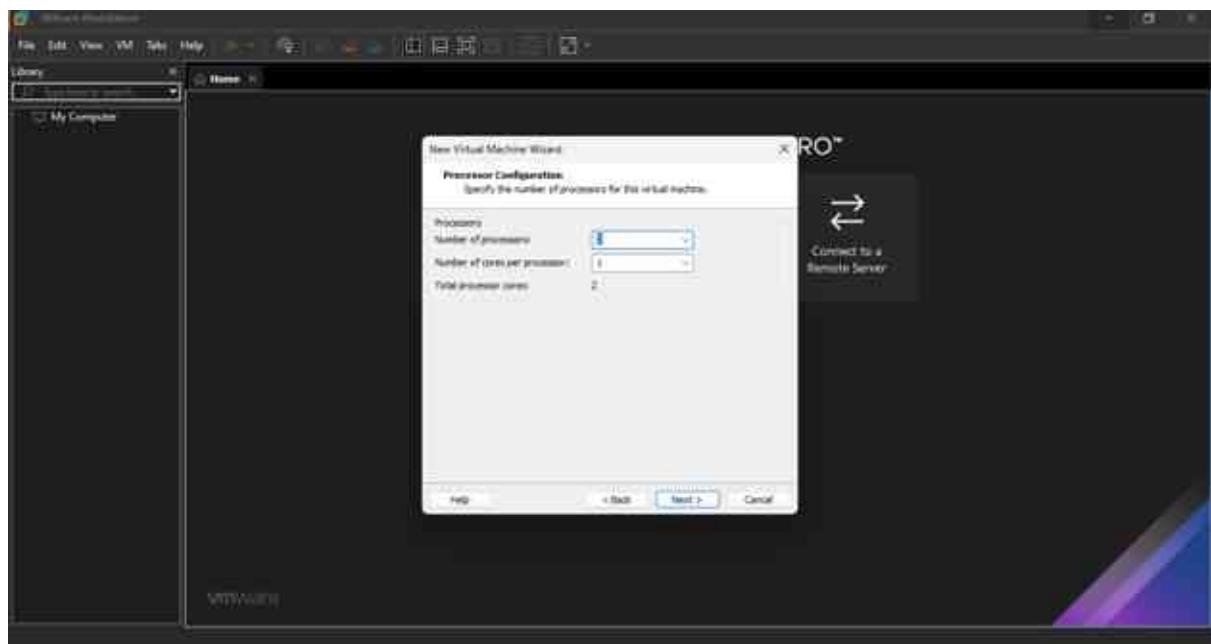
Step 6: Name the Virtual Machine: **Rahulk** and **click on Next**.



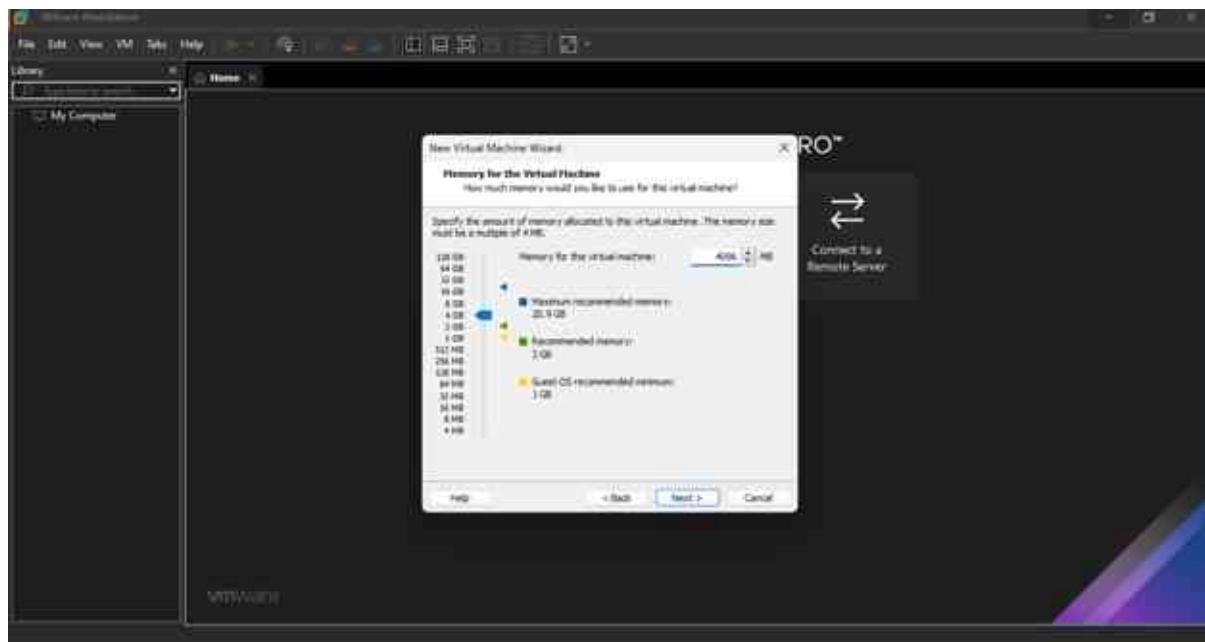
Step 7: Select Firmware Type **BIOS** and click on Next.



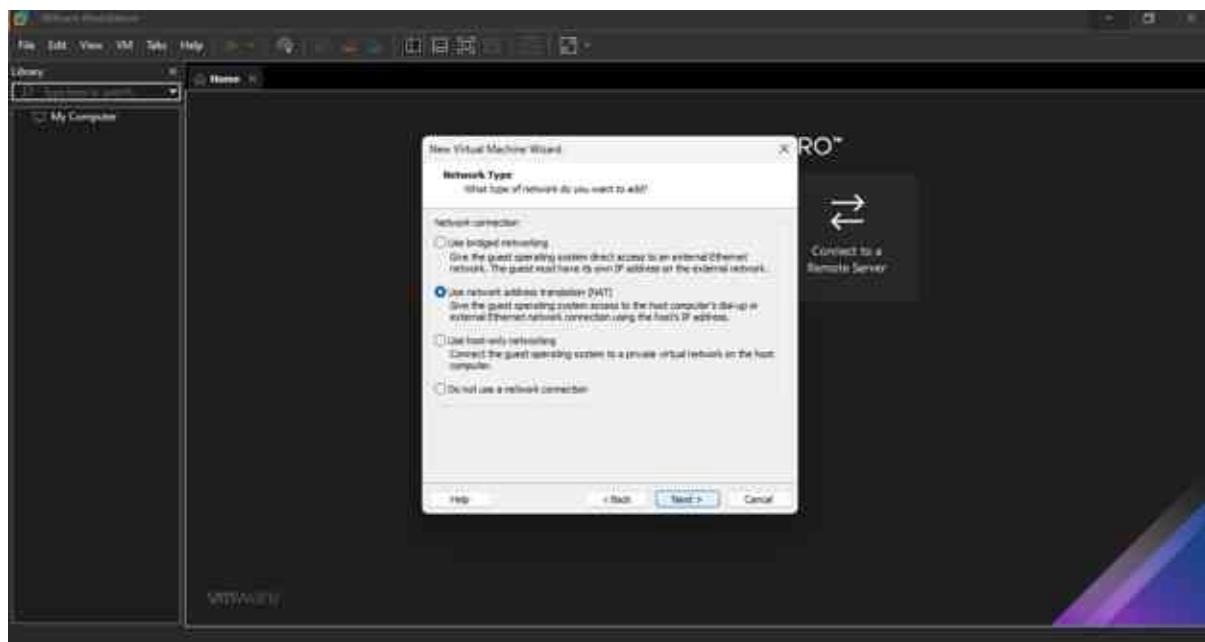
Step 8: Leave Processor Configuration as default and click on Next.



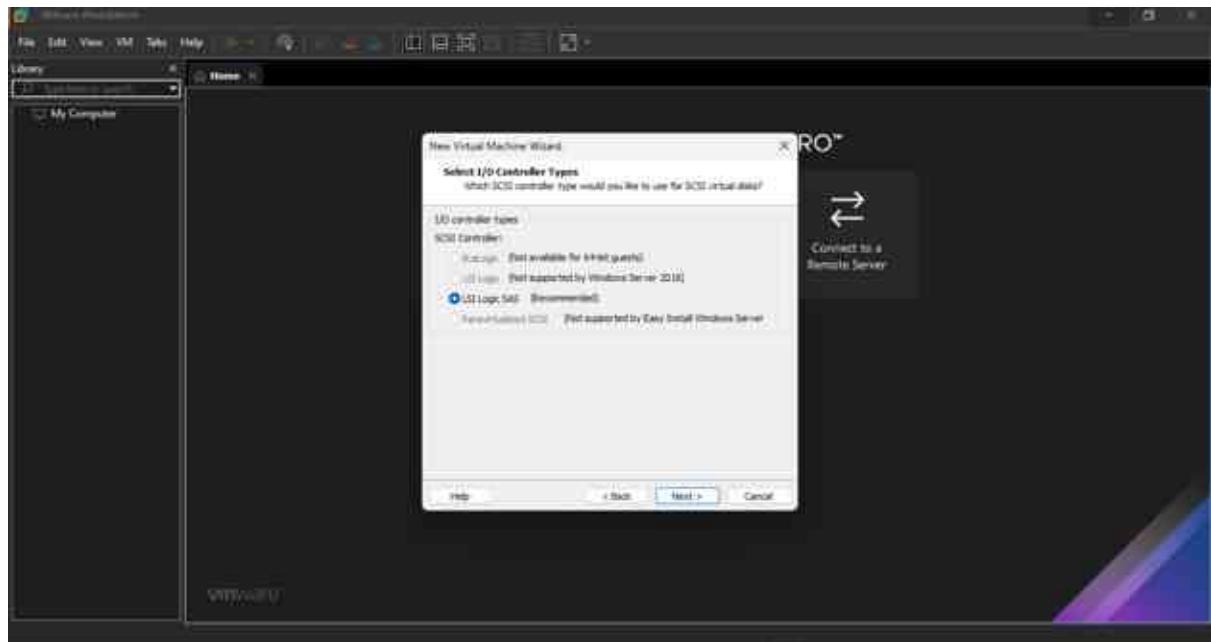
Step 9: Change the RAM to **4096 MB** and click on Next.



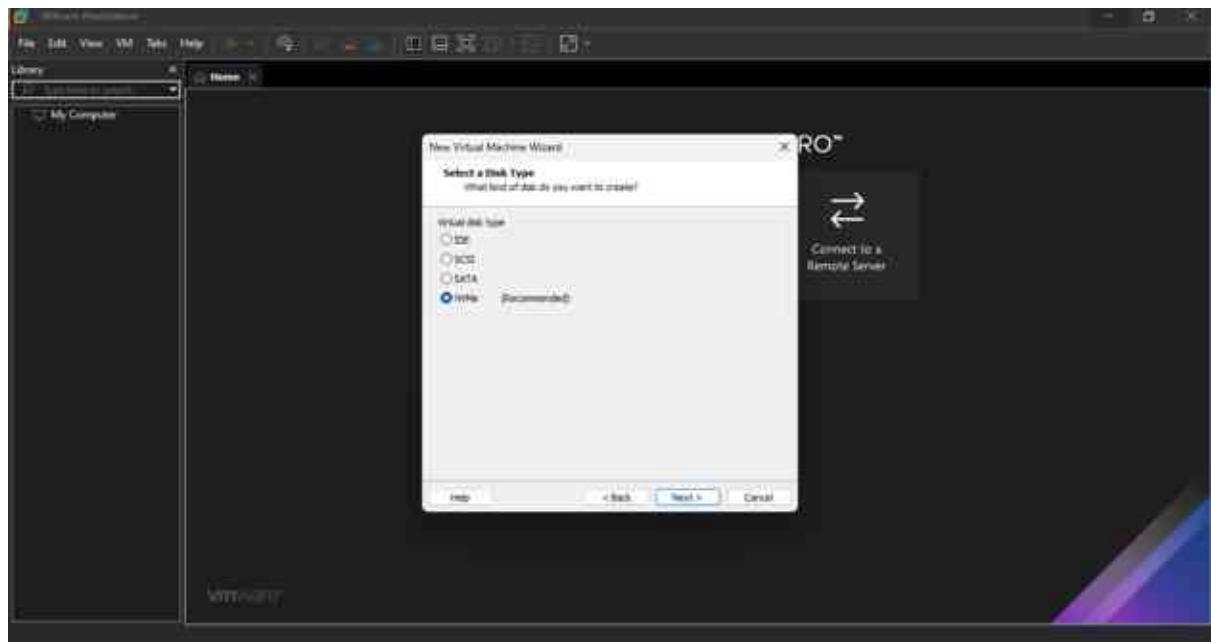
Step 10: Select Network Type **NAT** and click on Next.



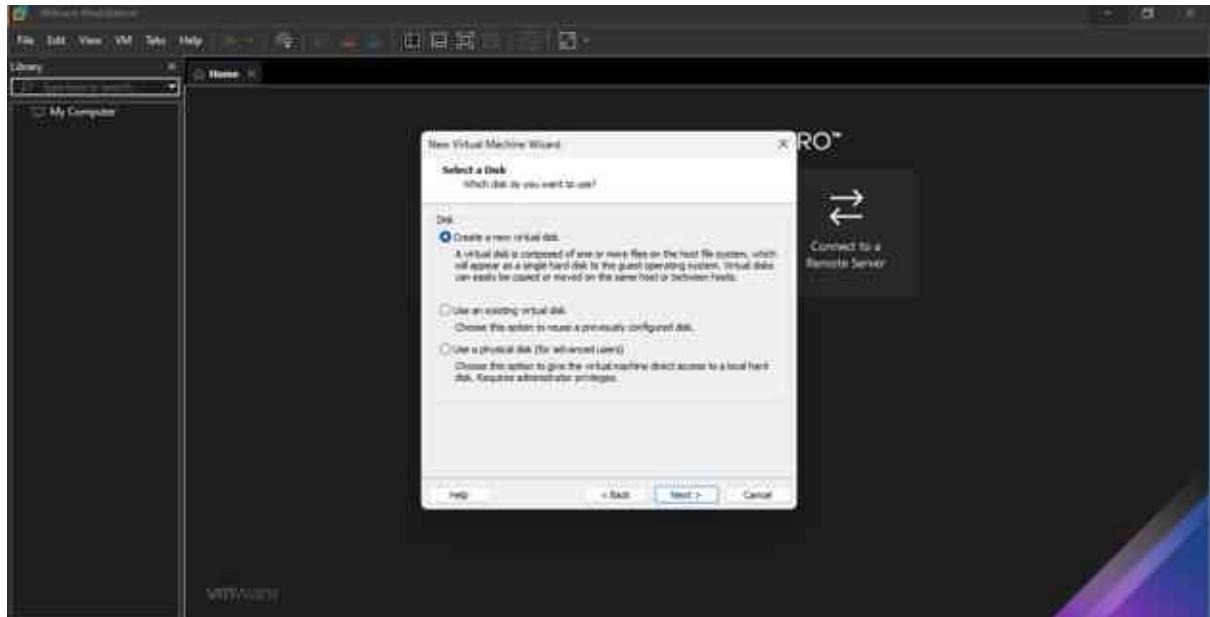
Step 11: Select **LSI Logic SAS** and click on Next.



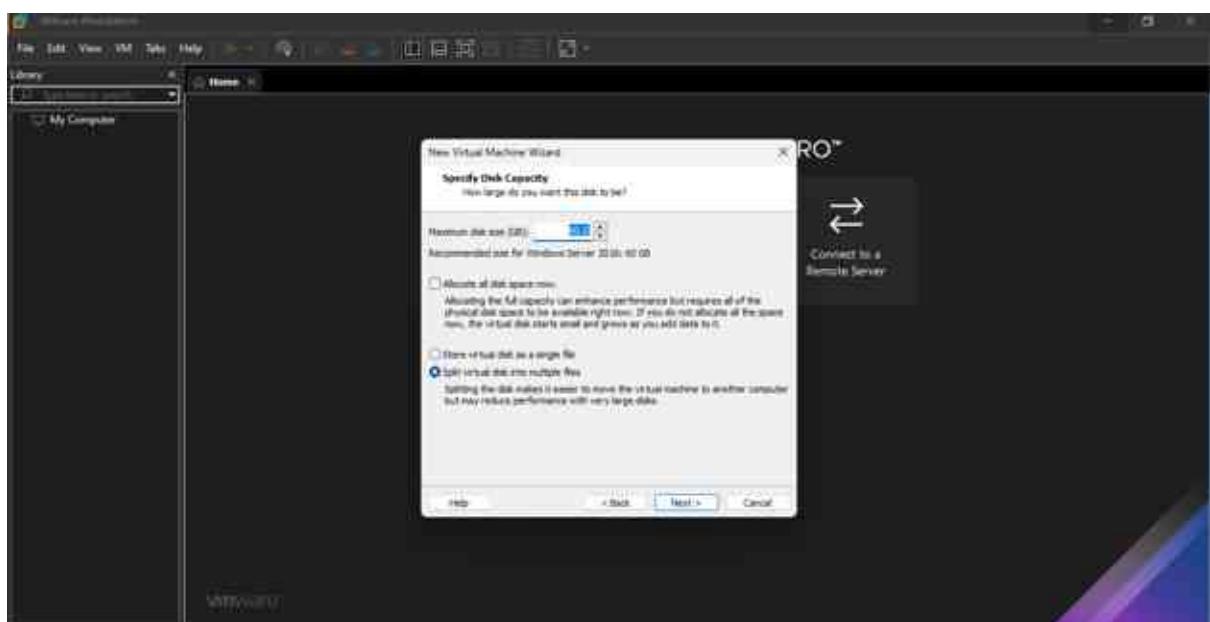
Step 12: Keep the default **NVMe** and click on Next.



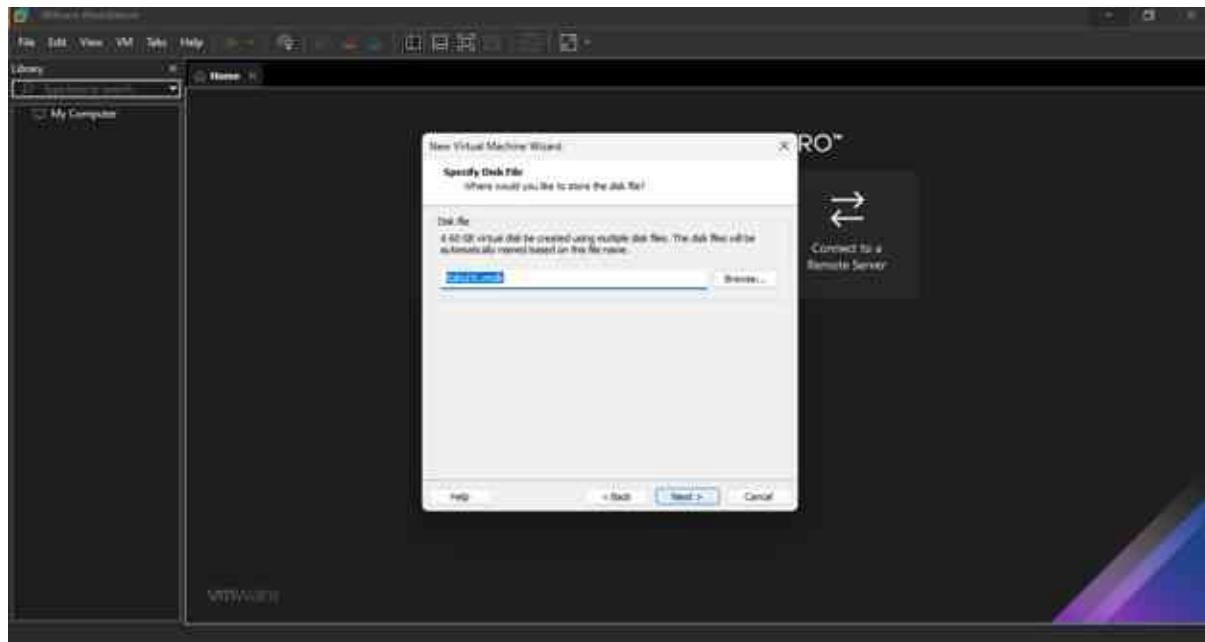
Step 13: Select a **create a new virtual disk** and click on Next.



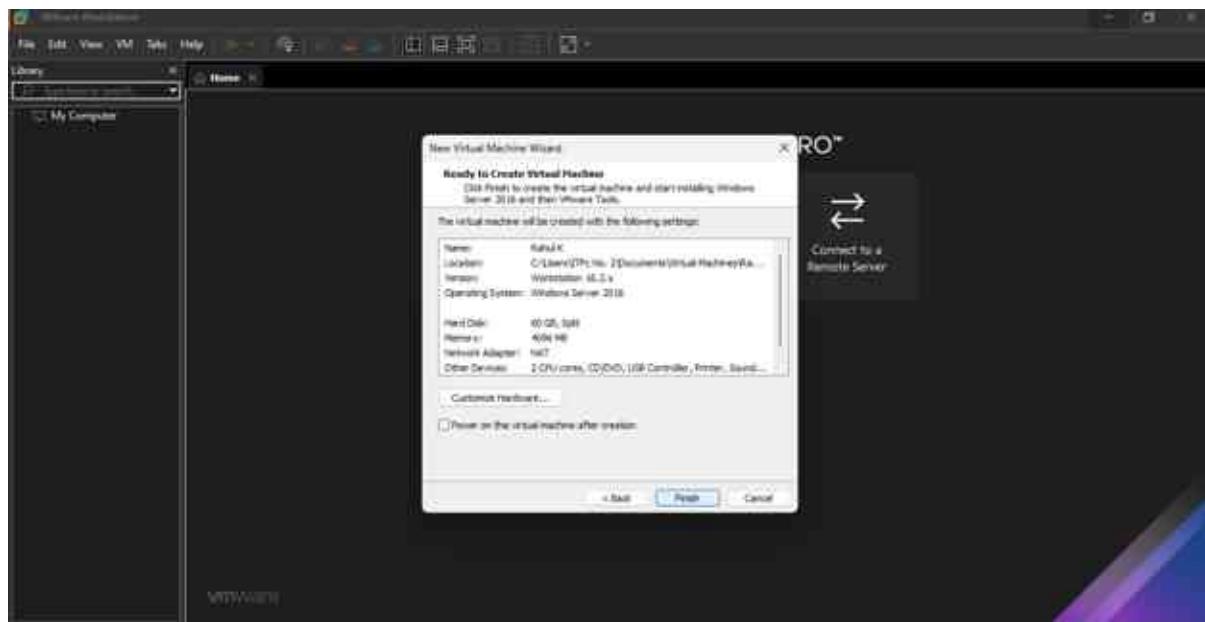
Step 14: Keep the default and click on Next.



Step 15: Leave it as default and click on Next.

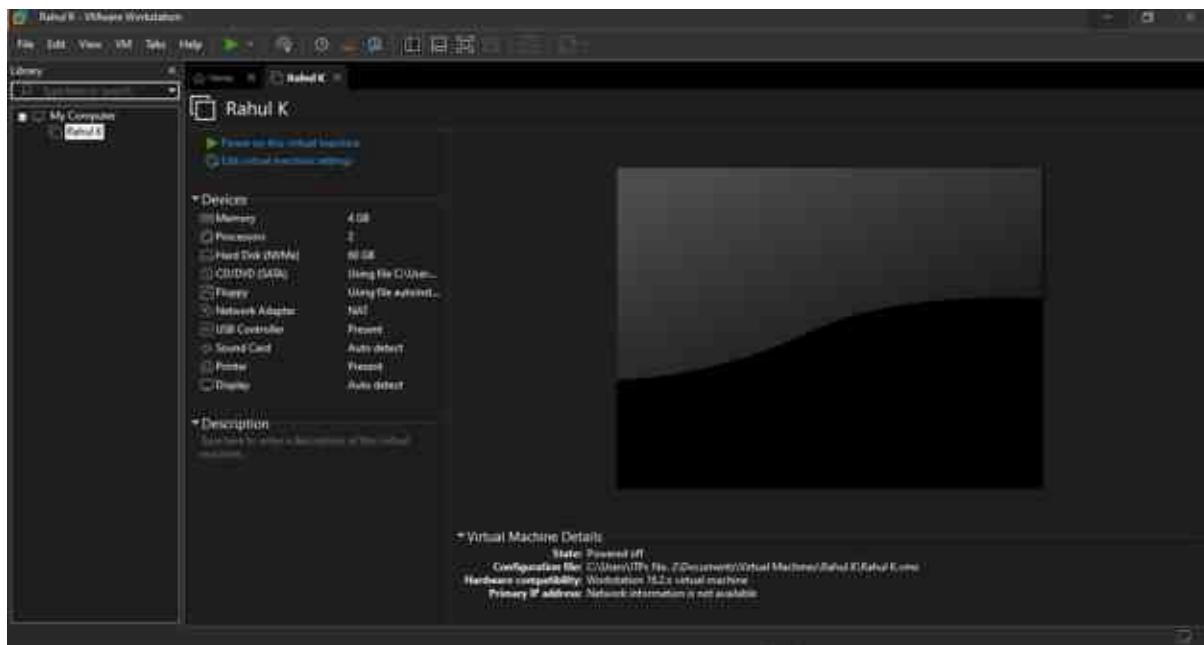


Step 16: click on finish.

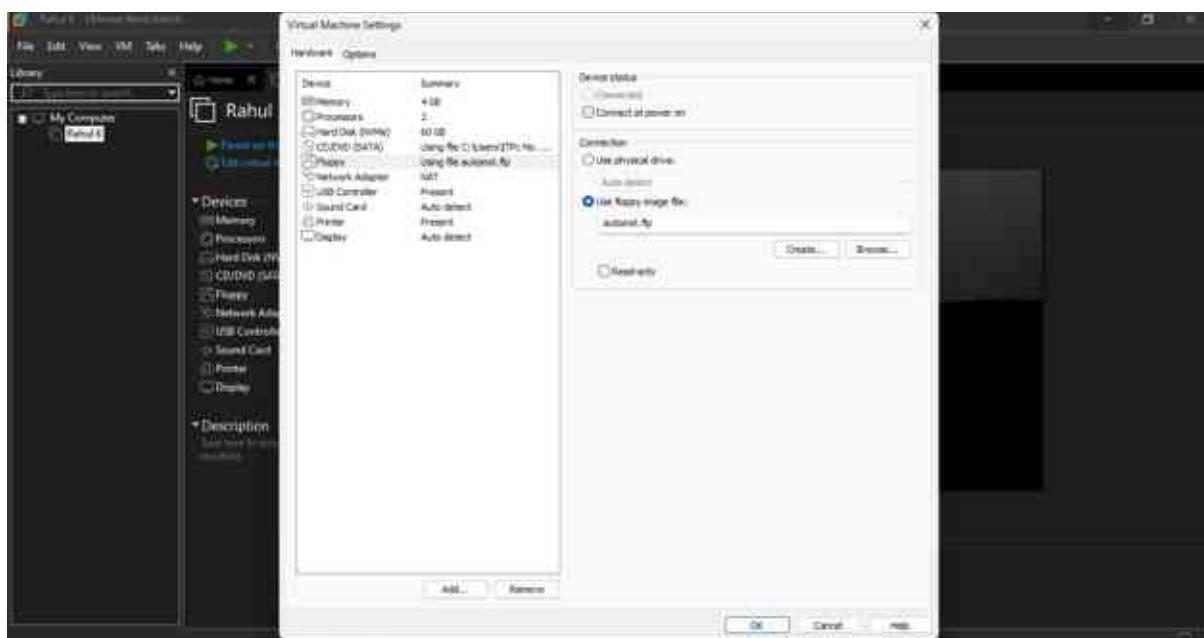


Step 17: Before Power on the virtual machine :

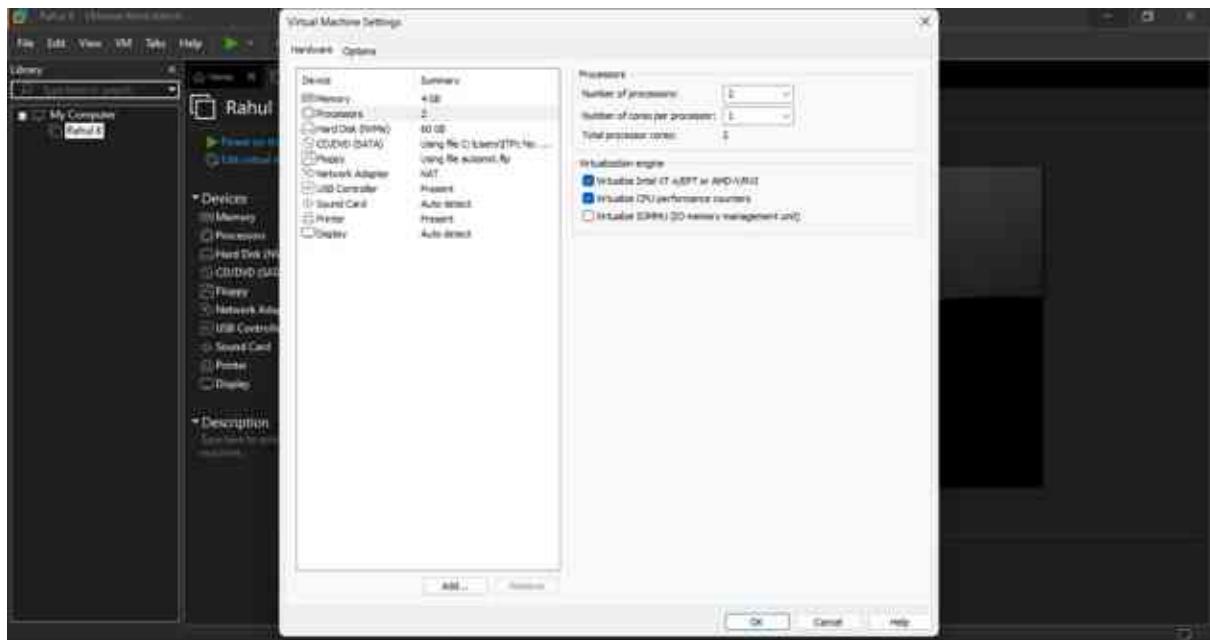
- Click on the **Edit Virtual Machine Settings**



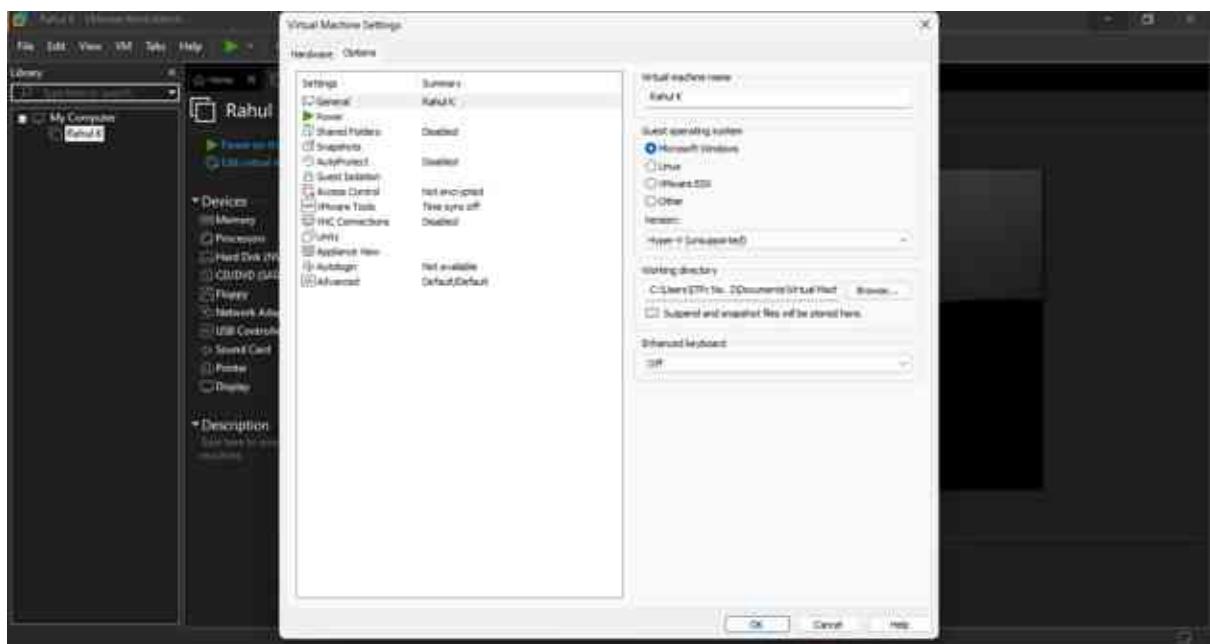
- In Virtual Machine Setting go to **Hardware** and click on **Floppy** and **uncheck the connect at power on**.



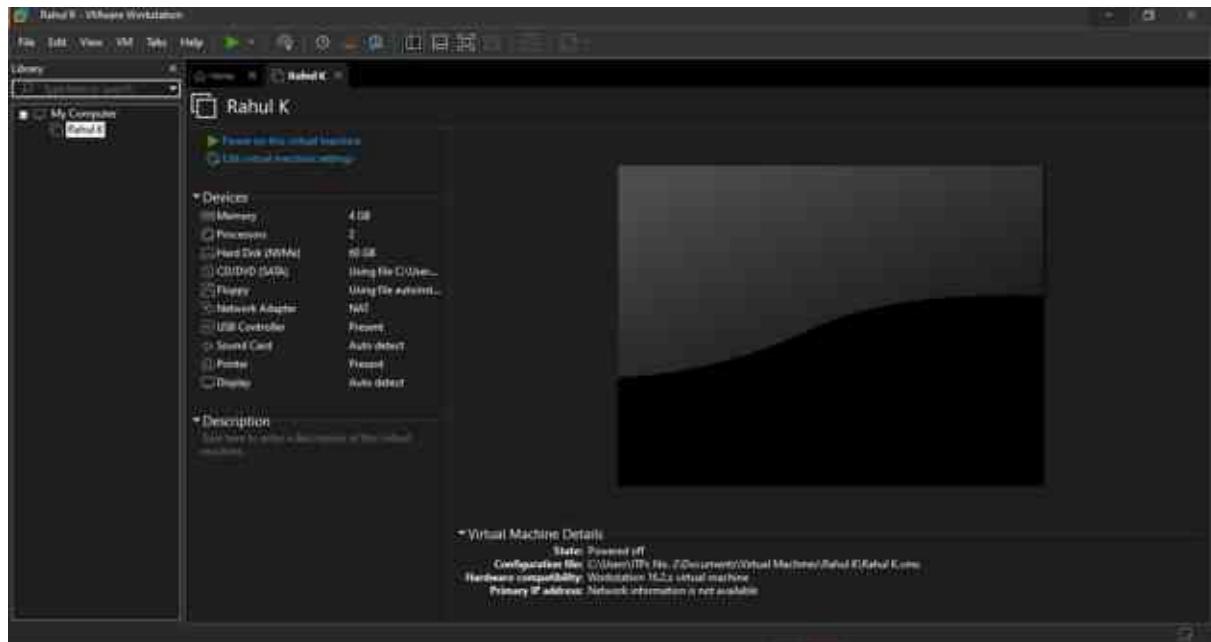
- In Hardware click on **Processors**
- In Virtualization engine check **Virtualize Intel VT -x/EPT or AMD-V/RVI**
- And also check **Virtualize CPU performance counters**



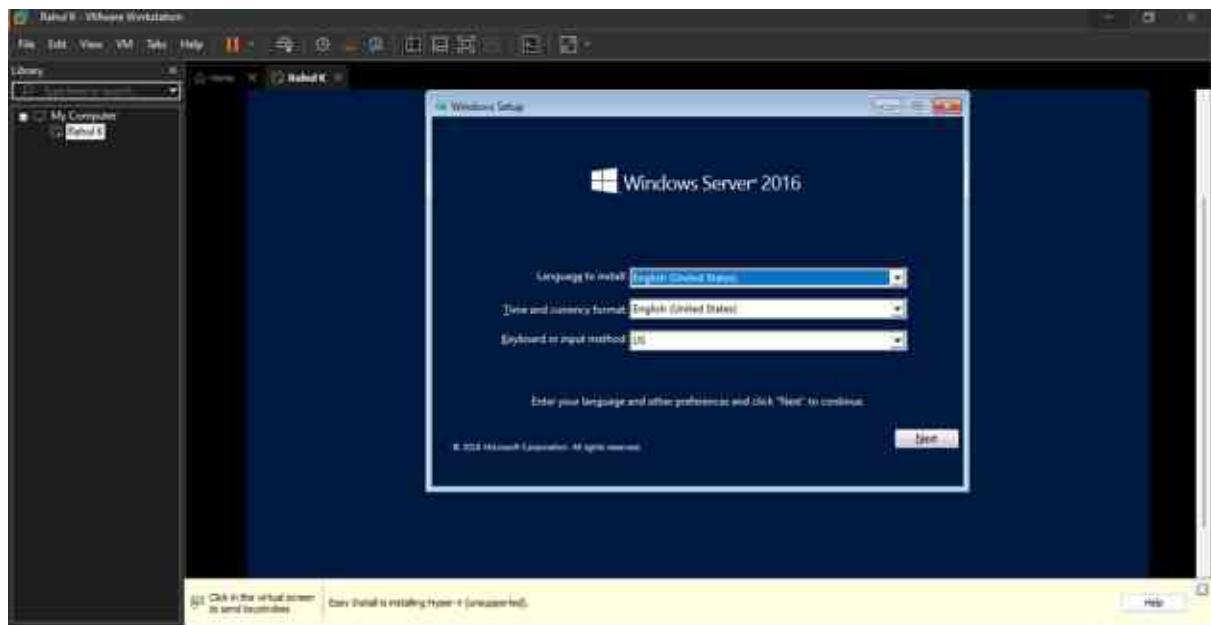
- In Virtual Machine Setting click on **options**
- Within **options** click on **General**
- In **General** click on **version** and select **Hyper-V (unsupported)** and click on **Ok**



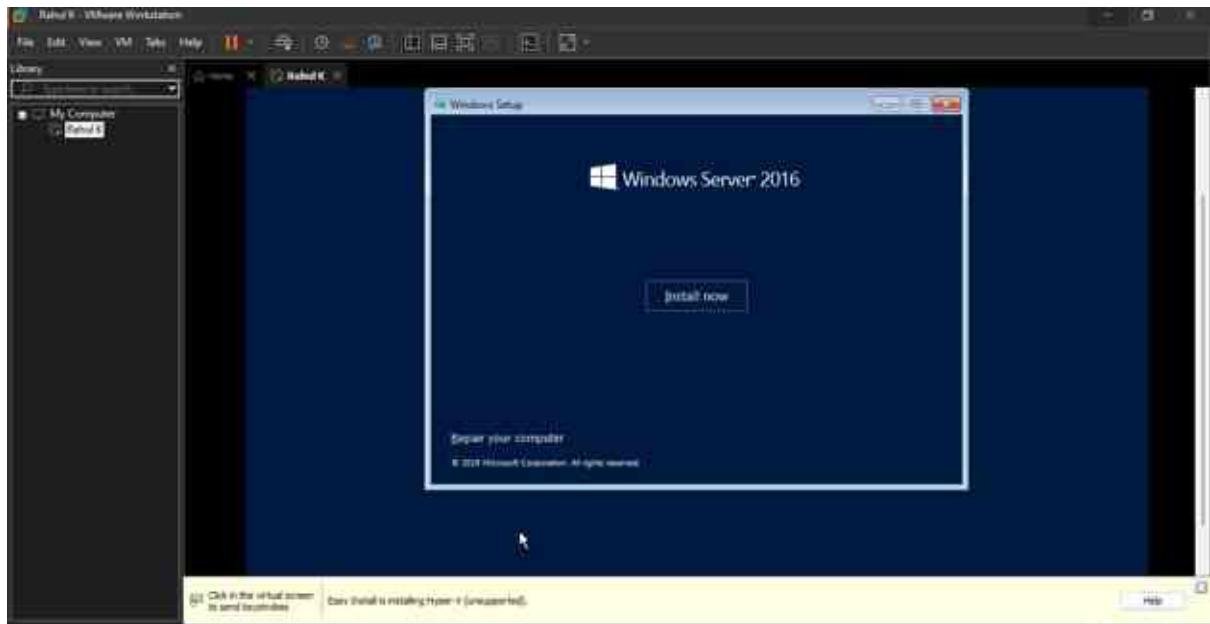
Step 18: Now Power on the virtual machine.



Step 19: Leave it as default and click on Next

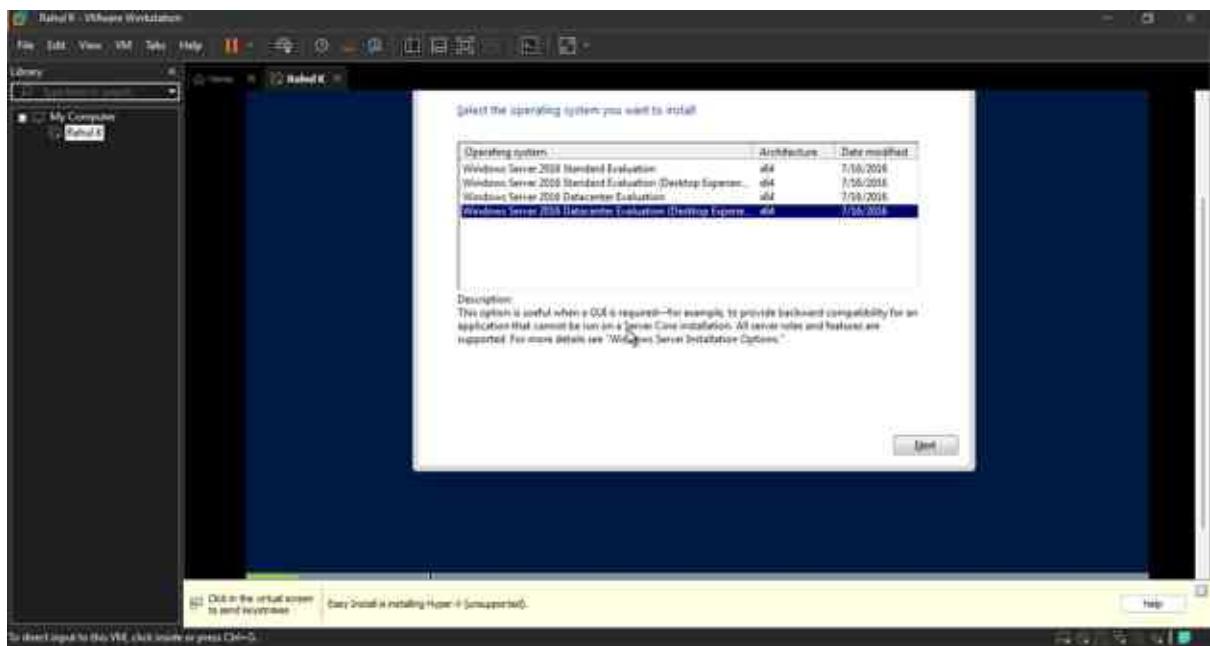


Step 20: click on Install Now

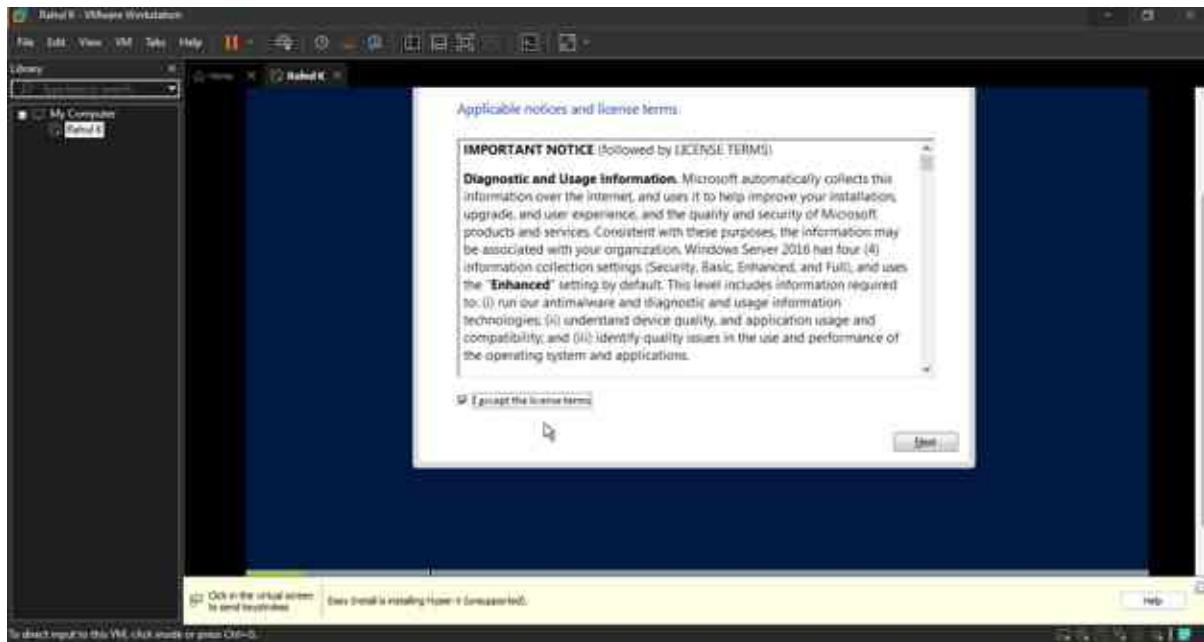


Step 21: Select **Windows Server 2016 Datacenter Evaluation (Desktop Experience x 64)**

And click on Next



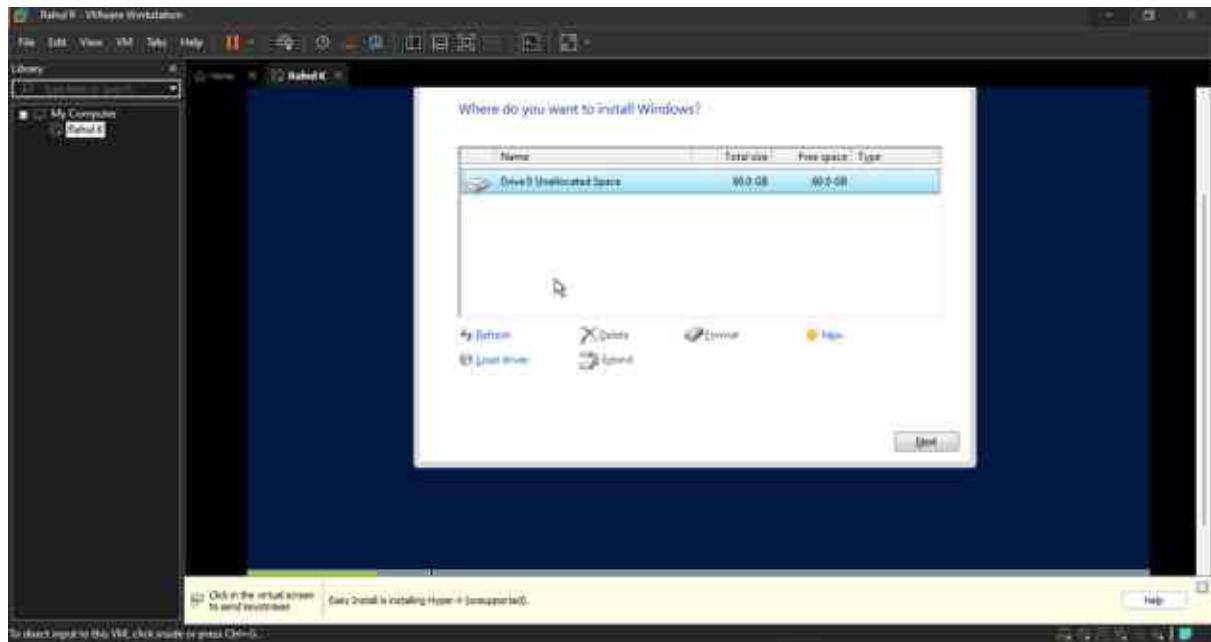
Step 22: click on I accept the license term and click on Next.



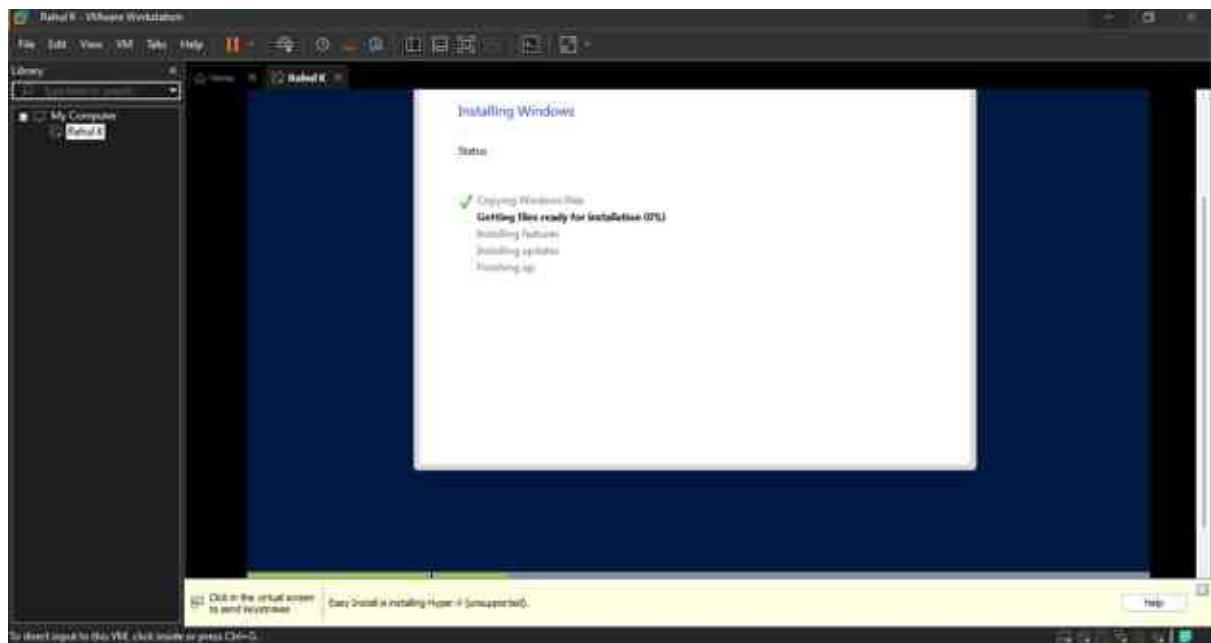
Step 23: On type of installation Select **Custom: Install Windows only (advanced)**



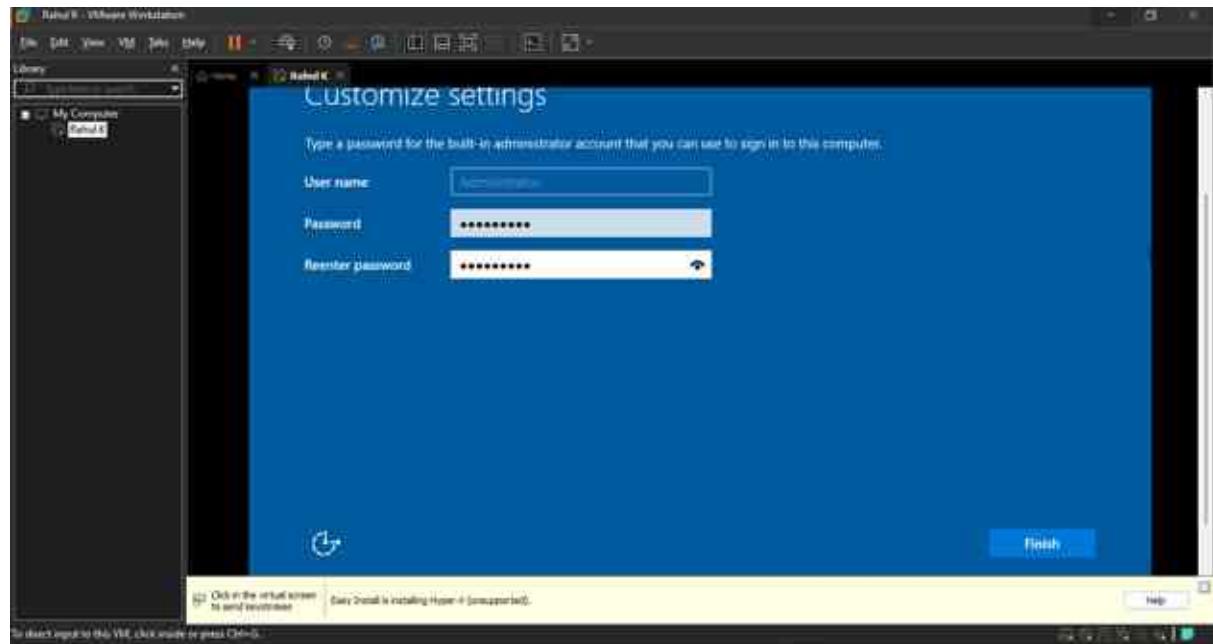
Step 24: Leave it as Default and click on Next.



Step 25: It will start installation



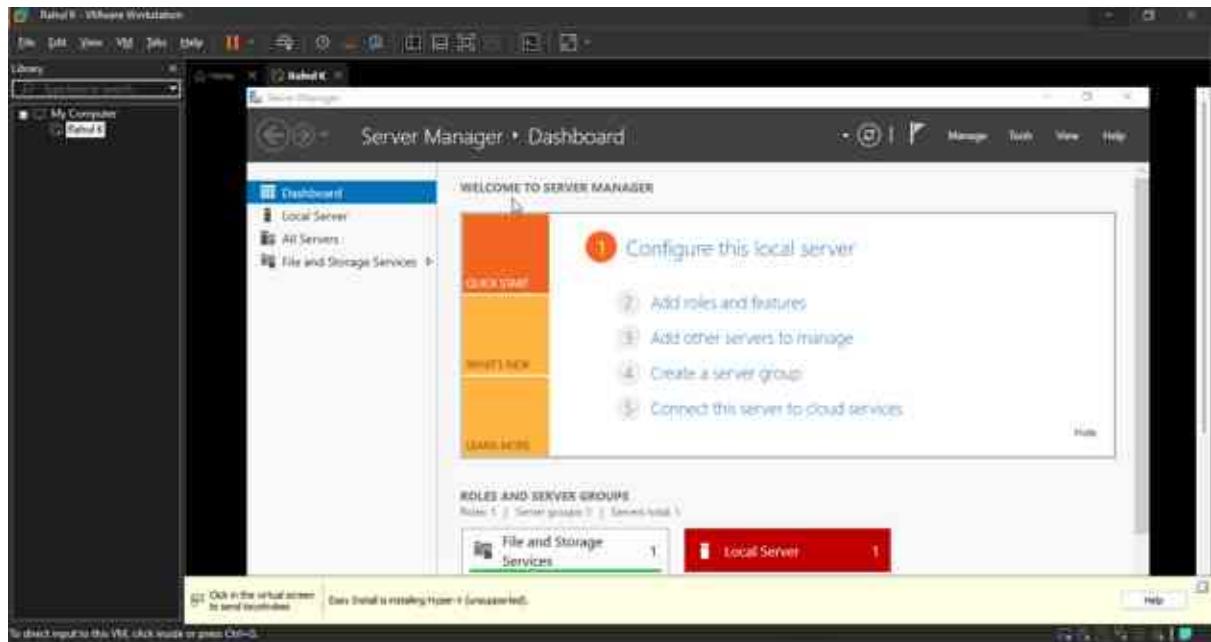
Step 26: Set your password and click on finish



Step 27: your windows server successfully created.

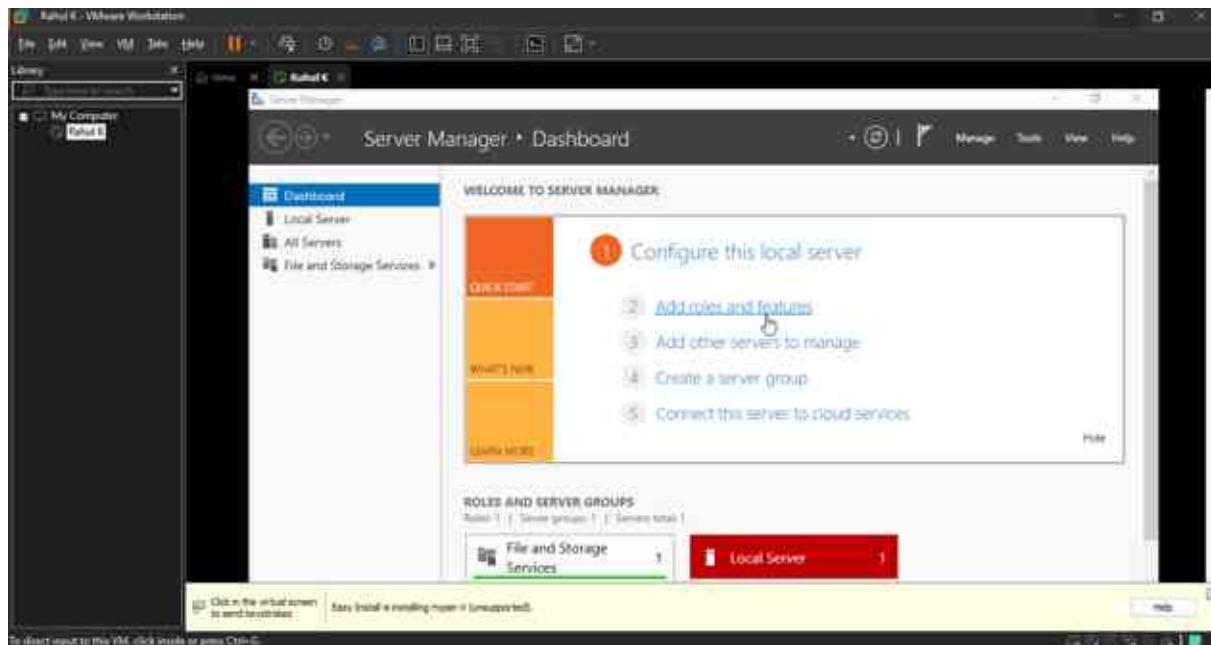


Step 28: Within Windows Server open Server Manager

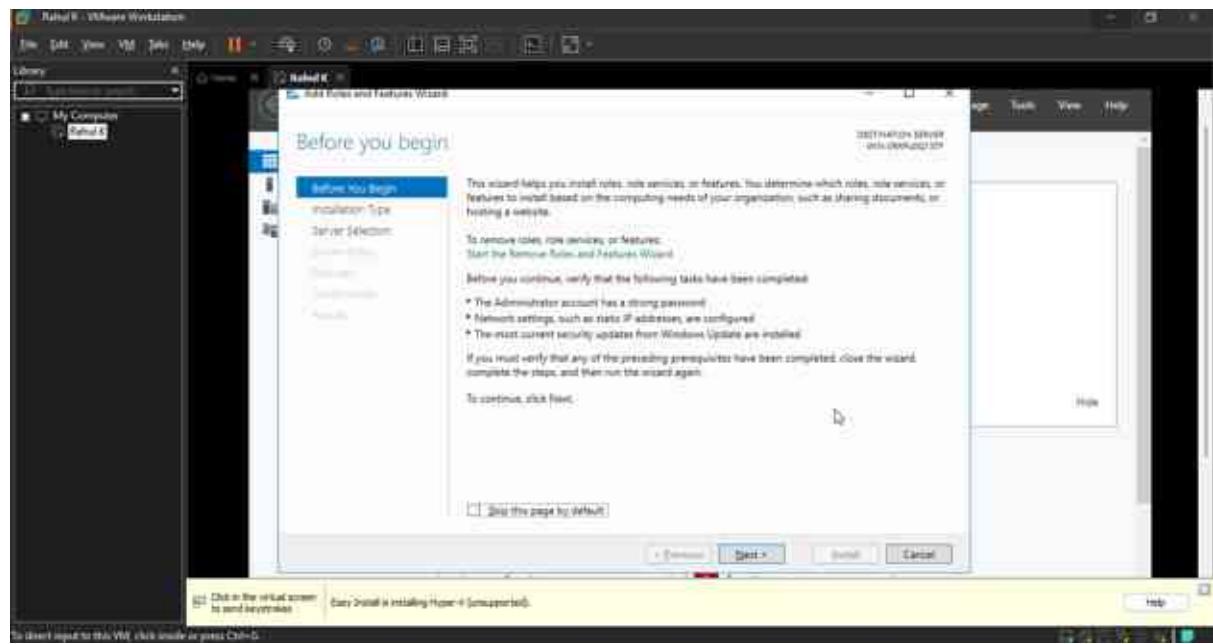


Step 29: Installing Hyper-V

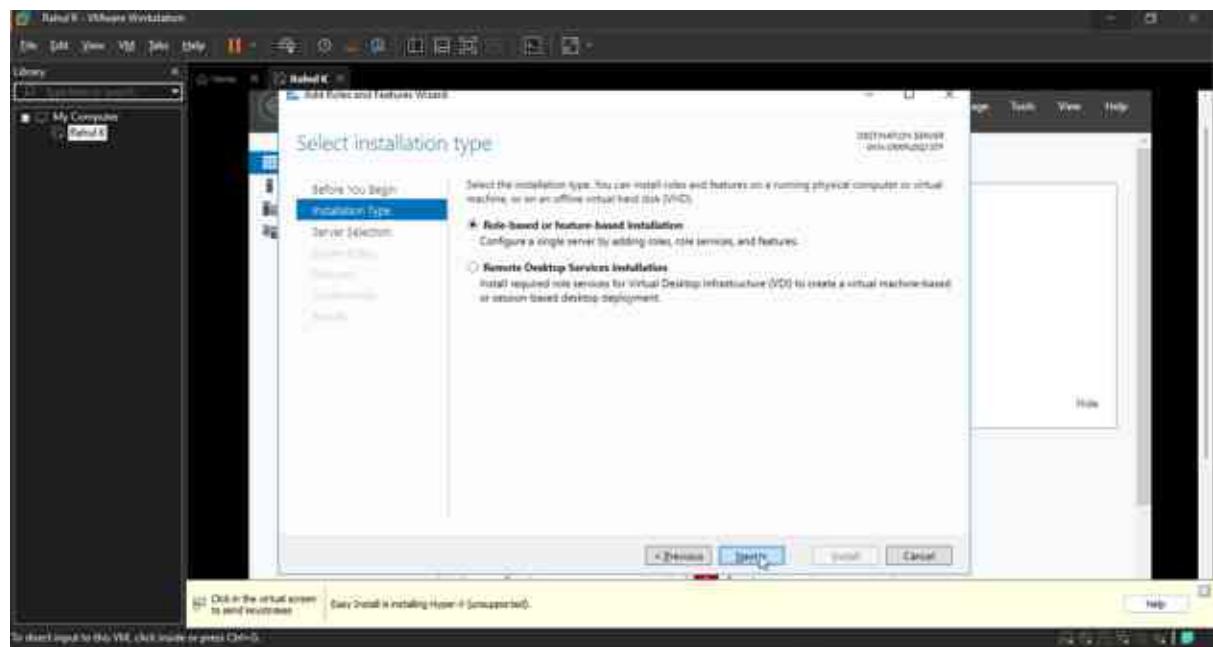
- Within Server Manager Click on Add roles and features



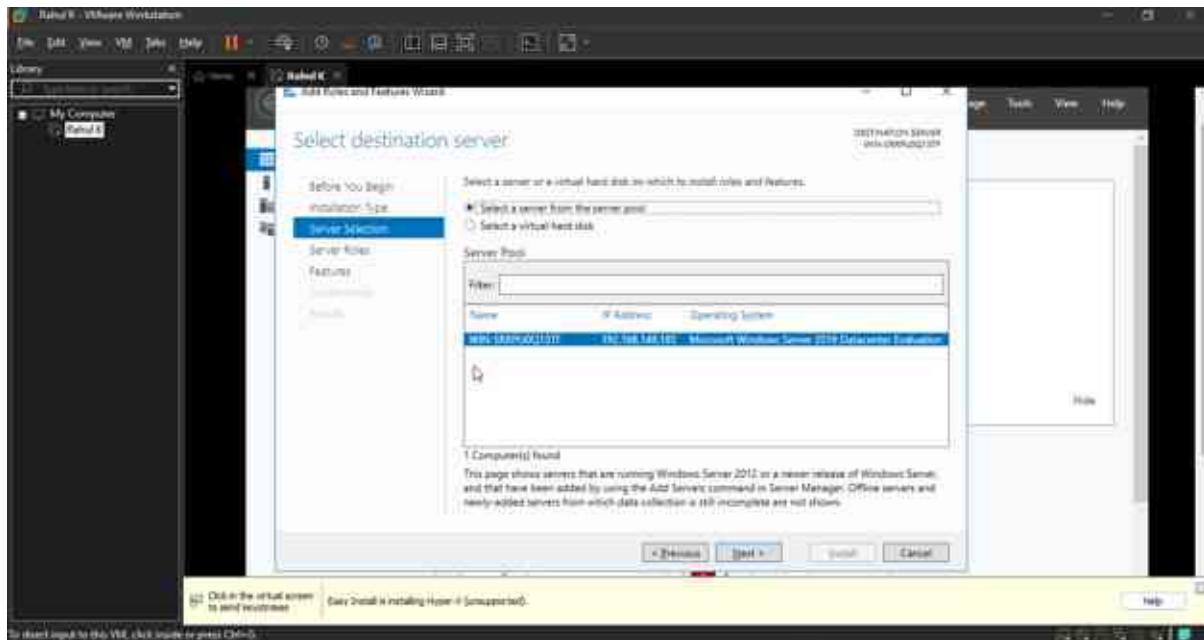
- Click On Next



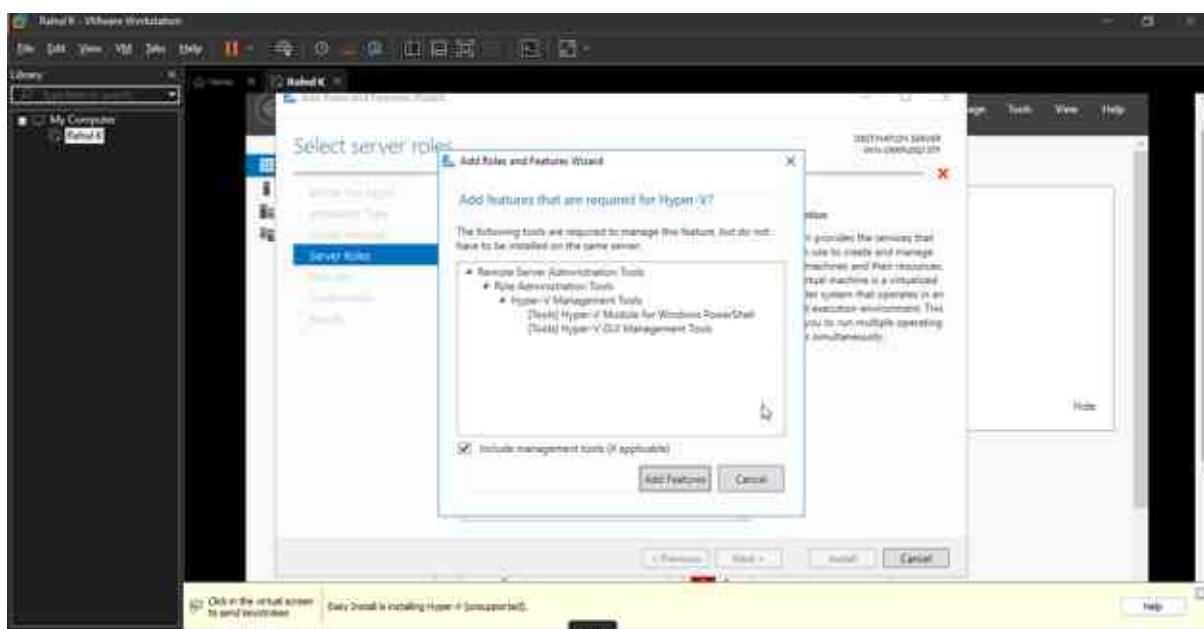
- In Installation Type Select **Role-based or feature-based installation**



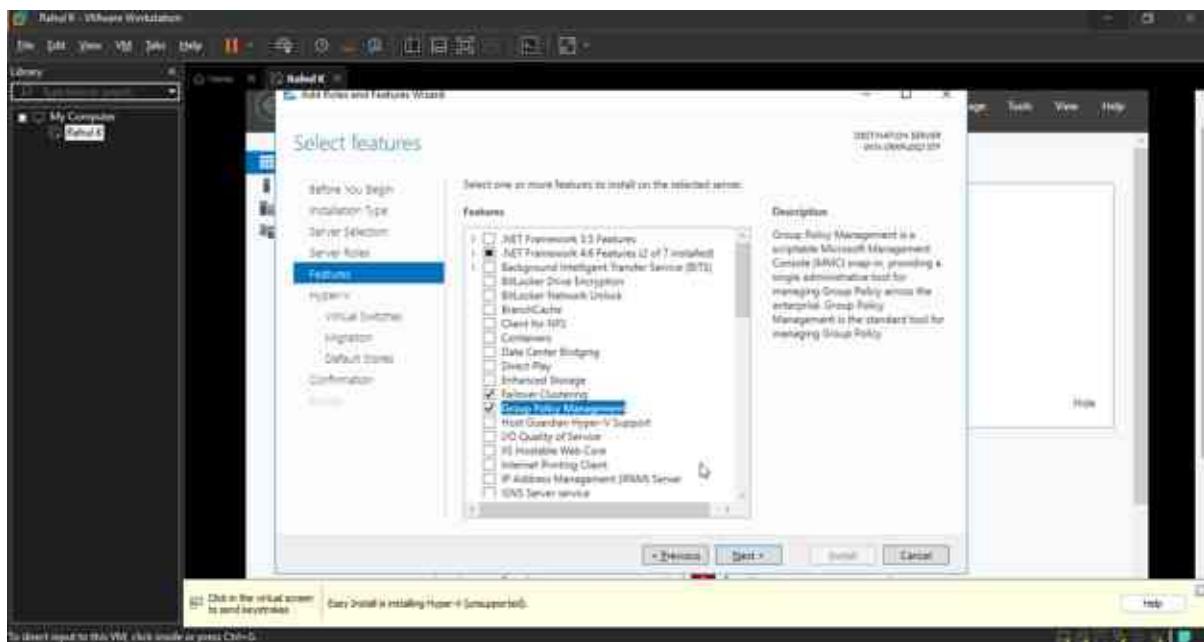
- Keep default setting and click on Next



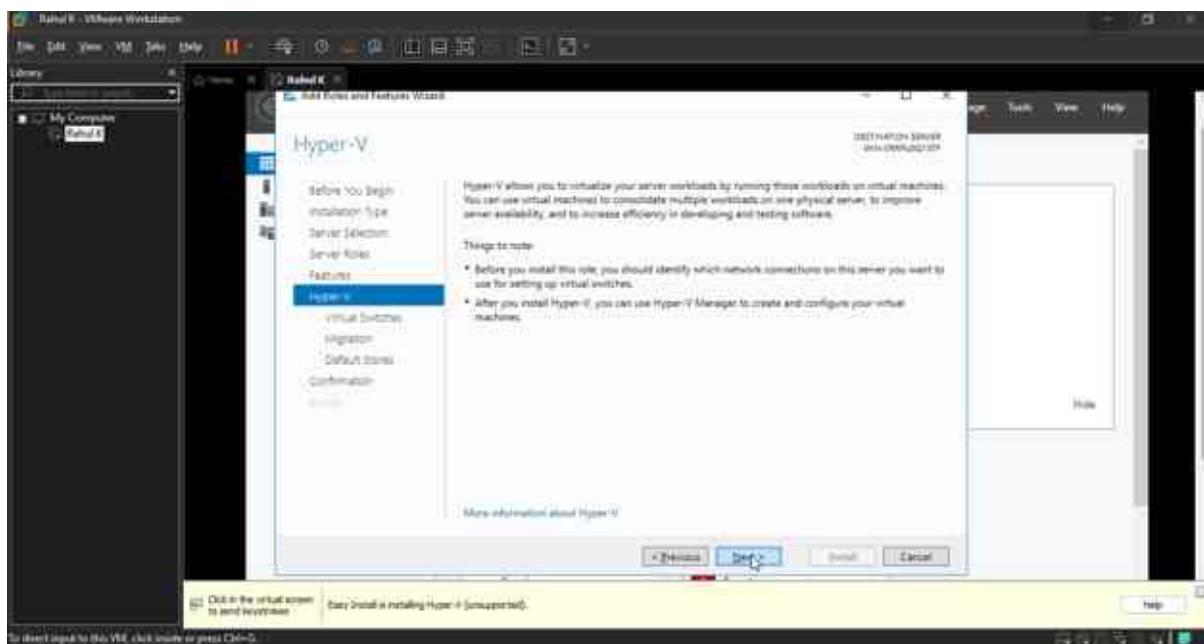
- Select Hyper-V and Click Add Features and Click Next



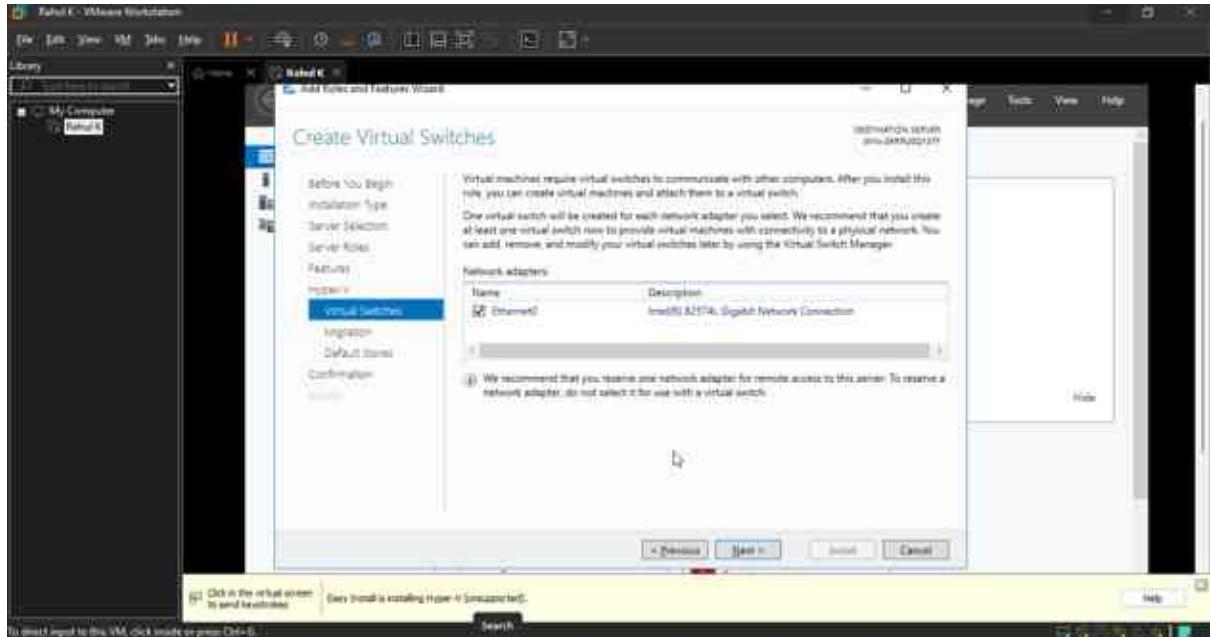
- Select **Failover Clustering** and click on **add feature** and click **Next**
- Make sure **Group Policy Management** also selected



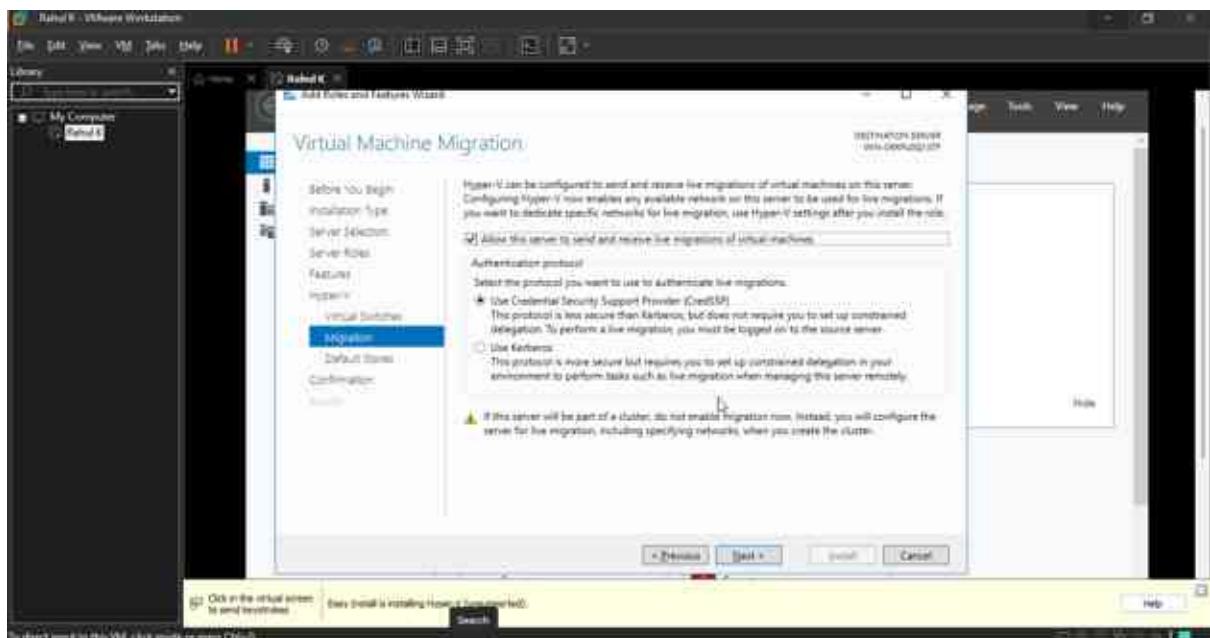
- Click **Next**



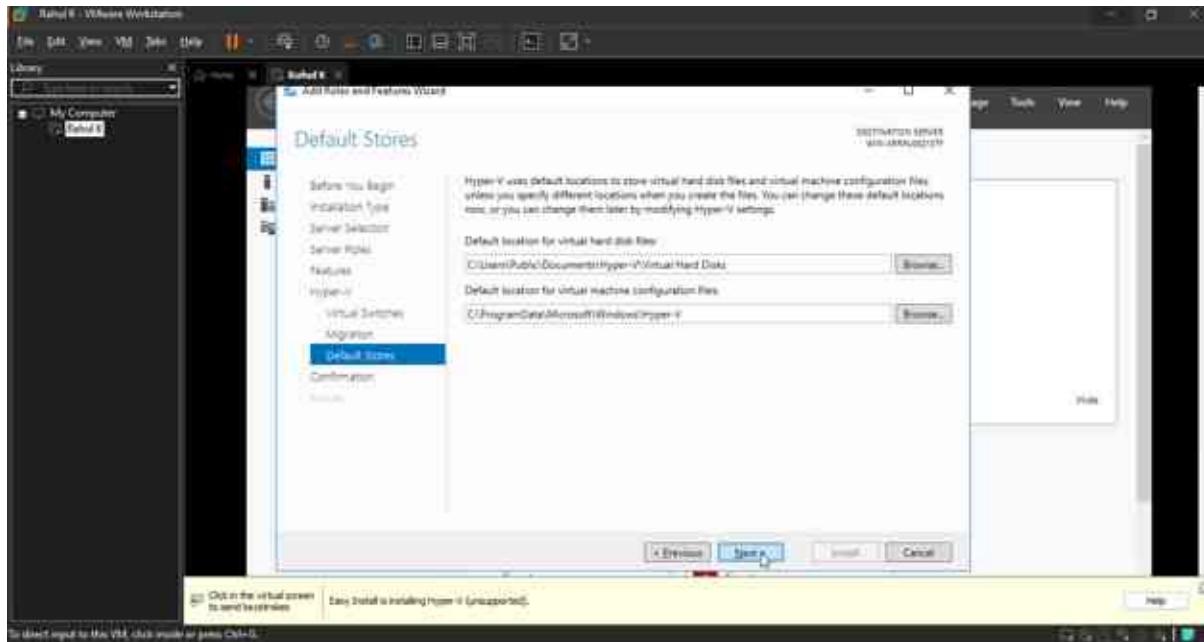
- In Network adapters: check **Ethernet0** and click **Next**



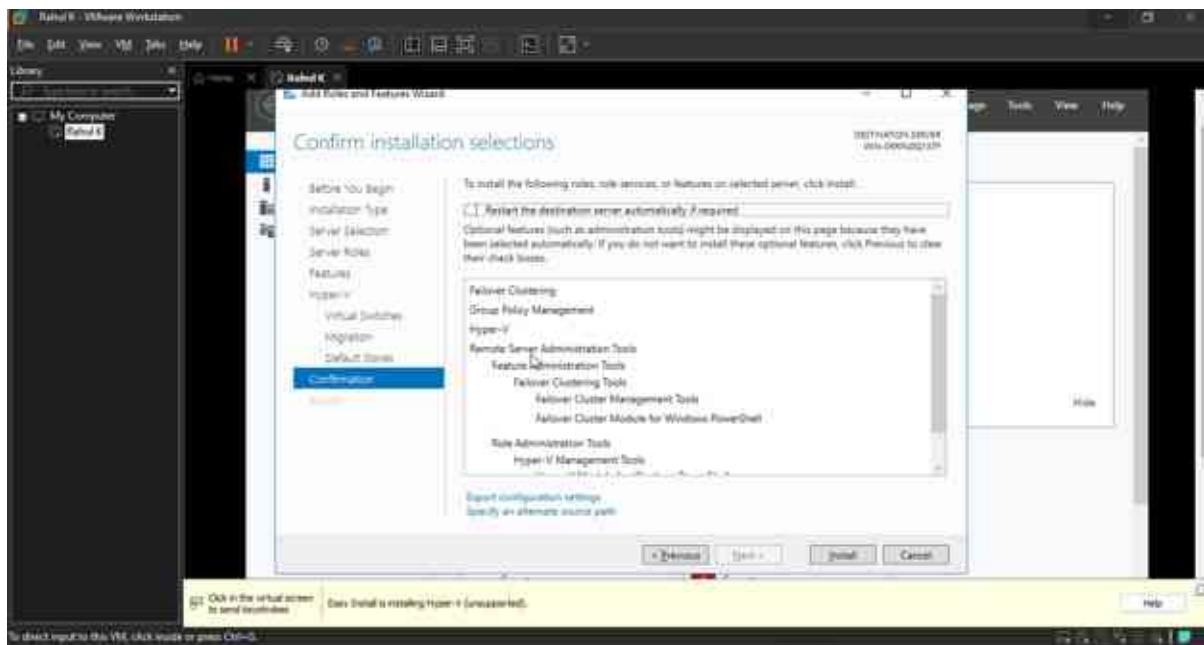
- Select **Allow this server to send and receive live migrations of virtual machines** And Click **Next**



- Keep default and click on Next

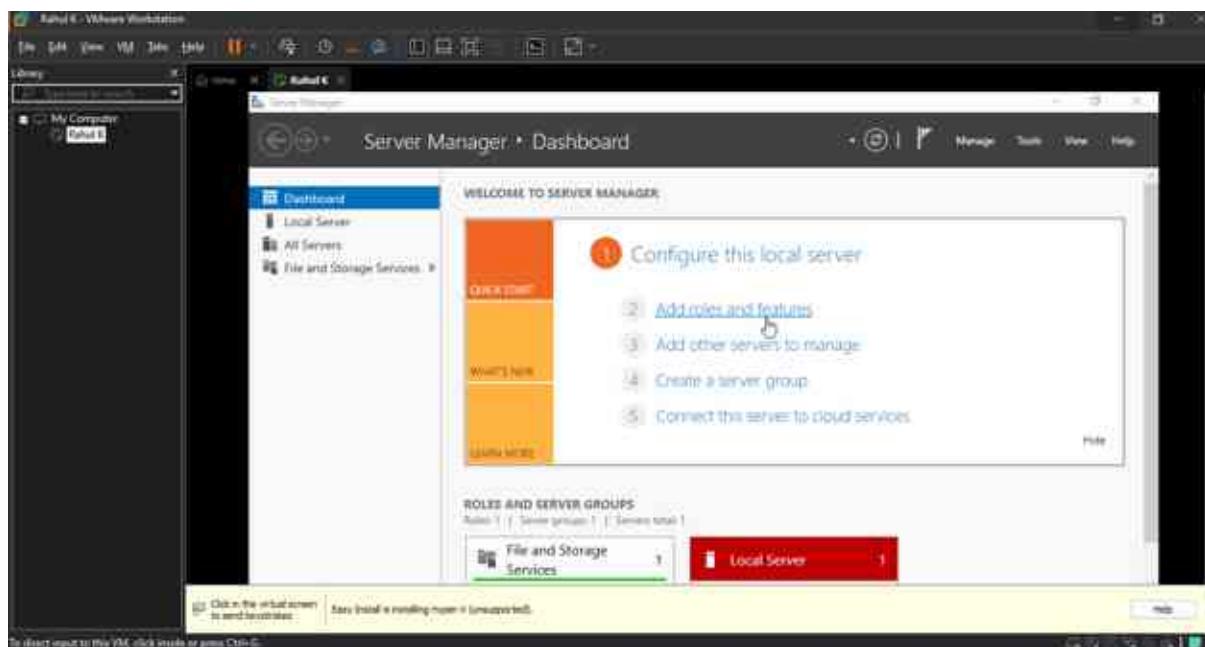


- Click install after installation of hyper-v restart the virtual machine.

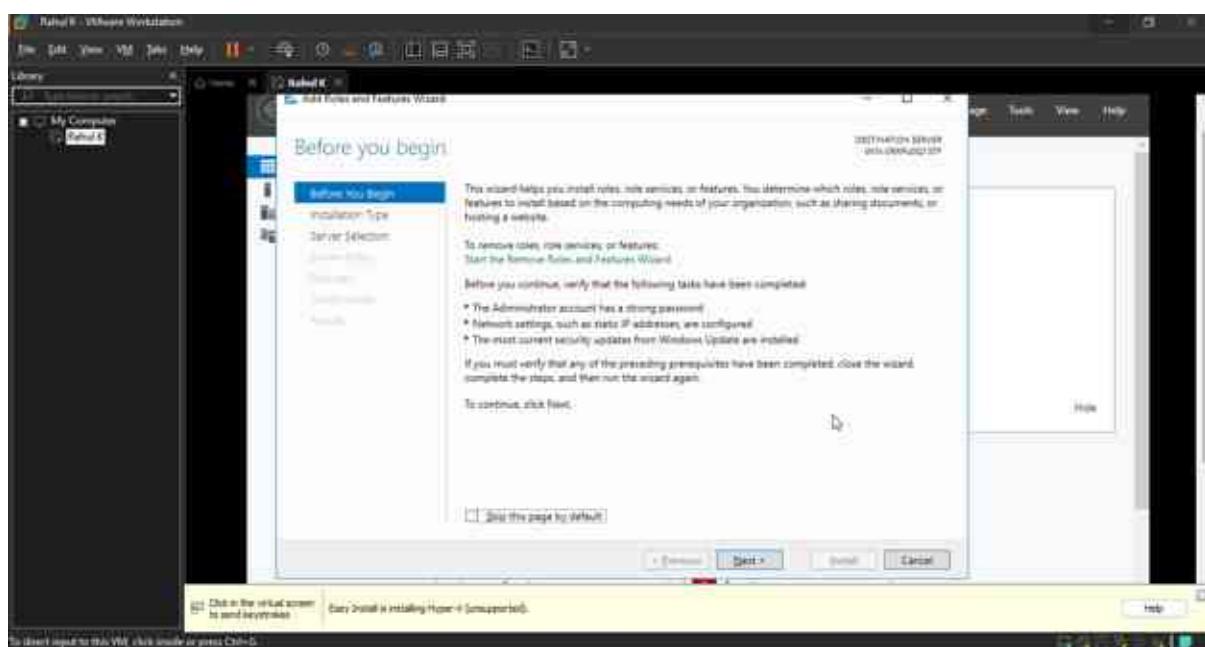


Step 30: Now Adding Active Domain Directory Services

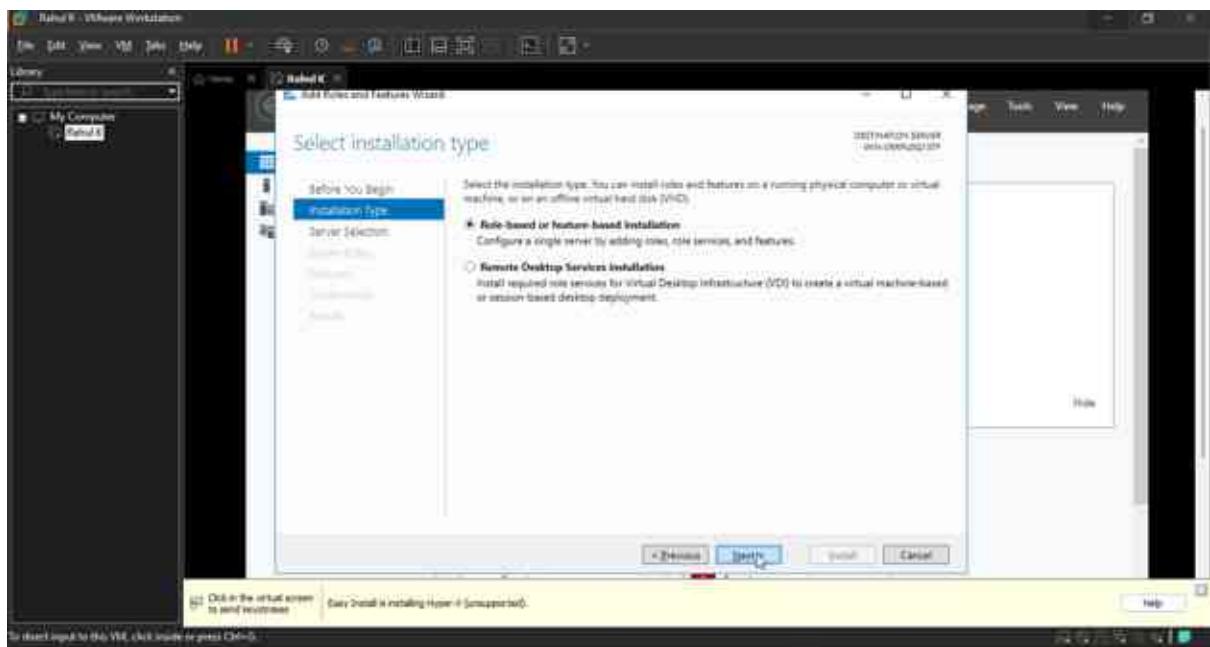
- Within Server Manager click on **add roles and features**



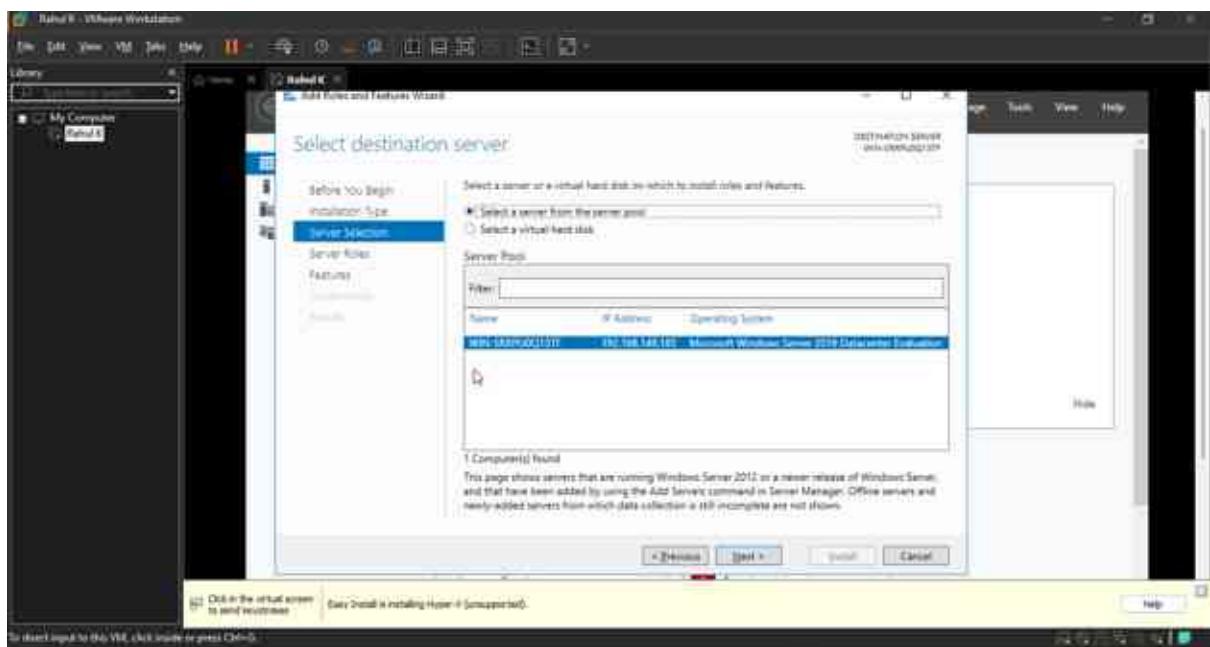
- Keep default and **click on Next**



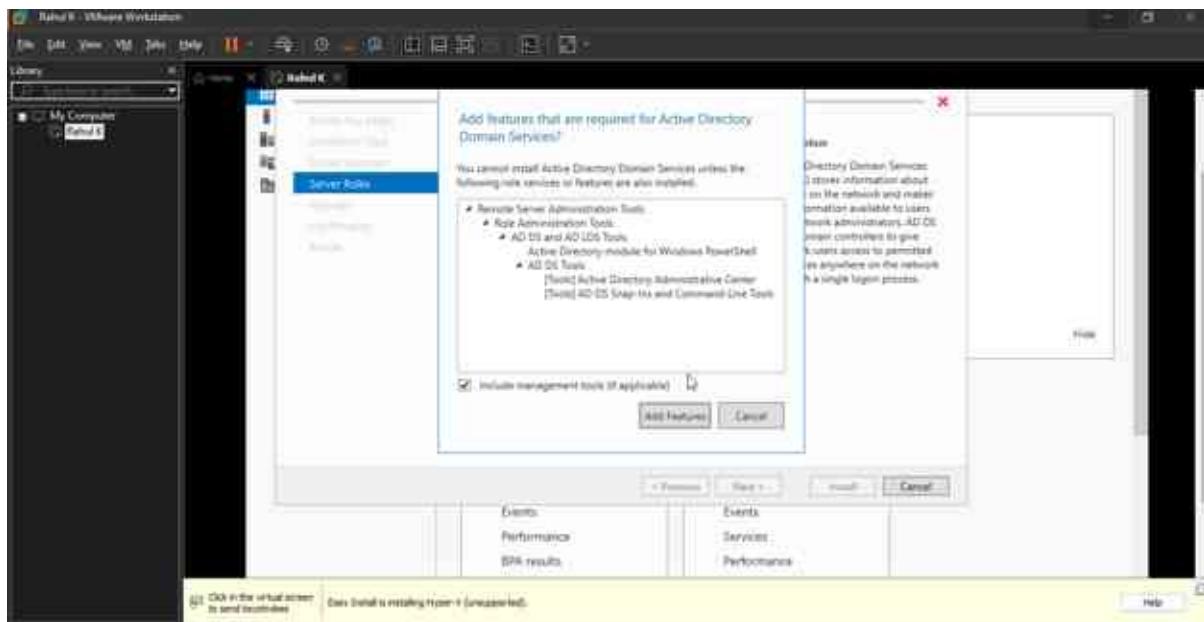
- In installation type select: **Role-based or feature-based installation**
- **Click on Next**



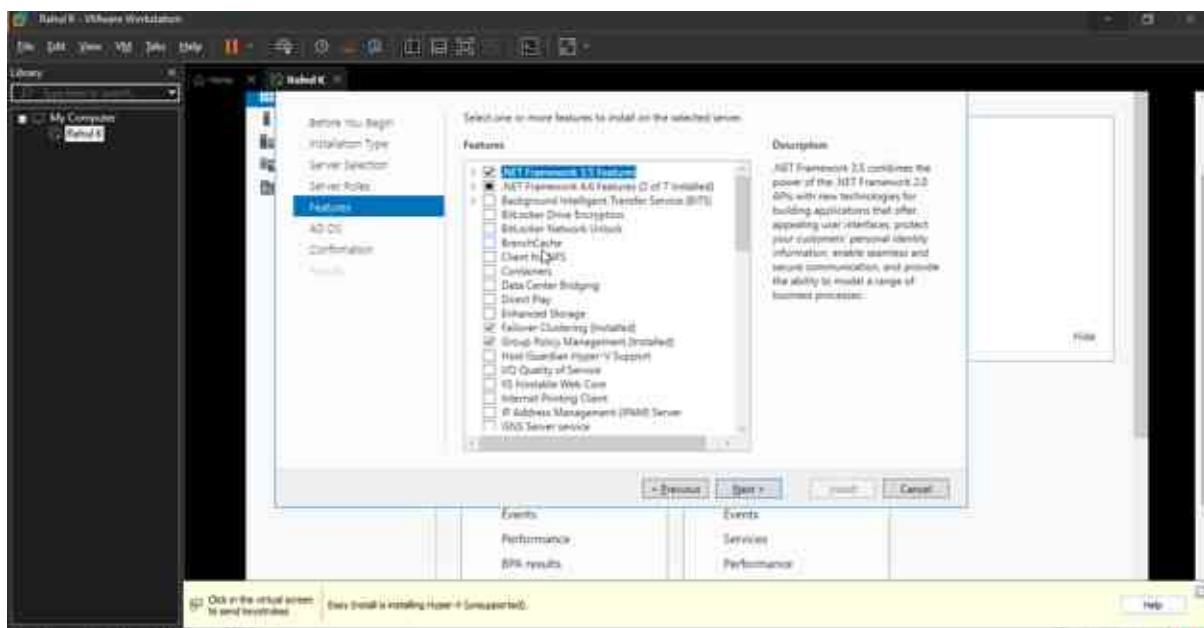
- Keep default Settings and **click on Next**



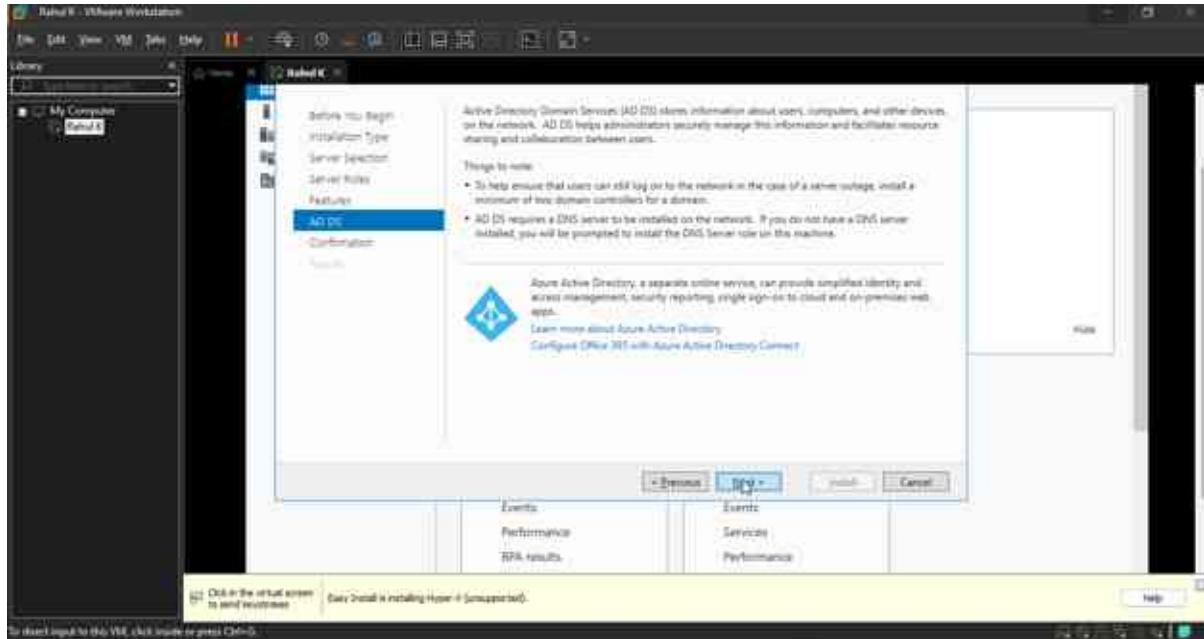
- In Server Roles Click on Active Directory Domain Services a pop-up will appear Click Add Features



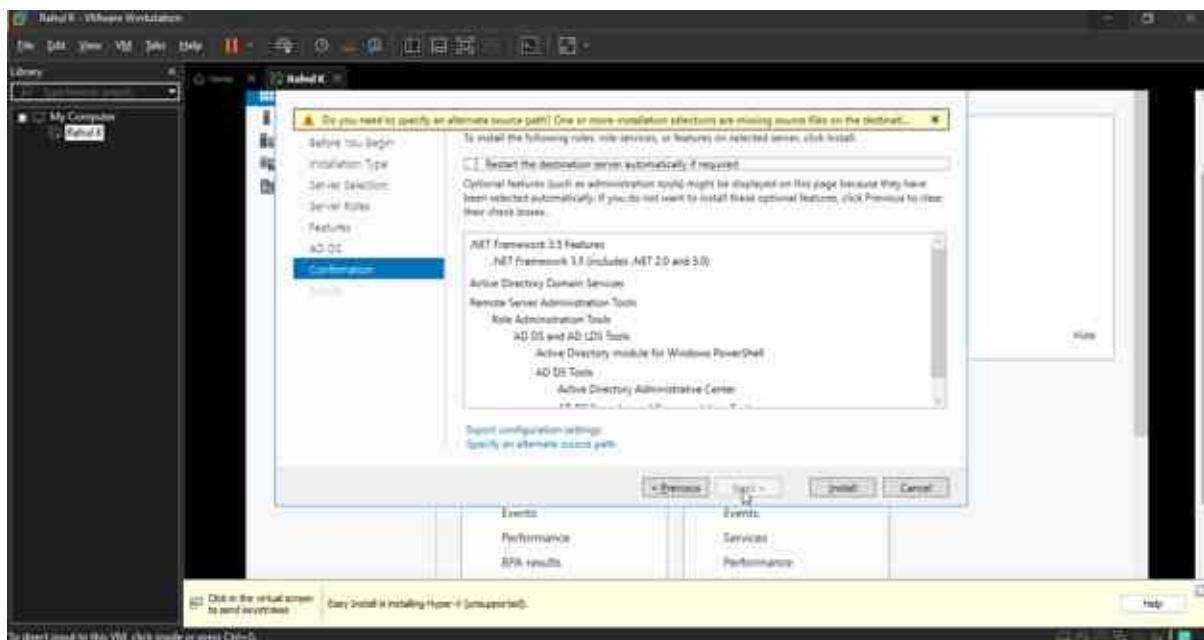
- In features selection select .NET Framework 3.5 Features and click on Next



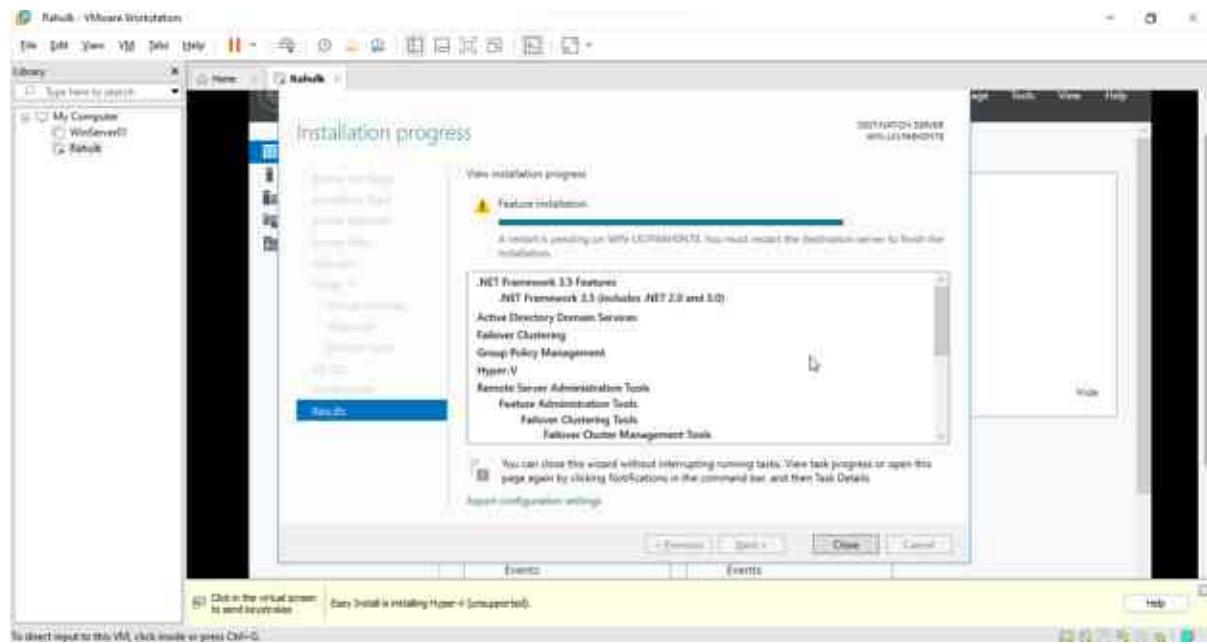
- Click Next



- Click on install

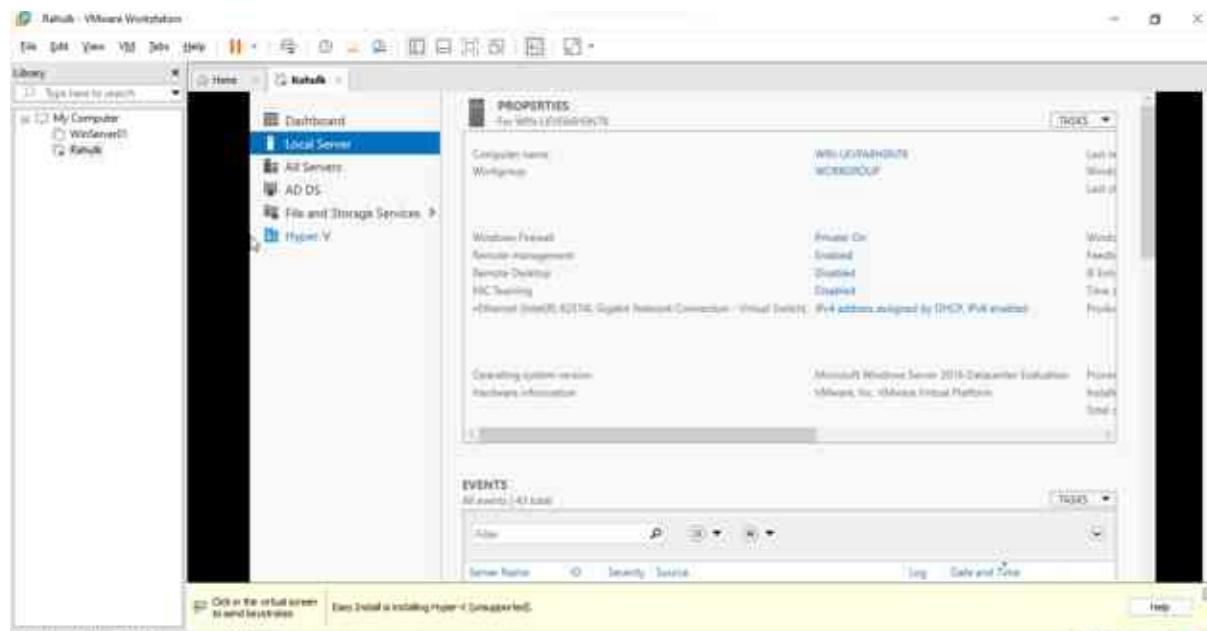


- Feature installation start after installation restart virtual machine.

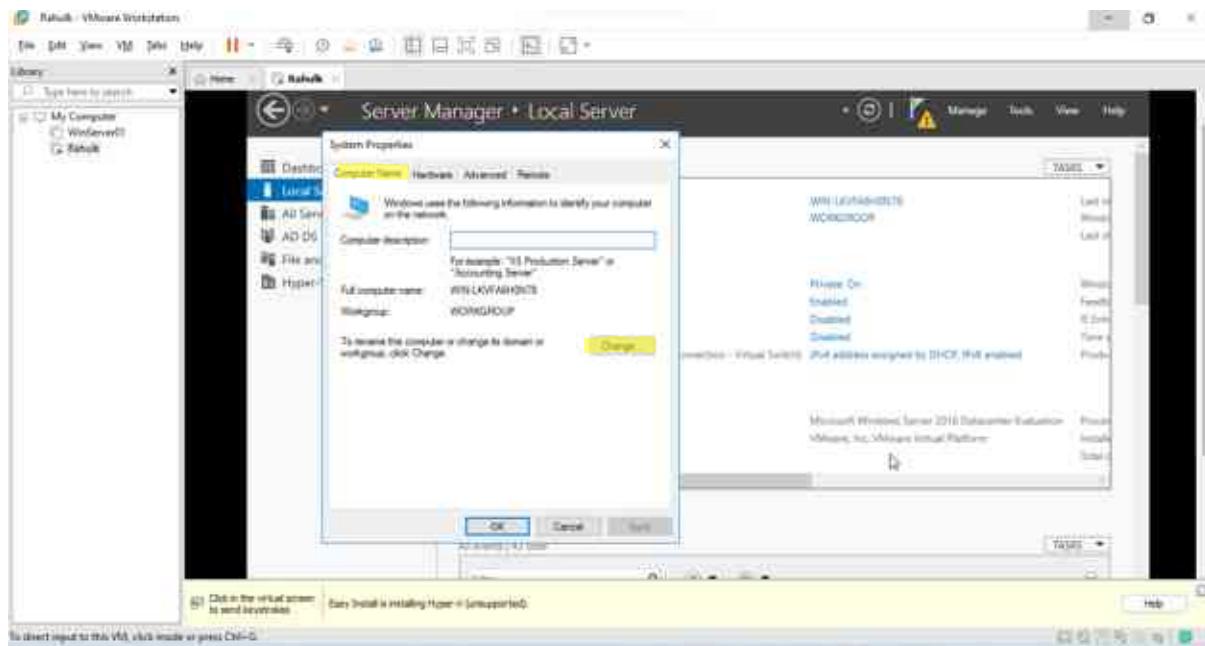


Step 31: Change Server Name

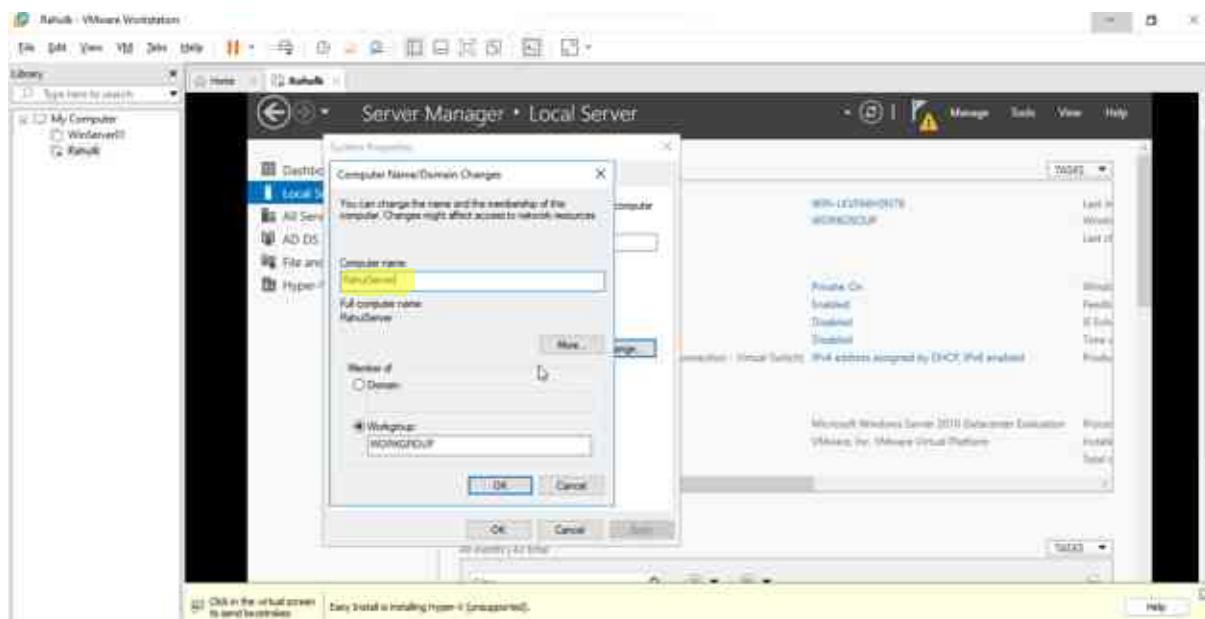
- Open Server Manager Click on Local Server



- In System Properties Click on Computer Name and click change

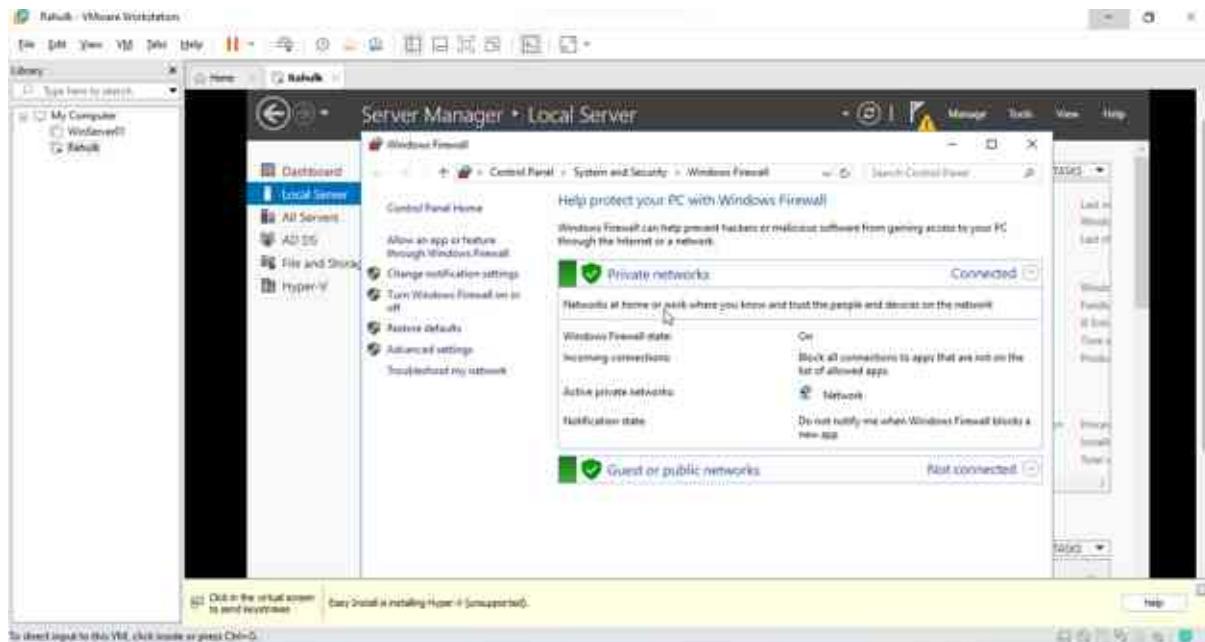


- Click on **Computer name**: At the Computer Name/Domain Changes window enter a name for your computer Here it is “RahulServer” and click on **OK**.
- Then click on “**Apply**” button at the **System Properties window**.
- Then VM require restart.

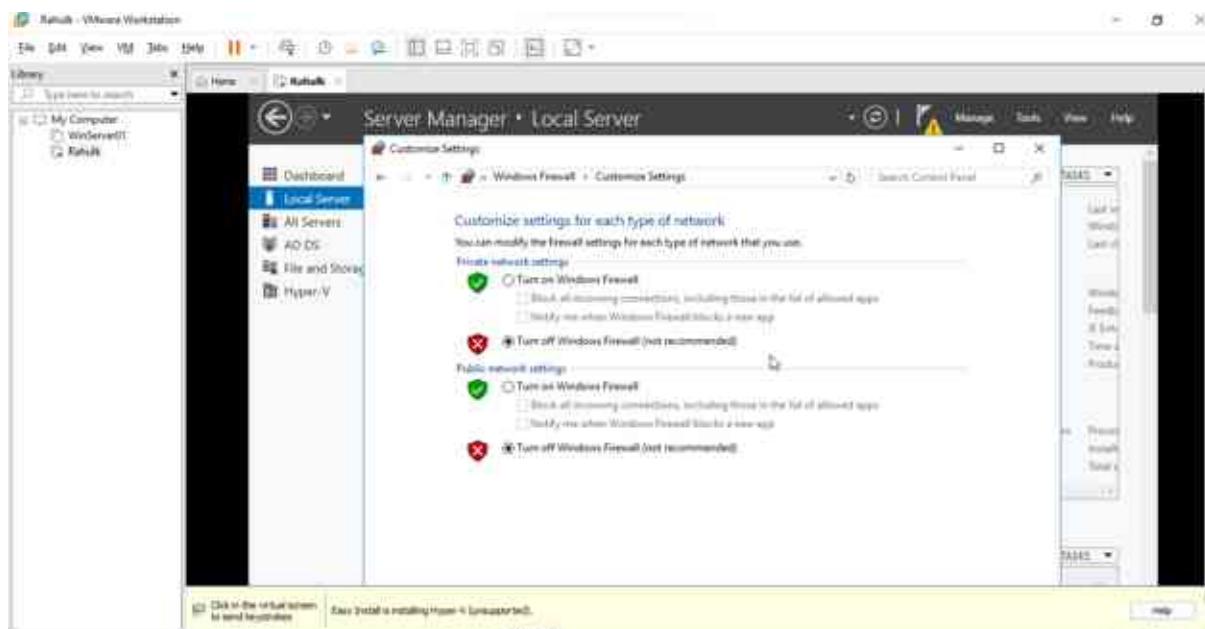


Step 32: Disable Firewall

- Within Server Manager click on Local Server and click on Firewall

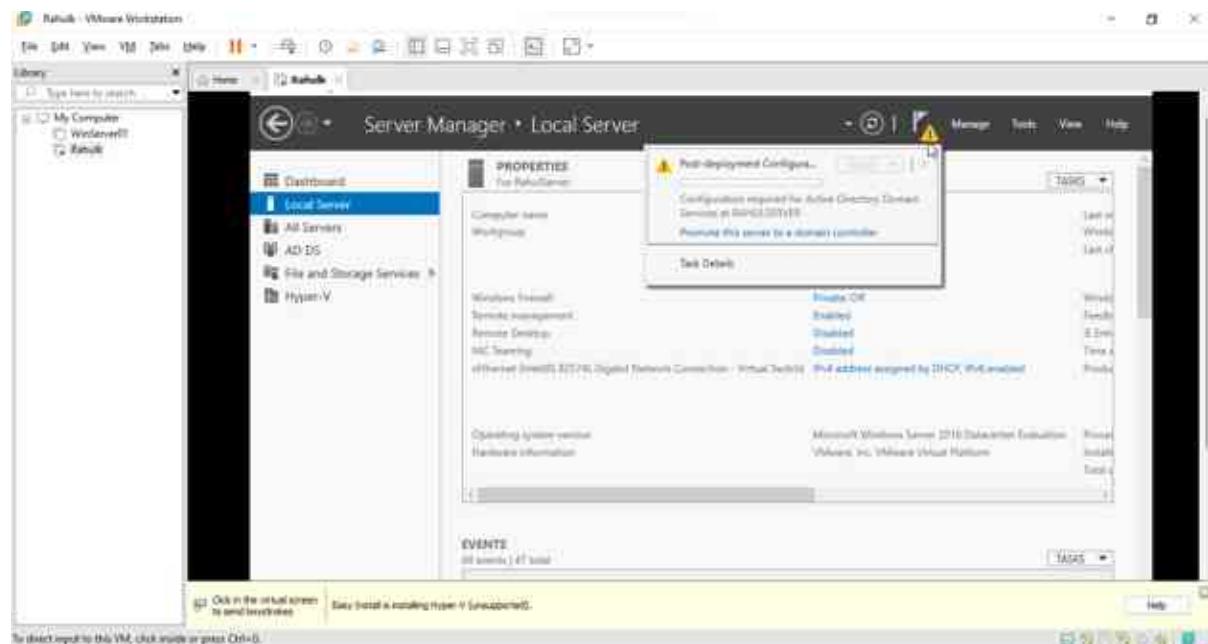


- Click Turn Windows Firewall On or Off and Select Turn off windows Firewall for both Public and Private. Then Click OK

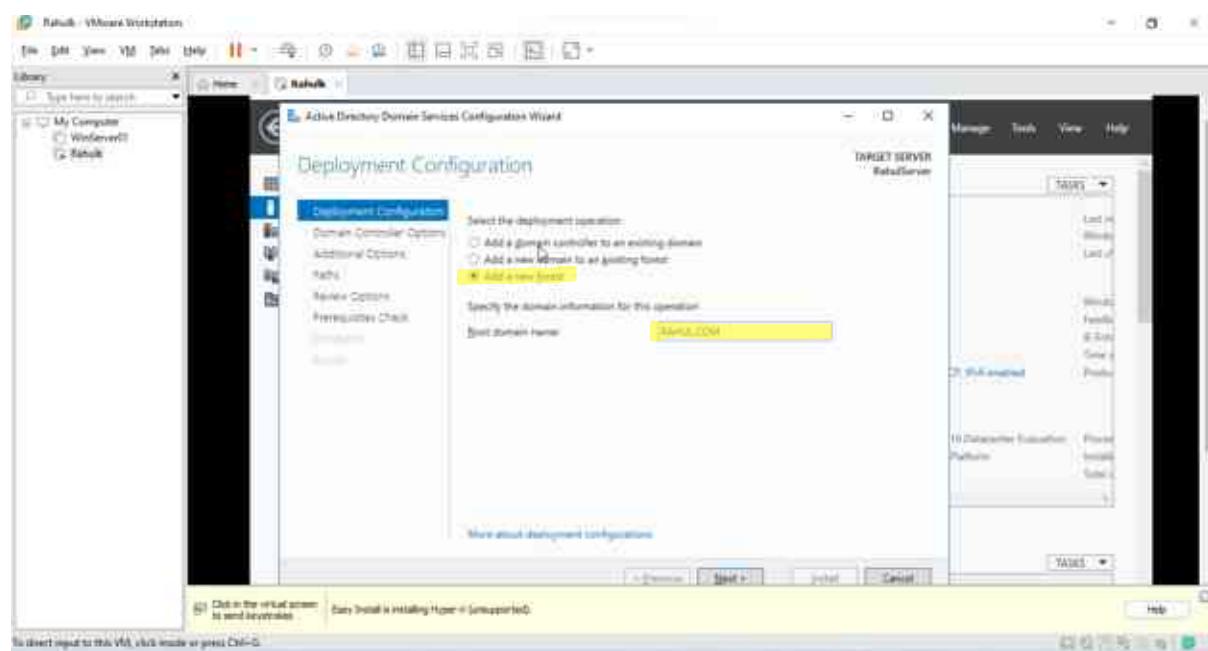


Step 33: Domain Creation

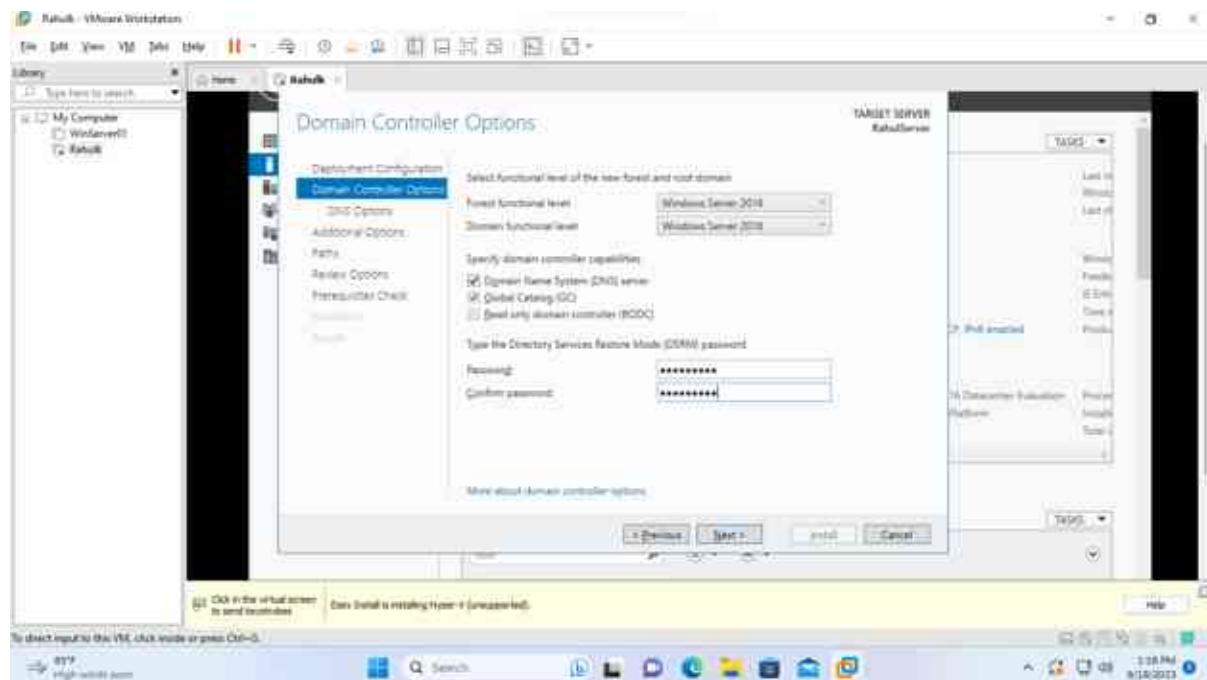
- After the restart open Server Manager. Go to the Notification flag as it will be showing a warning sign.
- In the **Post-deployment configuration notification** click on the given link “**Promote this server to a domain controller**”



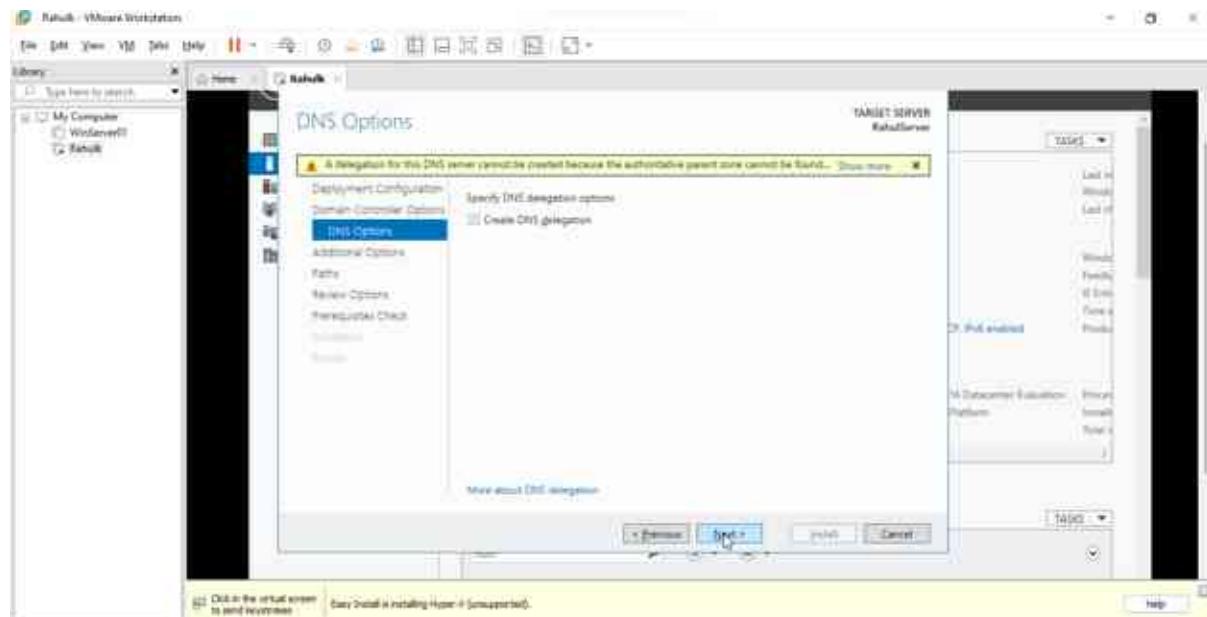
- This opens the **Active Directory Domain Services Configuration Wizard**, Select **Add a forest option**, enter a name for the new domain (here it is **RAHUL.COM**) and **Click Next**



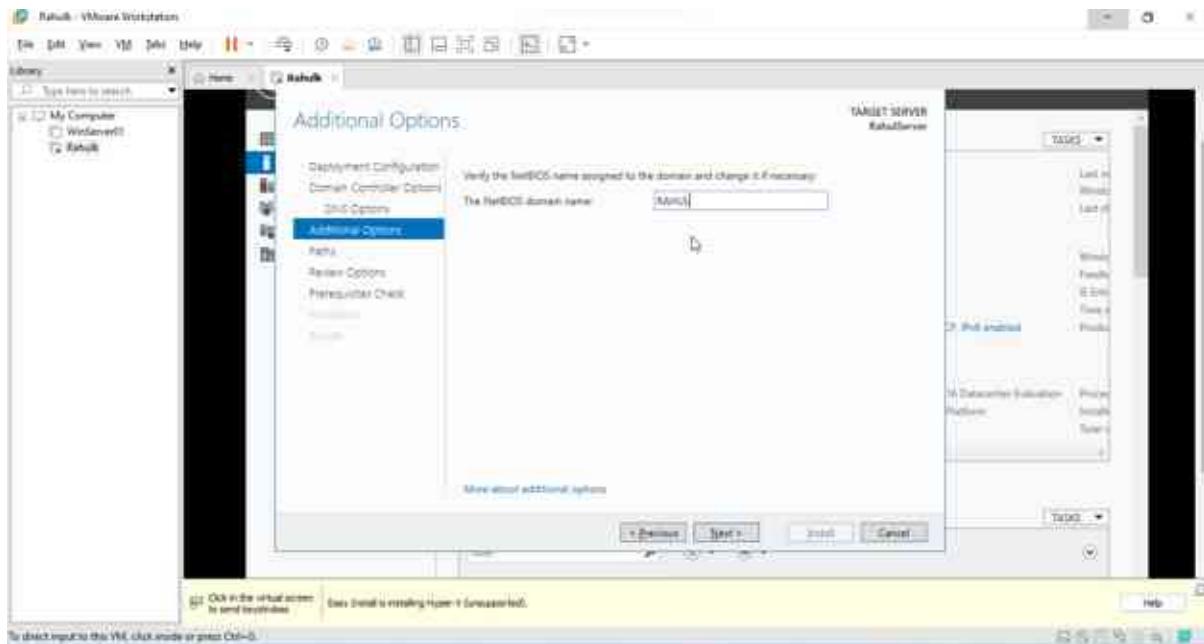
- Enter a password for the domain (keep it same as the administrator password, recommended). **Click on Next**



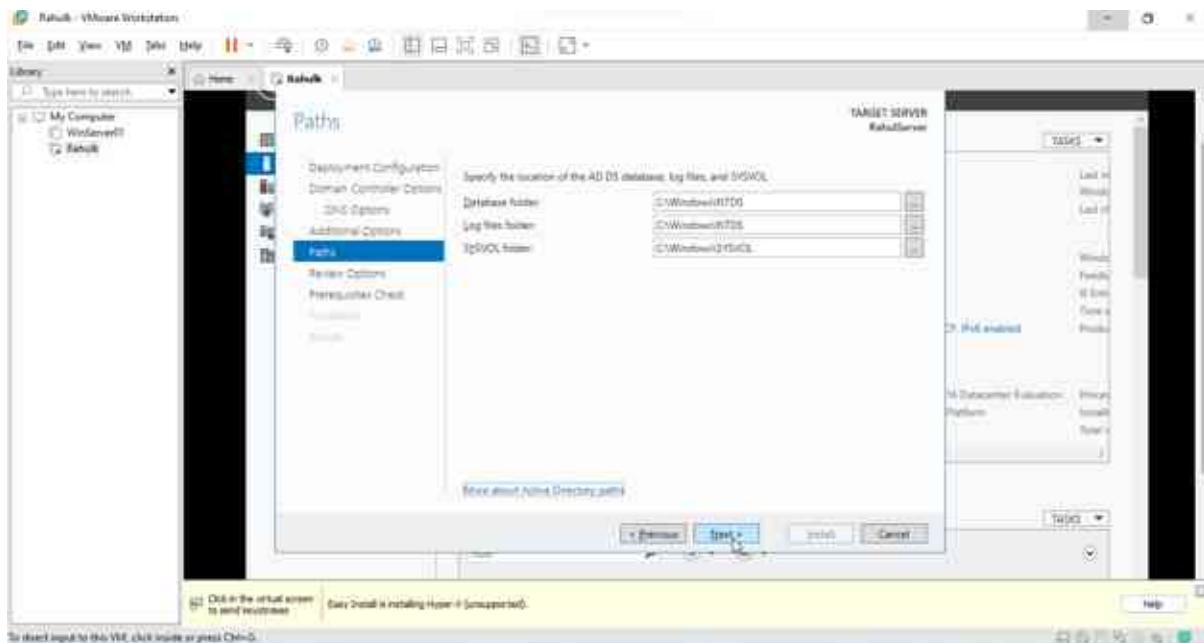
- At DNS Options **click on Next**



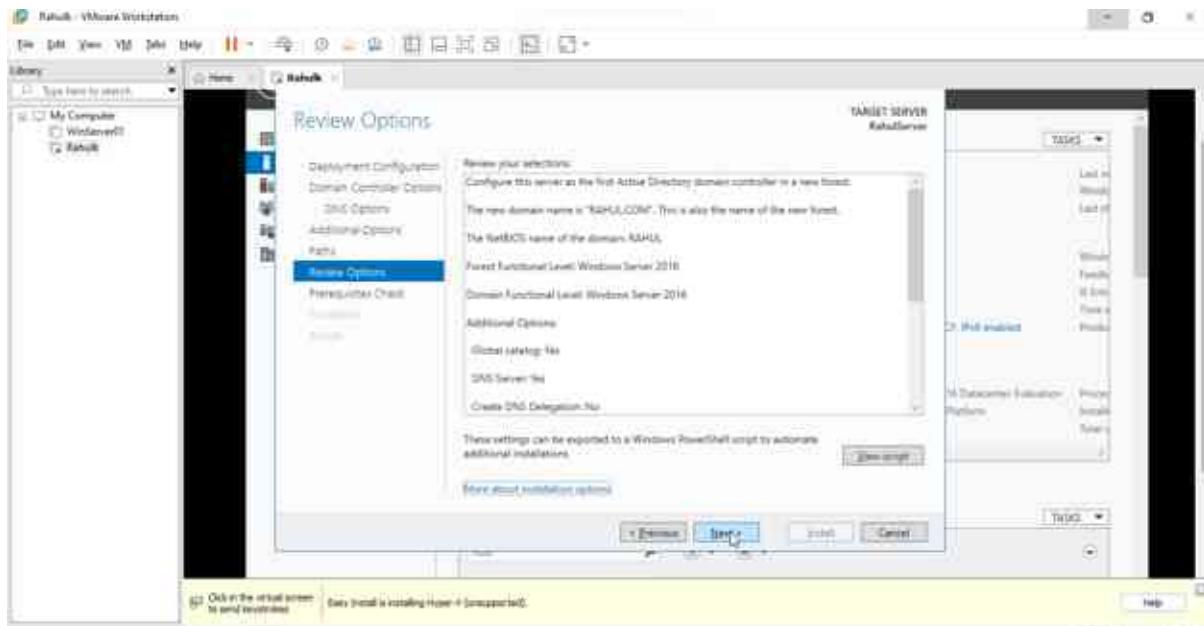
- At Additional Options Keep the default options and **click on Next**



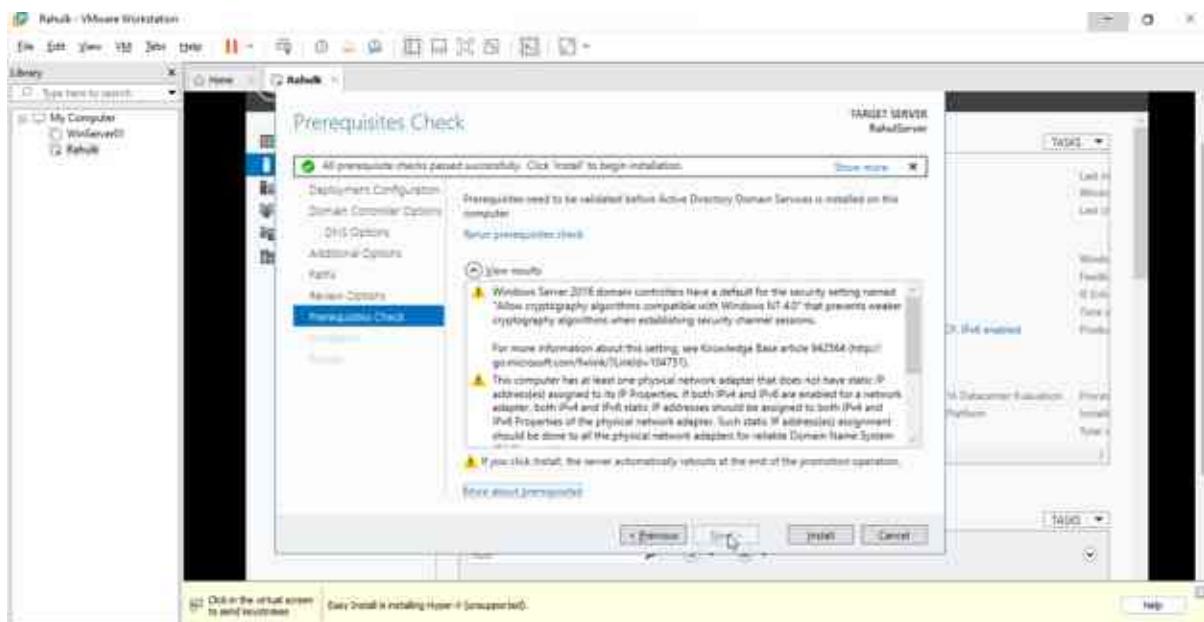
- At paths option Keep the default options and **click on Next**



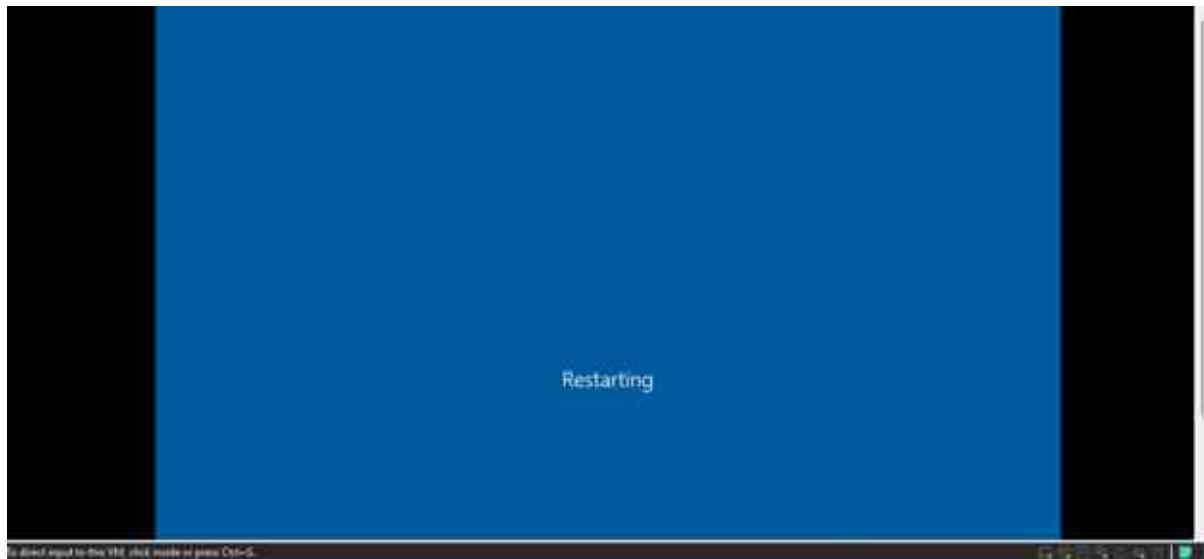
- Click on Next



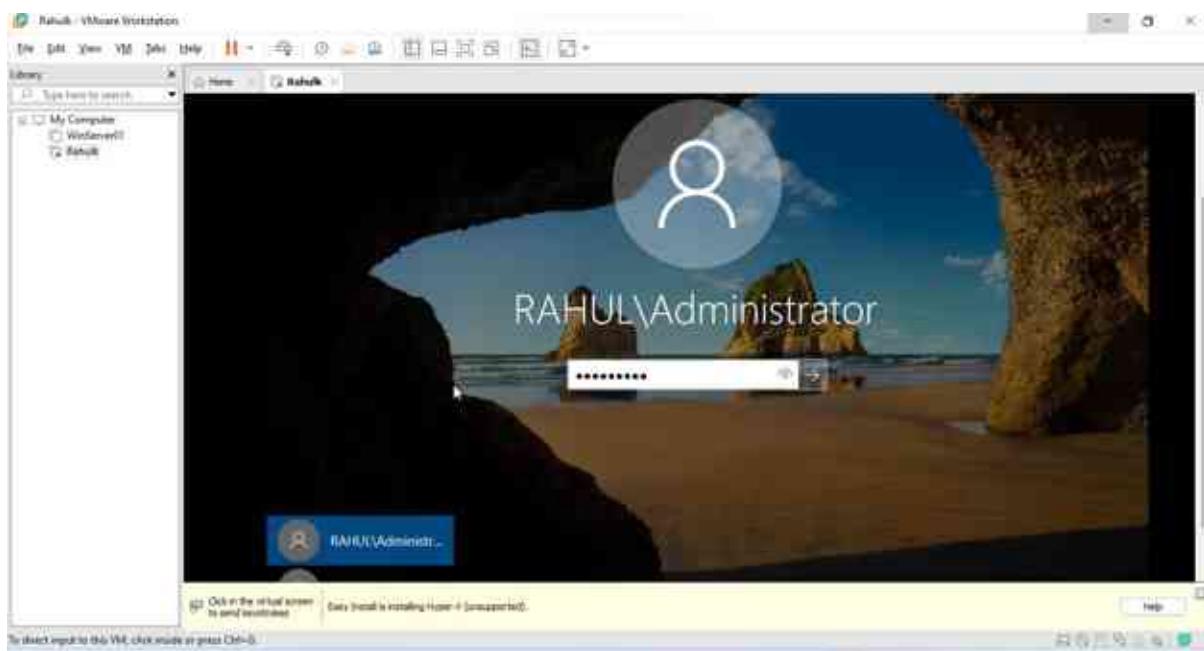
- At Pre-requisites Check. It should pass all prerequisites check and warning are acceptable
- Click on install



- After the Completion of installation the VM will restart for the changes take effect

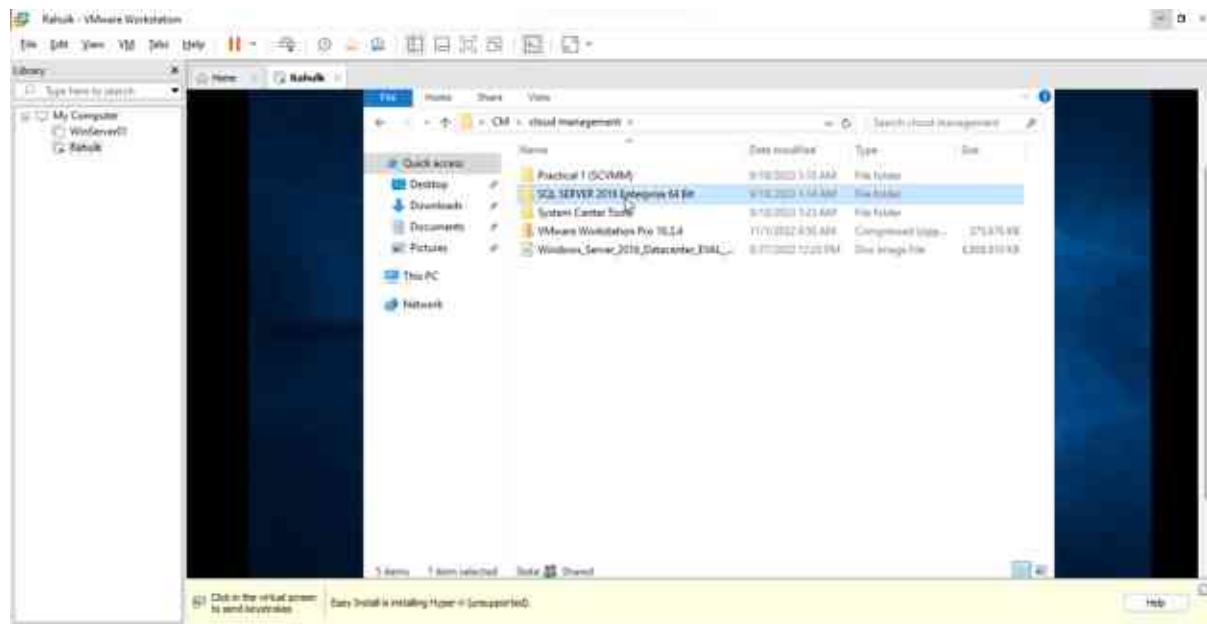


- **Log in as Administrator**

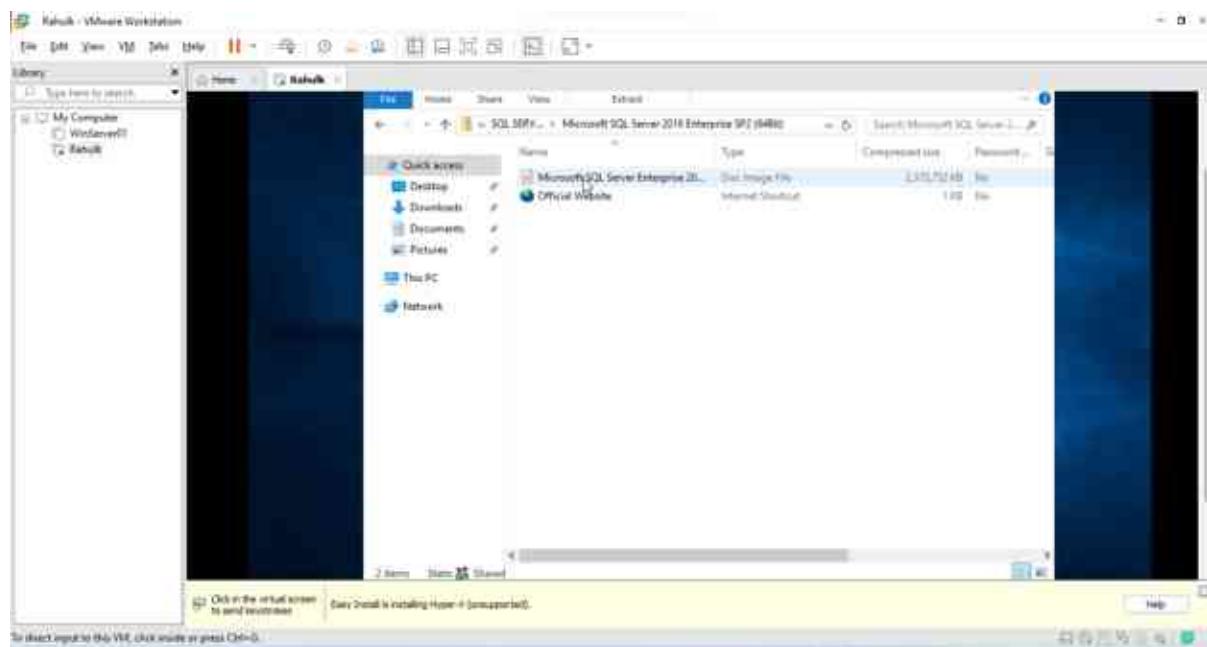


Step 34: Installing and Configuration SQL Server

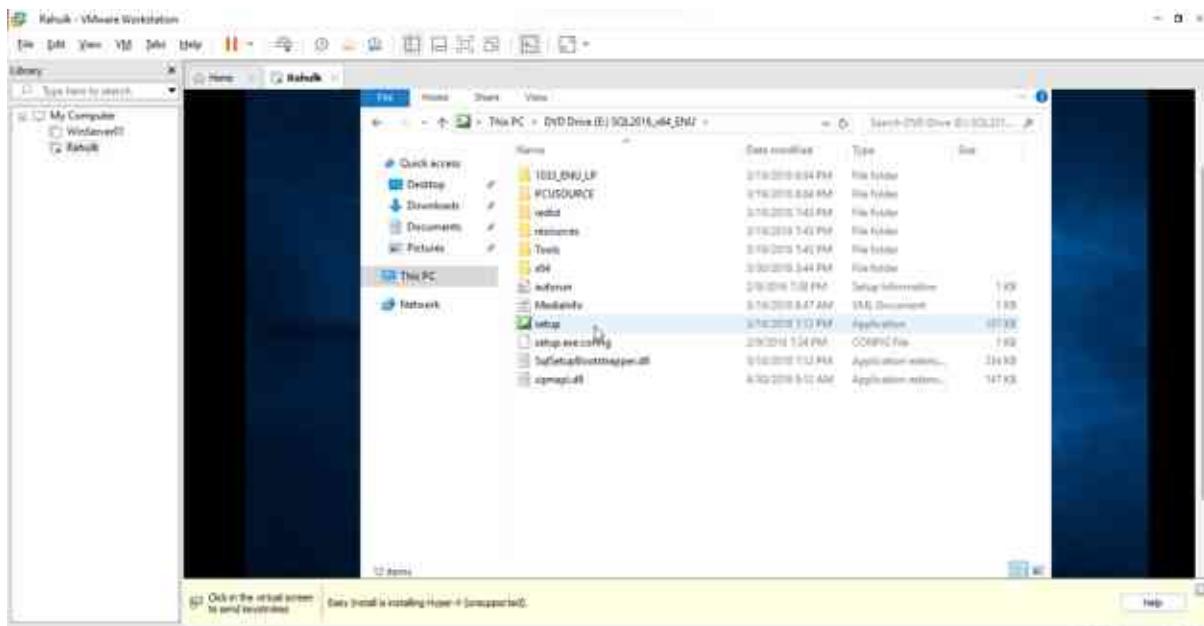
- Drag and drop the required file for the practical into the VM



- Mount the SQL Server iso file

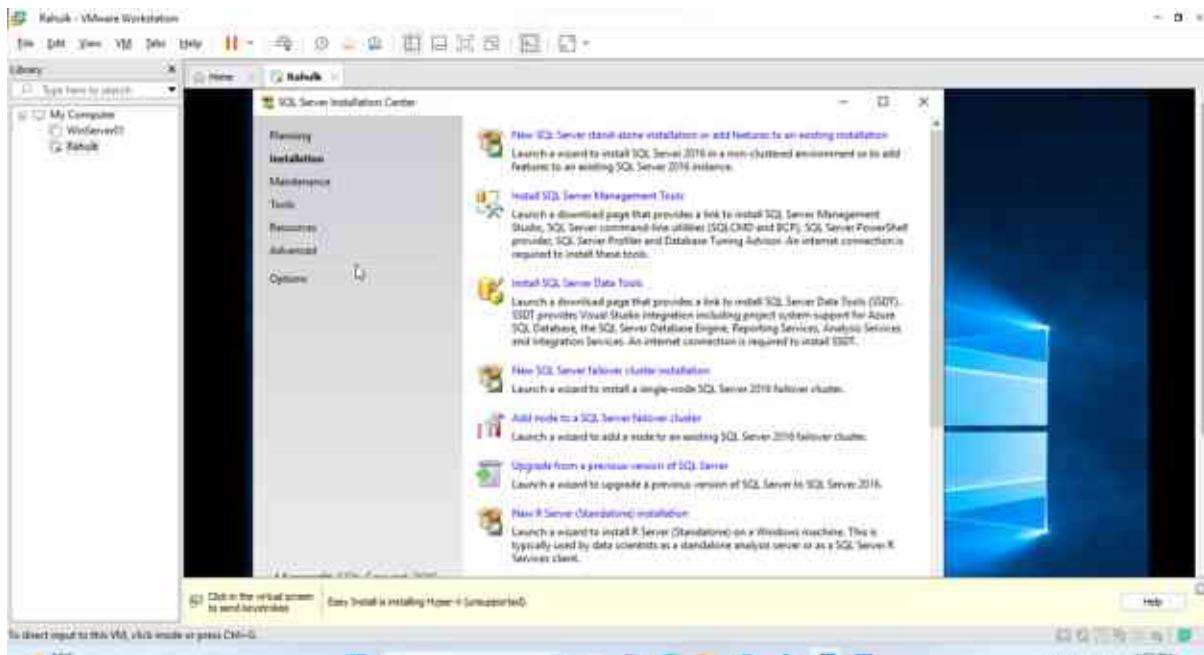


- Click on Setup

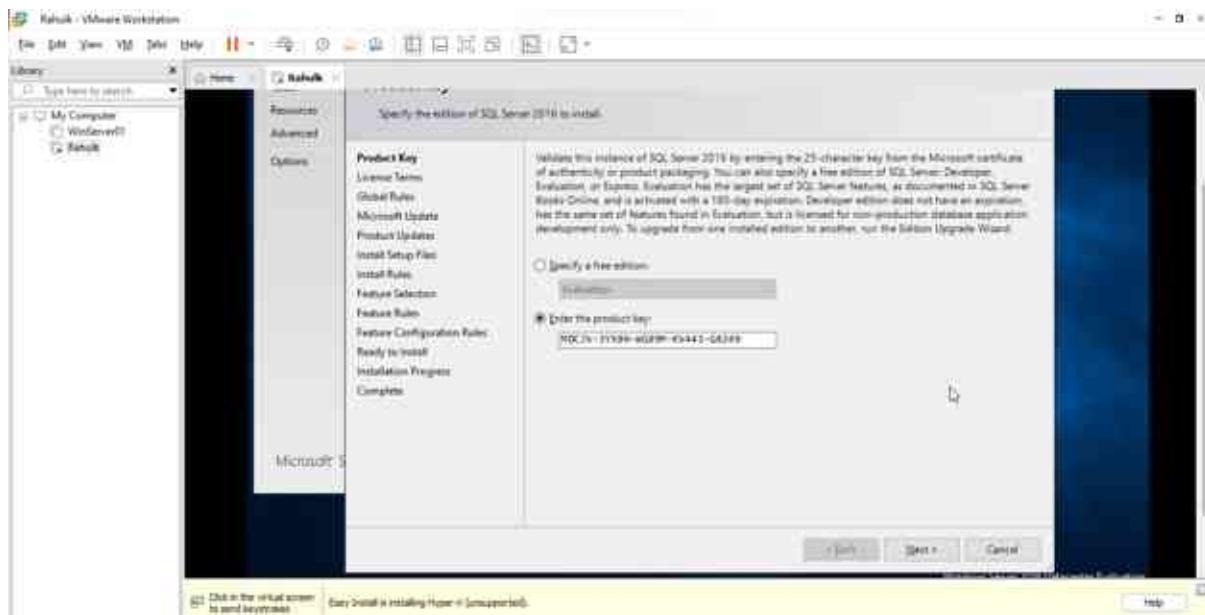


The SQL Server Installation Center Open Click on Installation.

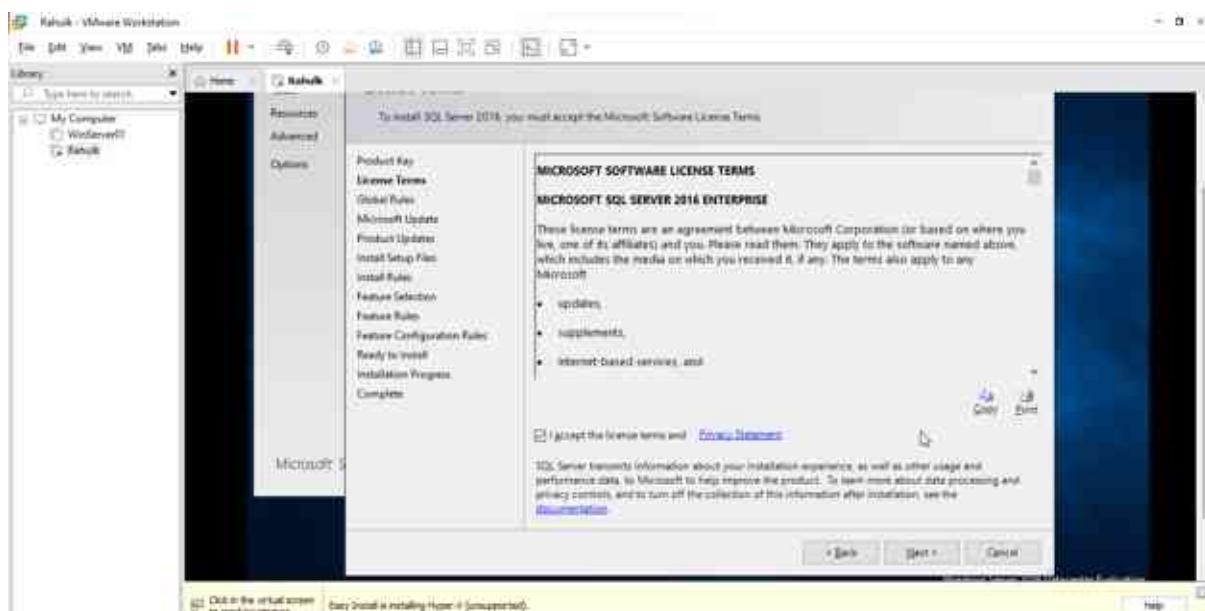
Within Installation Select New SQL Server stand-alone installation or add features to an existing installation



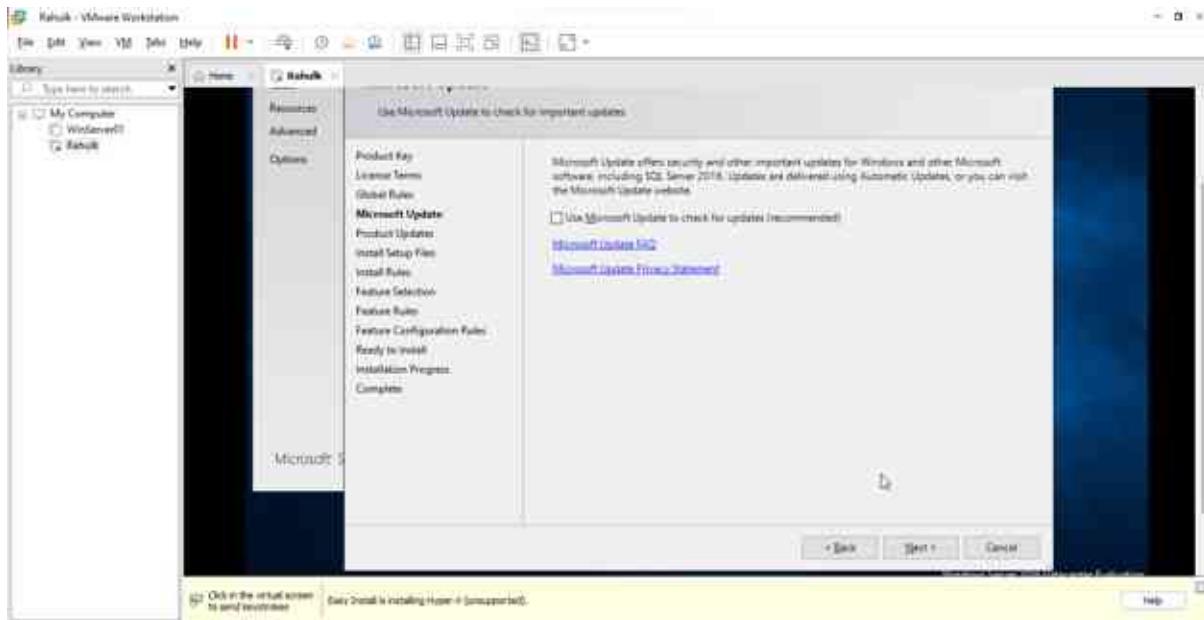
- Leaves it as default and click on Next



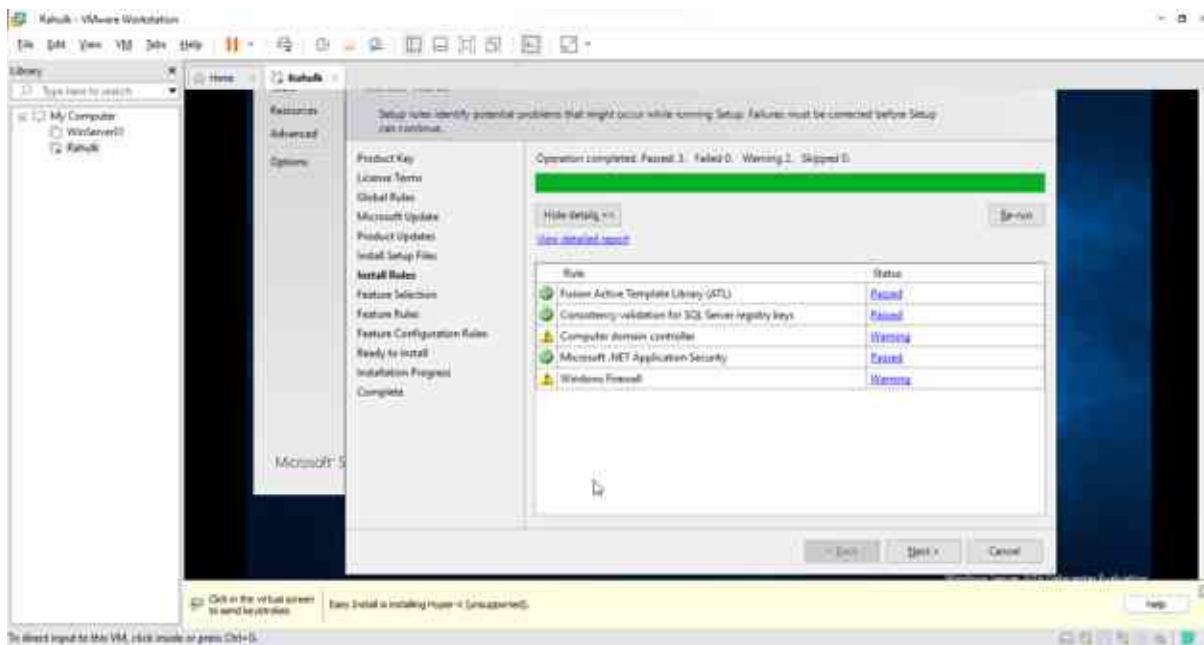
- Select Accept license and terms and Click Next

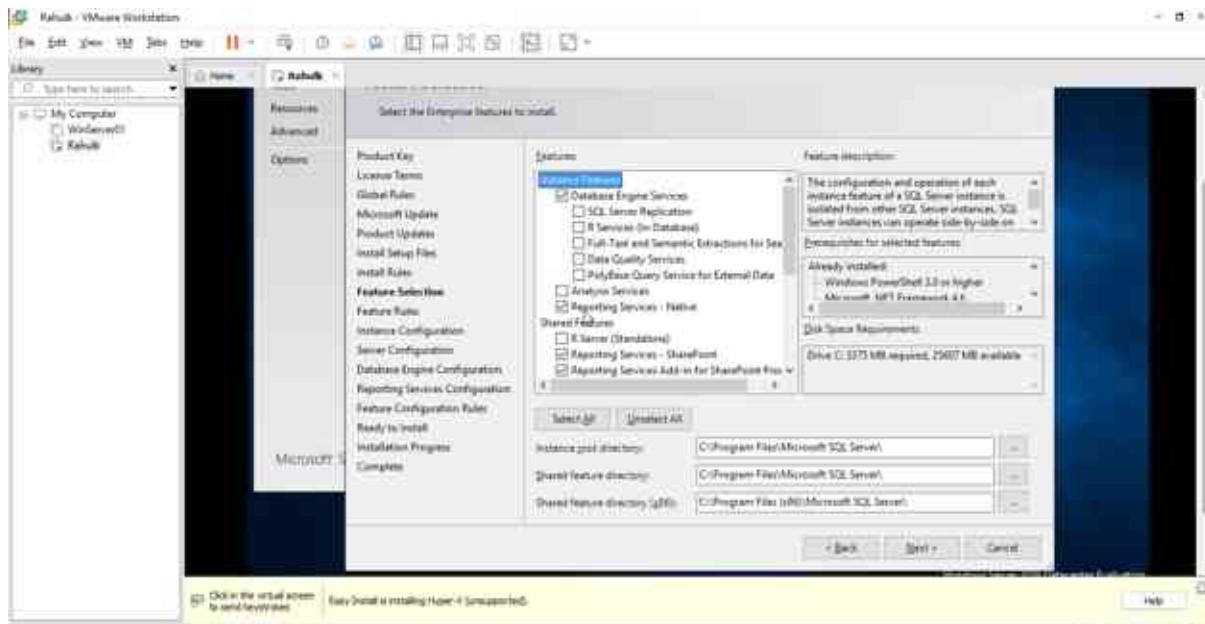


- Click On Next

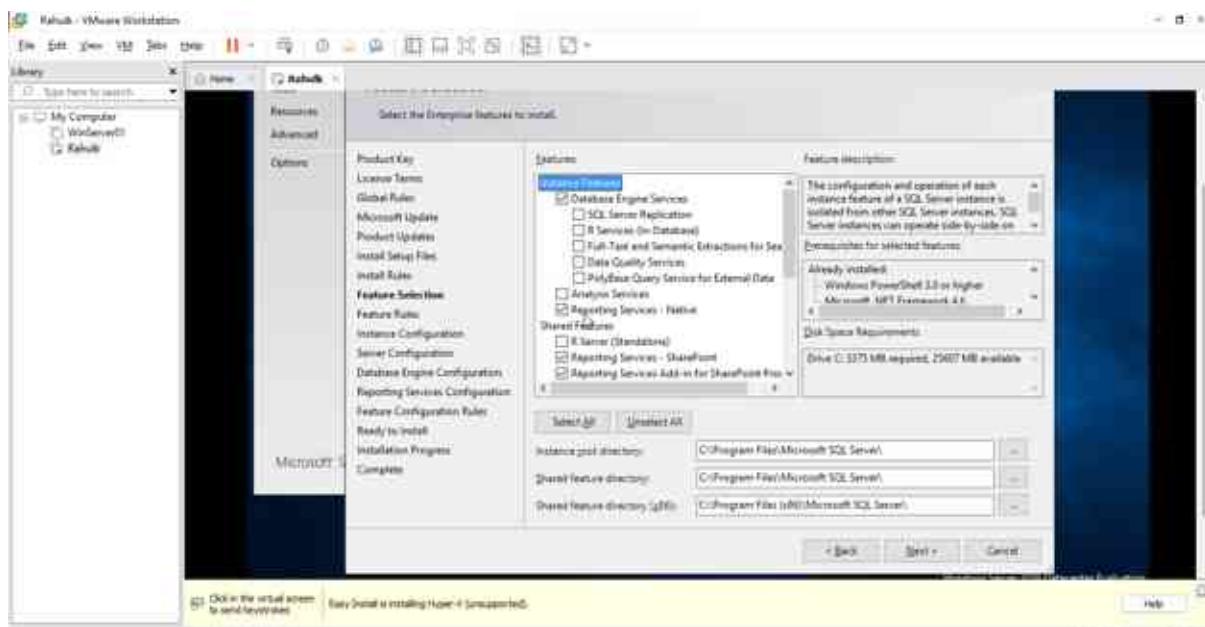


- Install Rules which should pass with only a few warnings and click on Next

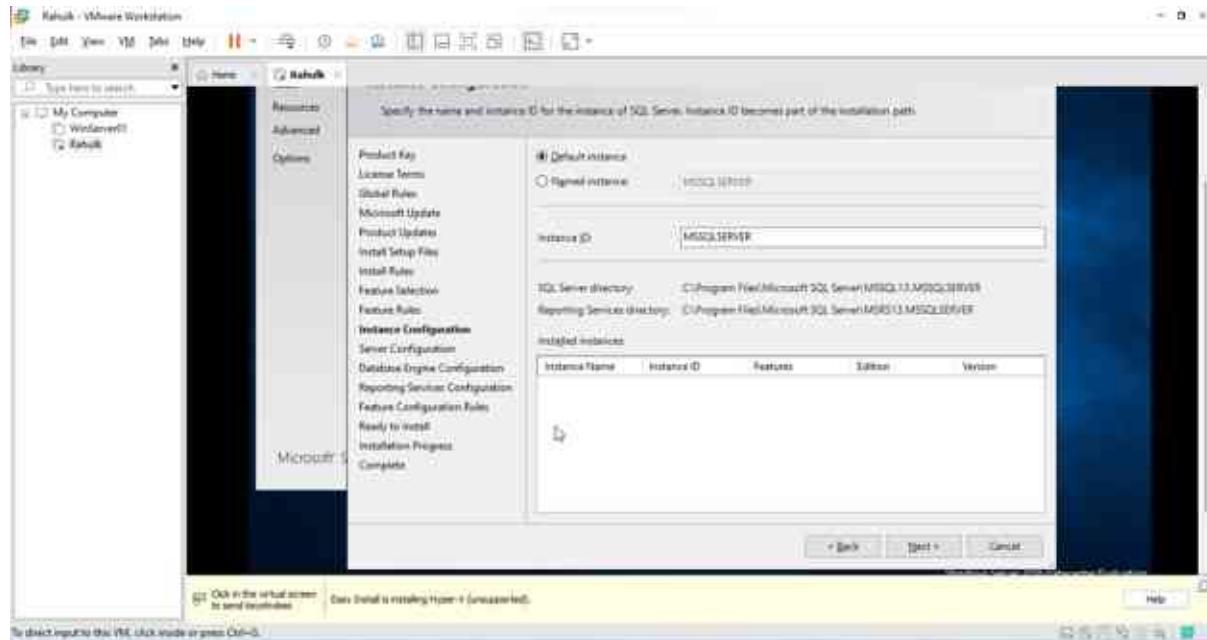




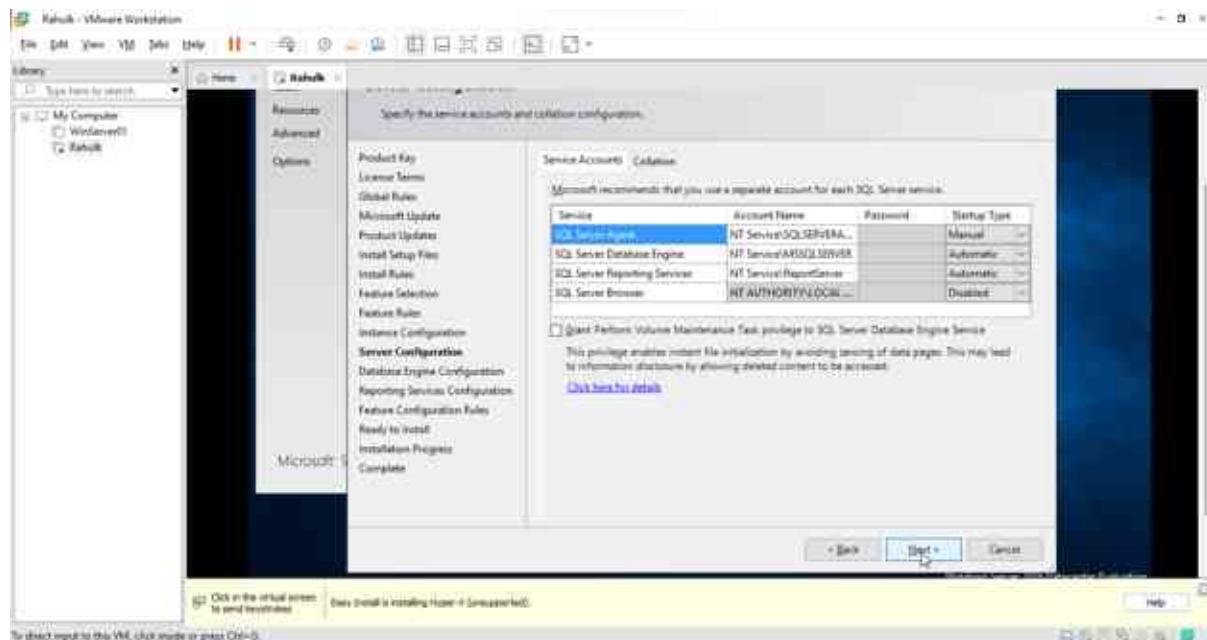
- In Feature Selection select the features given below:
 - 1. Database Engine Services**
 - 2. Reporting Services – Native**
 - 3. Reporting Services SharePoint**
 - 4. Reporting Services Add-in for SharePoint products**
 - 5. Client Tools Connectivity**
- After Feature Selection Click on Next



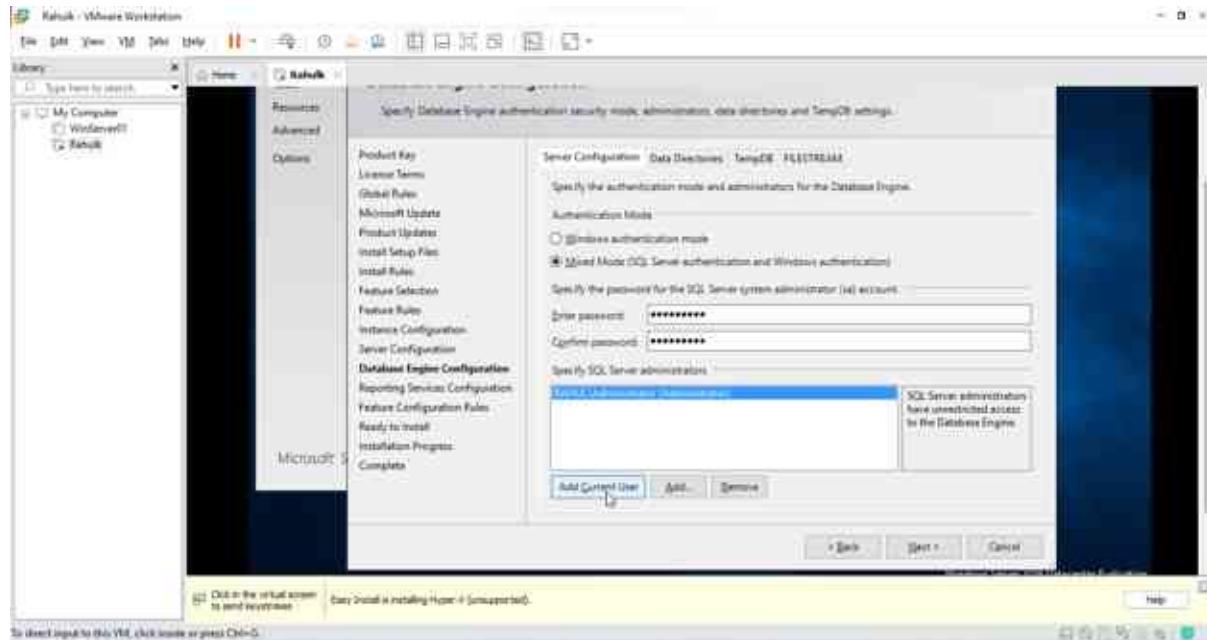
- Select Default instance and Click on Next



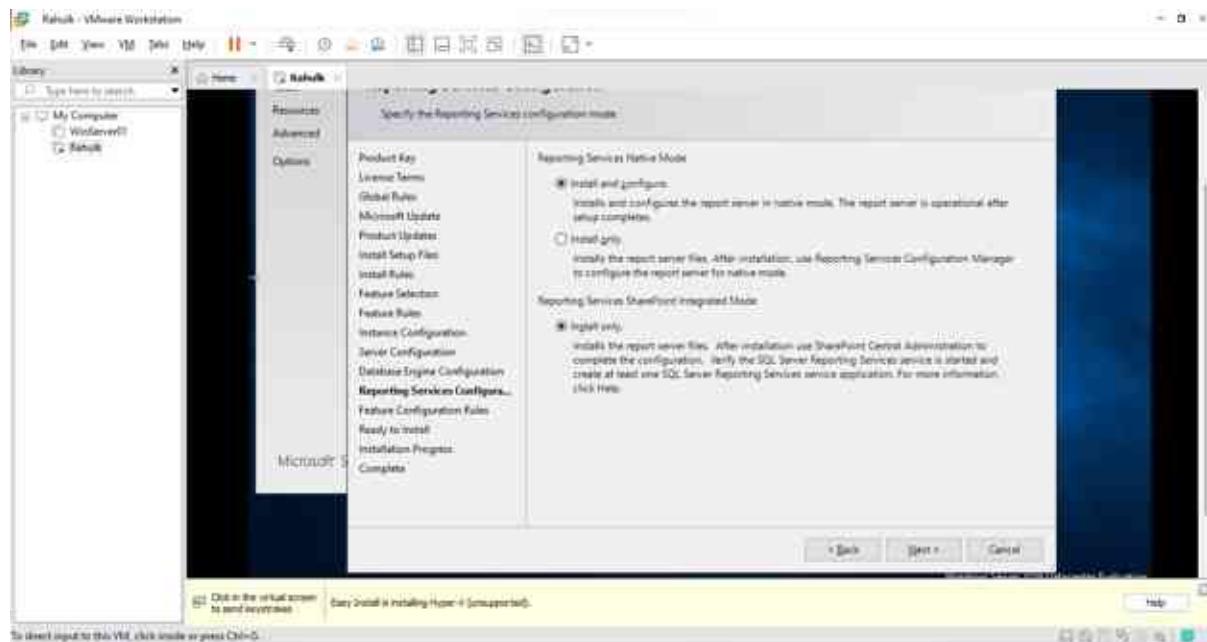
- Keep the default value and click on Next



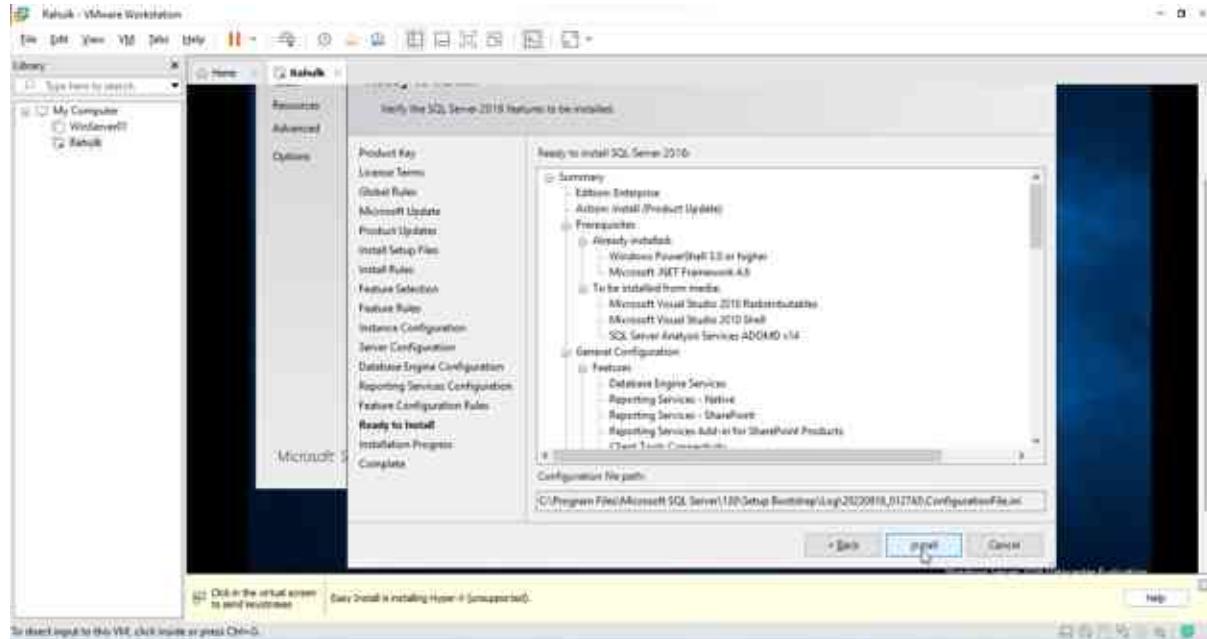
- In **Database Engine Configuration**, Select **Mixed Mode** and enter the same password as set while creating the VM
- Click on **Add Current User**, it should display the current Domain User and **Click Ok** and **click on Next**



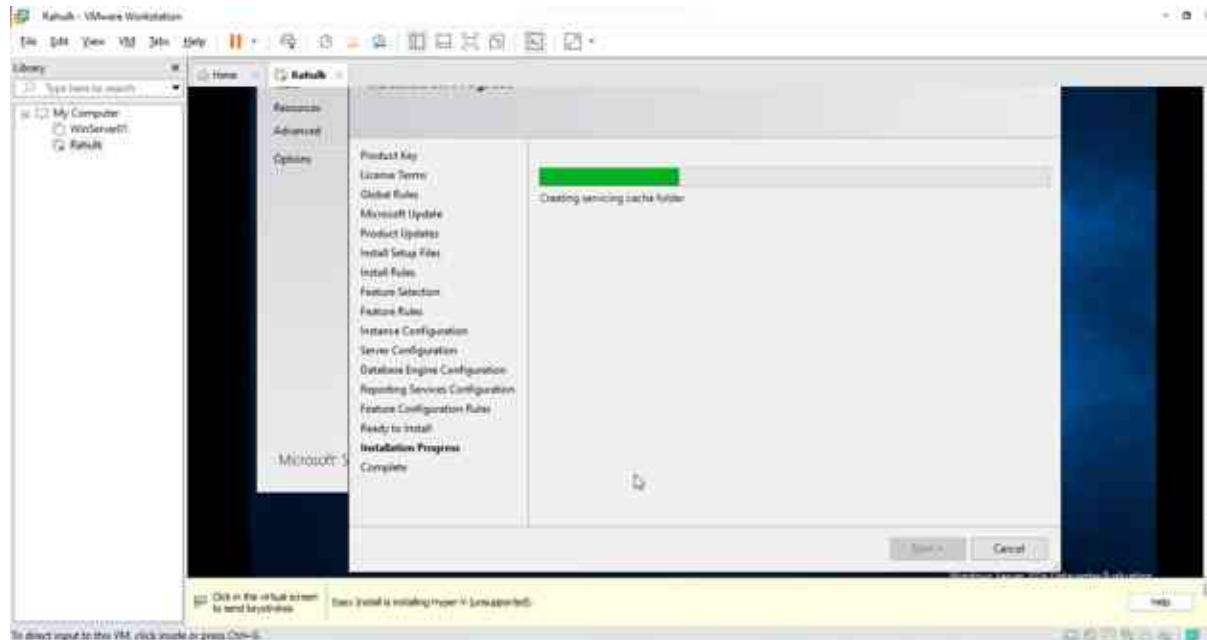
- Keep the default setting and **click on Next**



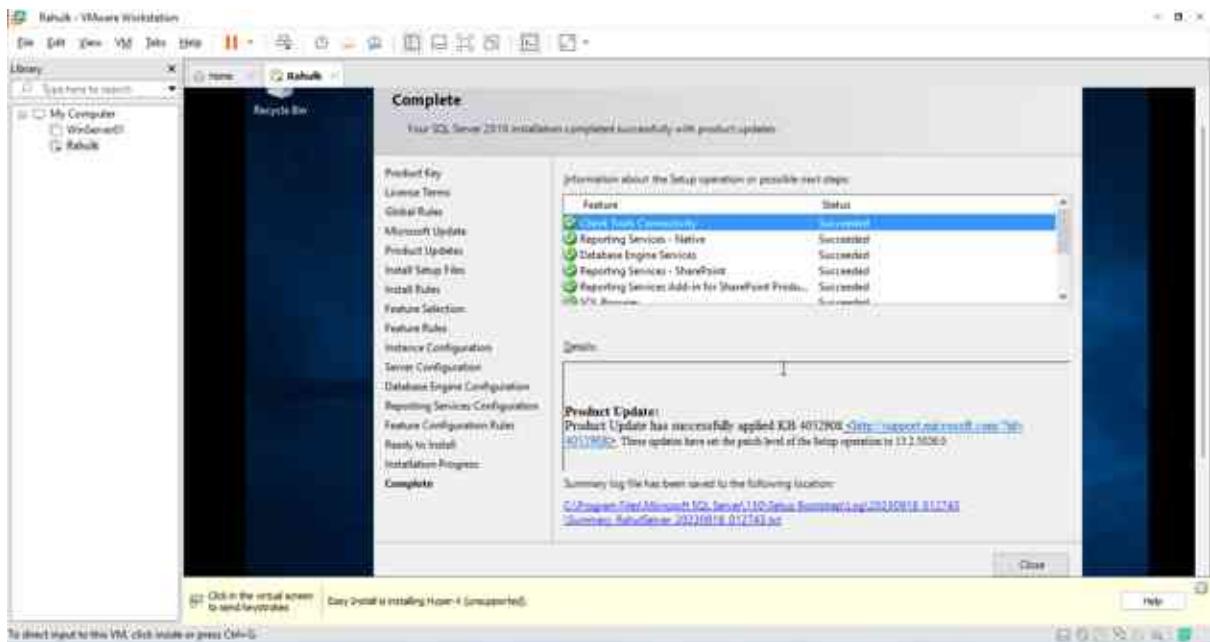
- Click on install



- It will start installation

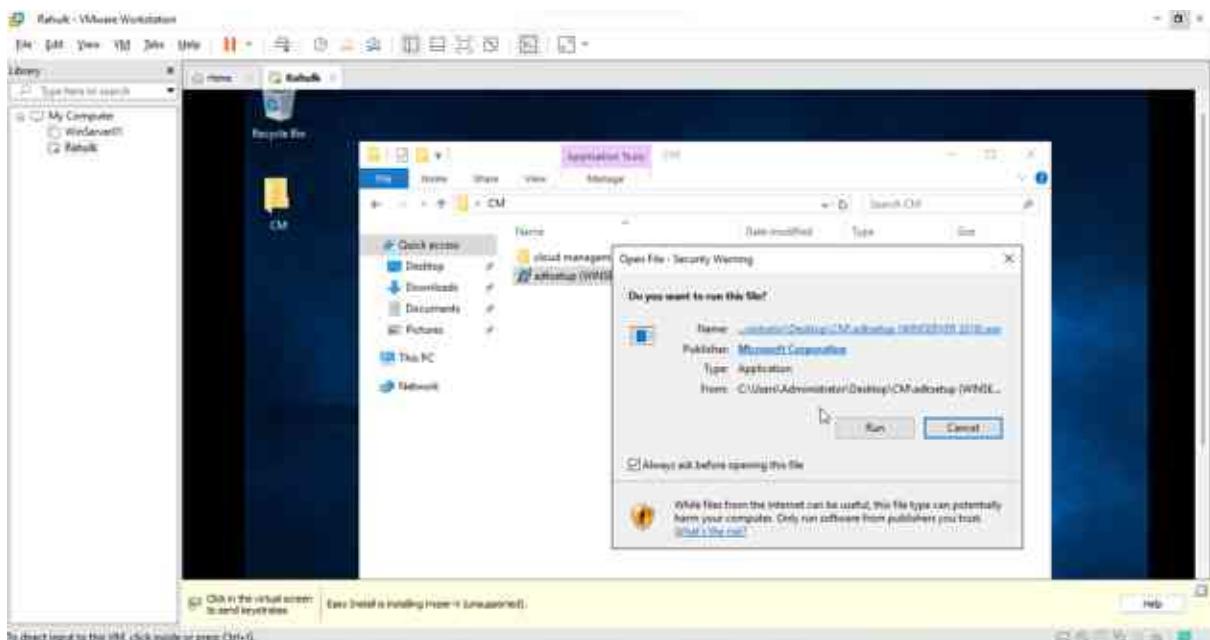


- It show installation Succeeded and **click on close**

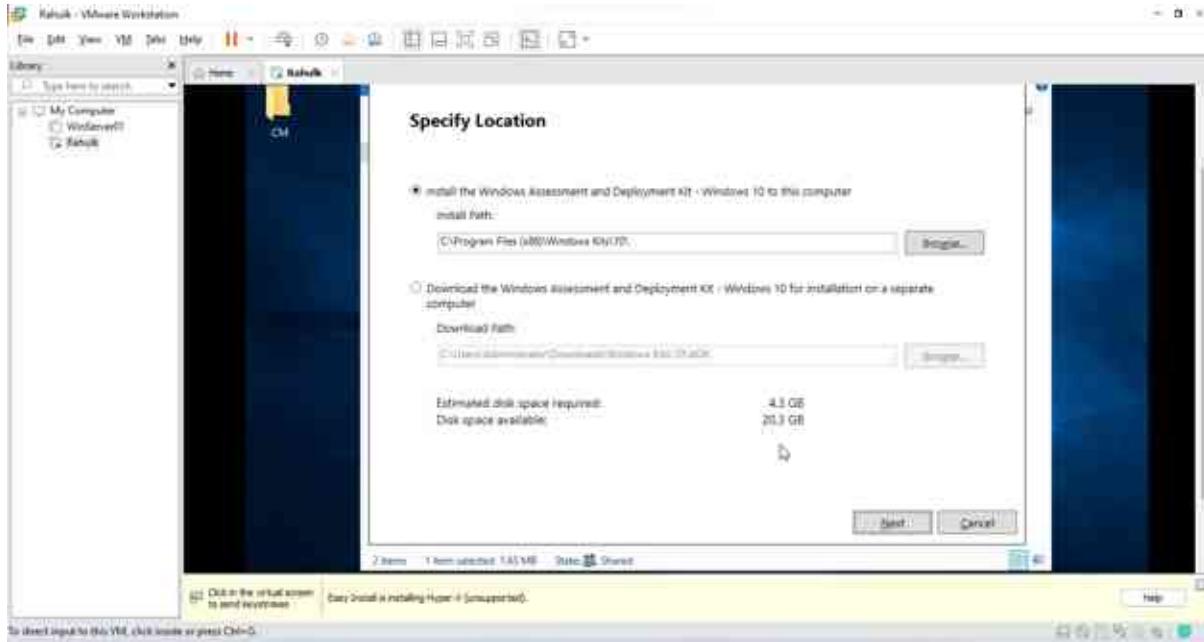


Step 35: Installing ADK-setup 2016 (Windows Toolkit)

- run the ADK setup



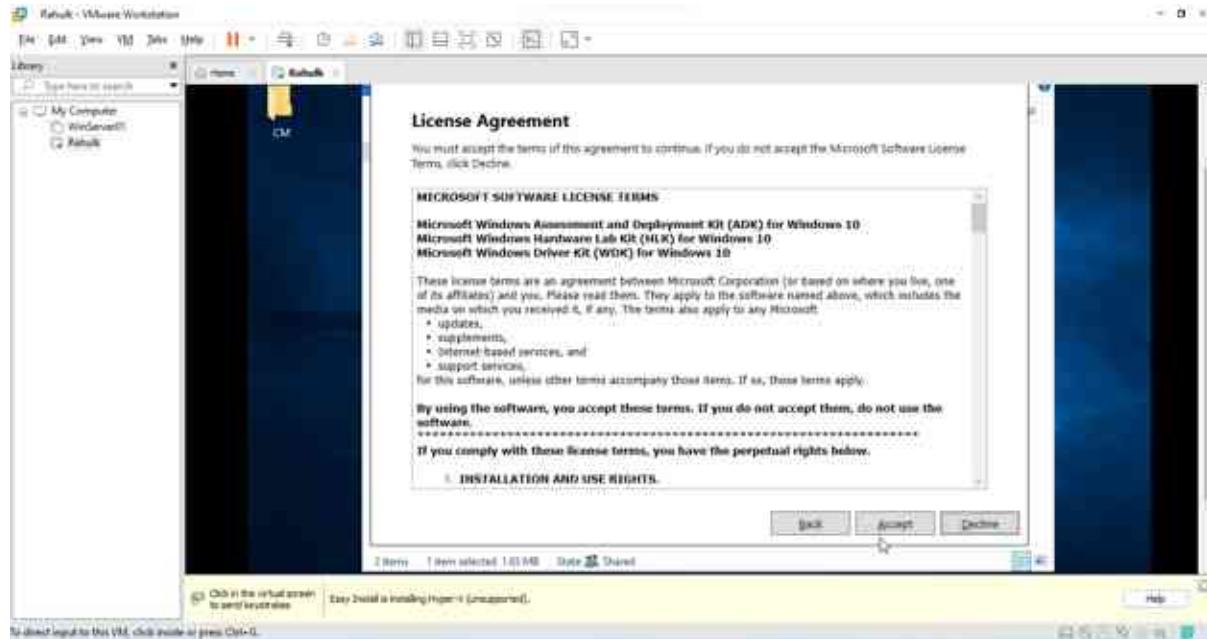
- Keep it as default setting and click on Next



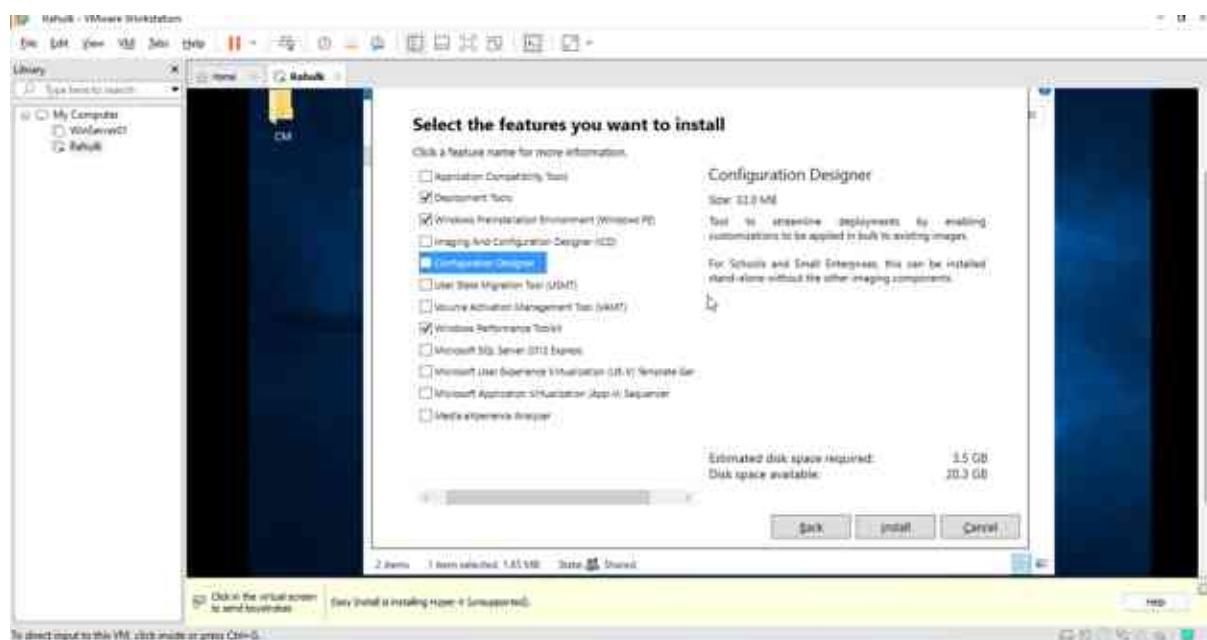
- Select No and click on Next



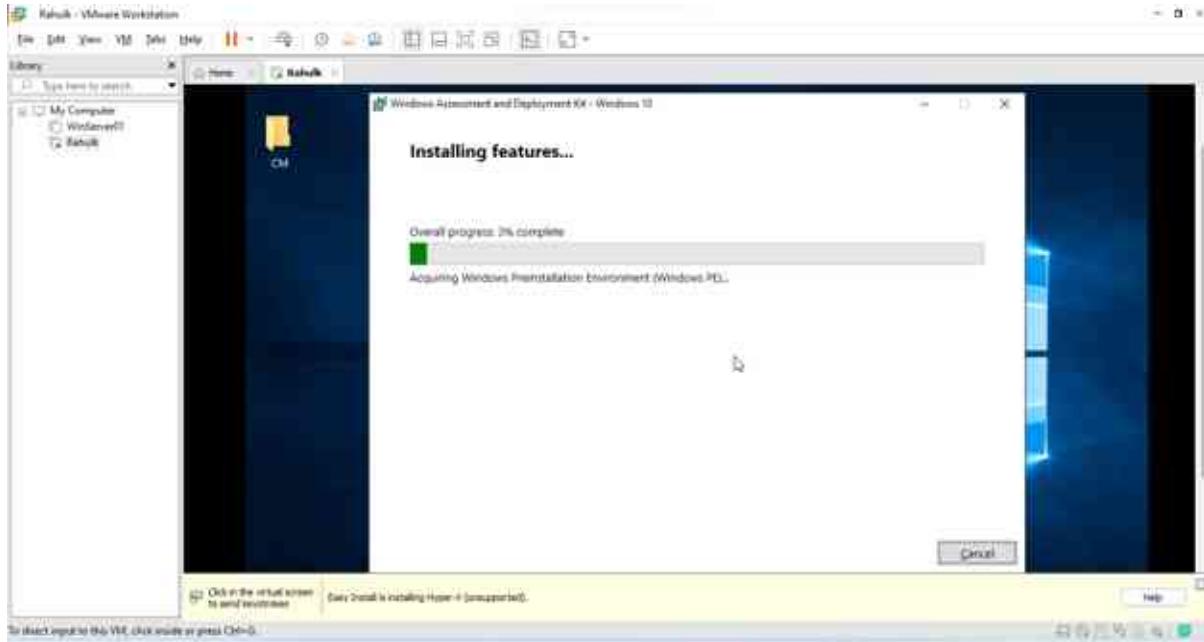
- For License Agreement **Click on Accept**



- Select the following feature:
 - Deployment Tools
 - Windows Preinstallation Environment (Windows PE)
 - Windows Performance Toolkit
- Click on install

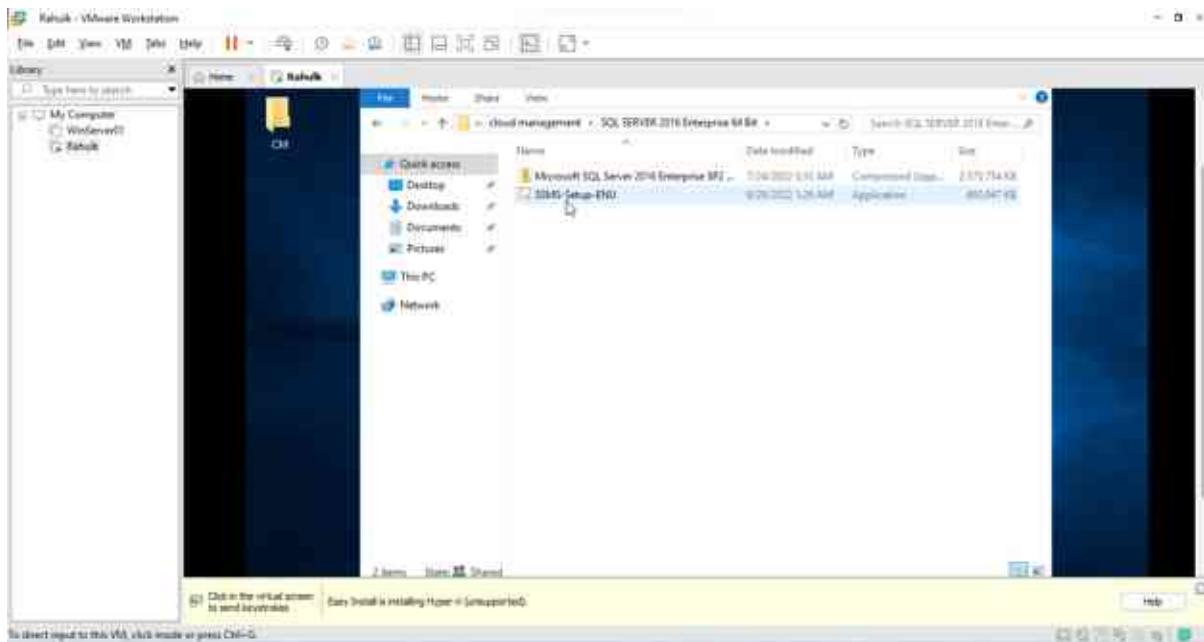


- Installation of feature will start

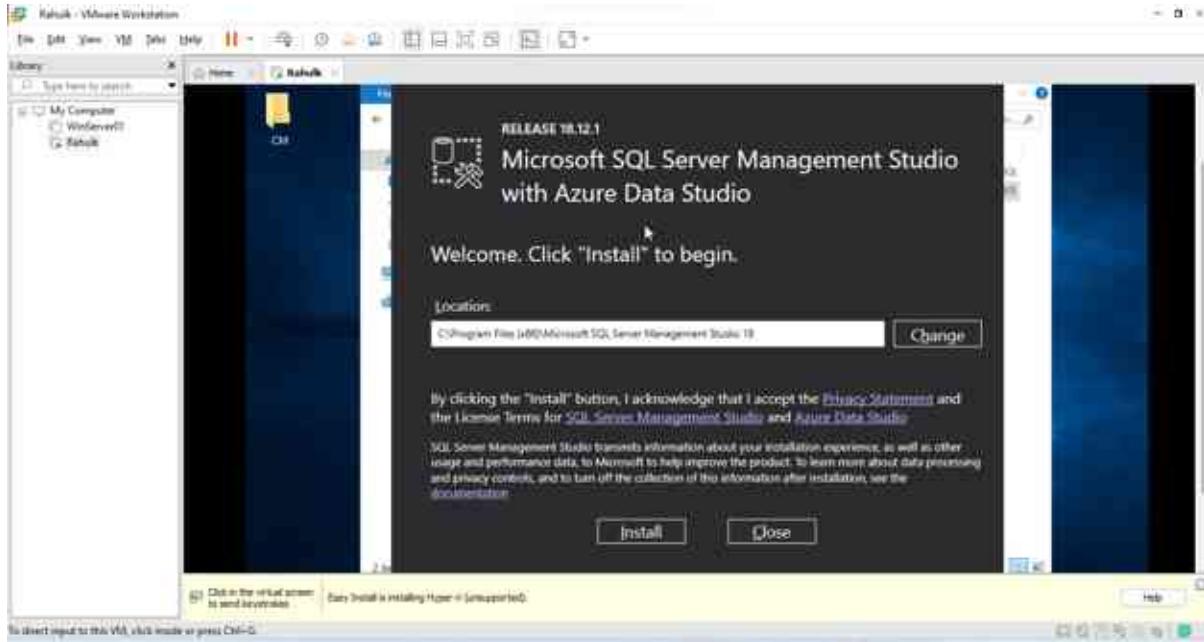


Step 36: Installing SQL Server Management Studio

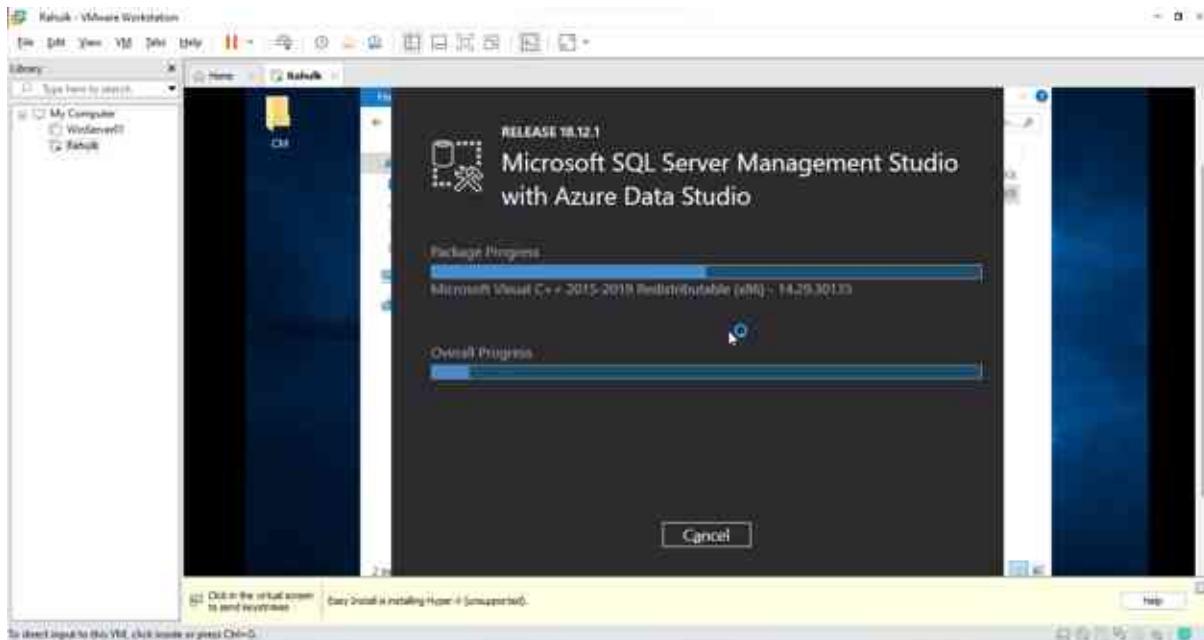
- Run the SSMS setup



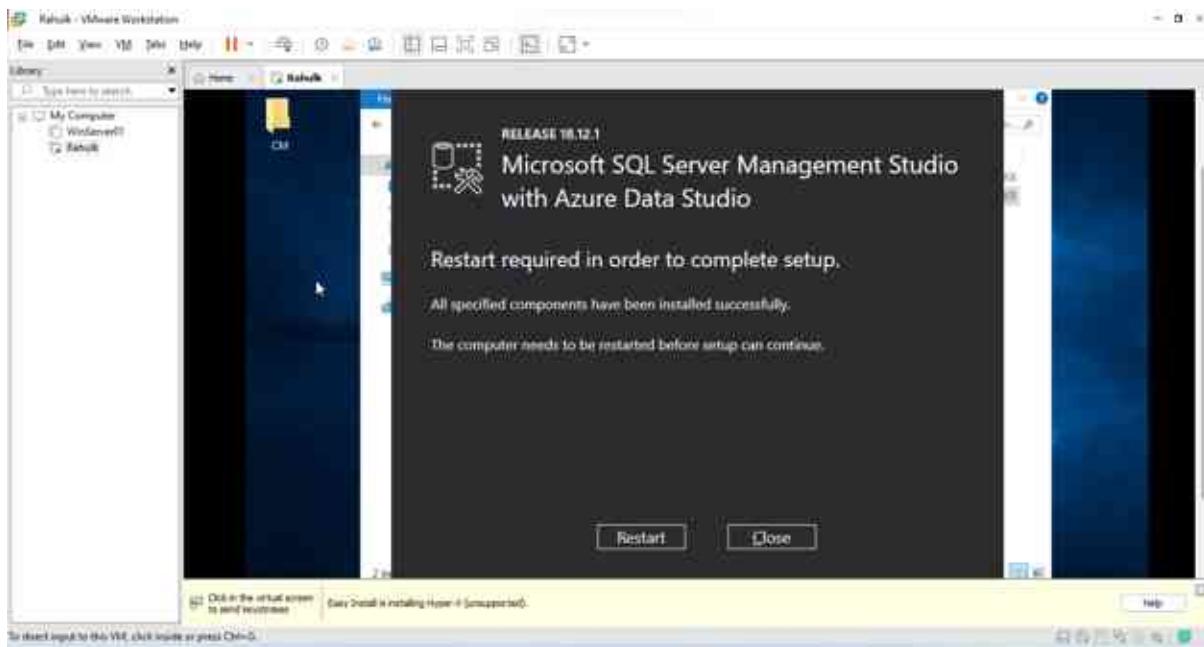
- Click on install



- Installation of feature will start

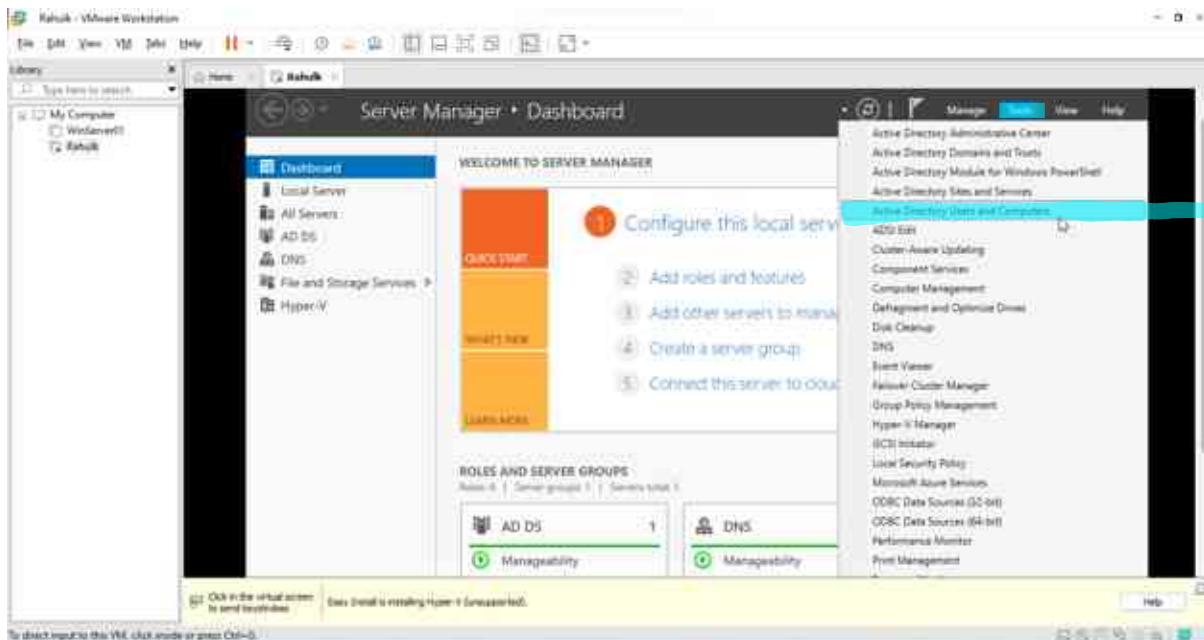


- Click on Restart

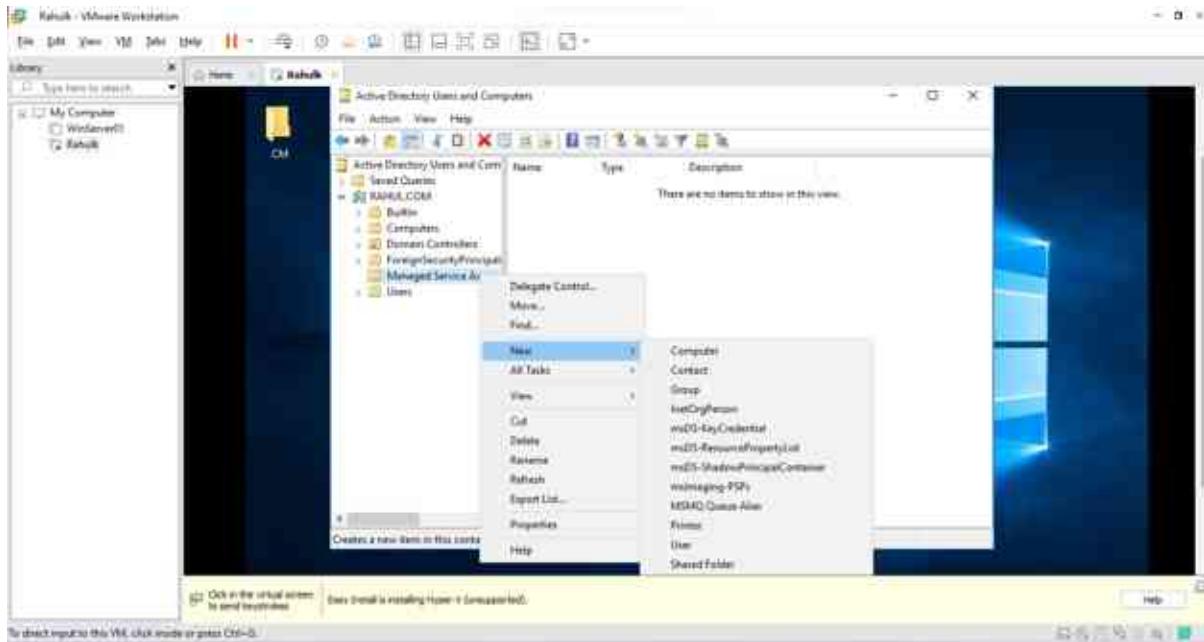


Step 37: Creation of User

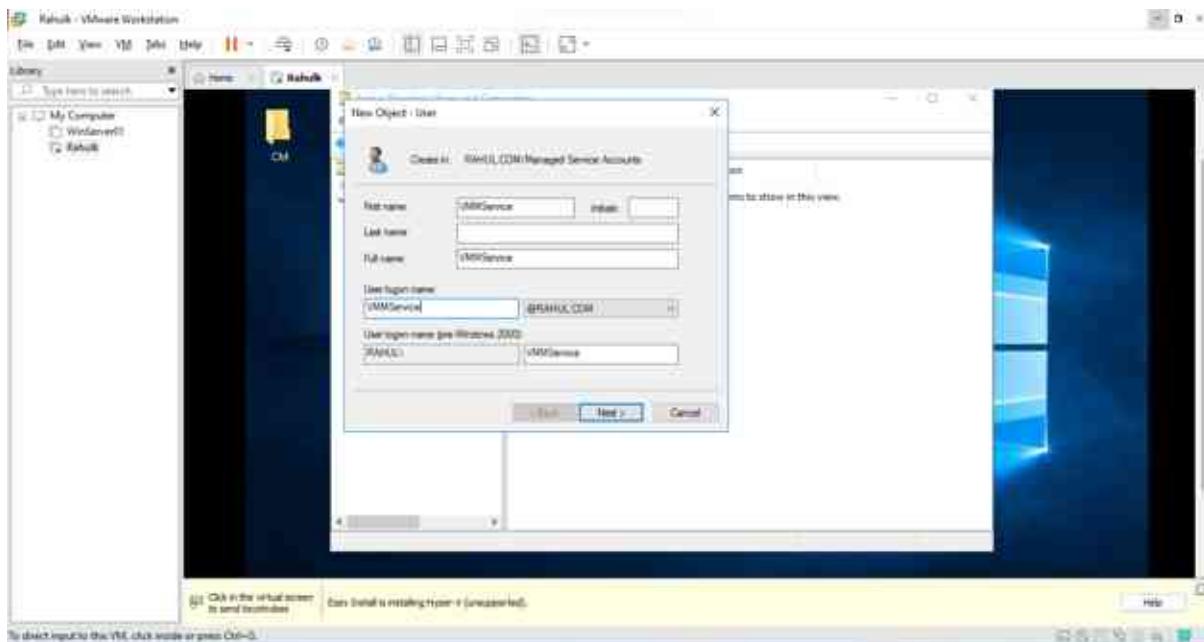
- Open Server Manager Click on Tools Within Tools Select Active Directory Users and Computers



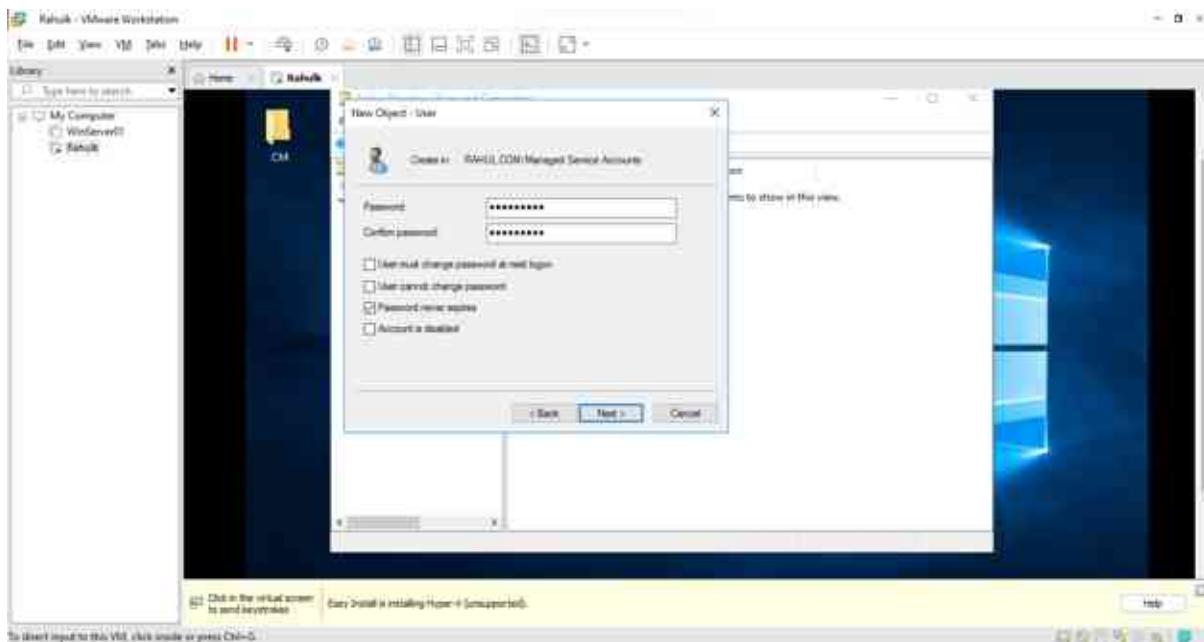
- Now Right Click on **Managed Service Accounts** and Select **New**
- Within New Select **User**



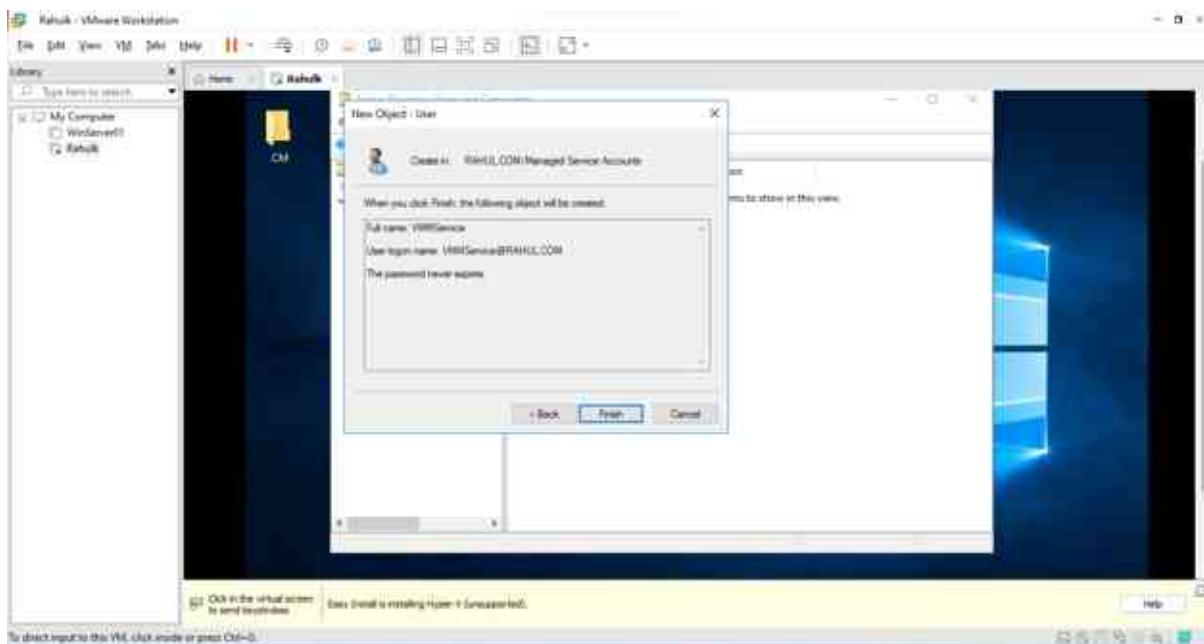
- New Object-User
- Enter a Username (**Here it is Username is VMMService**) on both **First name** and **User logon name** and click on **Next**



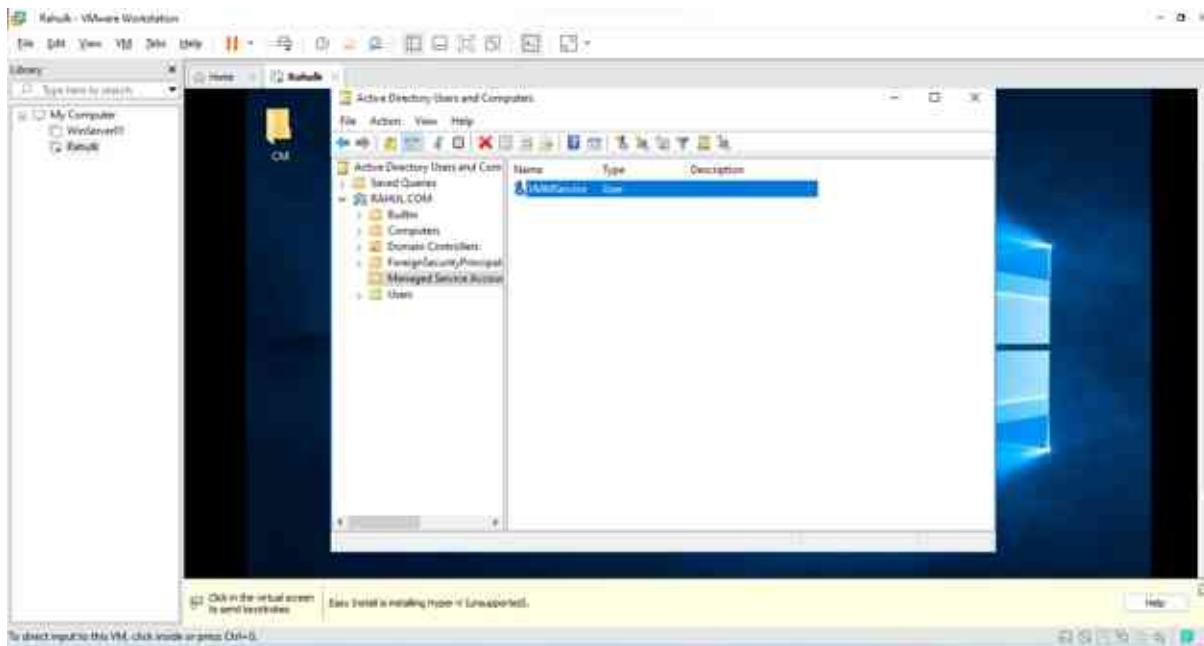
- In this Step Enter a **Password** for user same as the admin and select **Password never expires in the option** And **Click Next**



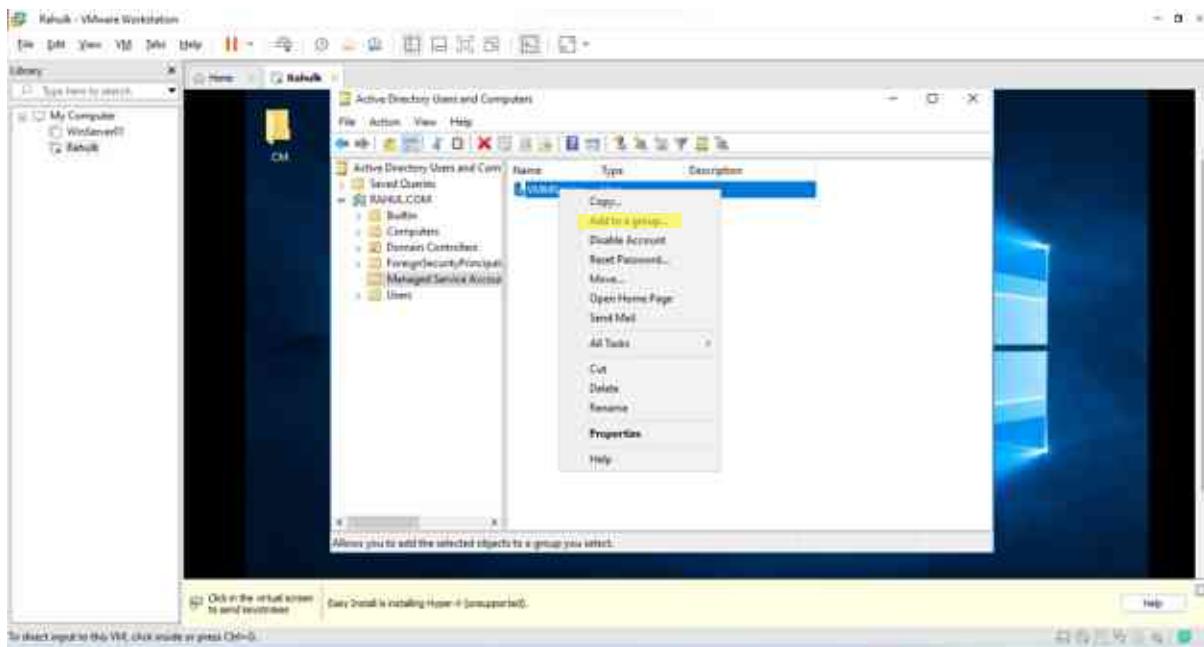
- **Click on Finish**



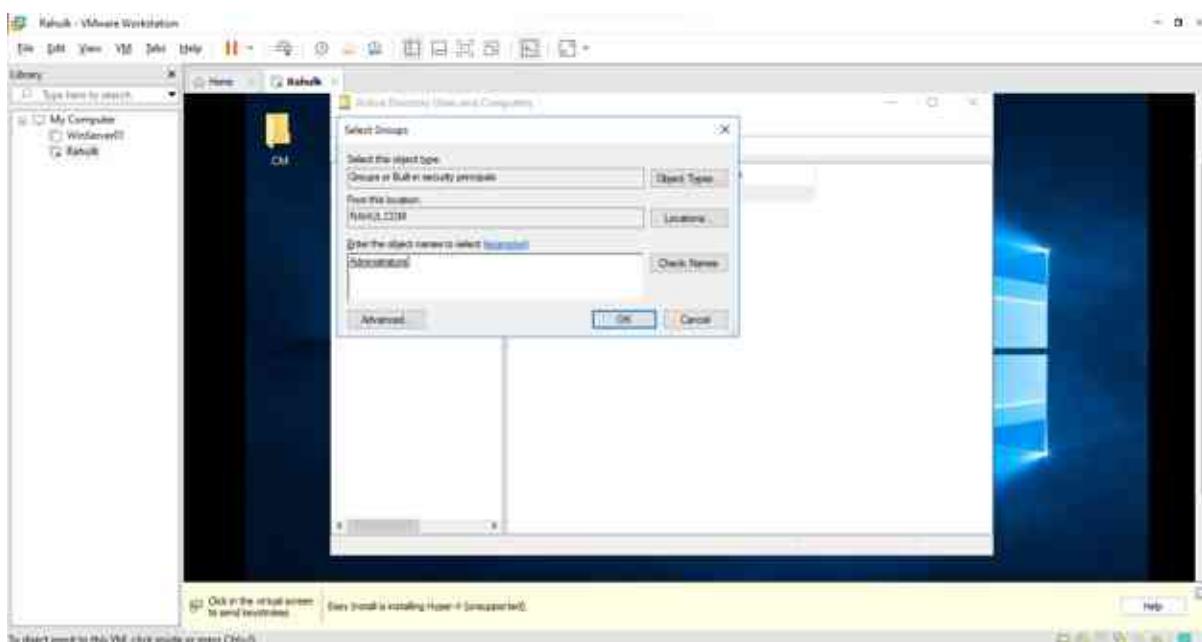
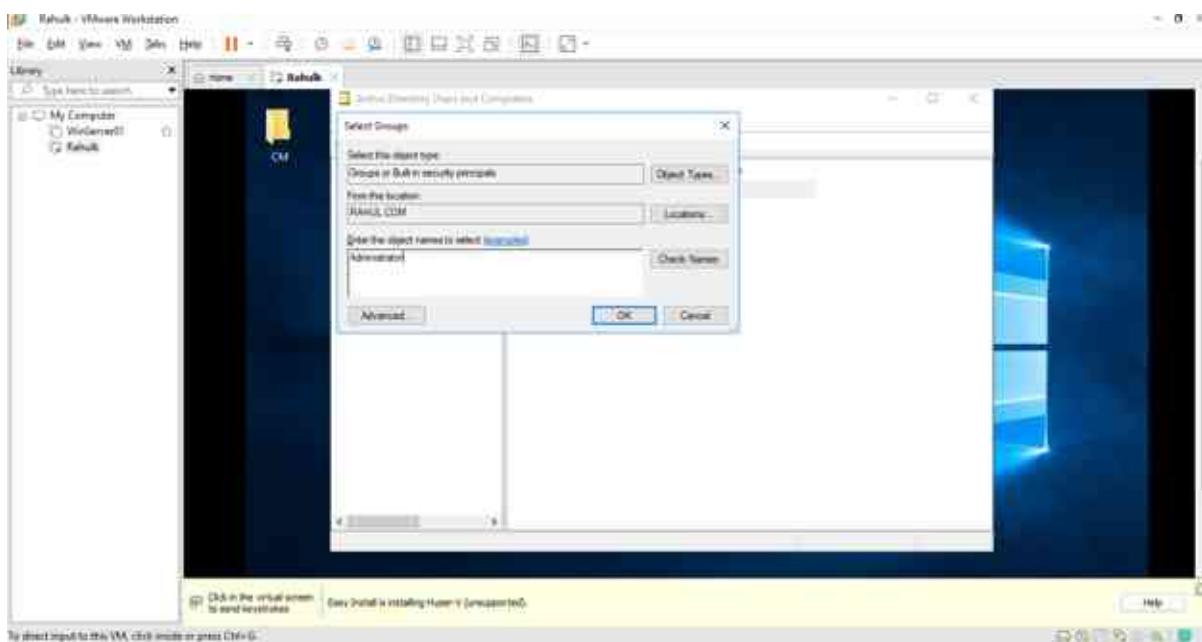
- Now VMMService will show up under Active Directory Users and Computer



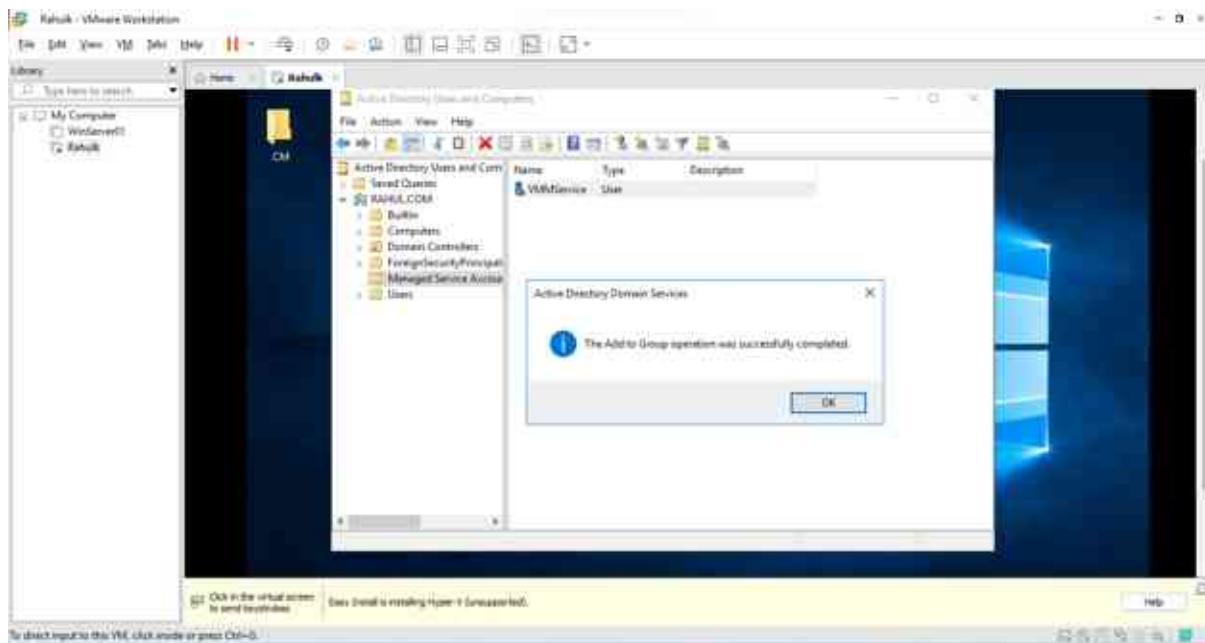
- Now Right-Click on VMMService and Select Add to a Group



- At the Select Groups window type the initial letters of Administrators user and click on “Check Names” window. The “Administrators” user is displayed, click on “OK” button.

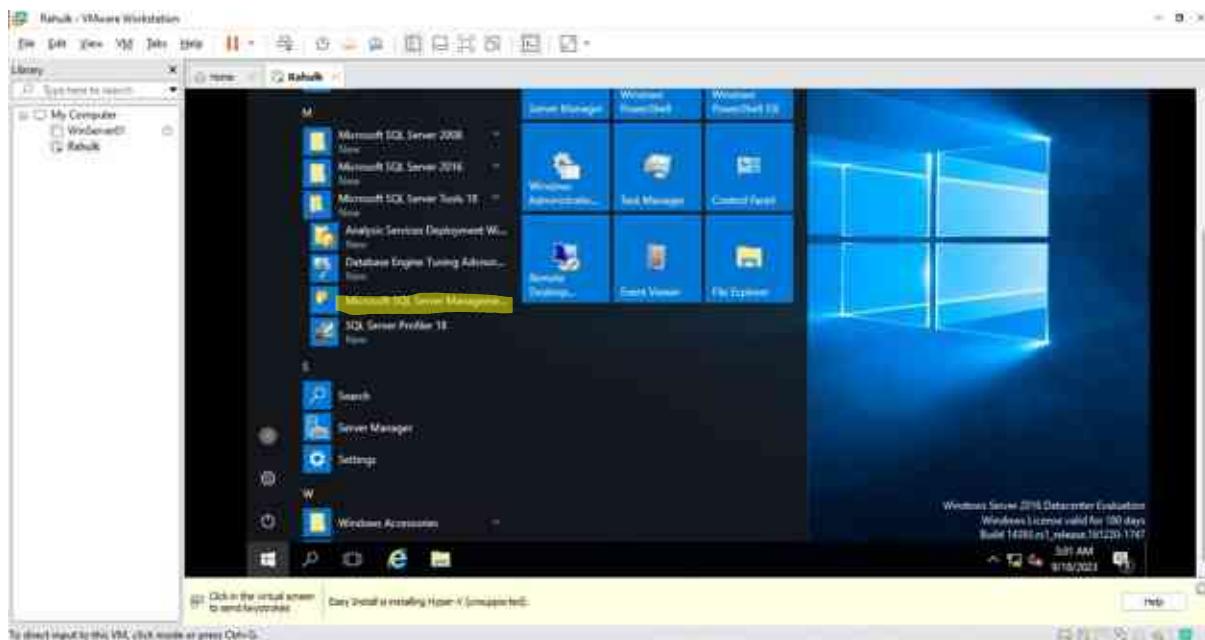


- The user is added to the group. Close Active Directory Users and Computers window.

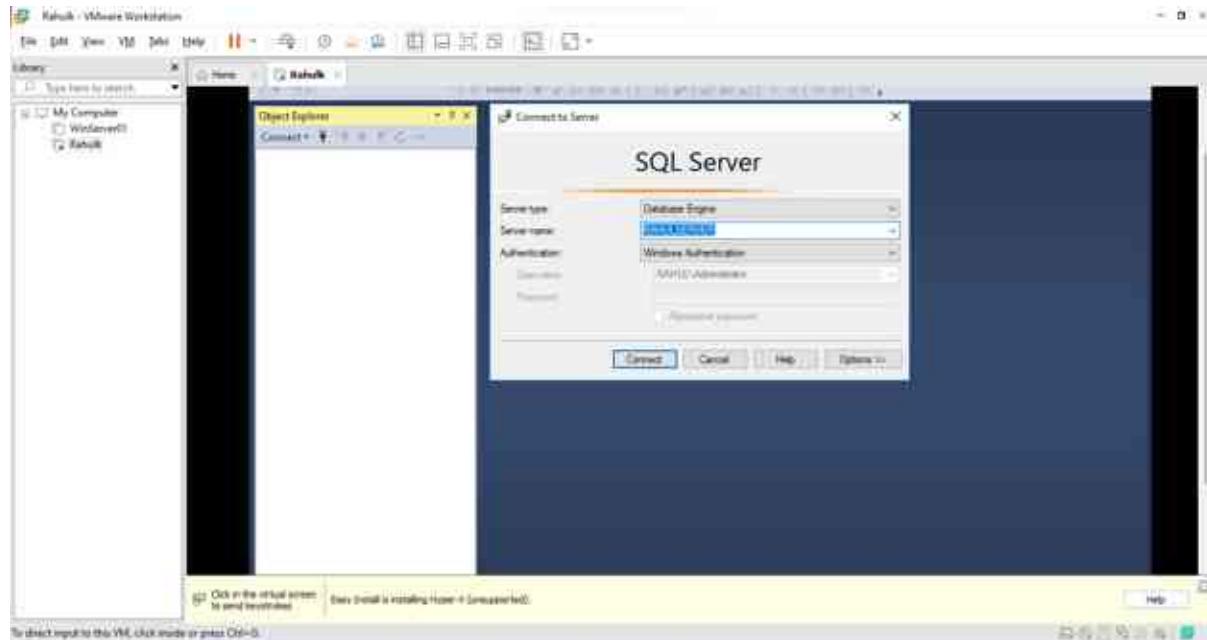


Step 38: Connecting SQL Server to Window Server

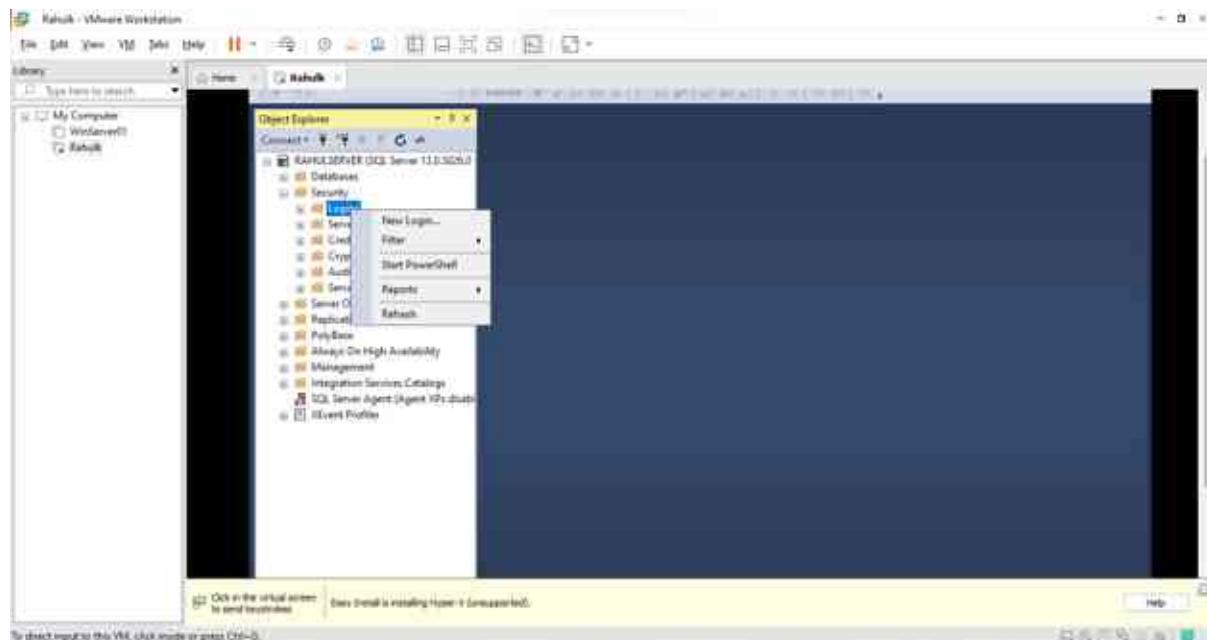
- Launch SQL Server Management Studio.



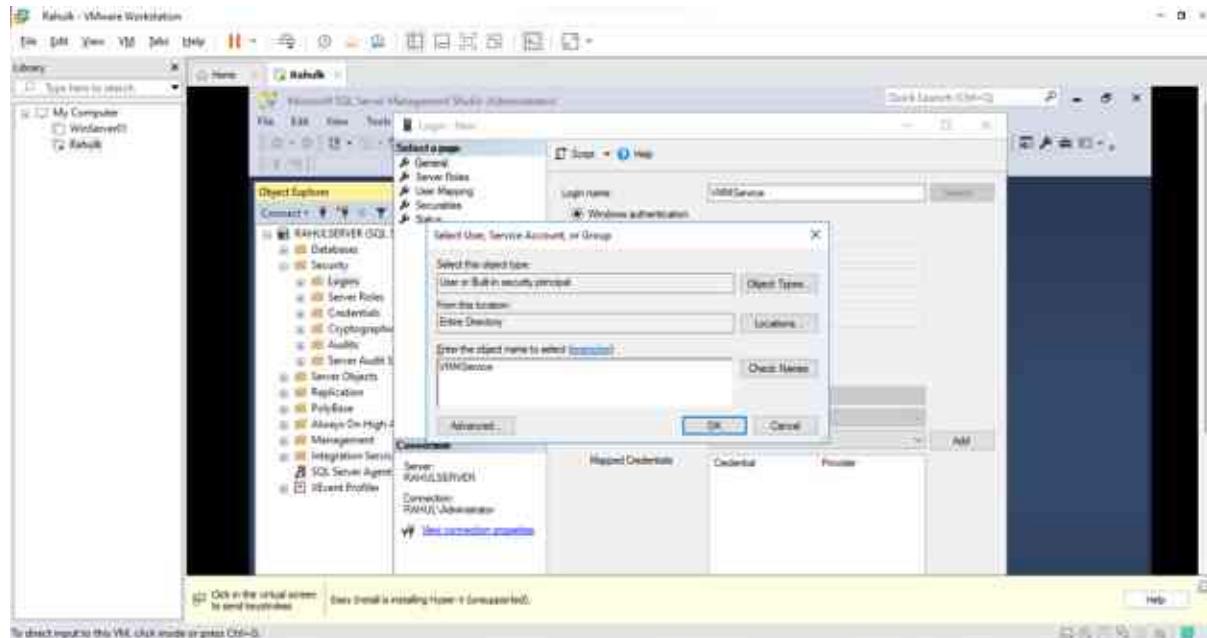
- Keep default value and Click on **Connect**



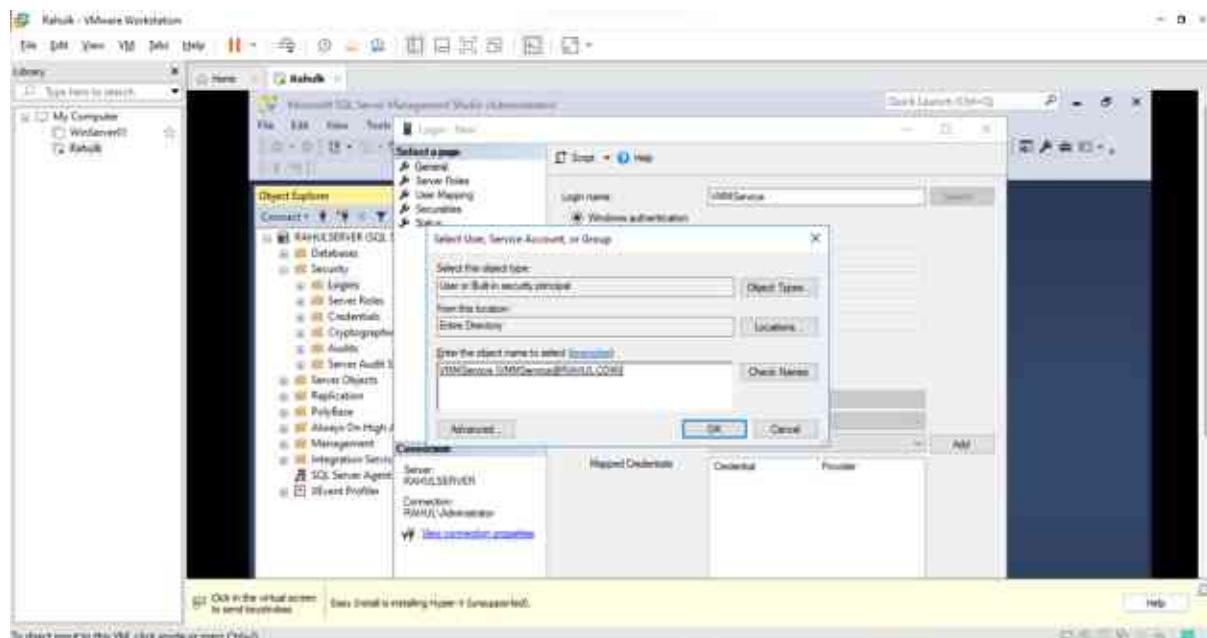
- Within **Object Explorer** Click on **Security** and right click on **Logins** and Select **New Login**



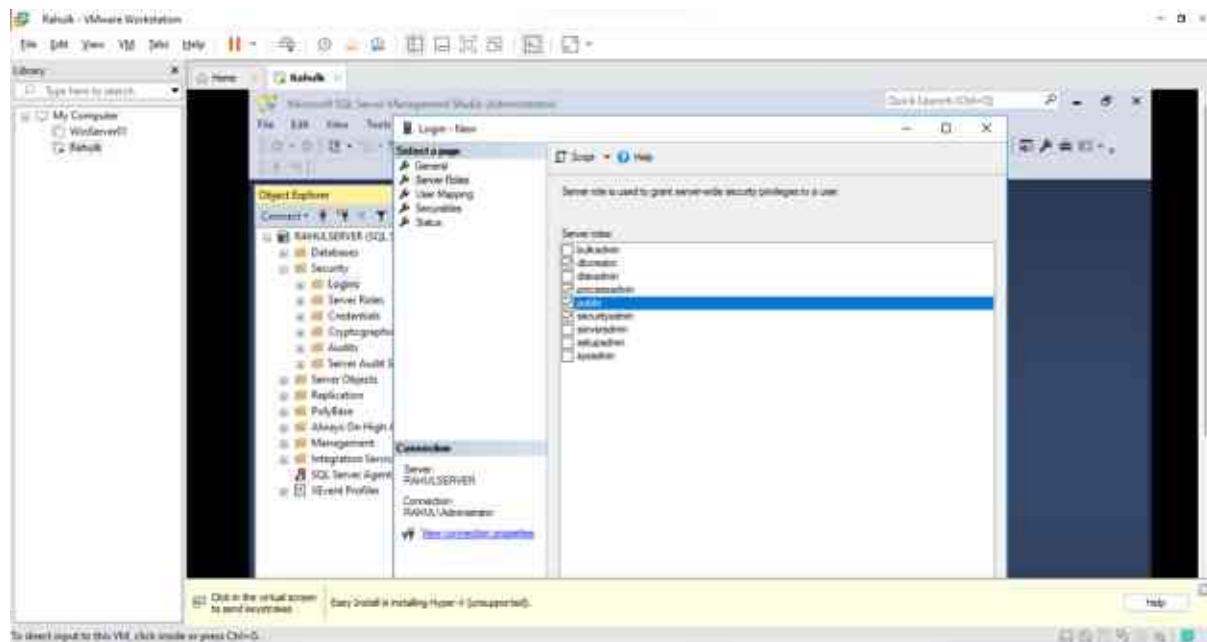
- At the **Login – New** Window type **Login name:** (**VMMService**) and click on “Search” button.
- At the **Select User, Service Account, or Group** window type the (**VMMService**) and click on “Check Names” window.



- The **username with the domain name** to which it belongs is displayed and click on “OK” button.

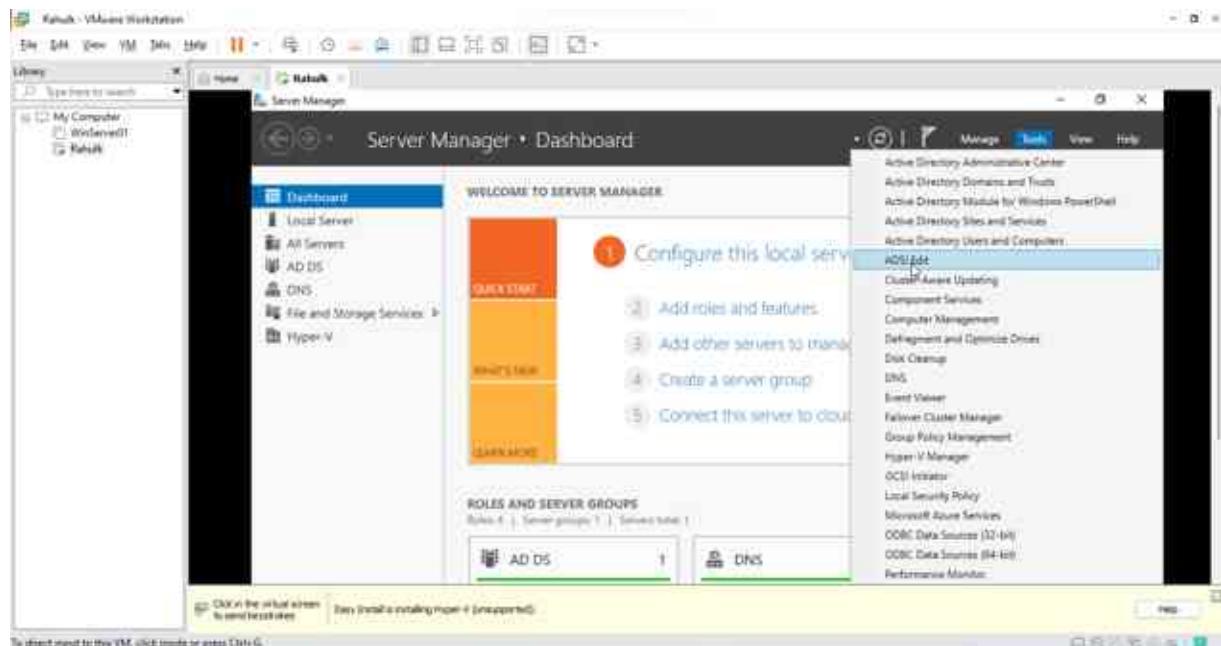


- Click on **Server Roles** In Server roles **public** selected by default.
- Select three more Server Roles:
 - **dbcreator**
 - **processadmin**
 - **securityadmin**
- Then Click on **Ok** and Close SSMS

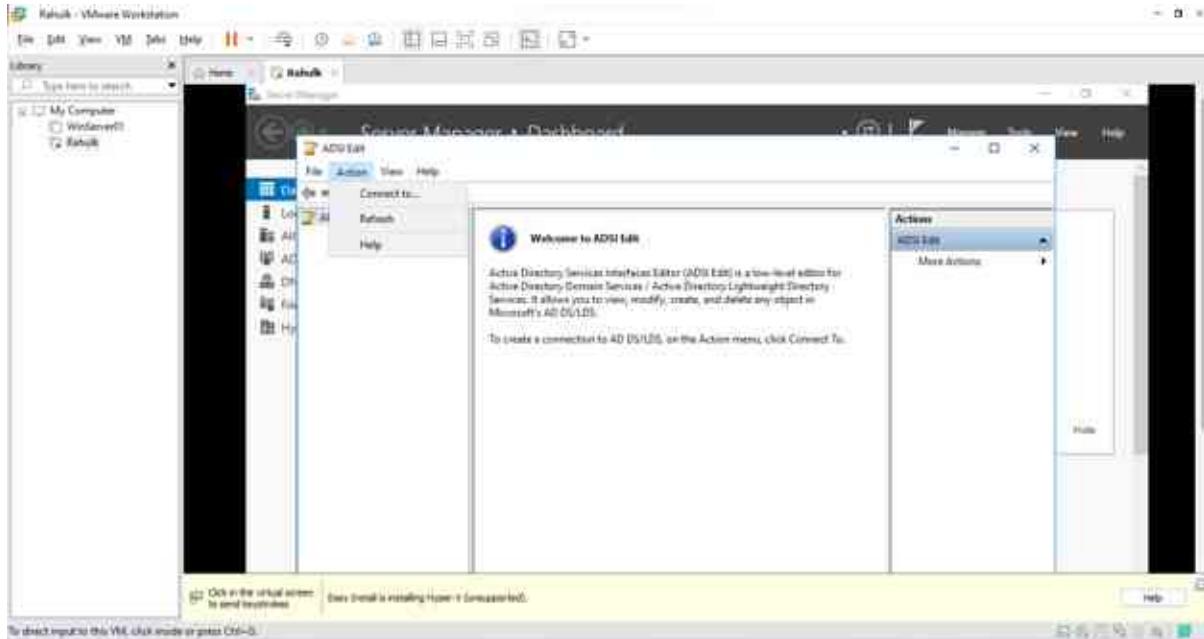


Step 39: Creating Object in ADSI Edit

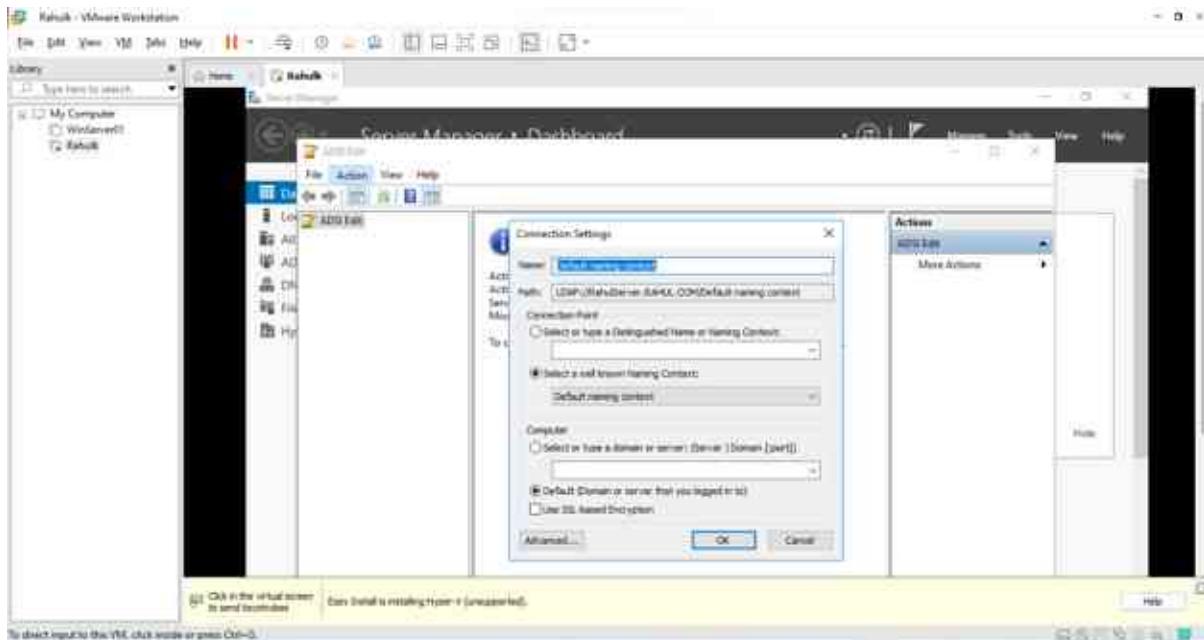
- Open Server Manager Click on Tools→ADSI Edits



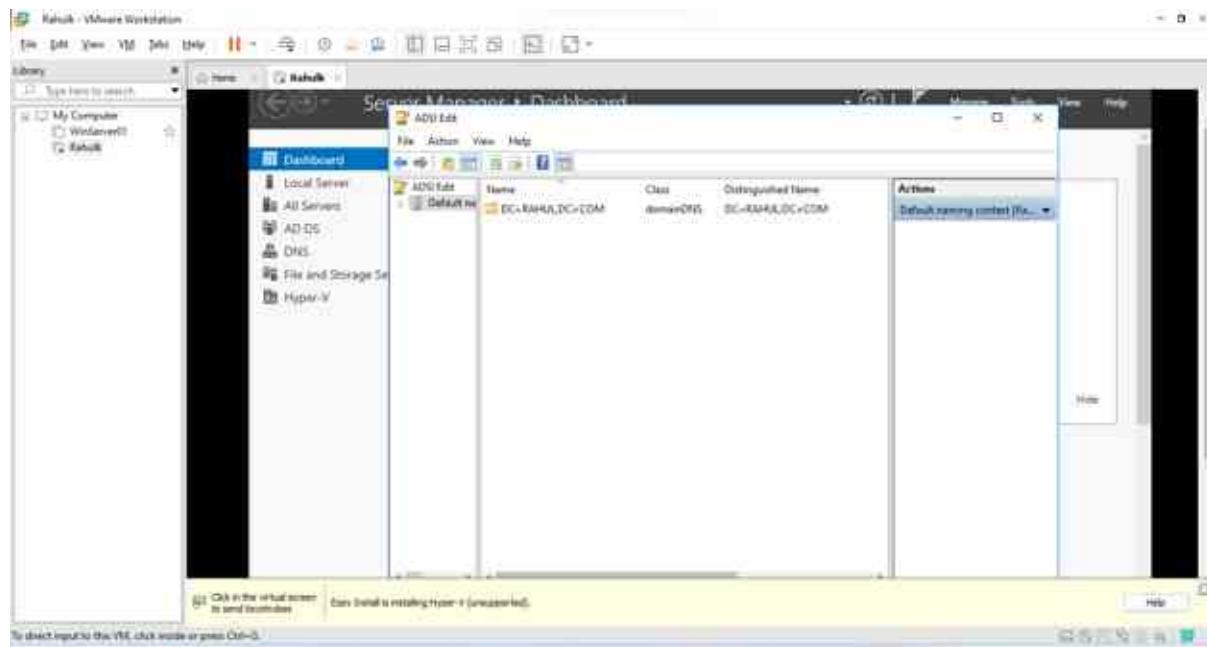
- At the **ADSI Edit** window go to **Action** and click on **Connect to....**



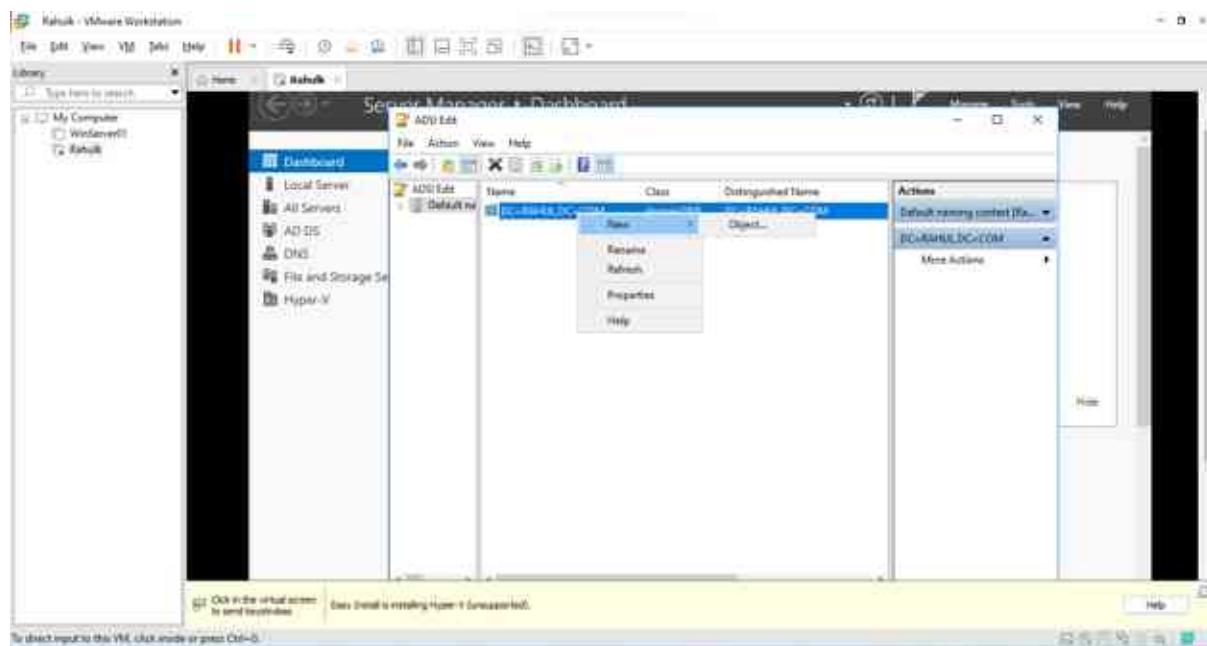
- In Connection Settings Keep the Default Values and **Click Ok** and a default value is created



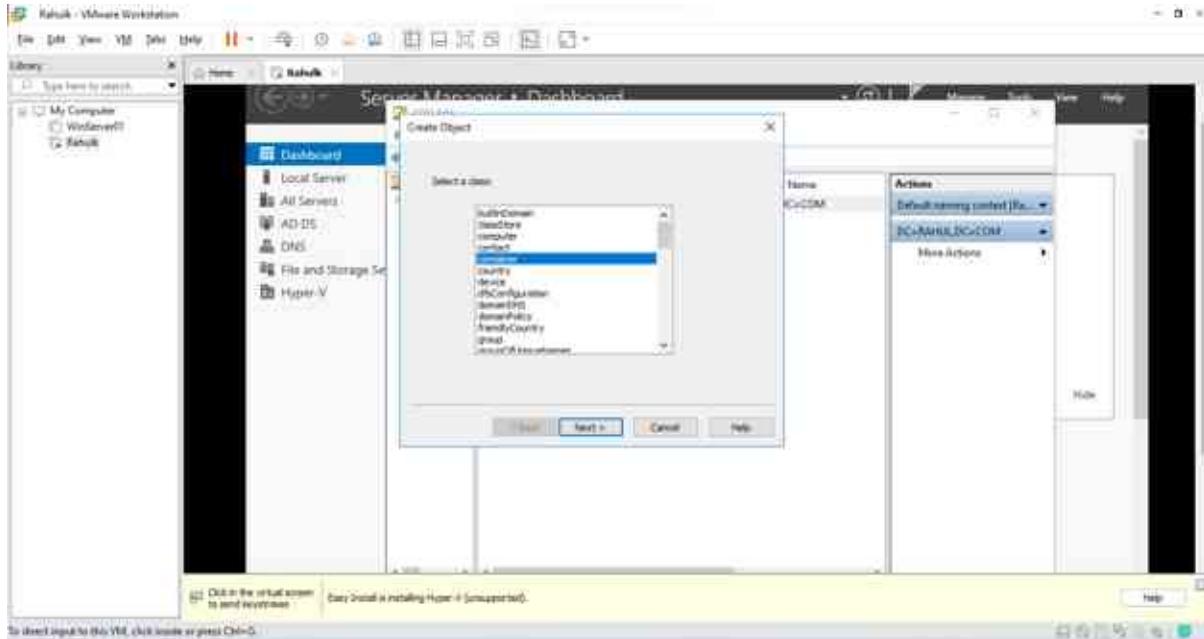
- At **ADSI Edit** window expand **Default naming context** by double clicking on it in the left pane.



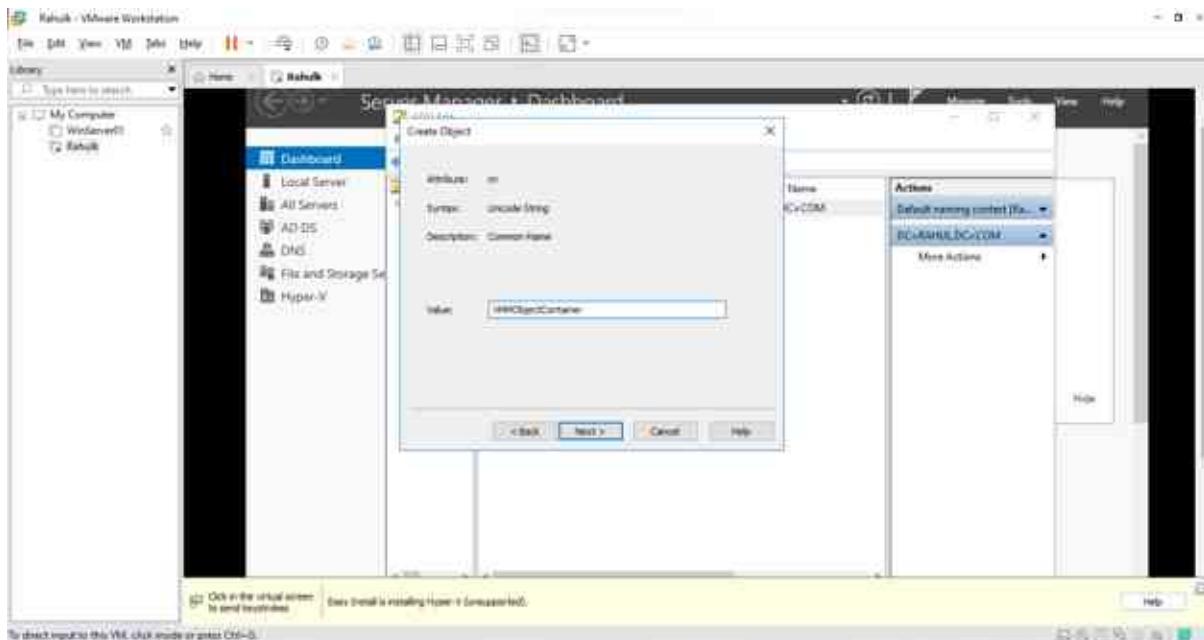
- Right Click on the **DC=RAHUL,DC=COM** Folder and **Click on New** and Select **Object**



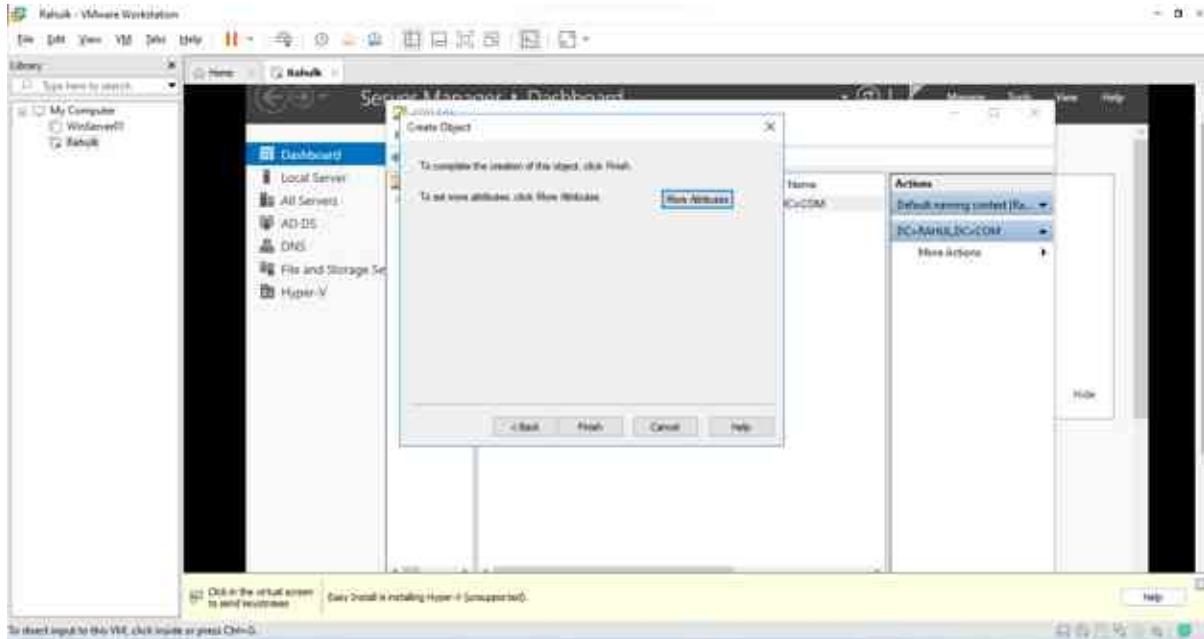
- At the **Create Object** Window Select the container class and click on **Next**



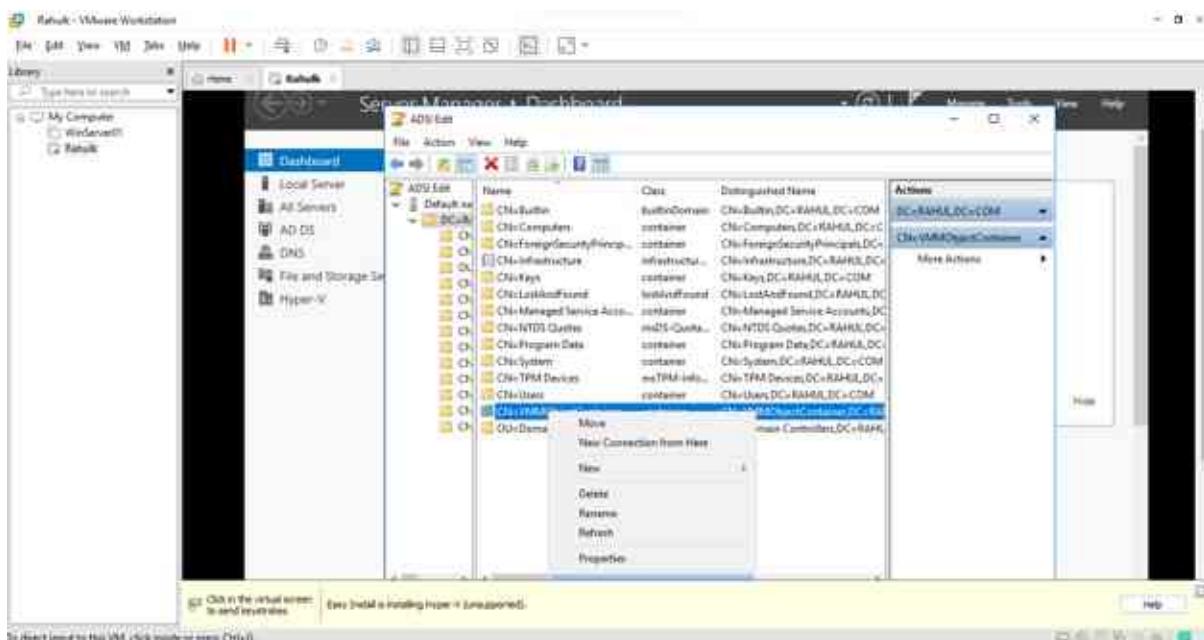
- Enter the value for the object (Here it is **VMMObjectContainer**) and click on **Next**



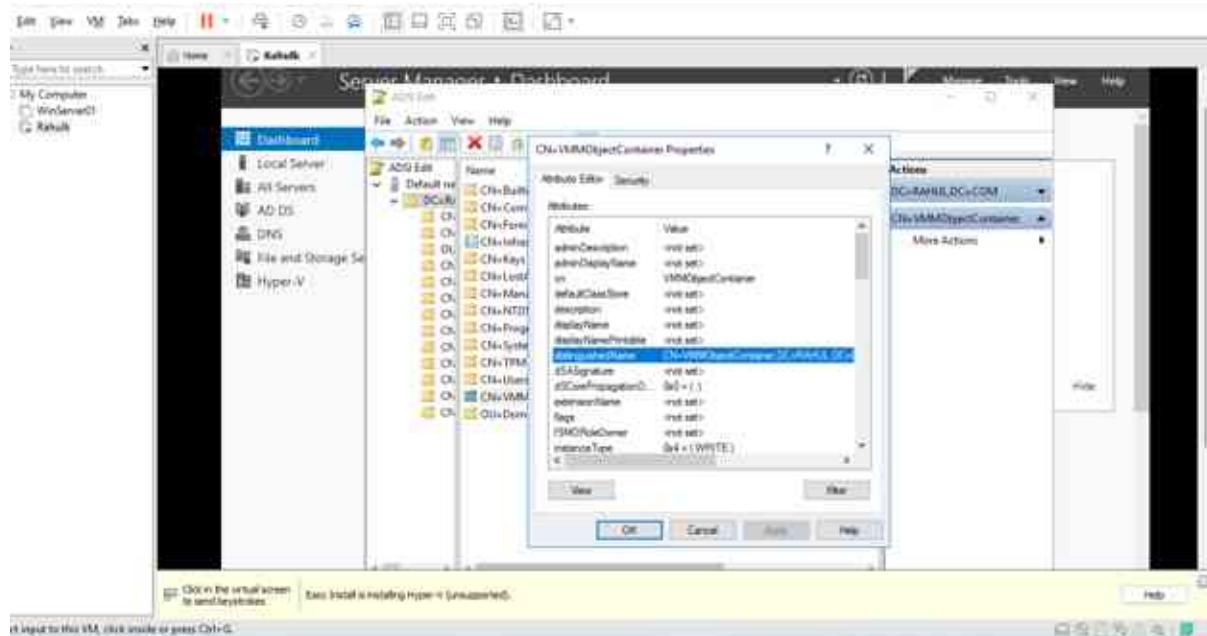
- At the final window click on **finish**



- Double Click on **DC=RAHUL** and Right Click on the **CN=VMMObjectContainer** Folder and Select **Properties**

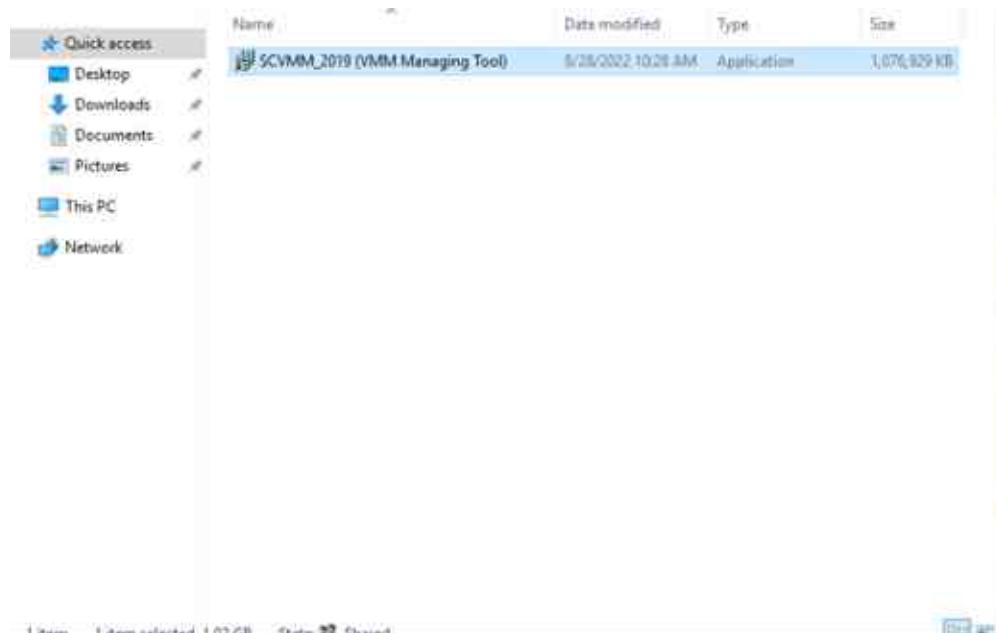


- Within **Properties** Click on **distinguishedName** and Click on **View**
- Copy the **distinguishedName** onto a Notepad as it is needed for the **SCVMM setup**
- {The **distinguishedName** of object created in **ADSI Edit** (my system's):
CN=VMMObjectContainer,DC=RAHUL,DC=COM}
- Close the **ADSI setup**

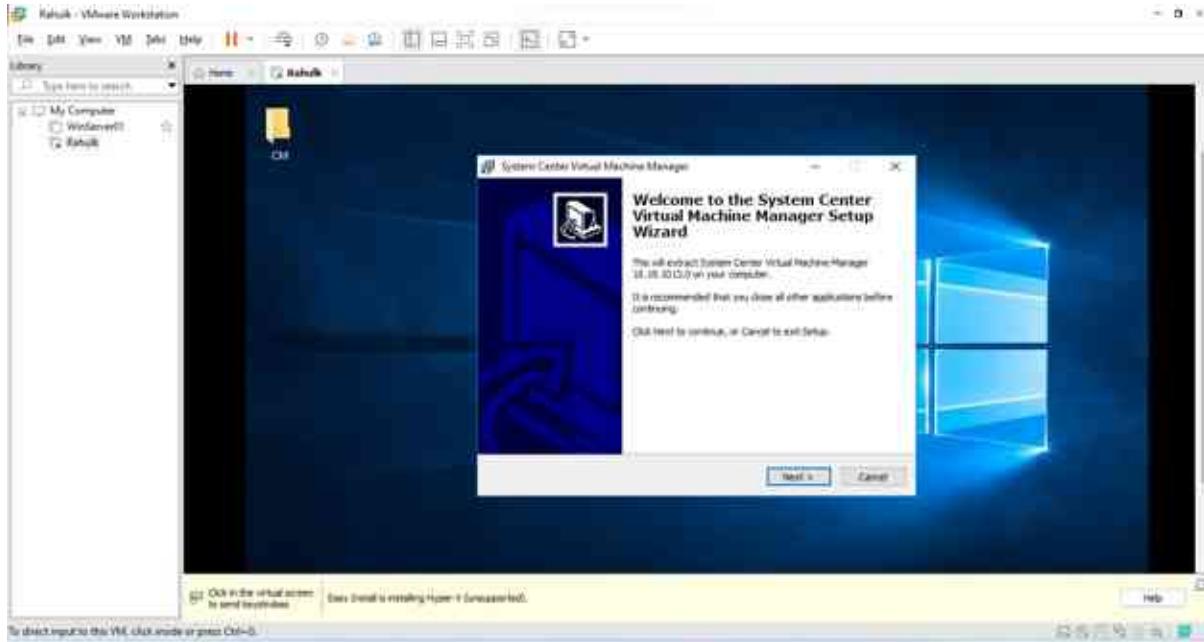


Step 40: SCVMM Setup

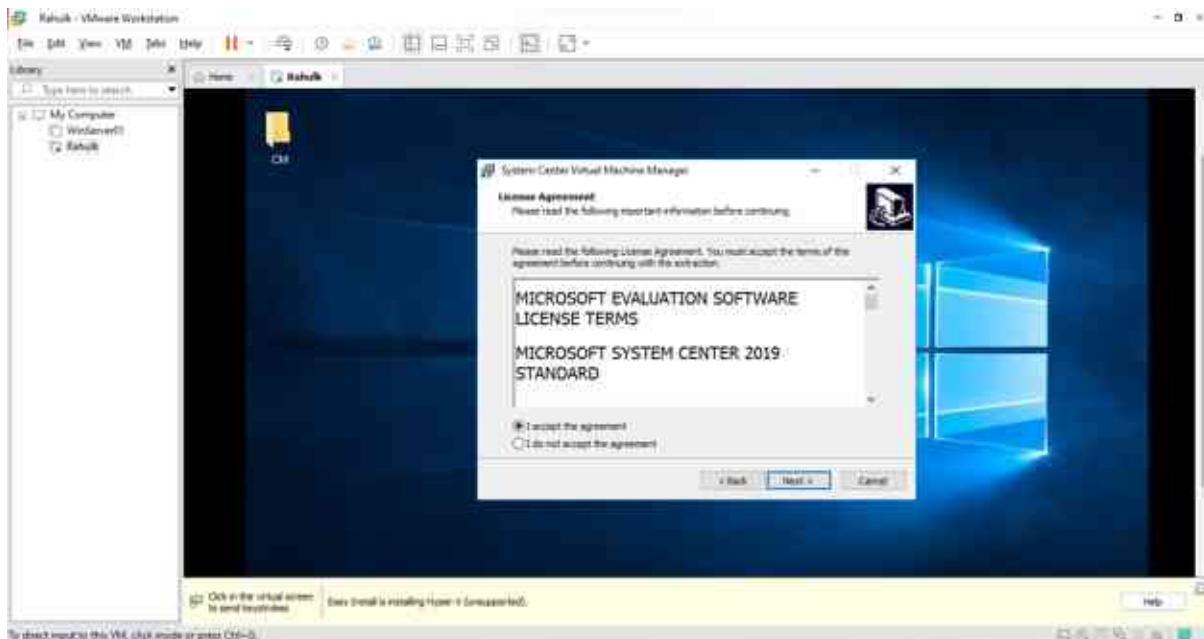
- From your CM Folder and Mount the SCVMM Setup file.



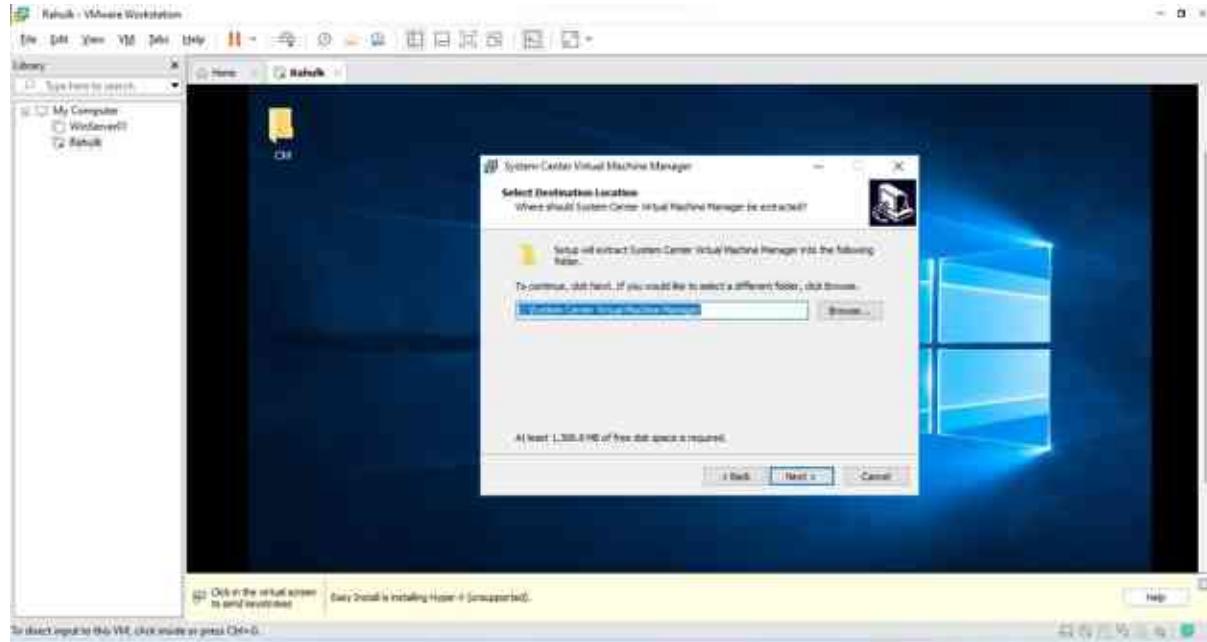
- Click on Next



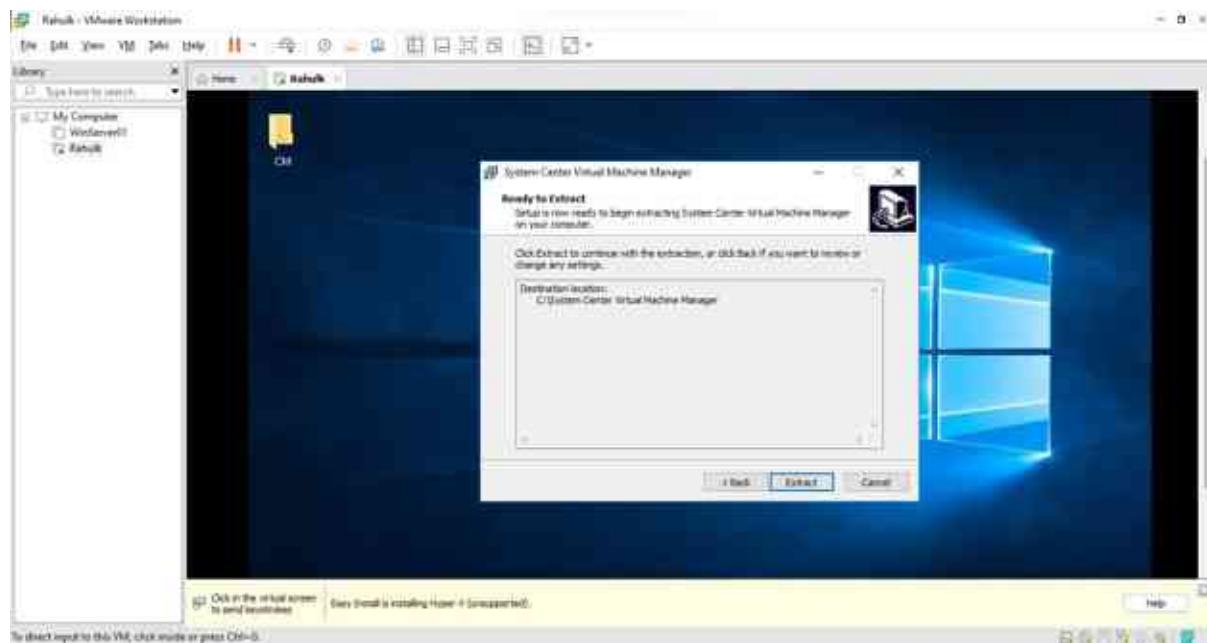
- Select I accept the agreement and click on Next



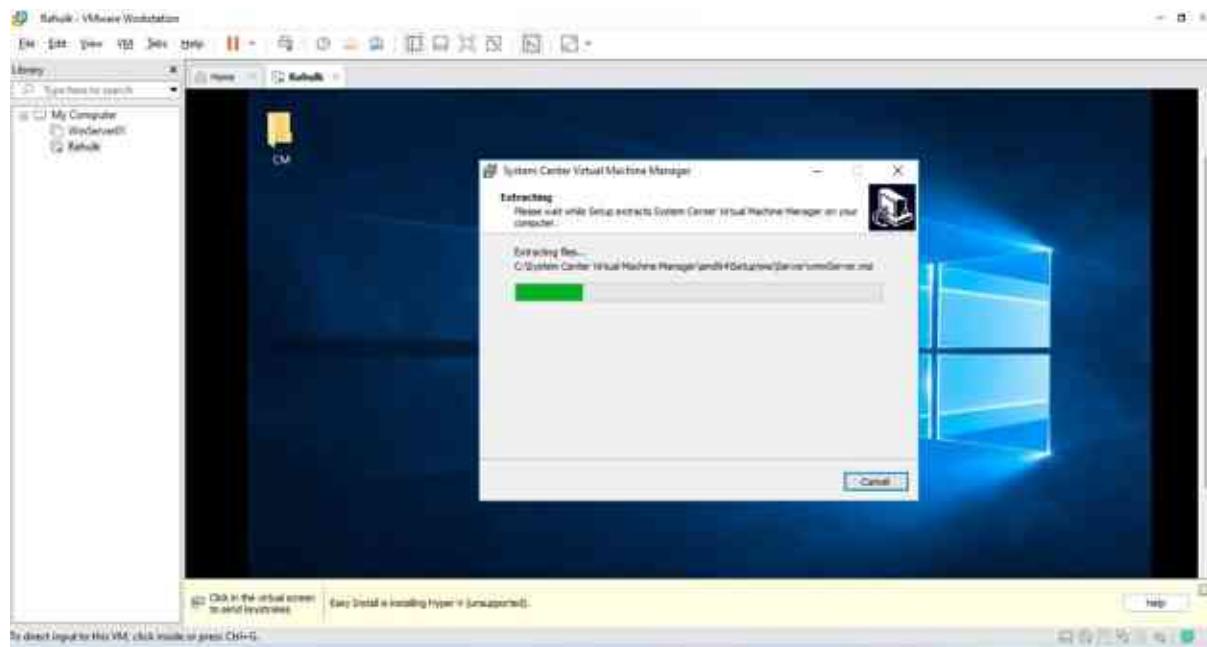
- Keep default setting and **Click on Next**



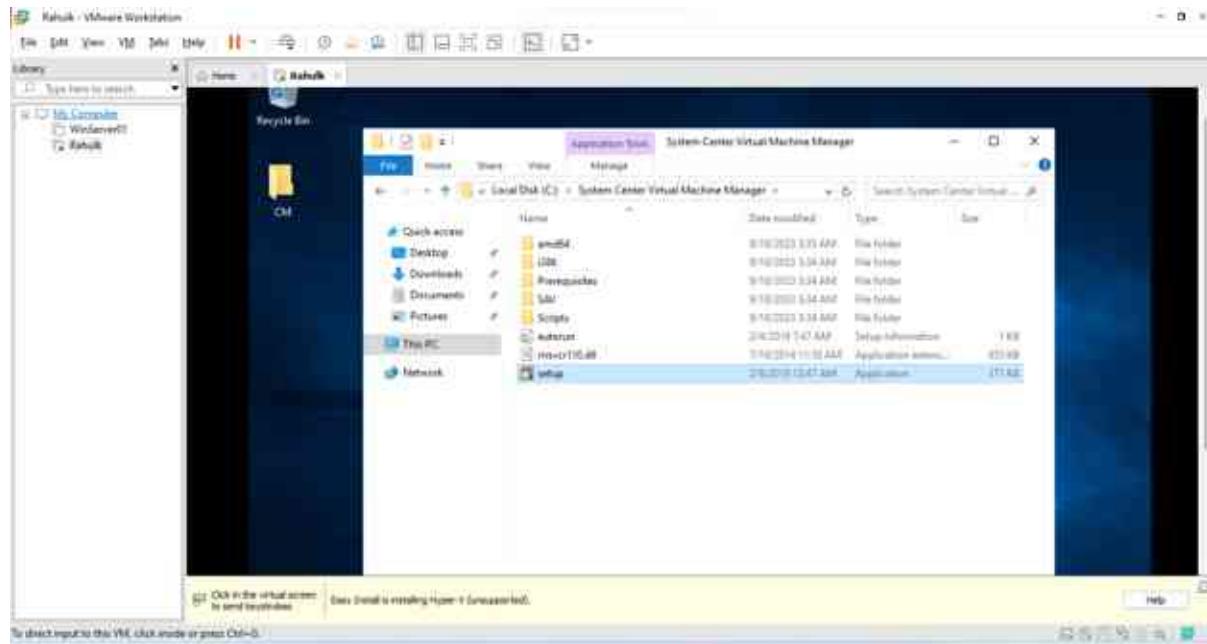
- **Click on Extract**



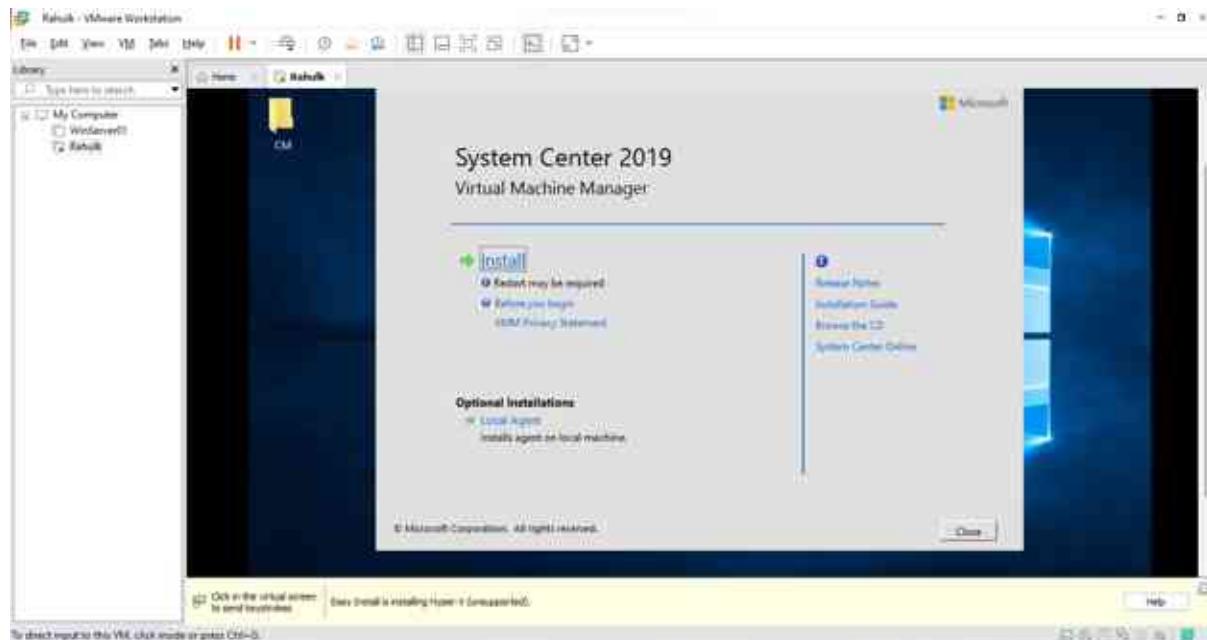
- It Will Extract the file



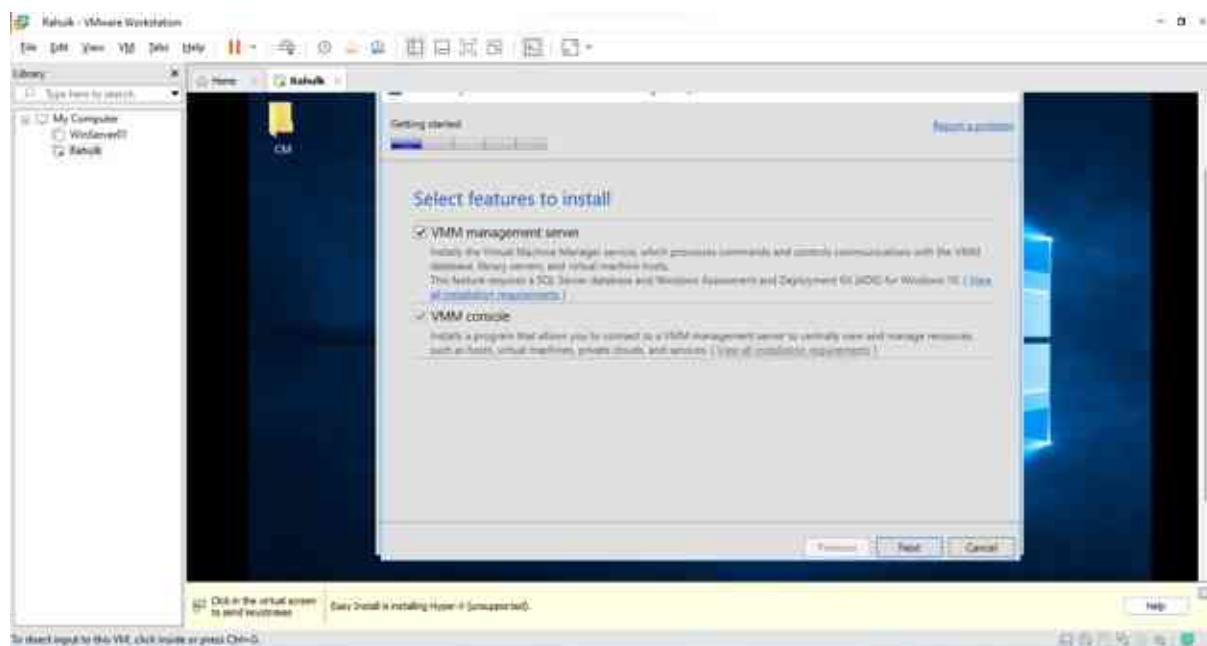
- Go to your Local Disk (C:)→System Center Virtual Machine Manager→setup
- Double click on setup



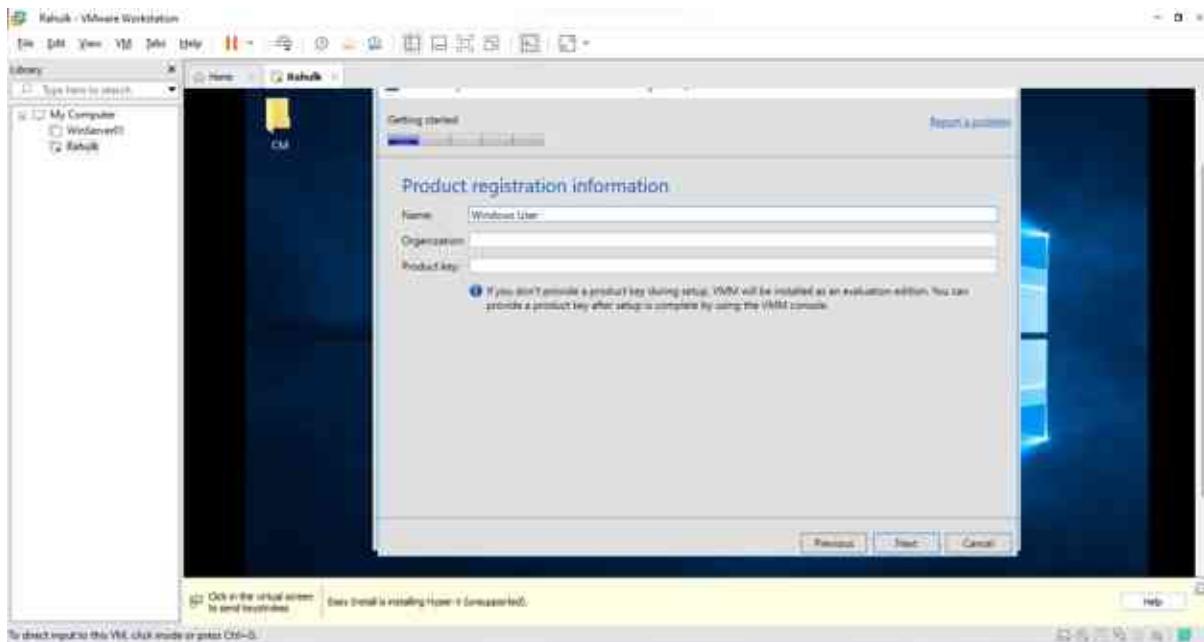
- System Center 2019 VMM window open
- Click on Install



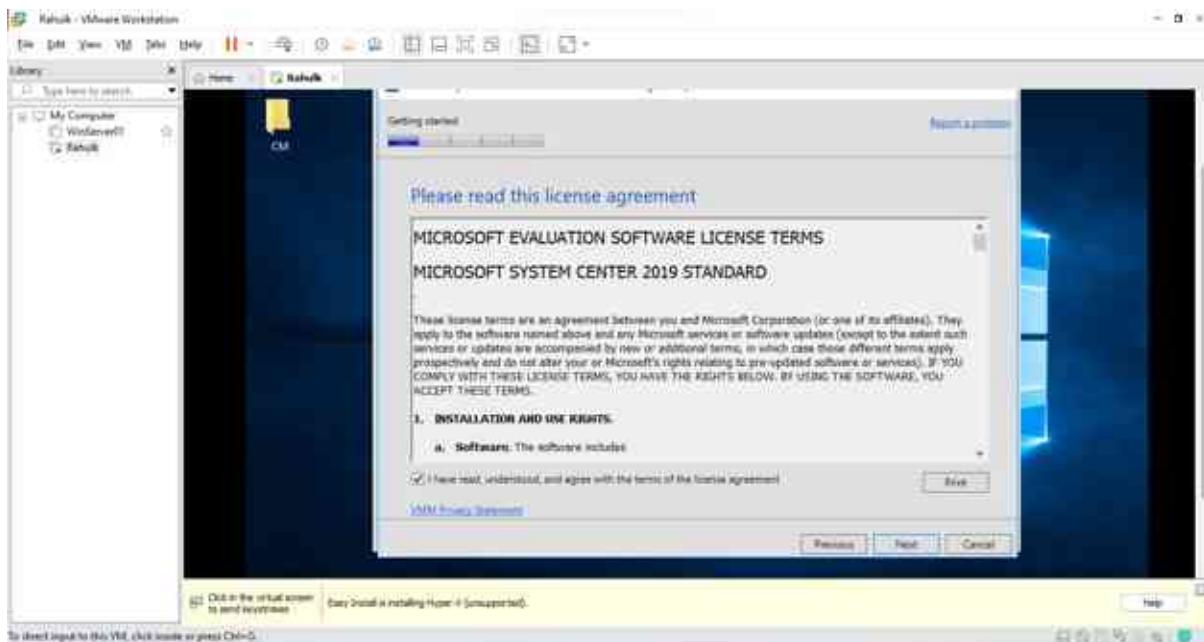
- Select **VMM management server** and **VMM console** get auto selected and click on **Next**



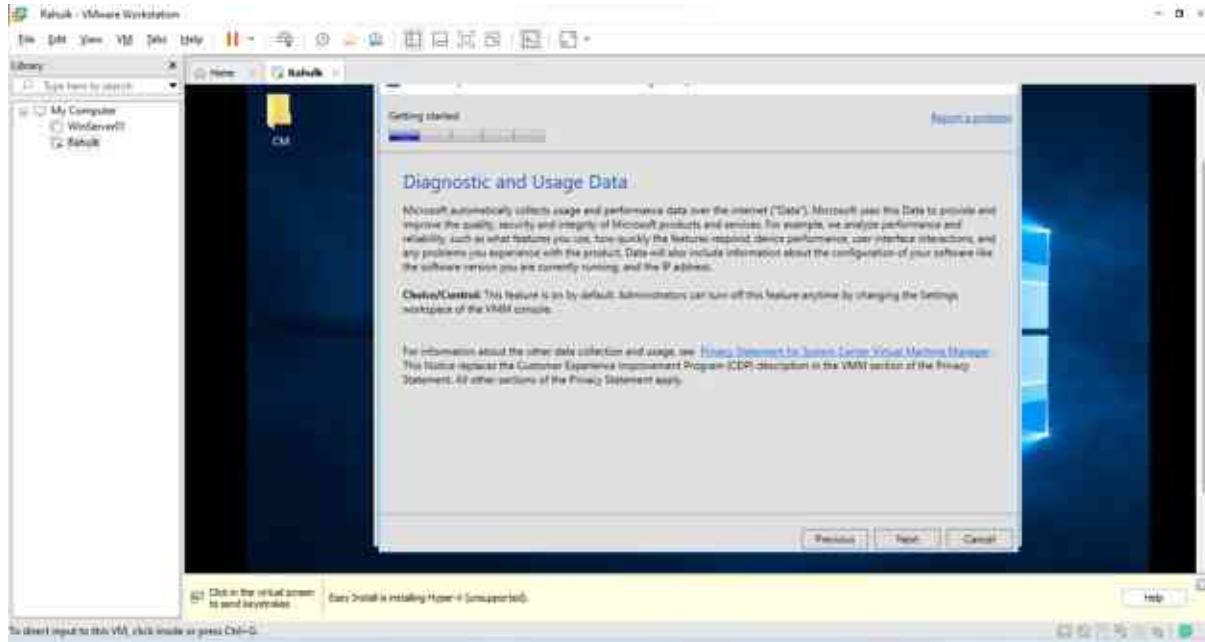
- Keep default setting and click on Next



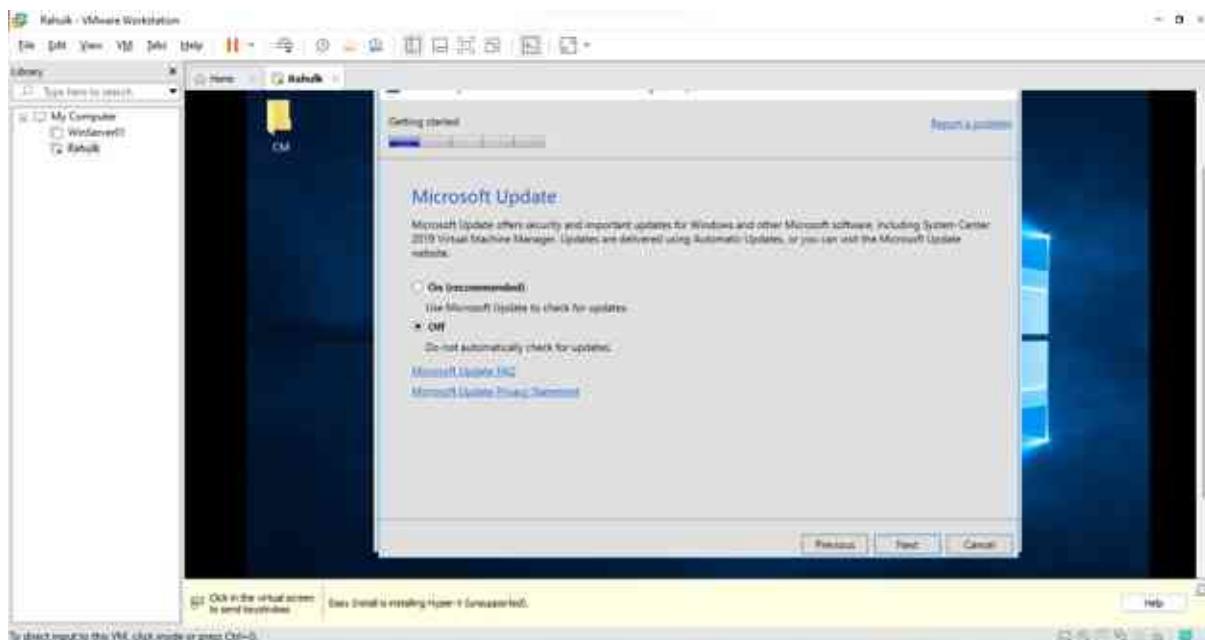
- Select I have read and accept the license agreement and Click Next



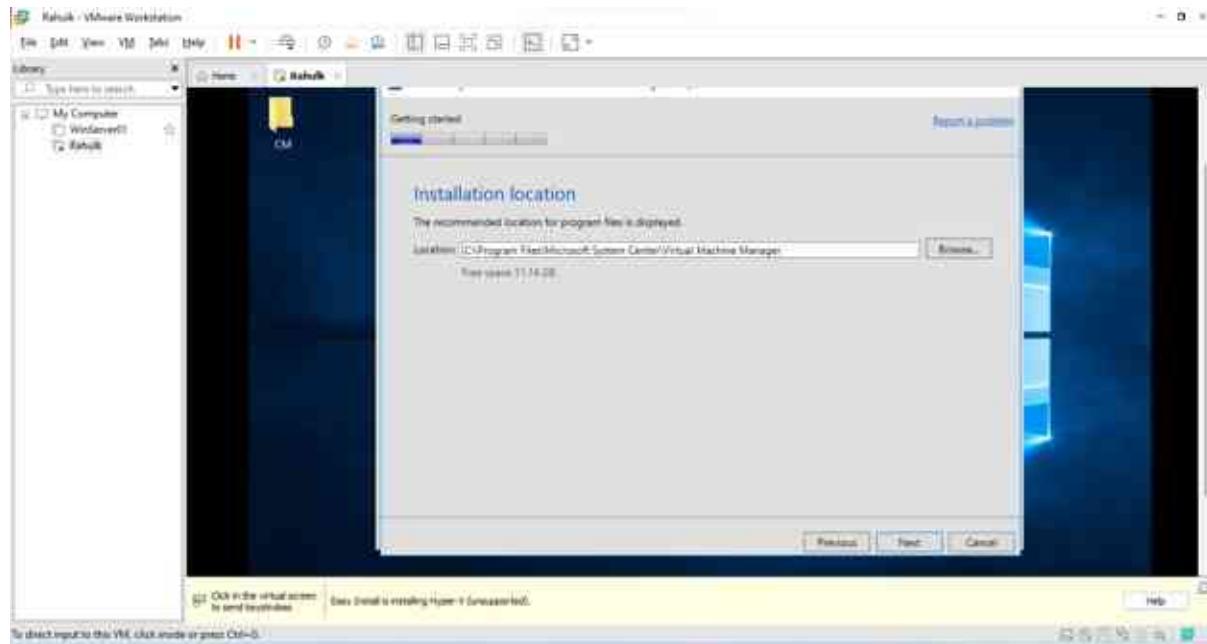
- Click Next



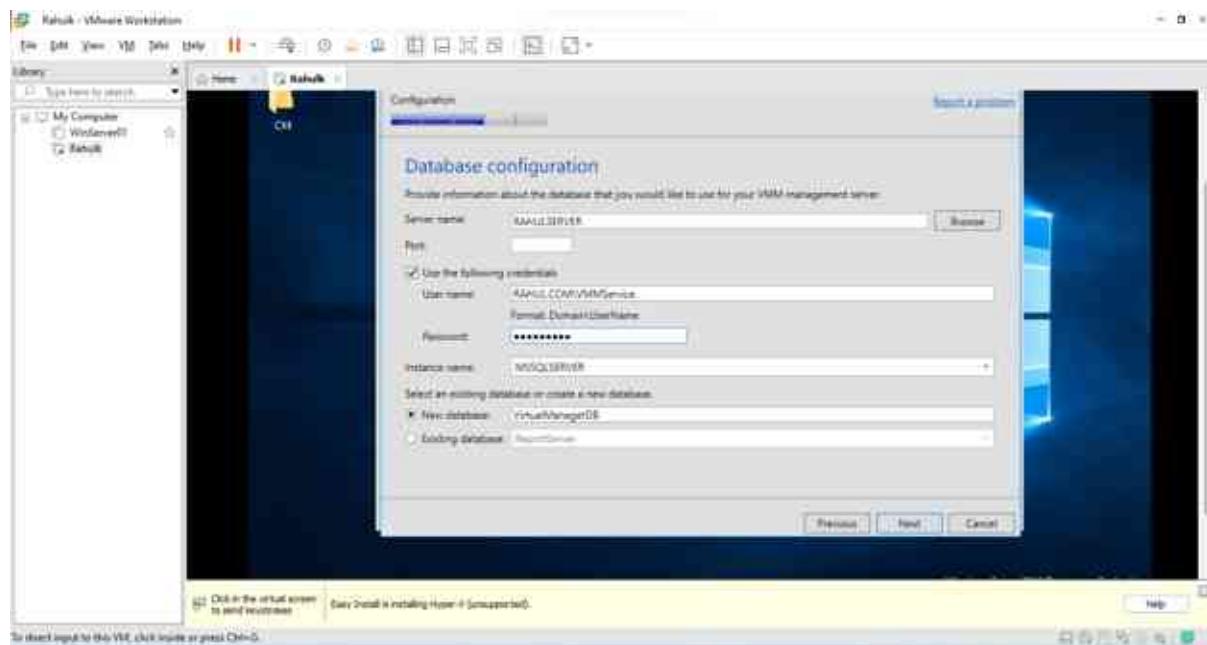
- For Microsoft Update Click on off and Click Next



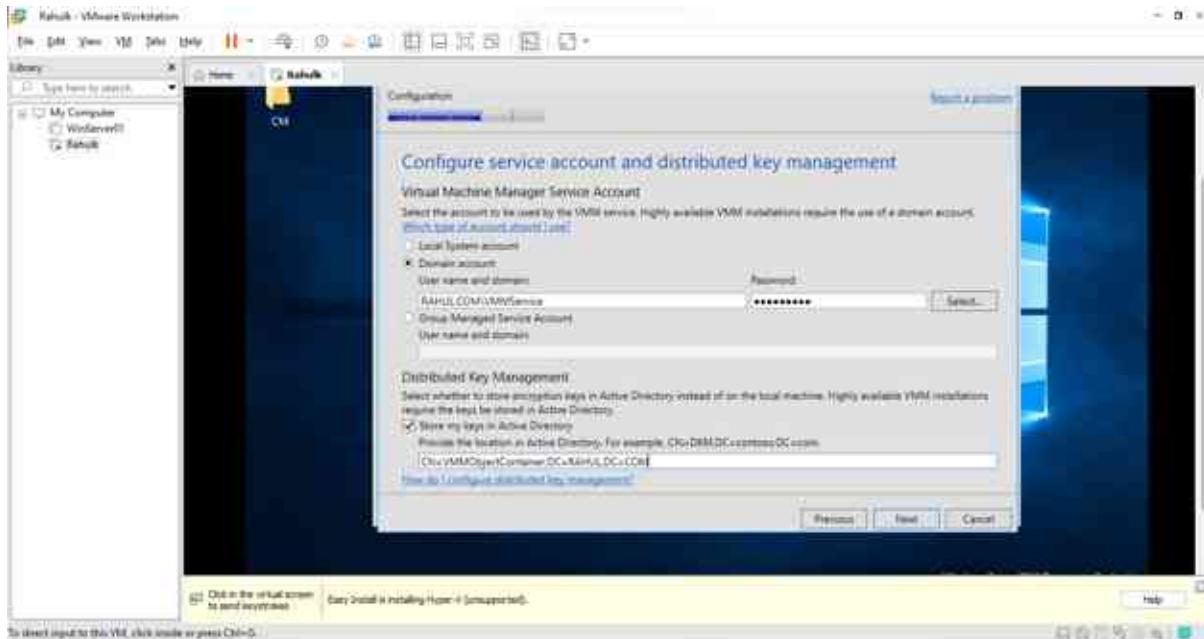
- Keep default Setting and click on Next



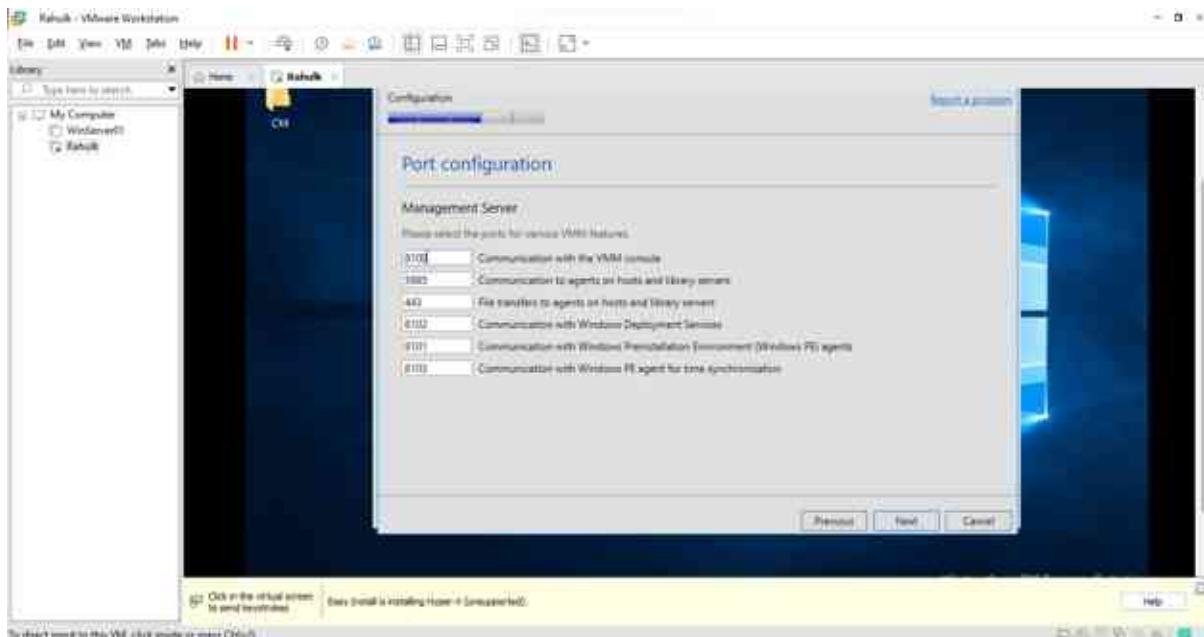
- Now in database configuration, type the same user and domain which was created (In this case its **VMMService**) and keep the **instance name as default MSSQLSERVE**



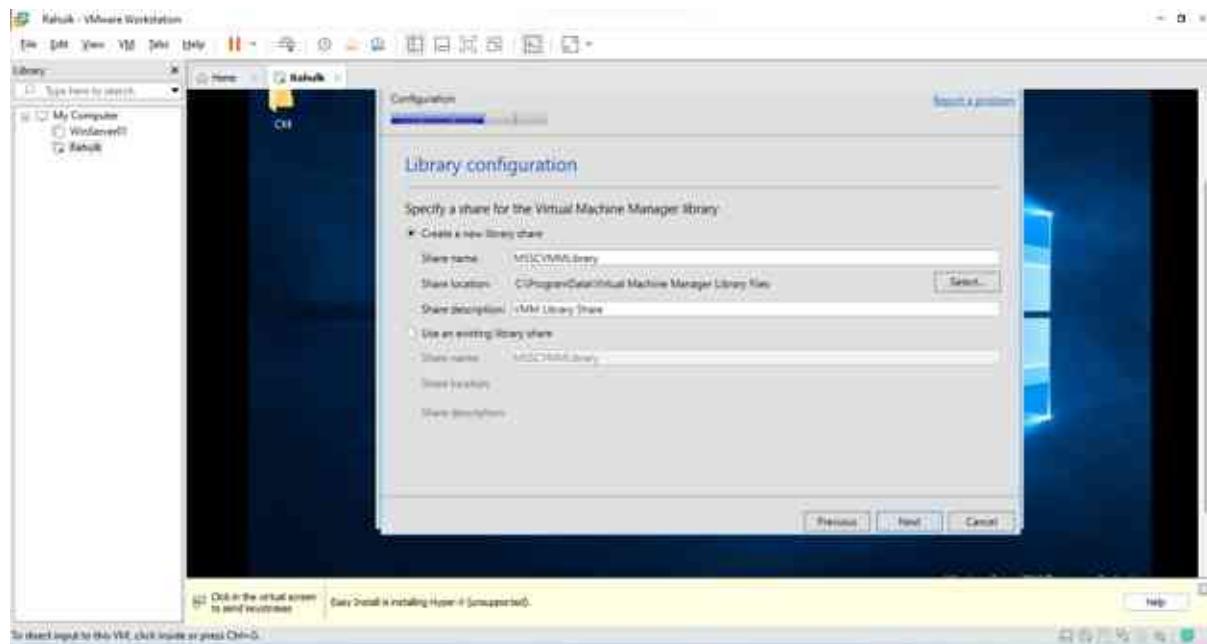
- Here in service account configuration, Select Domain Account and type in the User and Password (**For VMMService**)
- Select **Store my keys in Active Directory** and paste the **distinguishedName** that we have saved from before.



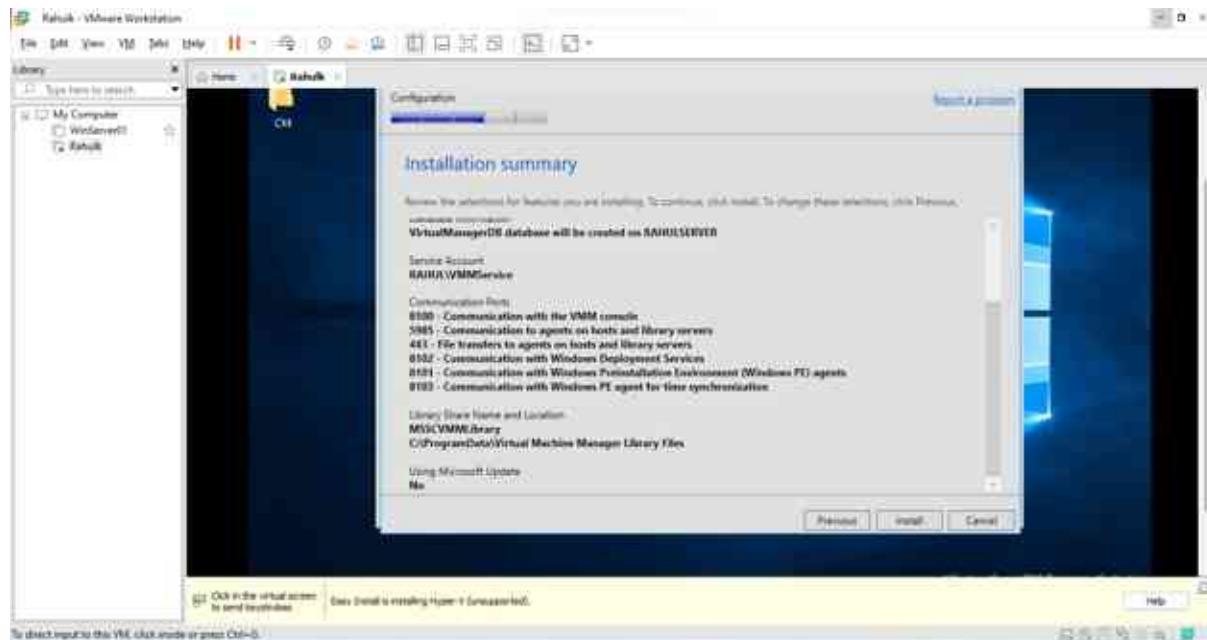
- Keep default setting and click Next



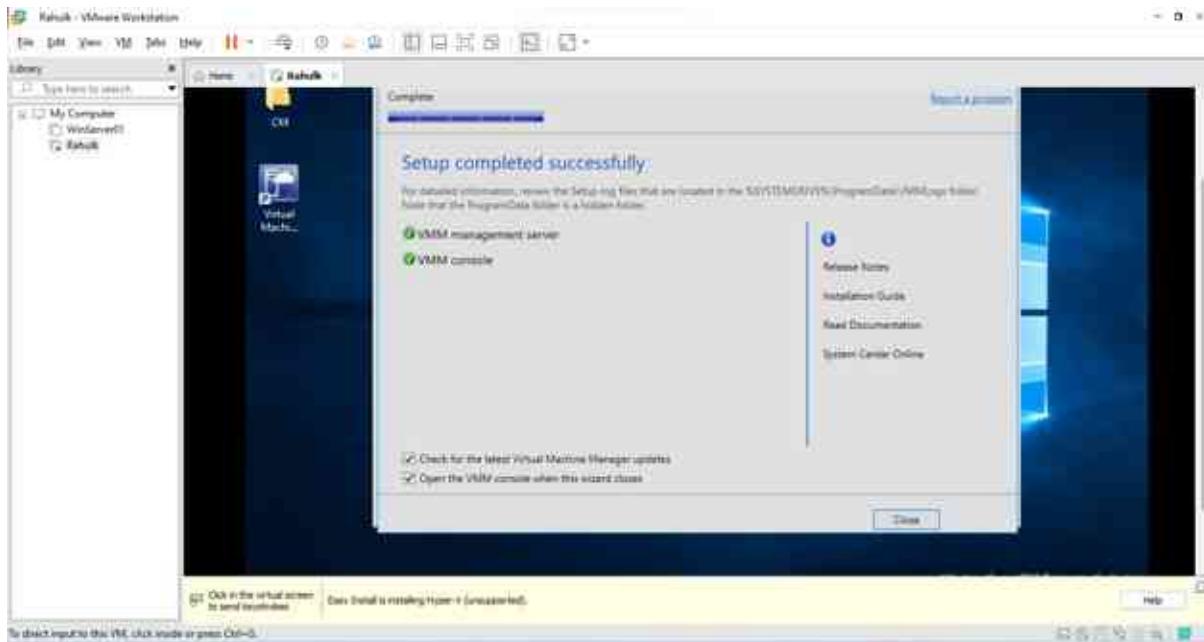
- Keep default setting and click Next



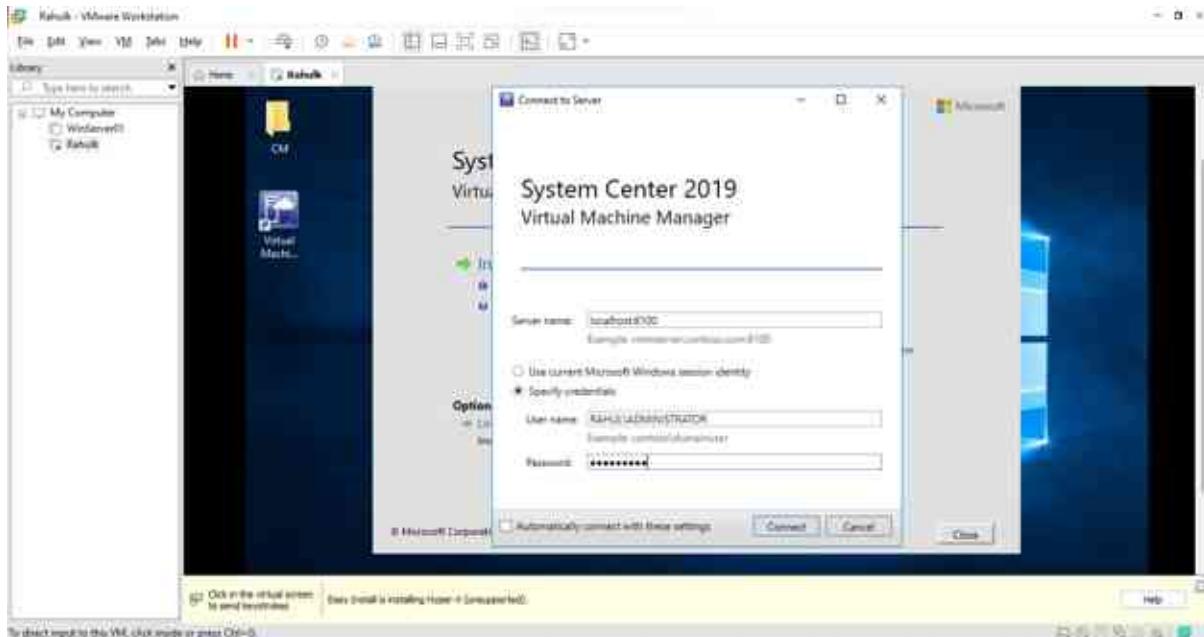
- Click on Install



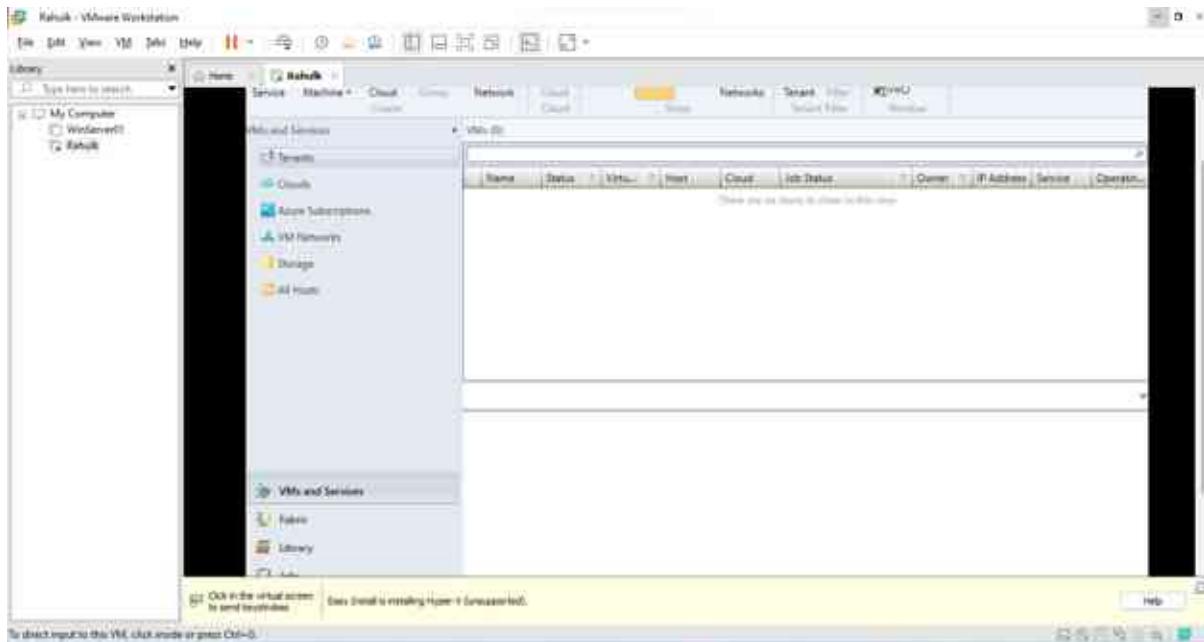
- After installation **Click on Close**



- At VMM's Connect to Server window select “Specify credentials” option. Enter the **Administrator username with the domain name** and give the **administrator password**. Click on “Connect” button.

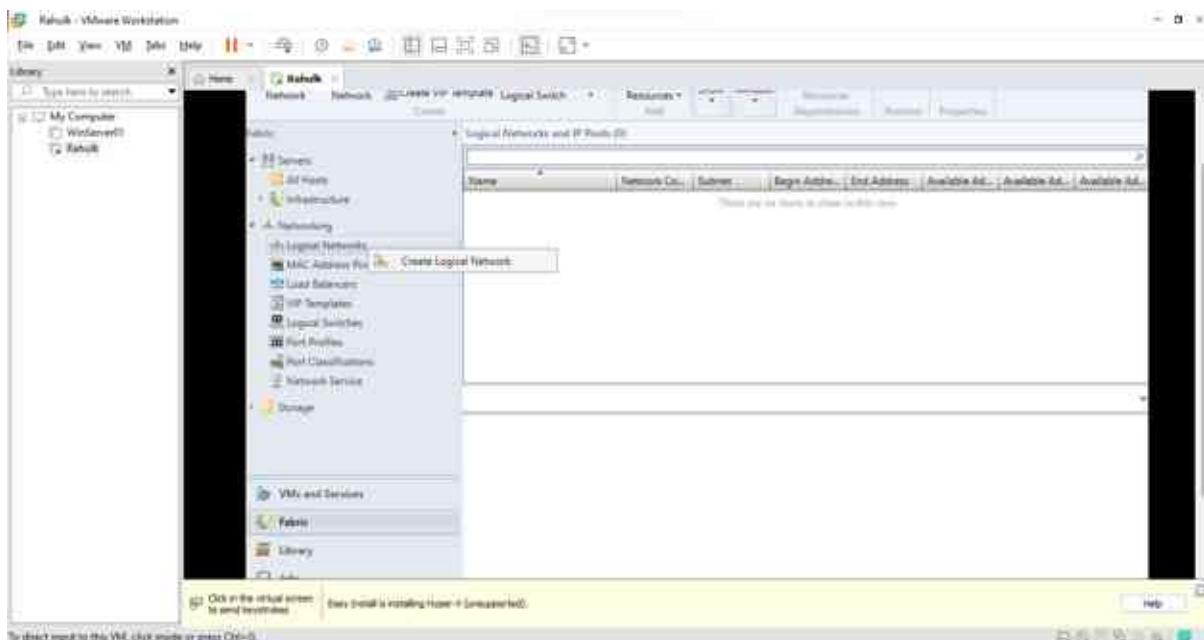


- The main window of Virtual Machine Manager (VMM) looks like...

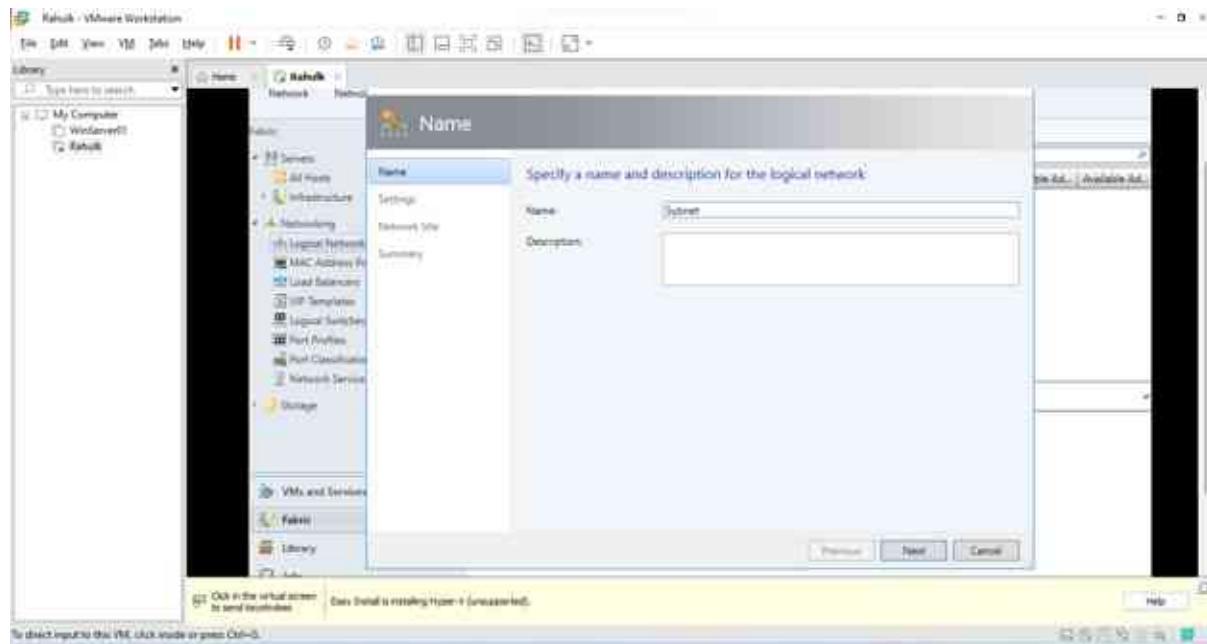


Step 41: Creation Logical Network

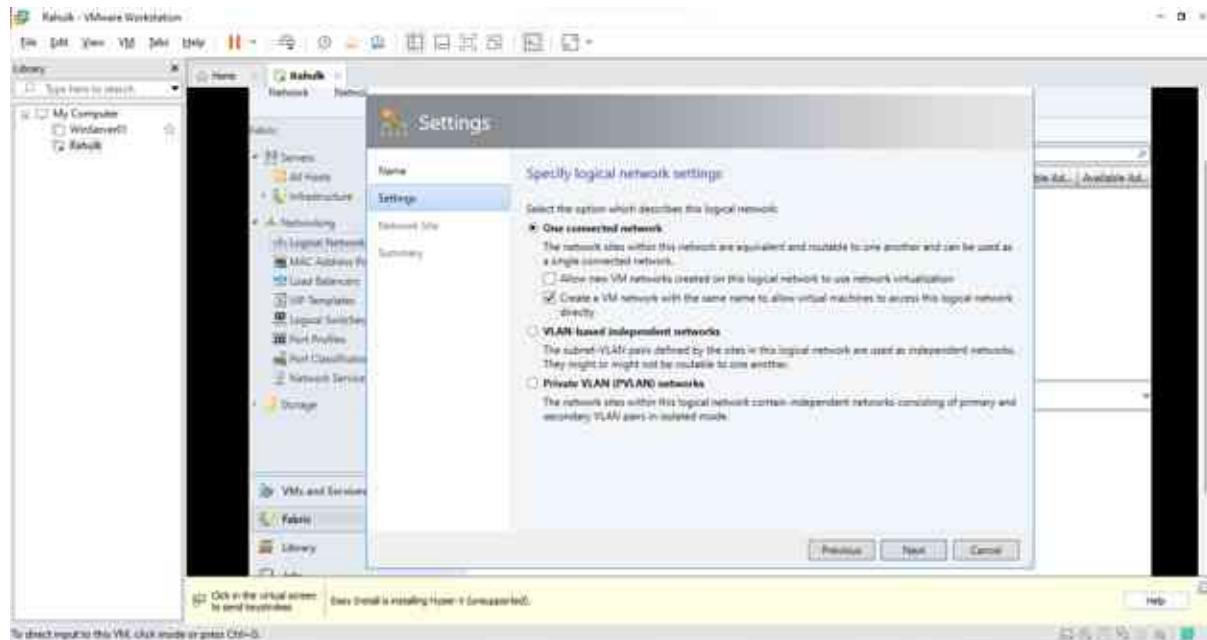
- Click on Fabric**
- Click on Networking**
- Within Networking right click on **Logical Network** and Select **Create Logical Network**



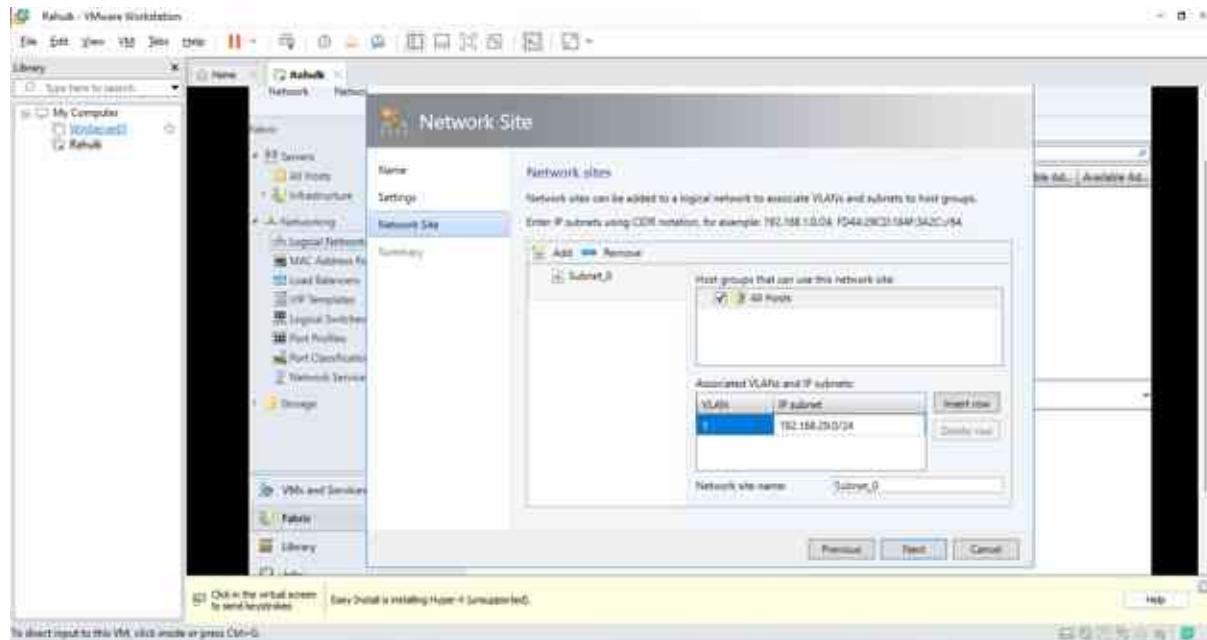
- Specify a name and description for the logical network Here **Name is Subnet**
- **Click Next**



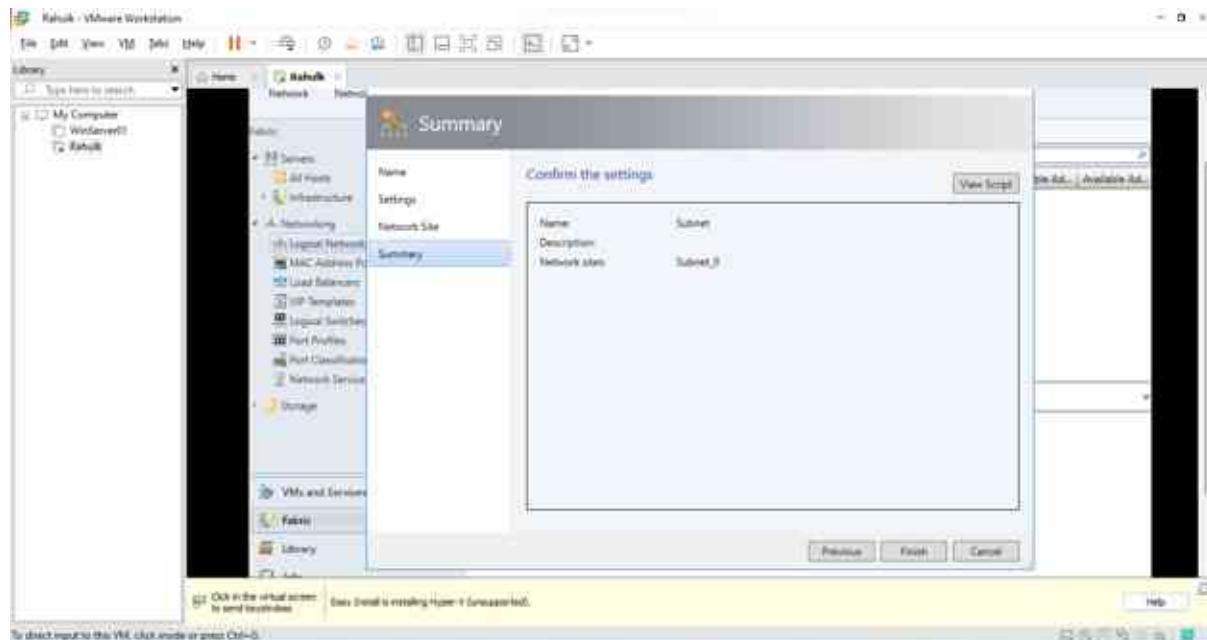
- Select **One connected network** within Select **Create a VM network with the same name to allow virtual machines to access this logical network directly**
- **Click Next**



- In Network Sites and Click Add
- Click on All hosts
- Click on Insert Now and Type 1 in VLAN and a sample IP (Here it is 192.168.29.0/24) and Click Next

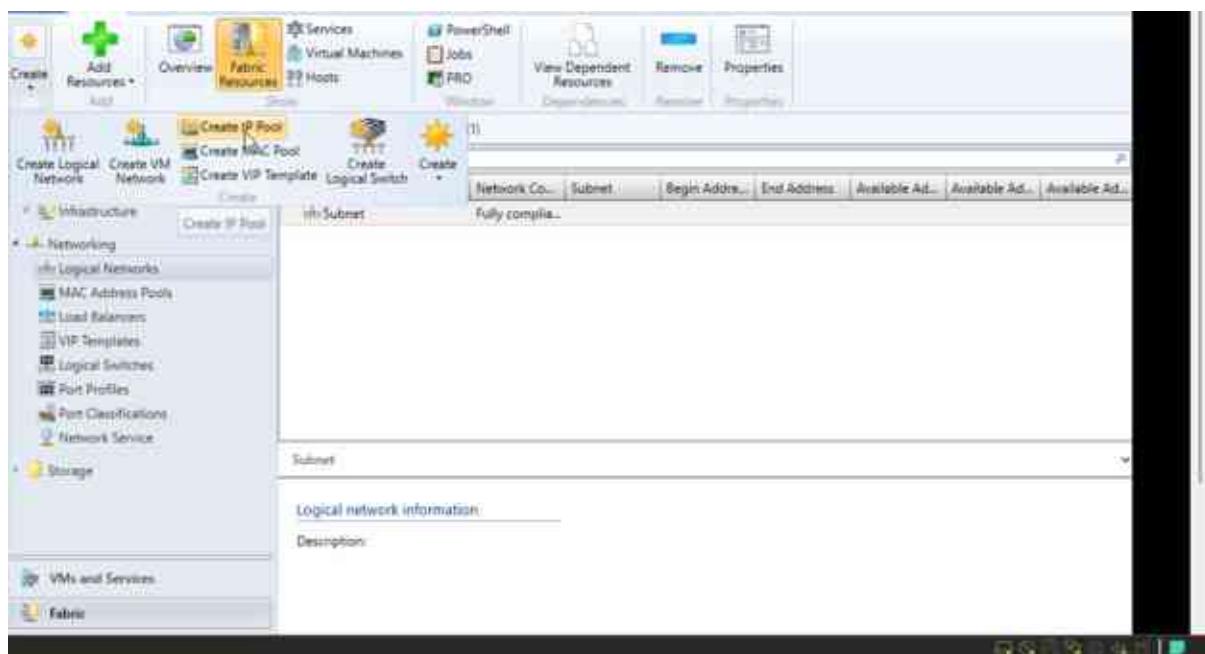


- Confirm the Settings and Click on Finish

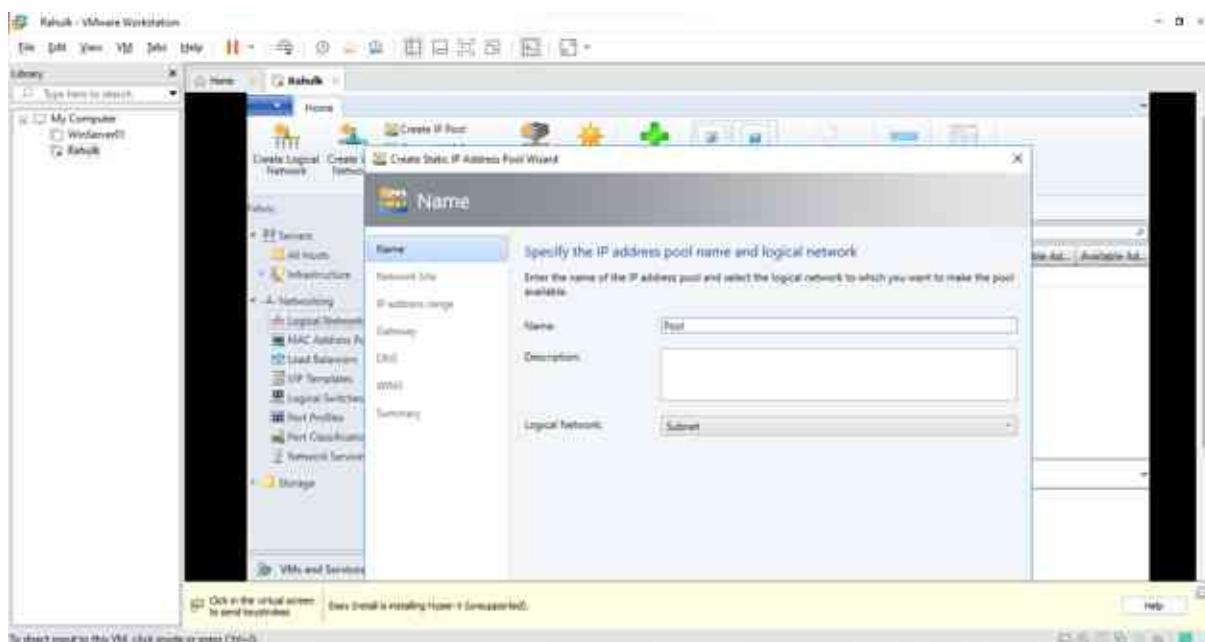


Step 42: Creating IP Pools

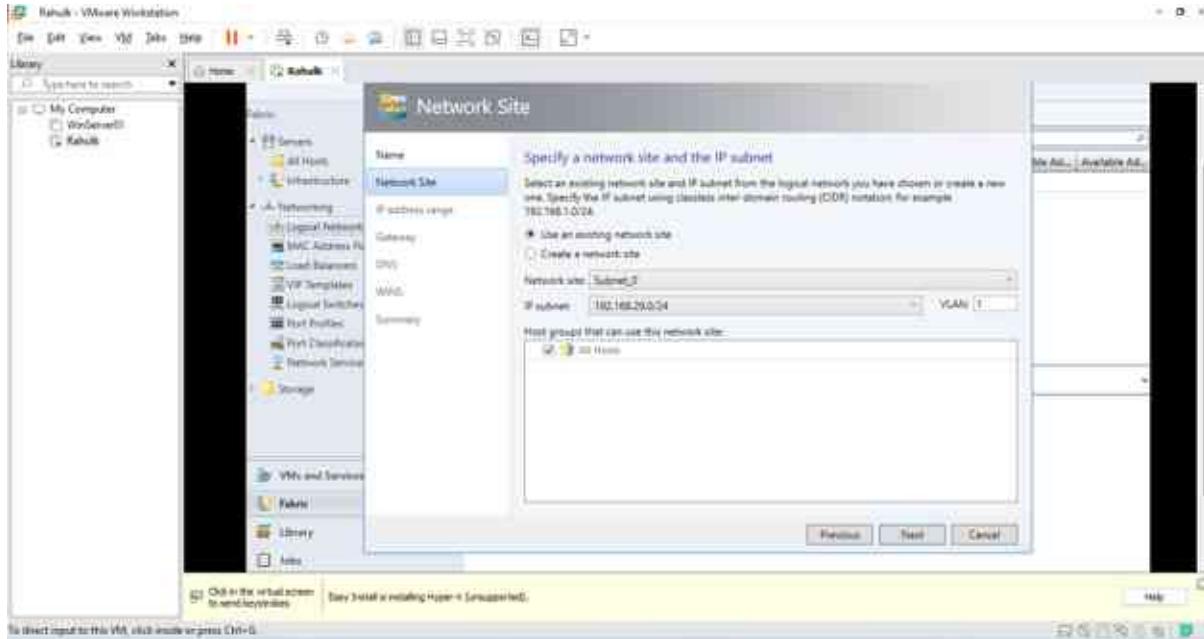
- Now in SCVMM on the Top Click on **Create**
- Within Create Click on **Create IP Pool**



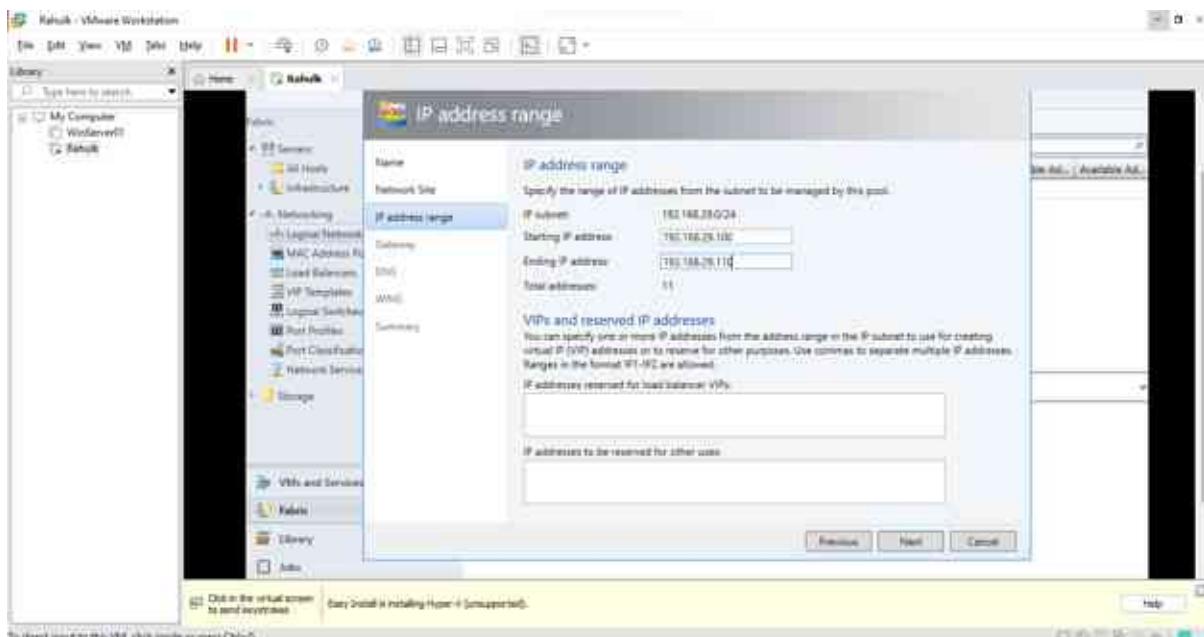
- Specify the IP address pool name and logical network Here **Name is Pool**
- And Make Sure **Logical Network is Subnet**
- Click on Next**



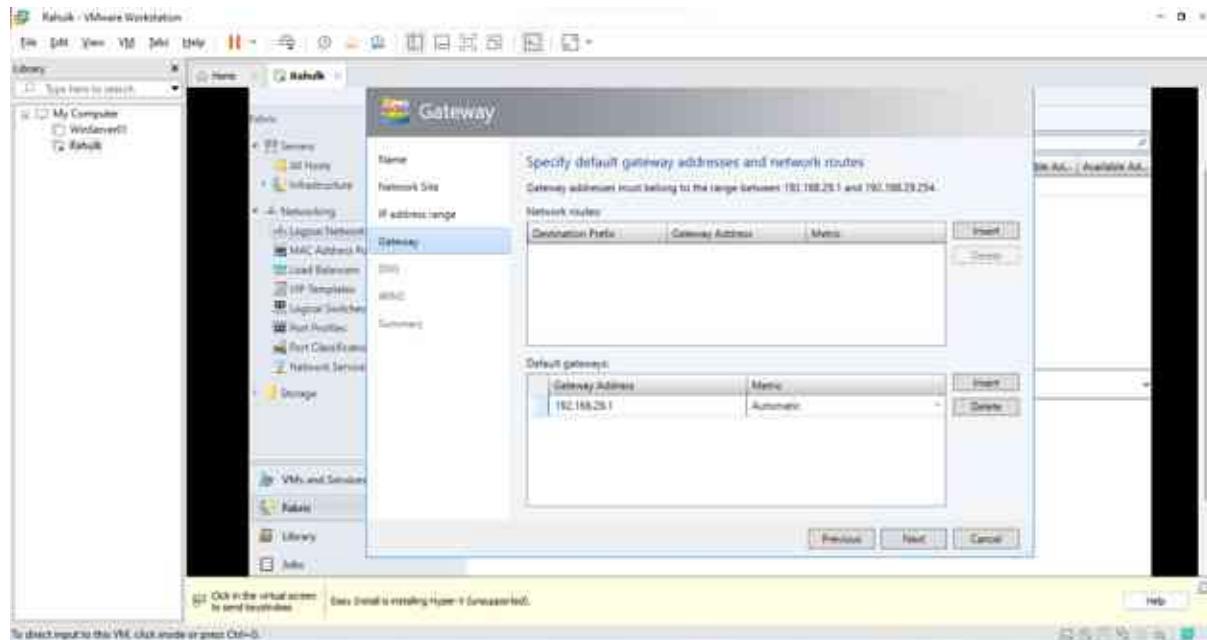
- Keep default values and **Click Next**



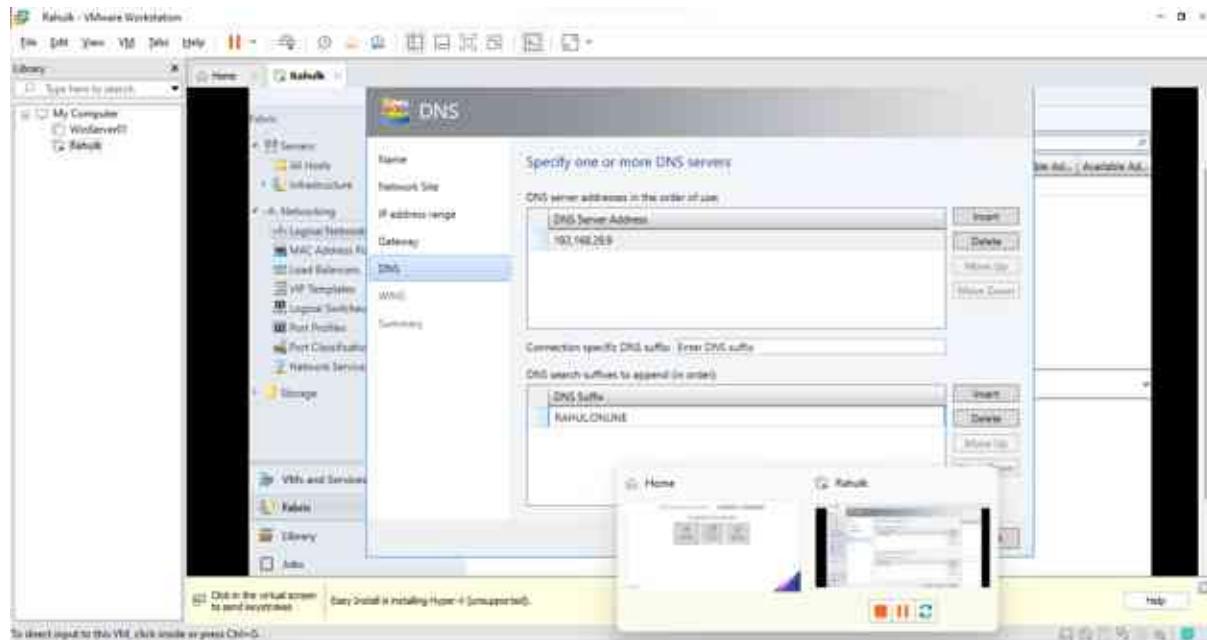
- In IP Address Range change the **Starting IP Address to 192.168.29.100** and **Ending IP Address Range to 192.168.29.110**
- **Click Next**



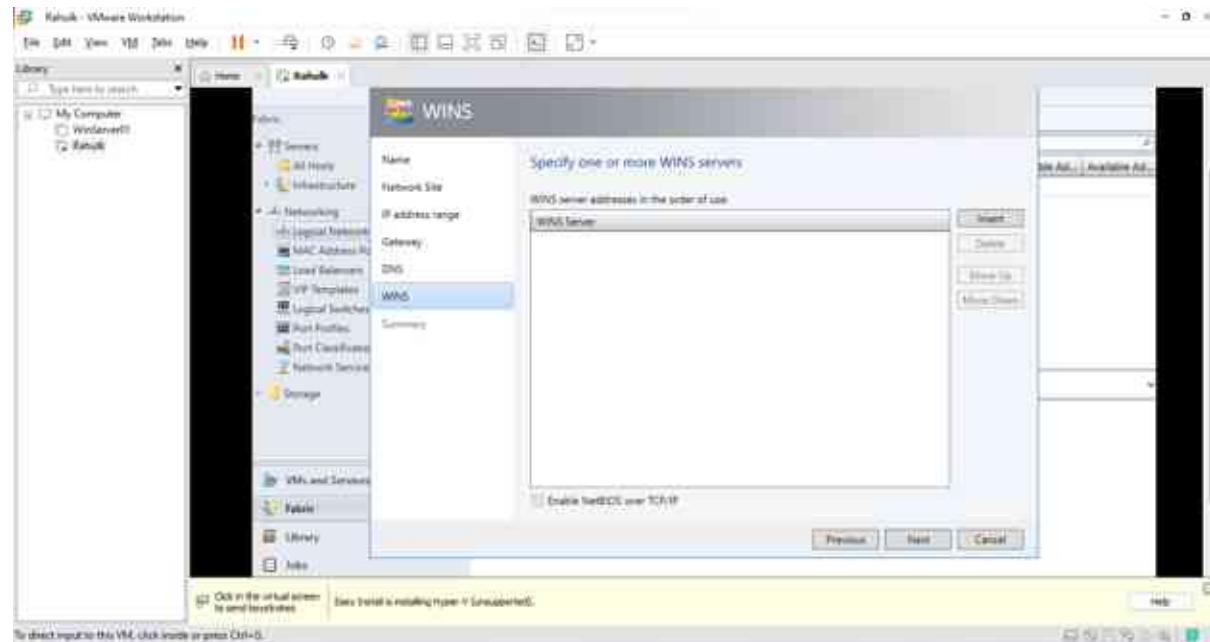
- In Gateway,
- Within Default Gateways **Click on Insert**
- Type the Gateway Address as **192.168.29.1** and Keep the metric as Automatic
- **Click Next**



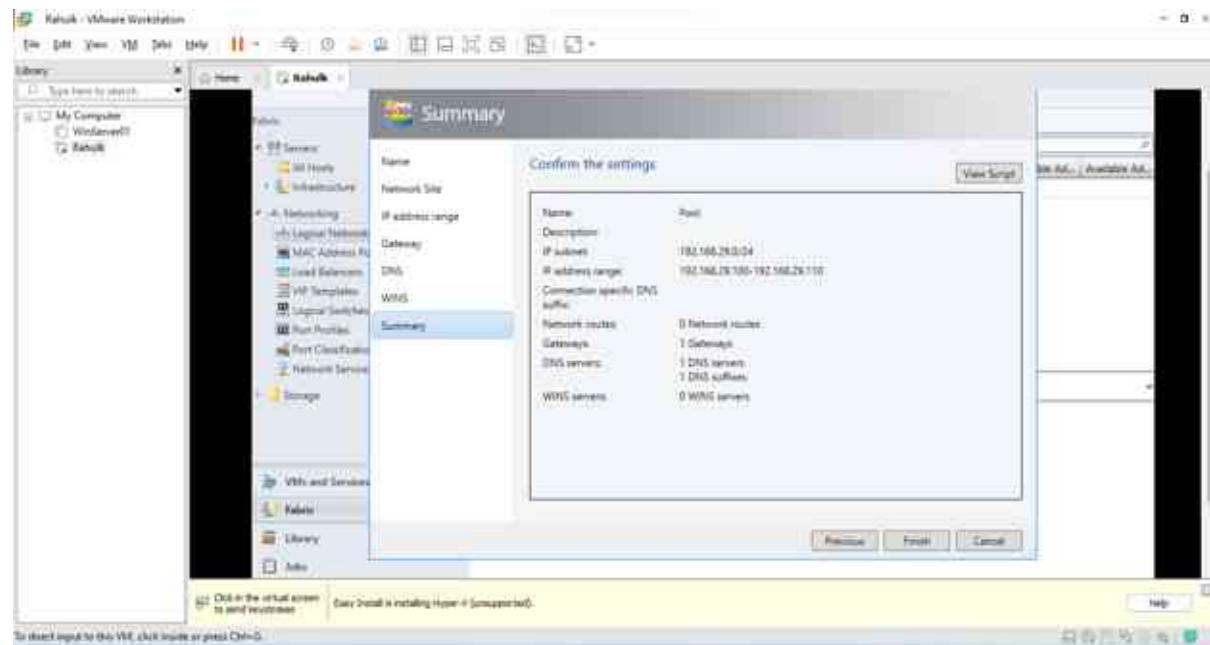
- In DNS, within **DNS server address in the order of use** Click on **Insert** Type in the **IP address 192.168.29.9**
- In **DNS Suffix** type your **Domainname.Online** i.e in this case it is **RAHUL.ONLINE**
- **Click Next**



In WINS Server Keep it as is and **Click Next**

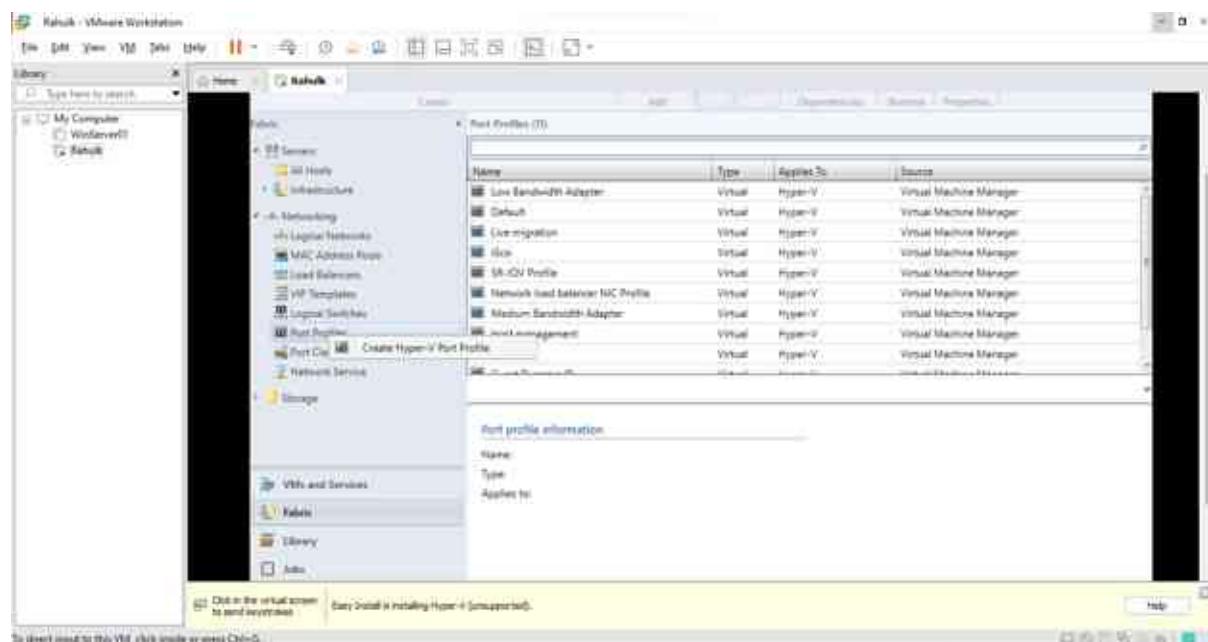


- View the Summary and **Click Finish**

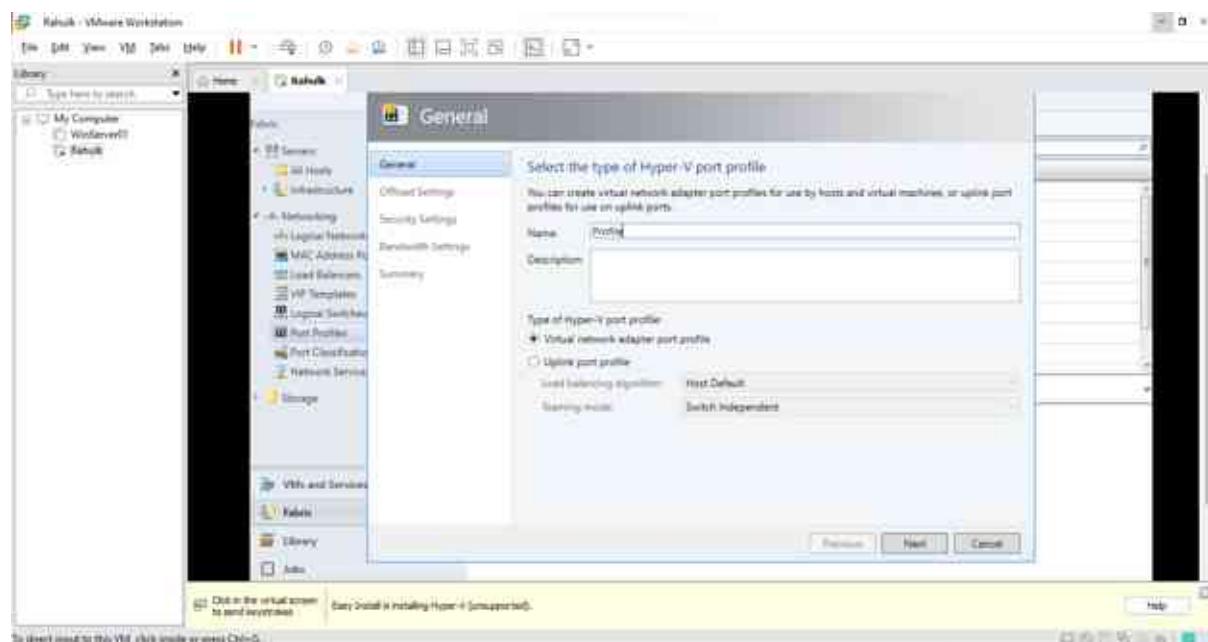


Step 43: Create IP Port Profile

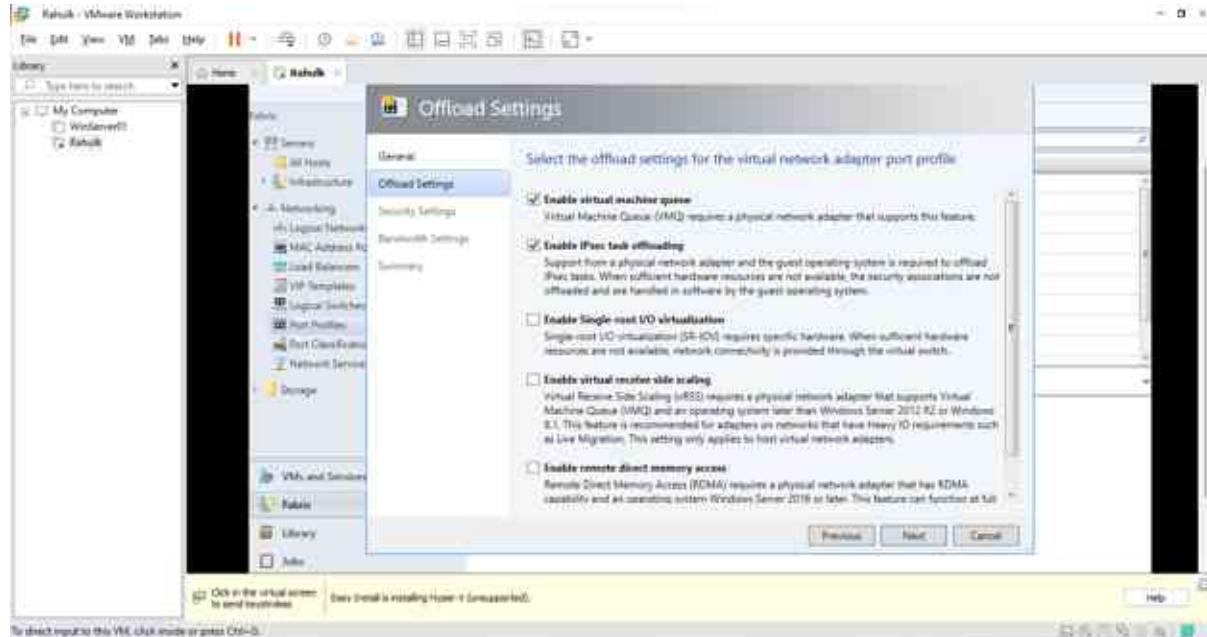
- In SCVMM Click on Fabric
- Within Fabric Click on Networking
- Within Networking Right Click on Port Profiles and Select Create Hyper-V Port Profile



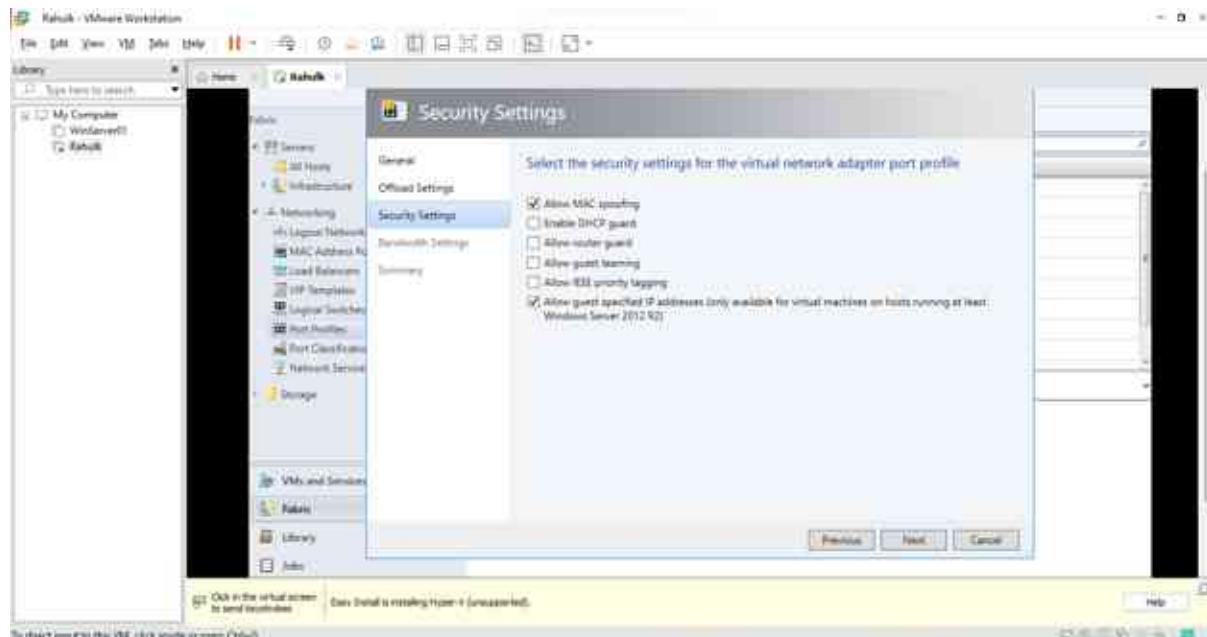
- Call this Profile and Click Next
- Make Sure Virtual network adapter port profile also selected



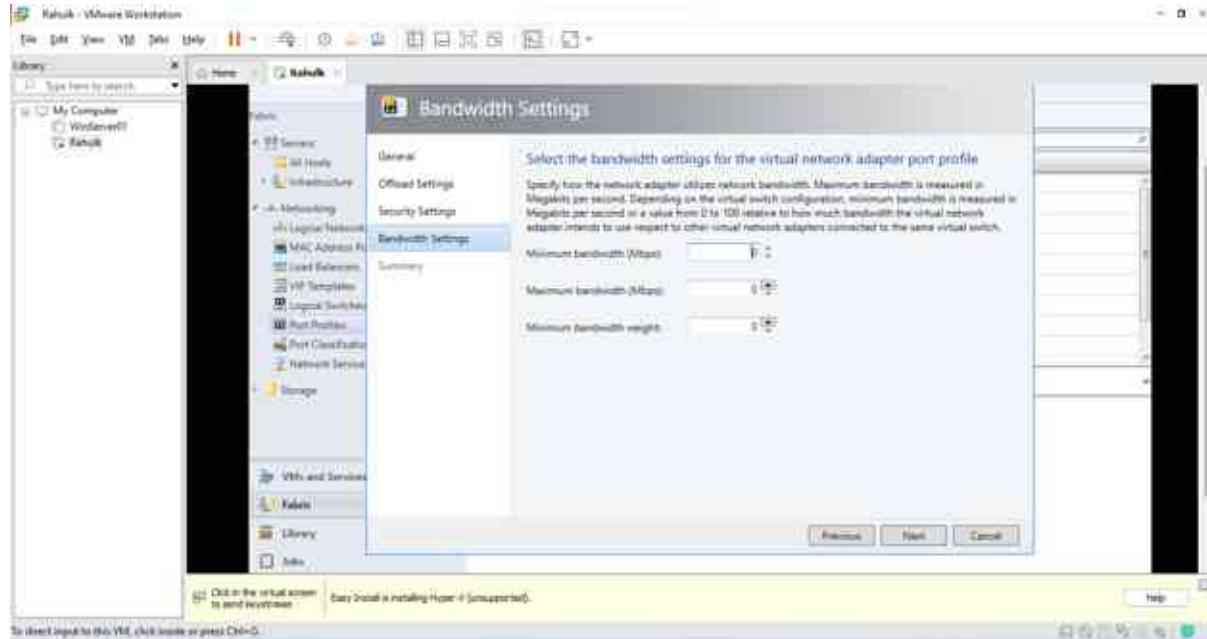
- In Offload Setting Select the following options:
 - Enable virtual machine queue
 - Enable IPSec task offloading
- Click on Next



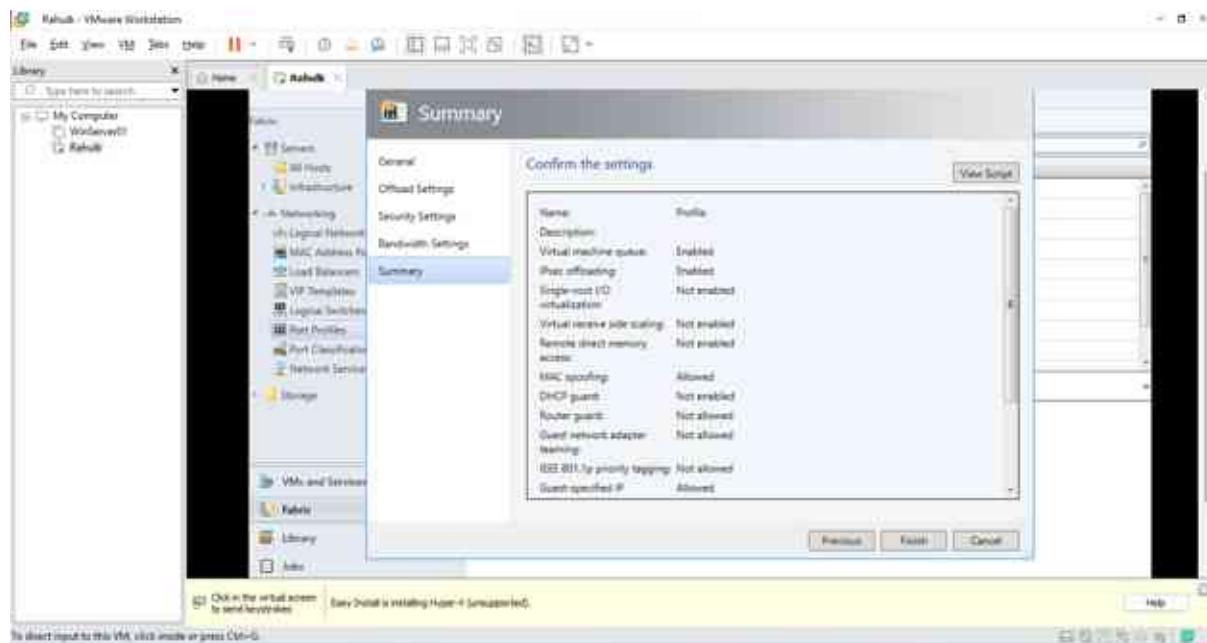
- In Security Settings Select Allow MAC spoofing and Click Next



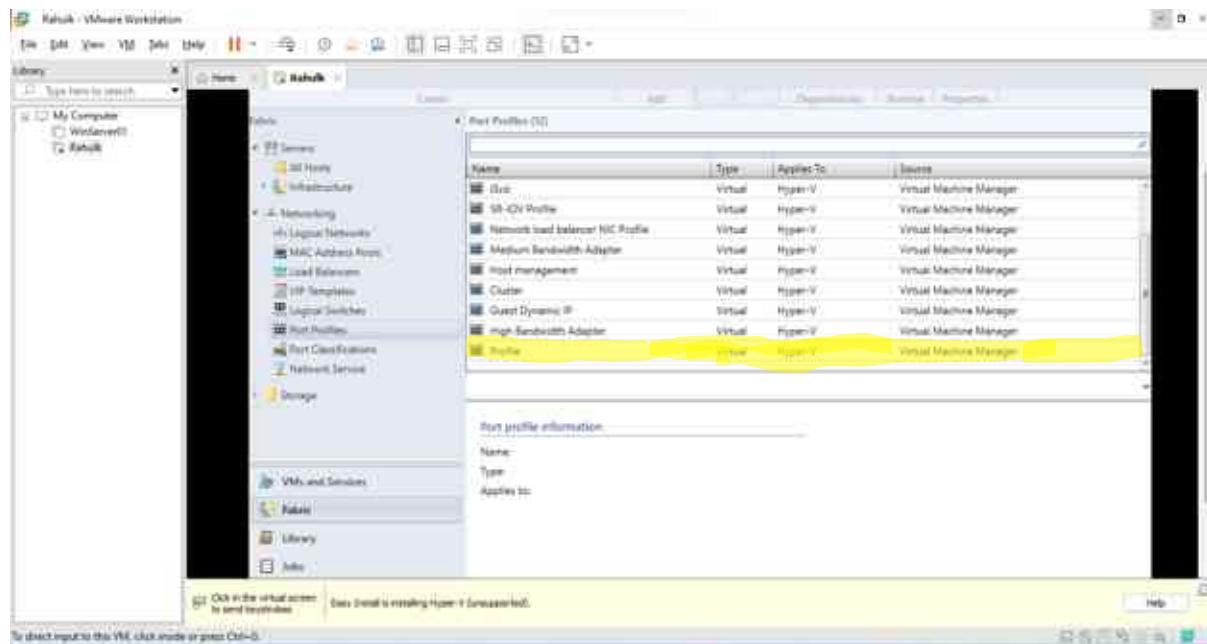
- Keep the default value and **Click on Next**



- Review the Summary and **Click On Finish**

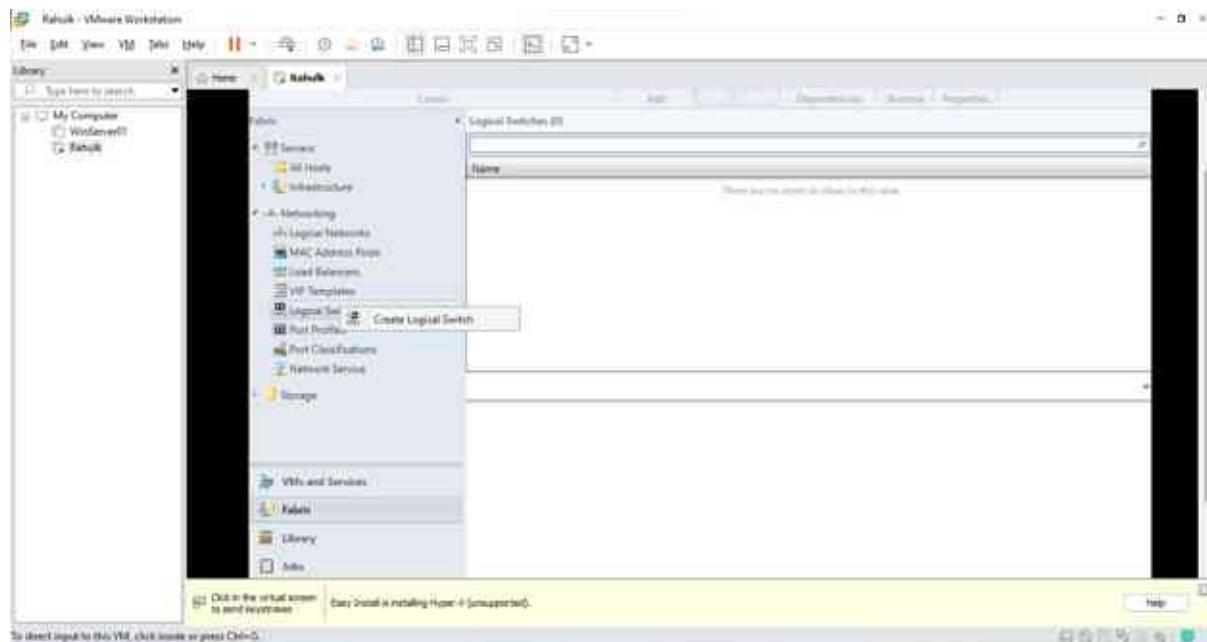


- New Port Profile called **Profile** is created

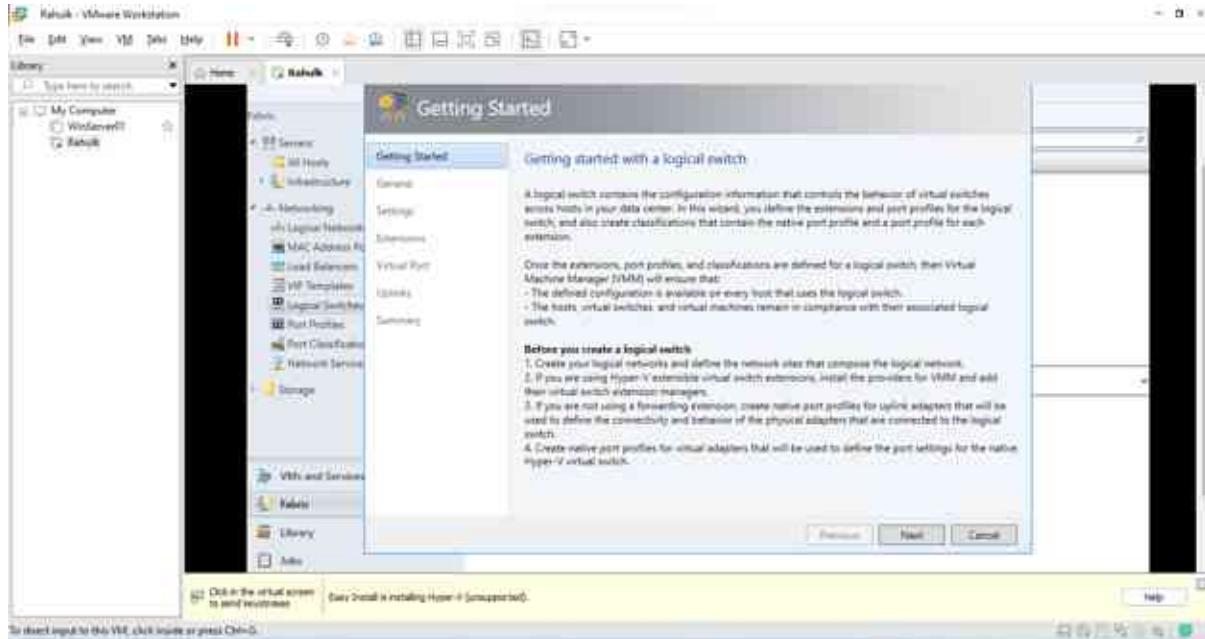


Step 44: Create Logical Switches

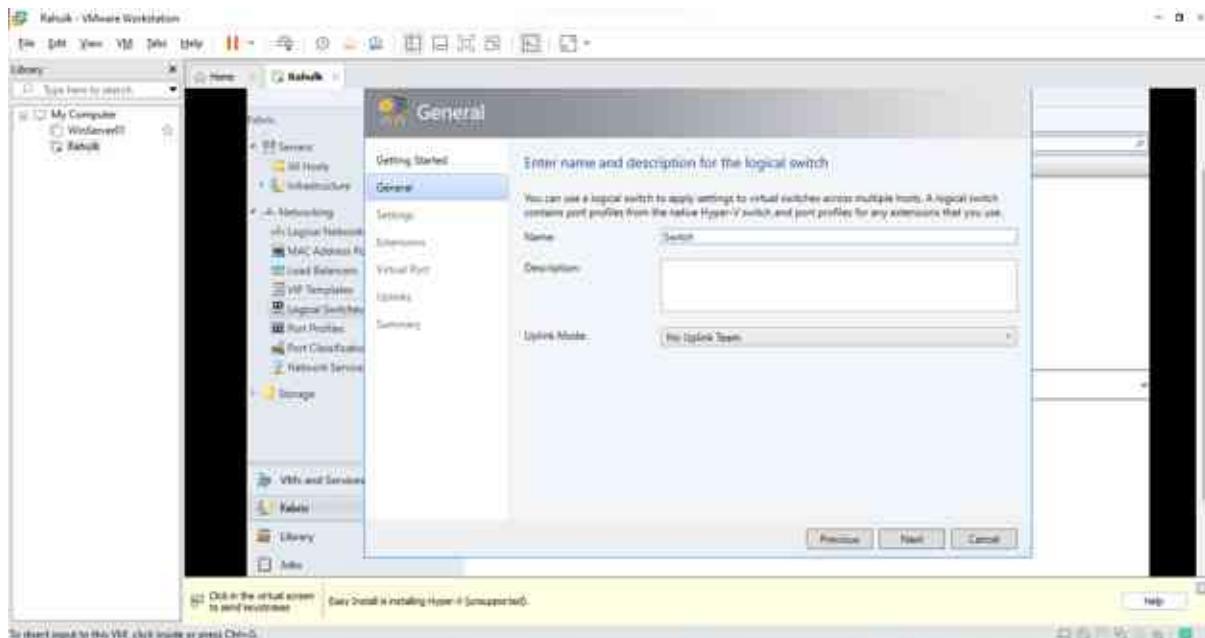
- In SCVMM Click on Fabric
- Within Fabric Click on Networking
- Within Networking Right-Click on Logical Switches and Select Create Logical Switch



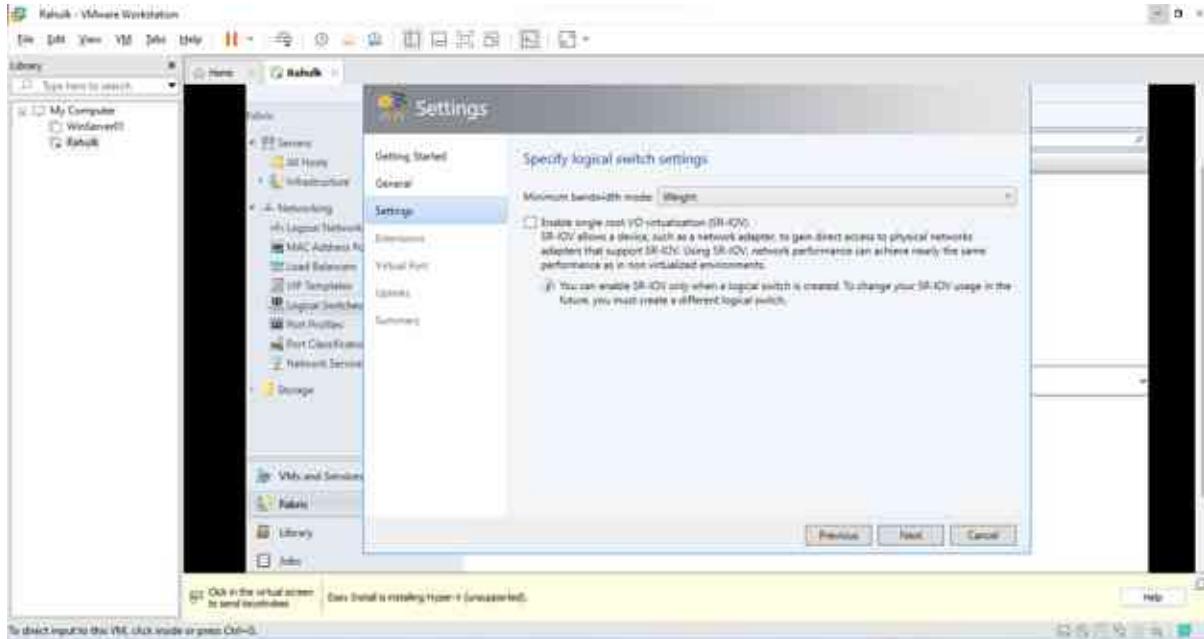
- Click on Next



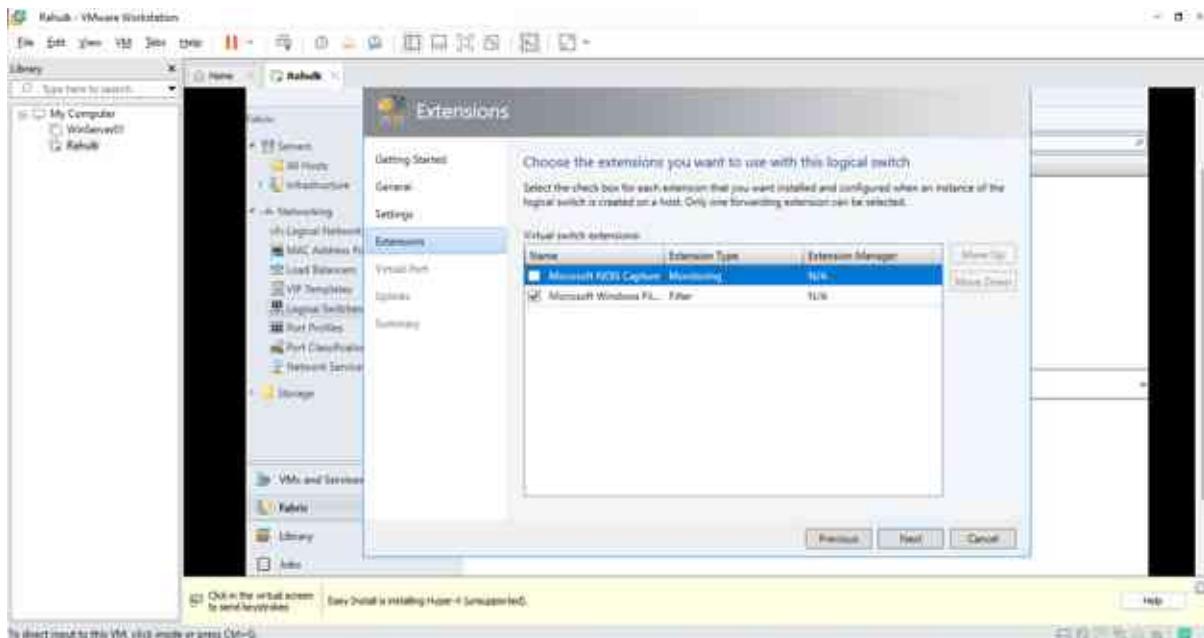
- Call it Switch and Click Next



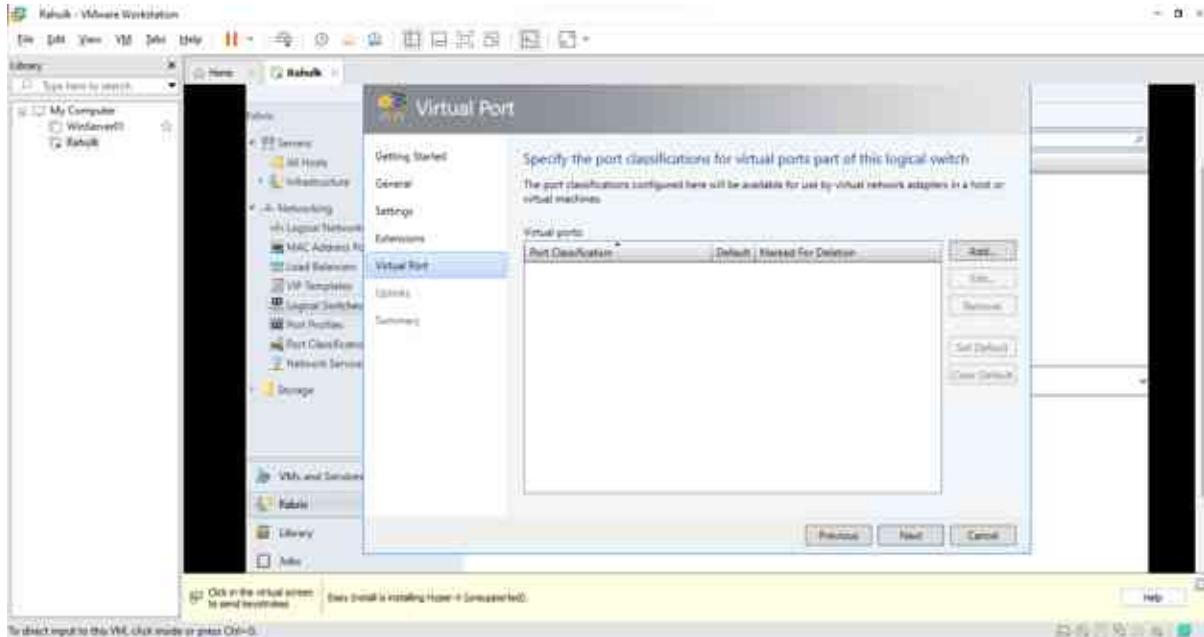
- Keep default values and **Click Next**



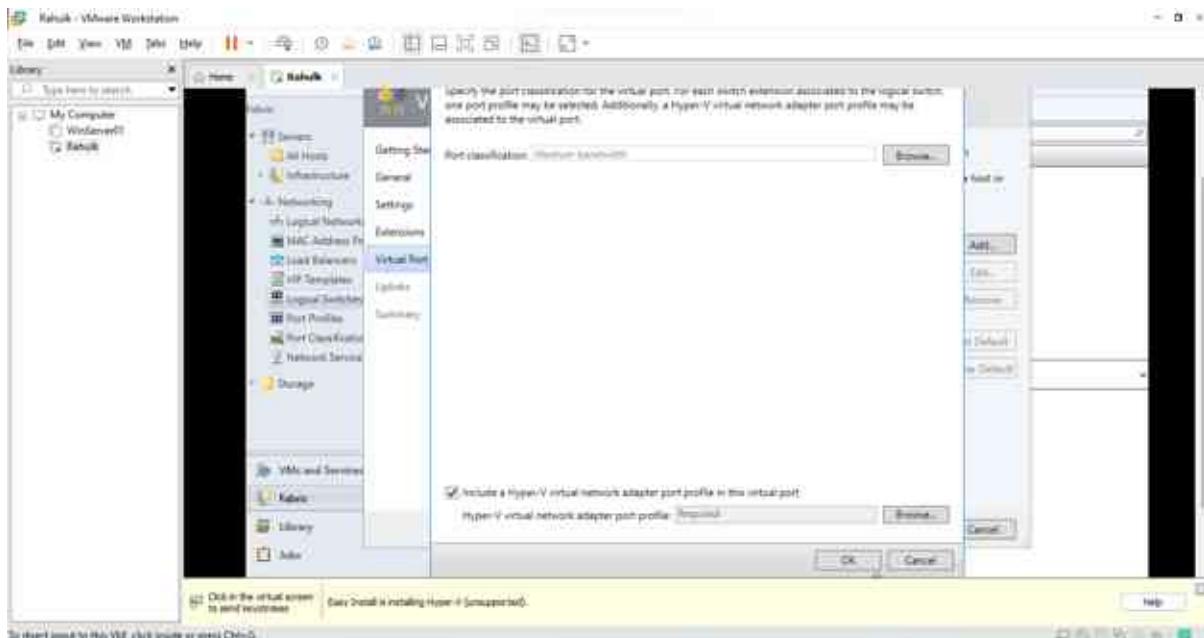
- Keep default values and **Click Next**



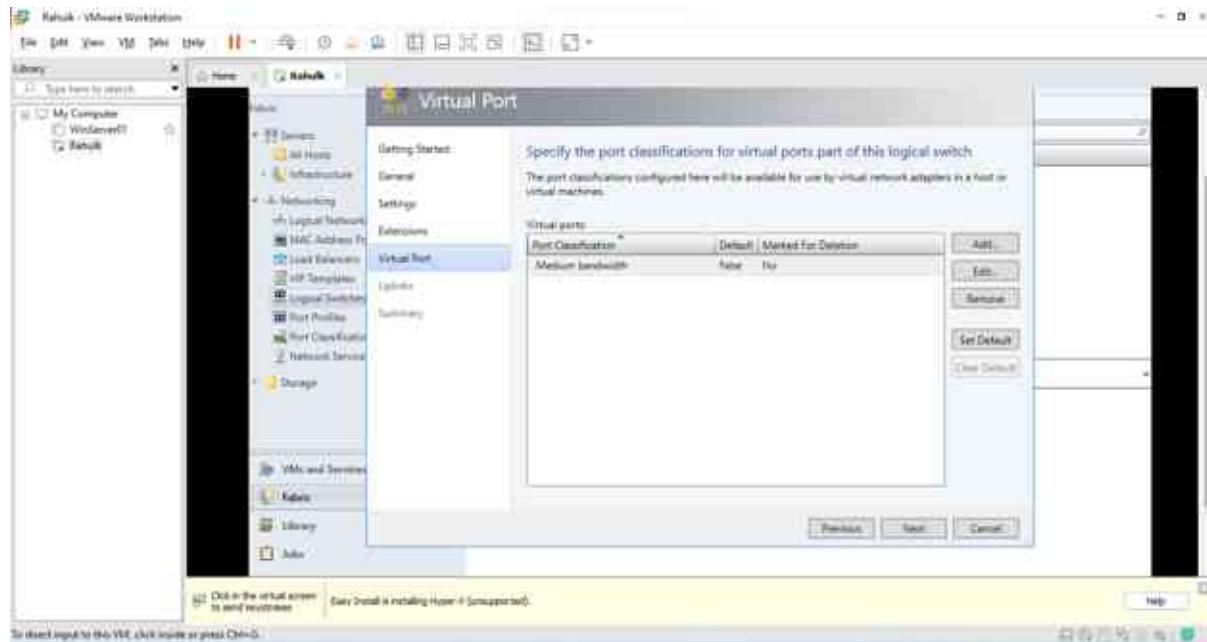
- In Virtual Port Click Add



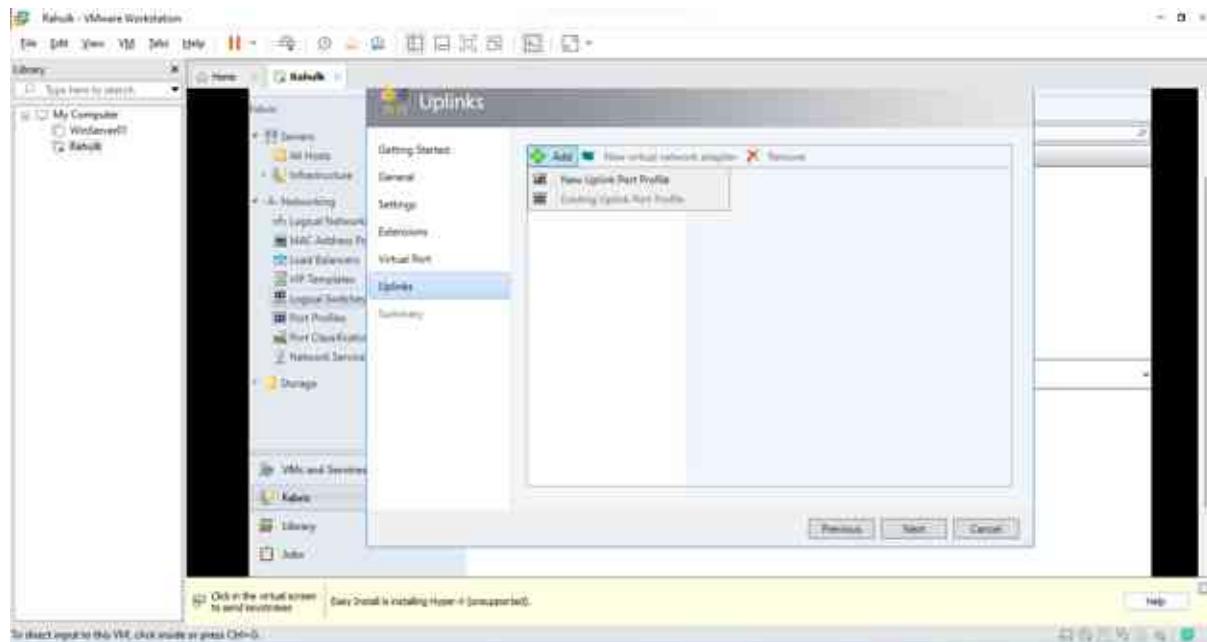
- In Port Classification Select Medium Bandwidth
- Click on Include a Hyper-V Virtual Network adapter port profile in this virtual port and Select Medium Bandwidth
- Click On OK



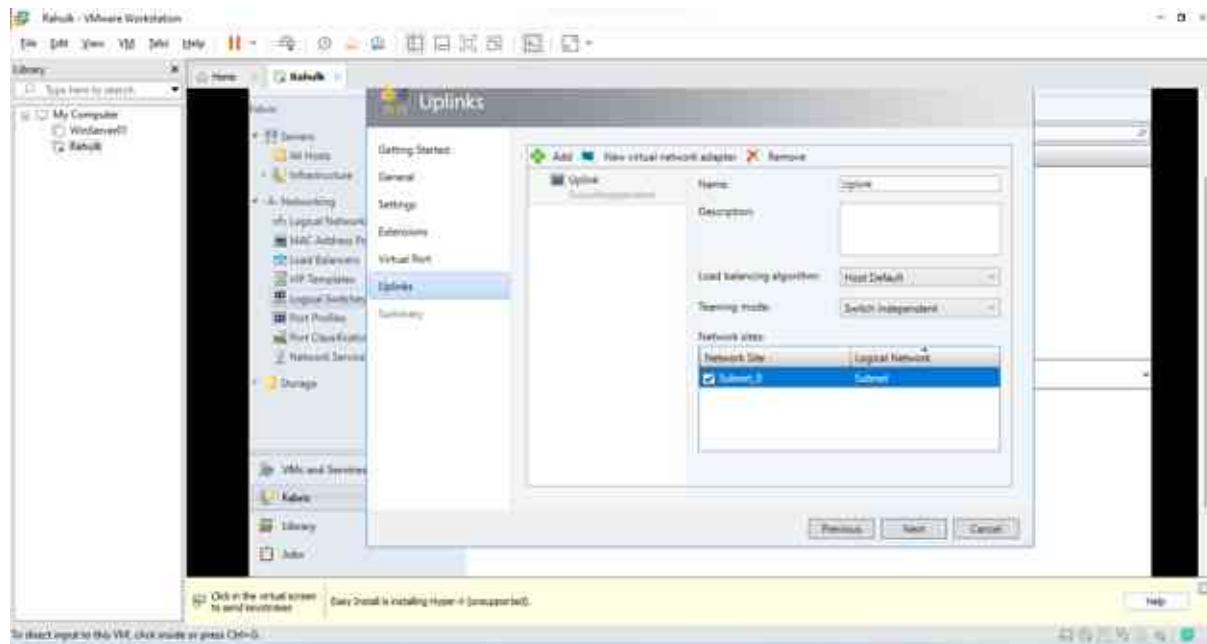
- On Virtual Port Click Next



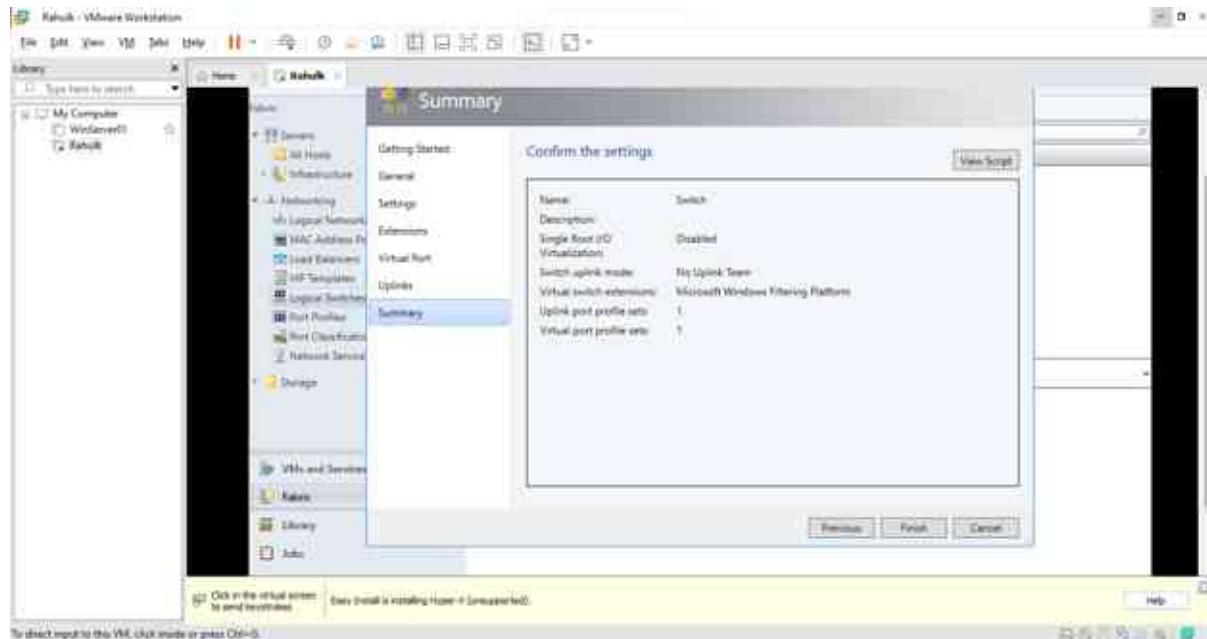
- On Uplink Click on Add
- Select New Uplink Port Profile



- In Name type Uplink
- Select the Subnet_0

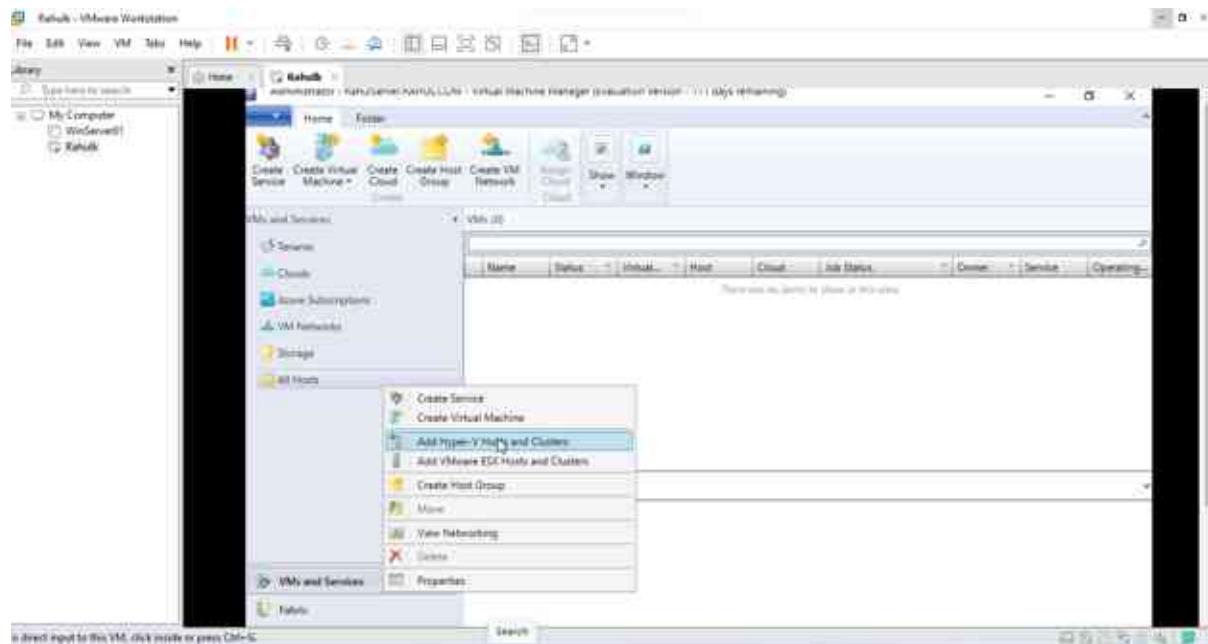


- Review the Summary and **Click on Finish**

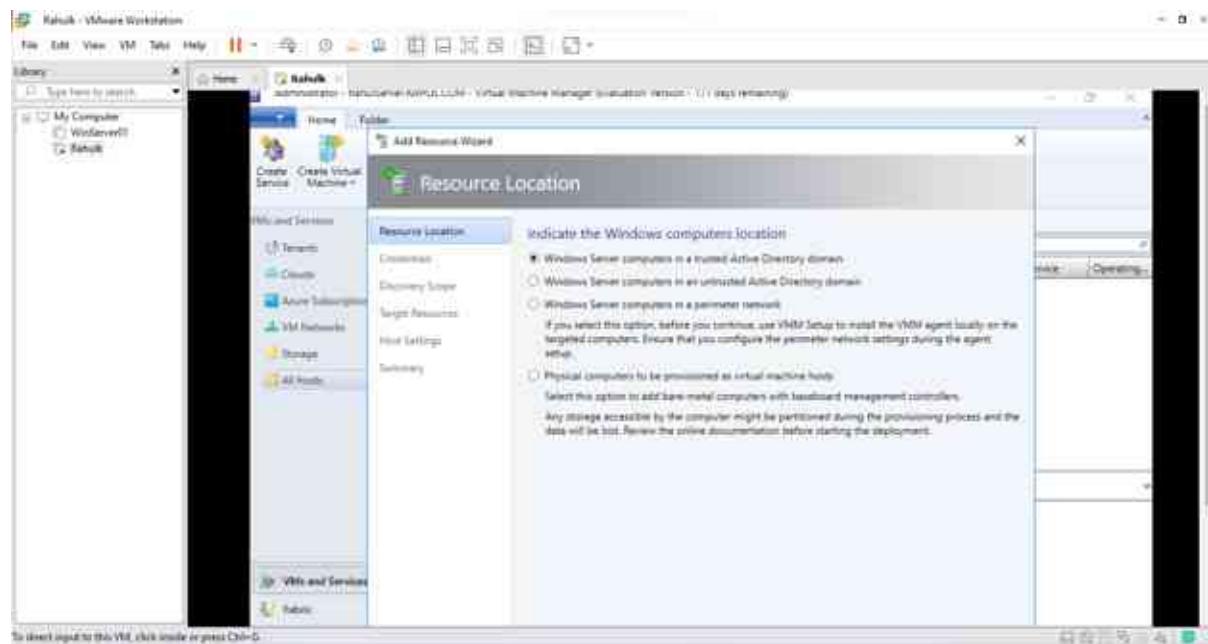


Step 45: Create Hyper-V Hosts and Clusters

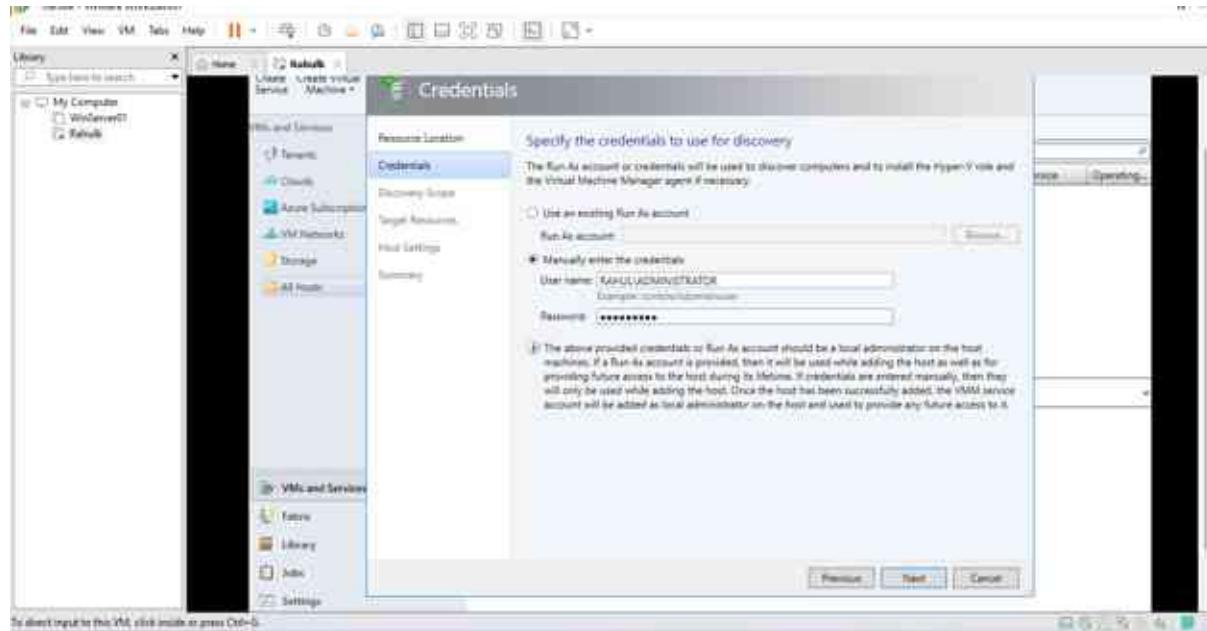
- In SCVMM Click on Fabric
- Right Click on All Hosts and Select Add Hyper-V Hosts and Clusters



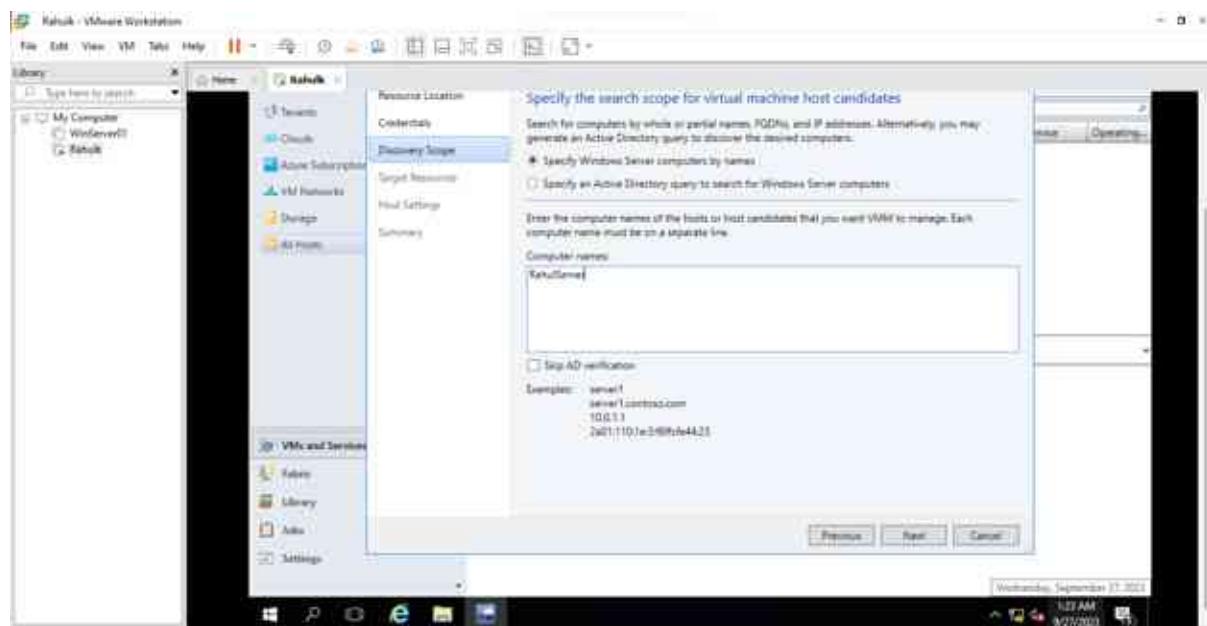
- Keep Default Setting and Click on Next



- In Credentials Select **Manually enter the credentials** and Enter user name and Password (Here user name is RAHUL\ADMINISTRATOR)
- Click on Next



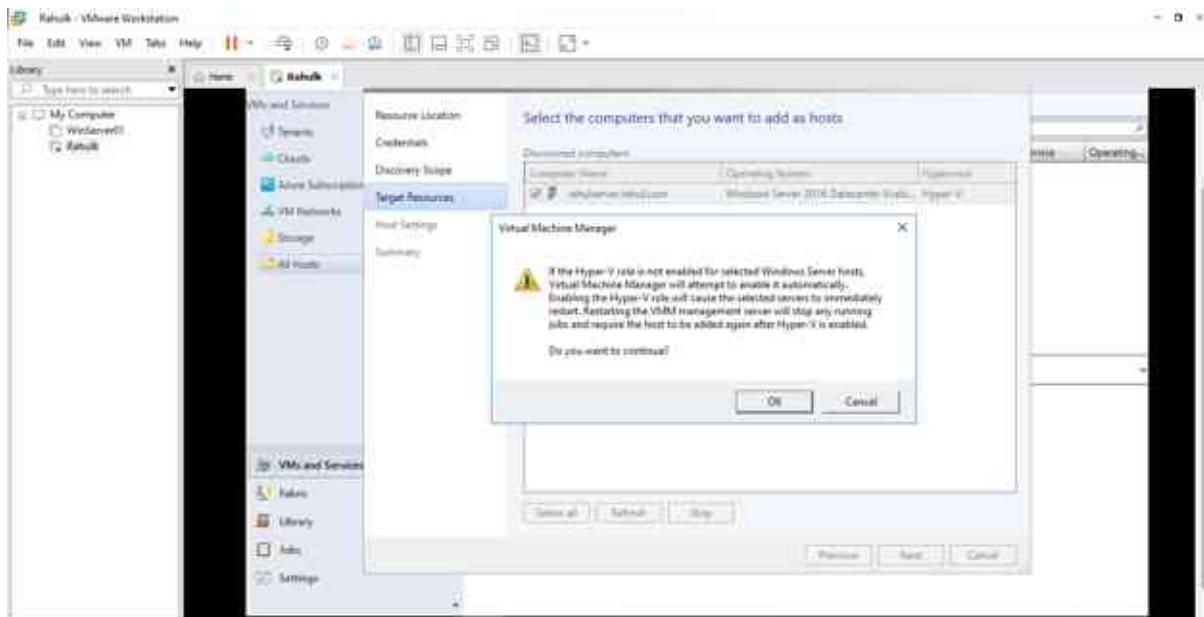
- In Computer names Specify your **computer name** (Here it is RahulServer)
- Click on Next



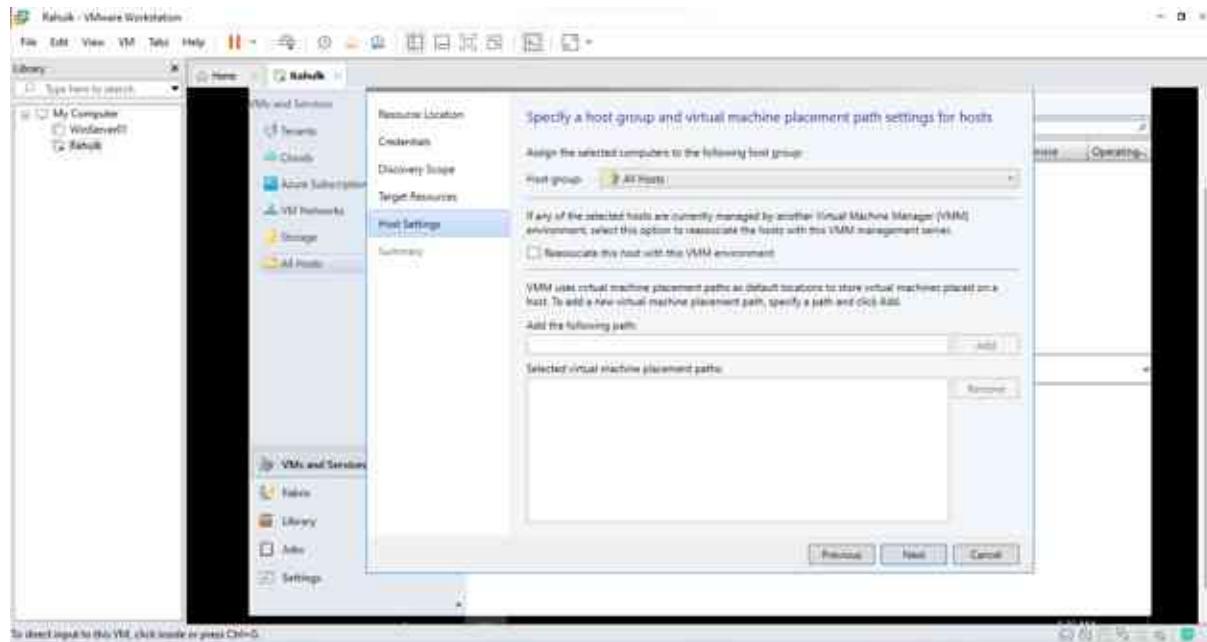
- In Target Resources Check Computer Name (**Here it is rahulserver.rahul.com**)



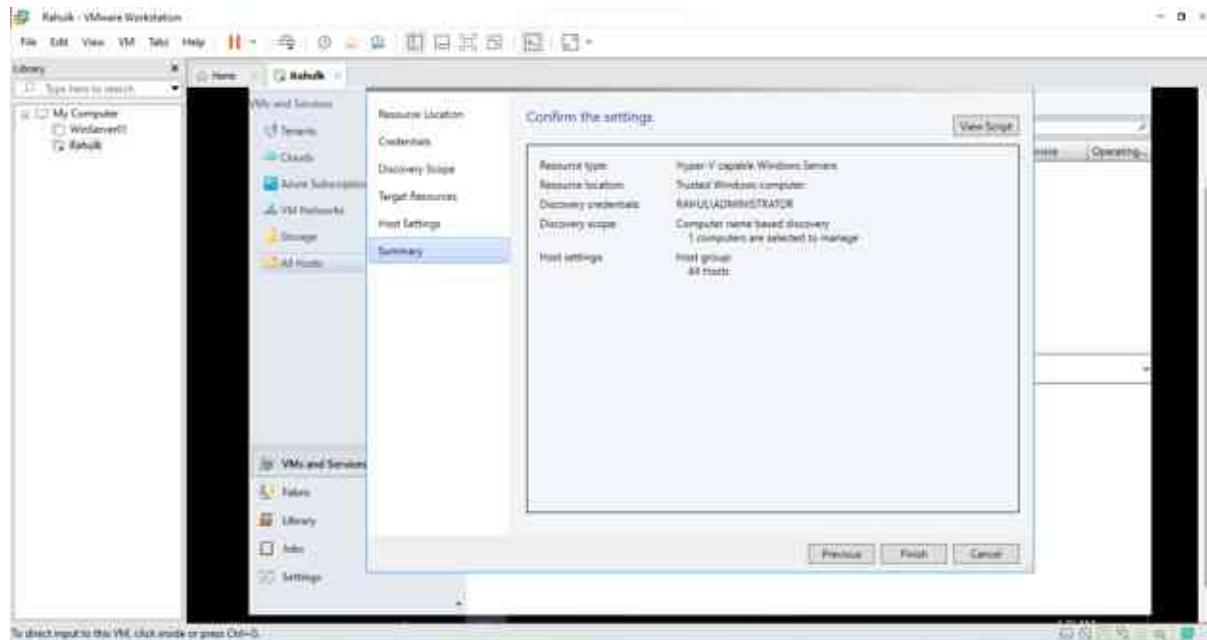
- After Check on computer name **pop-up window open click on OK**
- **Click on Next**



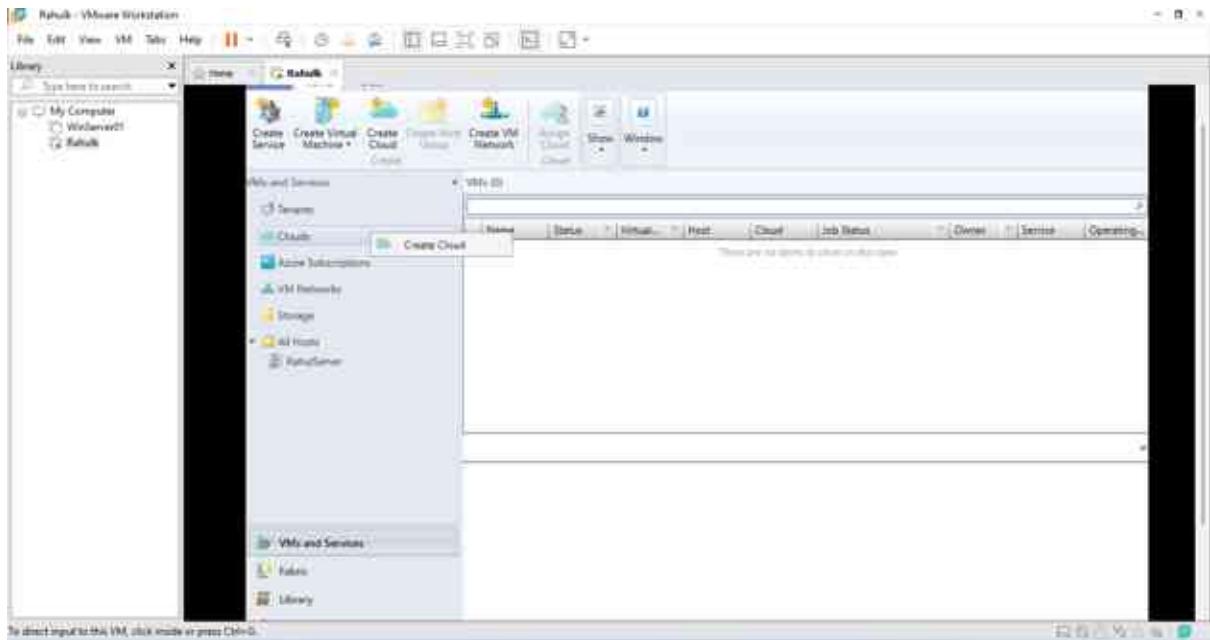
- Keep Default value and Click on Next



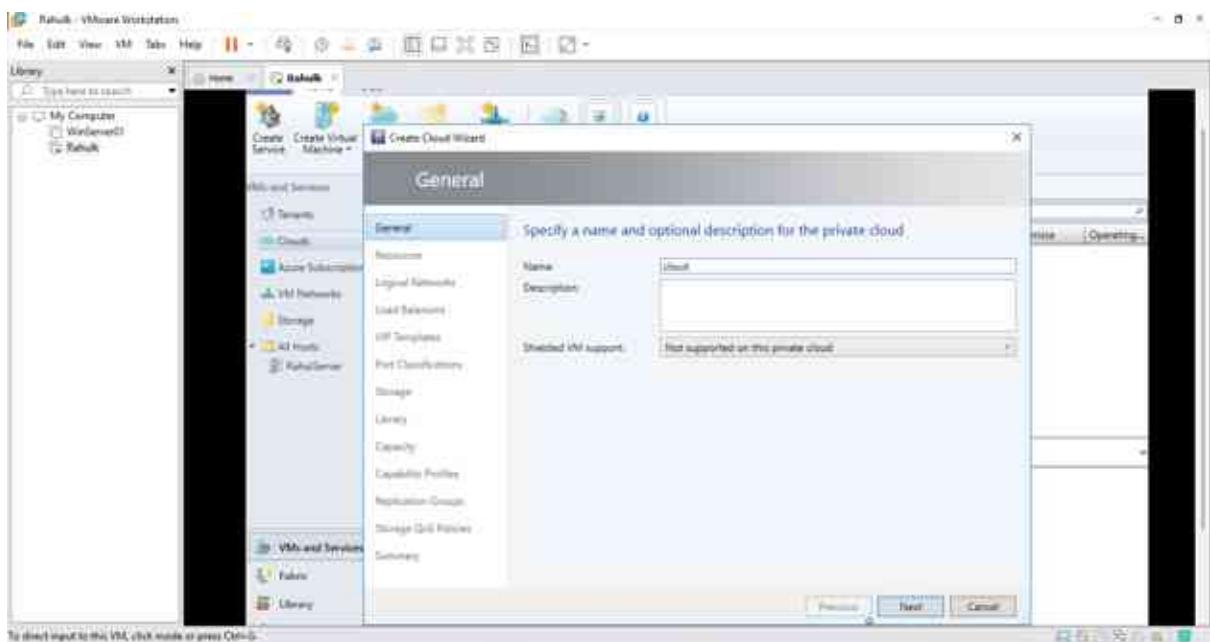
- View the Summary and Click on Finish



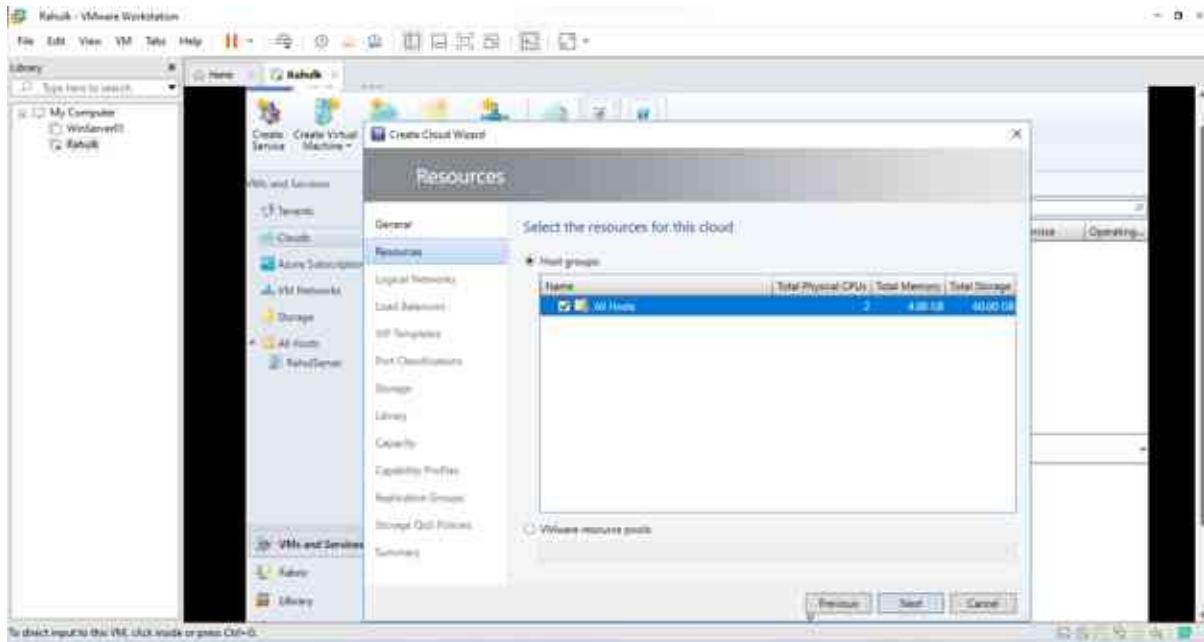
- In SCVMM Click on VMs and Services
- In VMs and Service Right-Click on Cloud Select **Create Cloud**



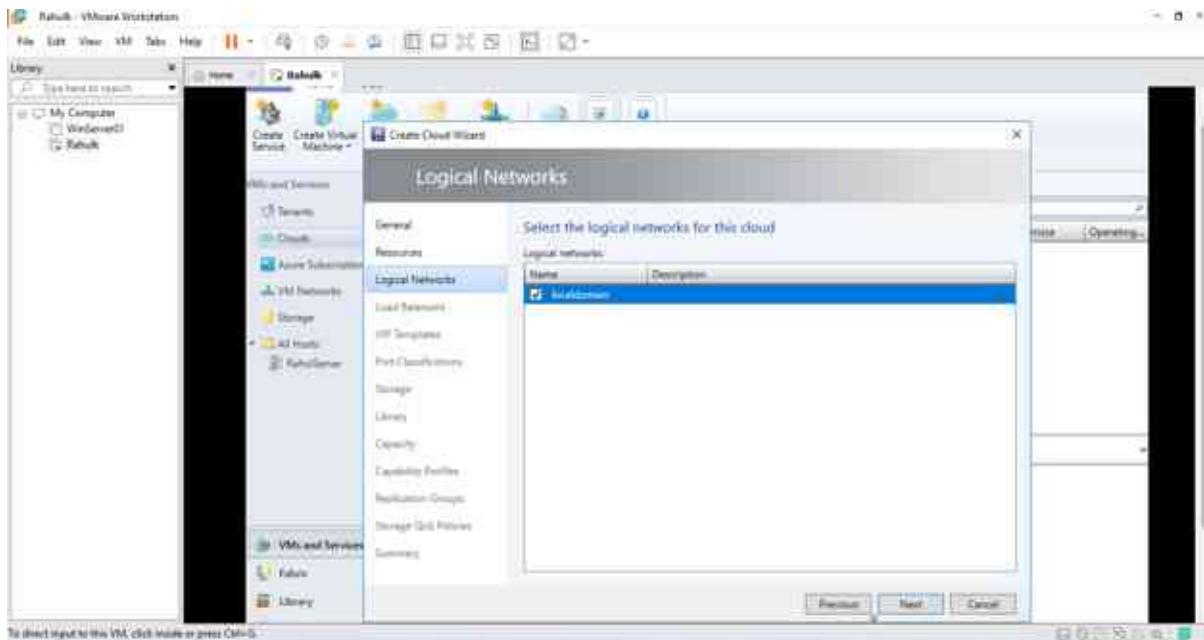
- Specify a name for the cloud (**Here it is cloud**) and **Click on Next**



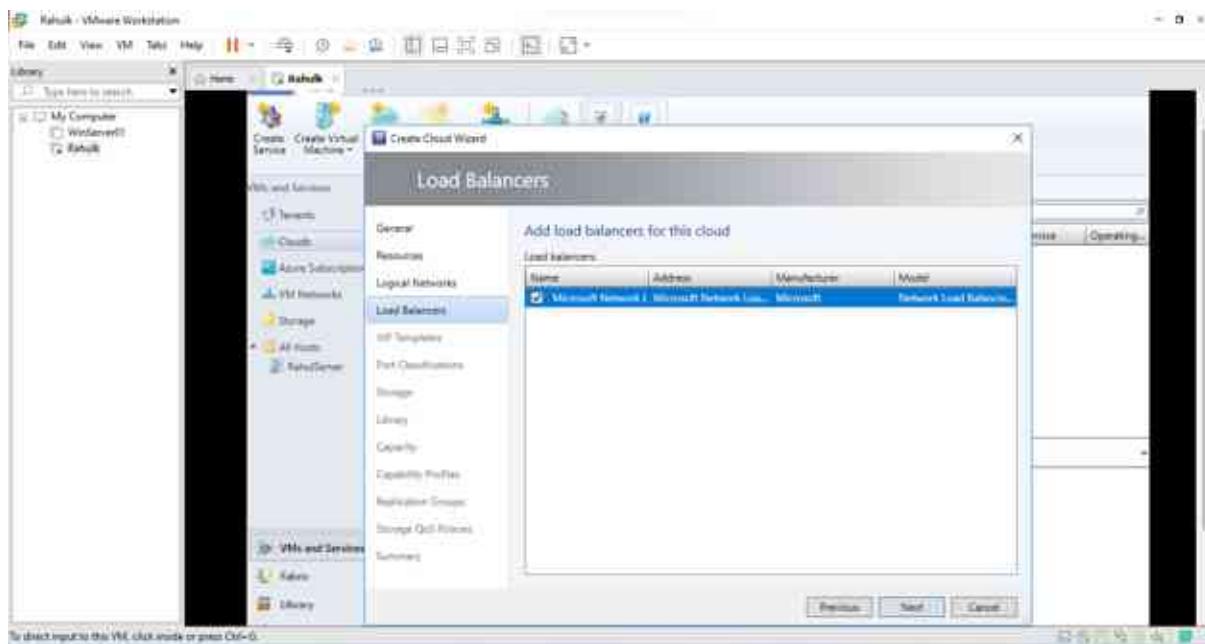
- In Resources Tick All Hosts and Click on Next



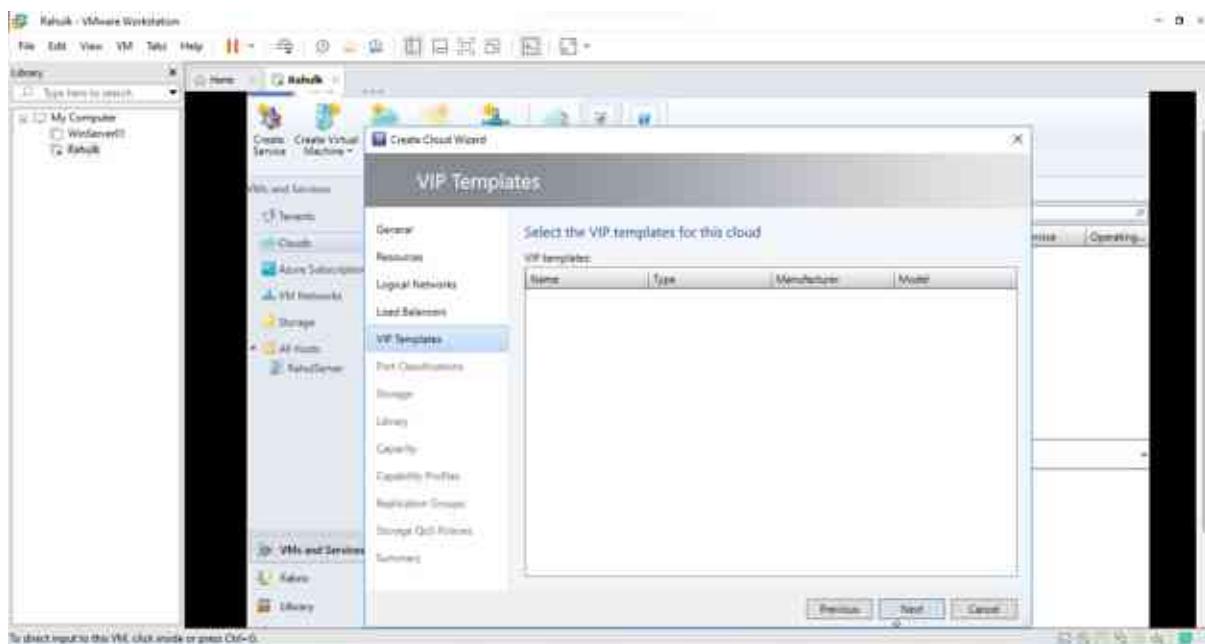
- In Logical Networks Tick localdomain and Click on Next



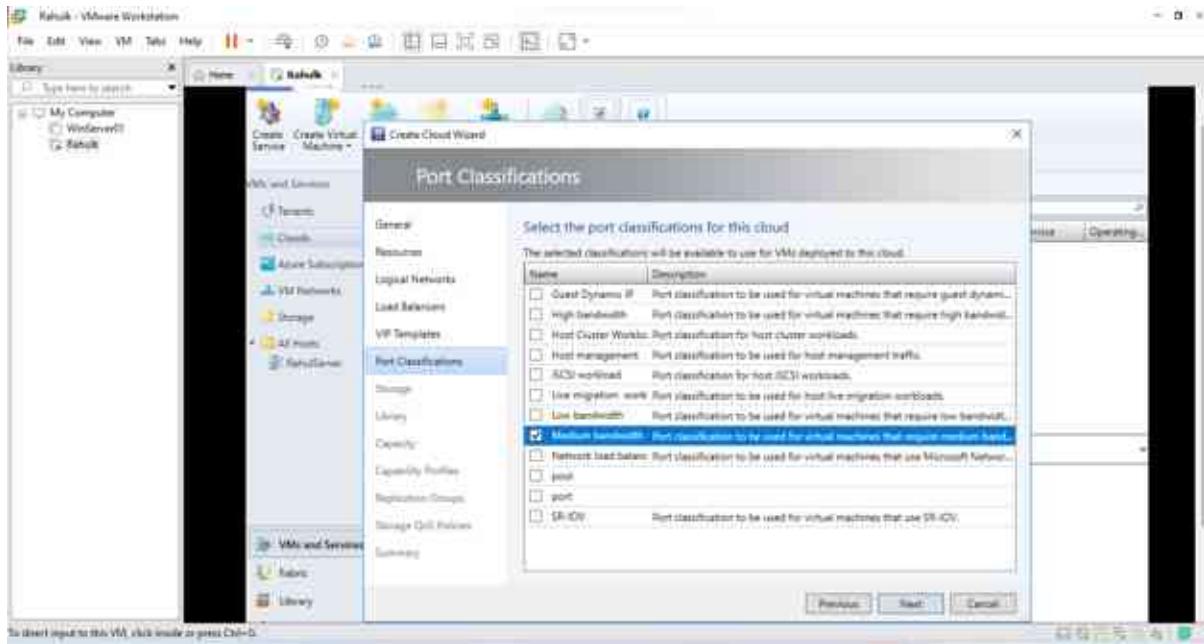
- In Load Balancers Select Microsoft Network Load Balancer and Click on Next



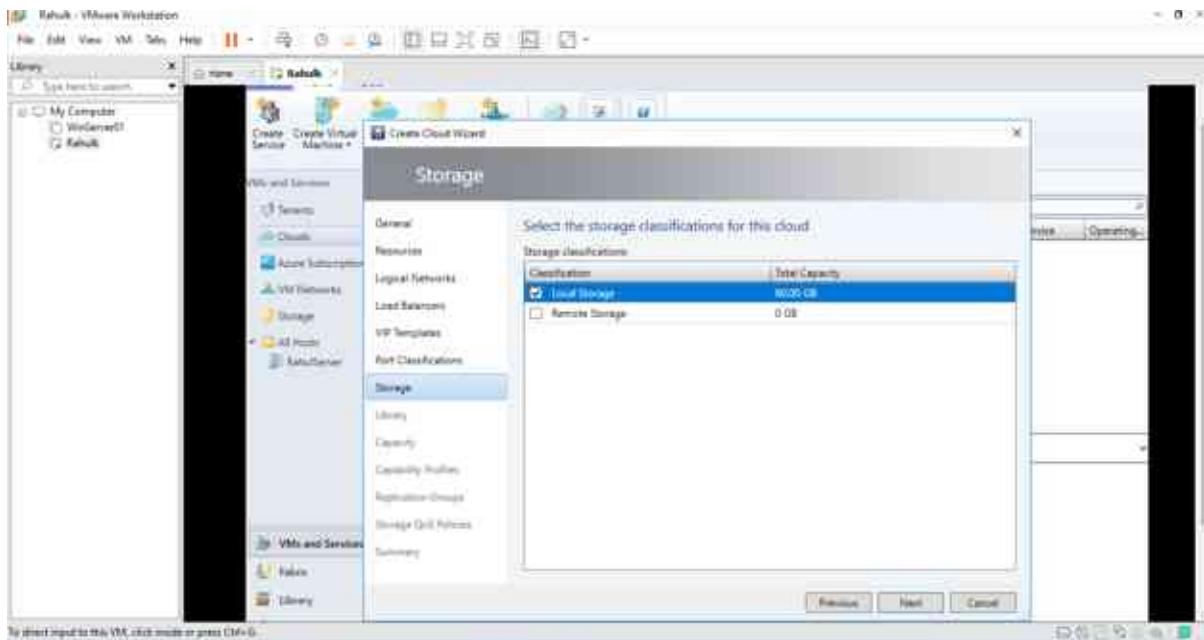
- Keep Default and Click on Next



- In Port Classification Select Medium bandwidth and Click on Next



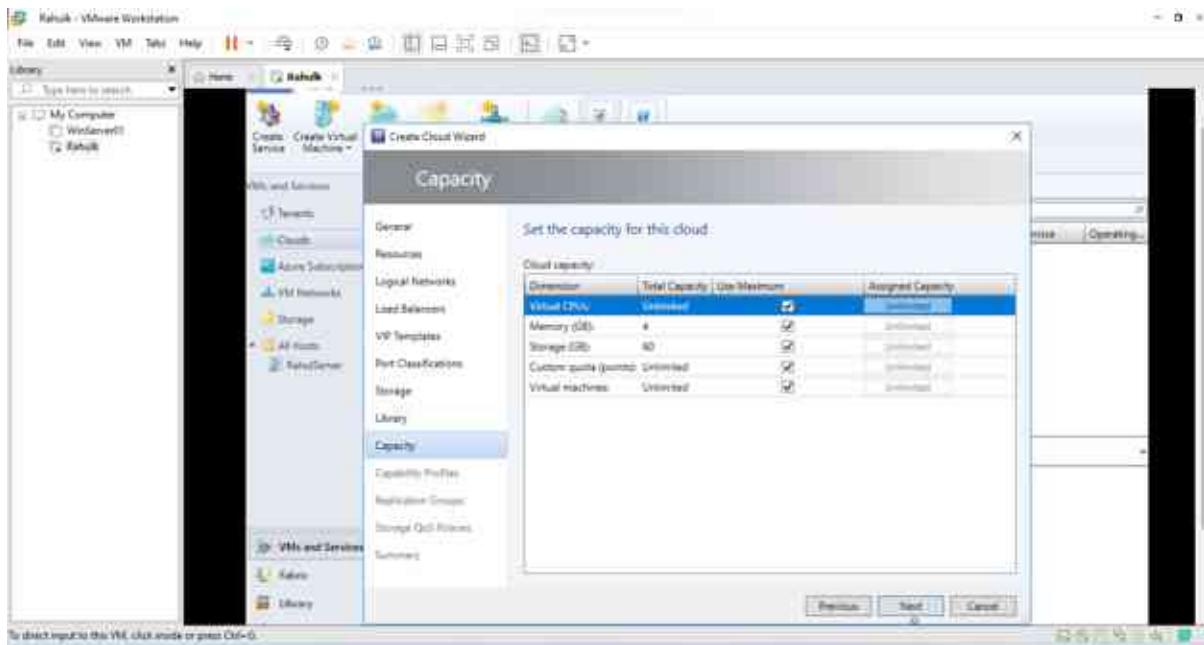
- In Storage Select Local Storage and Click on Next



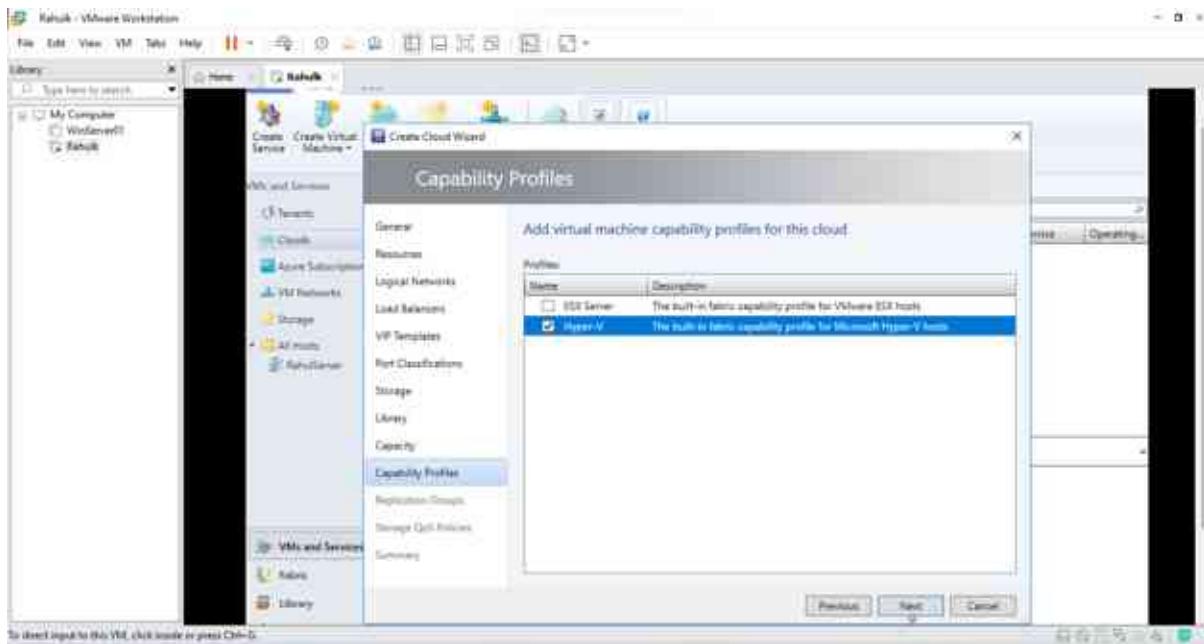
- In Library browse stored VM path and select **MSSCVMMLibrary** and Click **Ok**



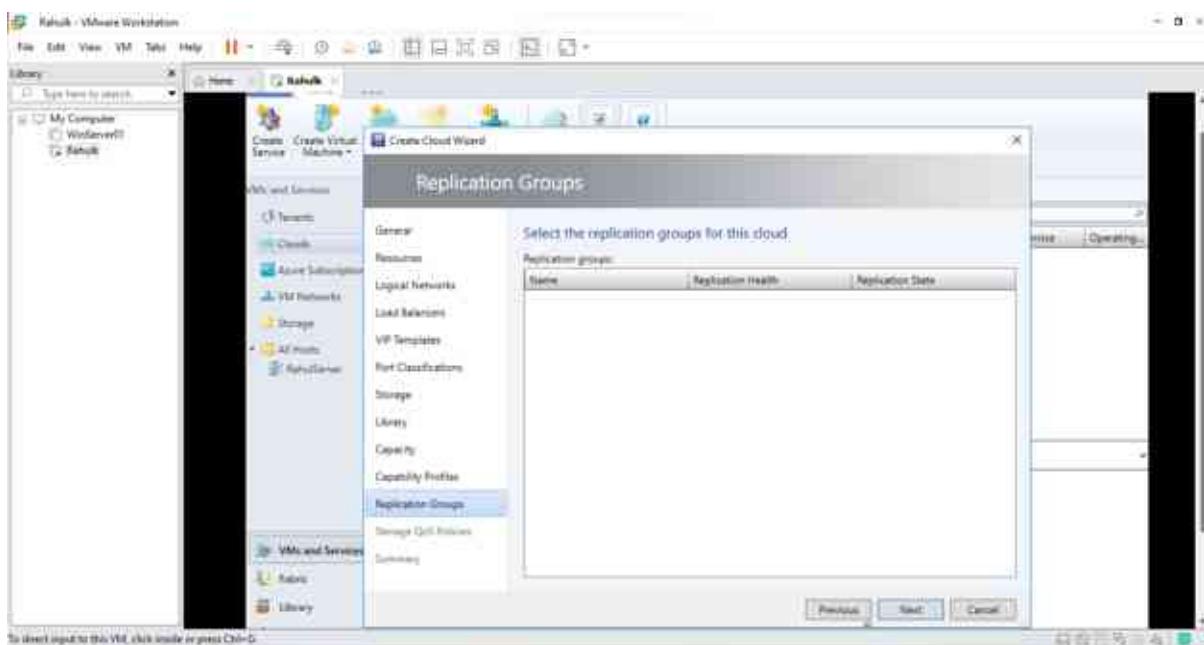
- Keep the Default Value and Click on **Next**



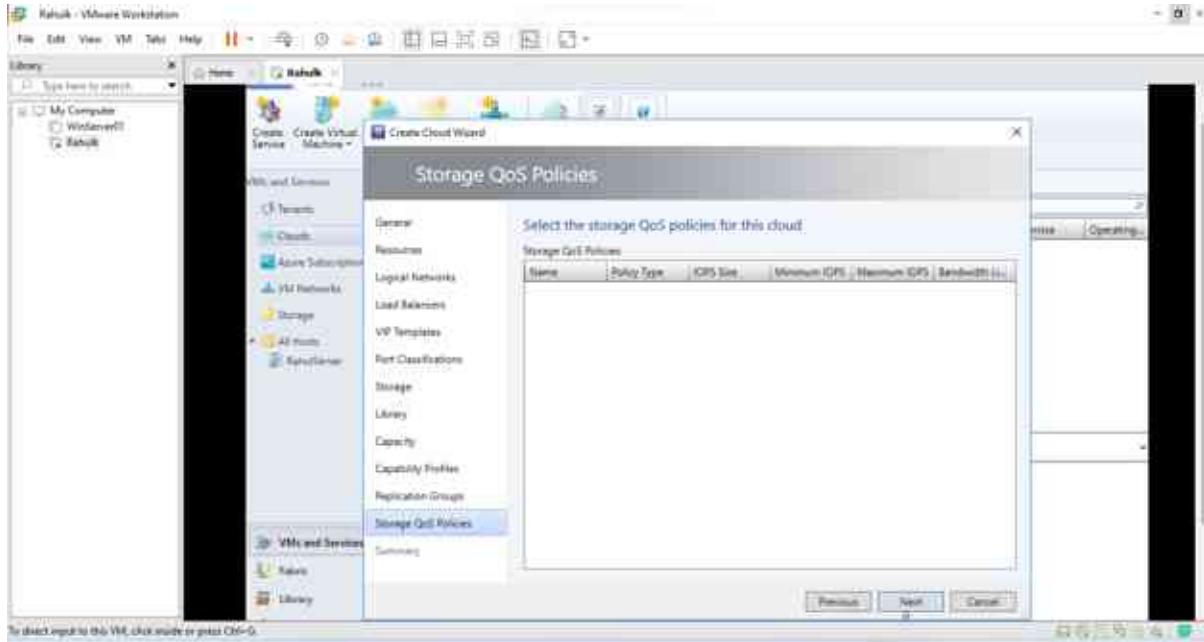
- In Capability Profiles Select Hyper-V and Click Next



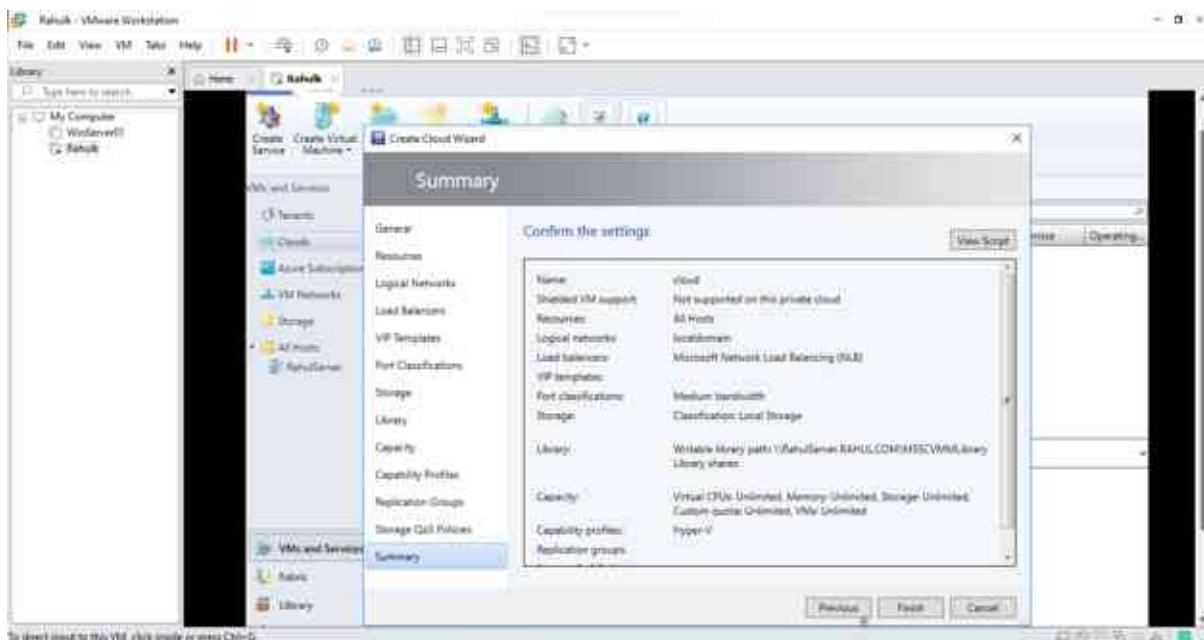
- Keep Default Value and Click on Next



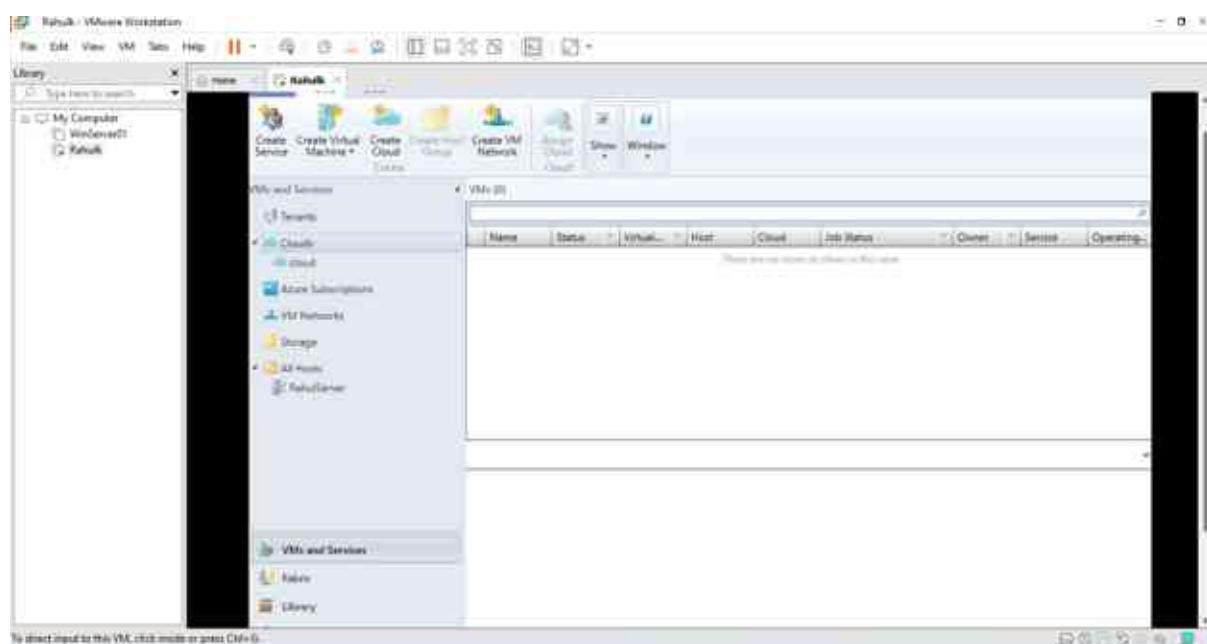
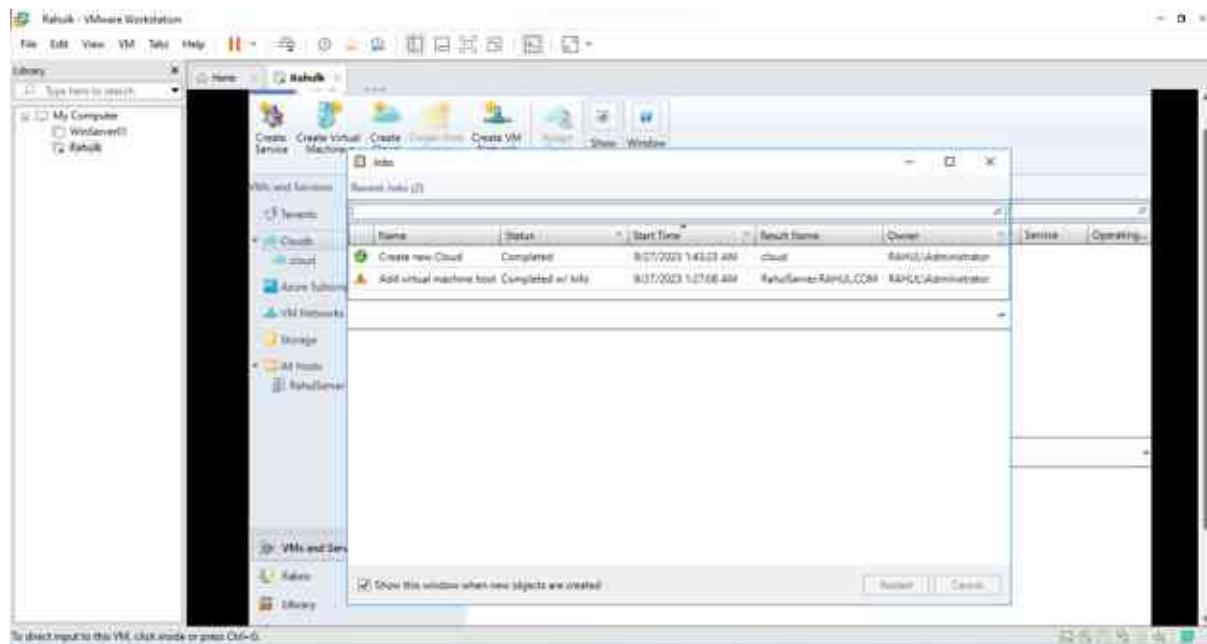
- Keep Default Value and Click on Next



- View Summary and Click on Finish

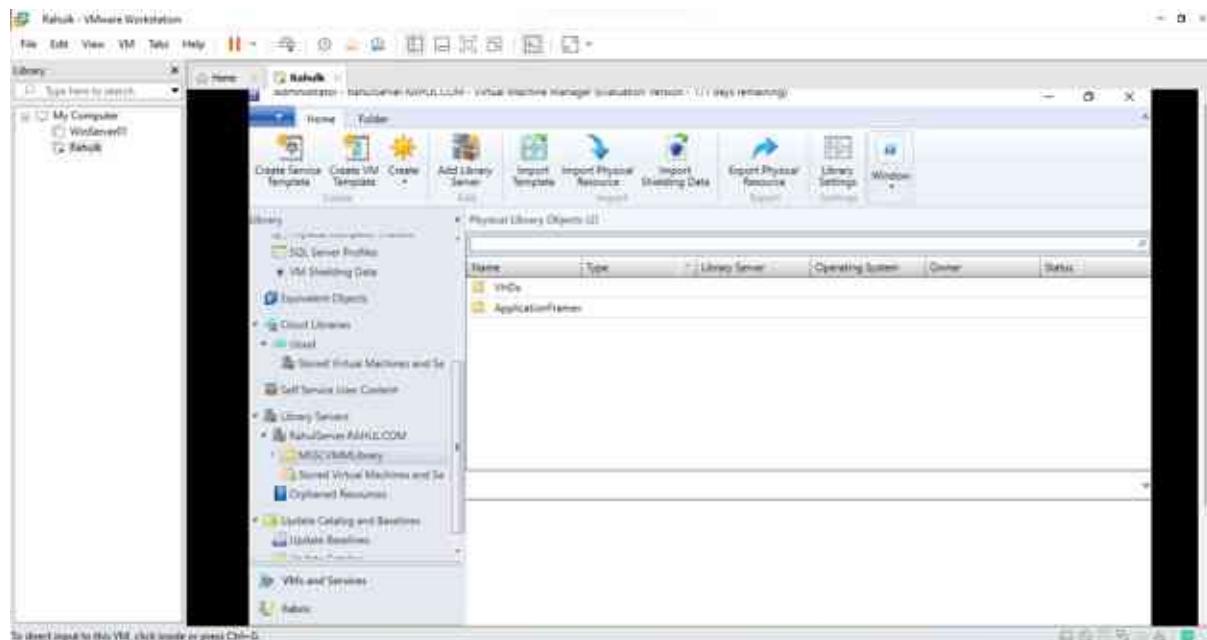


- Cloud Created

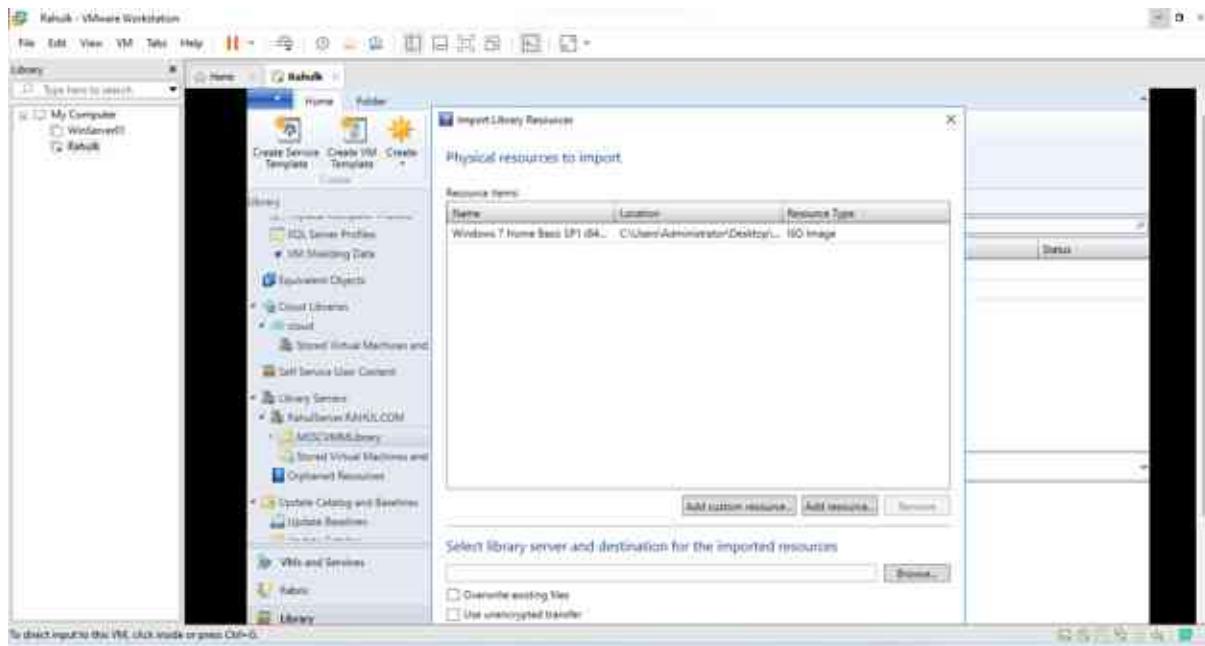


Step 46: Add Windows iso to SCVMM

- In SCVMM **Click on Library**
- Within Library **Click on Library Servers**
- Within Library Servers **Click on Domain Name (Here it is RahulServer.Rahul.COM)**
- Within that **Click on MSSCVMMLibrary**
- **On Top Click the Import Physical Resource**



- In Import Physical Resource **Click on Add resource and Select the Windows 7 iso file on your Desktop**
- In Select Library Server **Click Browse and Select MSSCVMMLibrary and Click Import**

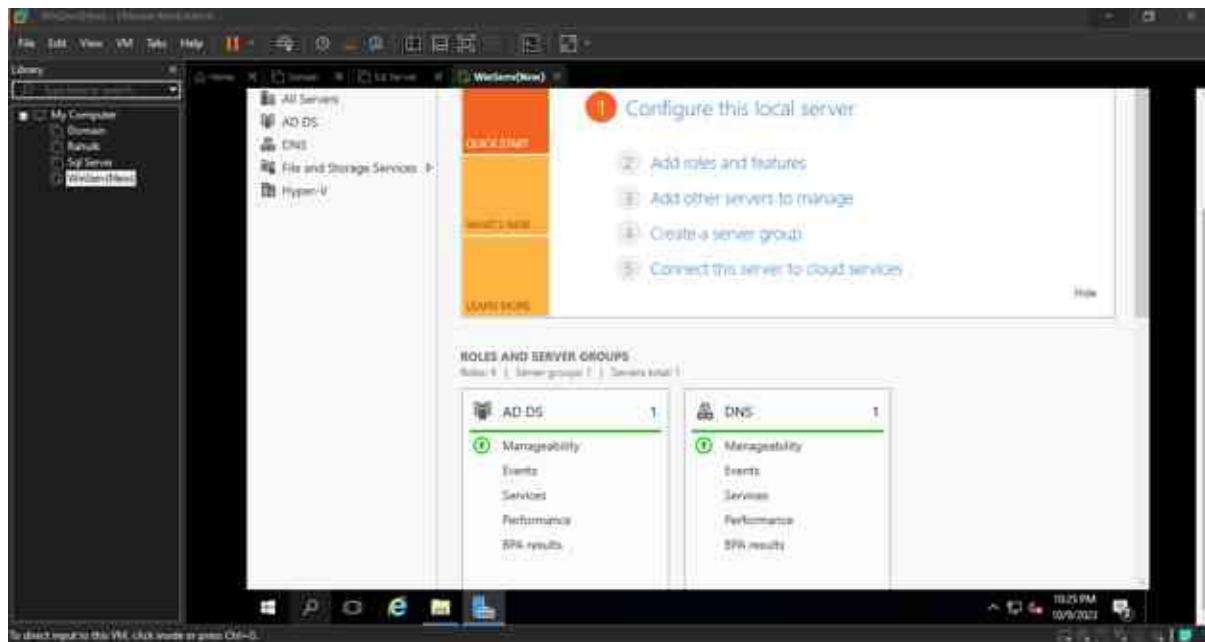


Practical 1-B:

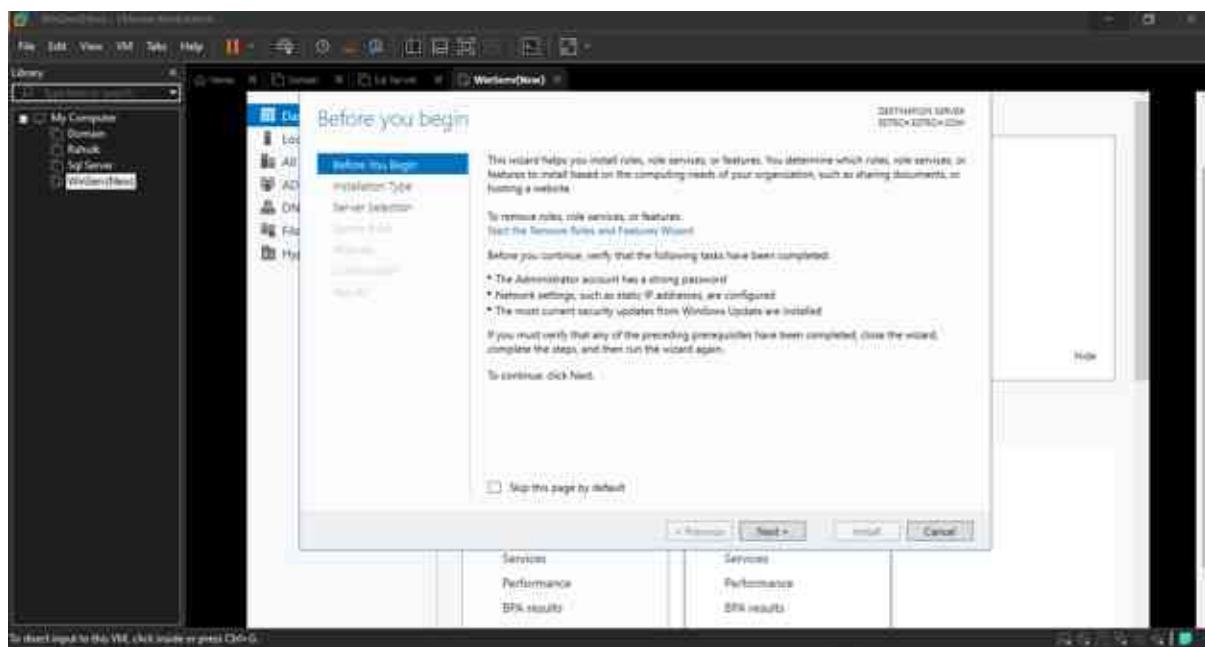
Aim: Installing and Enabling Host Guardian in a Cloud

Step 1: Adding the Host Guardian Role in Roles and Features

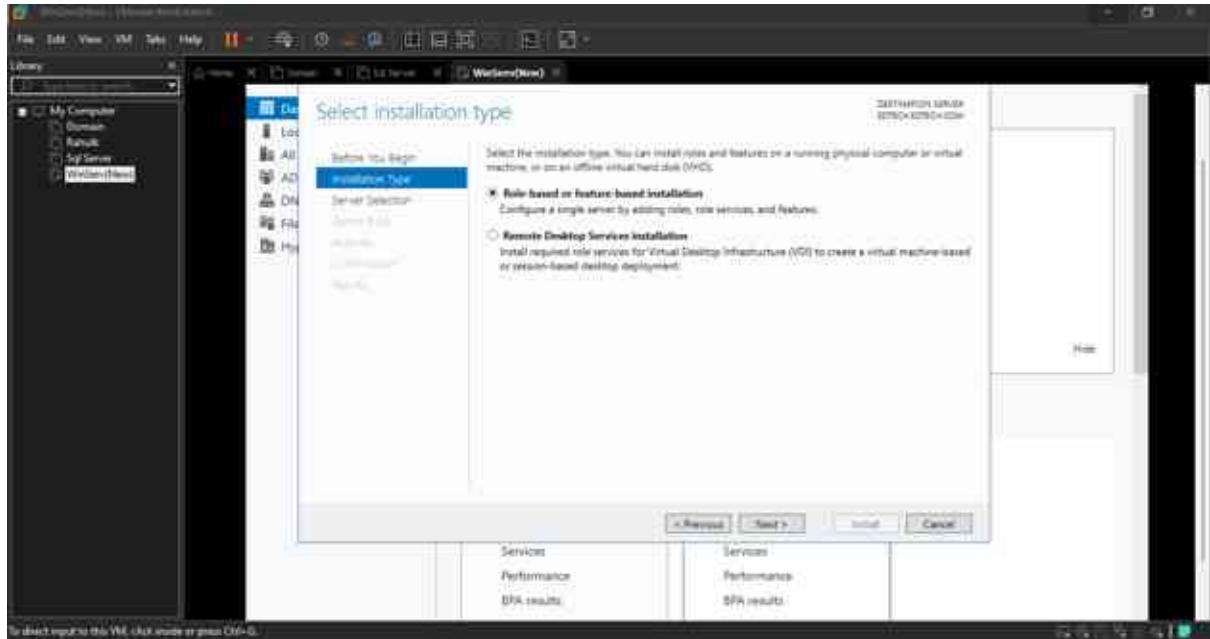
- Open Server Manager and Click on Add Roles and Features



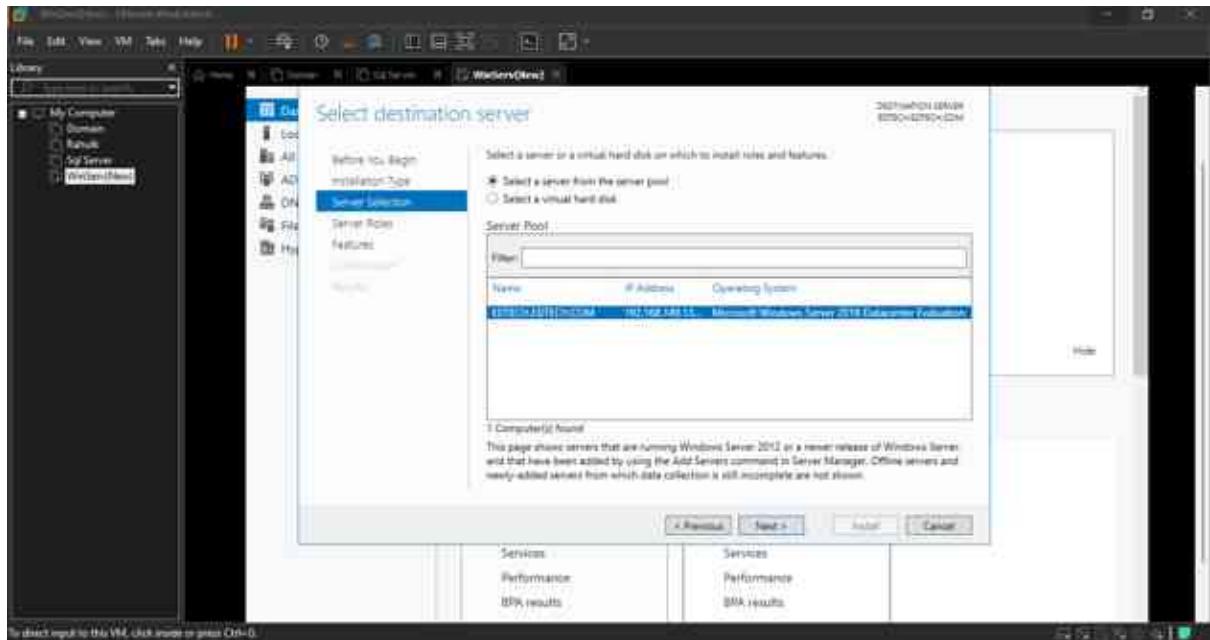
- Click Next



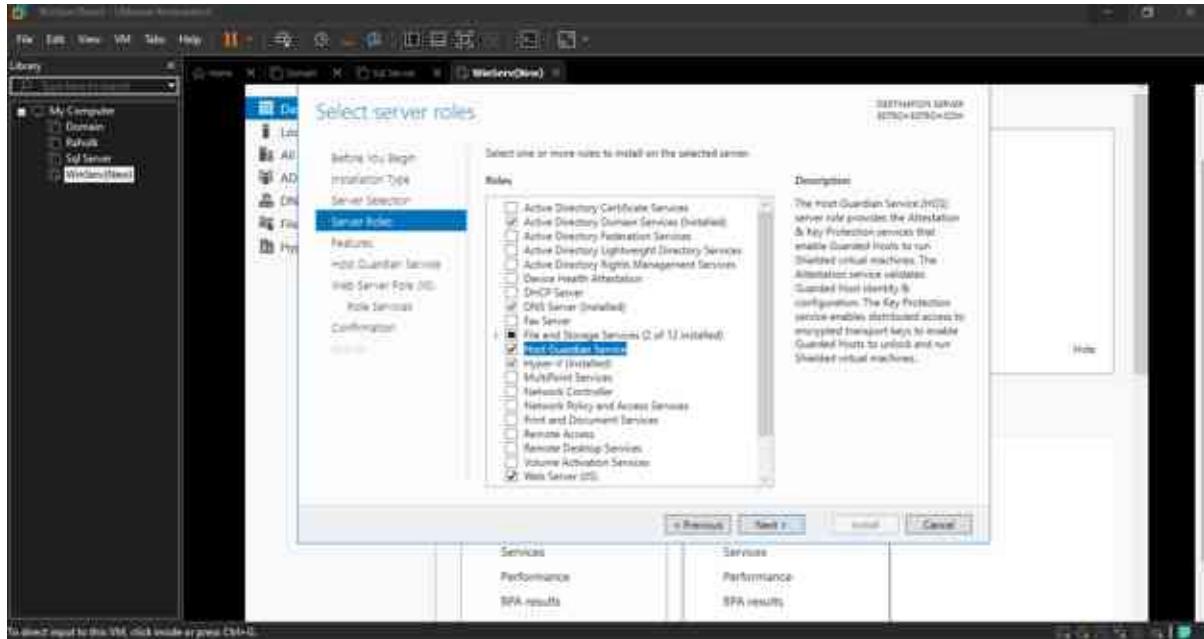
- Keep default values and Click Next



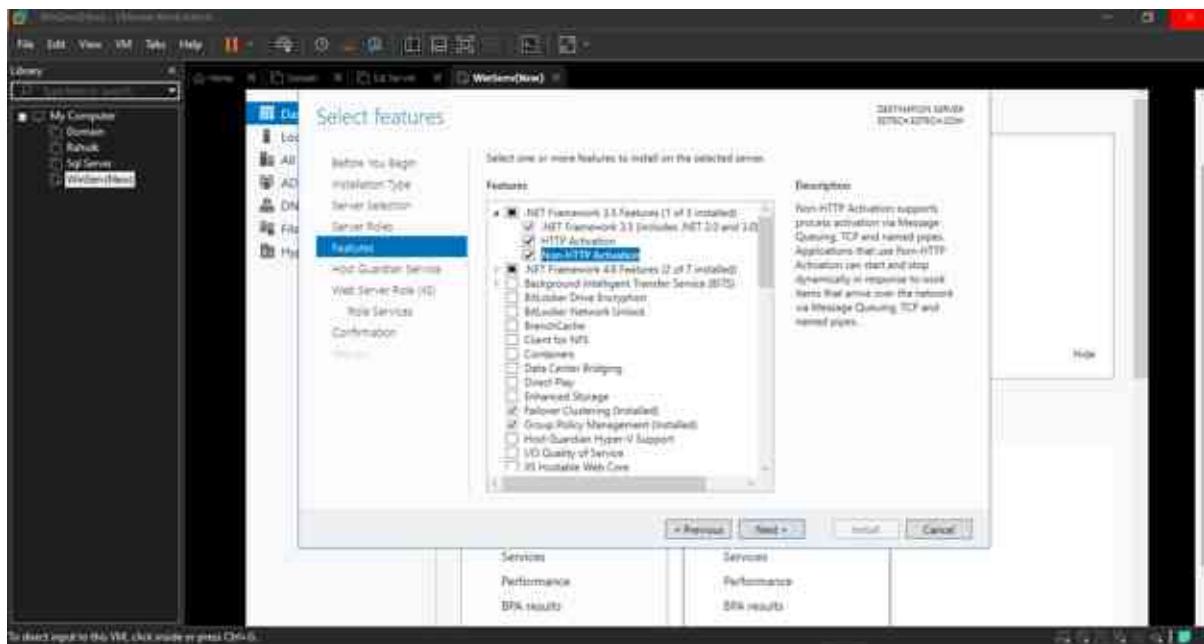
- Keep default values and Click Next



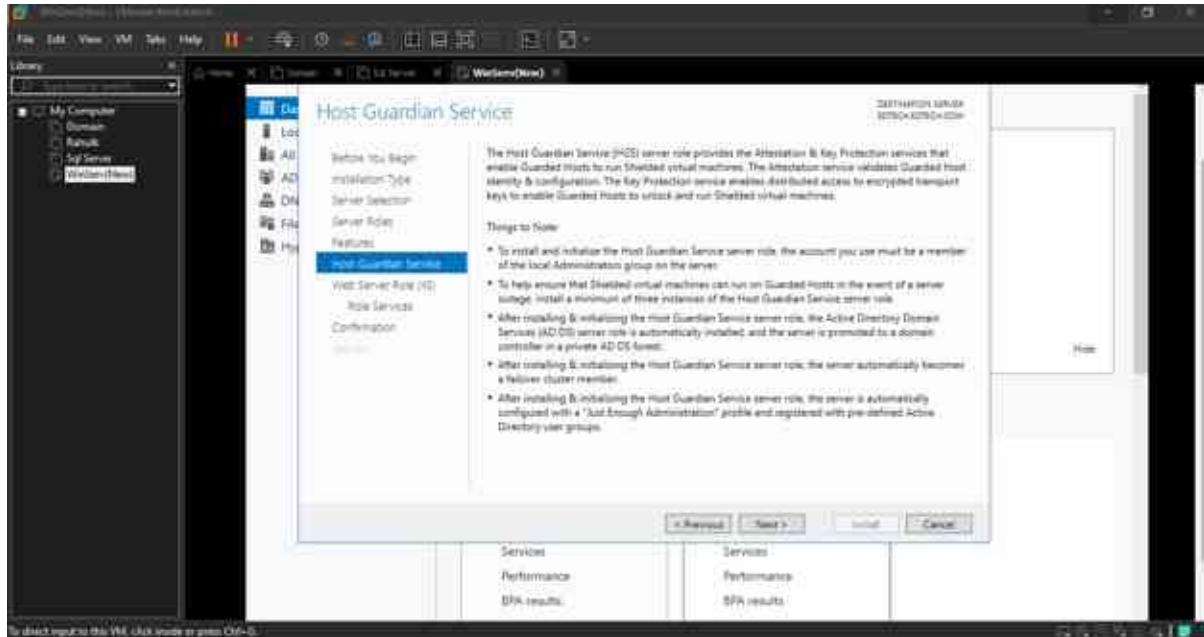
- Select Host Guardian Service and Click Add Features



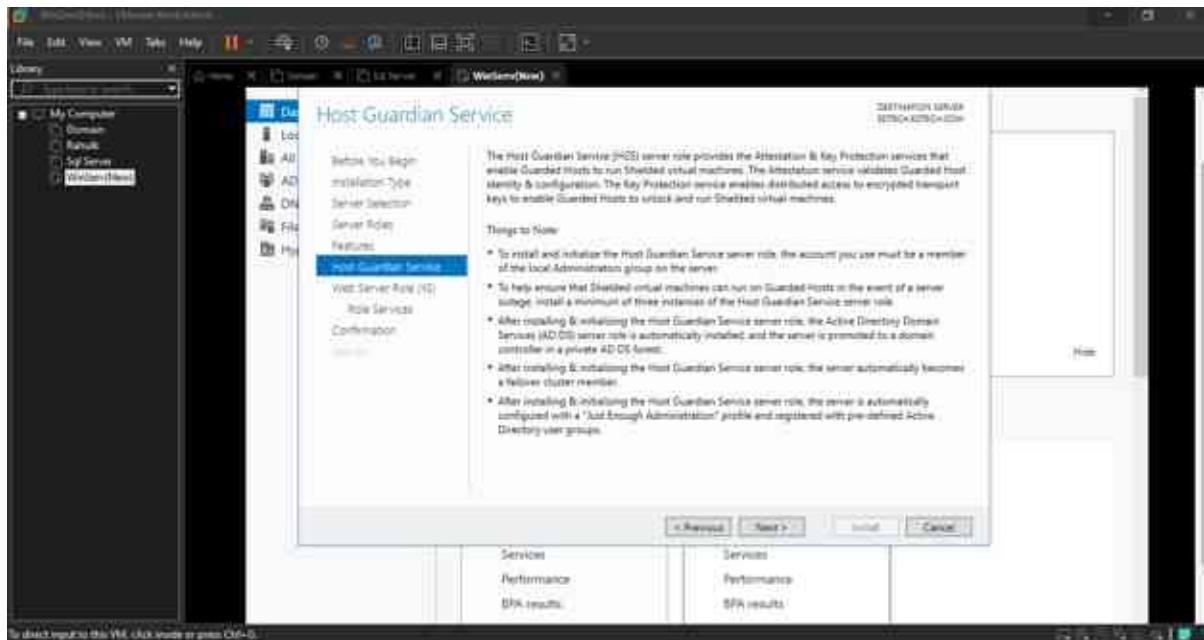
- Select the following feature and Click on Next



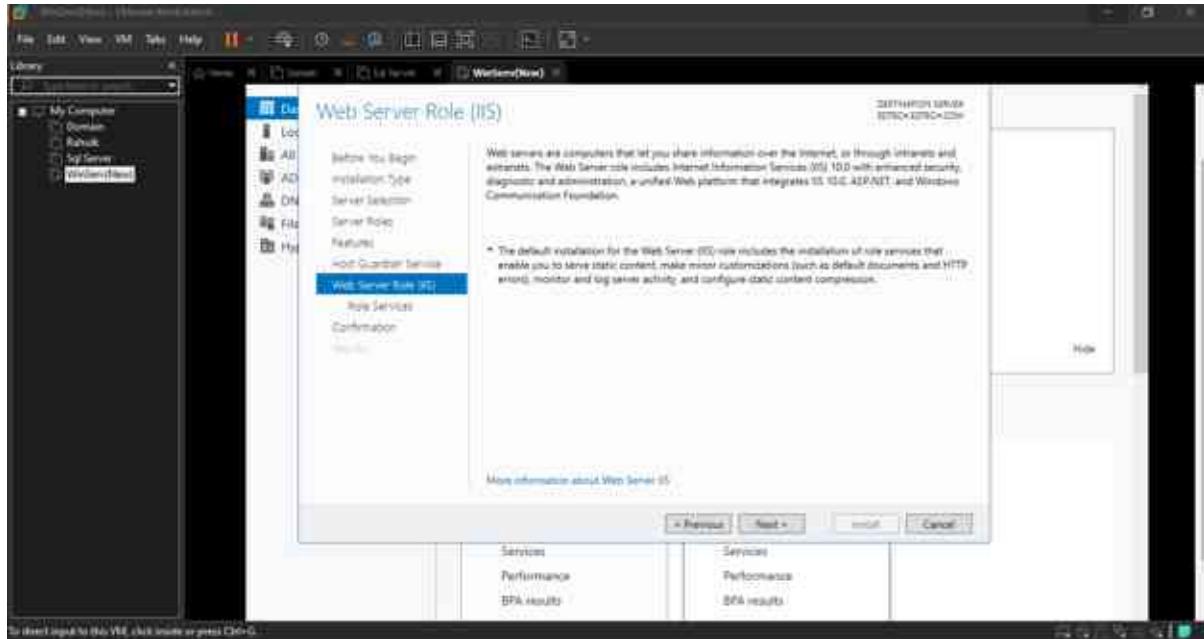
- Click Next



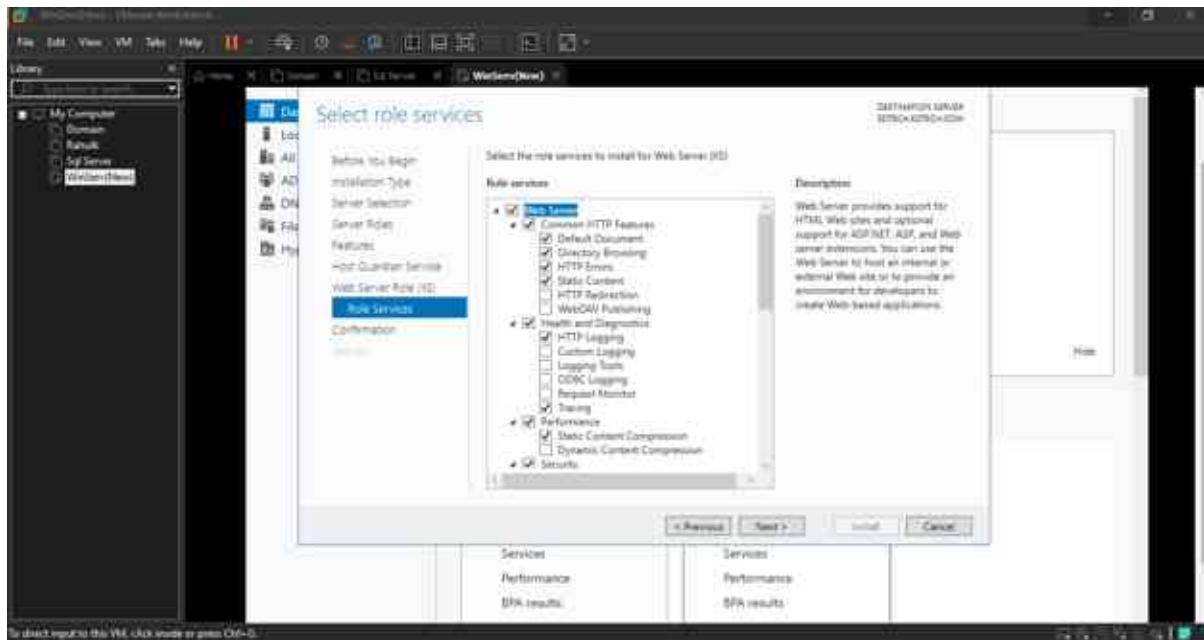
- Click Next



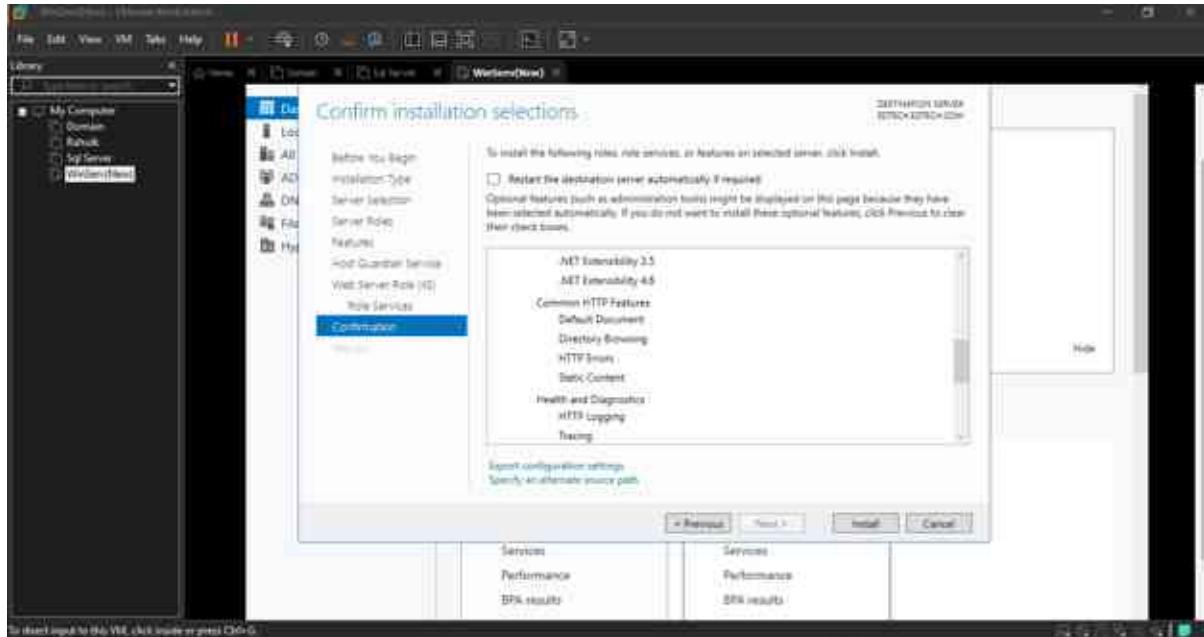
- Click Next



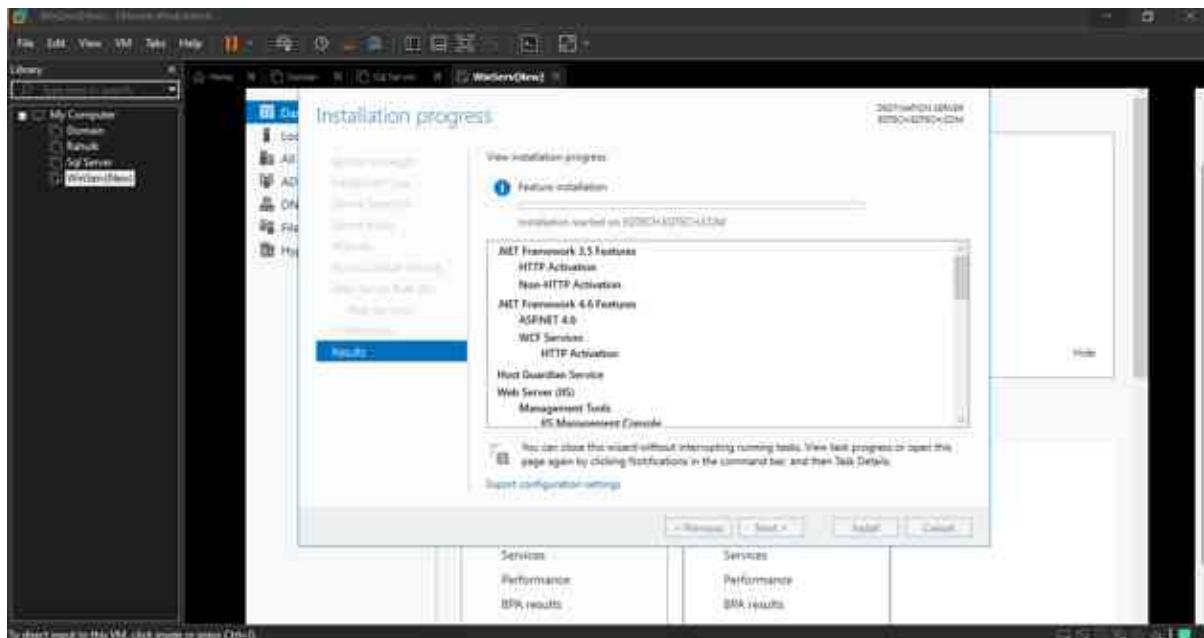
- Select the following features and Click on Next



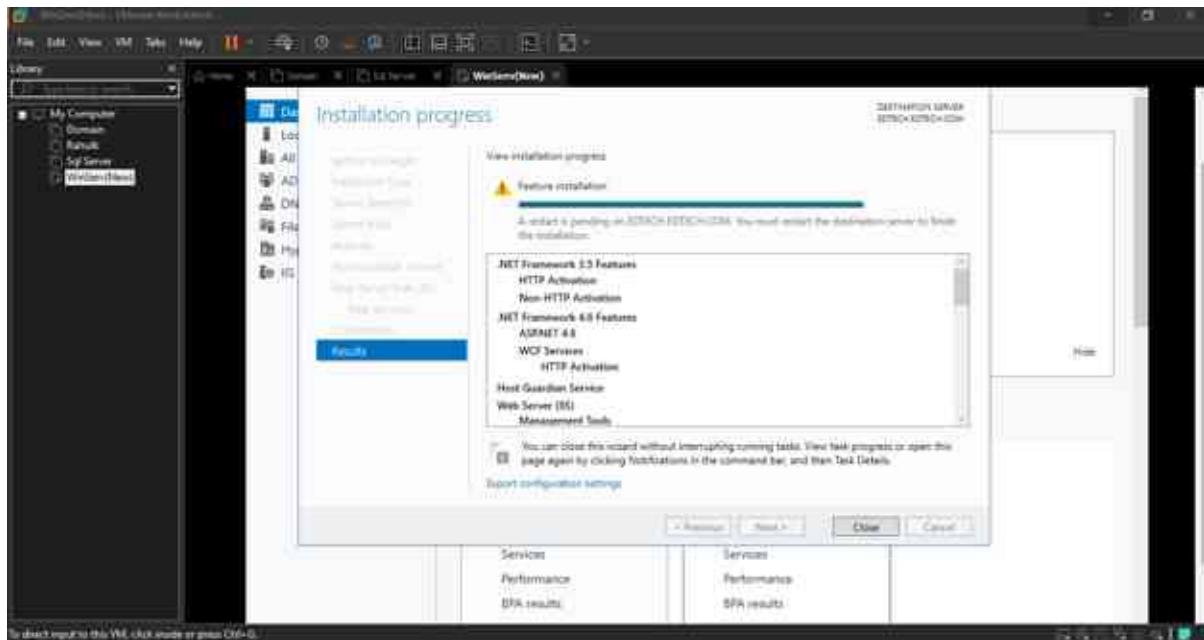
- Click on Install



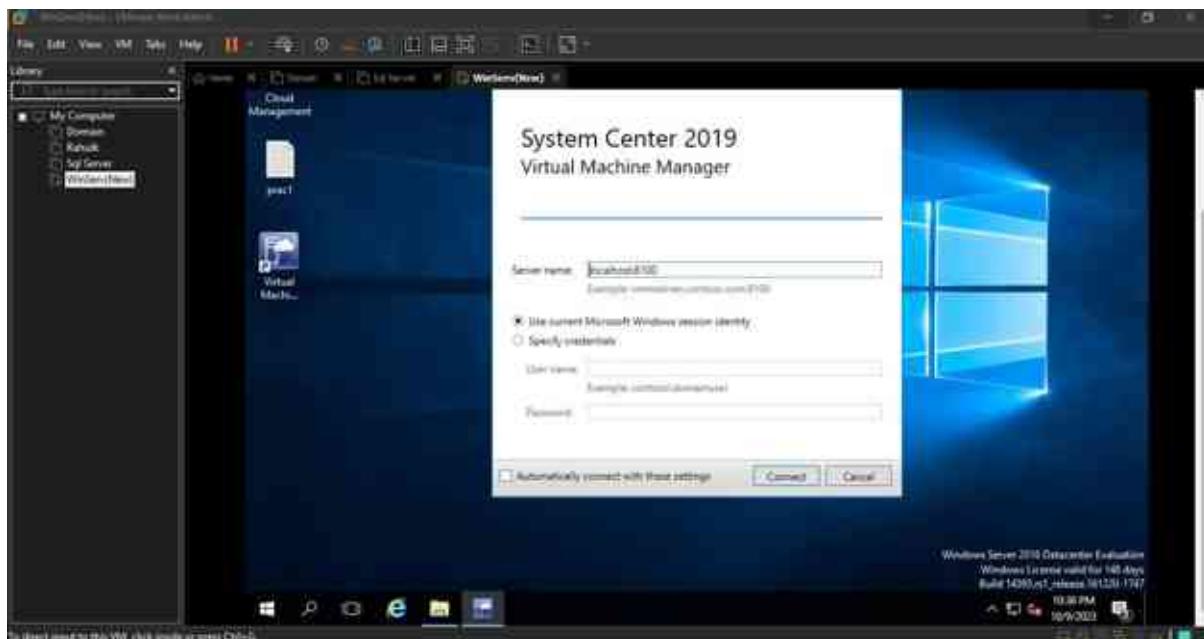
- installation process start



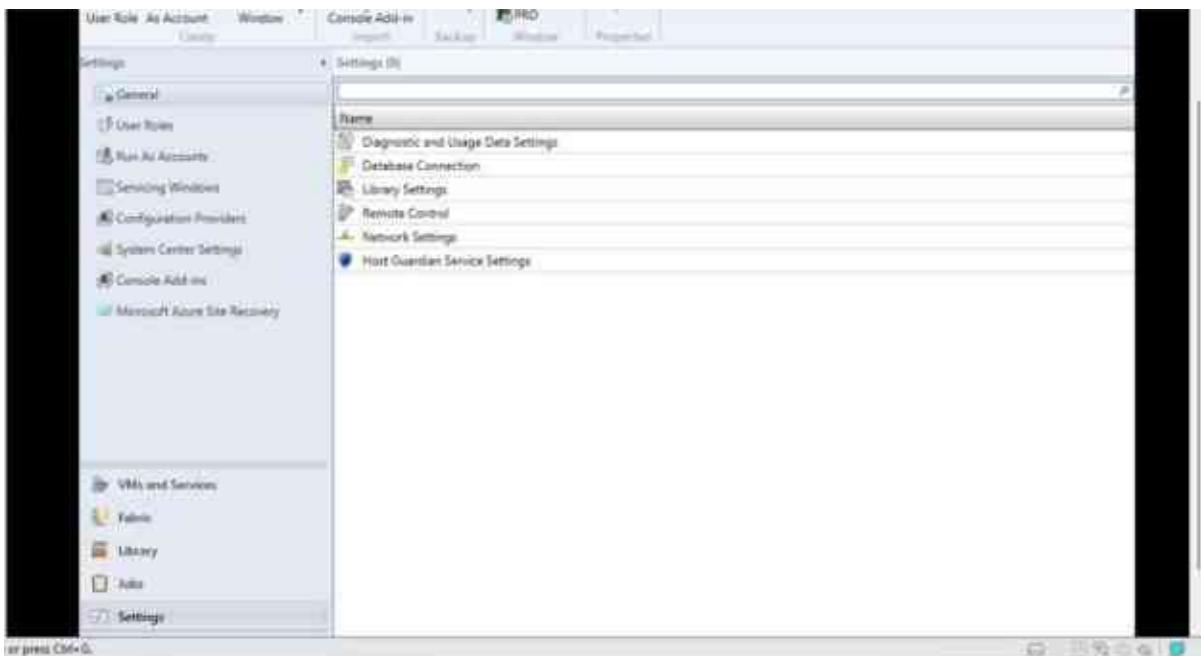
- After the installation of features click on close



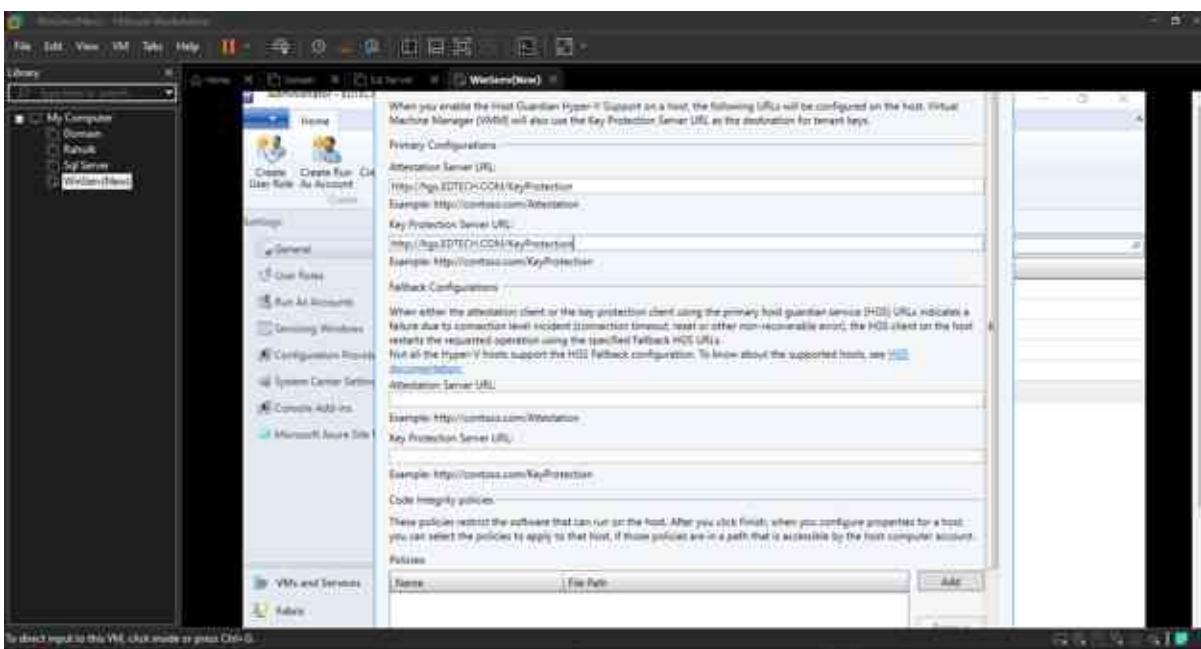
- After restarting open the System Center 2019 Virtual Machine Manager Select Use current Microsoft Windows session identity and Click on Connect



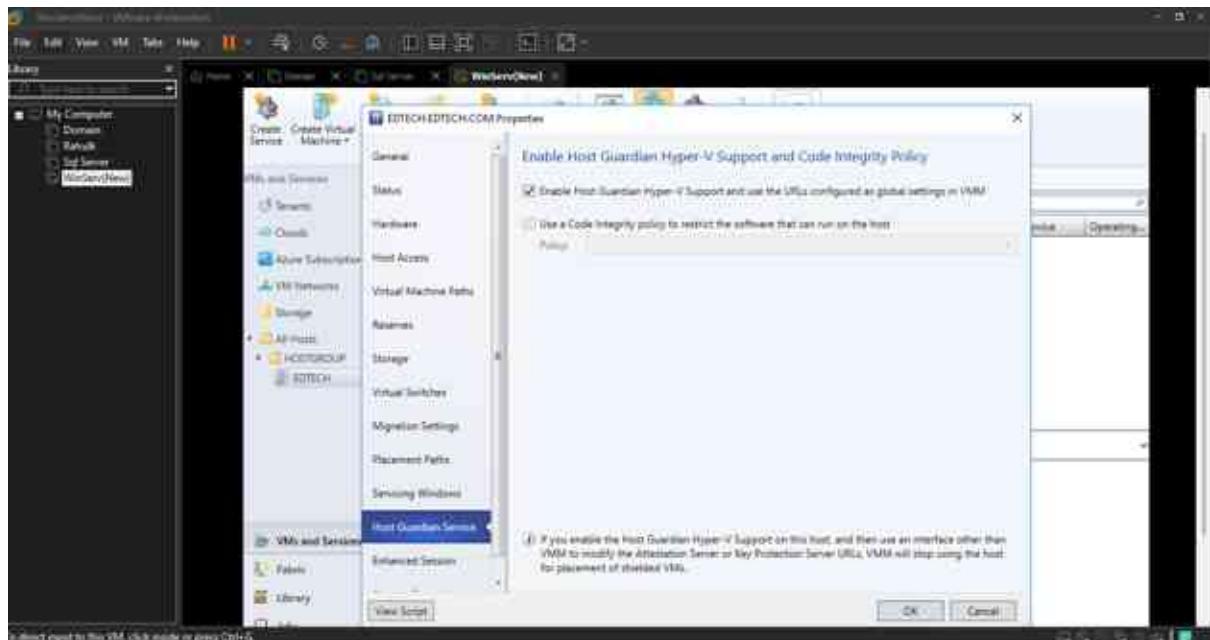
- On the dashboard Click on Settings and Select Host Guardian Service Settings



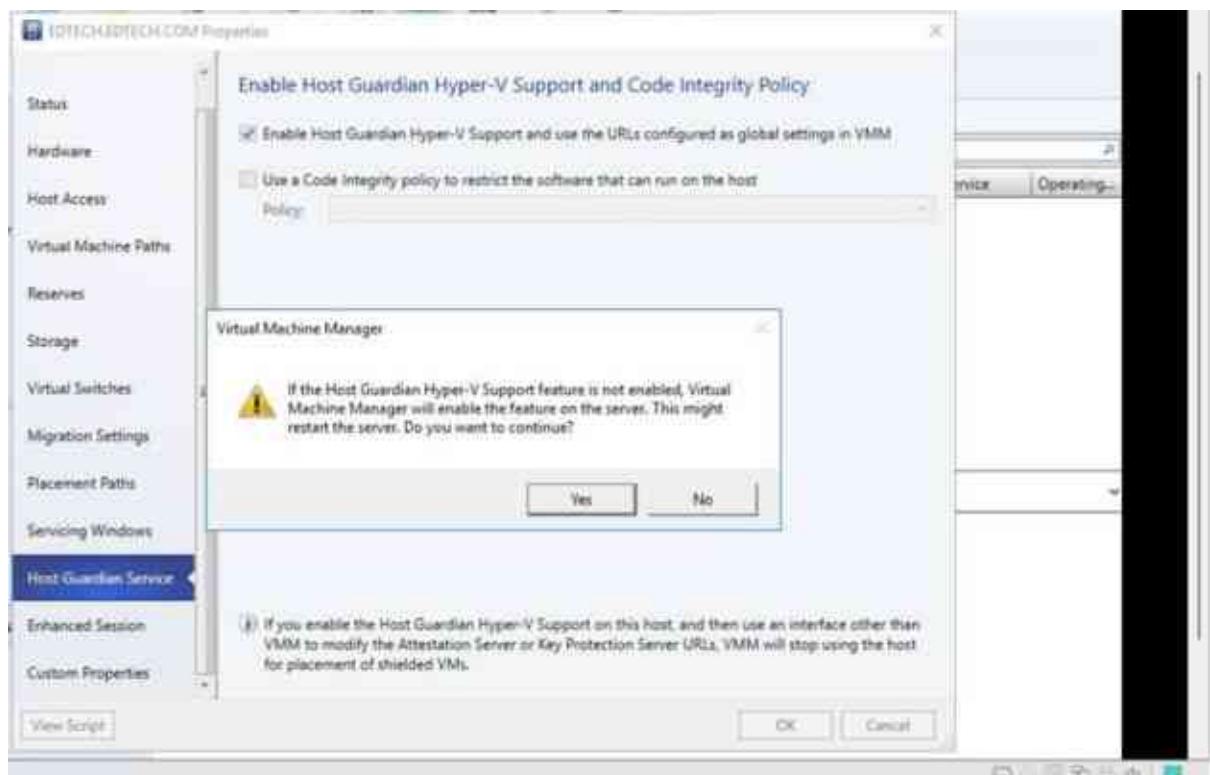
- Within Host Guardian Service Settings Enter your custom domain name followed by Attestation and Repeat the same for Key Protection.
- (Here it is <http://hgs.EDTECH.COM/Attestation> and <http://hgs.EDTECH.COM/KeyProtection>)
- After entering details Click on Finish



- Pre-requisite: Create a Cloud and Create a Server on a Host Group (Here it is EDTECH)
- Now within your Host Group Right-Click on EDTECH and Select Properties
- Within properties Select Host Guardian Service and Select Enable Host Guardian Hyper-V Support and use the URLs configured as global settings in VMM and Click Ok



- Pop up open click on yes



Step 2: Creating the pfx file for the HGS Server

- Open Windows Powershell as Administrator
- \$certificatePassword = Read-Host –AsSecureString –Prompt ‘Enter a password for the PFX file’

The screenshot shows a Windows PowerShell window titled 'Windows PowerShell' running as Administrator. The command entered is:

```
PS C:\Users\Administrator> $certificatePassword = Read-Host -AsSecureString -Prompt 'Enter a password for the PFX file'
```

A prompt 'Enter a password for the PFX file' is displayed. The command continues:

```
PS C:\Users\Administrator> $cert = New-SelfSignedCertificate -DnsName "HGS-01" -CertStoreLocation "Cert:\LocalMachine\My" -NotAfter (Get-Date).AddYears(1) -KeyUsage DigitalSignature
```

Then:

```
PS C:\Users\Administrator> Export-PfxCertificate -Cert $cert -FilePath "C:\Users\Administrator\temp\HGS-01.pfx" -Password $certificatePassword -CertStoreLocation "Cert:\LocalMachine\My"
```

The resulting file 'HGS-01.pfx' is shown in the file list:

Name	LastWriteTime	Length	File
HGS-01.pfx	10/9/2023 11:44 PM	2535	C:\Users\Administrator\temp\HGS-01.pfx

The screenshot shows a Windows PowerShell window titled 'Windows PowerShell' running as Administrator. The command entered is:

```
PS C:\Users\Administrator> Import-PfxCertificate -FilePath "C:\Users\Administrator\temp\HGS-01.pfx" -CertStoreLocation "Cert:\LocalMachine\My" -Password $certificatePassword -CertStoreLocation "Cert:\LocalMachine\My"
```

The resulting certificate is shown in the file list:

Name	LastWriteTime	Length	File
HGS-01.pfx	10/10/2023 12:12 AM	2539	C:\Users\Administrator\temp\HGS-01.pfx

The screenshot shows a Windows PowerShell window titled "Windows.ps1" running on a host named "WallyWin2". The left pane displays the file tree under "Windows.ps1". The right pane shows the command history and output:

```
PS C:\Users\Administrator> .\Windows.ps1
PS C:\Users\Administrator> Get-NetClientConfiguration
Get-NetClientConfiguration : The term 'Get-NetClientConfiguration' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ Get-NetClientConfiguration
+ ~~~~~
    + CategoryInfo          : ObjectNotFound: (Get-NetClientConfiguration:String) [Get-NetClientConfiguration], CommandNotFoundException
    + FullyQualifiedErrorId : CommandNotFoundException, System.Management.Automation.CommandNotFoundException
    + PSComputerName        :
```

The command `Get-NetClientConfiguration` is highlighted in red, indicating it is not a valid cmdlet.

Practical: 2

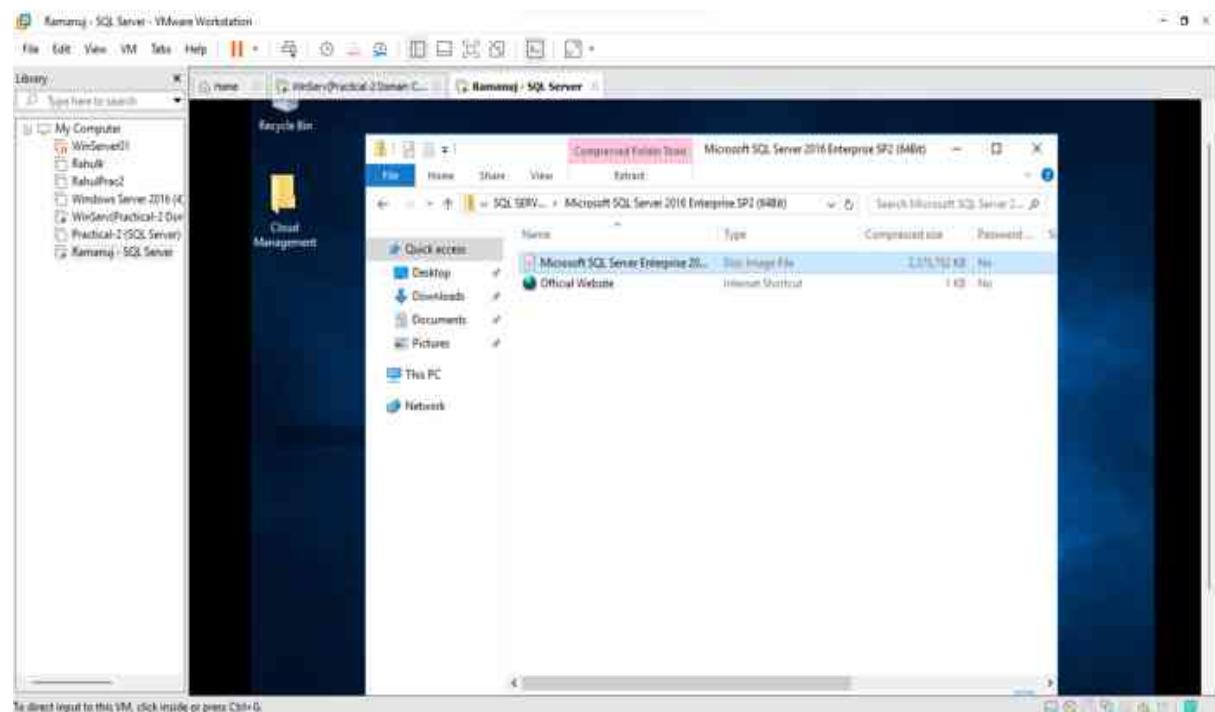
Aim: Deploy Service Manager and SQL Server Reporting Services for a 2 Computer Scenario.

Step 1: We have to establish a connection with a Domain Controller and a User (SQL SERVER)

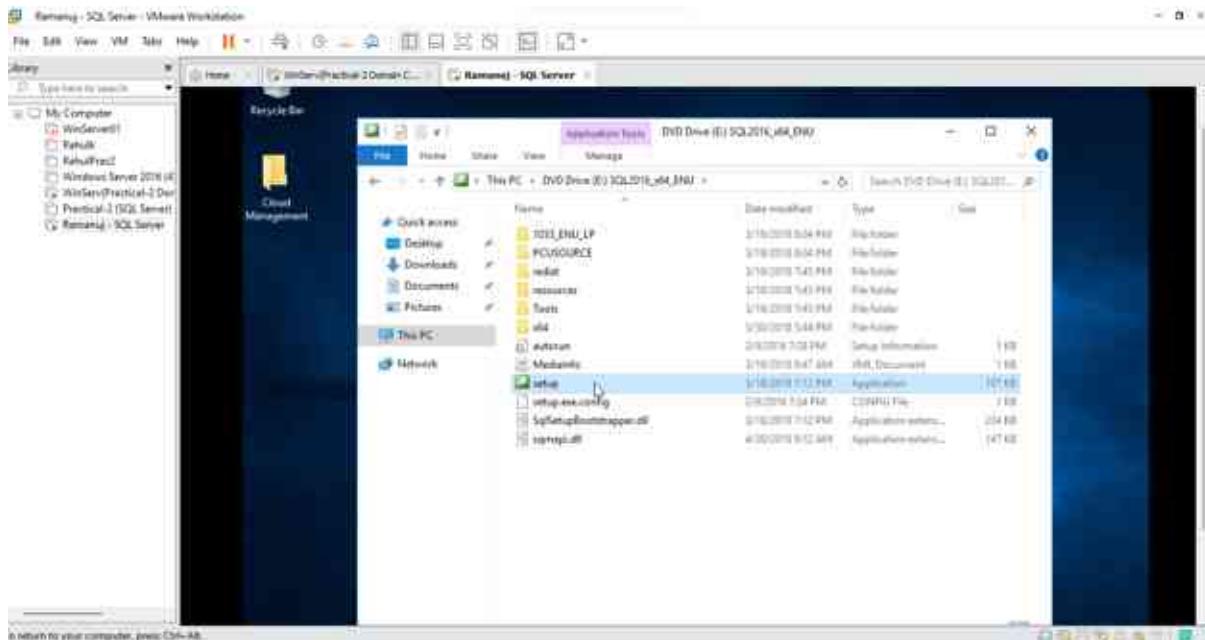


Step 2: Installing SQL Server 2016 in VM 2

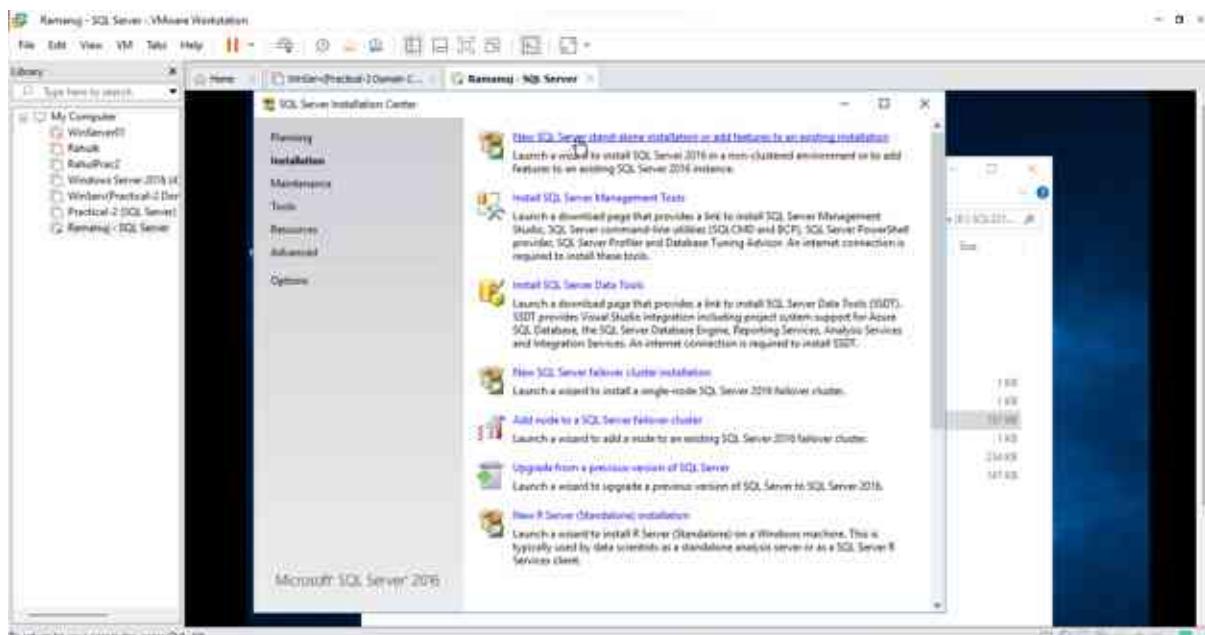
Within your Cloud Management Server Click on SQL Server 2016 iso.



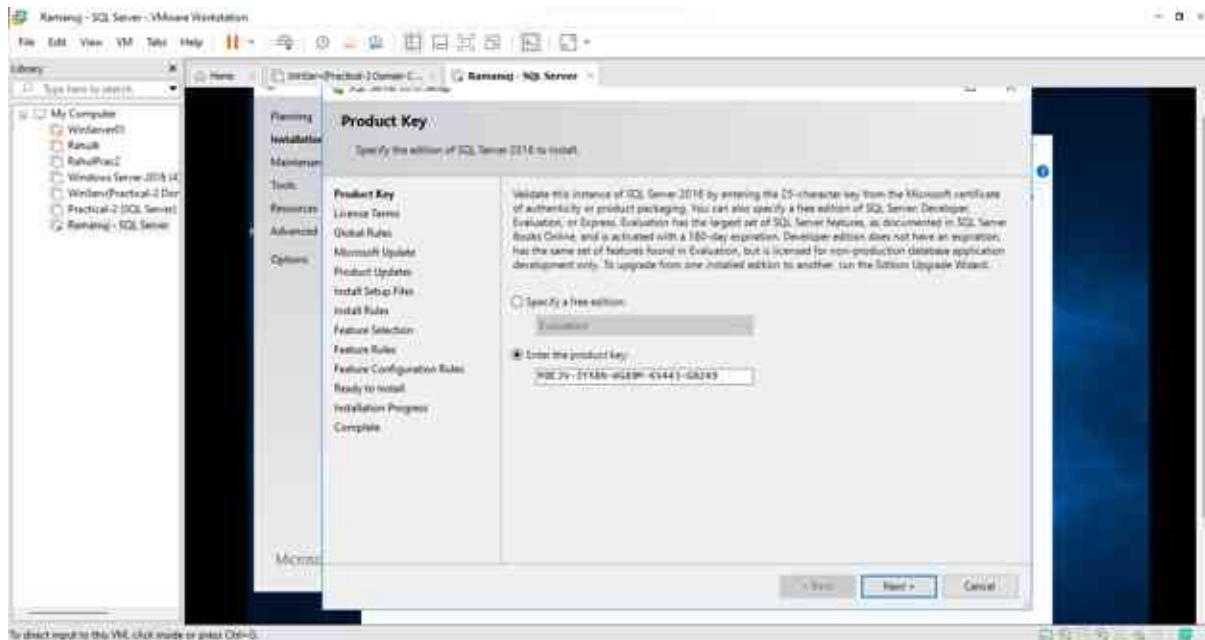
- Double Click Setup to start the installer



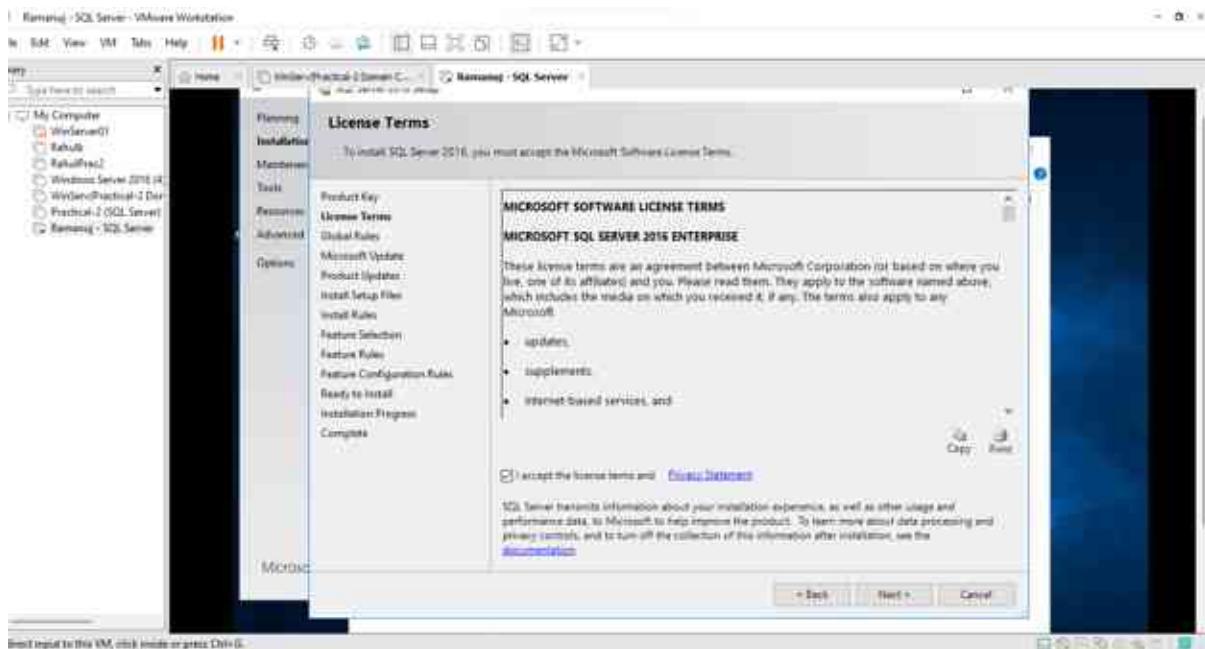
- Click on Installation and Click on New SQL Server standalone installation



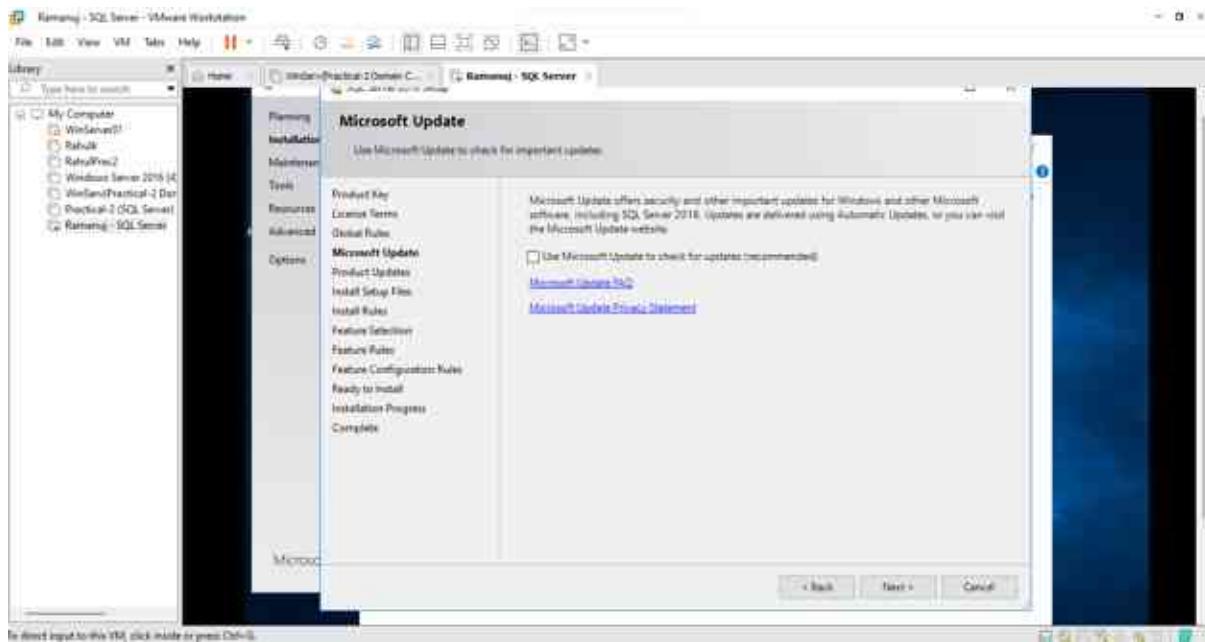
- Keep default values and Click Next



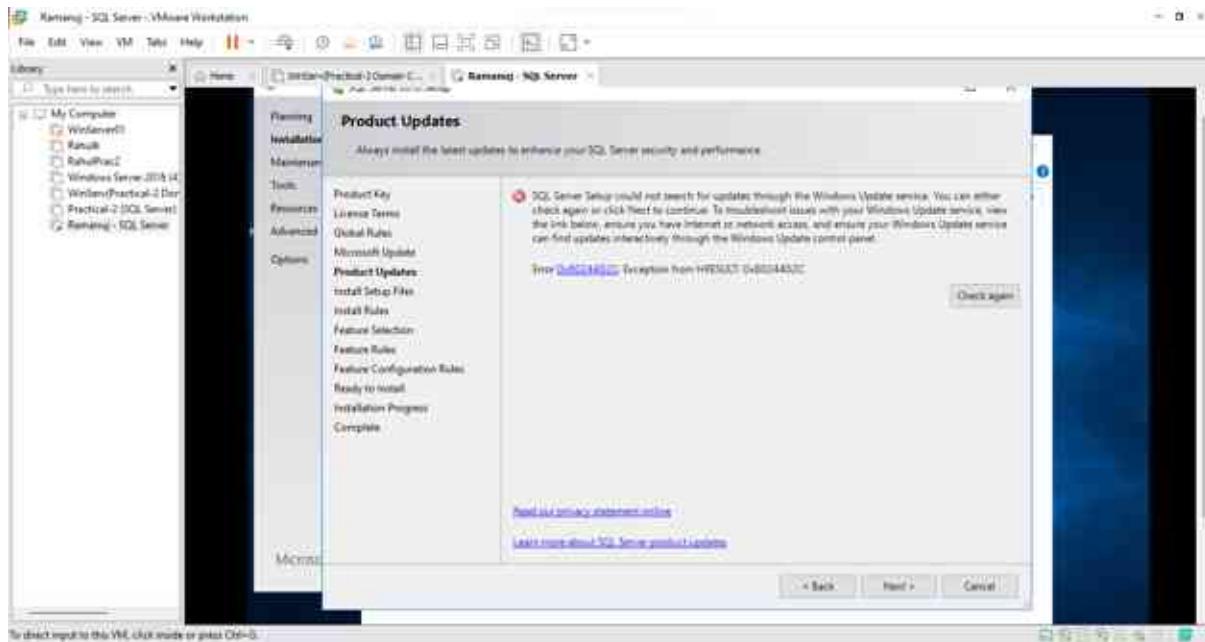
- Select I accept the license terms and Click Next



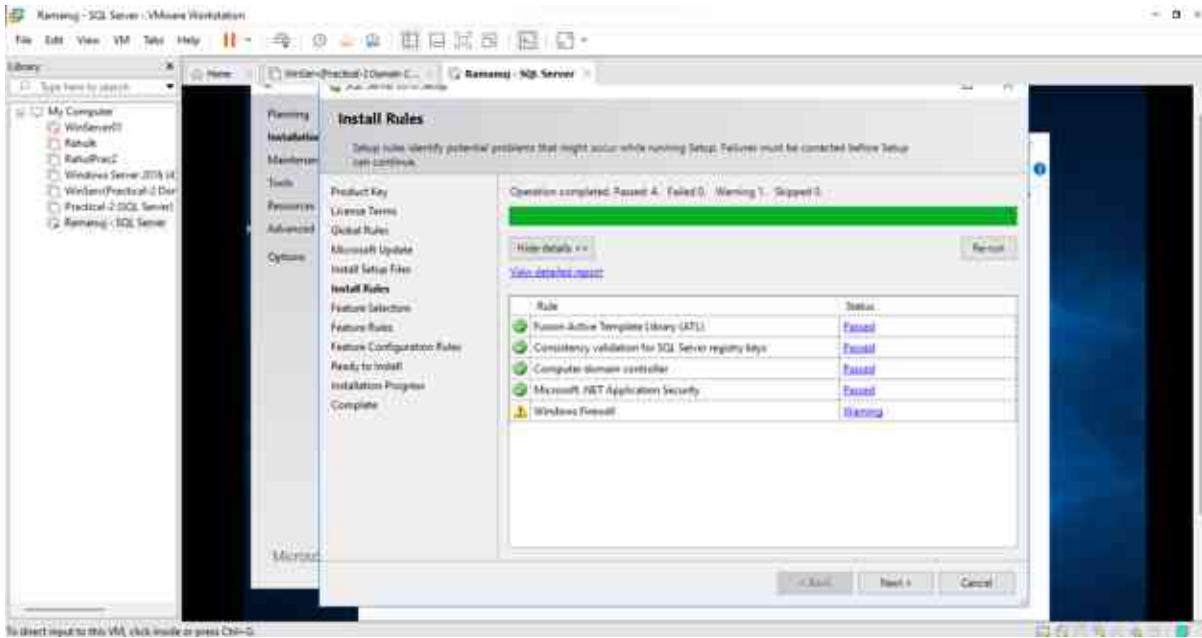
- Keep default values and Click Next



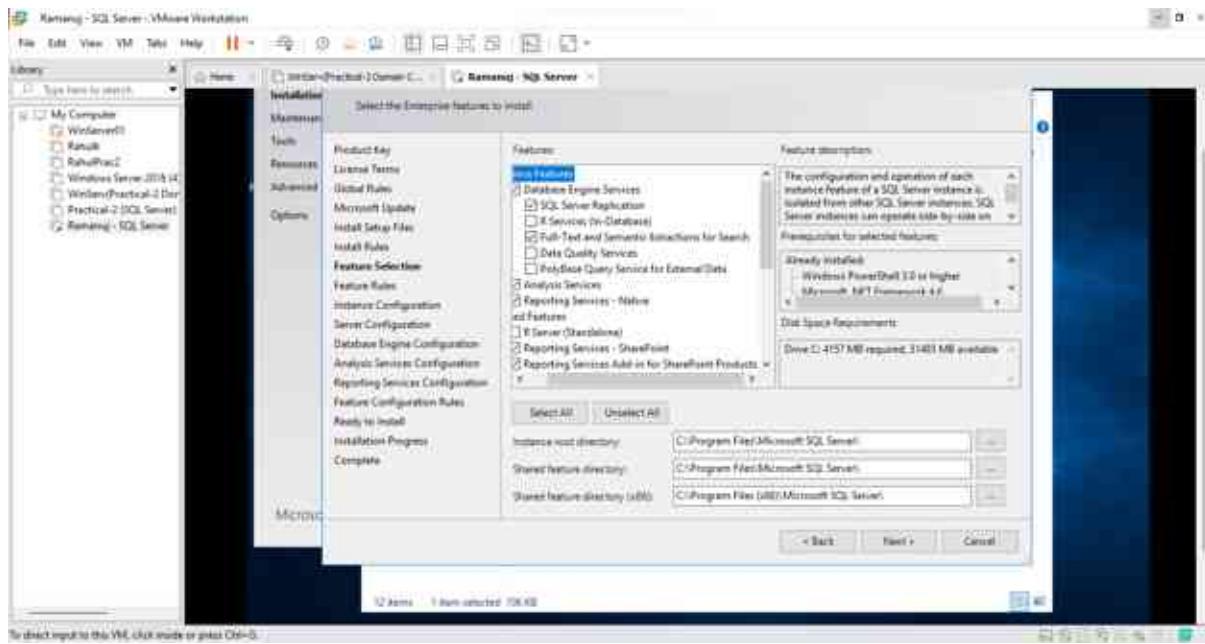
- Click Next



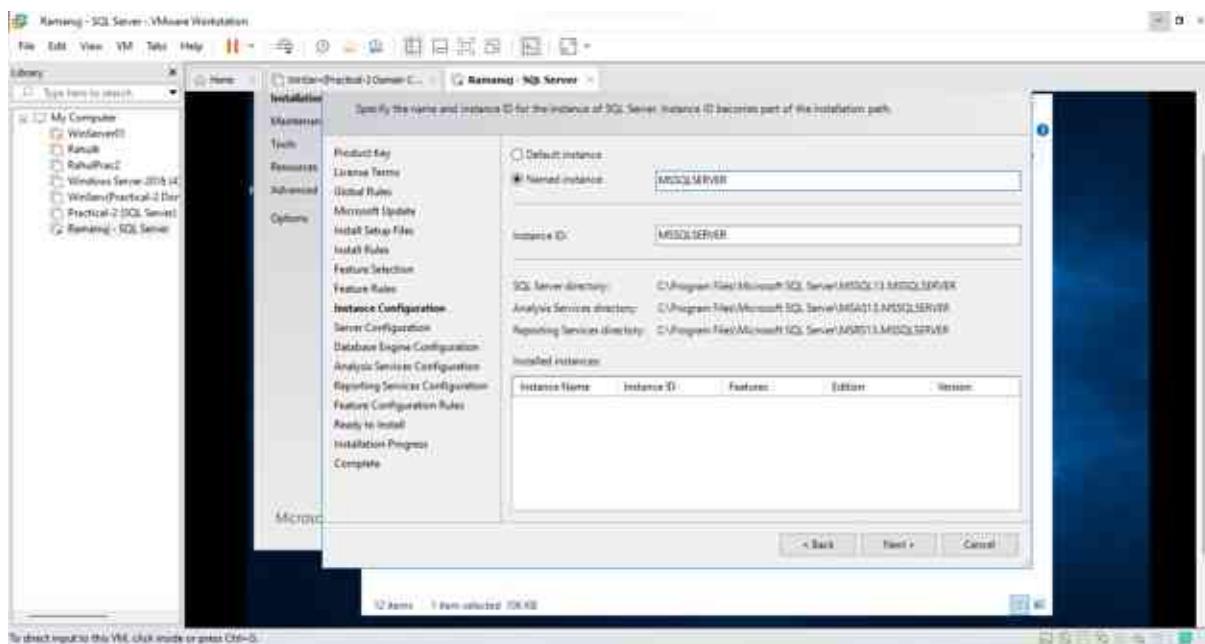
- Click Next



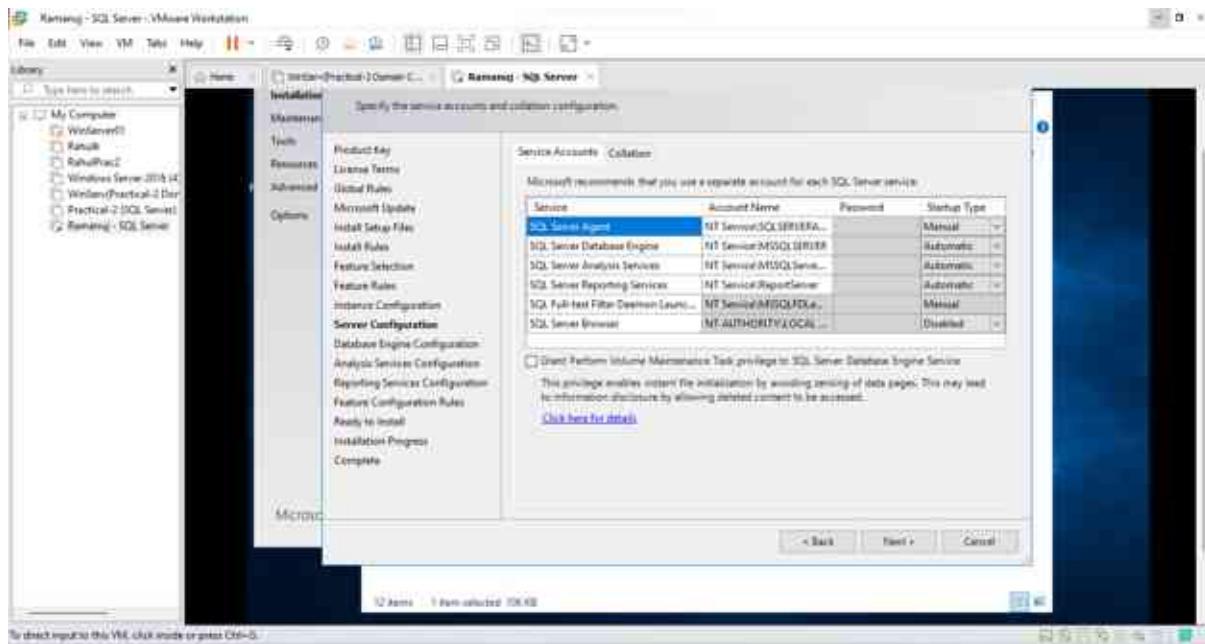
- Select the features given below:
 - **SQL Server Replication**
 - **Full Text and Semantic Extractions for Search**
 - **Analysis Service**
 - **Reporting Service –Native**
 - **Reporting Service –Sharepoint**
 - **Reporting Service add-in for Sharepoint Products**
 - And Click Next



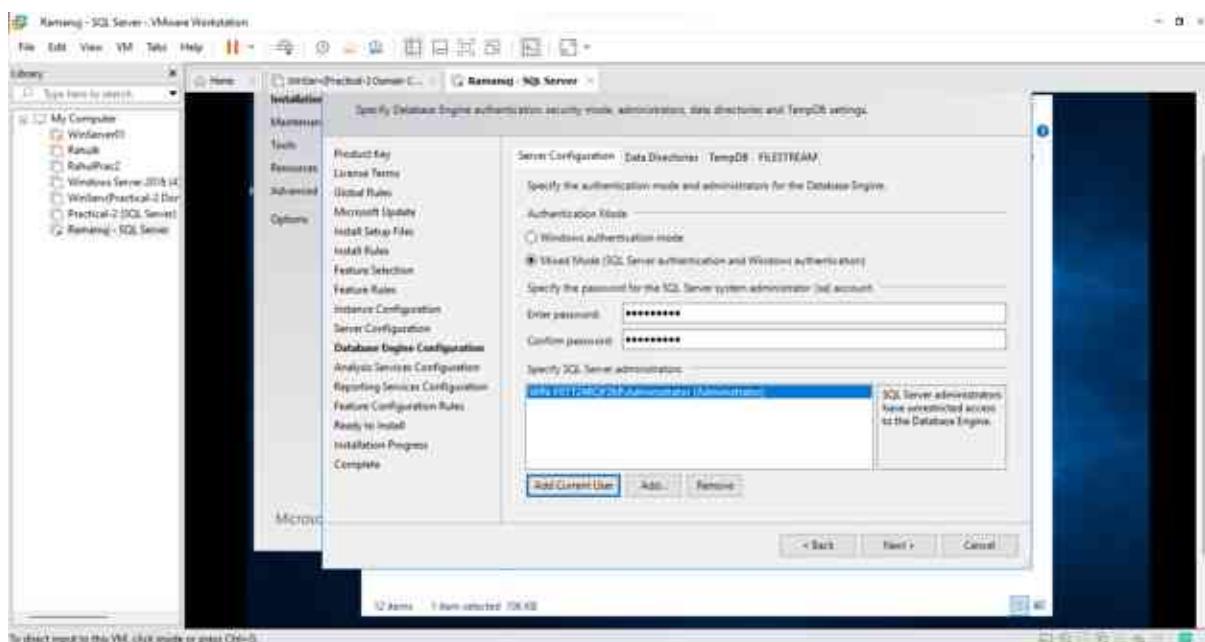
- Select **Named Instance** and type **MSSQLSERVER** and Click **Next**



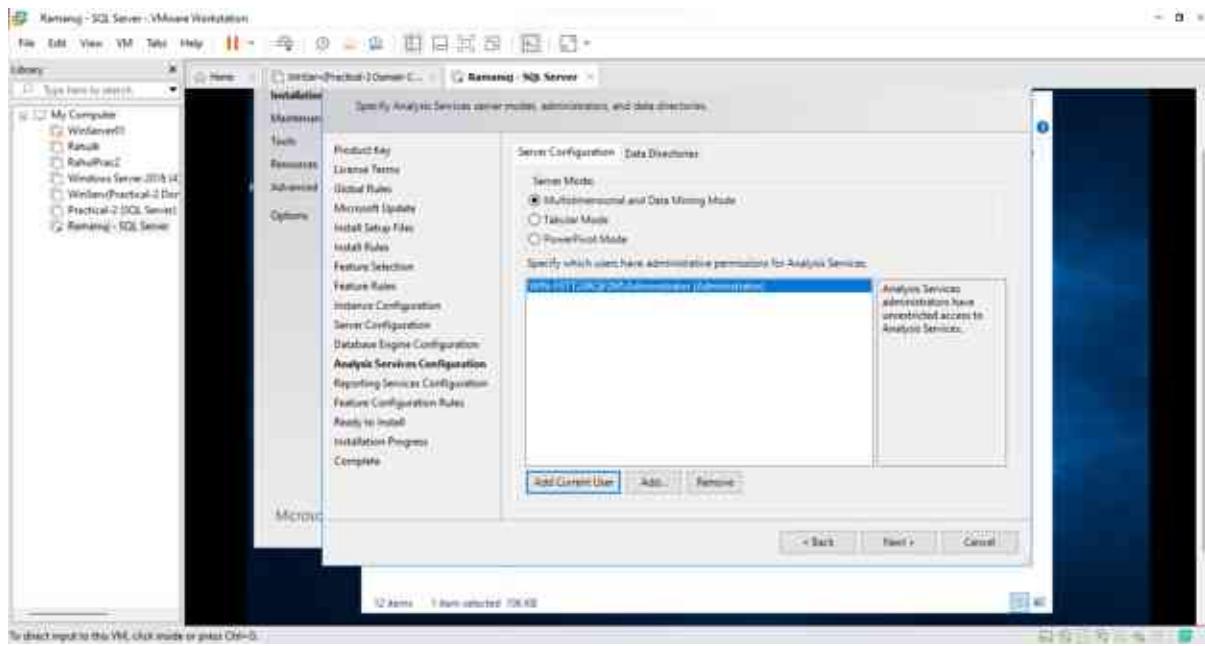
- Keep default values and Click **Next**



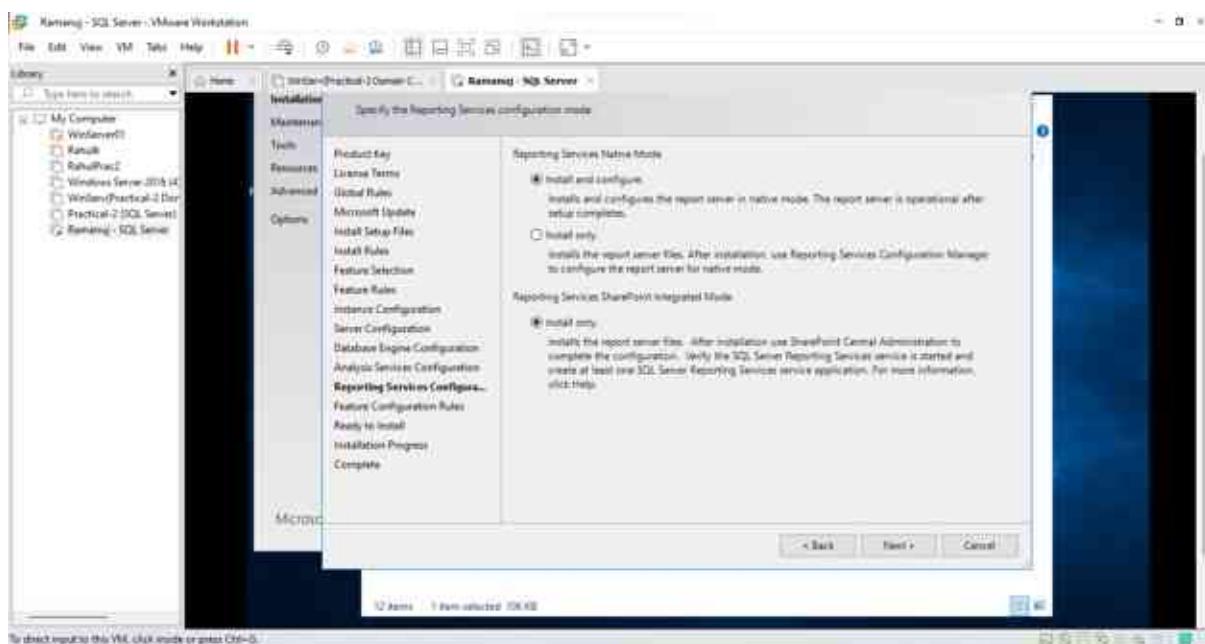
- Select **Mixed Mode** and Set a password (Here it is admin@123) and Click on **Add Current User** and Click **Next**



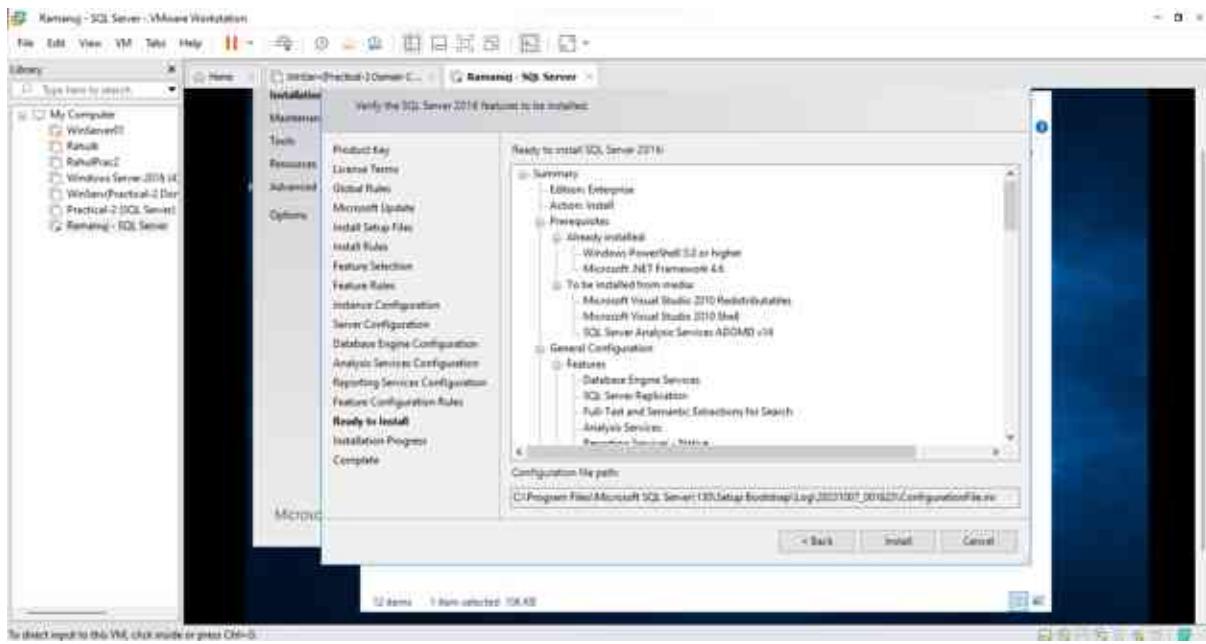
- Click on **Add Current User** and Click **Next**



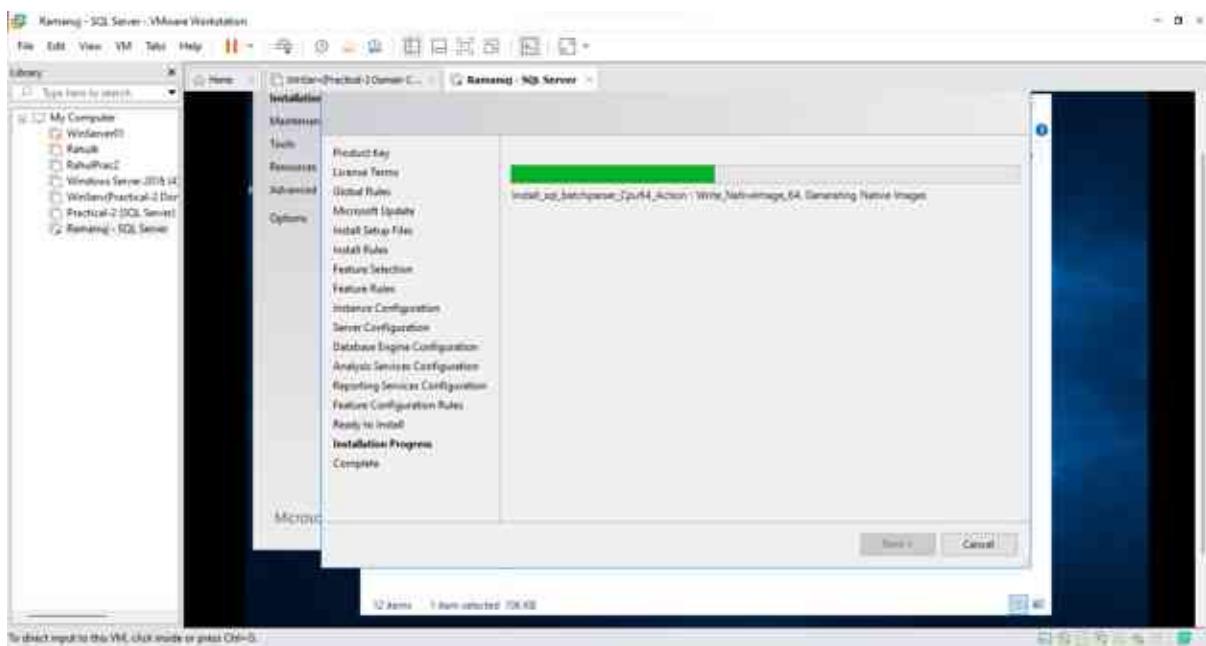
- Keep default values and Click Next



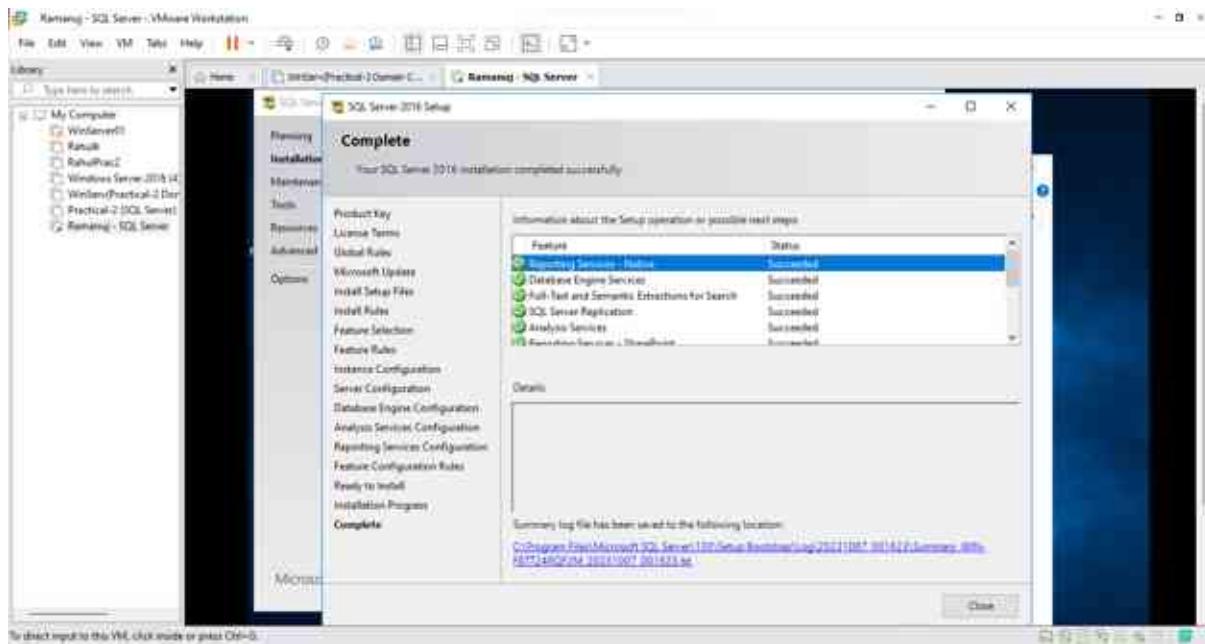
- Click on Install



- SQL Files will start installing

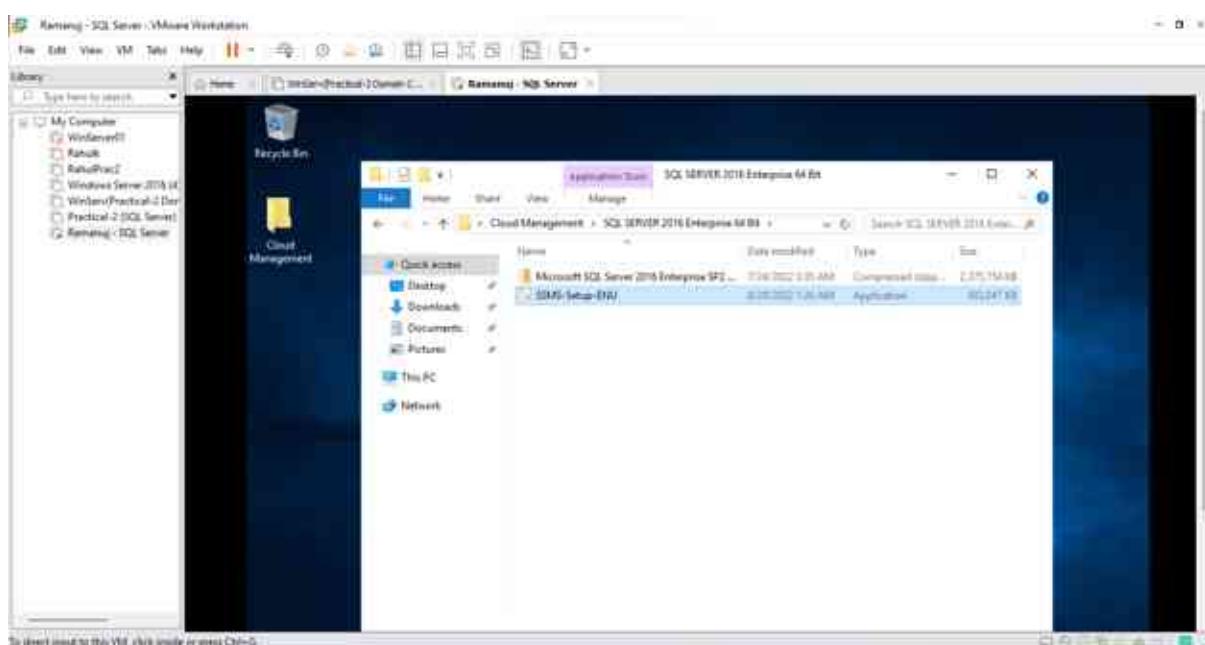


- SQL Server has finished installing and Click **Close**

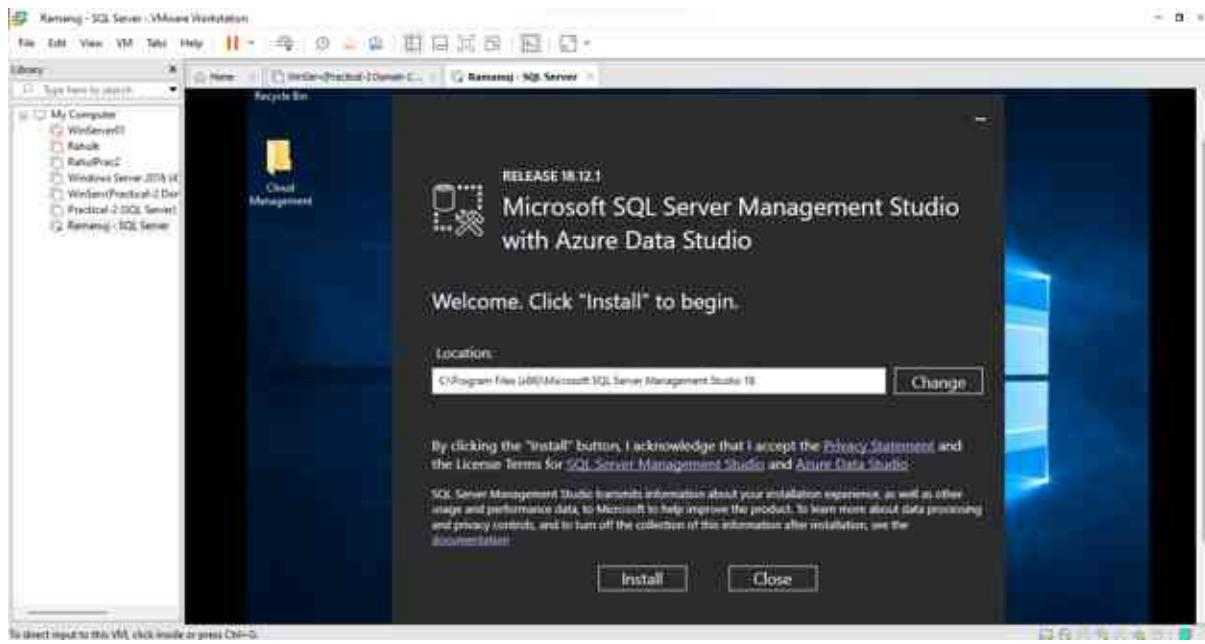


Step 3: Installing SSMS (SQL Server Management Studio)

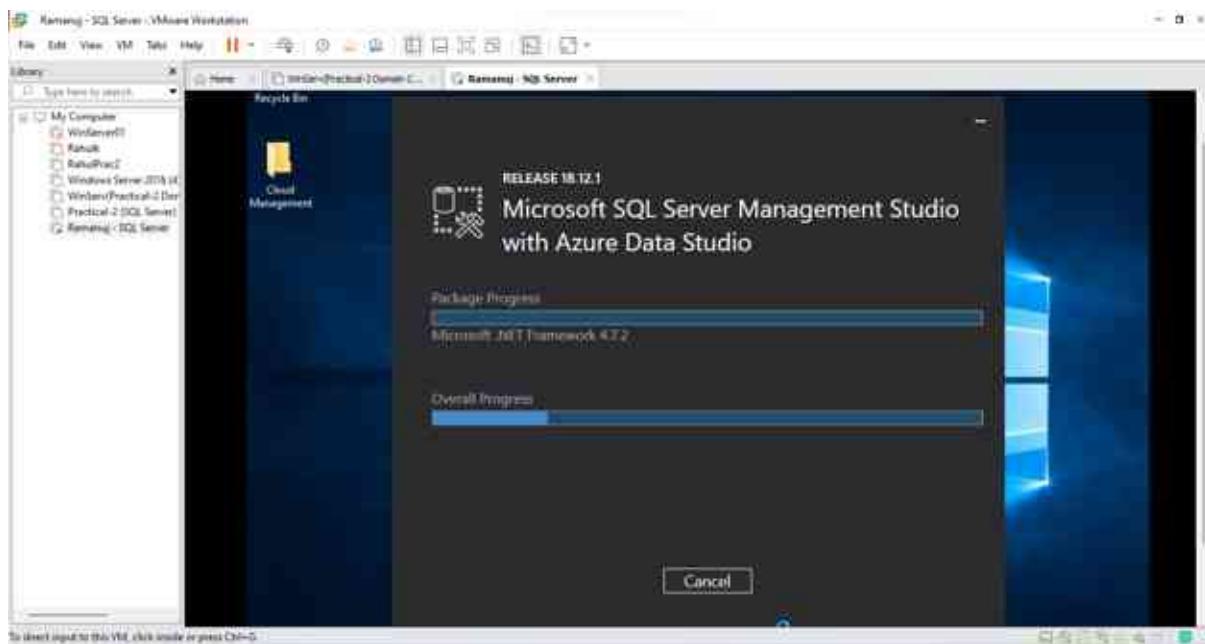
- Click on the SSMS setup



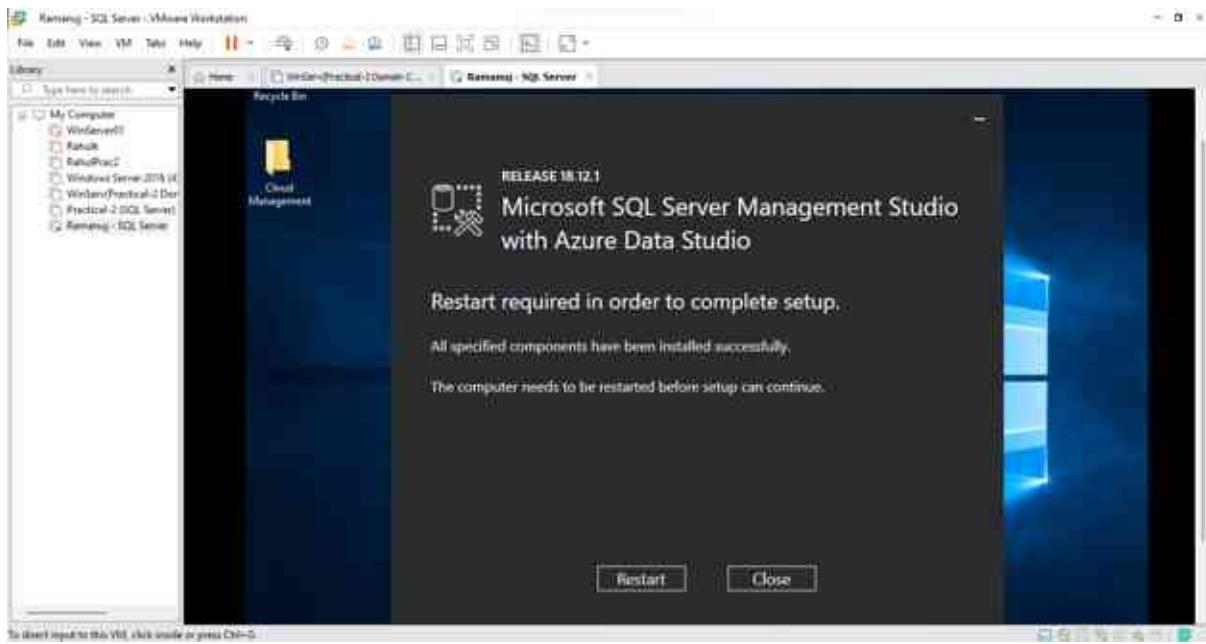
- Click **Install**



- SSMS will start installing

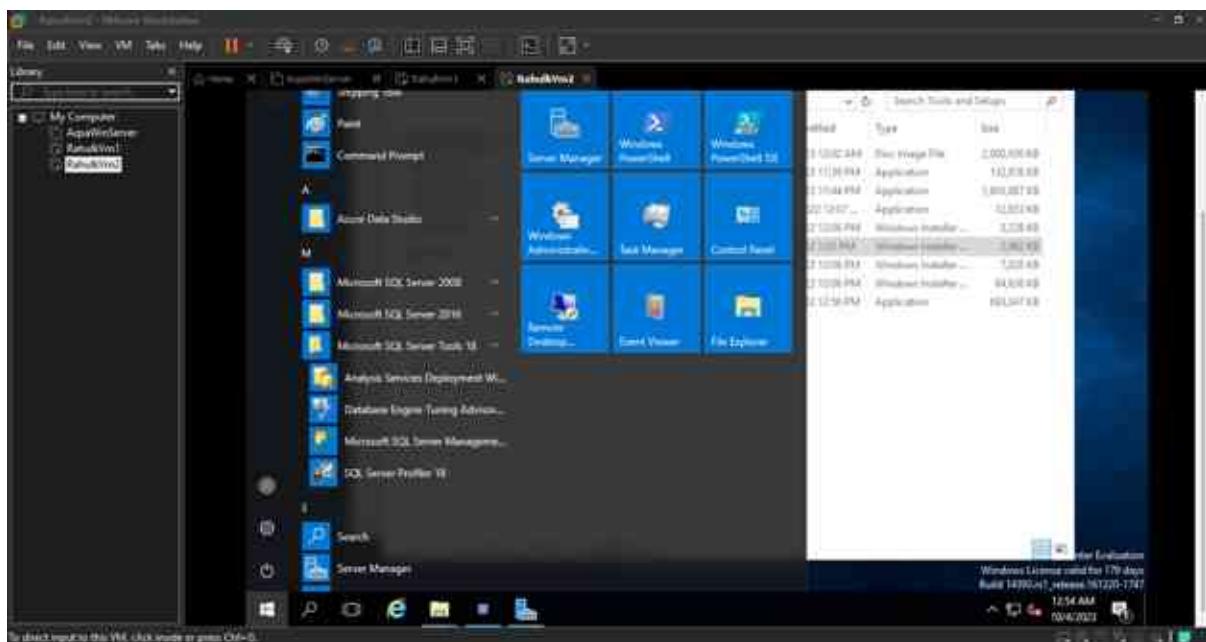


- After the components are Installed you will have to restart your VM. Click on **Restart**

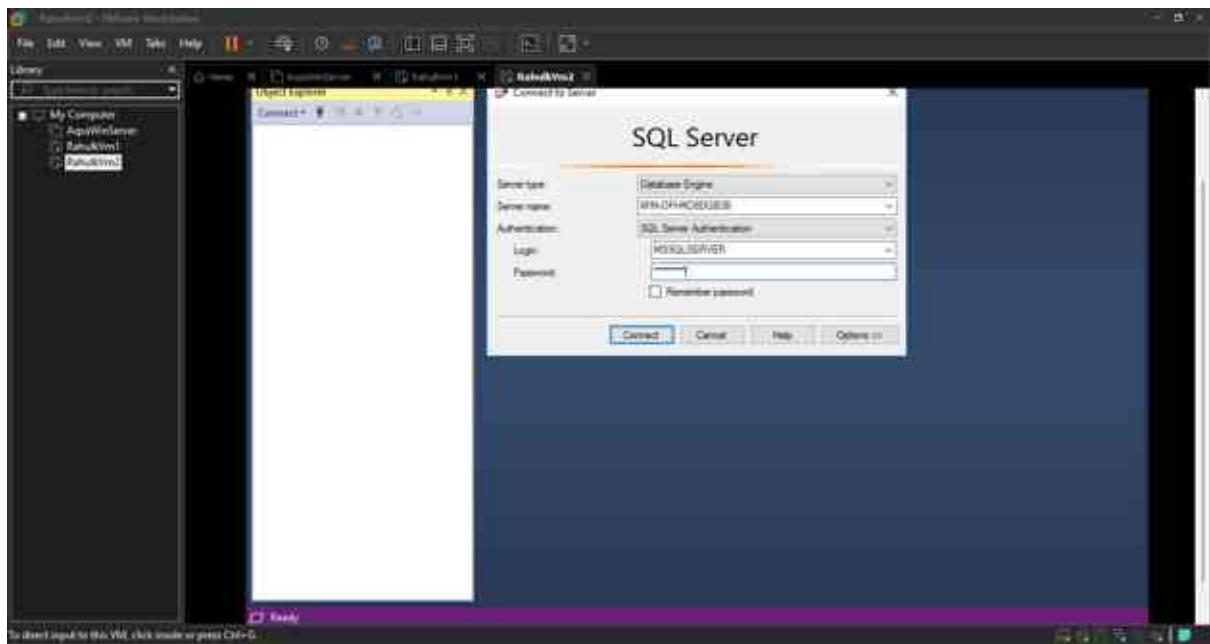


Step 4: Connect SQL Server to SSMS

- Open SSMS
- Click on Microsoft SQL Server Management

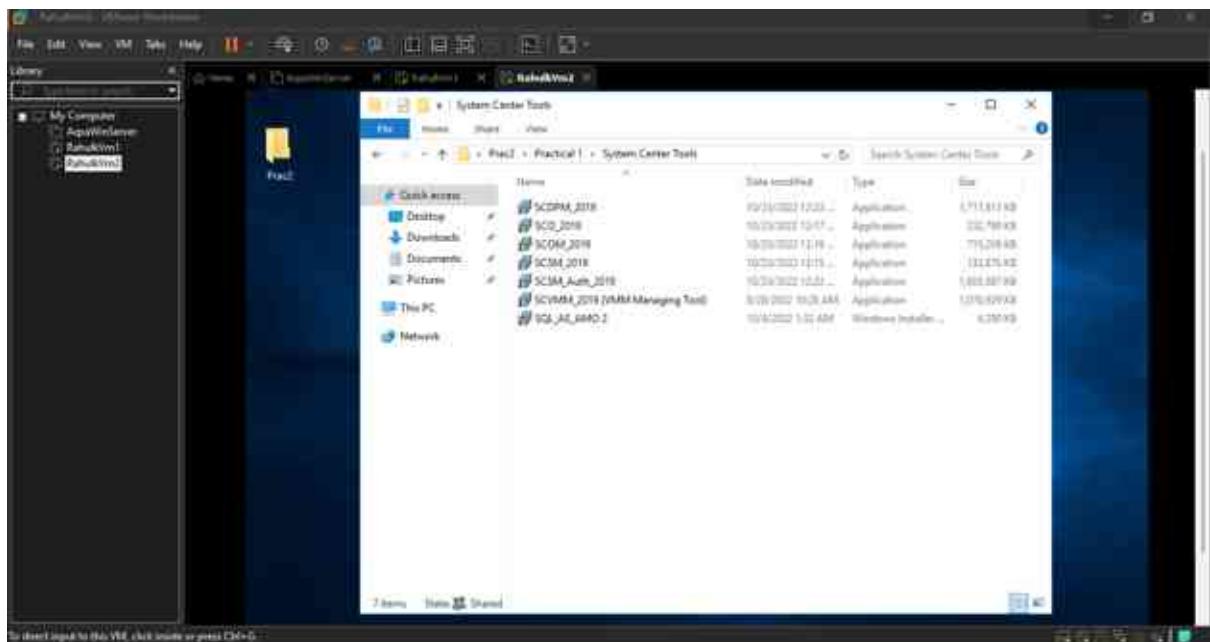


- Click on Connect

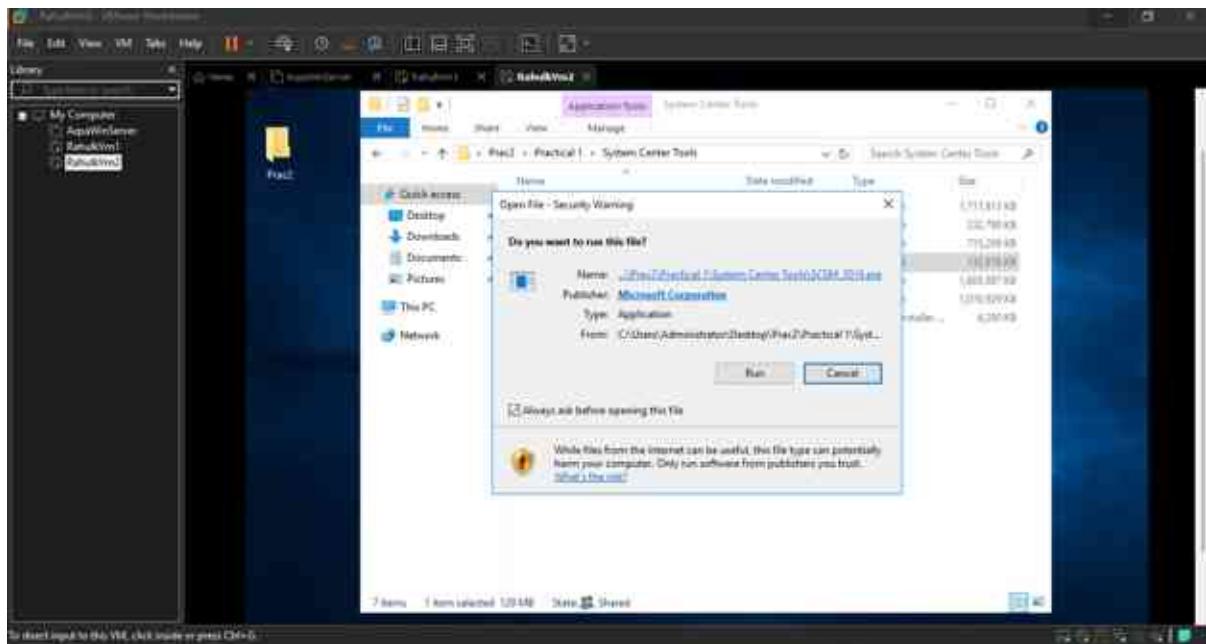


Step 5: Install System Center Service Manager 2019

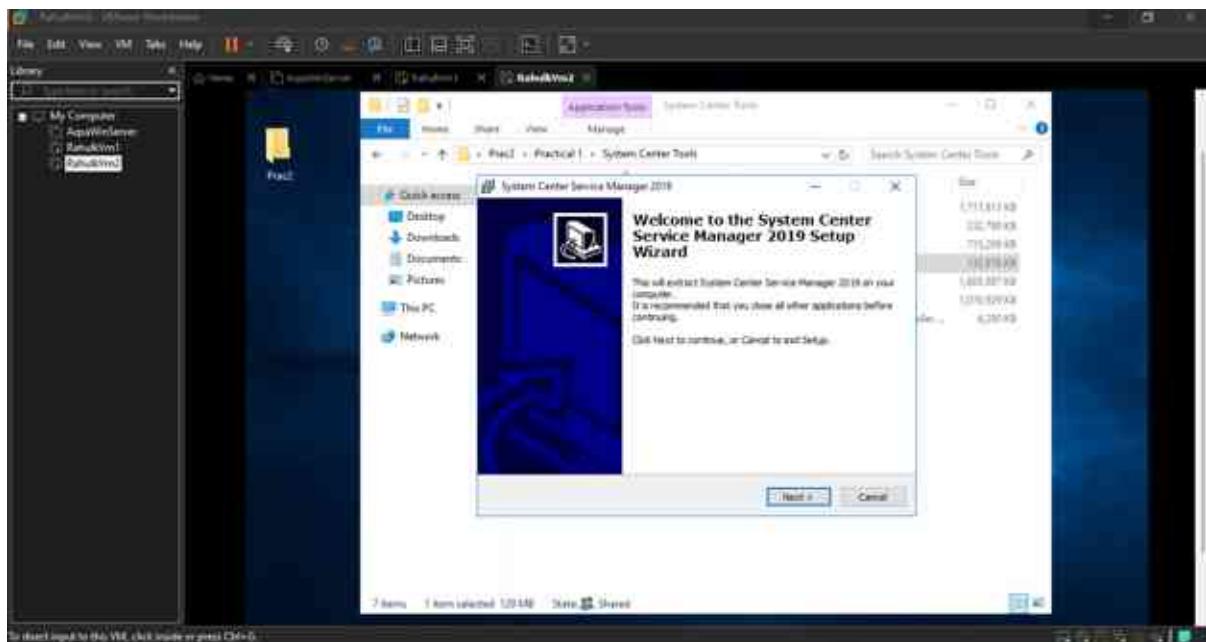
- Click on the SCSM_2019 setup



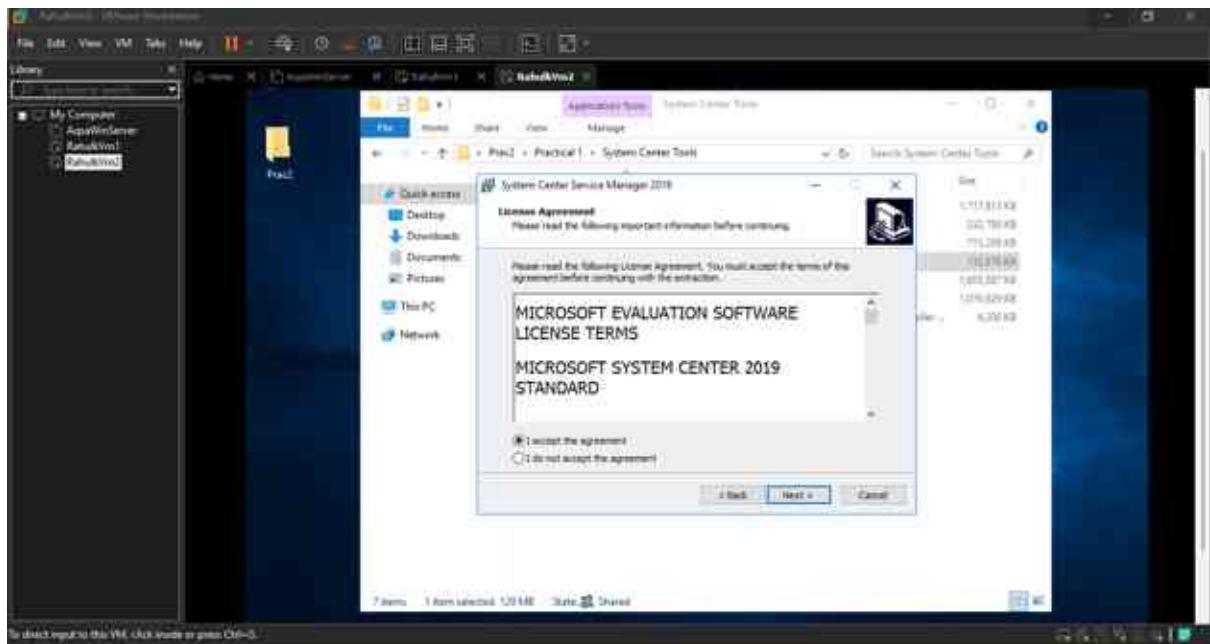
- Click on Run



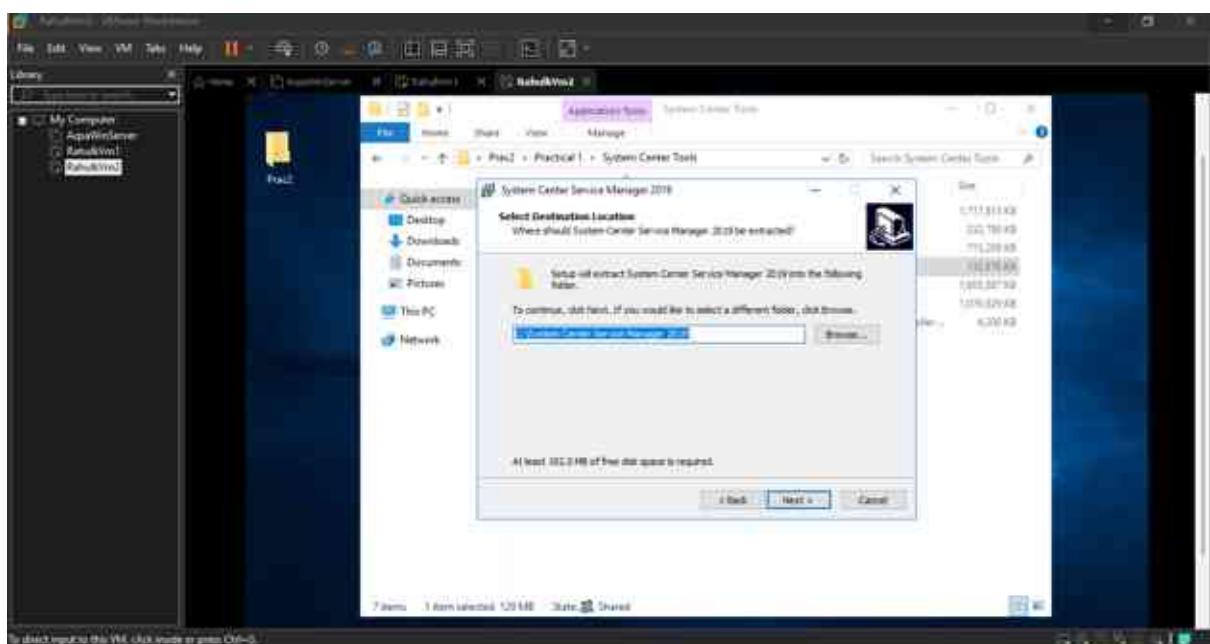
- Click Next



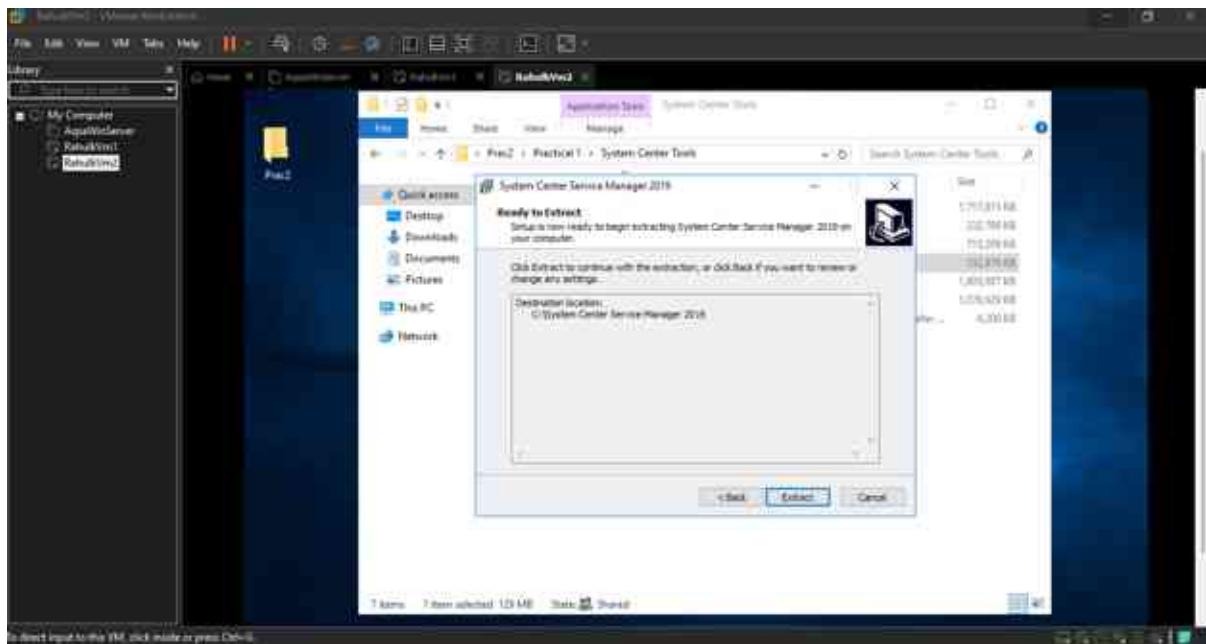
- Select I accept the agreement and Click Next



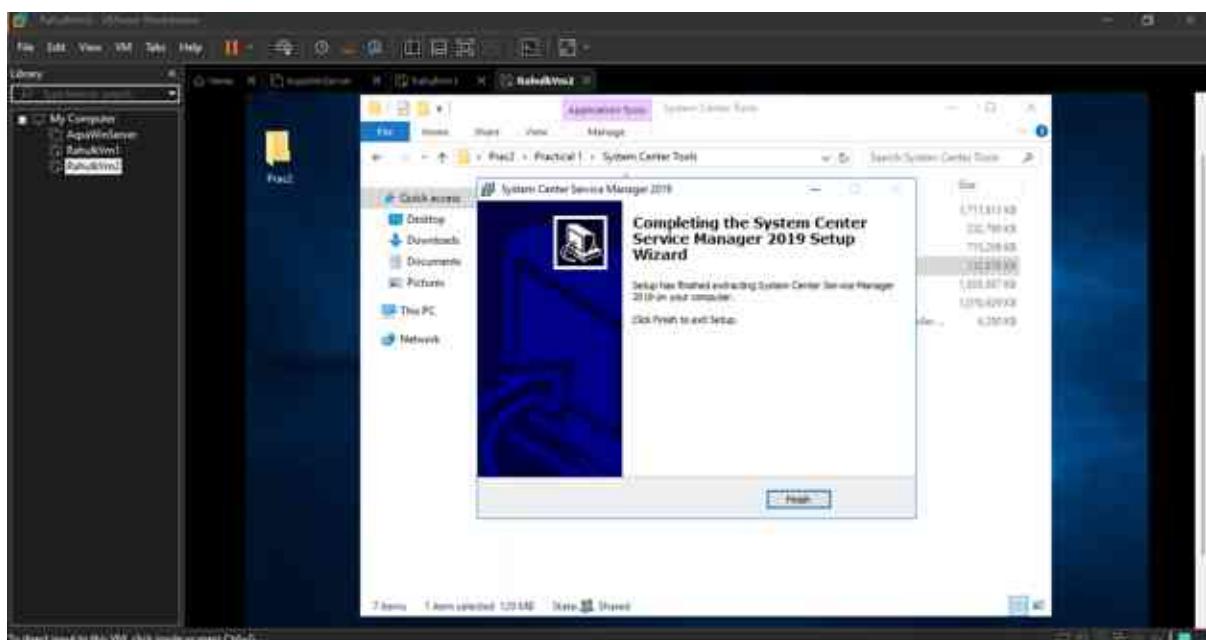
- Keep default path and Click Next



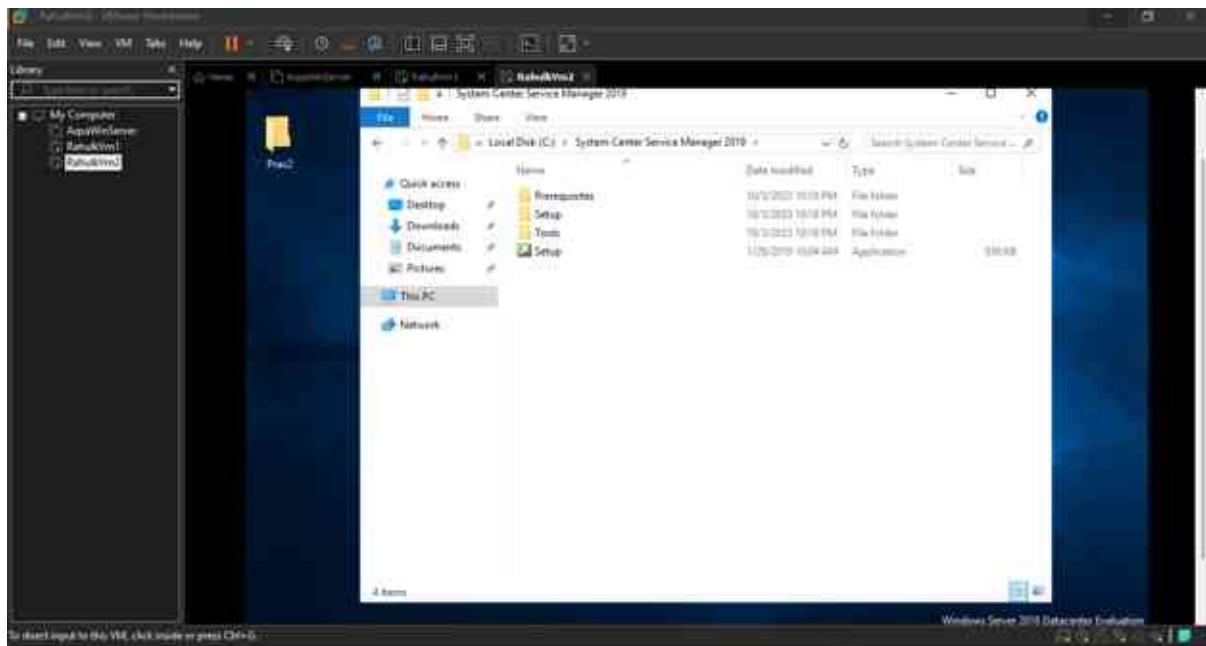
- Click on Extract



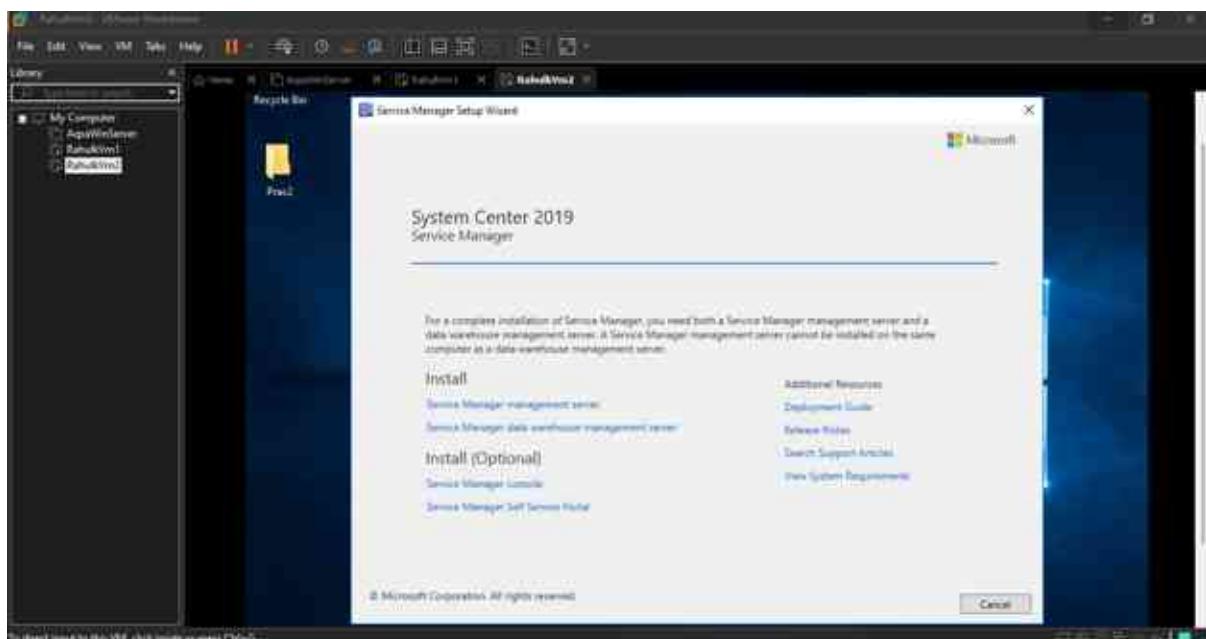
- Click on Finish



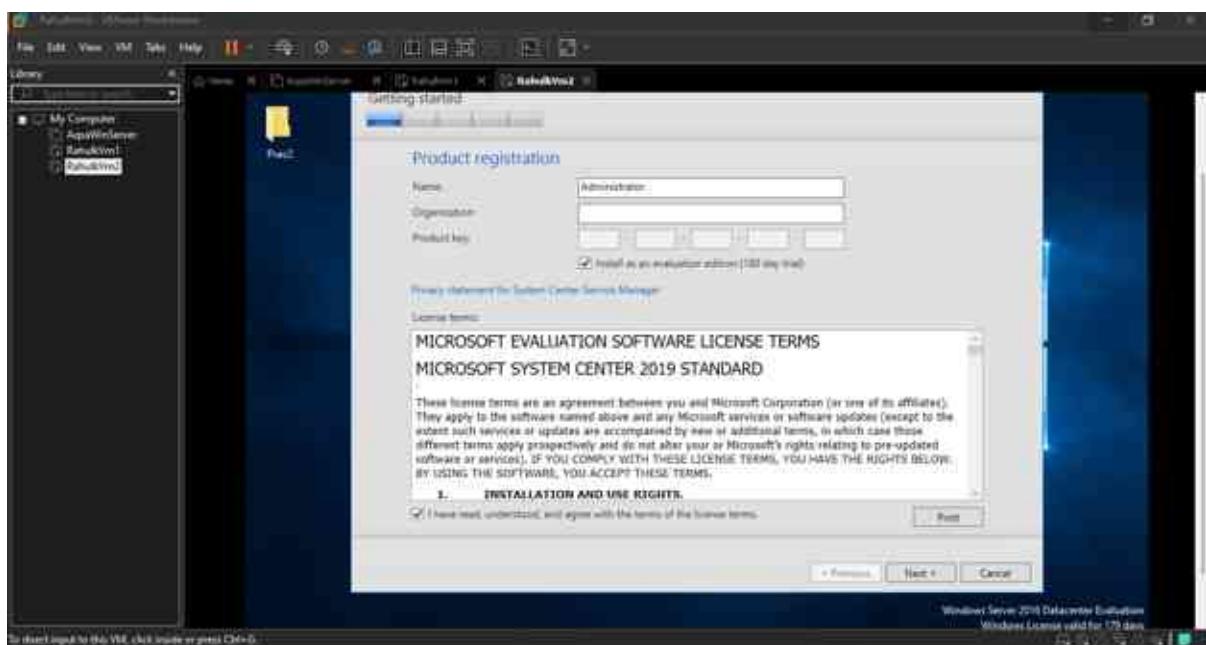
- After extracting open the SCSM 2019 file in your C: Directory and Click on **Setup**



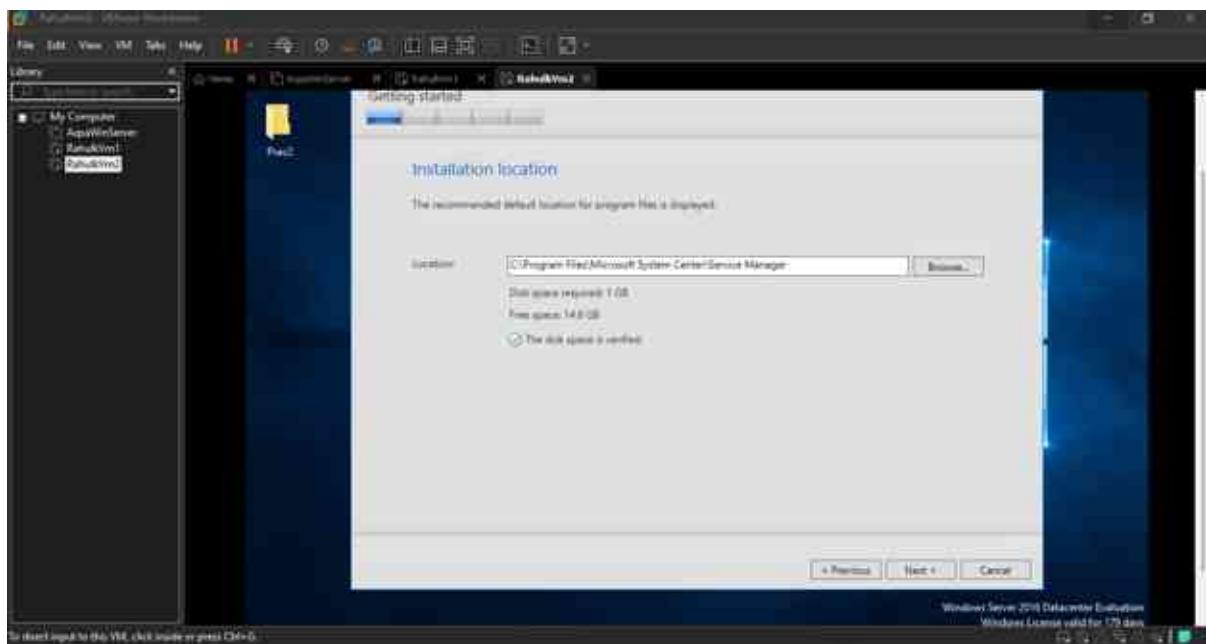
- Click on **Service Manager Management Server**



- Select **Install as Evaluation Edition** and Select **I have read and understood the above agreement** and Click **Next**

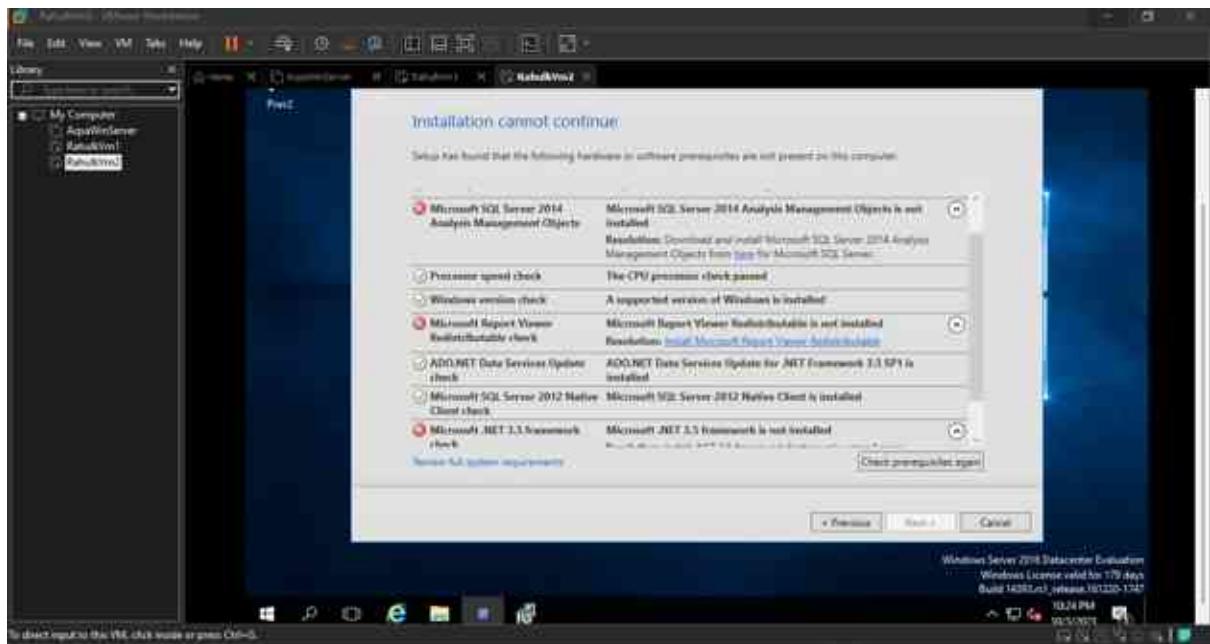


- Keep default values and Click **Next**

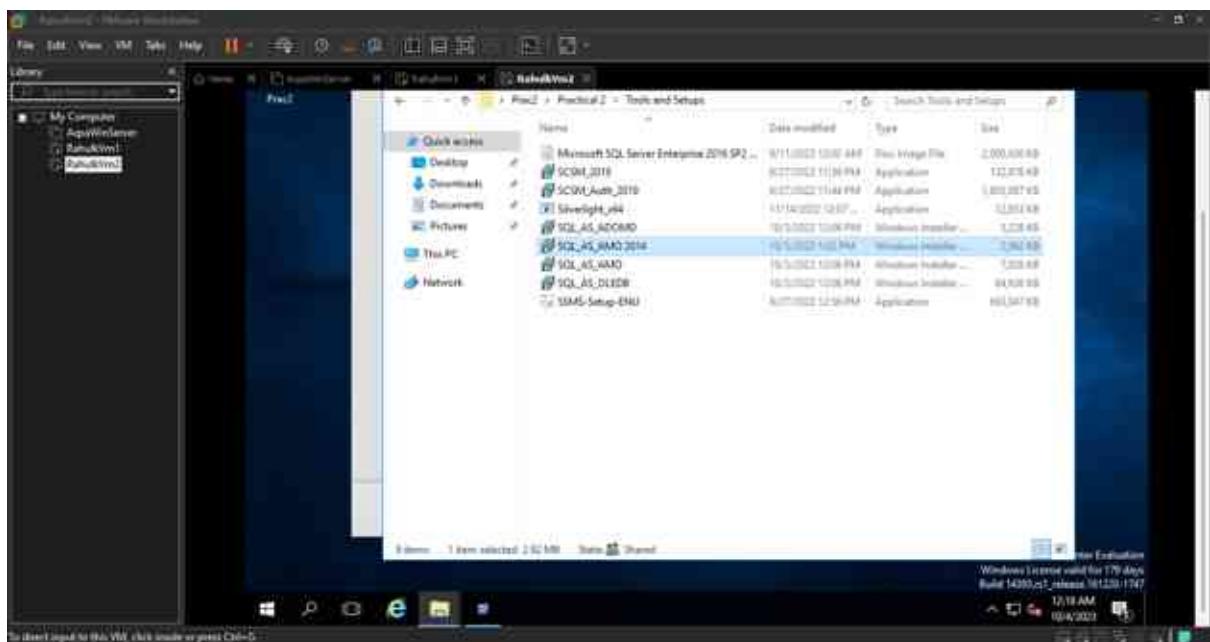


- Setup following hardware or software prerequisites on this computer
 - **Microsoft Report Viewer**
 - **Microsoft SQL Server 2014**

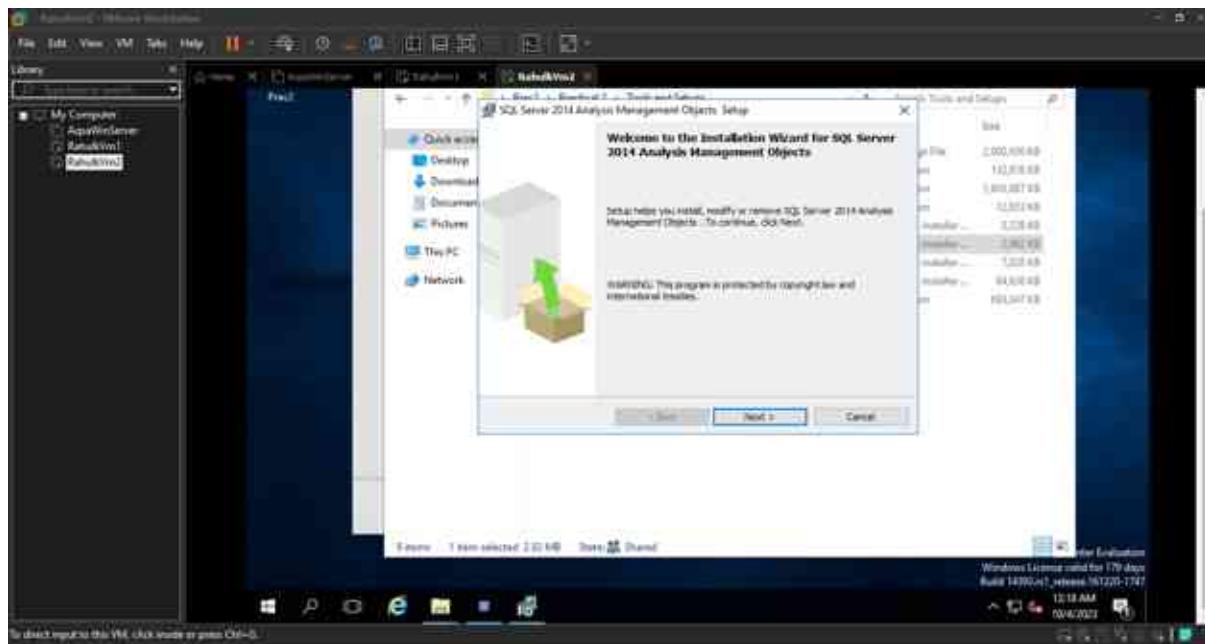
- Microsoft .NET 3.5 framework



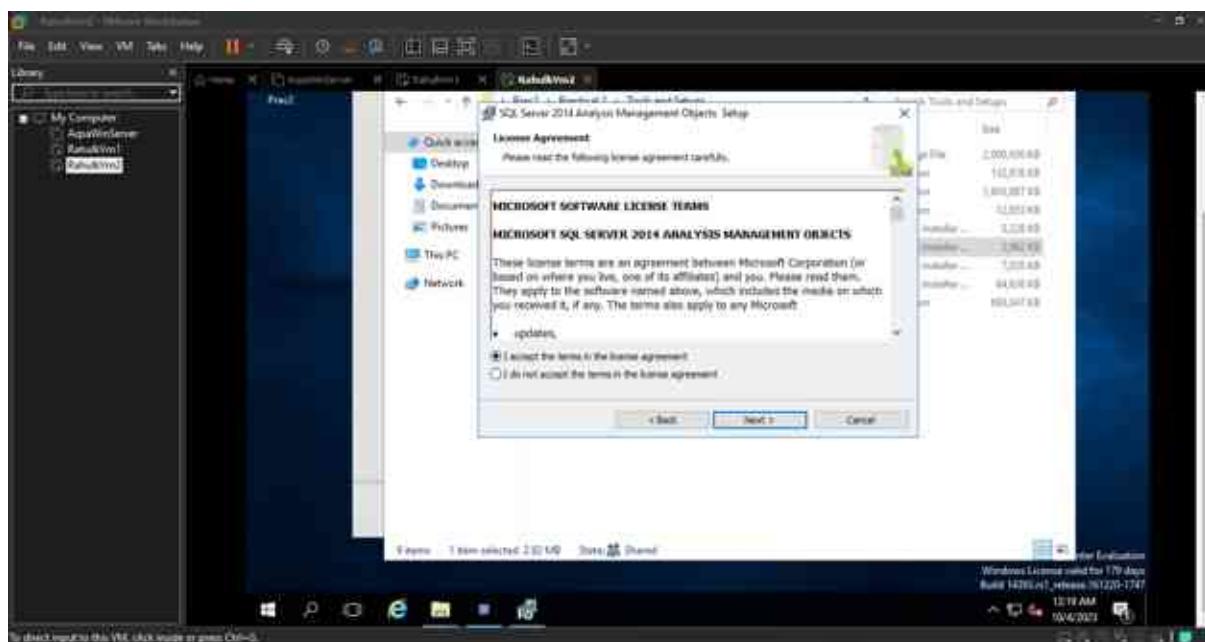
- install the Analysis Management Objects (AMO) 2014.
- Click on Setup file



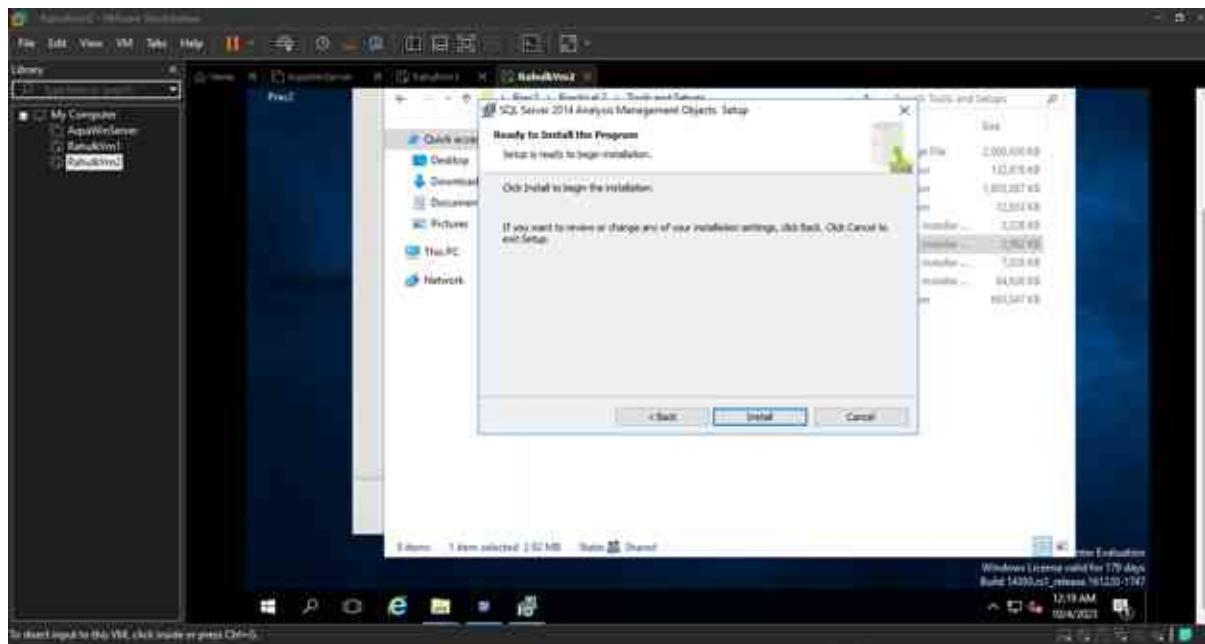
- Click Next



- Select **I accept the terms of this agreement** and Click **Next**



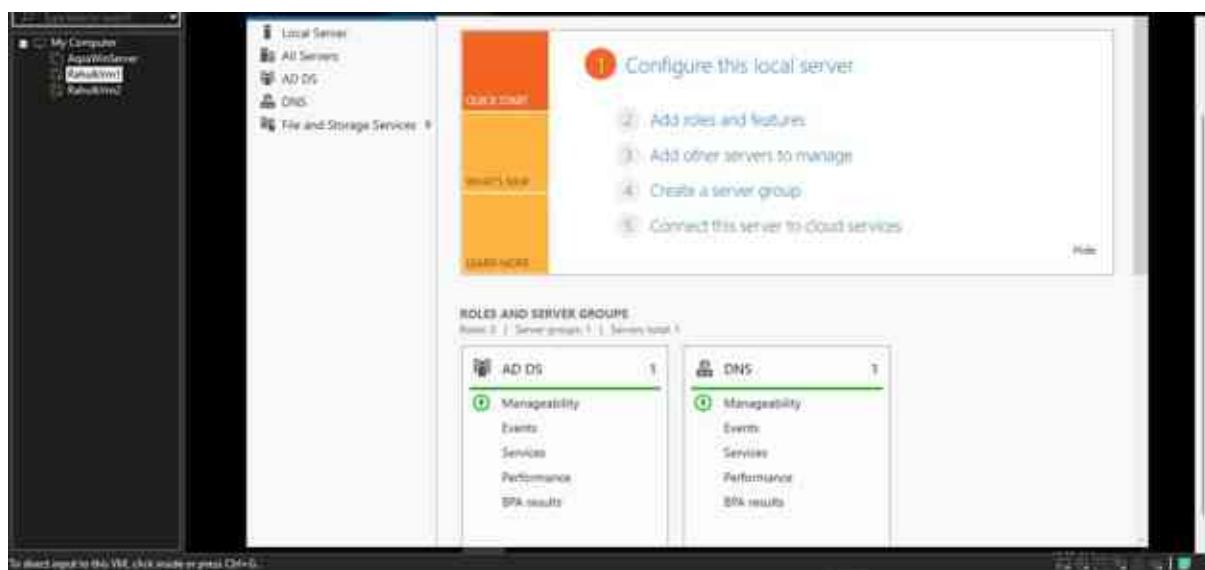
- Click on **Install**



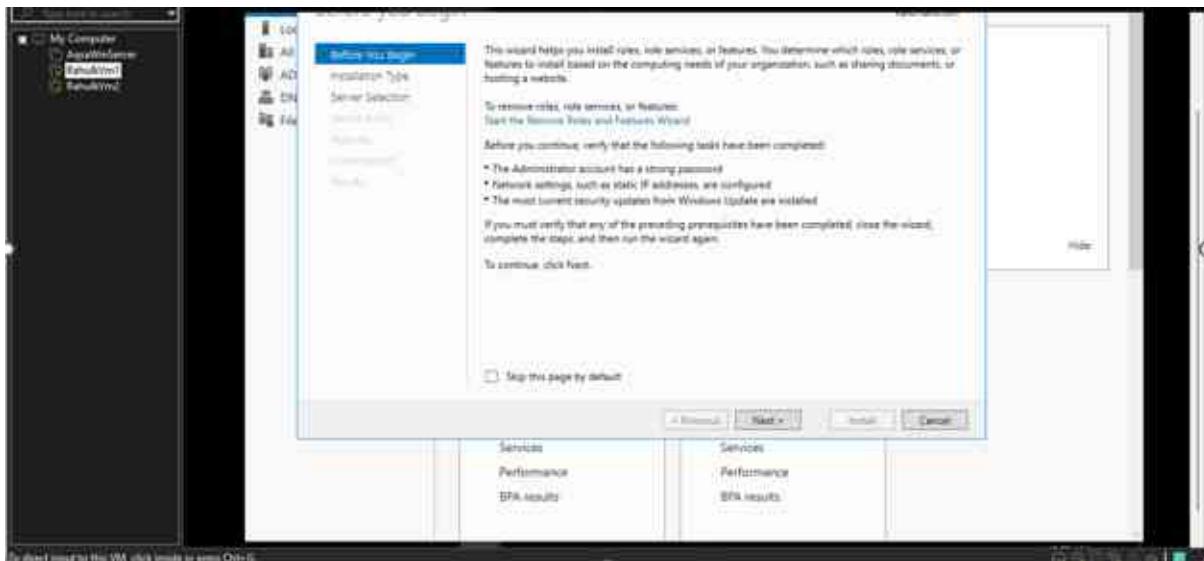
- Install Microsoft Report Viewer

To install Microsoft Report Viewer Click on Given Link [Install Microsoft Report Viewer Redistributable](#)

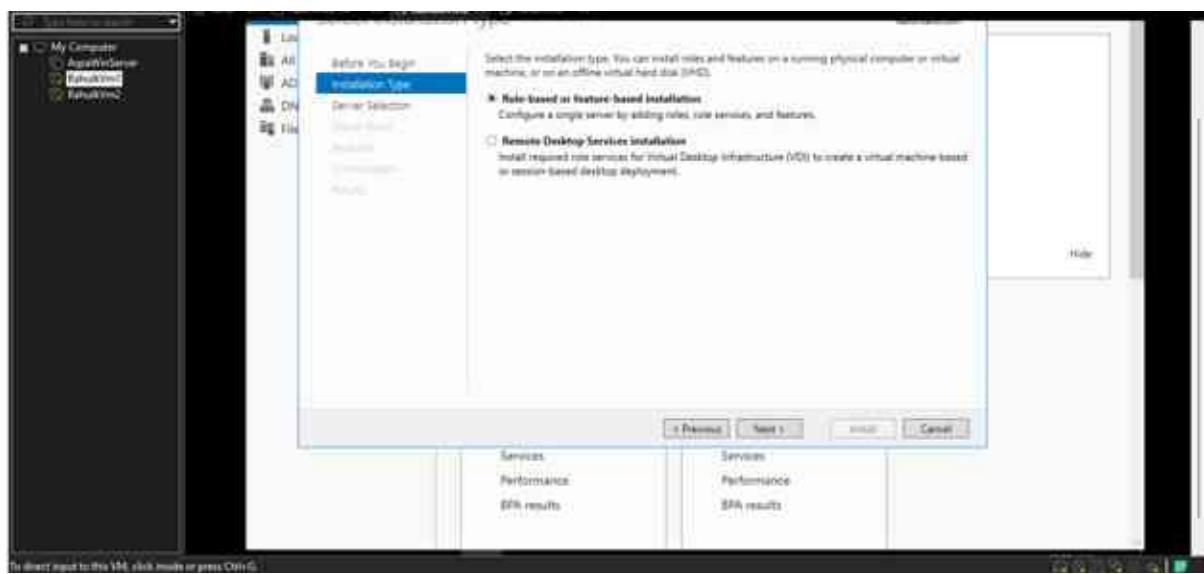
- Install Microsoft .NET 3.5 framework
- Go to the RahulVm2->Server Manager
- Click on Add roles and features



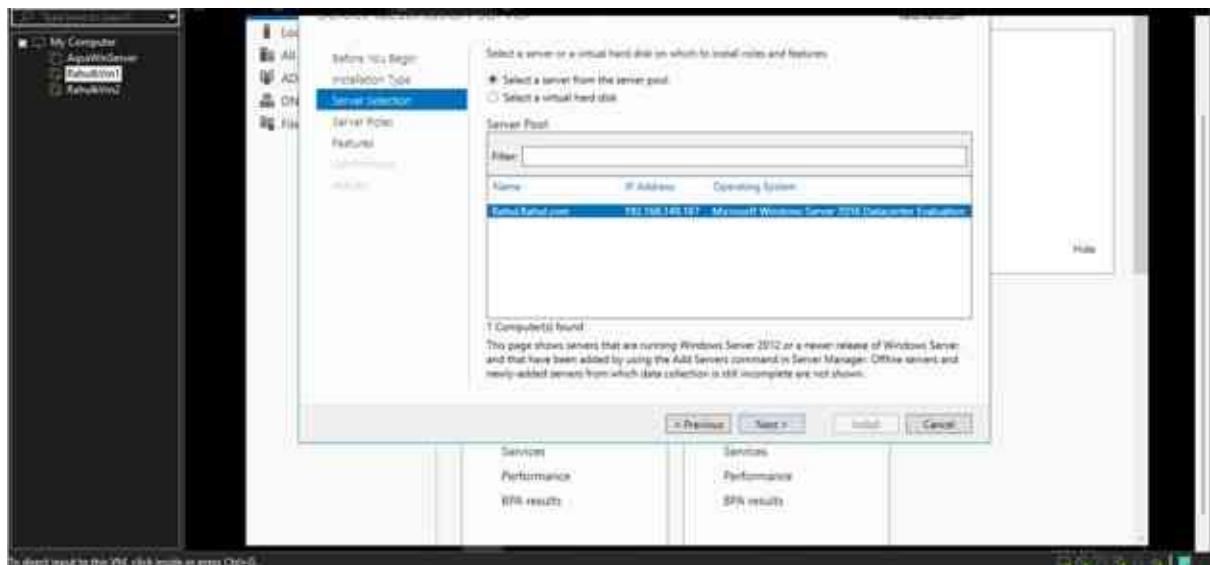
- Click on Next



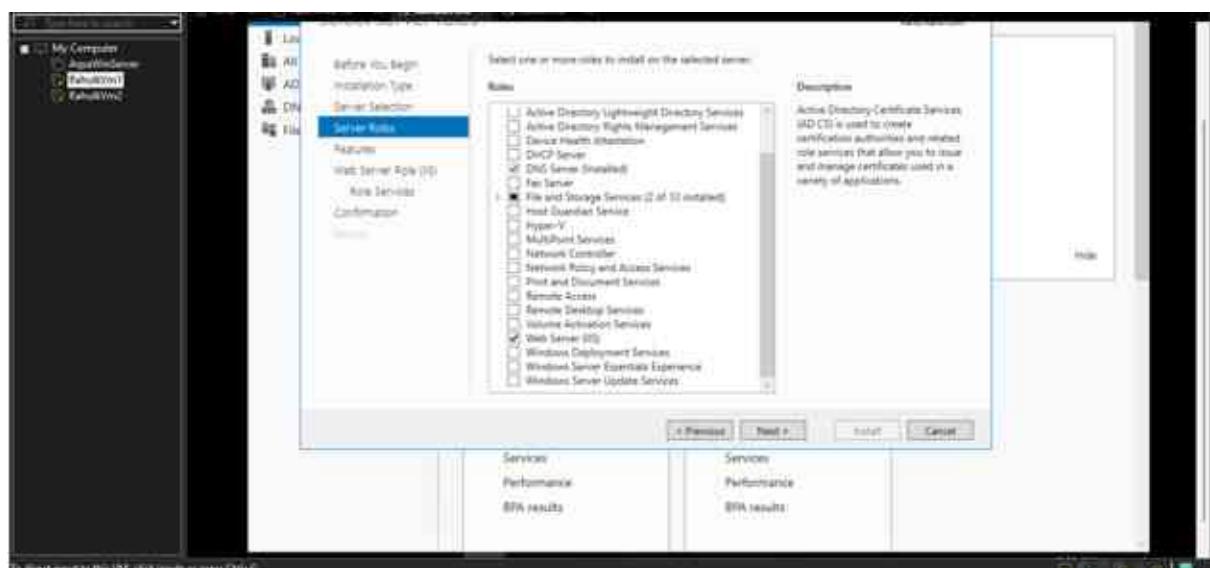
- Click on Next



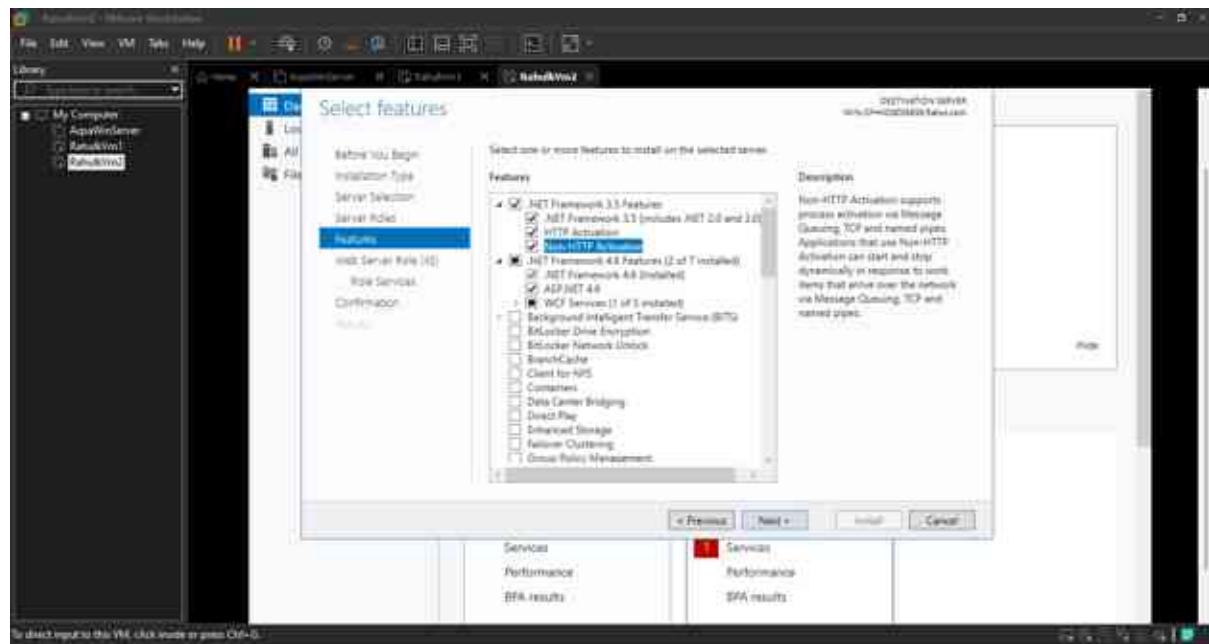
- Keep Default Setting and Click on Next



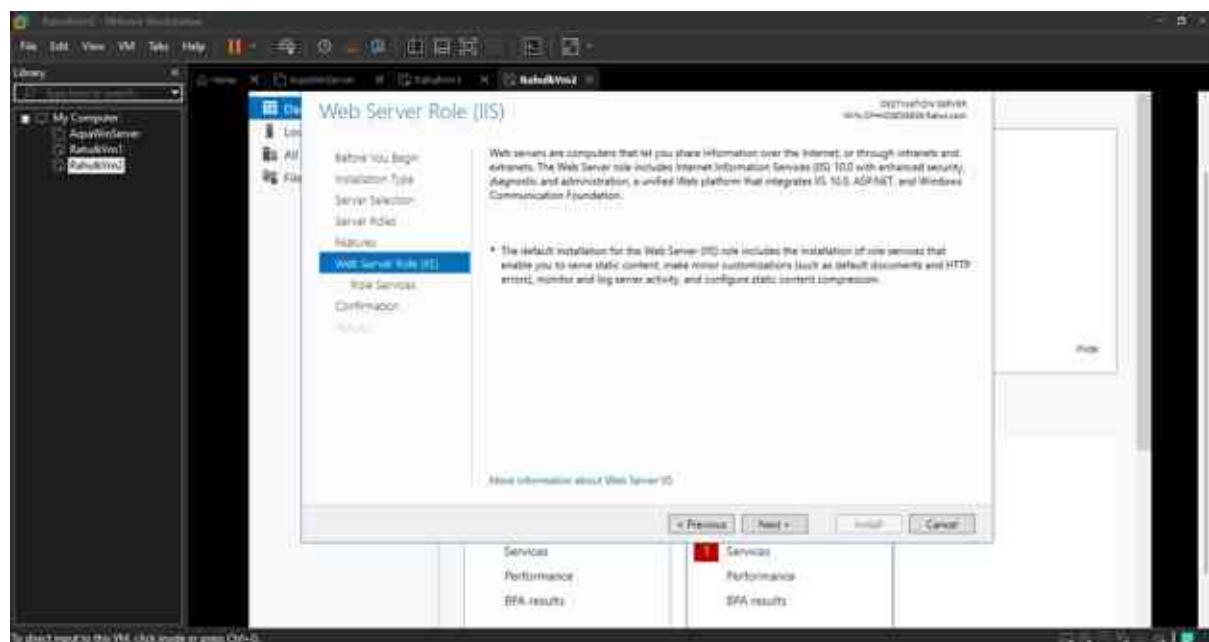
- Click on Next



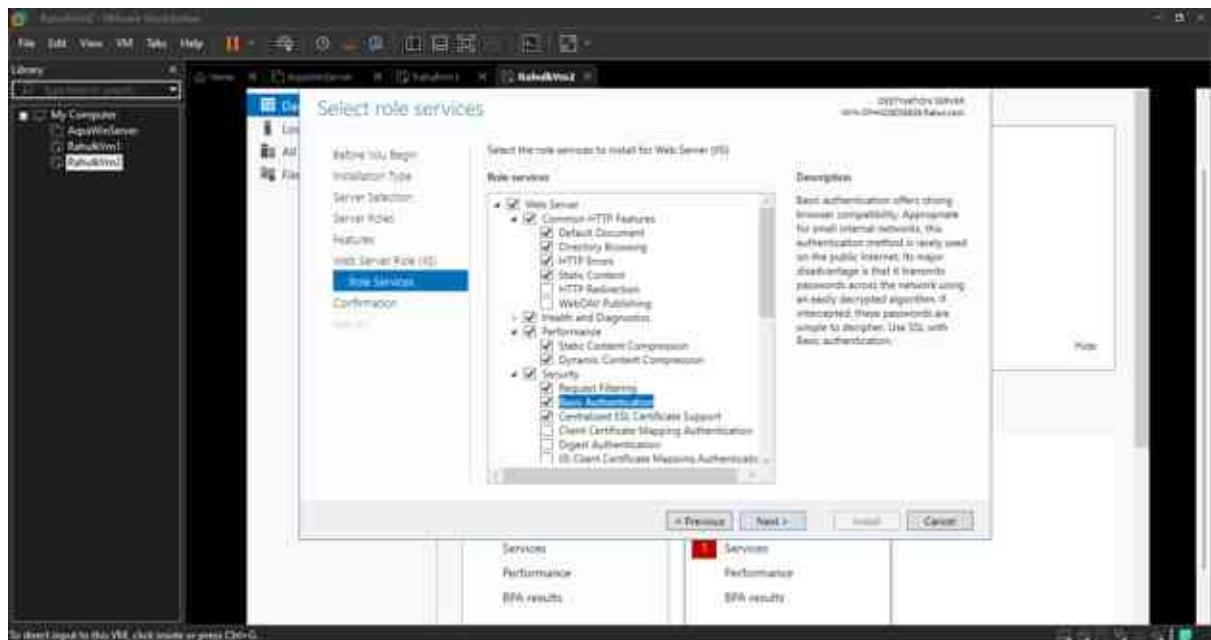
- Select .NET Framework 3.5 features and Click on Next



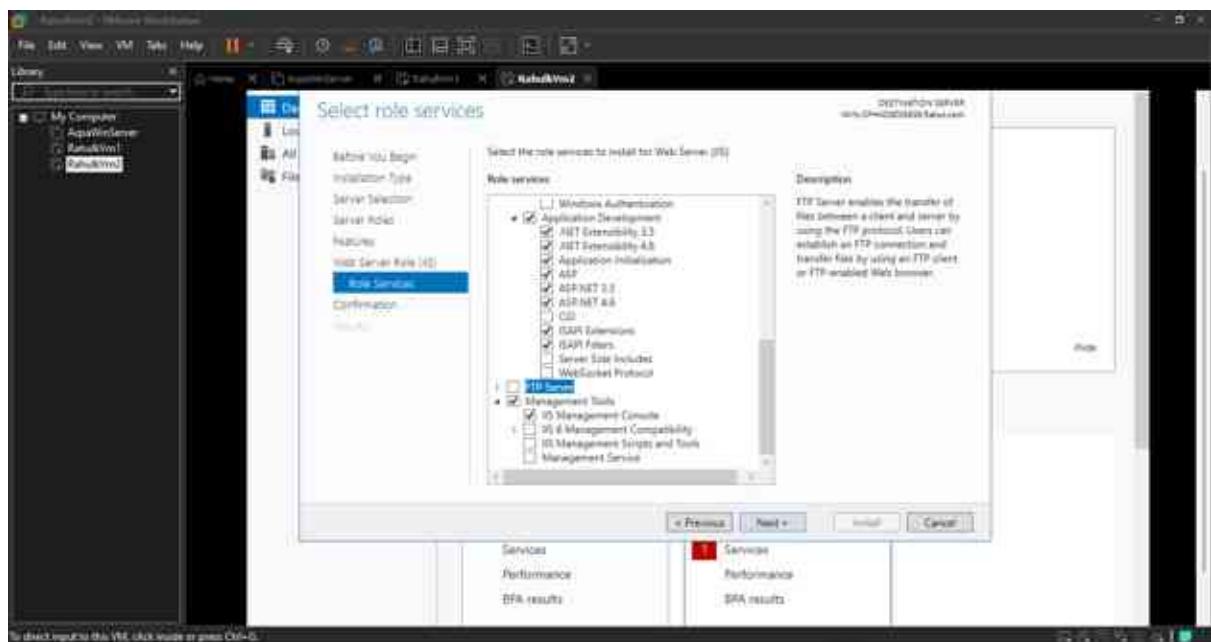
- Click on Next



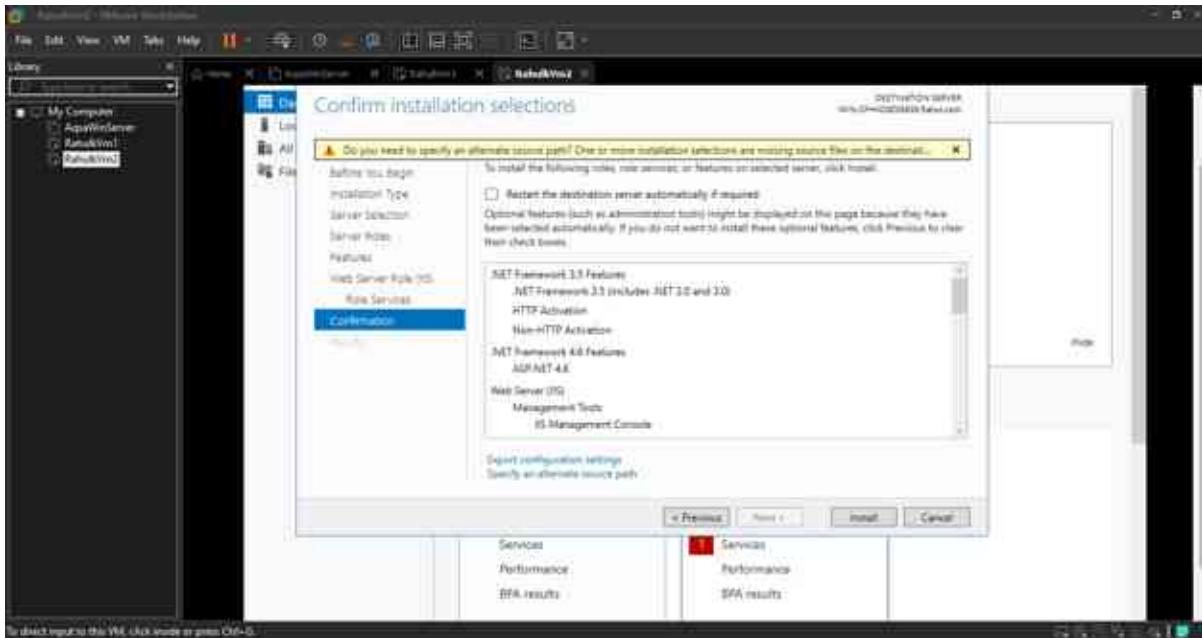
- Select the following features and **Click on Next**



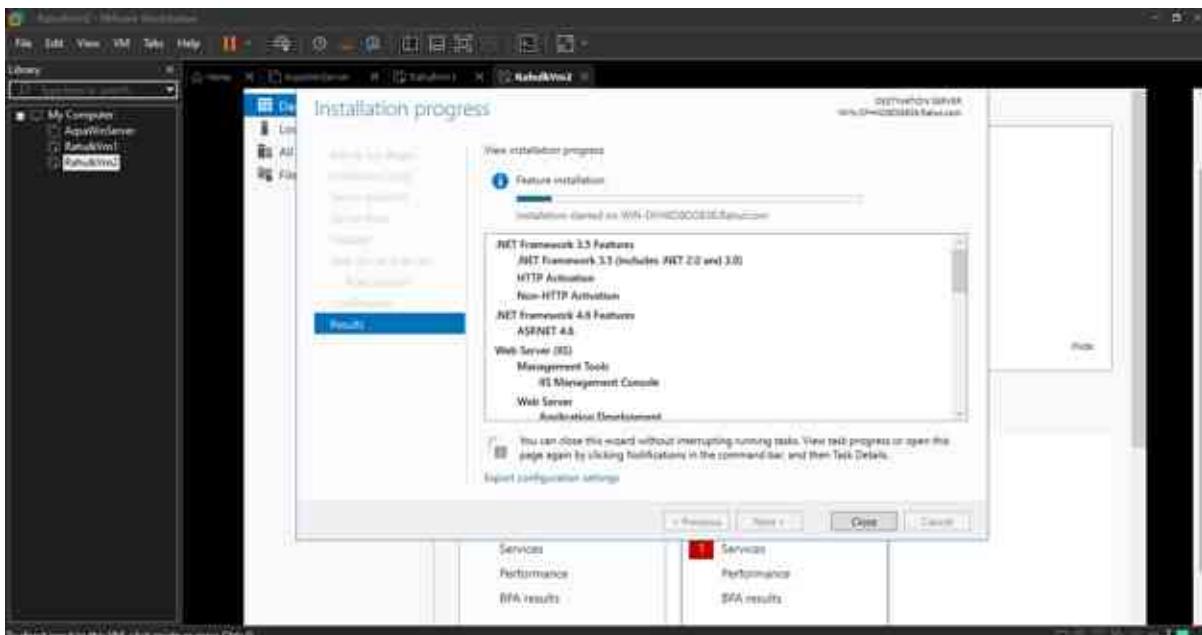
- Select the following features and **Click on Next**



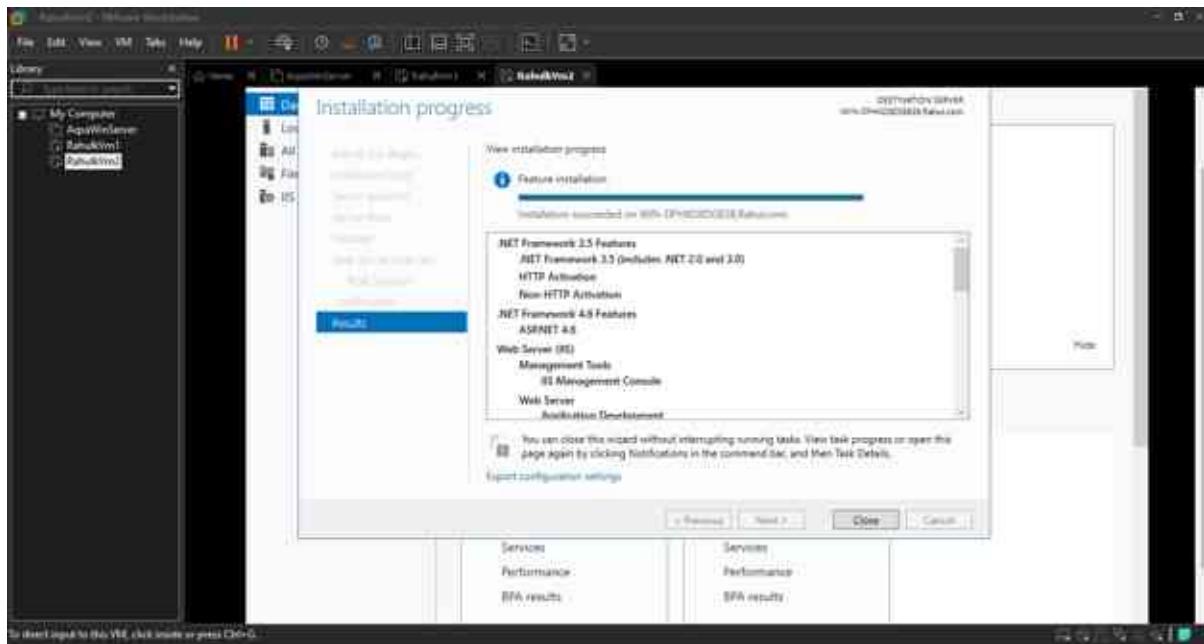
- Click on Install



- Installation Process Start



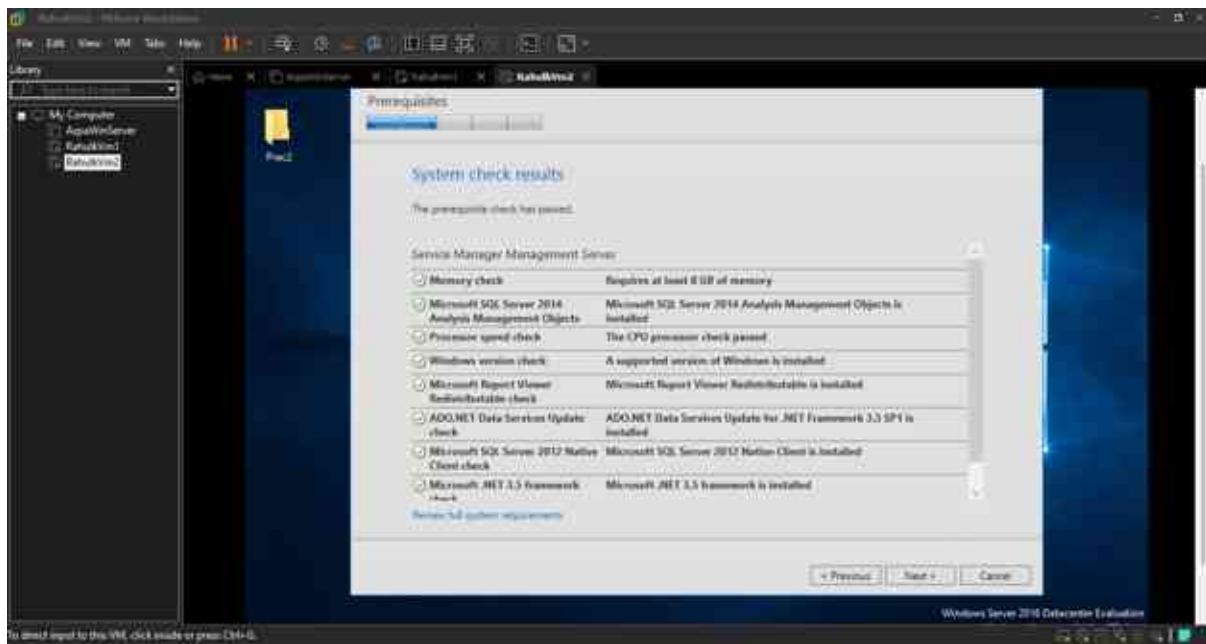
- After the Installation **Click on Close**



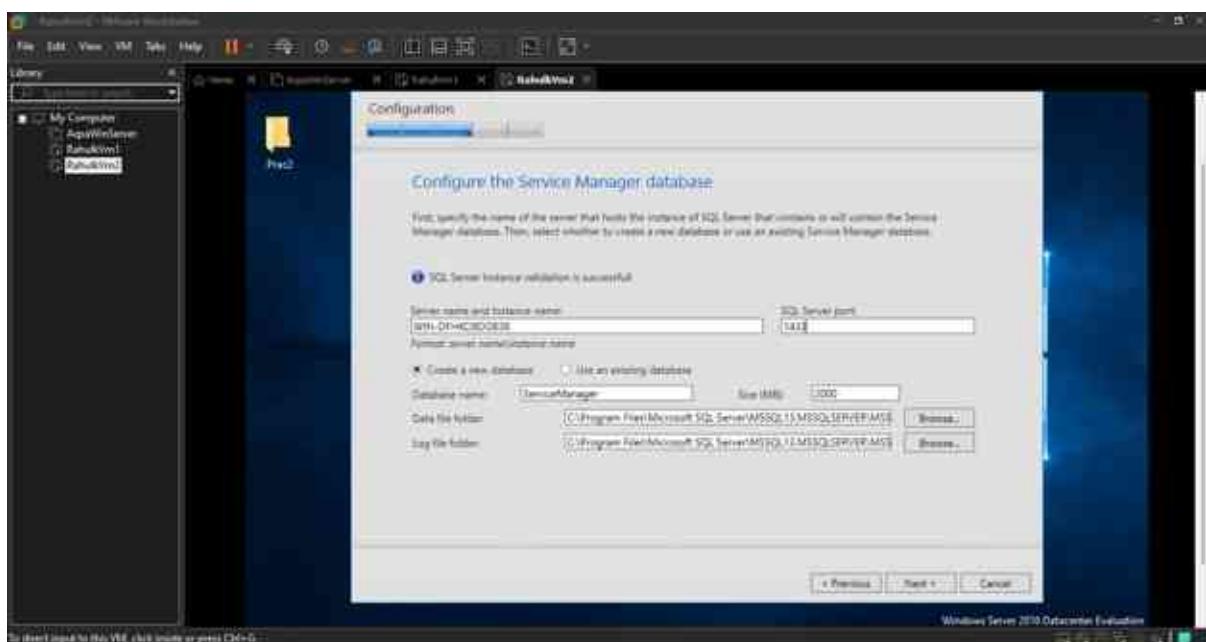
- After the Installation Following Setup:

- **Microsoft Report Viewer**
- **Microsoft SQL Server 2014**
- **Microsoft .NET 3.5 framework**

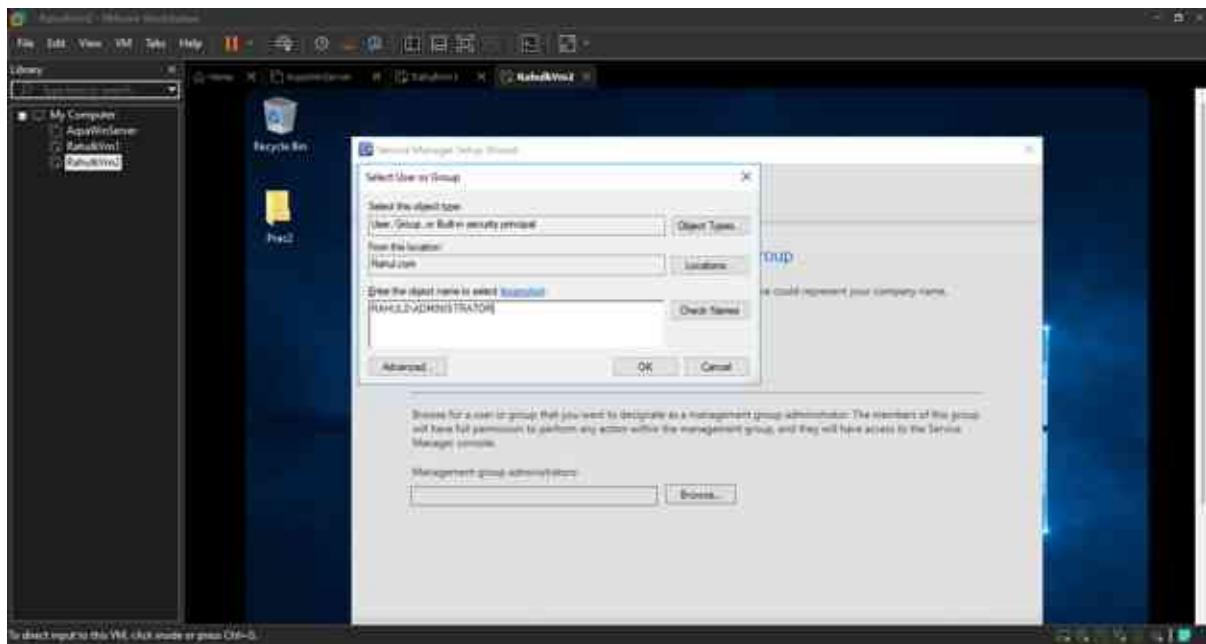
- Click on Check pre-requisites again, the error will be solved and **Click Next**



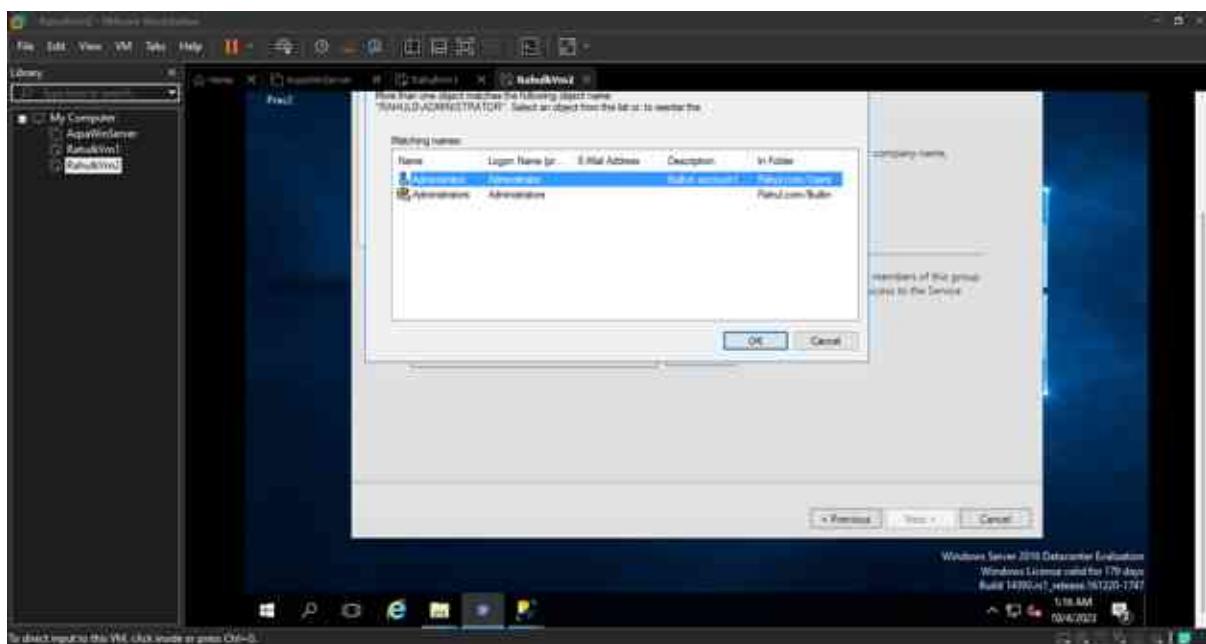
- Enter your SQL Server name (In this case it is WIN-DFHKO8DGB38) and Click **Next**



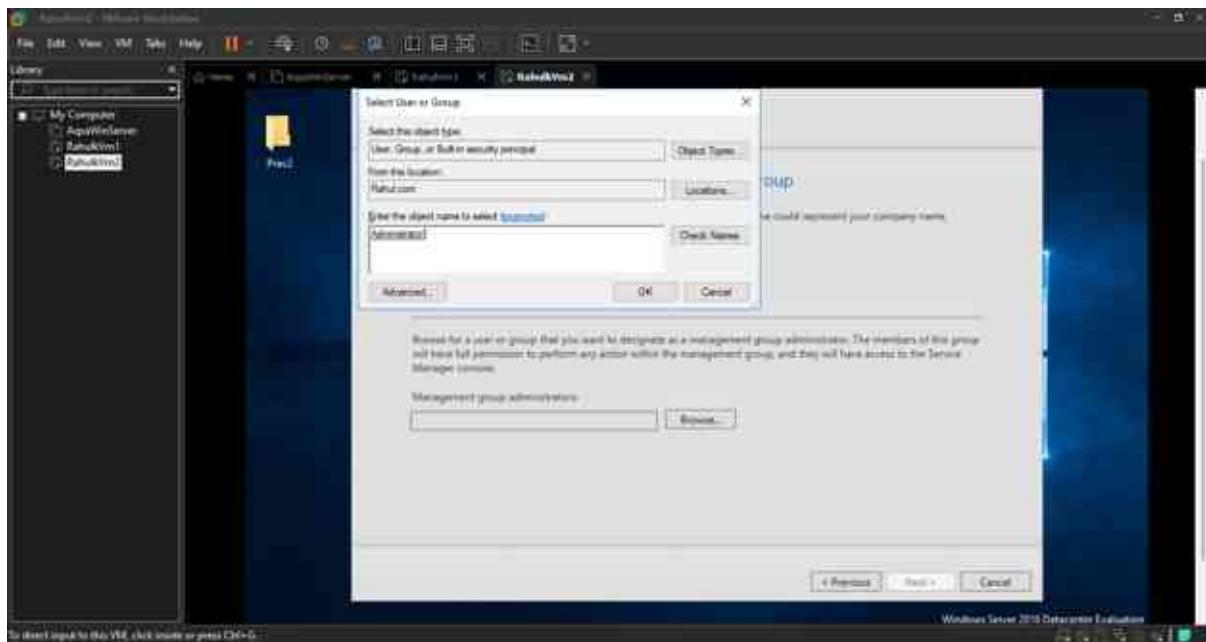
- Enter a management group name (Here it is SMGROUP) and Click on **browse** and within the text field type **RAHUL0\ADMINISTRATOR** and Click **Ok**



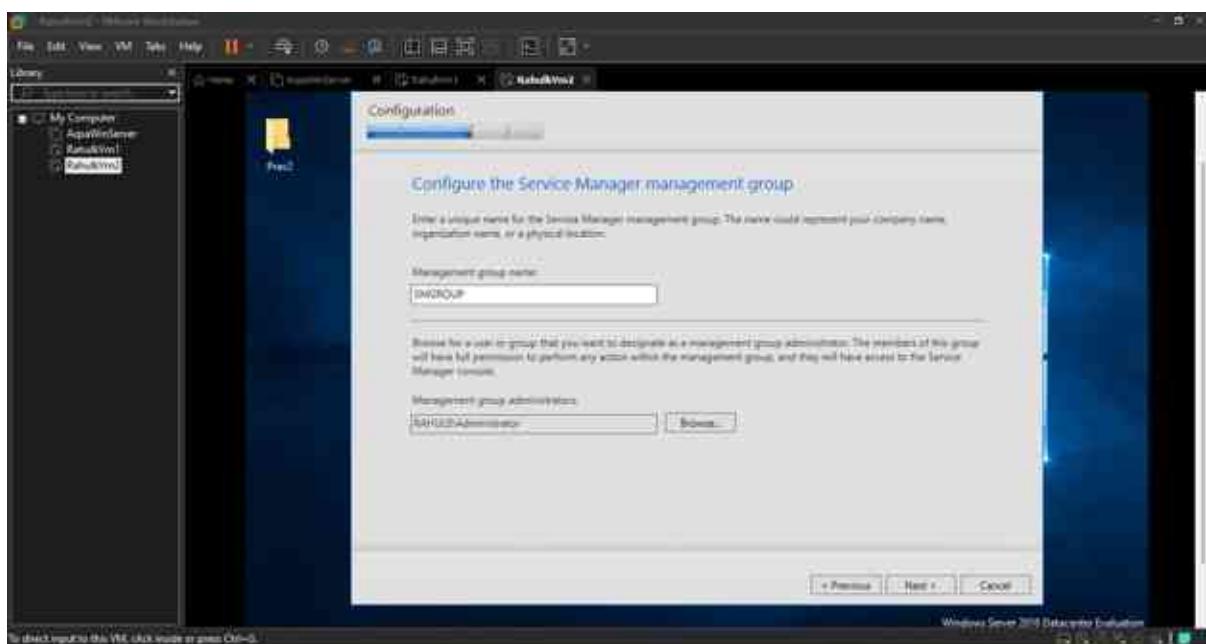
- Select the following **Click on Ok**



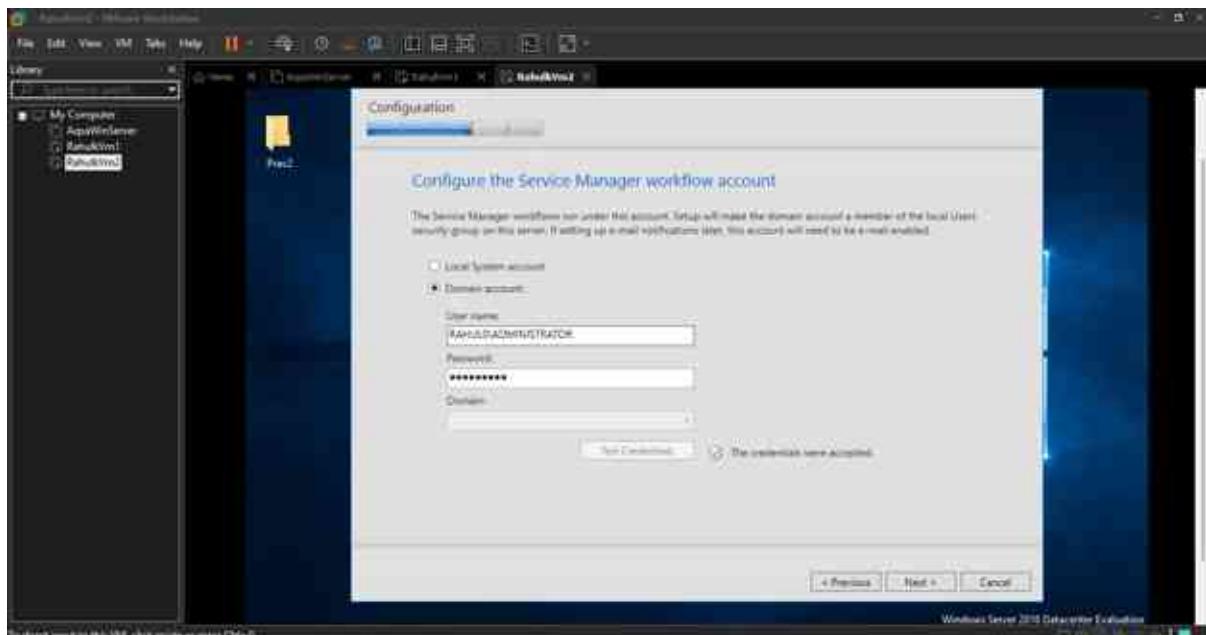
- **Click On**



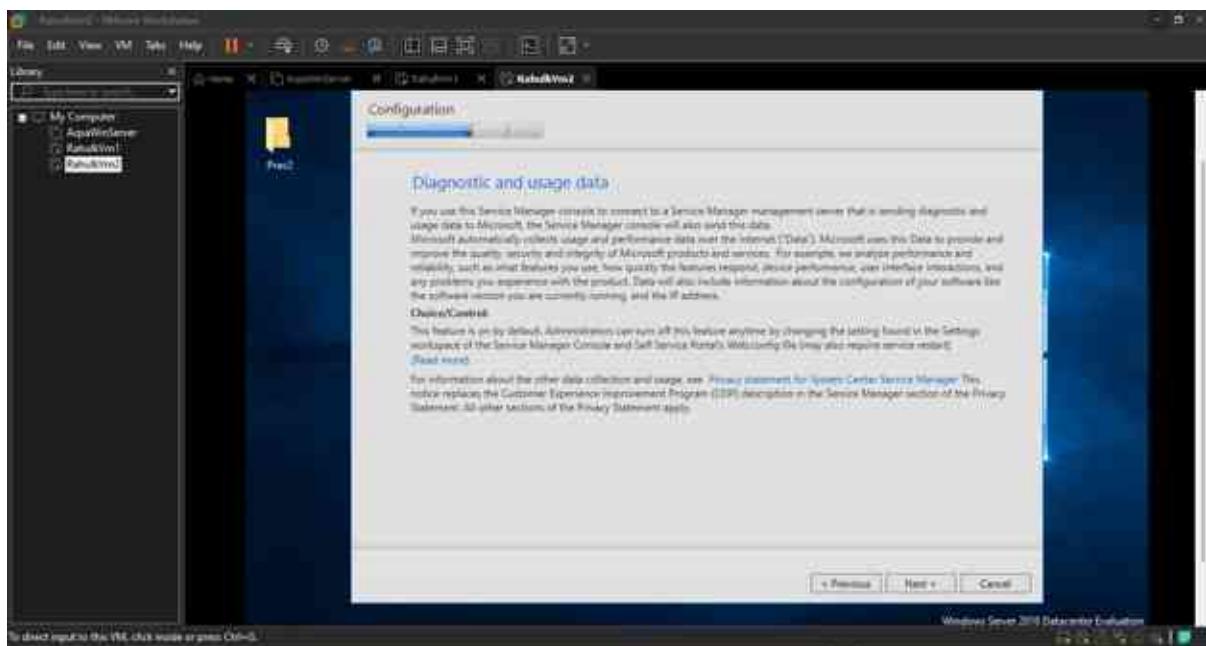
- Click Next



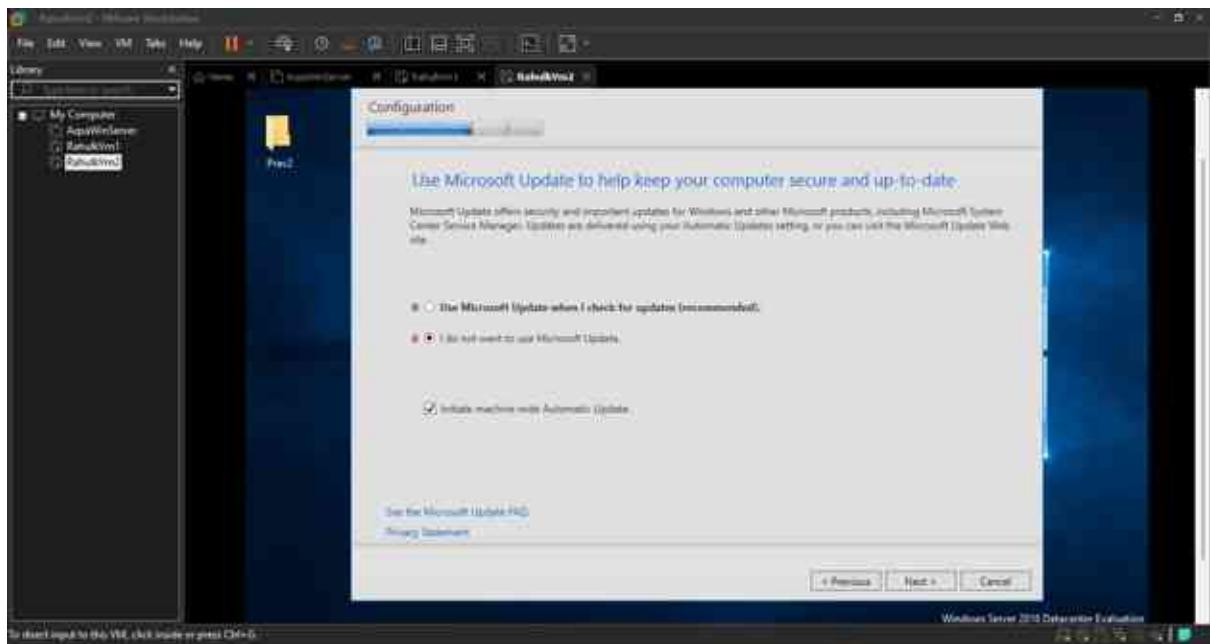
- Select Domain Account and Enter the details of the Domain Controller and Click Test Credentials and Click Next



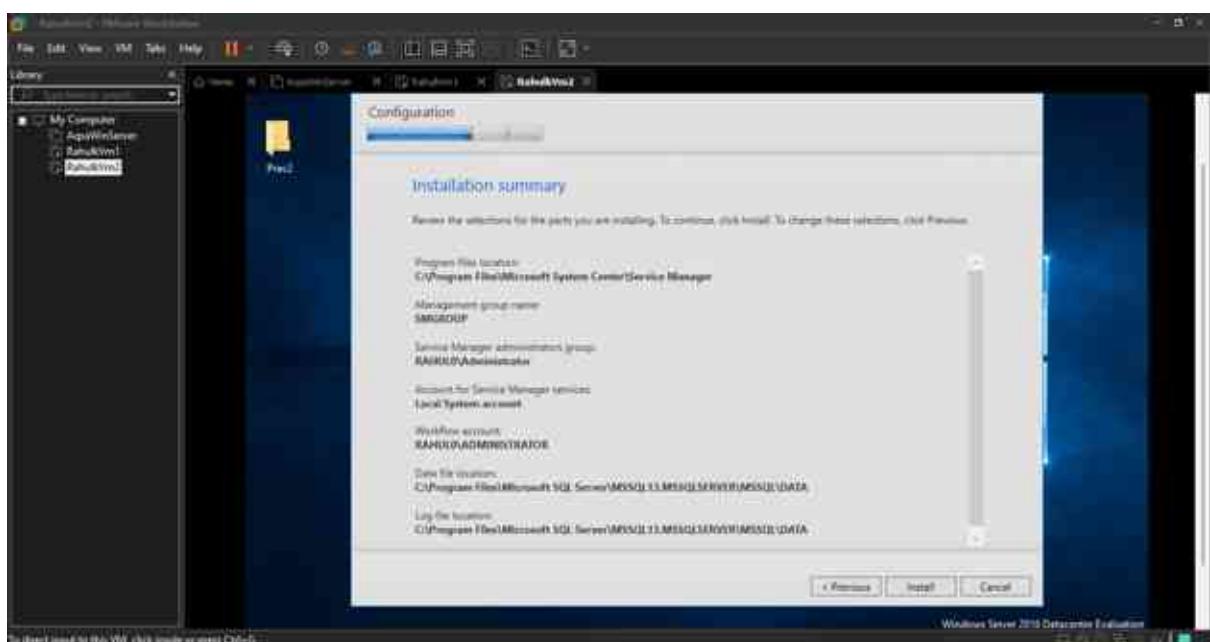
- Click Next



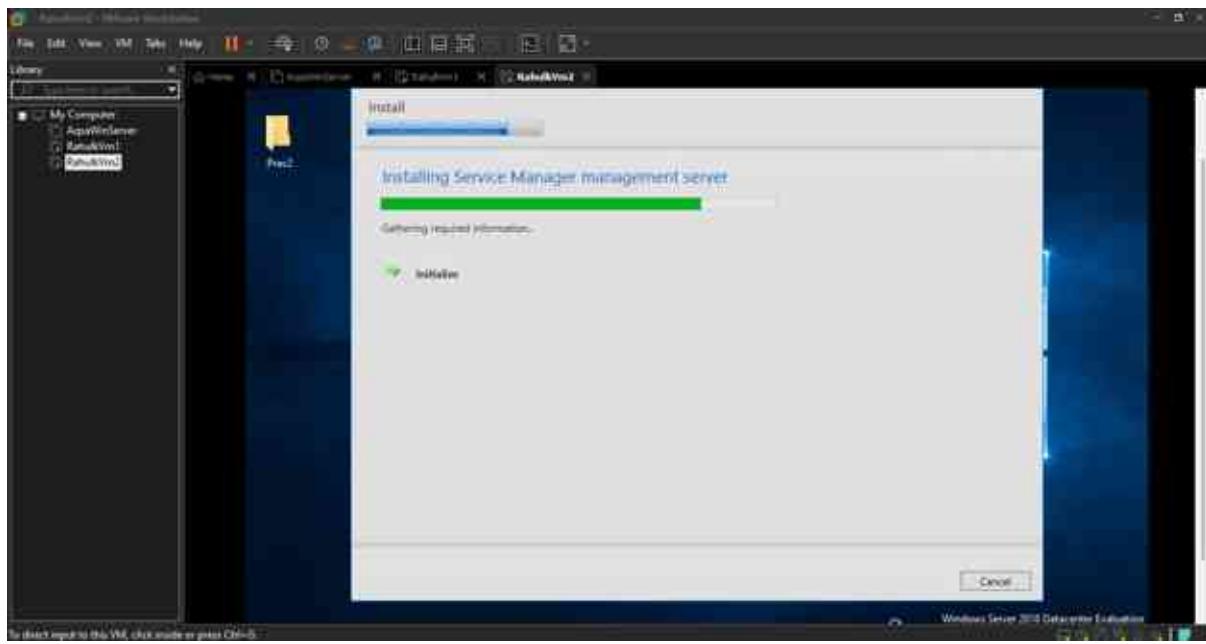
- Select I do not want Microsoft Updates and Click Next



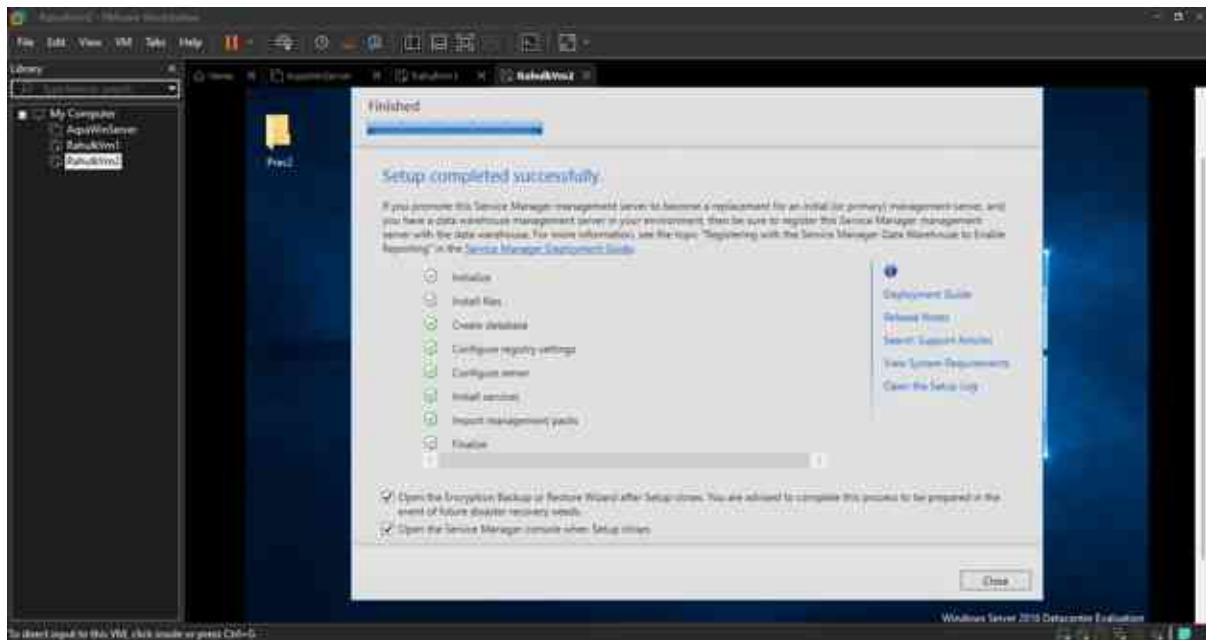
- Click Install



- Service Management Server will start installing

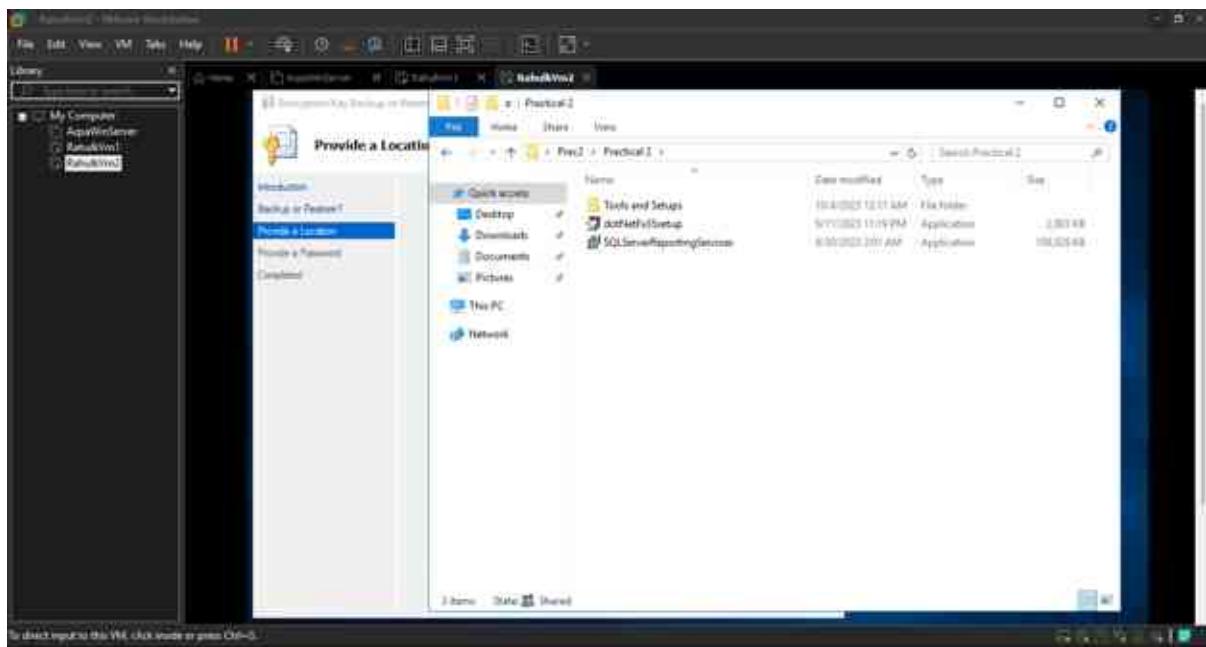


- The service management server is successfully created.

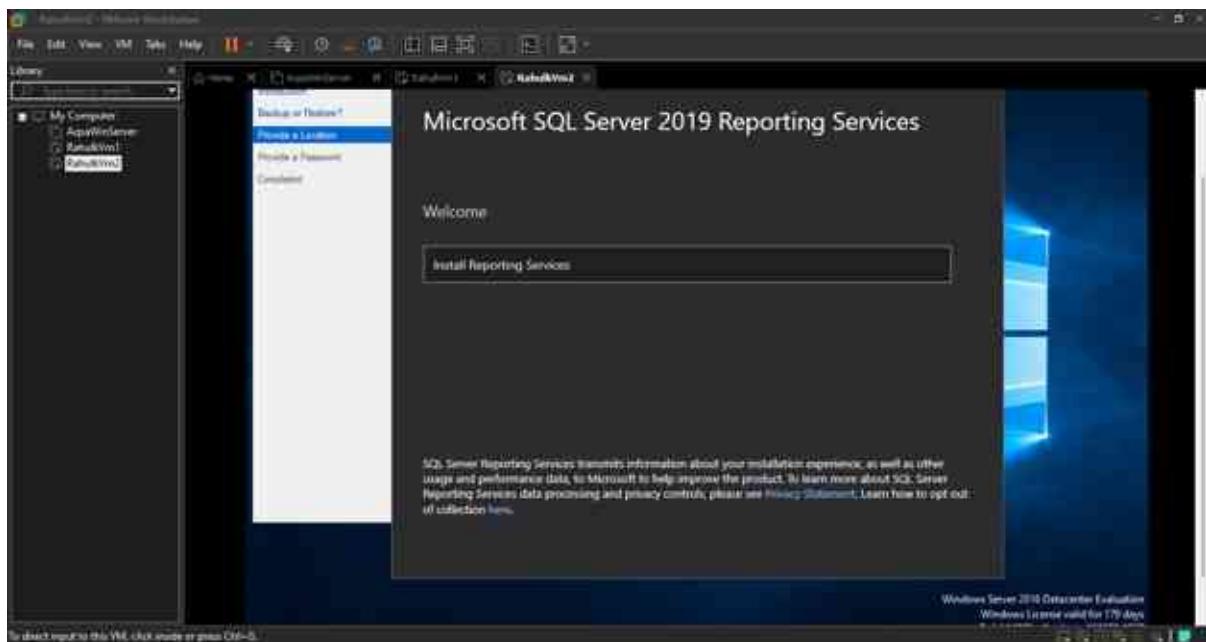


Step 6: Installing SQL Server Reporting Services

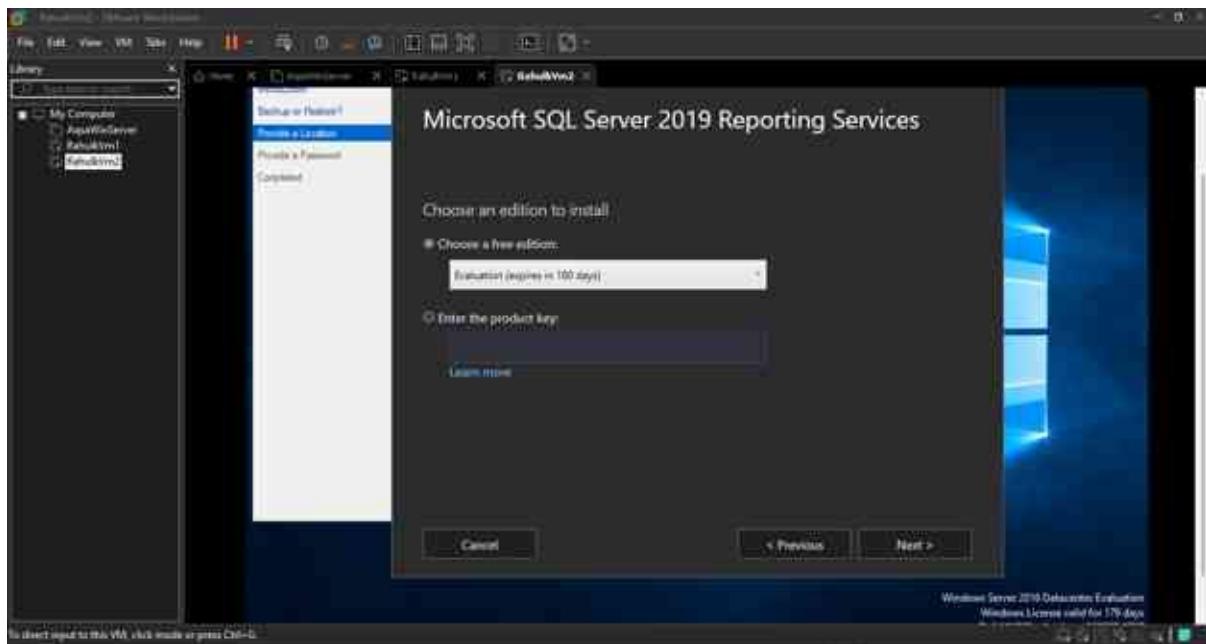
- Click on the **SQLSERVERREPORTINGSERVICES** installer



- Click on Install Reporting Services



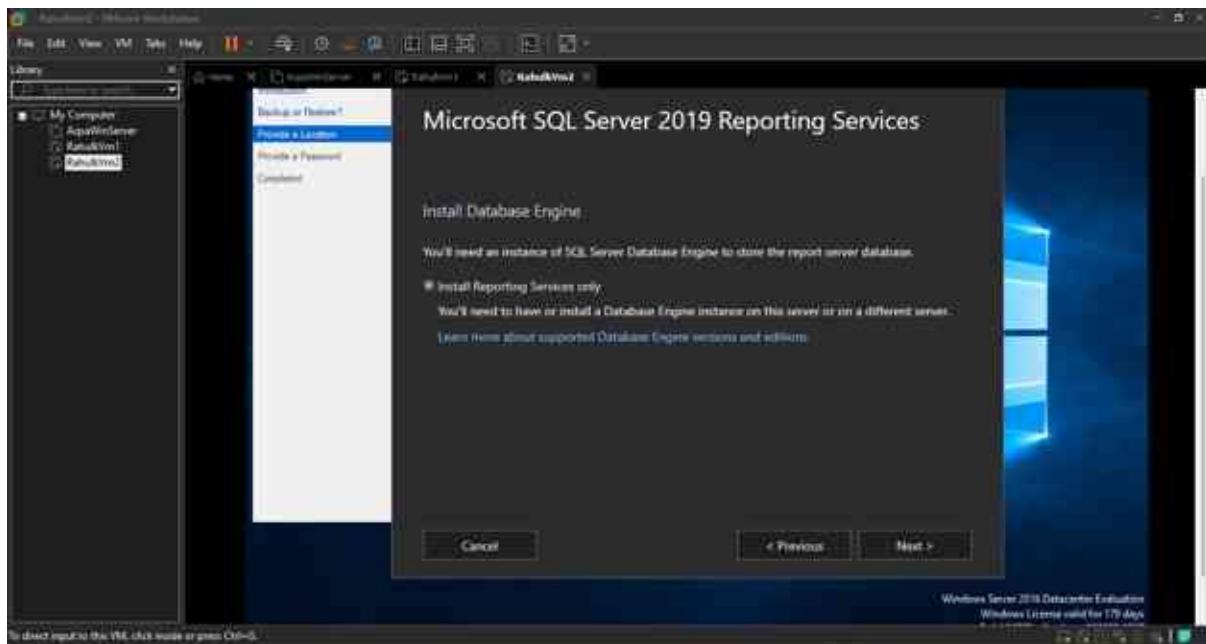
- Keep Default Setting Click on Next



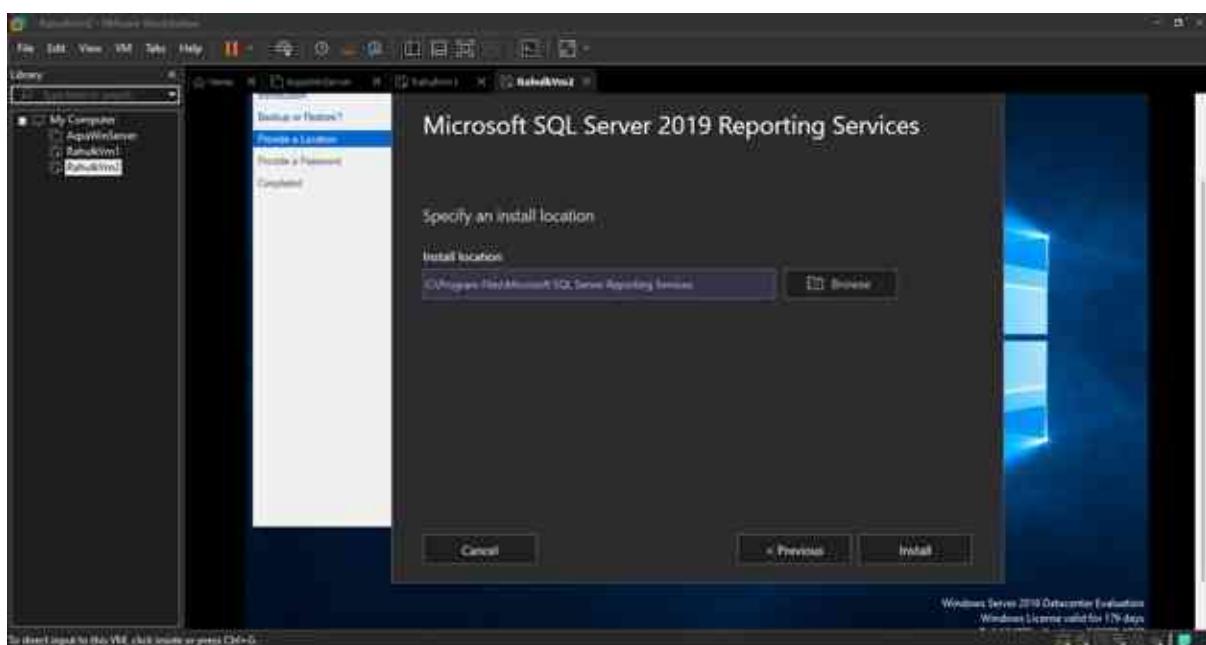
- Click on I accept the License term



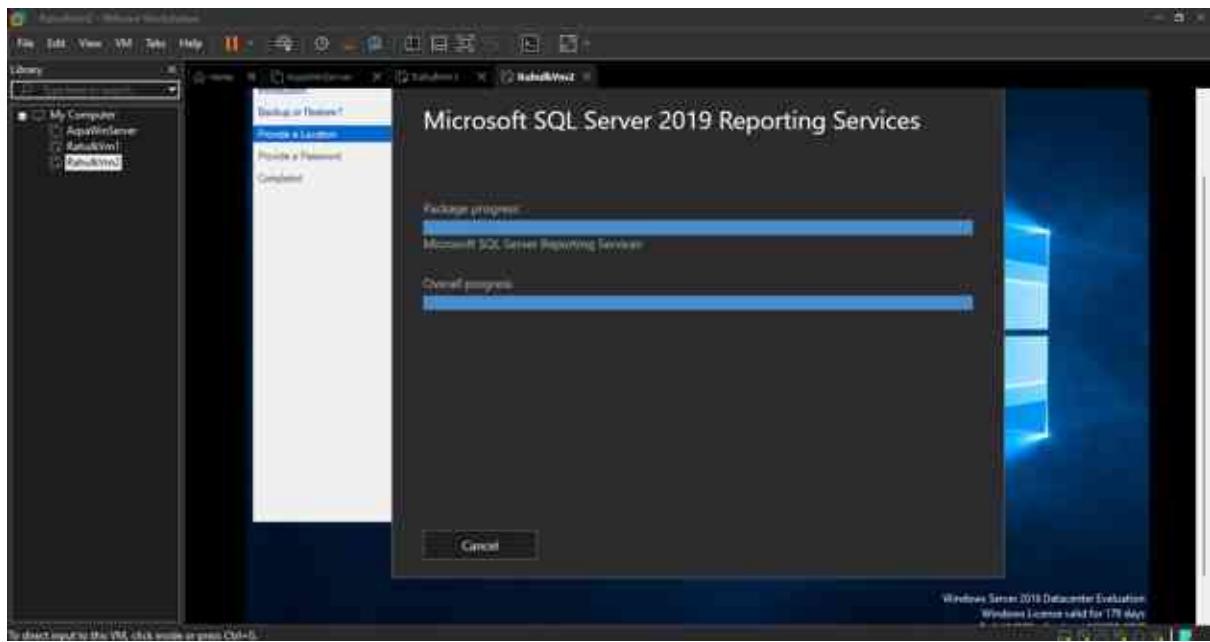
- Click on Next



- Click Next



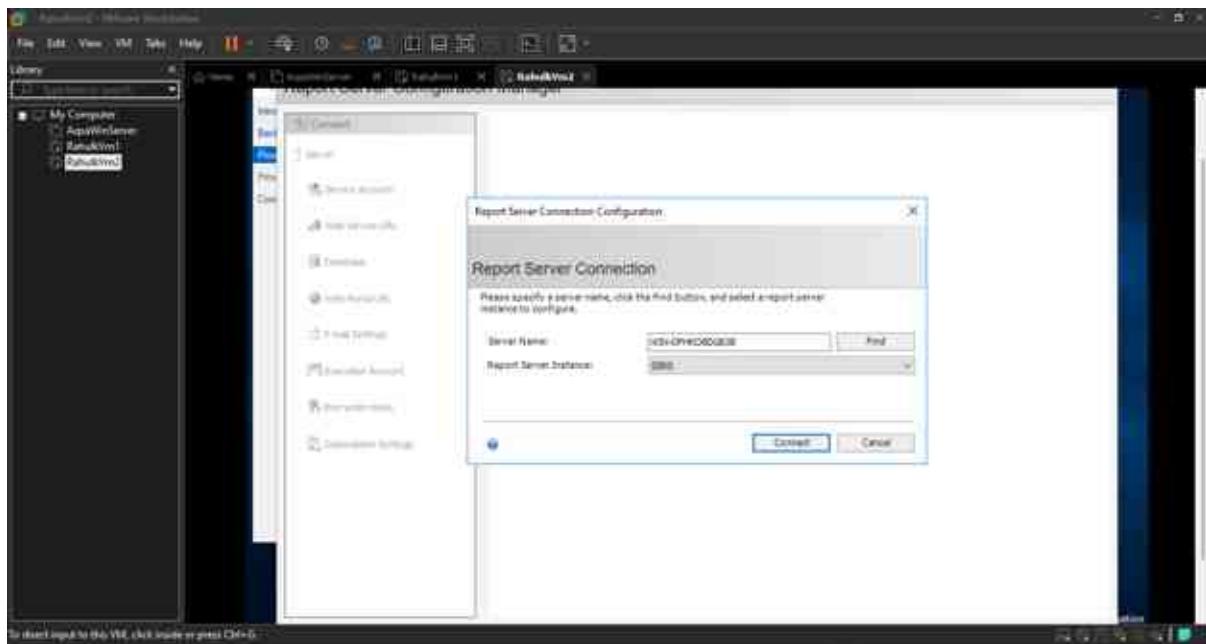
- Installation Process Start



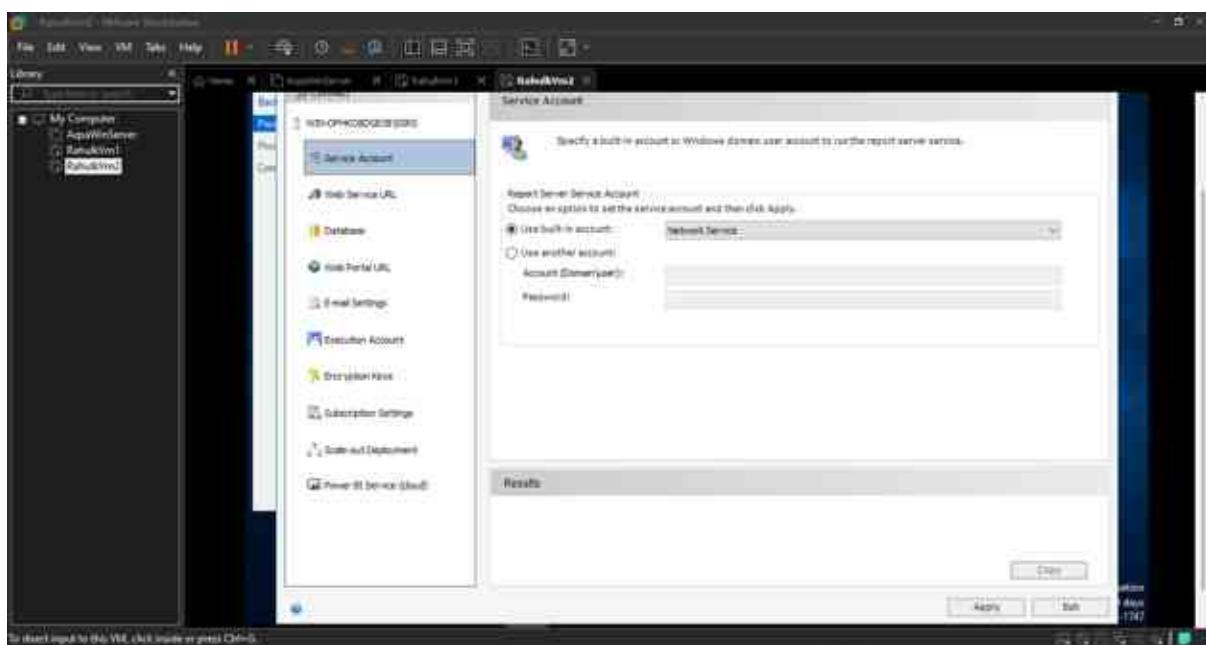
- After completion Click on **Configure Report Server**



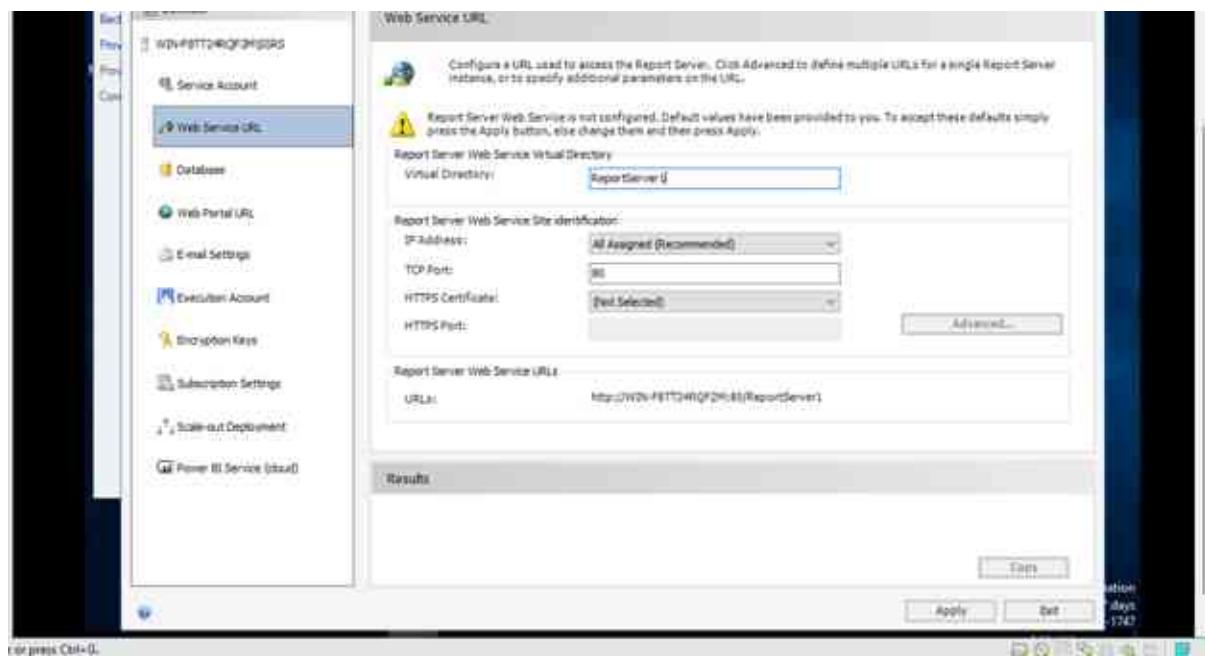
- Keep default values and Click on **Connect**



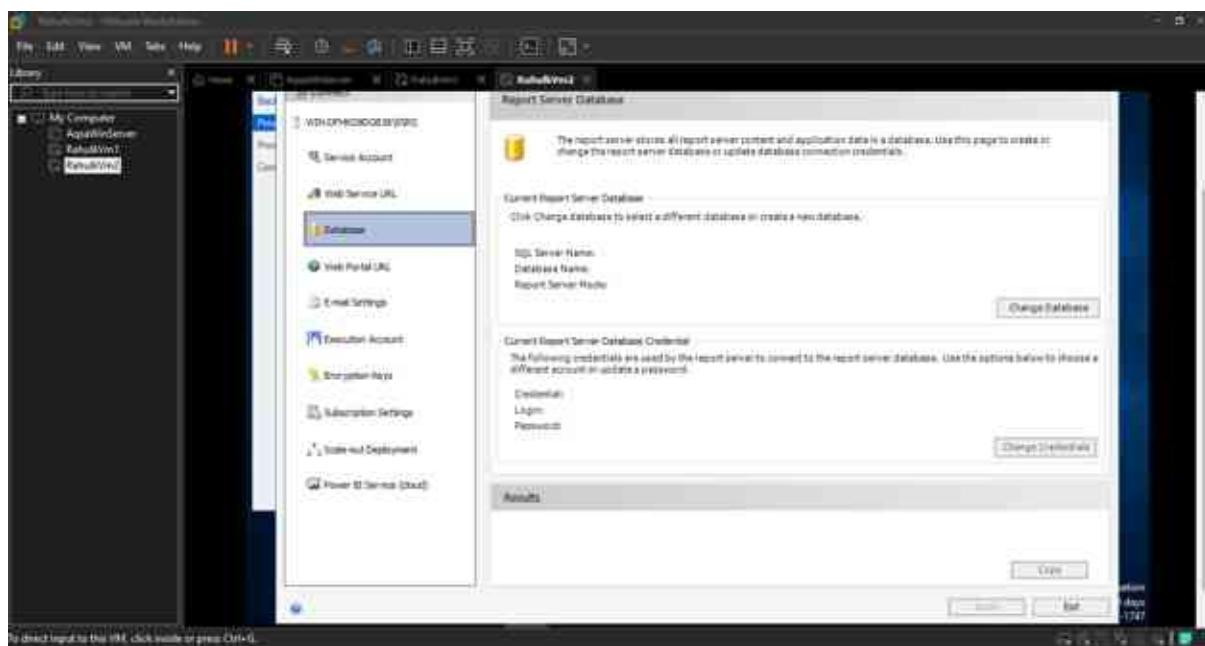
- Select **Service Account**, within service account in **Use built-in account** Select **Network Service** and Click **Apply**



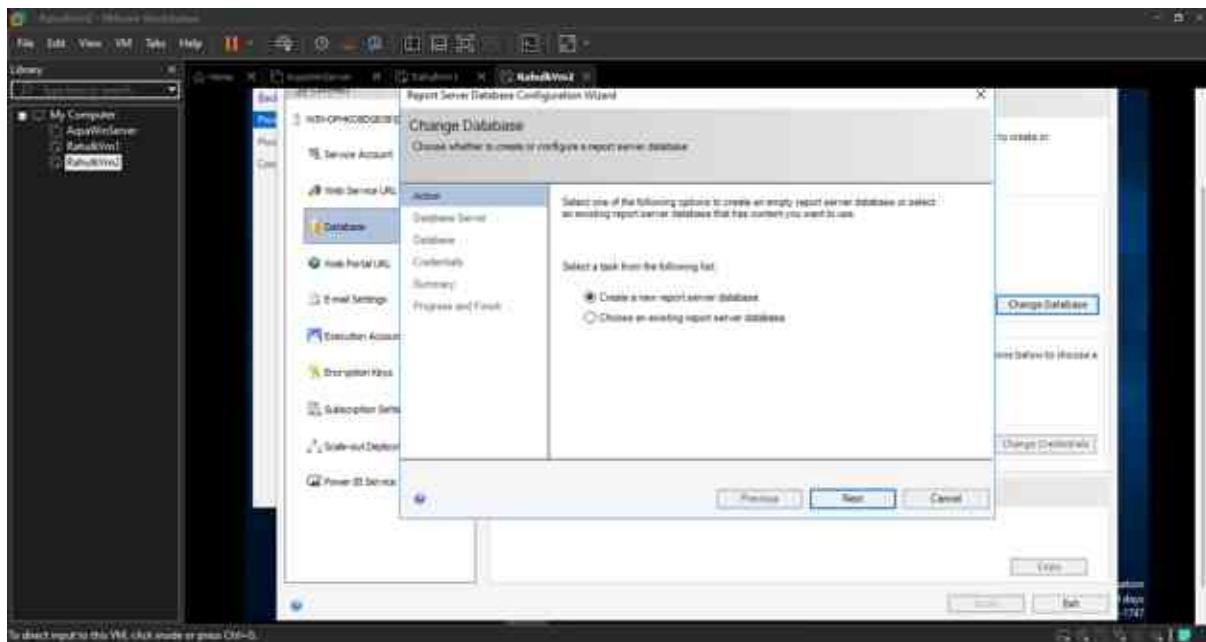
- Select **Web Service URL**, Change the Virtual Directory Value to **ReportServer1** and Click **Apply**



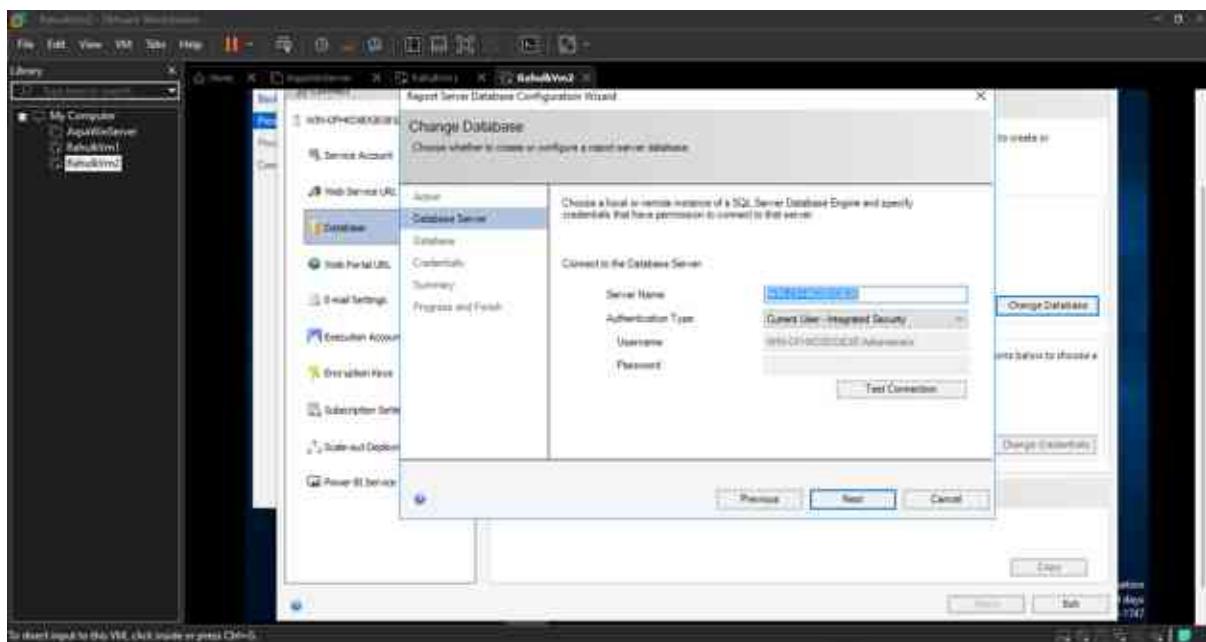
- Select **Database** and Click on **Change Database**



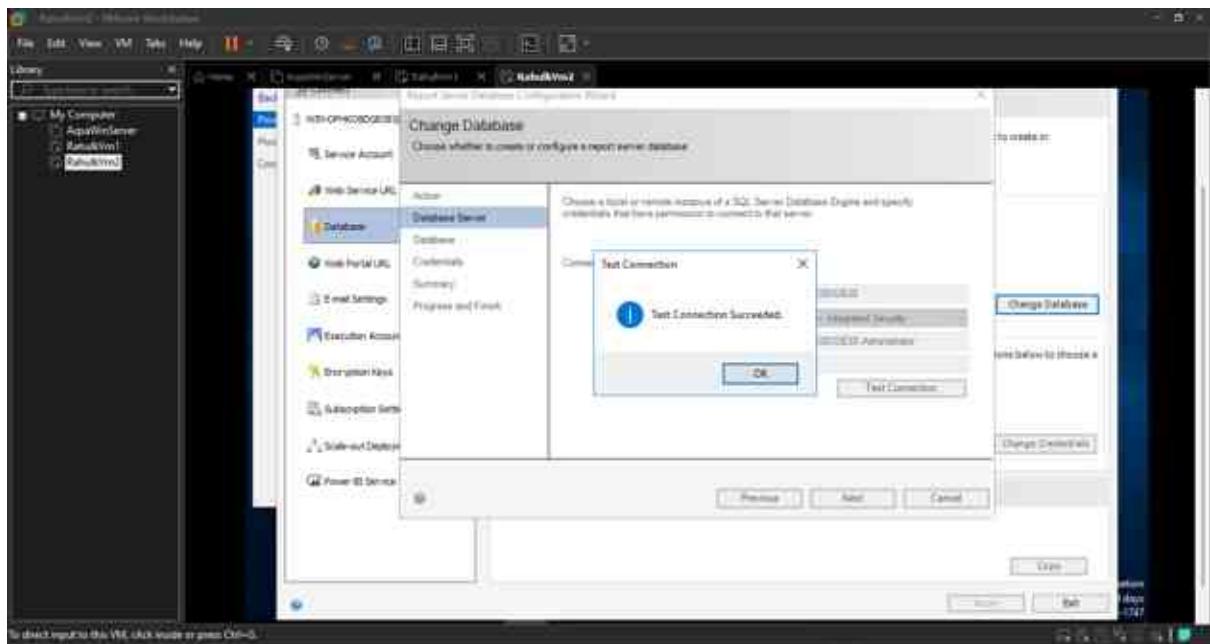
- Keep default values and Click **Next**



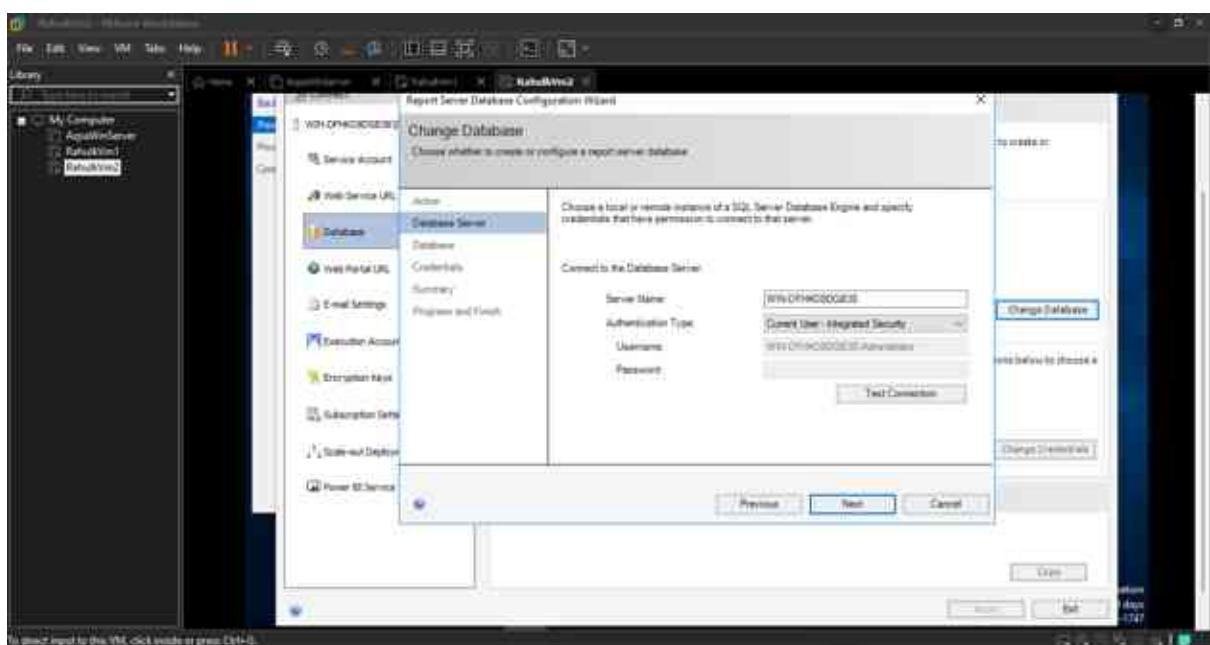
- Keep default values, Click on **Test Connection**



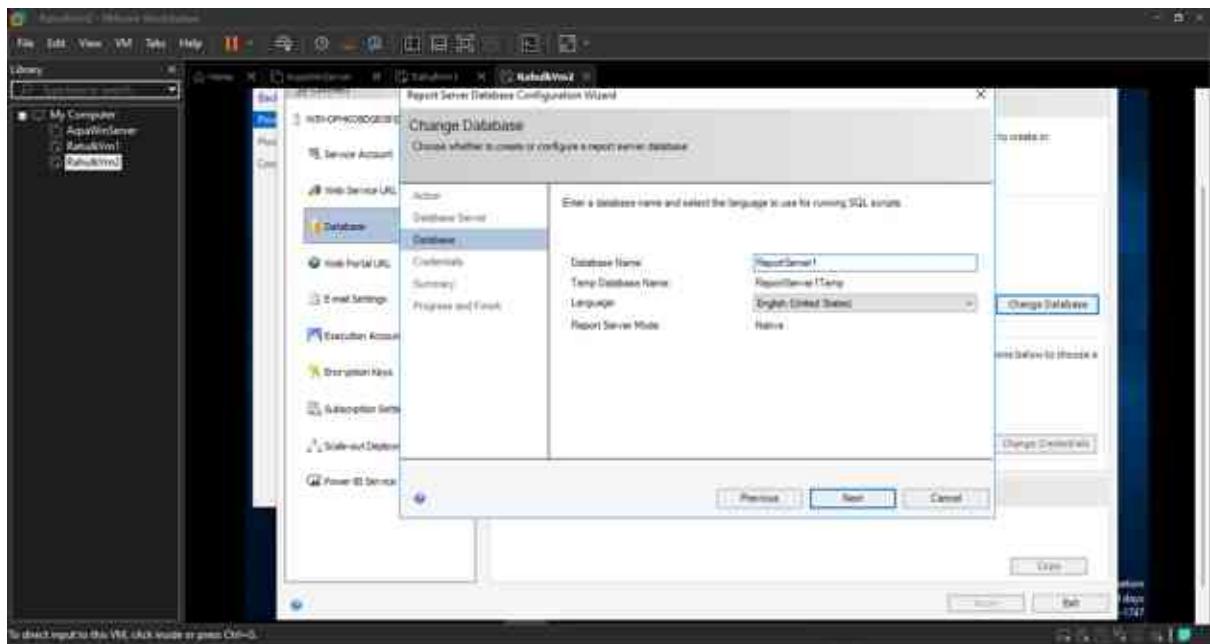
- Click on **OK**



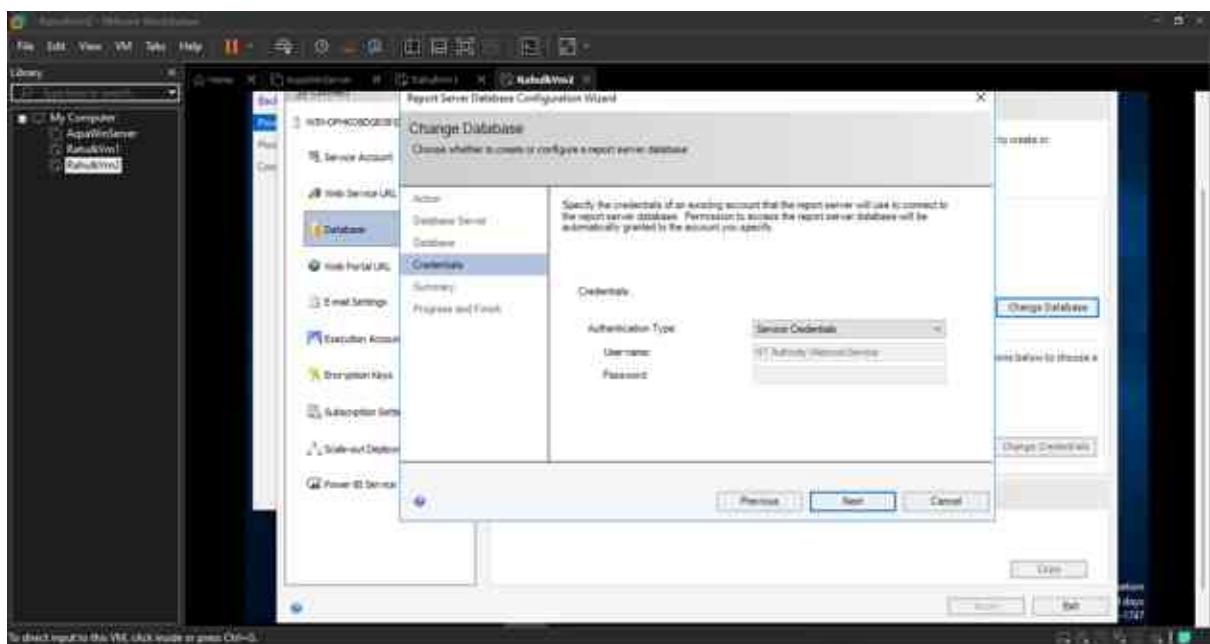
- Click on Next



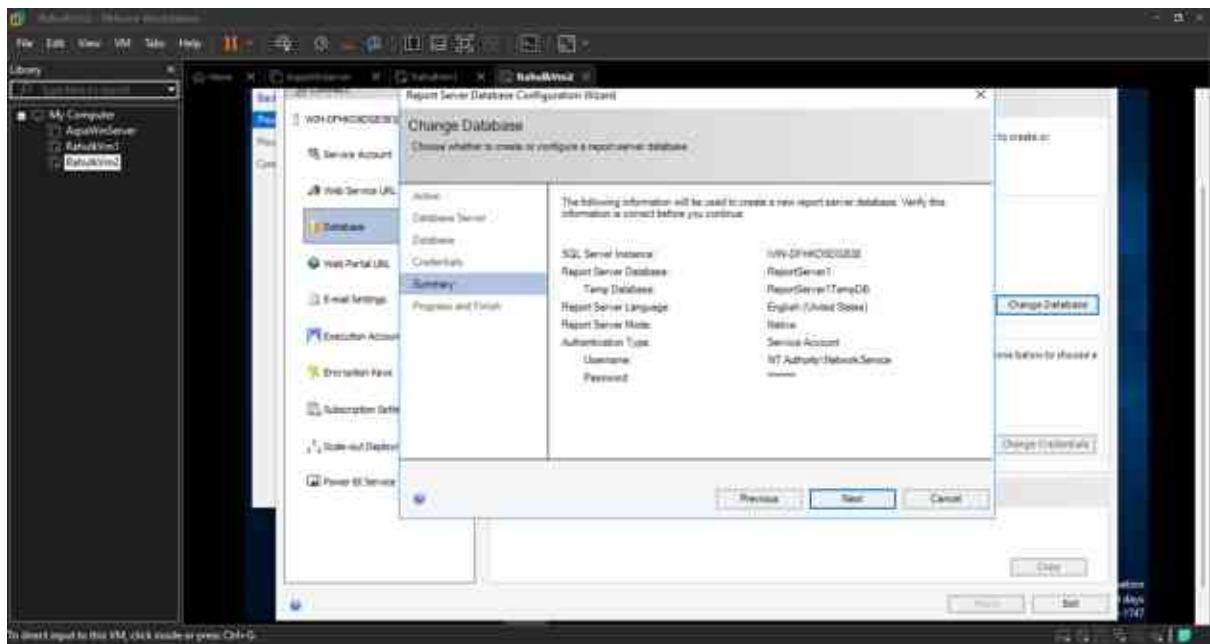
- Change Database name to **ReportServer1** and Click Next



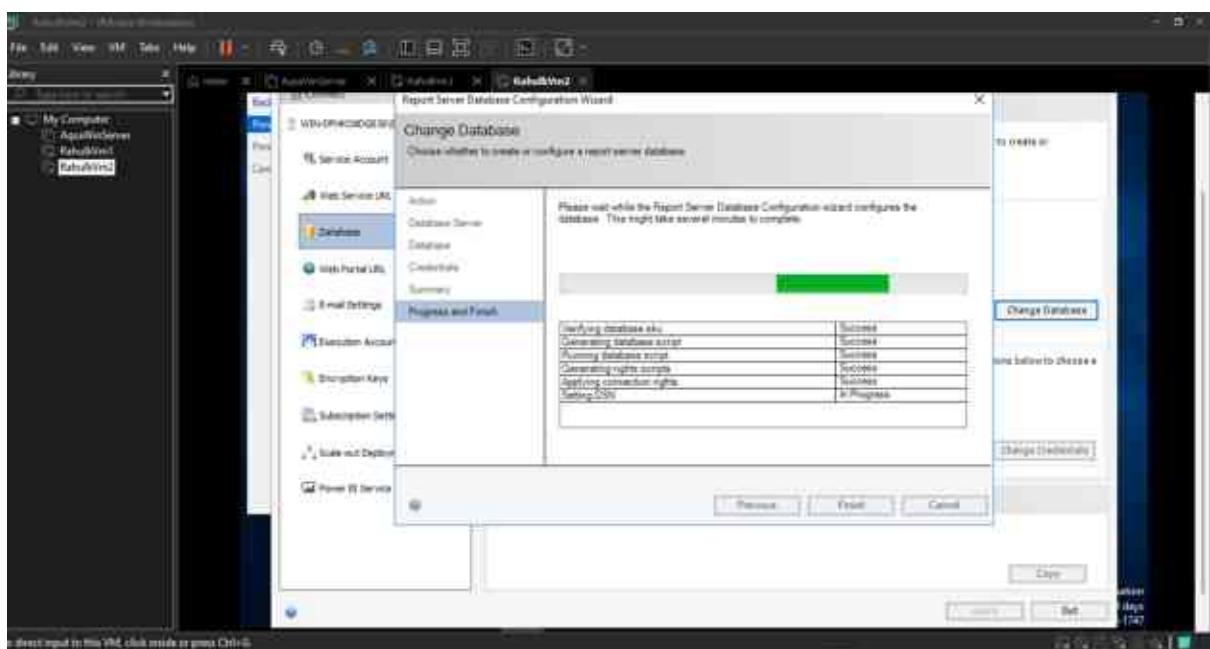
- Keep default values and Click **Next**



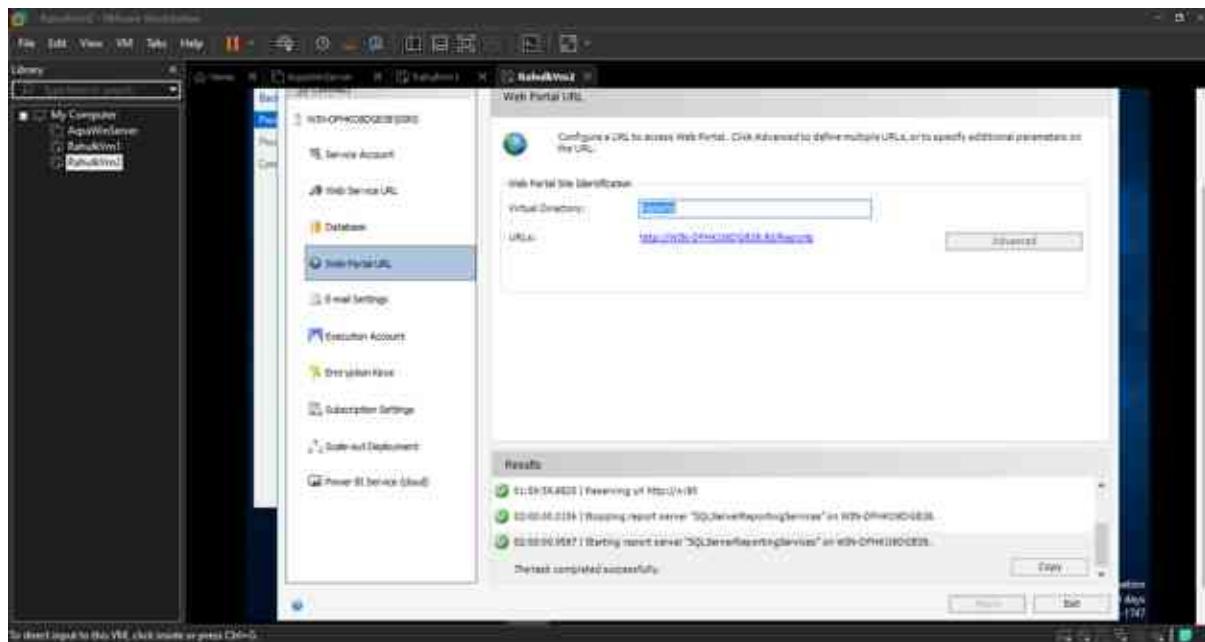
- Click on **Next**



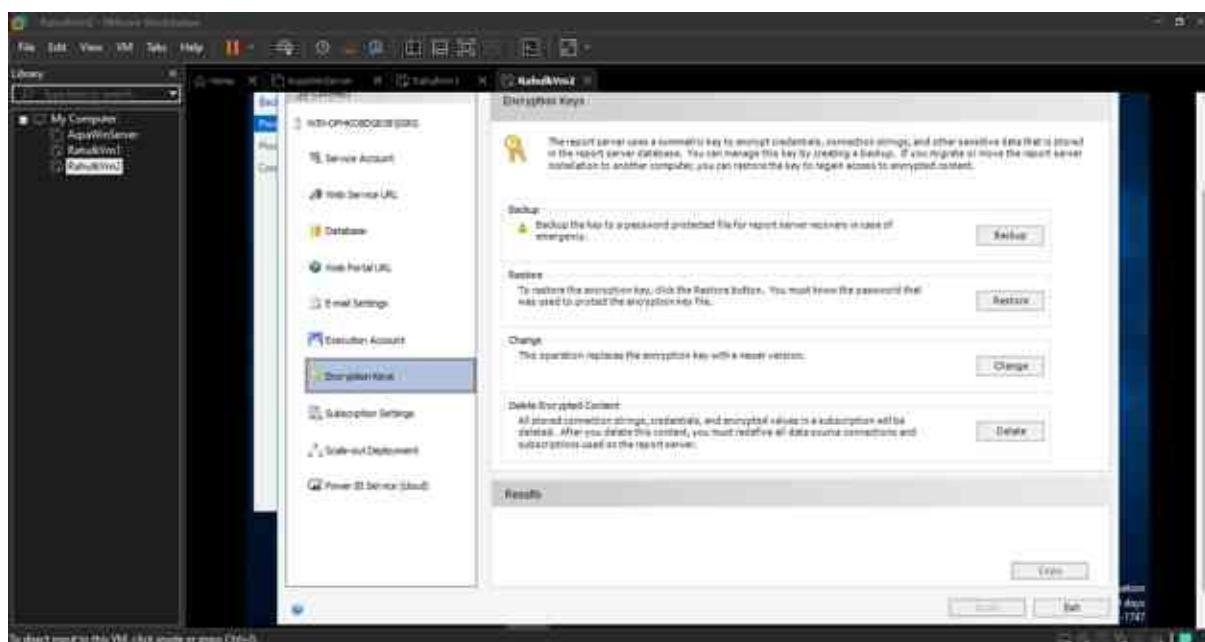
- Database configuration will install, after installation Click on **Finish**



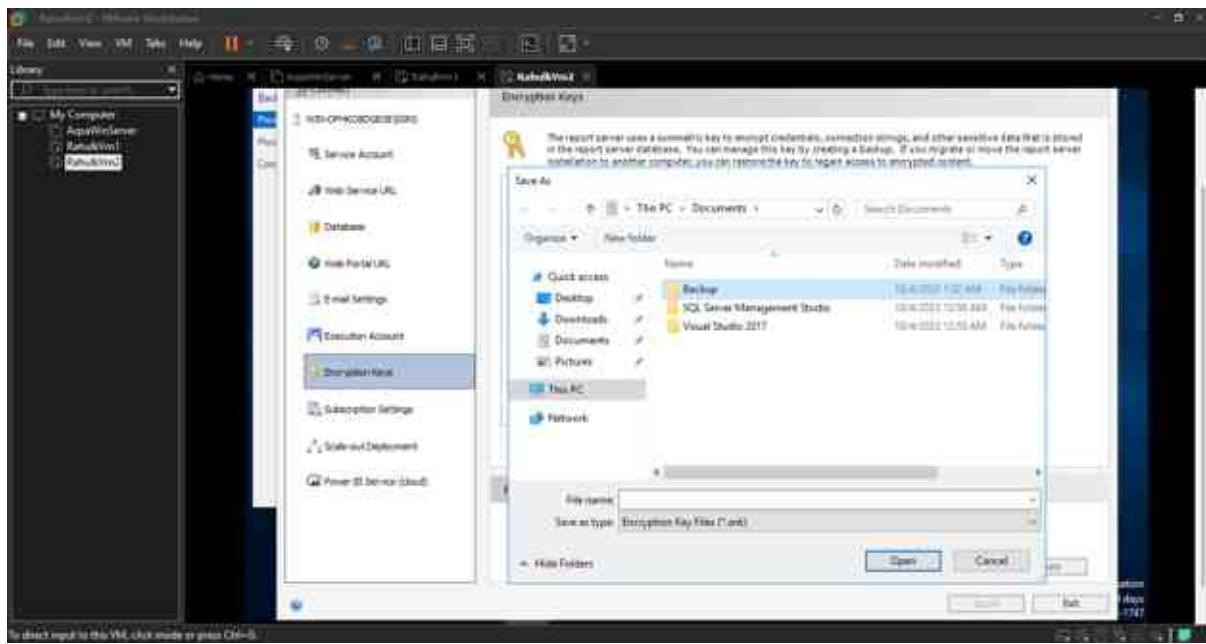
- Select **Web Portal URL** and keep a copy of the **url** on which your reports will be shown.



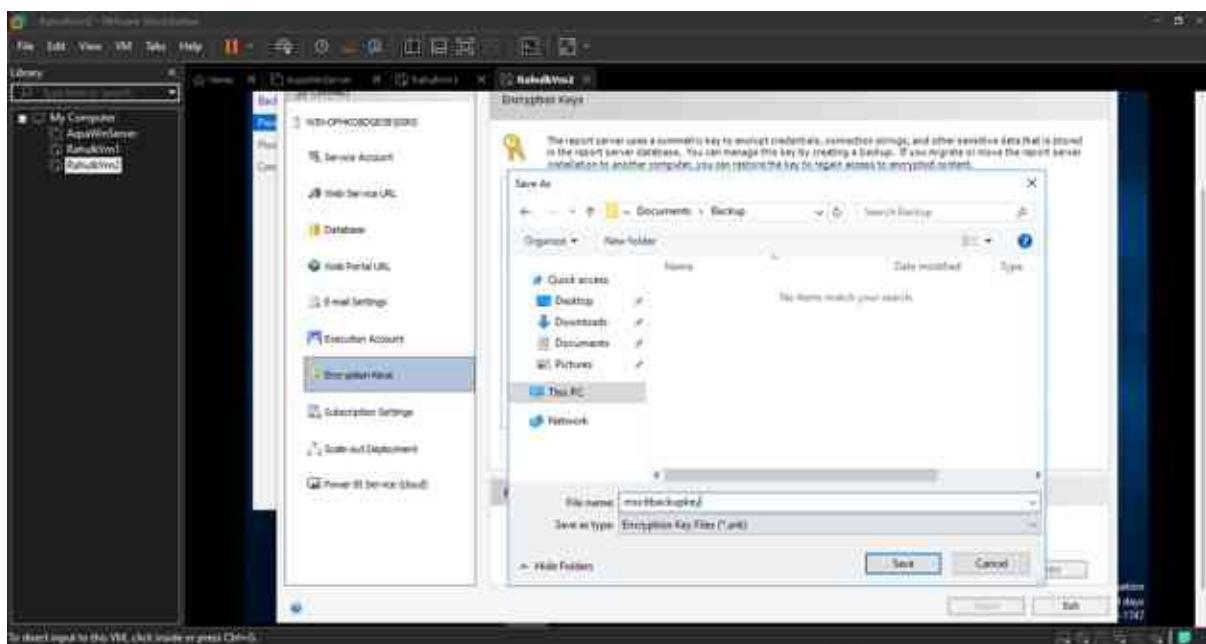
- Within your VM's Directory create a new folder named **Backup**
- Select **Encryption Keys** and Click on **Backup**



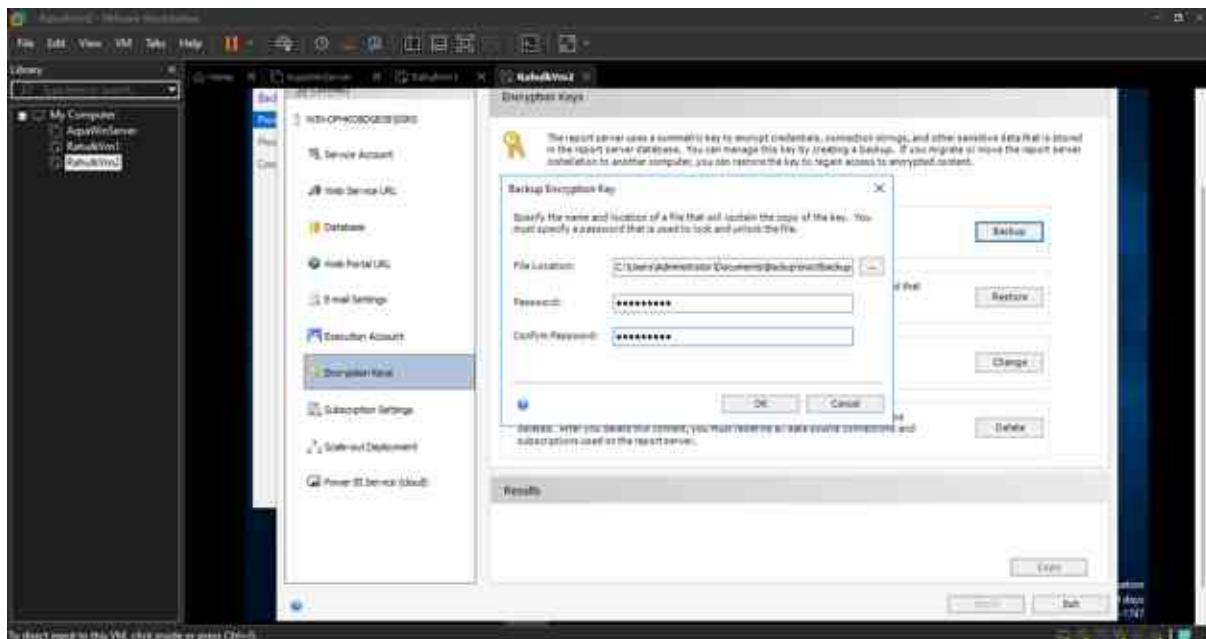
- Click on **Backup**



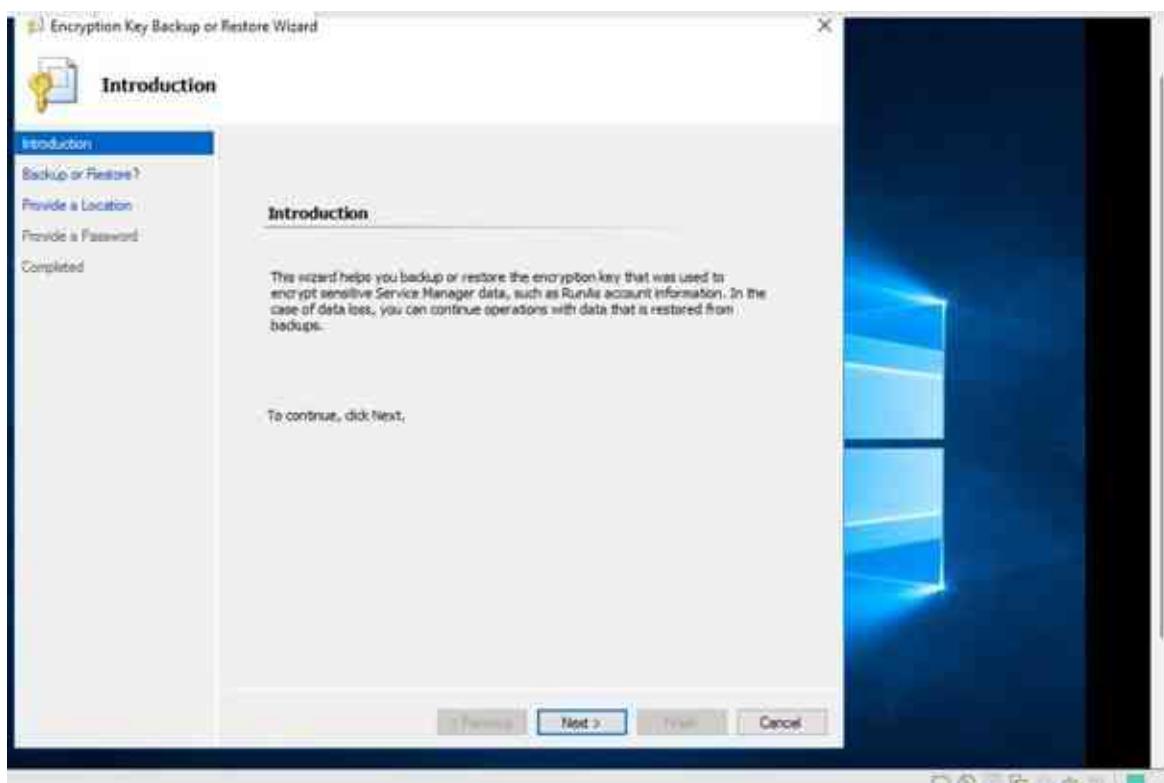
- Give File name **mscitbackupkey** and Click on Save



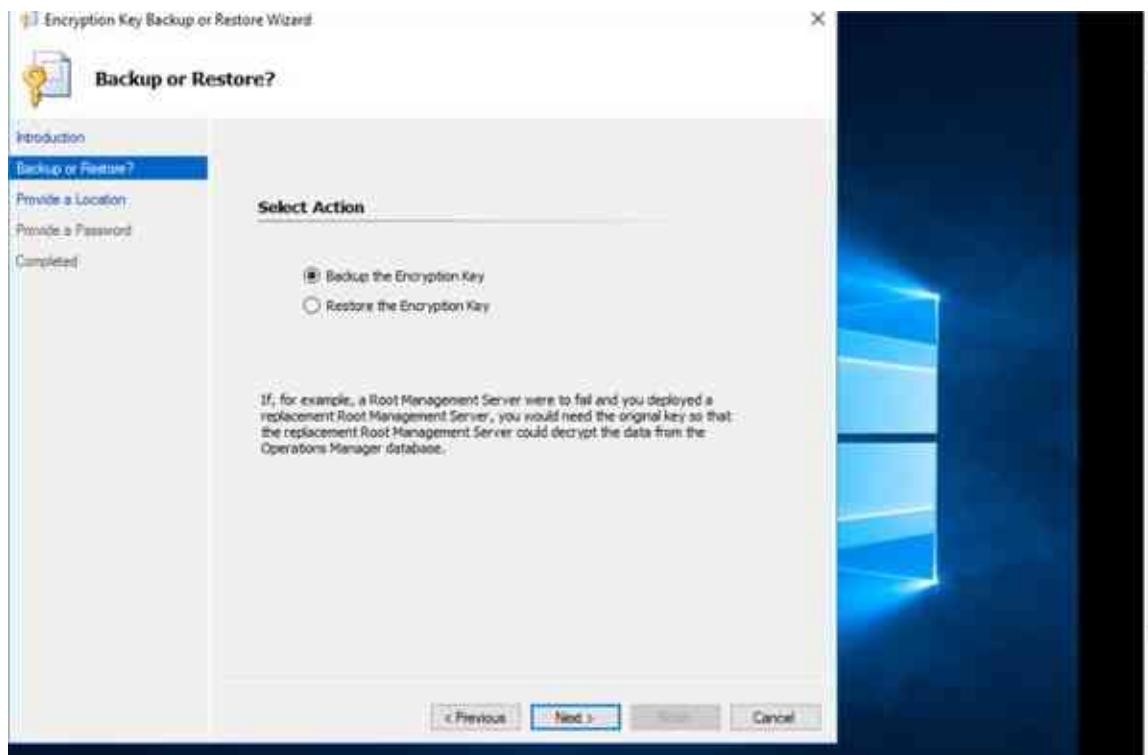
- Browse the folder that you just created and save a new file under any name (Here it is ReportServer1) and give it a password and Click Ok



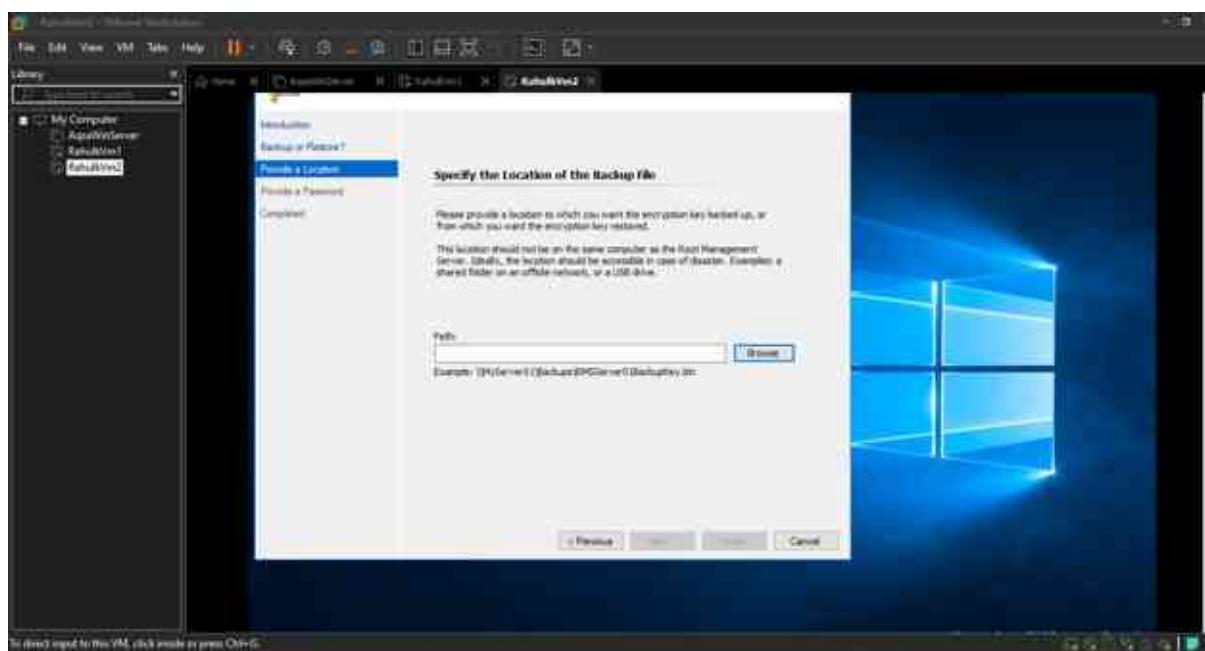
- Now go back to the SCSM setup and continue from Encryption Key Backup, Click **Next**



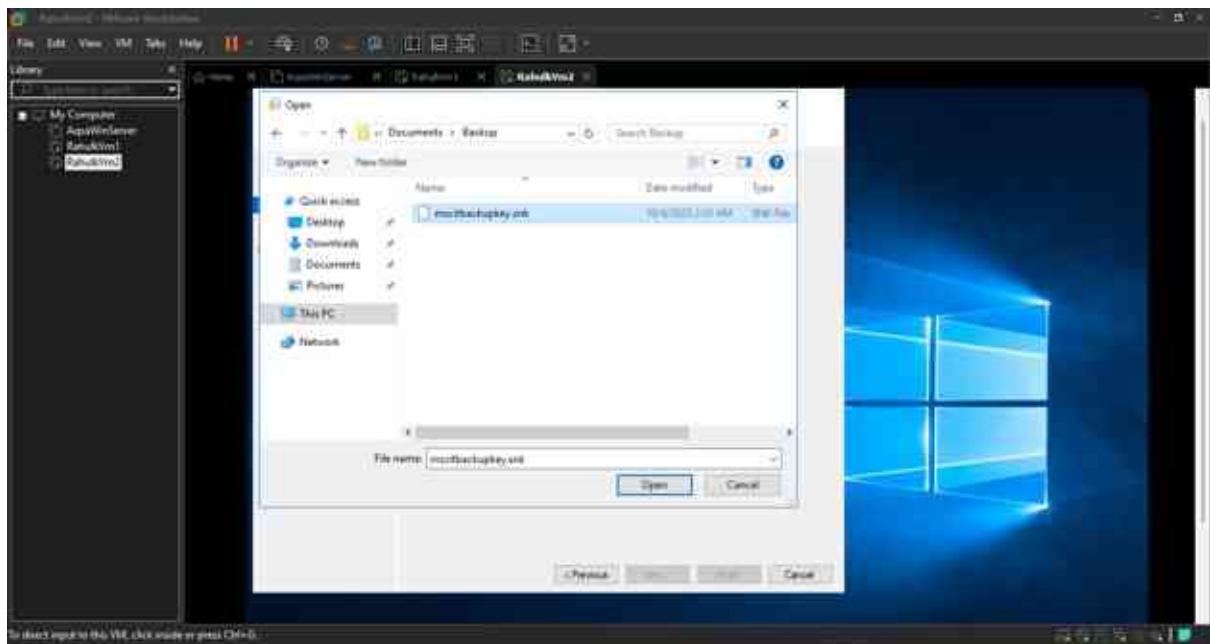
- Keep default values and Click **Next**



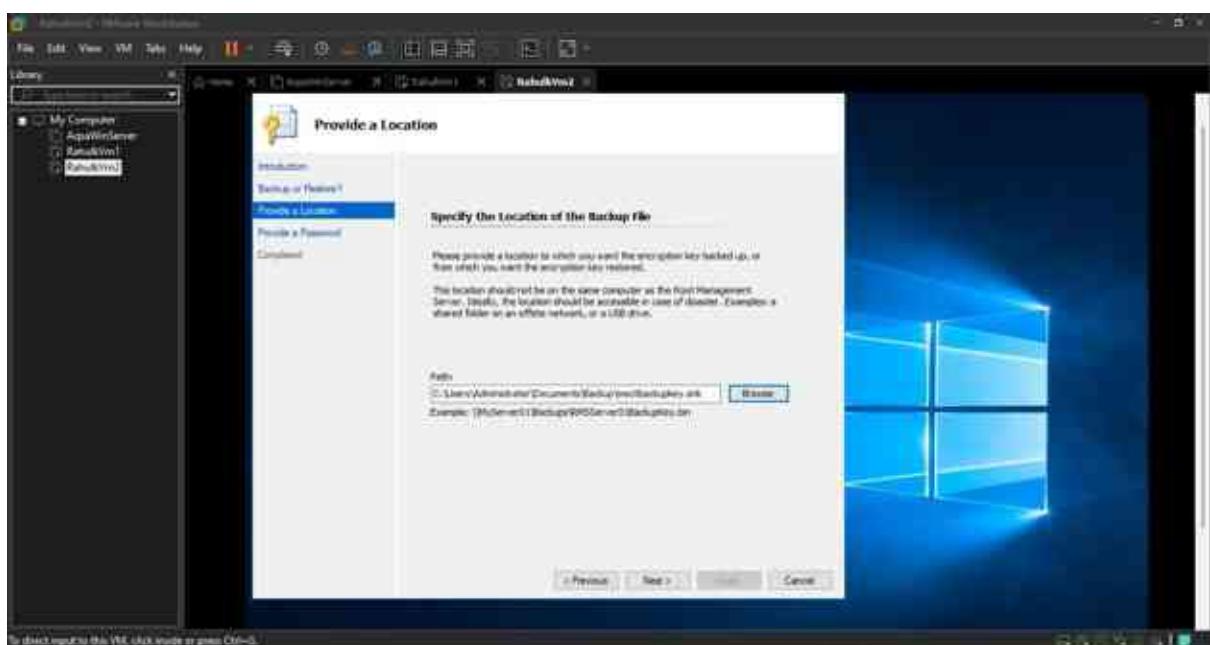
- Click on Browser



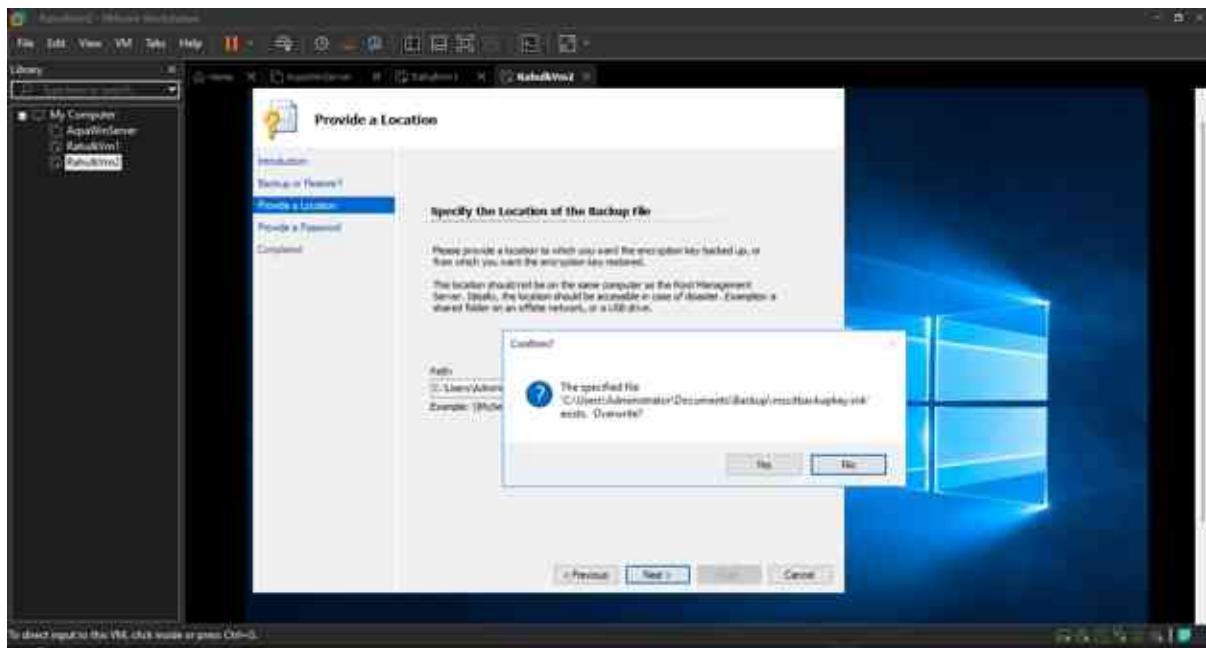
- Select **mscitbackupkey.snk** folder and Click on Open



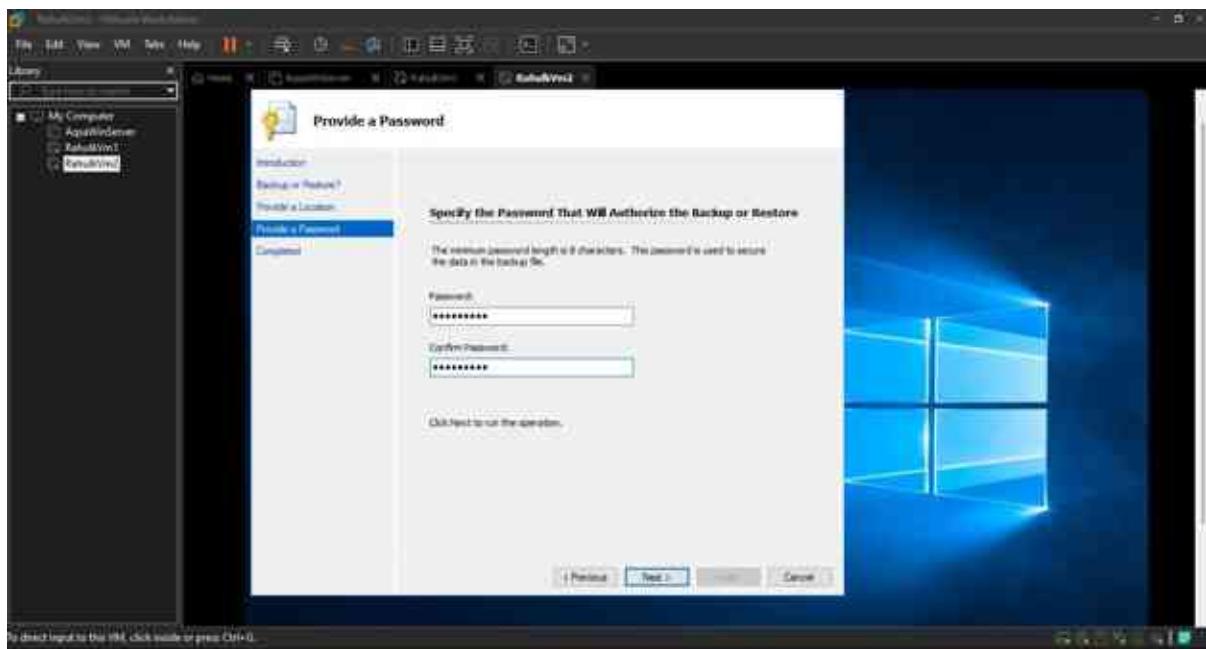
- Click Next



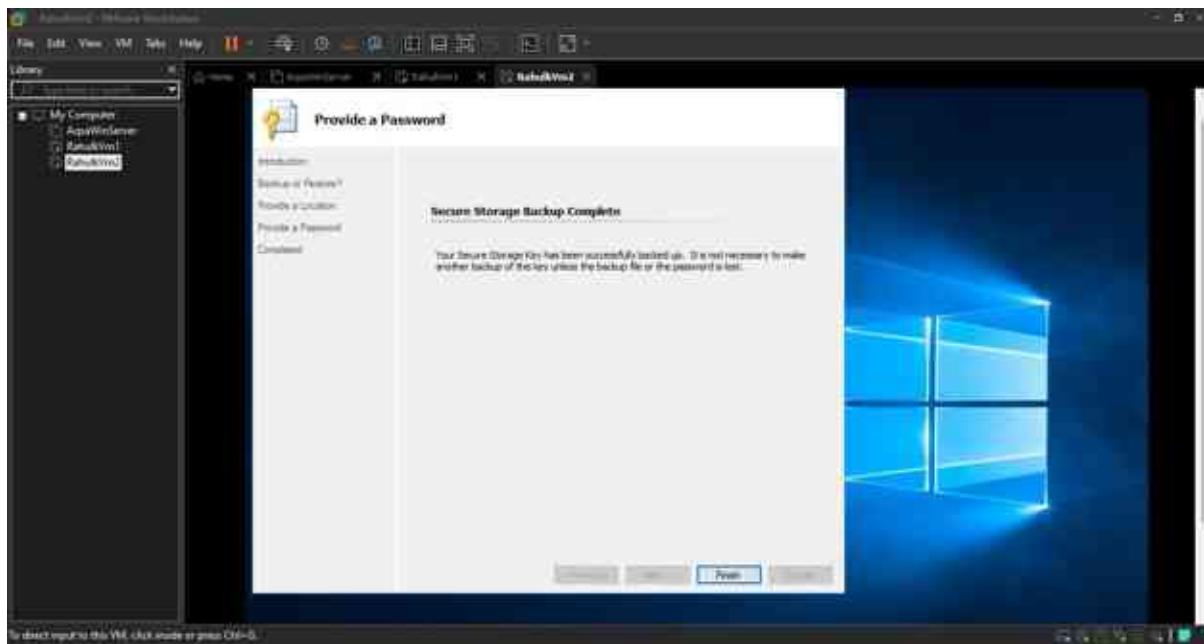
- Click on Yes



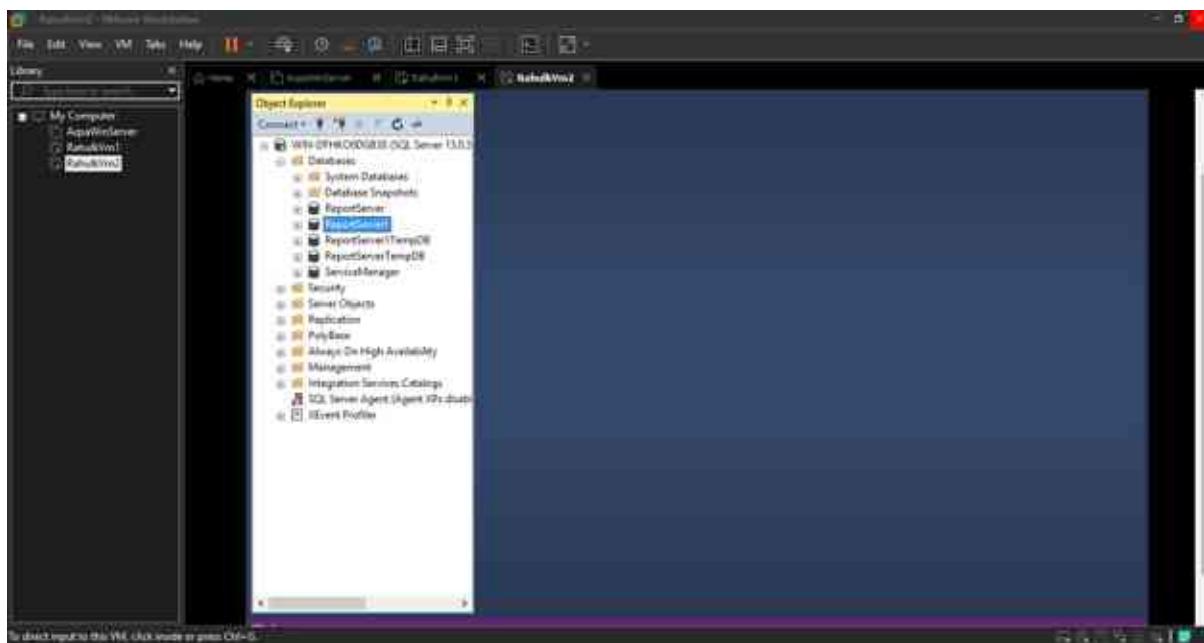
- Enter the password and Click Next



- Click on Finish



- Now within your SSMS you can see the new database that has been created



Practical: 3

Practical 3A: Installing System Centre Orchestrator

Aim: Installing System Centre Orchestrator

Pre-requisites:

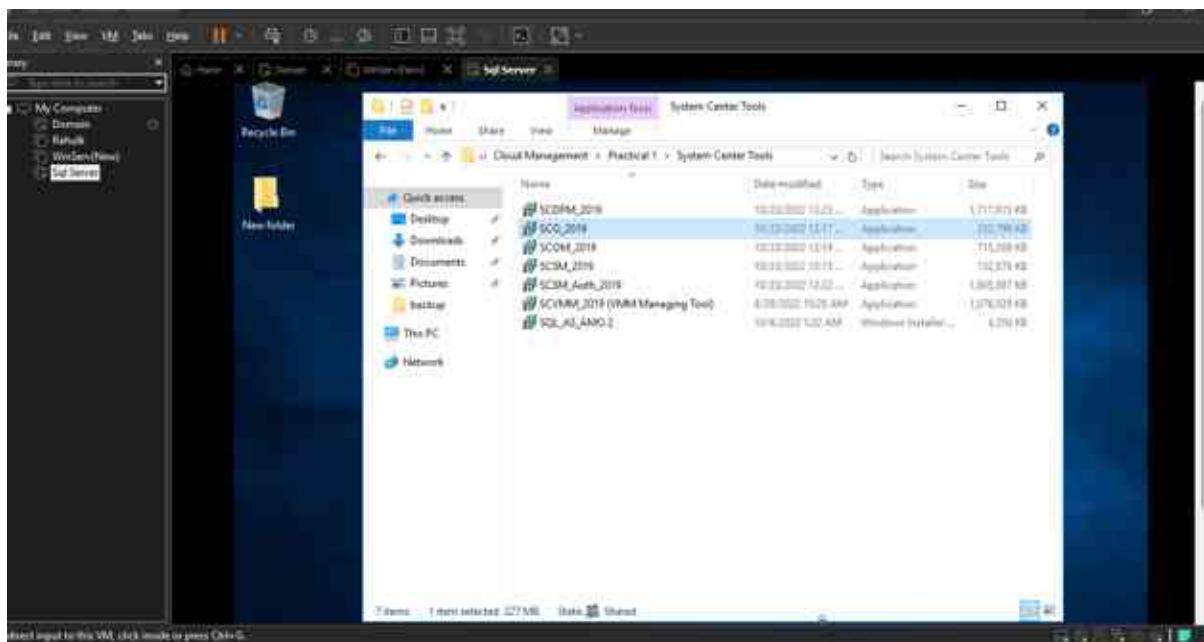
Using the two Computer scenario same as practical 2 we can use the Same Domain Controller and SQL instance in this practical

Feature require:

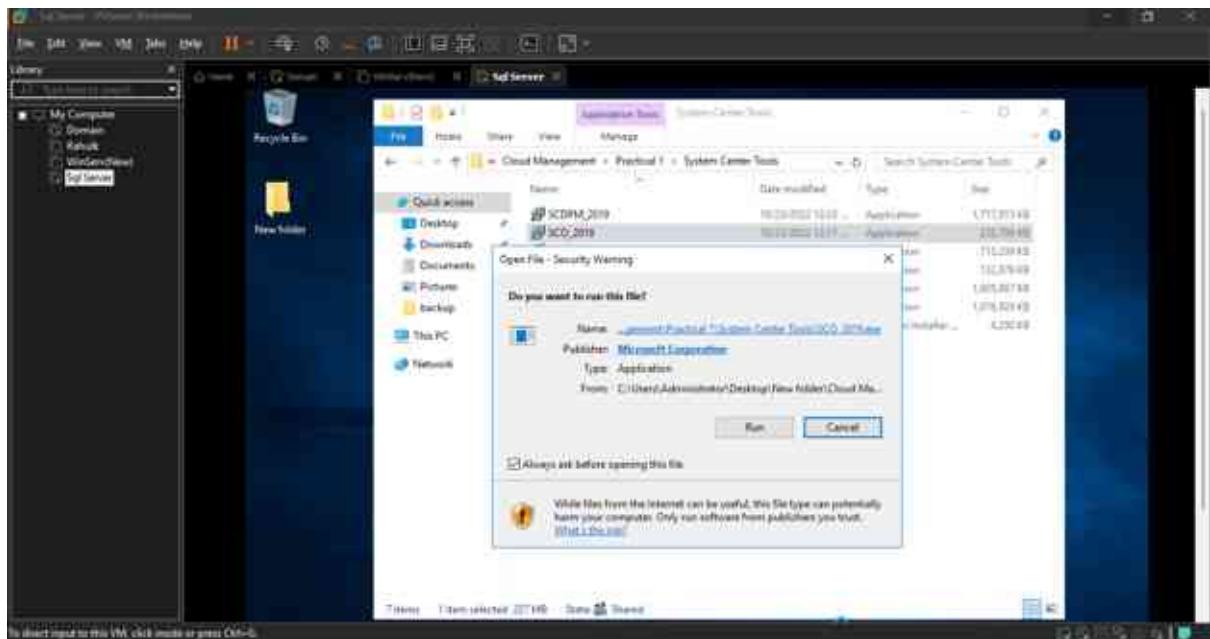
- System Centre Orchestrator 2019

Step 1: Installing System Center Orchestrator 2019

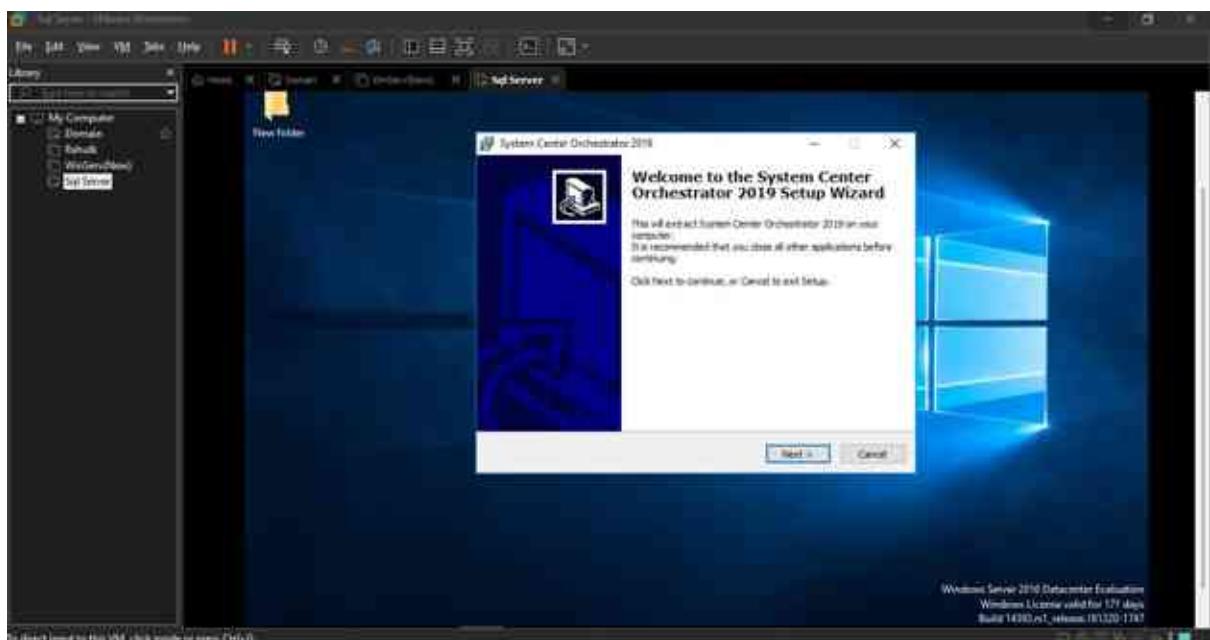
- Click on SCO_2019



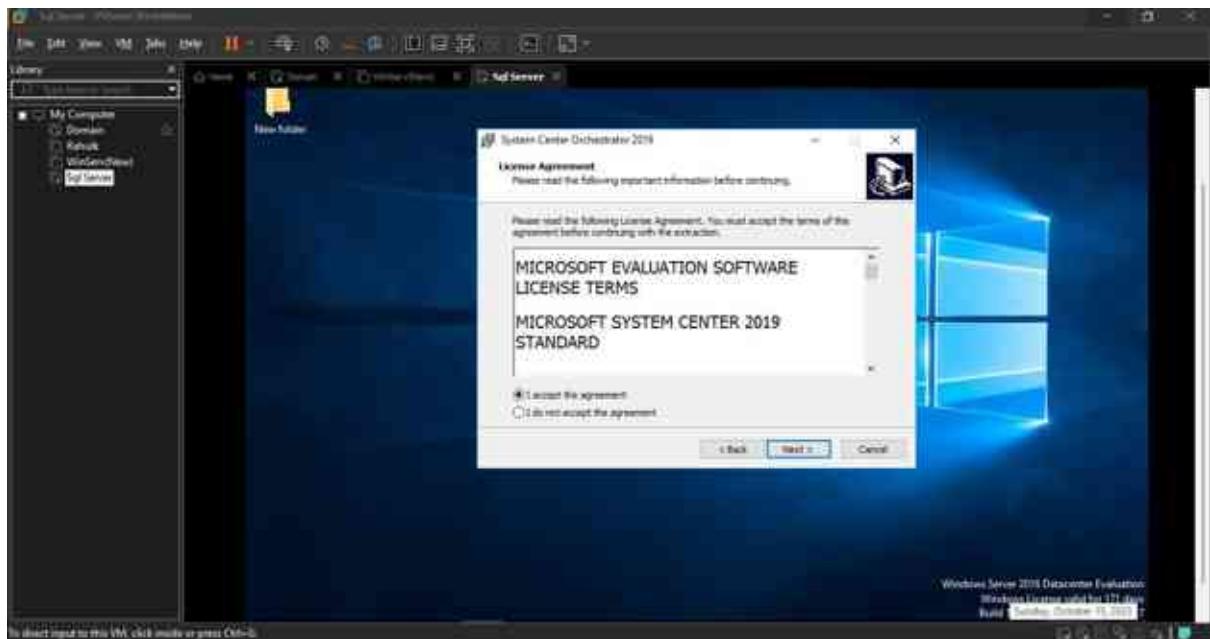
- Click on Run



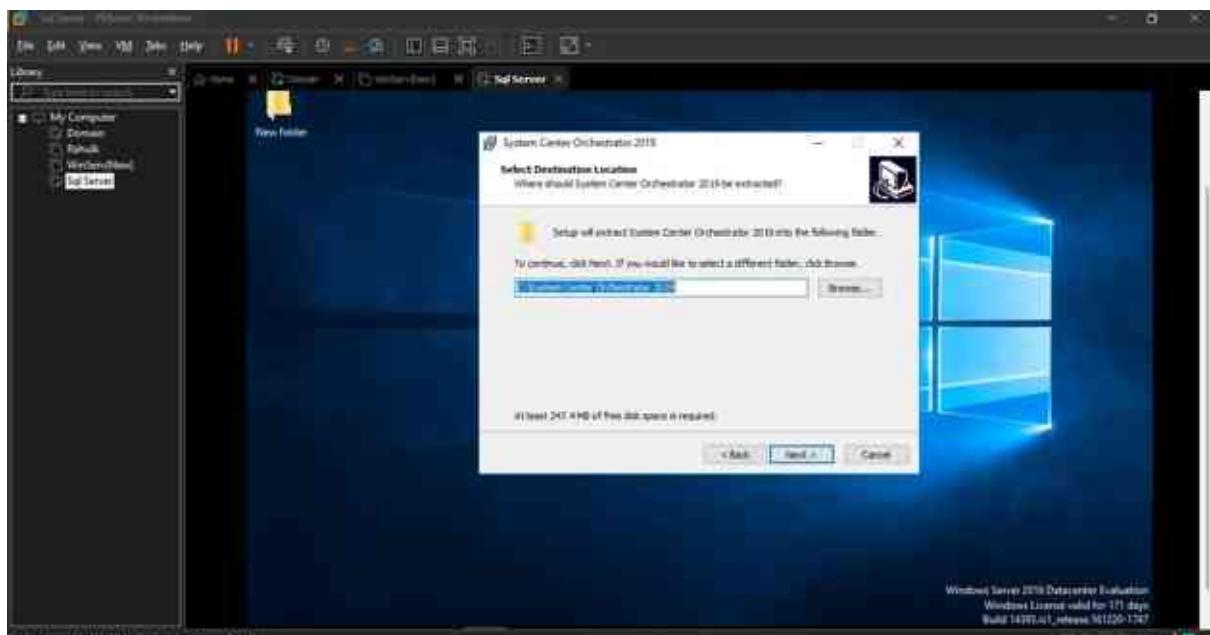
- Click on Next



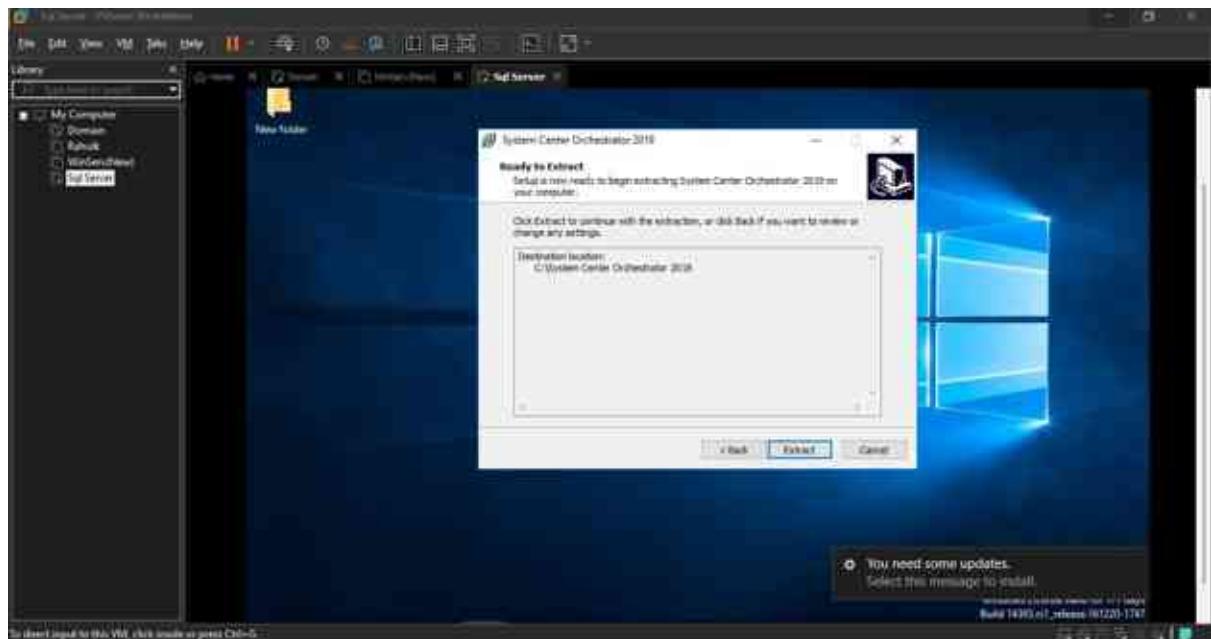
- Select I accept the agreement and Click Next



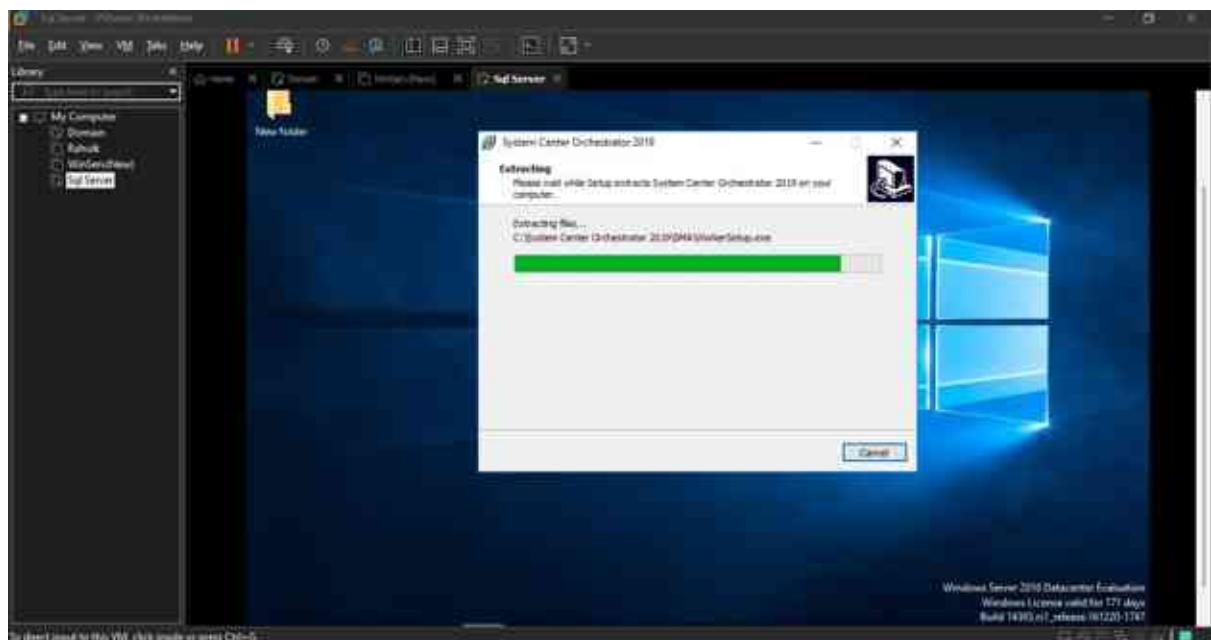
- Keep the default value and Click on Next



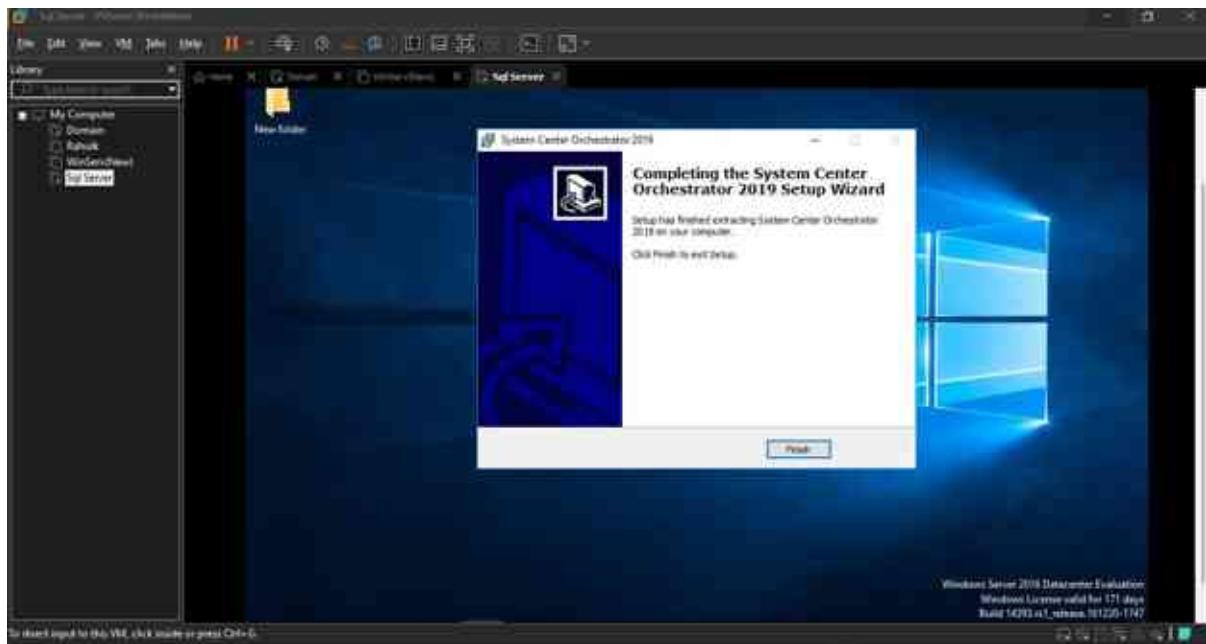
- Click on Extract



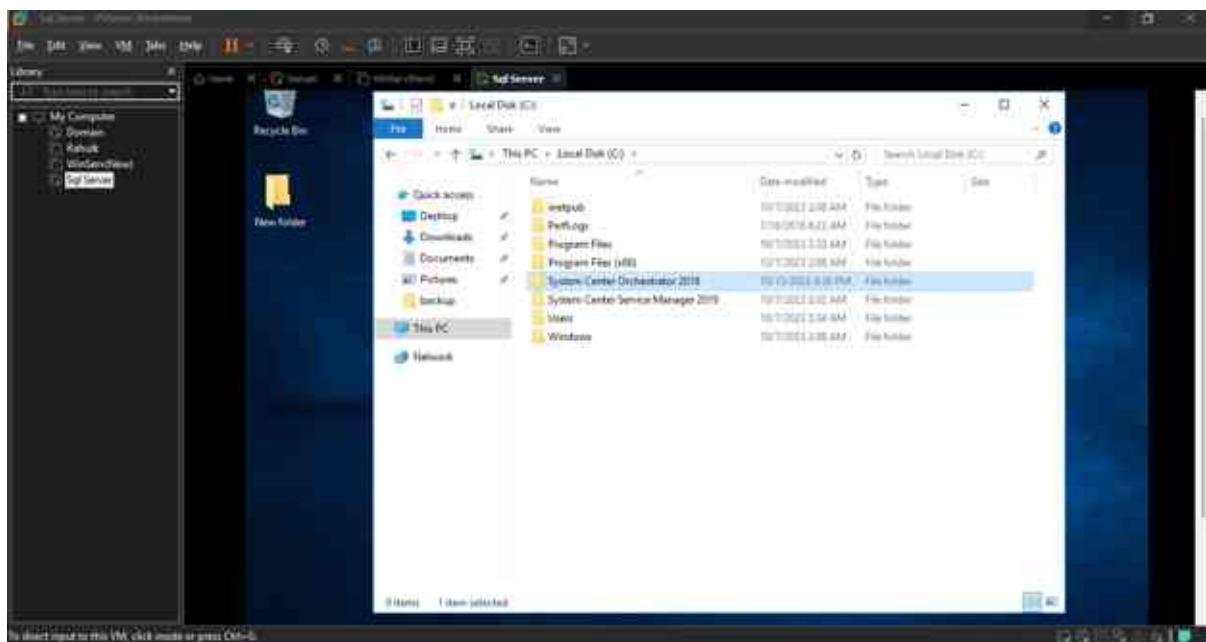
- It will start extracting the necessary files to the destination folder



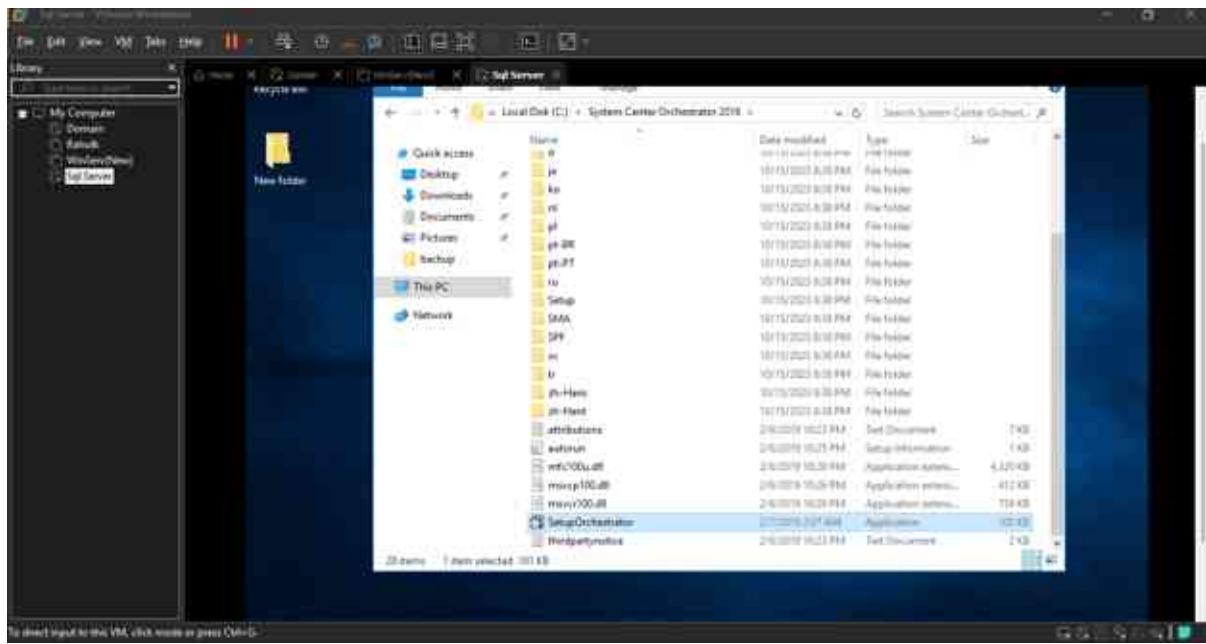
- Click on Finish



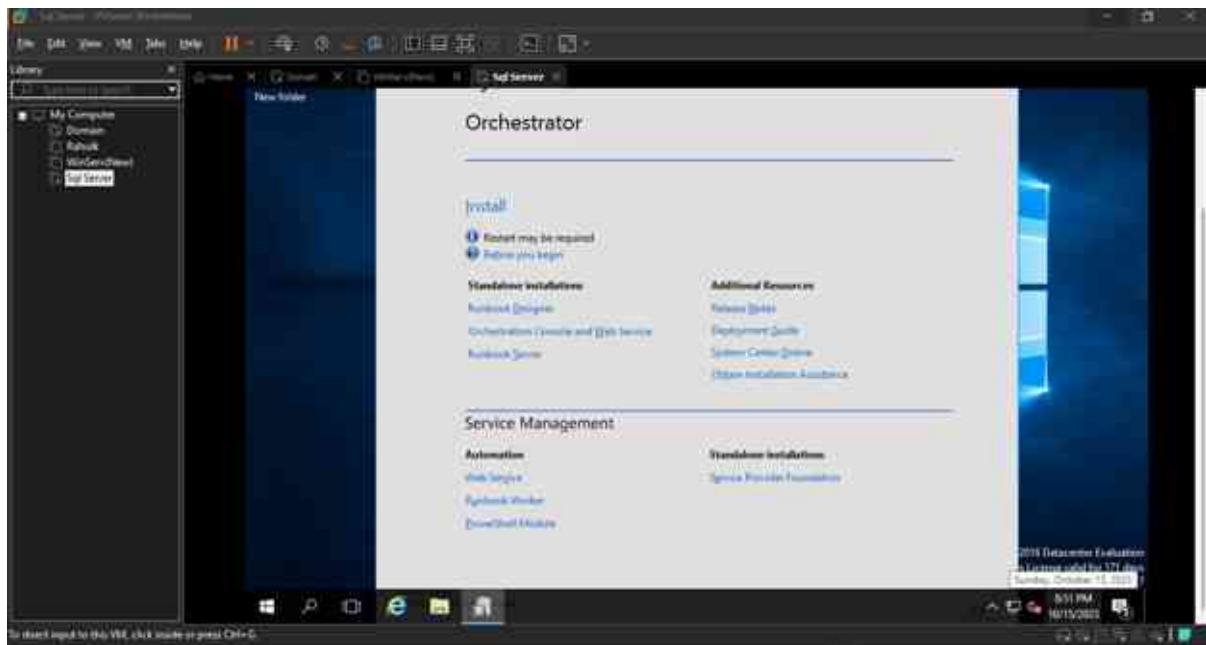
- Now go to Your Local Disk (C:) Within Local Disk **Click on System Center Orchestrator 2019**



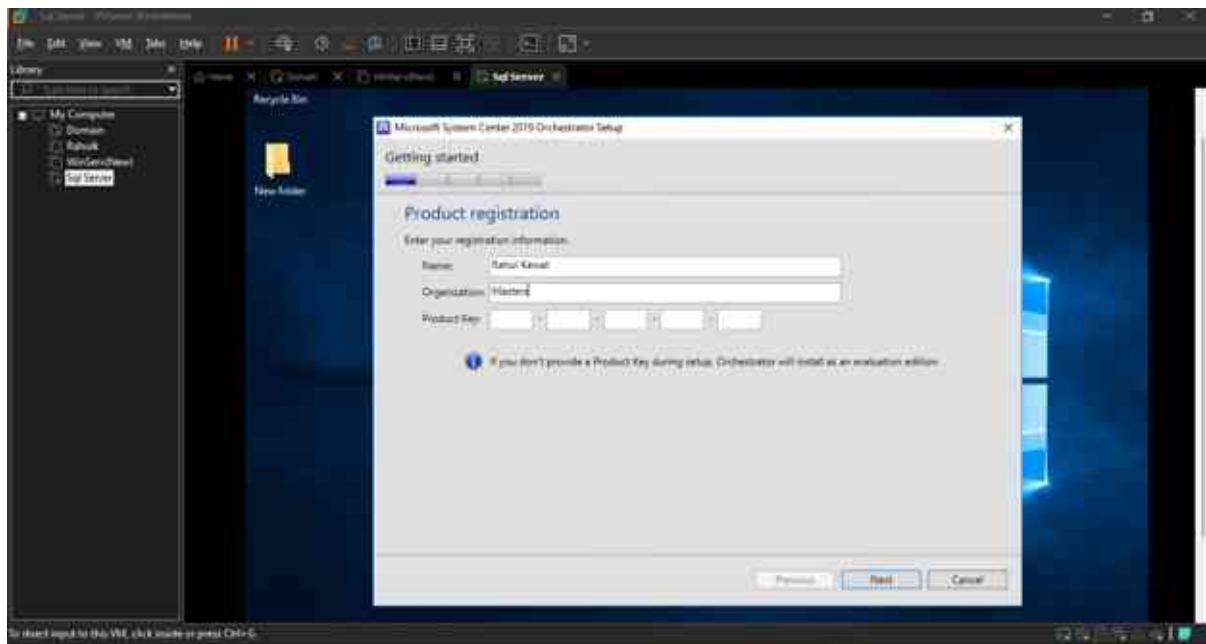
- Within System Center Orchestrator 2019 Double **Click on SetupOrchestrator**



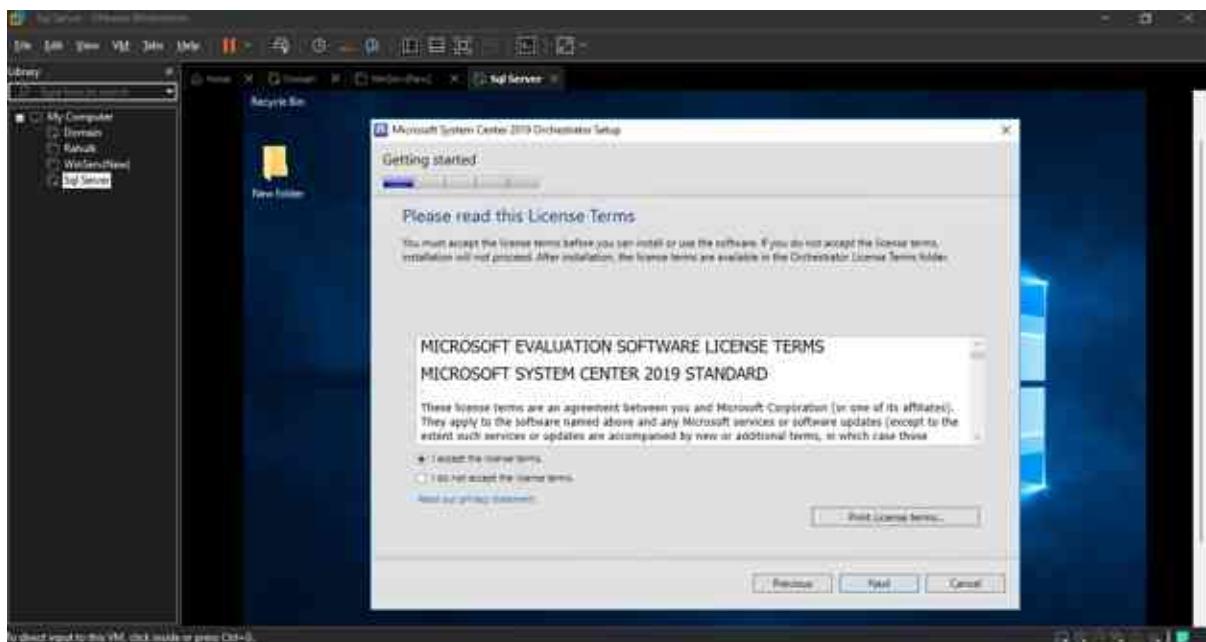
- Click on Install



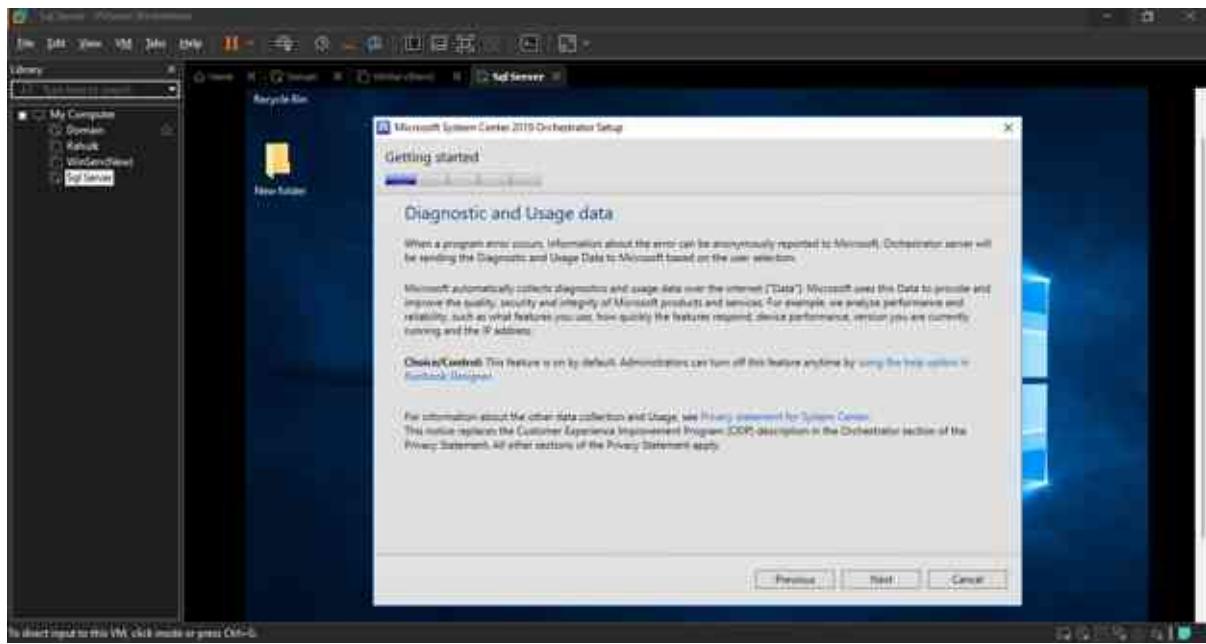
- Type a name under organization (**Here it is Masters**) and Click Next



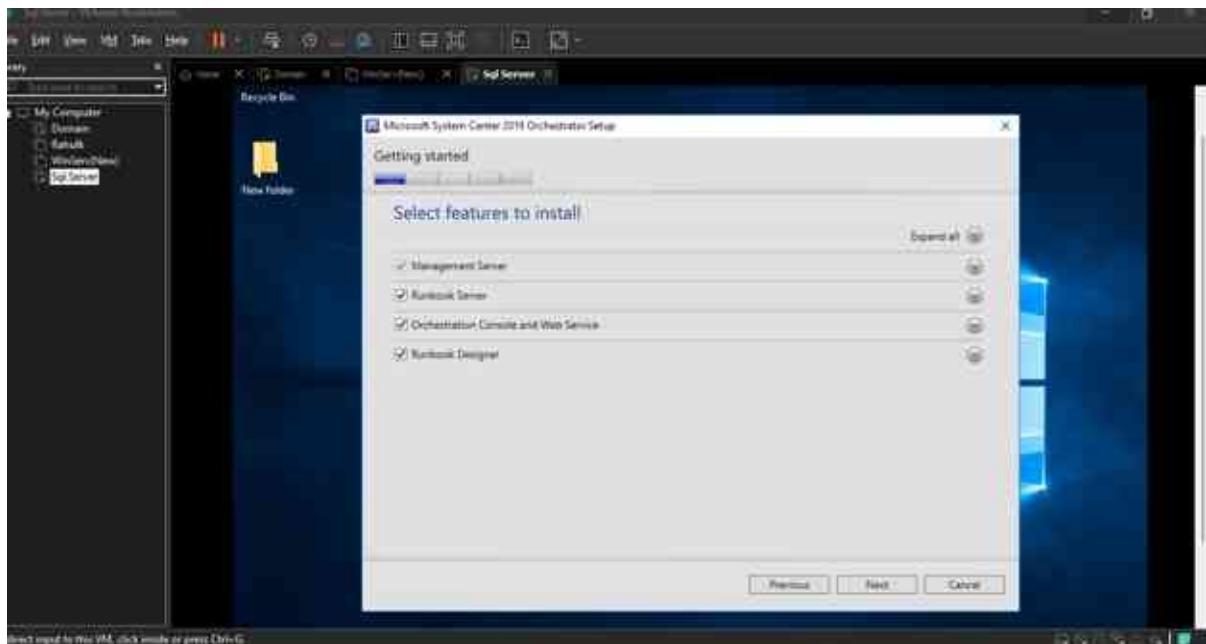
- Select I accept the license terms and Click Next



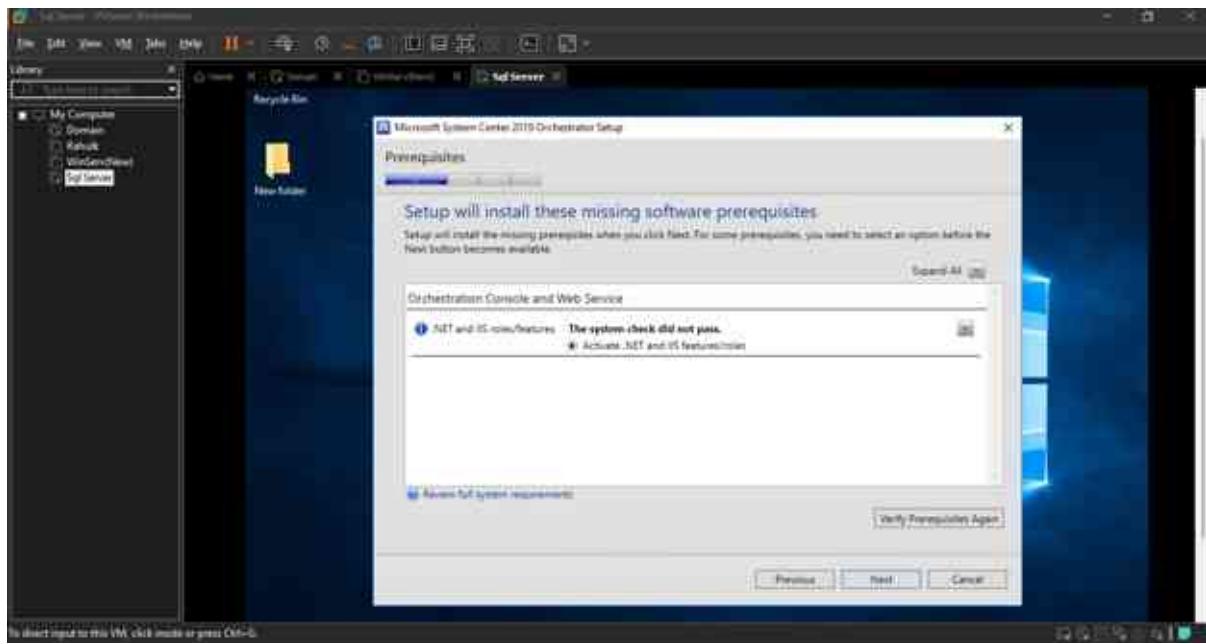
- Click on Next



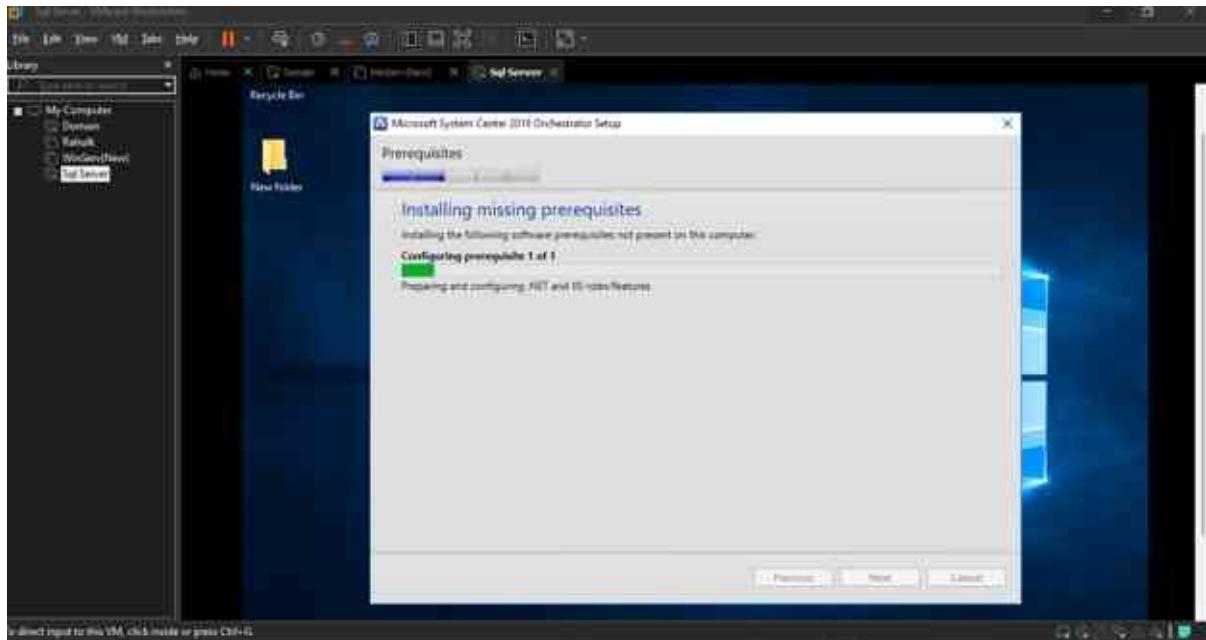
- Keep default values and Click Next



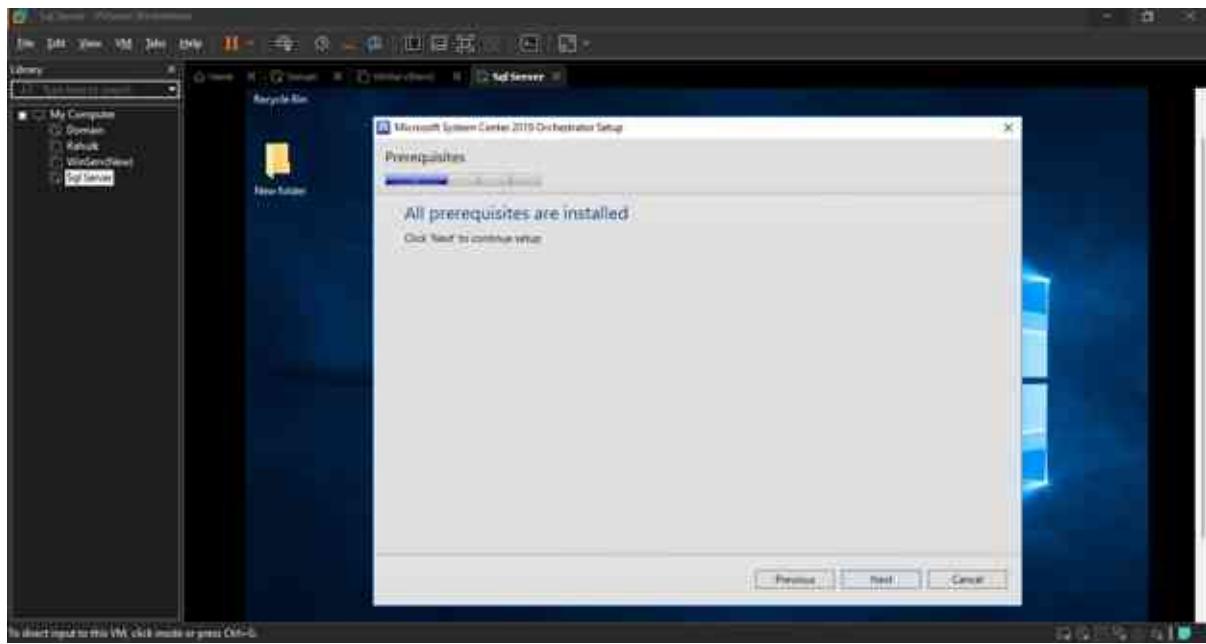
- Select Activate IIS/.NET features/roles and Click Next



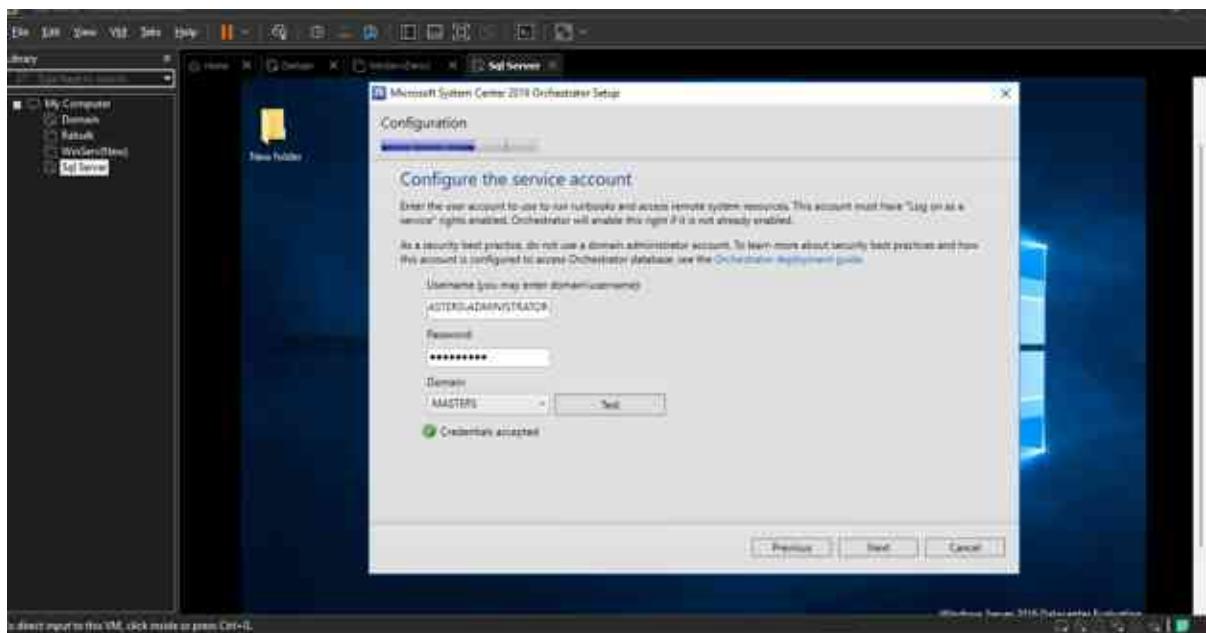
- It will start the installing prerequisites



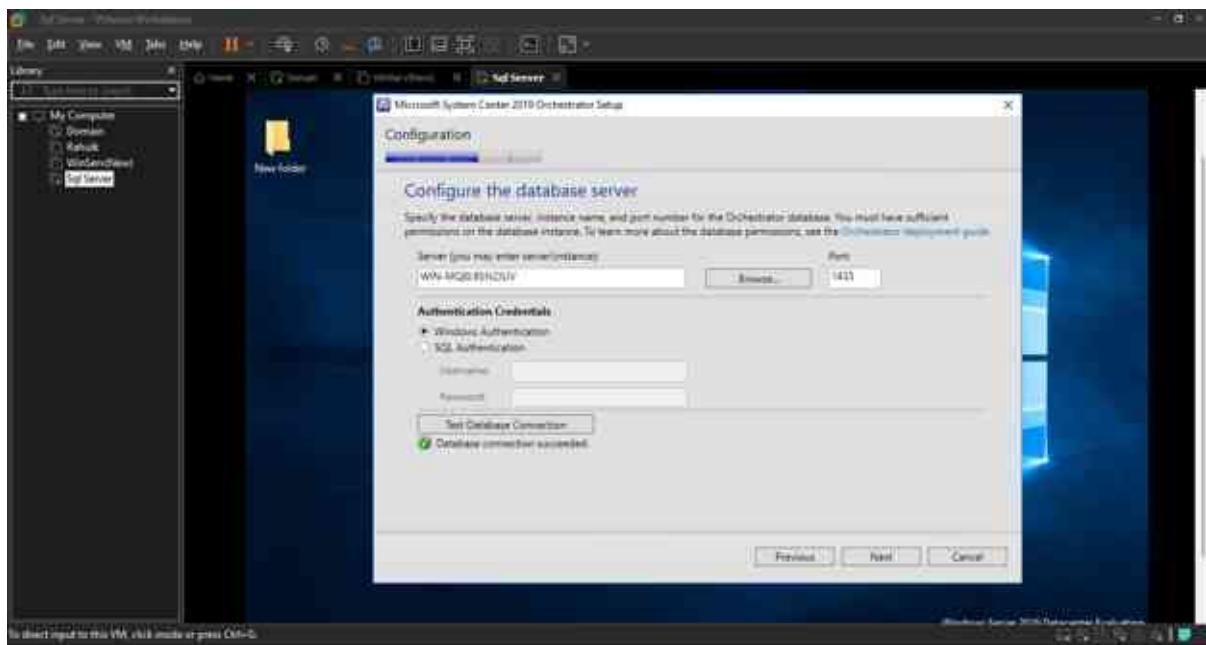
- After installing pre-requisites Click on Next



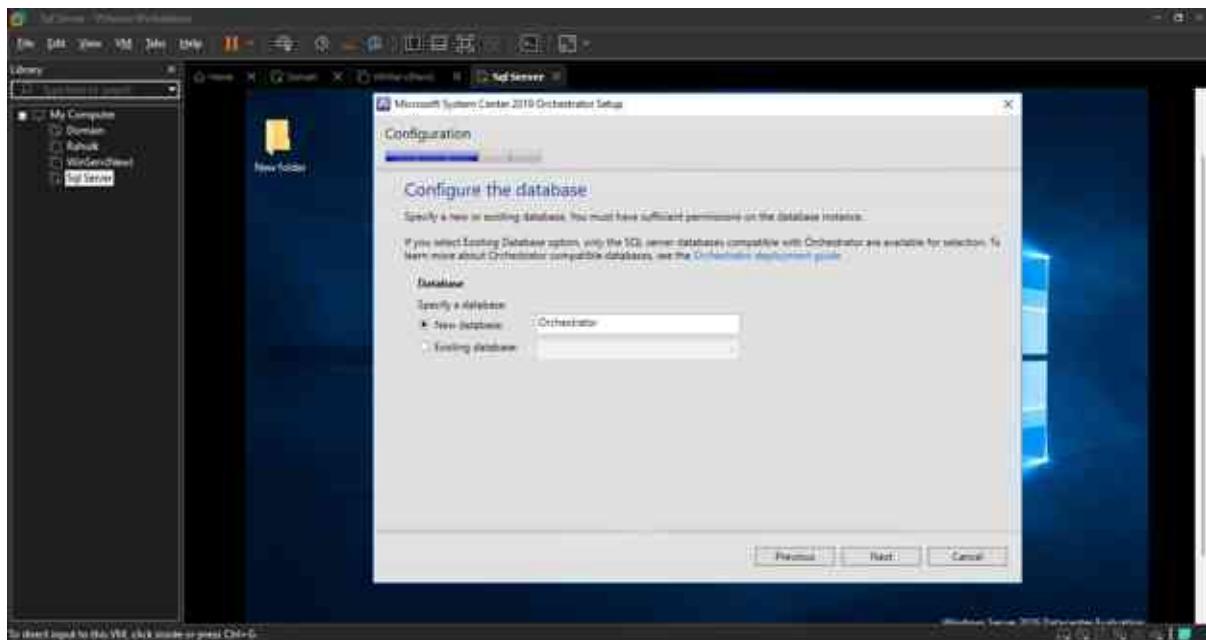
- In Configure Service Account Type the credentials of the domain you have selected and Test it, If the Test is successful **Click Next**



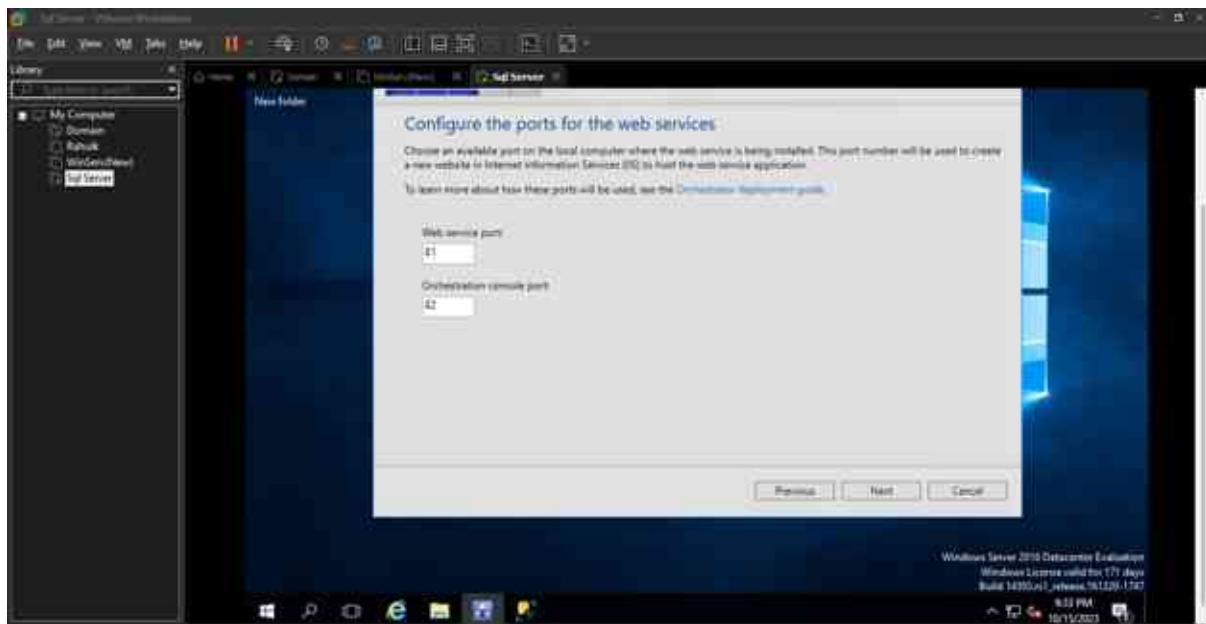
- Enter your SQL Database server name and Test the database server connection. If the Test is successful **Click Next**



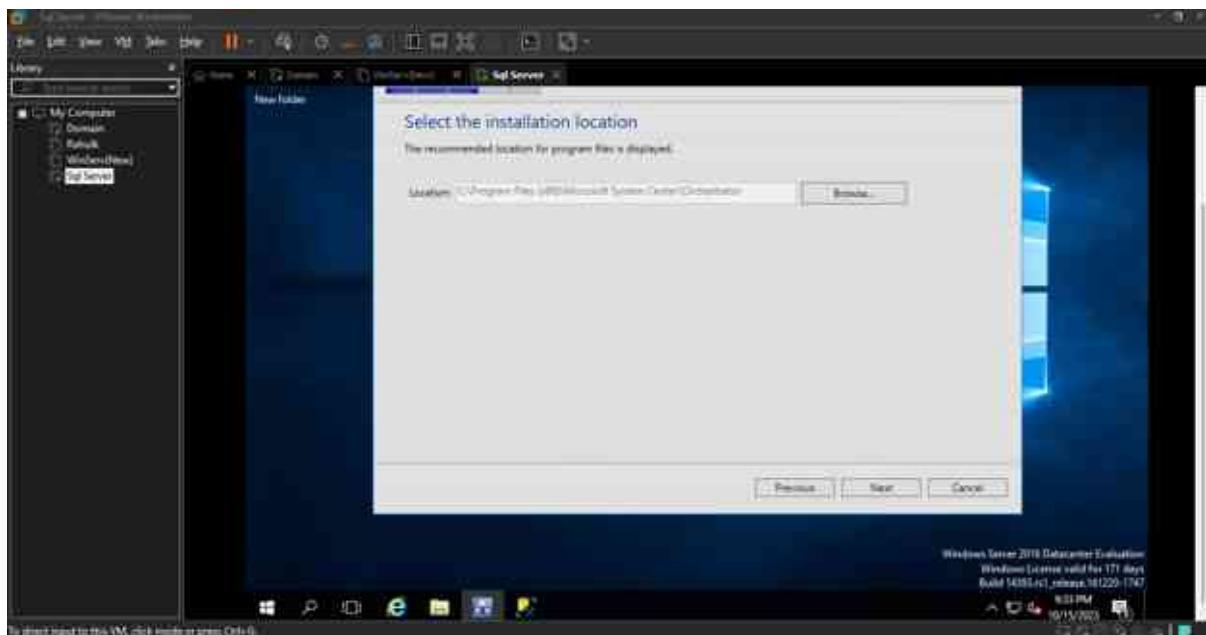
- Select New Database and Enter the name as **Orchestrator** and Click Next



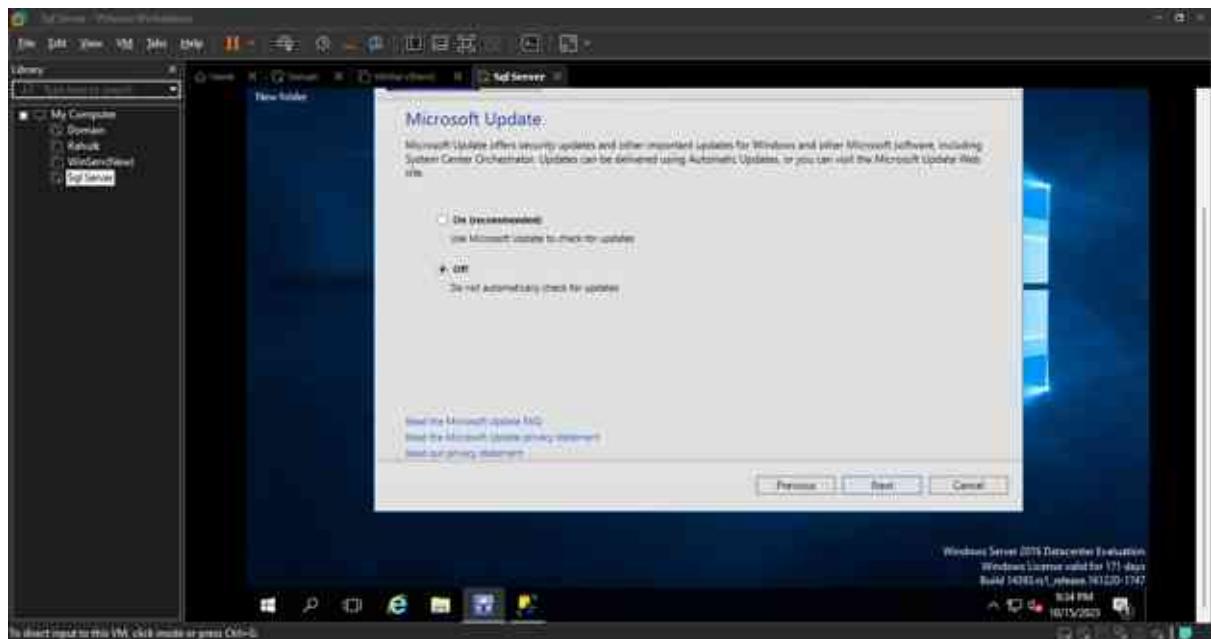
- Keep default values and Click Next



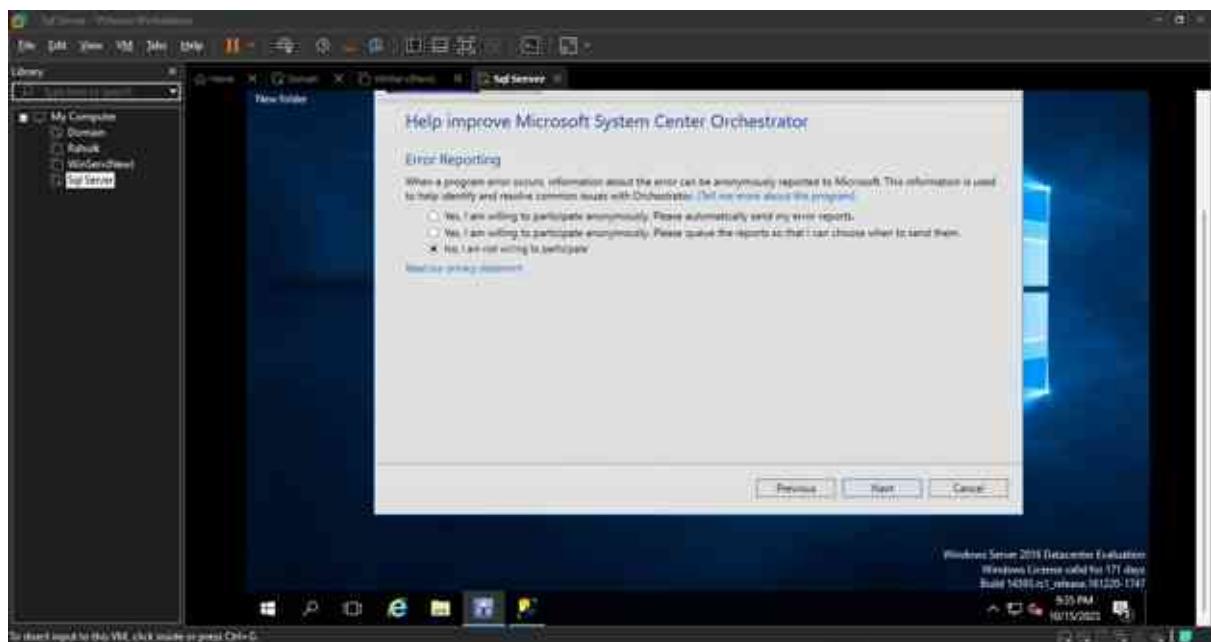
- Click on Next



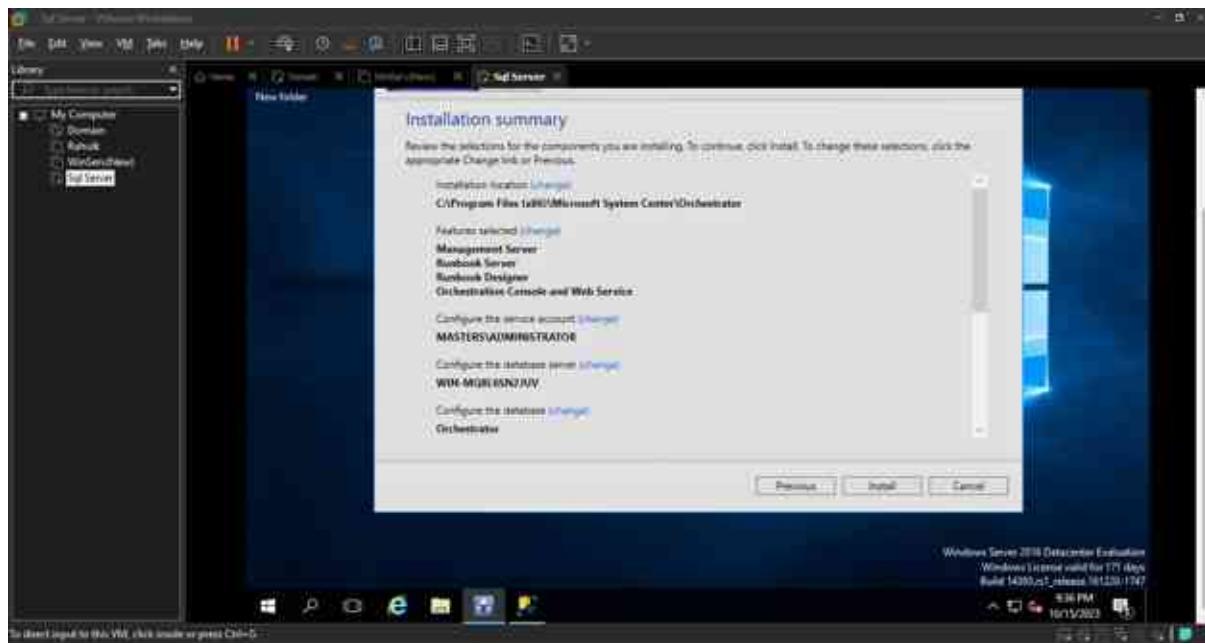
- Select Off and Click on Next



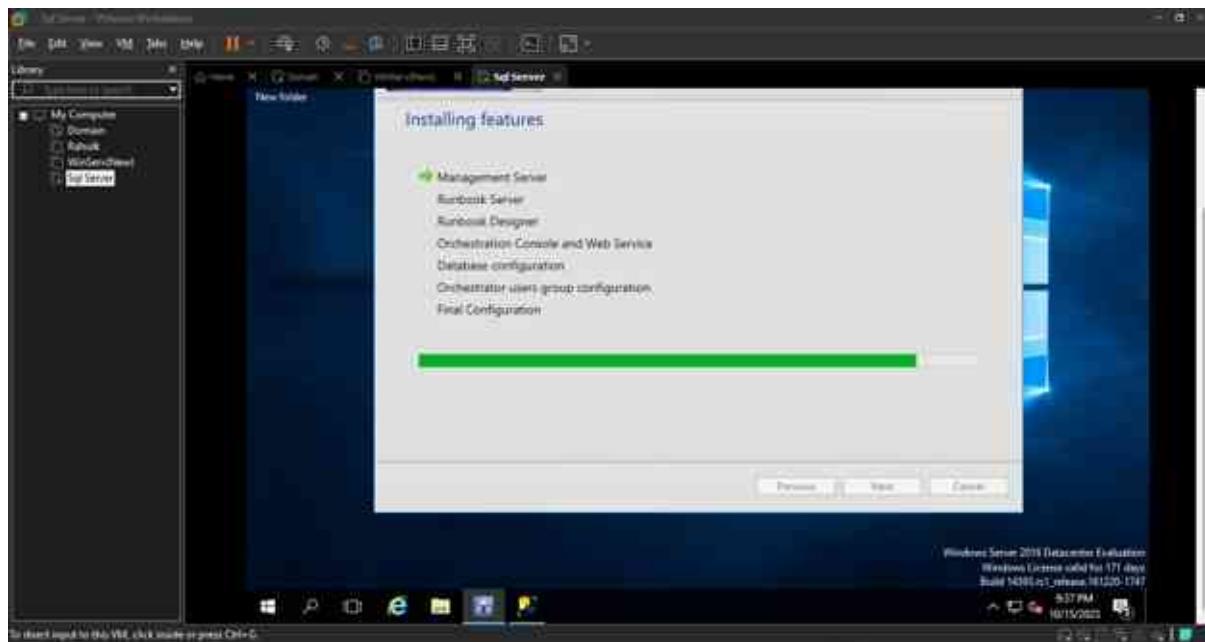
- Select No, I am not willing to participate and Click Next



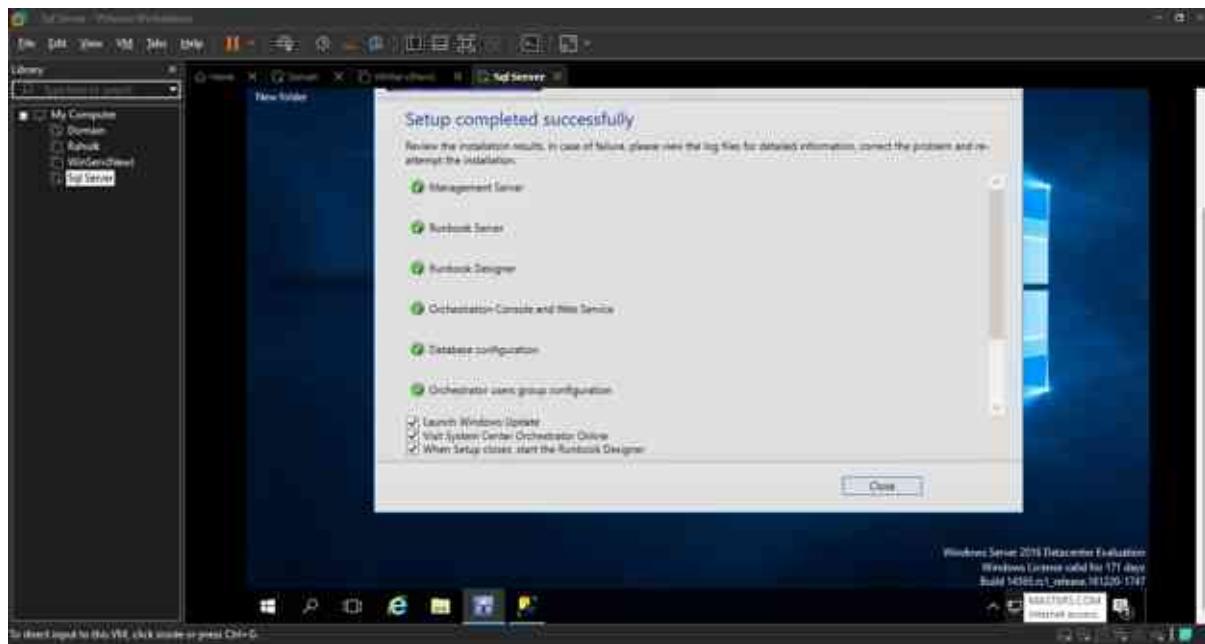
- Check the summary of your features and Click on Install



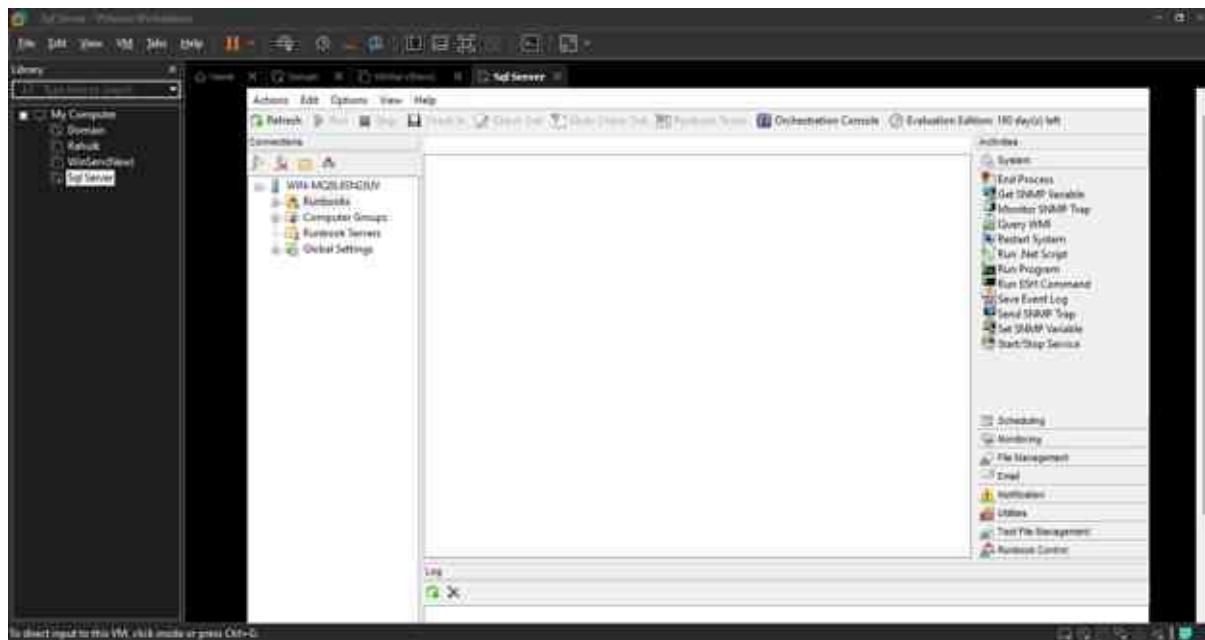
- It will start installing the features



- Click on Close

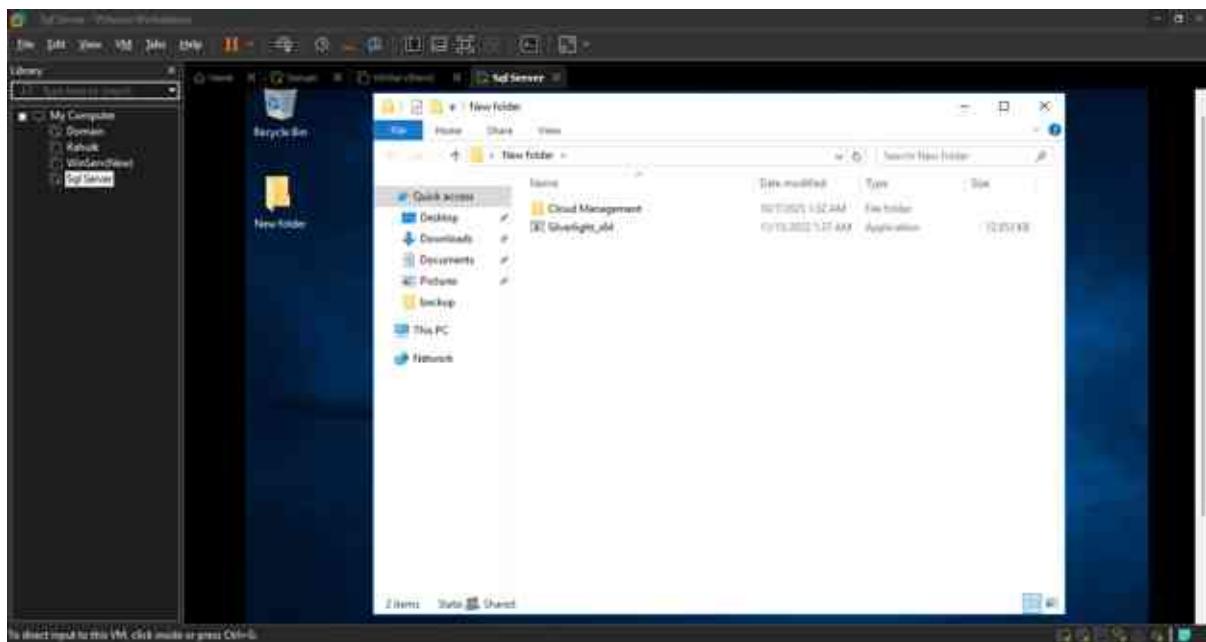


- After installation is complete the Runbook Designer will start



Step 2: : Installing Silverlight_x64

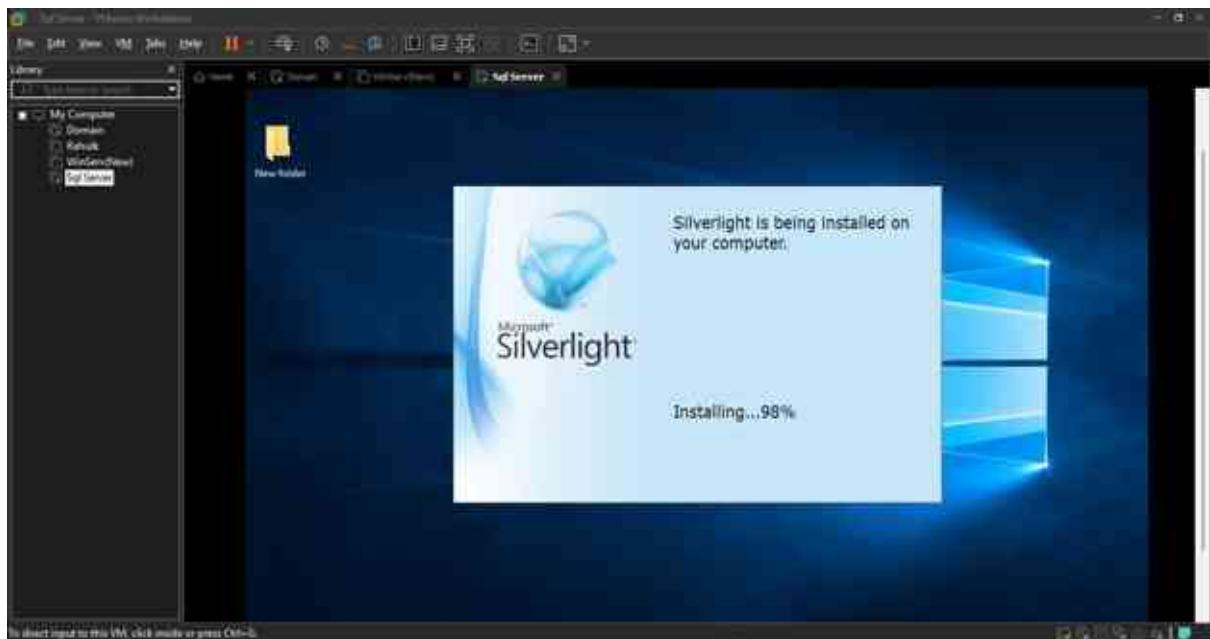
- In your New Folder Click on the Silverlight_x64 application



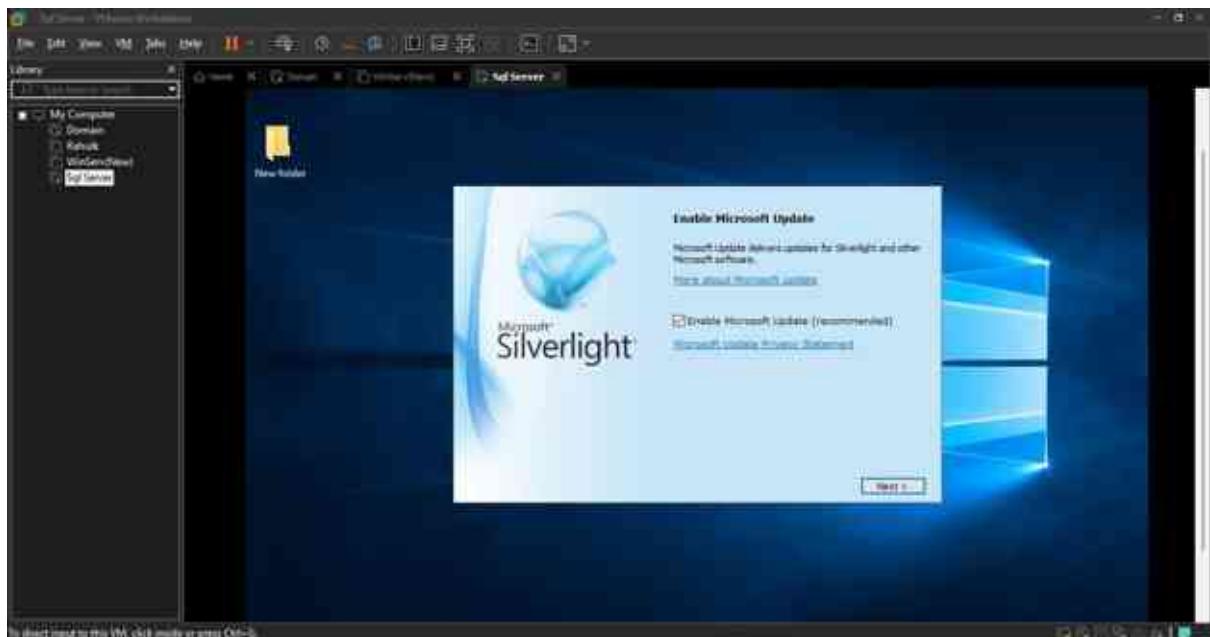
- Click on Install Now



- It will start the installation



- Click Next



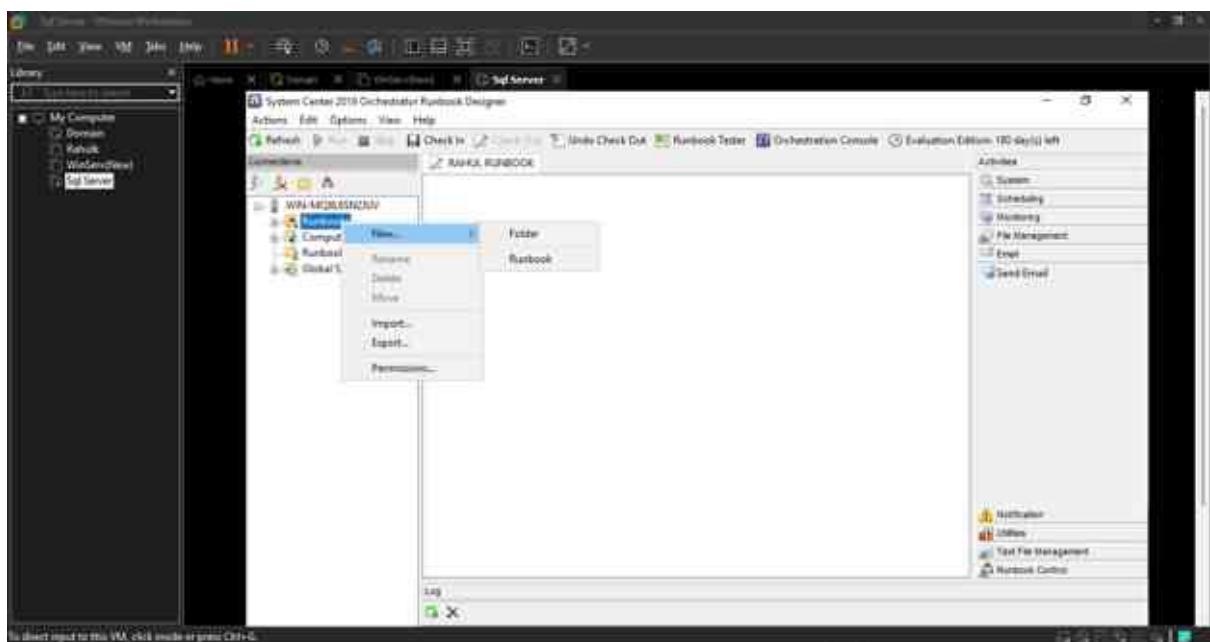
- Click Close



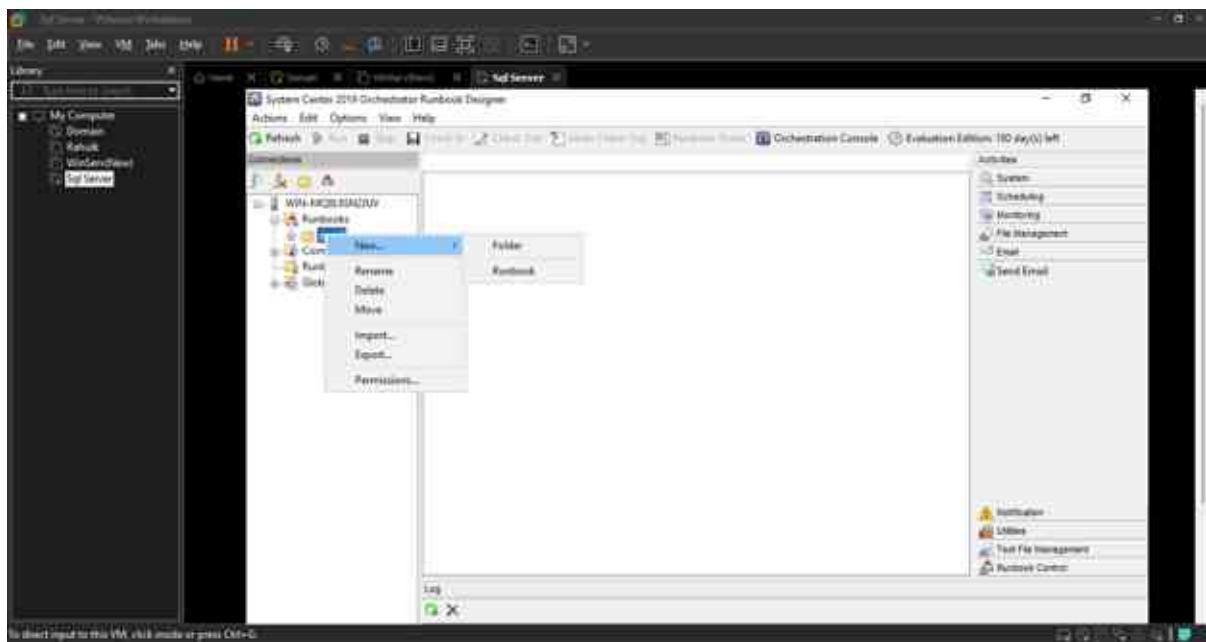
Practical 3-B: Creating & Testing a monitor Runbook

Aim: Creating and Testing a Monitor Runbook

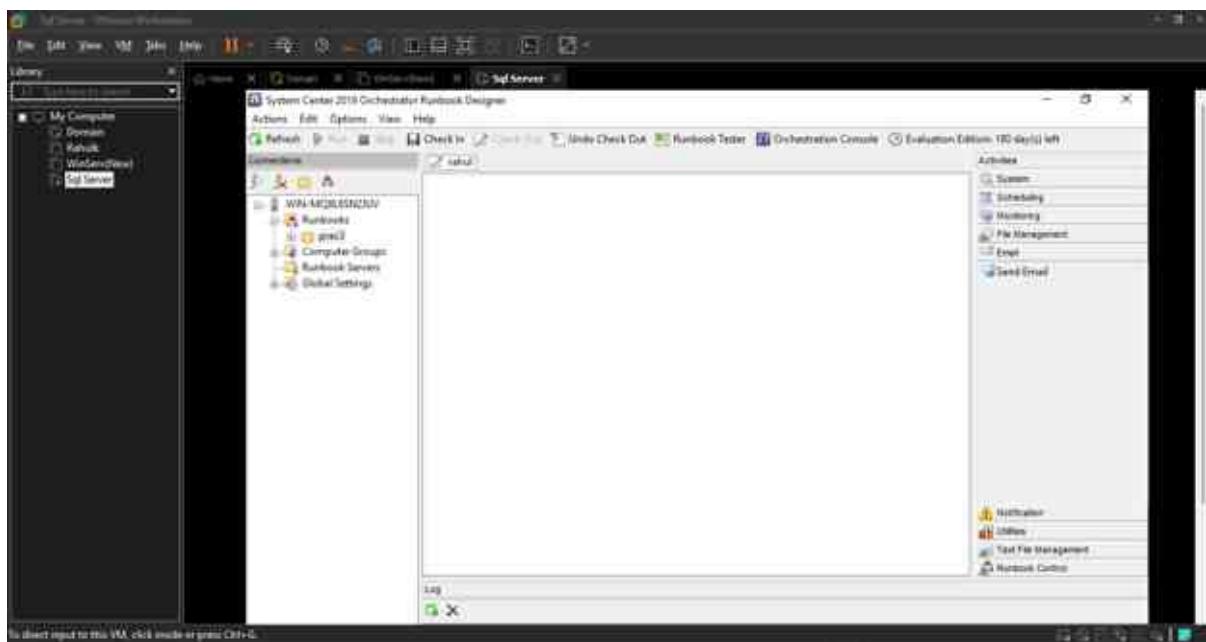
- Right-Click on Runbook and Select New Folder



- Name the folder and again Right-Click on the Folder and Select Runbook

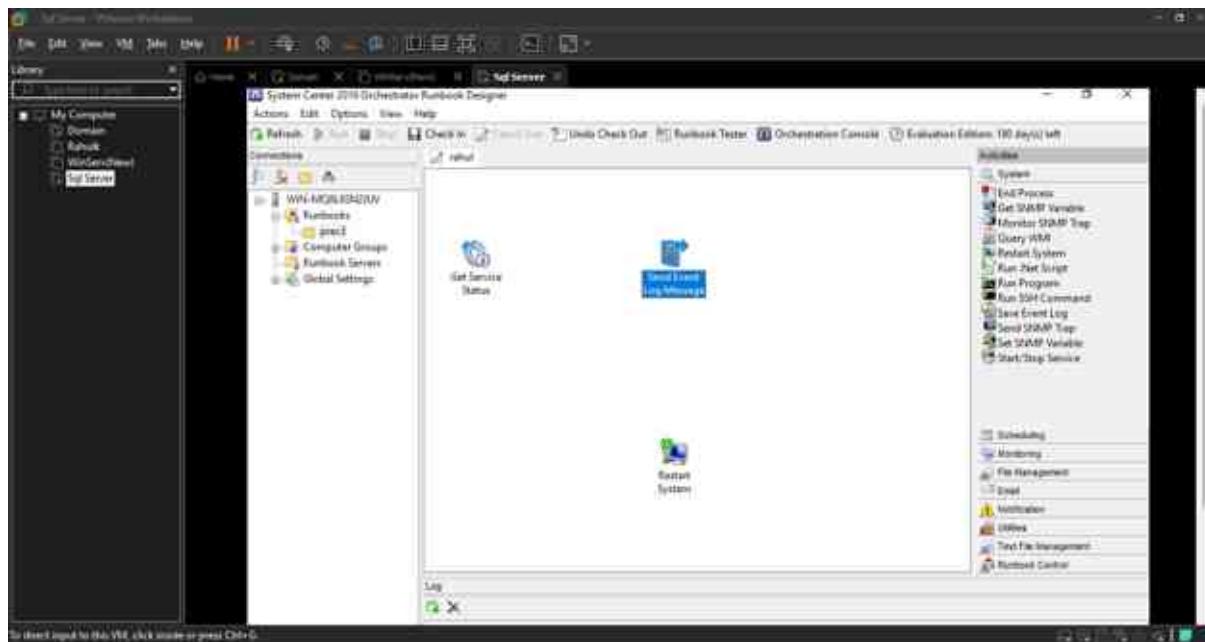


- New Runbook Created

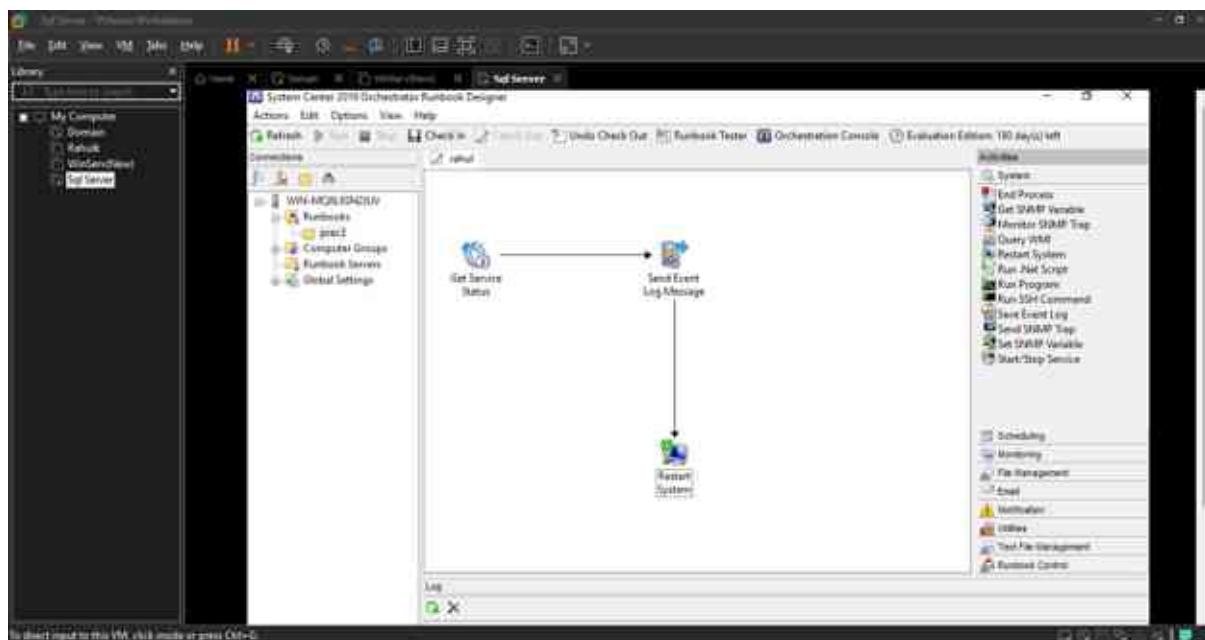


Now within the Runbook created we have to show a workflow being executed. On the left side in Activities Select the following Items:

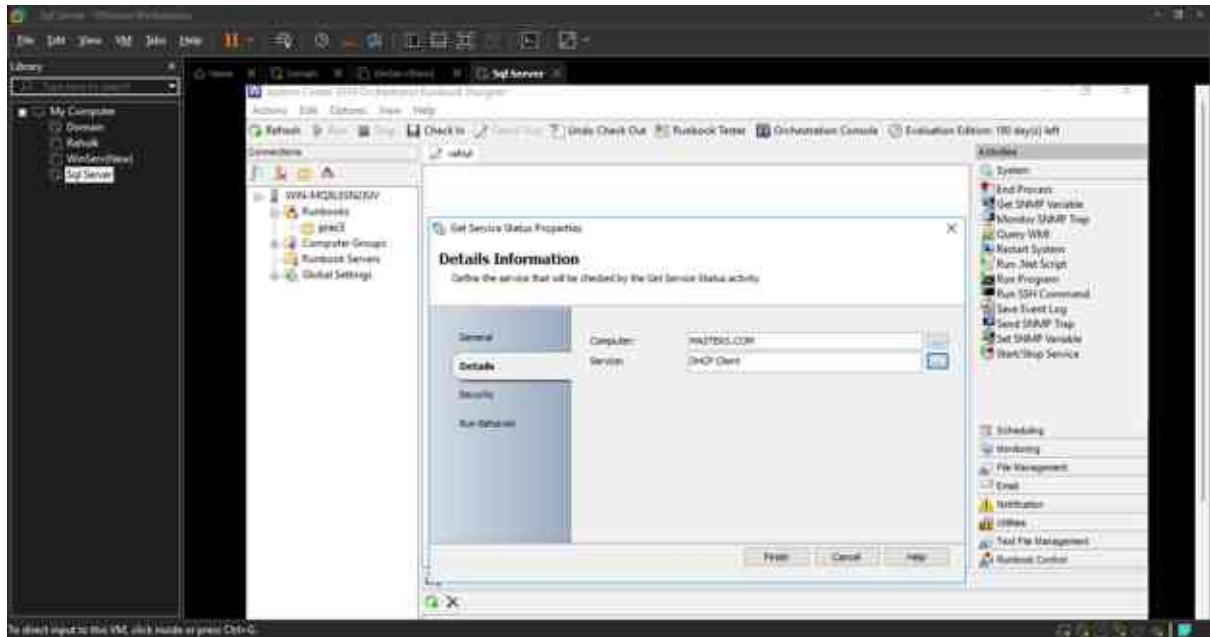
Monitoring: Get Service Status -> Notifications: Send Event Log Message-> System: Restart System



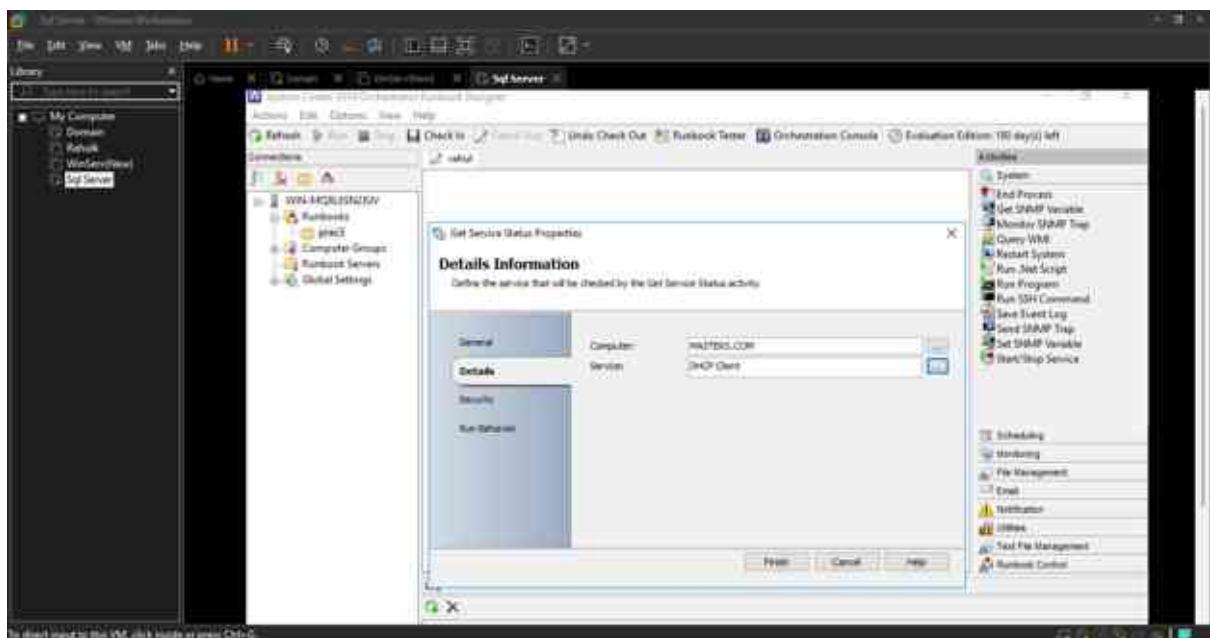
- Now with these three features link them to each other as shown below:



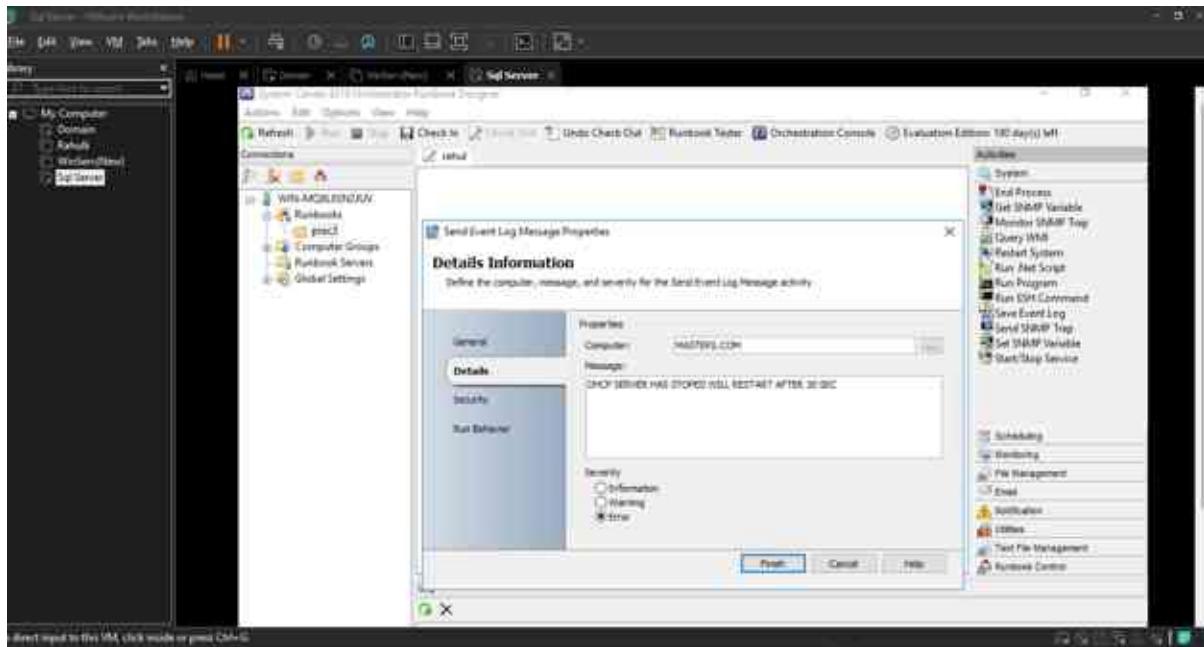
- Double-Click on **Get Service Status**, within it type a computer name (**Here it is MASTERS.COM**) and in Service select **DHCP Client**



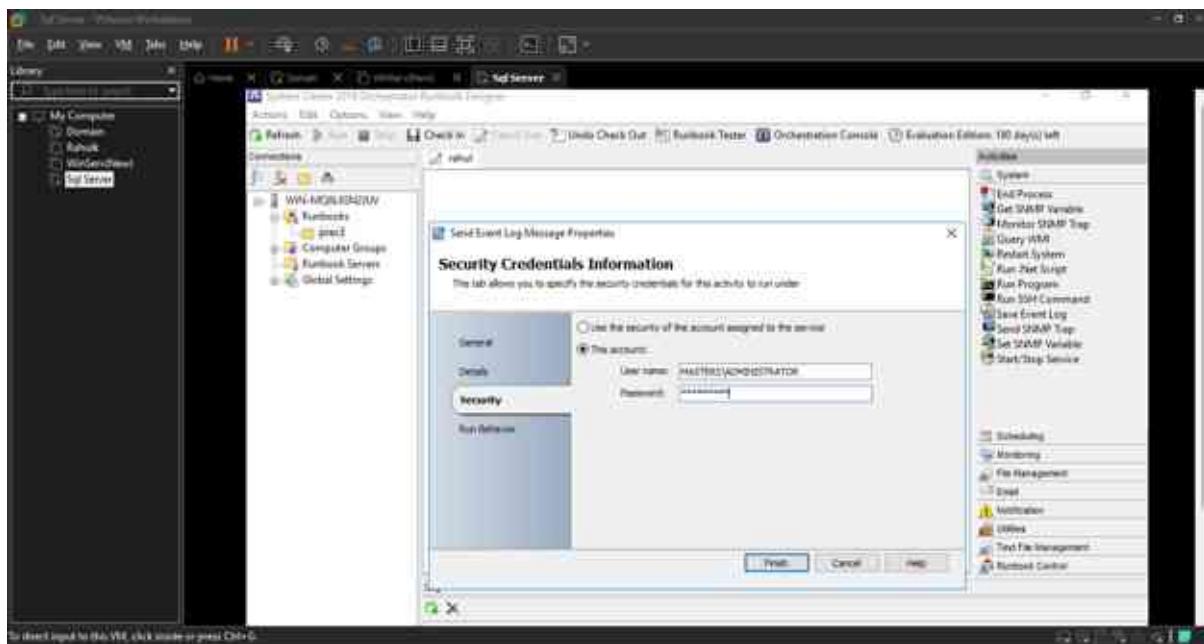
- Select Security and **Click on this account** and enter your credentials and **Click on Finish**



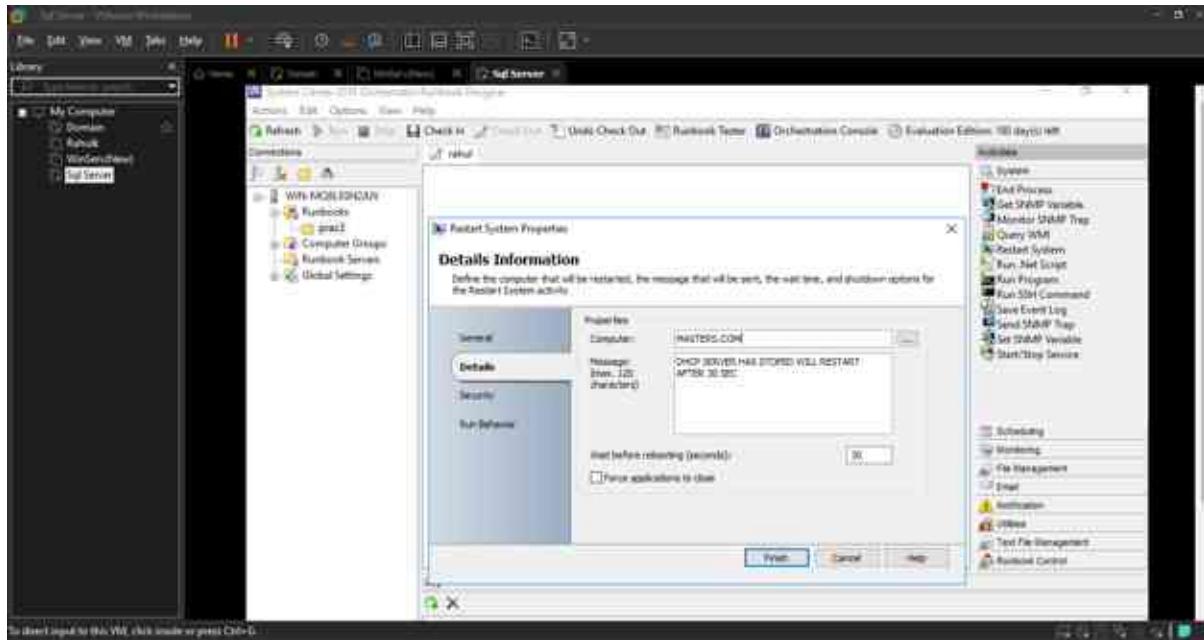
- Double-Click on **Send-Event-Log Message**, within that type the computer name (**Here it is MASTERS.COM**) and Enter a Message i.e **(DHCP SERVER HAS STOPED WILL RESTART AFTER 30 SEC)** and Select Error in Severity



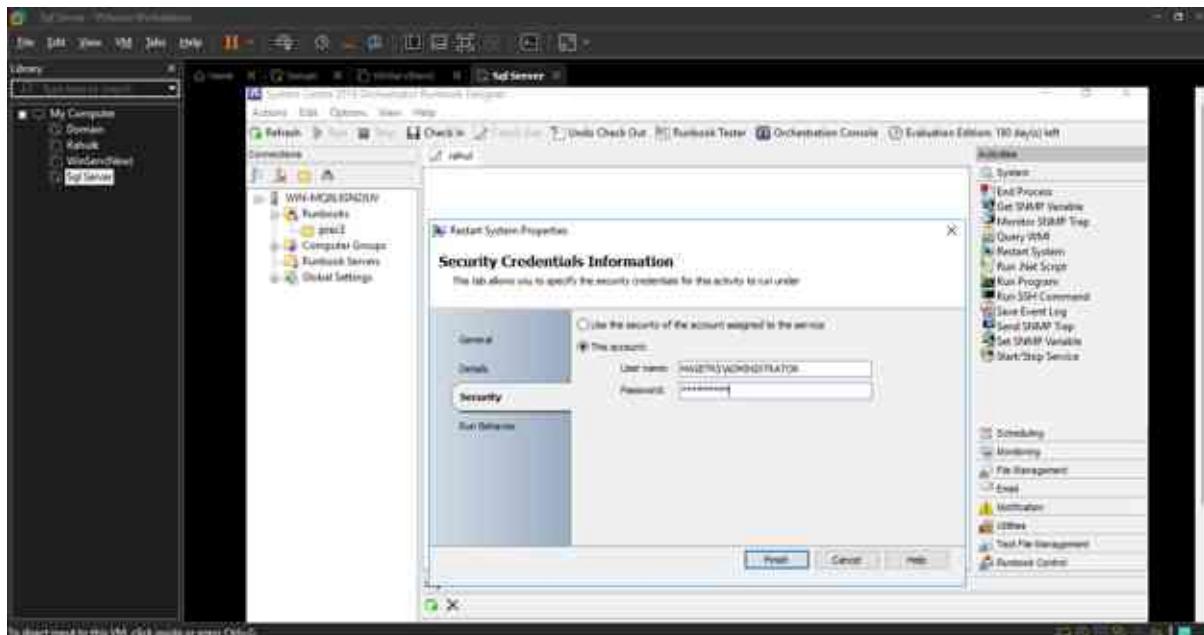
- Select Security and **Click on this account** and enter your credentials and **Click on Finish**



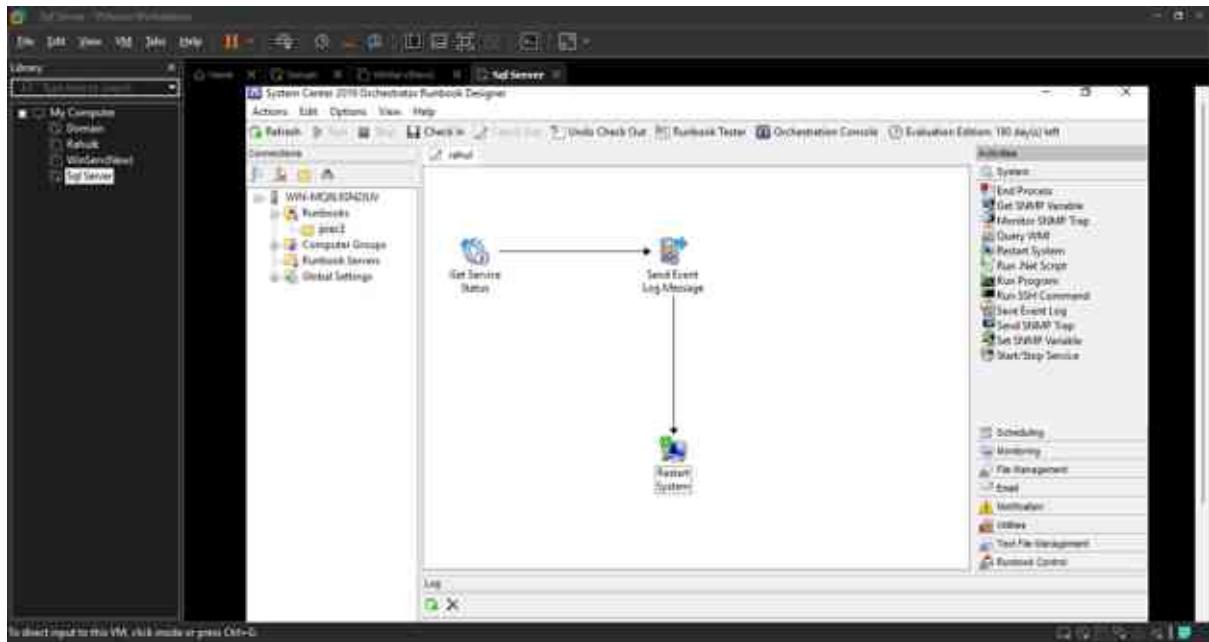
- Double-Click on Restart System, within that type the computer name (**Here it is MASTERS.COM**) and Enter a Message i.e (DHCP SERVER STOPEDd WILL RESTART AFTER 30 SEC)



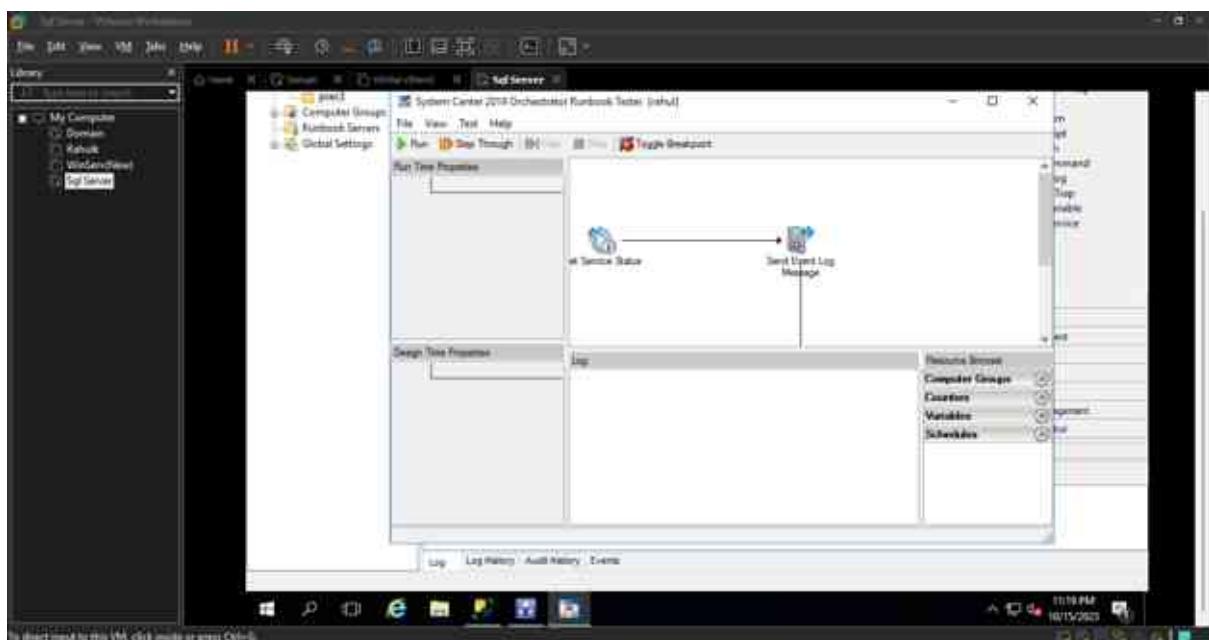
- Select Security and **Click on this account** and enter your credentials and **Click on Finish**



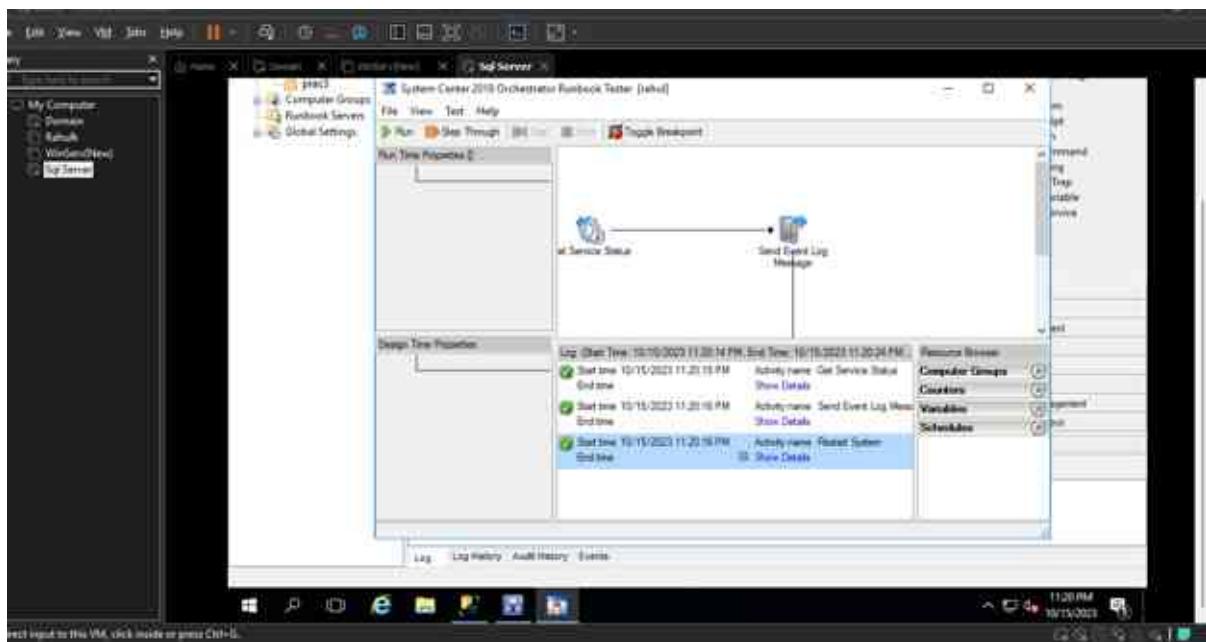
- Click on Runbook Tester



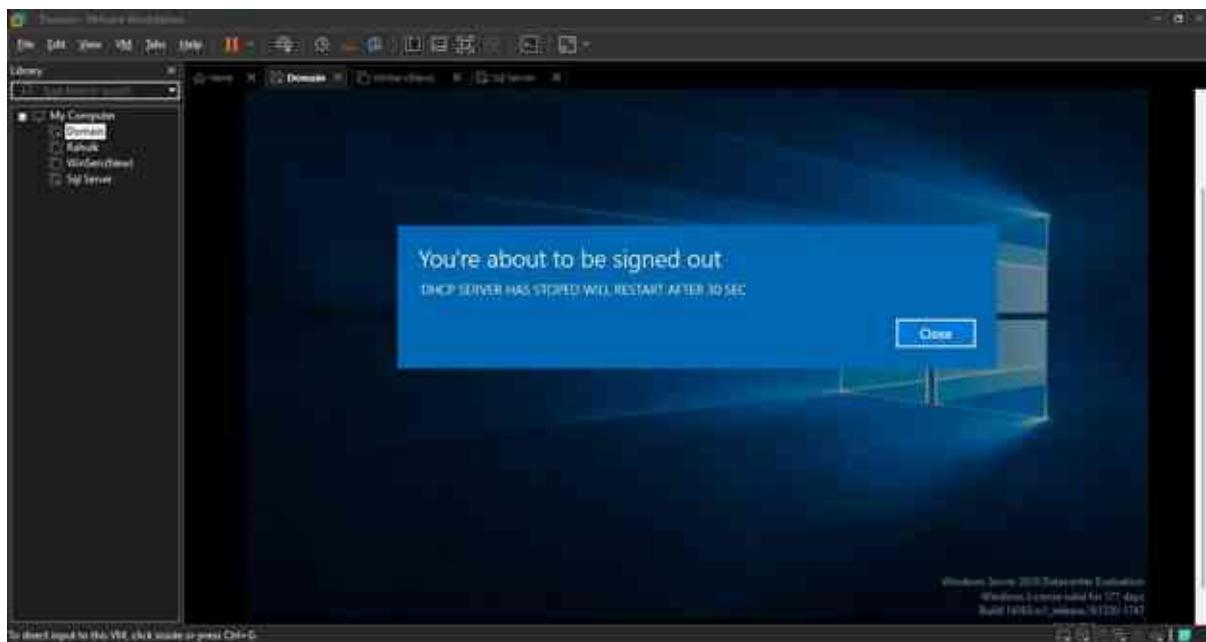
- Within Runbook Test Click on Run



- The Logs should show three successful tasks



- Now if we go back to our domain controller we will see this message and will restart your Domain Controller



Practical: 4

Aim: Deploy and Manage SDN infrastructure using SCVMM 2019.

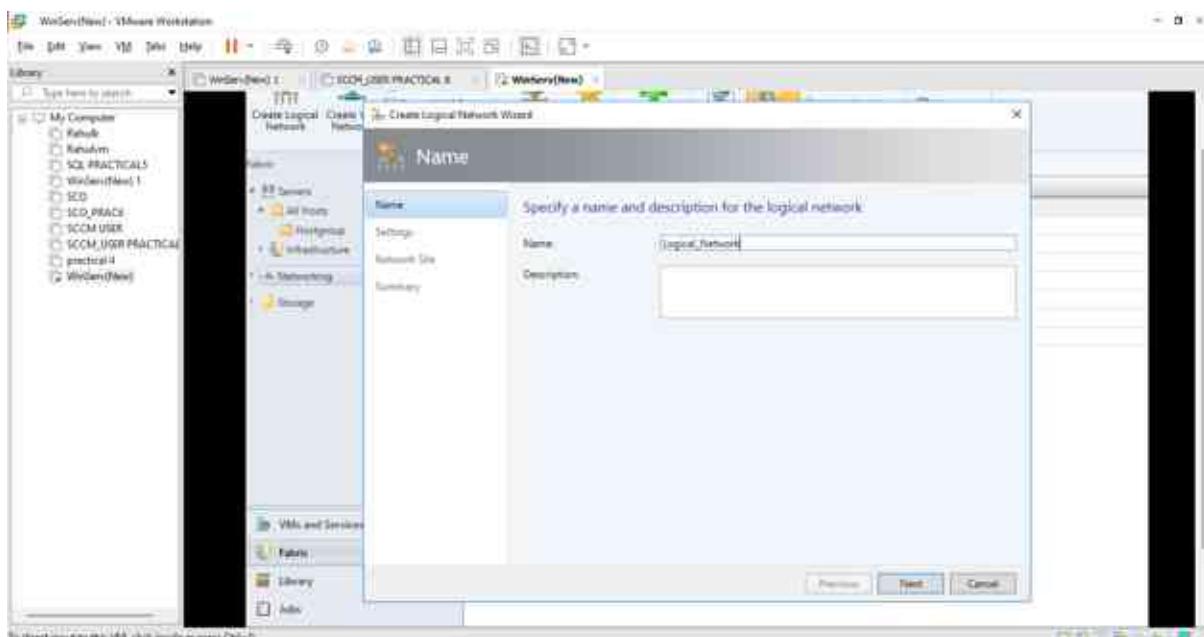
Pre-requisites:

- SCVMM from practical 1

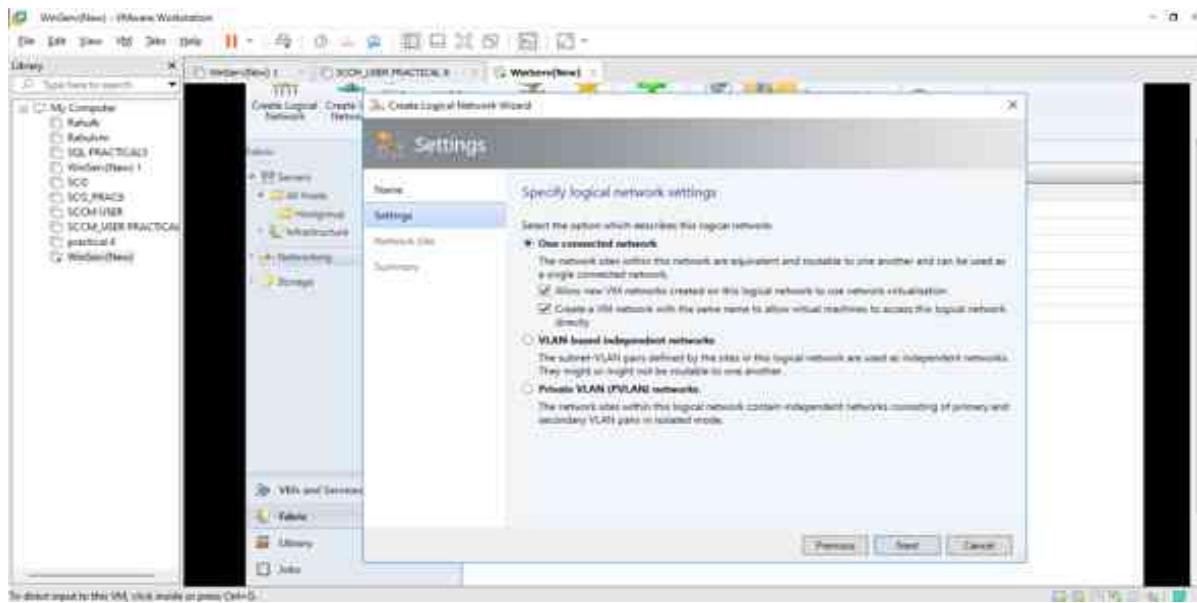
4-A: Deploying Network Controller

Step 1: Create a Logical Network

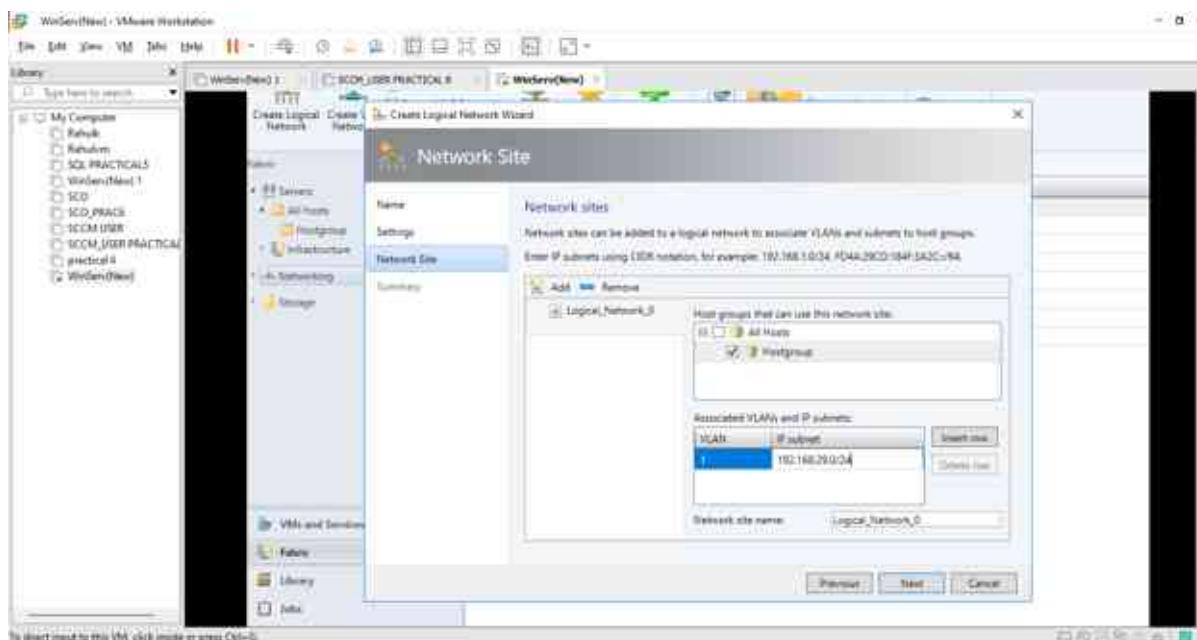
- Open SCVMM and Click on the Fabric Tab and Select Networking, within Networking Right-Click on Logical Network and Select Create Logical Network And Specify a name for the logical Network (Here it is: **Logical_Network**) and Click on Next



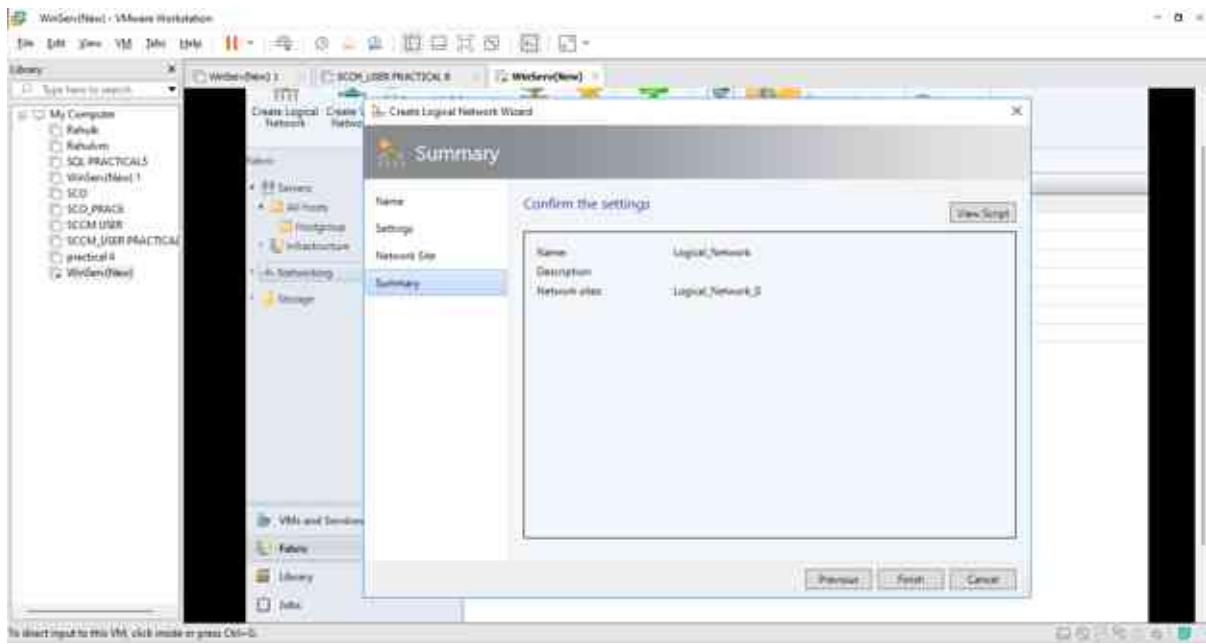
- Select One-connected network and Tick both Allow new VM networks created on the logical network to use network virtualisation and Click on Next



- Click on Add and Select Hostgroup and Click on Insert Now and type in the VLAN number and an IP Address and Click on Next

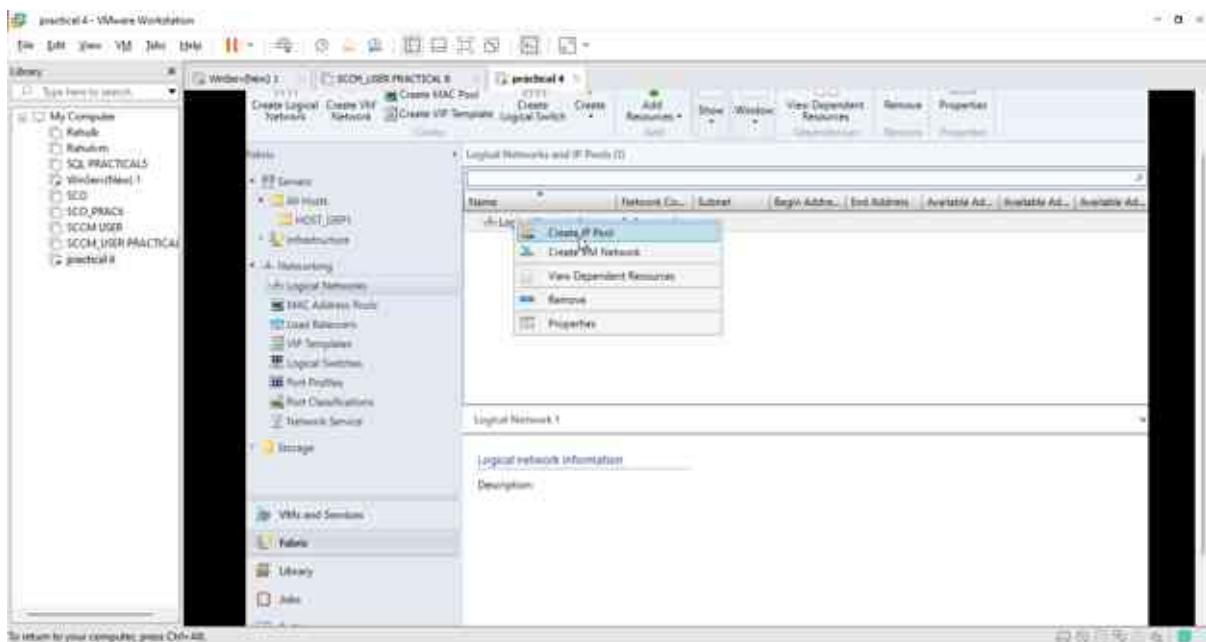


- Click on Finish

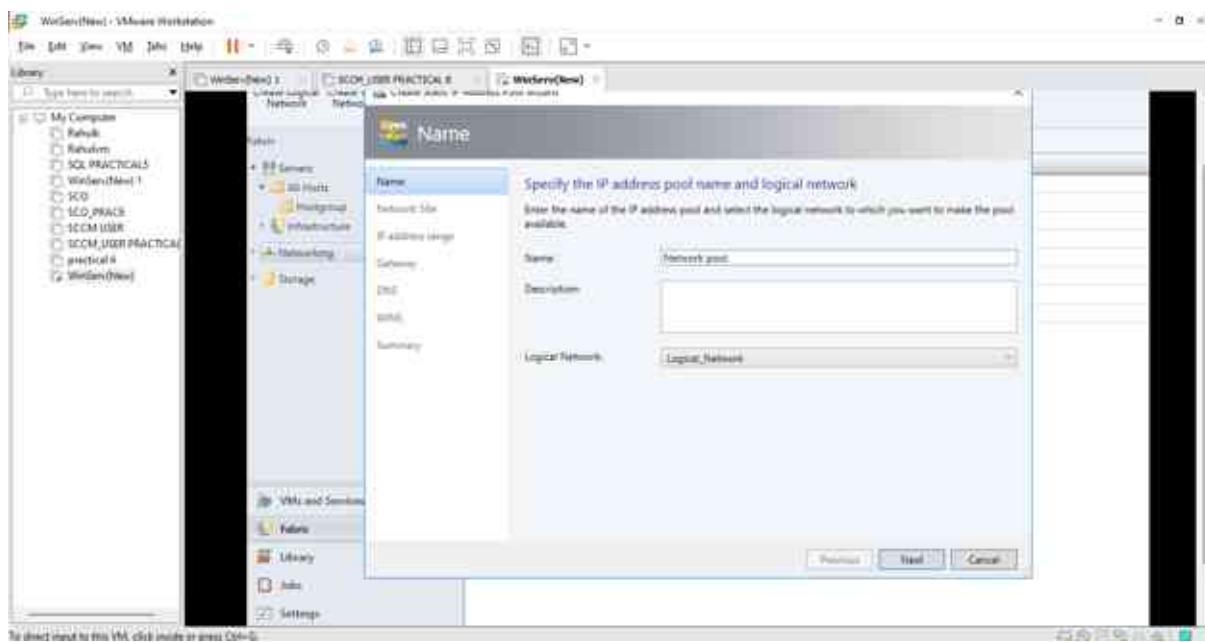


Step 2: Creating IP Pools

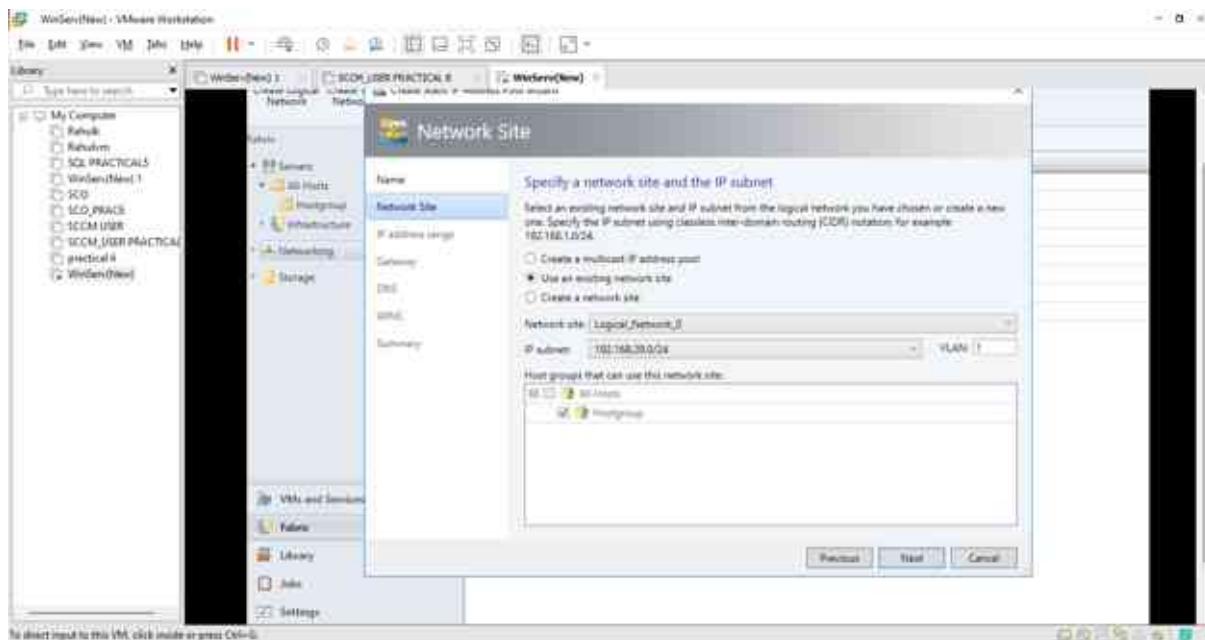
- Right-Click on Logical Network and Select Create IP Pool



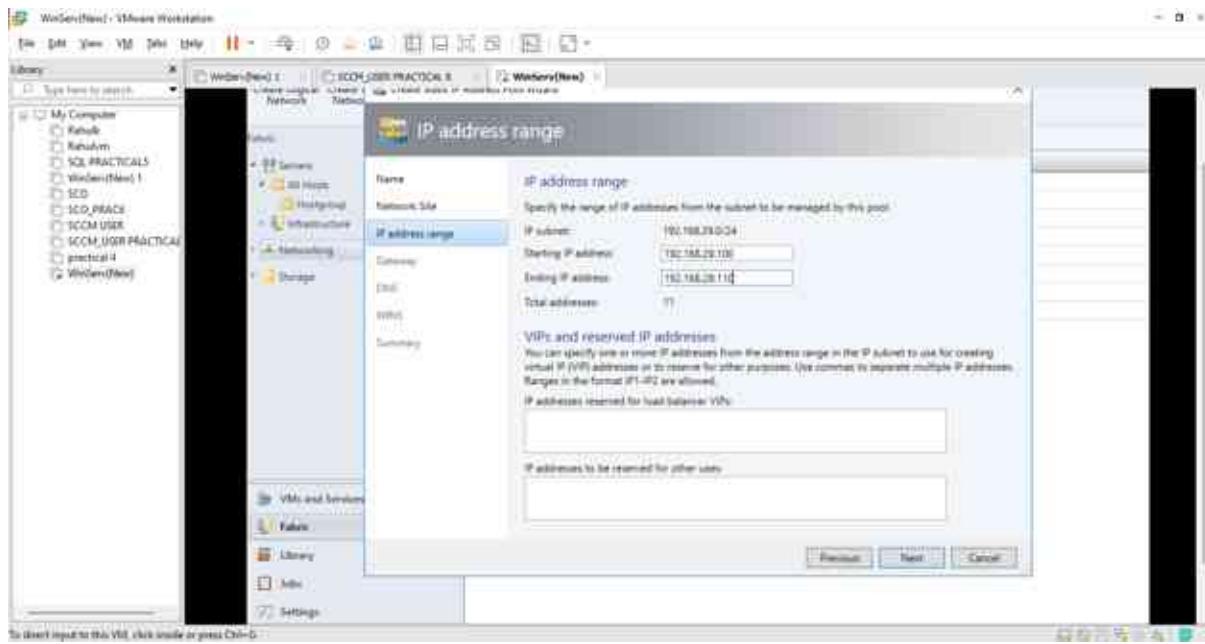
- Name it Pool and Make sure the Logical Network you just created has been selected and Click on Next



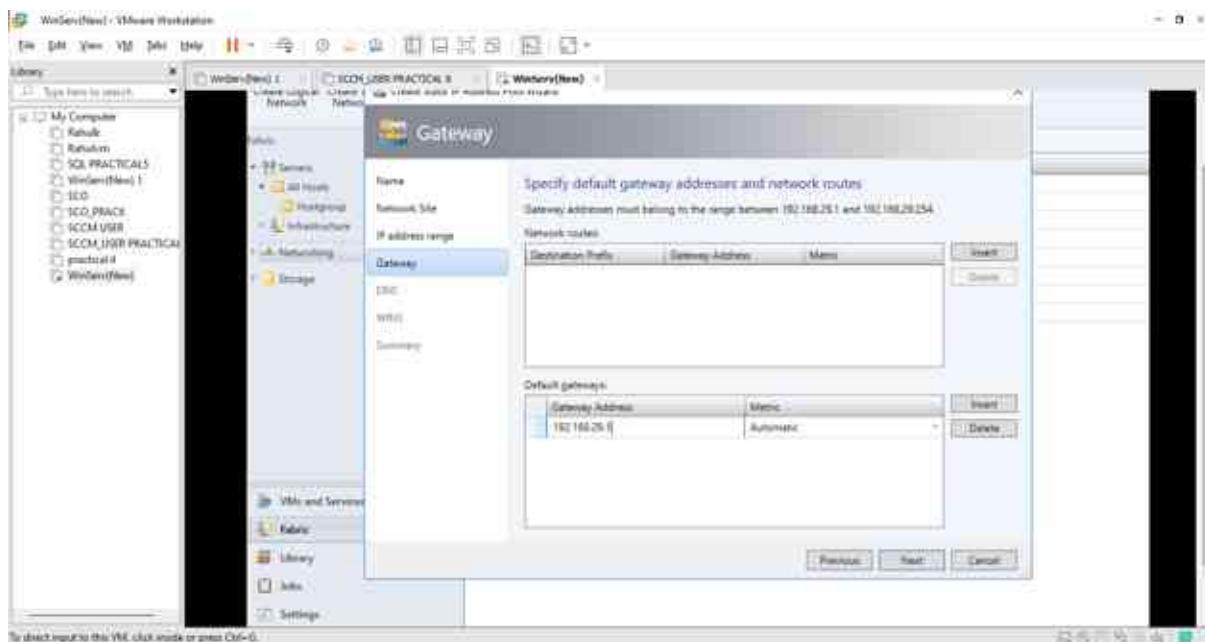
- Keep the default value and **Click on Next**



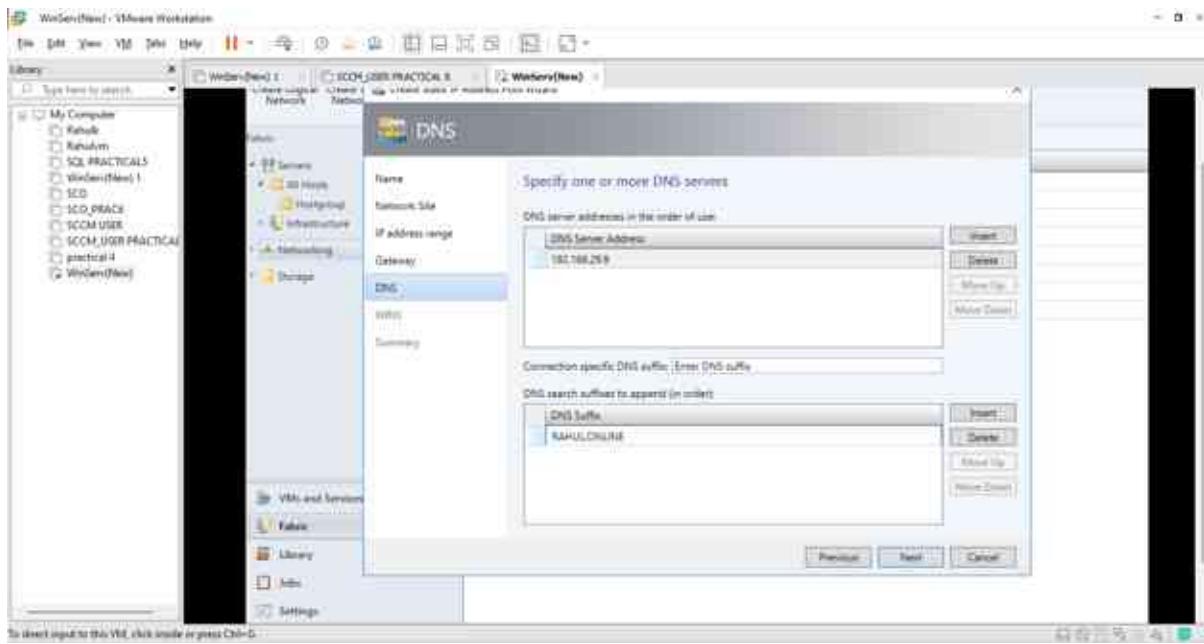
- In IP Address range Change the Starting IP Address to **192.168.29.100** and Ending IP Address Range to **192.168.29.110** and **Click on Next**



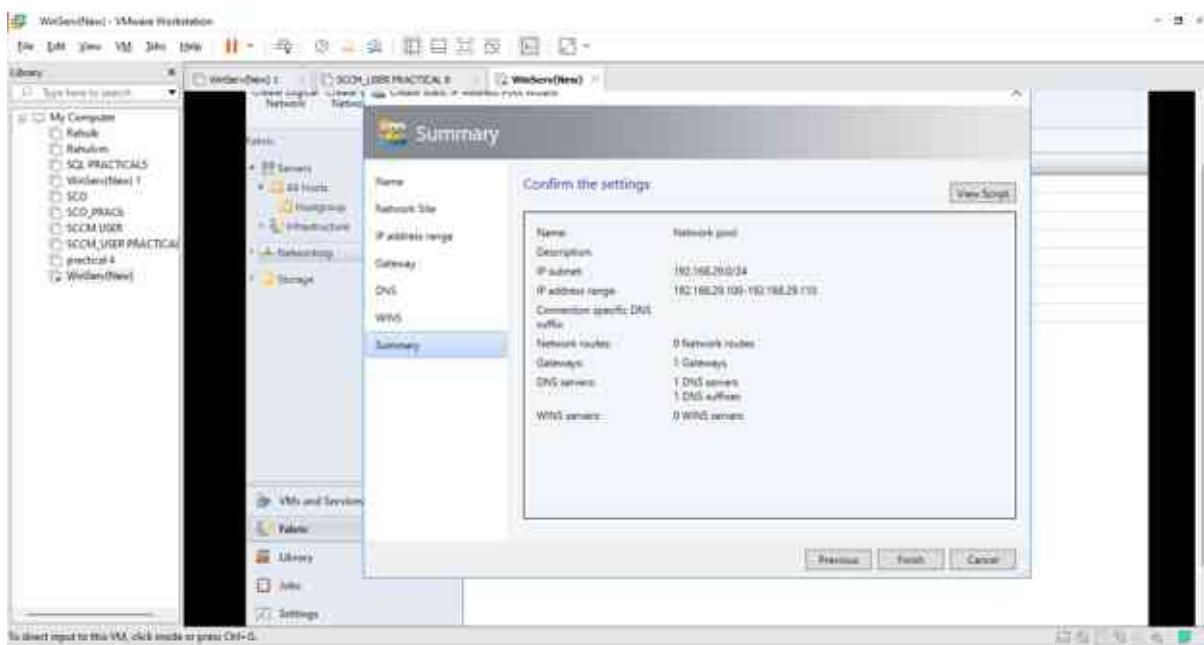
- Within Default Gateway **Click on Insert** and Enter the IP Address **192.168.29.1** and Keep the metric as Automatic and **Click on Next**



- In DNS, within DNS Server address in the order of use **Click on Insert** and Type in the IP Address **192.168.29.9** and **Click on Next**

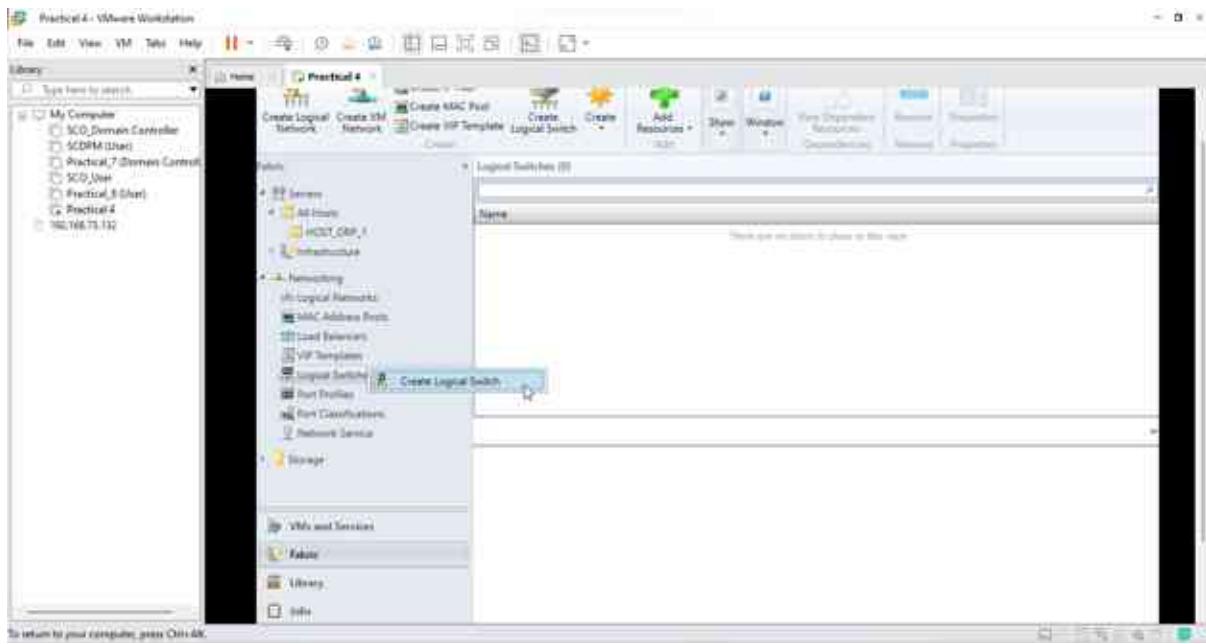


- Click on Finish

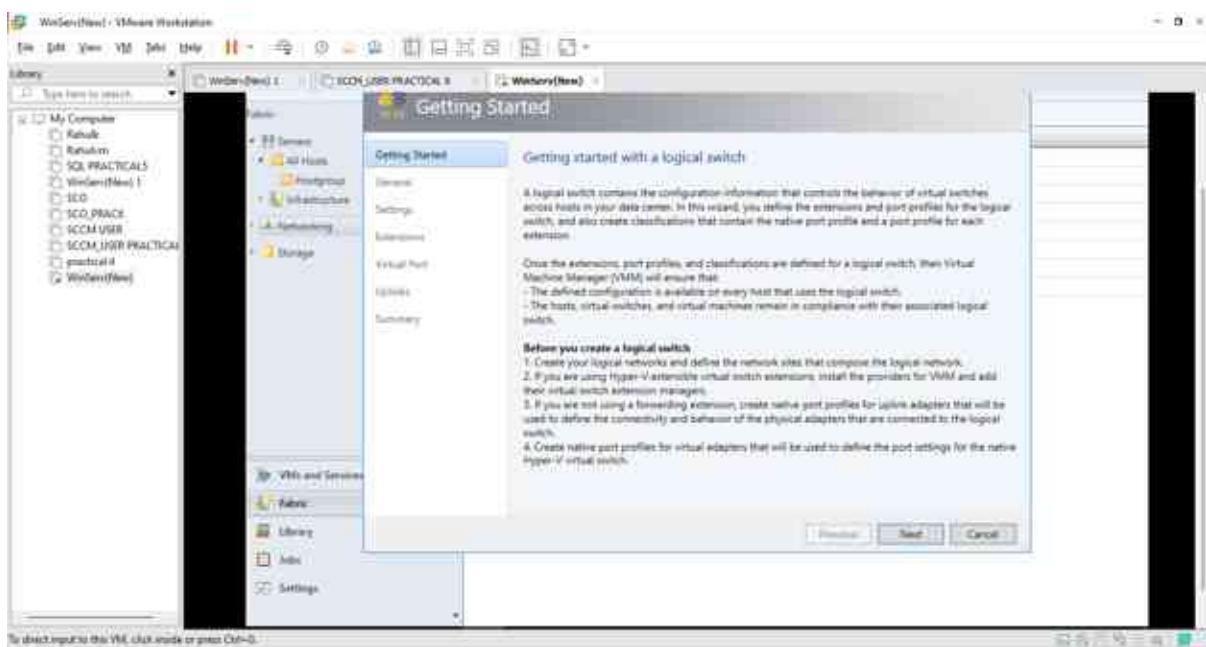


Step 3: Creating Logical Switch

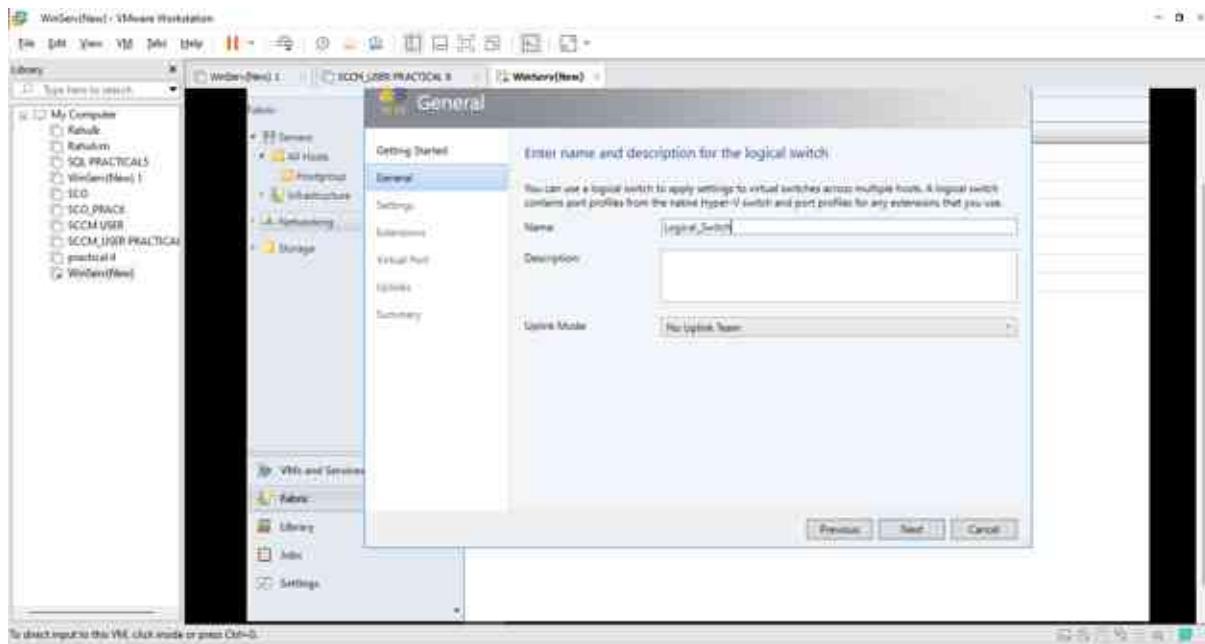
- In Networking, Right-Click on Logical Switch and Select Create Logical Switch



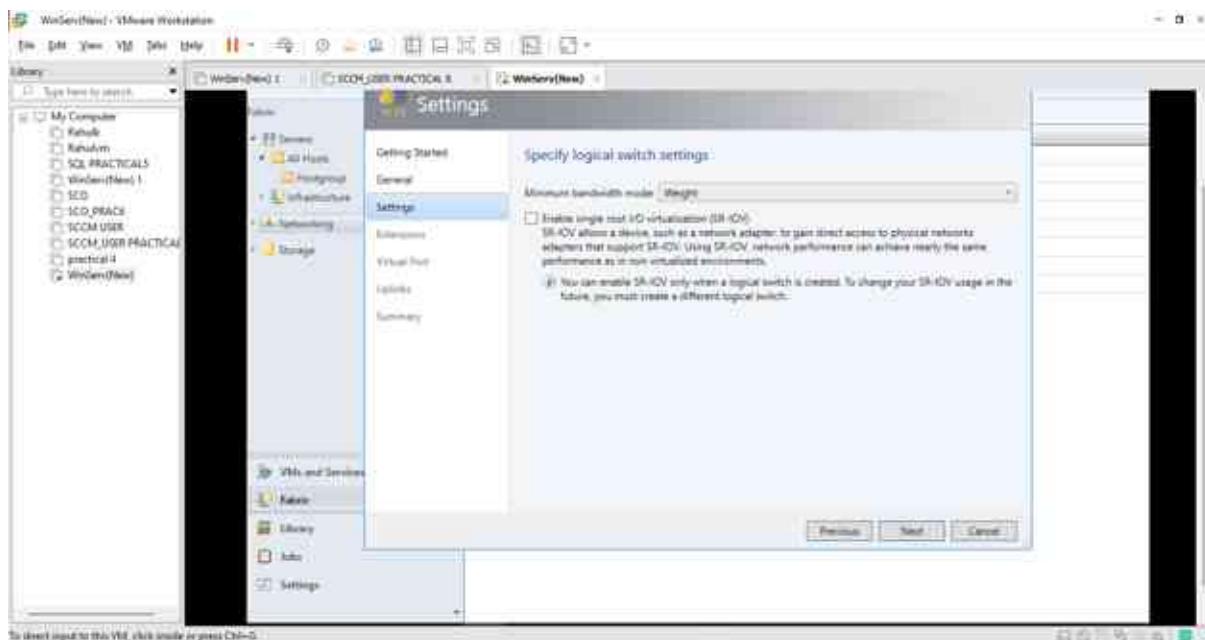
- Click on Next



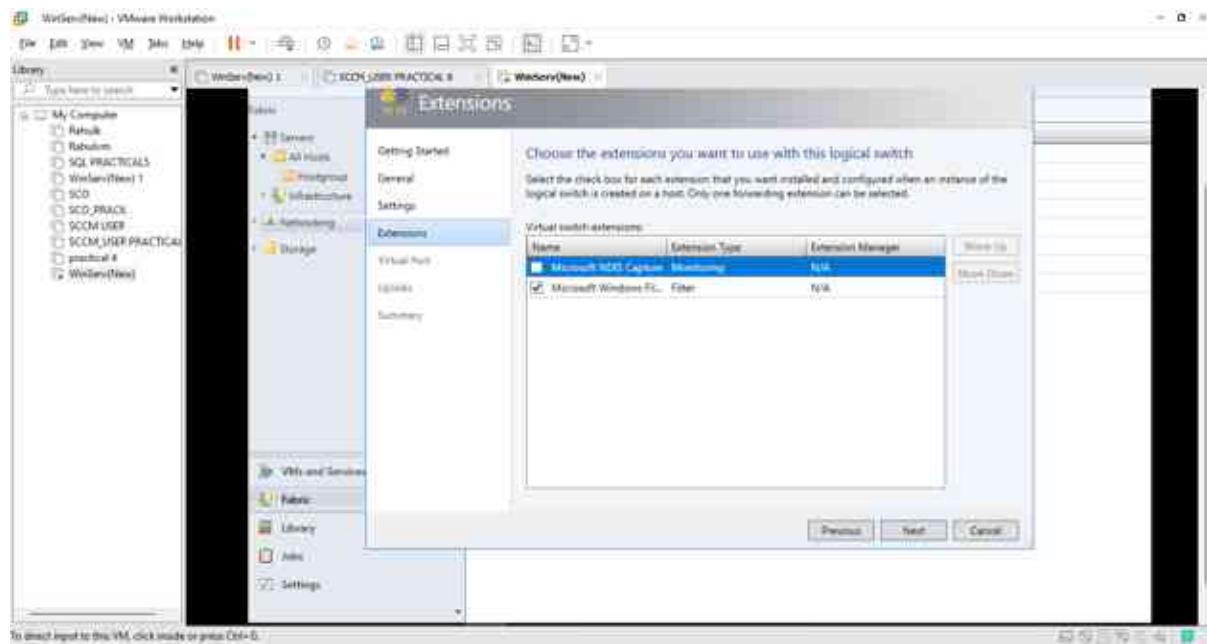
- Name the Switch and Select No Uplink Team and Click on Next



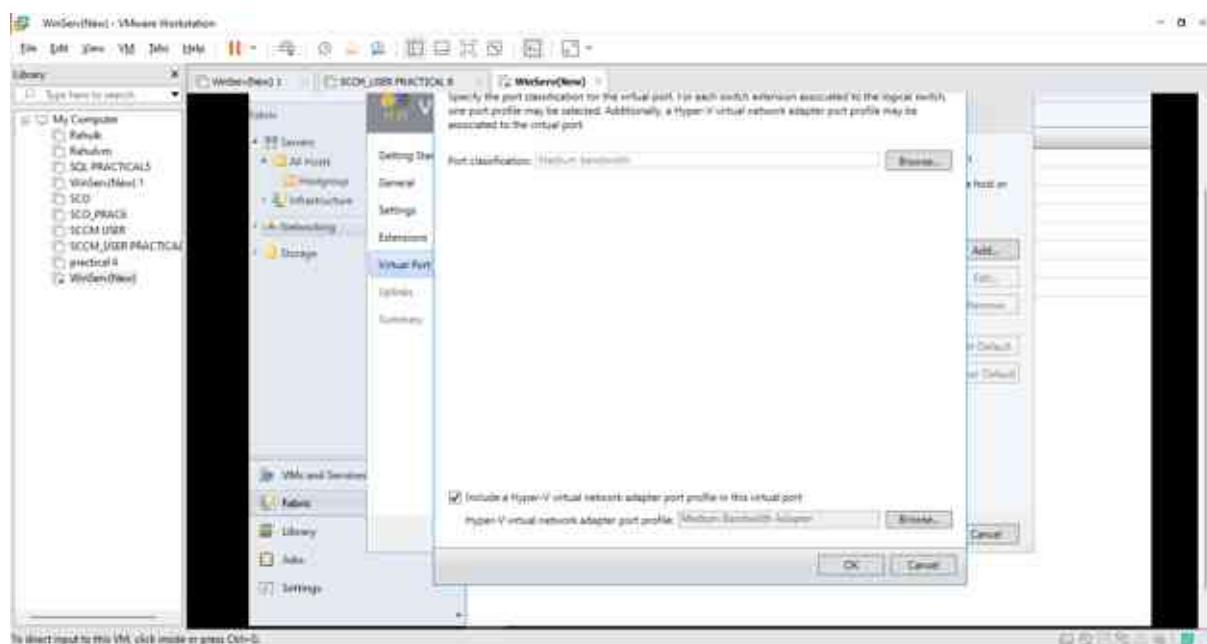
- Keep the default Setting and Click on Next



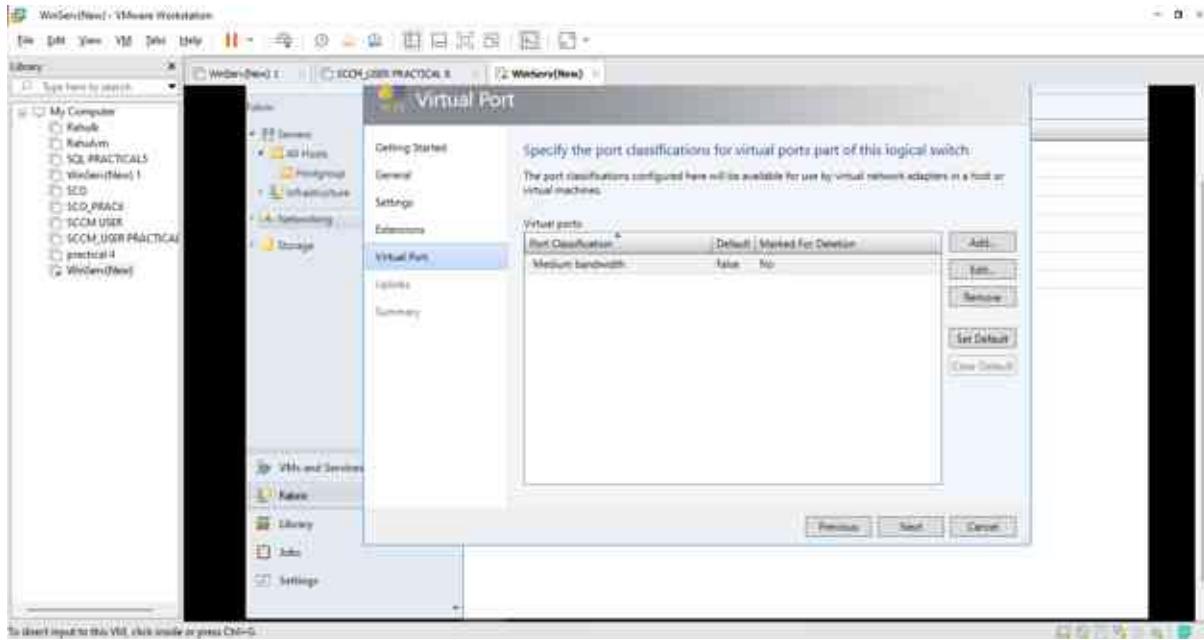
- Keep the default Setting and Click on Next



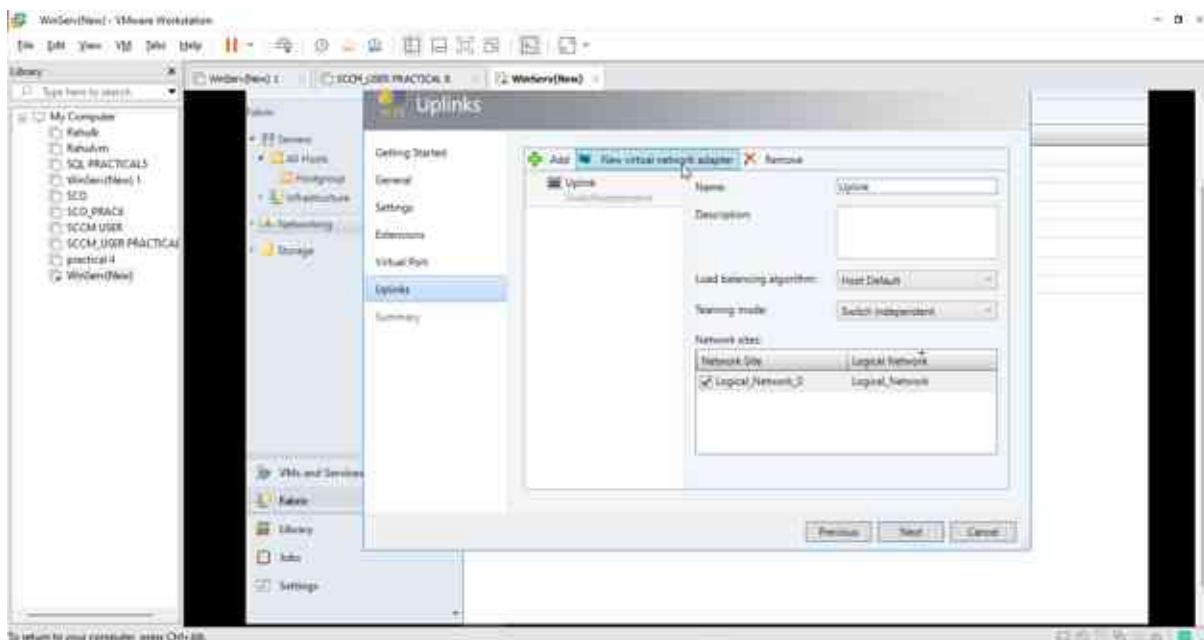
- Click on Add, in port classification Select **Medium bandwidth** and **Select Include a Hyper-V virtual network adapter port profile in this virtual port** and Select Medium bandwidth adapter and **Click on Ok**



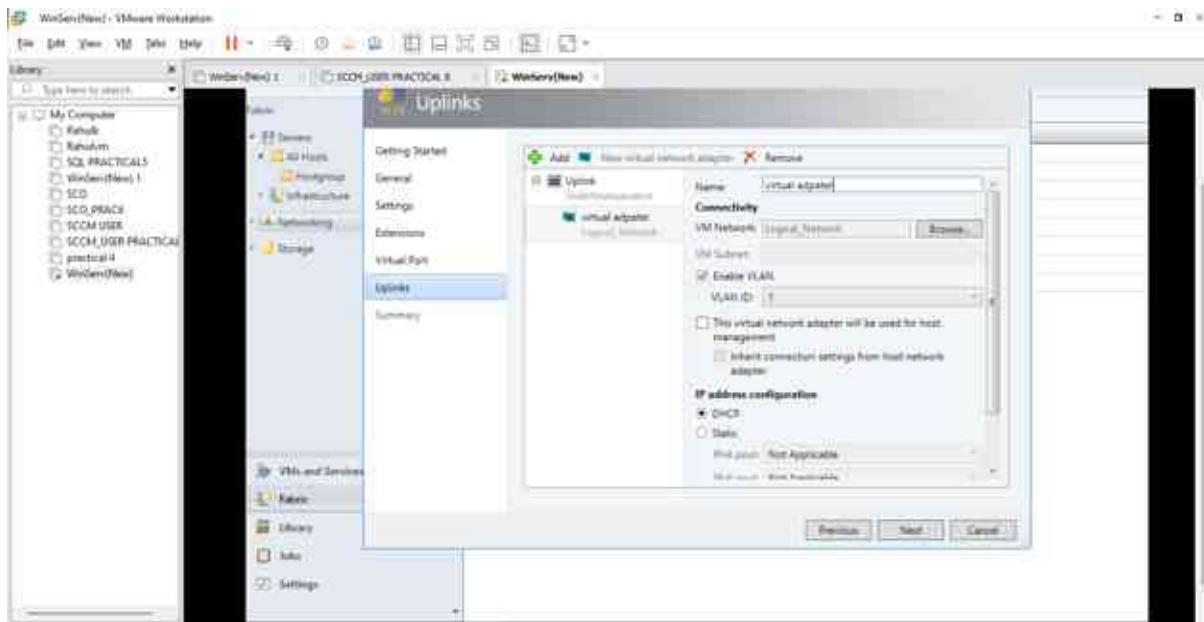
- Click on Next



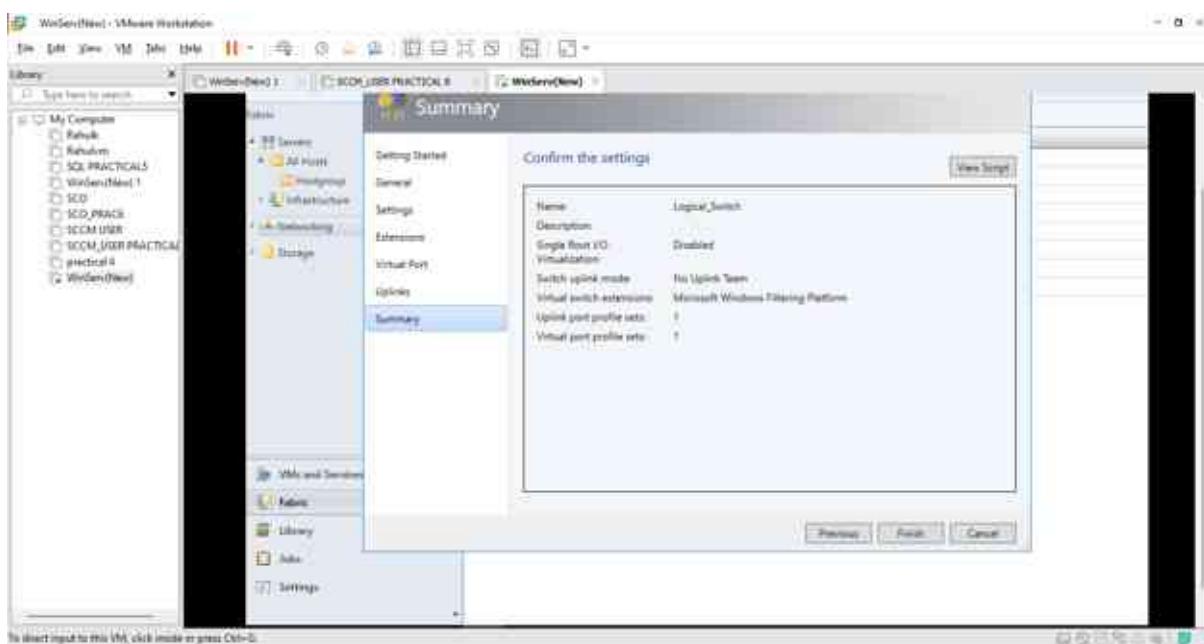
- Click on Add Give the Name (Here it is **Uplink**) and In Network sites: Check **Logical_Network_0** and then Click on New virtual network adapter



- Name your virtual network adapter and Keep majority of the settings default and Select Medium bandwidth in Port Profile and Click Next

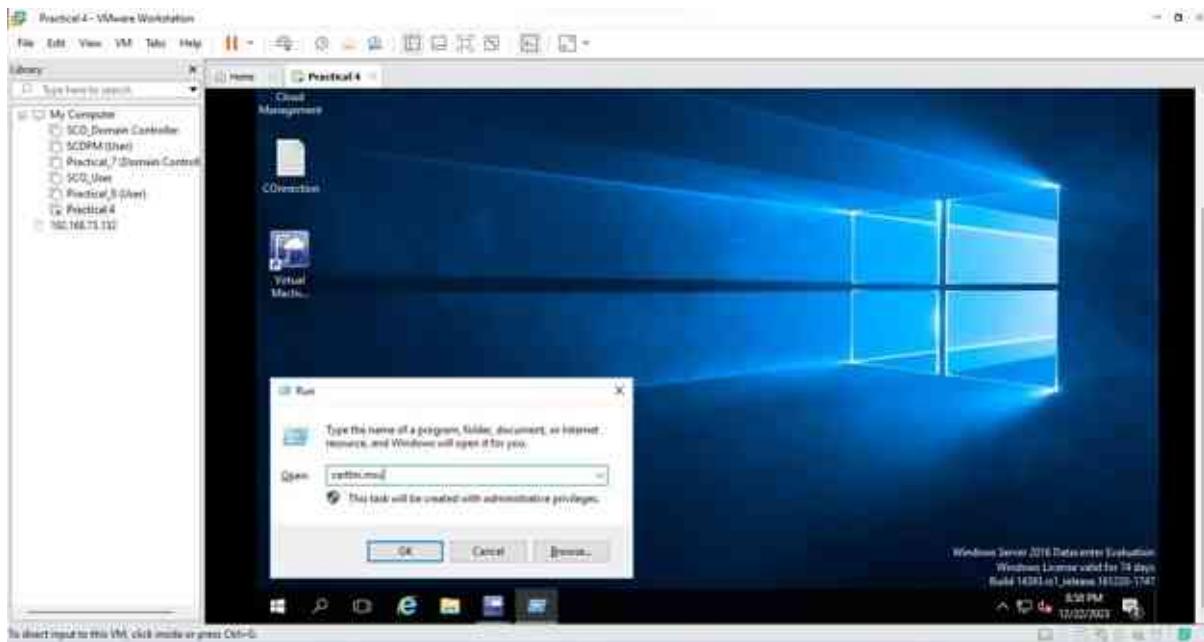


- Click on Finish

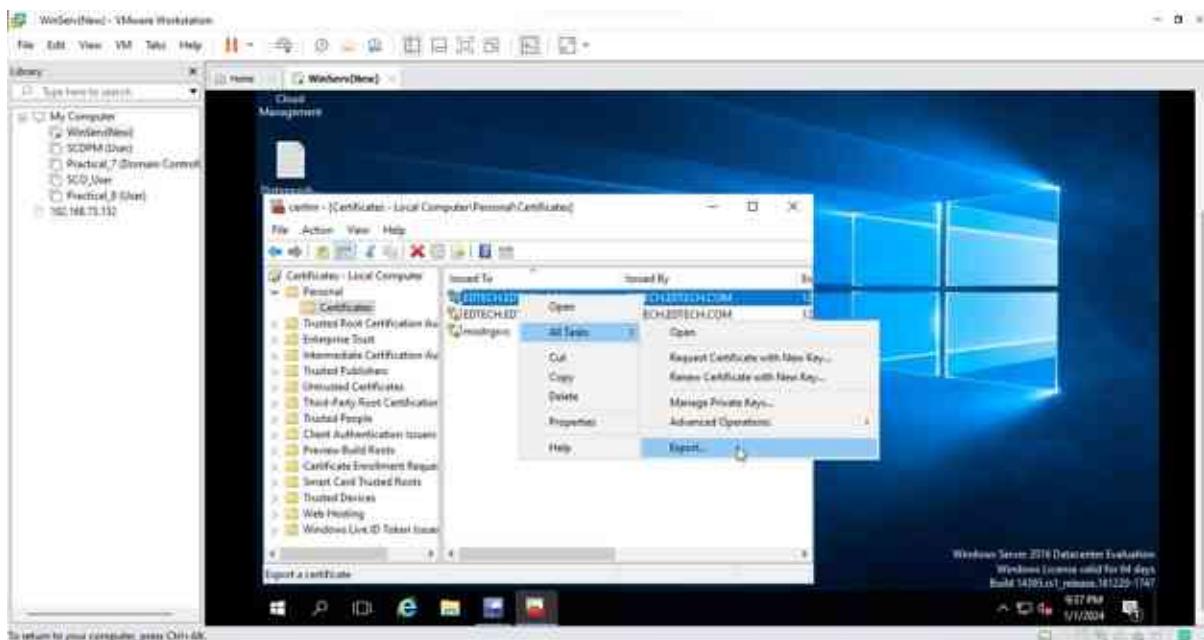


Step 4: Setting up the Security Certificate

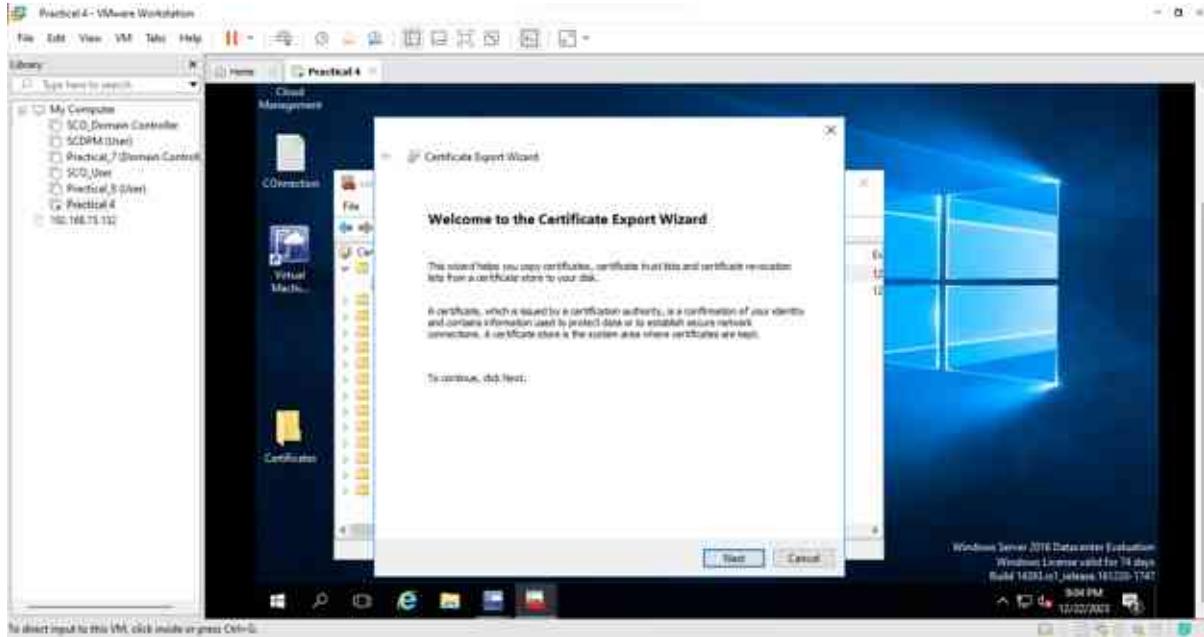
- In your Windows Run type in **certlm.msc** and **Click On Ok**



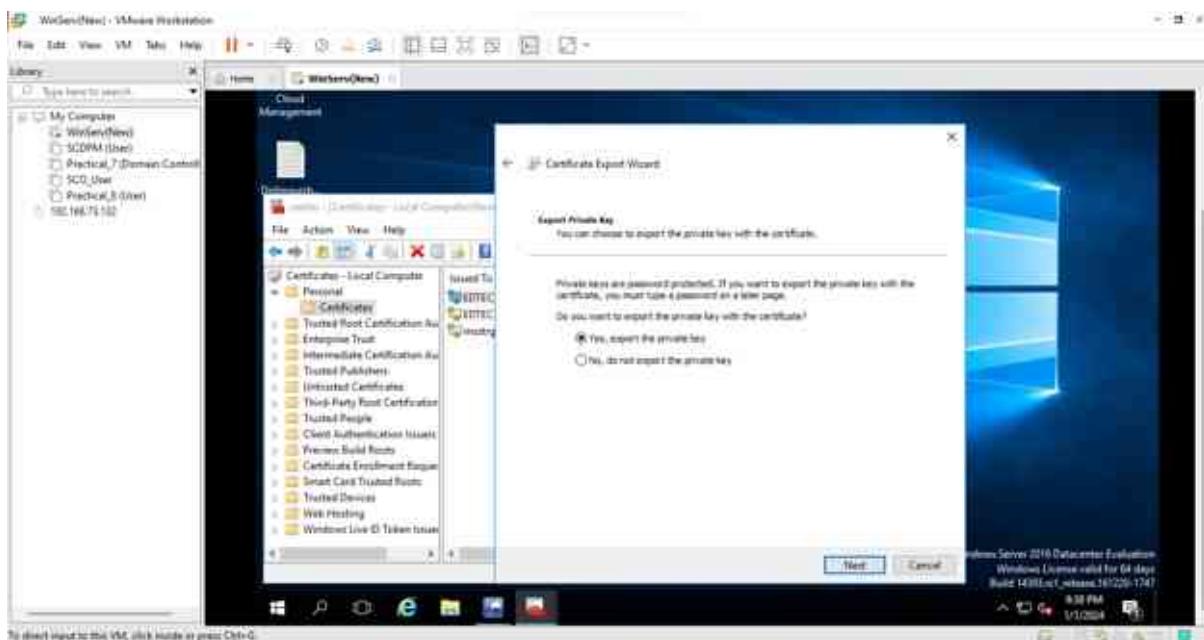
- Now Click on Personal and Select Certificate and within Certificate, Right-Click on EDTECH.EDTECH.COM and msstrgsvc and Click All tasks and Click Export



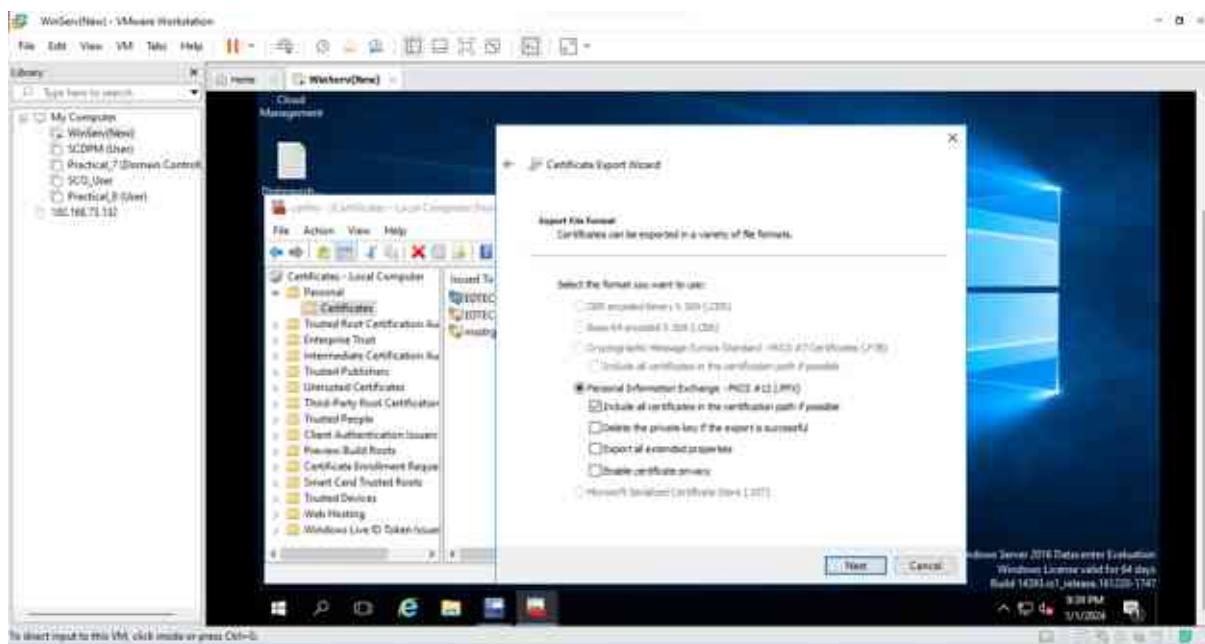
- Click Next



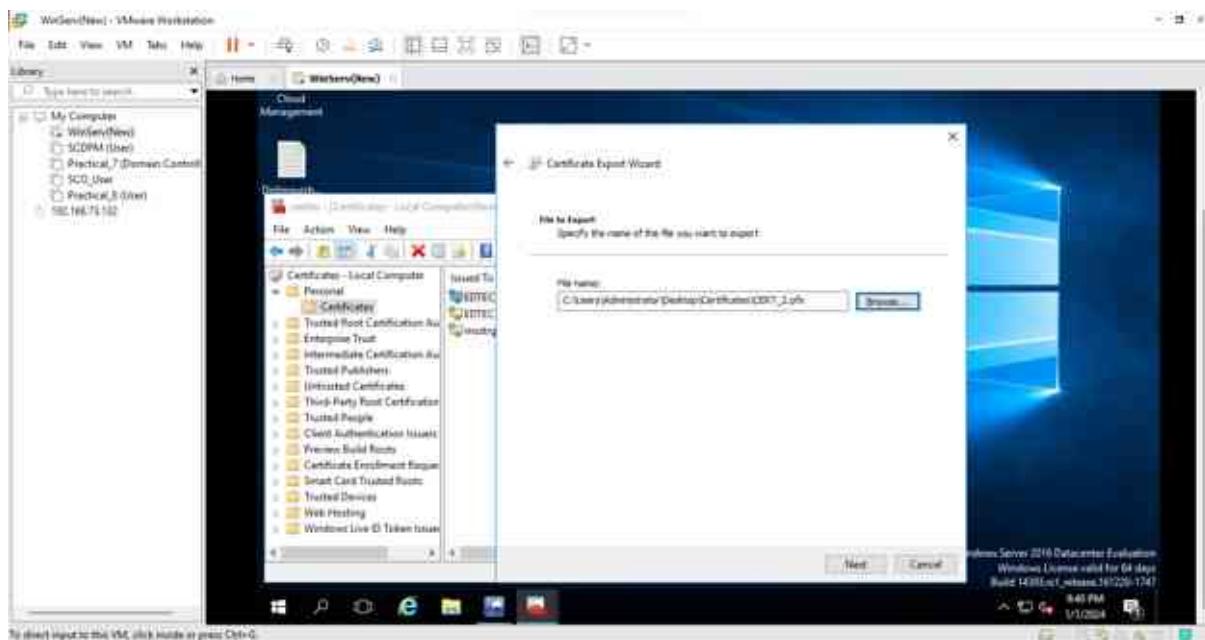
- Select Yes, export the private key and Click on Next



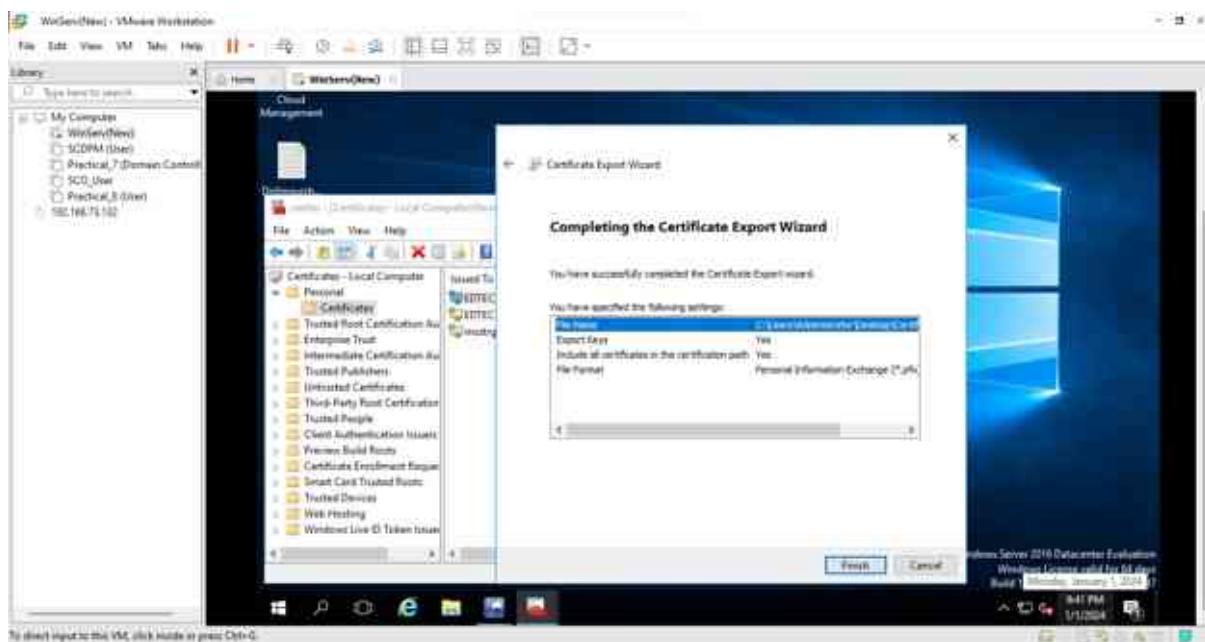
- Keep default values and Click on Next



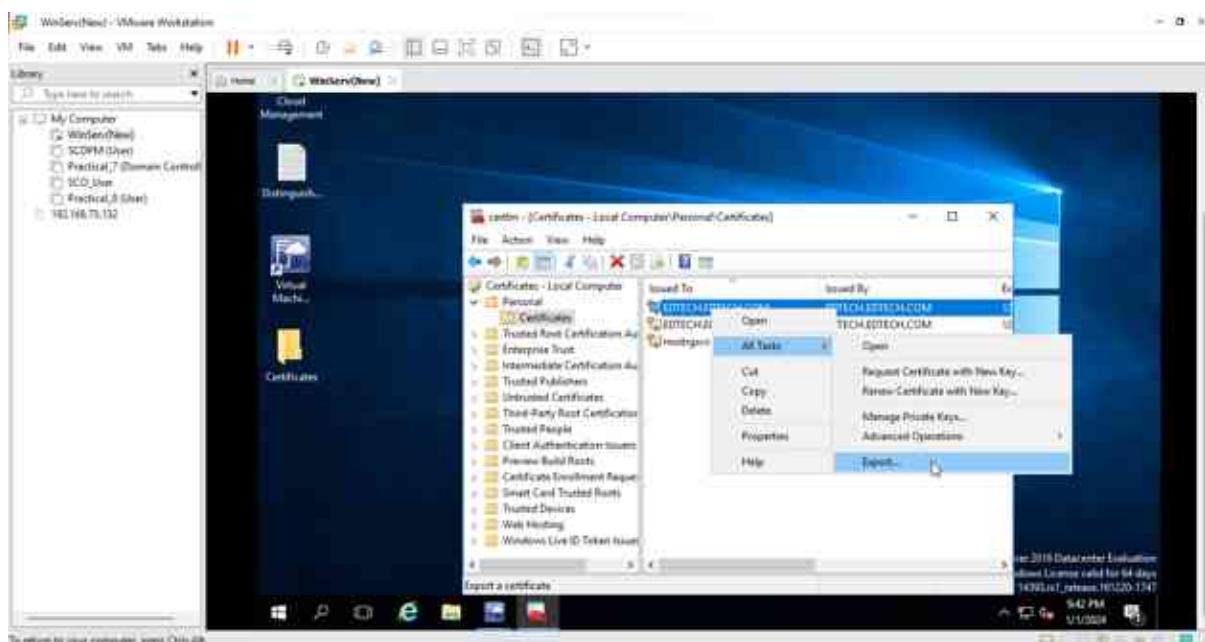
- Give it a file name and **Click on Next**



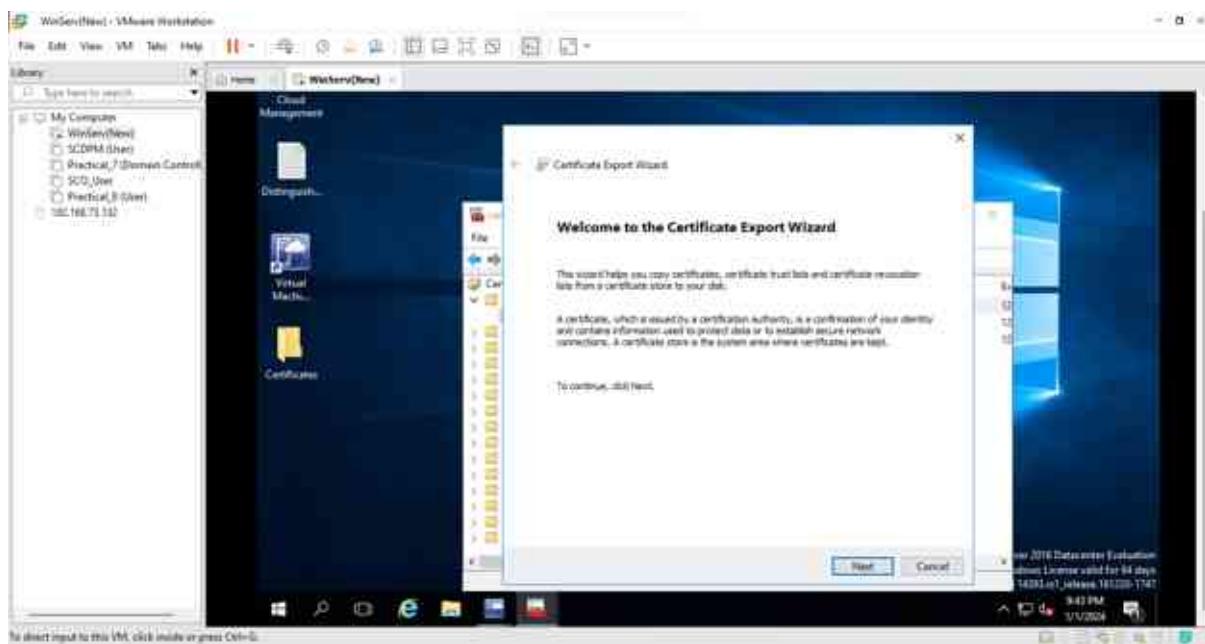
- **Click on Finish**



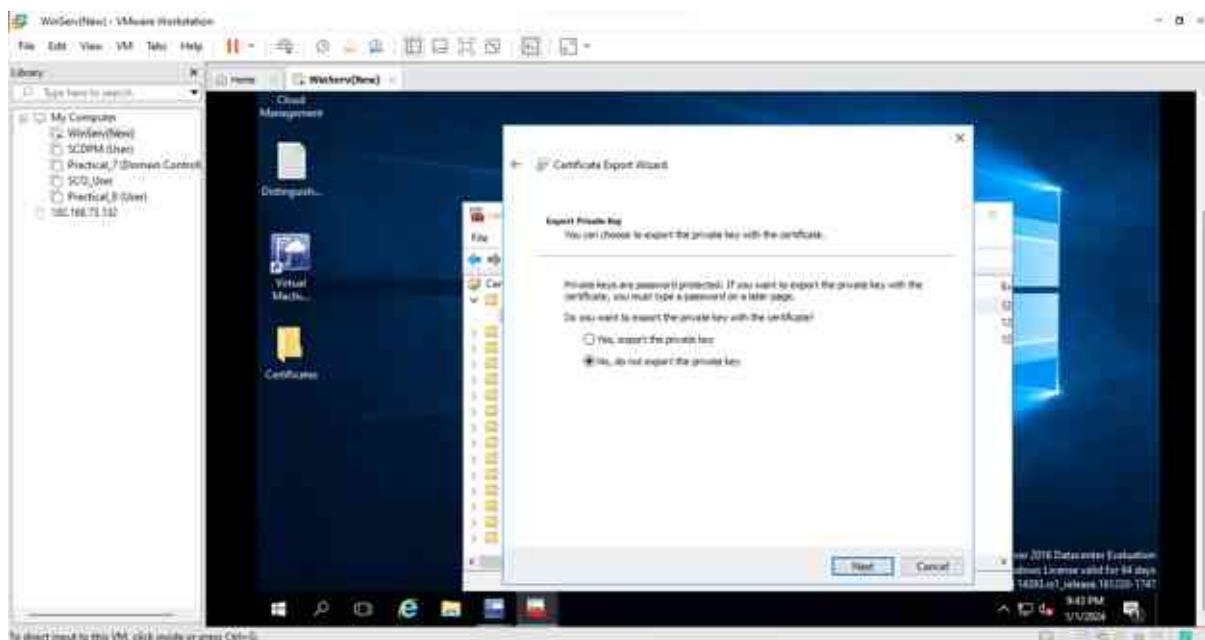
- Now Right-Click on the certificate again and Click on Export



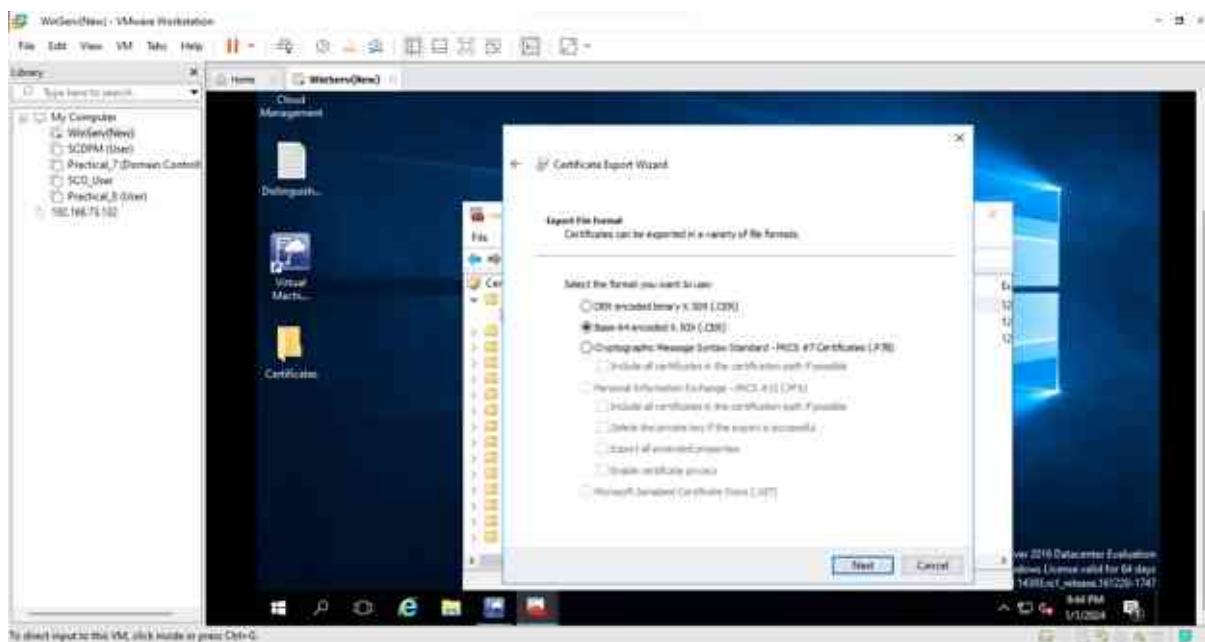
- Click On Next



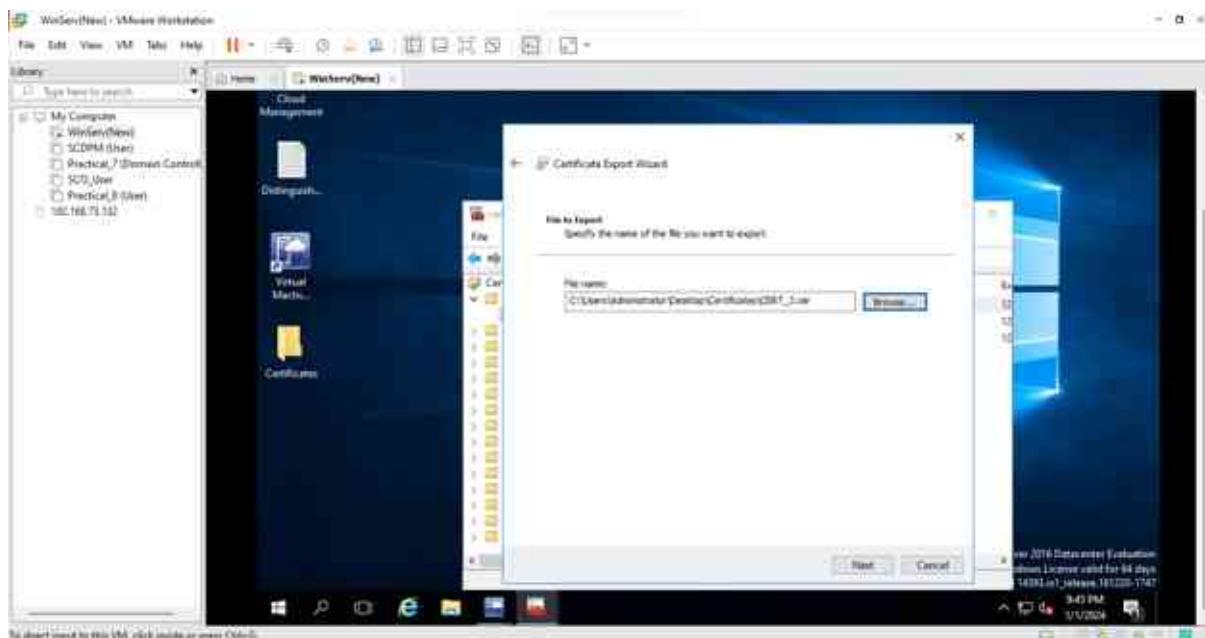
- Select **No, do not export the private key** and Click On Next



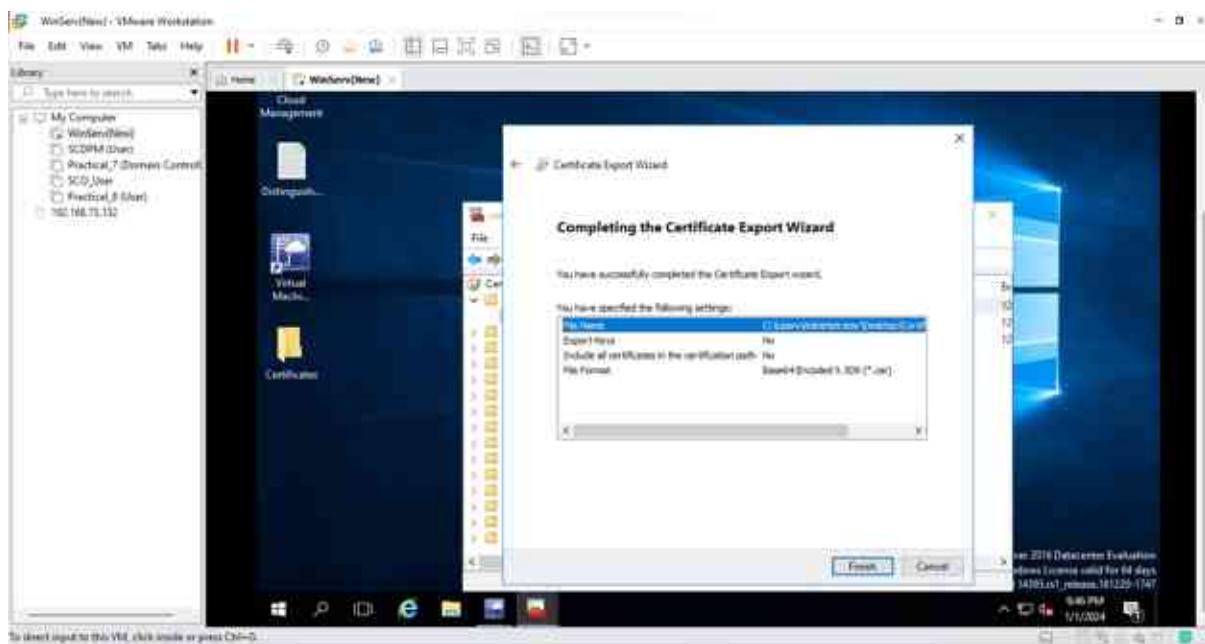
- Select **Base-64-encoded X.509 (.CER)** and Click On Next



- Give it a path and **Click On Next**

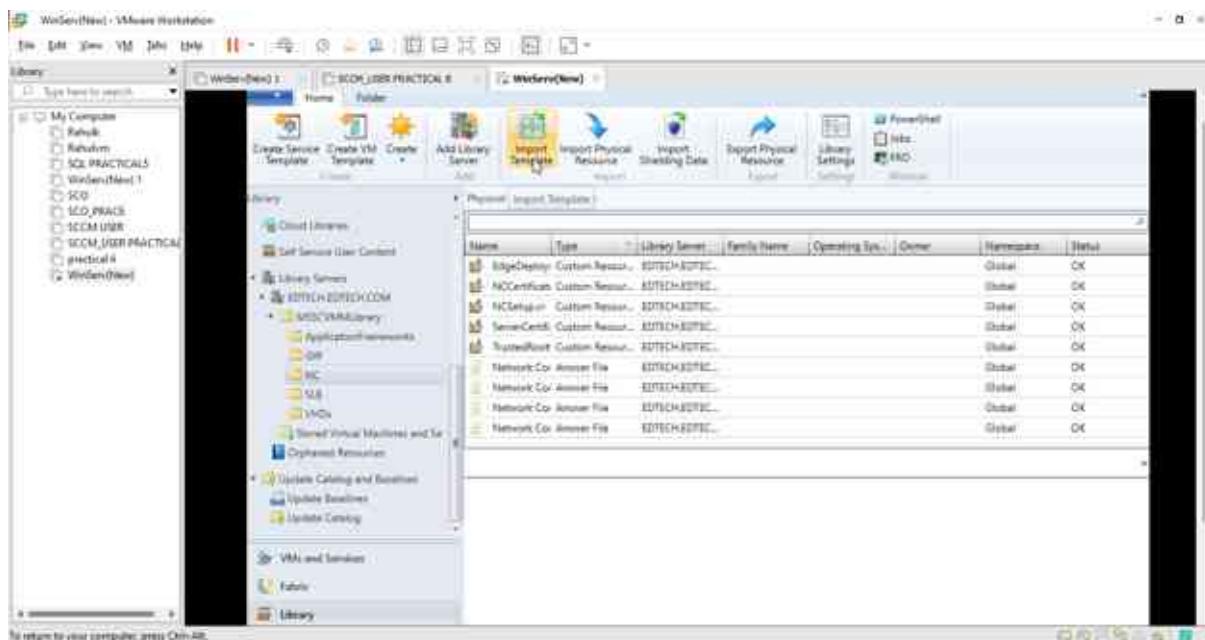


- **Click Finish**

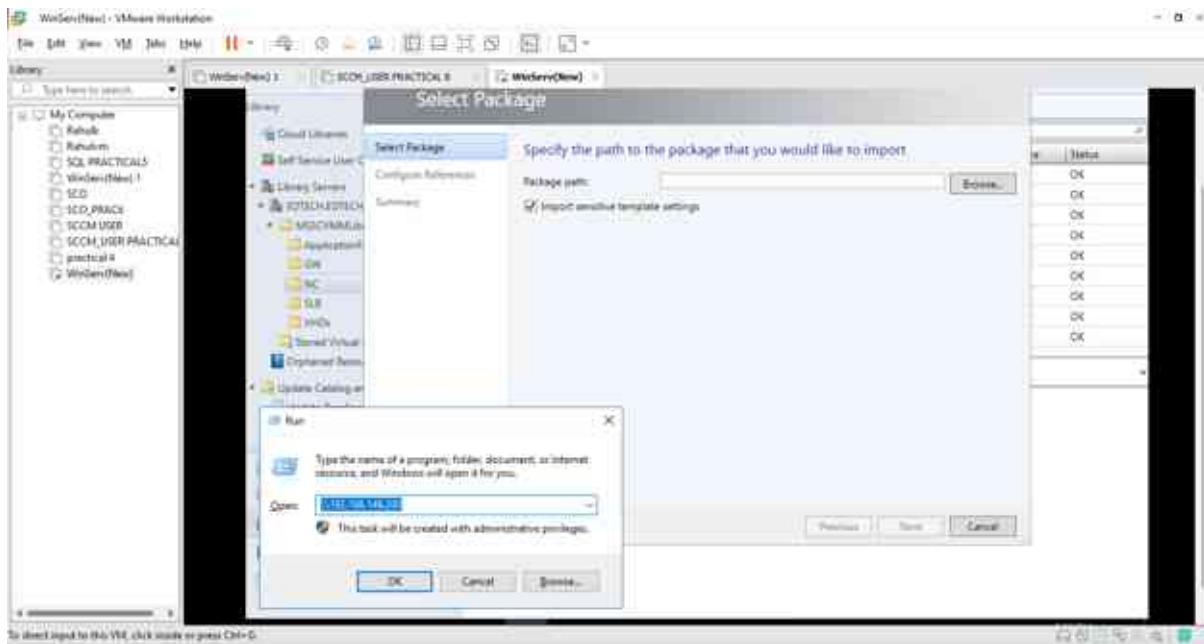


Step 5: Set up Service Template

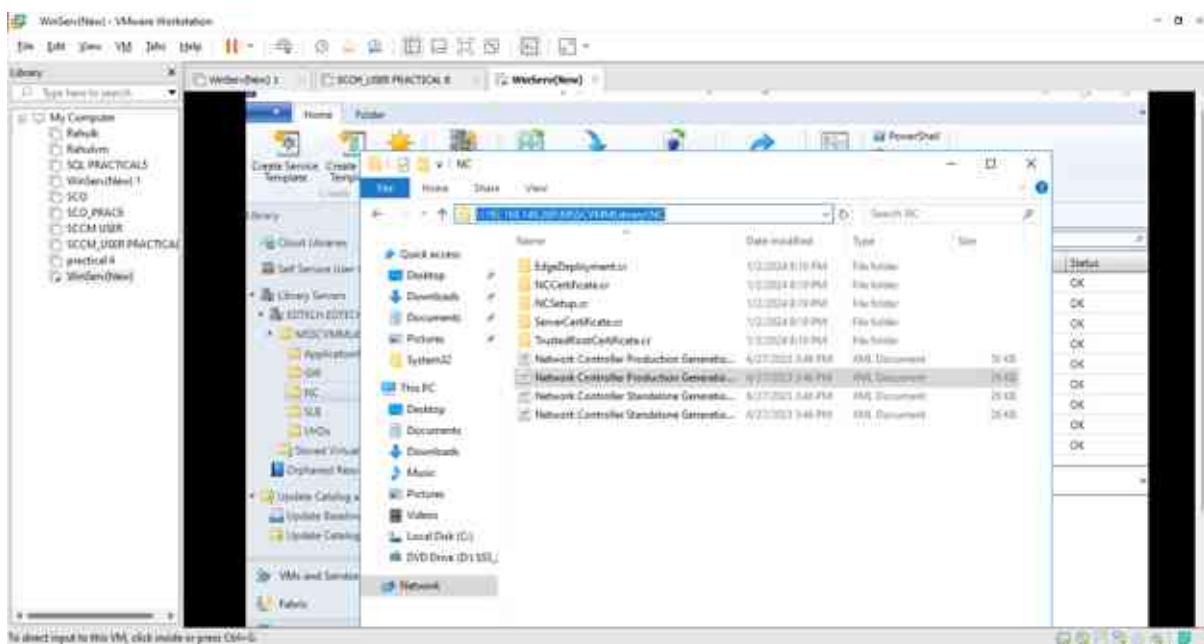
- In SCVMM Select the Library Tab and Click on Import Template



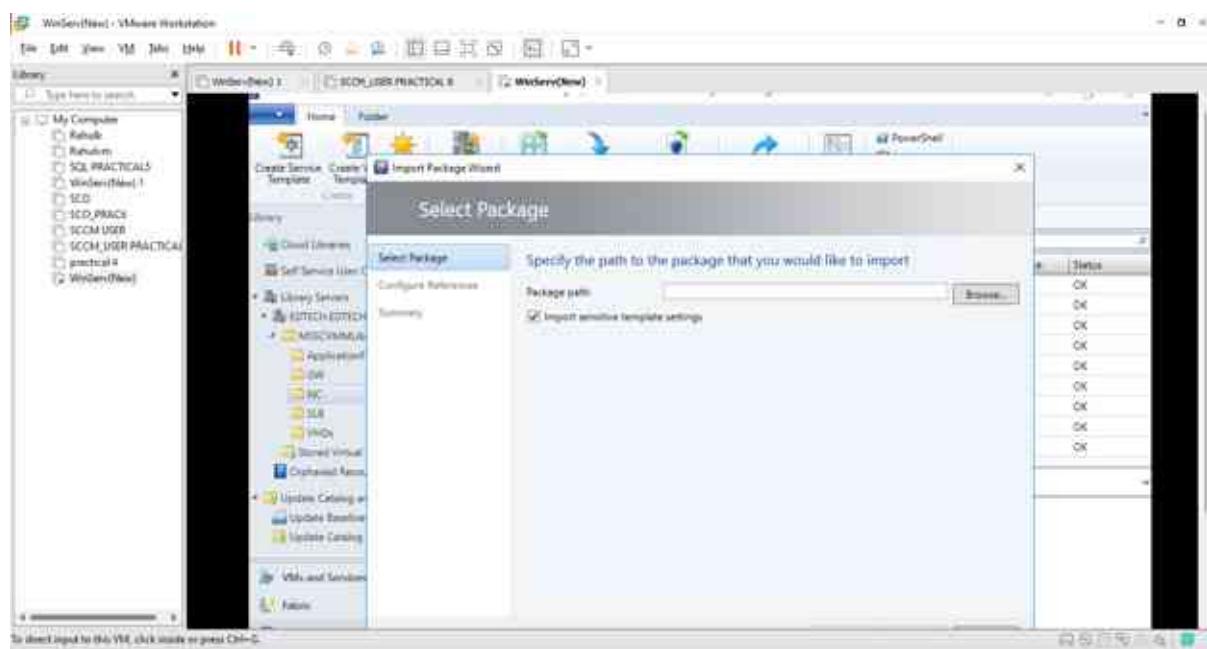
- In Select Package Open Run Window and then Type **IP address of the WinServ(New) (Here it is \192.168.149.200) Click on Ok**



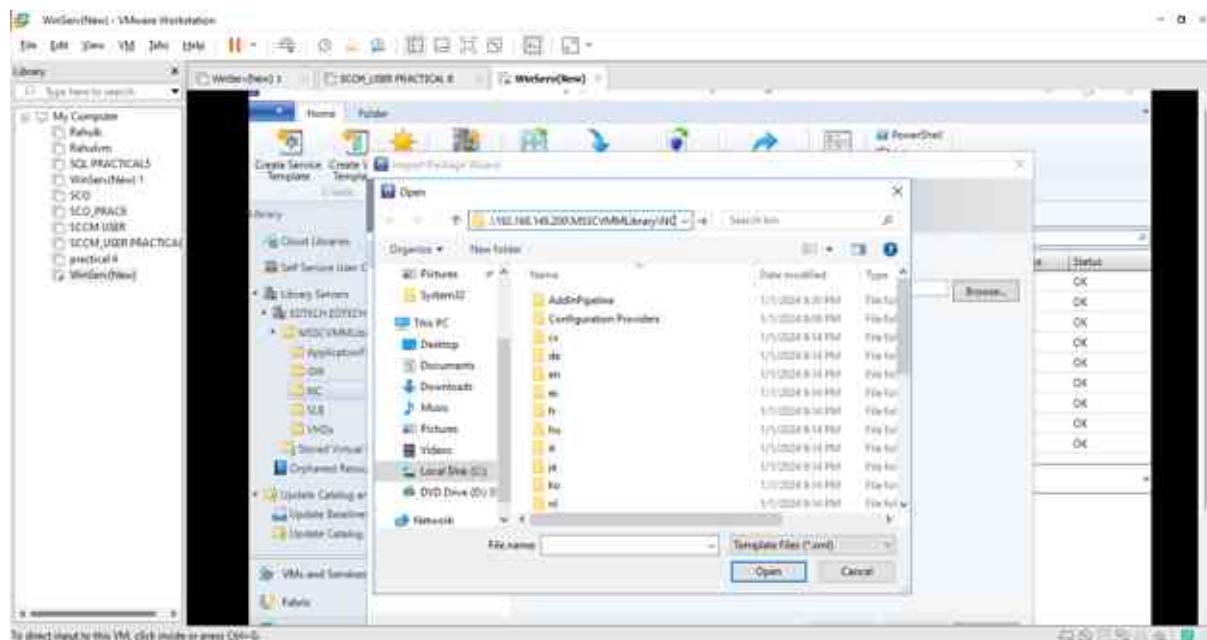
- Within **MSSCVMM Library** Select **NC** Folder and then **Copy the Path**



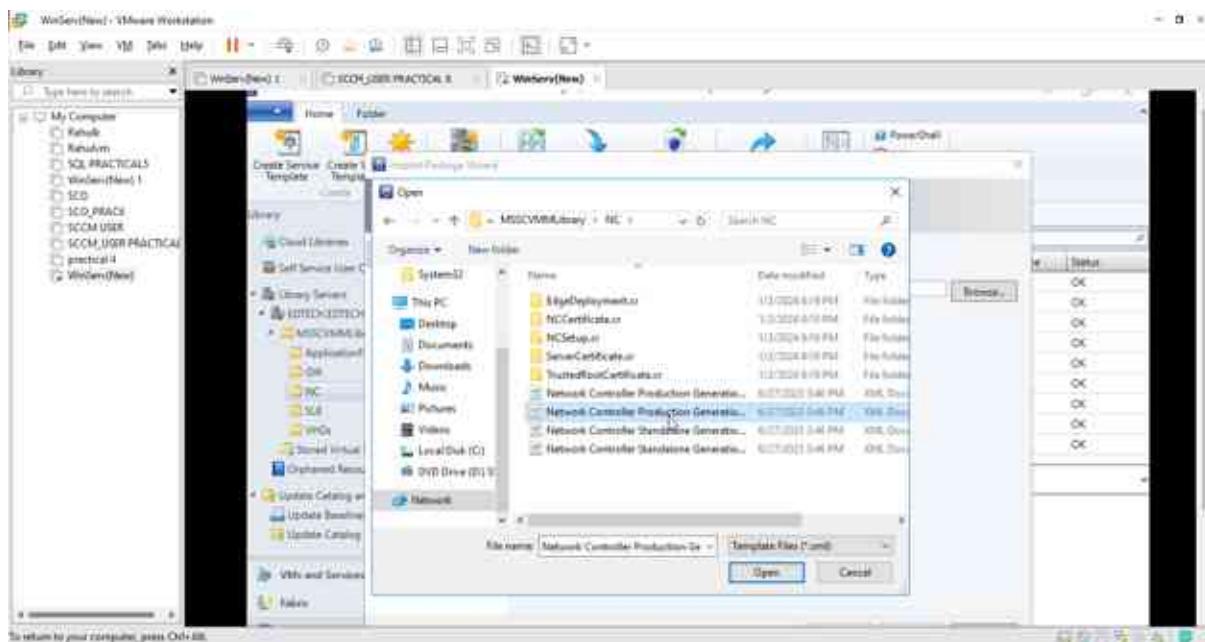
- Now again Go to the Select Package window **Click on Browse**



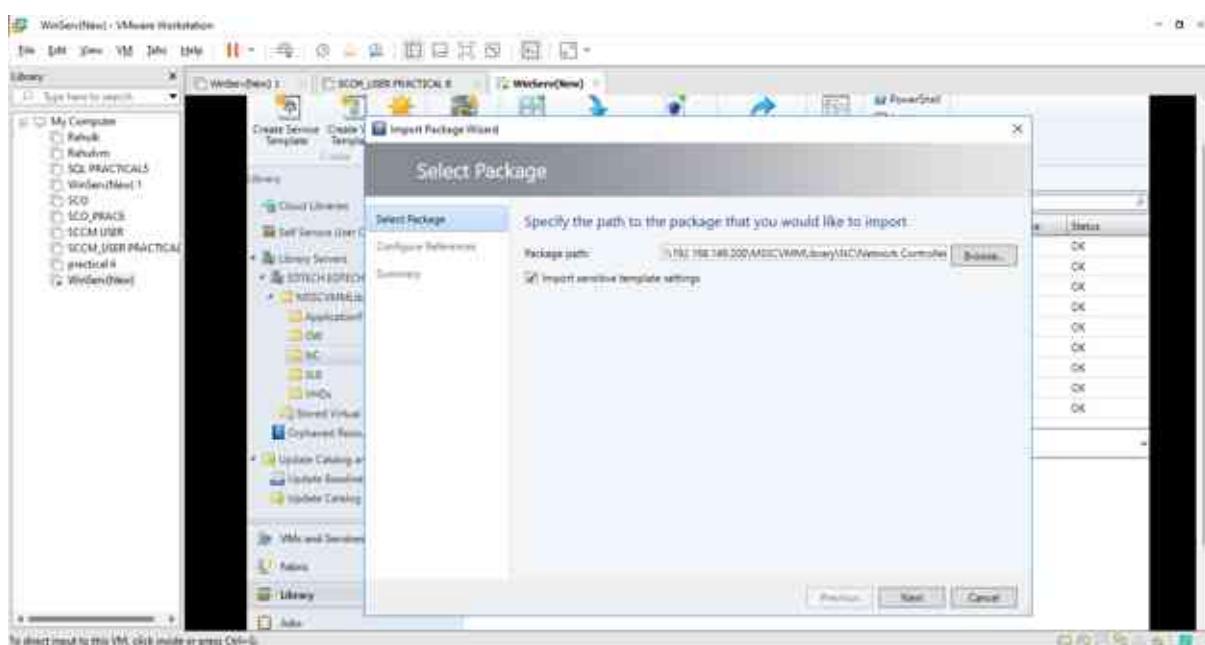
- Now paste the path for NC and then **Click on Enter**



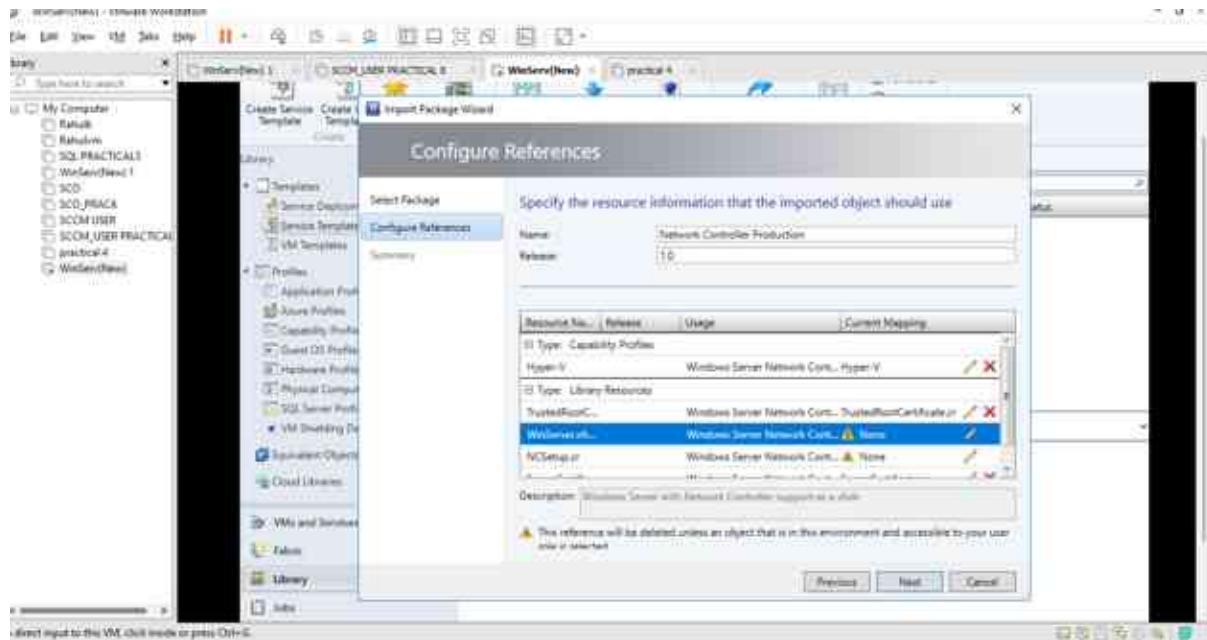
- Within NC Folder Select **Network Controller Production Generation 2** and then Click on Ok



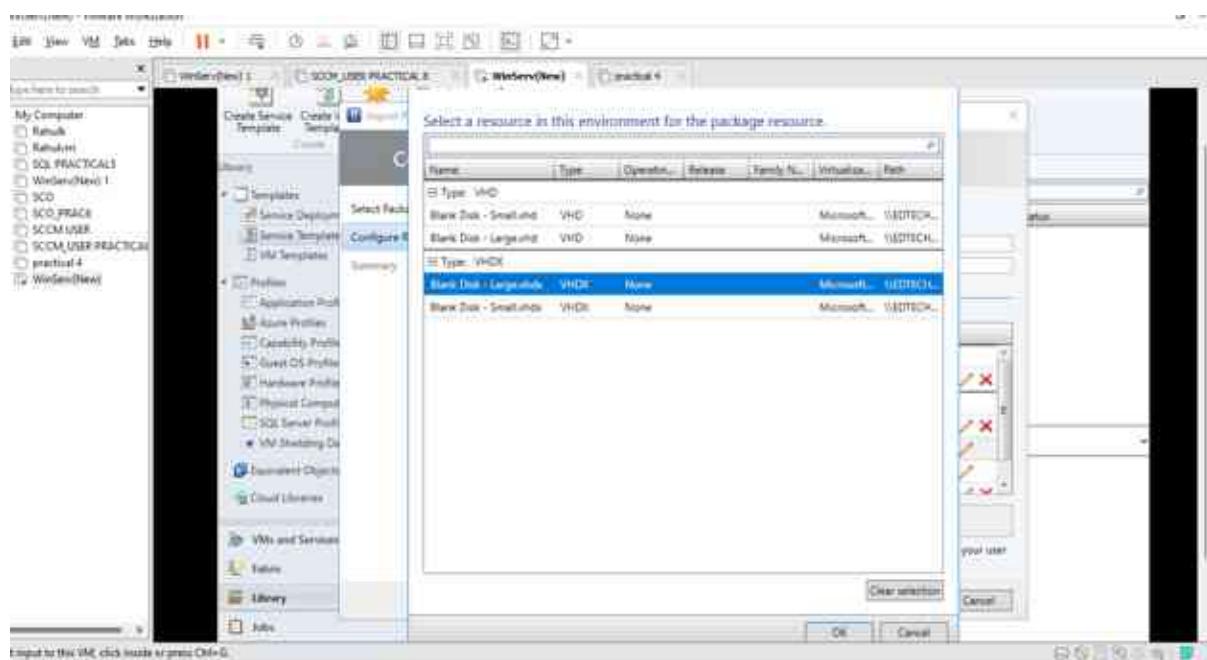
- Click on Next



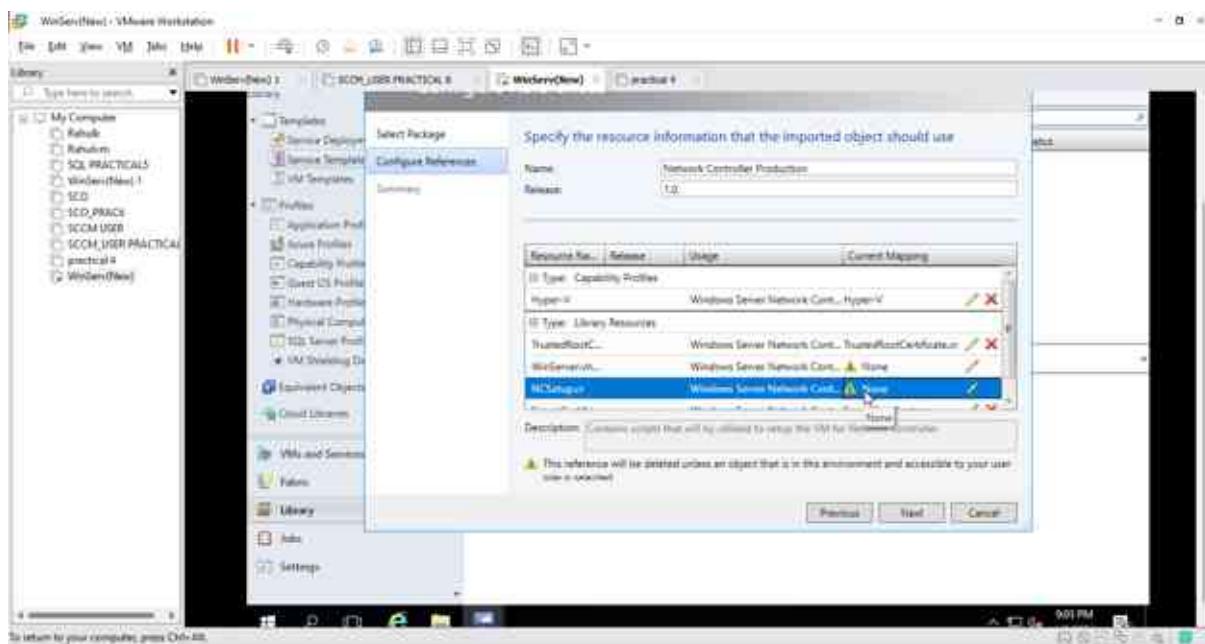
- Within Configuration References Click on WinServer.vh and then Click on Edit



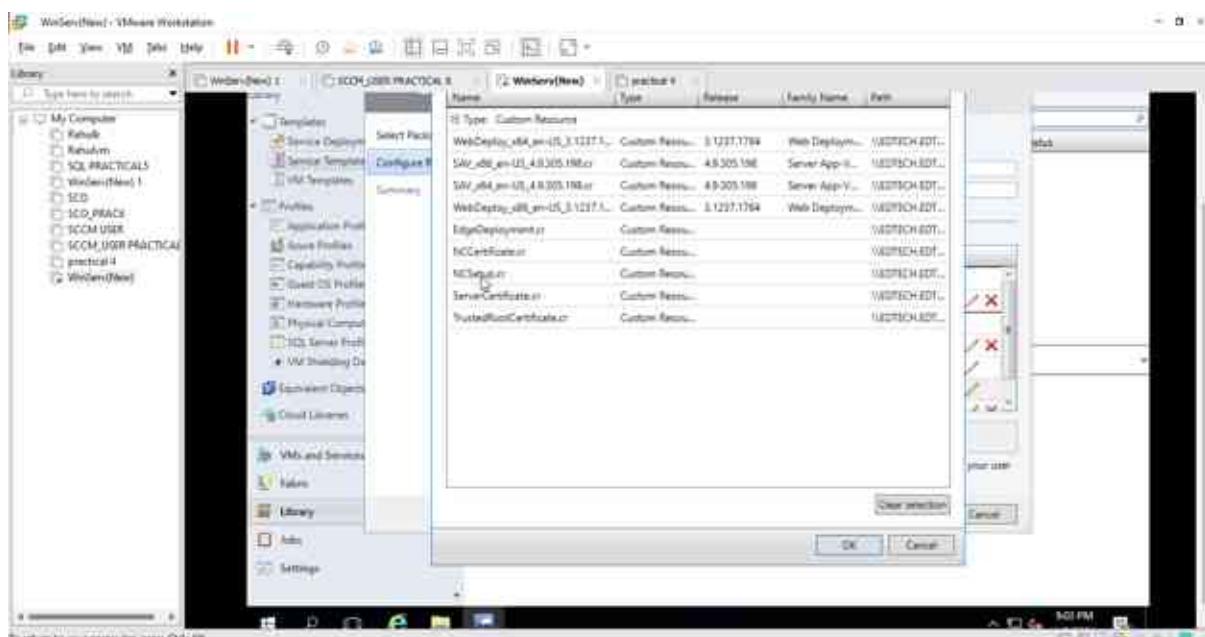
- Within Type: VHDX Select Blank Disk – Large.vhdx and Click on OK



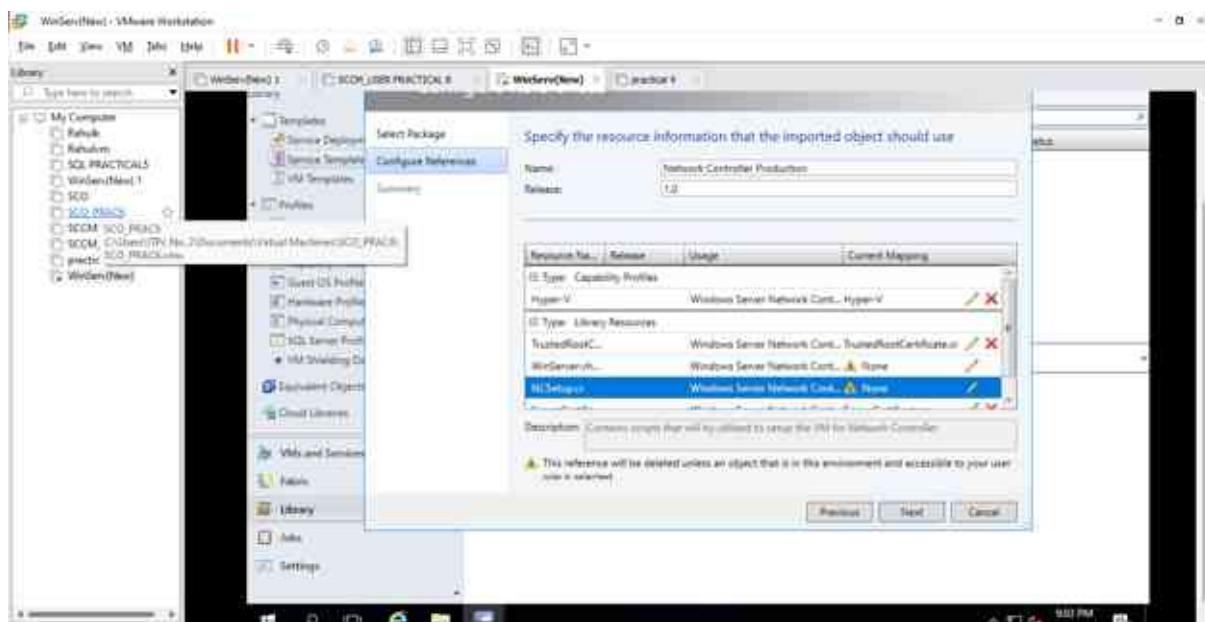
- Now again within Configure Reference Click on NCSetup.cr and then Click on Edit



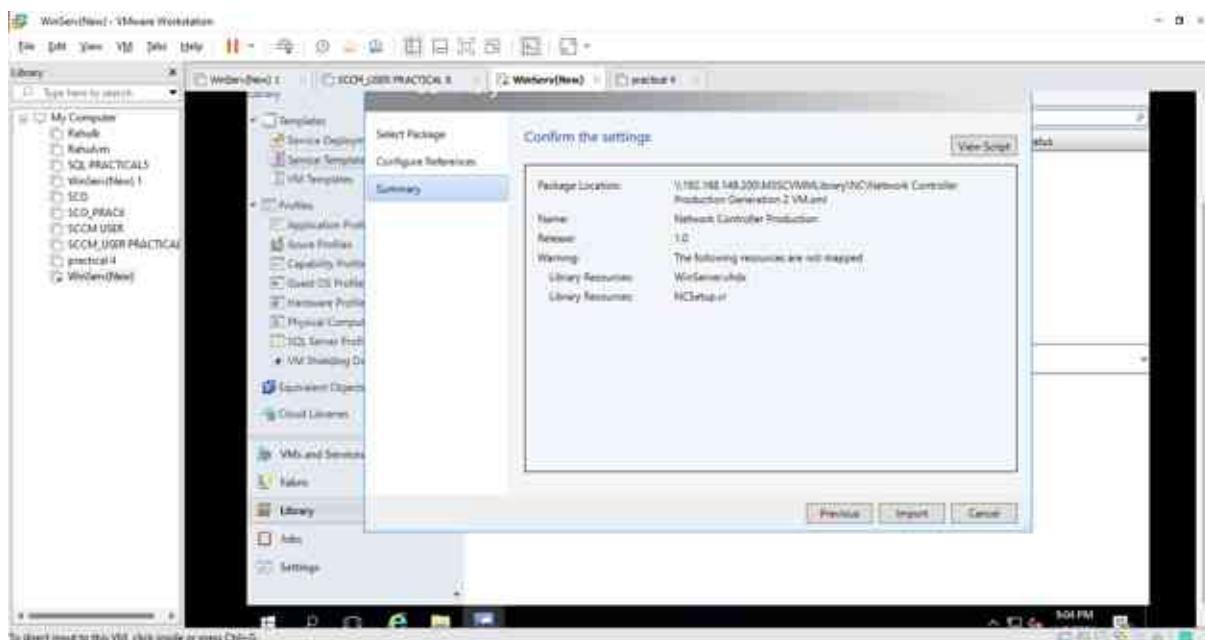
- Select NCSetup.cr and Click on Ok



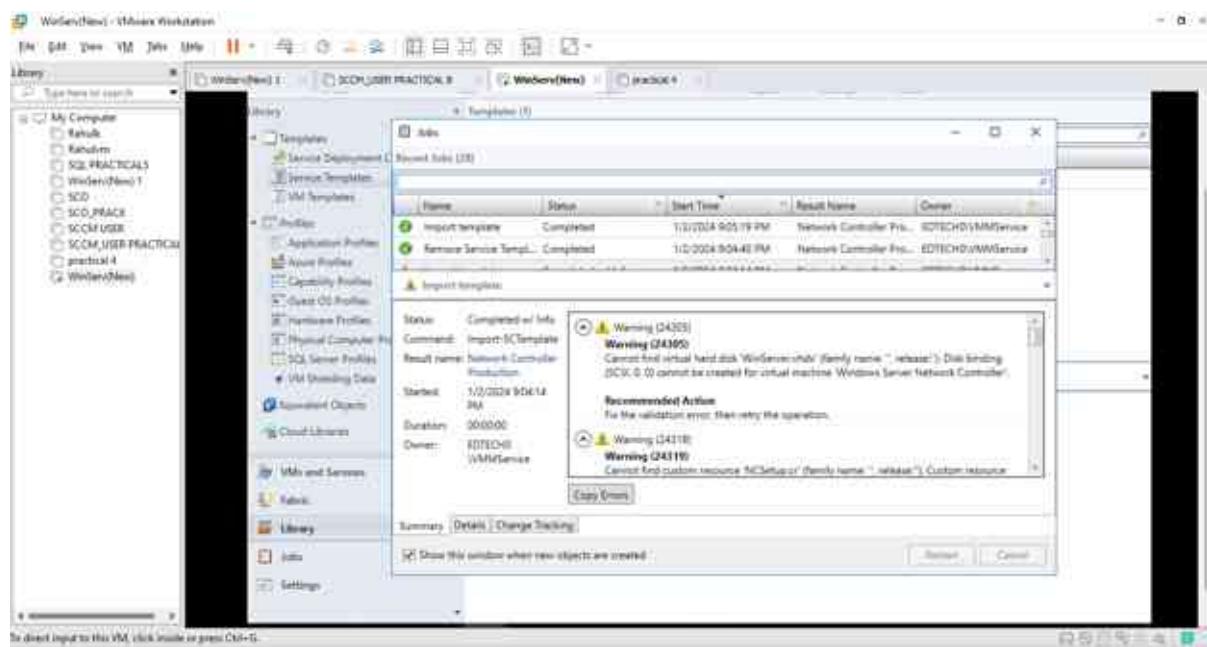
- Click on Next



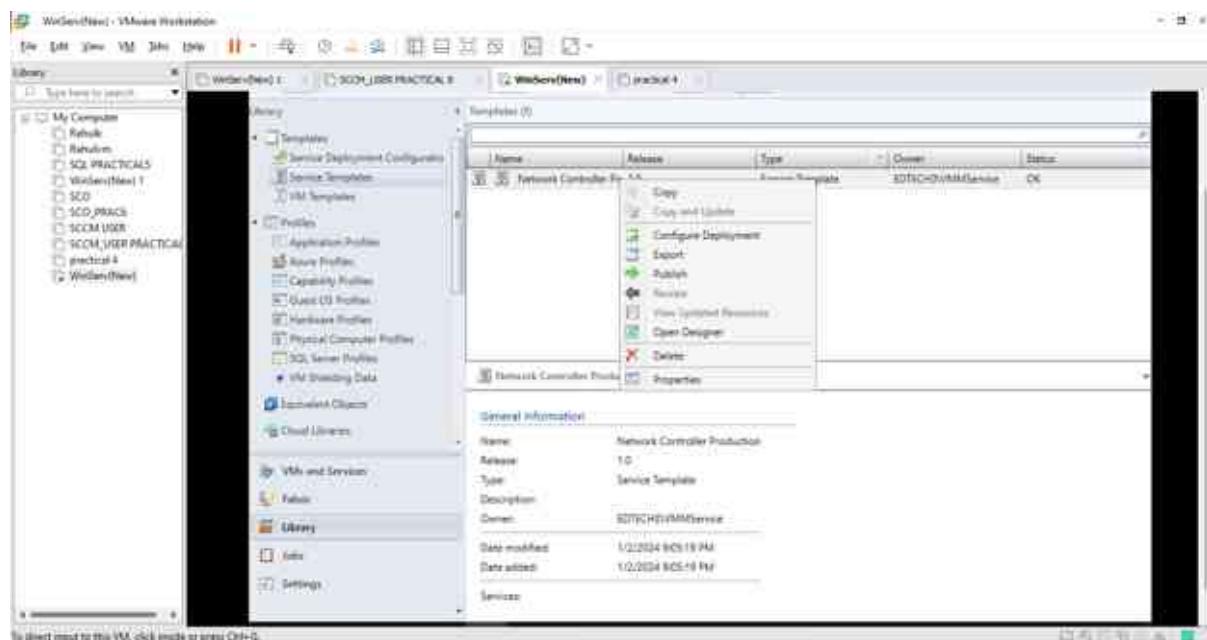
- Click on import



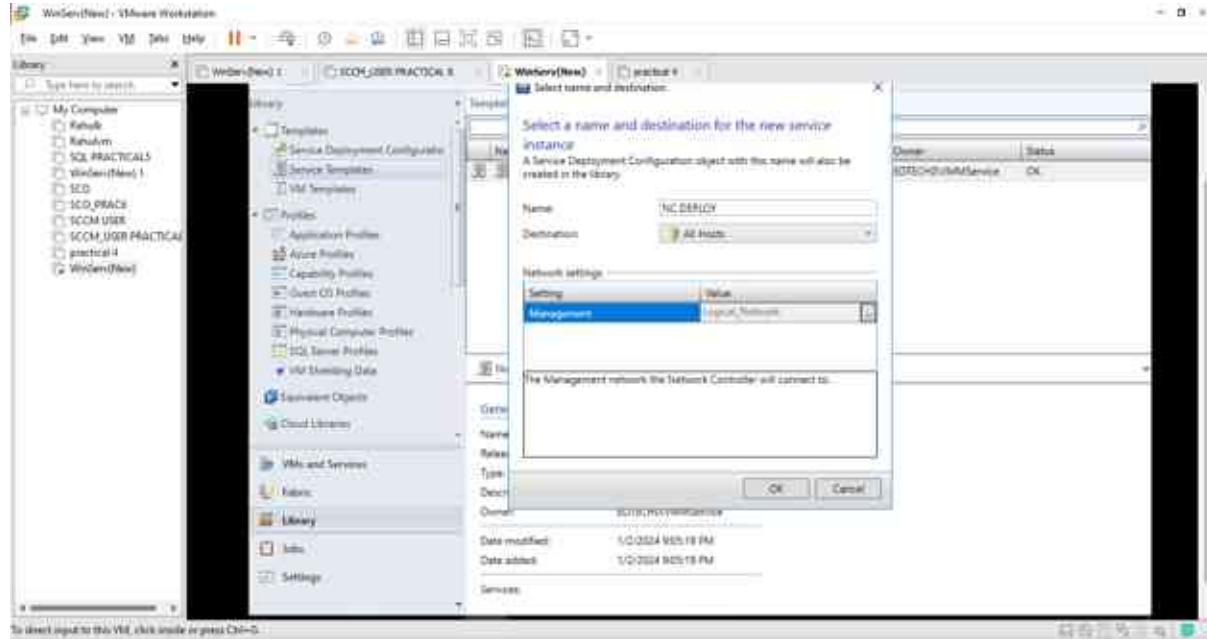
- Here we successfully import template



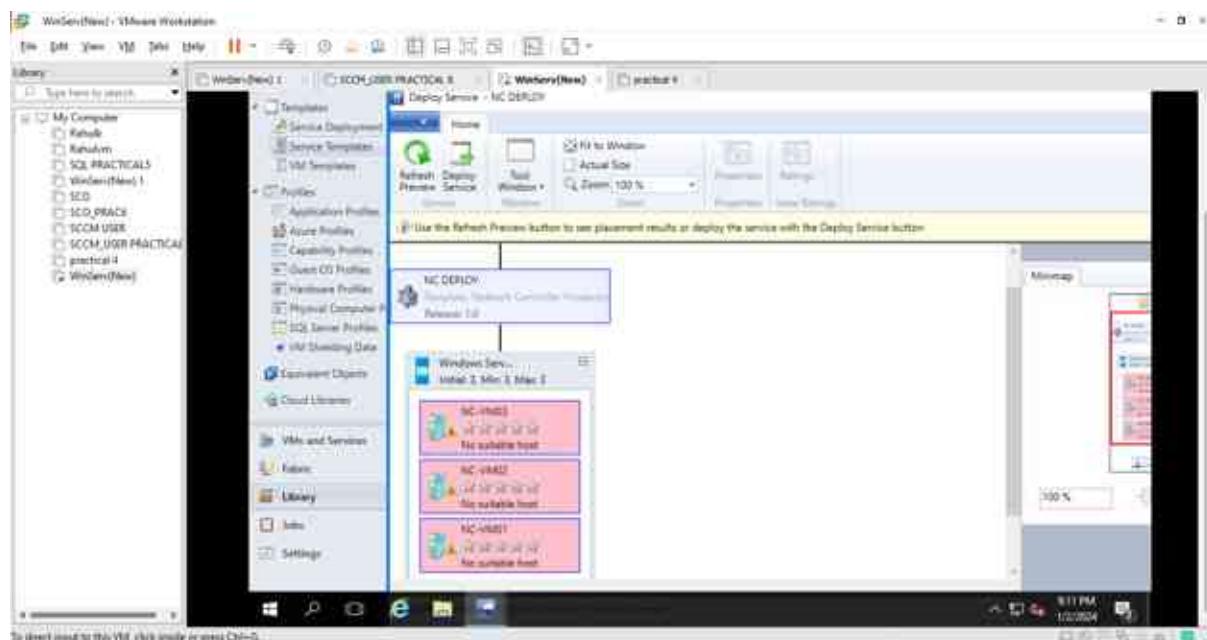
- Within Service Templates **Right-Click** on Network Controller Production 1.0 and then **Click on Configure Deployment**



- Give it a name and Select you management as your **Logical Network** and Click Ok.



- This is the deployment of the Network Controller Service Template



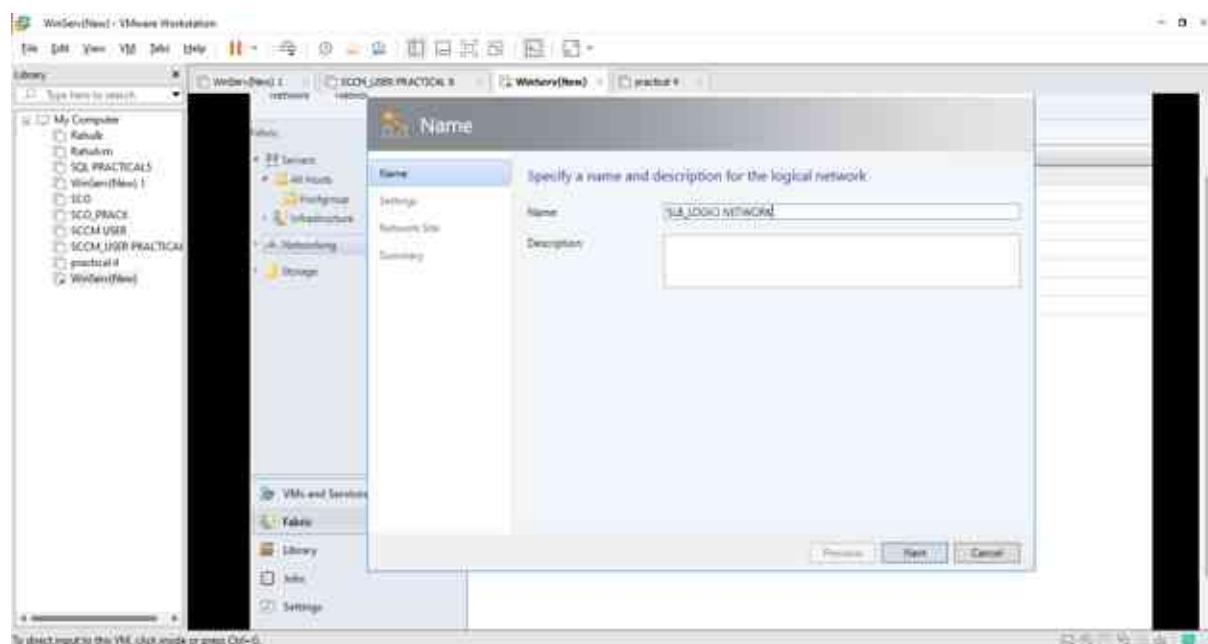
4-B: Deploying Software Load Balancer

Step 1: Create a Logical Network

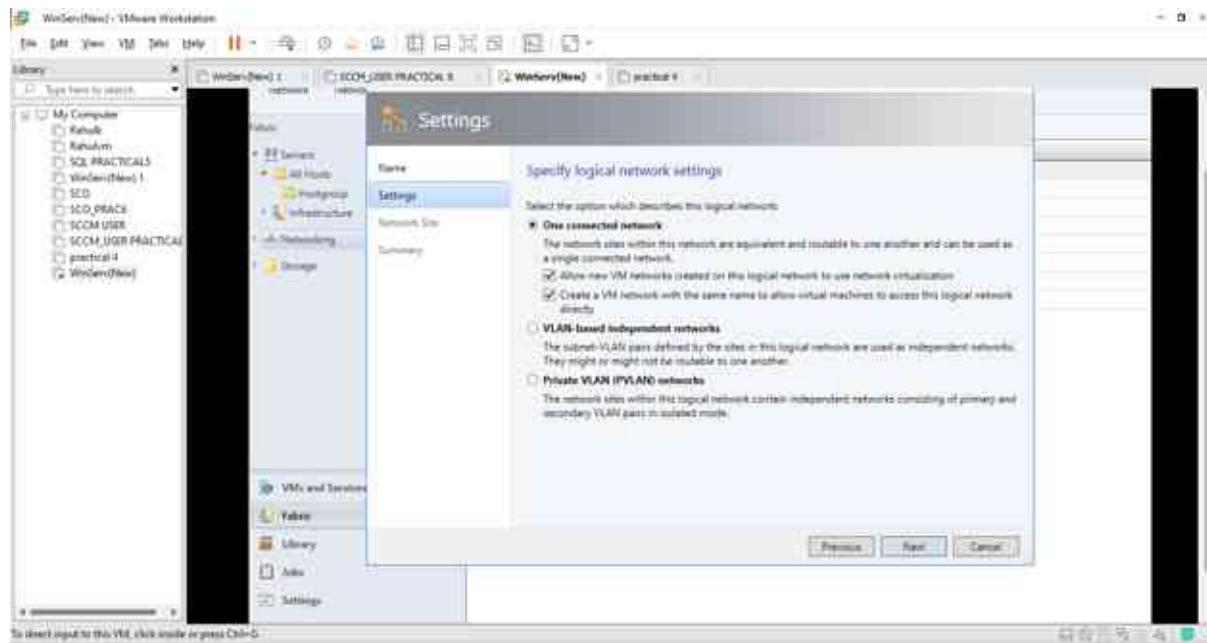
- **Create a new logical network by Selecting the Fabric Tab in SCVMM and Right-Click on Logical Networks and Select Create a Logical Network**



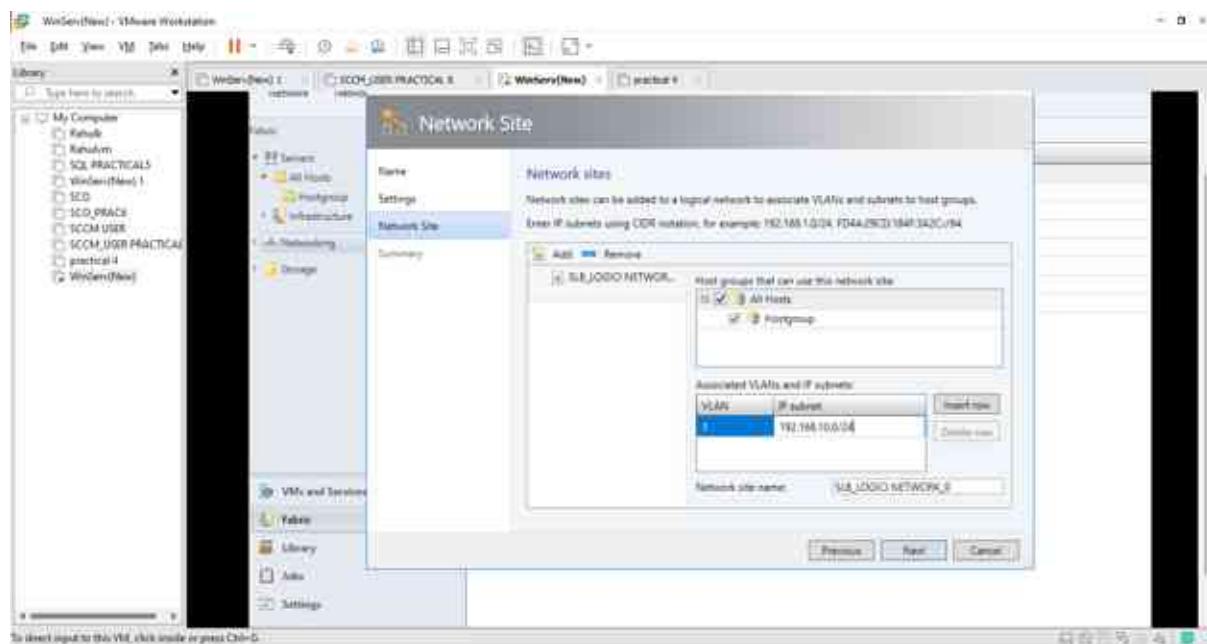
- Give Name for your Logical Network (Here it is: **SLB_LOGICAL NETWORK**) And then **Click on Next**



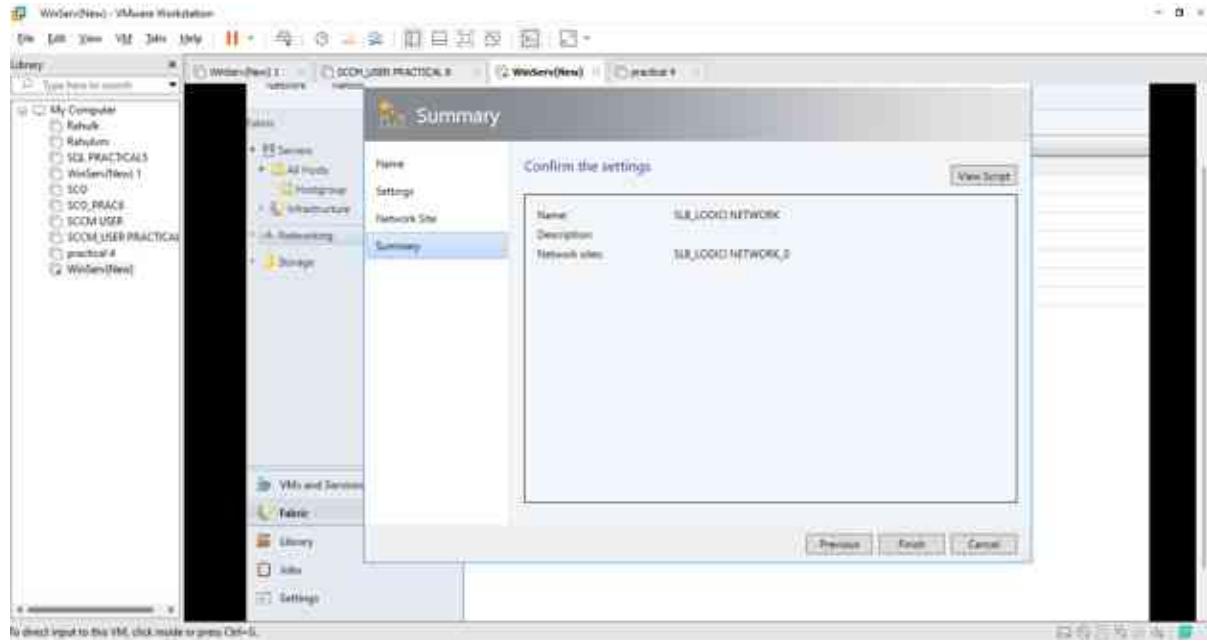
- Select **One-connected network** and **Tick both Allow new VM networks created on the logical network to use network virtualisation** and **Click on Next**



- Within Network Site **Click on Add Select All Hosts** and then **Click on Insert row** Enter VLAN and IP address Here it is: **192.168.10.0/24** and then **Click on Next**

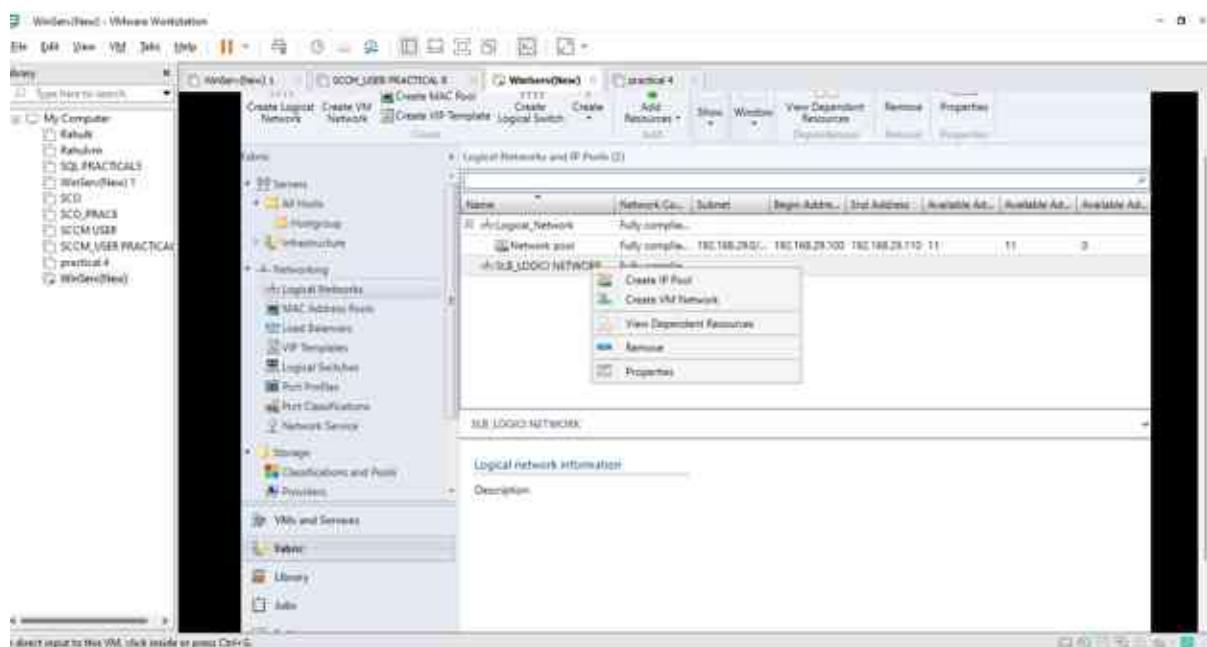


- Click on Finish

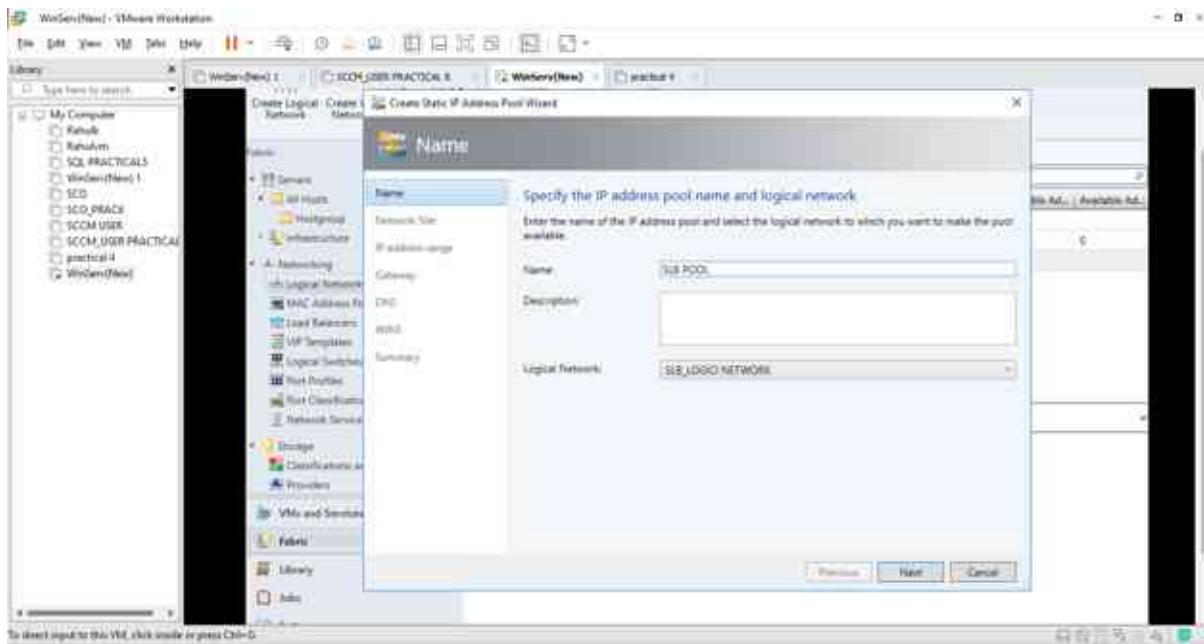


Step 2: Create IP Pool

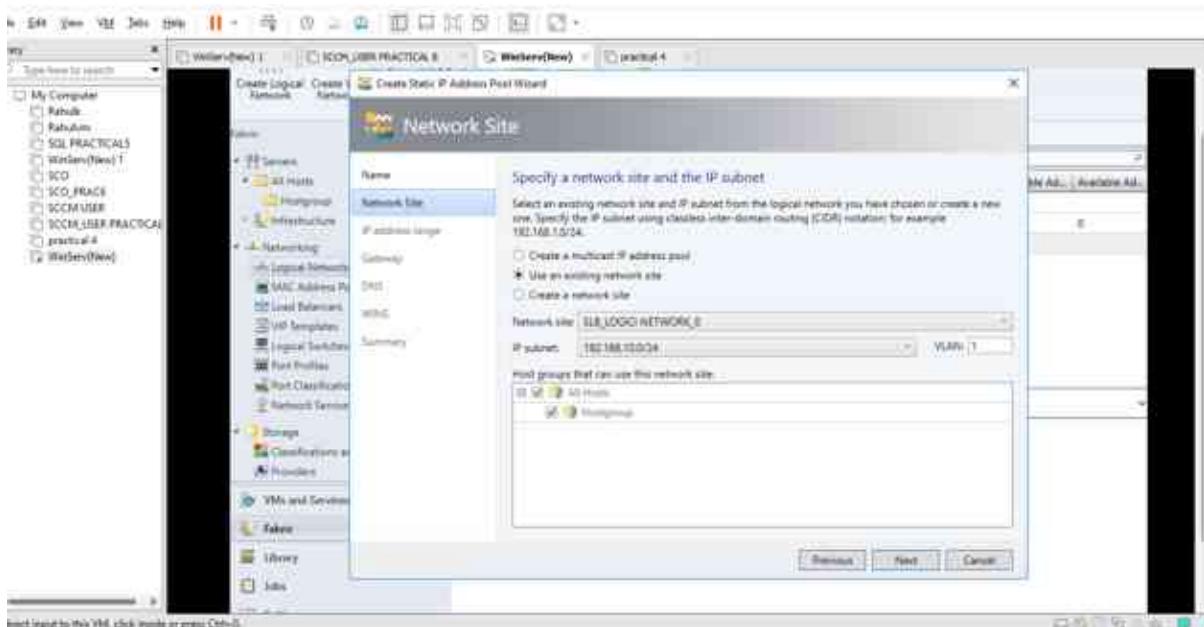
- Right-Click on **SLB_LOGICAL_NETWORK** and then Select **Create IP Pool**



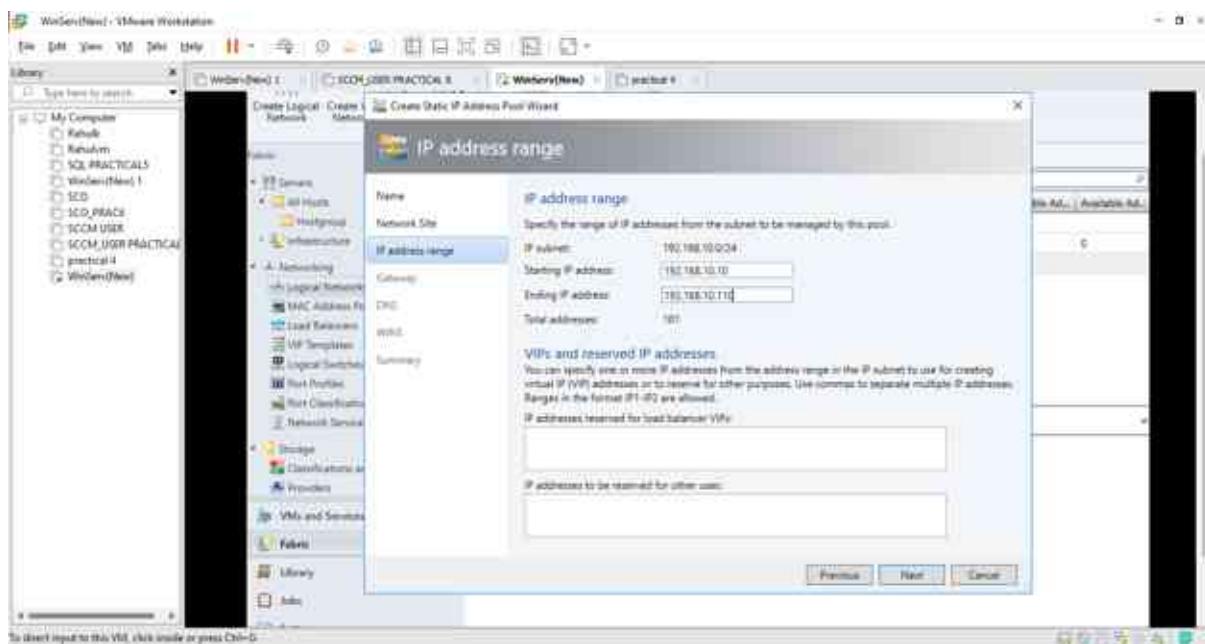
- Specify the IP address pool name and logical network (Here it is: **SLB POOL**) and then **Click on Next**



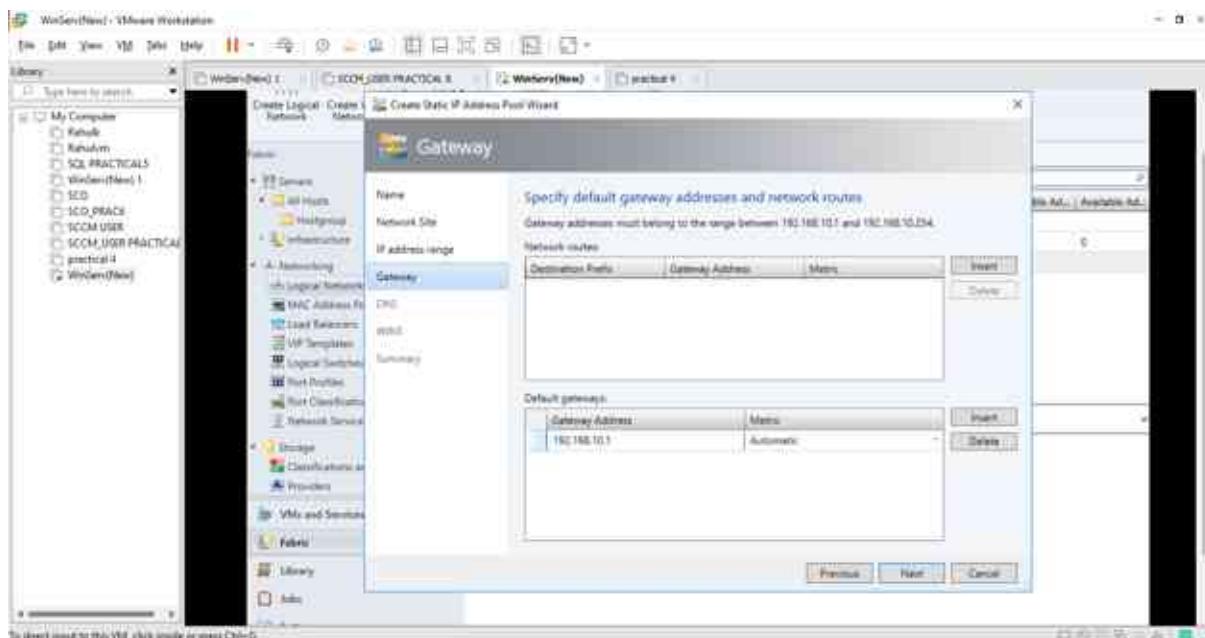
- Keep the default Value and **Click on Next**



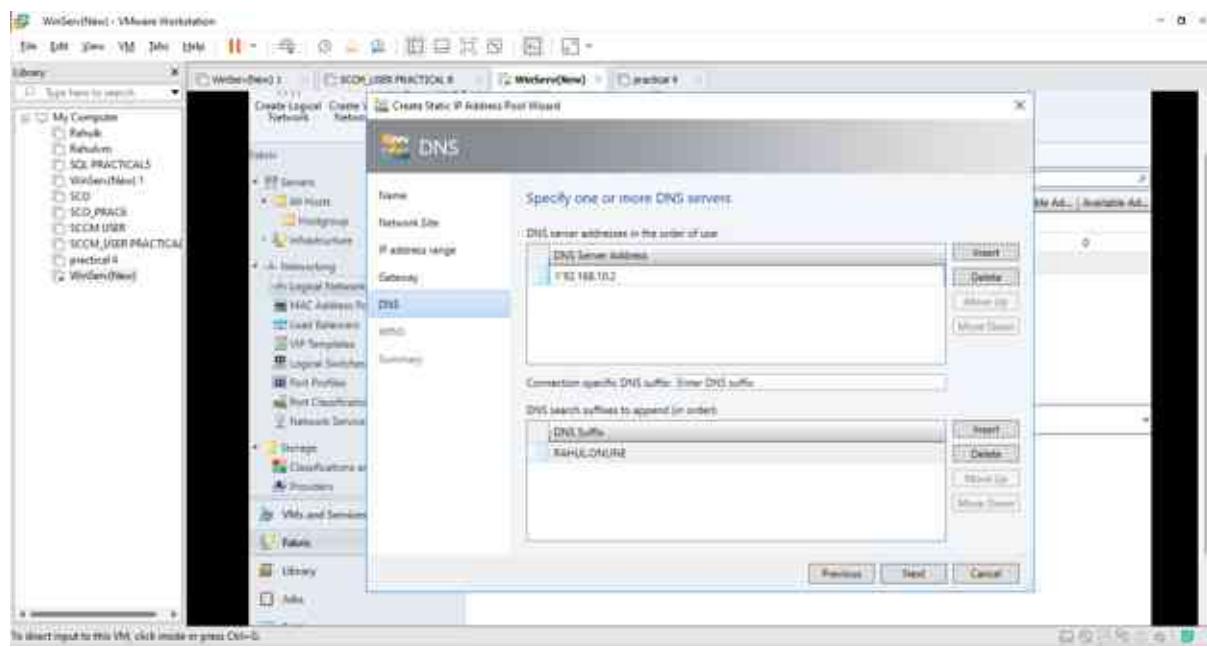
- Keep the Starting IP address as **192.168.10.10** and the Ending IP Address as **192.168.10.110** and **Click Next**



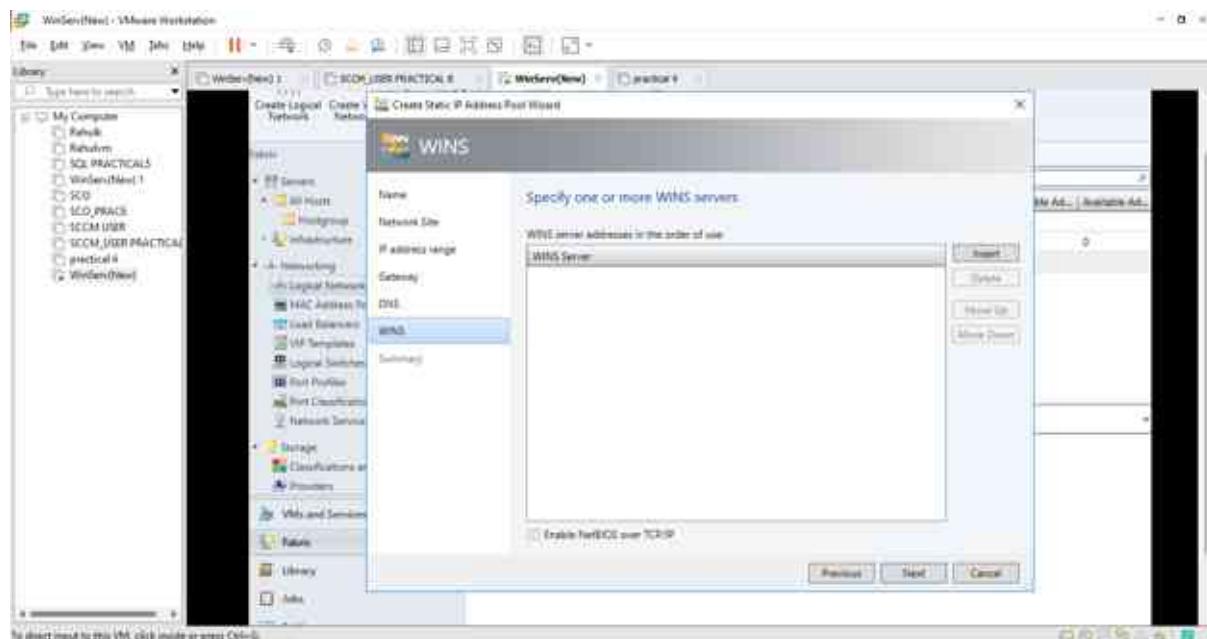
- Enter a Default gateway address **192.168.10.1** and Keep the Metric as **Automatic** and **Click on Next**



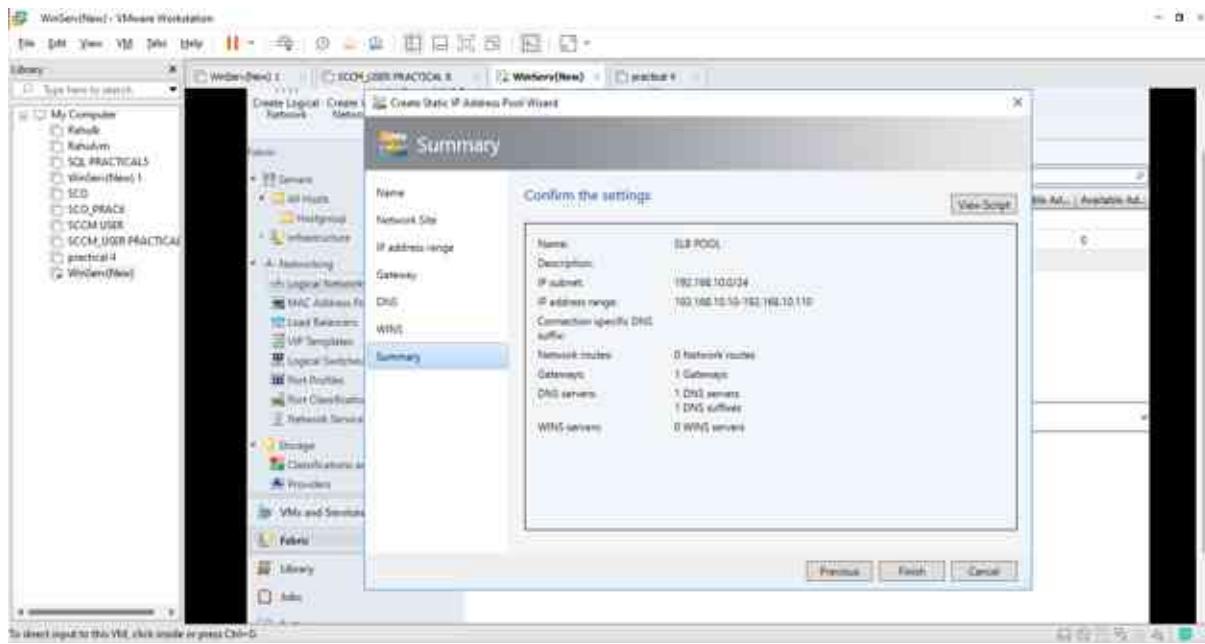
- Enter a DNS IP Address (**Here it is 192.168.10.2**) and a DNS Suffix which is your **DOMAIN_NAME.ONLINE** (**Here it is RAHUL.ONLINE**) and **Click on Next**



- Click on Next

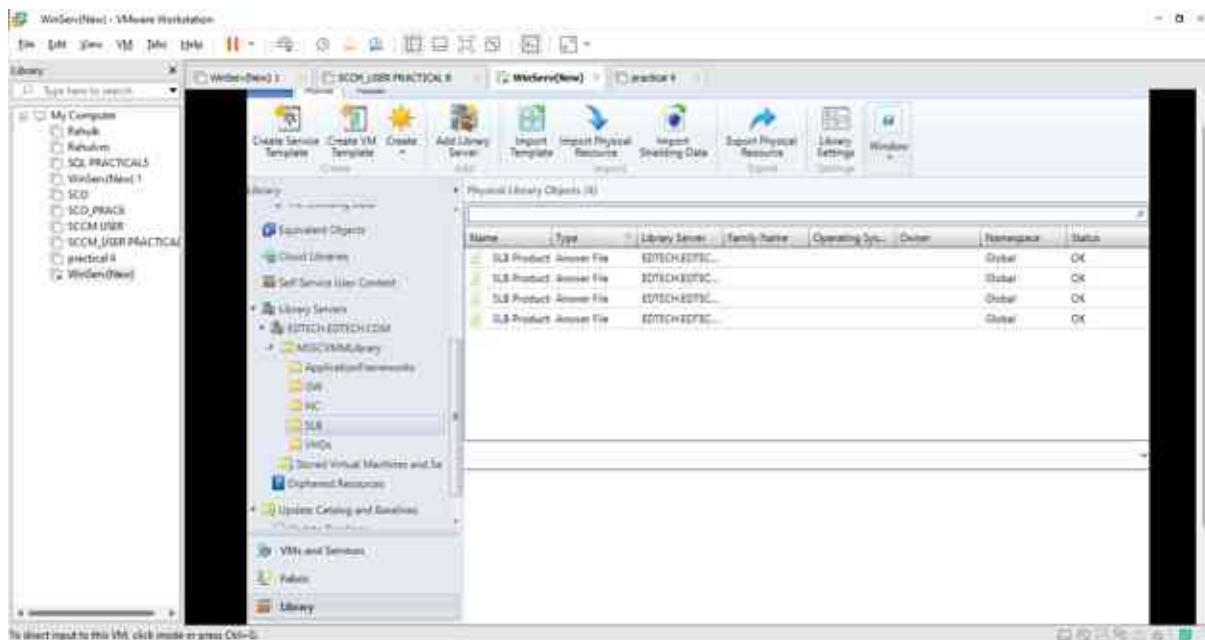


- Click on Finish

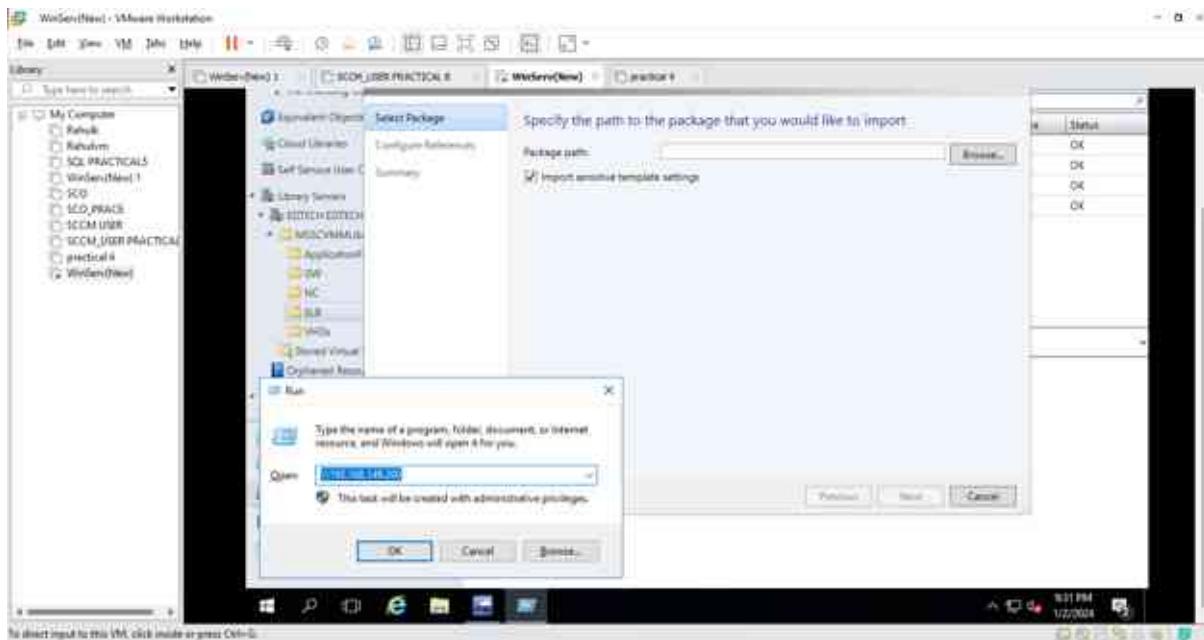


Step 3: Creating an SLB Service Template

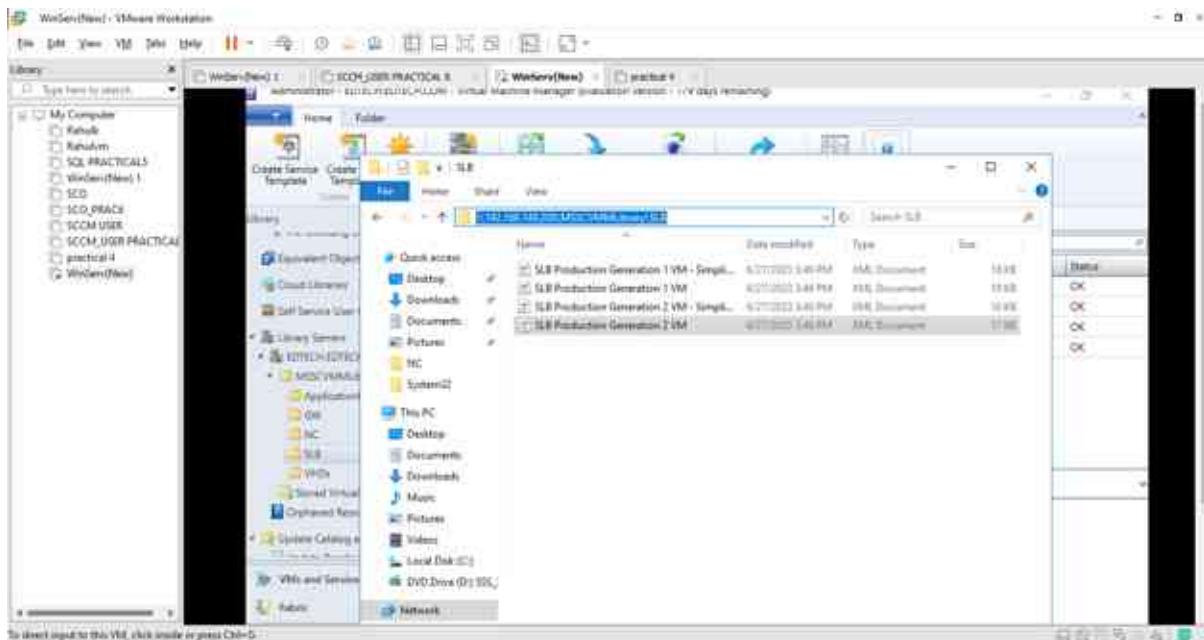
- Select the Library Tab and Click on Import Template



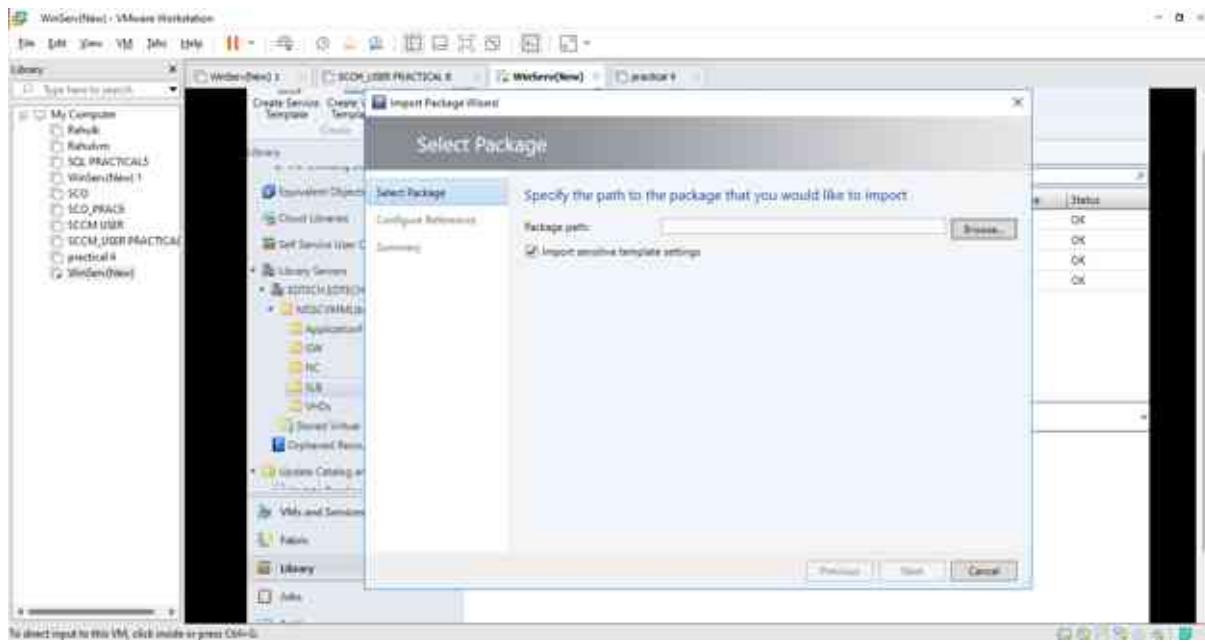
- In Select Package Open Run Window and then Type **IP address of the WinServ(New) (Here it is \\192.168.149.200) Click on Ok**



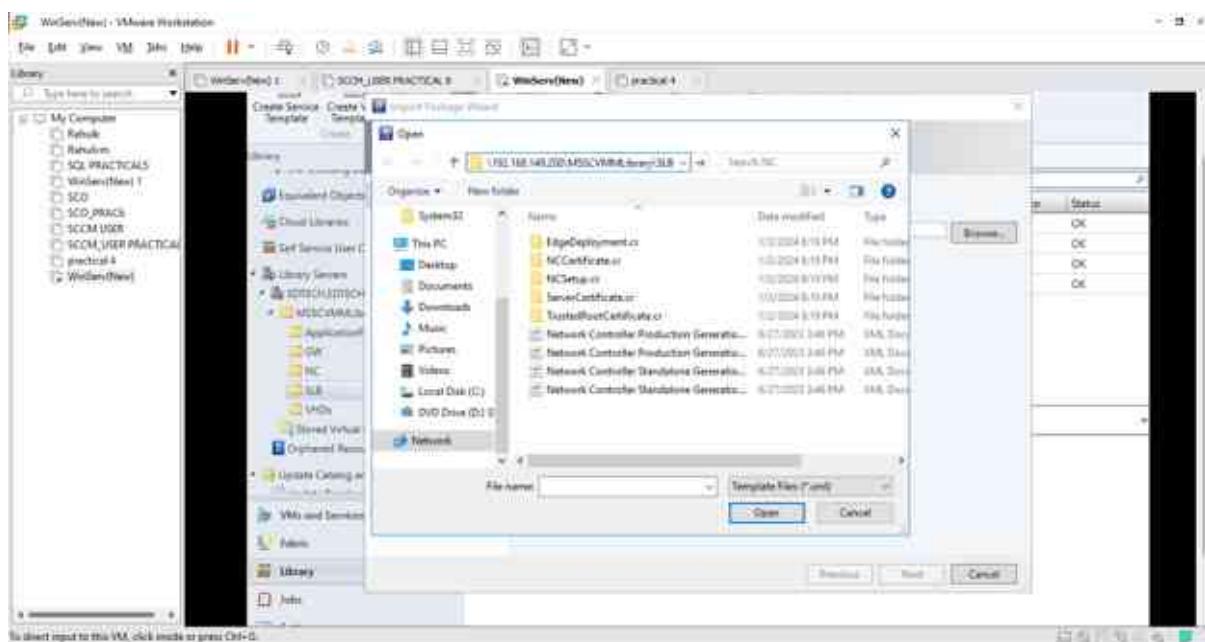
- Within **MSSCVMM Library Select SLB Folder and then Copy the Path**



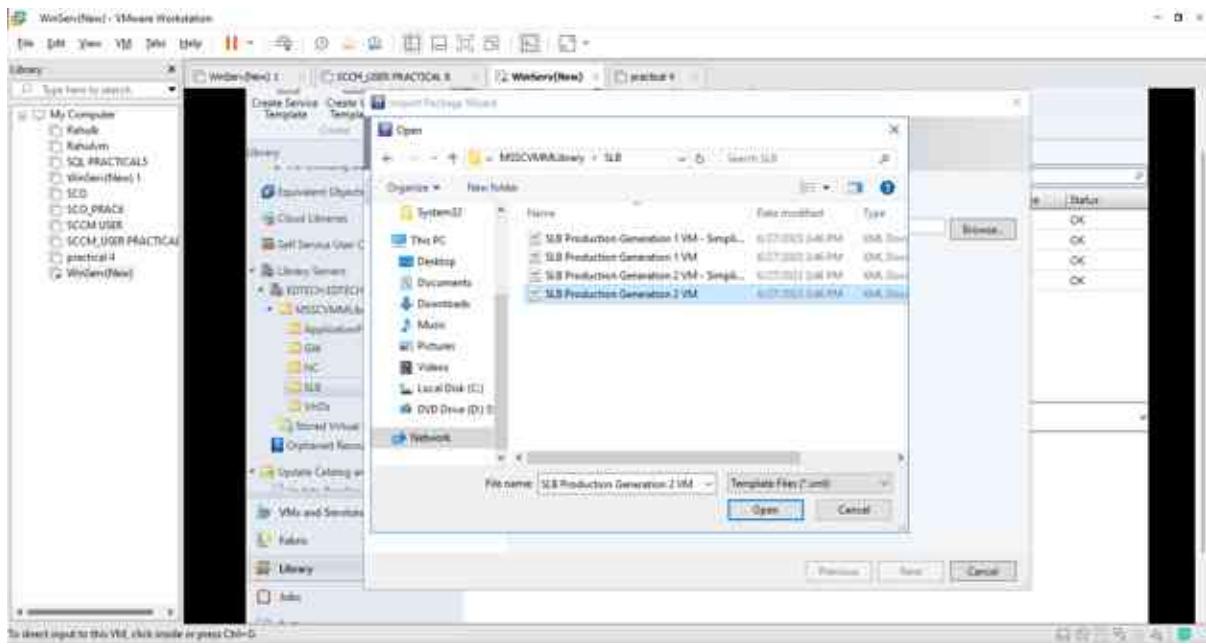
- Now again Go to the Select Package window **Click on Browse**



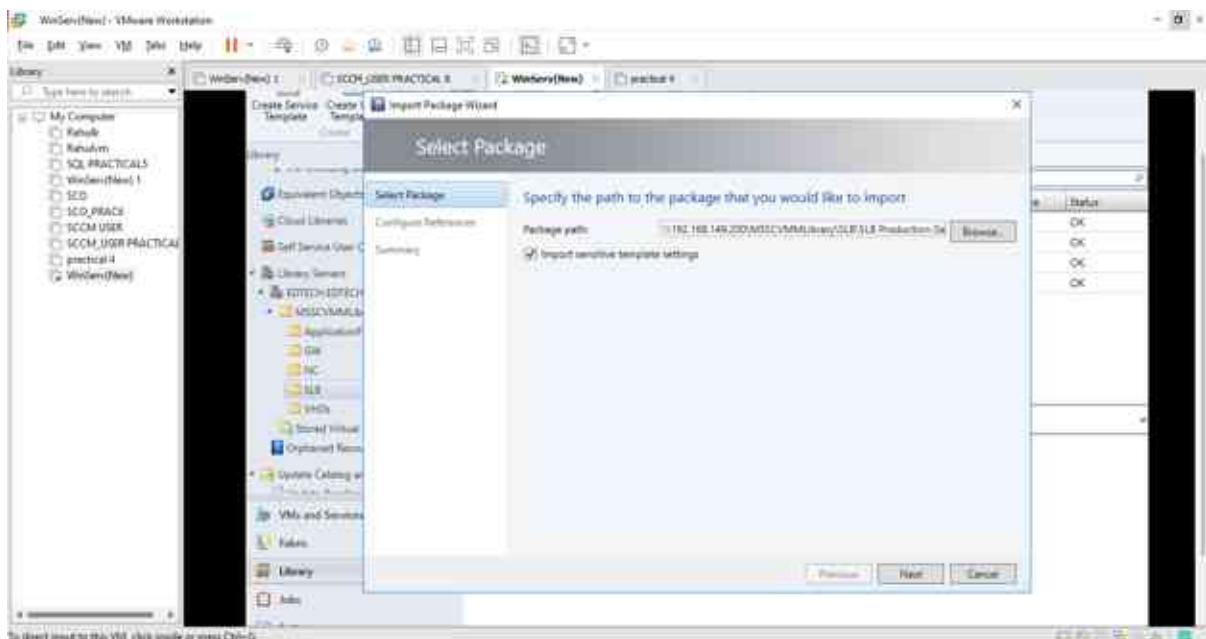
- Now paste the path for SLB and then **Click on Enter**



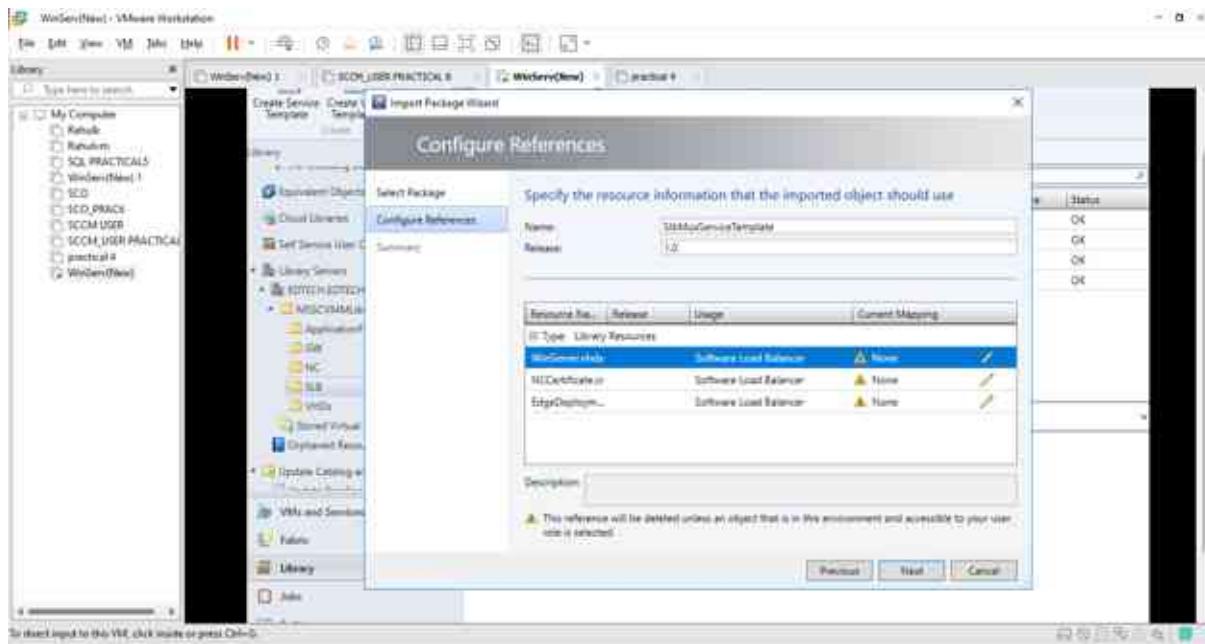
- Within SLB Folder Select Network **SLB Production Generation 2 VM** and then **Click on Open**



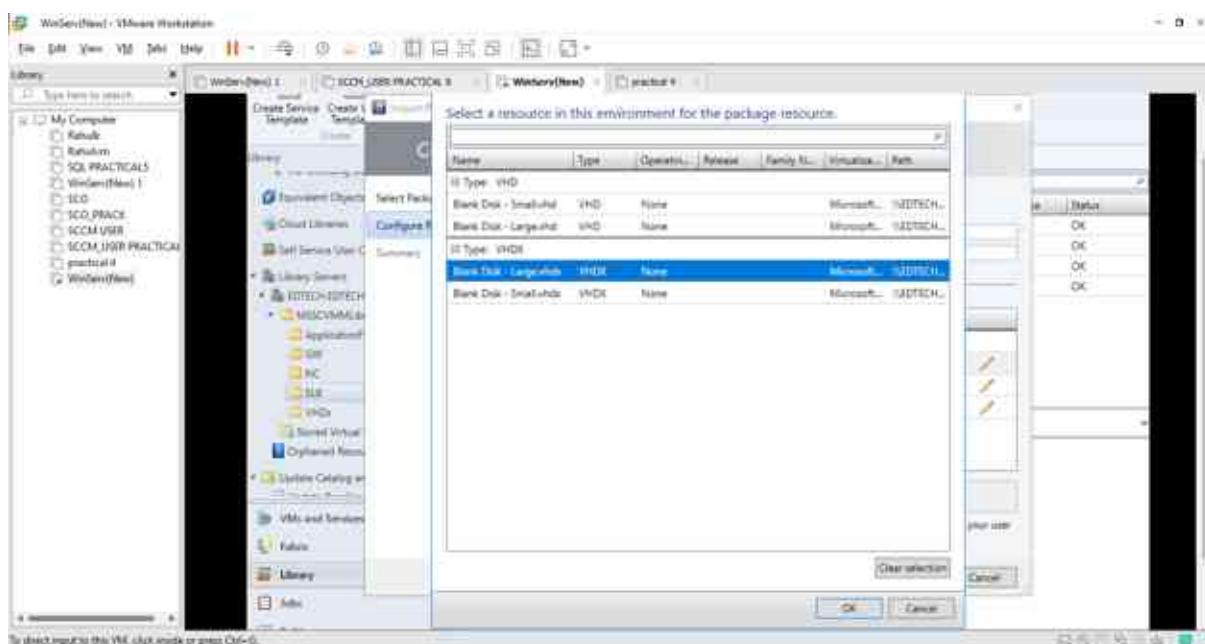
- Click on Next



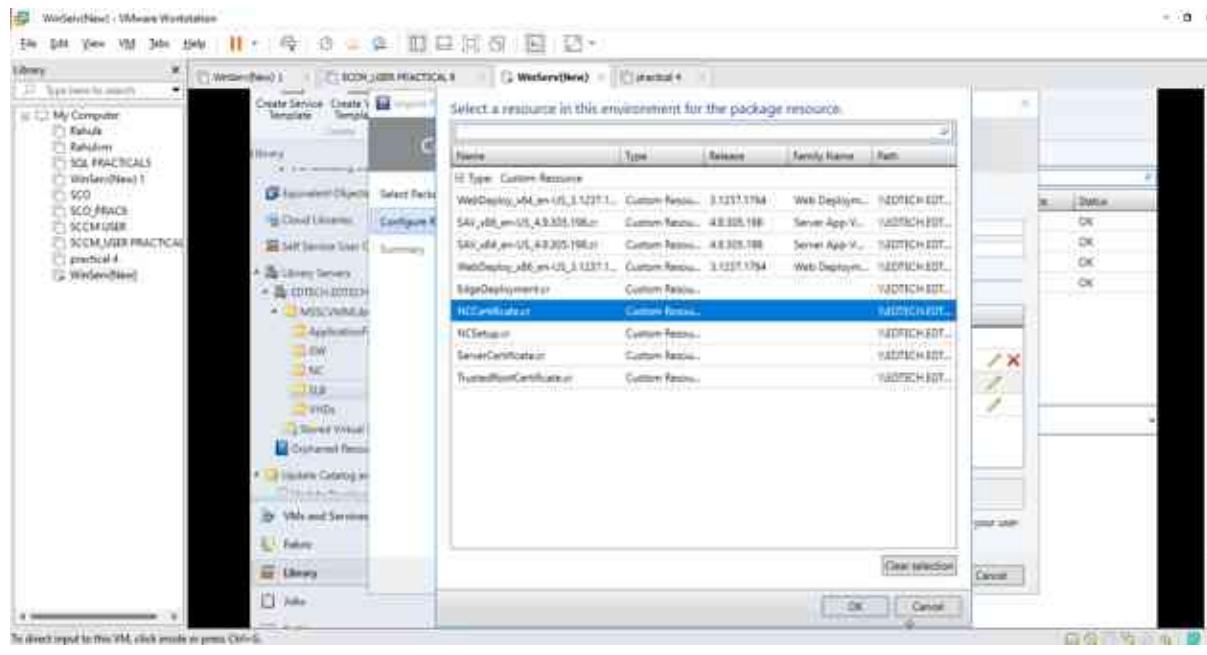
- Within Configuration References Click on WinServer.vhdx and then Click on Edit



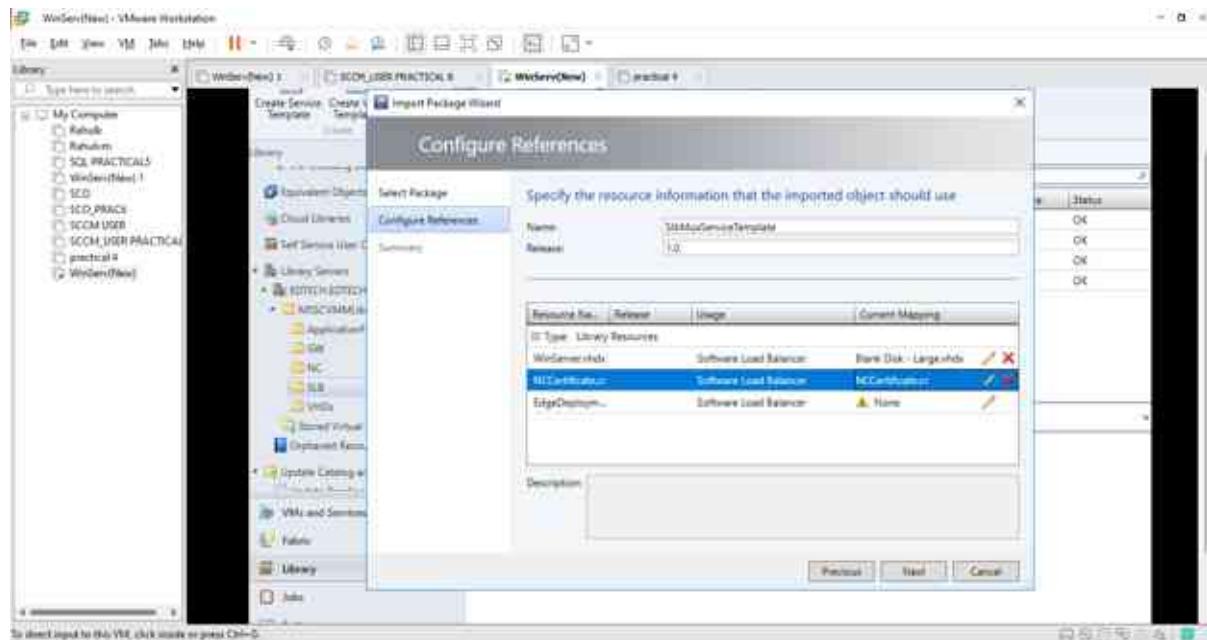
- Within Type: VHDX Select Blank Disk – Large.vhdx and Click on OK



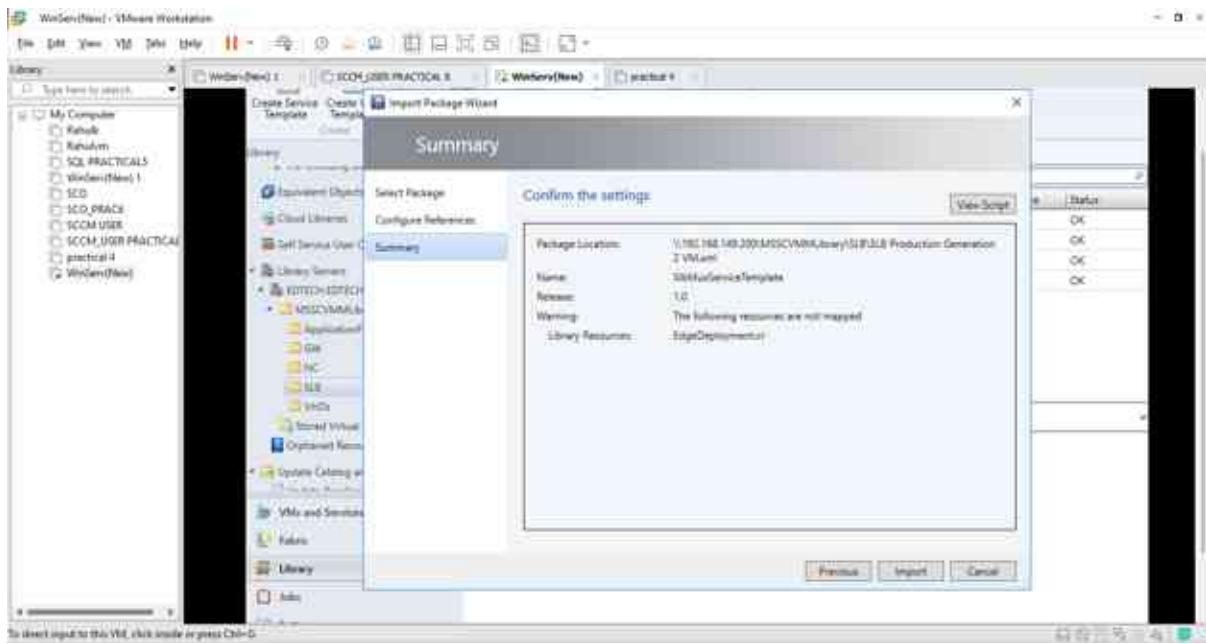
- In NCCertificate, Click on the Custom Resource NCCertificate.cr and Click Ok



- Click on Next

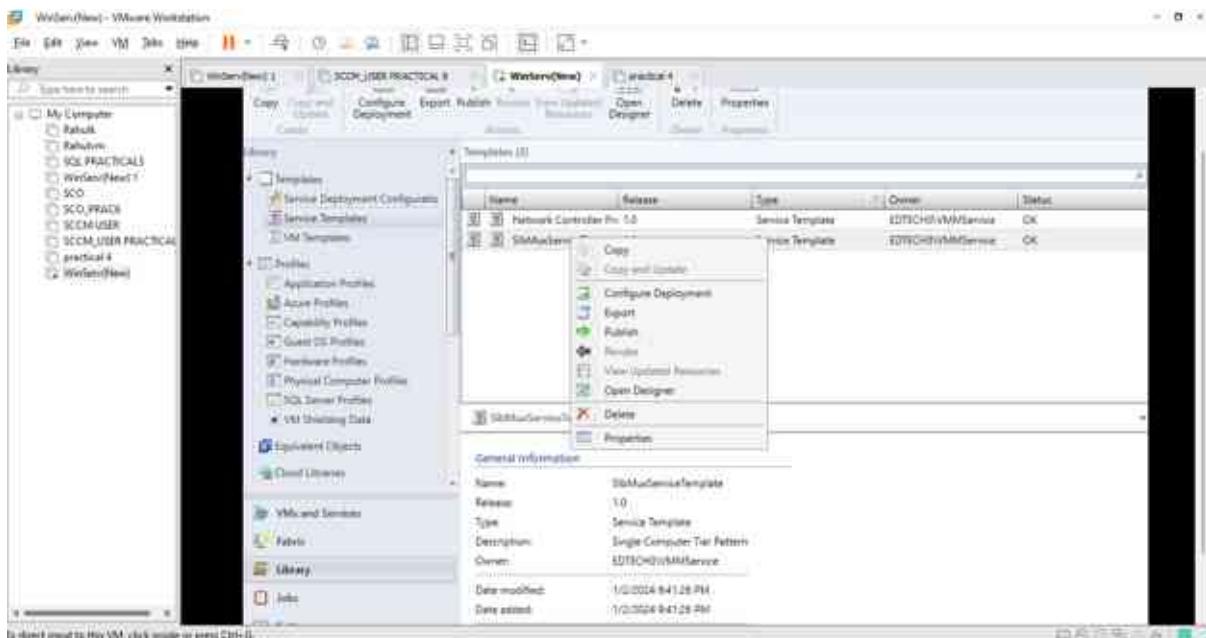


- **Click on Import**

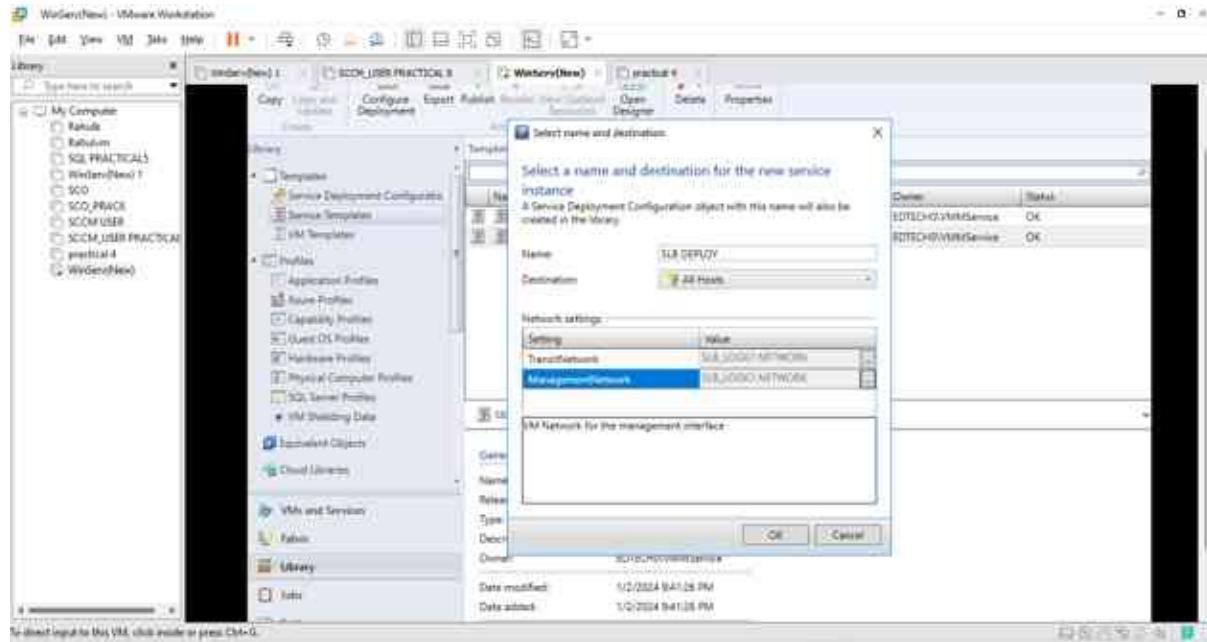


Step 4: Deploying the SLB Service Template

- Within Service Templates Right-Click on **SlbMuxServiceTemplate** and then Click on **Configure Deployment**



- Type in the name (Here it is **SLB_DEPLOY**) and in the **Transit and Management Network** Select the newly created Logical Network (**Here it is SLB_LOGI NETWORK**) and Click on **Ok**



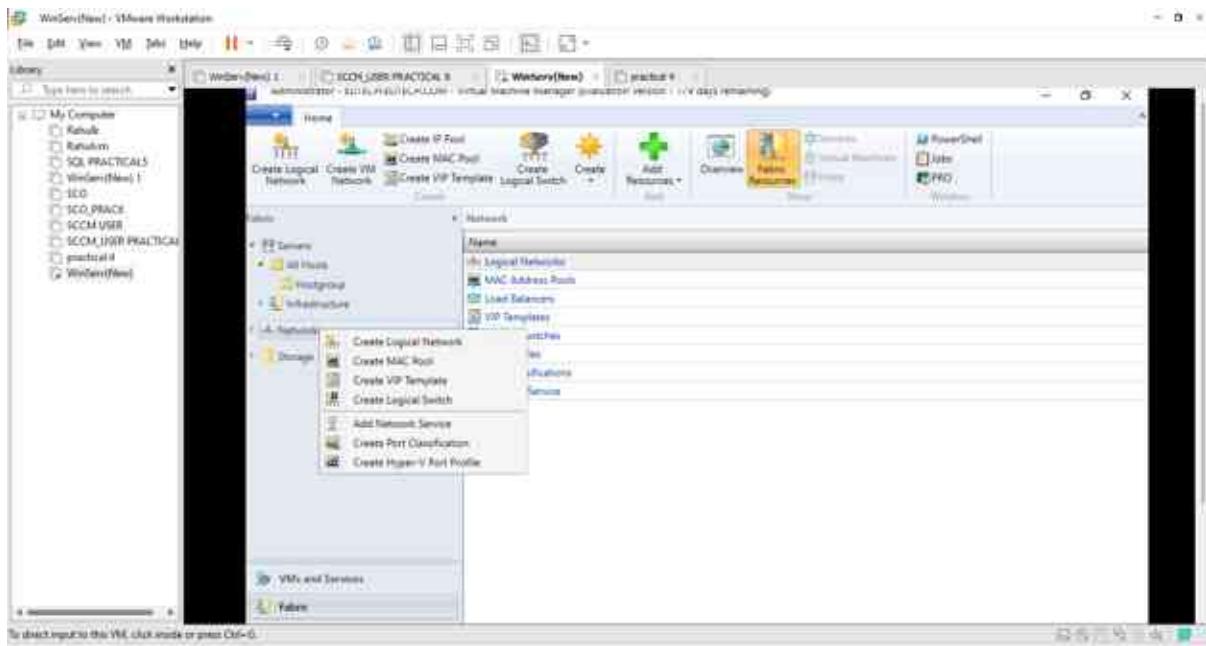
- Now in Settings Select the Following:
- **localAdmin:** NT AUTHORITY\Local Service
- **ManagementNetwork:** SLB_LOGI NETWORK
- **MgmtDomainAccount:** NT AUTHORITY\LocalService
- **MgmtDomain FQDN:** EDTECH.EDTECH.COM
- **SelfSignedCertificate:** True
- **TransitNetwork:** SLB_LOGI NETWORK



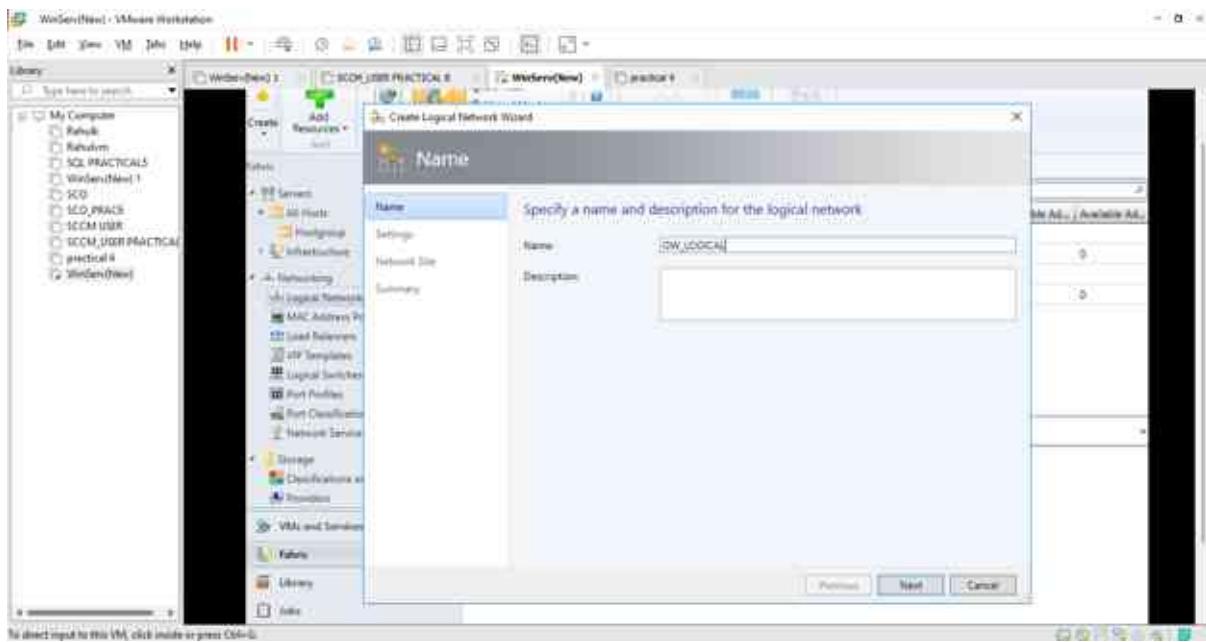
Step 4: Deploying the GRE Service Template

Step 1: Create a Logical Network

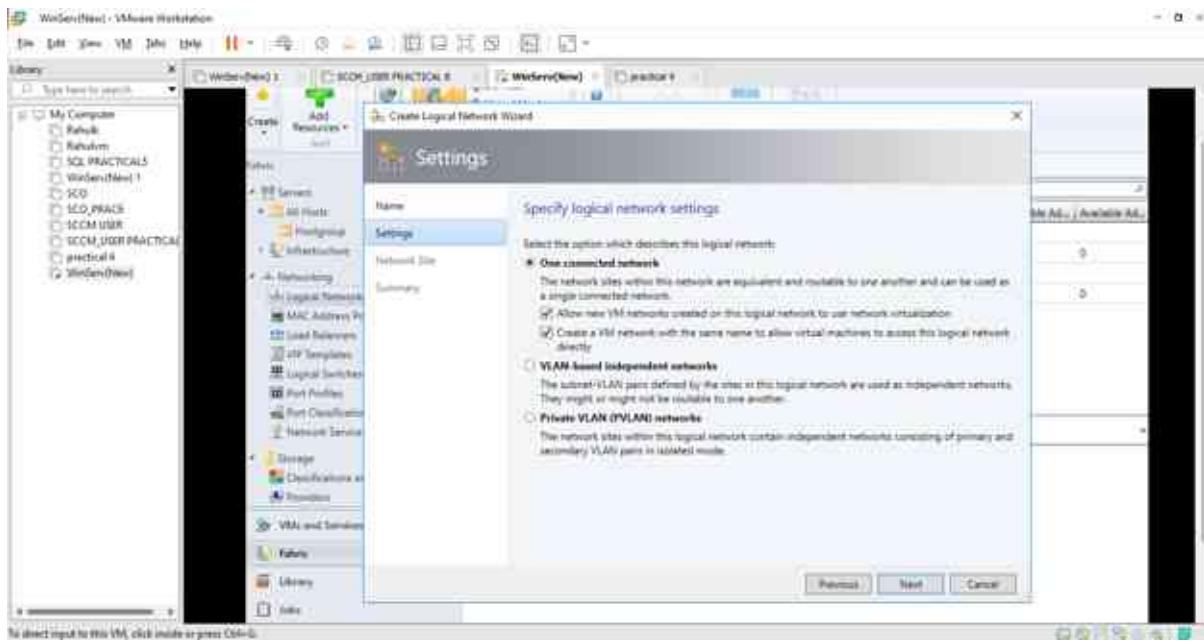
- **Create a new logical network** by Selecting the **Fabric Tab** in SCVMM and **Right-Click on Logical Networks** and Select **Create a Logical Network**



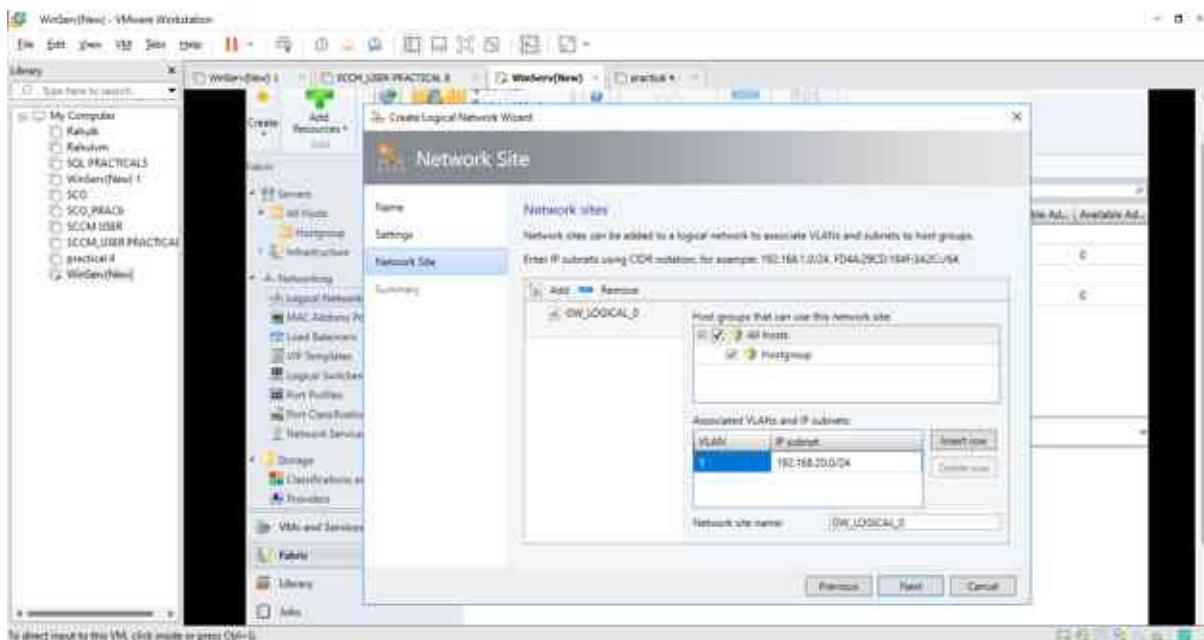
- Give Name for your Logical Network (Here it is: **GW_LOGICAL**)
And then **Click on Next**



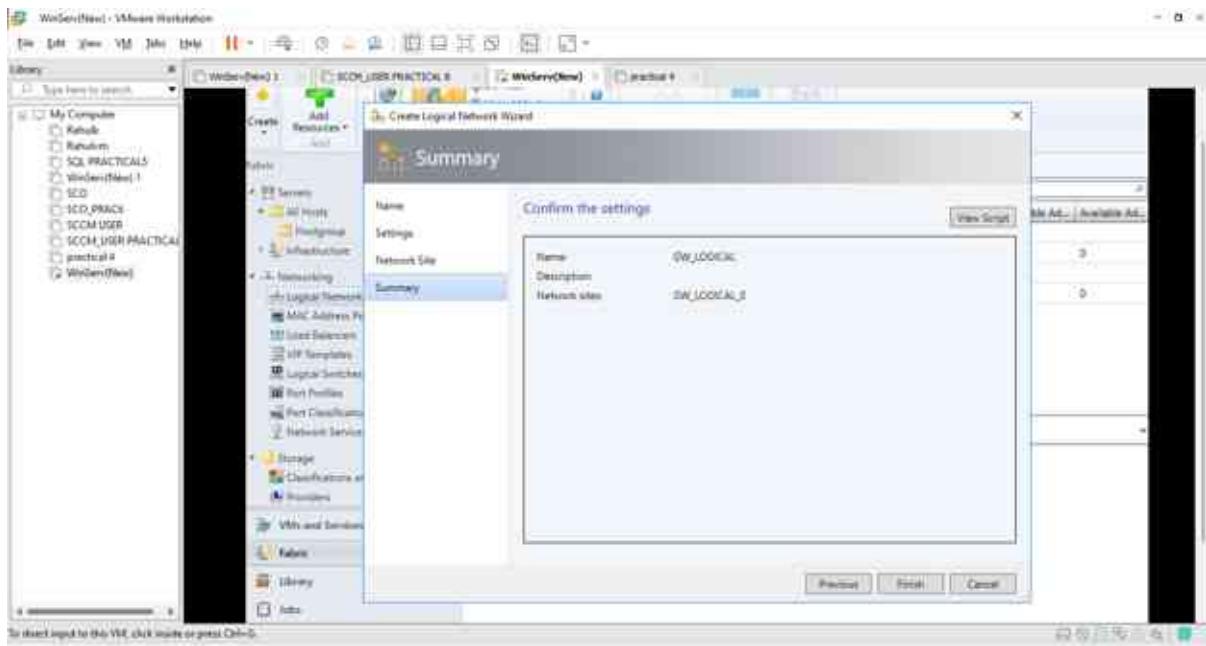
- Select **One-connected network** and Tick both **Allow new VM networks created on the logical network to use network virtualisation** and **Click on Next**



- Within Network Site Click on Add Select All Hosts and then Click on Insert row Enter VLAN and IP address Here it is: **192.168.20.0/24** and then Click on Next

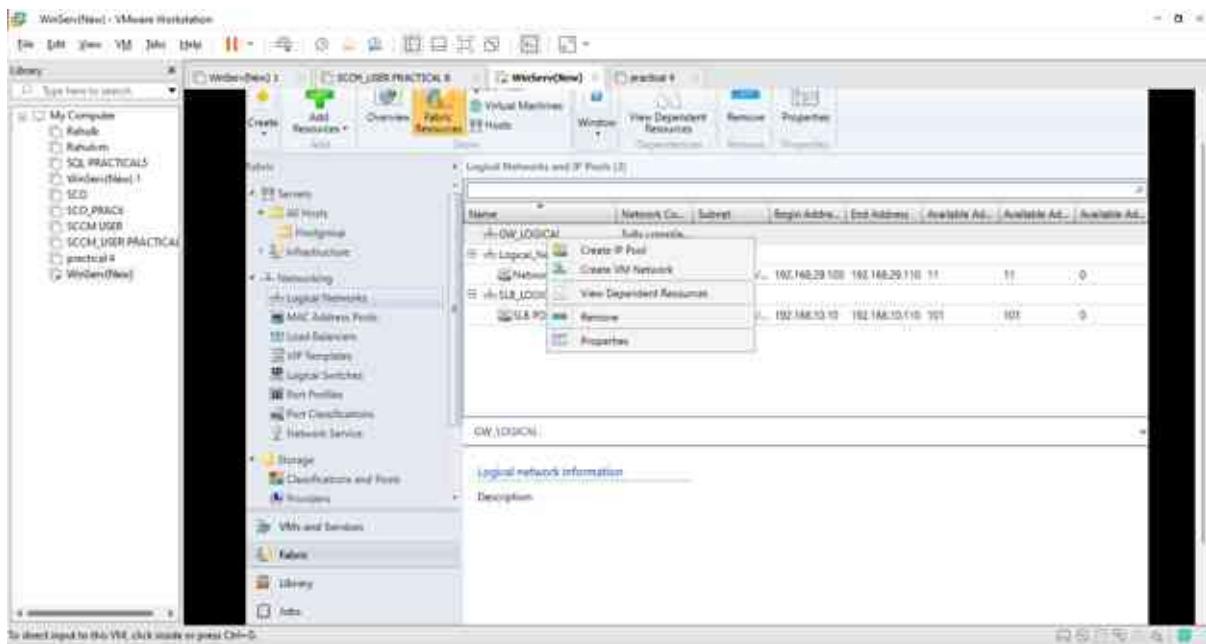


- Click on Finish**

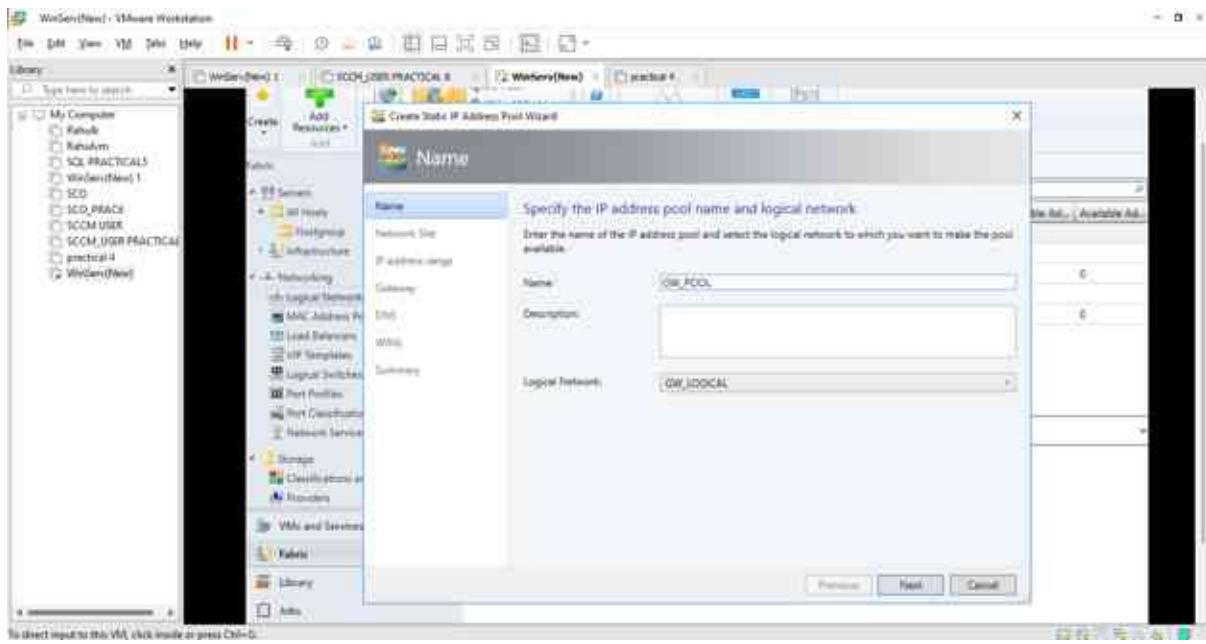


Step 2: Create IP Pool

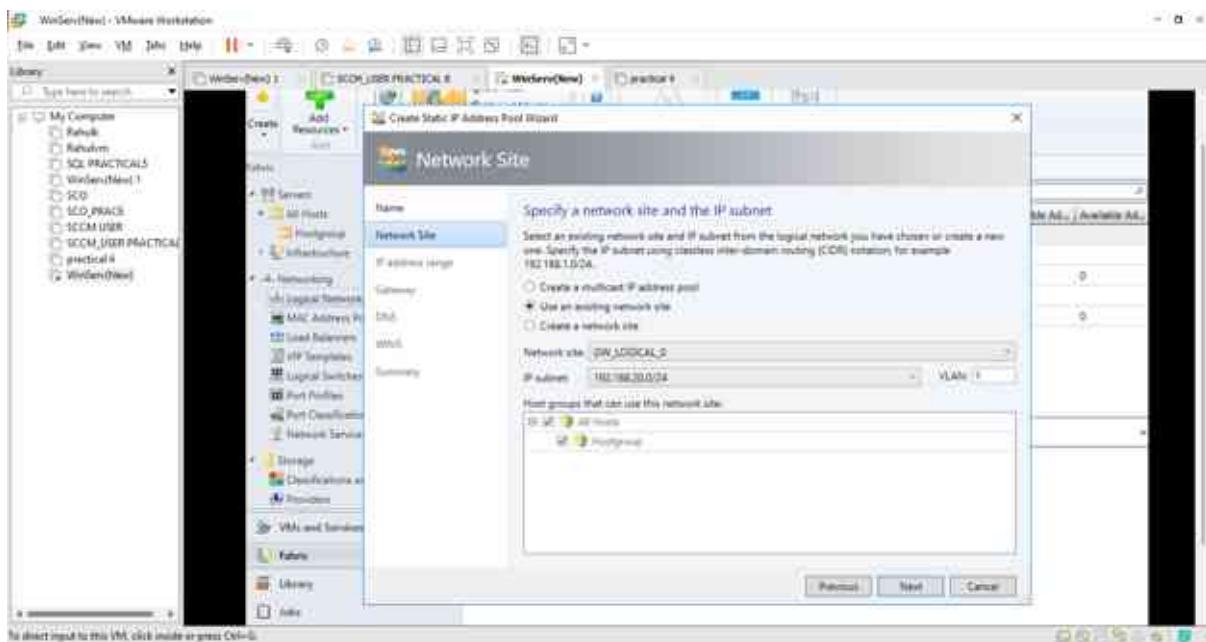
- Right-Click on **GW_LOGICAL** and then Select **Create IP Pool**



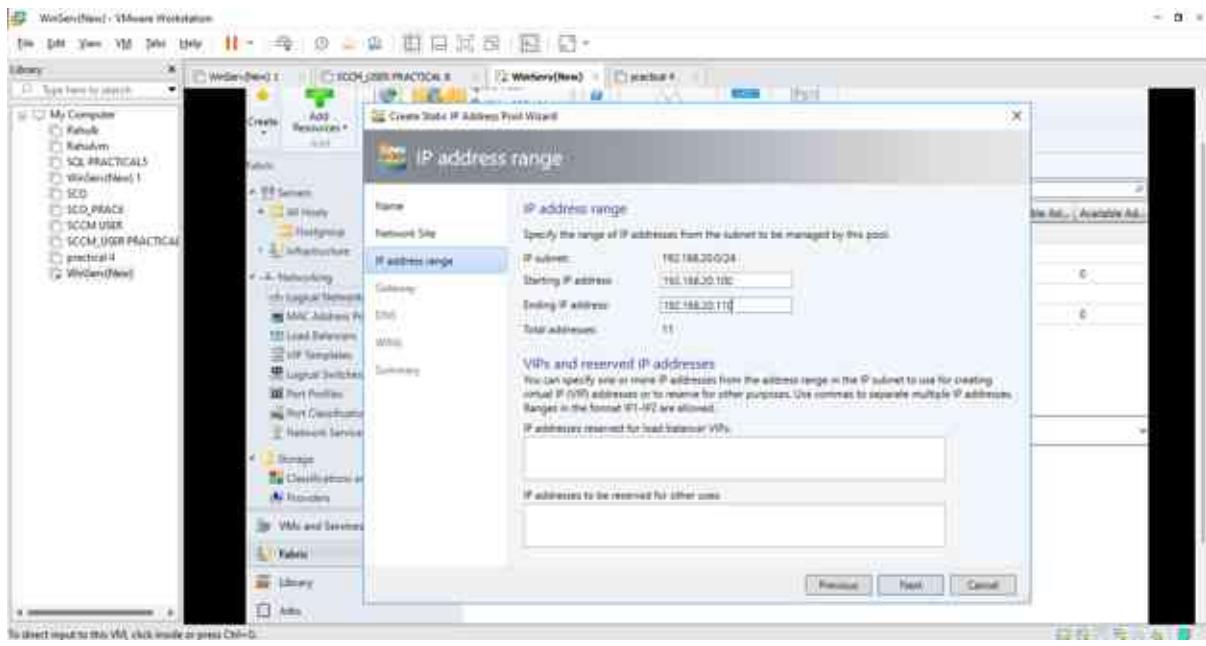
- Specify the IP address pool name and logical network (Here it is: **GW_POOL**) and then **Click on Next**



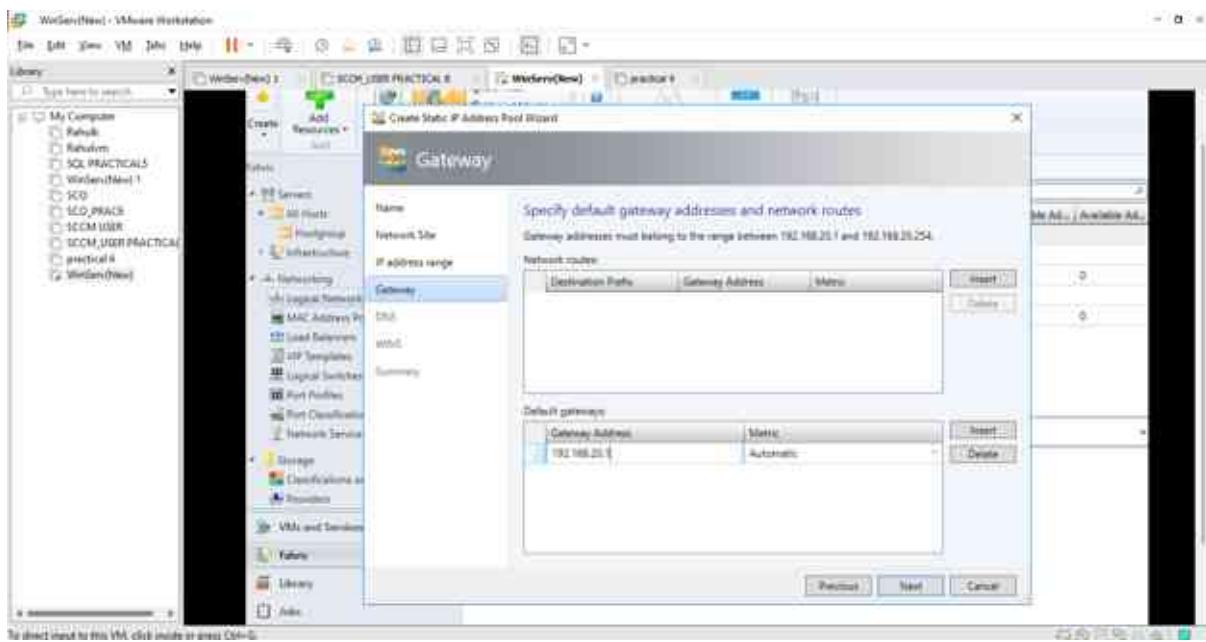
- Keep the default Value and Click on Next



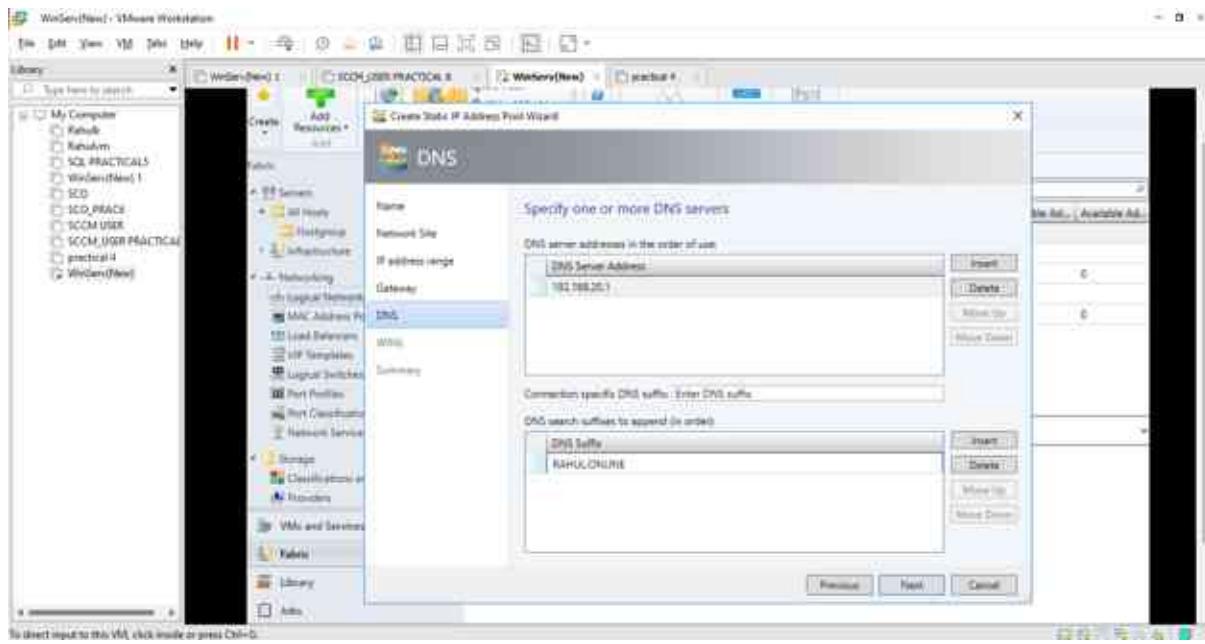
- Keep the Starting IP address as **192.168.20.100** and the Ending IP Address as **192.168.20.110** and Click Next



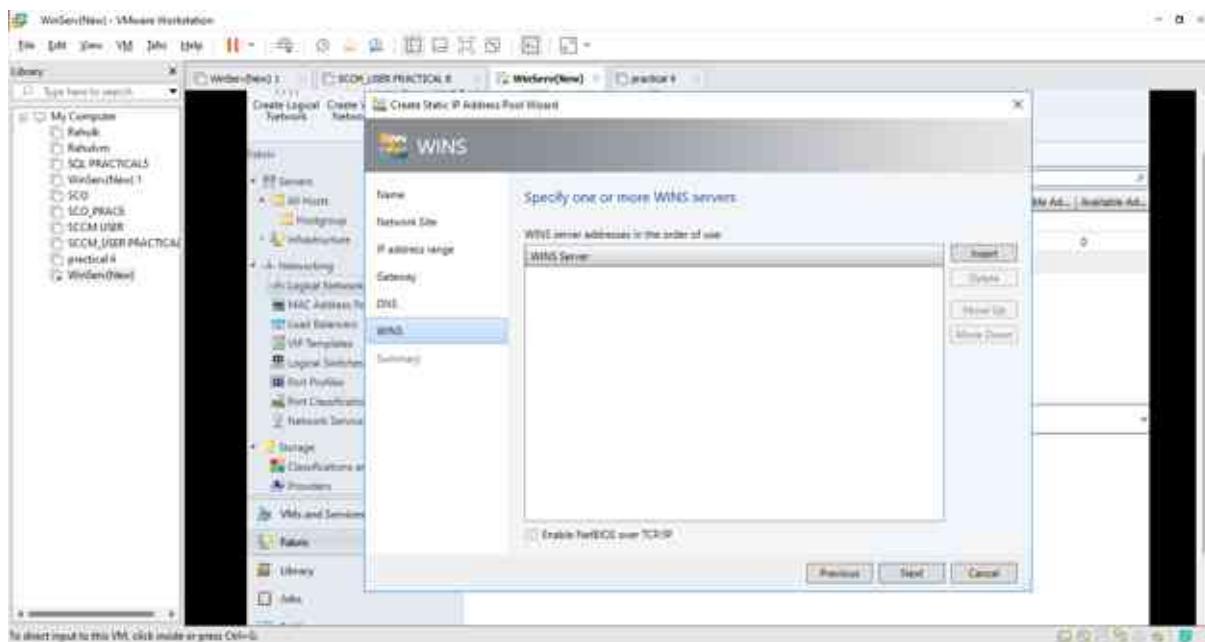
- Enter a Default gateway address **192.168.20.1** and Keep the Metric as **Automatic** and **Click on Next**



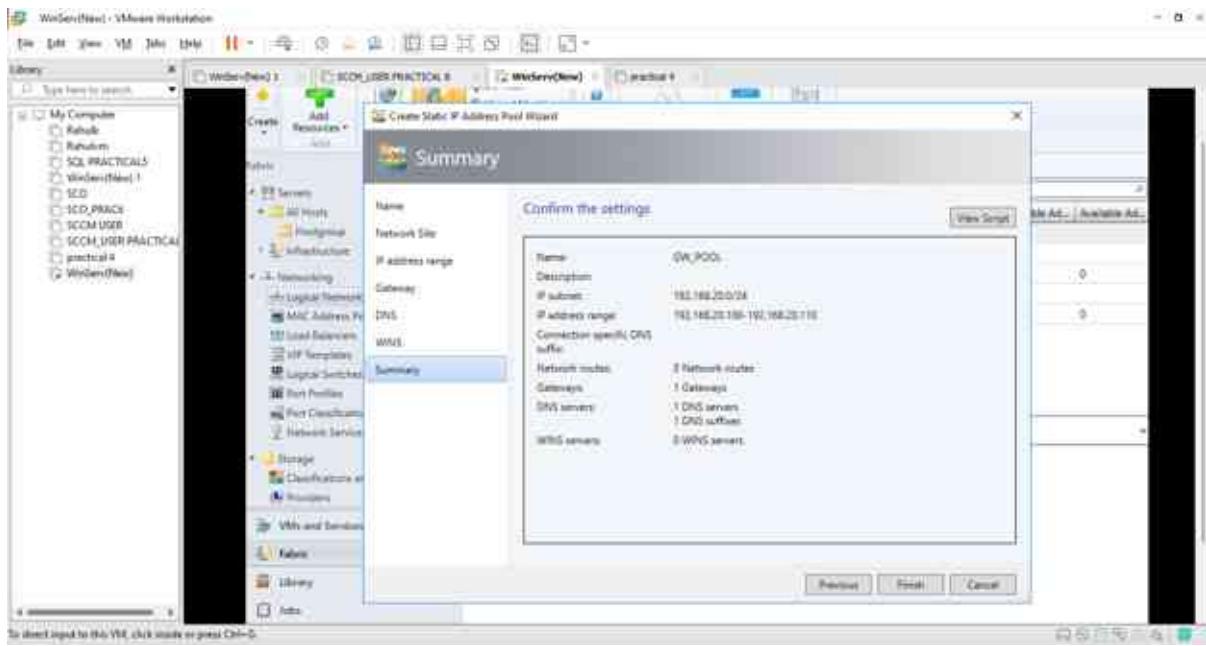
- Enter a DNS IP Address (**Here it is 192.168.20.1**) and a DNS Suffix which is your **DOMAIN_NAME.ONLINE** (**Here it is RAHUL.ONLINE**) and **Click on Next**



- Click on Next

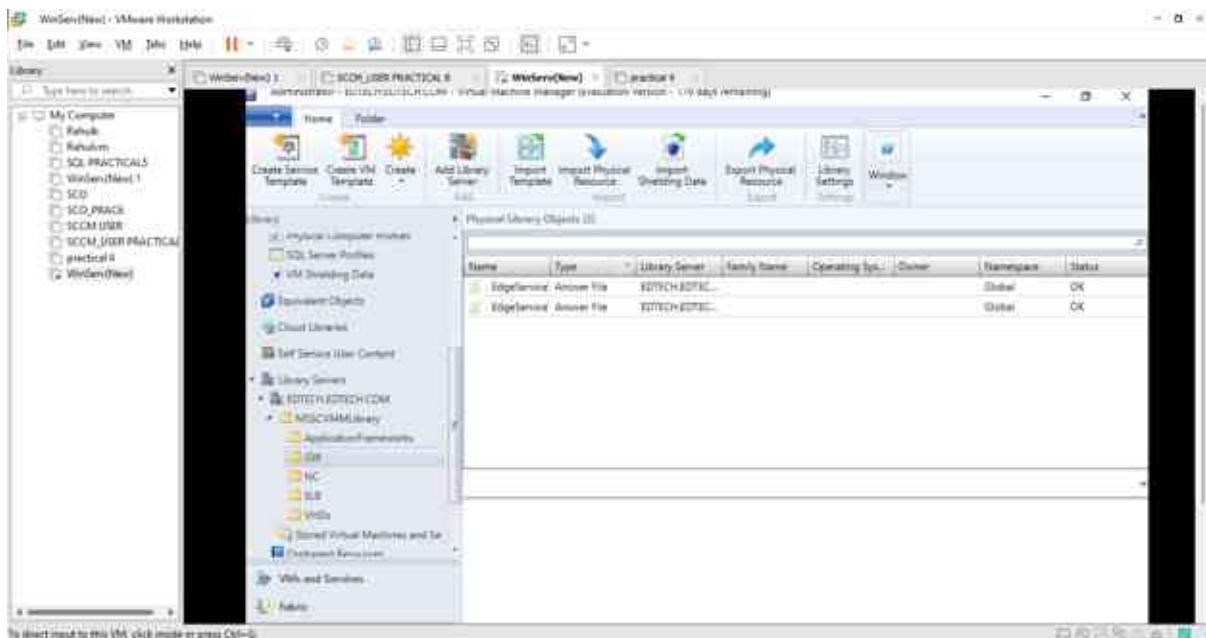


- Click on Finish

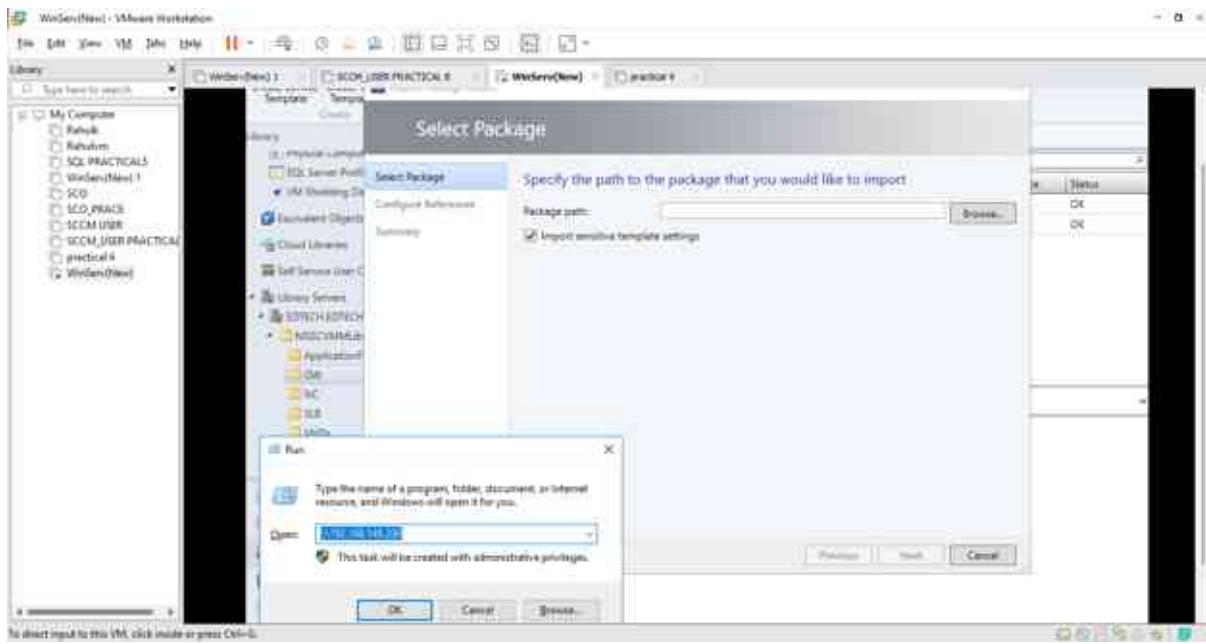


Step 3: Creating a GW Service Template

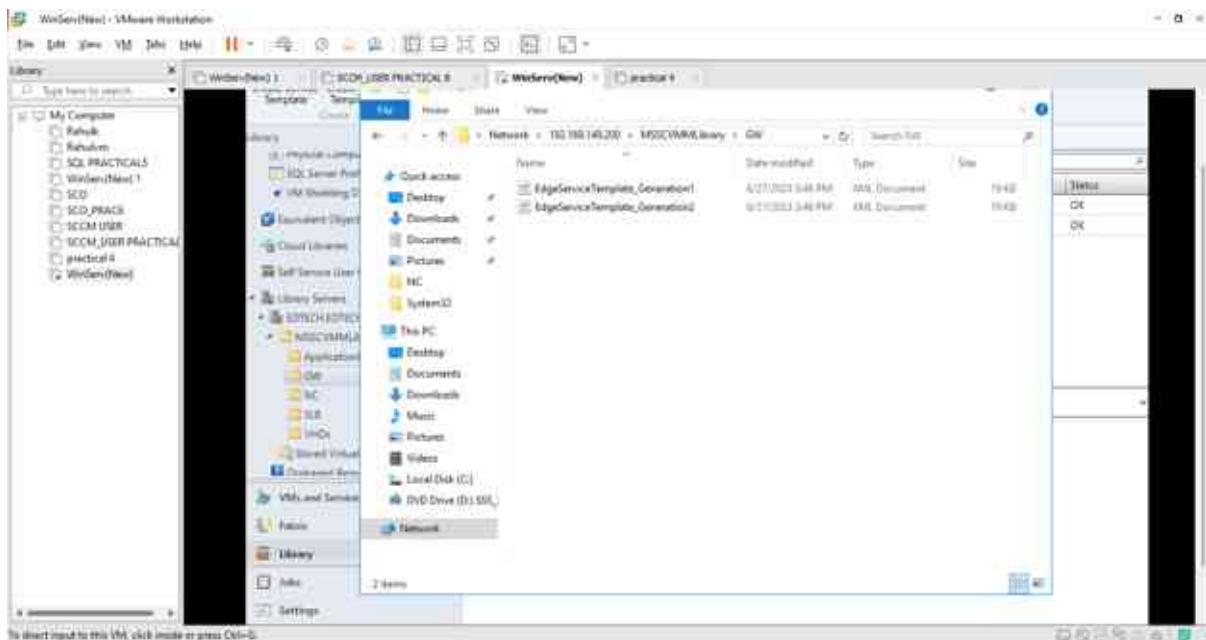
- Select the Library Tab and Click on Import Template



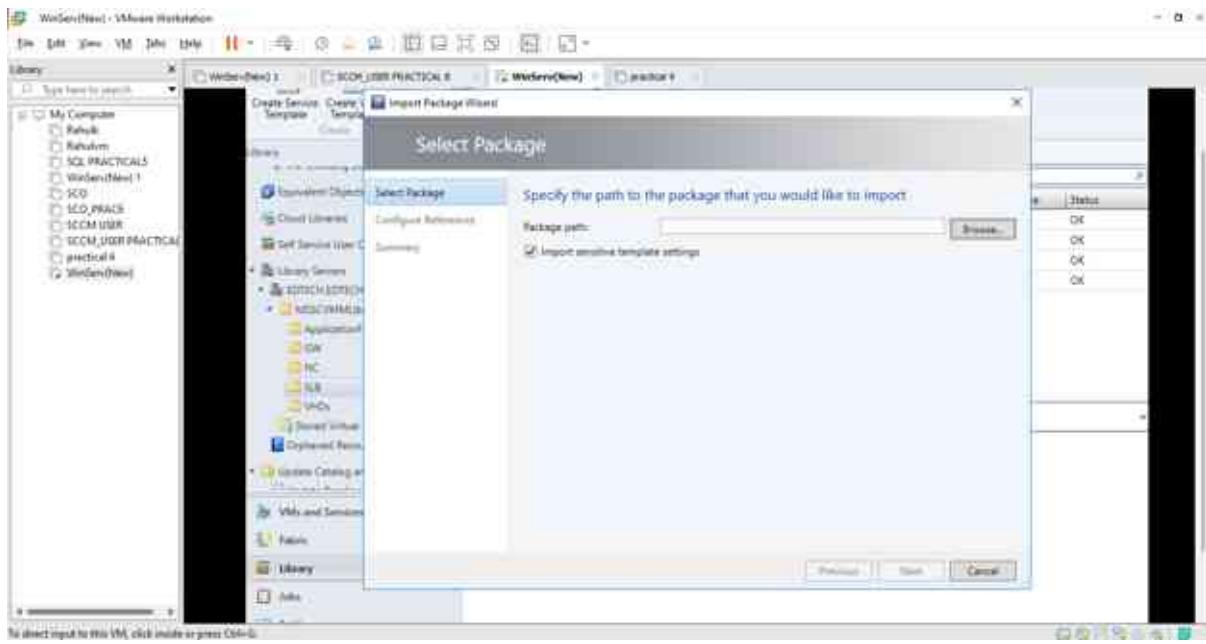
- In Select Package Open Run Window and then Type **IP address of the WinServ(New) (Here it is \\192.168.149.200) Click on Ok**



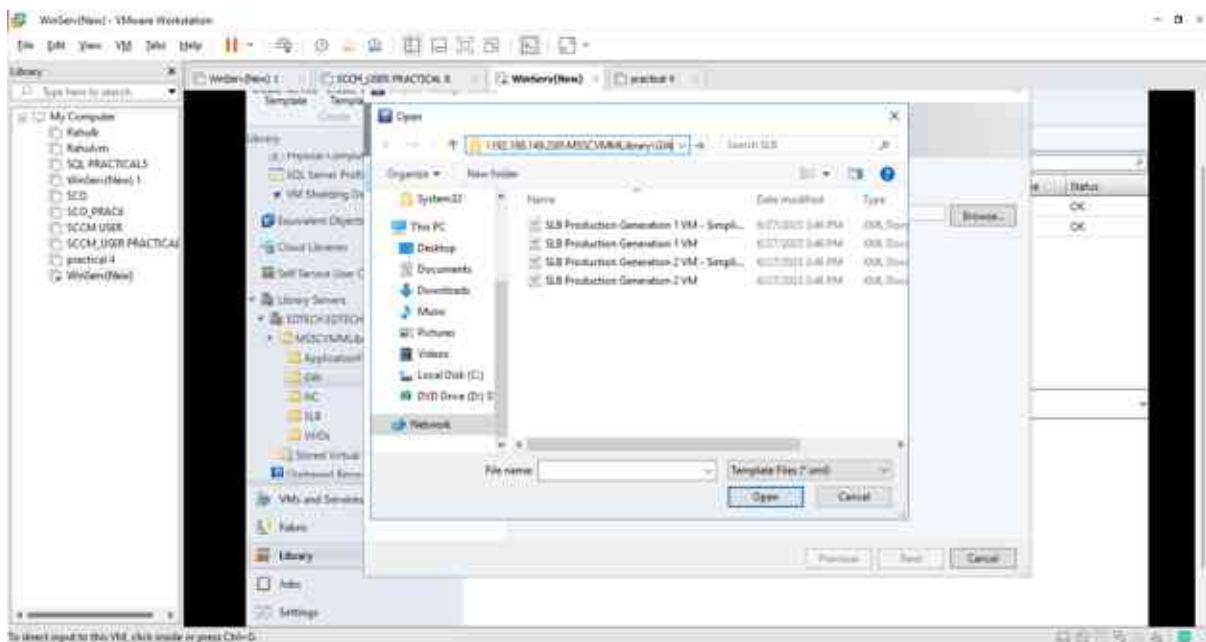
- Within **MSSCVMM Library** Select **GW** Folder and then **Copy the Path**



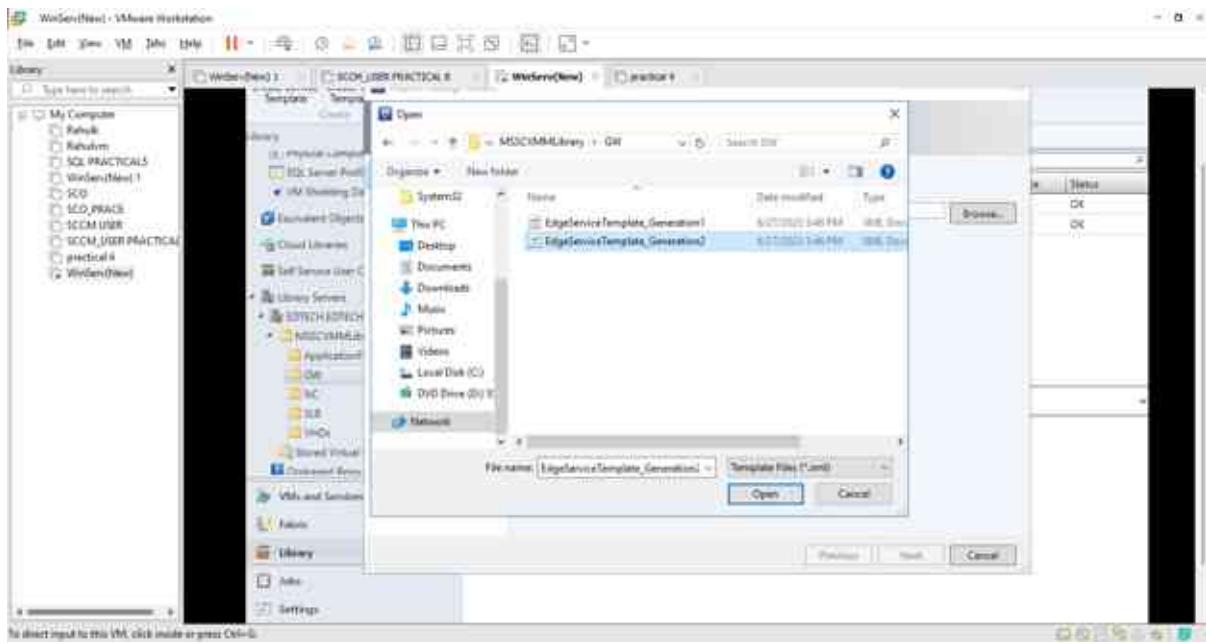
- Now again Go to the Select Package window **Click on Browse**



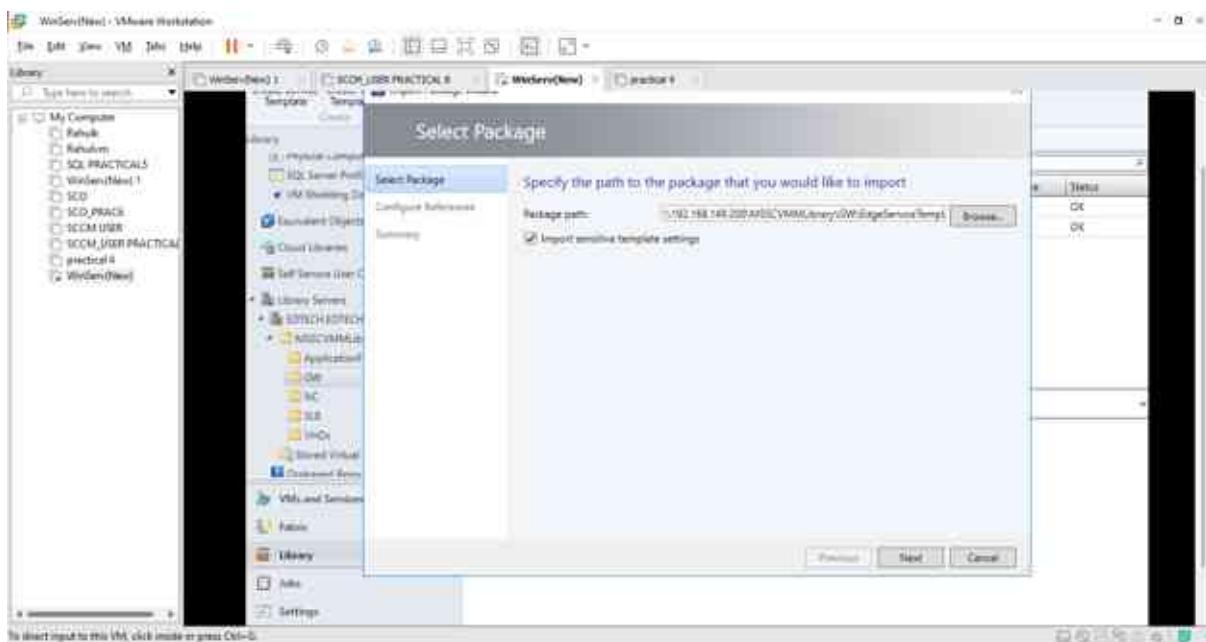
- Now paste the path for GW and then **Click on Enter**



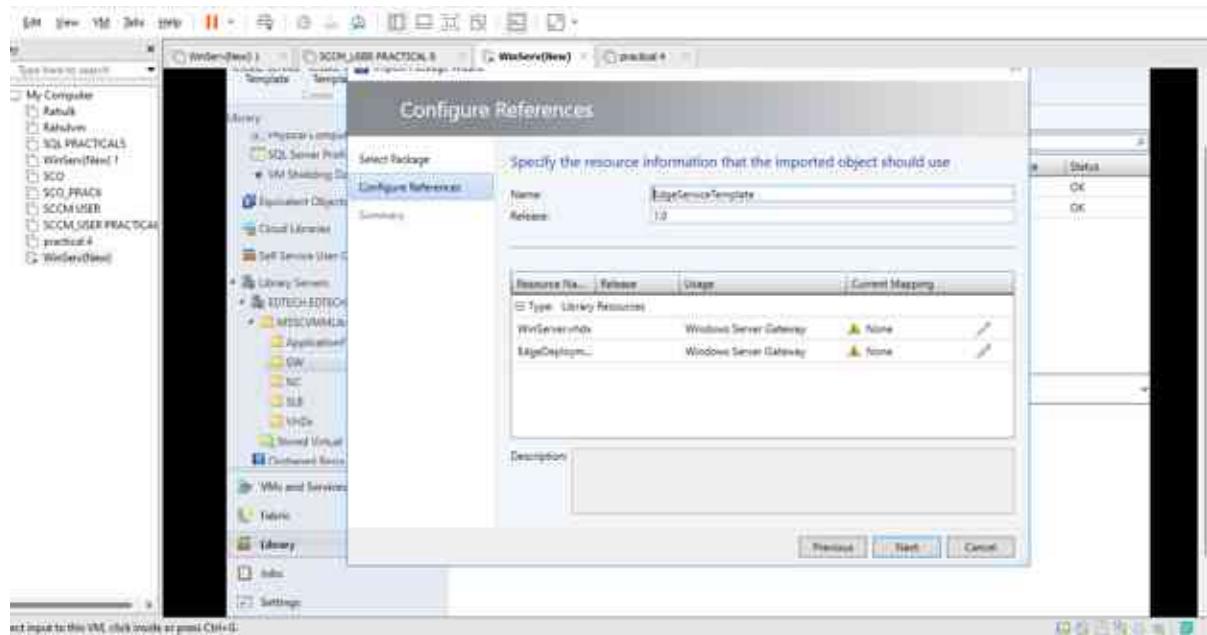
- Within GW Folder Select Network **EdgeServiceTemplate_Generation 2 VM** and then **Click on Open**



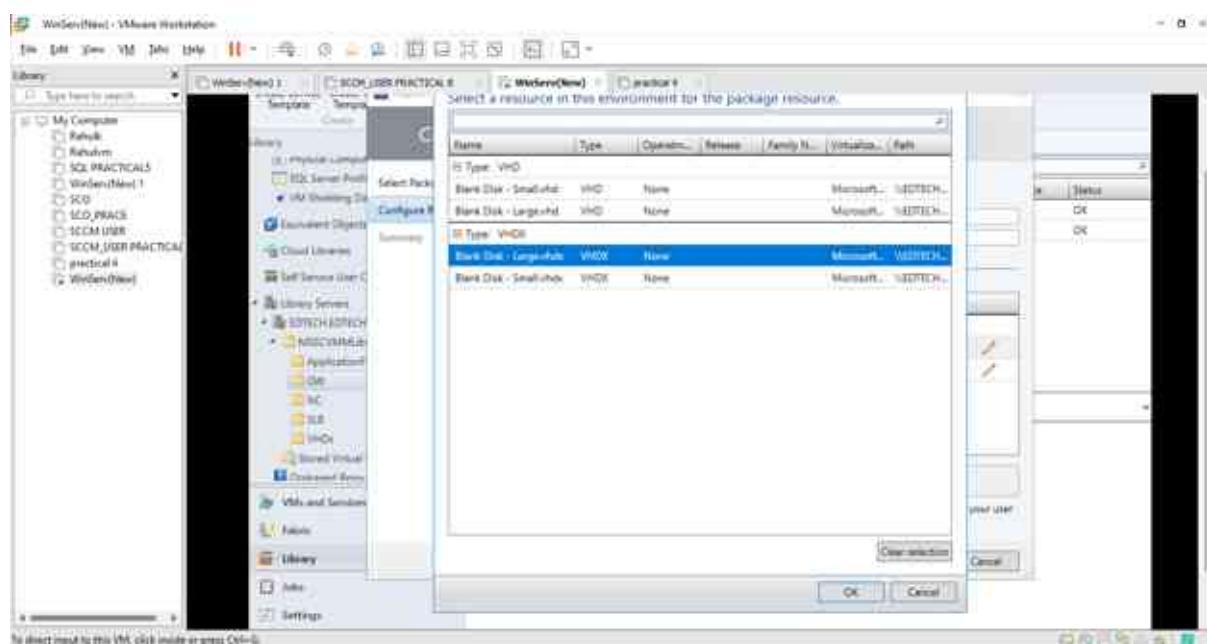
- Click on Next



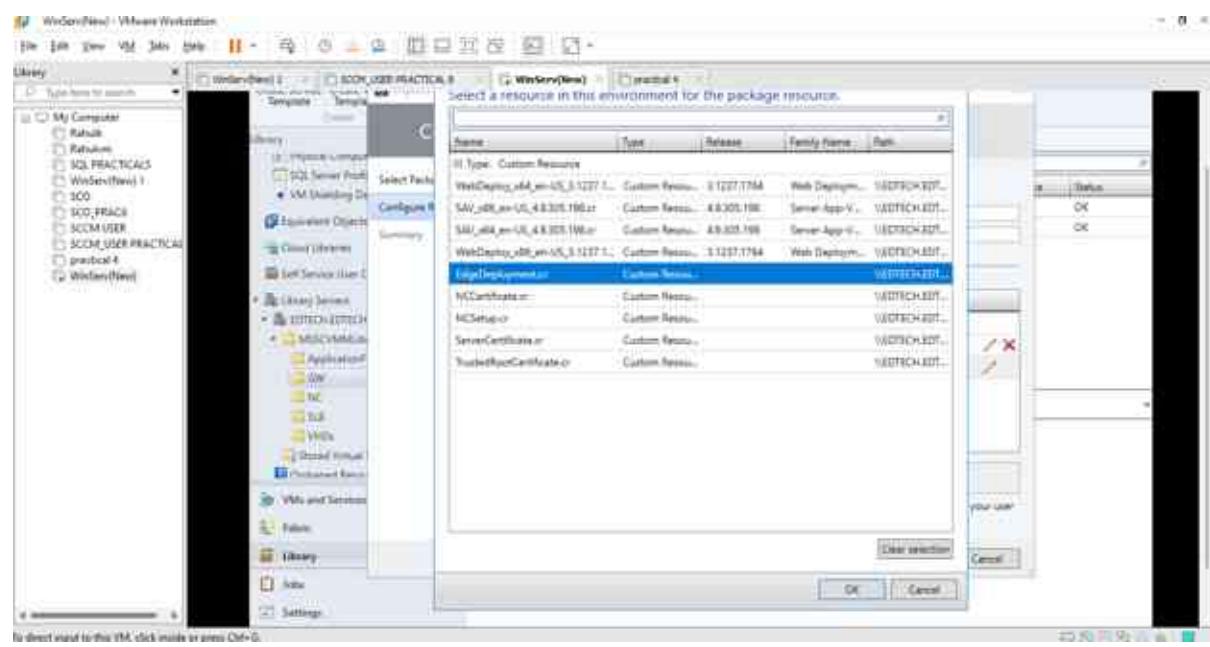
- Within Configuration References Click on WinServer.vhdx and then Click on Edit



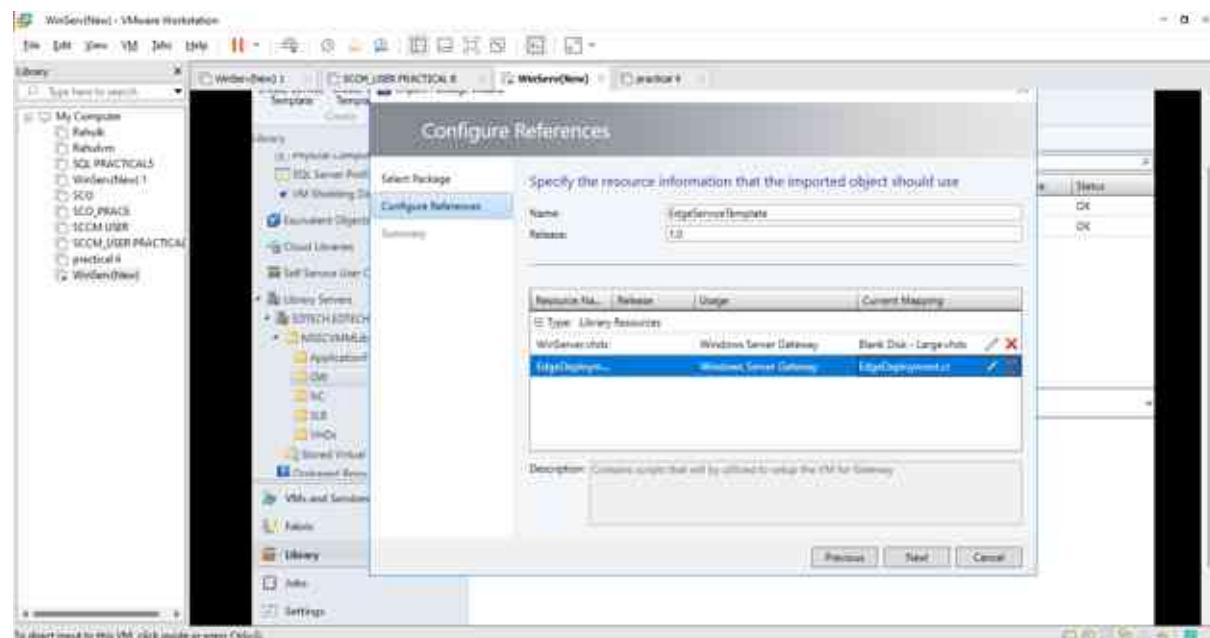
- Within Type: VHDX Select Blank Disk – Large.vhdx and Click on OK



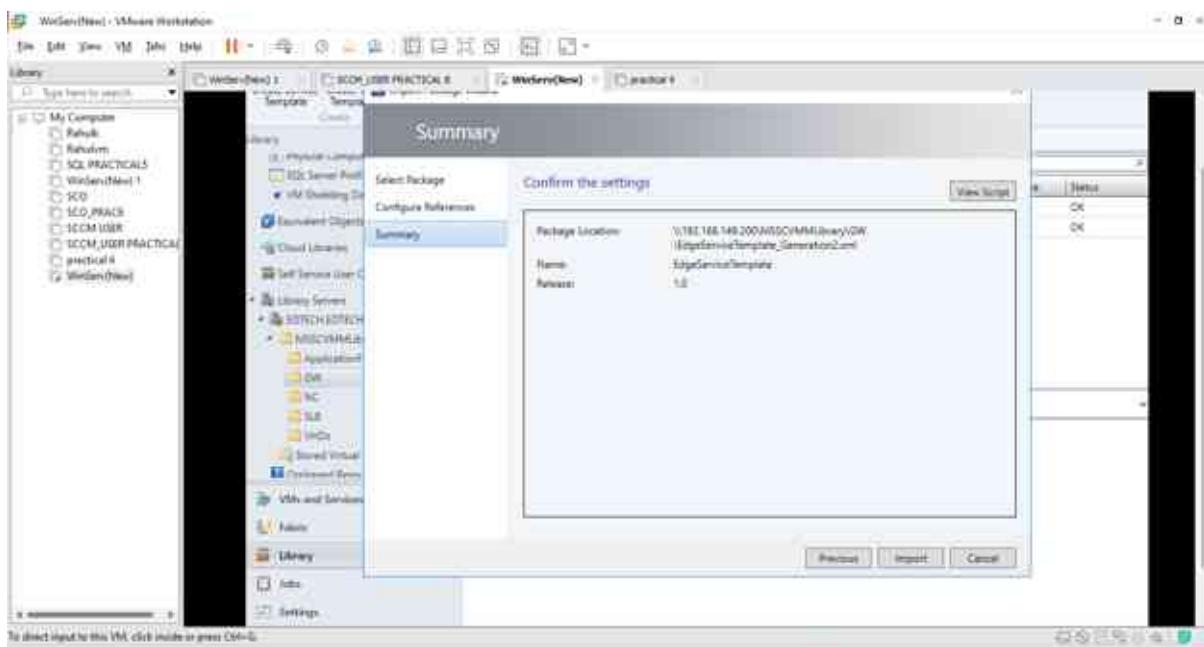
- Click on EdgeDeployment Windows Server Gateway and then Select EdgeDeployment.cr and Click on Ok



- Click on Next

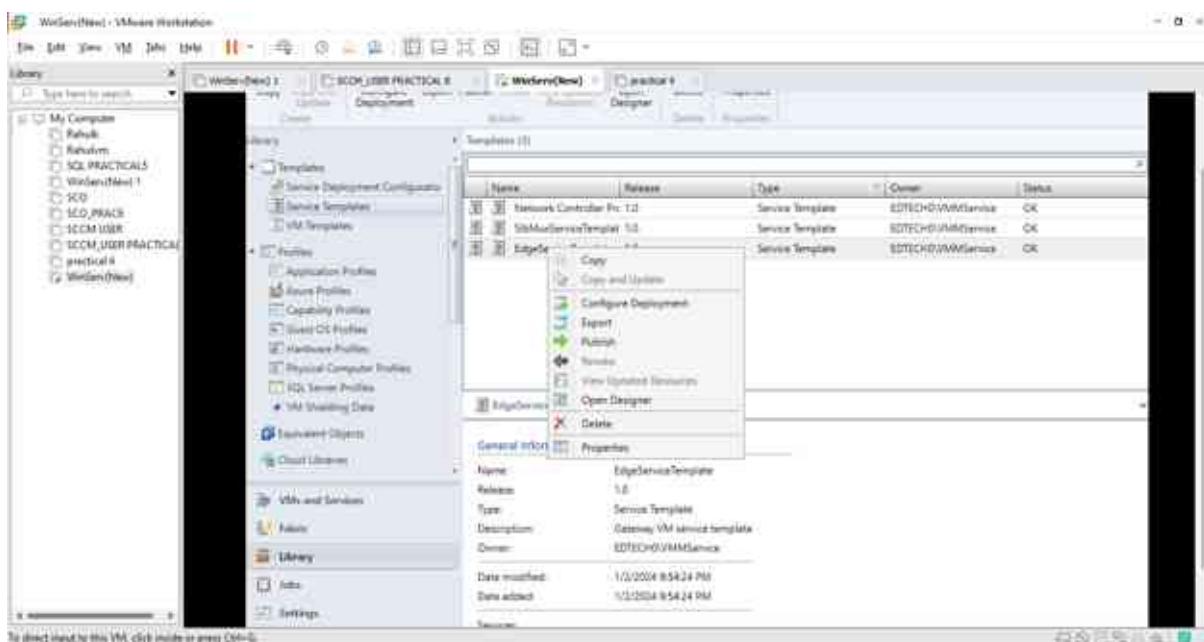


- Click on Import

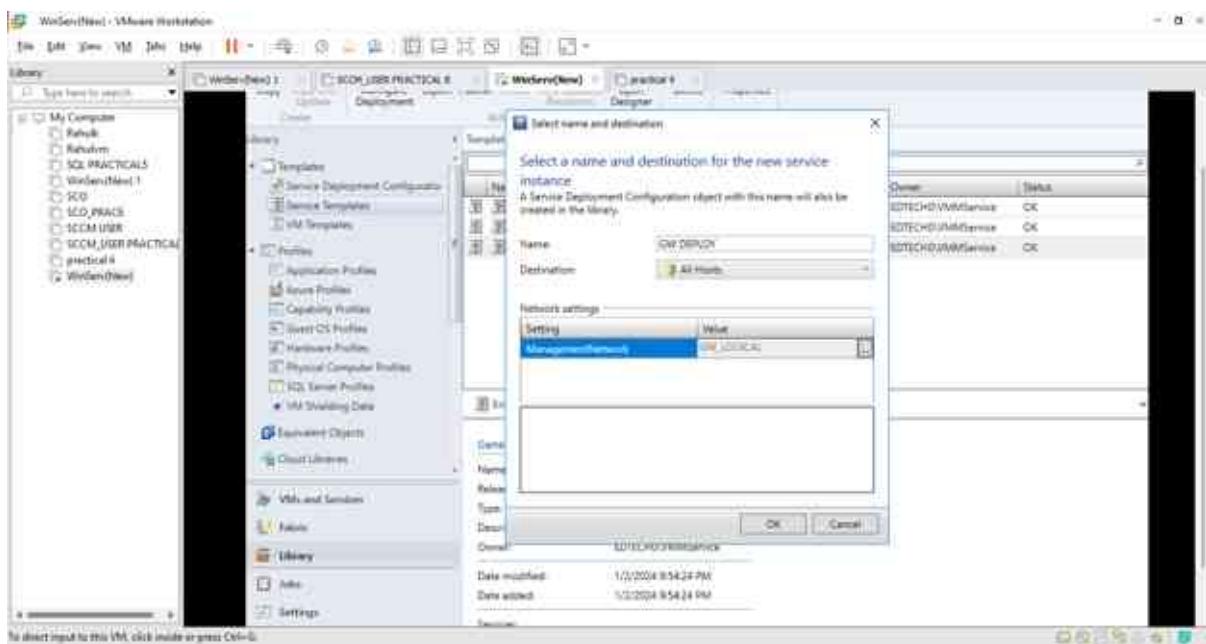


Step 4: Deploying the GW Service Template

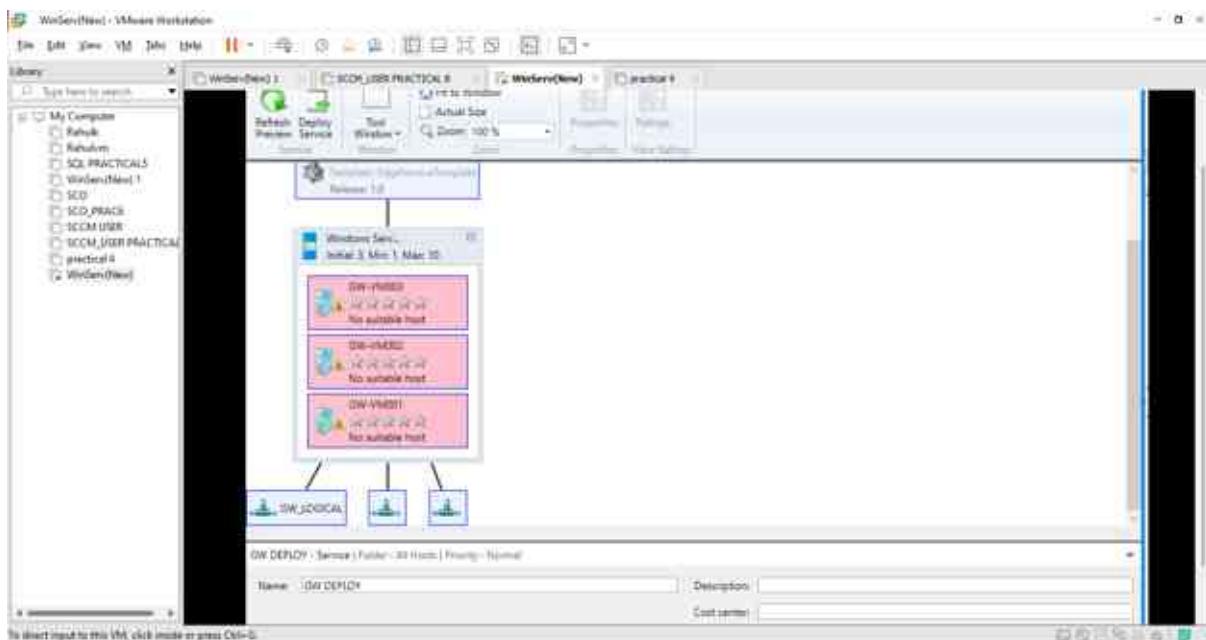
- Within Service Templates Right-Click on EdgeServiceTemplate and then Click on Configure Deployment



- Type in the name (Here it is **GW DEPLOY**) and in the **Transit and Management Network** Select the newly created Logical Network (**Here it is GW_LOGICI**) and Click on Ok



- Here enter the following:
- AdminAccount: NT AUTHORITY\LocalService
- MangementNetwork: GW_LOGICAL
- MgmtDomainAccount: NT AUTHORITY\Local Service
- MgmtDomainFQDN: EDTECH.EDTECH.COM



Practical: 5

Aim: Install and Deploy DPM.

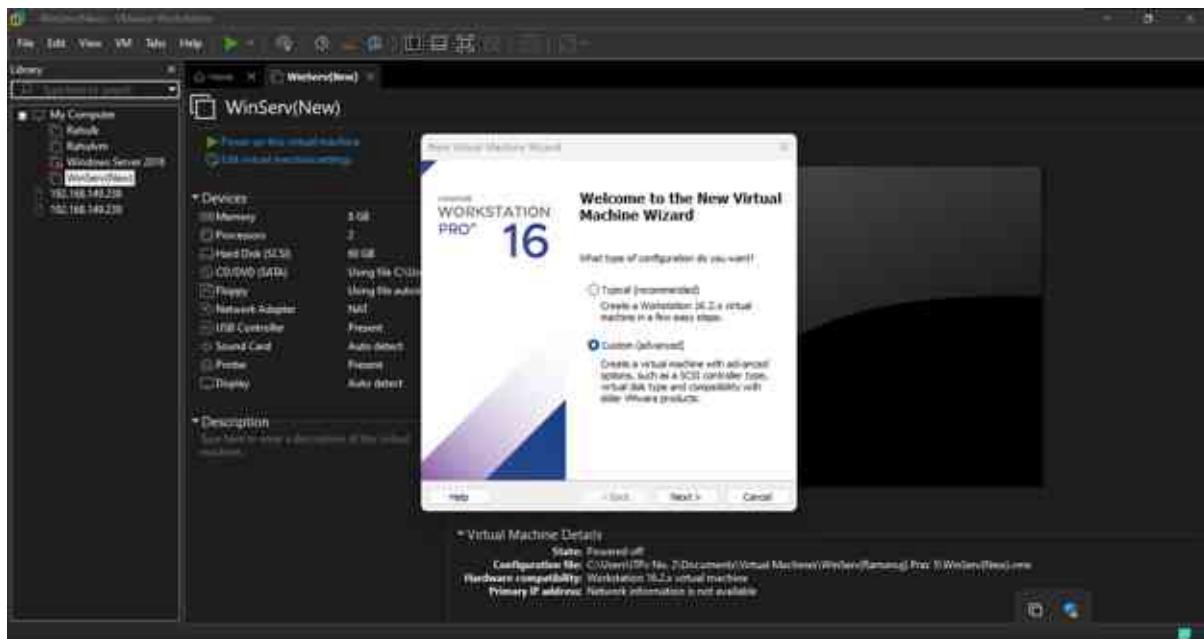
5A: Installing DPM

Pre-requisites:

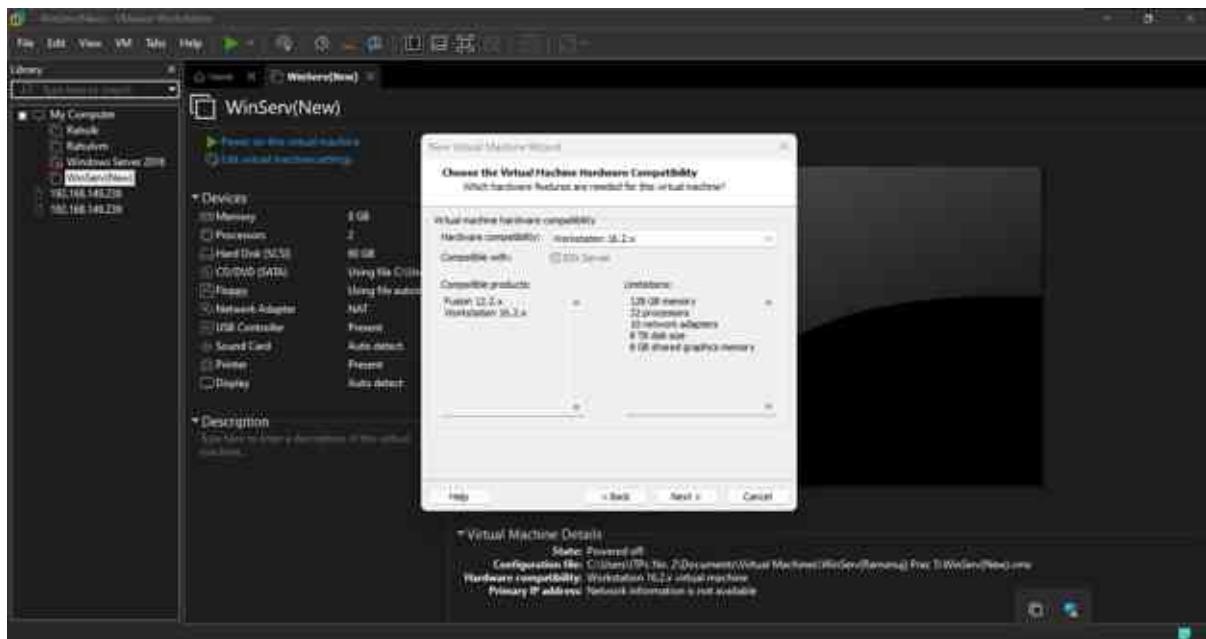
- **Domain Controller** (Here Domain Controller Name **Winser (New)**)
- **User Containing SQL Server** (Here User Name **SQLPRACTICAL5**)

Step 1: We will be using the same Domain Controller created in Practical 2 and only have to create a new User VM.

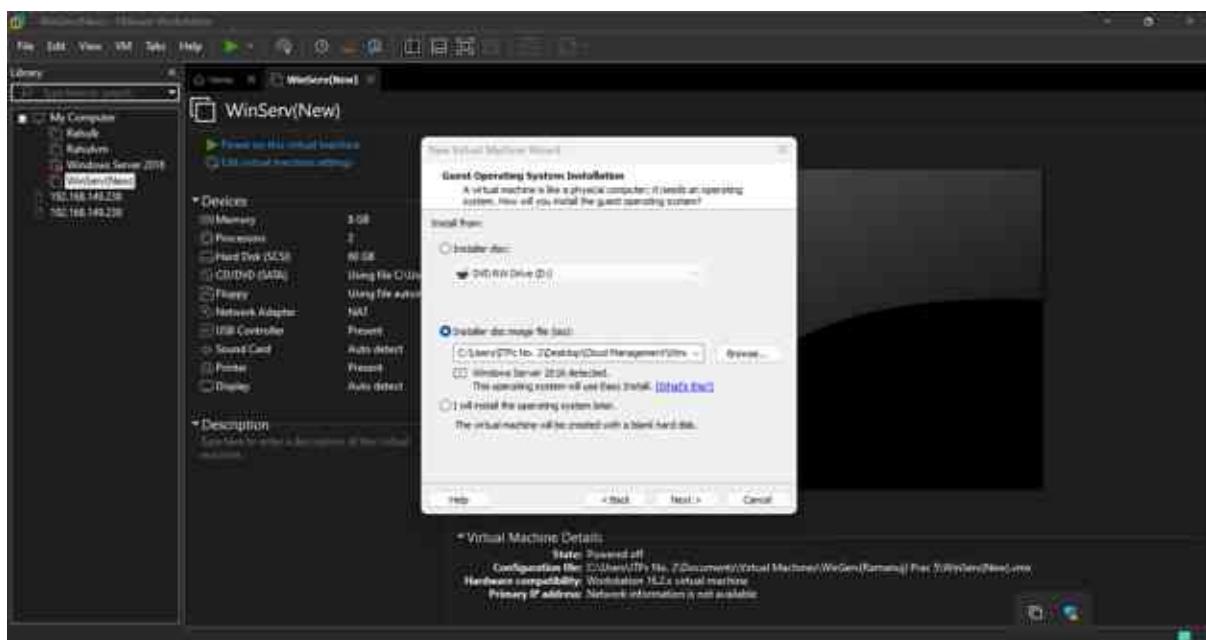
- Open VMware Workstation and **Click on Create a New Virtual Machine.**
- Select **Custom** and **Click on Next.**



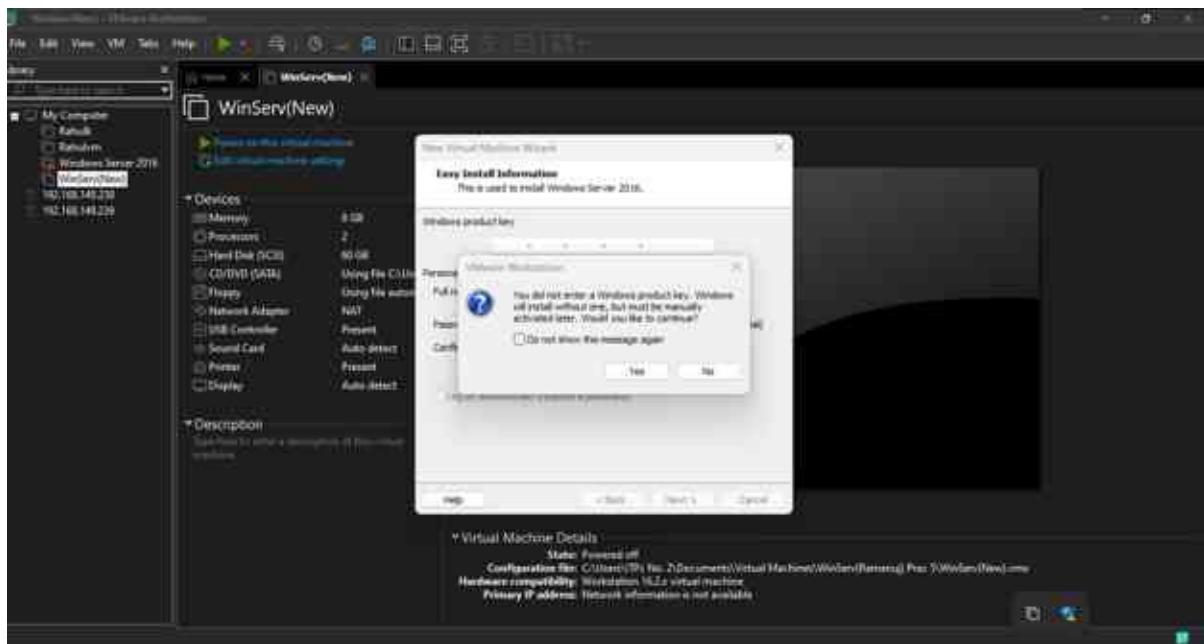
- **Keep default values and Click Next**



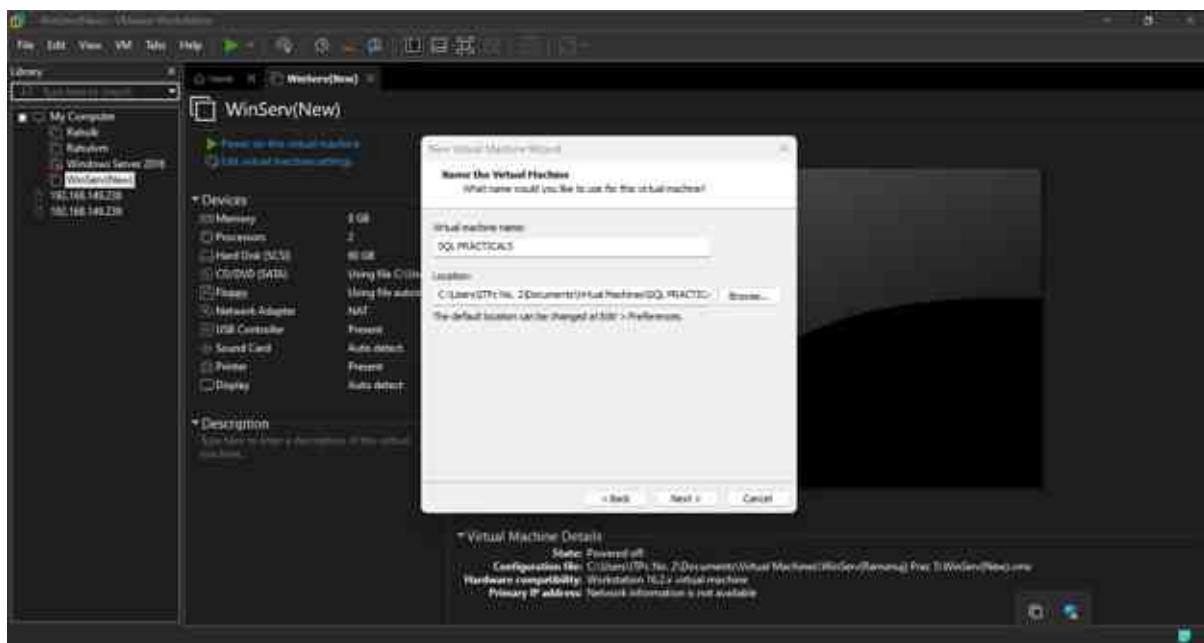
- Select Installer disc image file (iso): Click on Browser and Select Windows Server 2016 and Click on Next



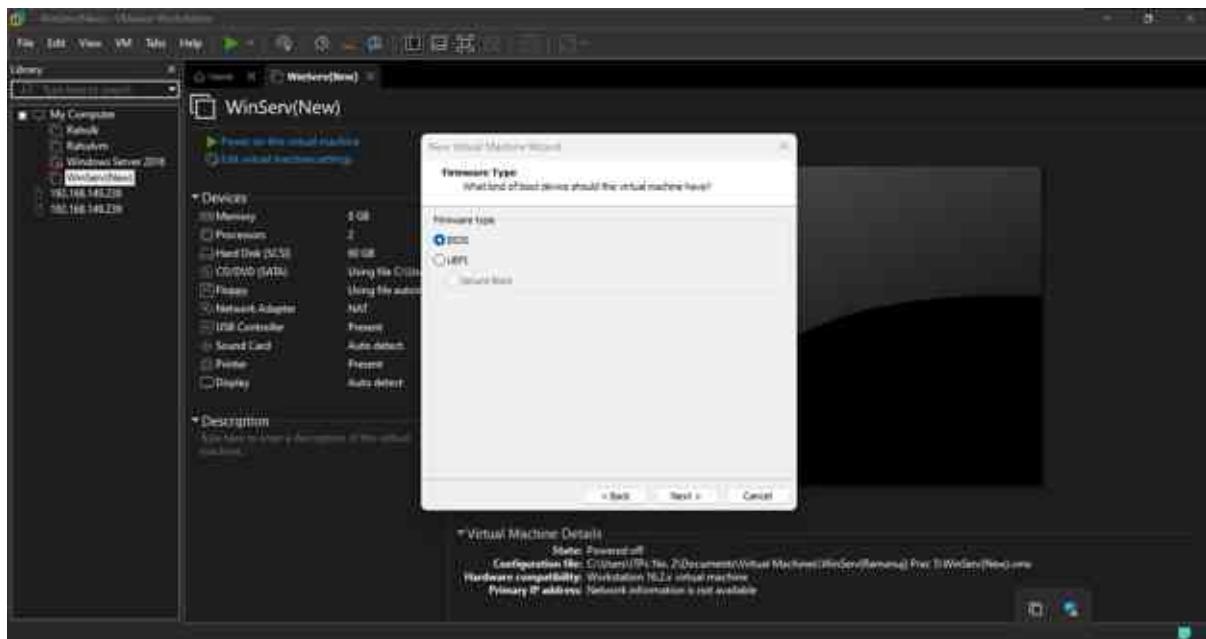
- Click Yes and Click on Next



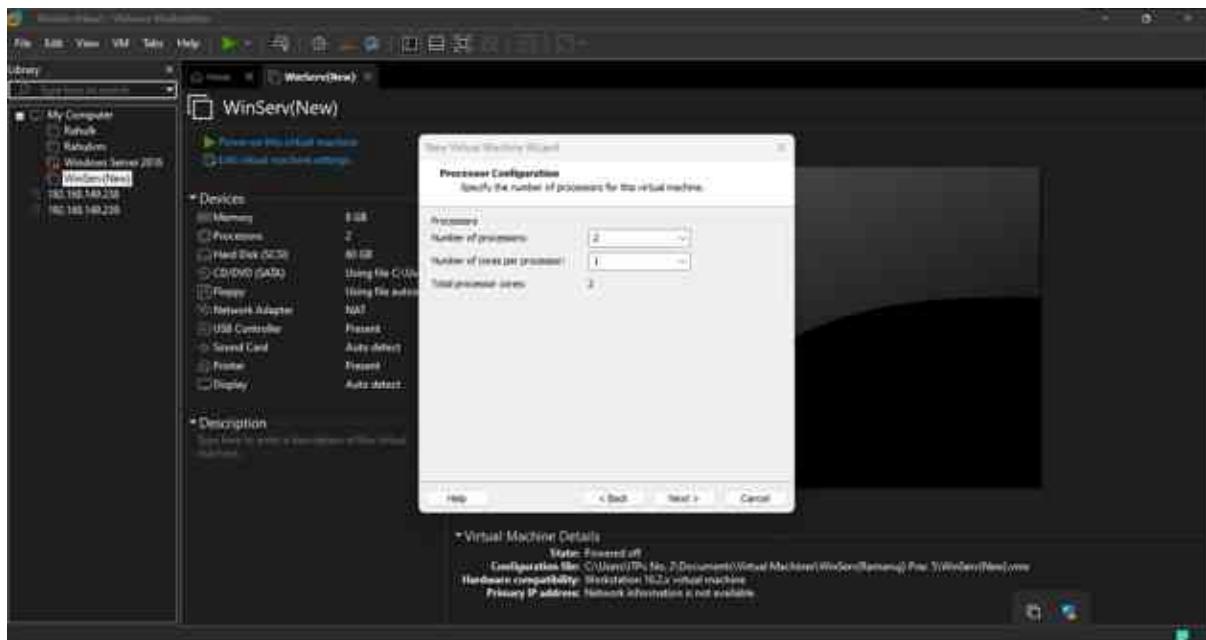
- Give Virtual Machine Name (Here it is **SQLPRACTICAL5**) and Click on Next



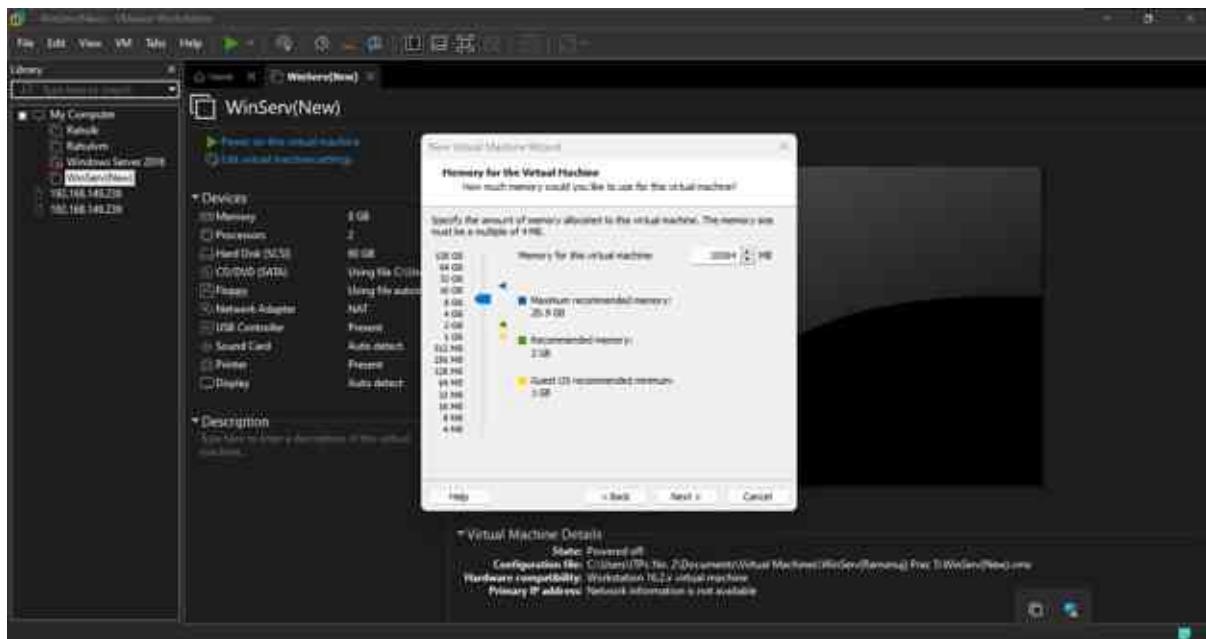
- Select BIOS and Click on Next



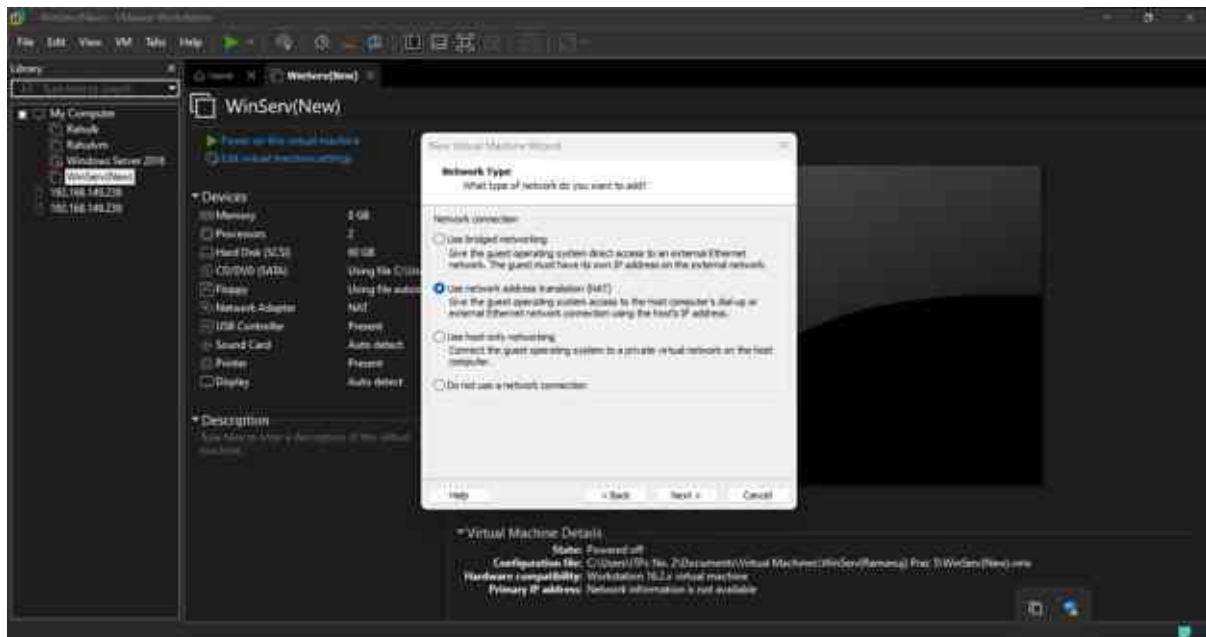
- Keep default values and Click on Next



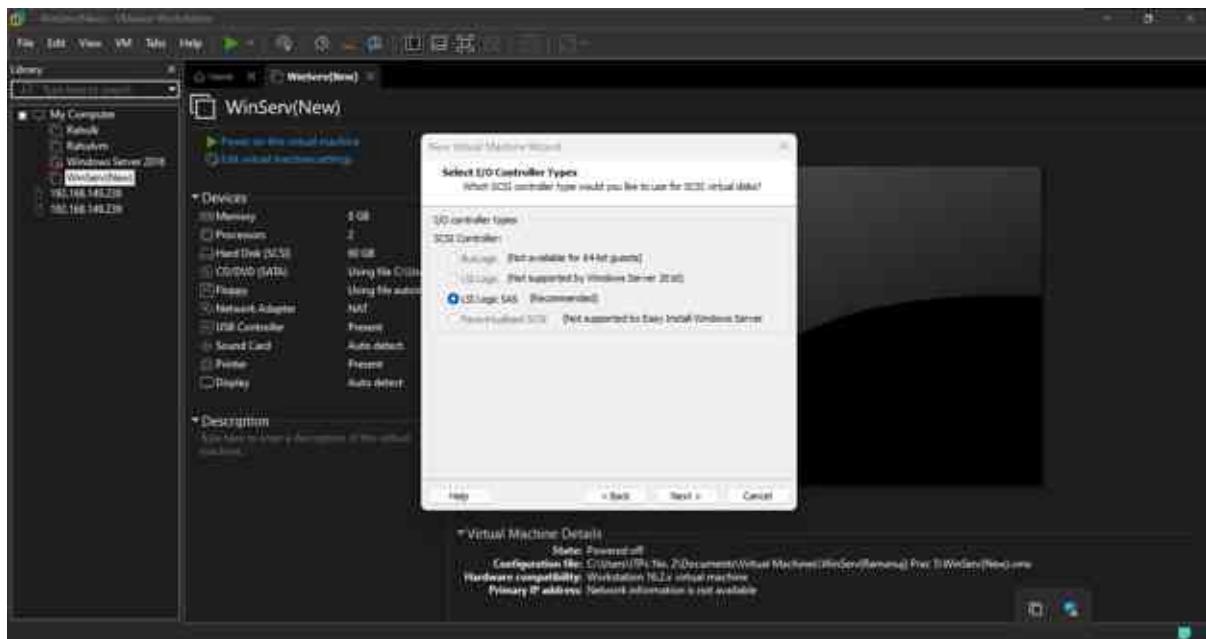
- Change the RAM value to 10084 MB and Click Next



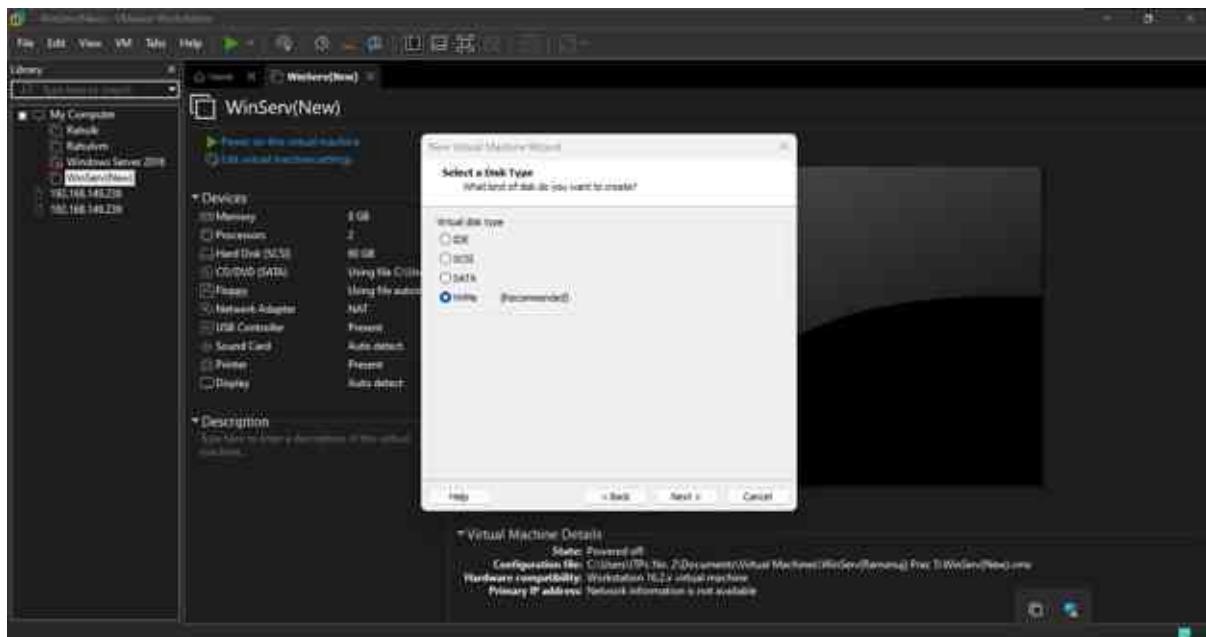
- Keep default values and Click on Next



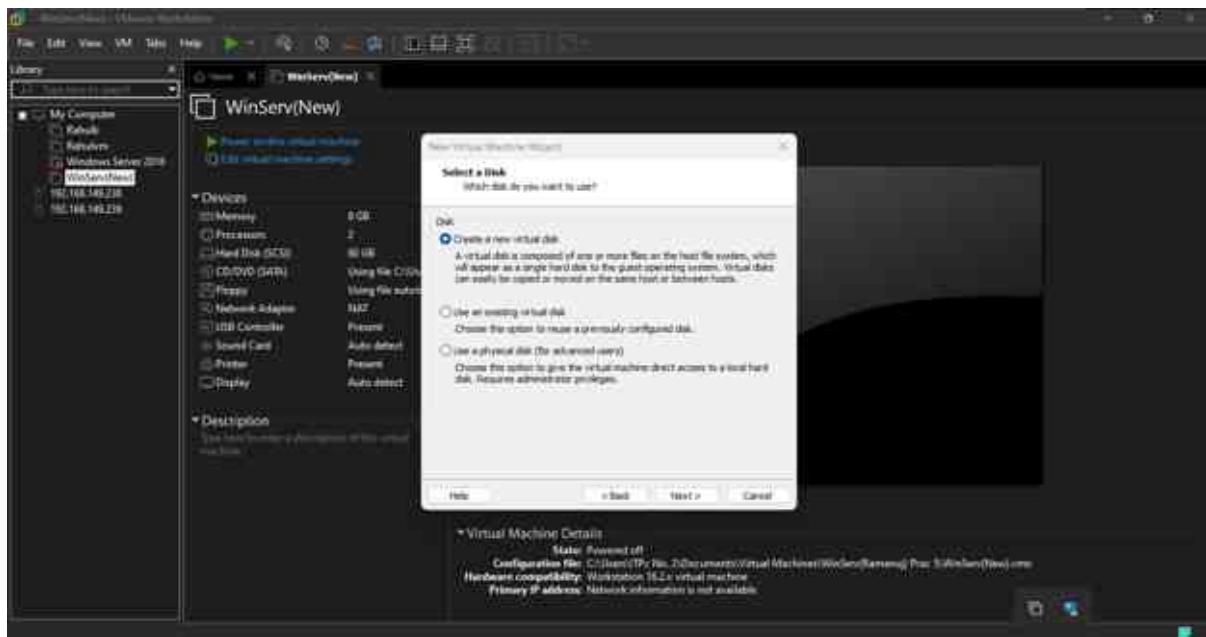
- Keep default values and Click on Next



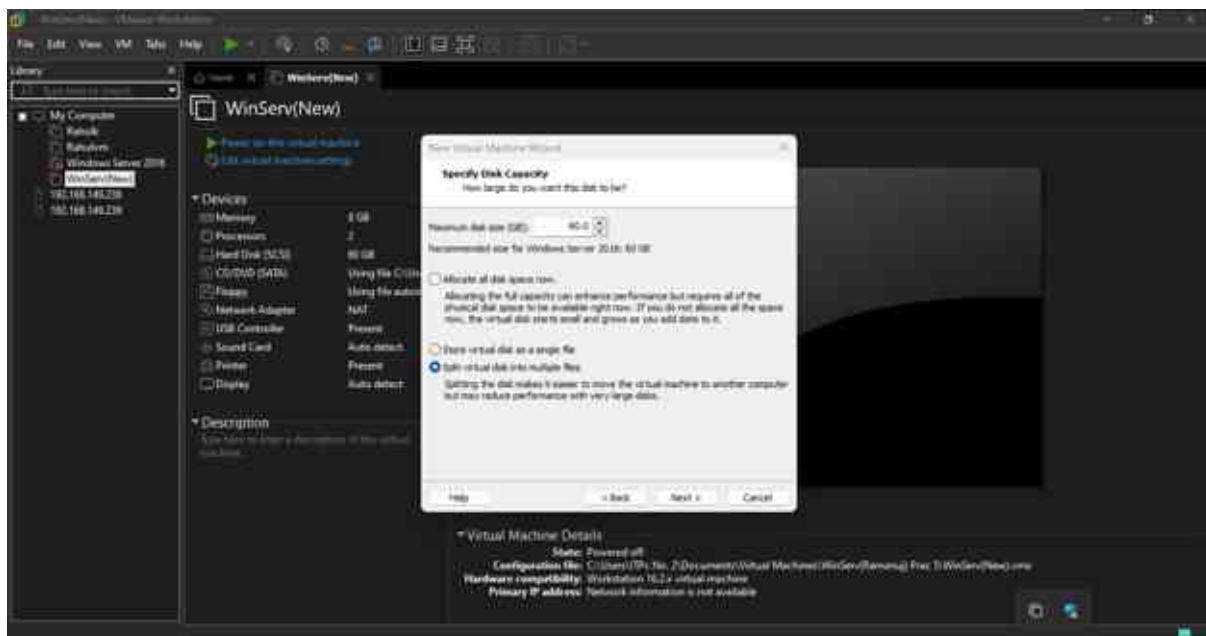
- Keep default values and Click on Next



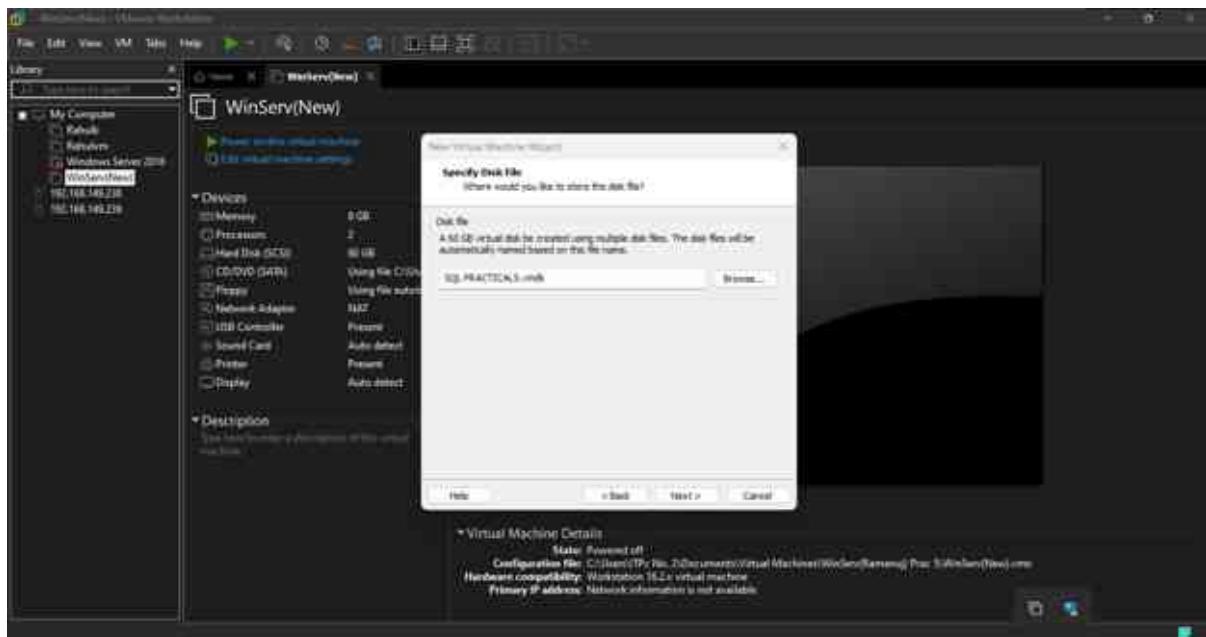
- Keep default values and Click on Next



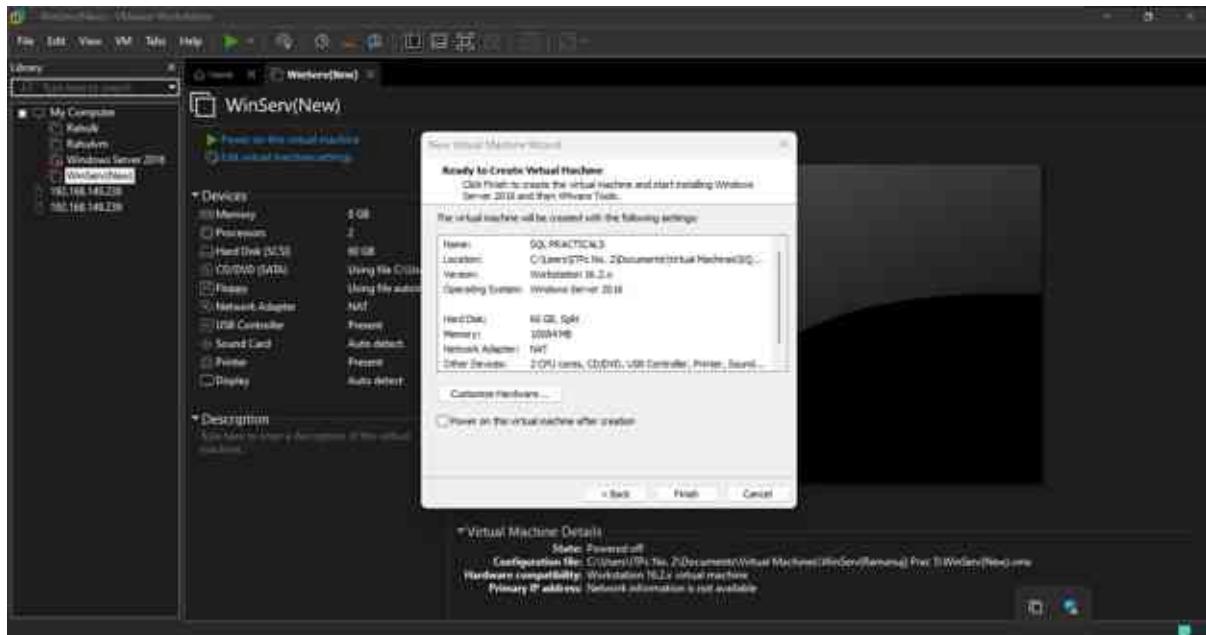
- Keep default values and Click on Next



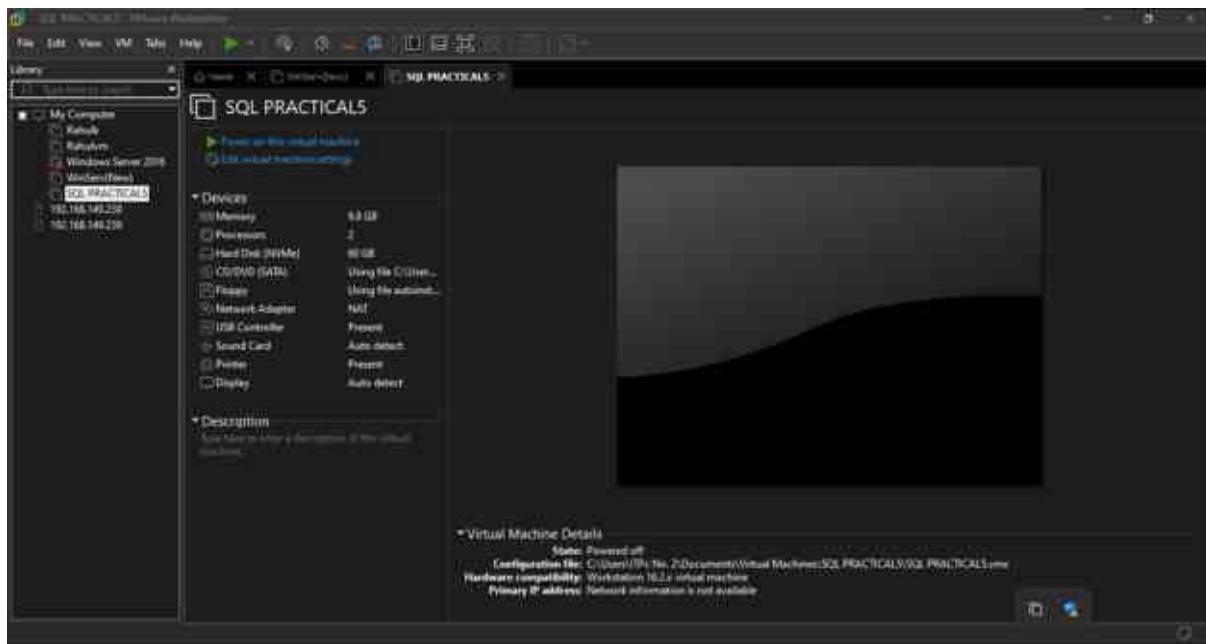
- Keep default values and Click on Next



- Click on Finish

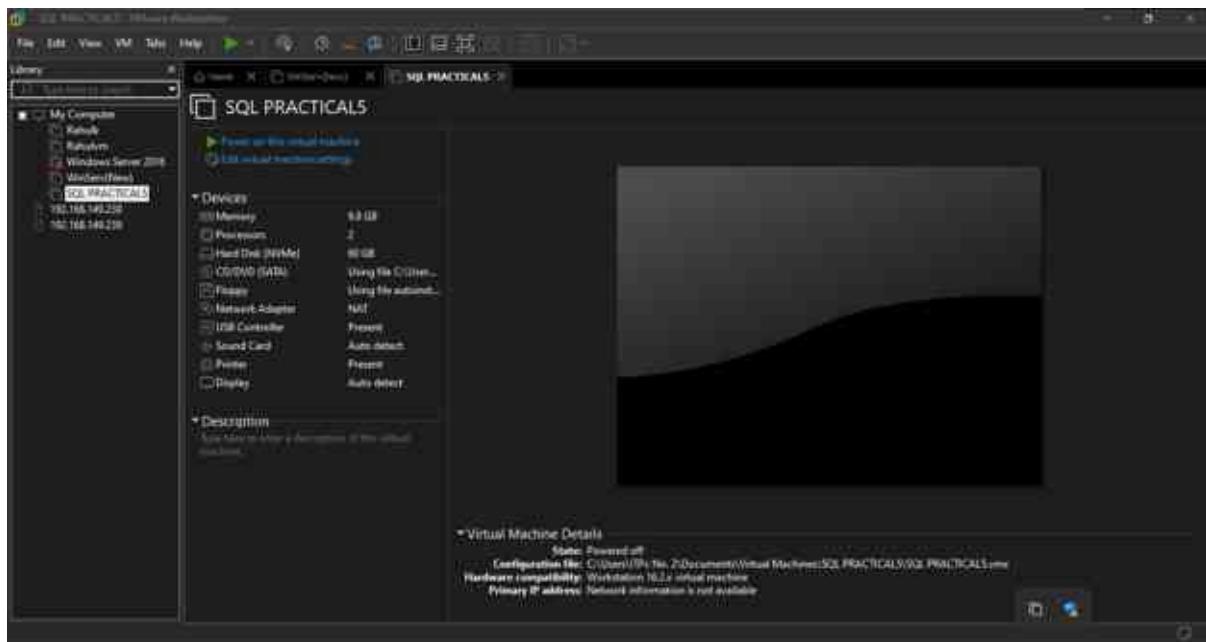


- Your Virtual Machine Has Been Created

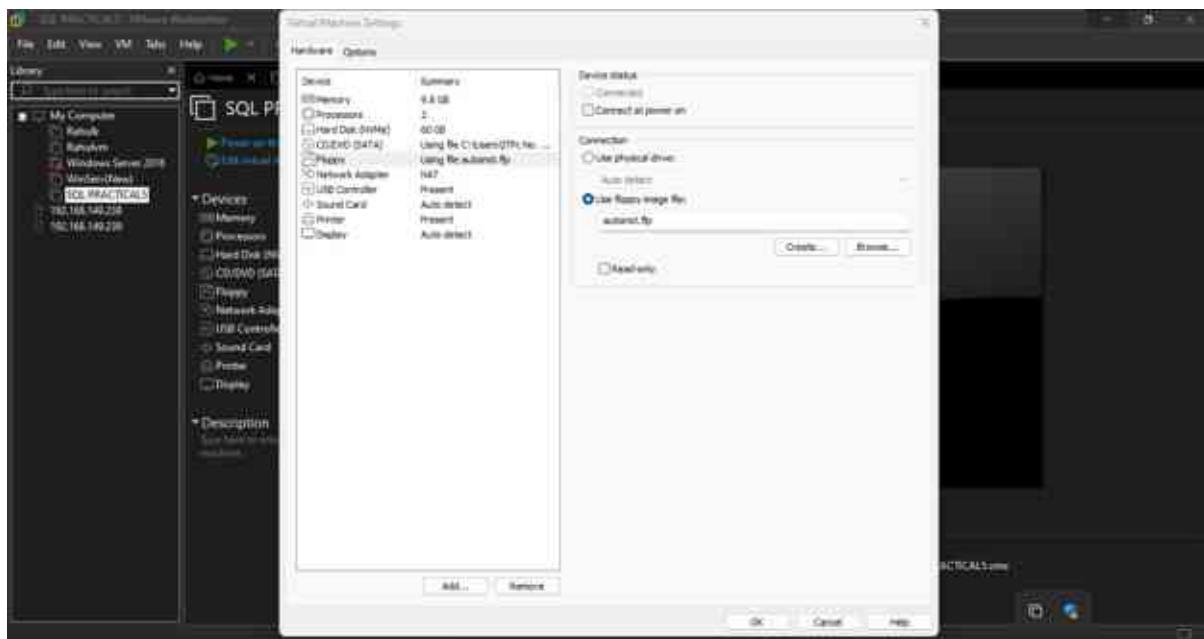


Step 2: Before **Power on this virtual machine** a few changes need to be in this **virtual machine settings**.

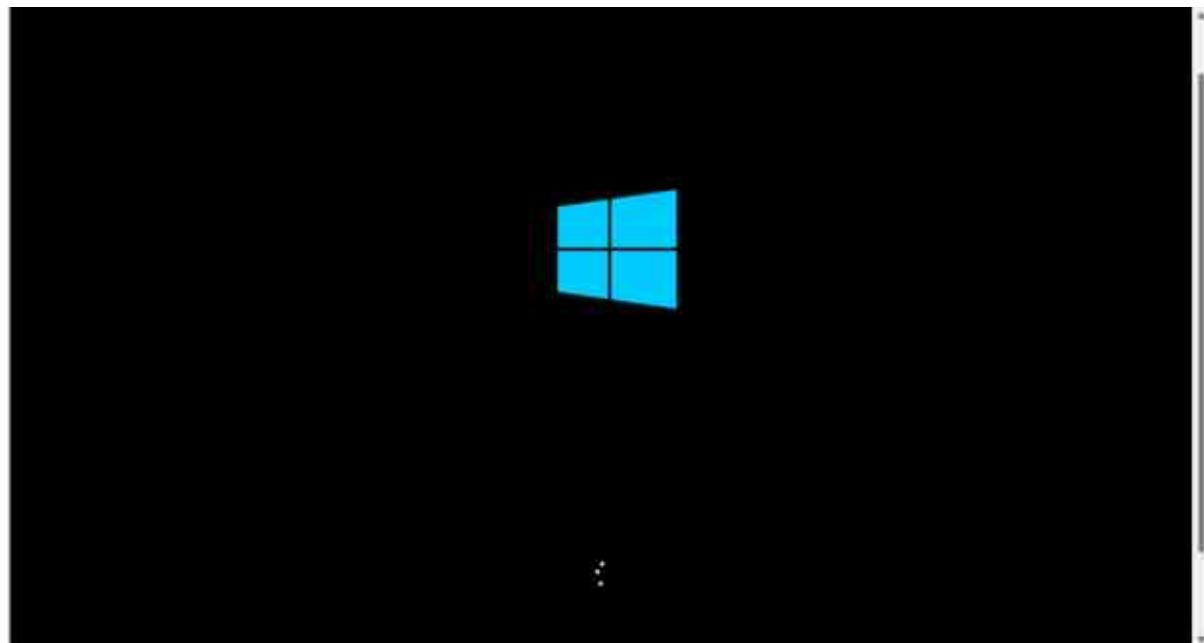
- Click on **Edit virtual machine settings**



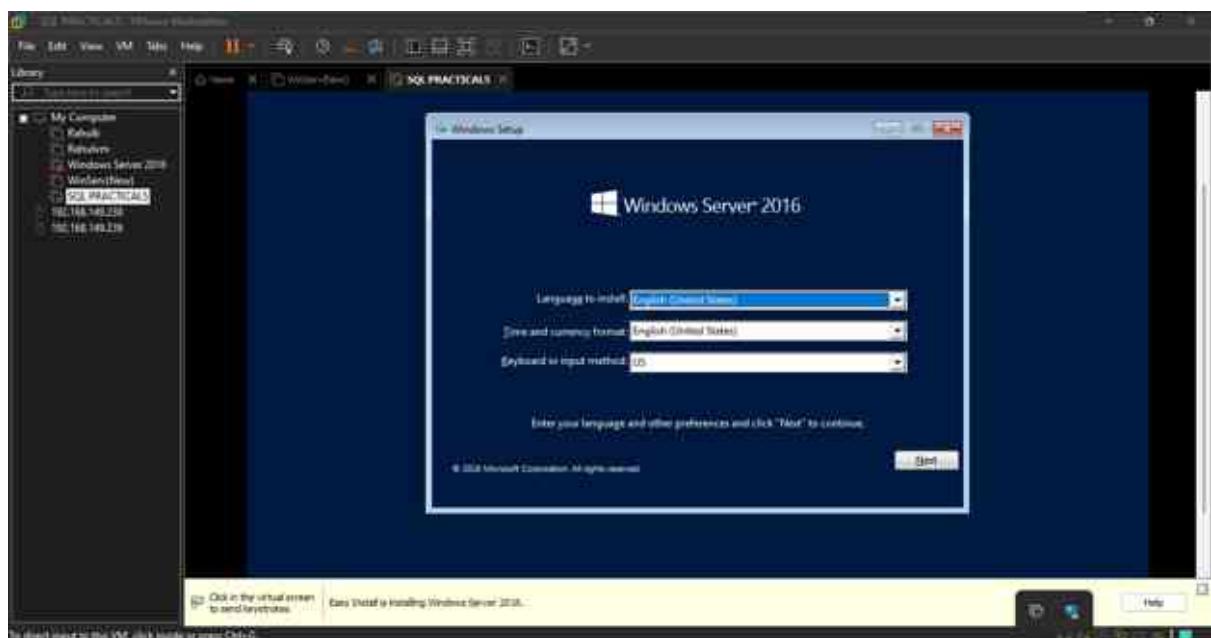
- Within virtual machine settings Select Floppy and Un-Click Connect on Power On and Click on OK



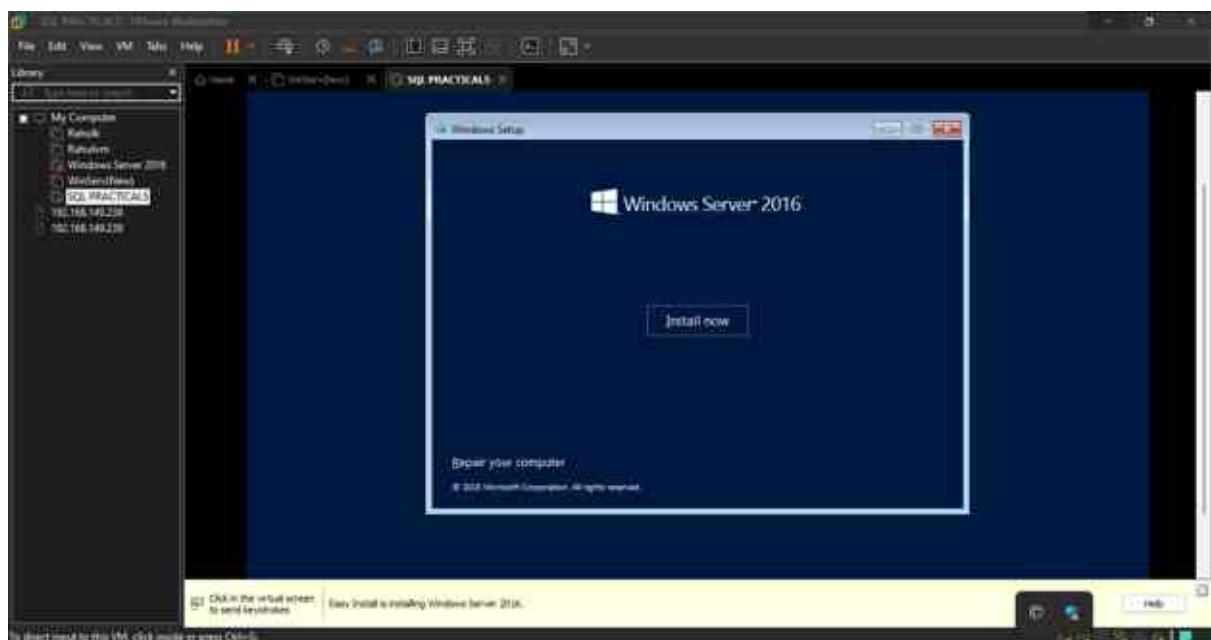
- Now Power On your virtual machine



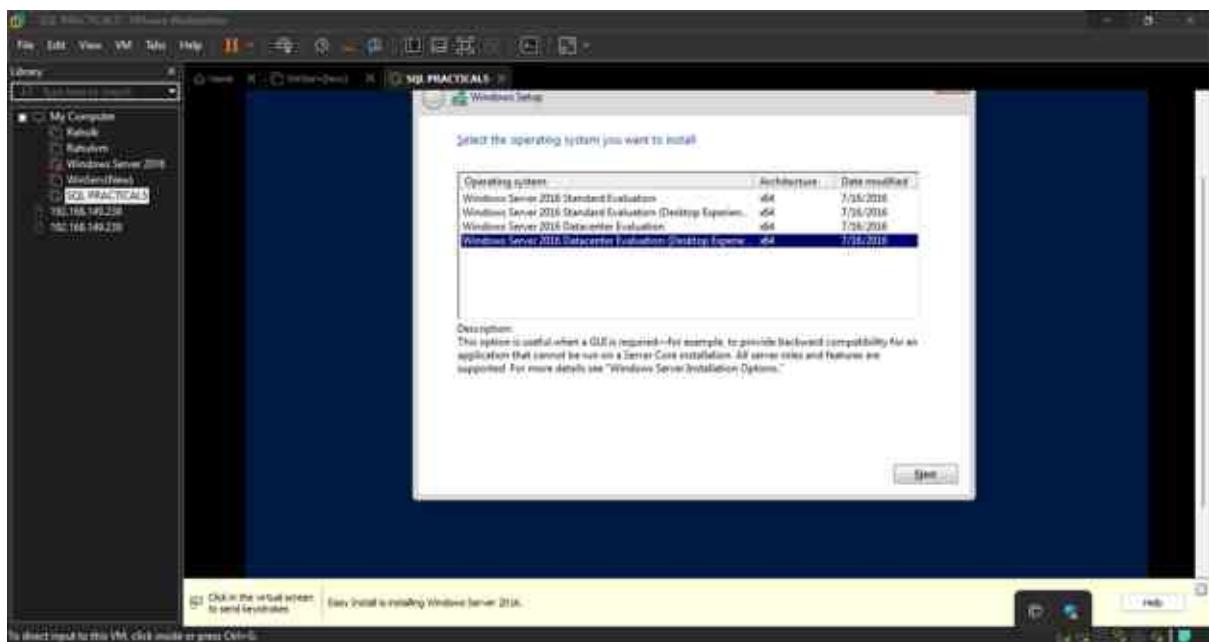
- Click on Next



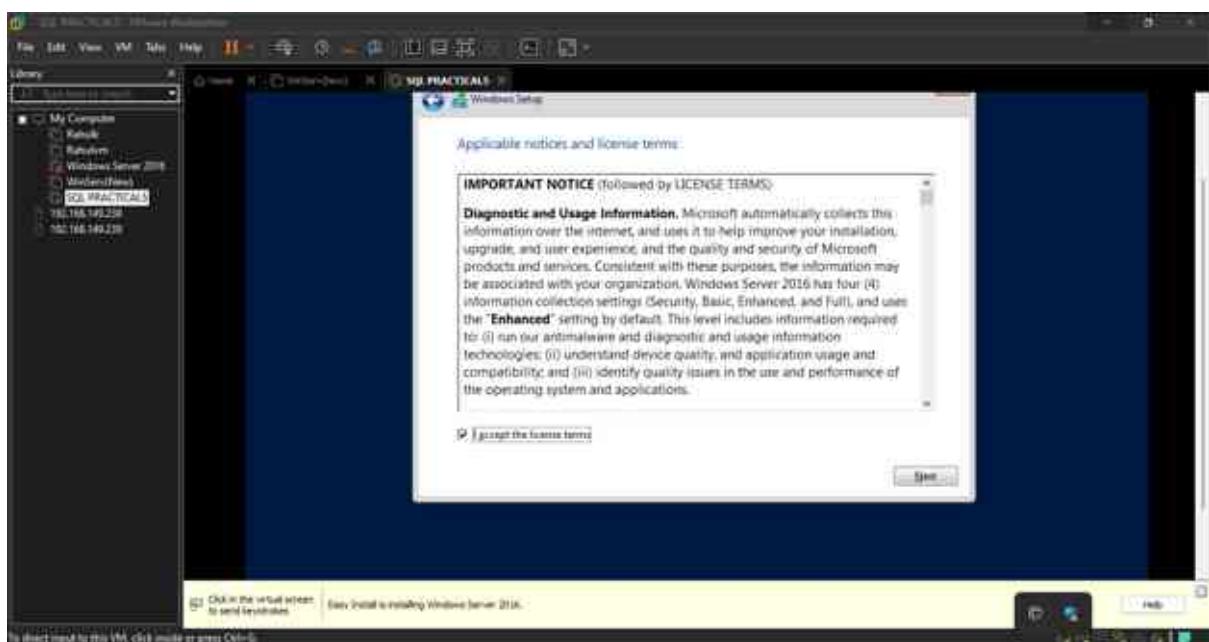
- Click on Install Now



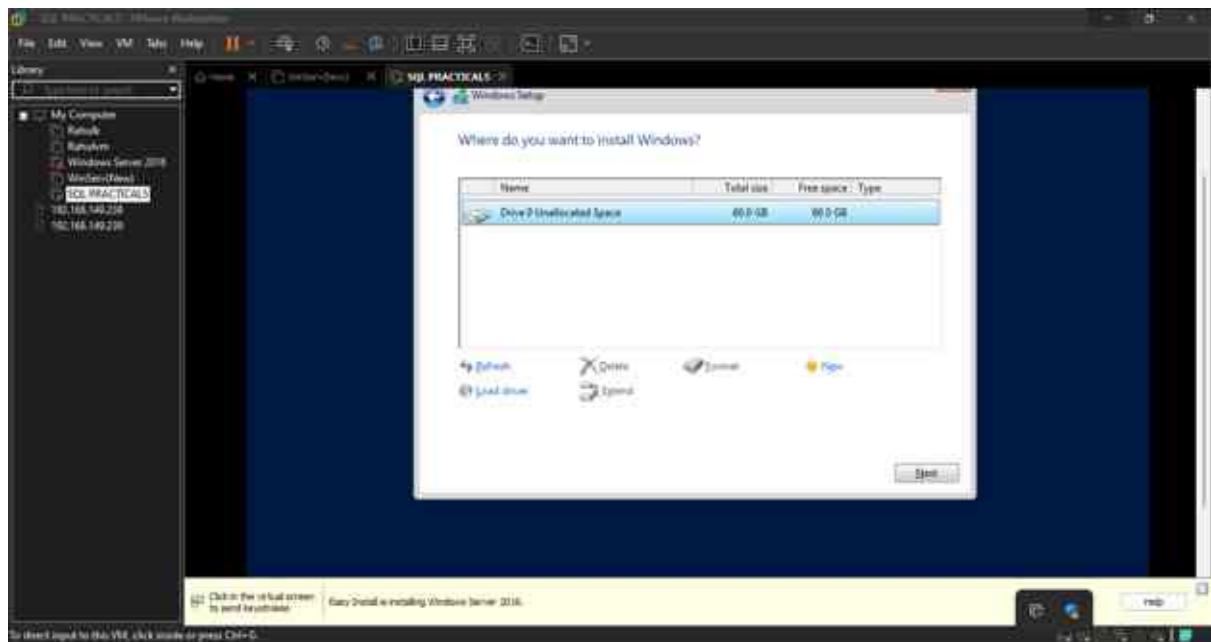
- Select Window Server 2016 Datacenter Evaluation (Desktop Experience) and Click on Next



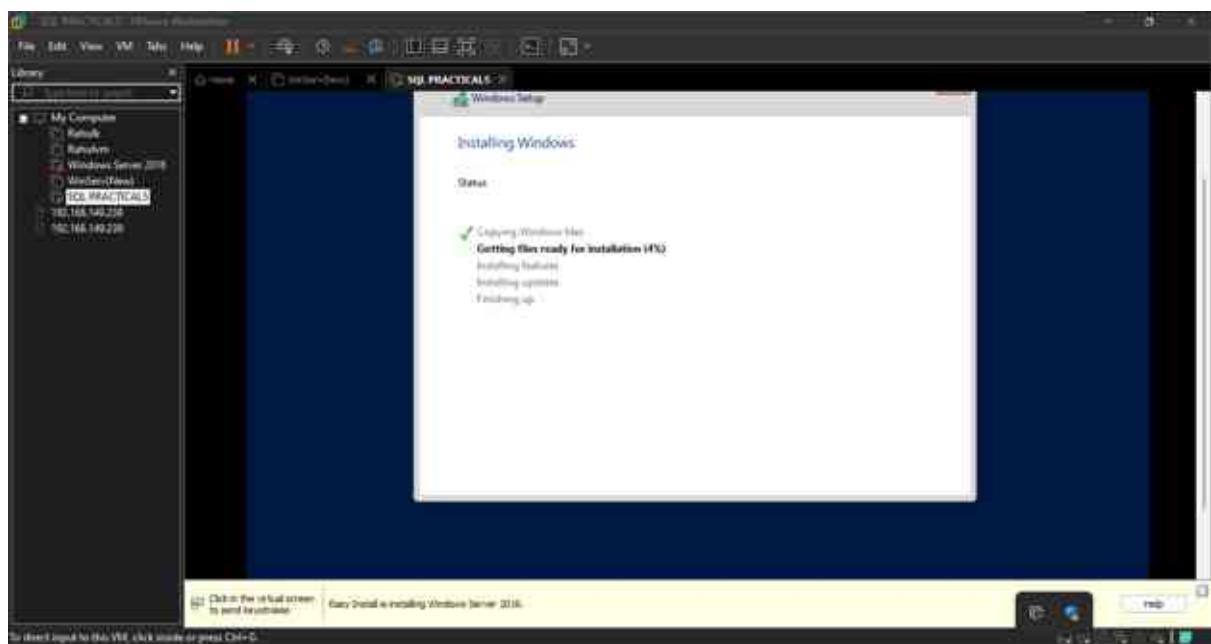
- Select I accept the license and Click on Next



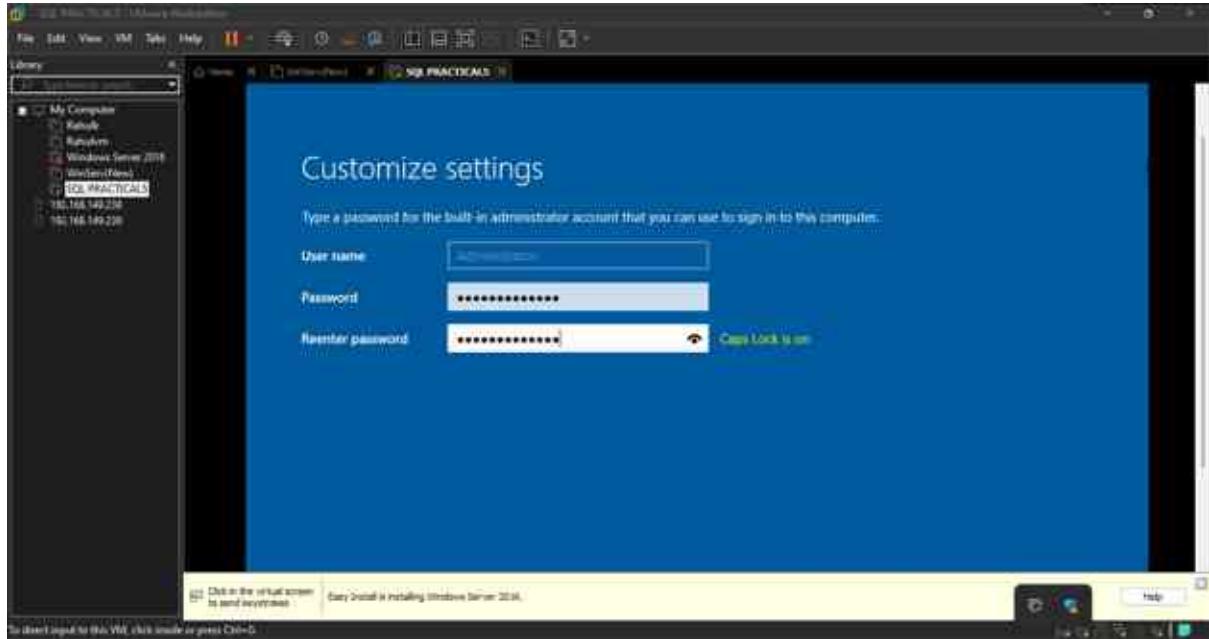
- Keep default settings and Click on Next



- Windows Server will begin installing



- After installation type in a password for the Windows Server and Click Finish

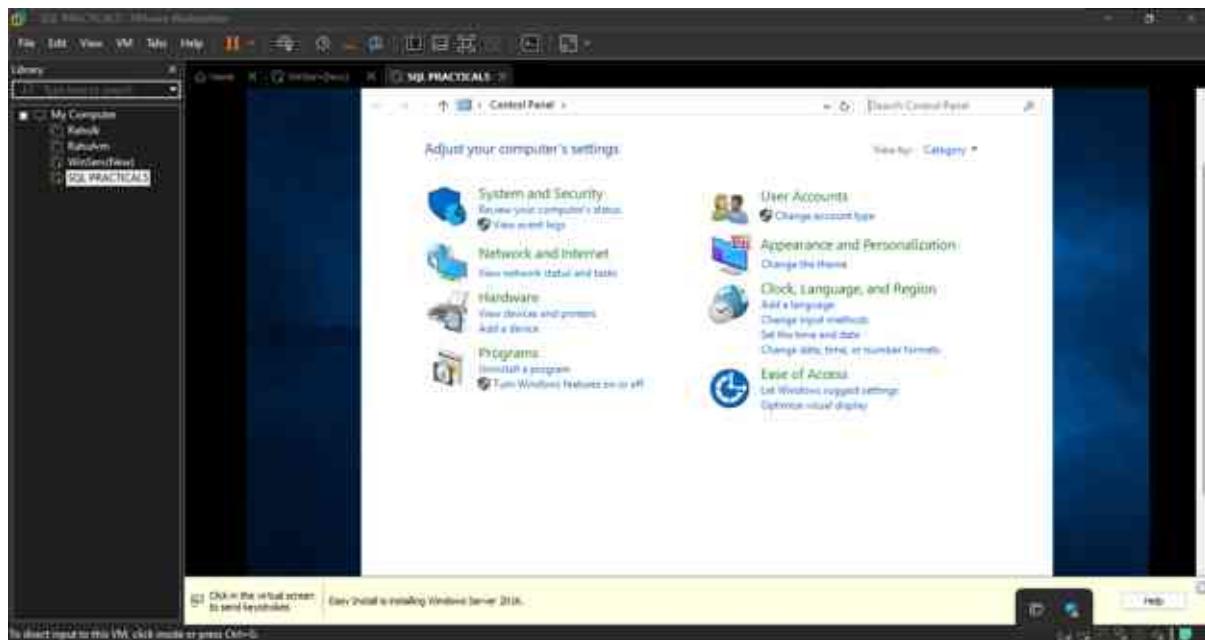


- Your Windows Server has now been successfully created

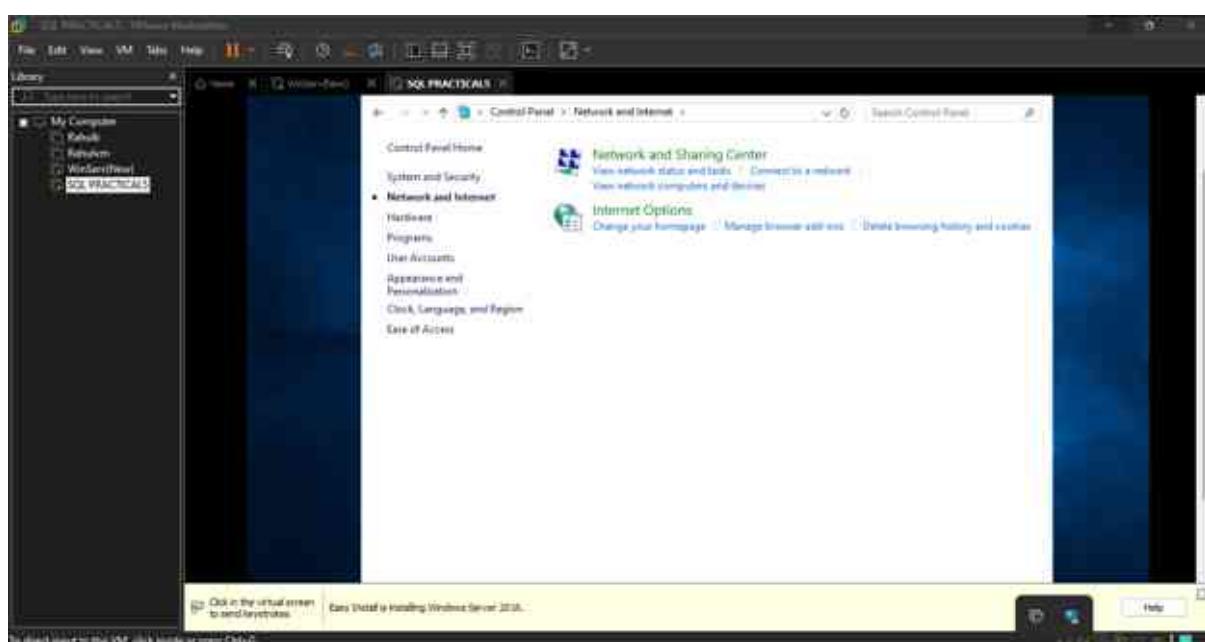


Step 3: Establishing a connection with the User VM and Domain Controller by connecting the User VM to the Domain Controller's Workgroup

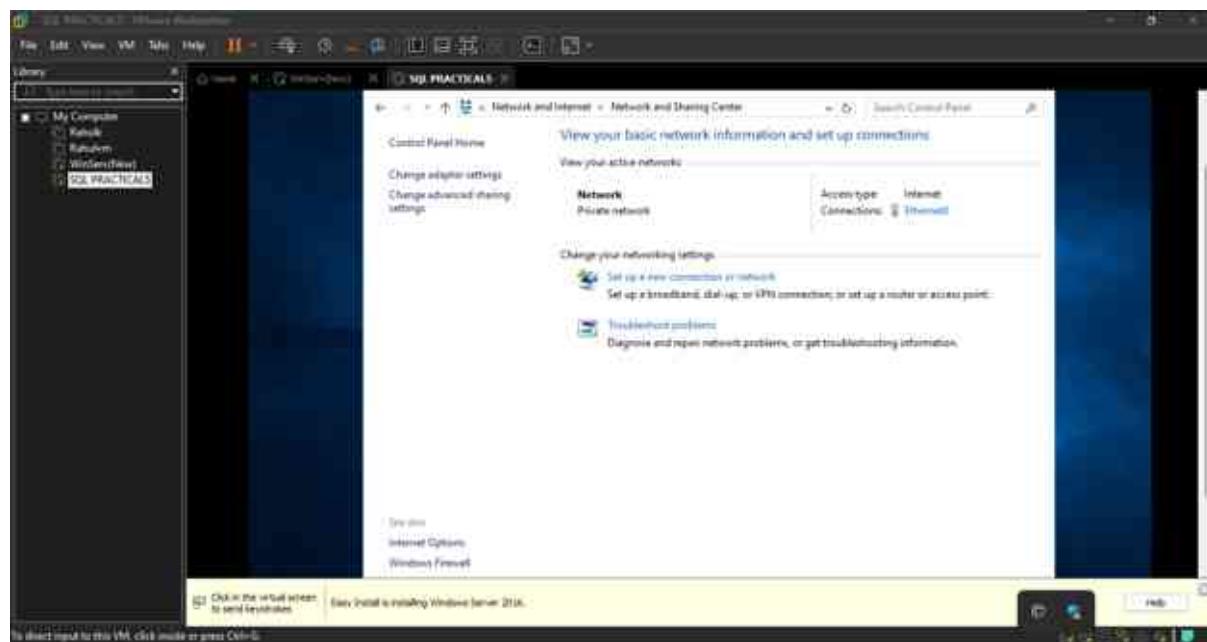
- Open Control Panel and Click on Network and Internet



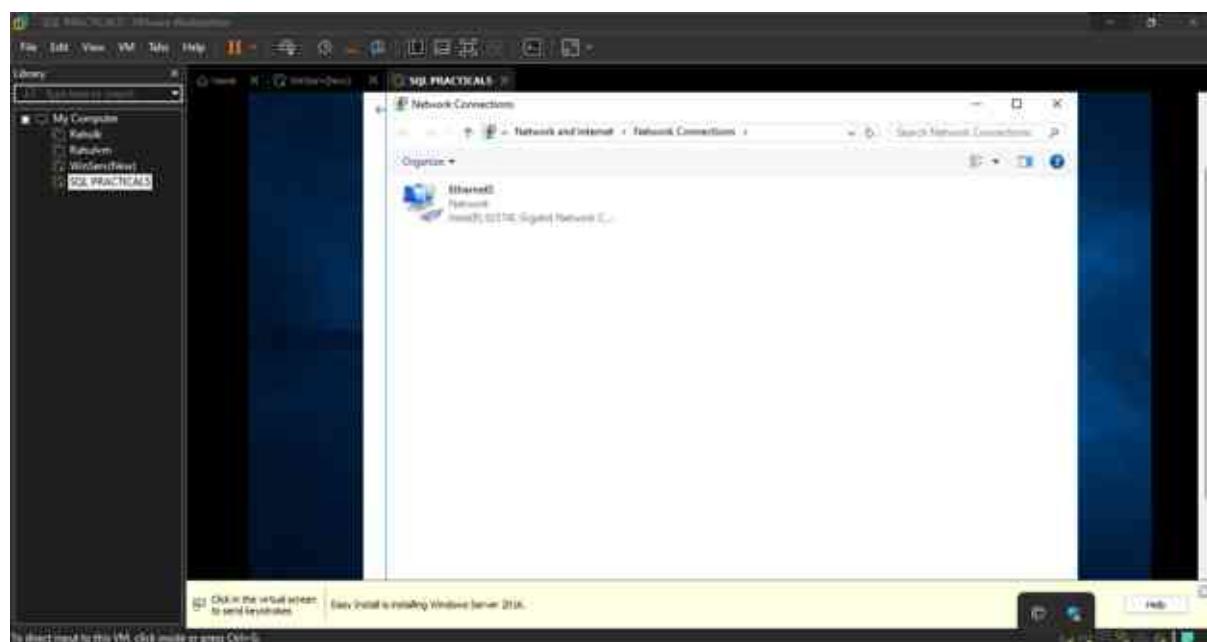
- Click on Network and Sharing Center



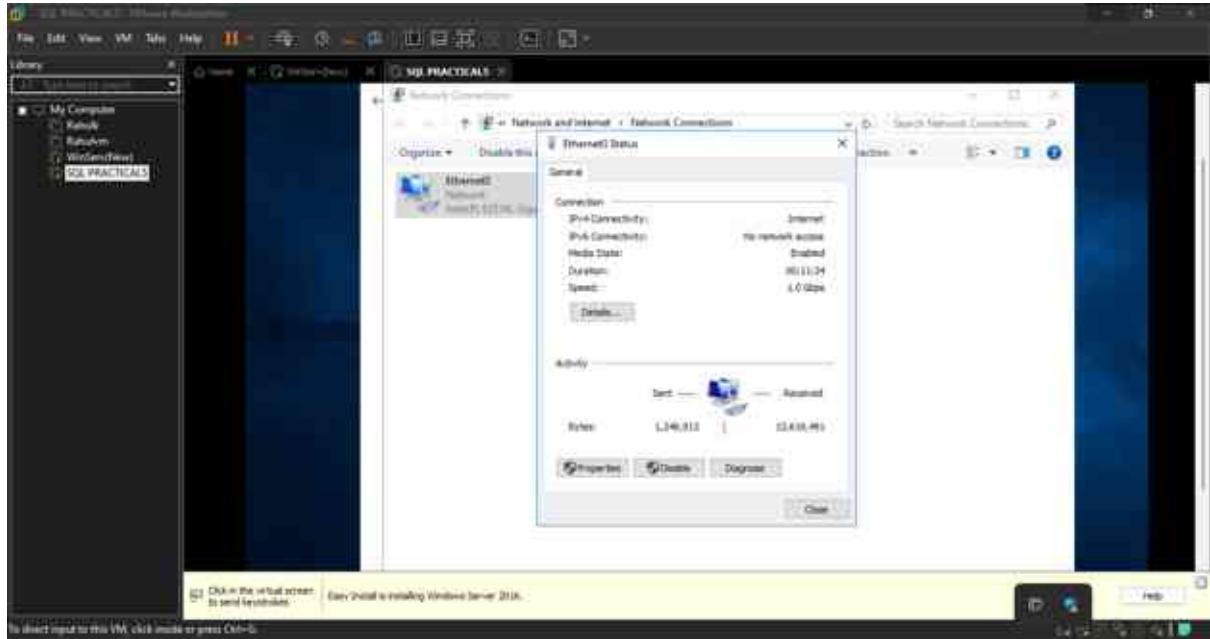
- Click on Change adapter settings



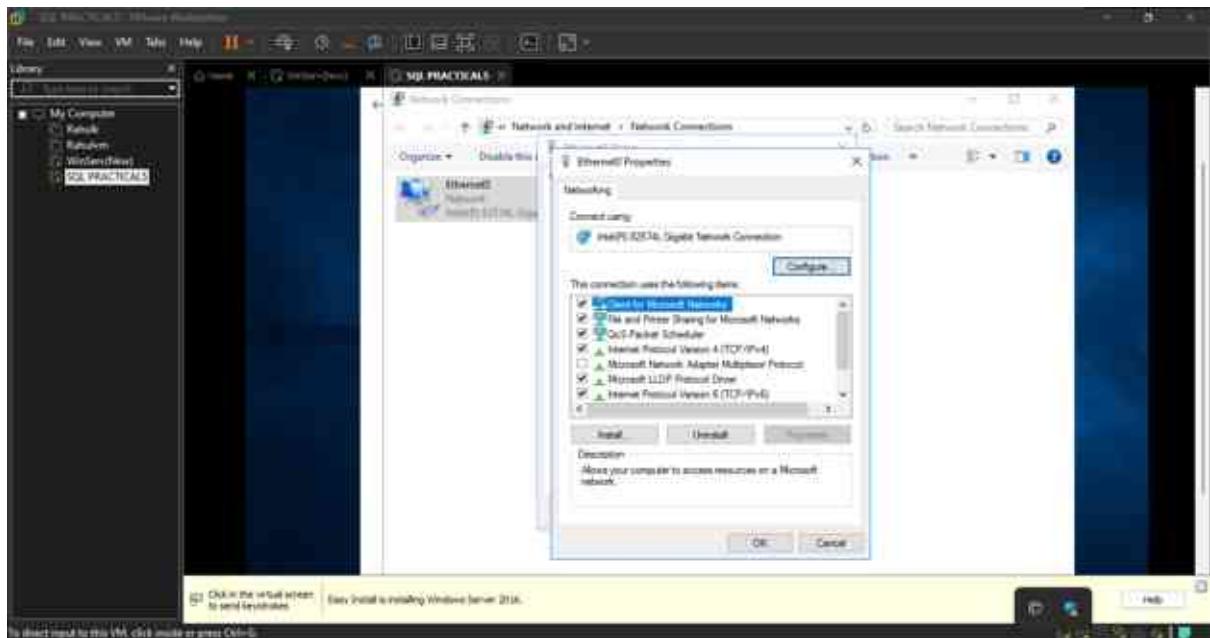
- Right Click on Ethernet0 and Select Properties



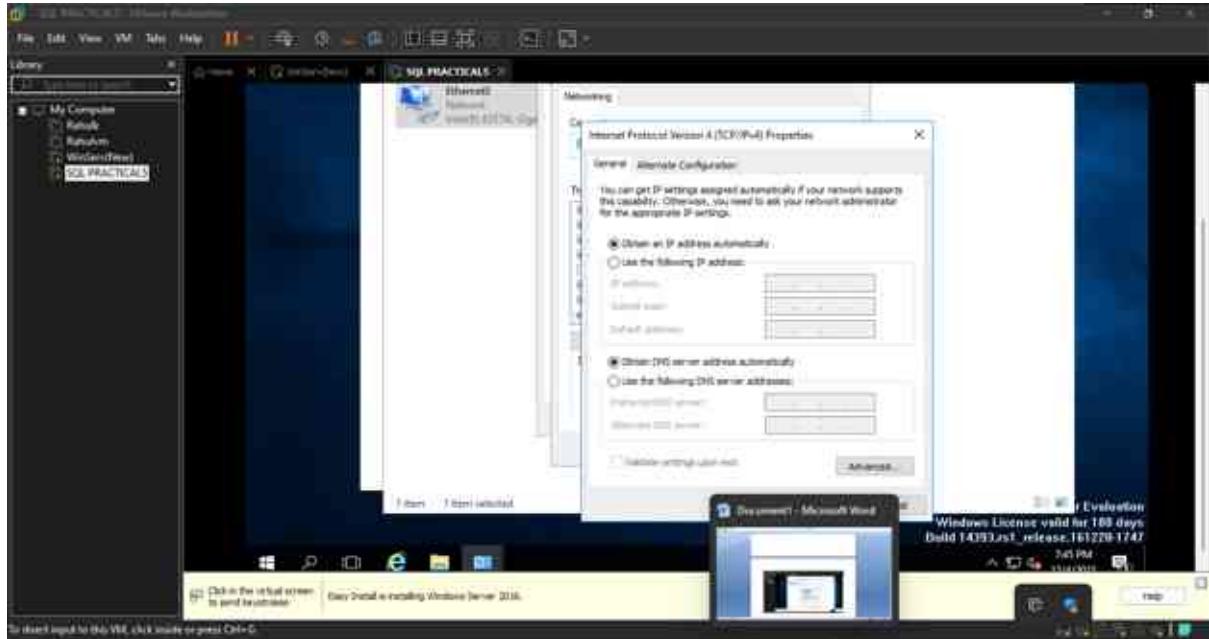
- Within Ethernet0 Status Click on Properties



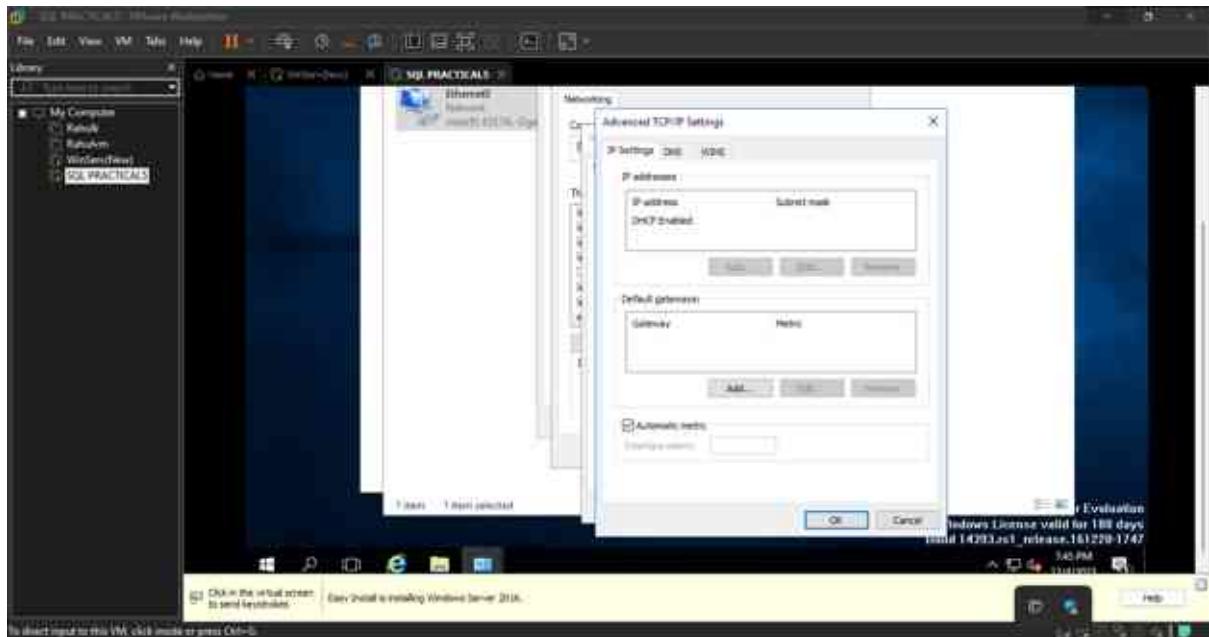
- Click on Internet Protocol Version 4



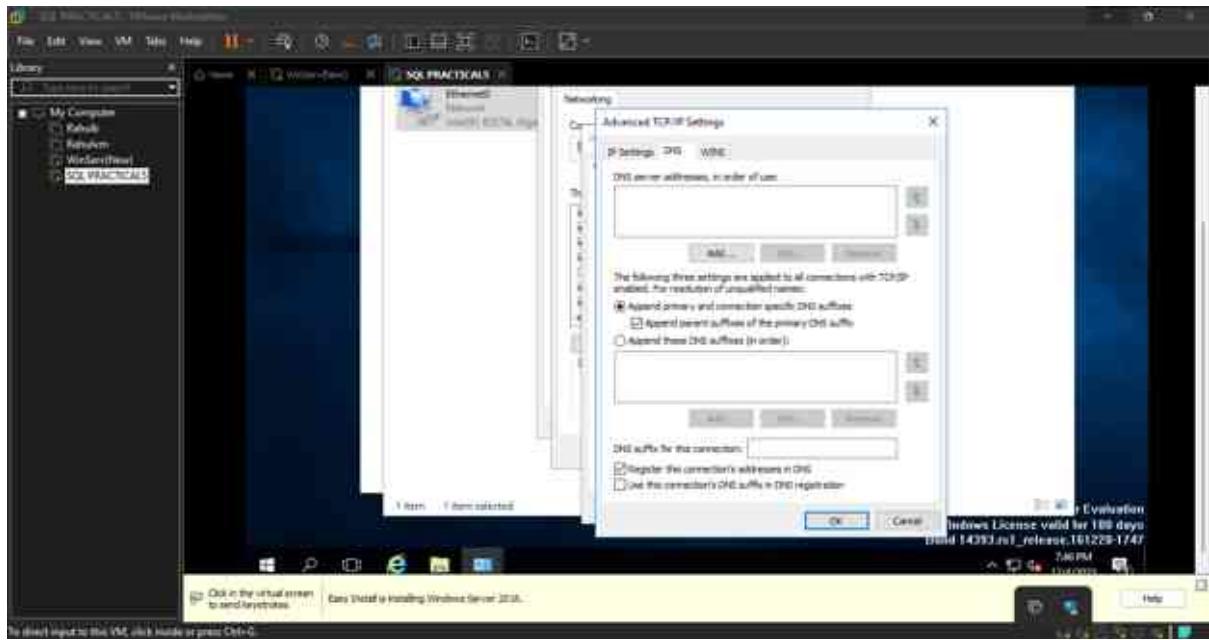
- Click on Advanced



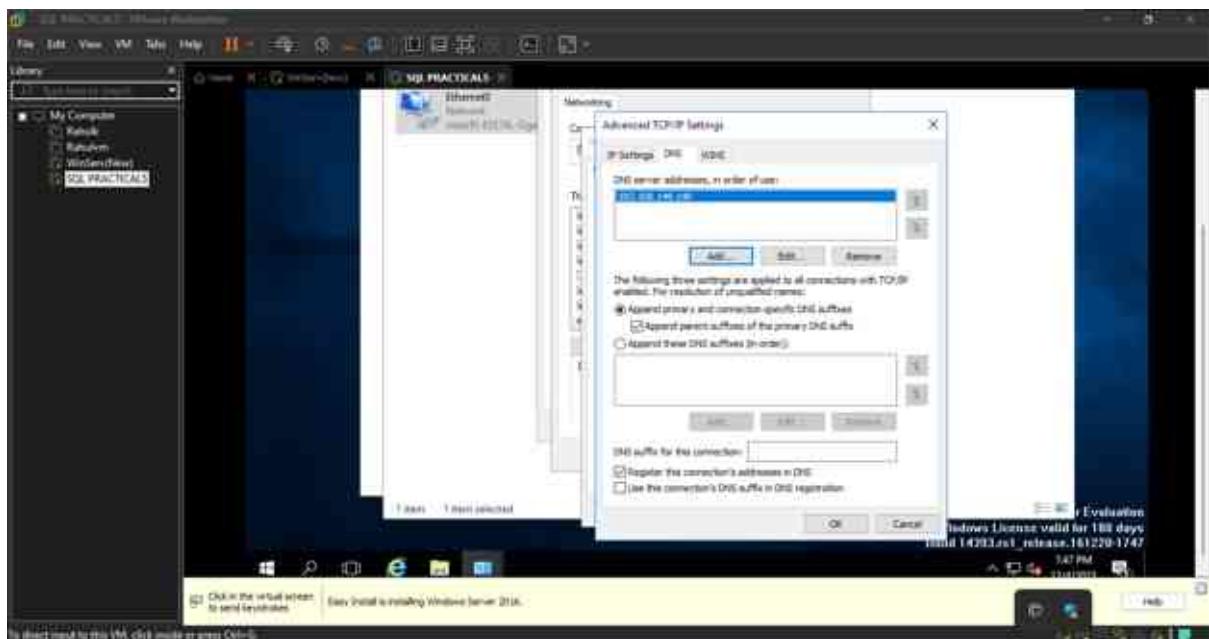
- Click on DNS



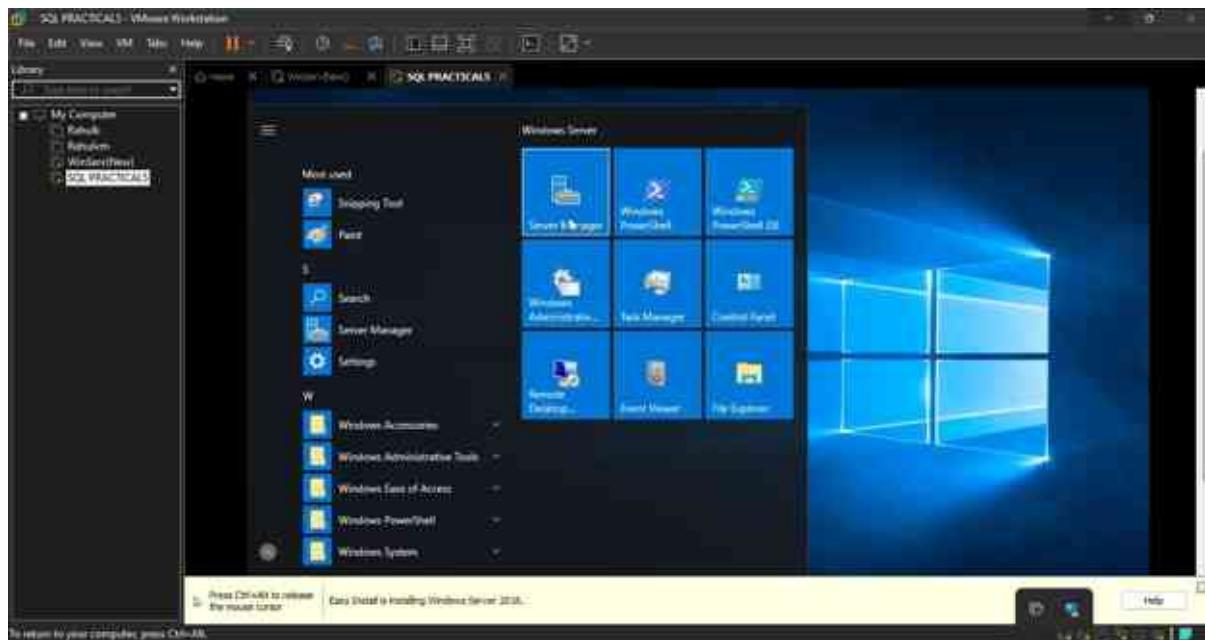
- Click on Add



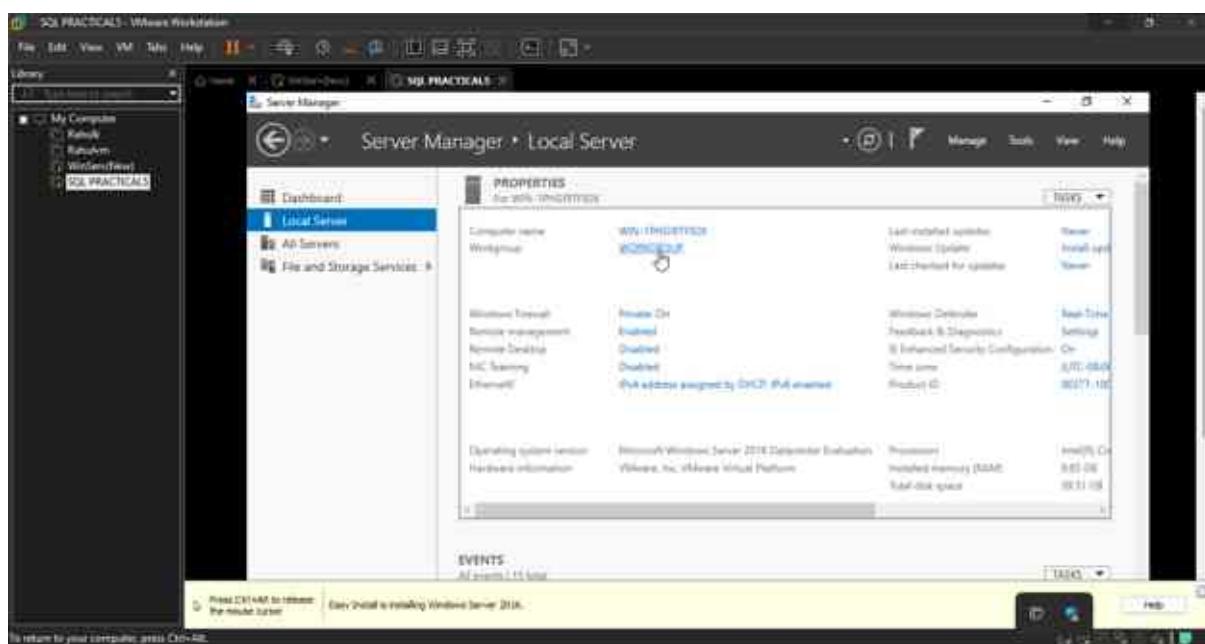
- Add the IP Address of the Domain Controller and Click Ok



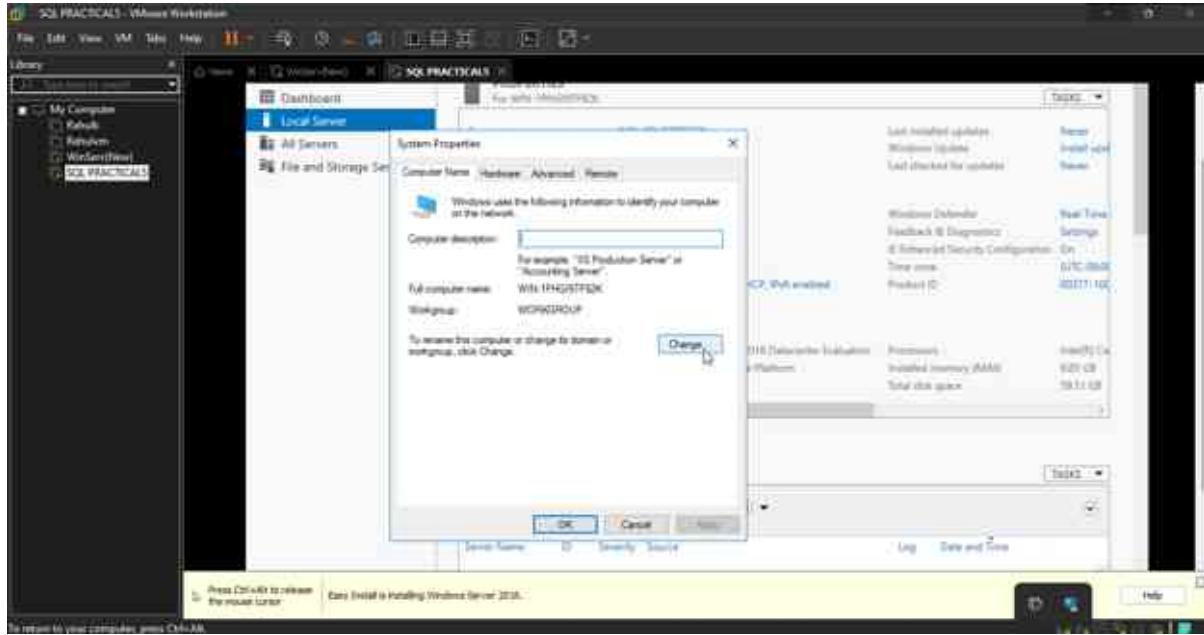
- Now Exit out of **network settings** and **Click on Server Manager**



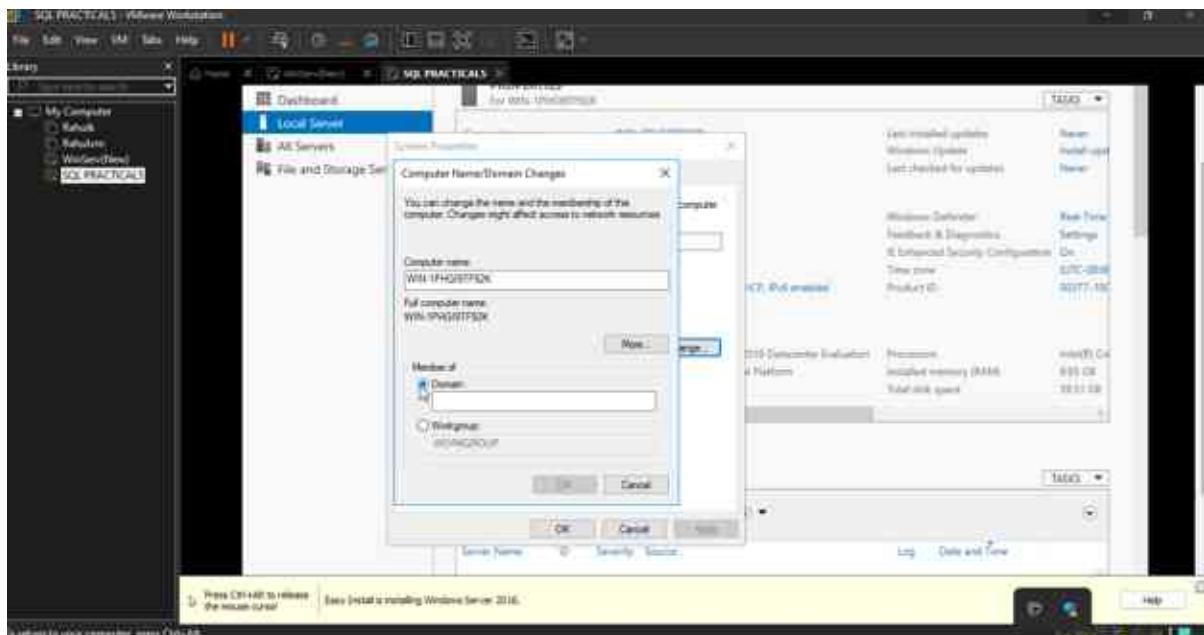
- Within **Server Manger** Click on **Local Server** and **Select Workgroup**



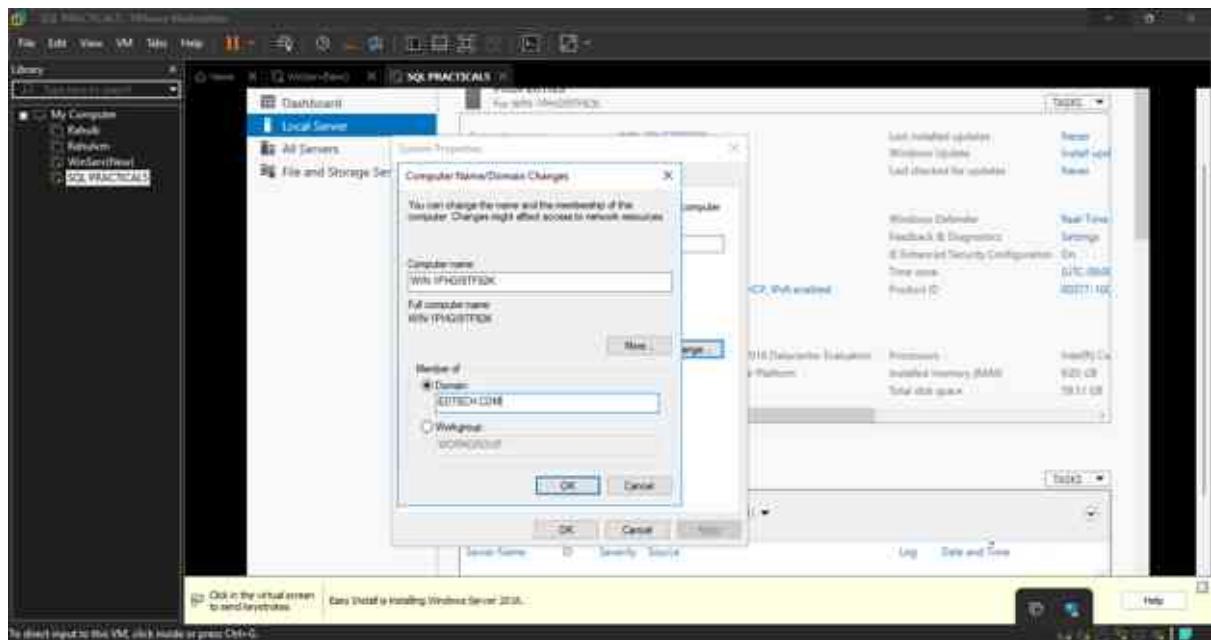
- Click on Change



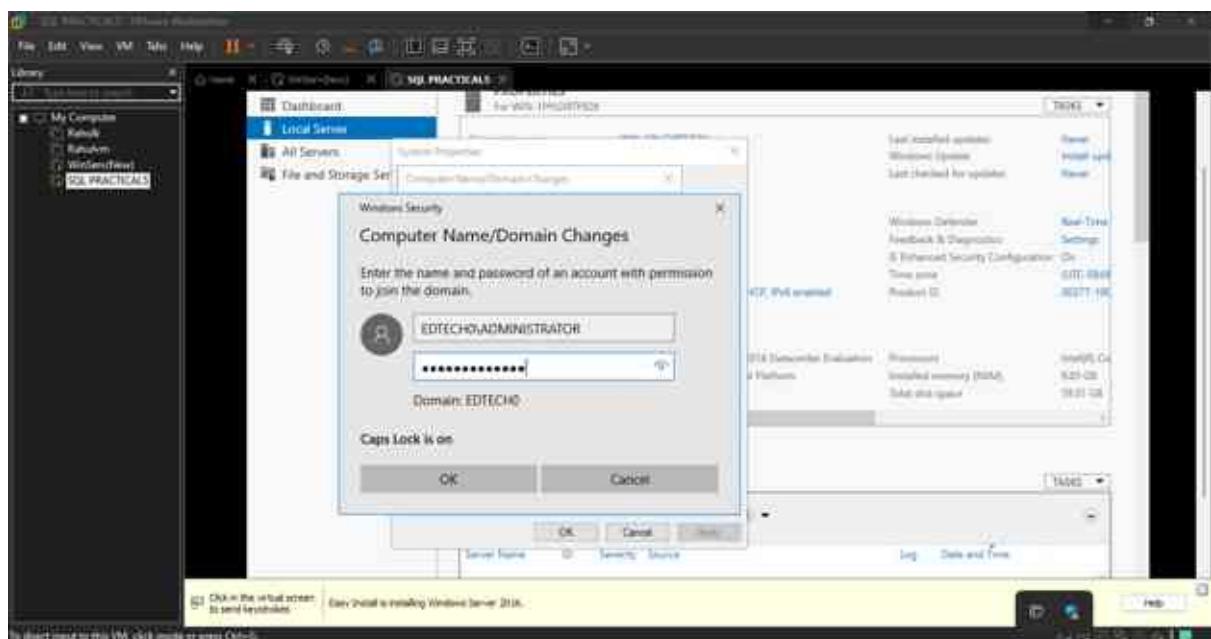
- Click on Domain



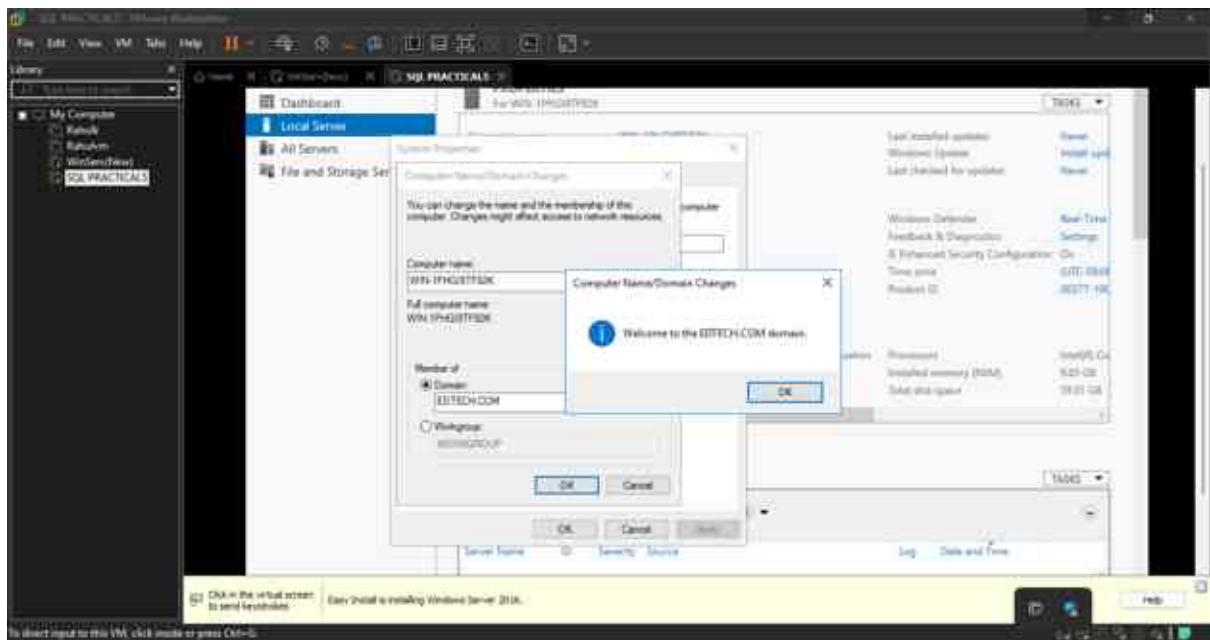
- Type the **Domain name** (here it is EDTECH.COM) and **Click Ok**



- Enter the credentials of the Domain Controller and Click on Ok**

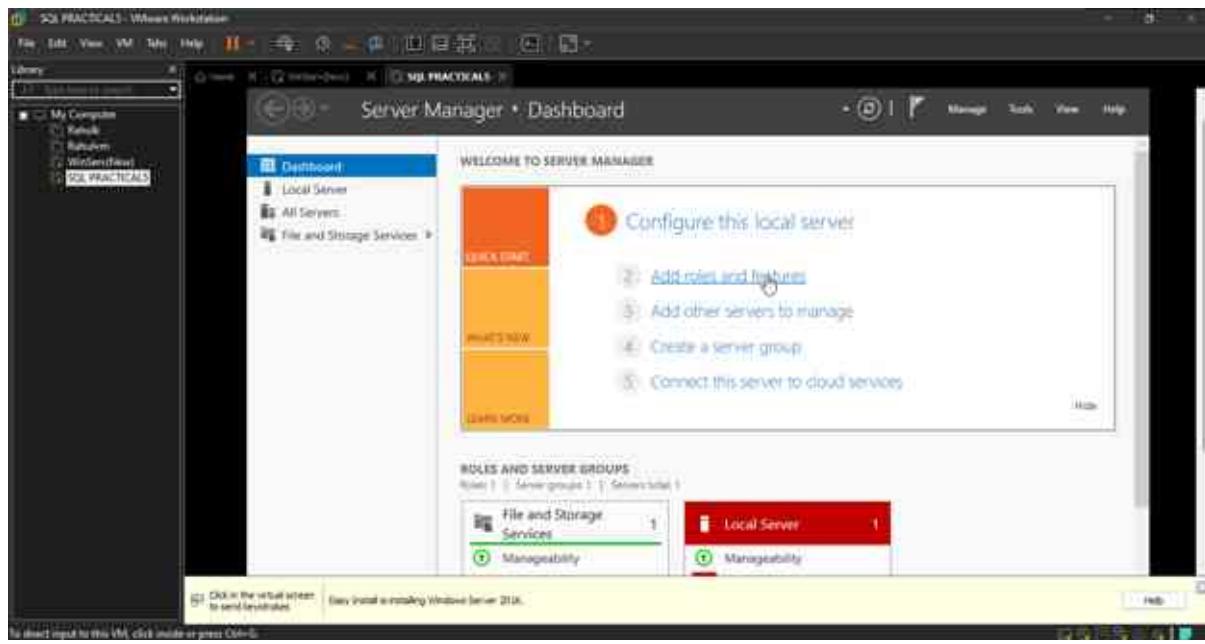


- The User VM is now in the same Domain as the Domain Controller and the system will require a restart for the changes to take effect

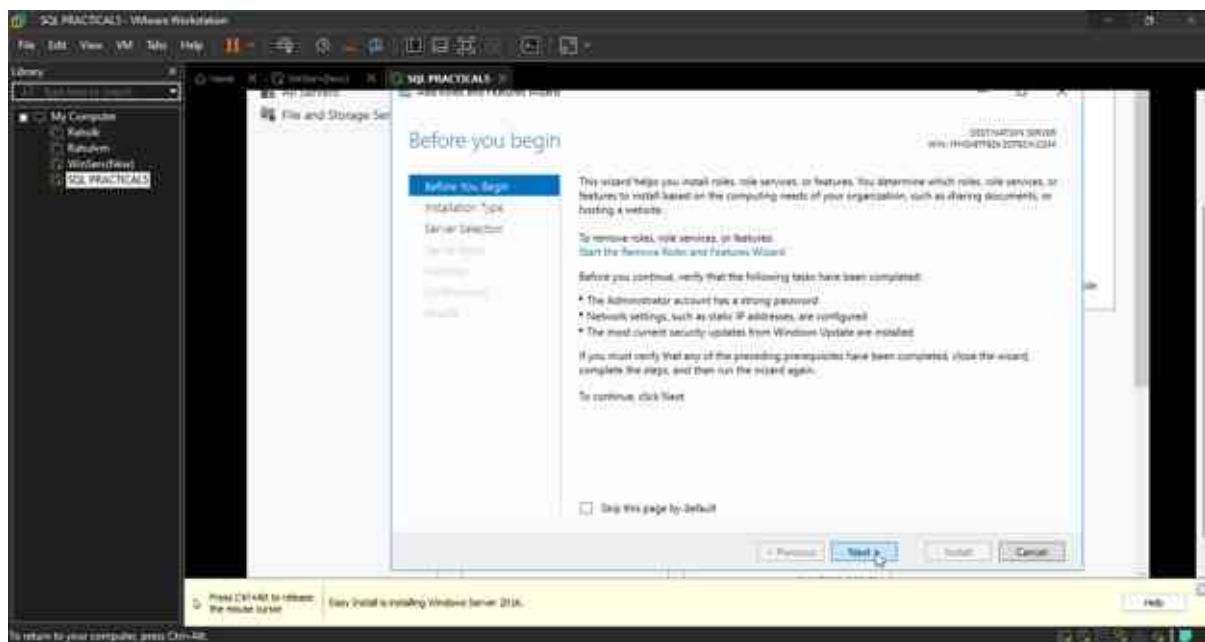


Step 4: Creation of User (SCDPM)

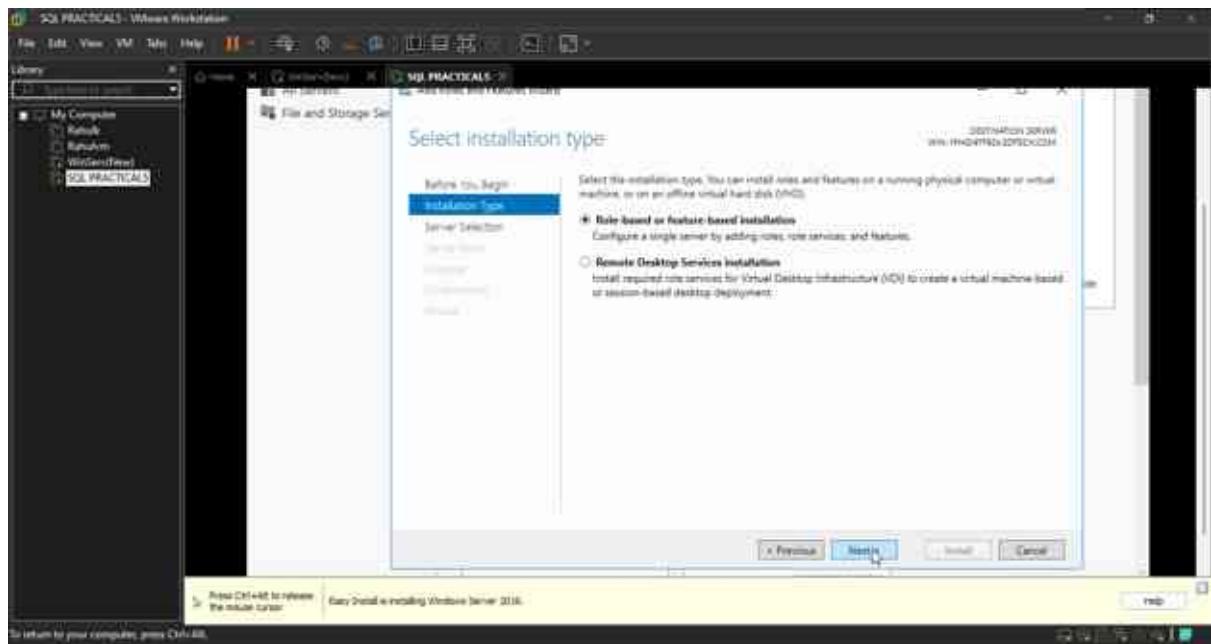
- To create a **User** first we require the **Active Directory Domain Service** which can be added through the **Server Manager**
- Open Server Manager and Click on Add Roles and Features**



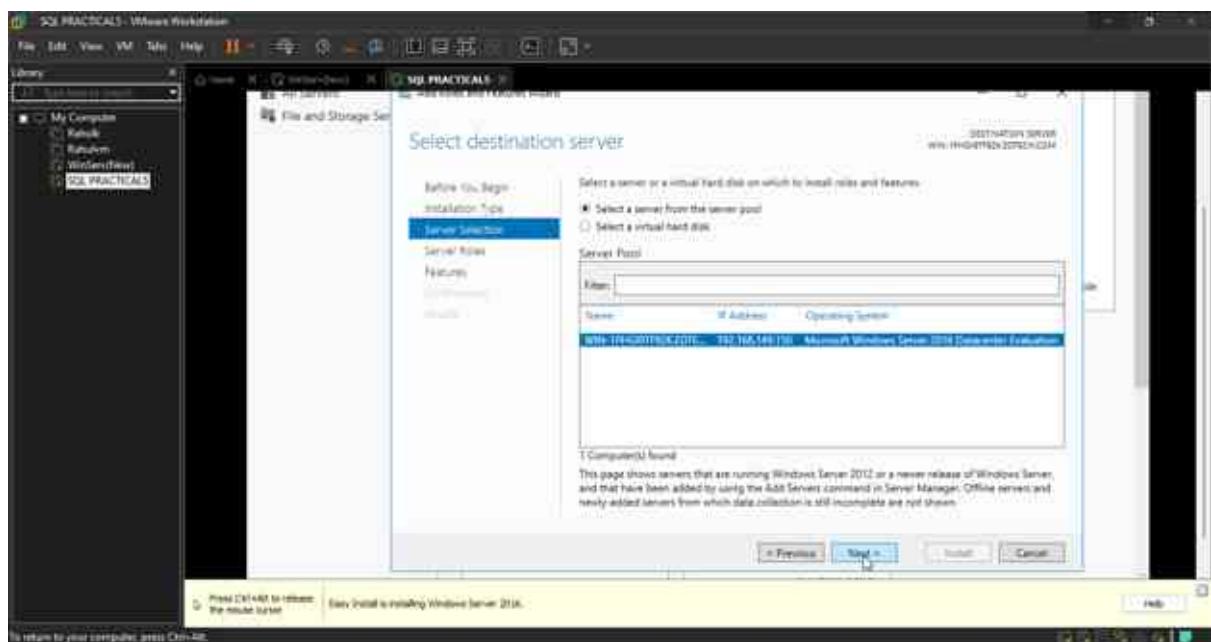
- Click on Next



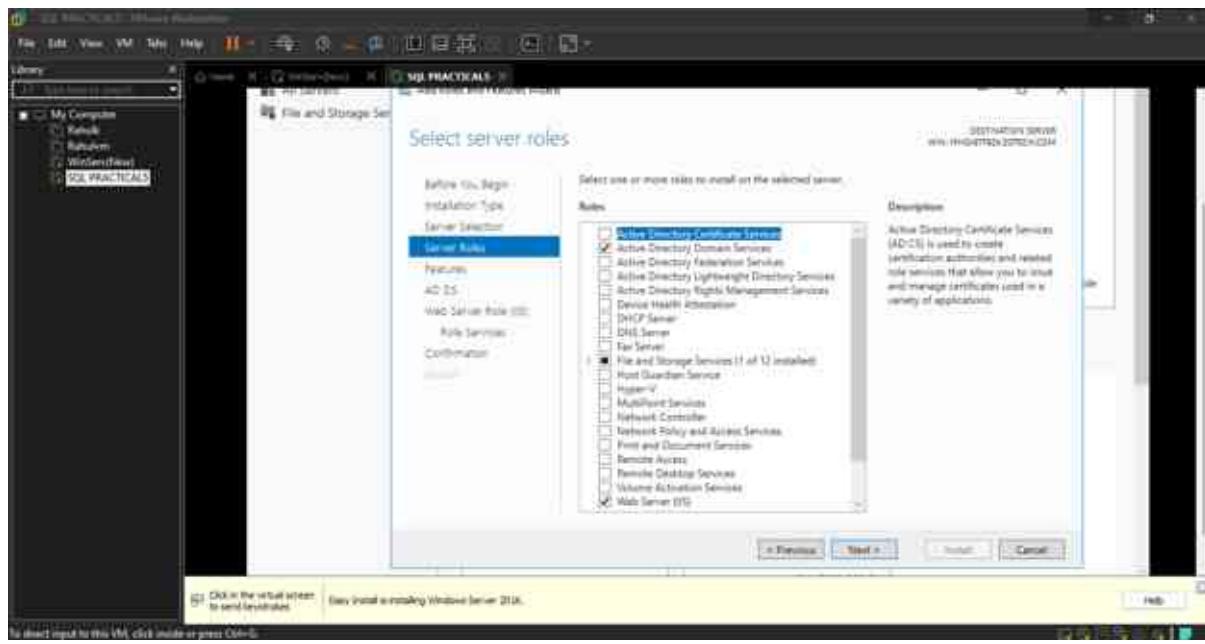
- Select Role-based or Feature-based installation and Click Next



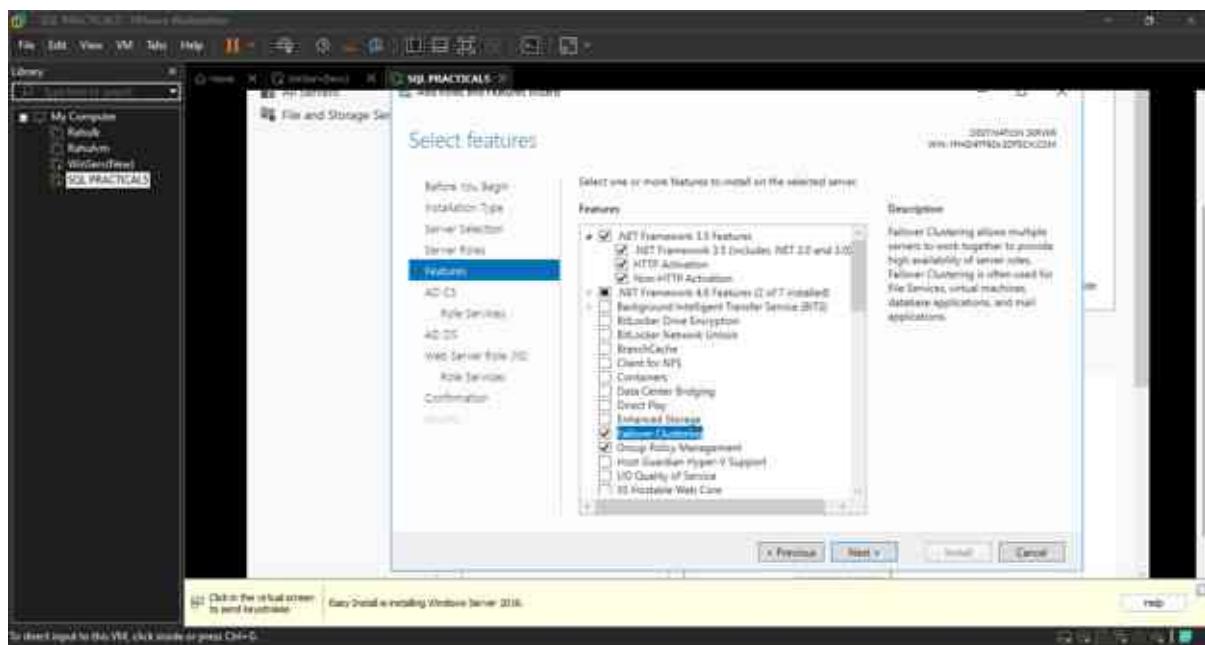
- Keep default settings and Click on Next



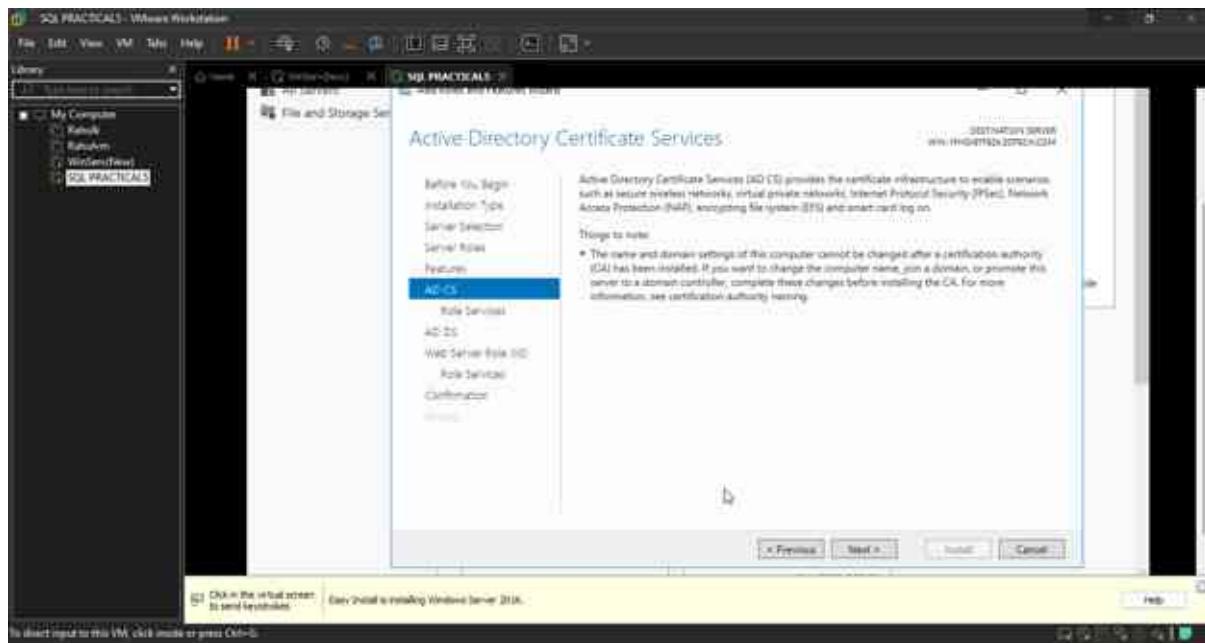
- Select Active Directory Domain Service and Click on Add Feature and Click on Next



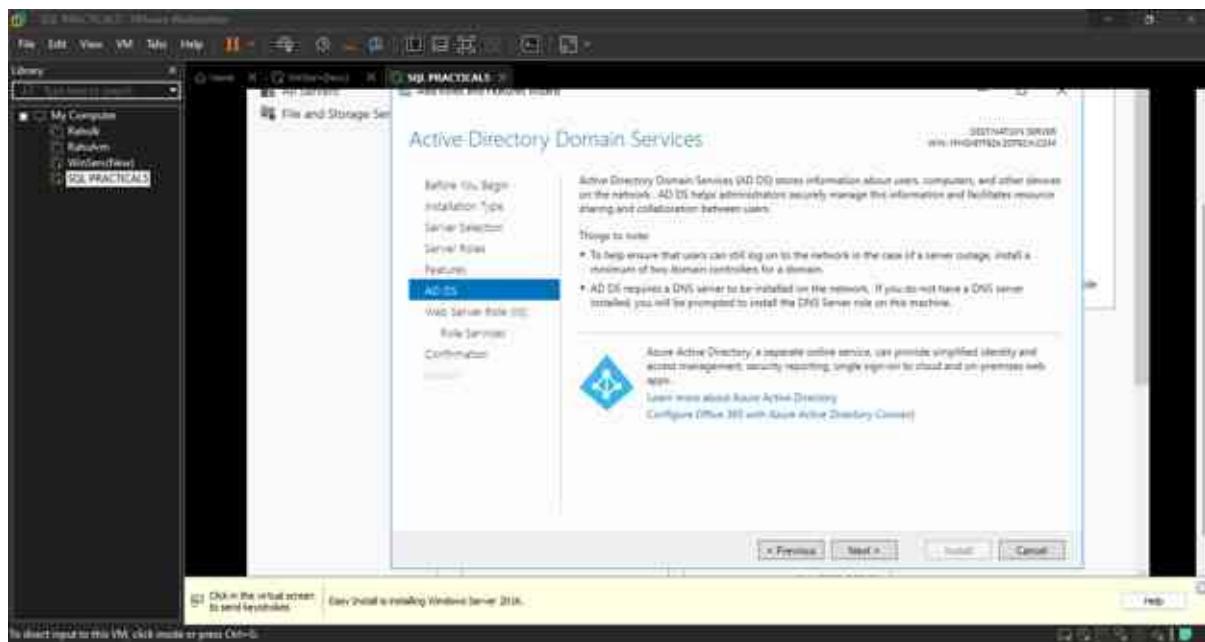
- Select the following feature and Click on Next



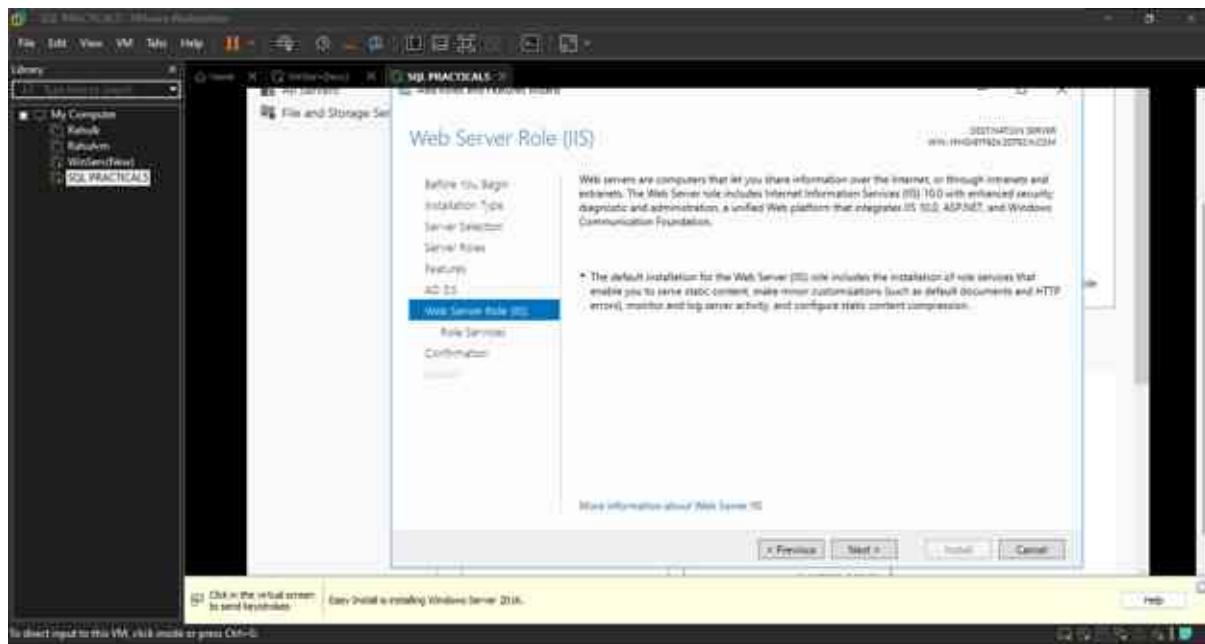
- Click on Next



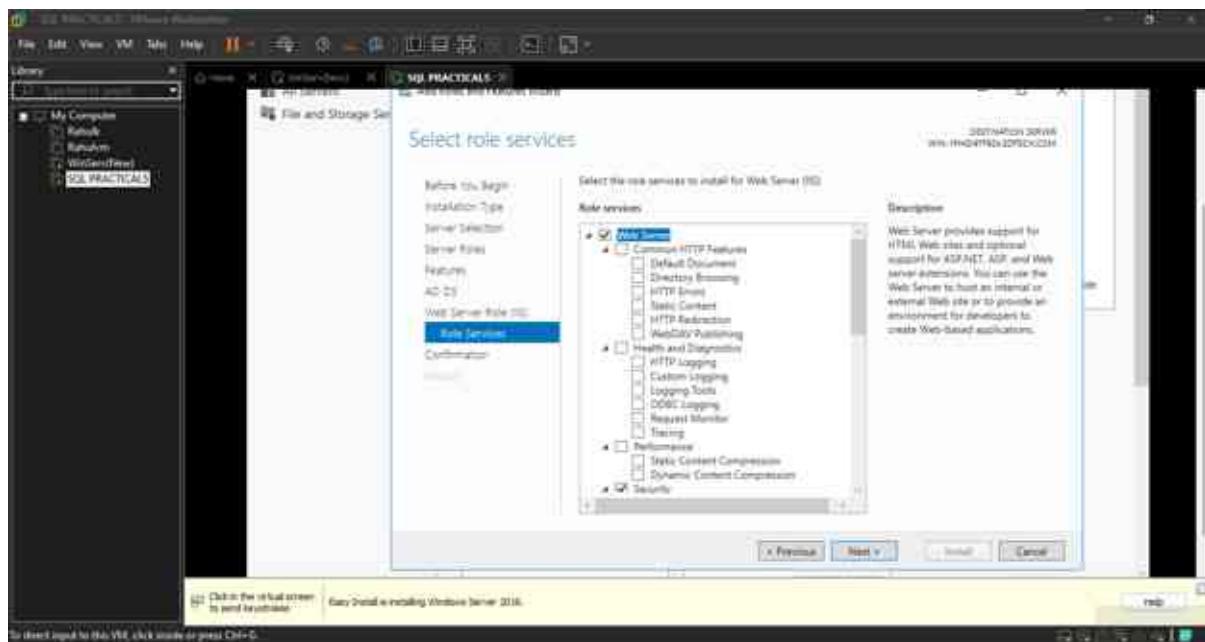
- Click on Next



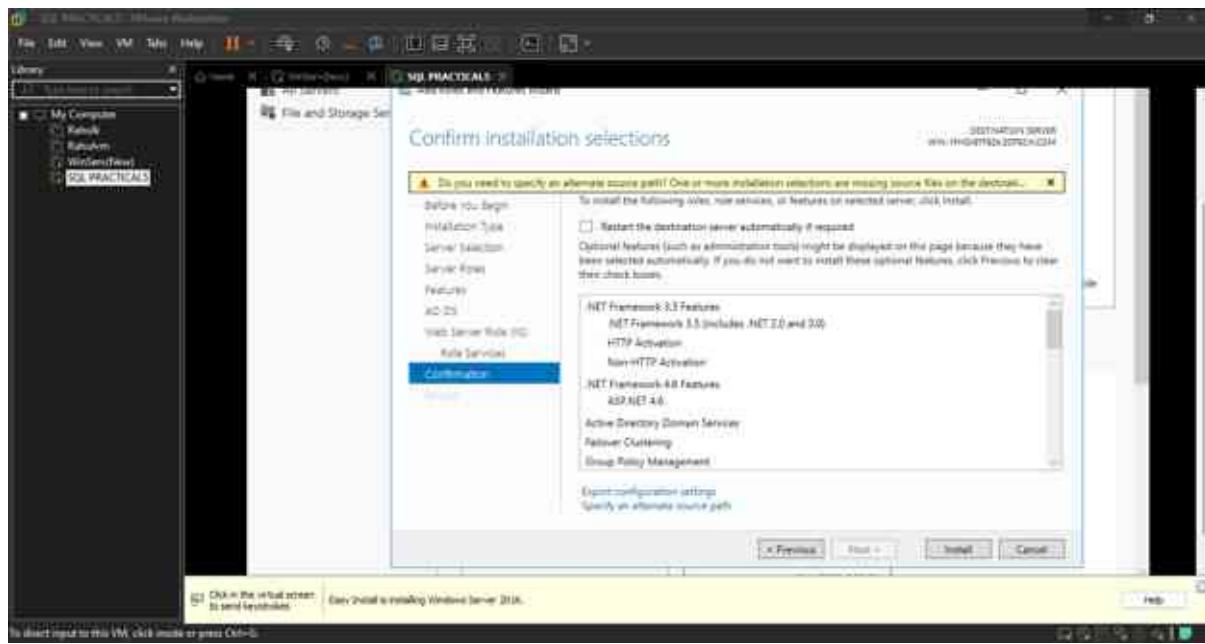
- Click on Next



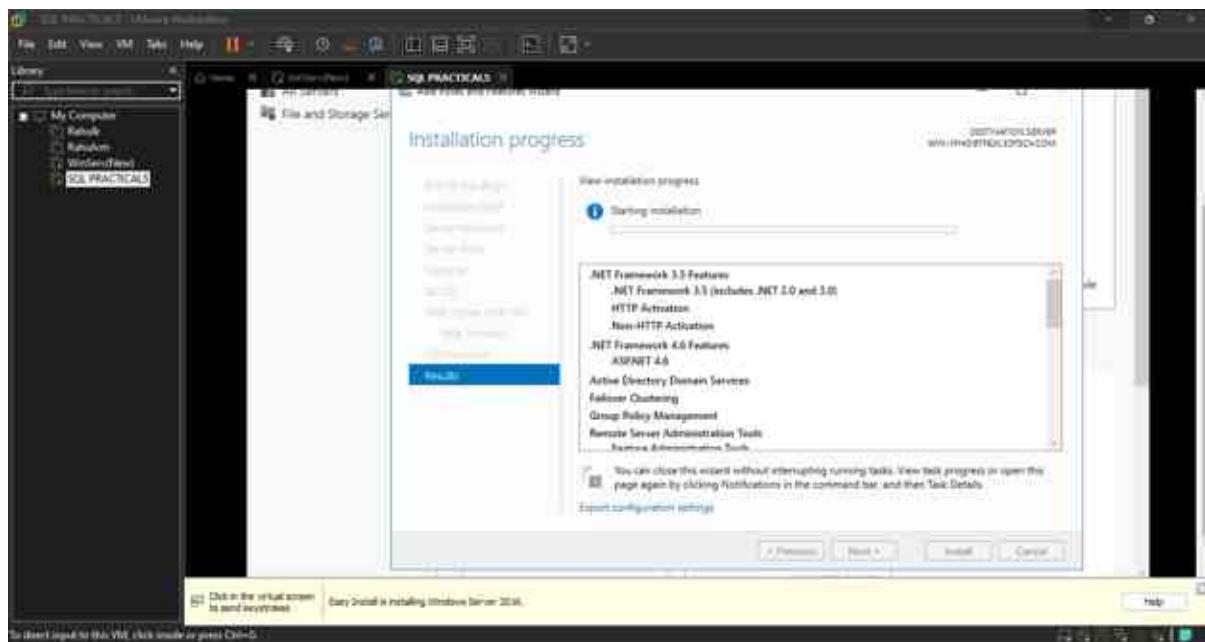
- Click on Next



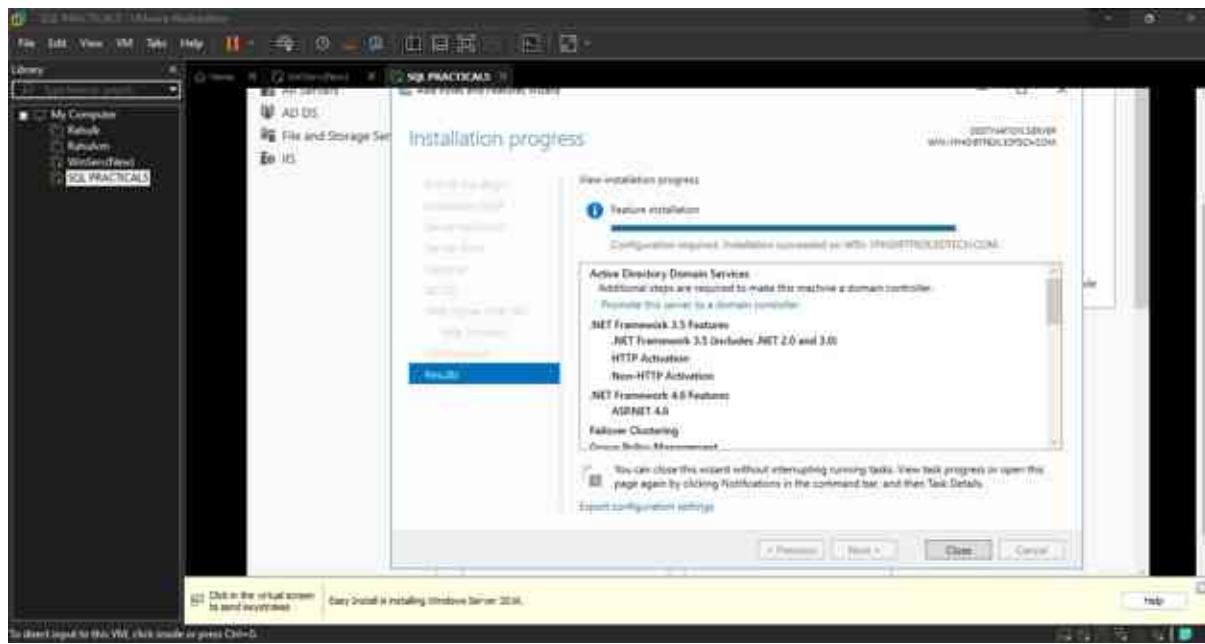
- Click on Install



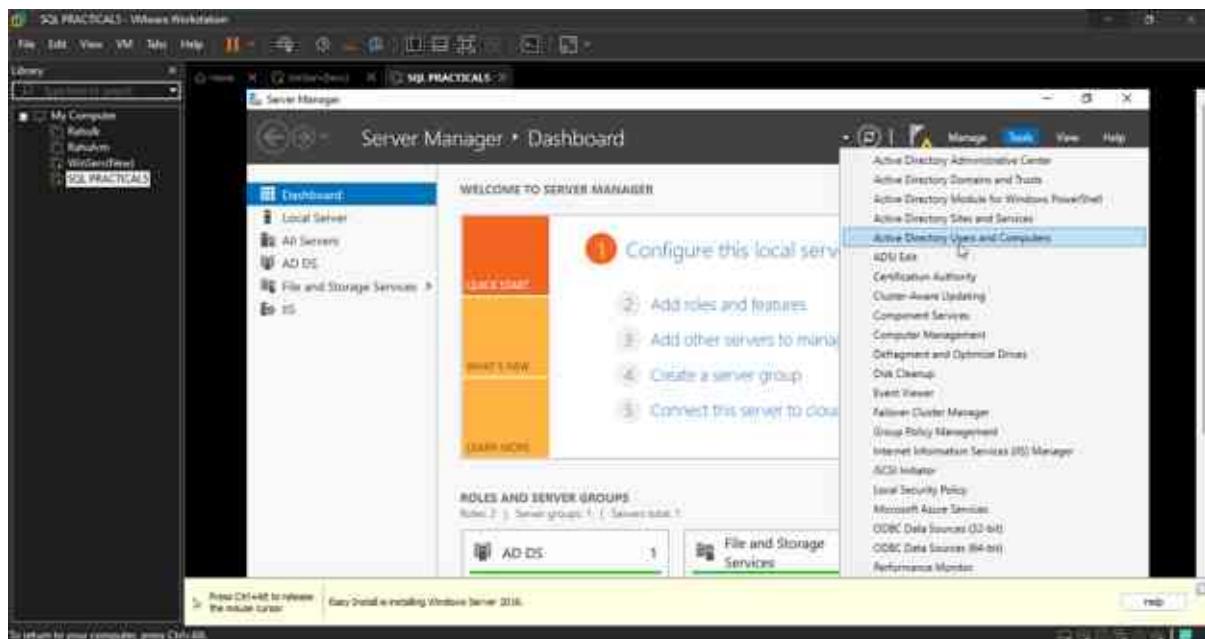
- **Installation Process Start**



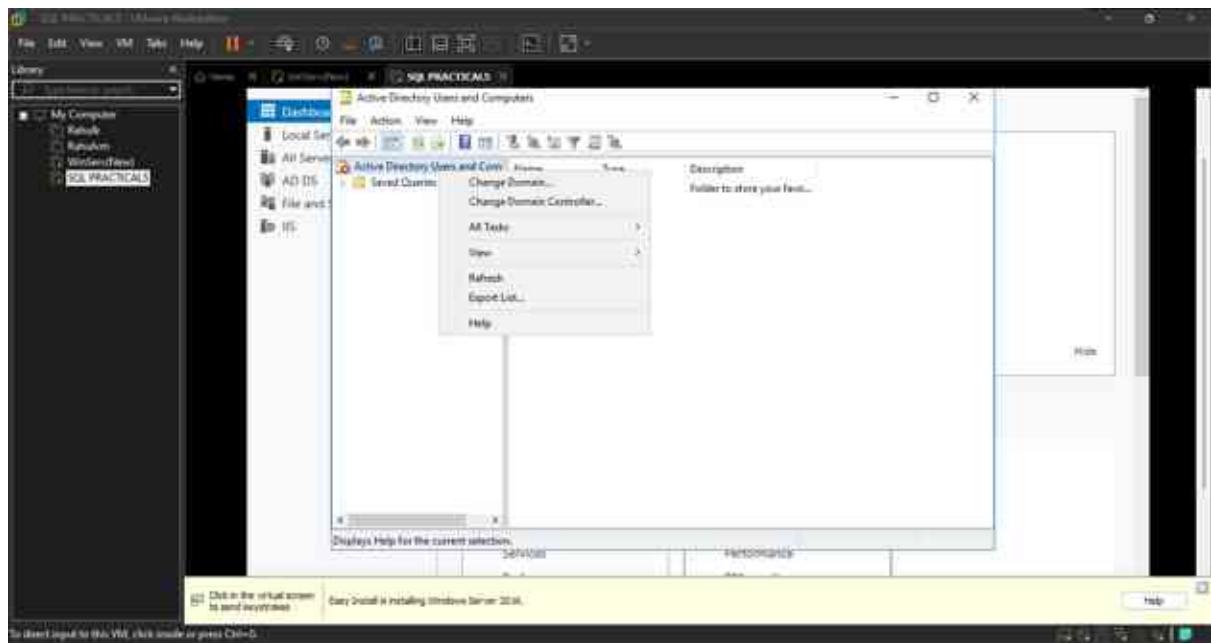
- **After Installation Click on Close**



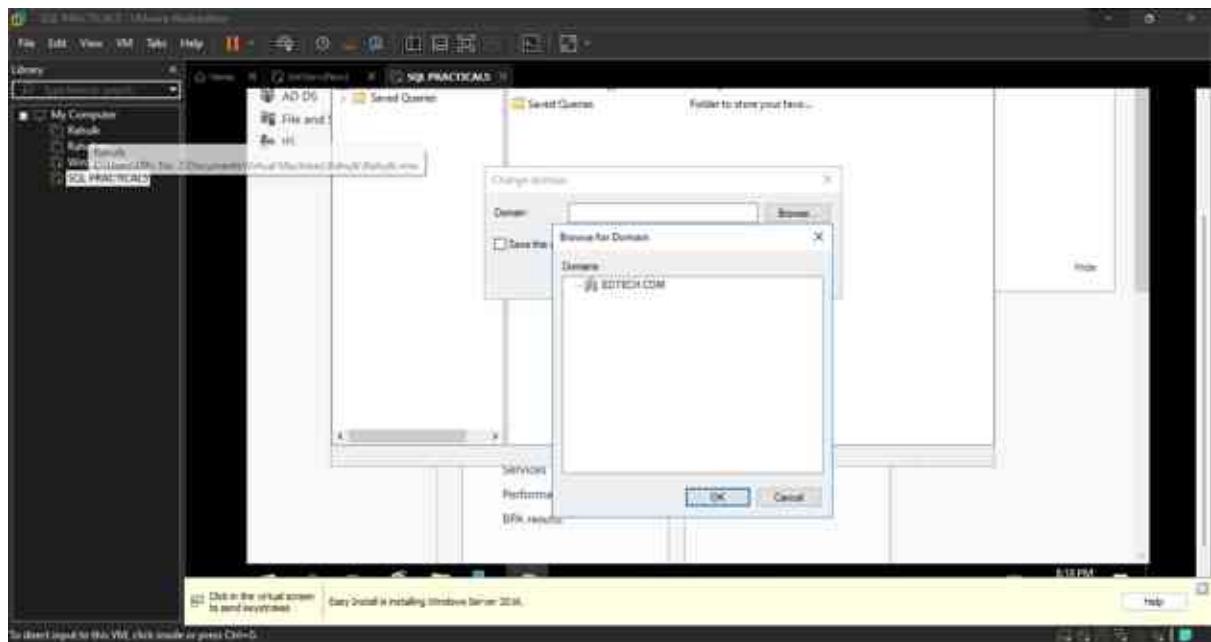
- After installation, within **Server Manager** Click on Tools and Select **Active Directory User and Computers**



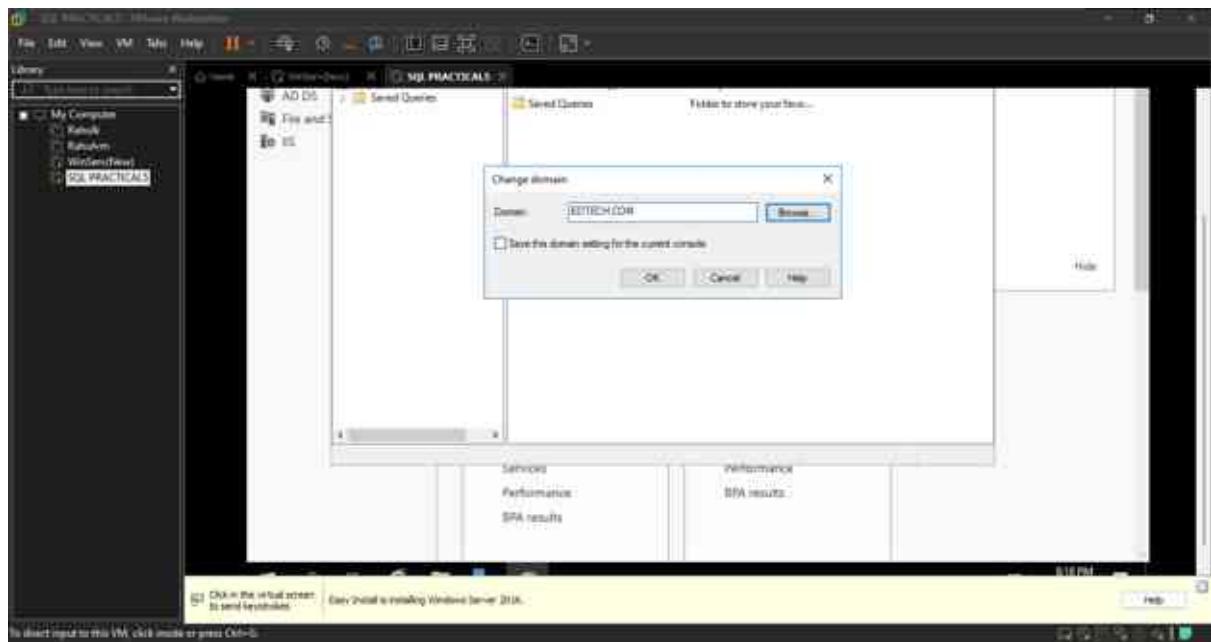
- Within **Active Directory Users and Computers**, Click on Action and Select **Change Domain**



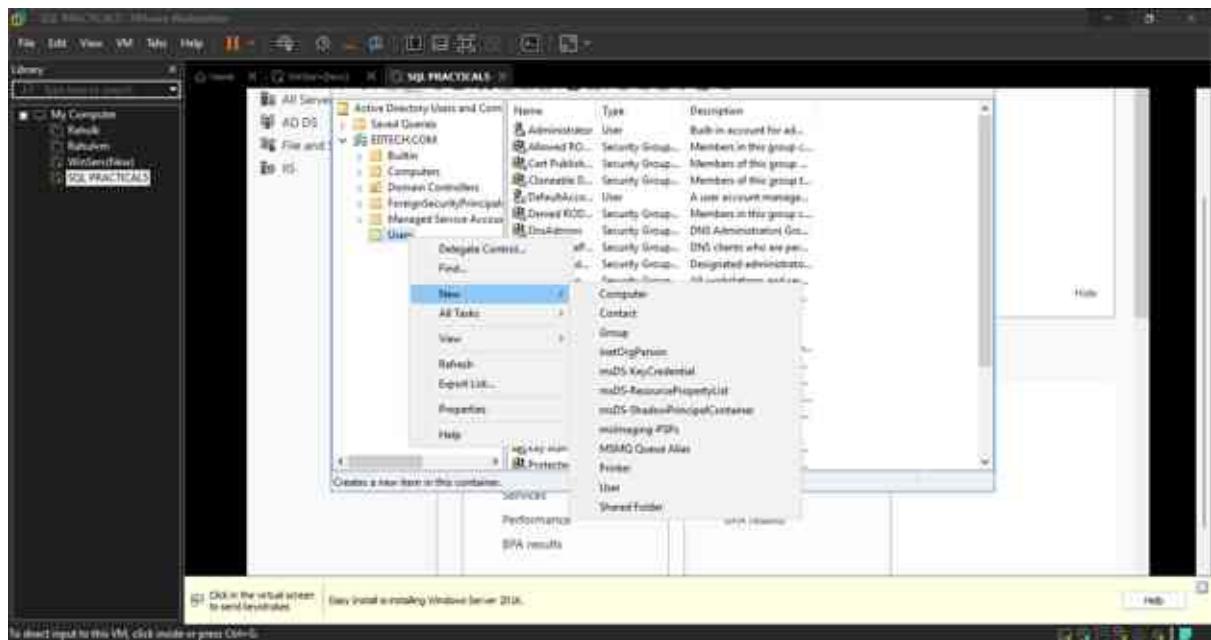
- Click on Browse and Select the Domain Controller (Here it is EDTECH.COM) and Click Ok



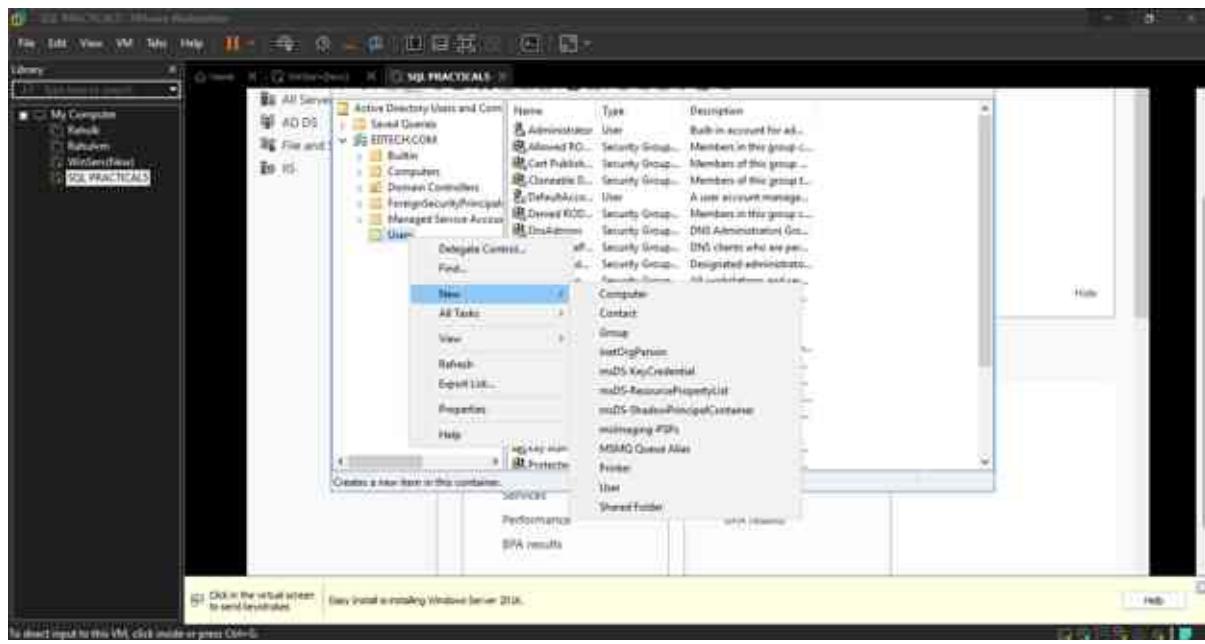
- Click on OK



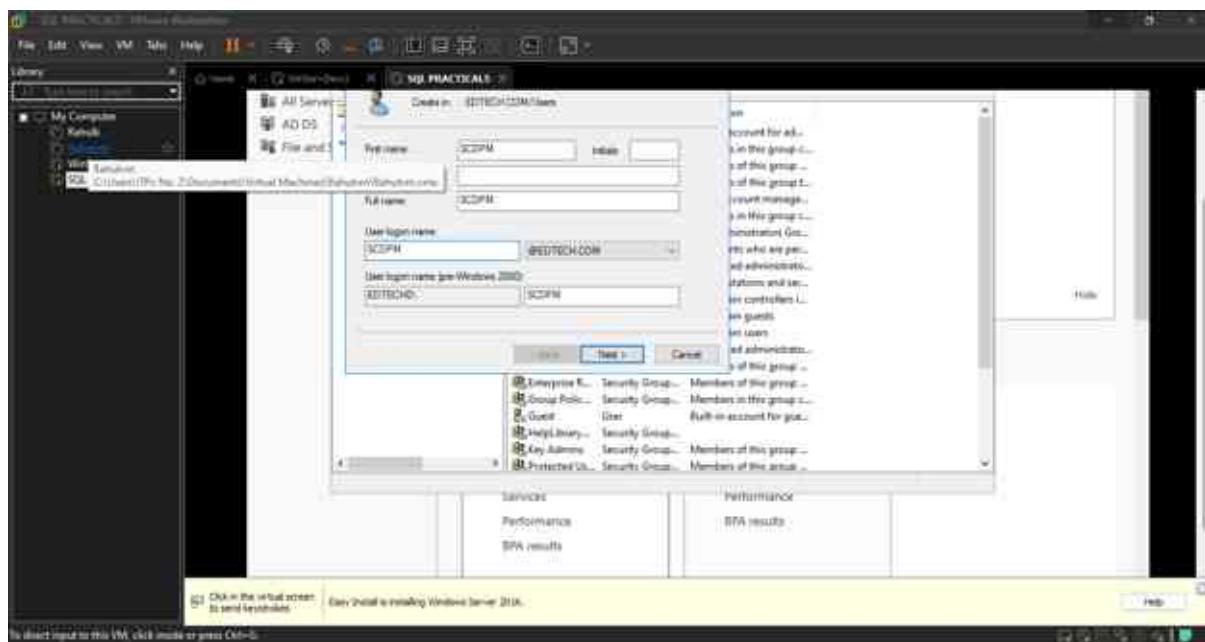
- Now the **Domain Controller** will be added, **Click on the Domain Controller** and **Click on Users**



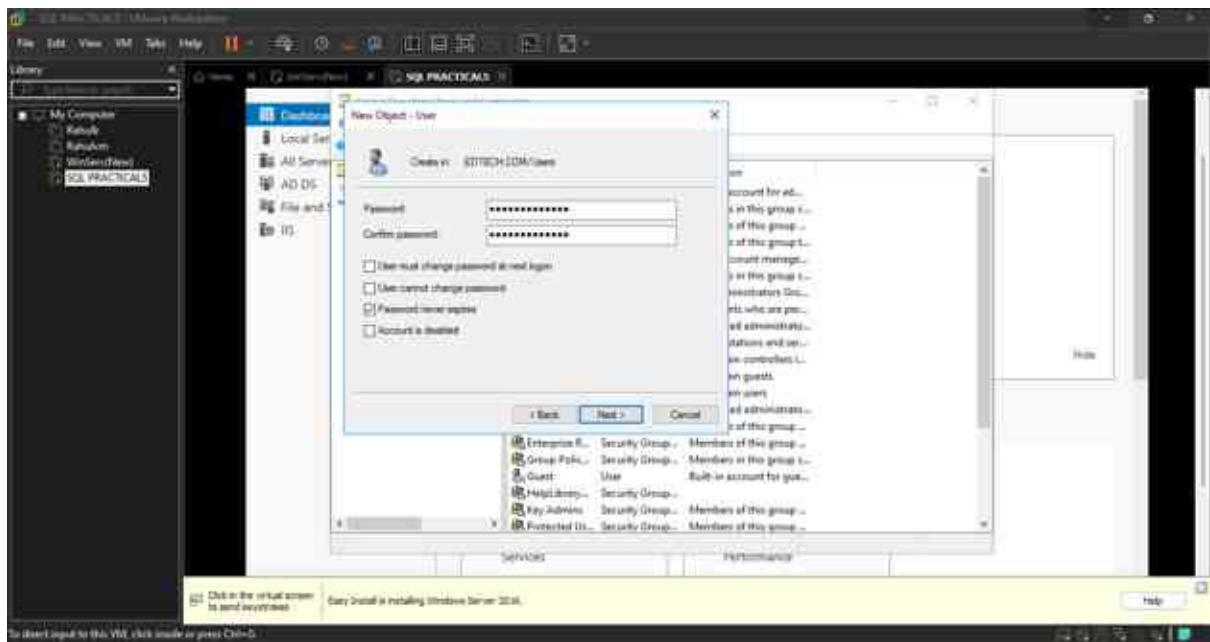
- Right **Click on Users** and **Click New and User**



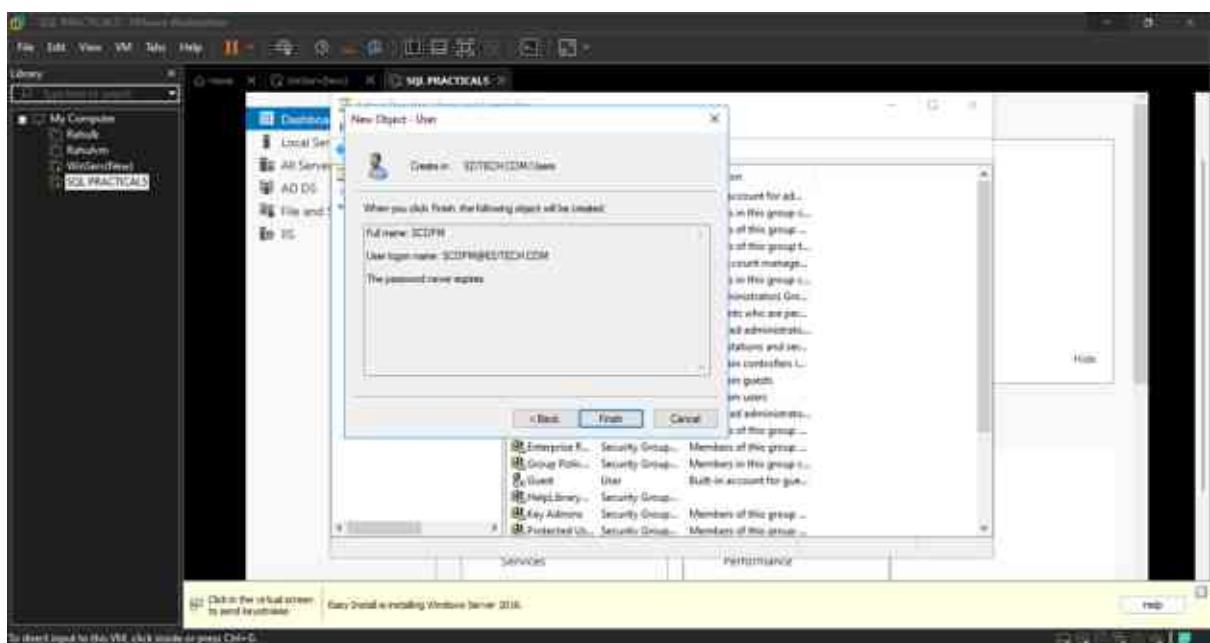
- Type in a new User name (here it is SCDPM) and Click Next



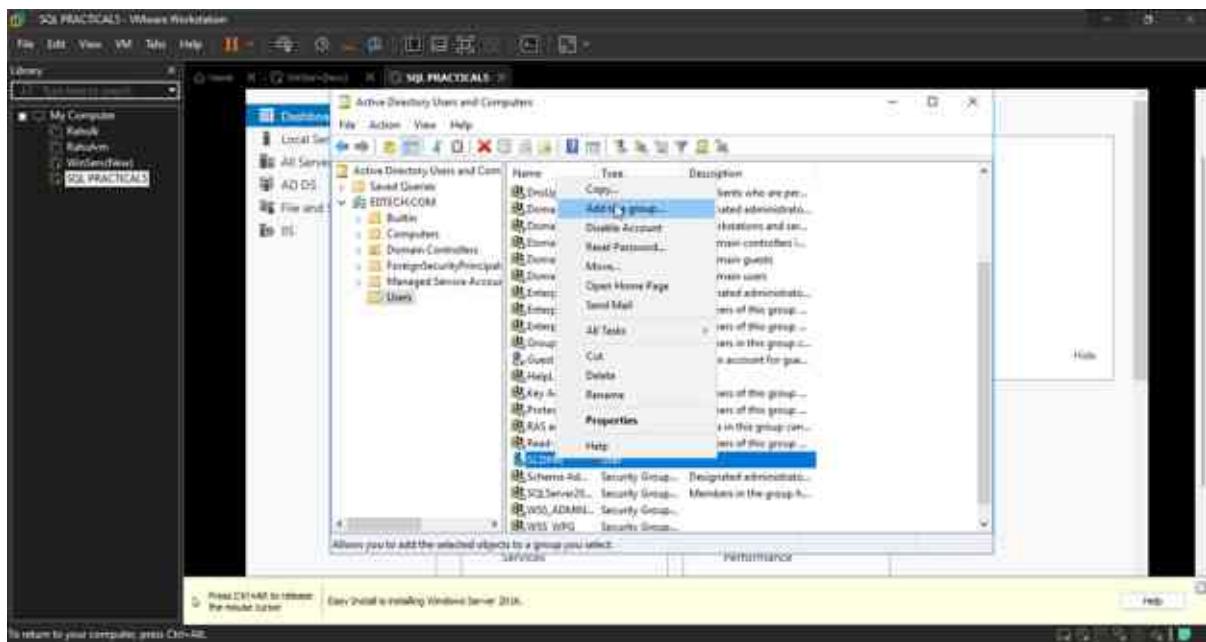
- Type in a password and Select Password never expires and Click Next



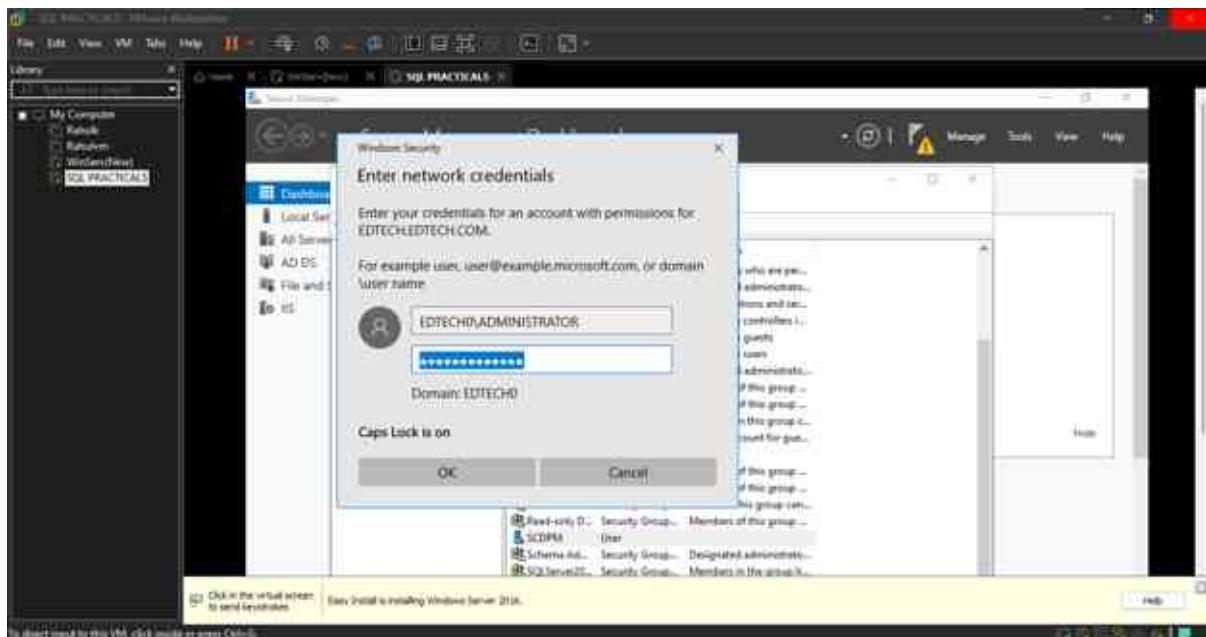
- Click on Finish



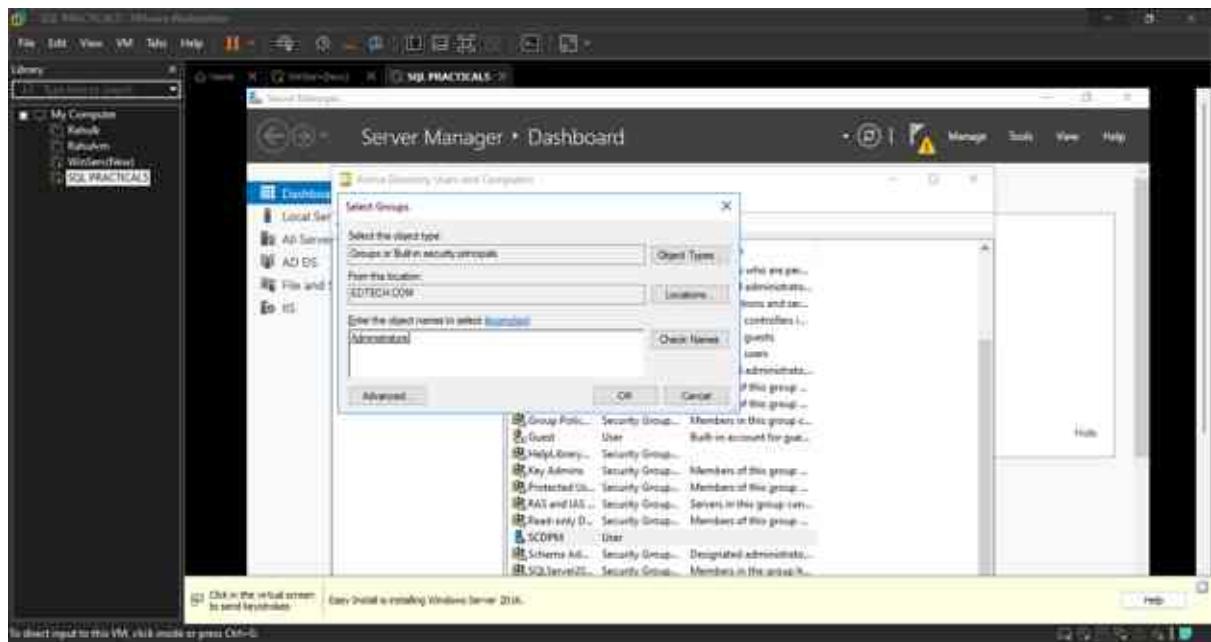
- Add the User to the Domain Group, Right Click on SCDPM and Select Add to a group



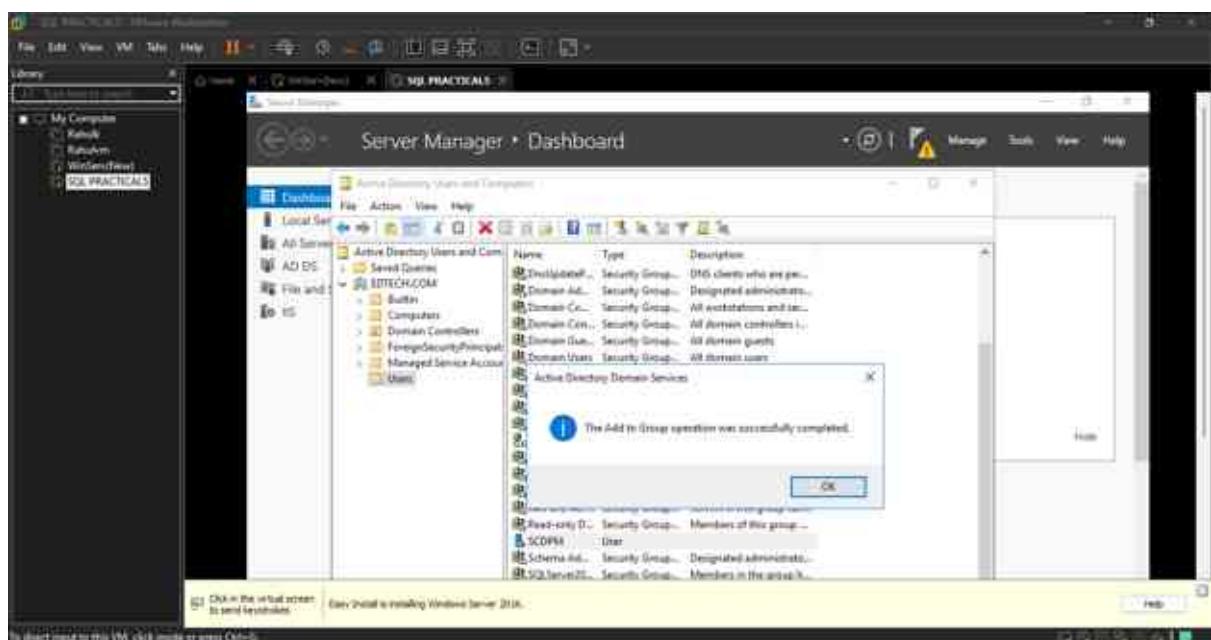
- Enter your credentials for an account with permissions for EDTECH.EDTECH.COM



- Type in **Administrator** and Click on **Check Names** and **Click on Ok**



- Click on OK



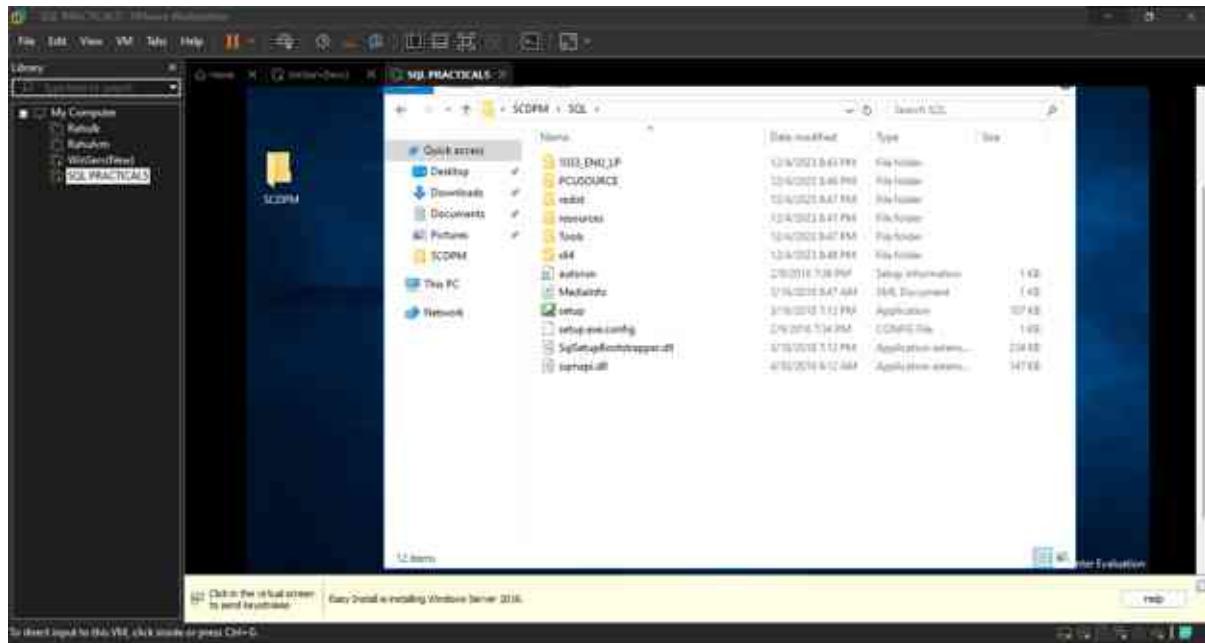
- Now Login as SCDPM



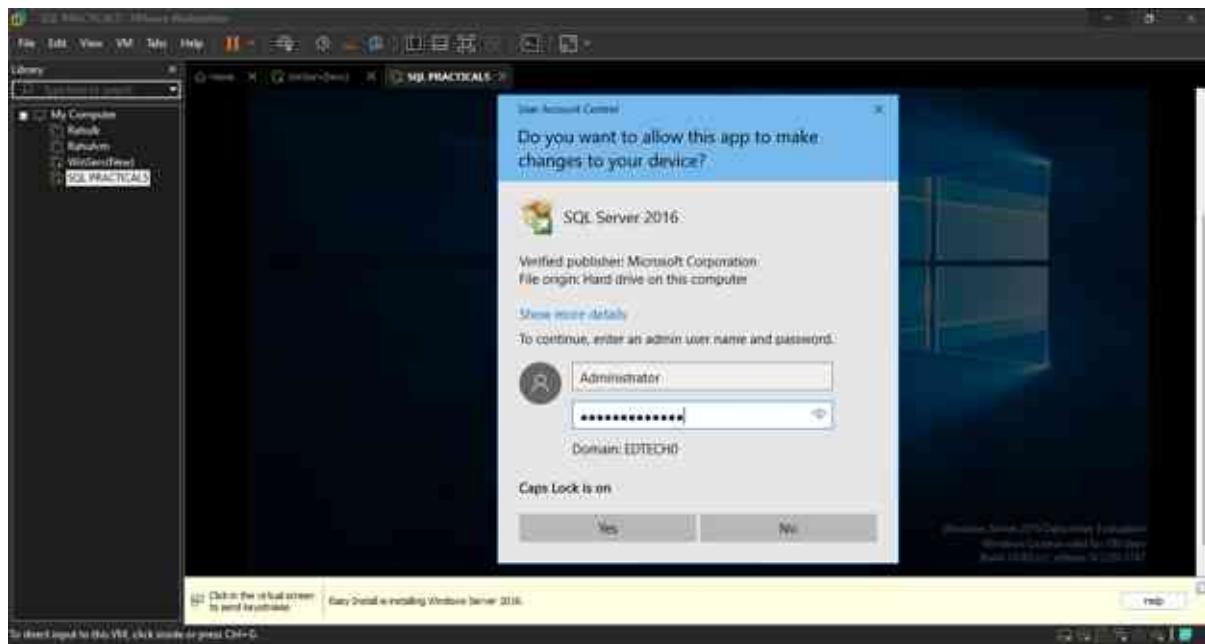
Step 5: Installing SQL Server

- Now Open the SQL 2016 setup file from your folder

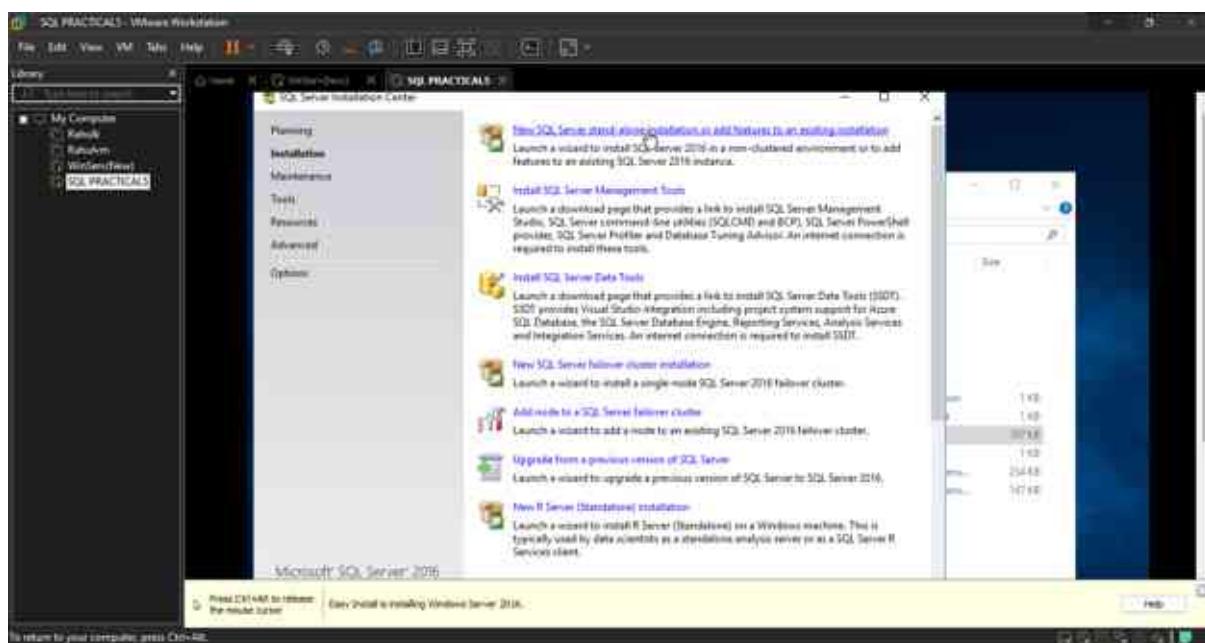
Note: This has to take place within **SCDPM User** and not **Administrator**



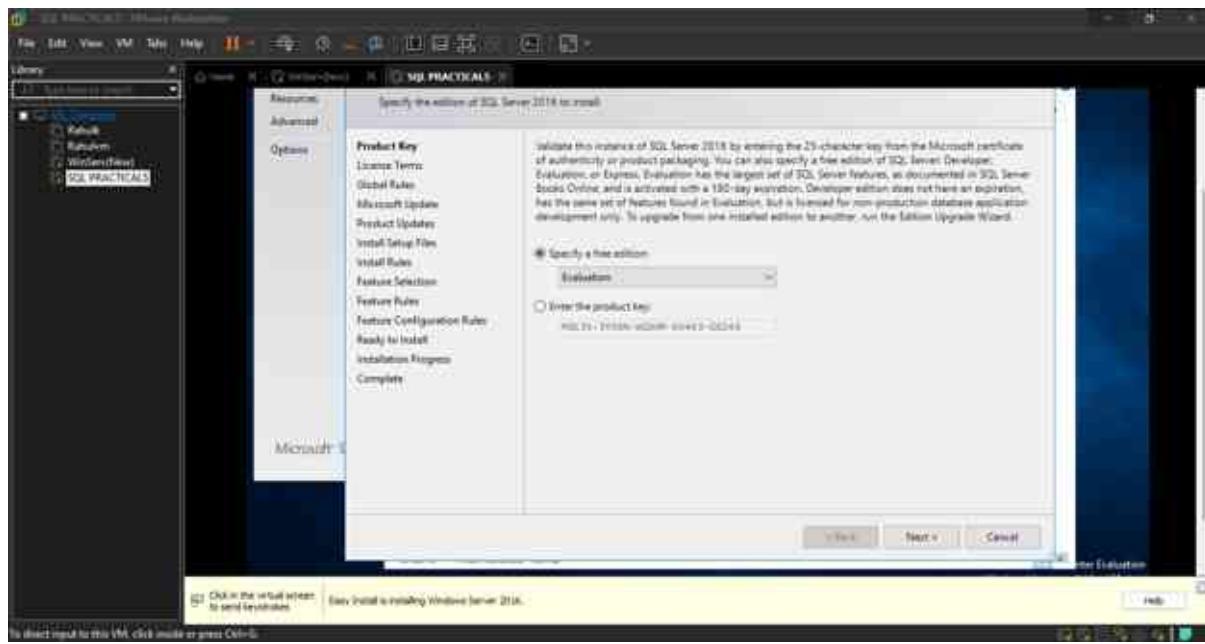
- Enter Credential for admin



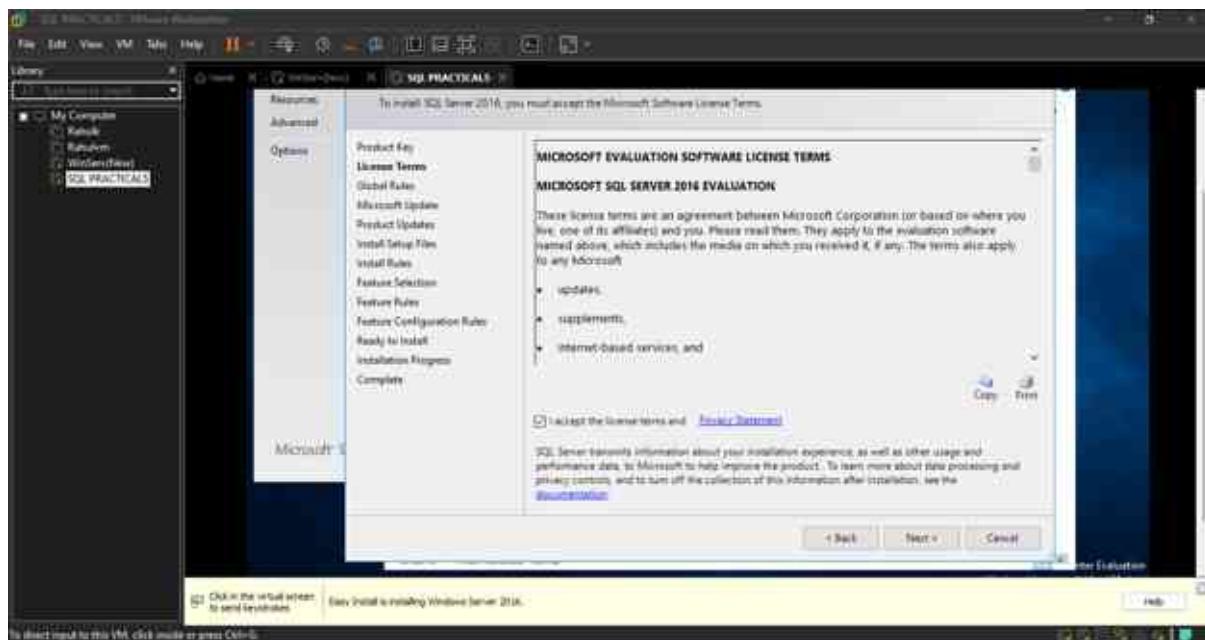
- Select Installation and Click on New SQL Server Stand-alone installation



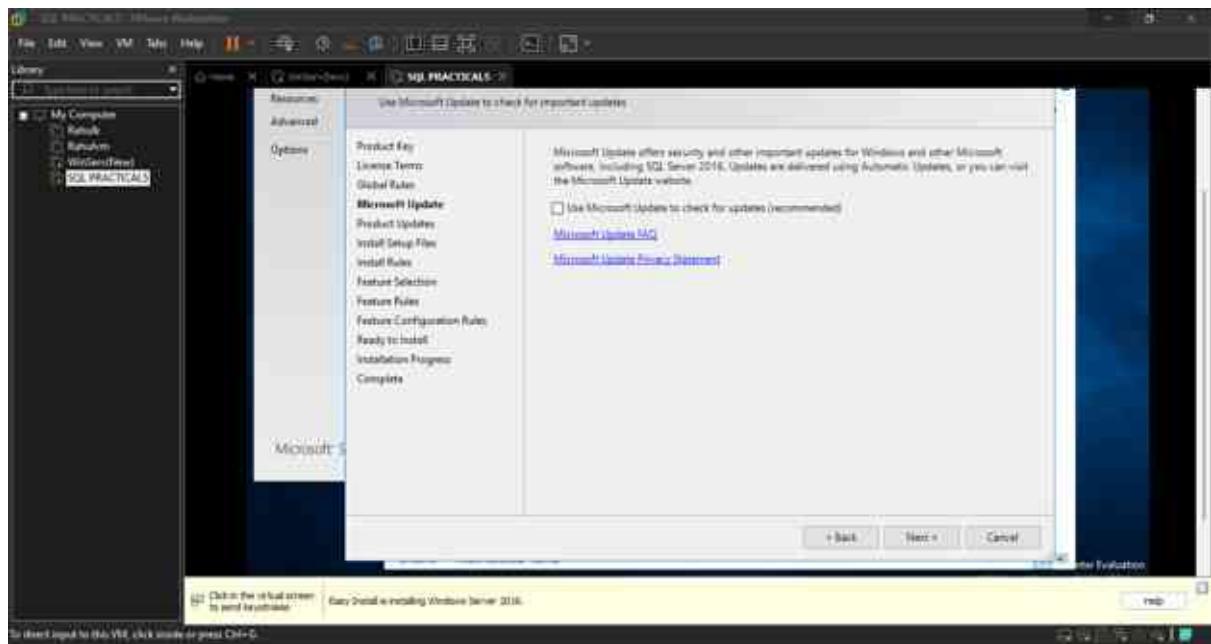
- Click on Specify a free edition and Select Evaluation and Click on Next



- Accept the license and Click on Next

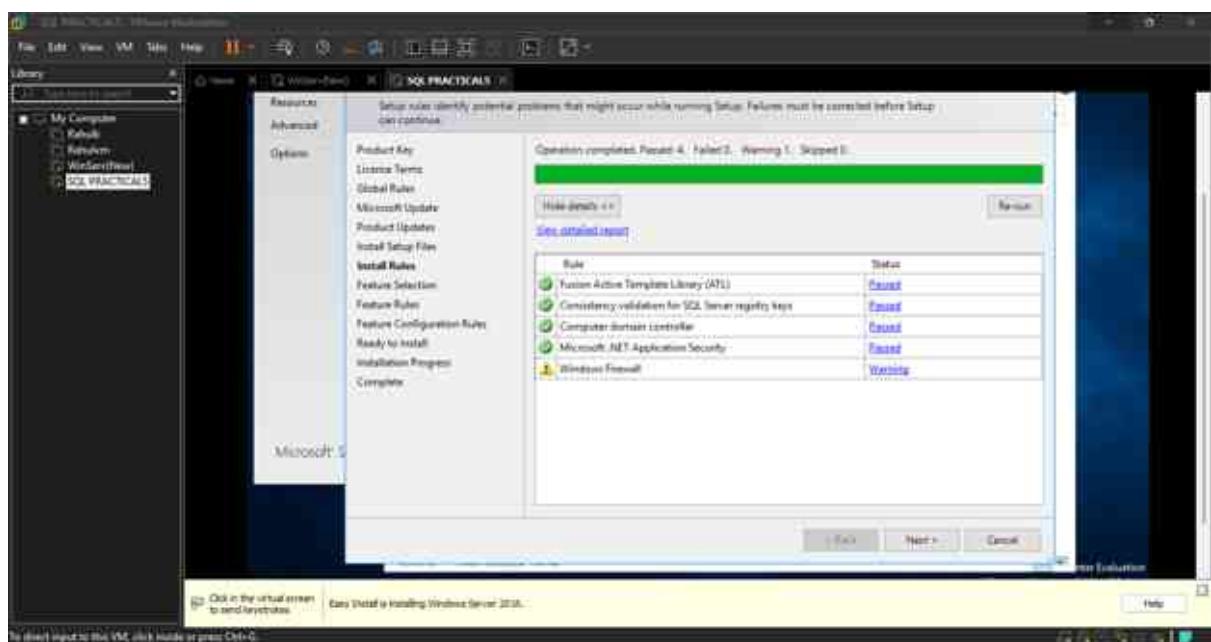


- Click on Next



- Click on Next

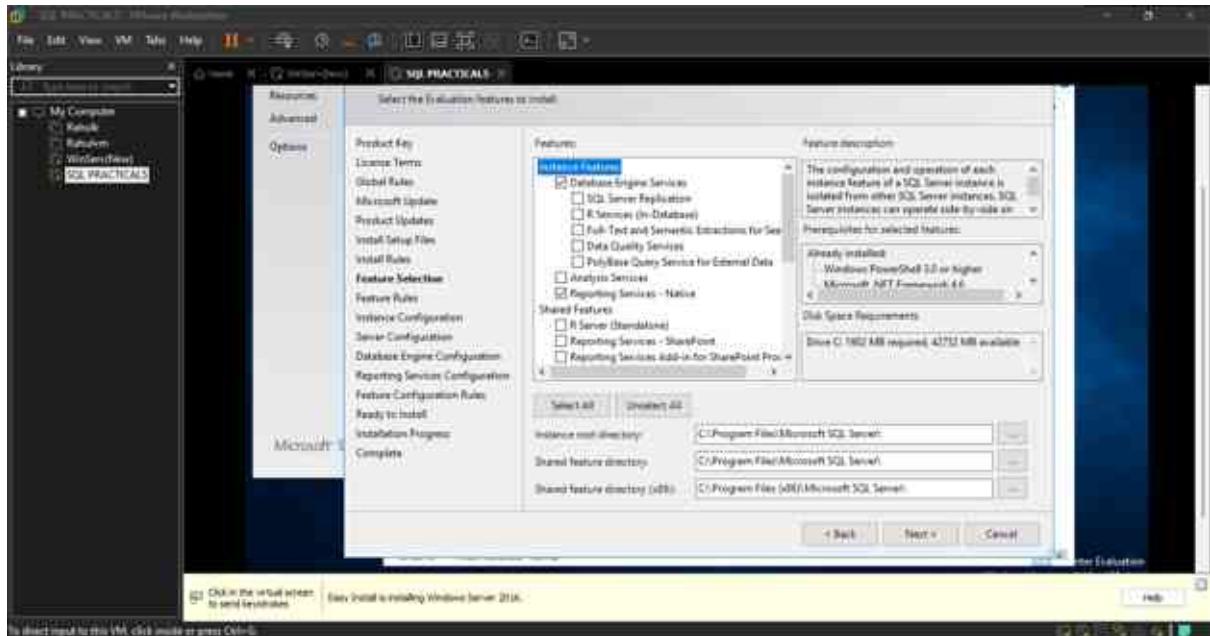
Note: Windows Firewall Warning accept



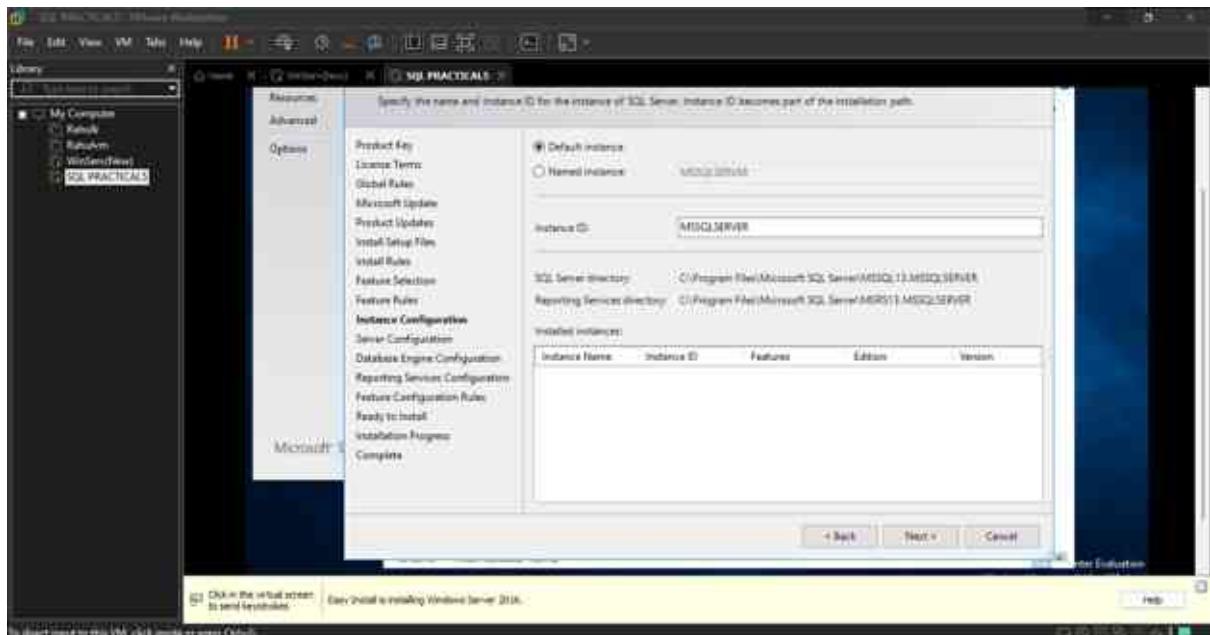
Select the following Features:

- Database Engine Service

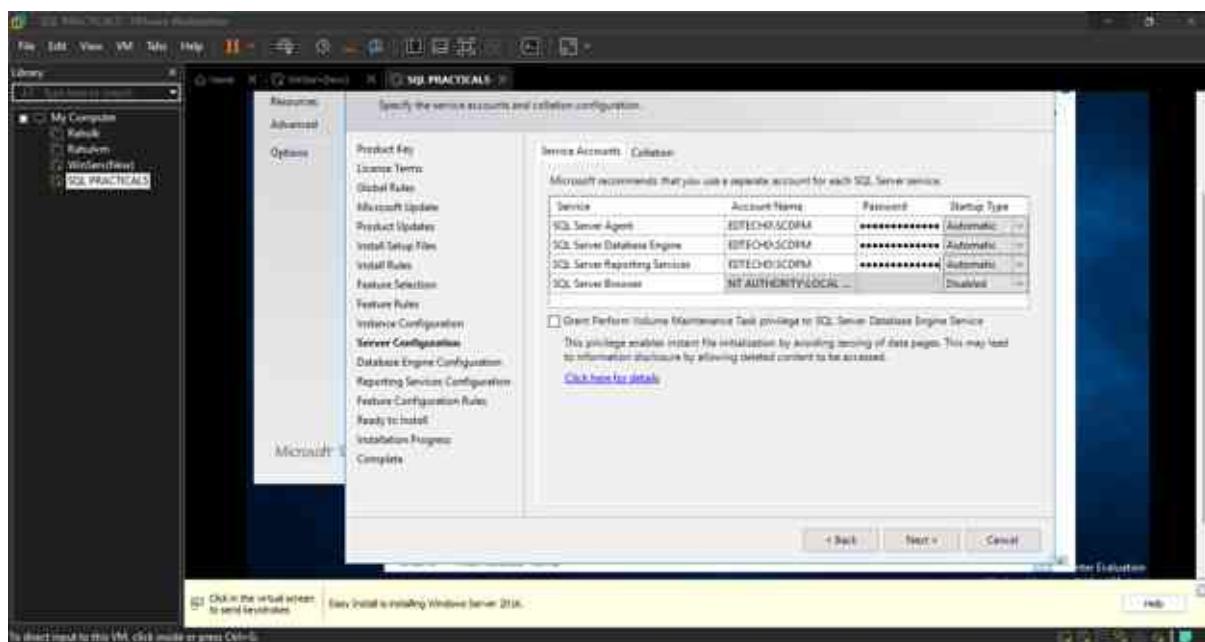
- **Reporting Service-Native**
- **Click on Next**



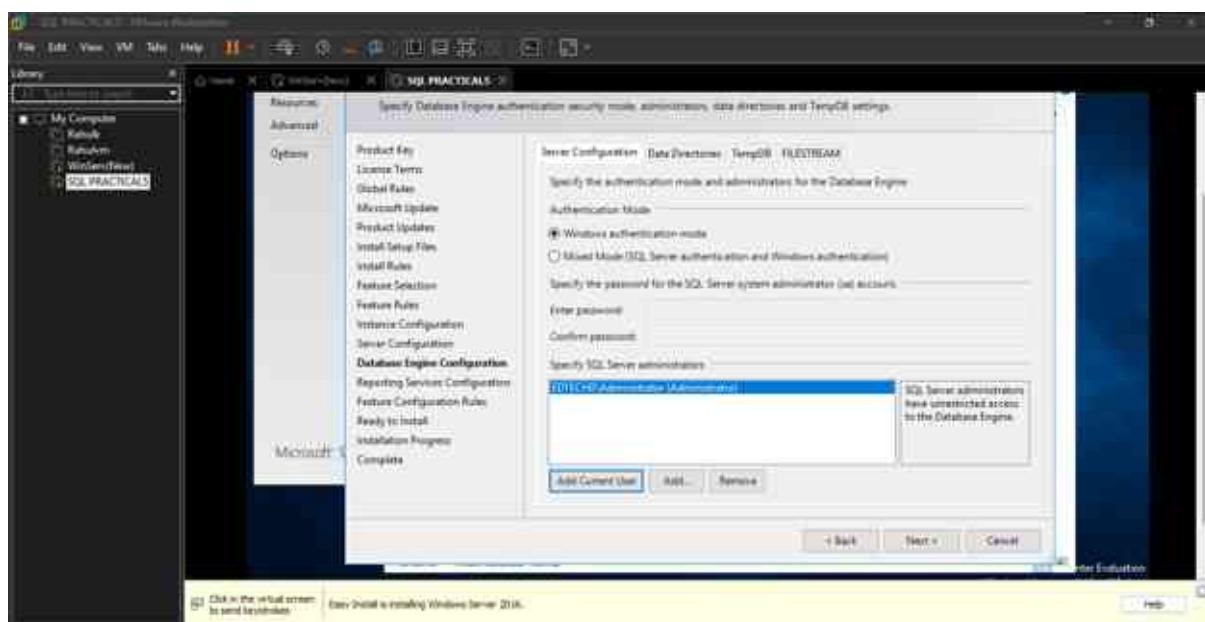
- **Keep the Default Setting and Click on Next**



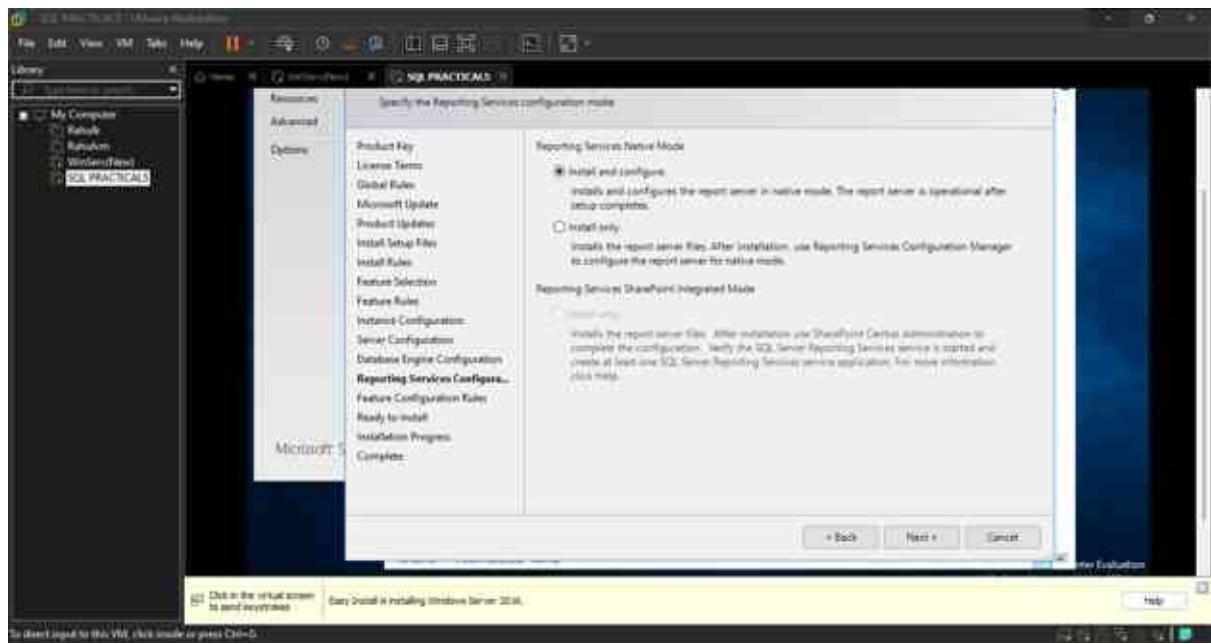
- **Change the Account Name for SQL Server Agent, Database Engine and Reporting Services to the Users Account and Ensure the Start-up type is Automatic and Click Next**



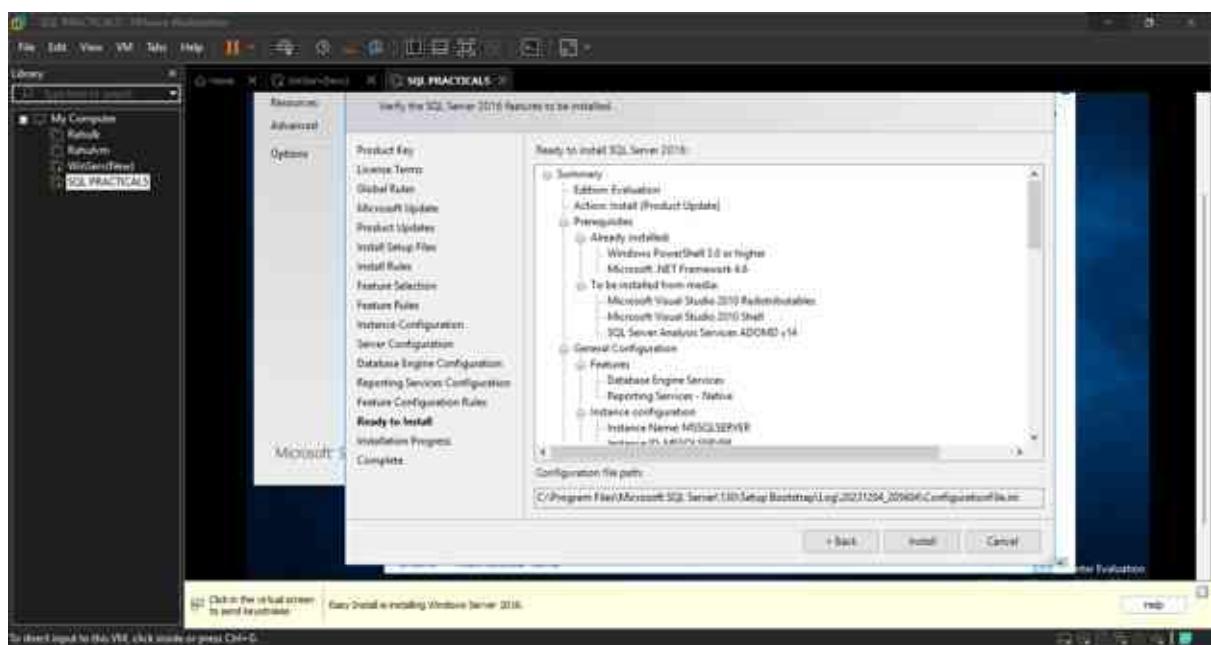
- Click on Add Current User (Ensure it is SCDPM and not the Administrator) and Click Next



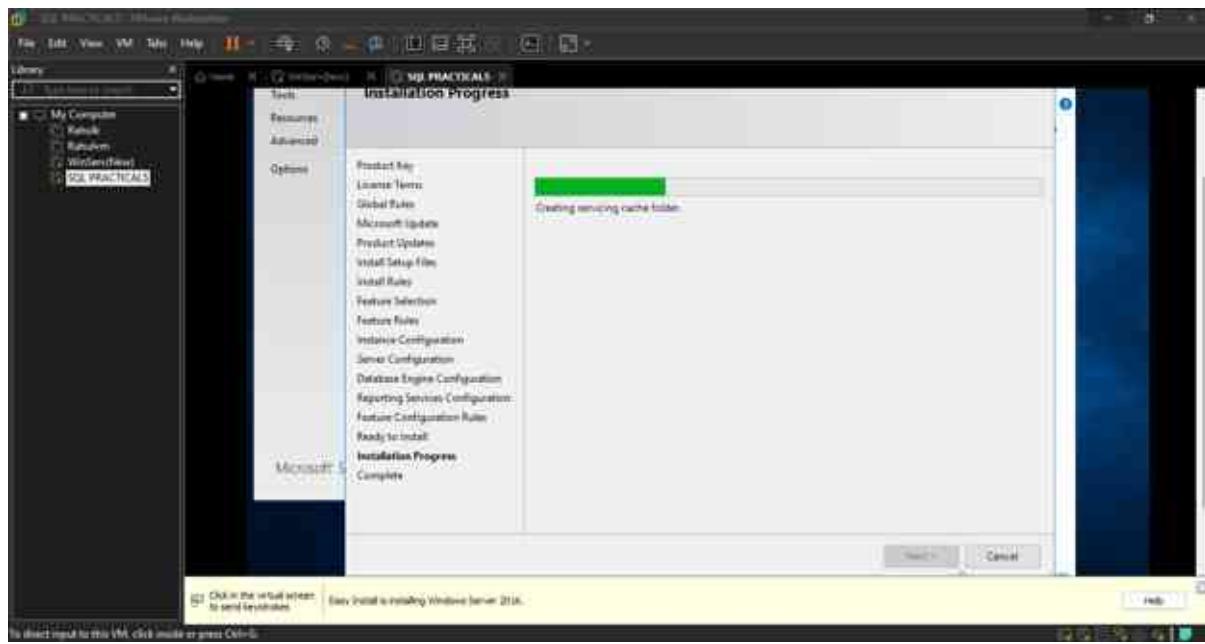
- Select Install and configure and Click on Next



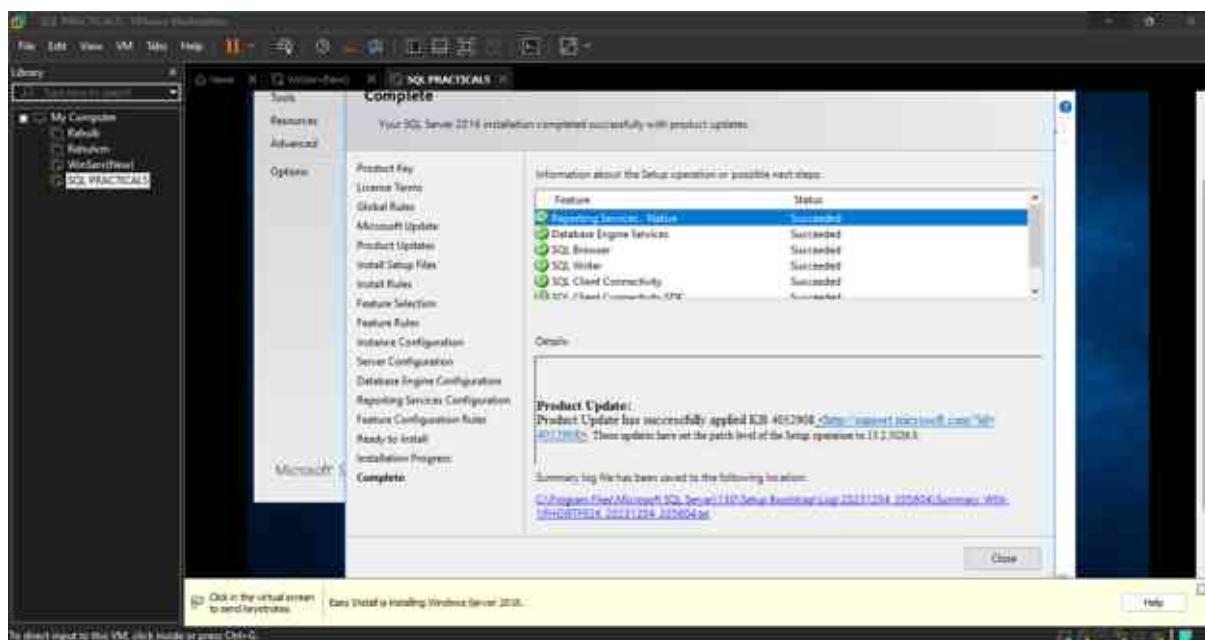
- Click on Install



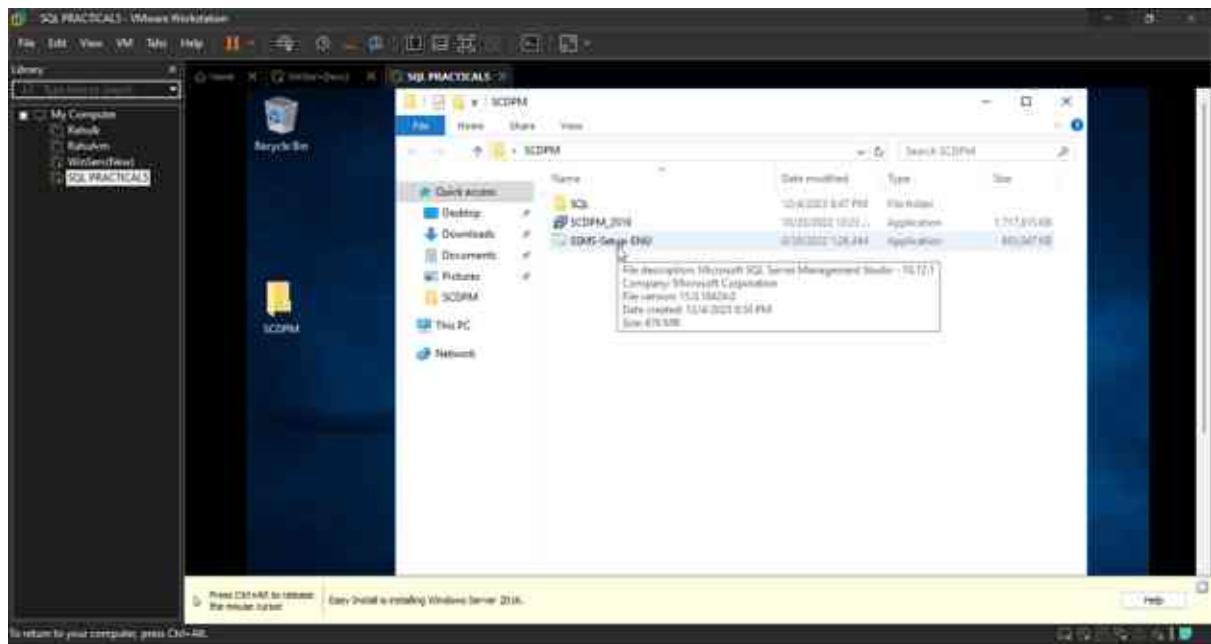
- Installation Process start



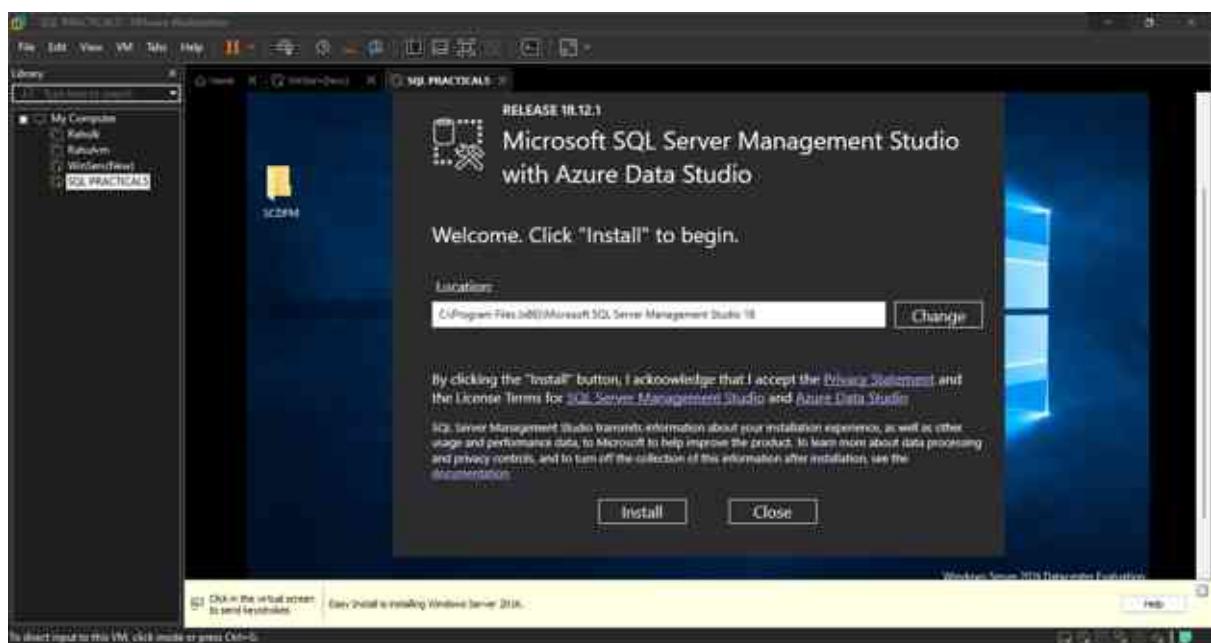
- After the installation of feature **Click on Close**



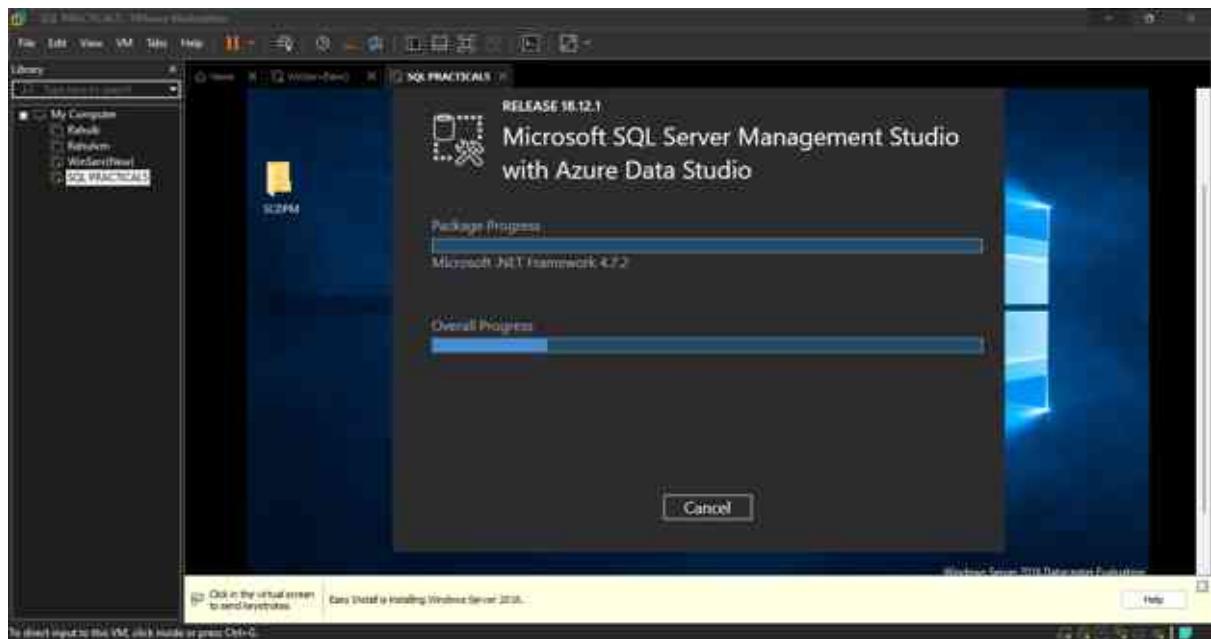
- Now Open SSMS Setup from your folder



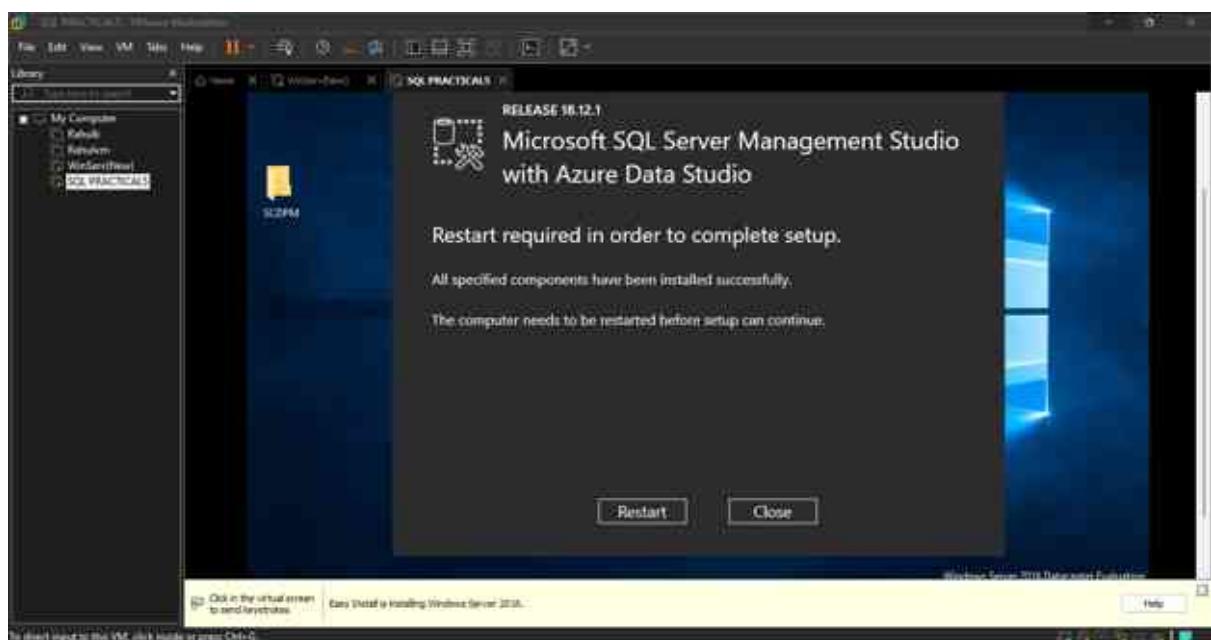
- Click on Install



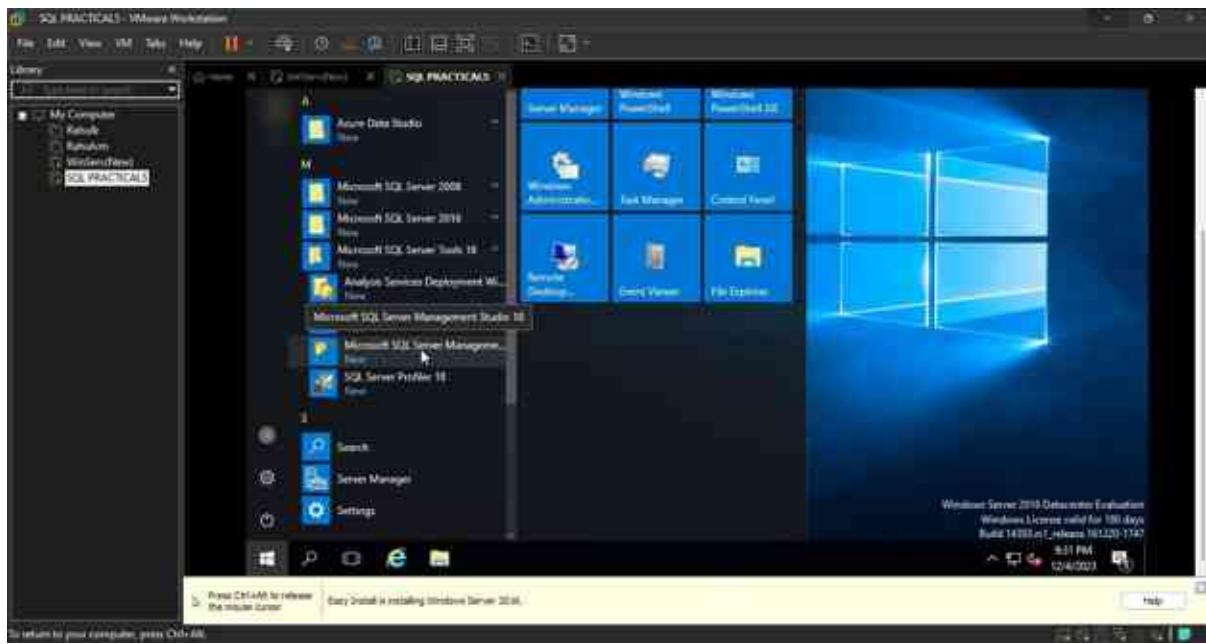
- SSMS will start installing onto your system



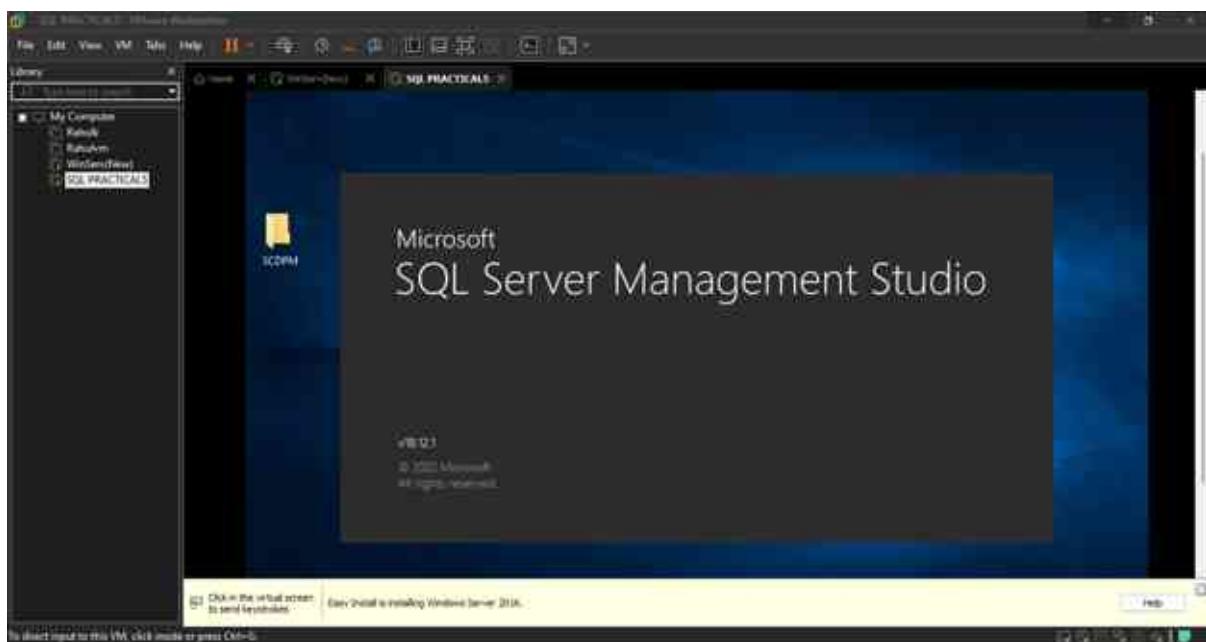
- After the installation **Click on Restart**



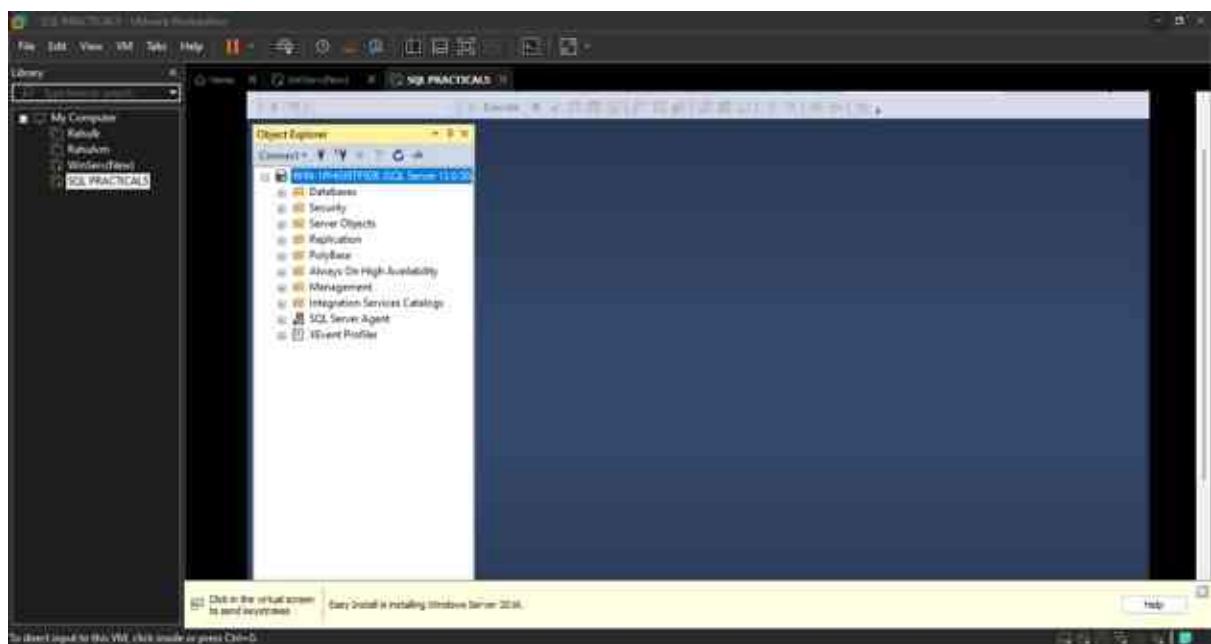
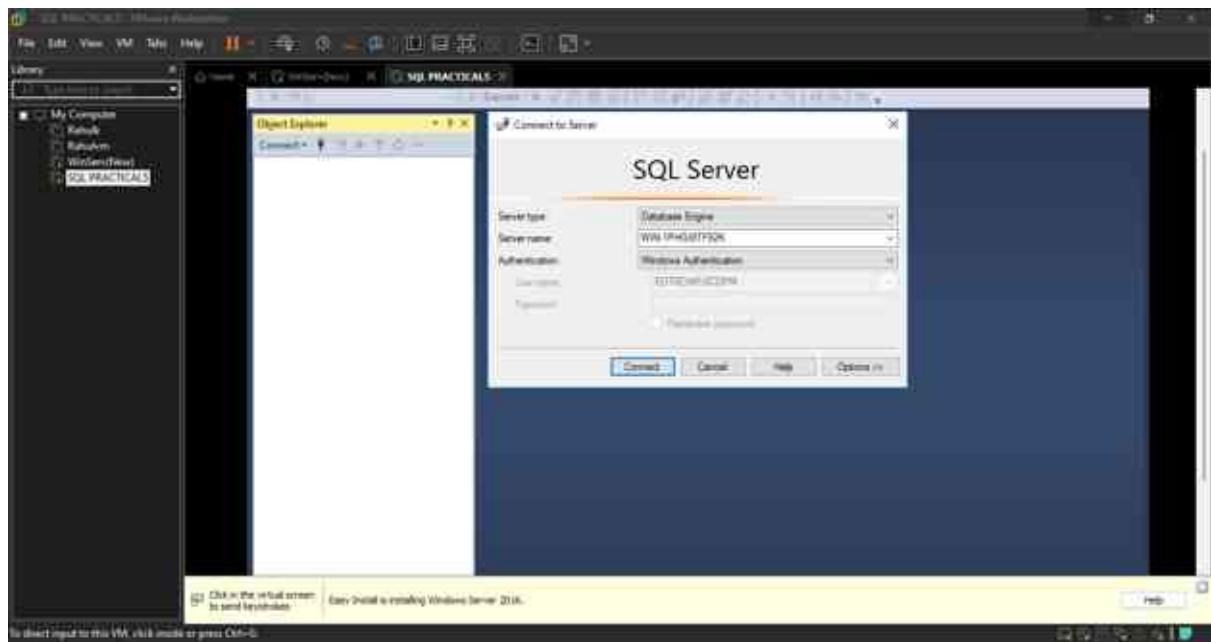
- **Open SQL Server Management Studio 18**



- **SQL Server Management Studio Window Open**

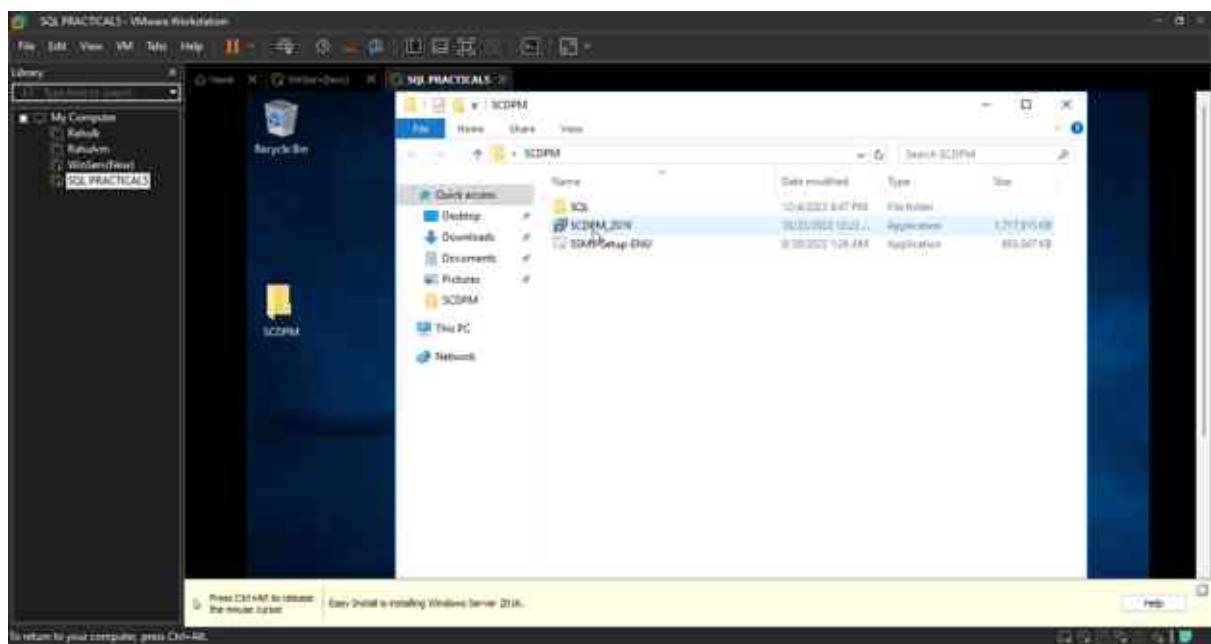


- **Keep the Default Setting and Click on Connect**

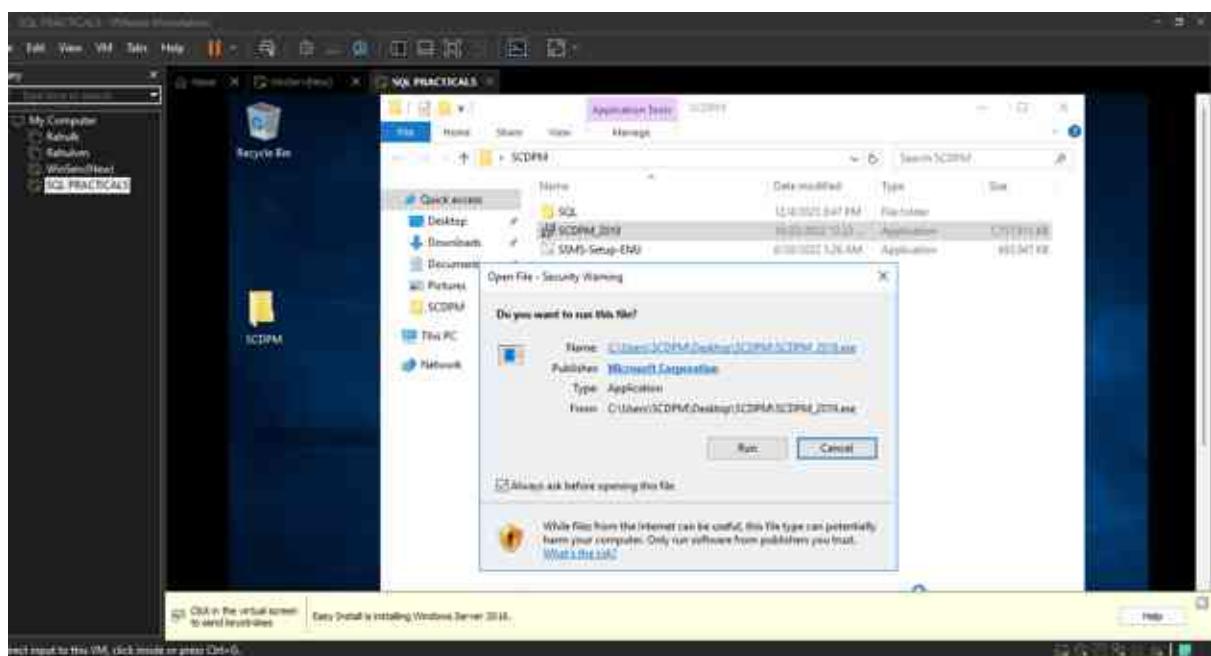


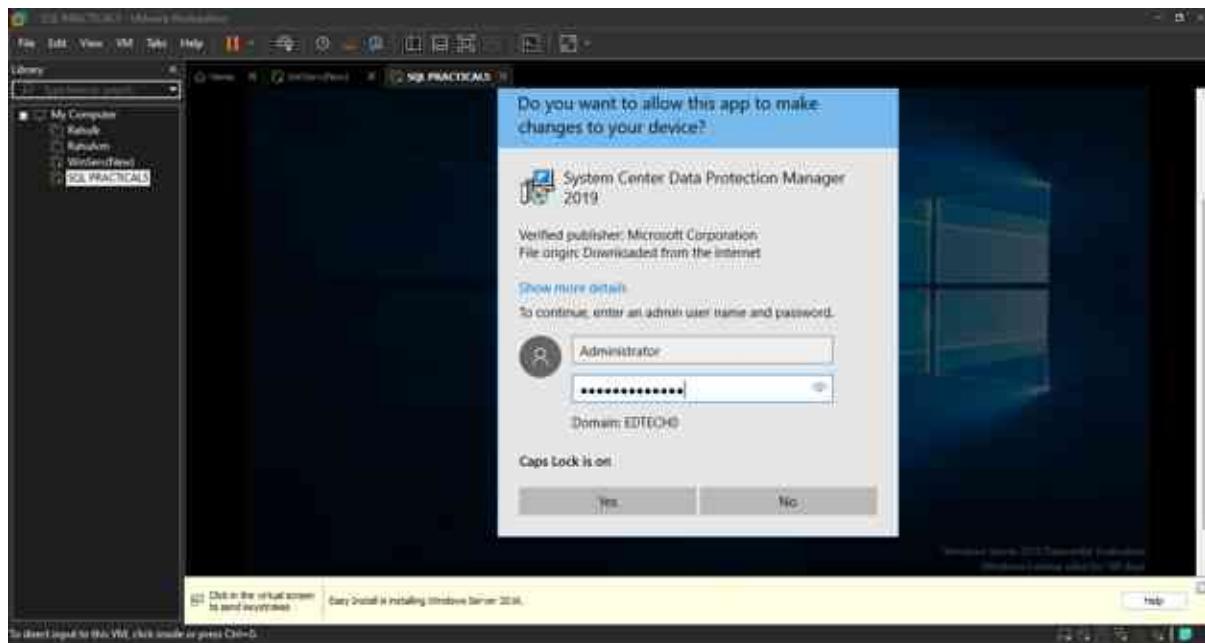
Step 6: Installing Data Protection Manager

- Open SCDPM_2019 from your folder

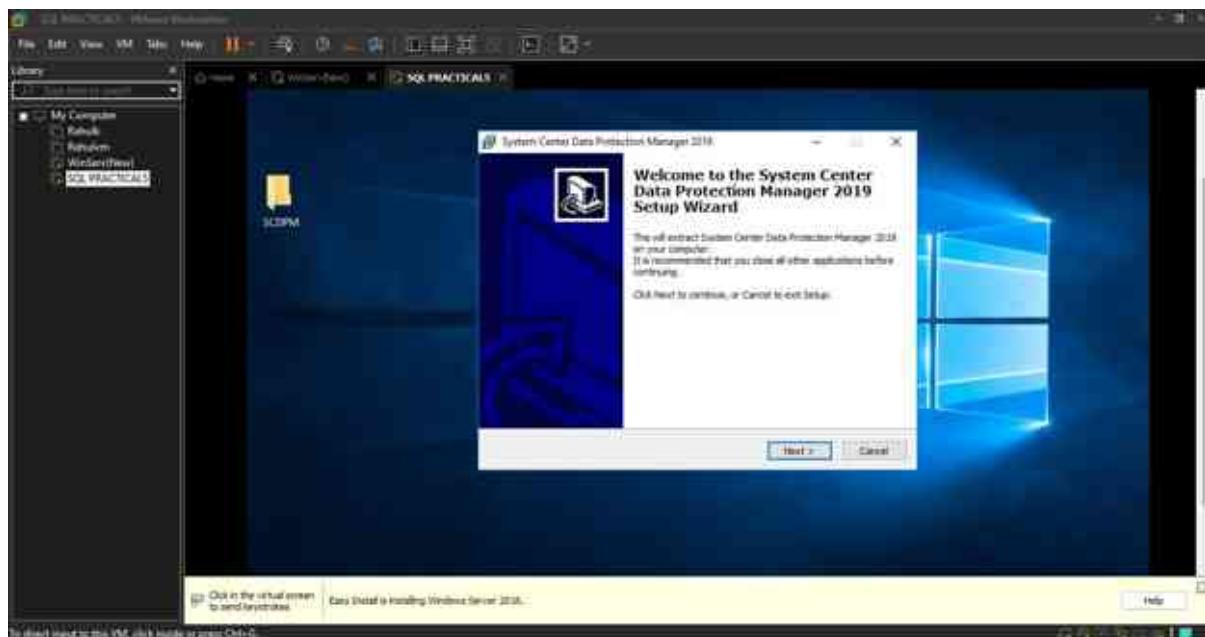


- Click on Run

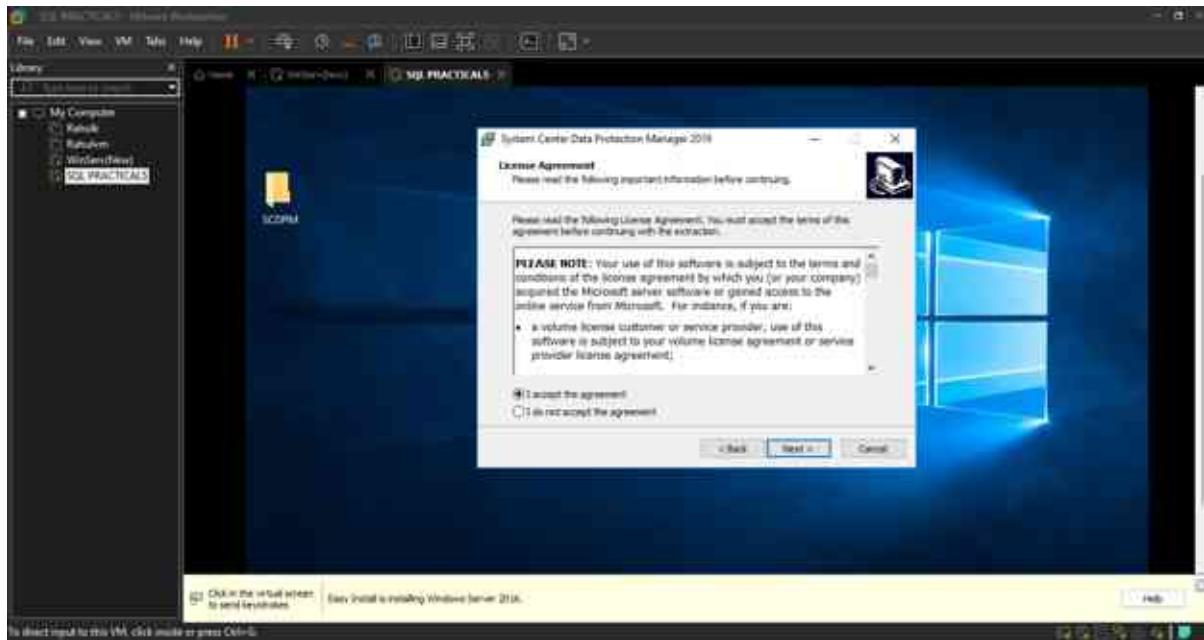




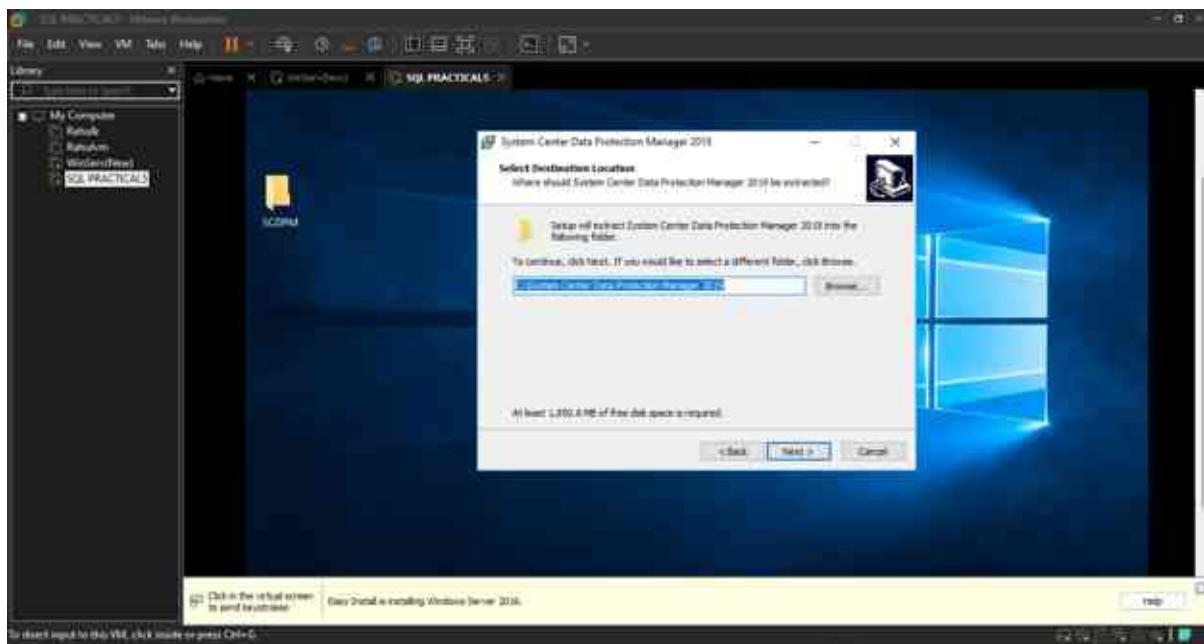
- Click on Next



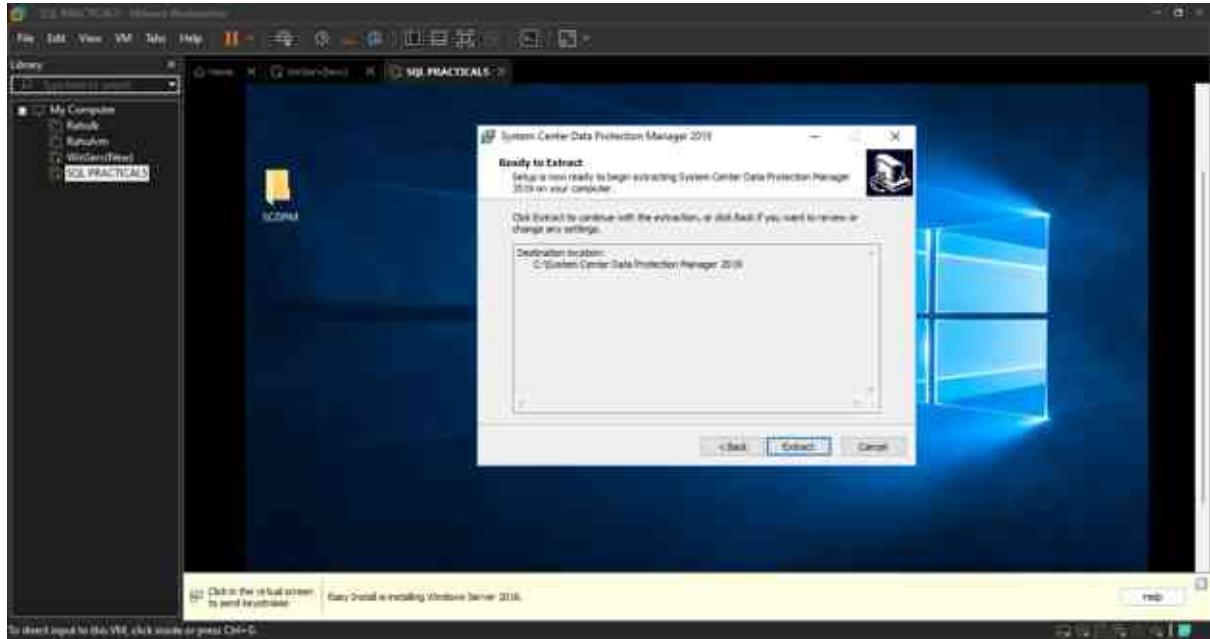
- Accept the agreement and Click on Next



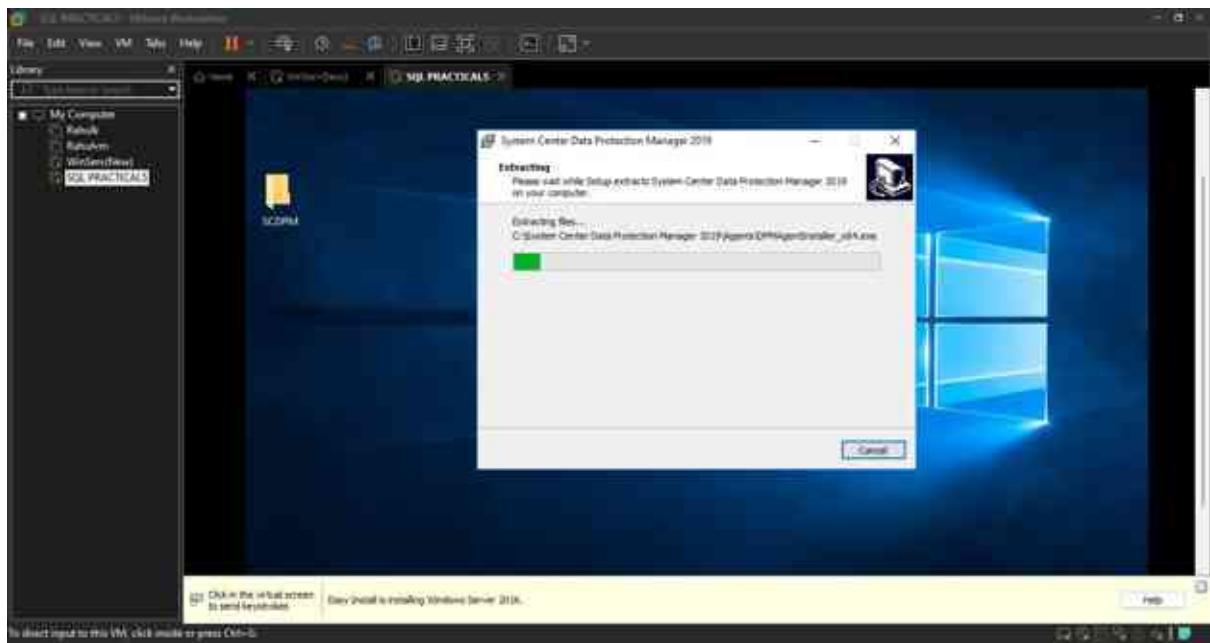
- Keep the default setting and Click on Next



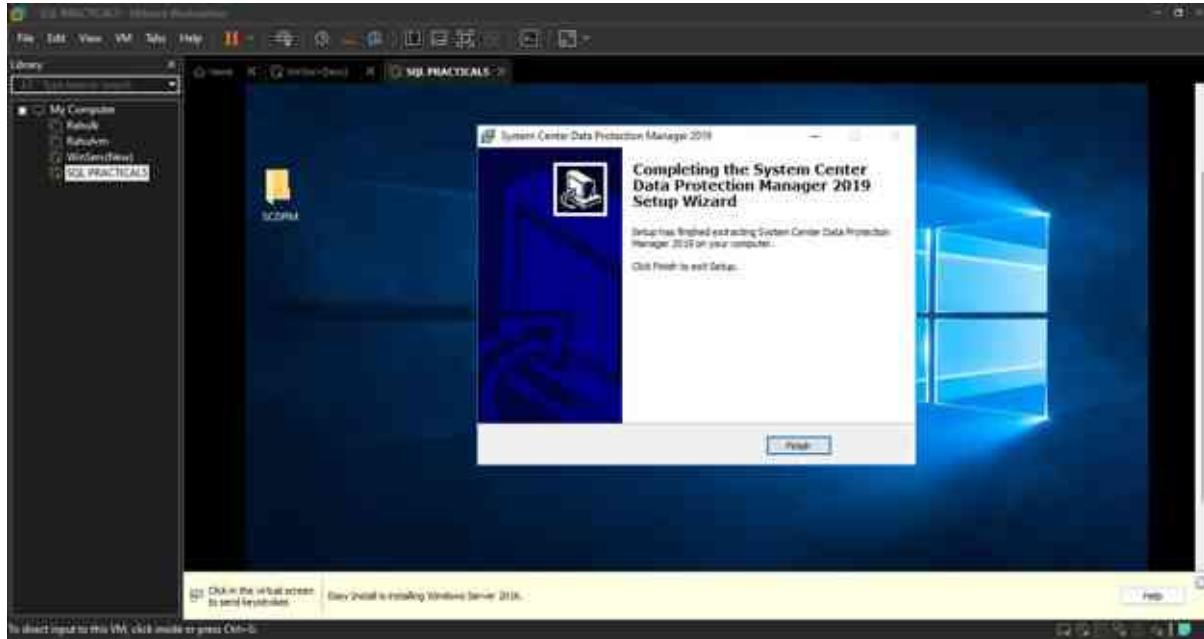
- Click on Extract



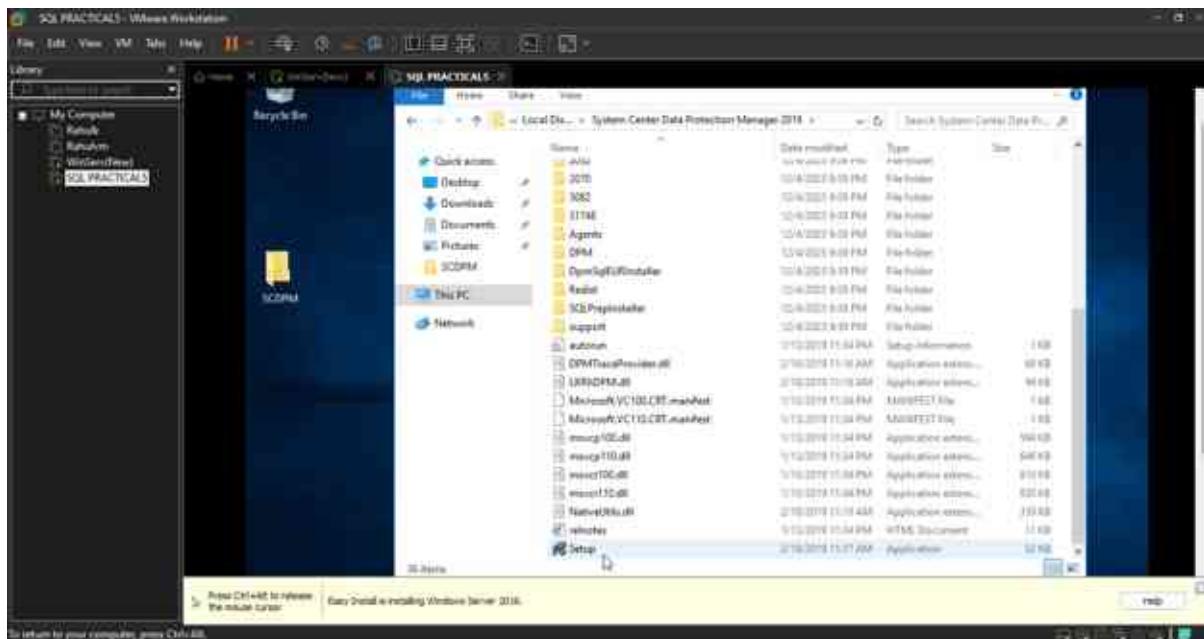
- Extracting the necessary file

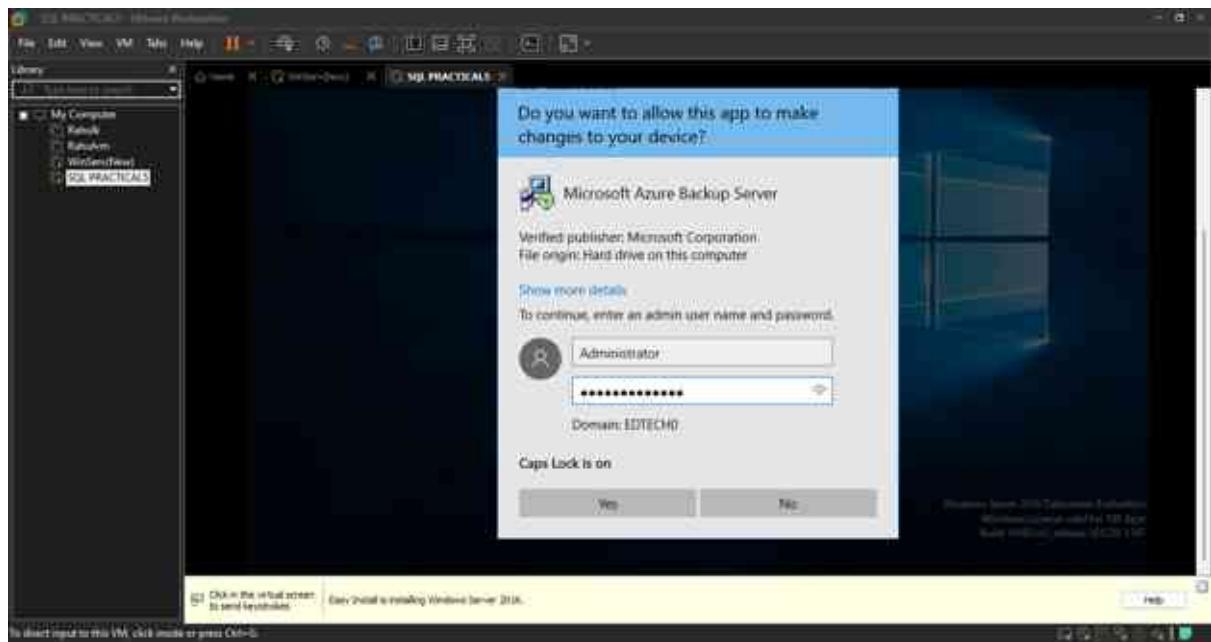


- Click on Finish

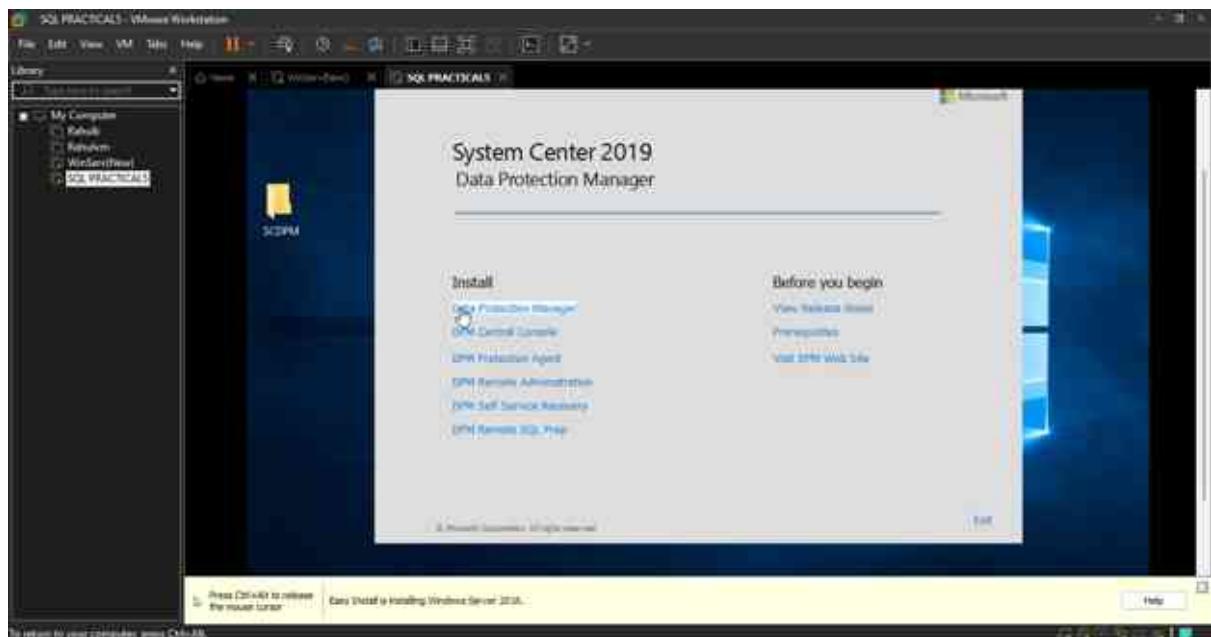


- Now In you C: Directory Click on the System Center Data Protection Manager folder and Click on Setup

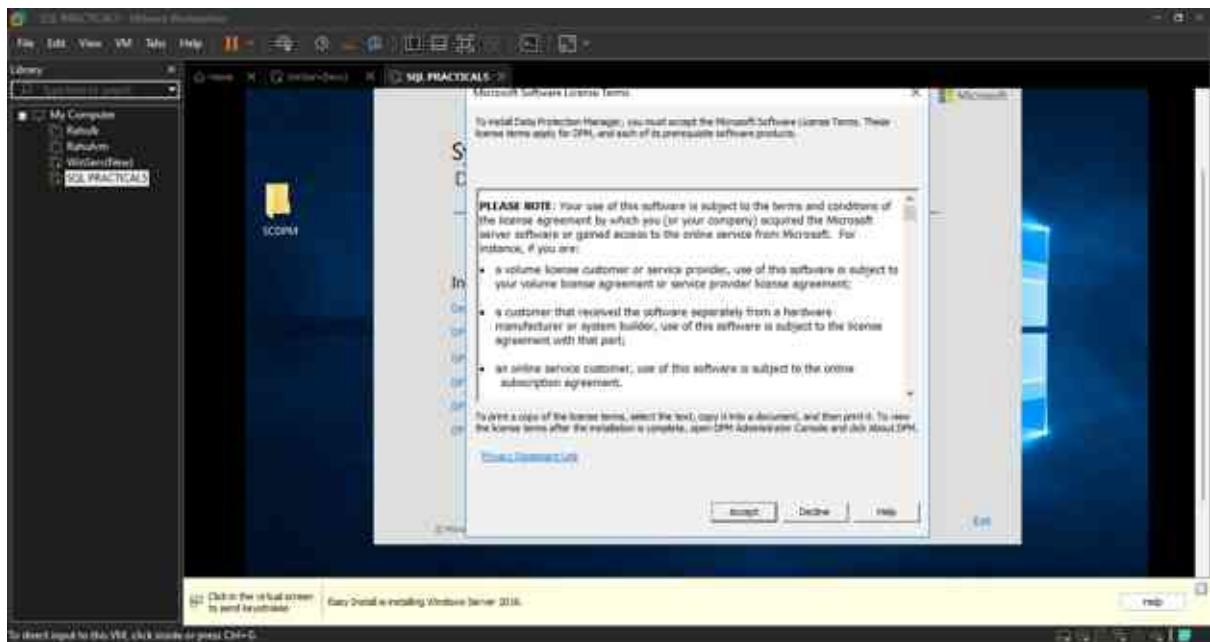




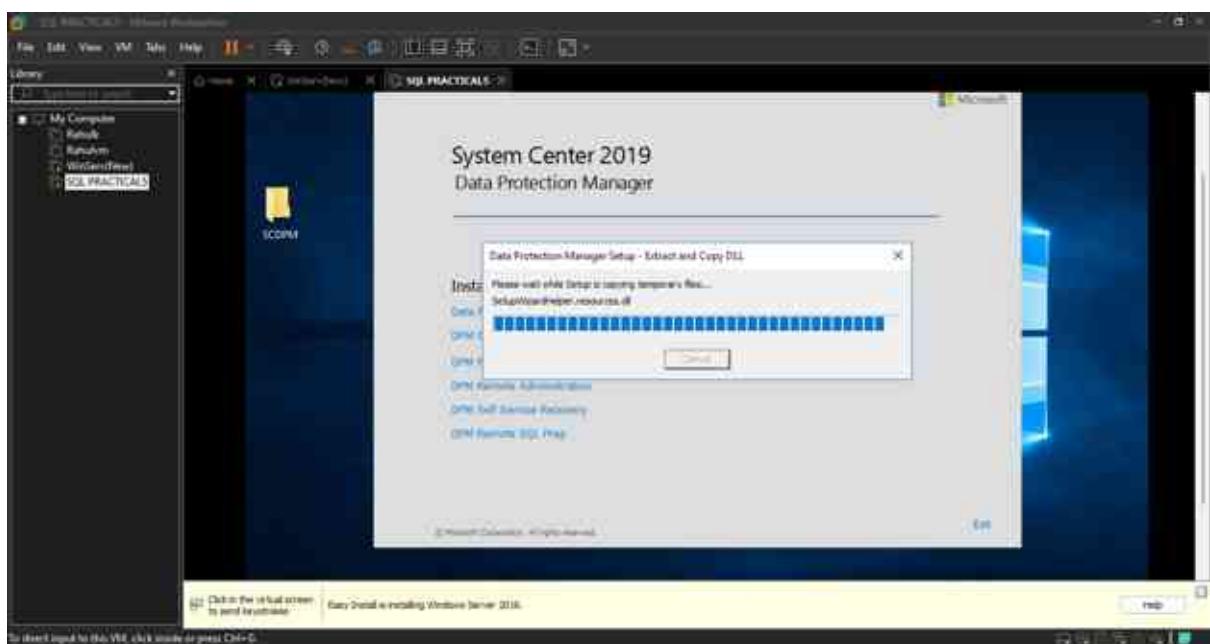
- Click on Data Protection Manager



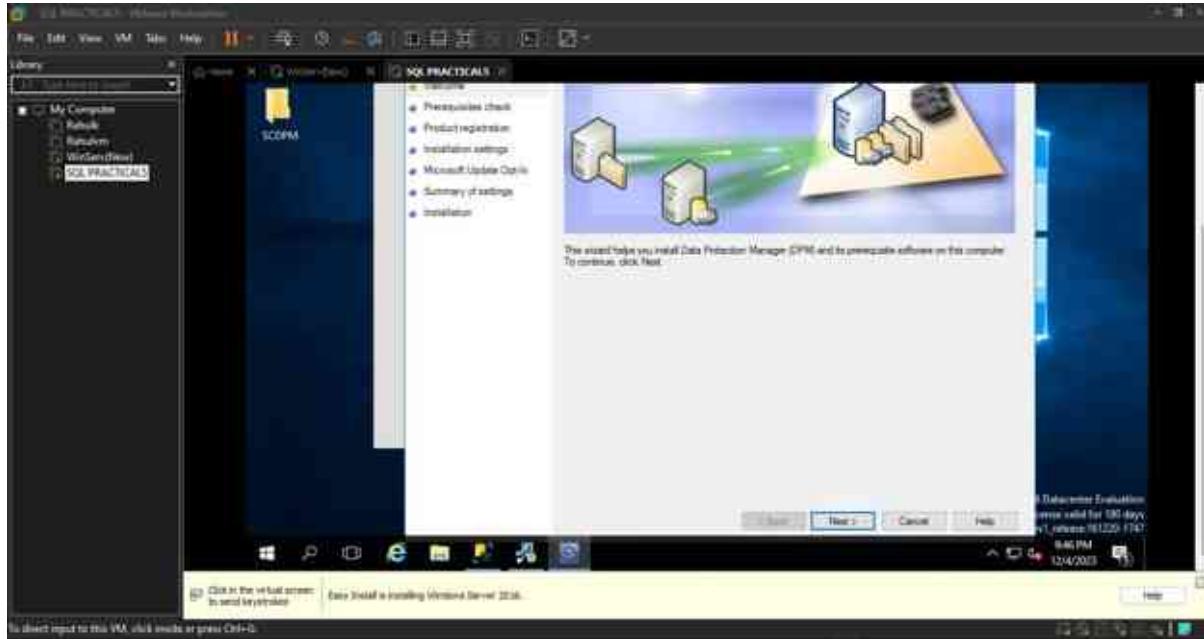
- Accept the license



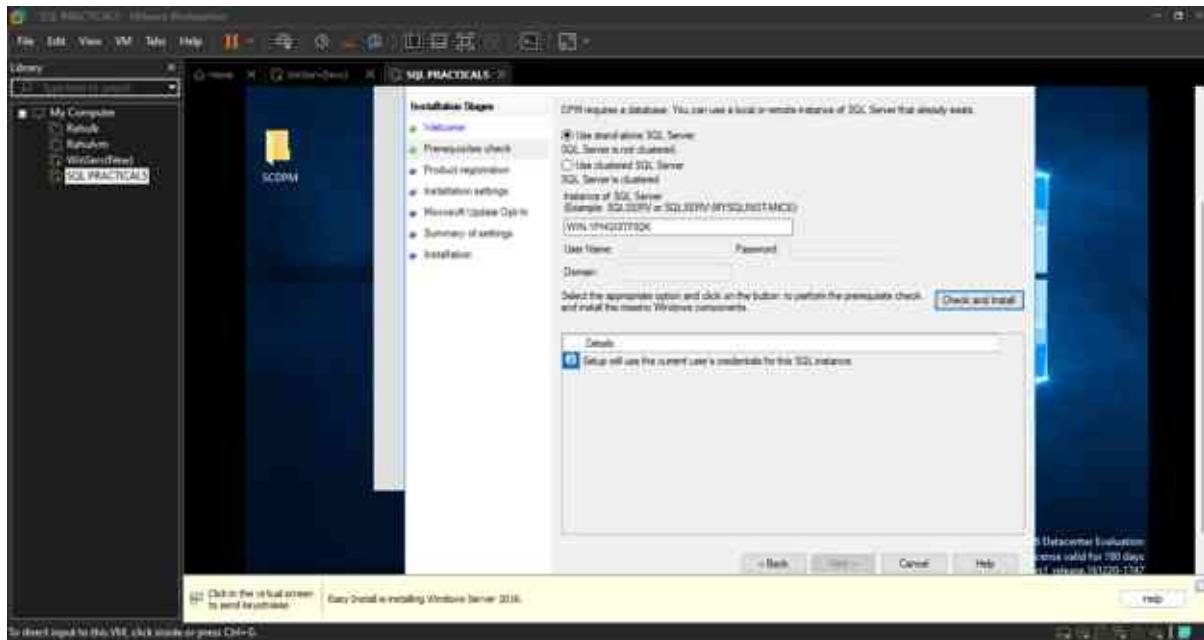
- **Extracting the Necessary file**



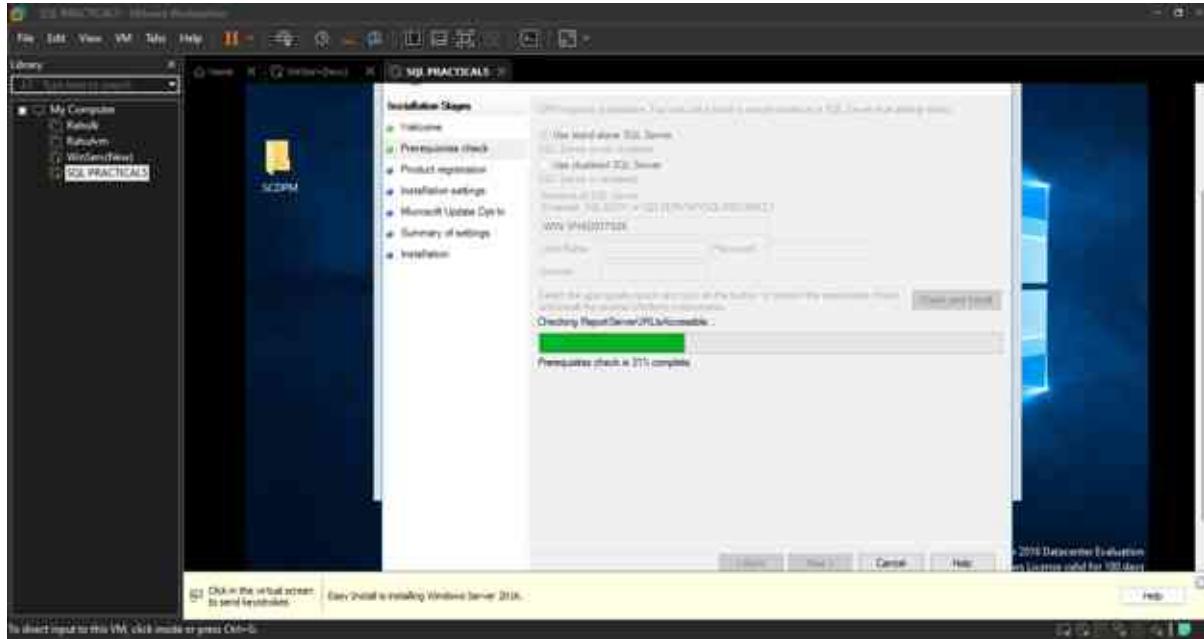
- Click on Next



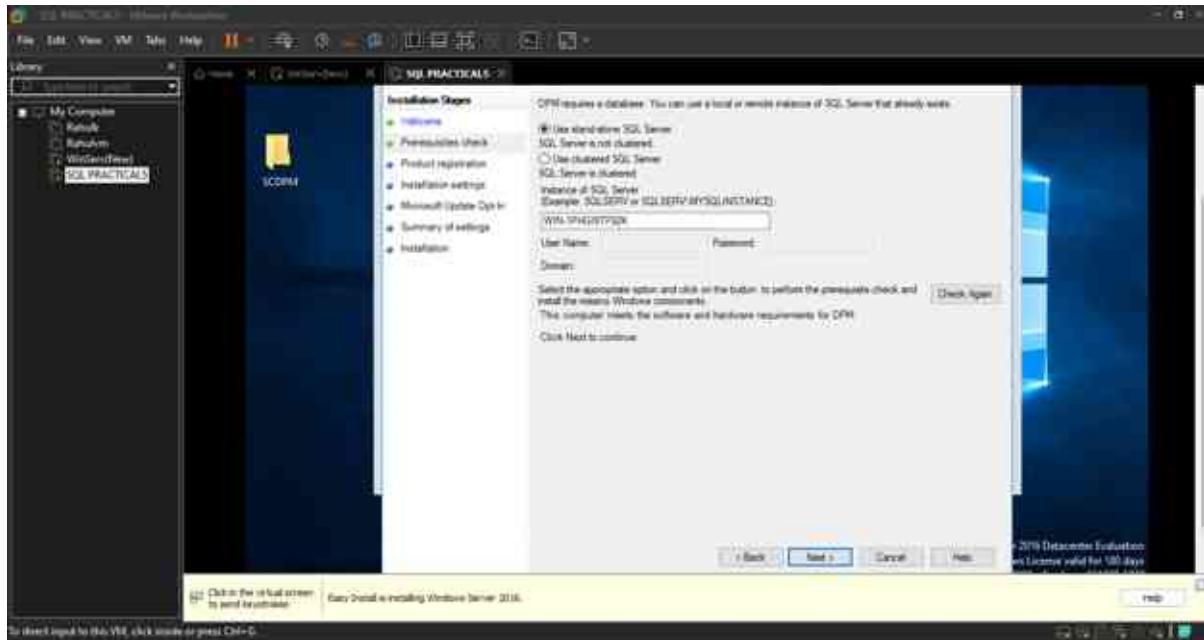
- Select Use Stand-alone SQL Server and Enter the Server Name and Click on Check and Install



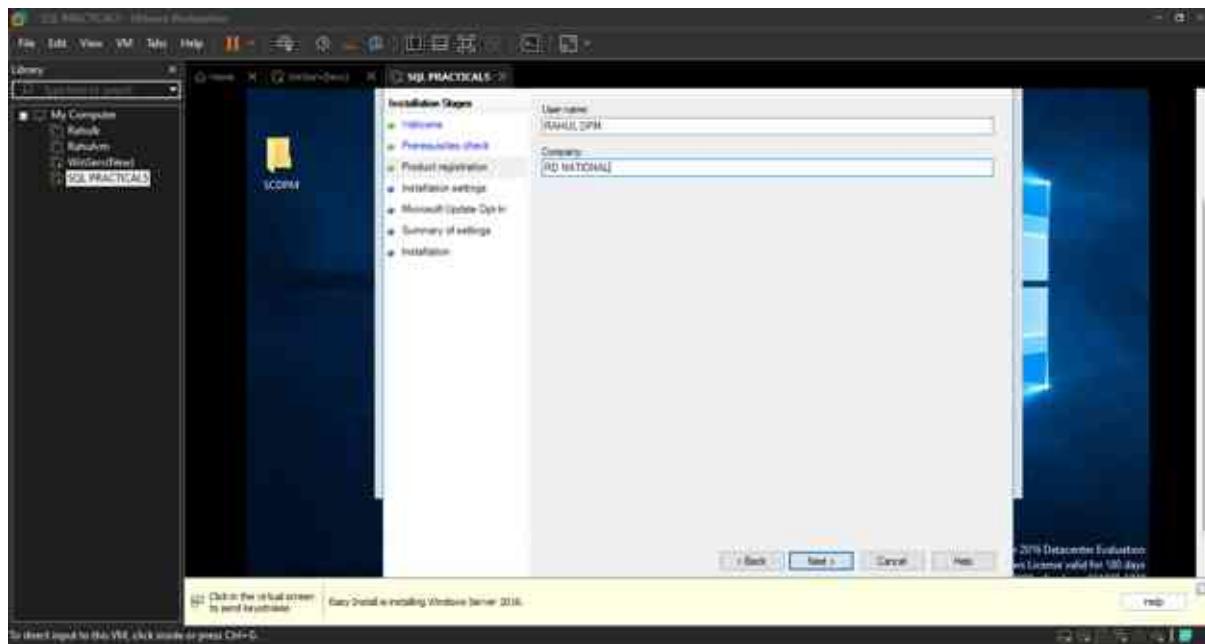
- It will start Checking Prerequisites



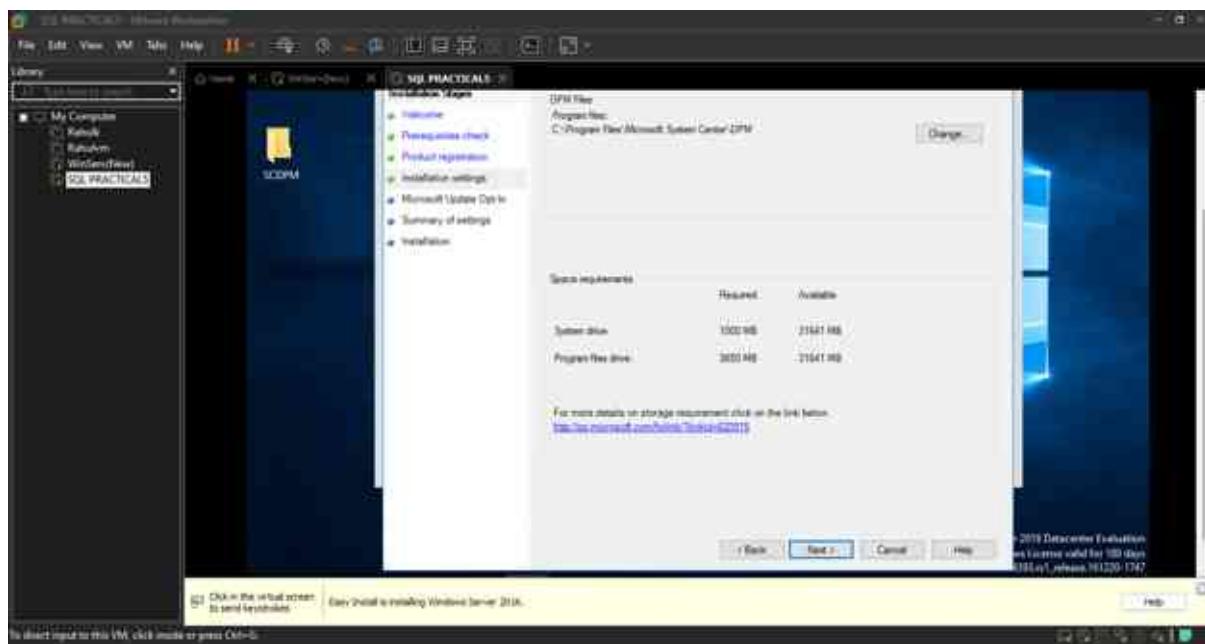
- After the checks are completed Click Next



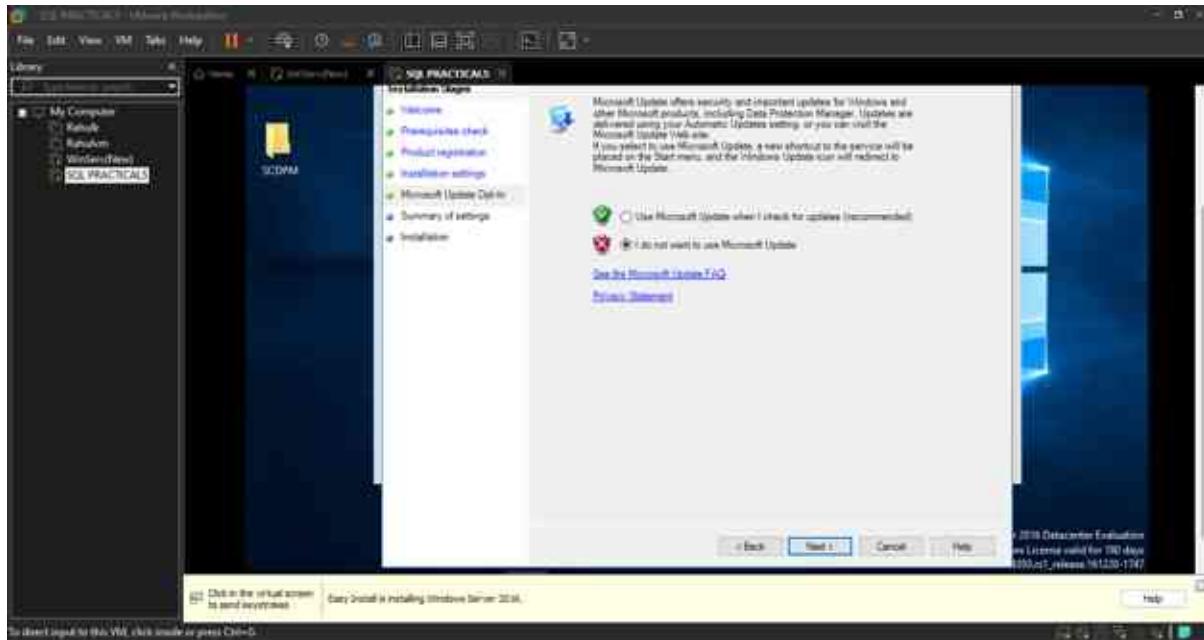
- Enter User name: RAHUL DPM and Company Name: RD NATIONAL and Click on Next



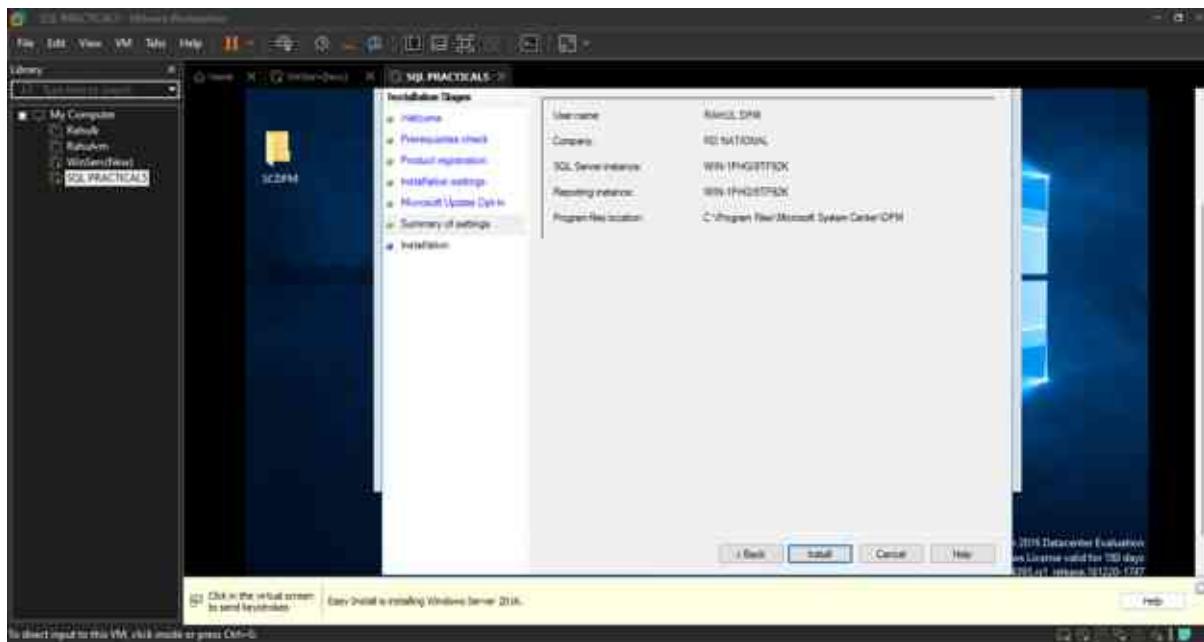
- Keep default setting and Click on Next



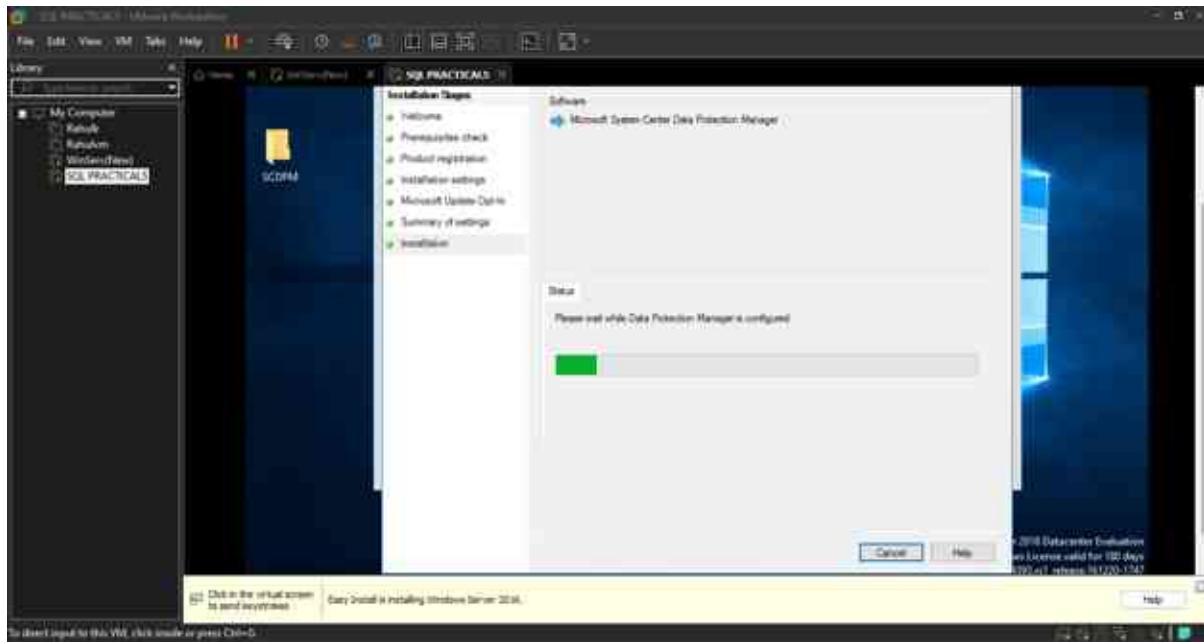
- **Click on I do not want to use Microsoft Update and Click on Next**



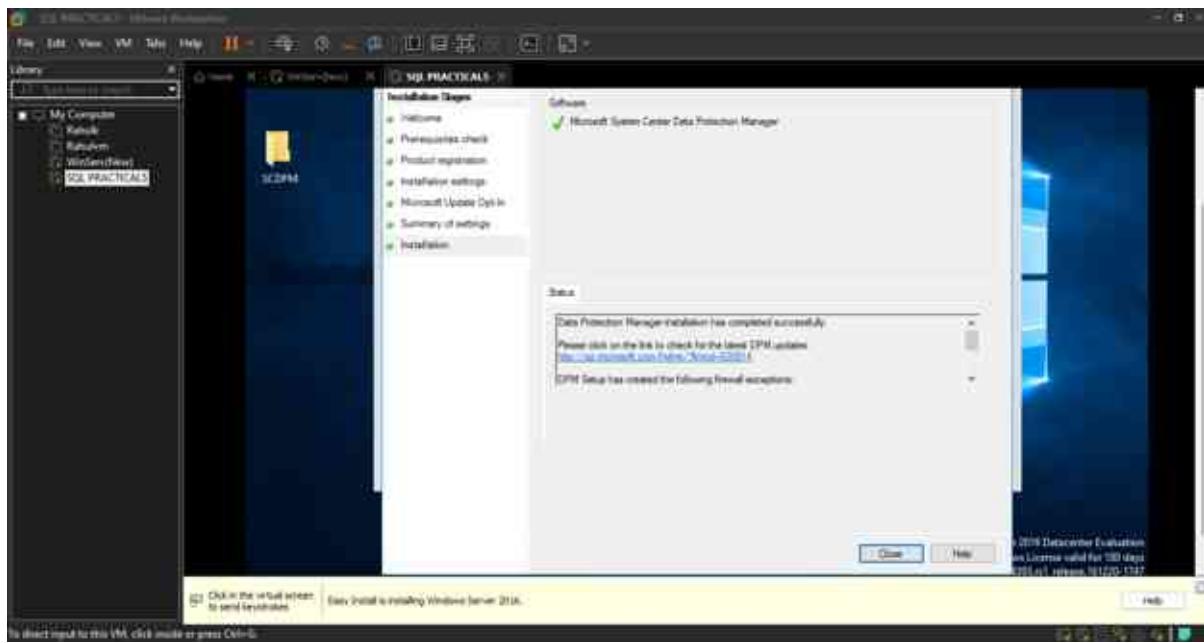
- **Click on Install**



- DPM will start installing



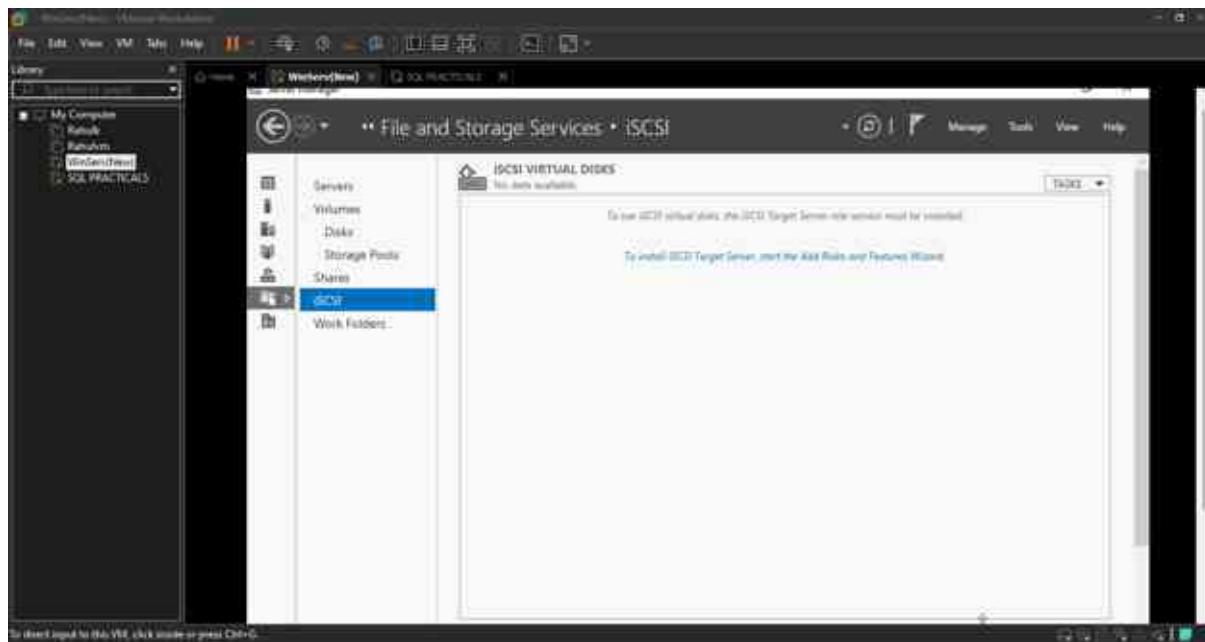
- After the Installation of DPM Click on Close



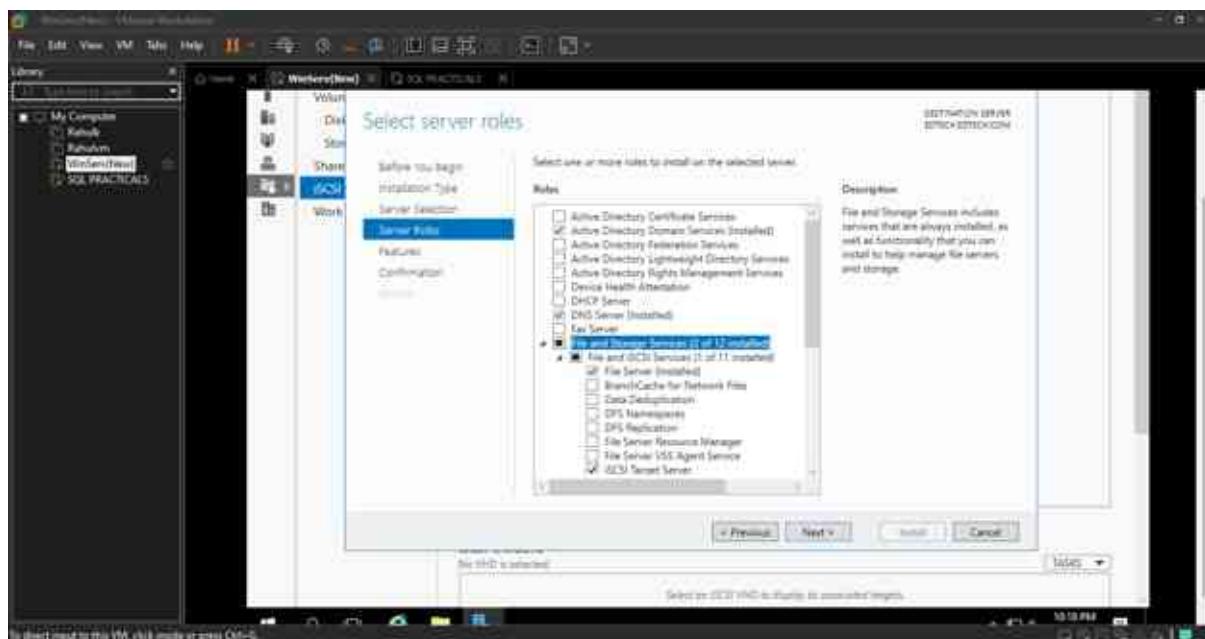
Step 7: Creating and initializing iSCSI Disk Storage

The following steps have to be executed in the Domain Controller:

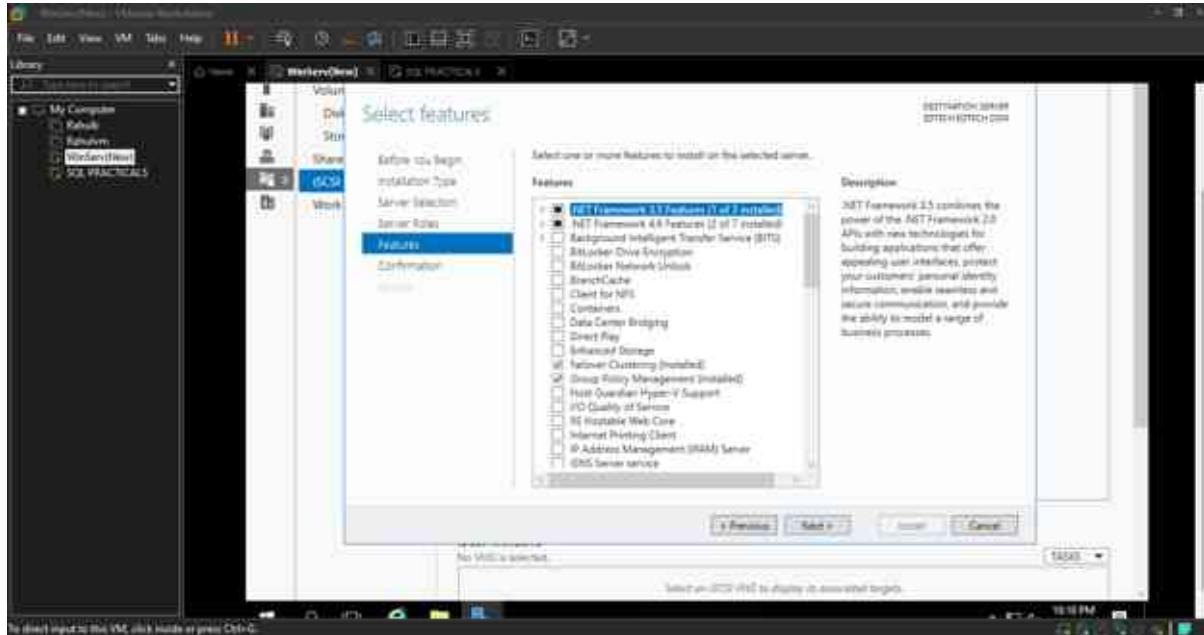
- Open Server Manager and Click on File and Storage Services
- Within File and Storage Services Click on iSCSI and Click on To install iSCSI Target Server, Start the Add Roles and Features Wizard



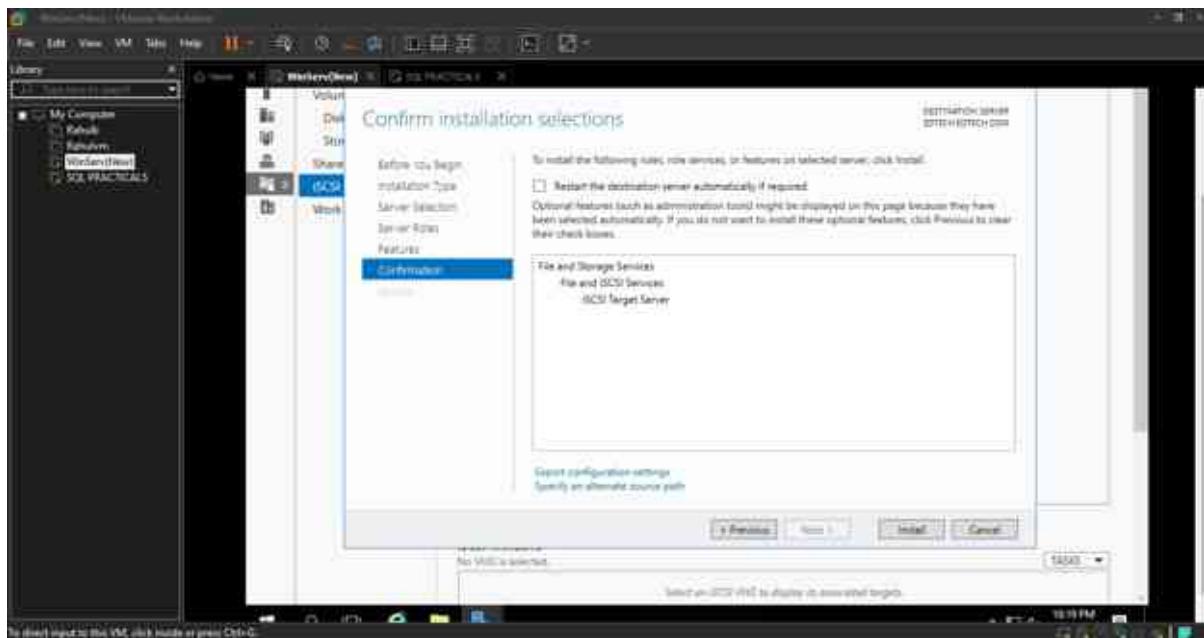
- Select the following feature and Click on Next



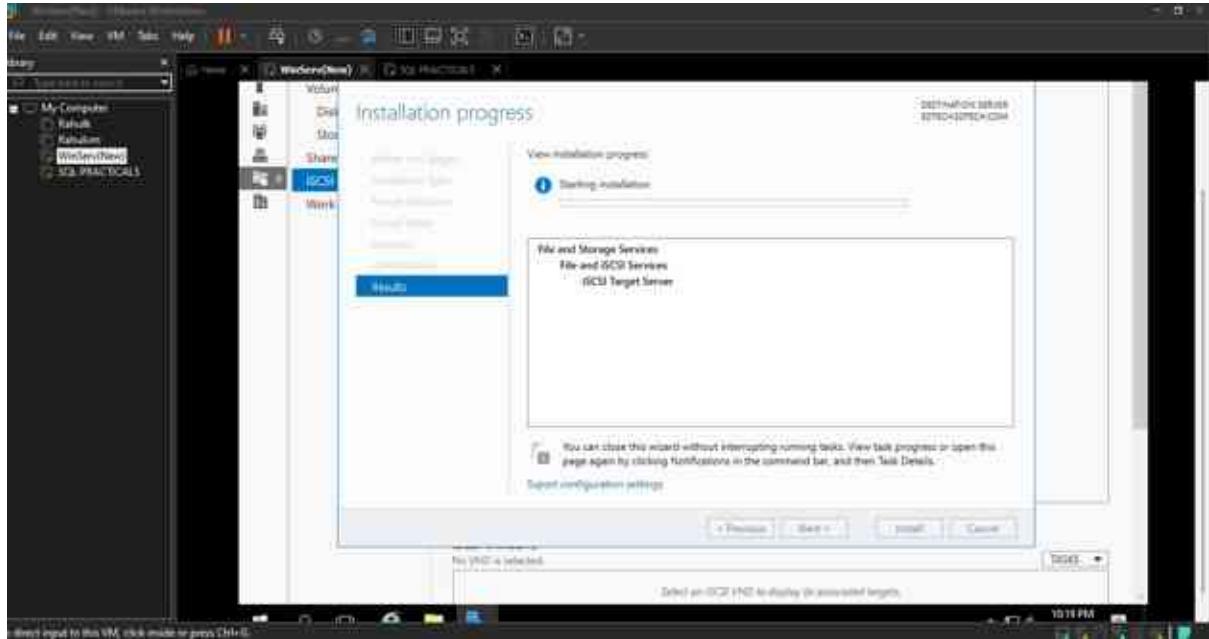
- Select the following feature and Click on Next



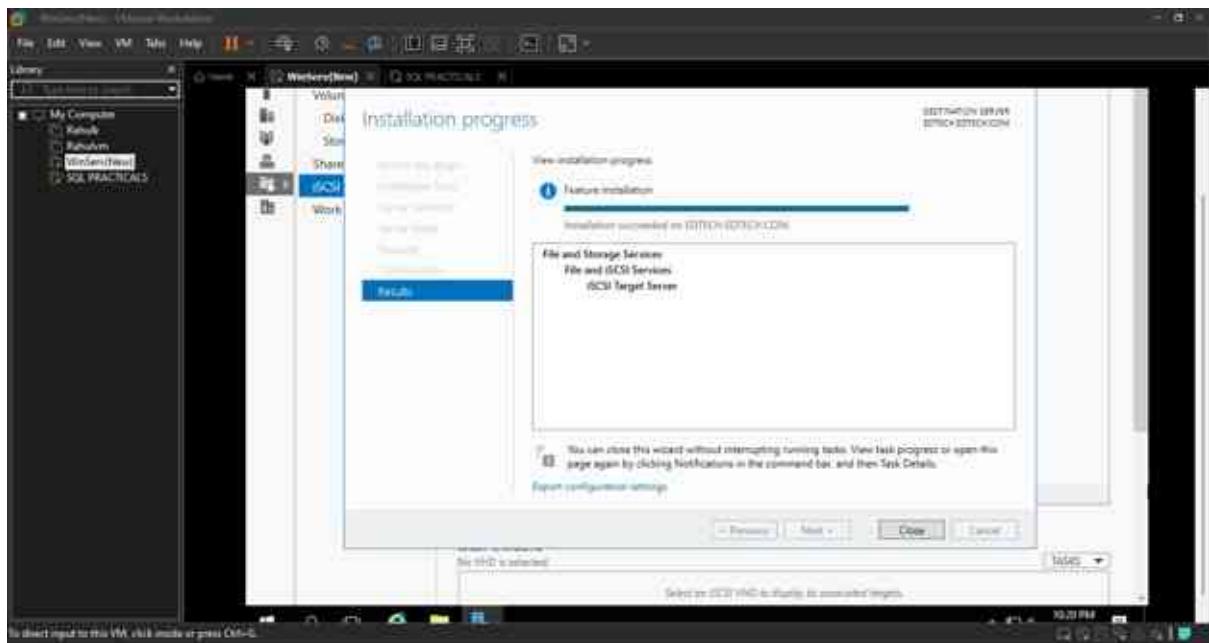
- Click on Install



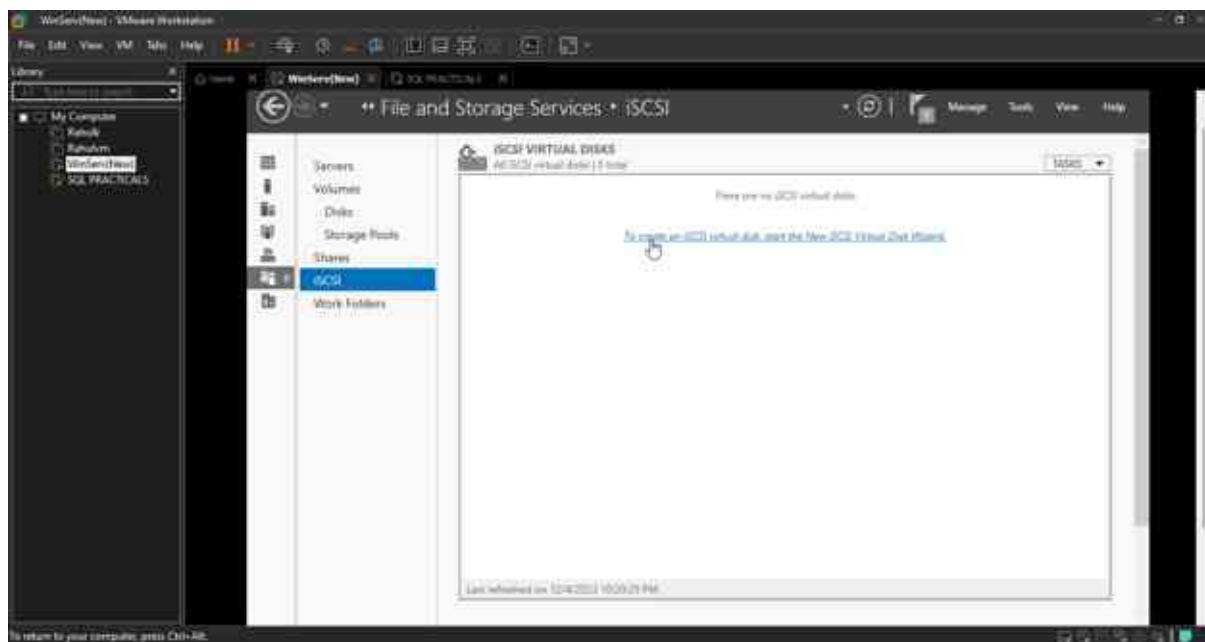
- Starting Installation



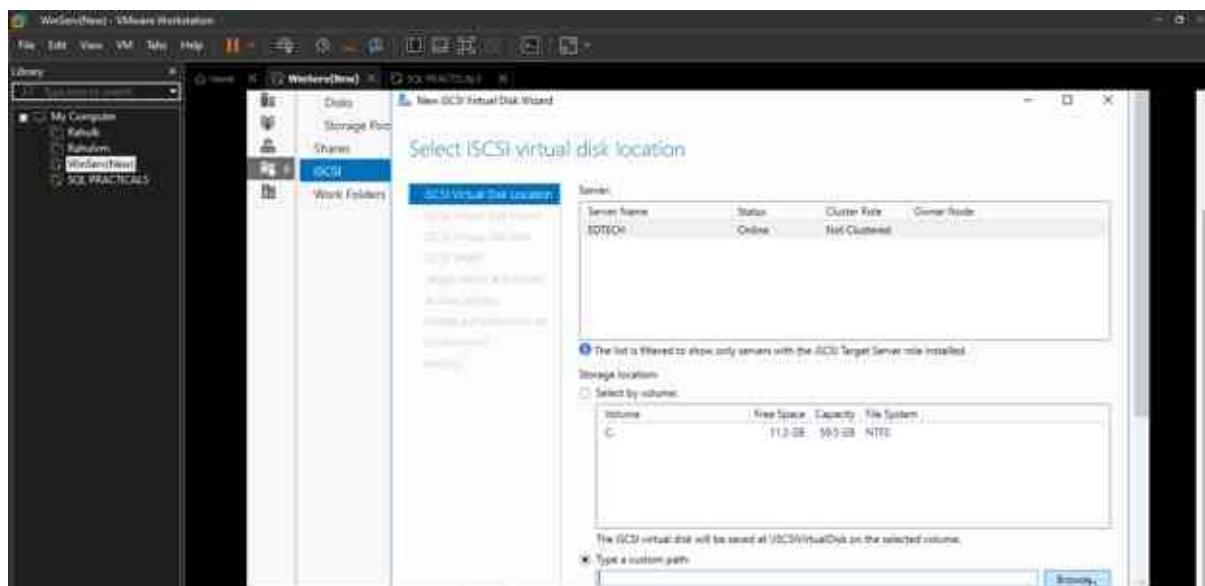
- After the Installation Click on Close



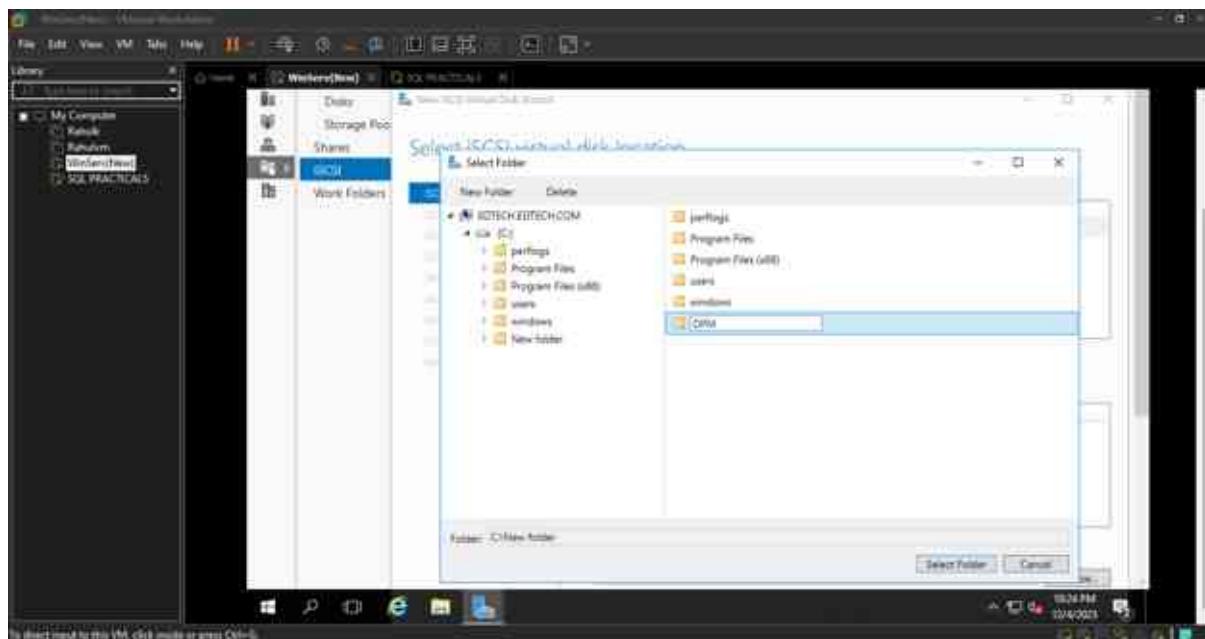
- Click on To create an iSCSI virtual disk, start the New iSCSI Virtual Disk Wizard



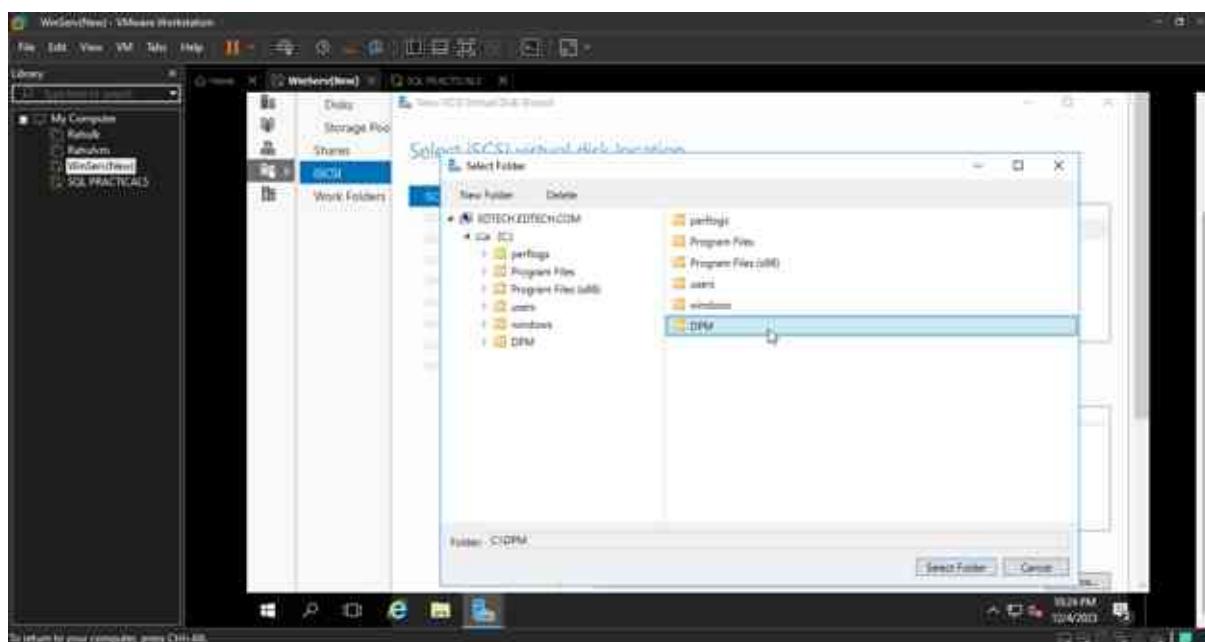
- Select Type a Custom path and Click on Browse



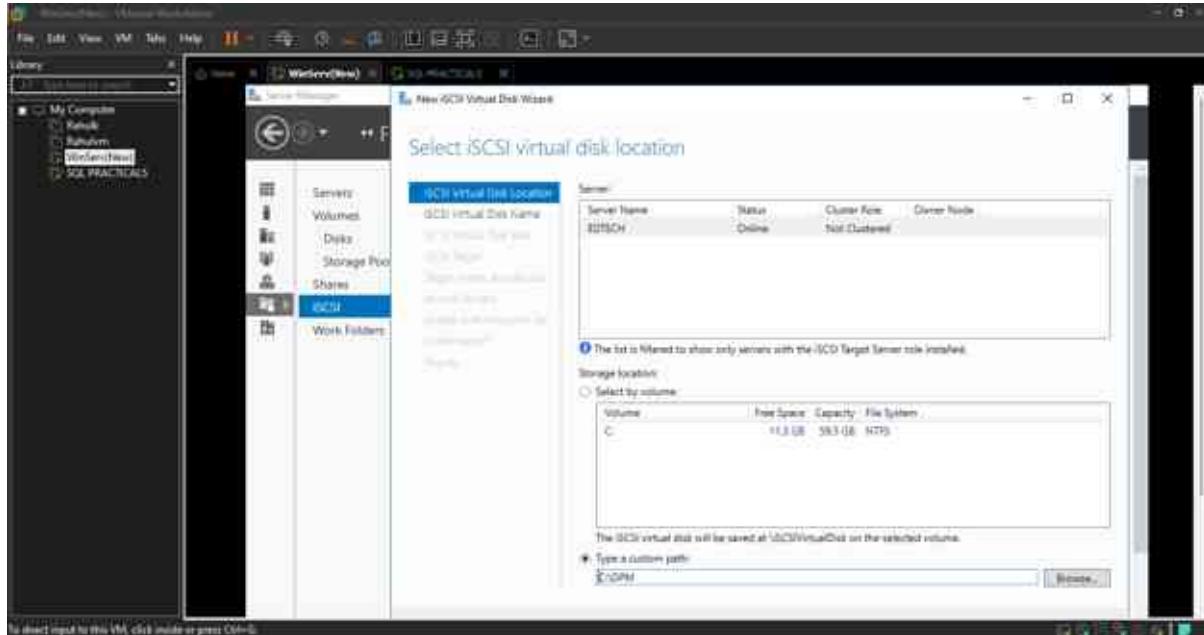
- Create New Folder and Give Name DPM



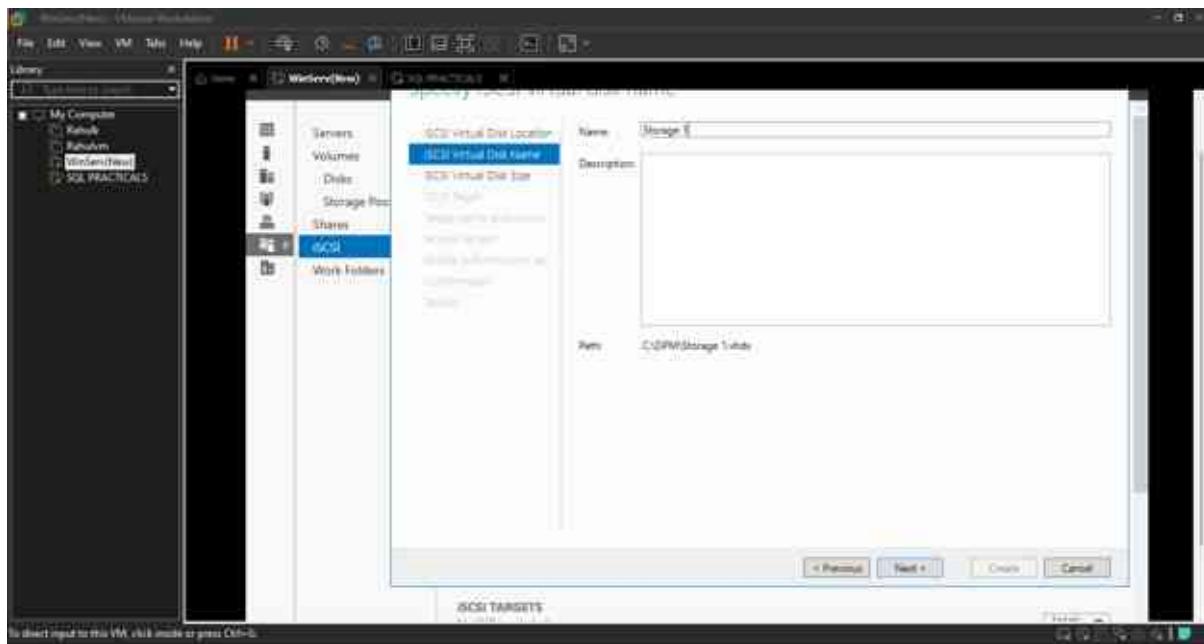
- Select DPM Folder



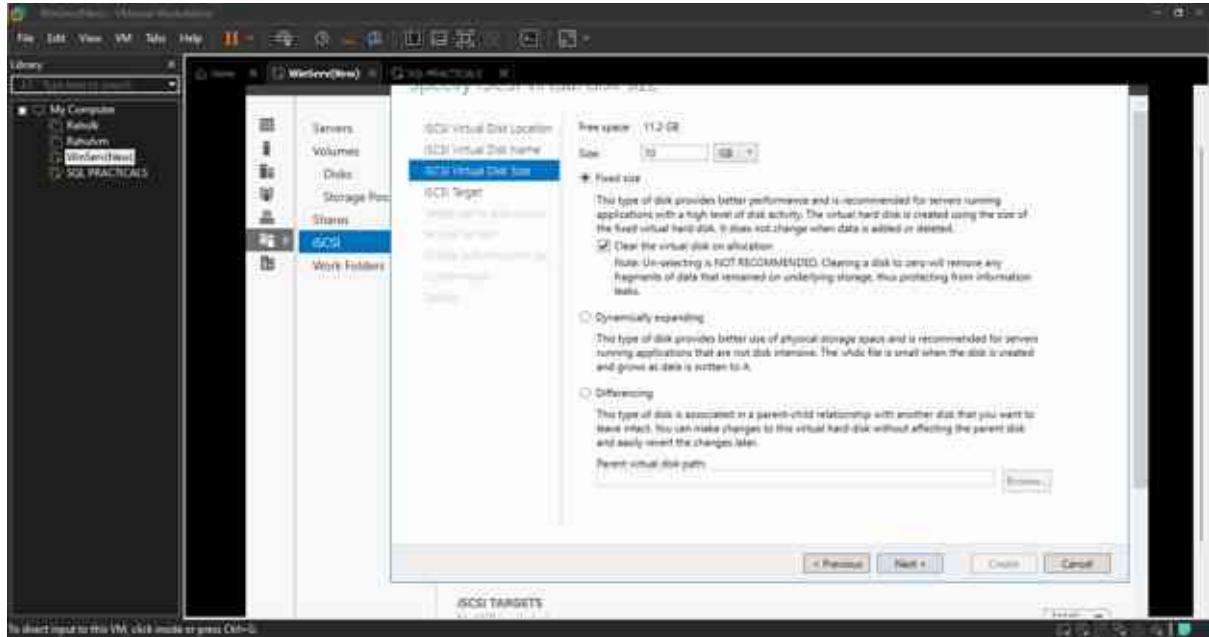
- Click on Next



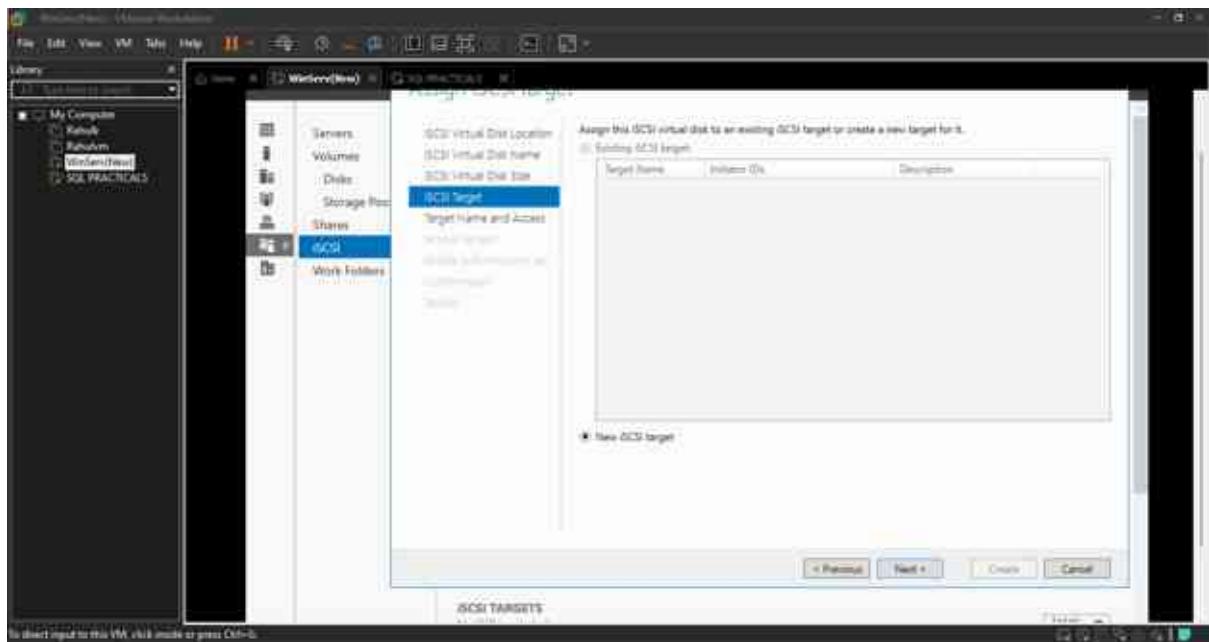
- Give iSCSI Virtual Disk Name (Here it is Storage 1) and Click on Next



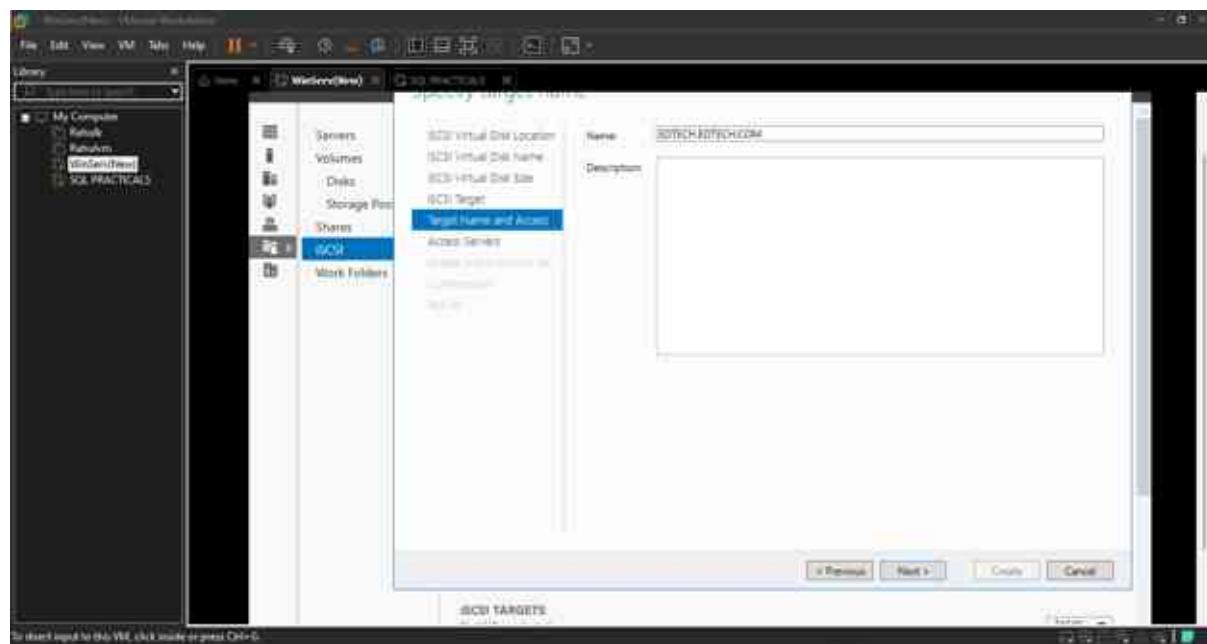
- Give iSCSI Virtual Disk Size: 10 GB and Select Fixed size and Click on Next



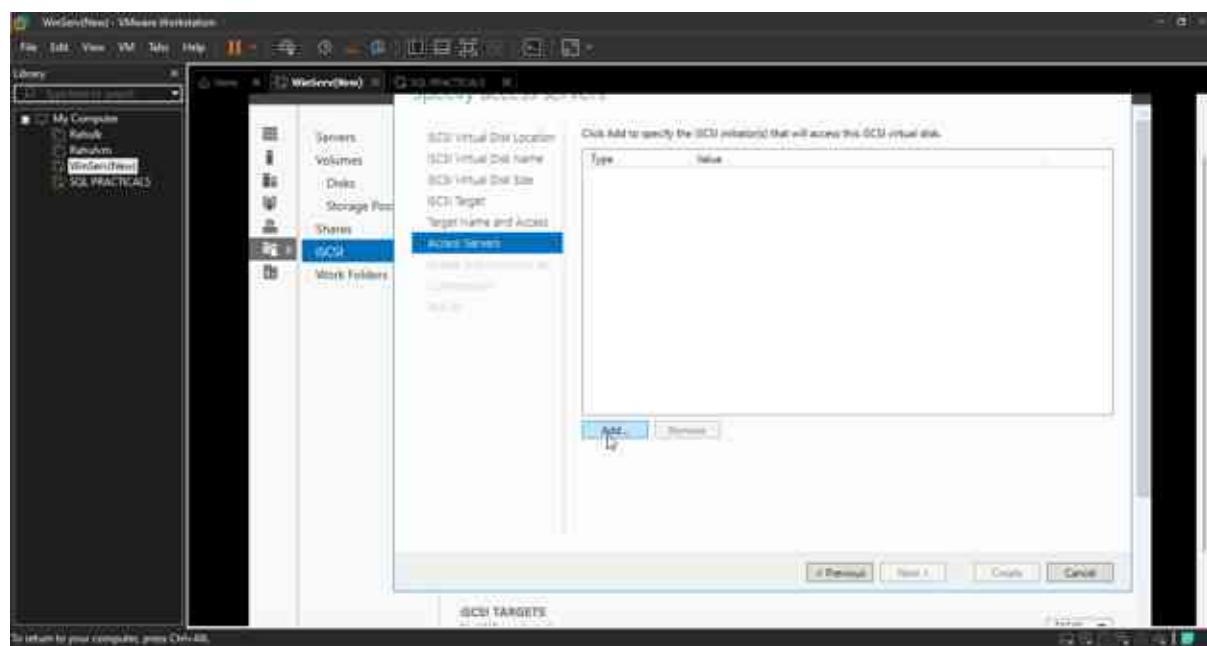
- Select New iSCSI target and Click on Next



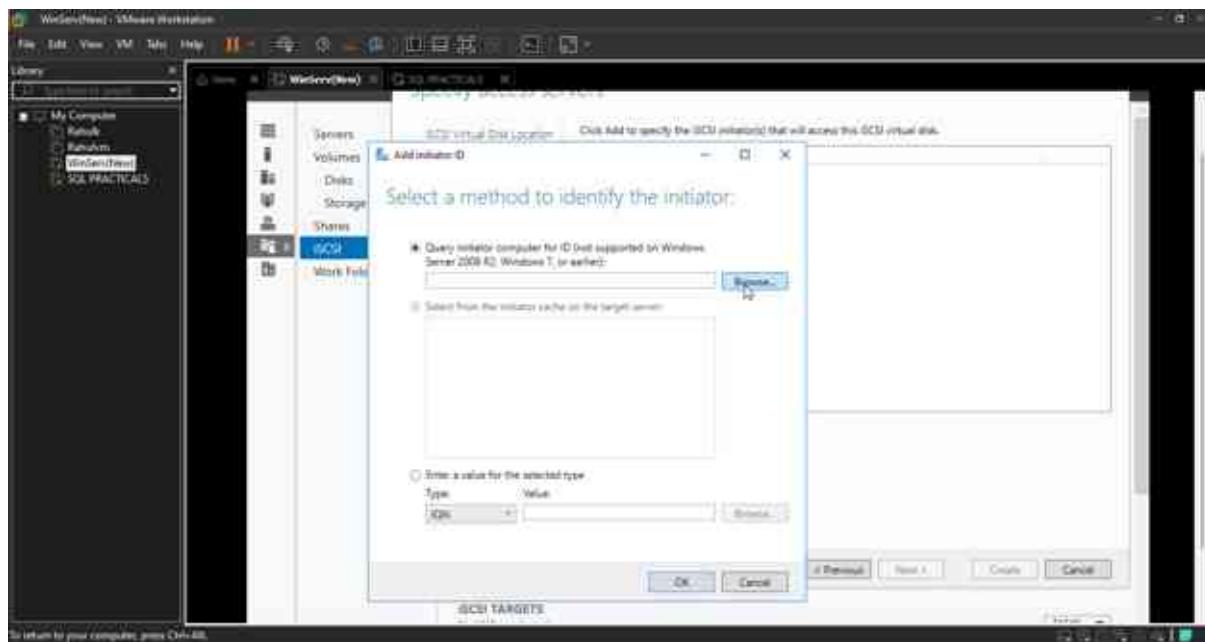
- Enter Target Name and Access (Here it is EDTECH.EDTECH.COM) and Click on Next



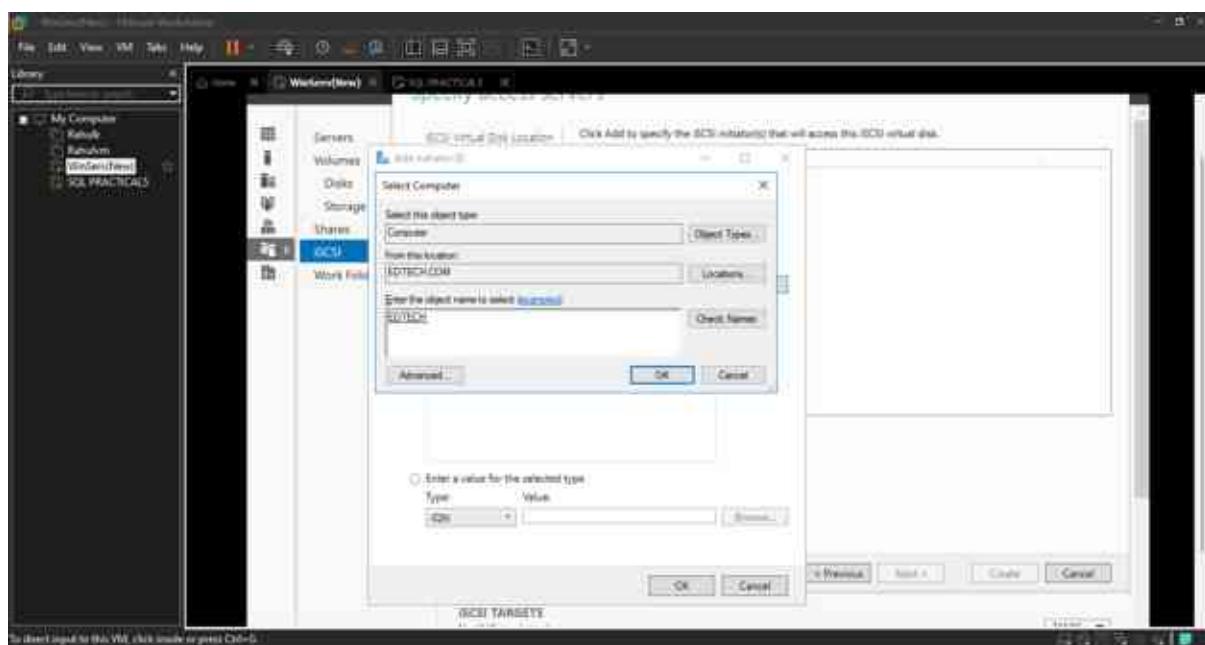
- In Access Server Click on Add



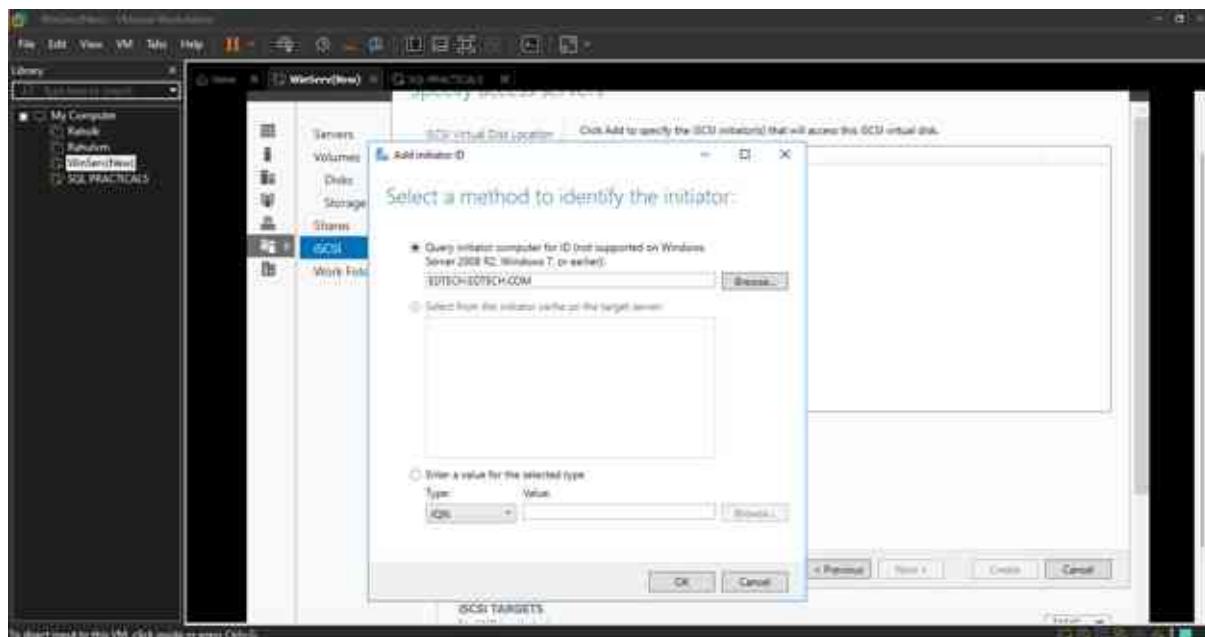
- Click on Browse



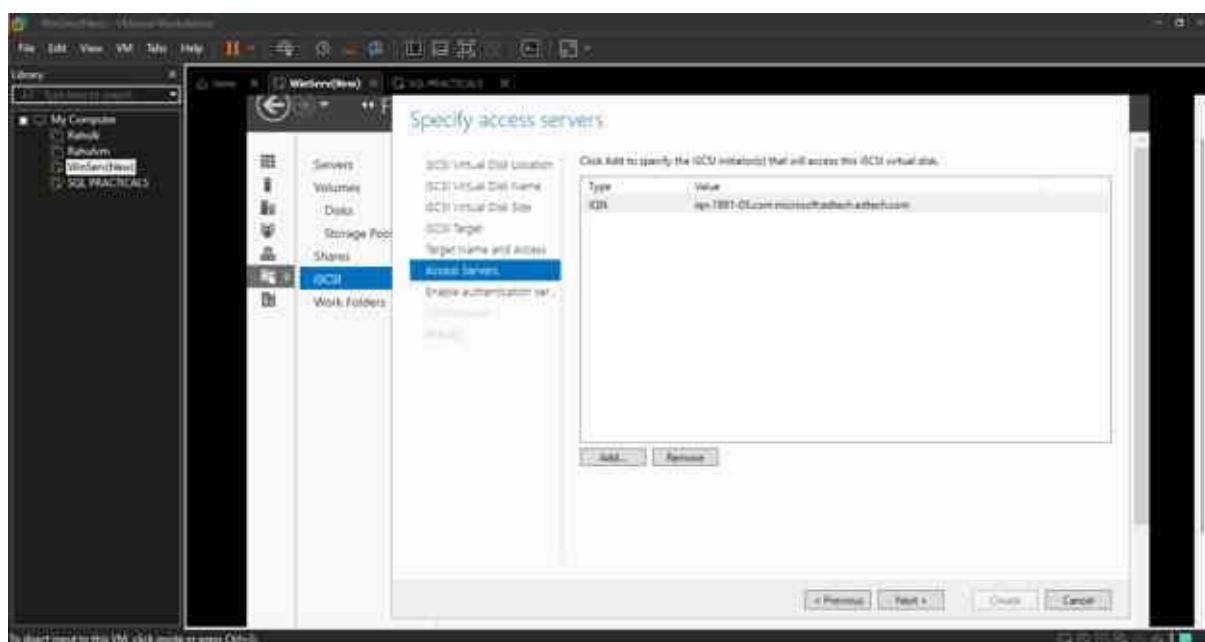
- Type EDTECH and Click on Check Names and Click on OK



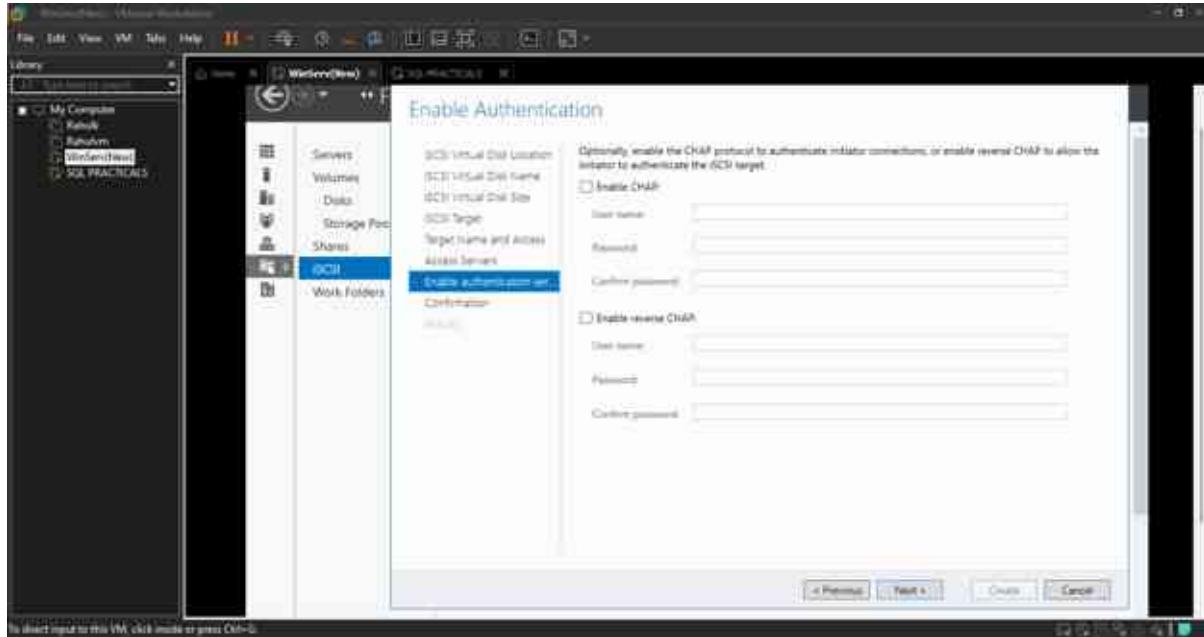
- Click on OK



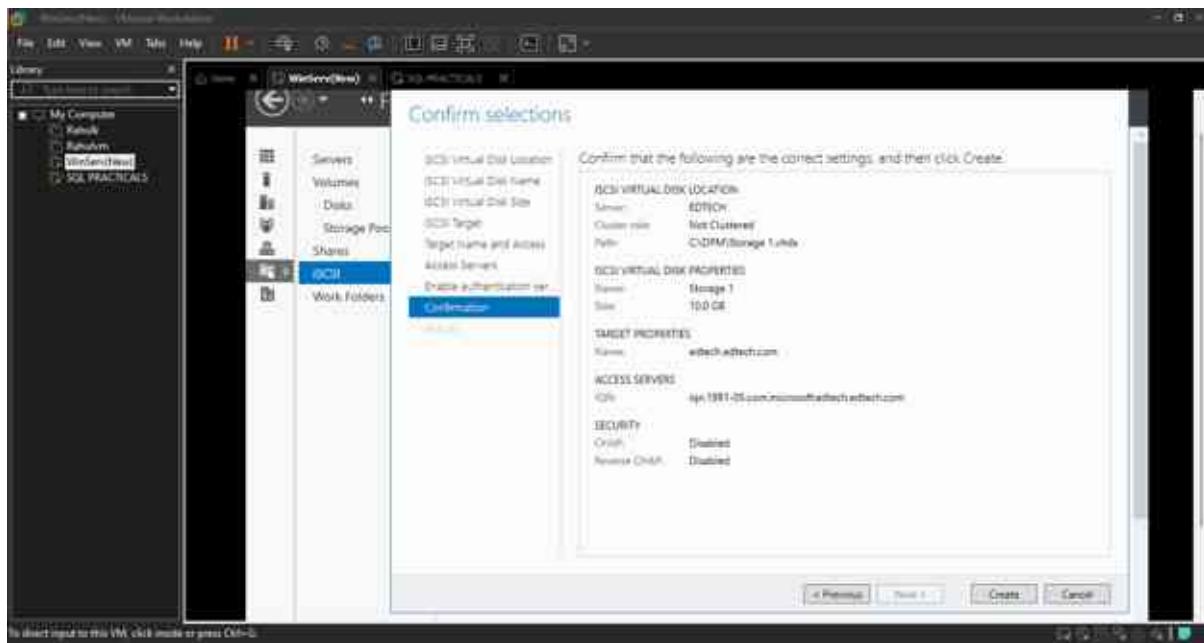
- Click on Next



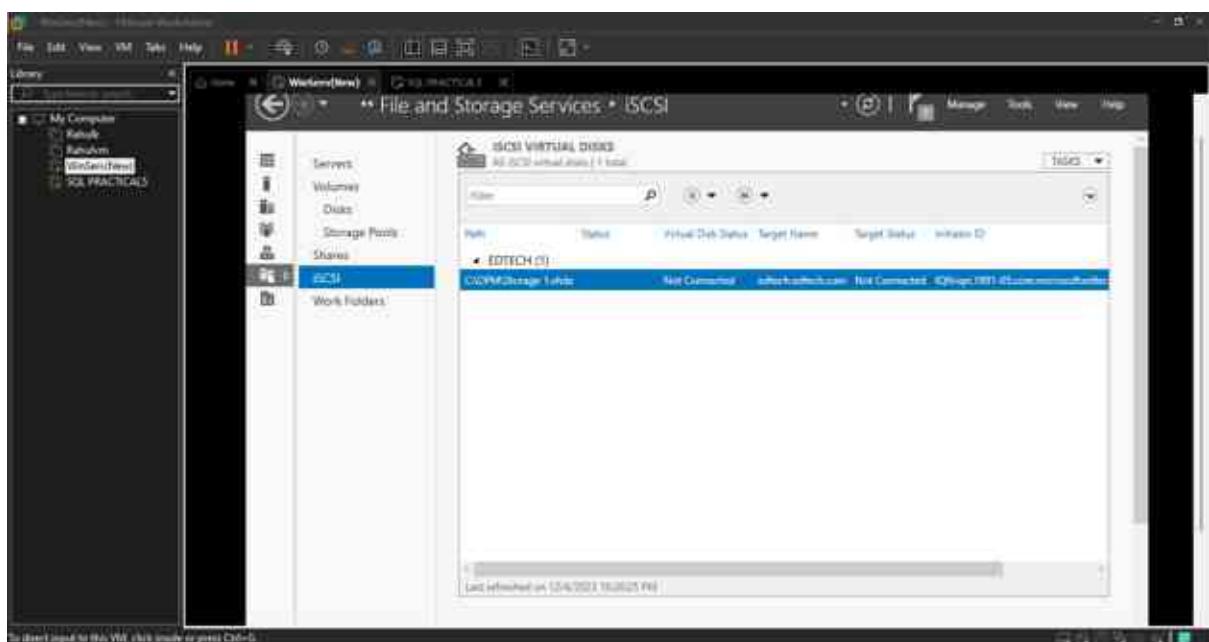
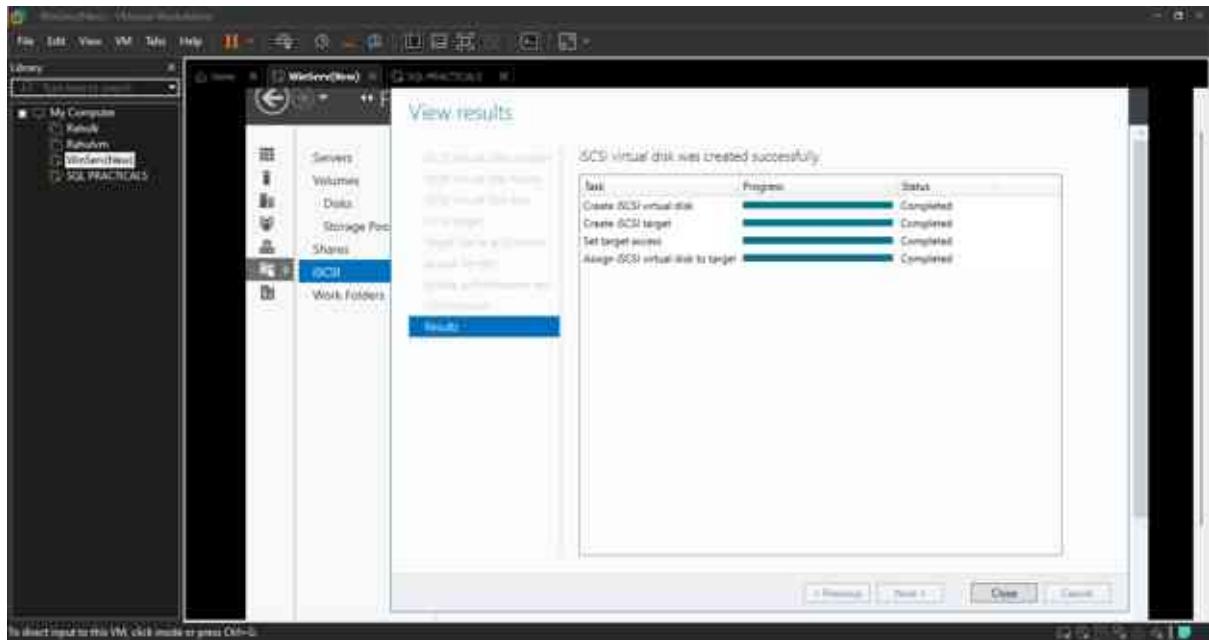
- Keep Default Setting and Click on Next



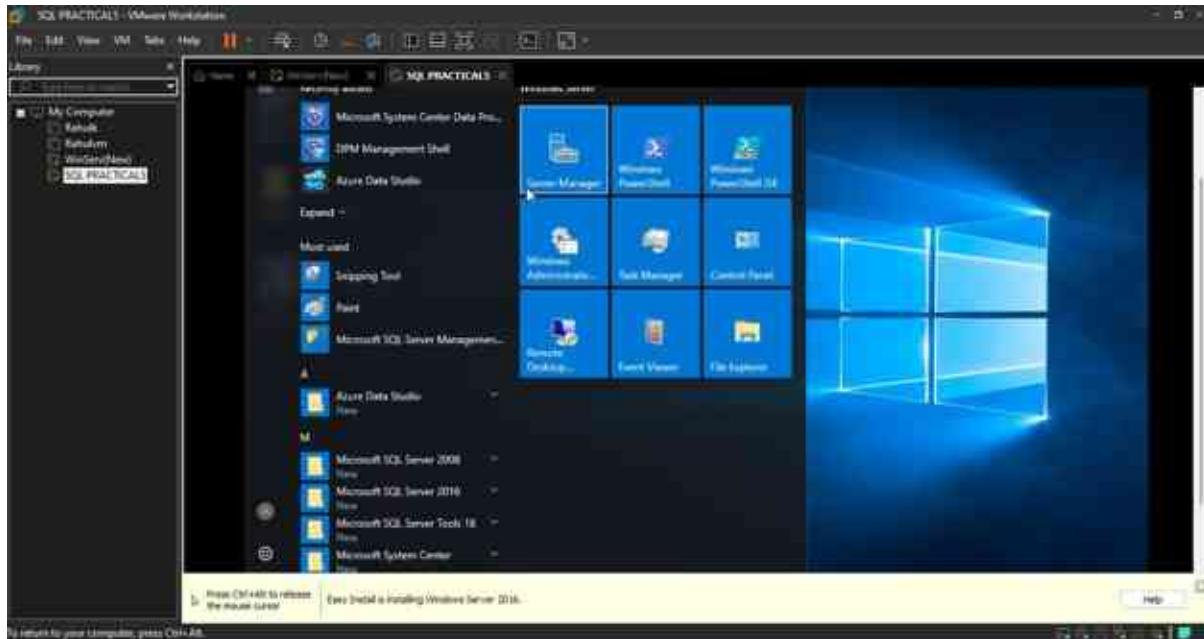
- Click on Create



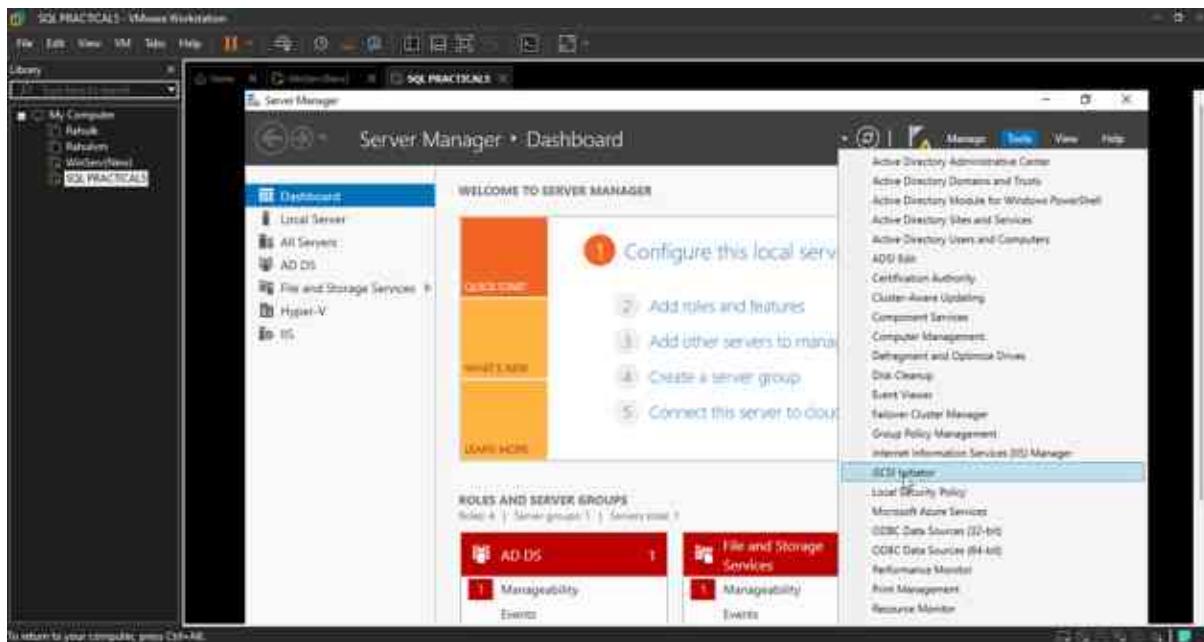
- After iSCSI virtual disk created **Click on Close**



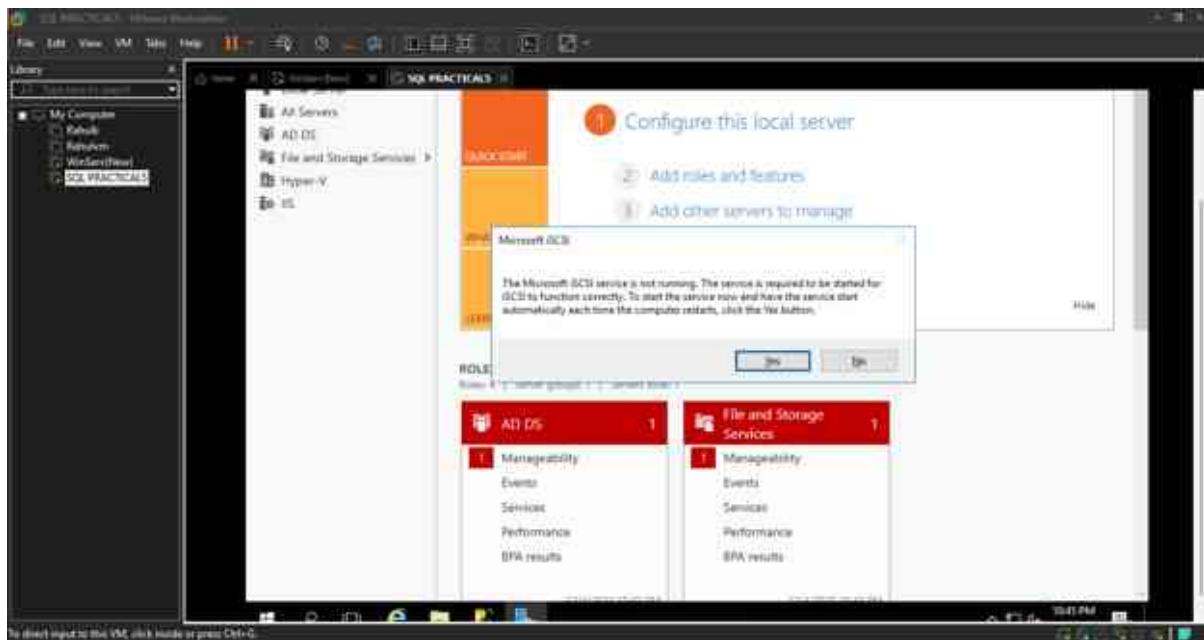
- **Note:** The following steps are for the SCDPM VM instance, where we will initialize the iSCSI instance created in the domain controller. Ensure that both VM are running
- Open Server Manager



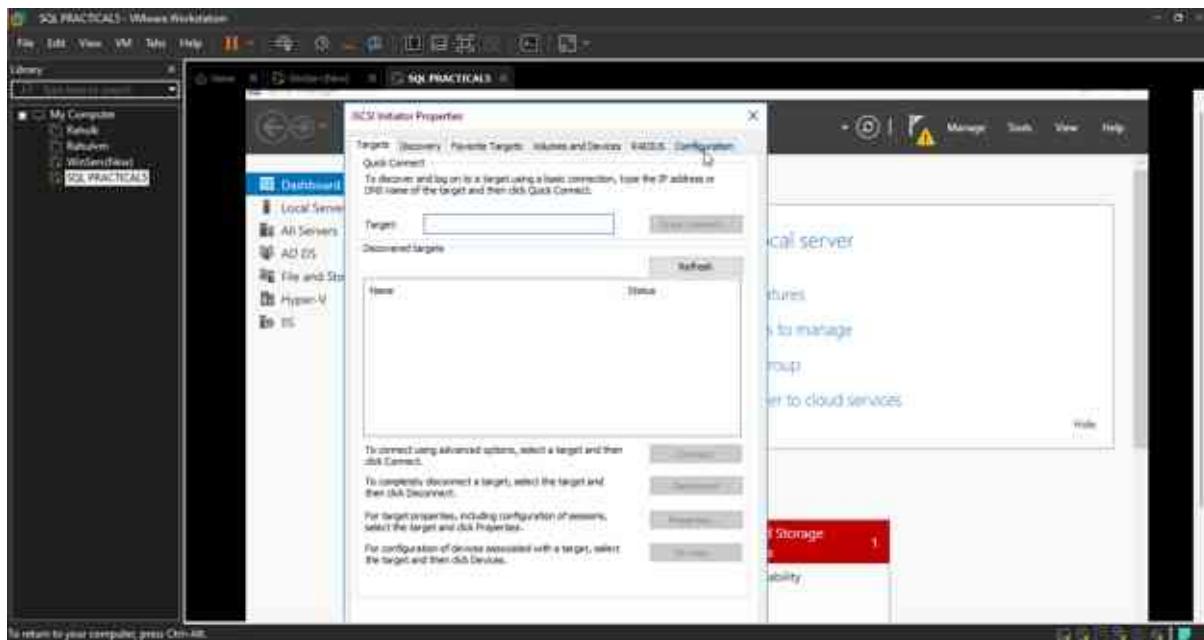
- Within Server Manager Click on Tools and Select iSCSI Initiator



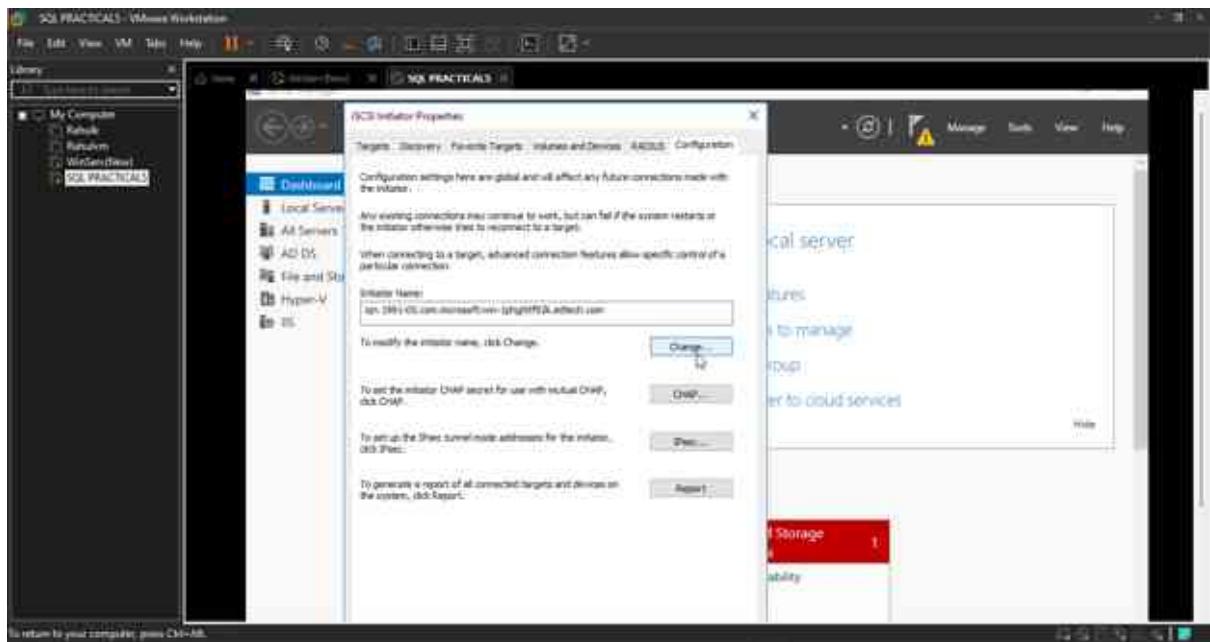
- Click on Yes



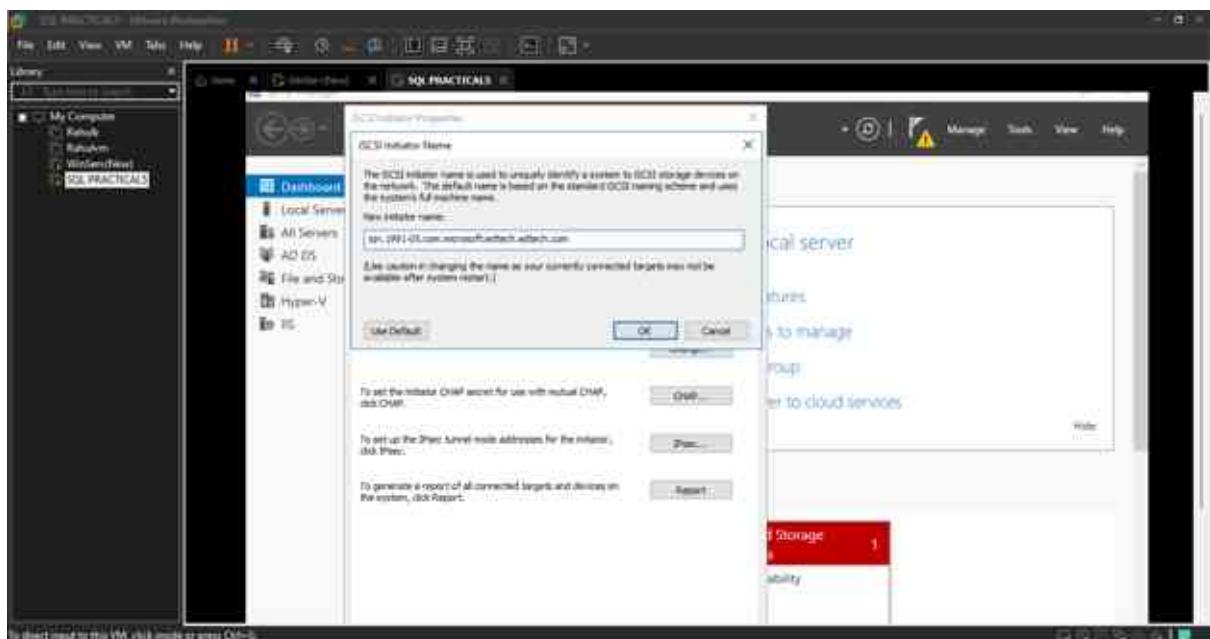
- Within iSCSI Initiator Click on Configuration



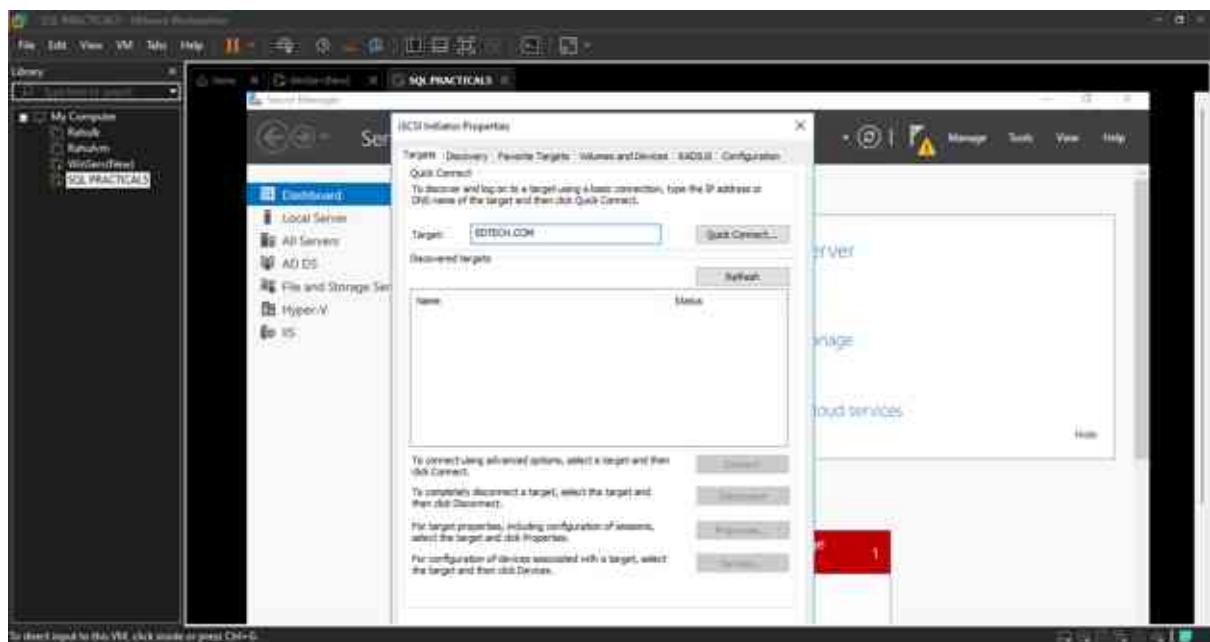
- Click on Change



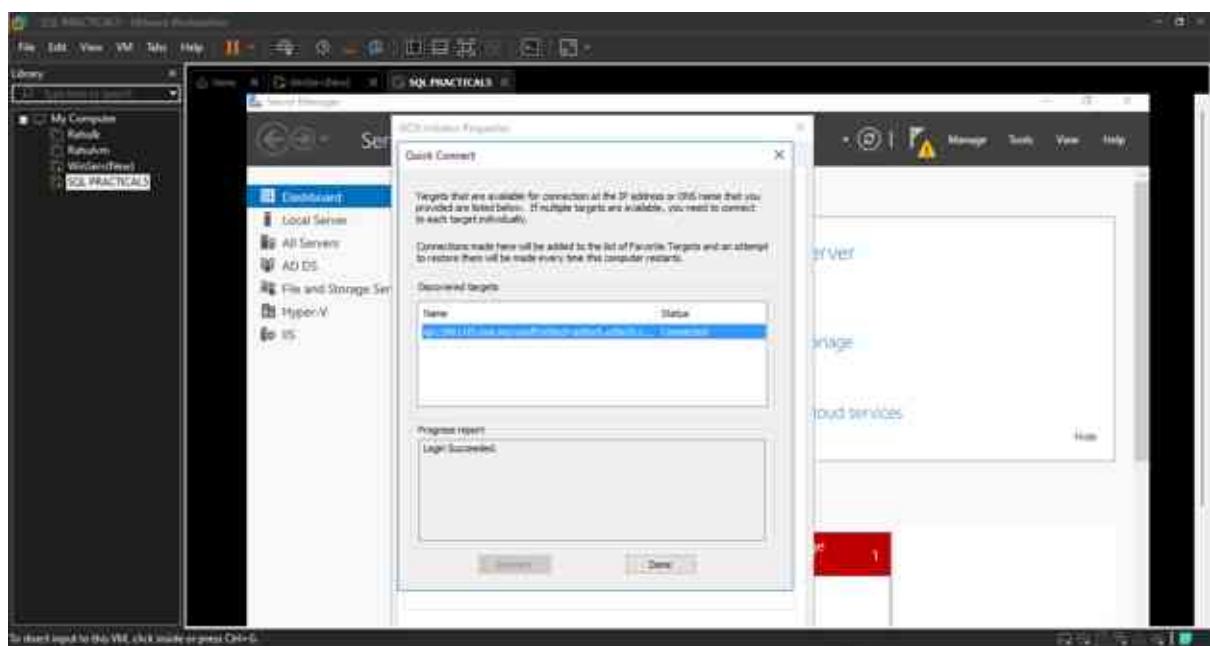
- After Click on Change and paste IQN value from the Domain Controller and Click Ok



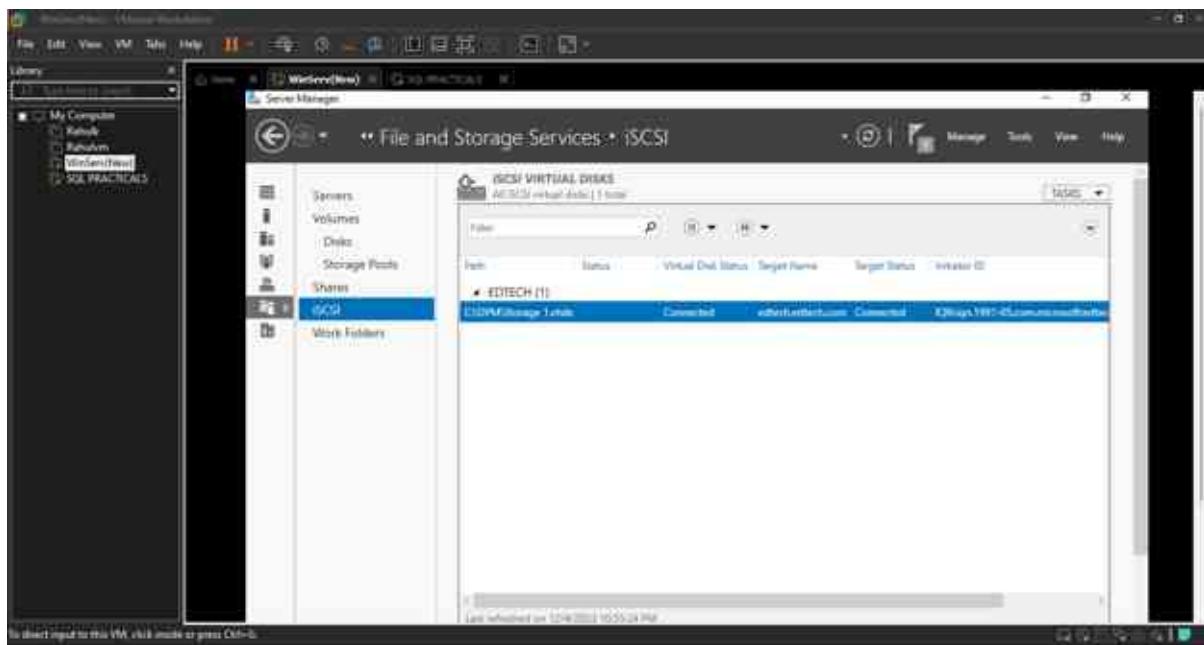
- Now Click on Targets and Enter the Target Name (Here it is EDTECH.COM) Domain Controller and Click on Quick Connect



- It show Login Succeeded.

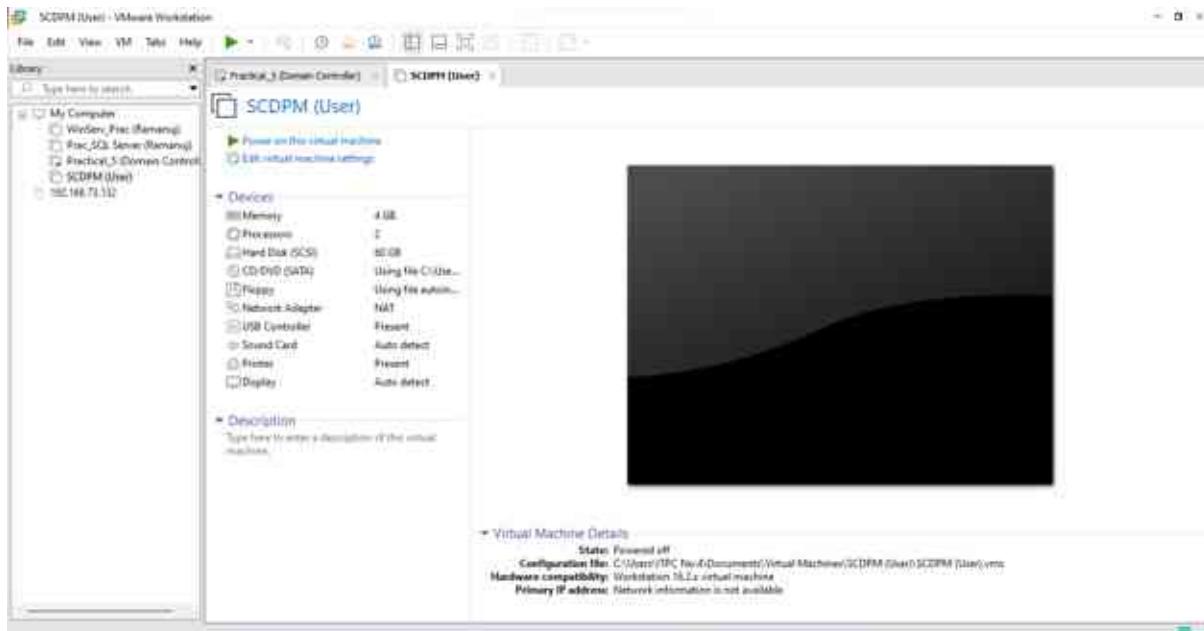


- Confirm the connection on the iSCSI Server on the Domain Controller
- It Show Virtual Disk Target Connected.

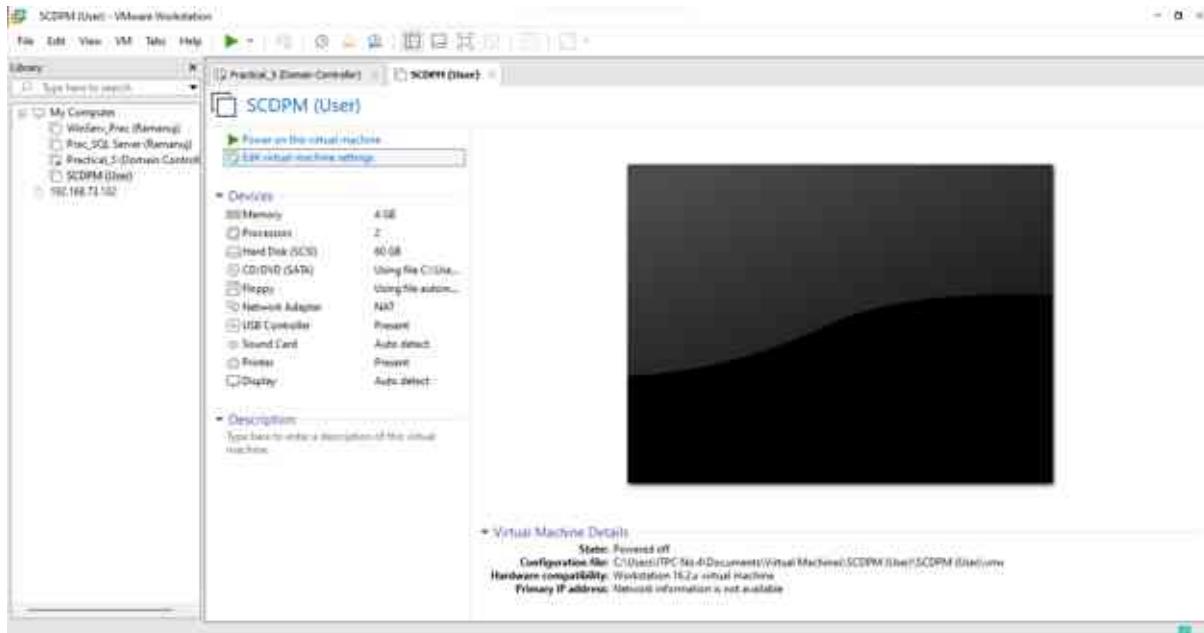


Step 8: Creating Disk Storage in SCDPM

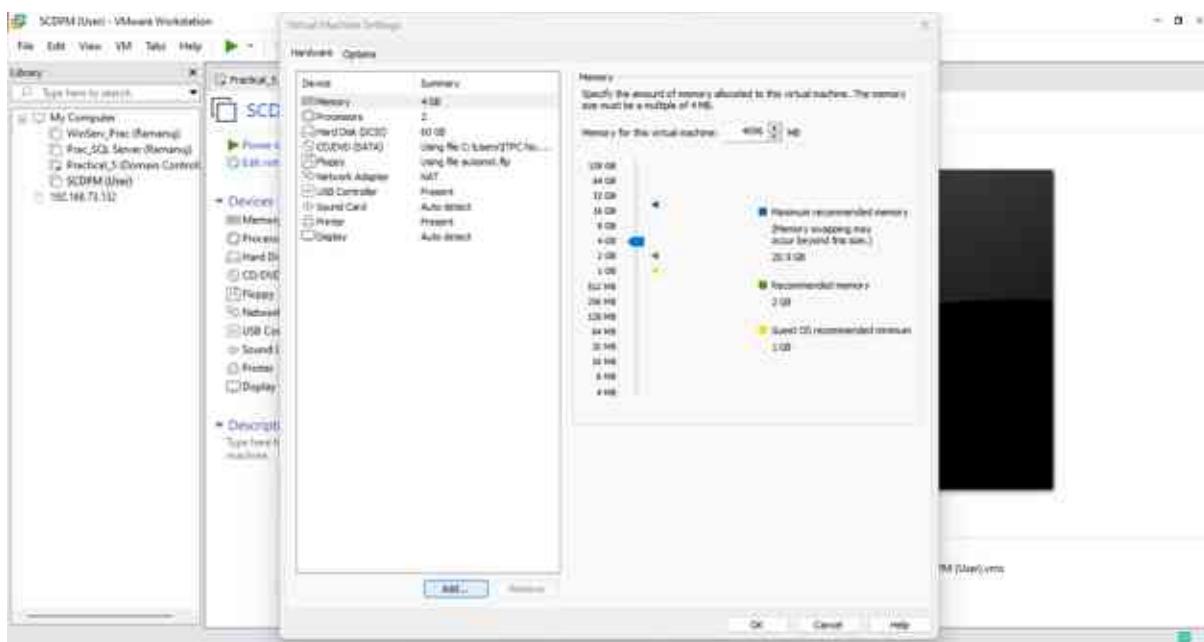
- There are a few modification that need to be made to the SCDPM VM
- Shutdown the VM



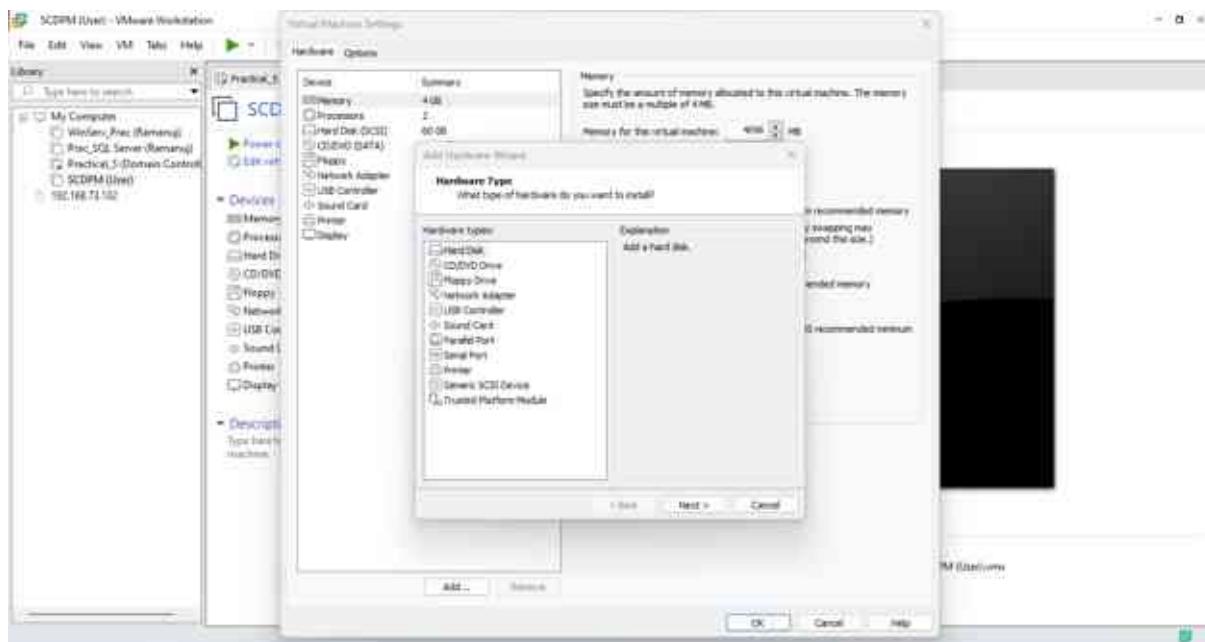
- Click on Edit virtual machine settings



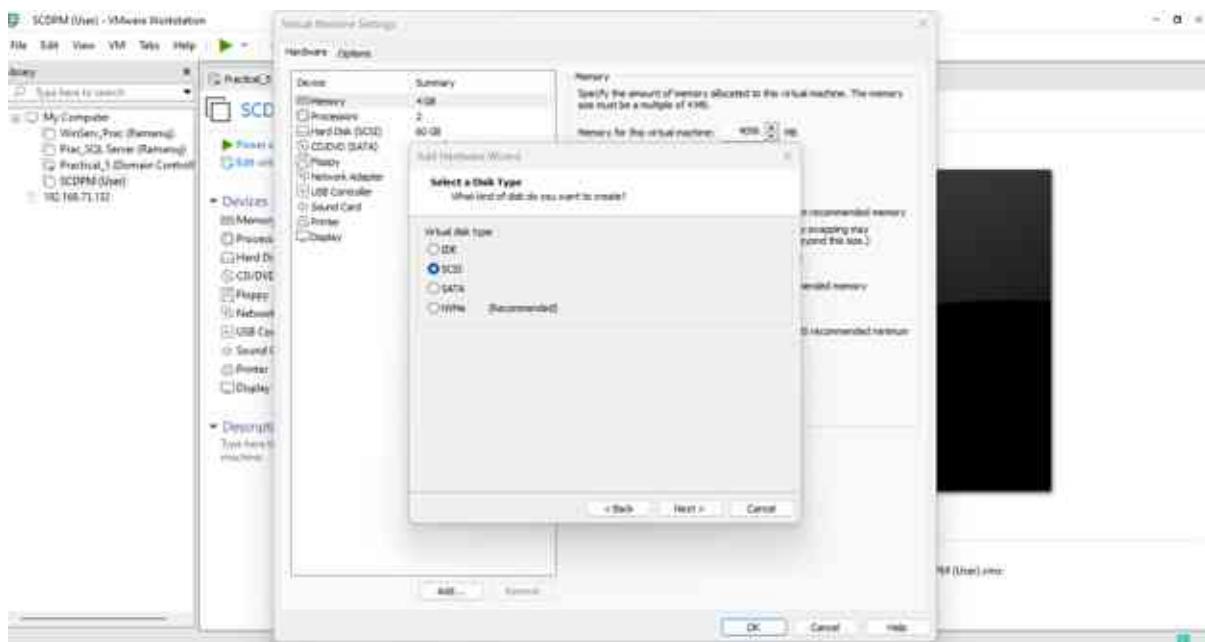
- Now within Edit virtual machine settings Click on Add



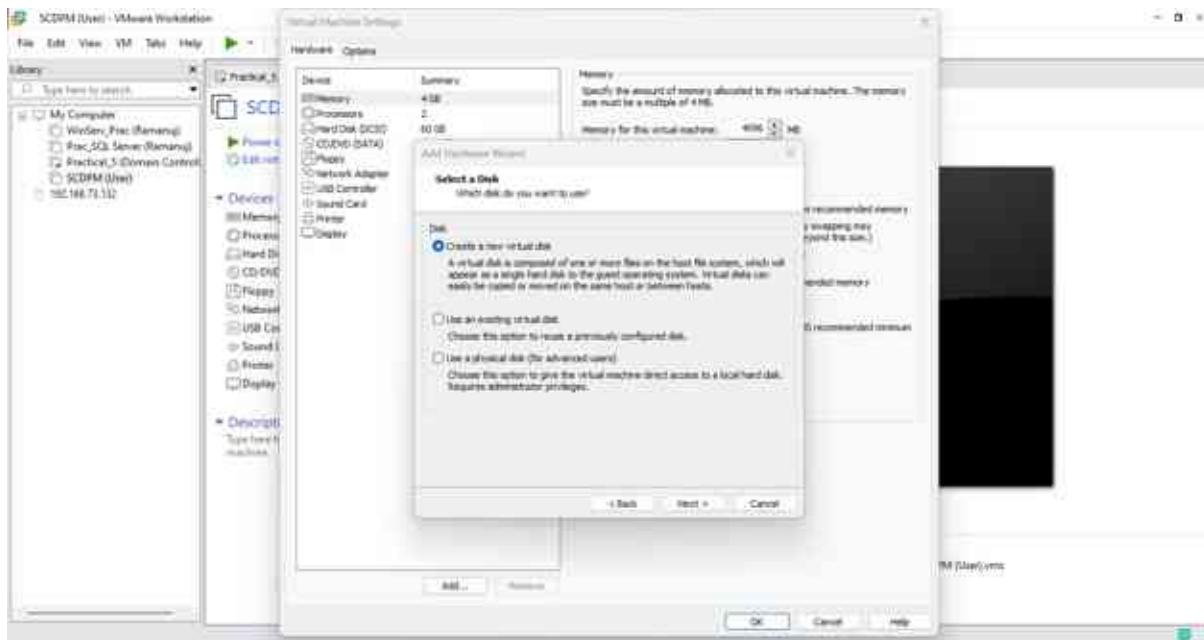
- Select Hard Disk and Click Next



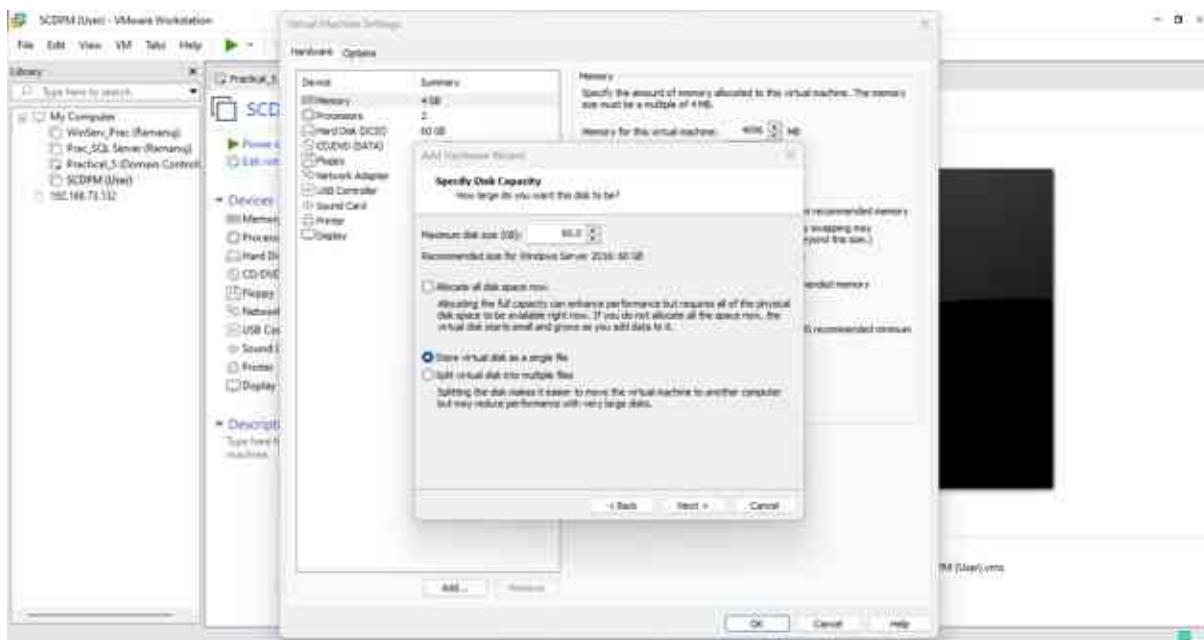
- Select SCSI and Click Next



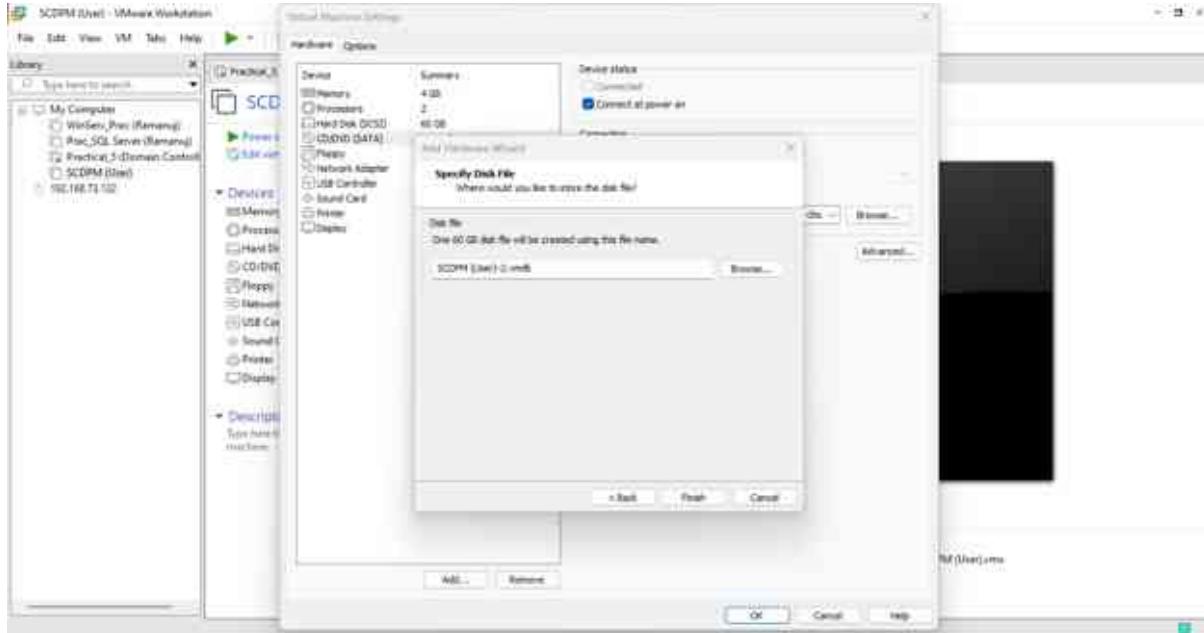
- Keep default values and Click Next



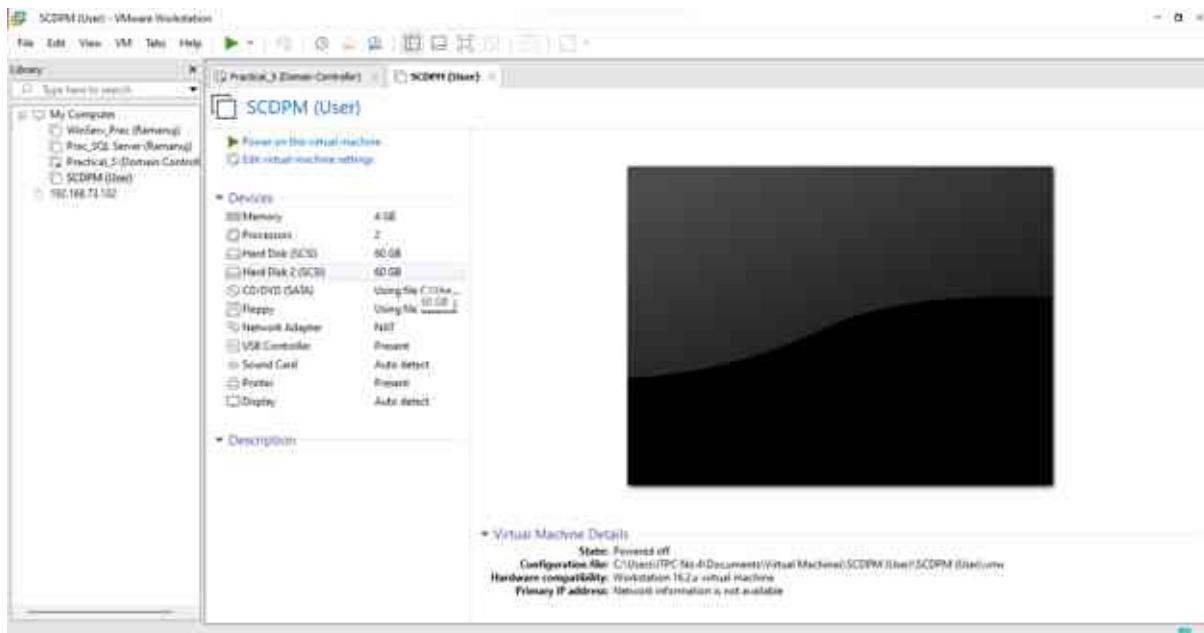
- Select Store virtual disk as a single file and Click Next



- Click on Finish

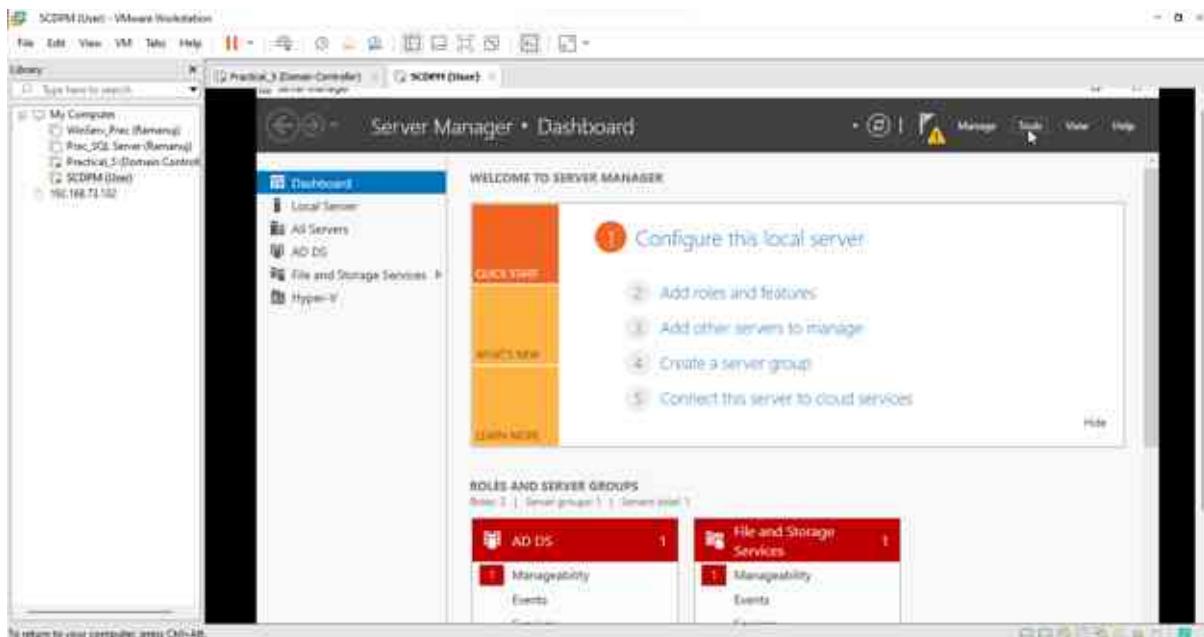


- Click on Ok and Check if the hard is detected by the VM

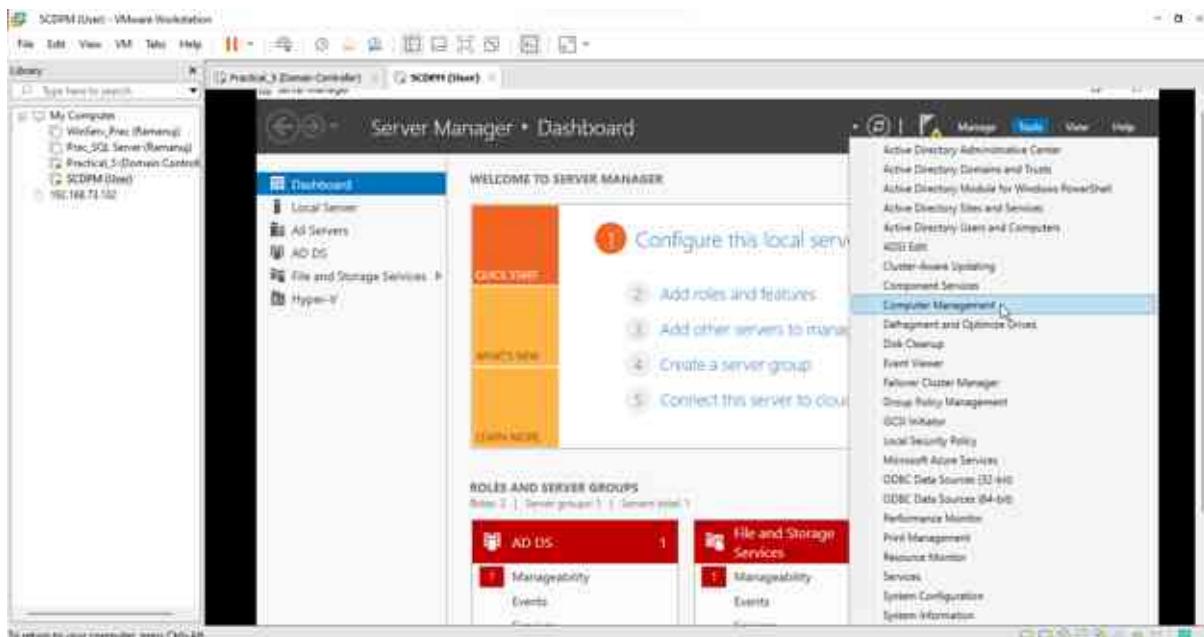


- Now Turn On the VM and Open Server Manager Click on Tools

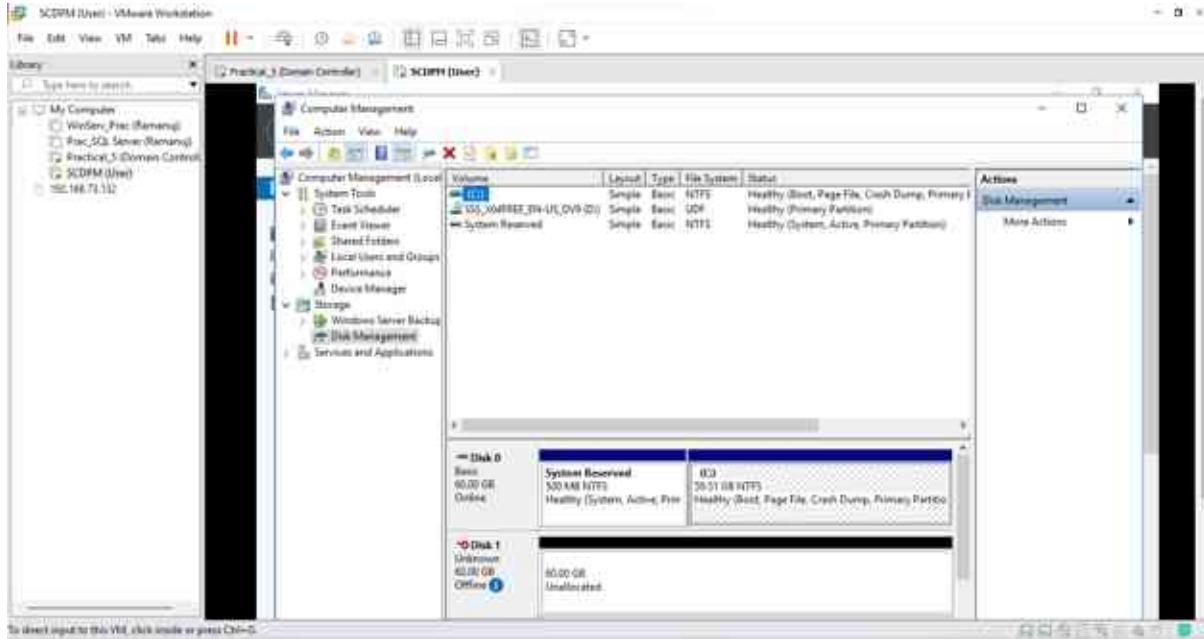
Note: This is to be done in the Administrator and not as SCDPM



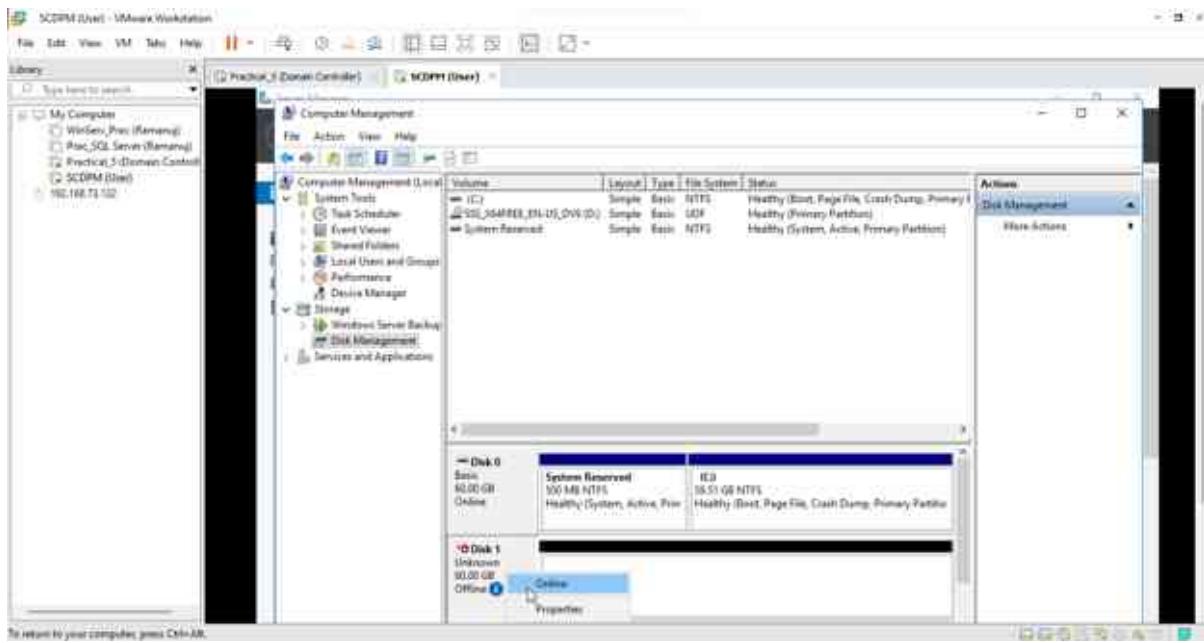
- In Tools Click on Computer Management



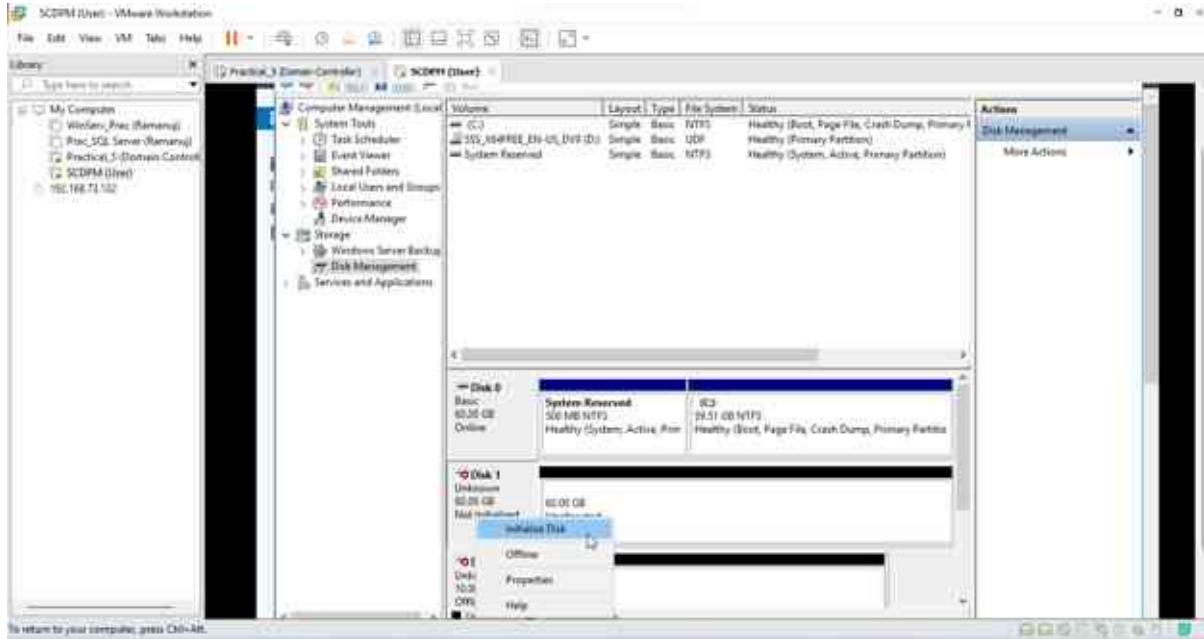
- Click on Disk Management



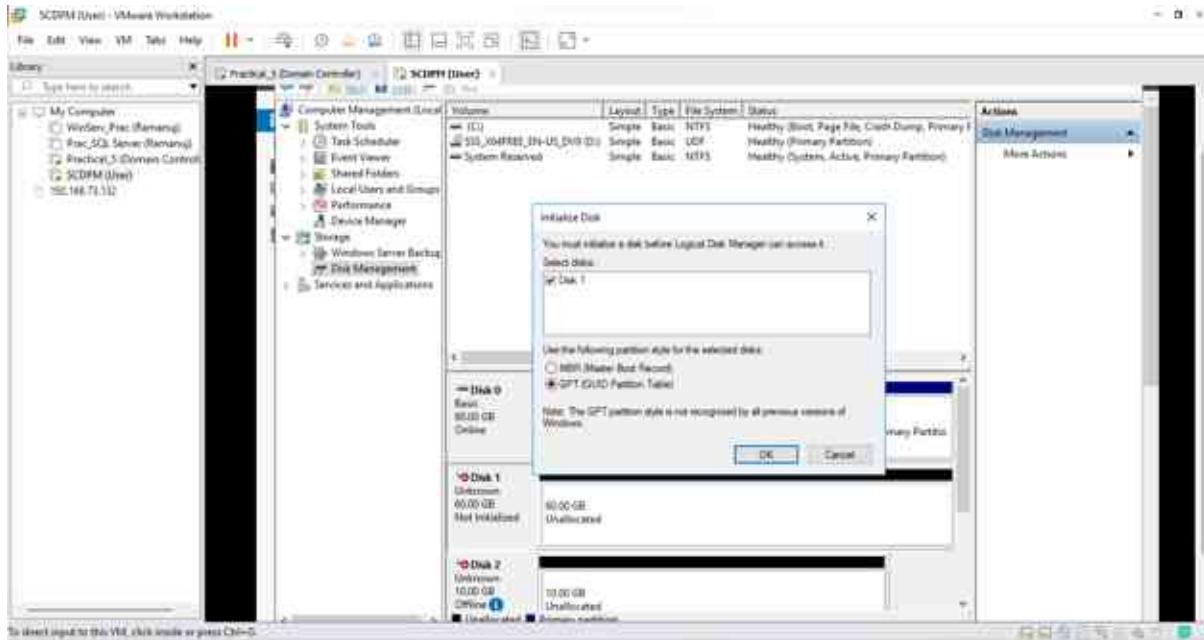
- Right Click on Disk 1 and Select Online



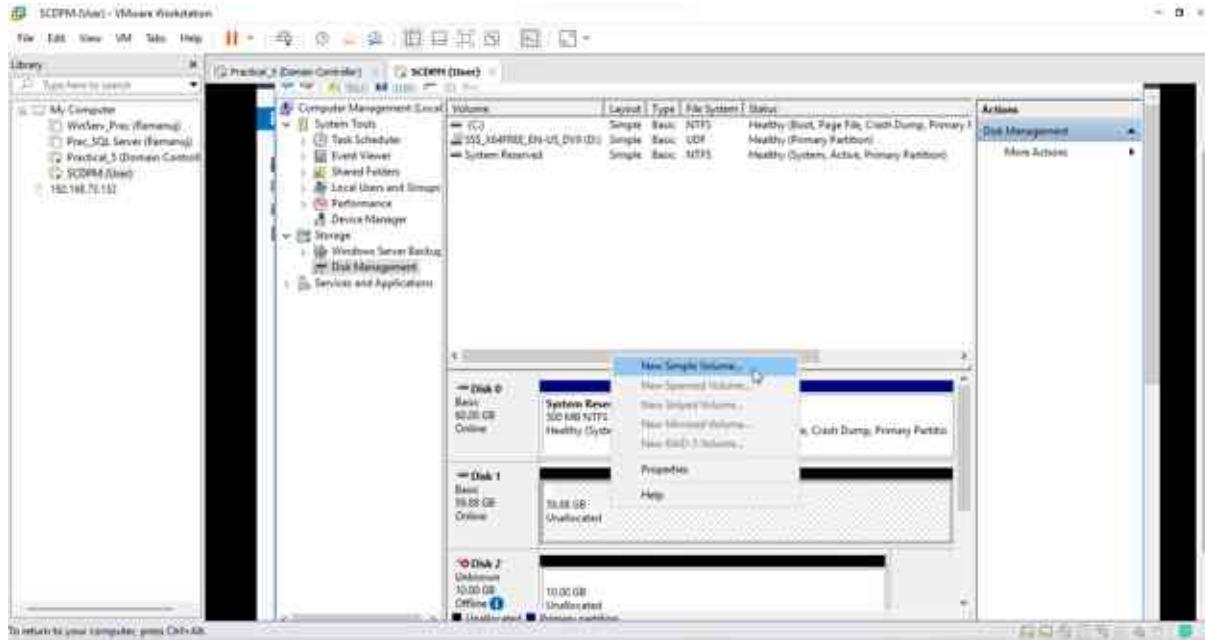
- Again Right Click on Disk 1 and Select Initialise Disk



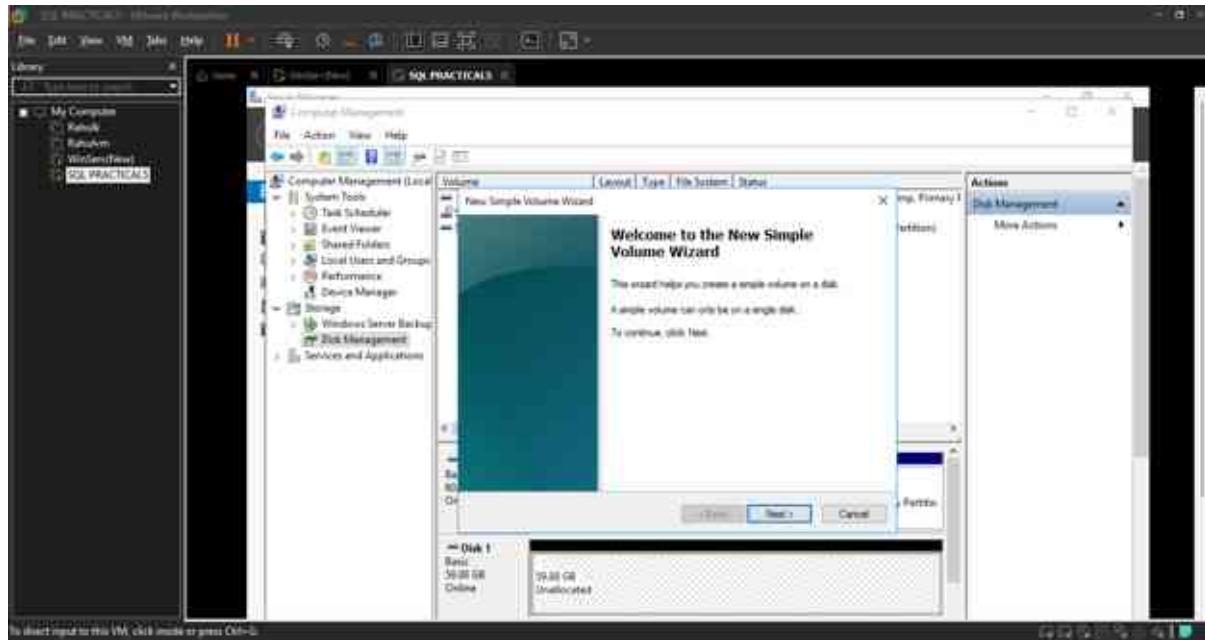
- Select GPT and Click Ok



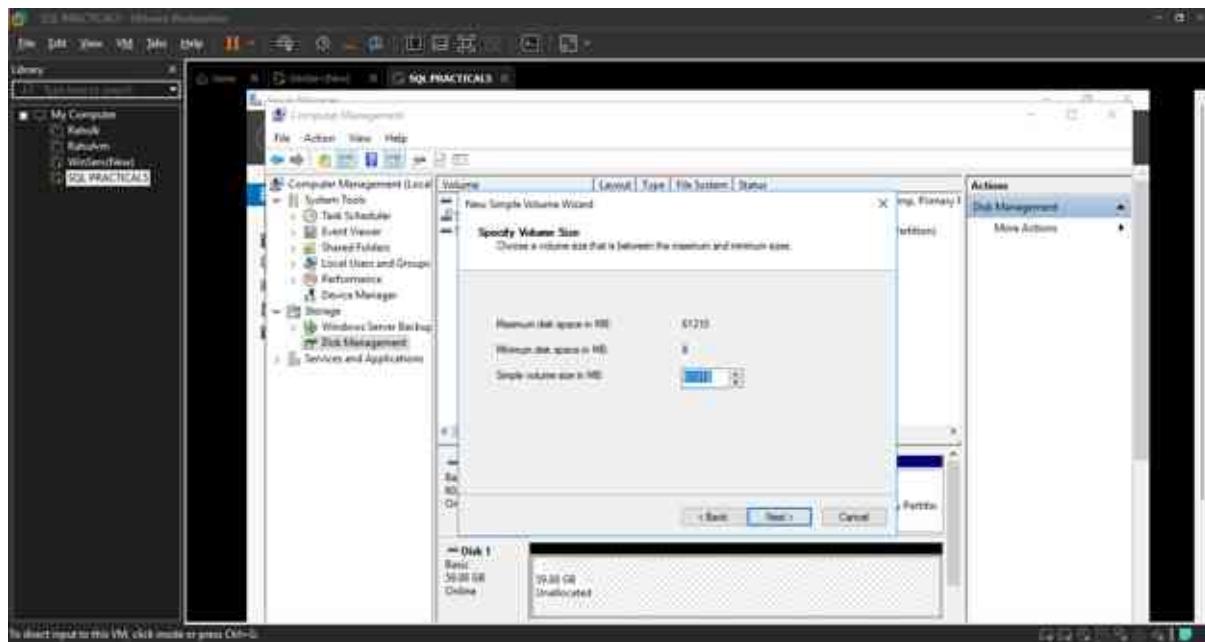
- Right-Click on the storage of Disk 1 and Click on Create new simple volume



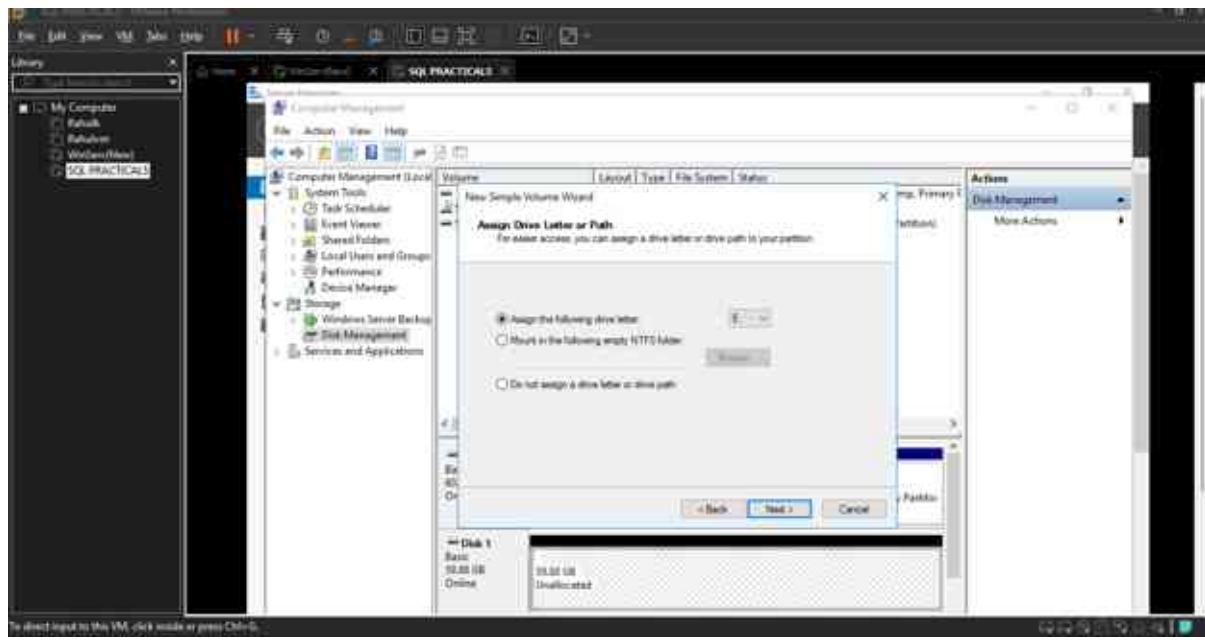
- Click on Next



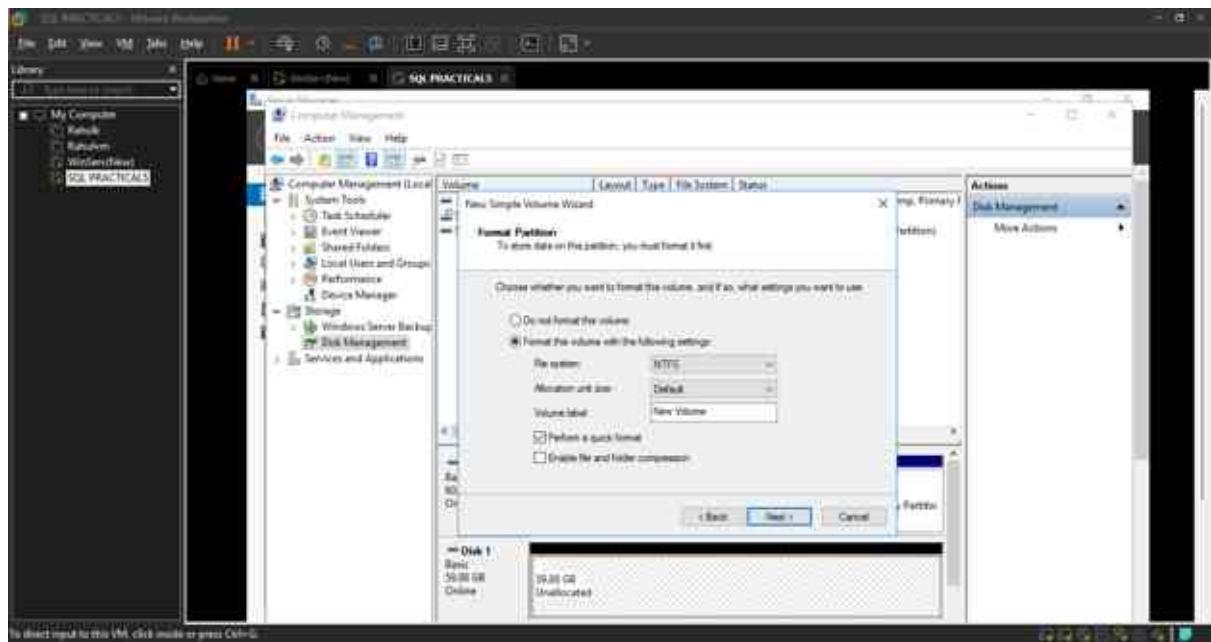
- Keep default values and Click on Next



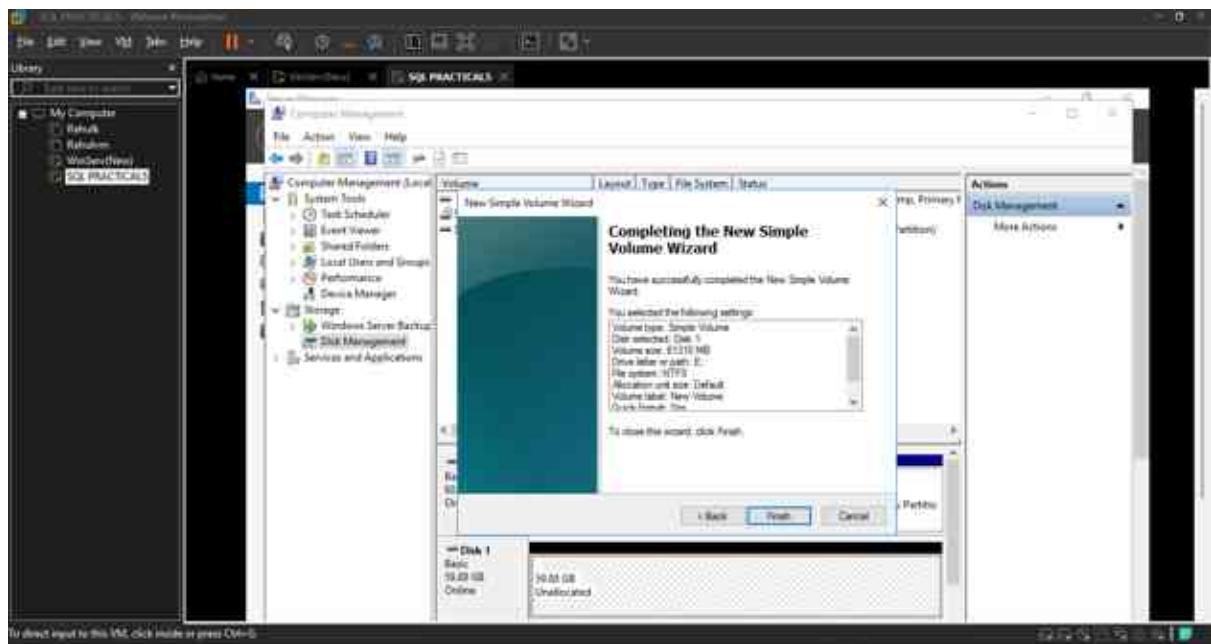
- Keep default values and Click on Next



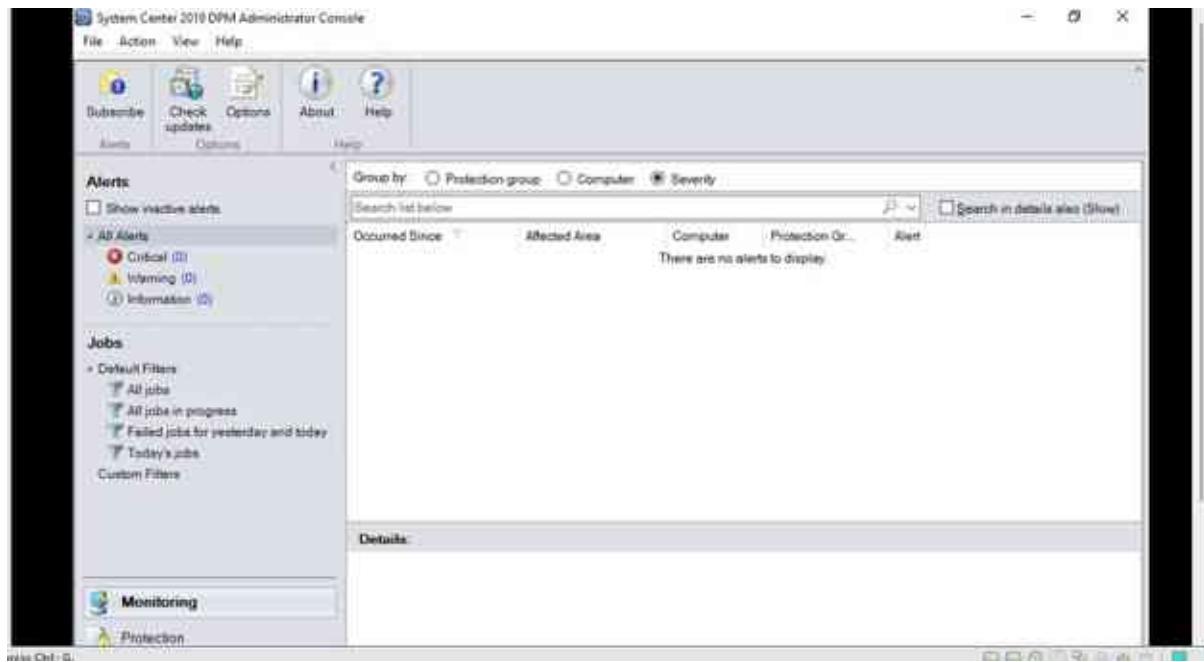
- Keep default values and Click on Next



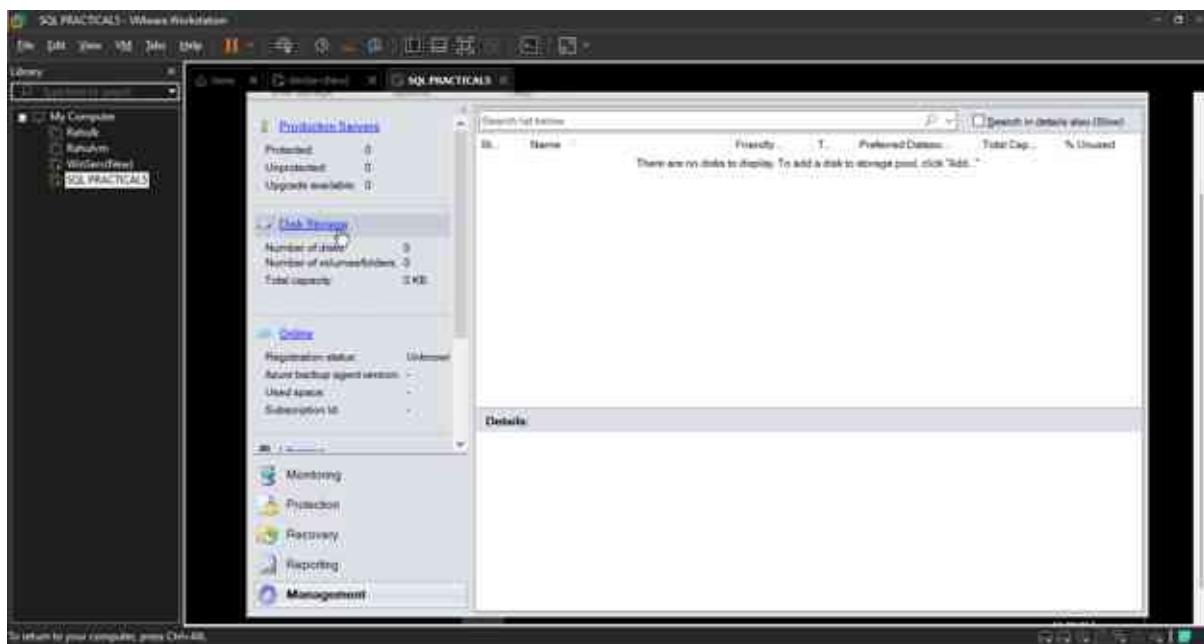
- Click on Finish



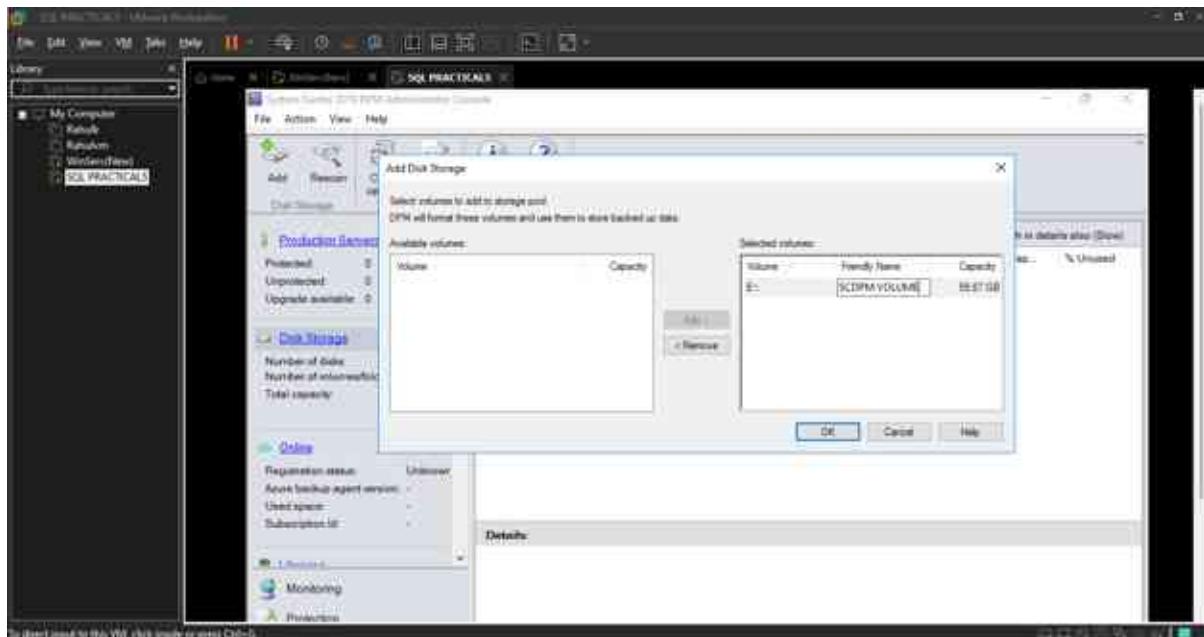
- After the volume is created **change the user back to SCDPM** and **Run SCDPM**



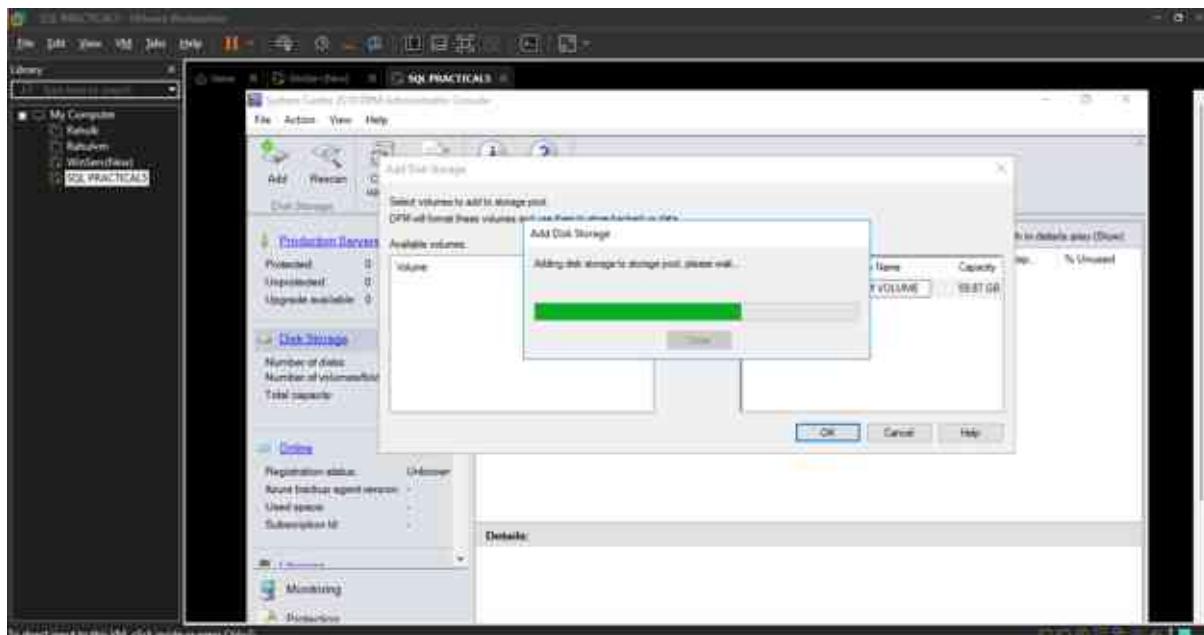
- Click on Management and Select Disk Storage



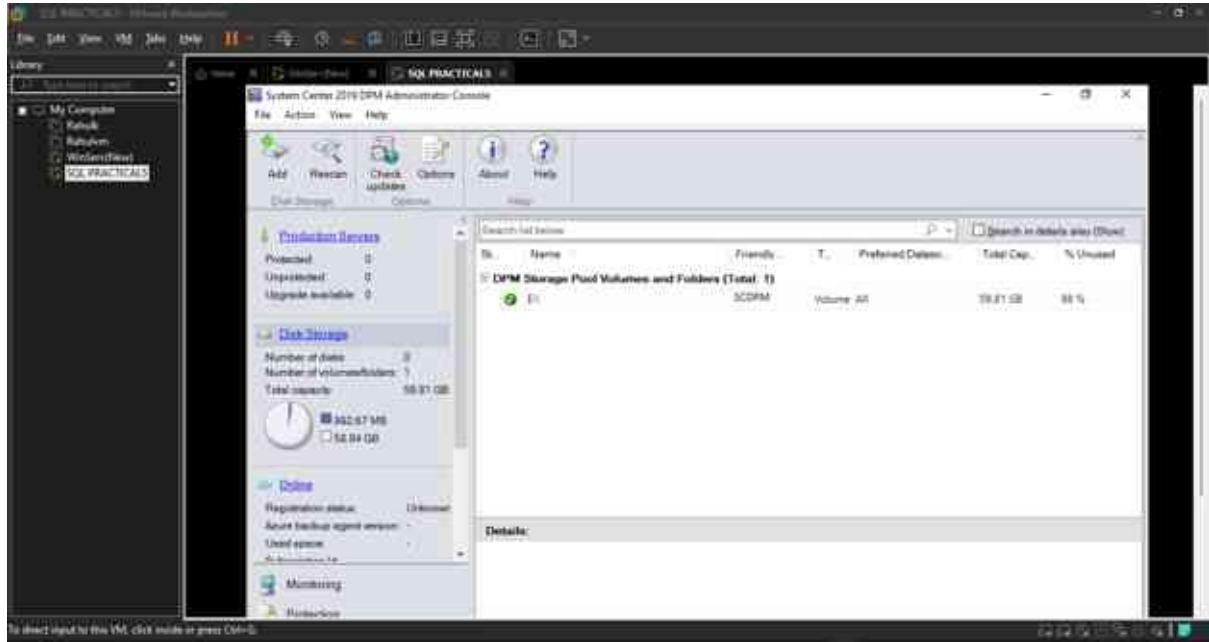
- Click on Add
- Select volume E and Click Add, then Name the Storage (Here it is SCDPM VOLUME) and Click Ok



- It will start Adding disk storage



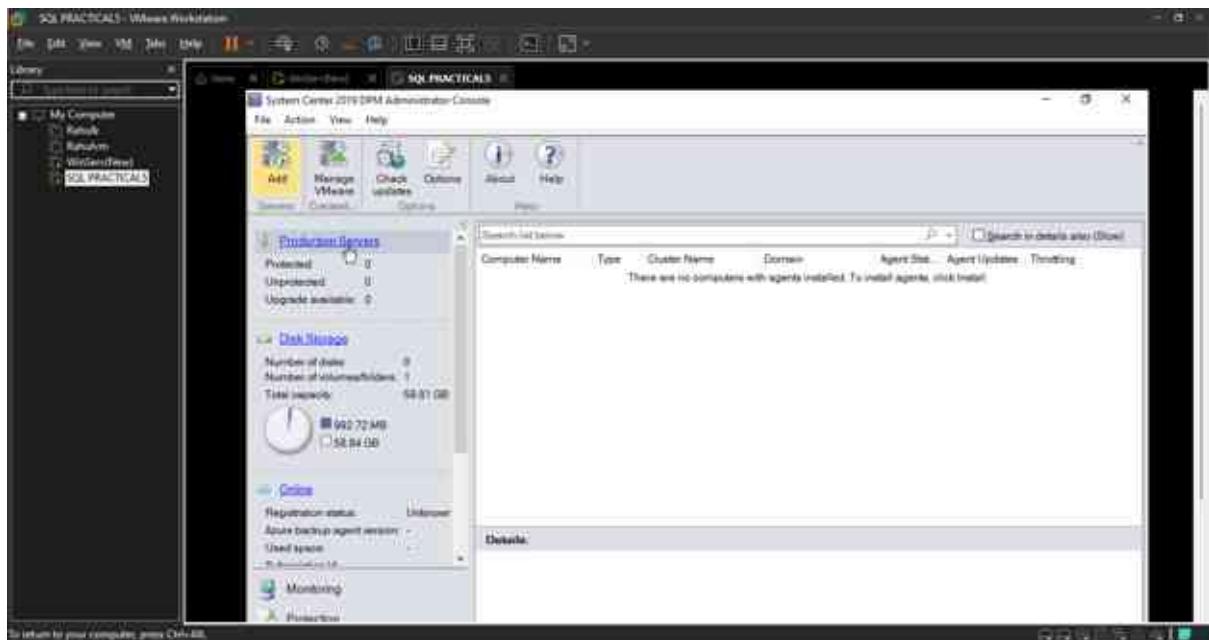
- The Storage has been created



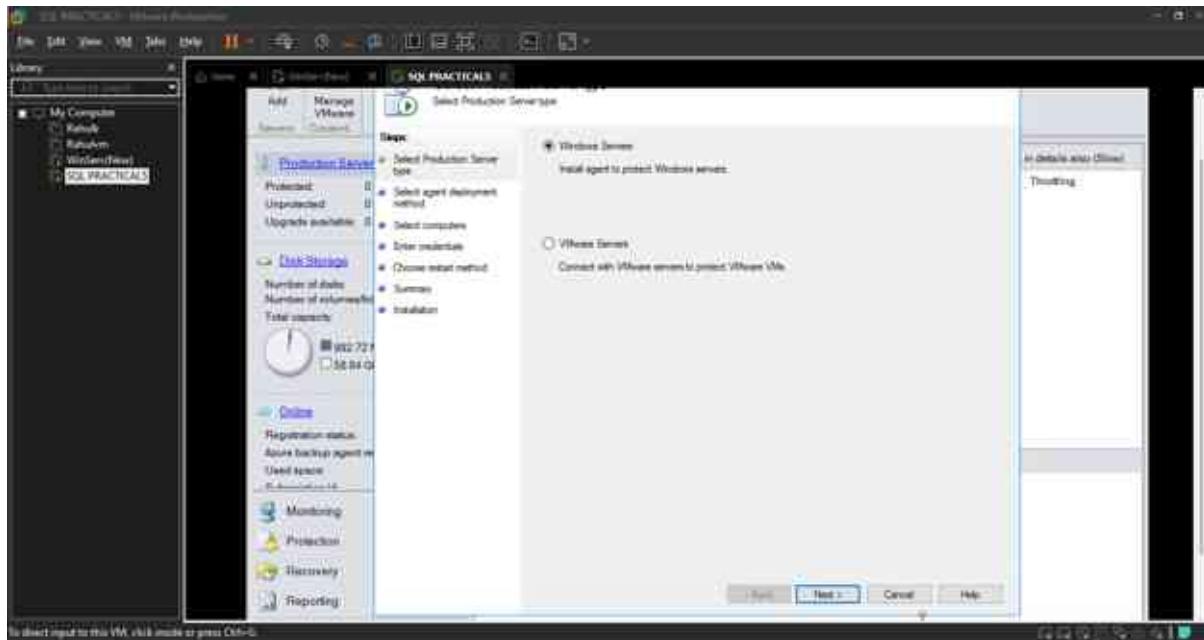
5B: Deploy Protection Agent

Step 9: Creating a Production Server

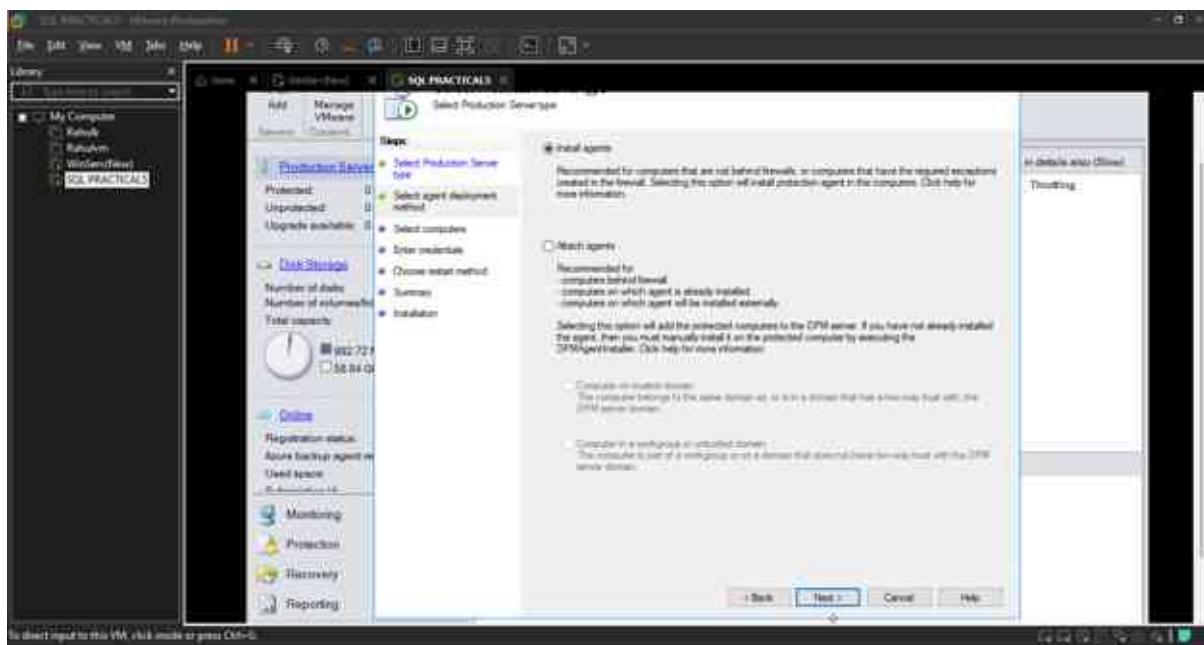
- Within Management Click on Production Servers and Click on Add



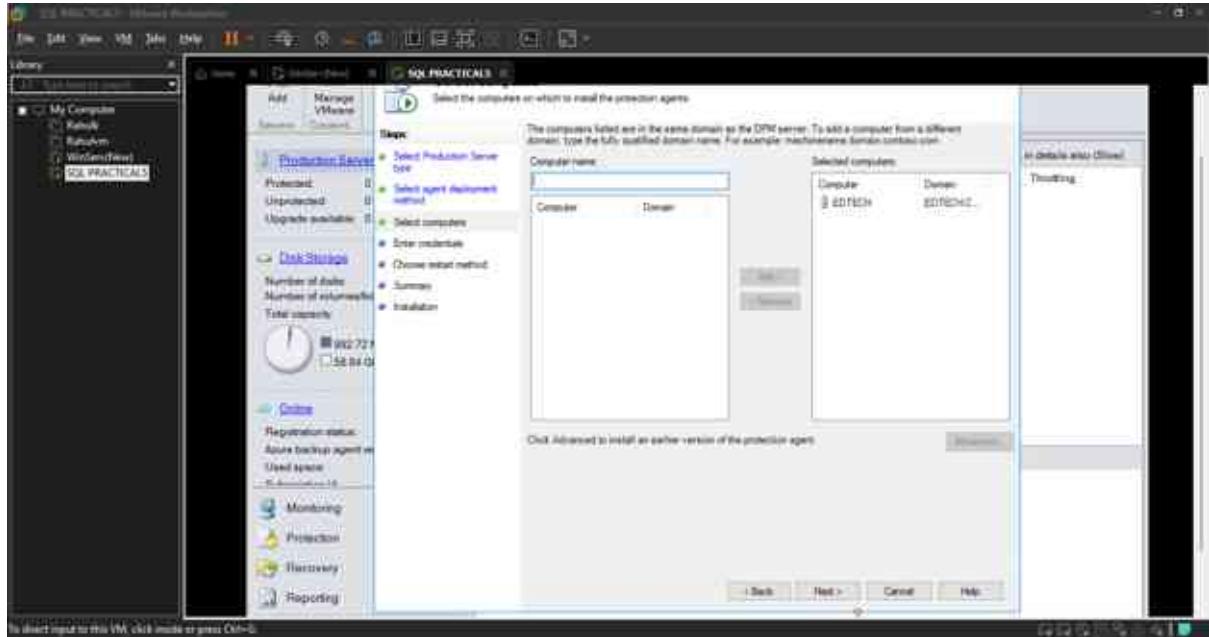
- Select Windows Server and Click on Next



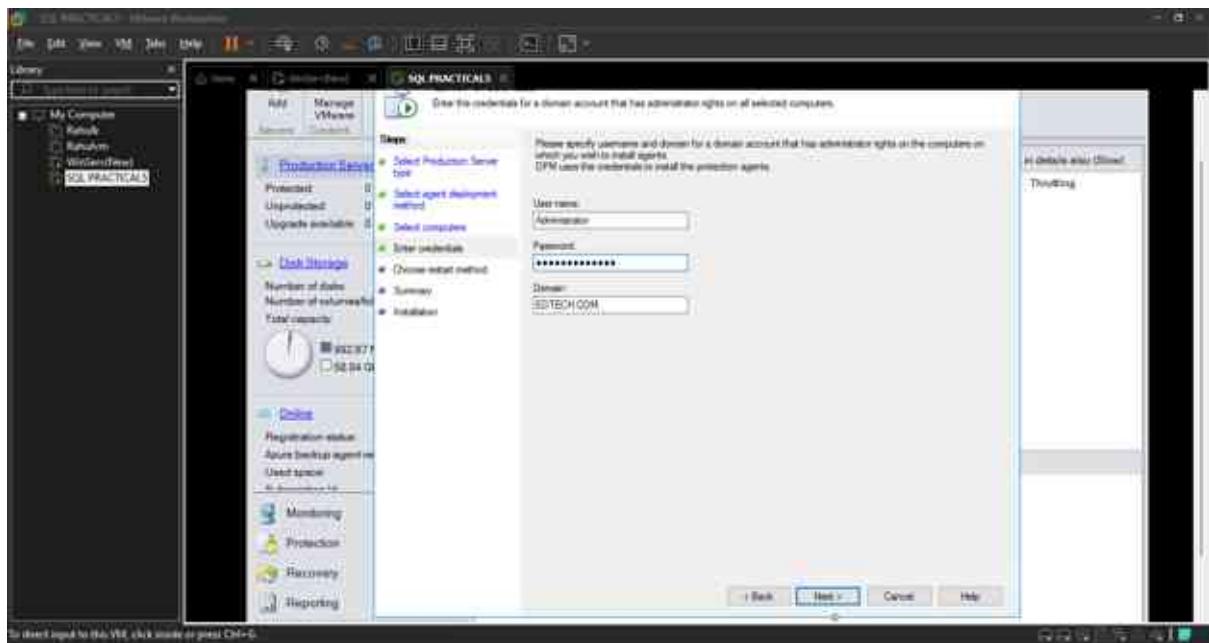
- Select Install Agents and Click Next



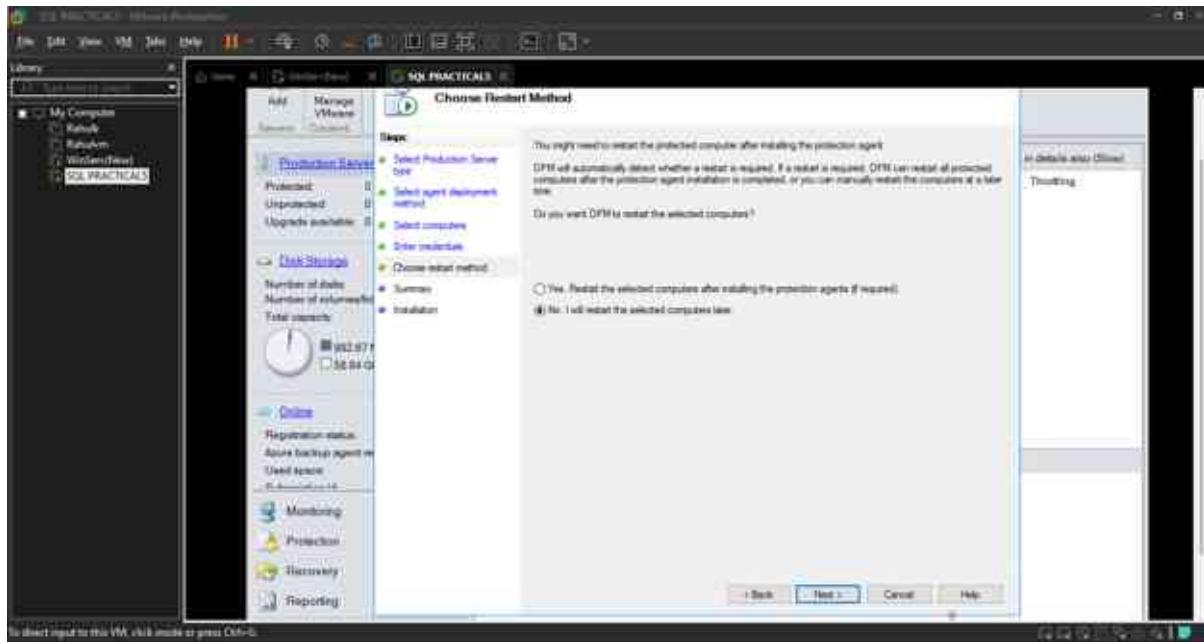
- Select EDTECH and Click Add and then Click on Next



- Type in the credentials and Click on Next

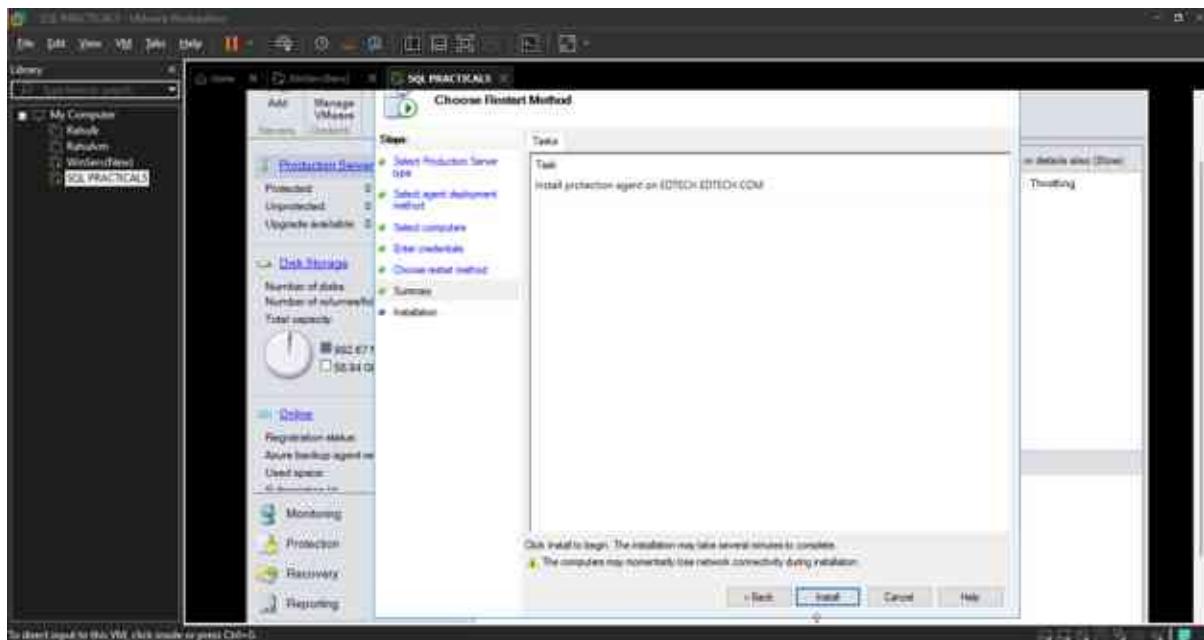


- Select No, I will restart the selected computers later and Click Next

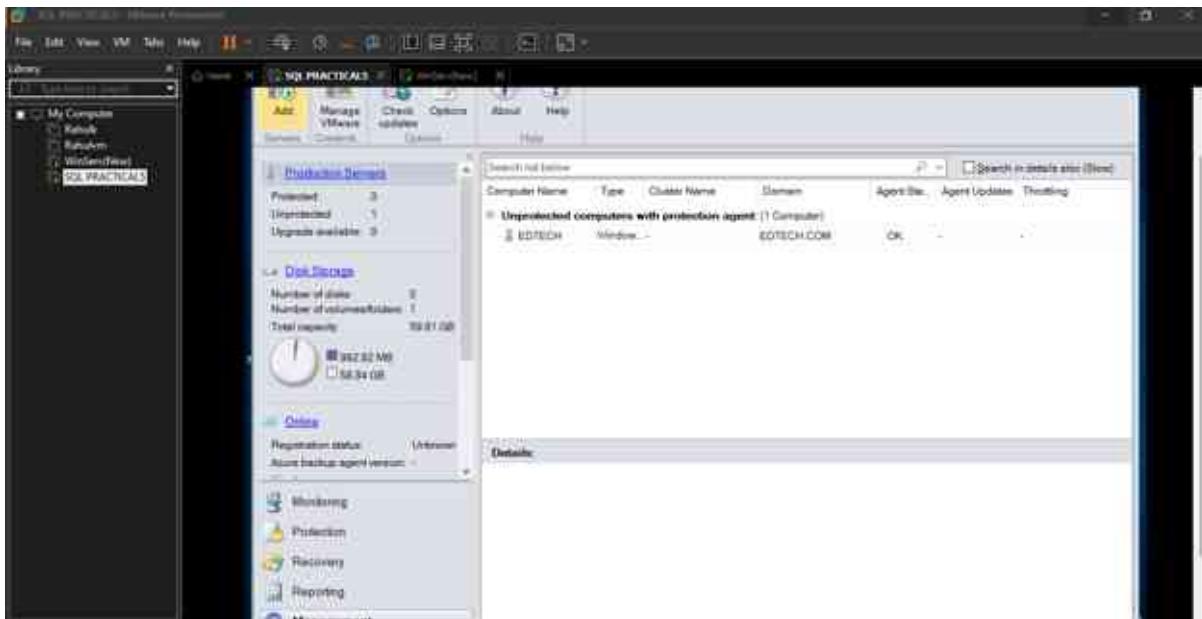


- Click on Install

Note: If there is an error 313 or 319 then Disable the firewalls of both the Domain Controller and SCDPM. You can also refer to Step 11 for the cmd commands for allowing particular files in the firewall



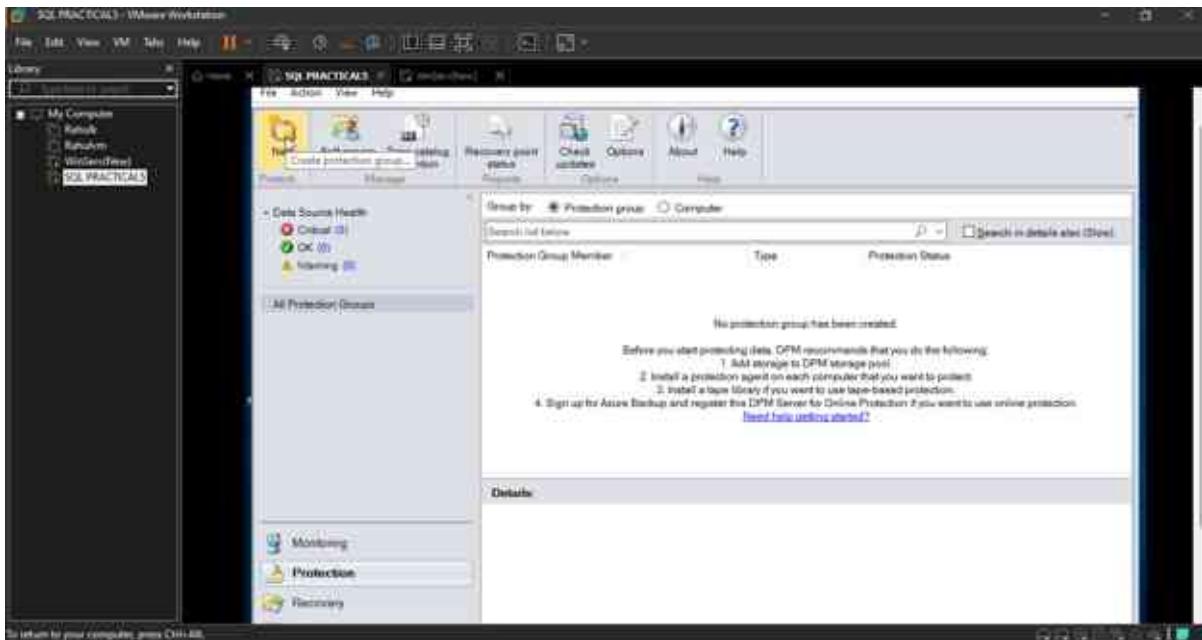
- Protection agent deploy successfully.



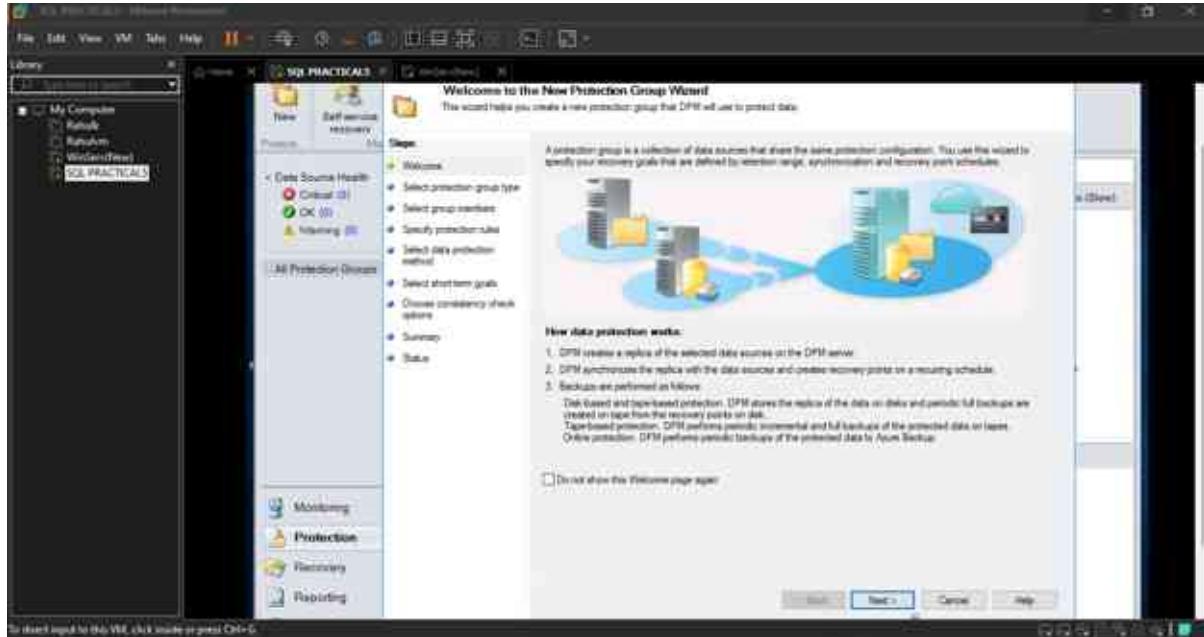
5C: Deploy Protection Groups

Step 10: Creating a Protection Group in SCDPM

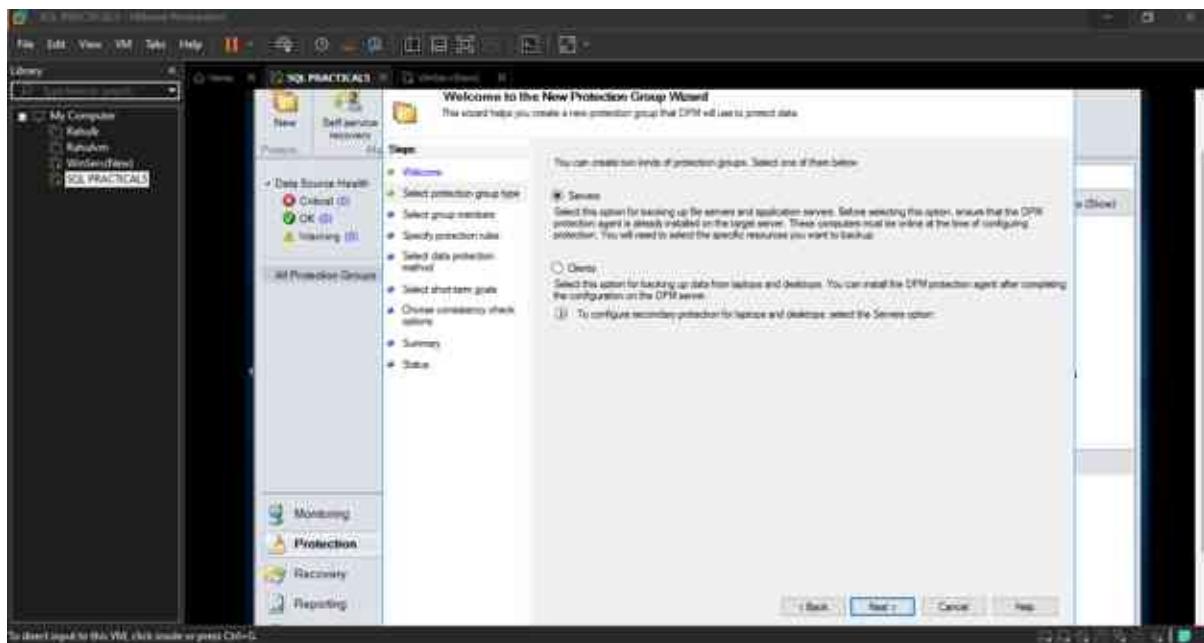
- Click on Protection and Click on New



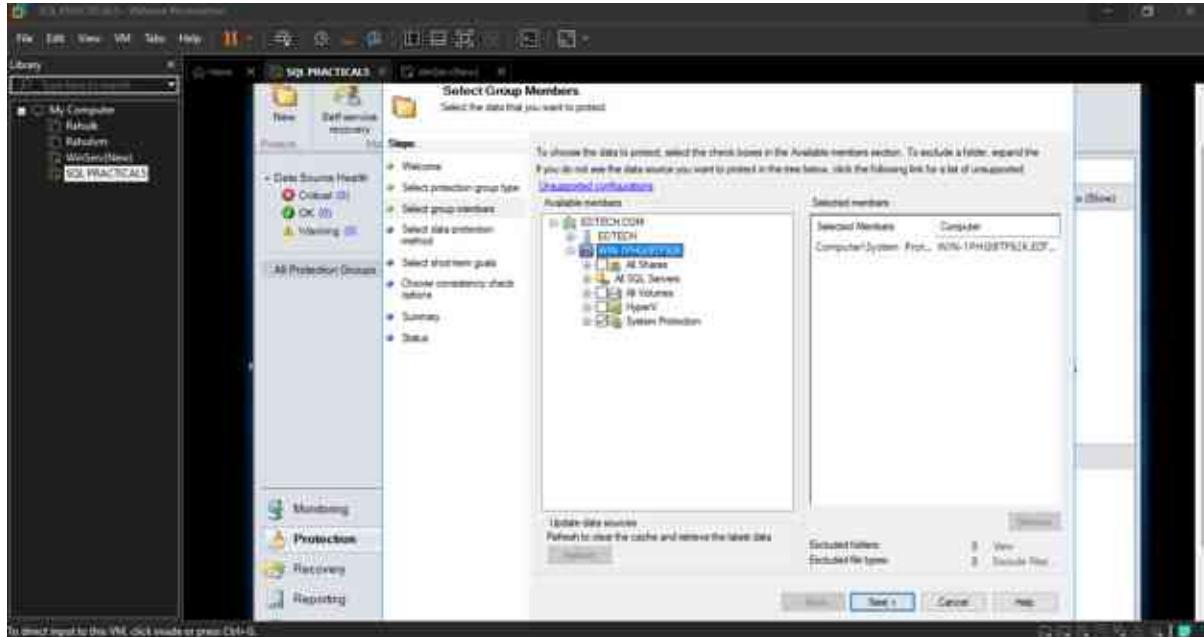
- Click on Next



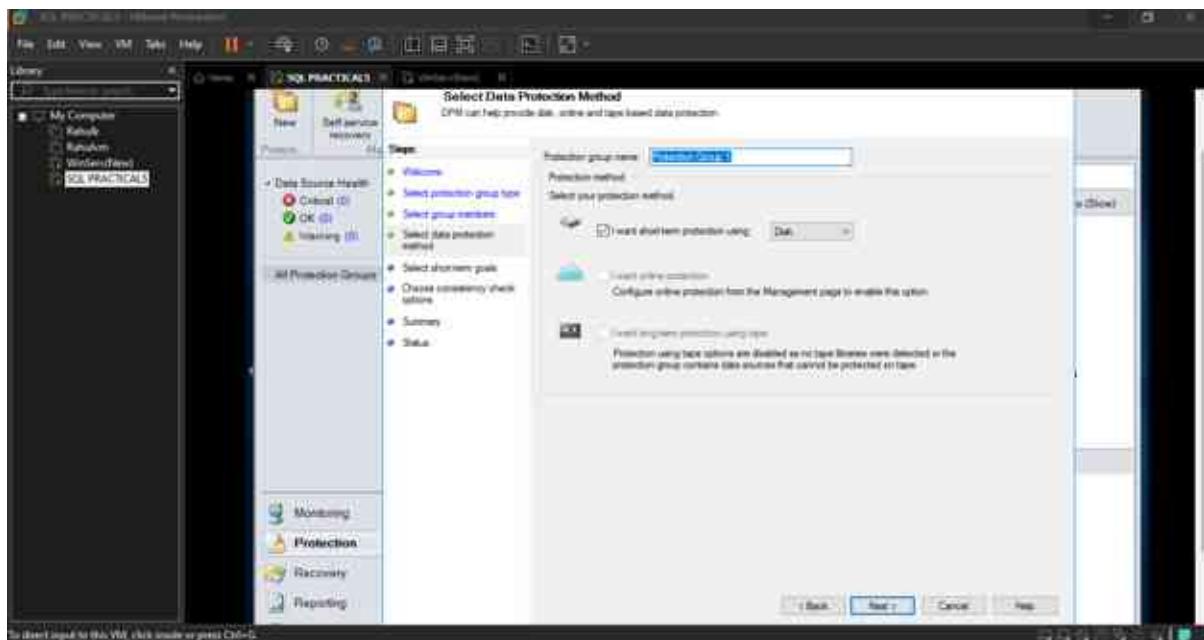
- Select Server and Click on Next



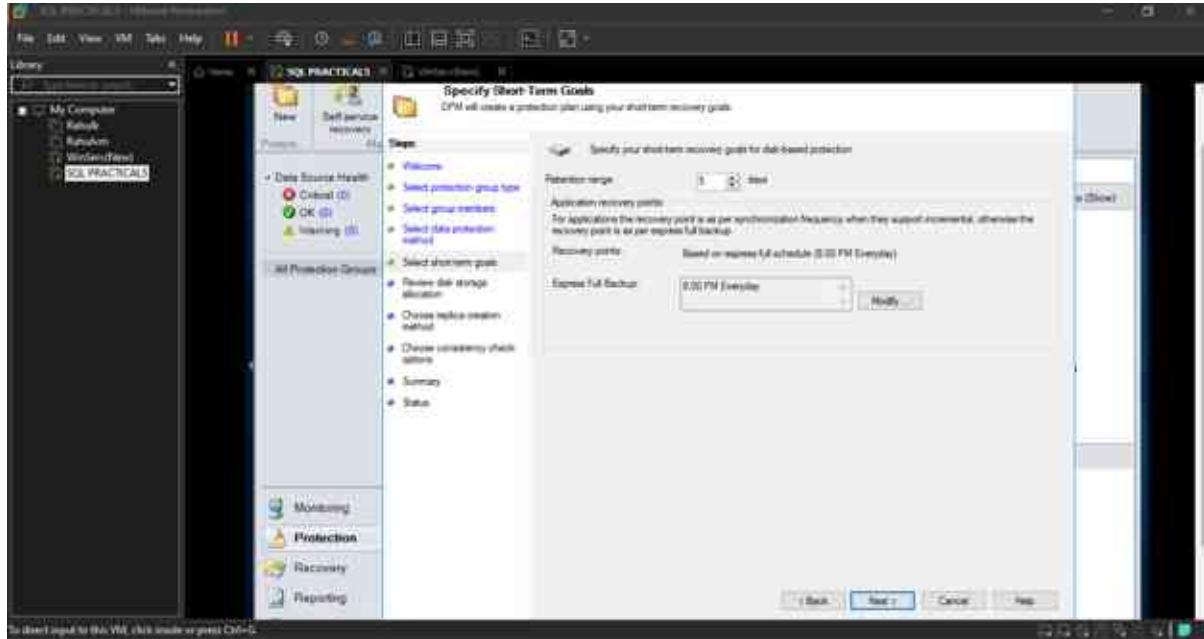
- Keep the default values and Click on Next



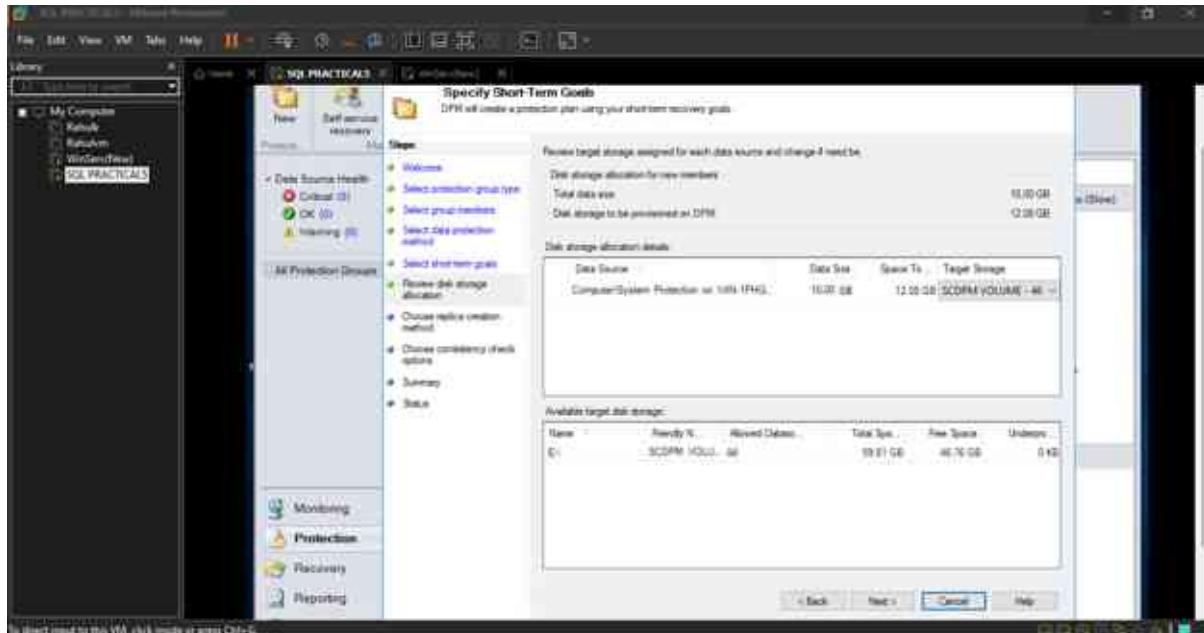
- Keep the default values and Click on Next



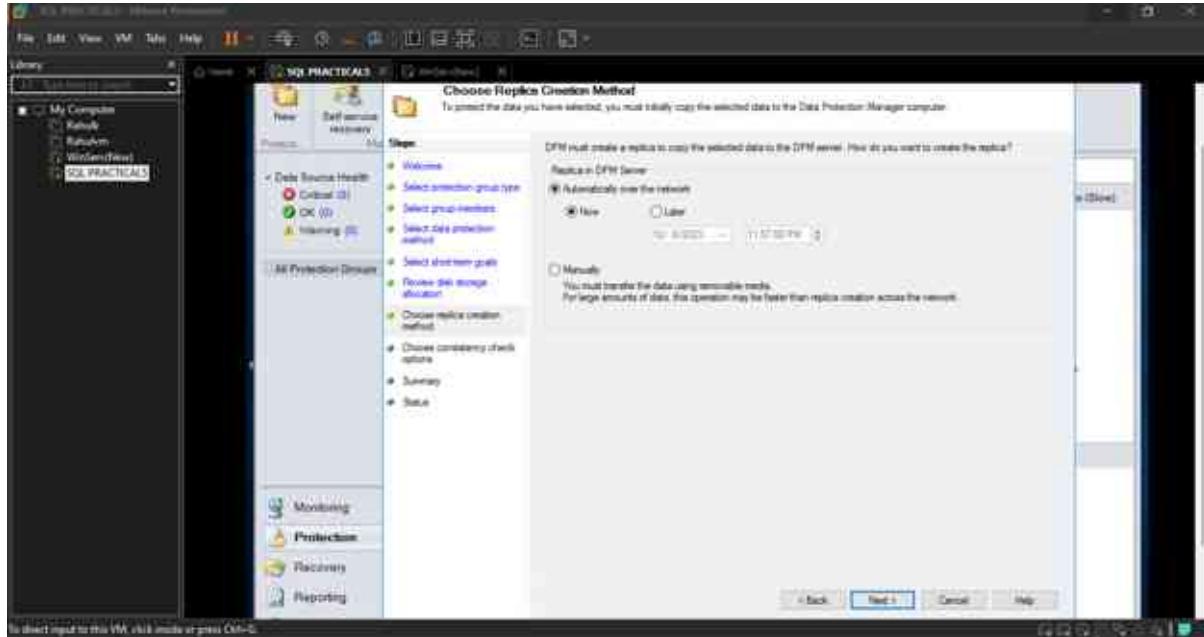
- Keep the default values and Click on Next



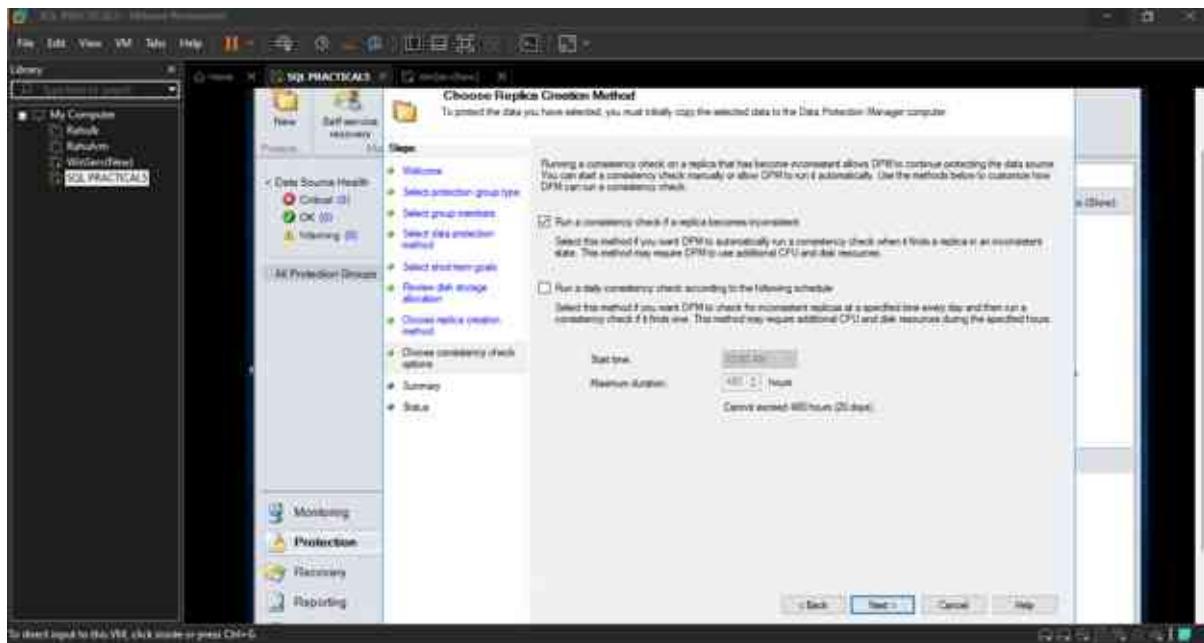
- Keep the default values and Click on Next



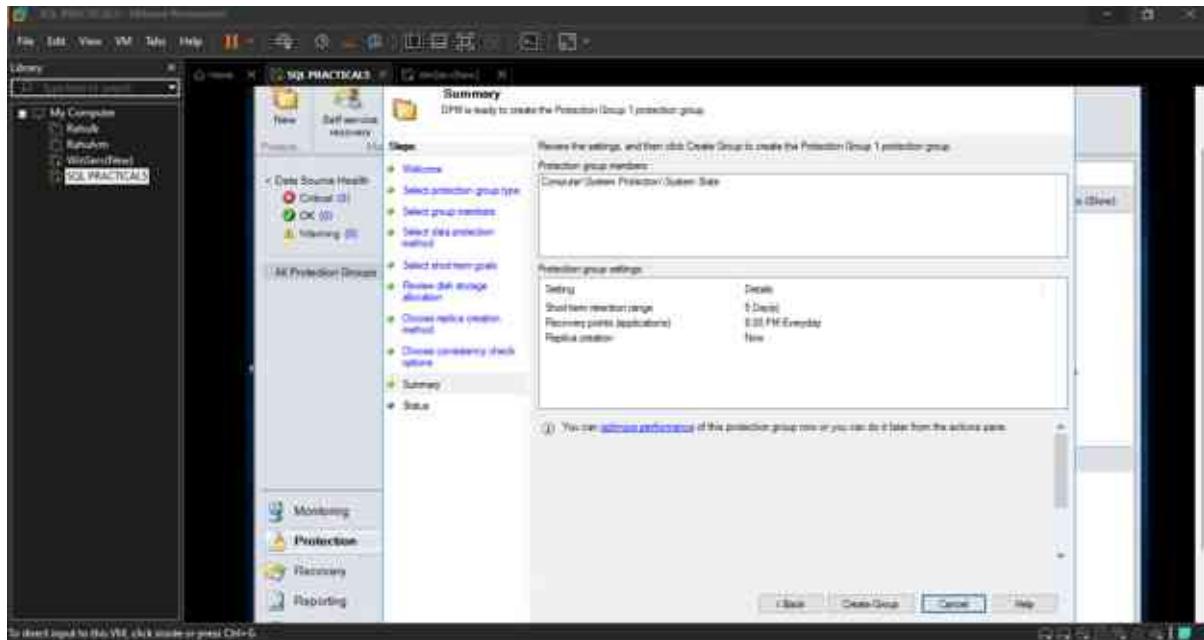
- Select Automatic and Click on Next



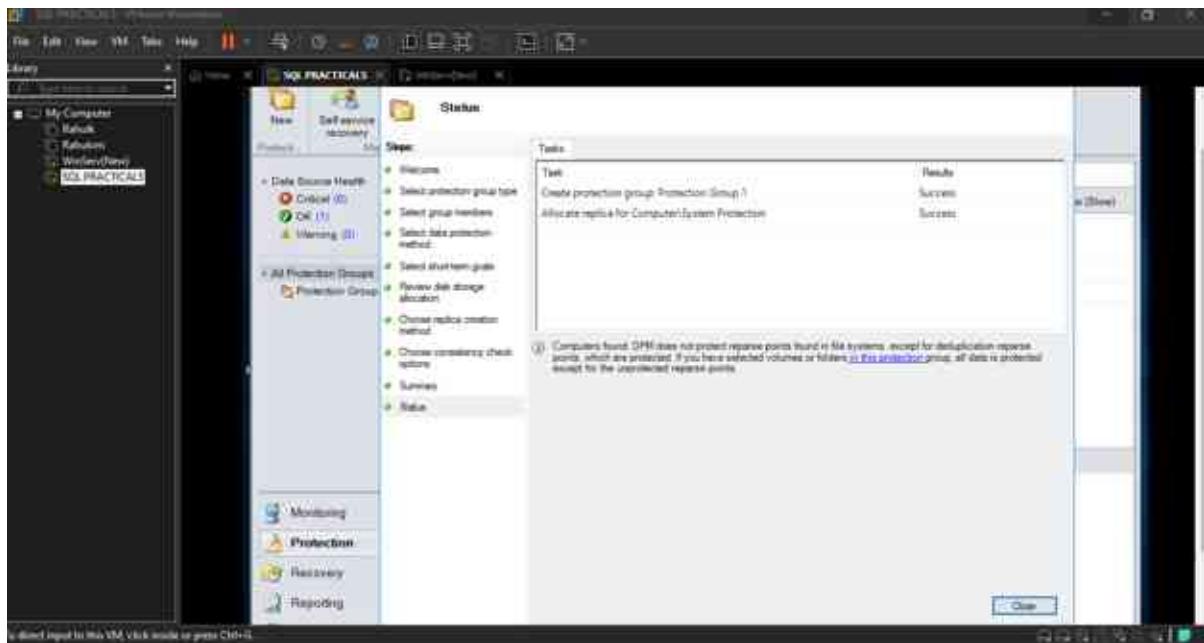
- Keep the default values and Click on Next



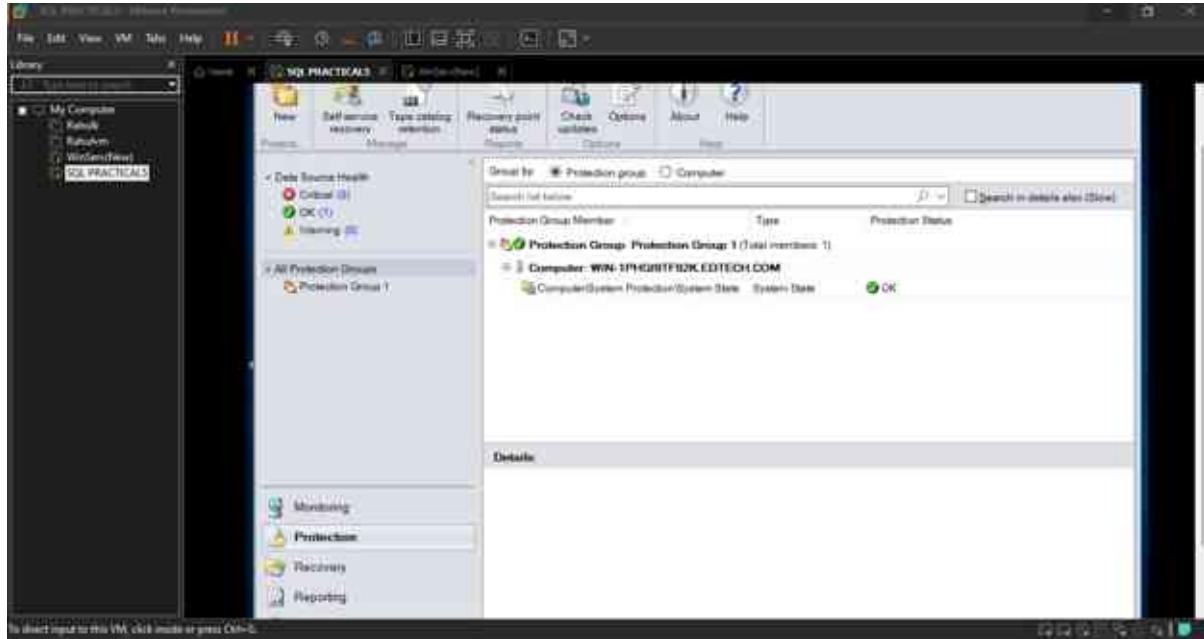
- Click on Create Group



- Protection Group has been successfully created



- Protection Group has been successfully created



5D: Configure Firewall Settings

Step 11: Run firewall commands in command prompt

- netsh advfirewall firewall add rule name="DCOM TCP 135" dir=in action=allow protocol=TCP localport=135
- netsh advfirewall firewall add rule name="DCOM Dynamic Ports" dir=in action=allow protocol=TCP localport=1024-65535
- netsh advfirewall firewall add rule name="DPM Agent Coordinator 5718" dir=in action=allow protocol=TCP localport=5718
- netsh advfirewall firewall add rule name="DPM Protection Agent 5719" dir=in action=allow protocol=TCP localport=5719
- netsh advfirewall firewall add rule name="DNS UDP 53" dir=in action=allow protocol=UDP localport=53
- netsh advfirewall firewall add rule name="Kerberos UDP 88" dir=in action=allow protocol=UDP localport=88
- netsh advfirewall firewall add rule name="Kerberos TCP 88" dir=in action=allow protocol=TCP localport=88
- netsh advfirewall firewall add rule name="LDAP TCP 389" dir=in action=allow protocol=TCP localport=389
- netsh advfirewall firewall add rule name="LDAP UDP 389" dir=in action=allow protocol=UDP localport=389
- netsh advfirewall firewall add rule name="NetBIOS UDP 137" dir=in action=allow protocol=UDP localport=137

- netsh advfirewall firewall add rule name="NetBIOS UDP 138" dir=in action=allow protocol=UDP localport=138
- netsh advfirewall firewall add rule name="NetBIOS TCP 139" dir=in action=allow protocol=TCP localport=139

```

Windows PowerShell - Run as administrator
File Edit View VM Help
Windows PowerShell - Run as administrator
C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS Dynamic Ports" dir=in action=allow protocol=tcp
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS Dynamic Ports" dir=in action=allow protocol=tcp
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS Dynamic Ports" dir=in action=allow protocol=tcp localport=1024-65535
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="DHM Agent Coordinator STP" dir=in action=allow protocol=tcp localport=6718
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="DHM Protection Agent STP" dir=in action=allow protocol=tcp localport=5738
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="TDS TCP 53" dir=in action=allow protocol=tcp localport=53
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="Kerberos UDP 46" dir=in action=allow protocol=udp localport=46
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="Kerberos TCP 46" dir=in action=allow protocol=tcp localport=46
Ok.

C:\Windows\system32>

```

Screen input to this VM, click inside or press Ctrl+G.

```

Windows PowerShell - Run as administrator
File Edit View VM Help
Windows PowerShell - Run as administrator
C:\Windows\system32>netsh advfirewall firewall add rule name="LDAP TCP 389" dir=in action=allow protocol=tcp localport=389
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="LDAP UDP 389" dir=in action=allow protocol=udp localport=389
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS UDP 139" dir=in action=allow protocol=tcp localport=139
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS UDP 139" dir=in action=allow protocol=tcp localport=139
Ok.

C:\Windows\system32>netsh advfirewall firewall add rule name="NetBIOS TCP 139" dir=in action=allow protocol=tcp localport=139
Ok.

C:\Windows\system32>

```

Screen input to this VM, click inside or press Ctrl+G.

Practical: 6

Aim: Manage Orchestrator Servers.

6A: Manage Orchestrator Servers-1

Note: Establishing a connection with the User VM and Domain Controller by connecting the User VM to the Domain Controller's Workgroup

6A-1: Runbook permissions

Runbook access permissions are set through the Runbook Designer. By default, only users in the Orchestrator Users Group have full access to a runbook. Here We Add additional User and give access to additional users to run, start, stop, view, and change runbooks at either the folder level or the individual runbook level.

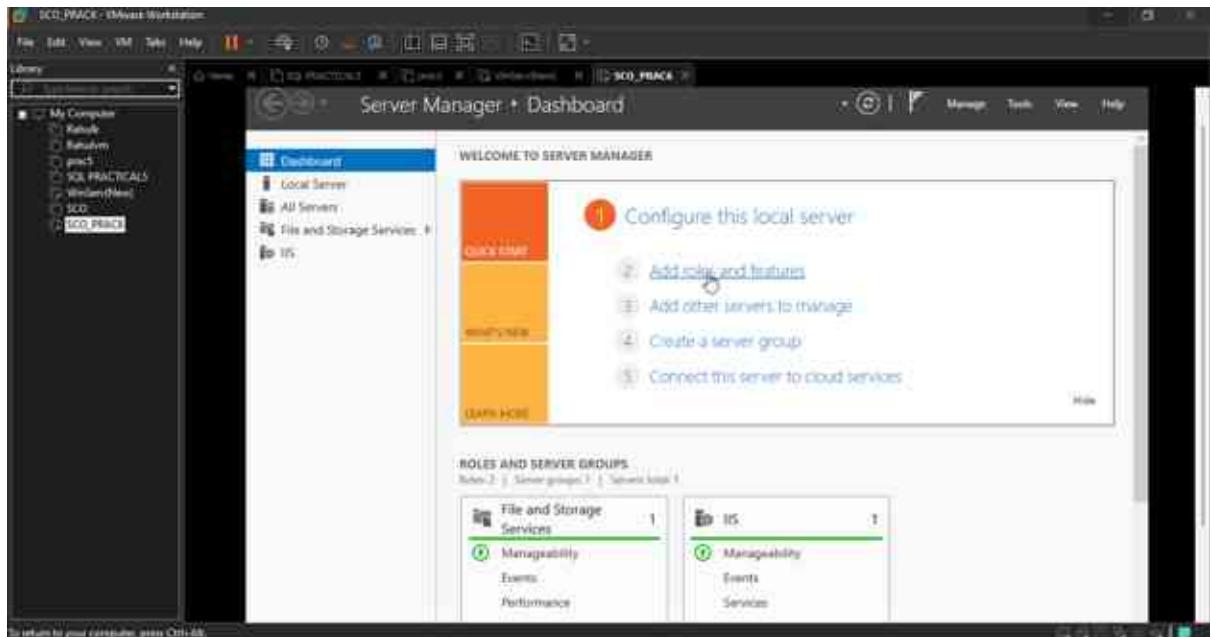
Pre-requisites:

Domain Controller (Here Domain Controller Name **Winser (New)**)

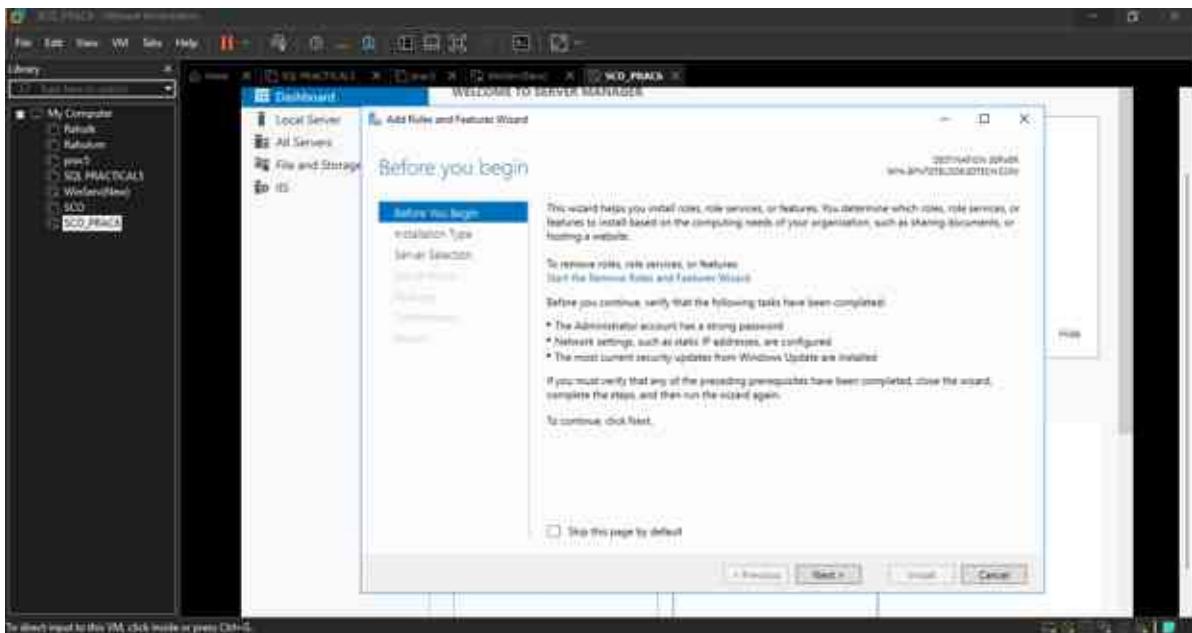
User Server (Here User Name **SCO_PRAC6**)

Step 1: Creation Of User (**SCO_PRAC6**)

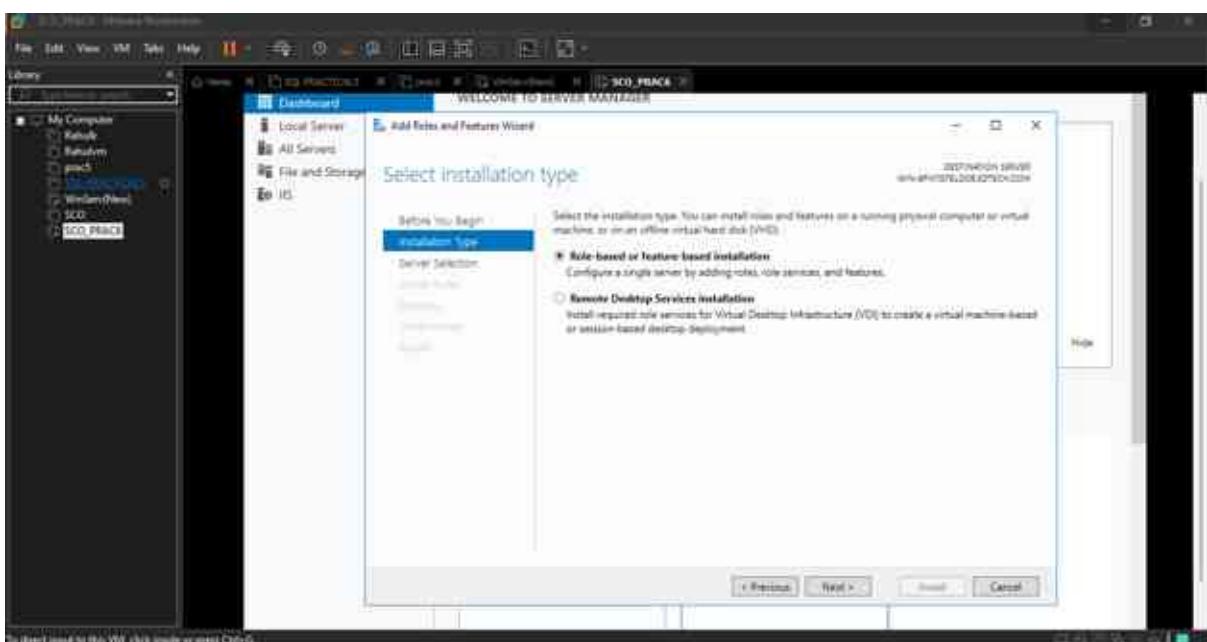
- To create a **User** first we require the **Active Directory Domain Service** which can be added through the **Server Manager**
- **Open Server Manager and Click on Add Roles and Features**



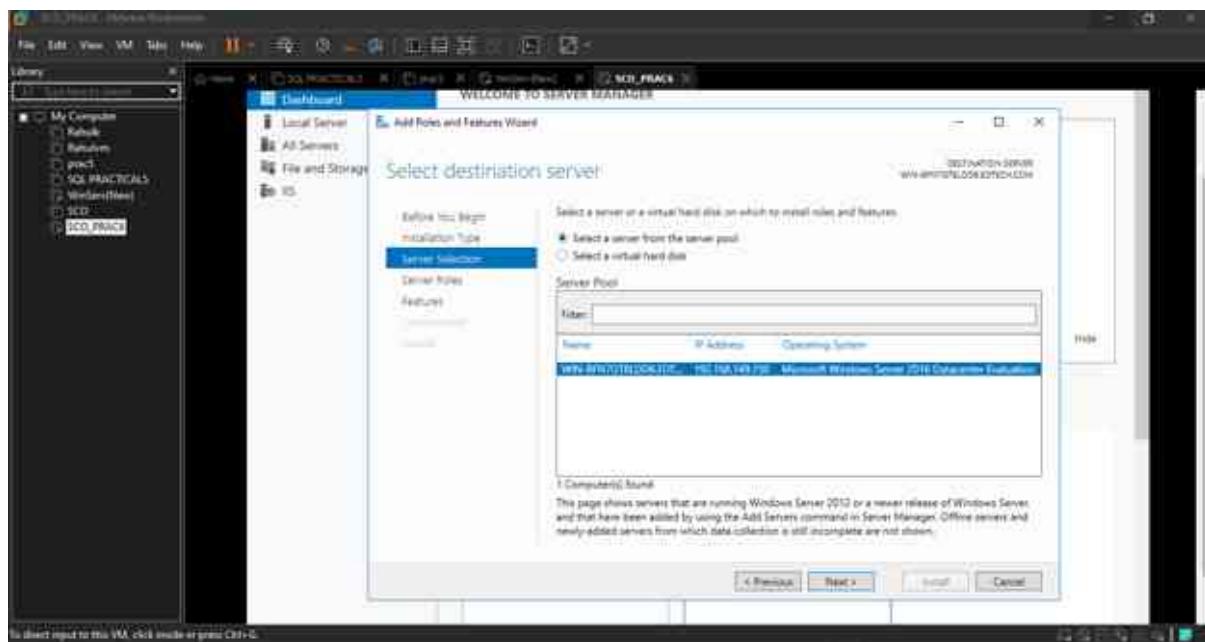
- Click on Next



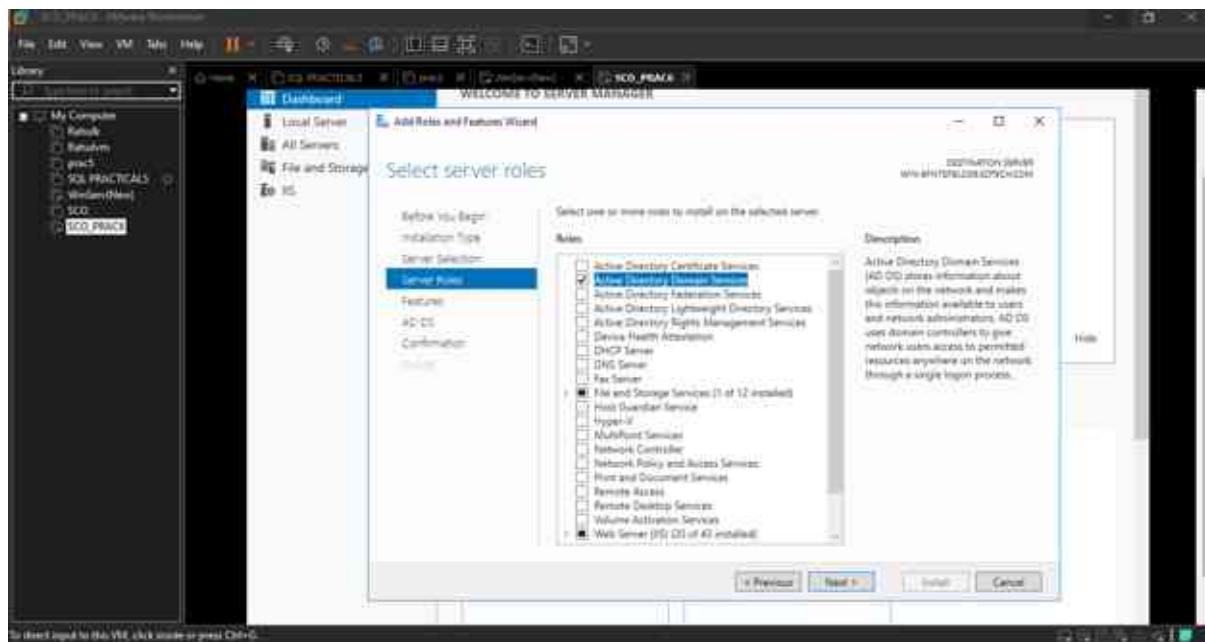
- Select Role-based or Feature-based installation and Click Next



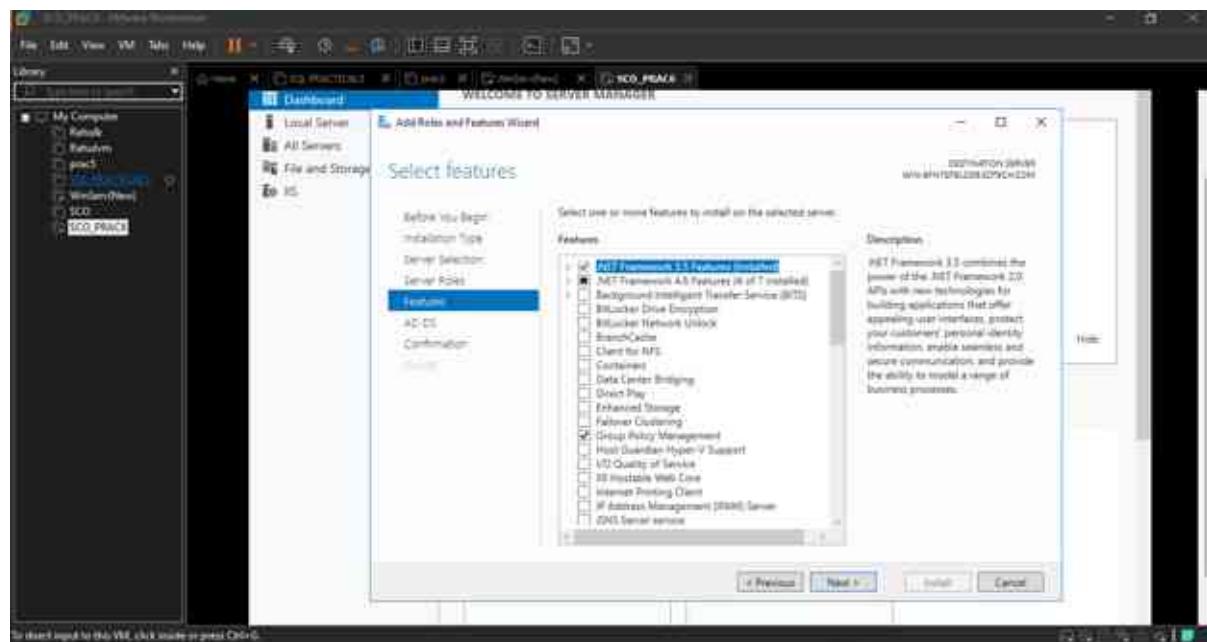
- Keep default settings and Click on Next



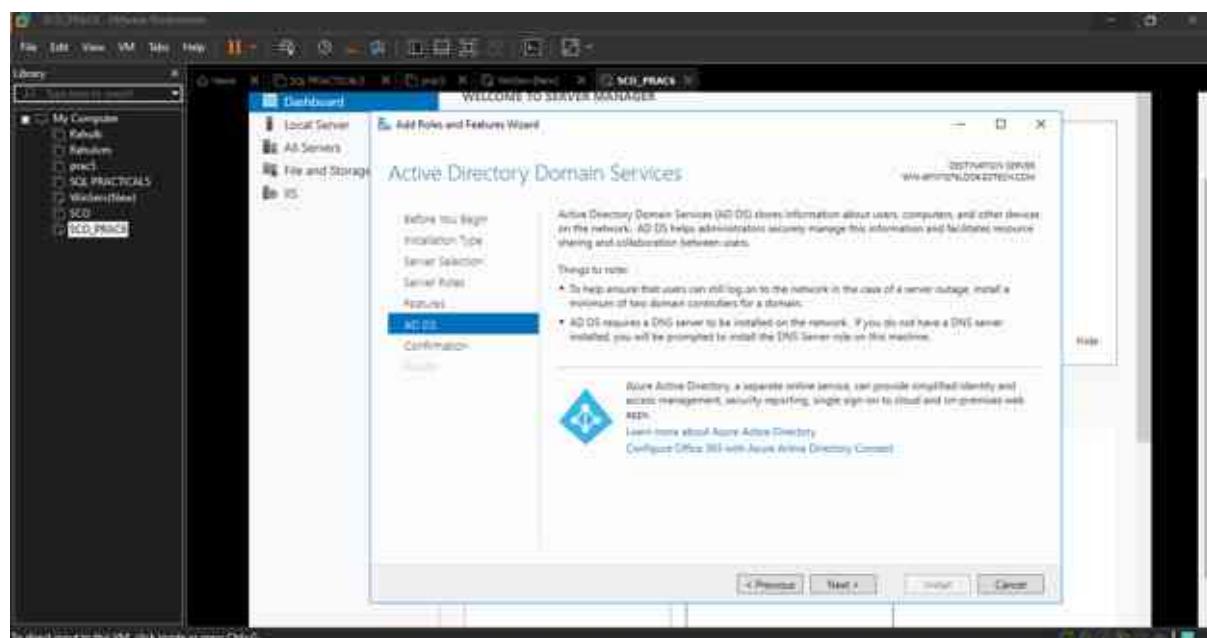
- Select Active Directory Domain Service and Click on Add Feature and Click on Next



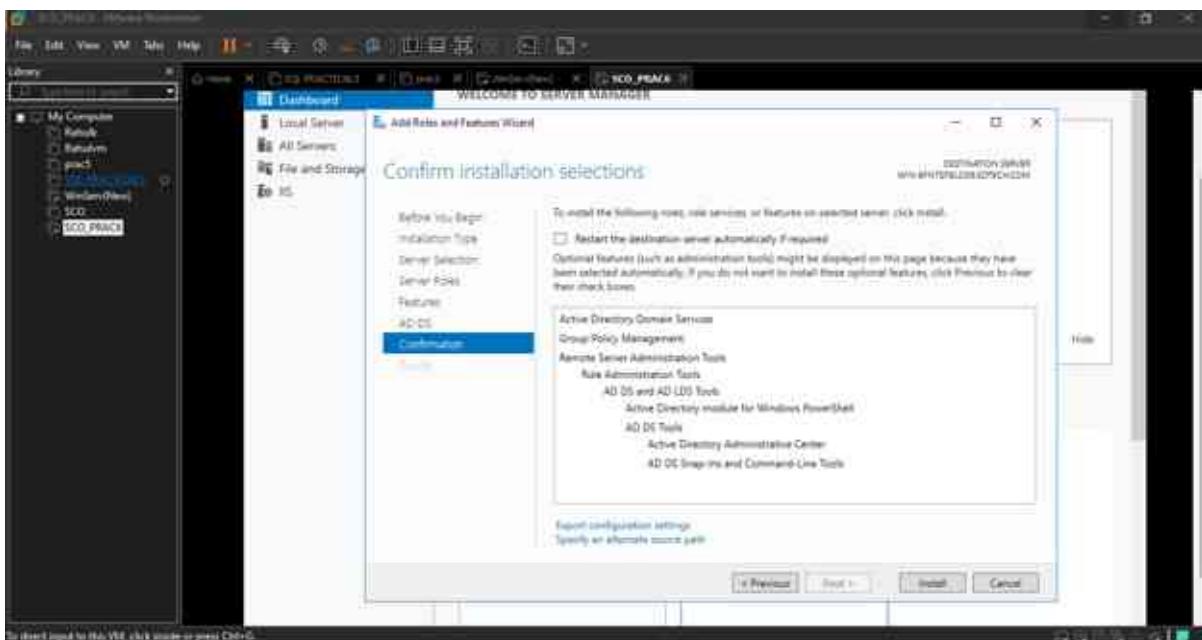
- Select the following feature and Click on Next



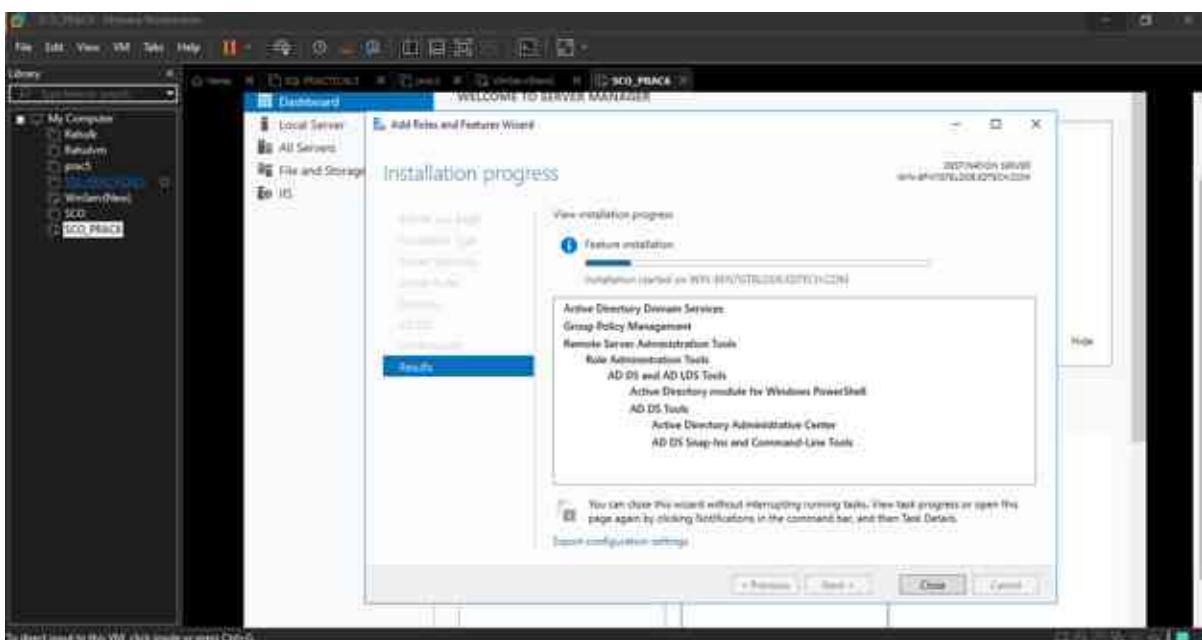
- Click on Next



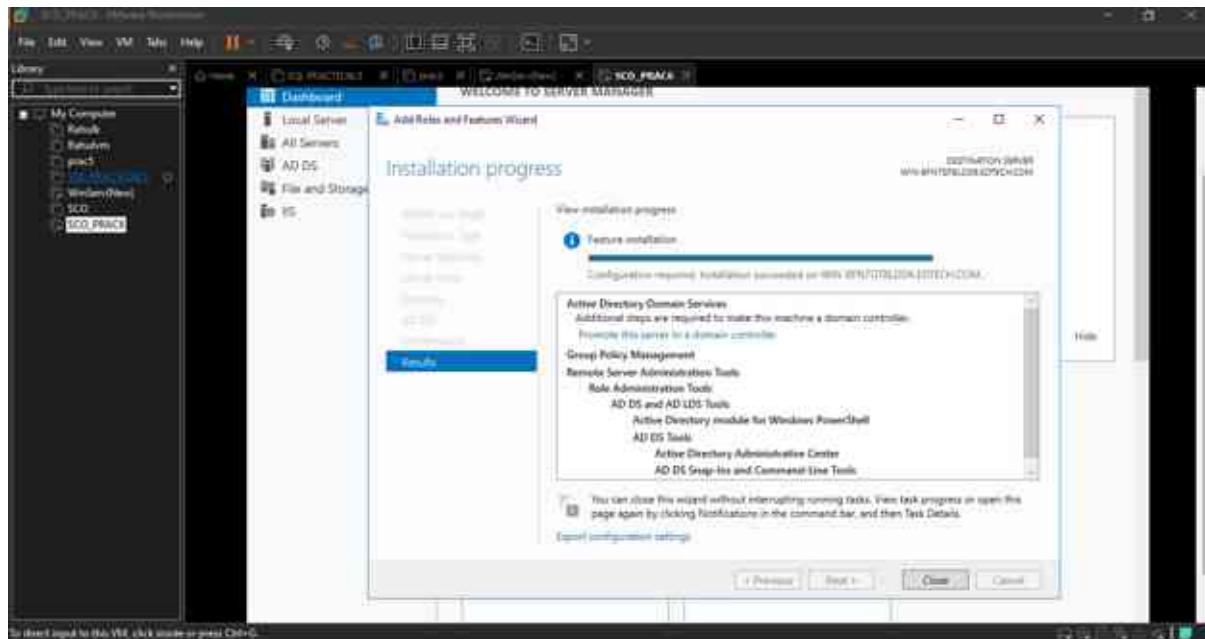
- Click on Next



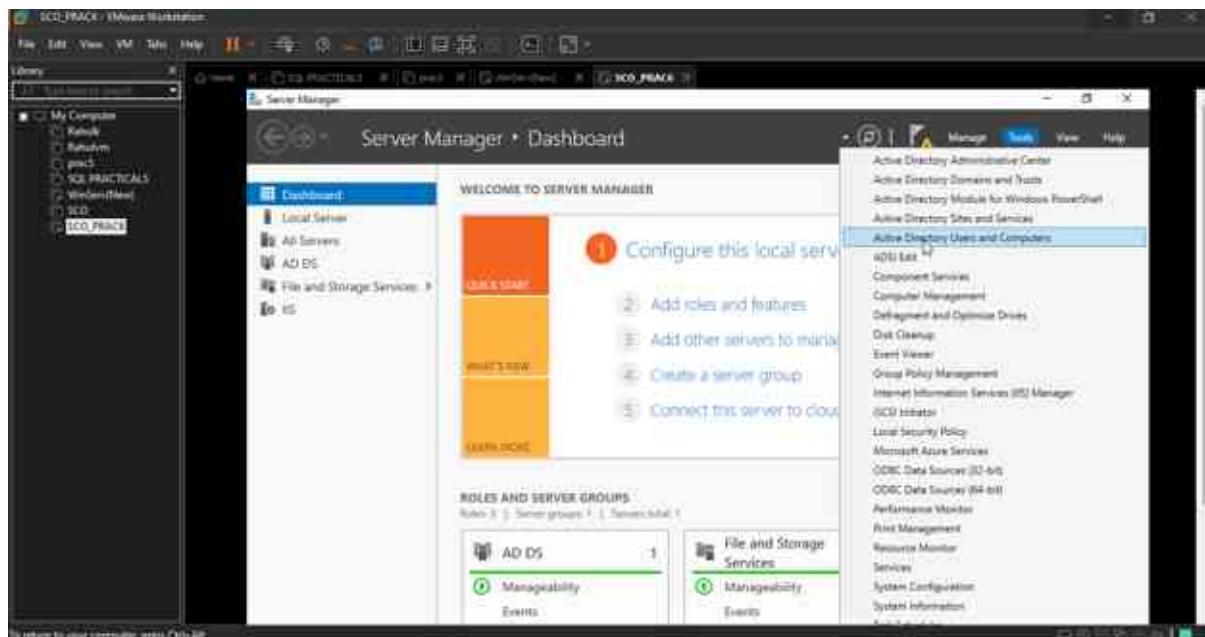
- Feature installation Processes start



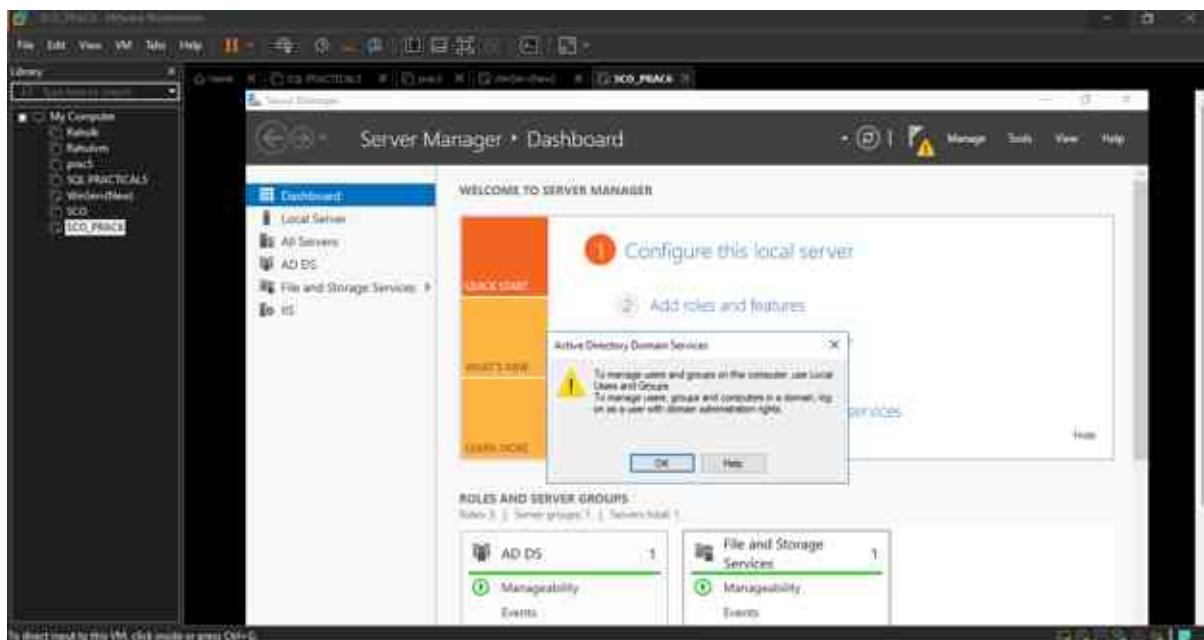
- After the installation **Click on Close**



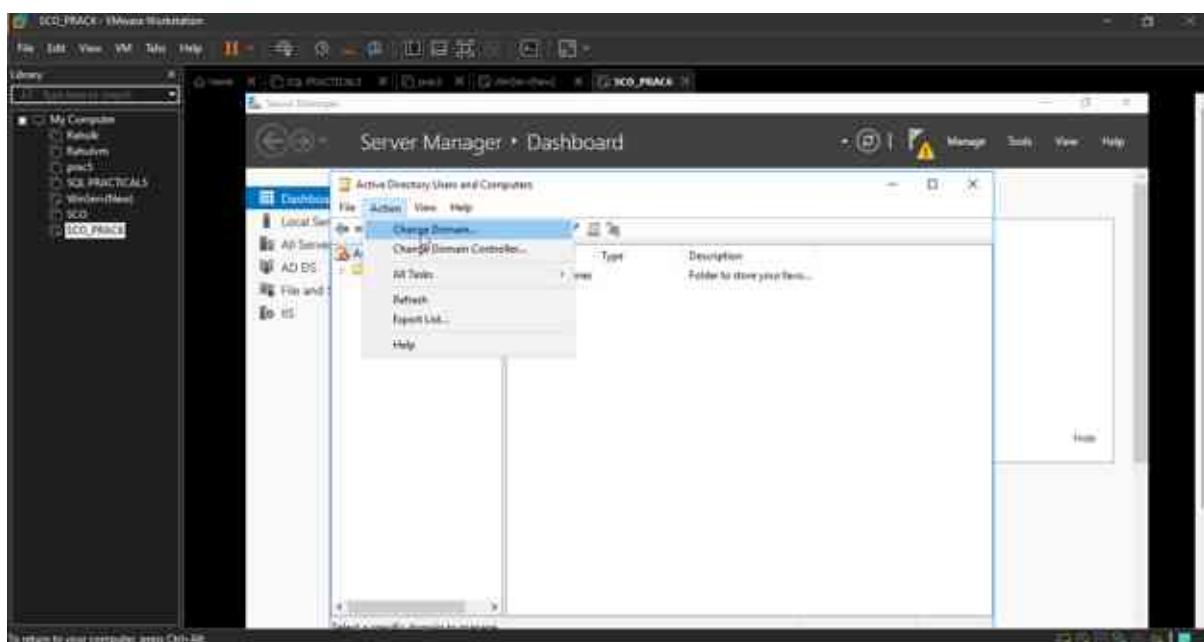
- After installation, within **Server Manager** Click on Tools and Select **Active Directory User and Computers**



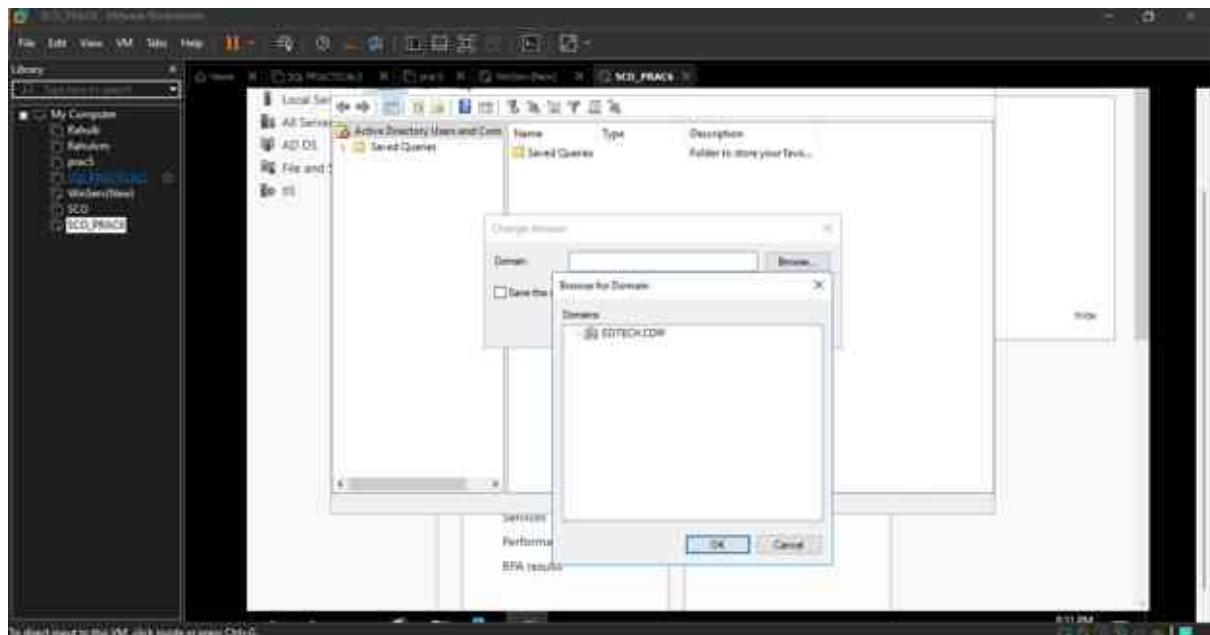
- Click on Ok



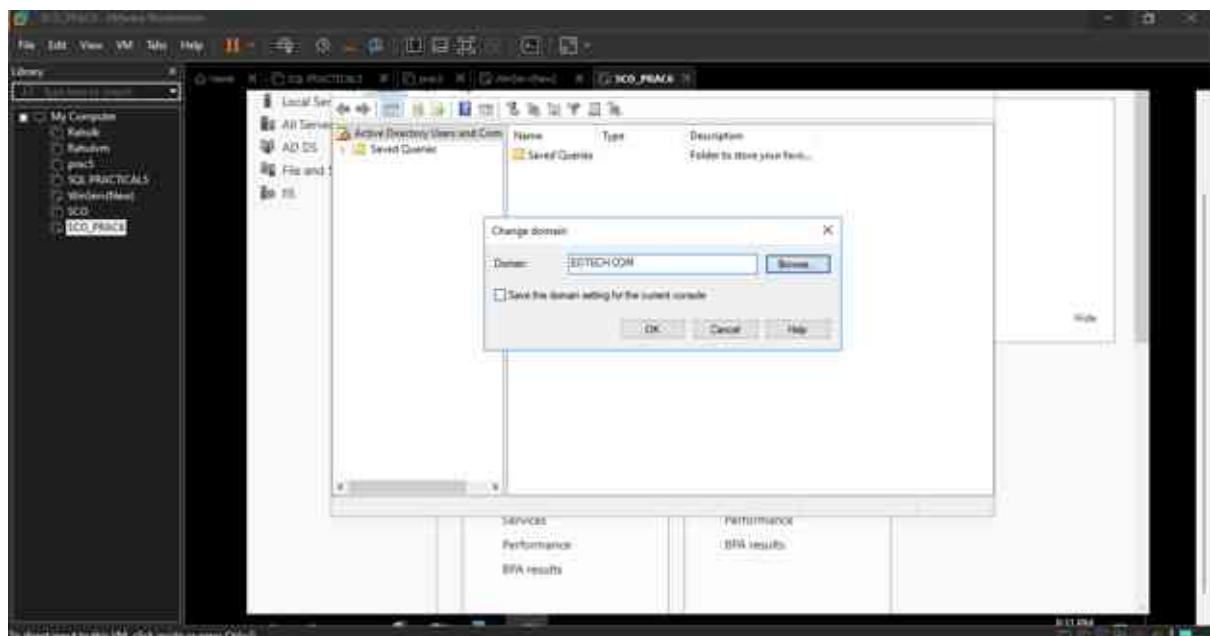
- Within Active Directory Users and Computers, Click on Action and Select Change Domain



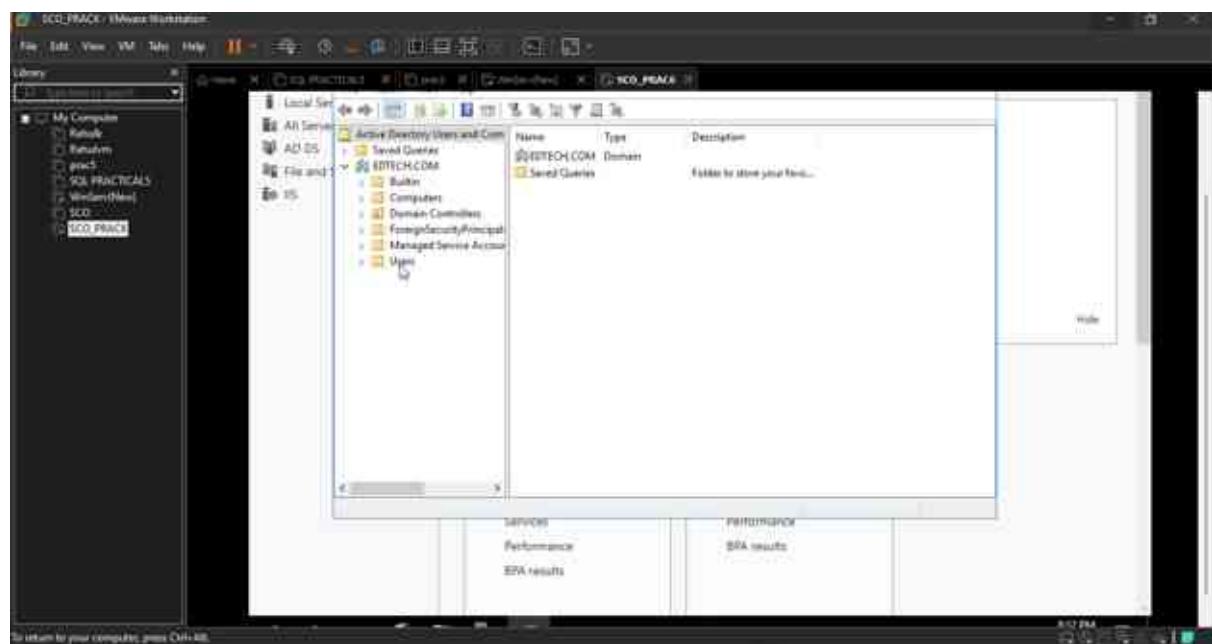
- Click on Browse and Select the Domain Controller (Here it is EDTECH.COM) and Click Ok



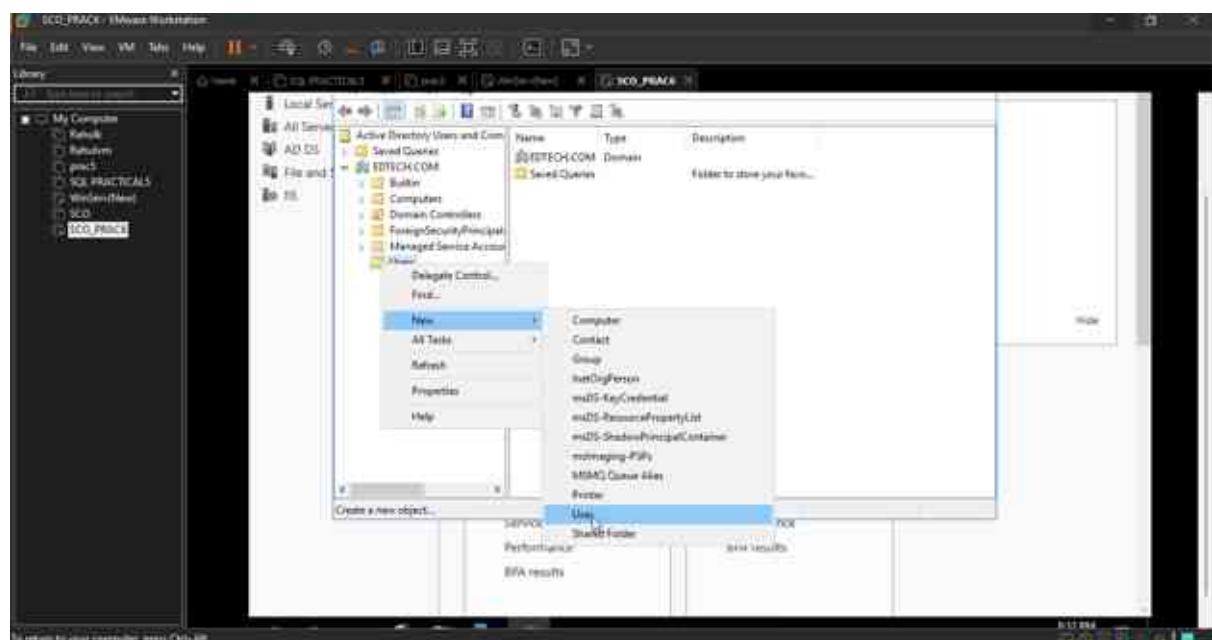
- Click on Ok



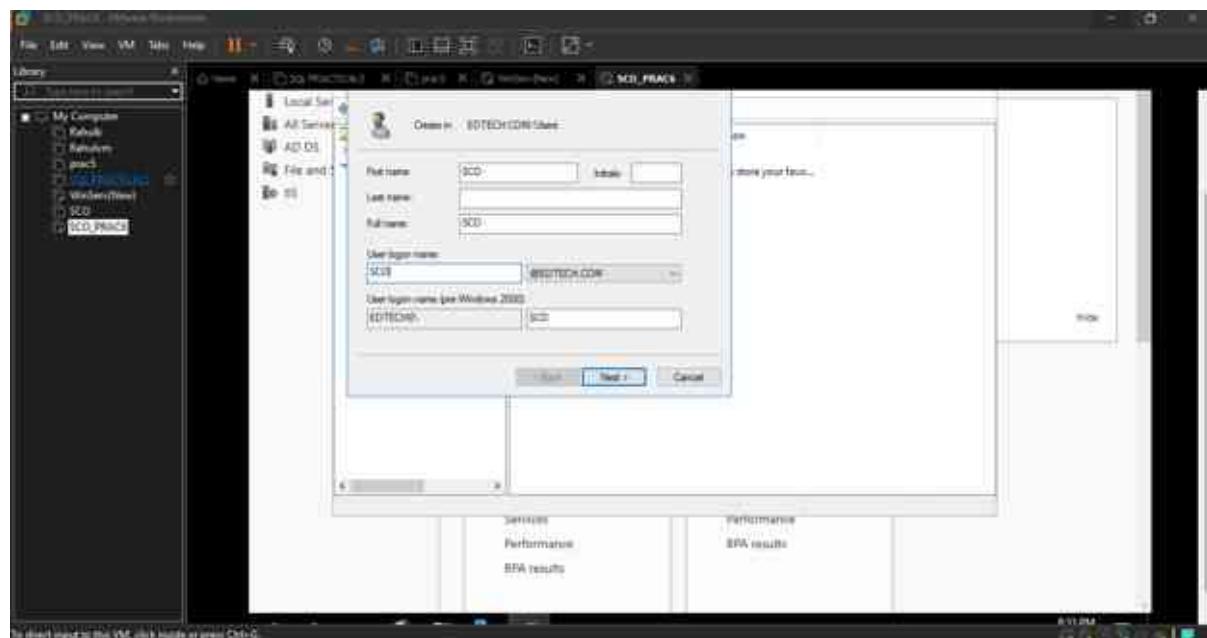
- Now the **Domain Controller** will be added, **Click on the Domain Controller** and **Click on Users**



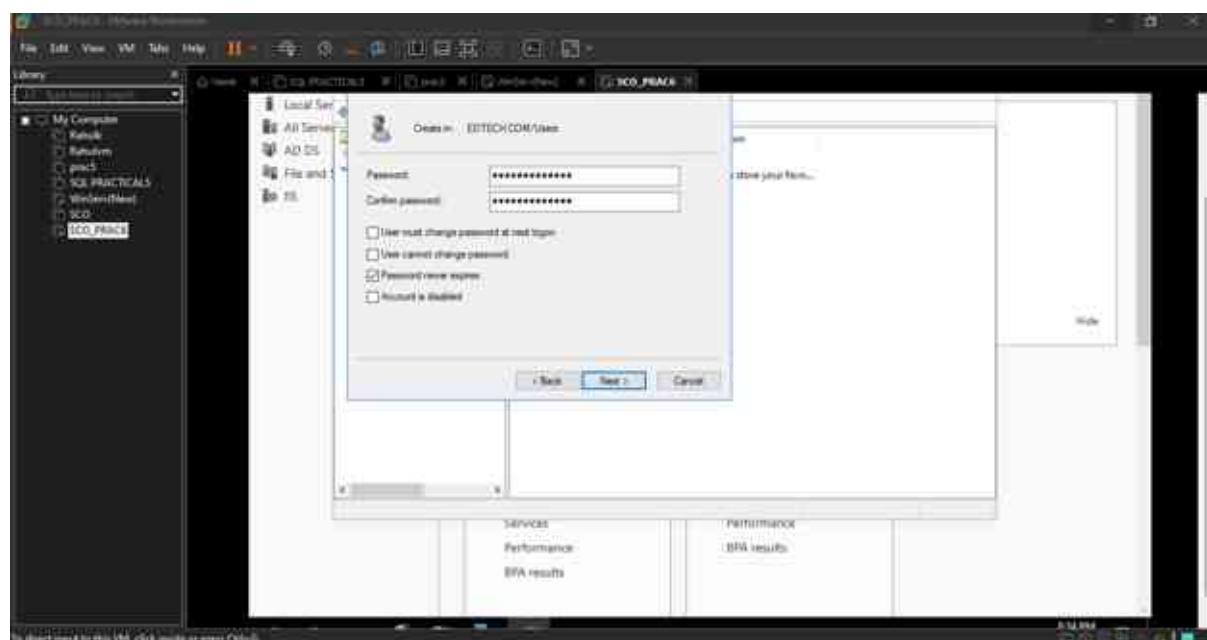
- Right **Click on Users** and **Click New and User**



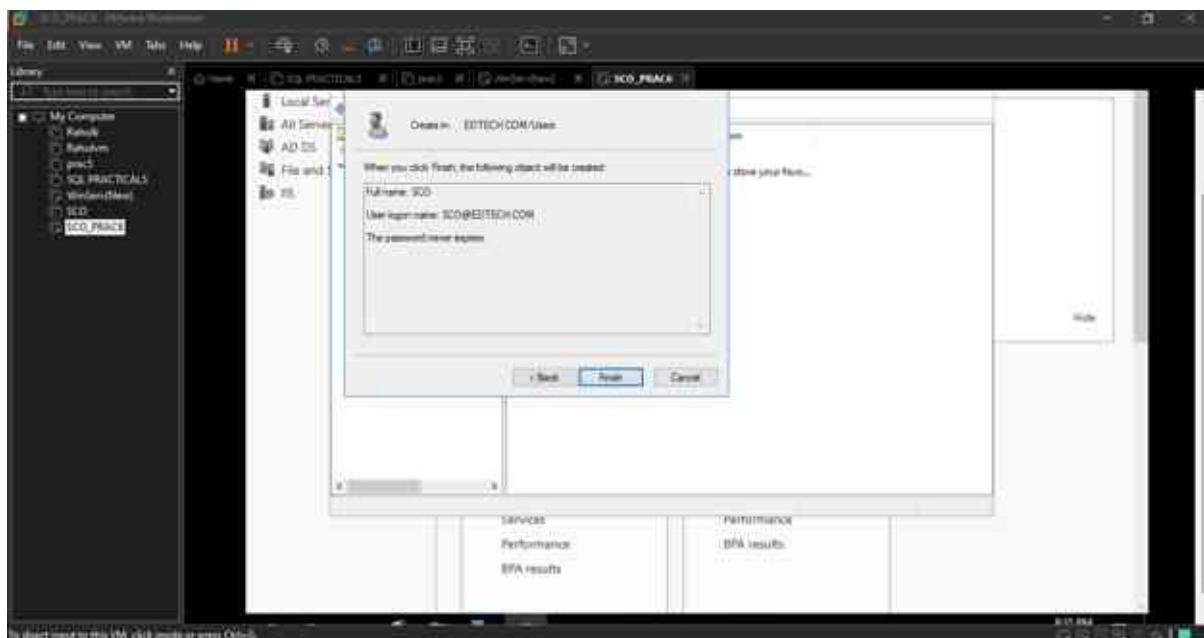
- Type in a new User name (here it is SCO) and Click Next



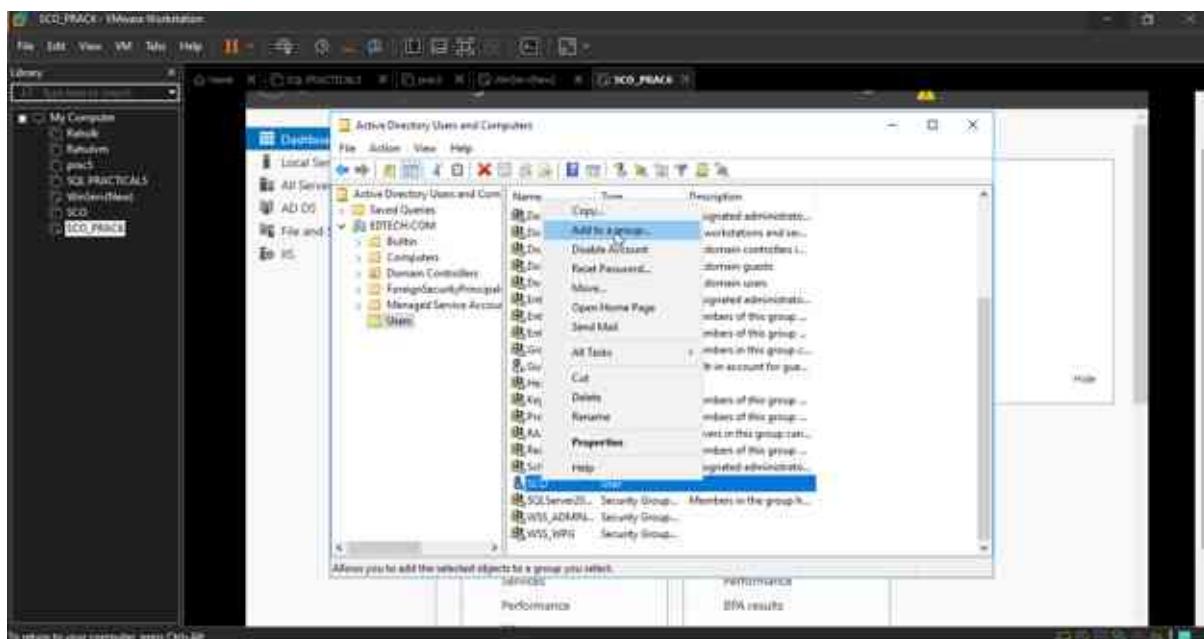
- Type in a password and Select Password never expires and Click Next



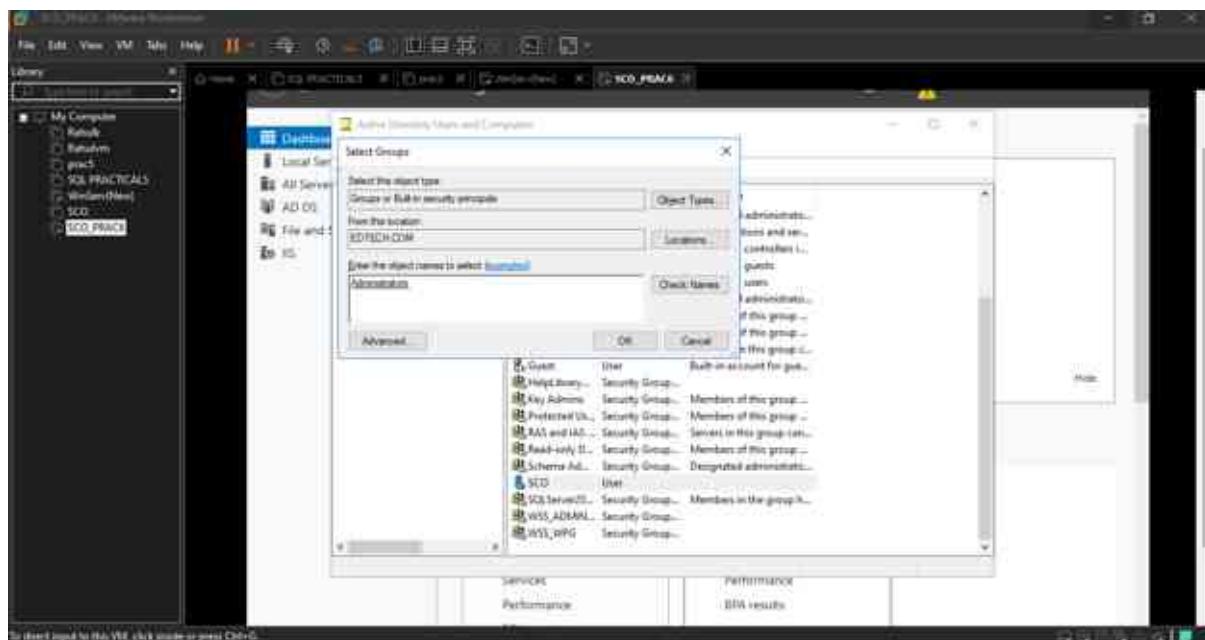
- Click on Finish



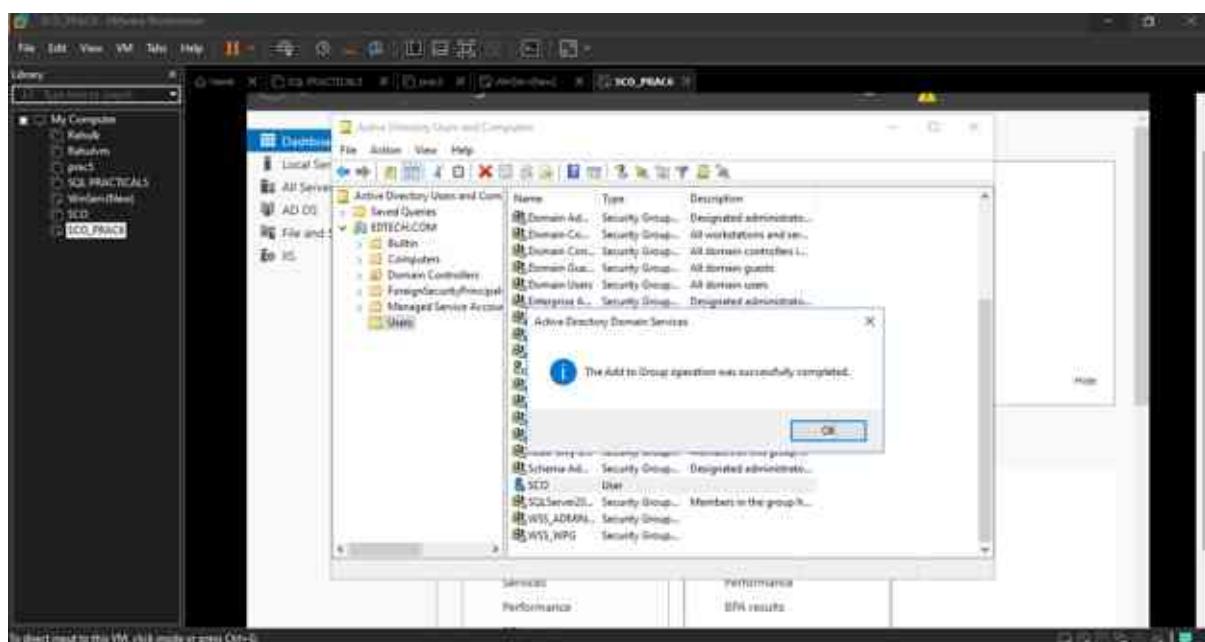
- Add the User to the Domain Group, Right Click on SCDPM and Select Add to a group



- Type in **Administrator** and Click on **Check Names** and Click on **Ok**

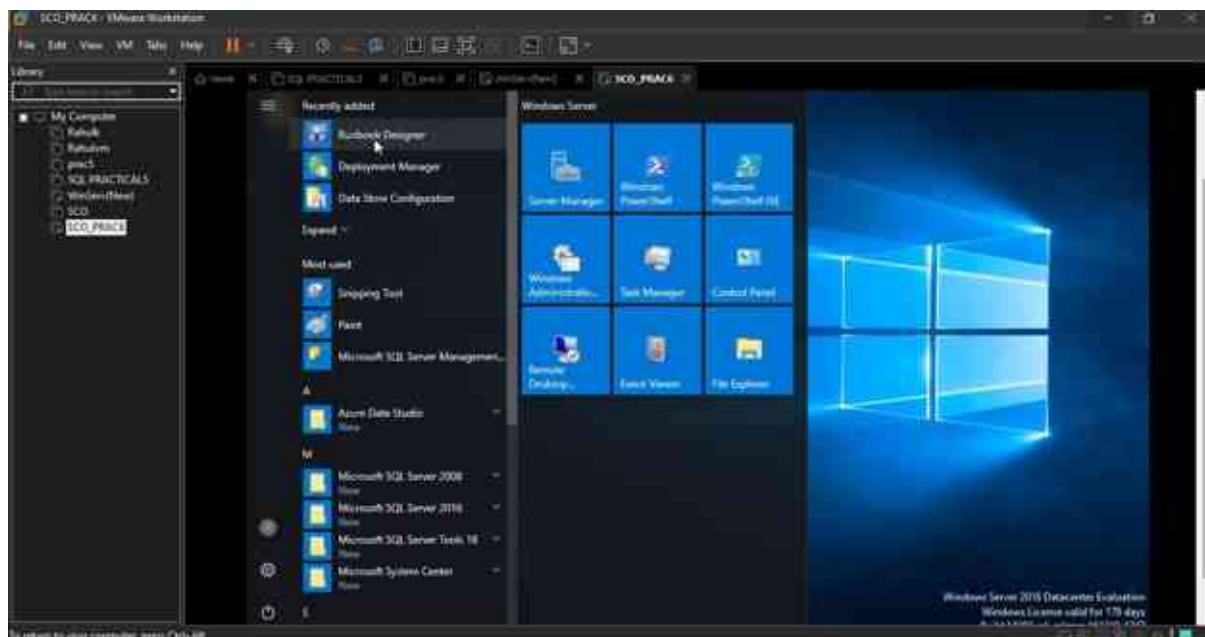


- Click on **OK**

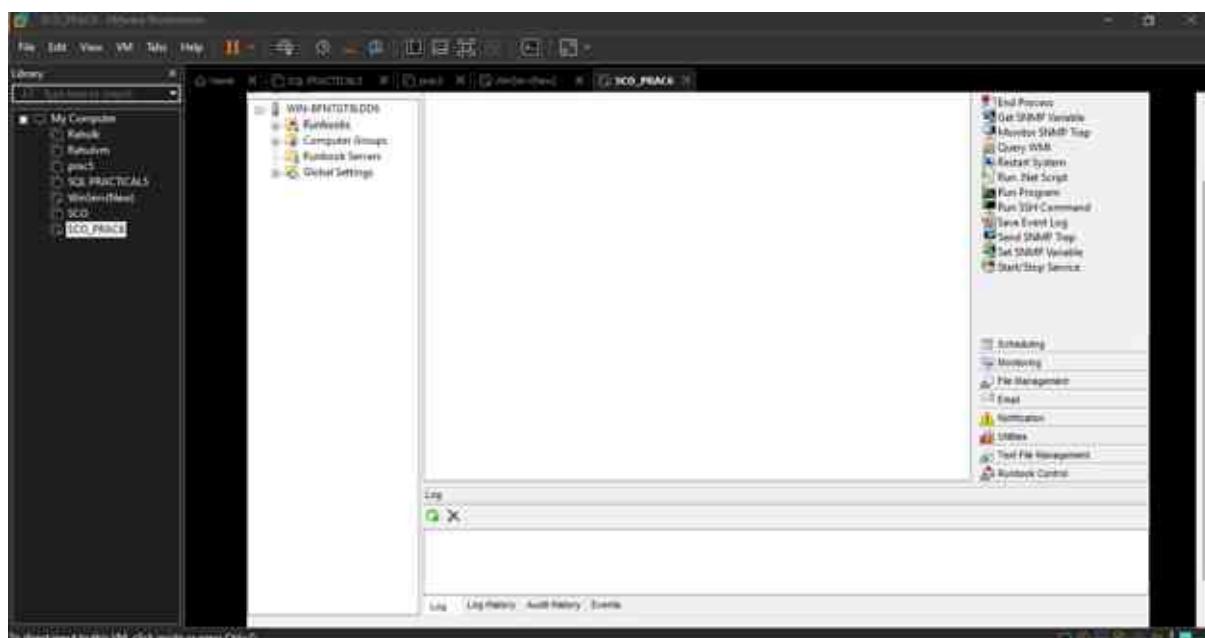


Step 2: View or modify the permissions of a runbook

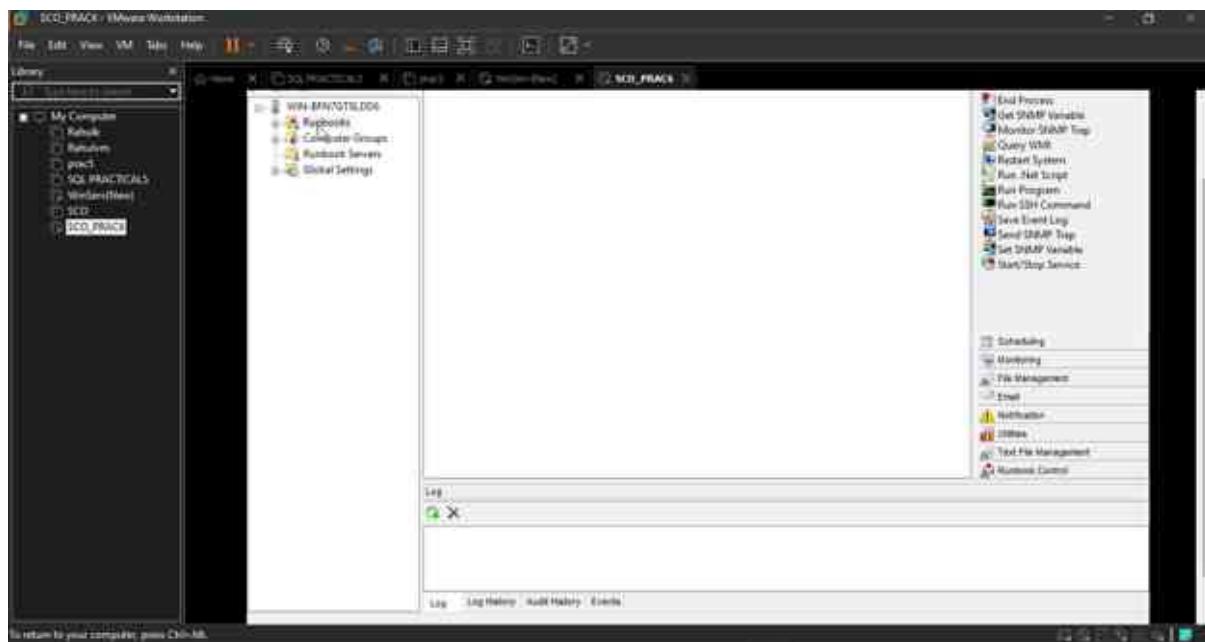
- Open Runbook Designer



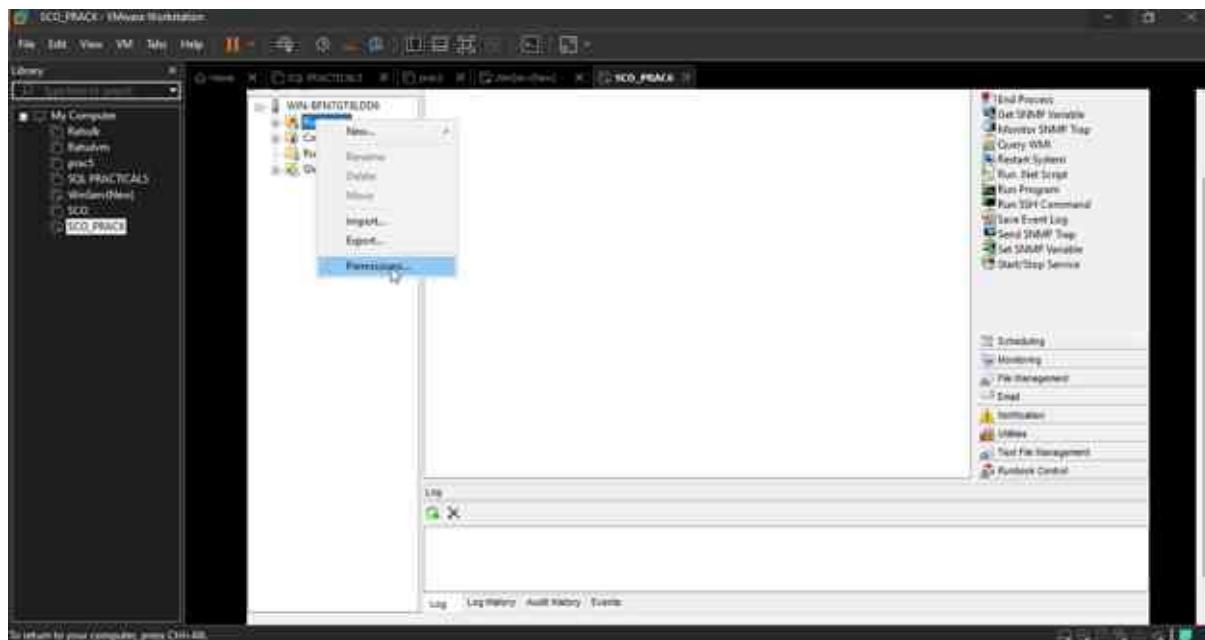
- Runbook Designer Window Open



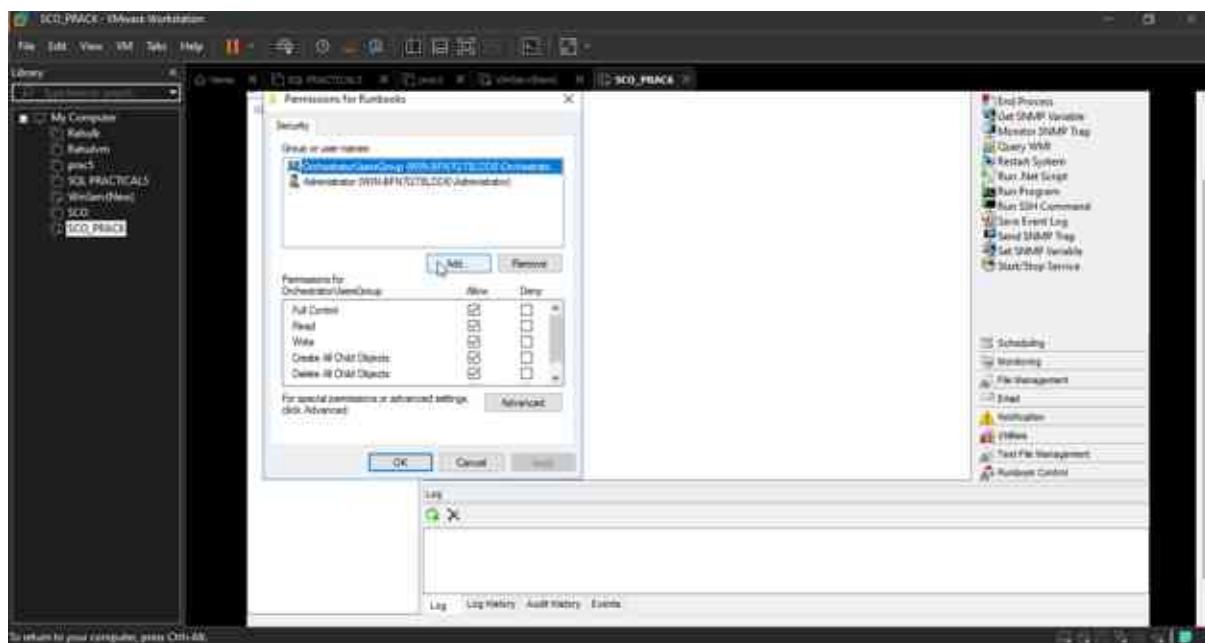
- In the **Runbook Designer**, in the Connections pane, select the **Runbooks** folder.



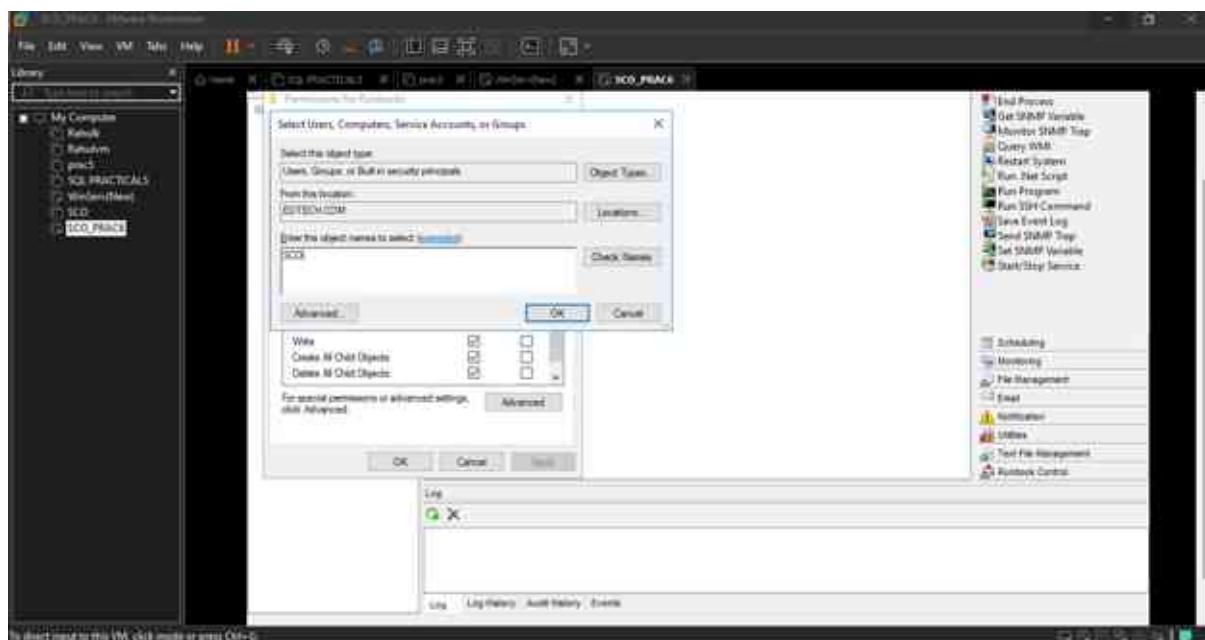
- In the **Runbook Designer Design workspace**, right-click the tab for a runbook to select **Permissions**.



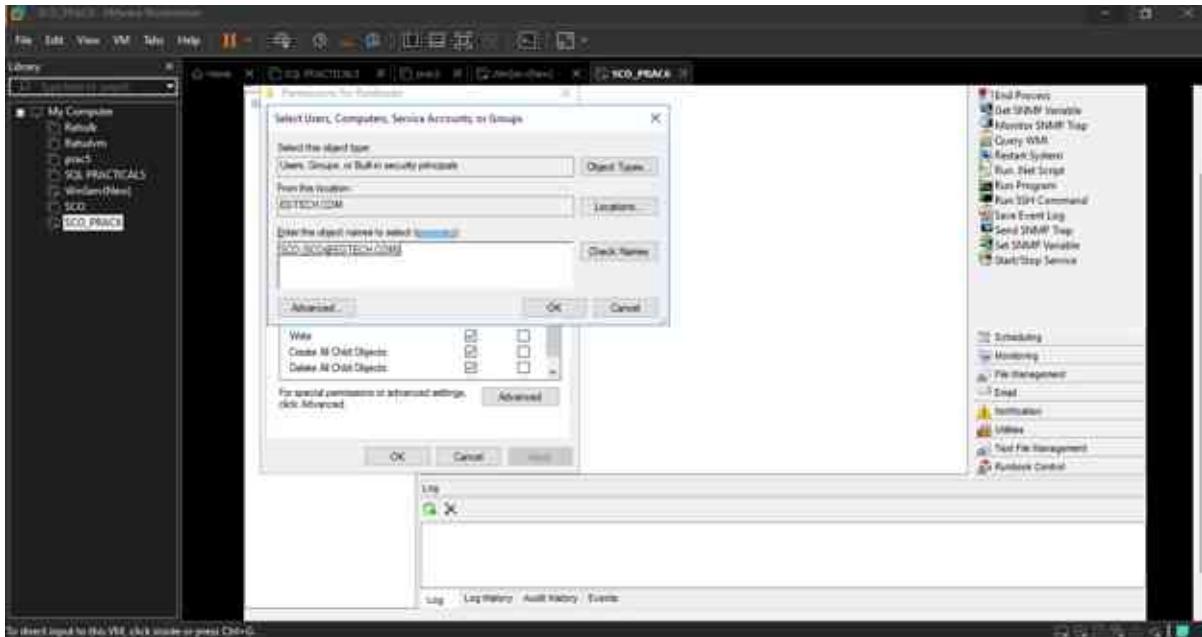
- To give another user or security group access to the runbook, select the Add button.



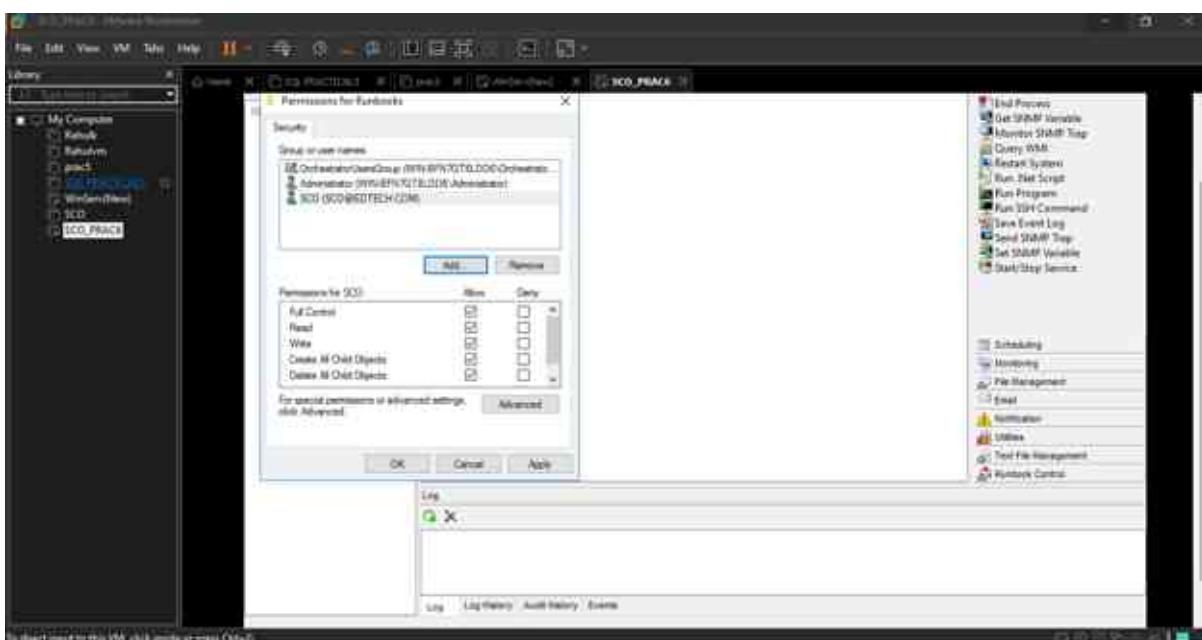
- select the user or security group from the local computer or from the domain.
- Here in Window Type SCO and Click on Check Names



- Click on Ok



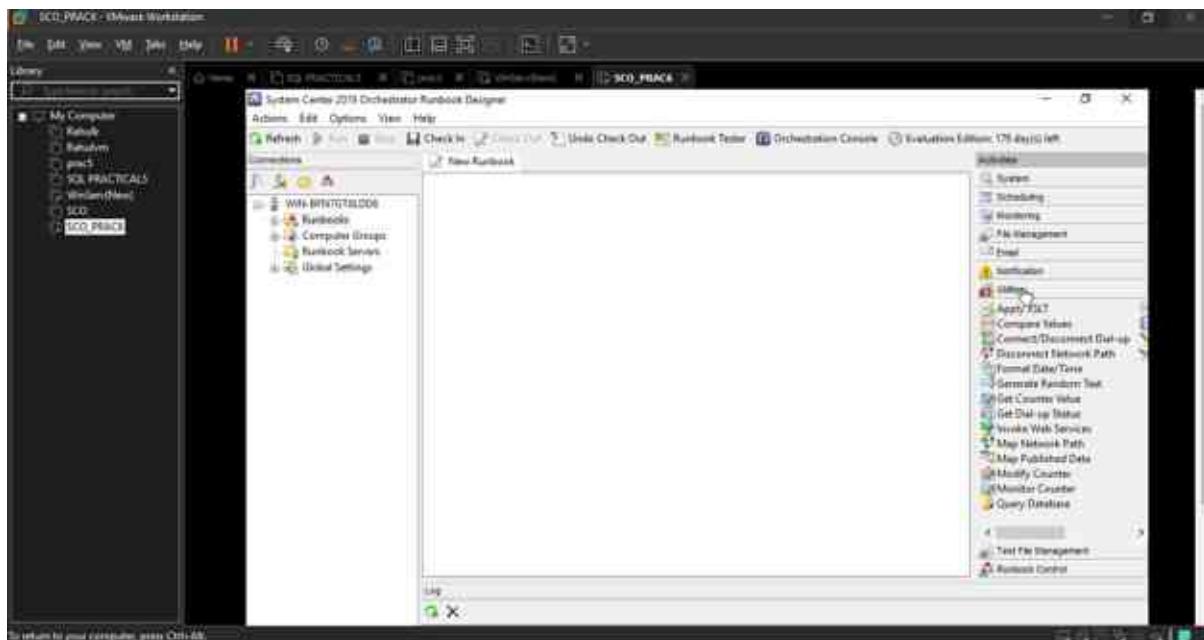
- Here We Can See **new user SCO** Added to the **Runbook**.
- Now this user has access to run, start, stop, view, and change runbooks at either the folder level or the individual runbook level.
- To close the Permissions for Runbook dialog and save any changes, **select OK**



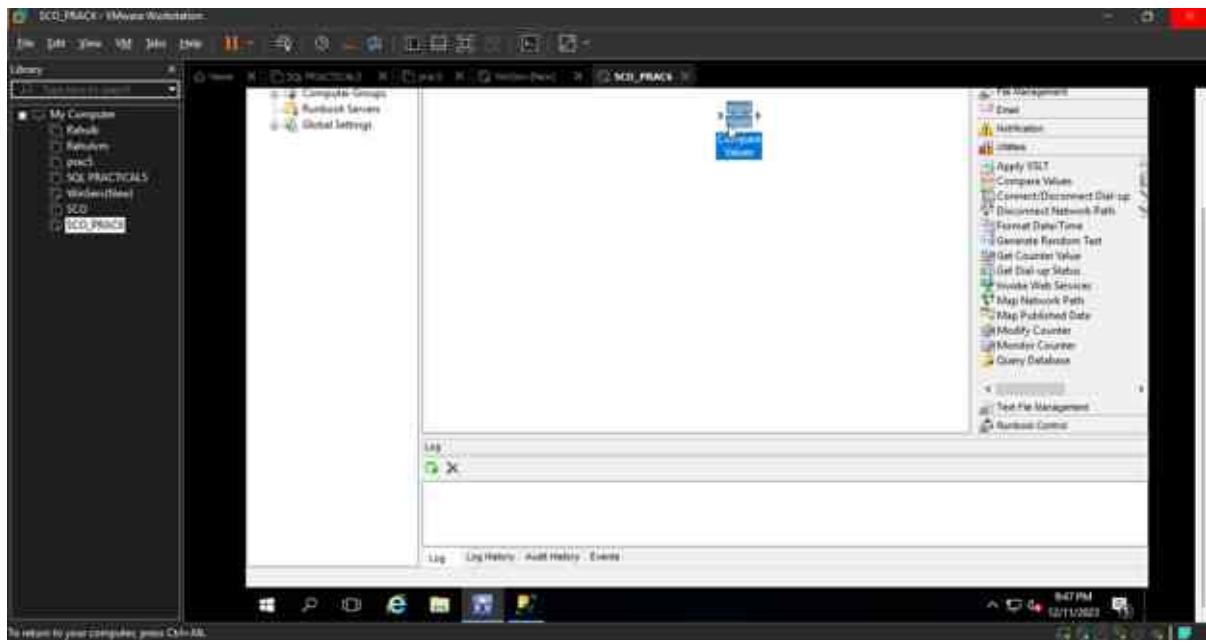
6A-2: Create a benchmark runbook

Step 3: Create a runbook that can be used to benchmark your Orchestrator environment

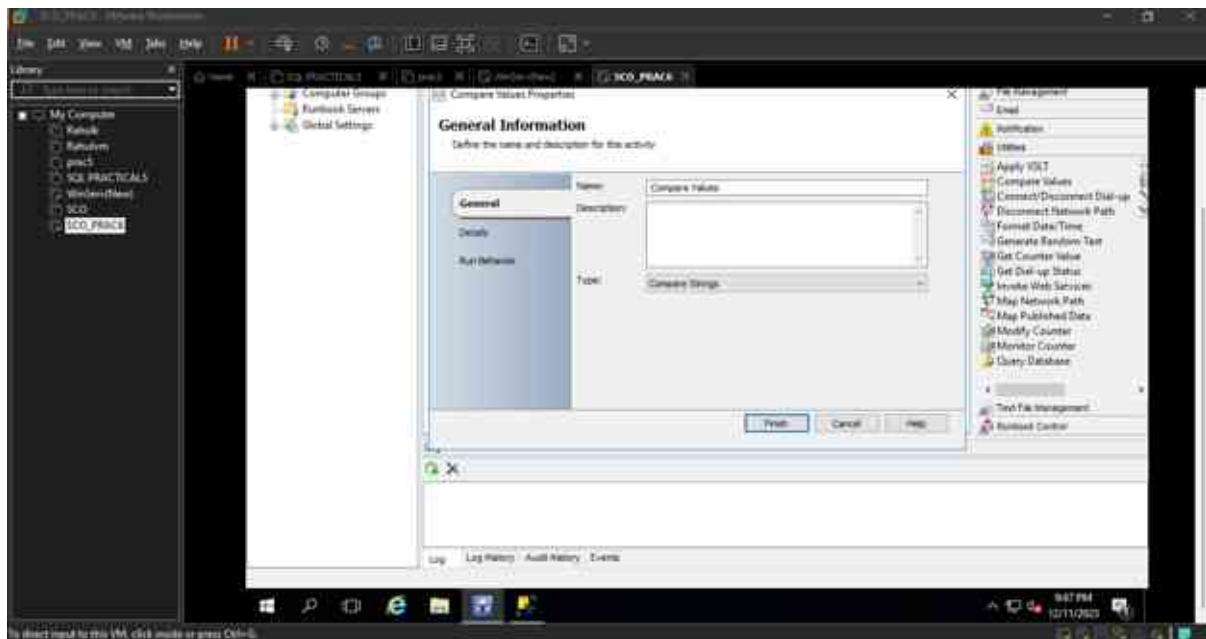
- **Create a New Runbook**



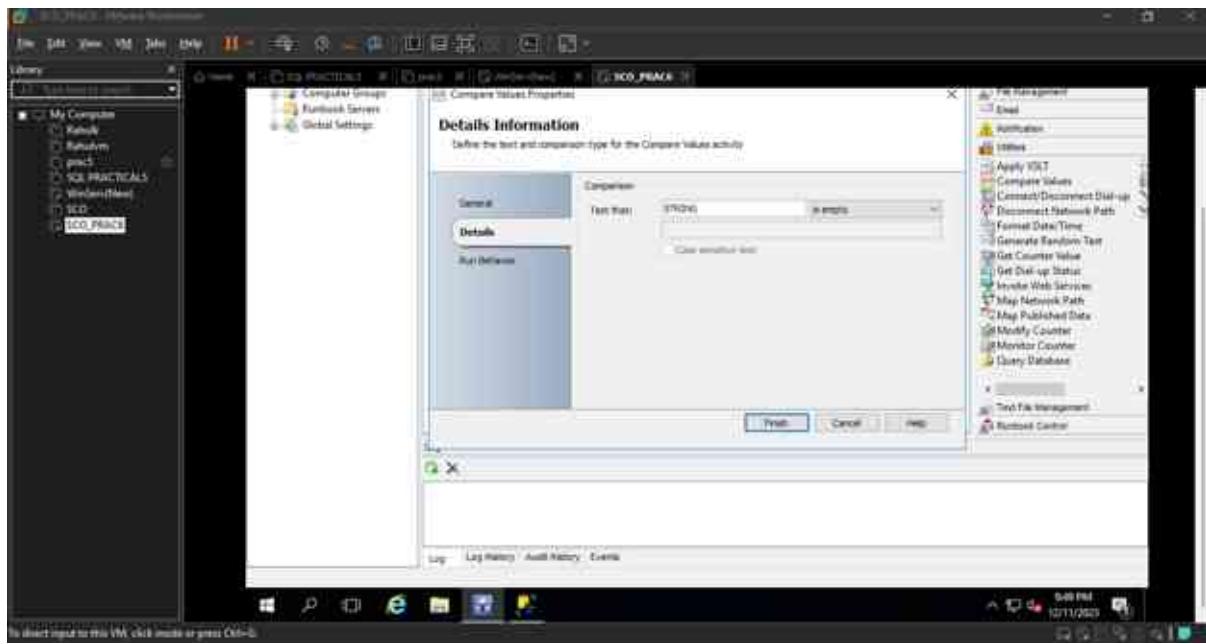
- **Add a Compare Values activity from the Standard Activity palette.**
- **Double-click the activity to configure it.**



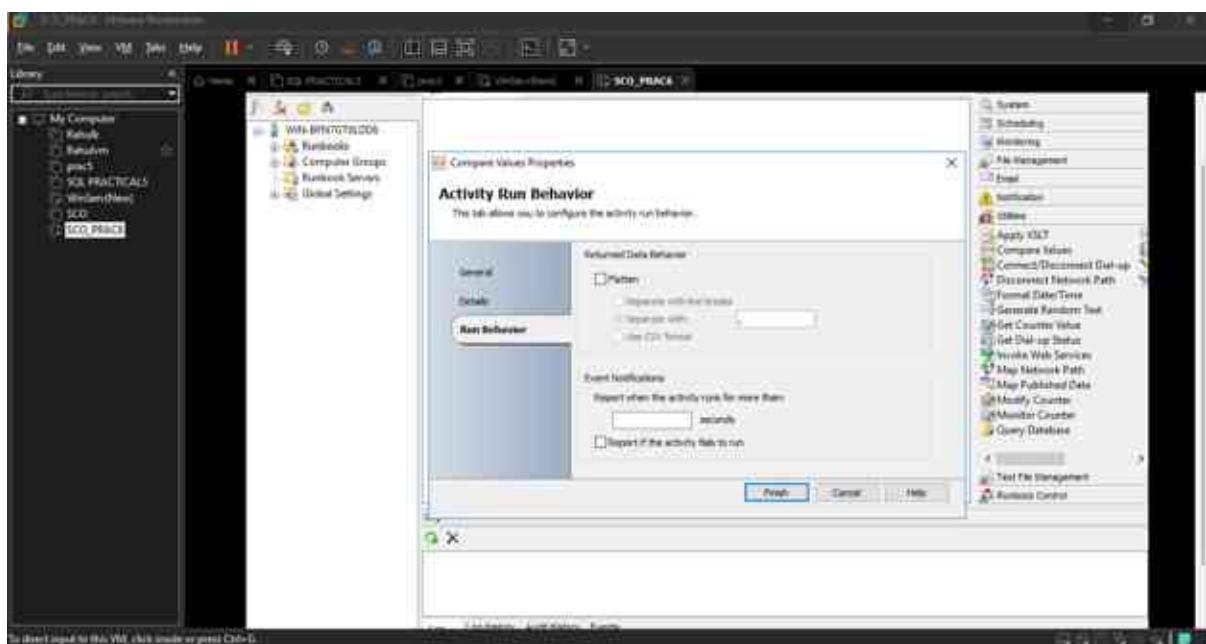
- Select the **General tab** and configure this **activity** to **compare strings** (the **default value**).



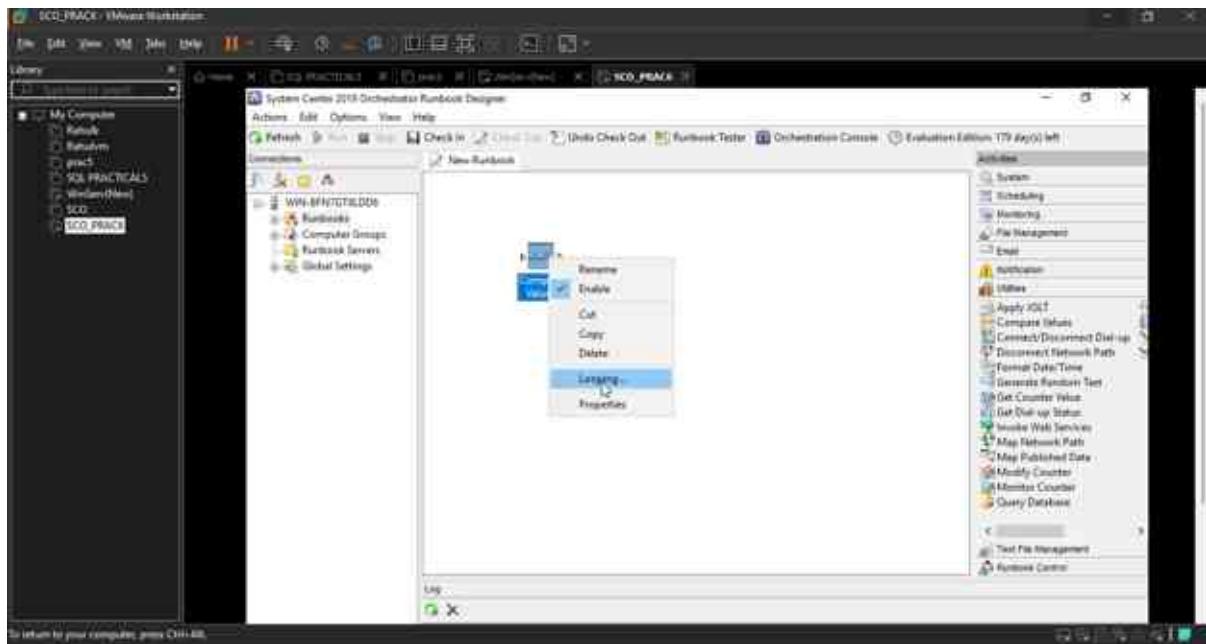
- Select the **Details tab**, enter the value **STRING** in the **Test** box and **select is empty**.



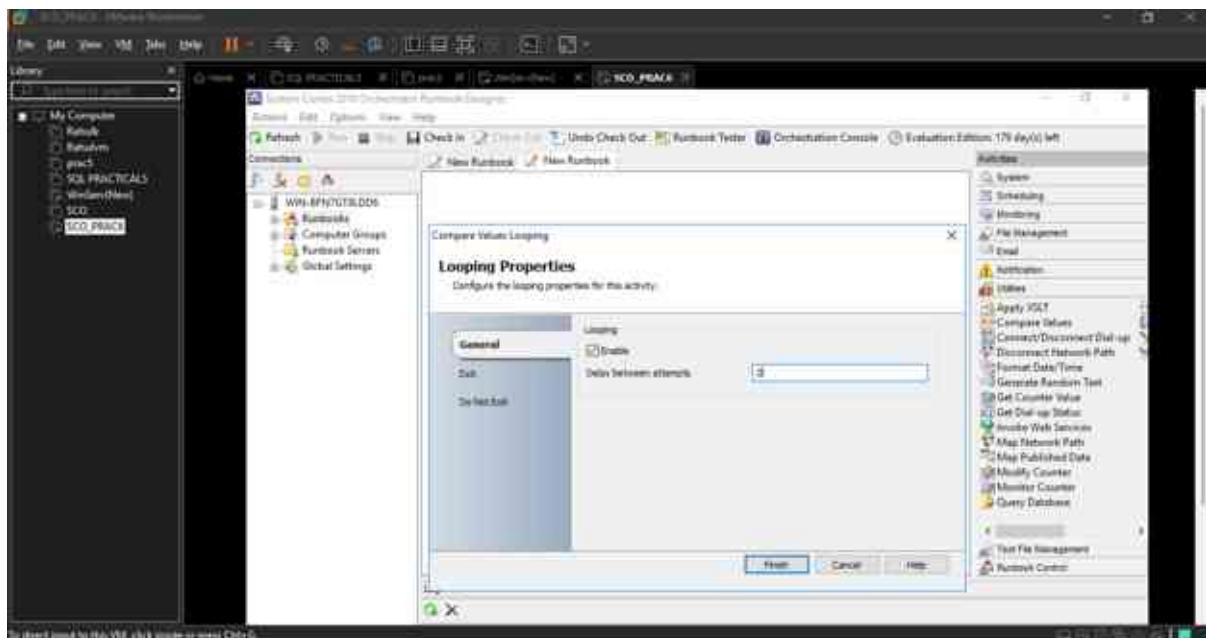
- **Keep the default setting.**
- **Select Finish to save the updates to the activity.**



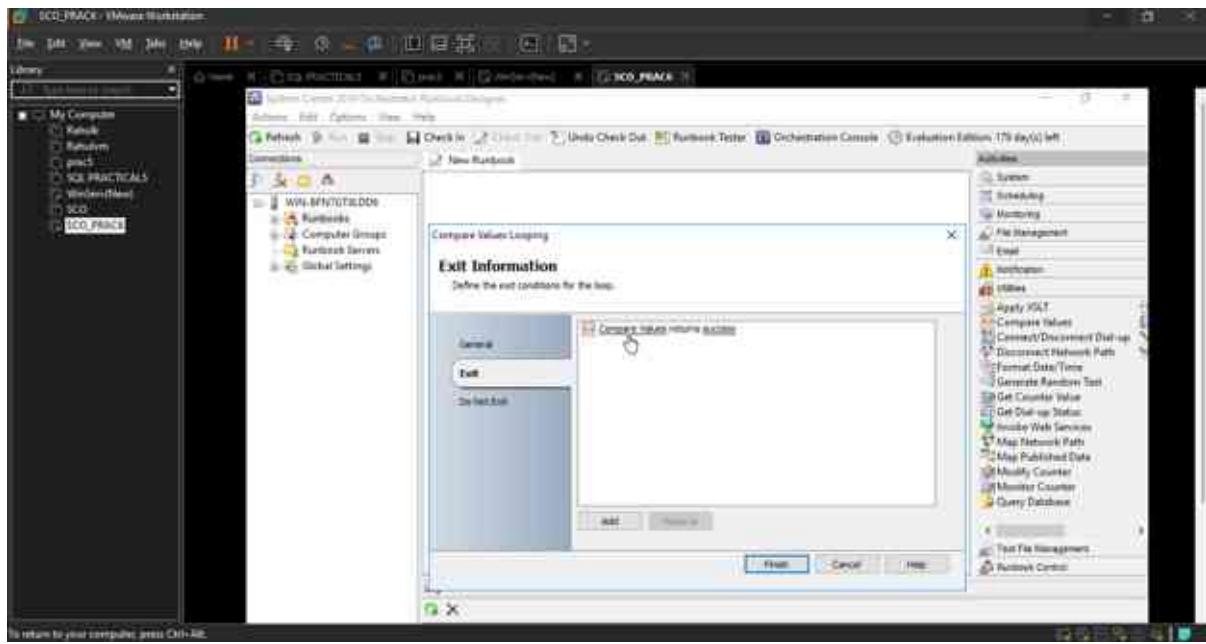
- **Right-click the activity and select Looping.**



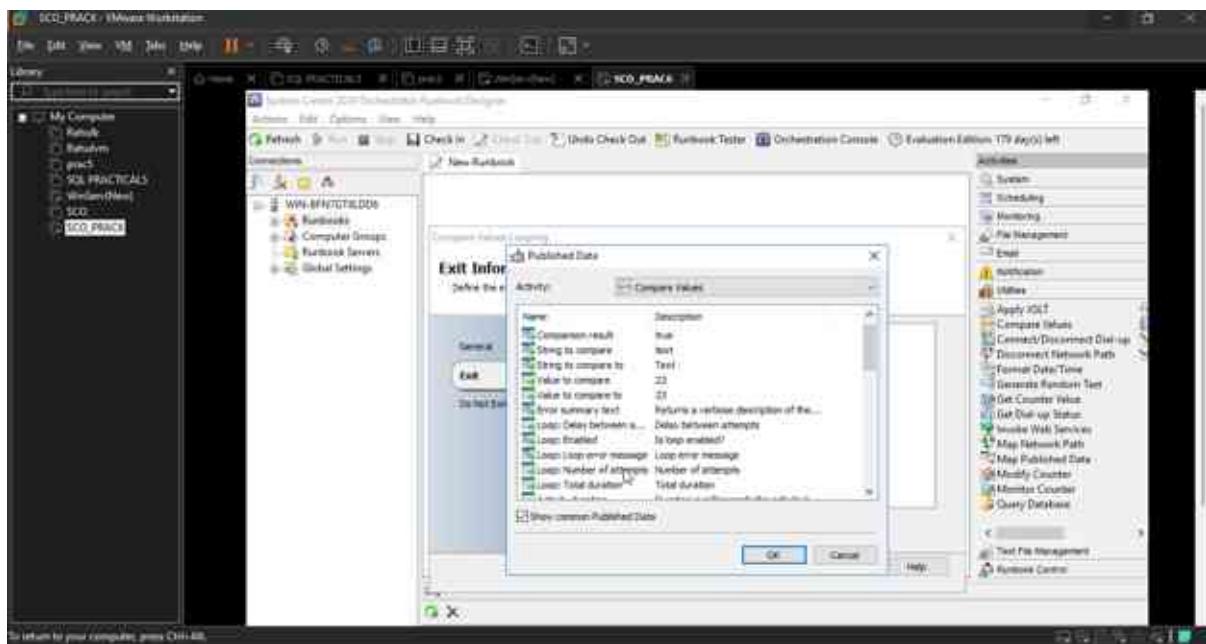
- Select the **Enable checkbox** and enter the number **0 (zero)** for Delay between attempts.



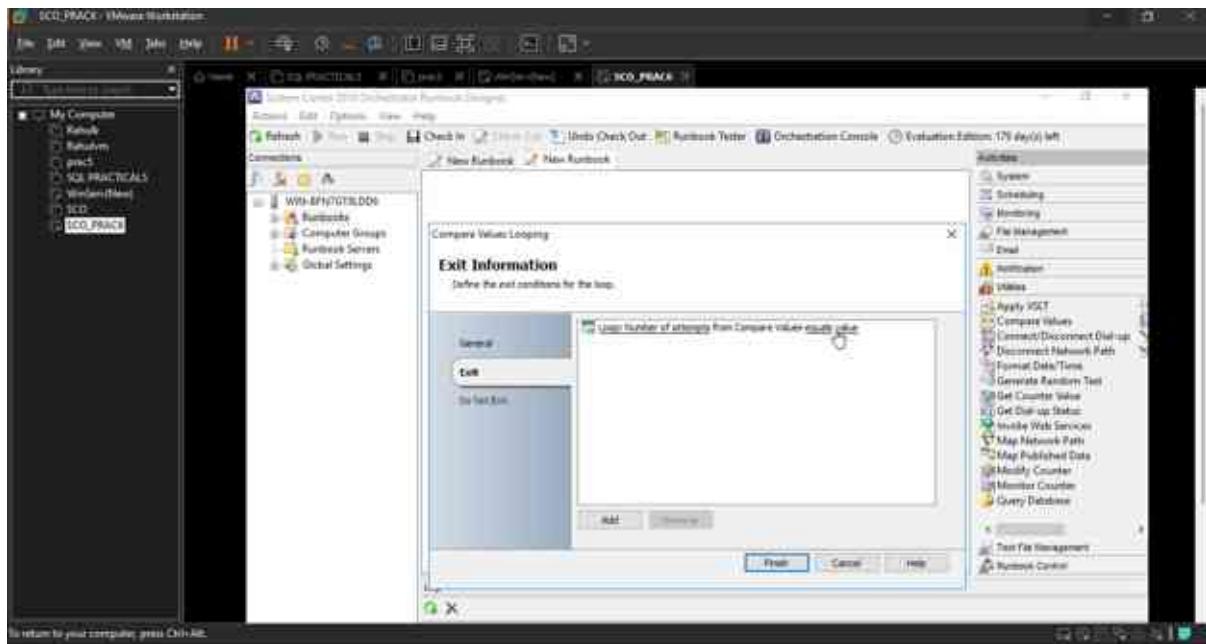
- Select the **Exit tab** and Click on **Compare Values**



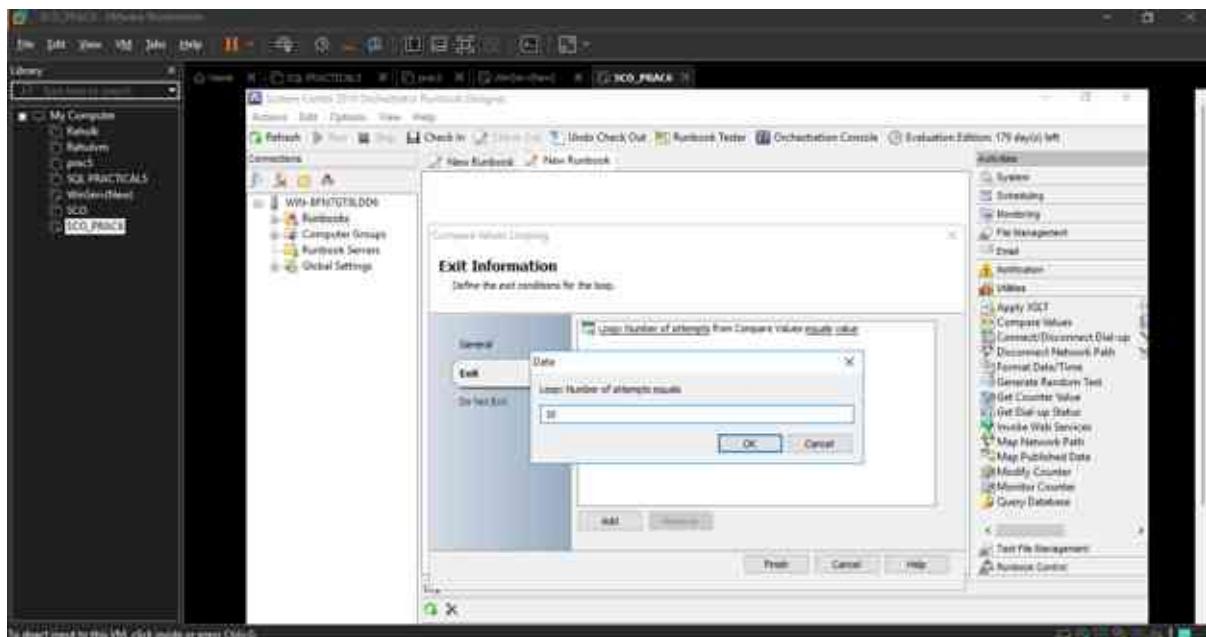
- check the **Show Common Published Data** checkbox, and select **Loop: Number of attempts**.
- Select **OK** to save this change.



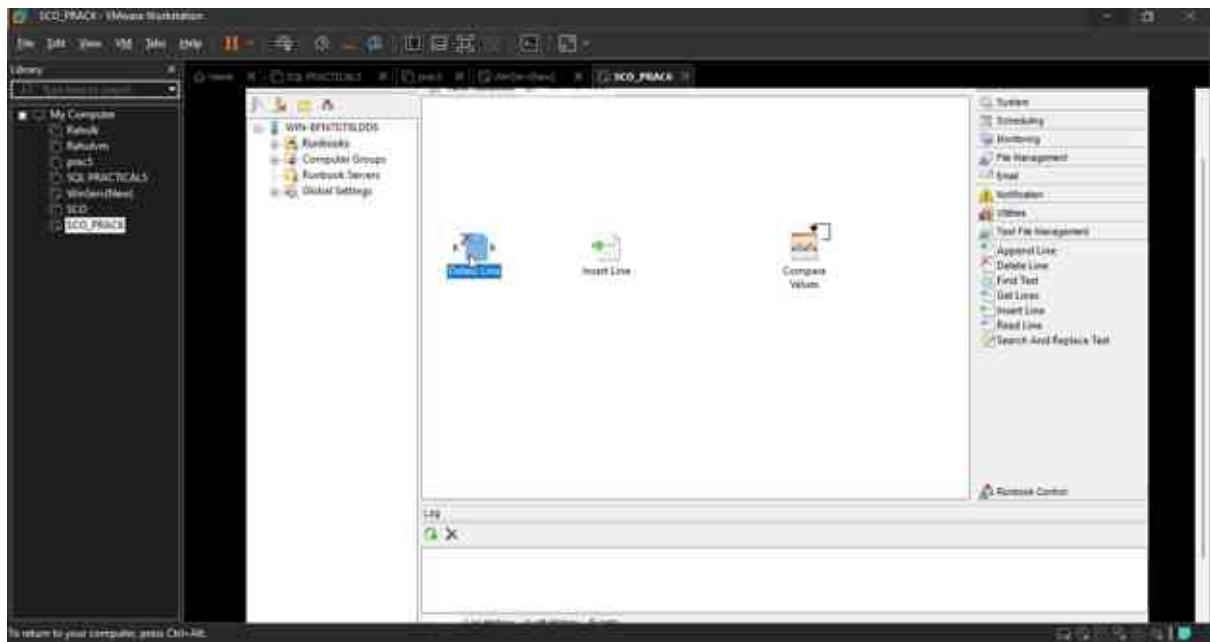
- Click on equals value



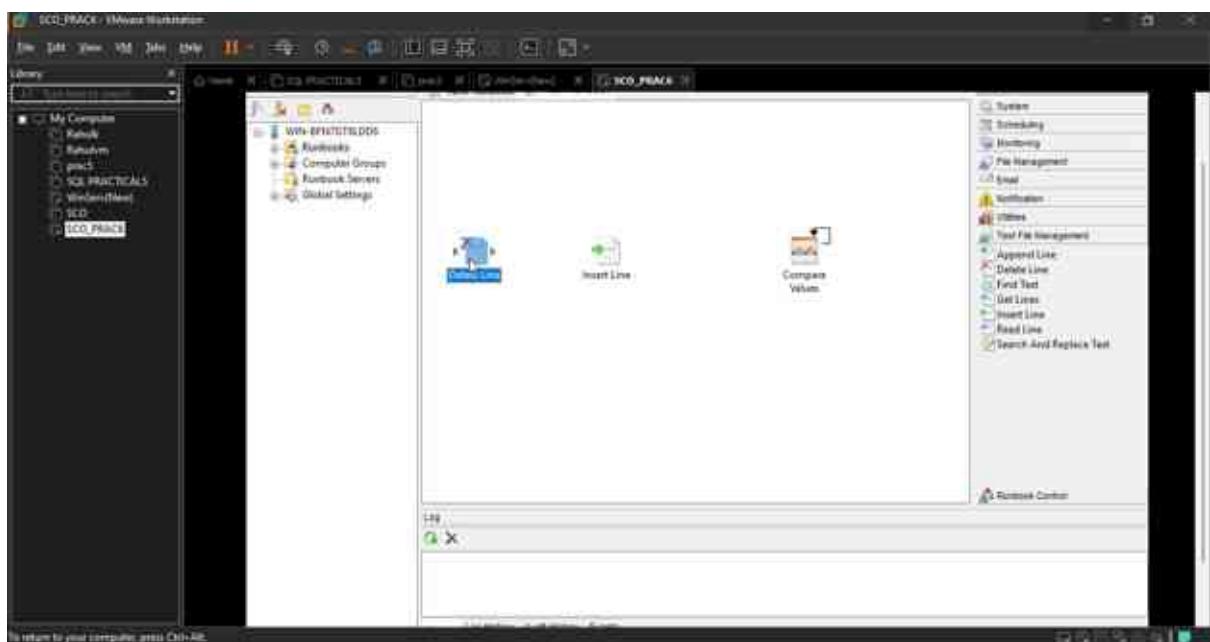
- Enter the number 10.
- Select OK to save this change.
- Select Finish to save these updates.



- Add a Delete Line and Insert Line activity from the Standard Activity palette.

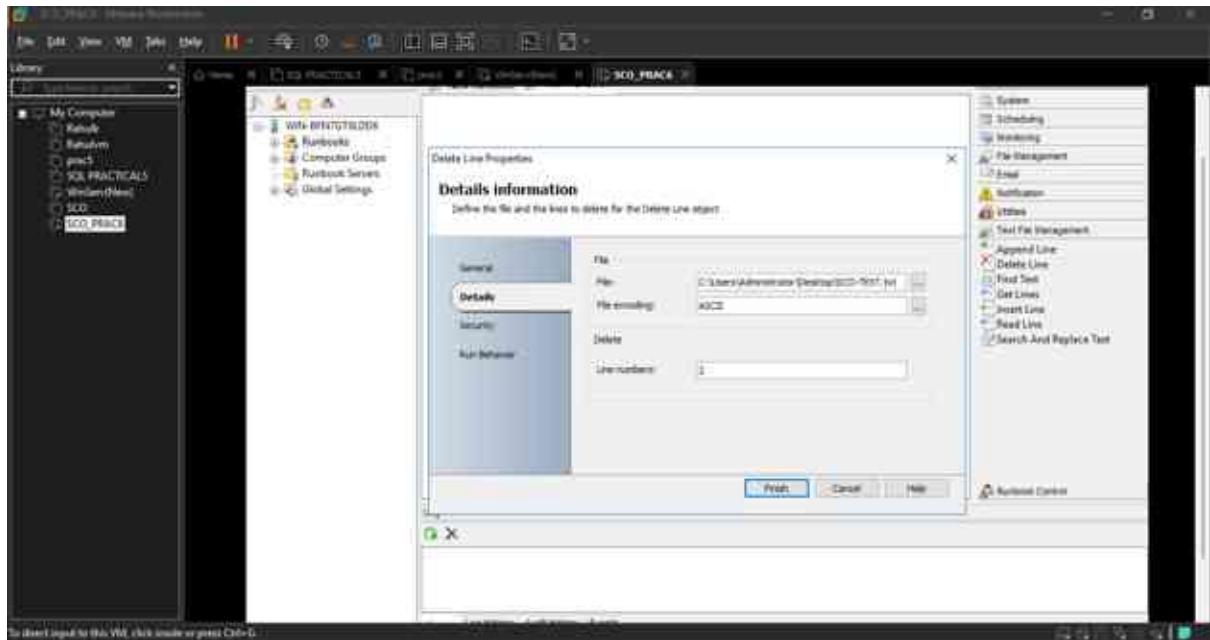


- Click on Delete Line

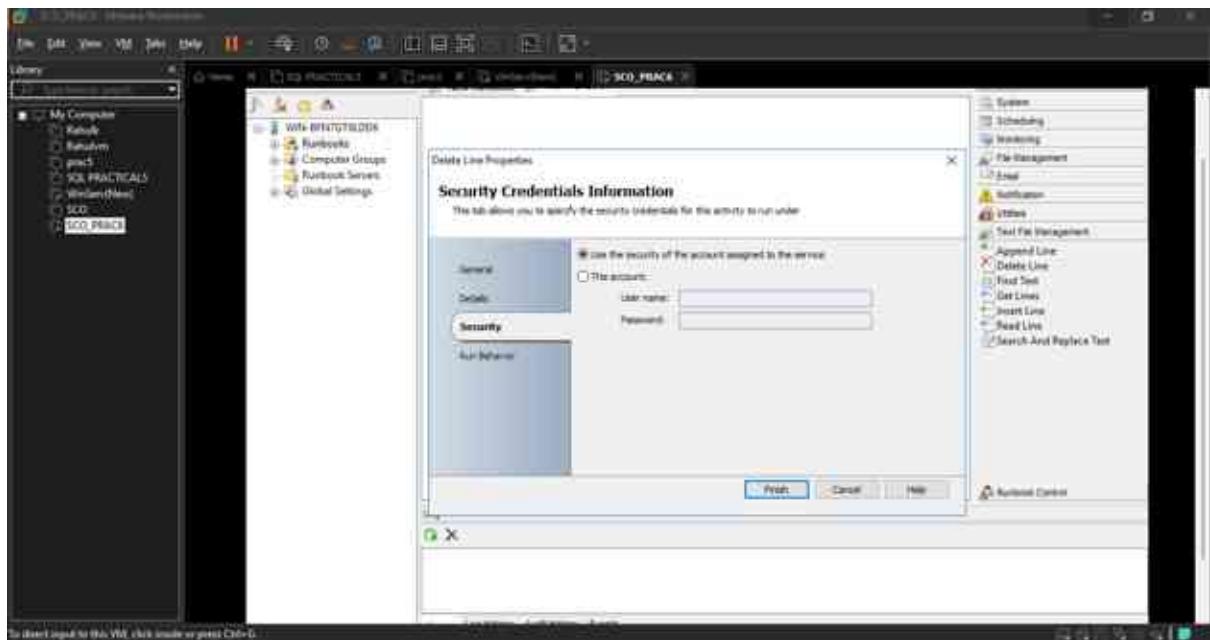


- Select the Details Tap Within Details Click on File Select SCO-TEXT.txt From Desktop.
- Click on File encoding Select ASCII

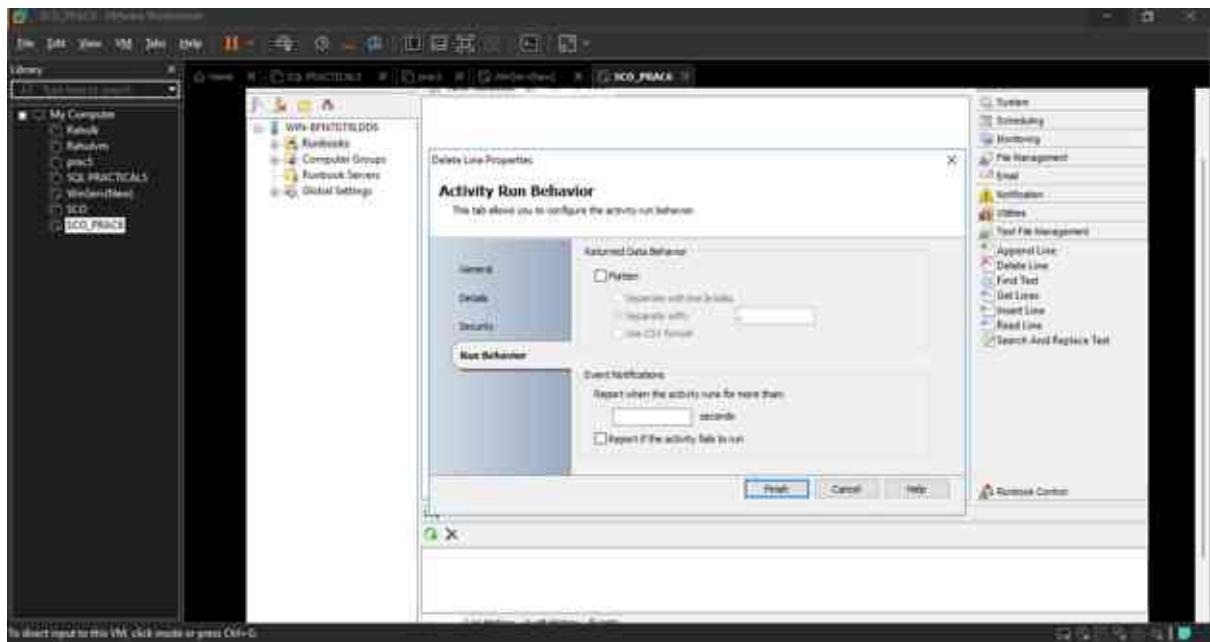
- Within Delete Enter the line number of the text that you want to delete from the SCO-TEXT.txt file (Here line number 2)



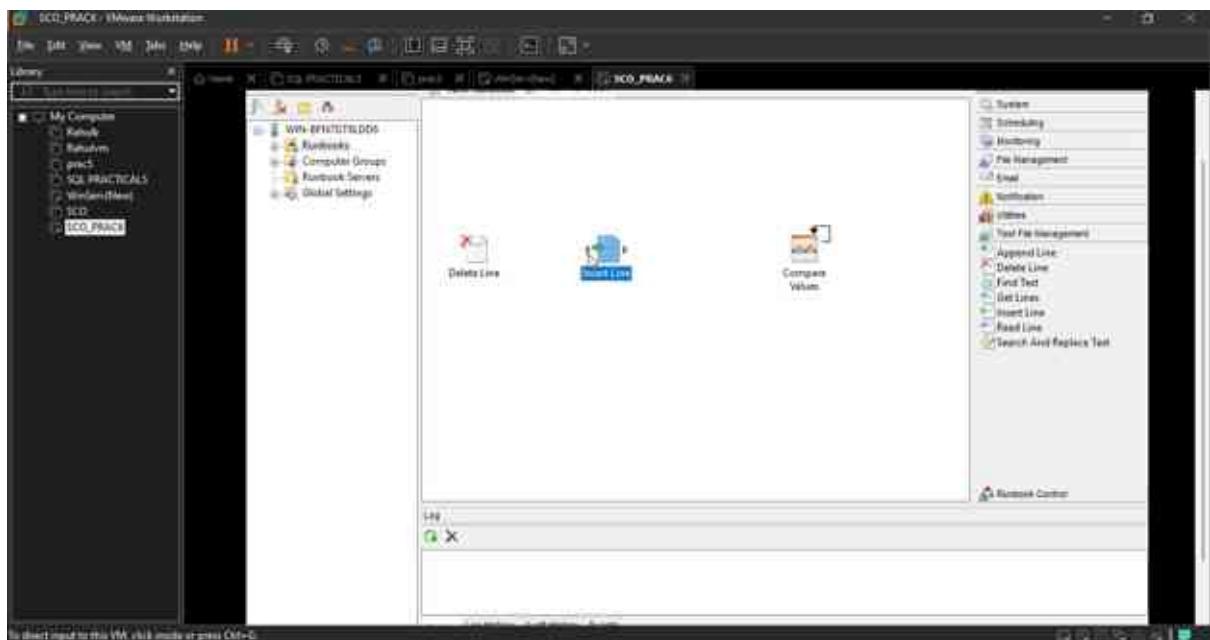
- Keep the default value



- Keep the default value and Click on Finish to Save the Changes to the Delete Line Activity.

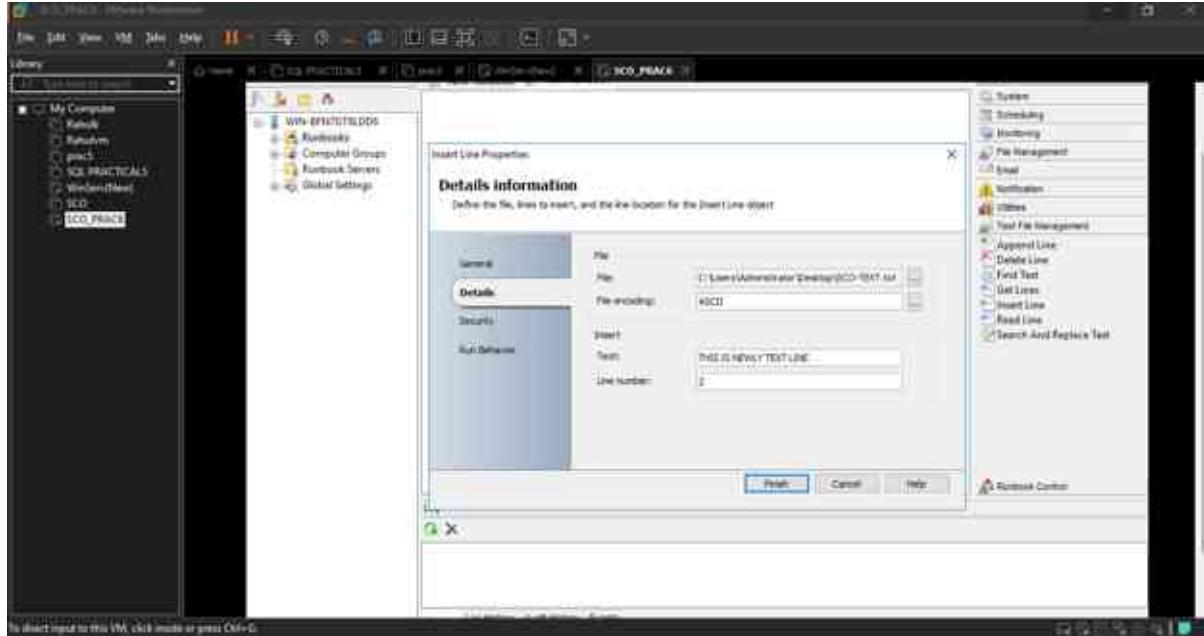


- Click on Insert Line

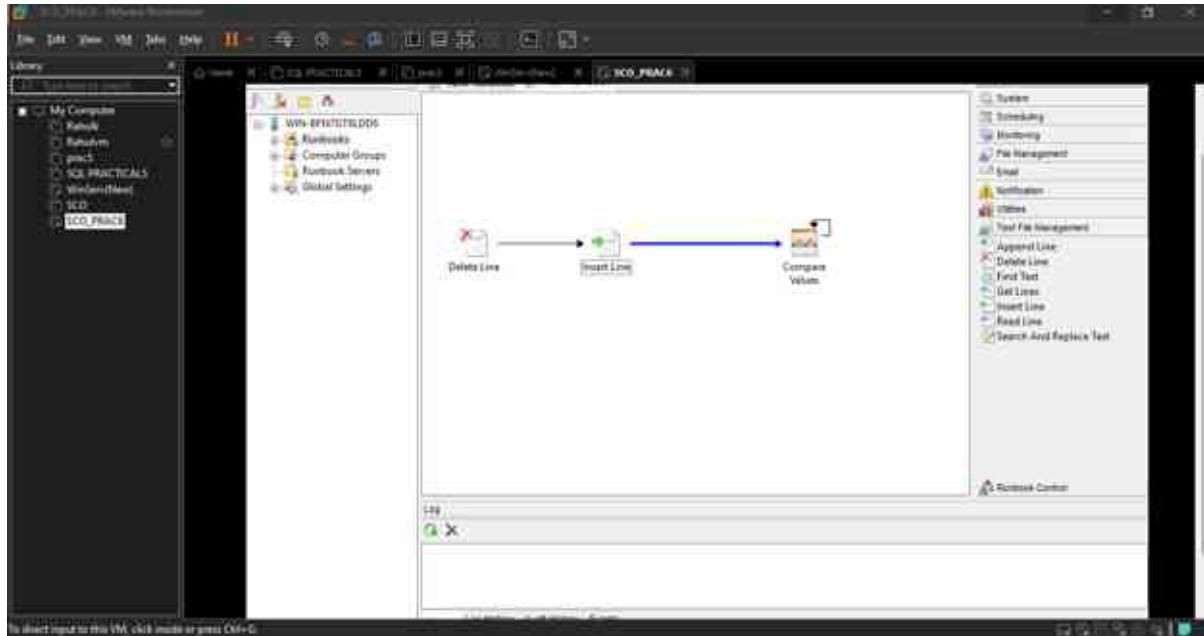


- Select the Details Tap Within Details Click on File Select SCO-TEXT.txt From Desktop.
- Click on File encoding Select ASCII

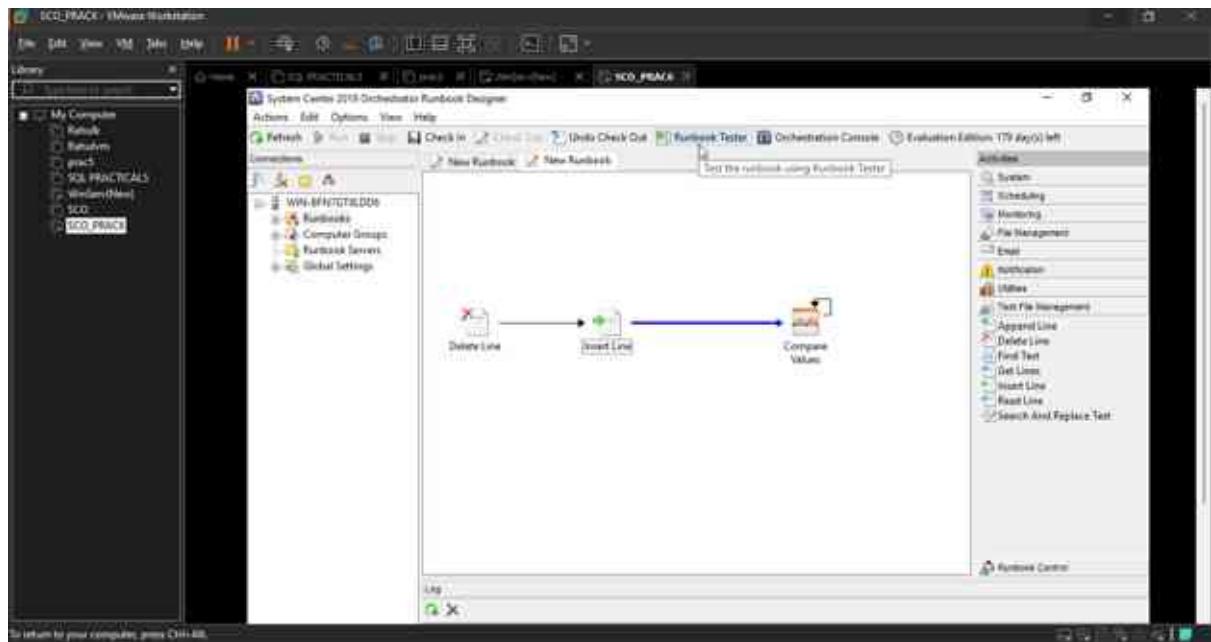
- Within Insert Enter the text that you want to insert into the file (Here New Text line is: **THIS IS NEW TEXT LINE**)
- Within Insert Enter the line number where the text will be inserted (Here line number: 2) and Click on Finish to save the changes to the Insert activity.



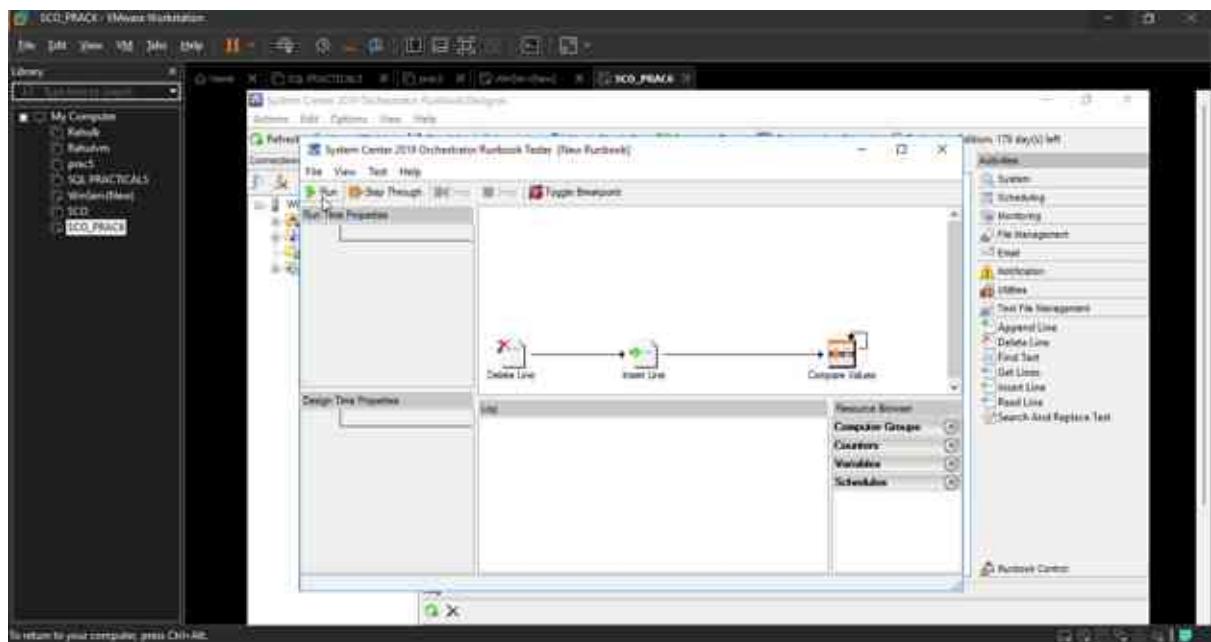
- Now Connect the activity through the smart Link

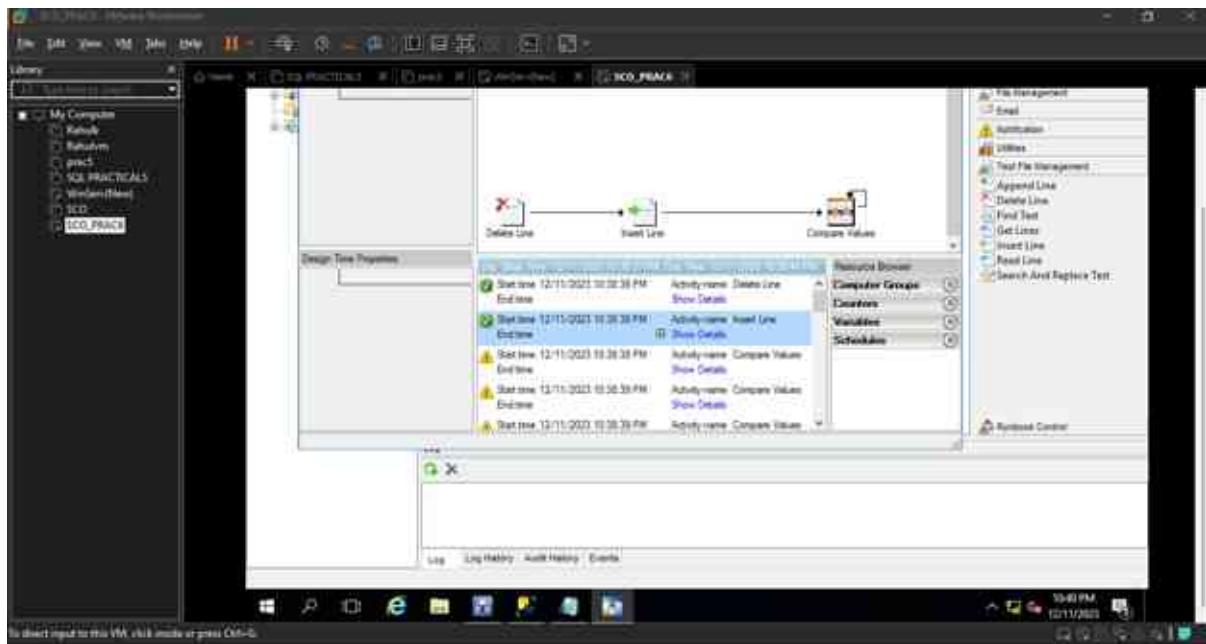


- Click on Runbook Tester



- Click on Run





6A-3: Optimize performance of .NET activities

Improve assembly load time

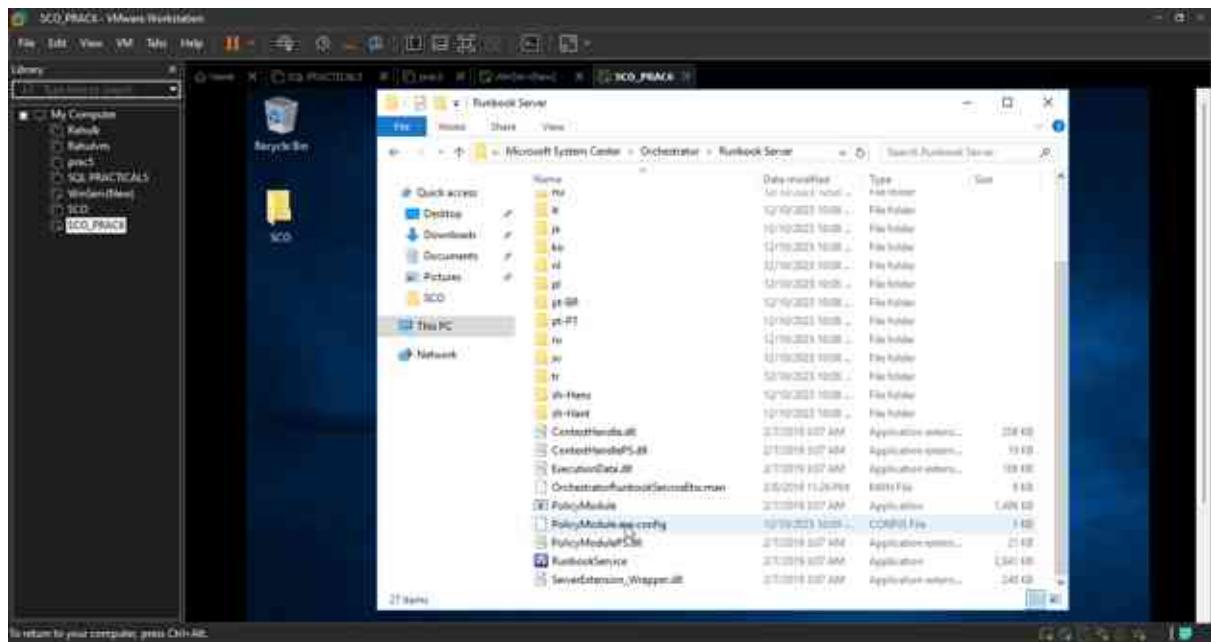
When a runbook containing an activity that references the .NET assemblies executes, the job process has to load the referenced assembly when such an activity is executed. Any subsequent execution of the same activity or other activities from the assembly will reuse the loaded assembly.

Loading an assembly may cause a delay of up to 30 seconds. This delay can also occur when a runbook is started on a computer without Internet access, because Windows can't verify the Microsoft Authenticode signature for the .NET assemblies.

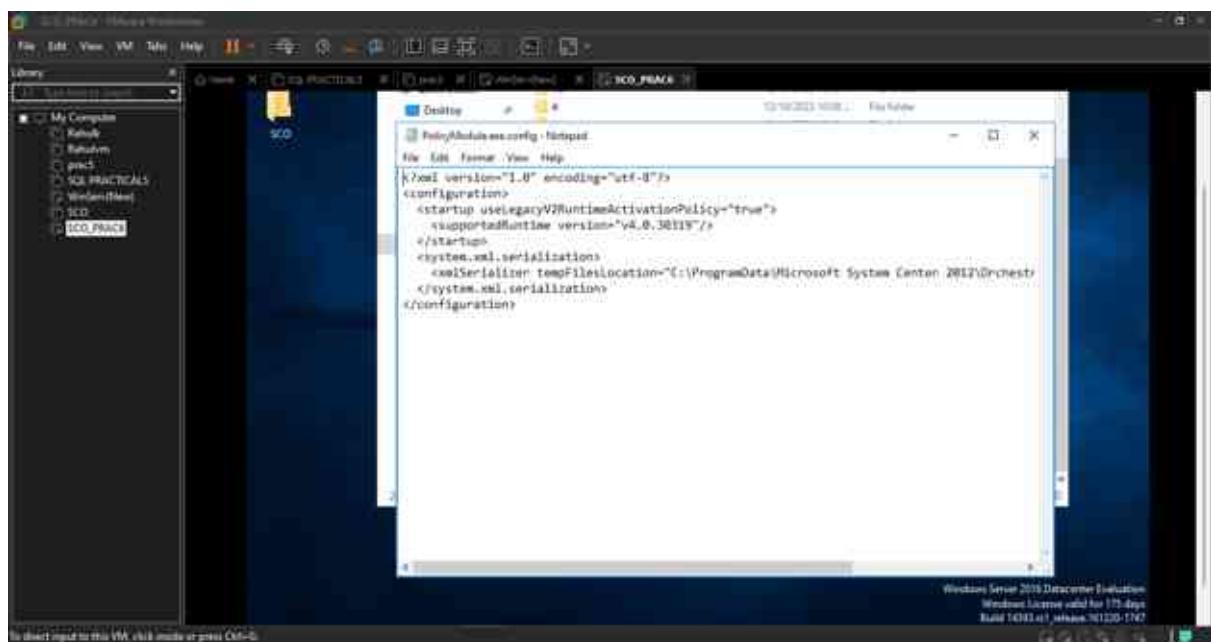
To remove the delay you can either deactivate **generatePublisherEvidence** in **PolicyModule.exe**, or you can create a profile for the service account.

Step 4: Deactivate **generatePublisherEvidence** in **policymodule.exe.config**.

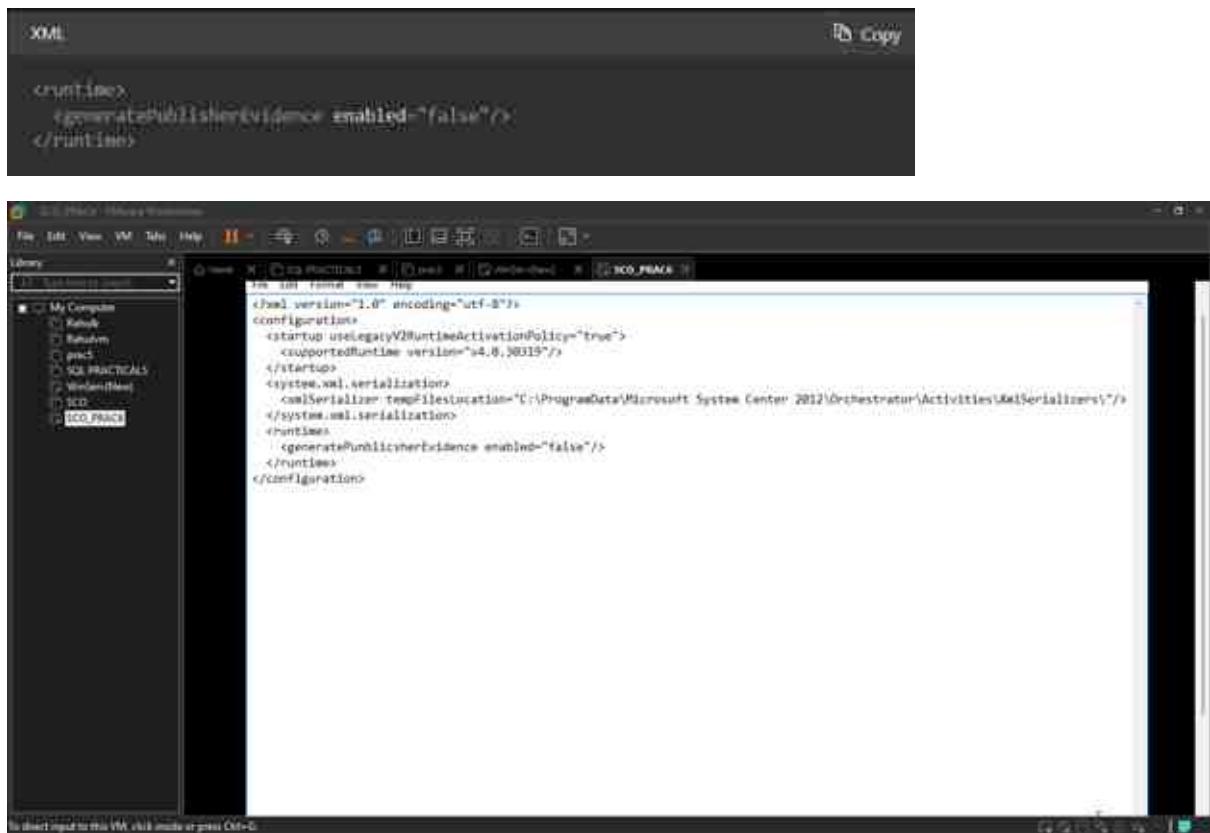
- Locate the file **C:\Program Files (x86)\Microsoft System Center\Orchestrator\Runbook Server\policymodule.exe.config** on the runbook server that executes runbooks containing an activity referencing a .NET assembly.



- Open **policyModule.exe.config** File on Notepad.



- Add the following code to **policymodule.exe.config**:



```

<configuration>
  <runtime>
    <generatePublisherEvidence enabled="false"/>
  </runtime>
</configuration>

```

The screenshot shows a Windows Command Prompt window with the title "Windows PowerShell - Microsoft VM". The current directory is "C:\Program Files\Microsoft System Center 2012\Orchestrator\Activities\Serializers". The command entered is "notepad policymodule.exe.config". The content of the file is displayed in the editor:

```

<configuration>
  <startup useLegacyV2RuntimeActivationPolicy="true">
    <supportedRuntime version="v4.0.30319"/>
  </startup>
  <system.xml.serialization>
    <xmlSerializer tempFileLocation="C:\ProgramData\Microsoft System Center 2012\Orchestrator\Activities\Serializers"/>
  </system.xml.serialization>
  <runtime>
    <generatePublisherEvidence enabled="false"/>
  </runtime>
</configuration>

```

6B: Manage Orchestrator Servers-2

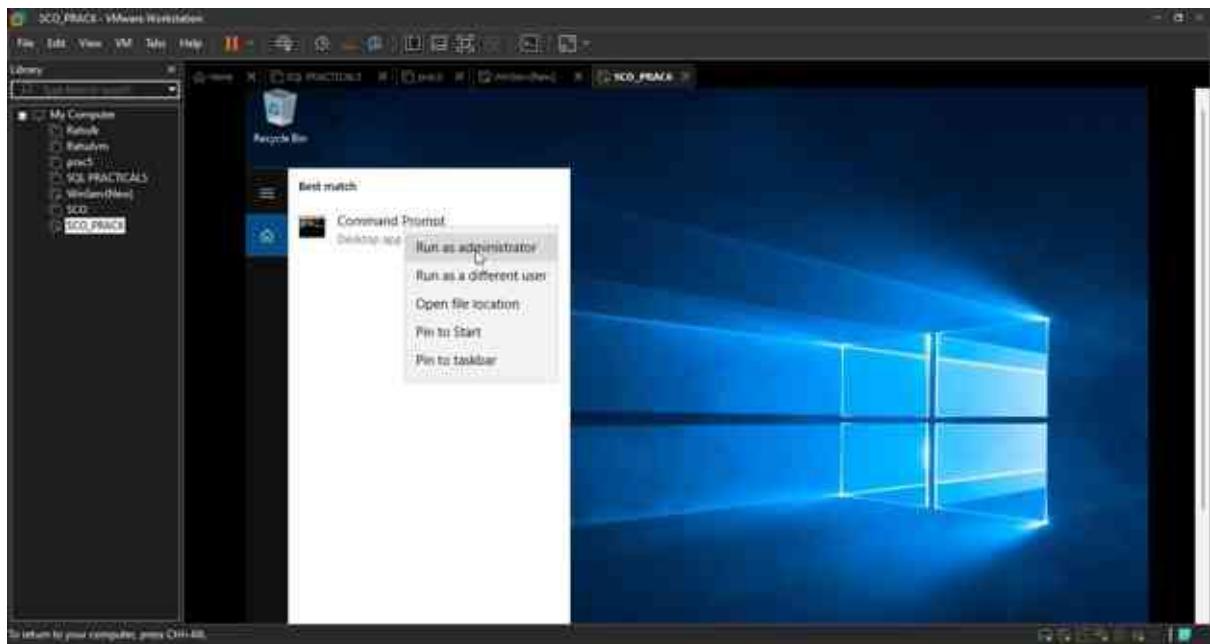
6B-1: recover web components

When you use the Database Configuration utility to modify the Orchestrator database, the tool won't modify the Web Service database reference (only the installer performs this task). You will need to manually modify it after updating with the database configuration utility.

Step 5: Modify the Web Service database

Decrypt the connection string

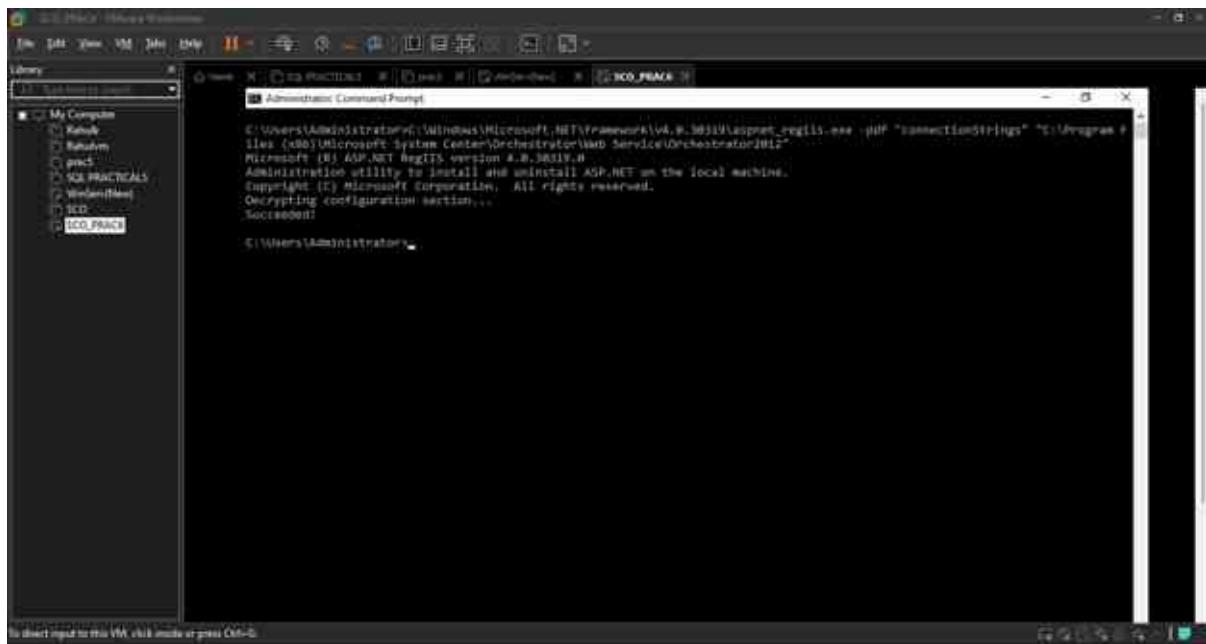
- Open a **Command Prompt** using **Run as administrator**.



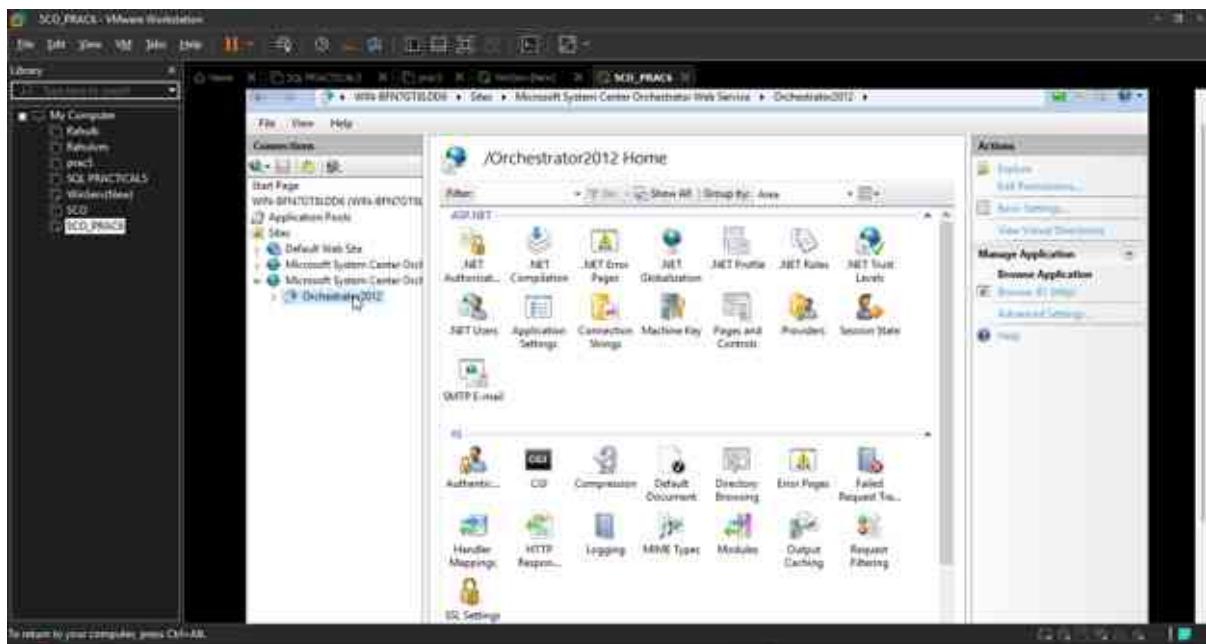
- Execute the following command (assuming the default installation path):

```
Decrypting Connection String...Normal  
File Edit Format View Help  
C:\Windows\Microsoft.NET\Framework\v4.0.30319\x86net_english.exe -pdf "connectionStrings" "C:\Program Files (x86)\Microsoft System Center\Orchestrator\web\serviceorchestrator\2012"
```

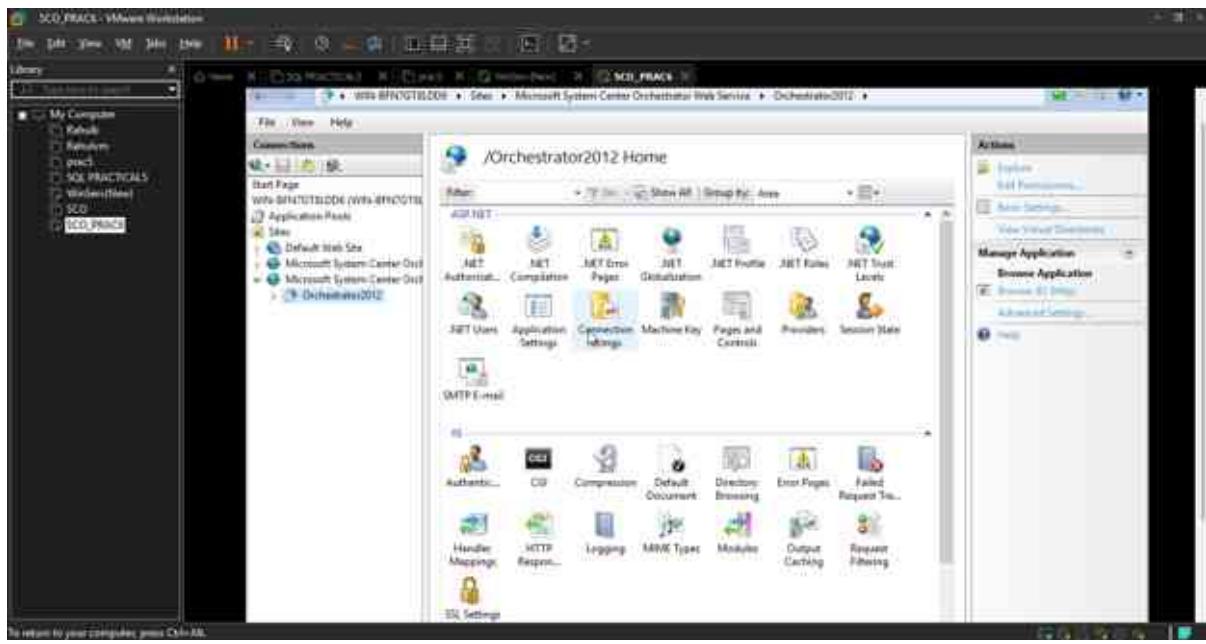
- **Decryption of Connection String Succeeded**



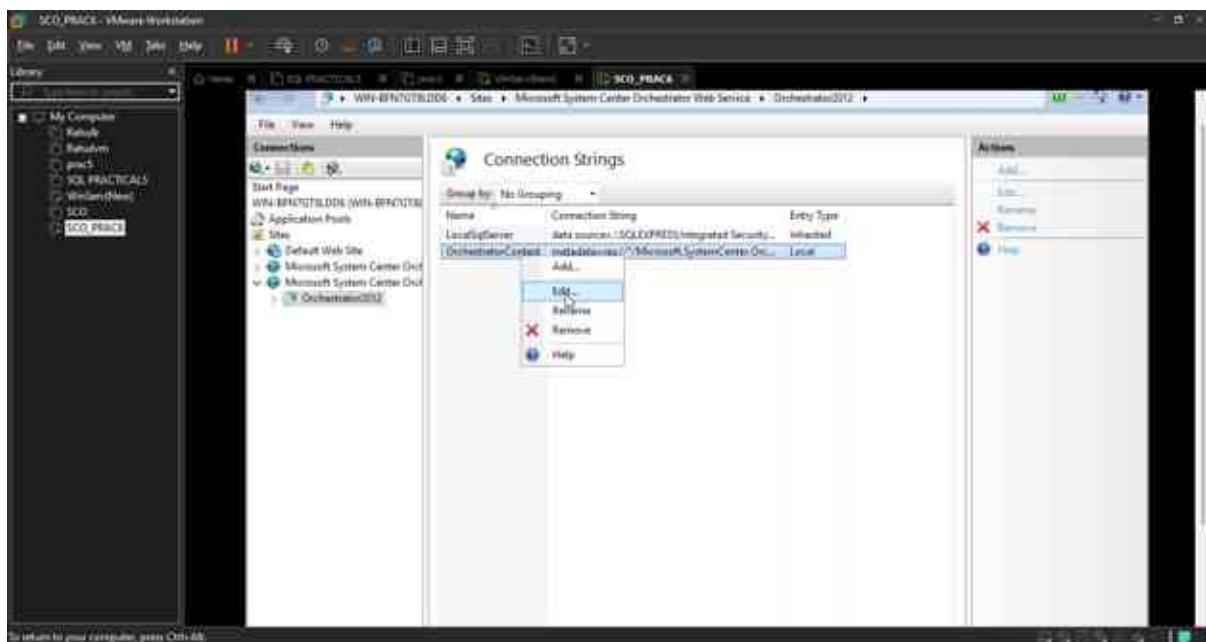
- Open Server Manager Click on Tools Within Tools Select Internet Information Services (IIS) Manager
- Click on Sites Within Sites Click on Orchestrator2012



- Double Click on Connection Strings

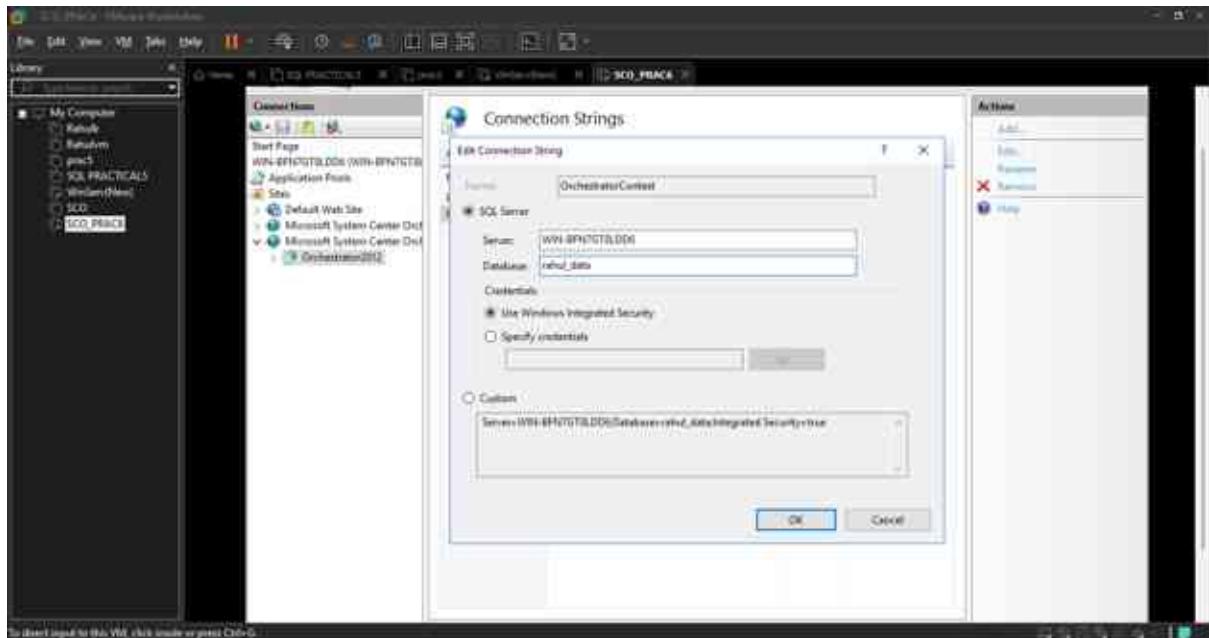


- Right-Click on OrchestratorContext and Click on Edit

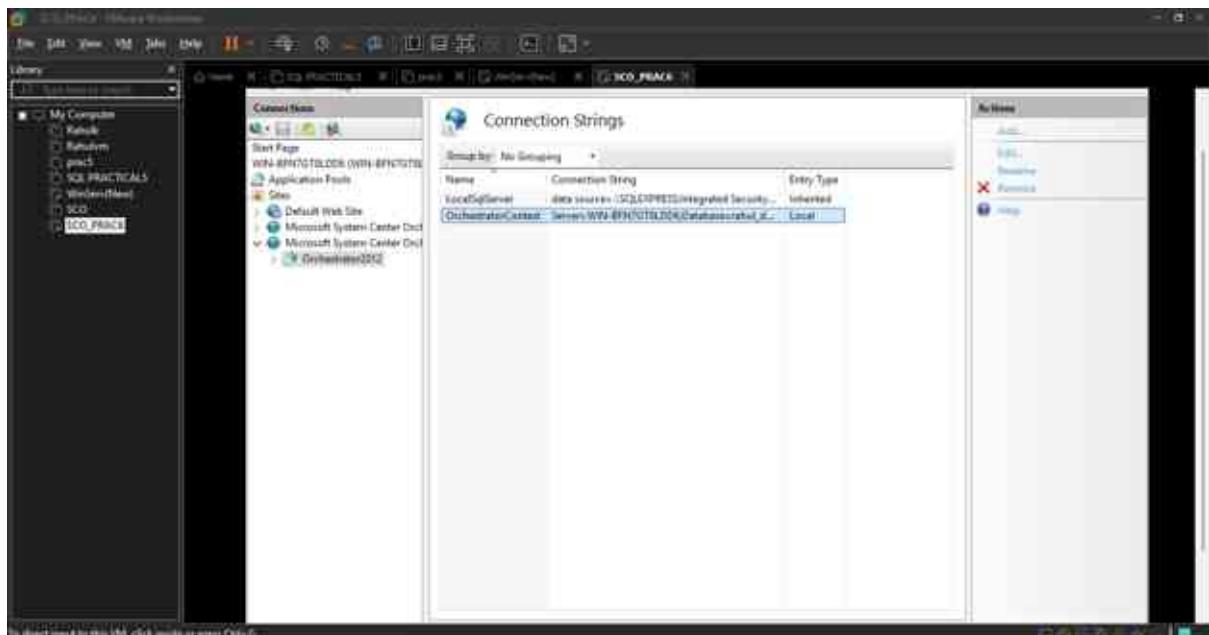


- Open SQL Server Manager Within Database Create a New Database and Give Name rahul_data

- Click on SQL Server Enter SQL Server Name (Here Server Name: WIN-BFN7GTBLDD6) and Database Name (Here Database Name: rahul_data)
- Click on Ok



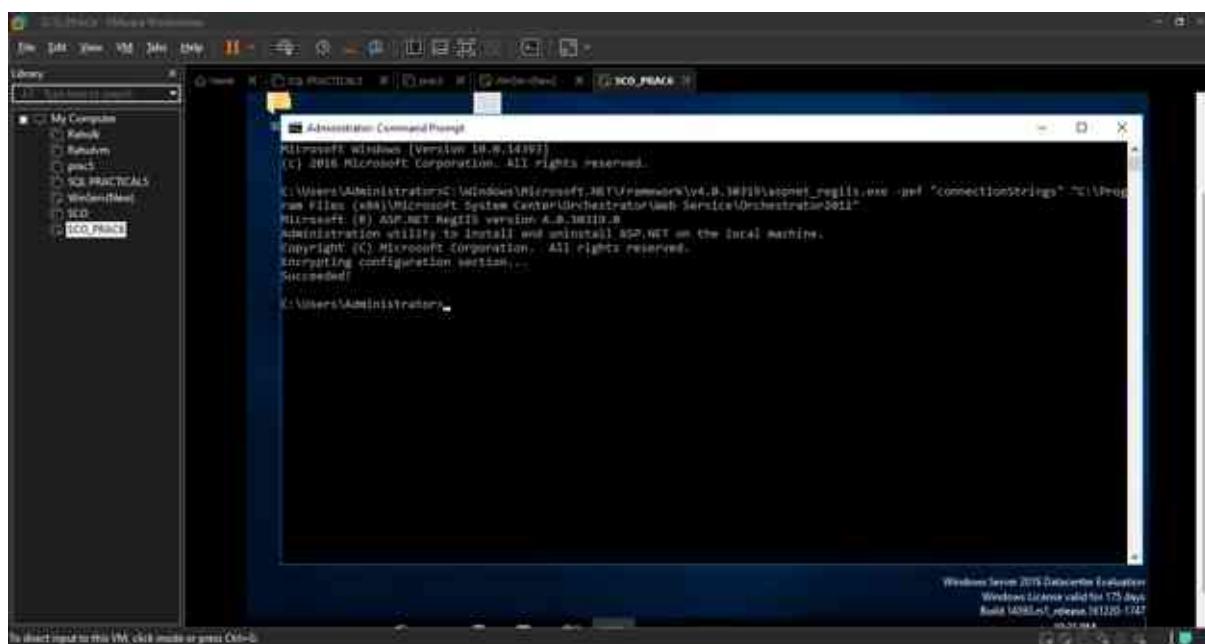
- In Connection String Server Name Database Name



- re-encrypt the connection strings, you can execute the following command at the command prompt:



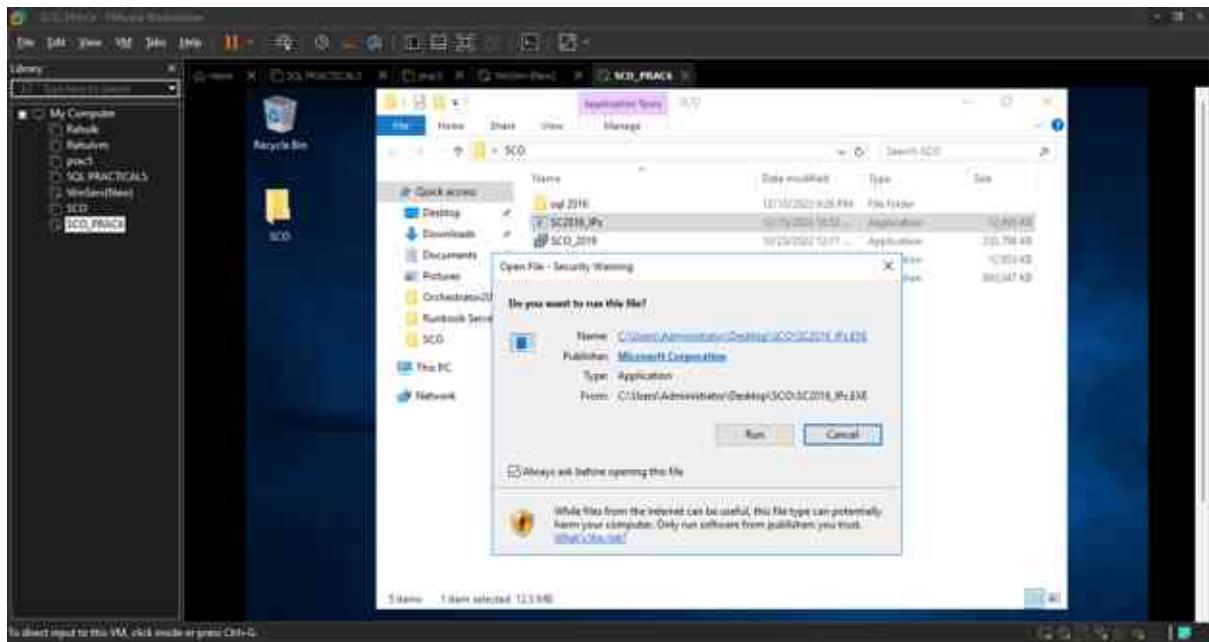
- Here we Can Encryption of Connecting Strings Succeeded.



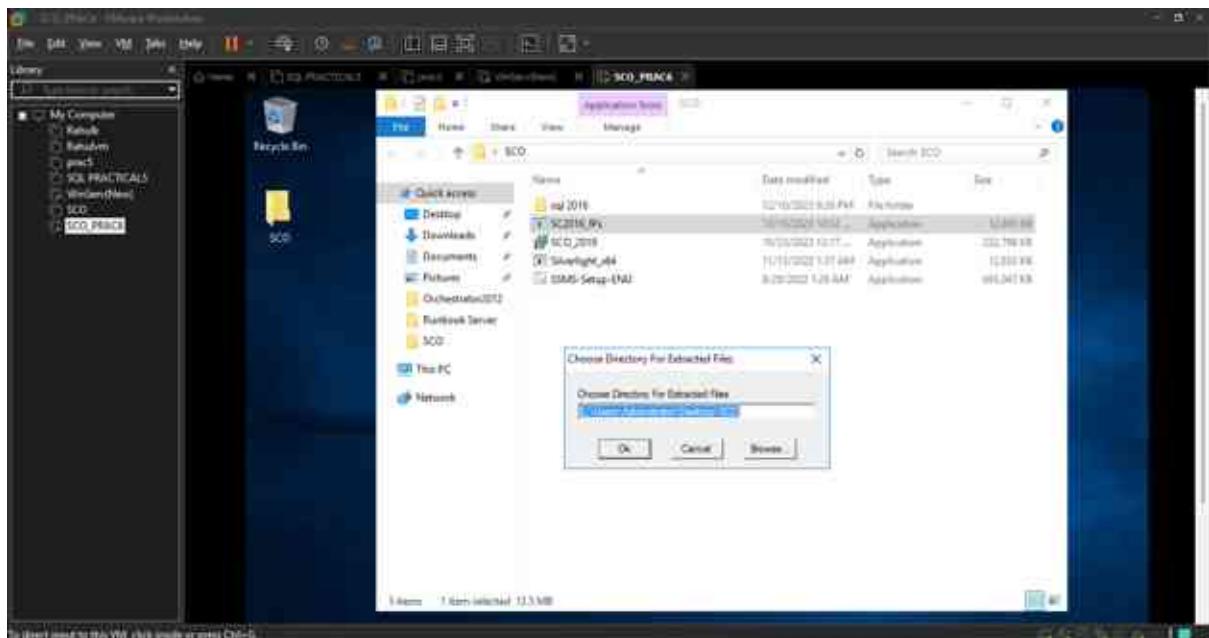
6B-2: Add an integration pack

Step 6: Install System Center (SC) 2016

- After the Installation System Center 2016 Go to the SQL Folder and Double Click on SC2016_Ips
- **Click on Run**



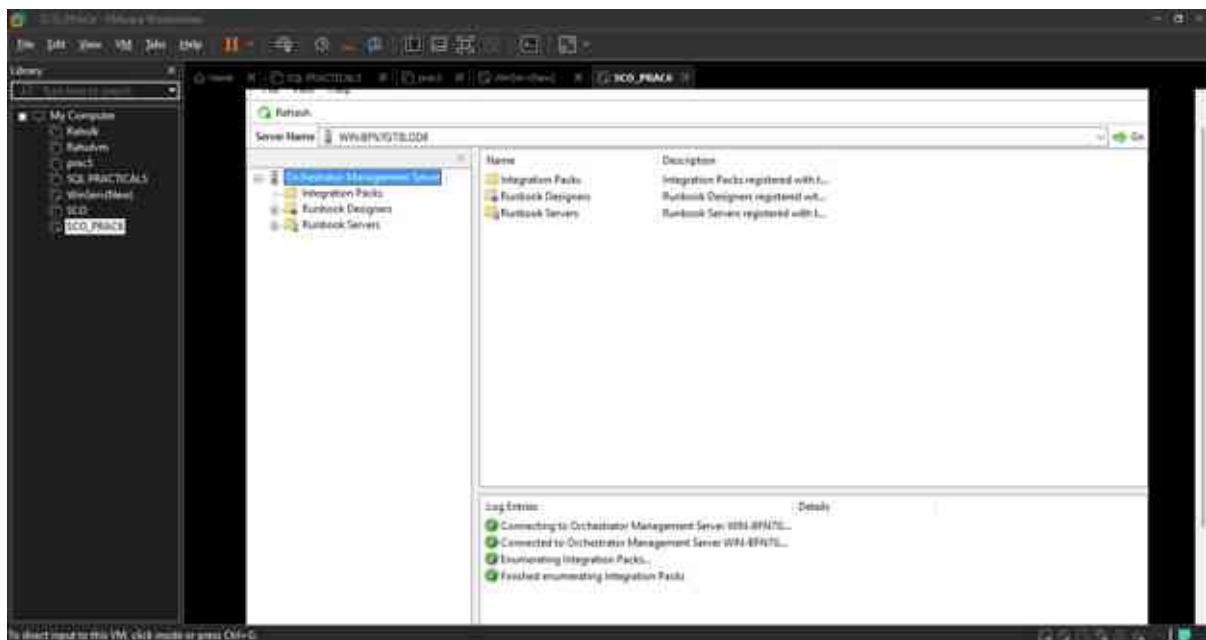
- **Click on Ok**



- **Click on Deployment Manager**

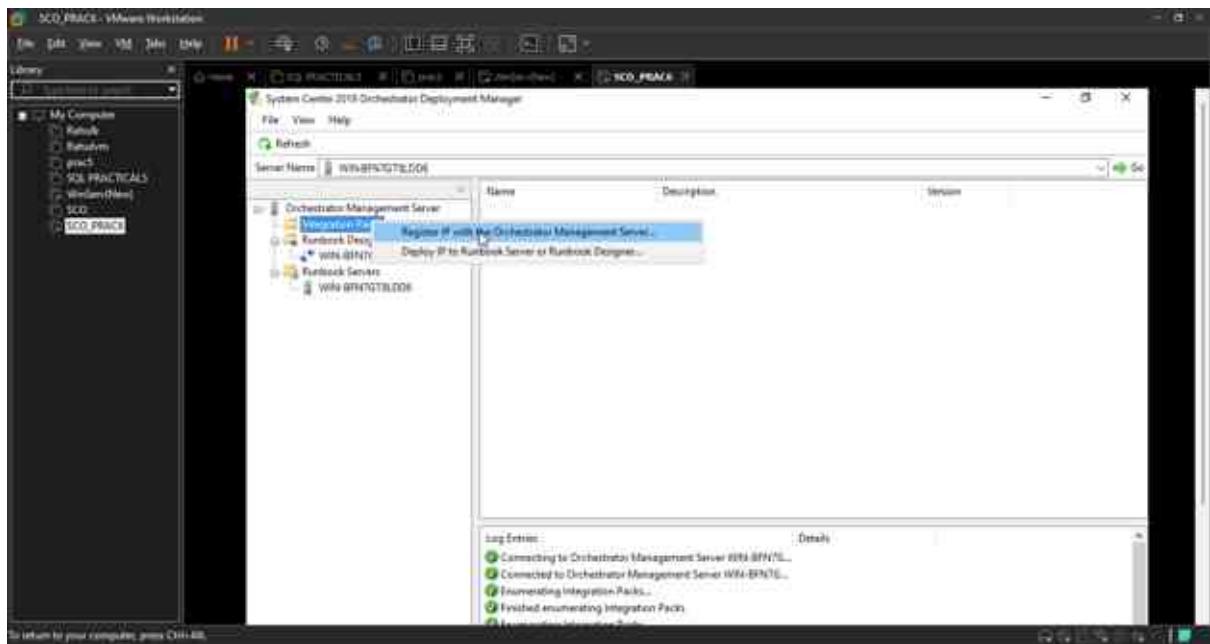


- Deployment Manager Window Open

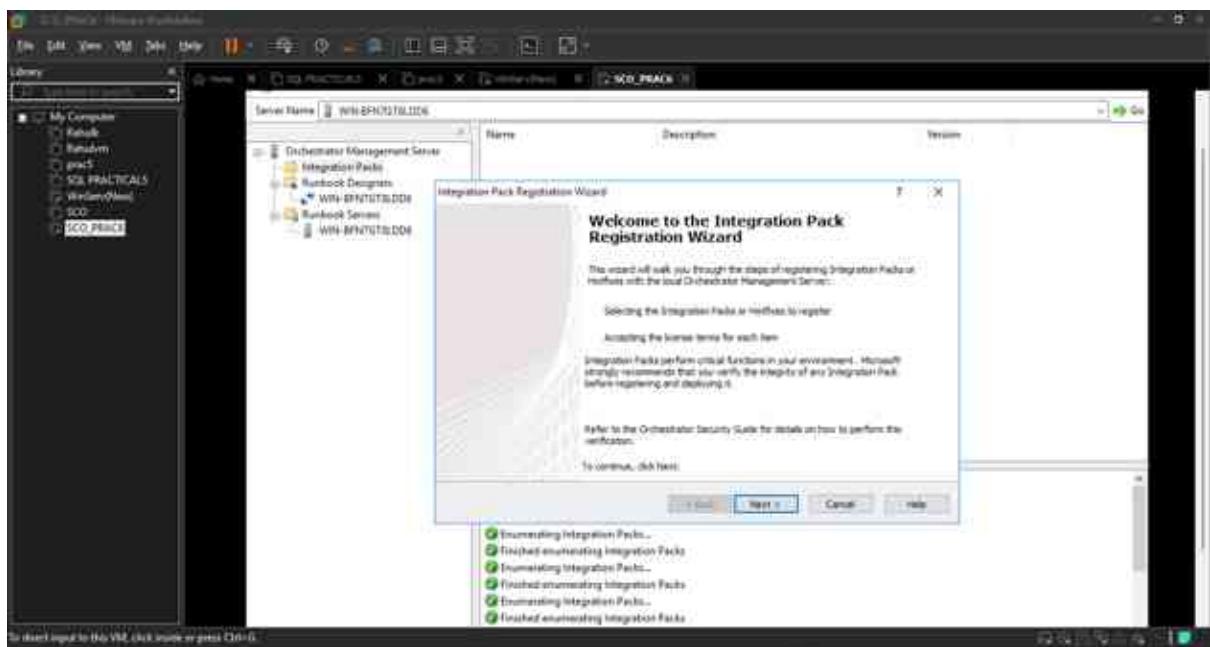


Step 7: Register Integration Pack

- Right-Click on Integration Pack and Select Register IP with Orchestrator Management Server

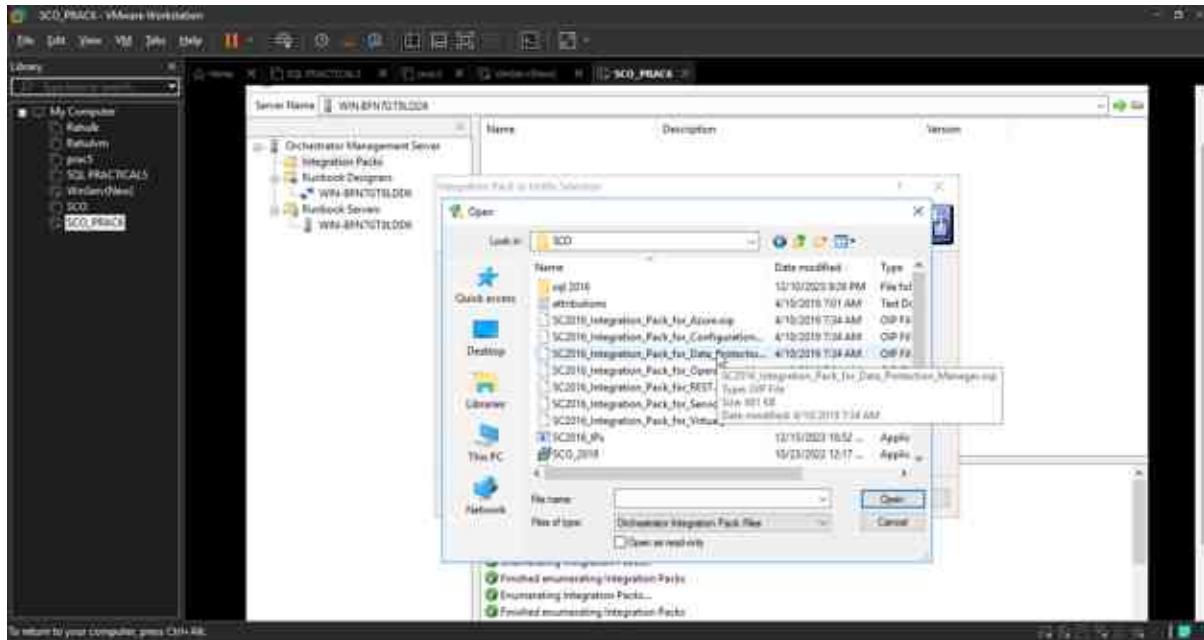


- Integration Pack Registration Wizard Open
- Click on Next

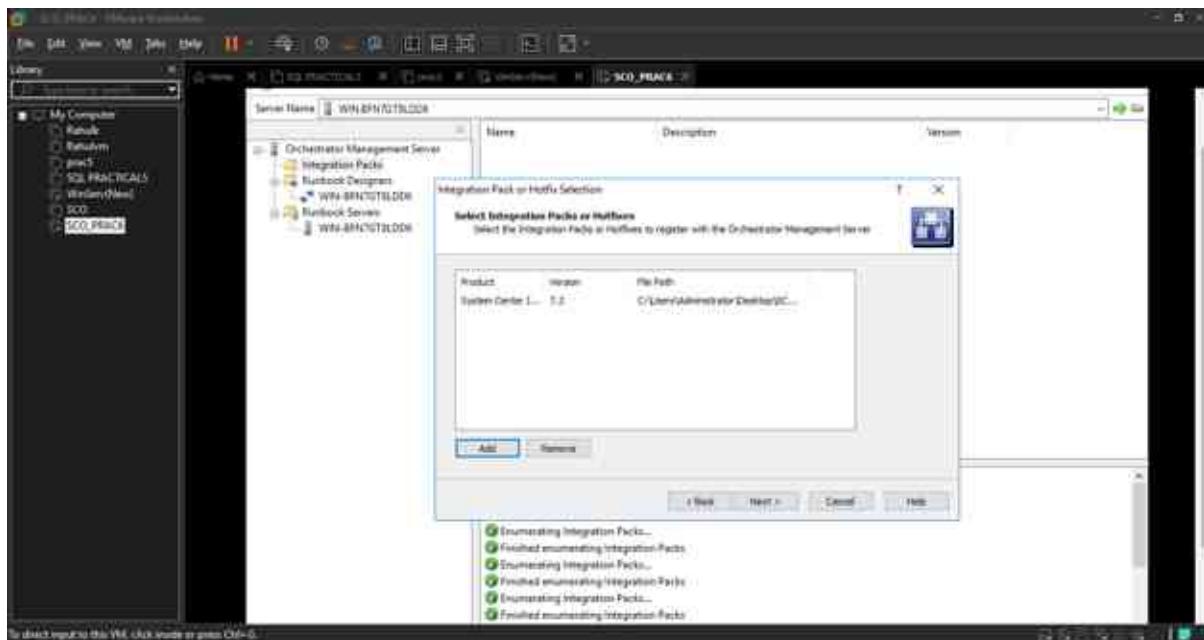


- In the Select Integration Packs or Hotfixes dialog, select Add.

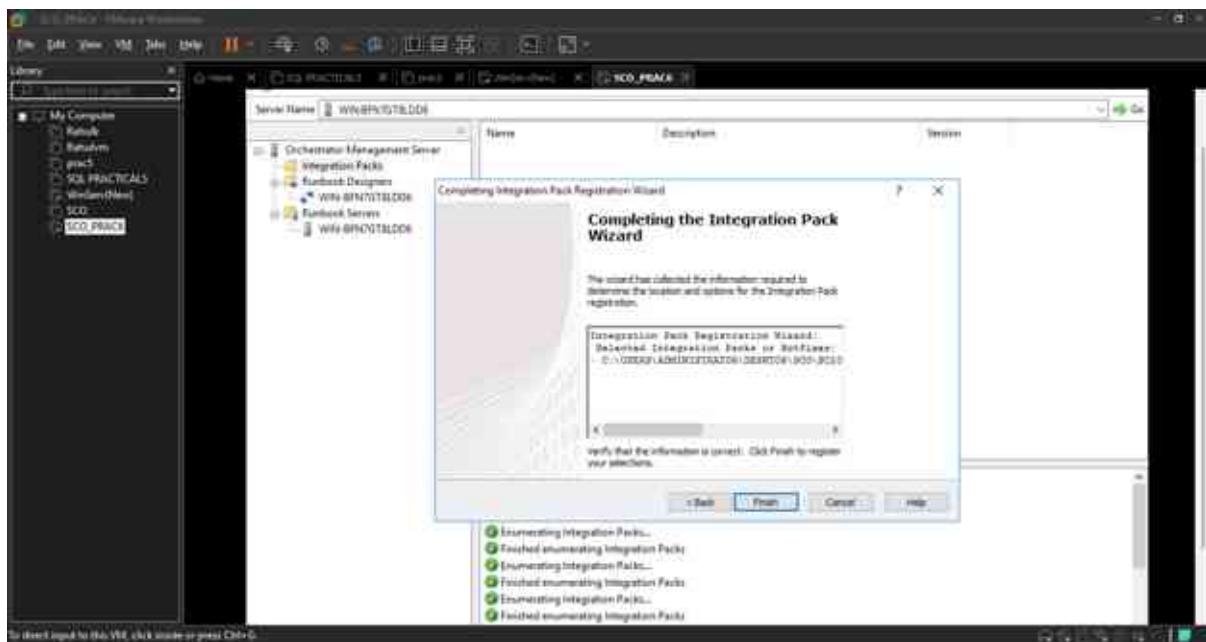
- Within SCO Select **SC2016_Integration_Pack_for_Data_Protection** and Click on Open



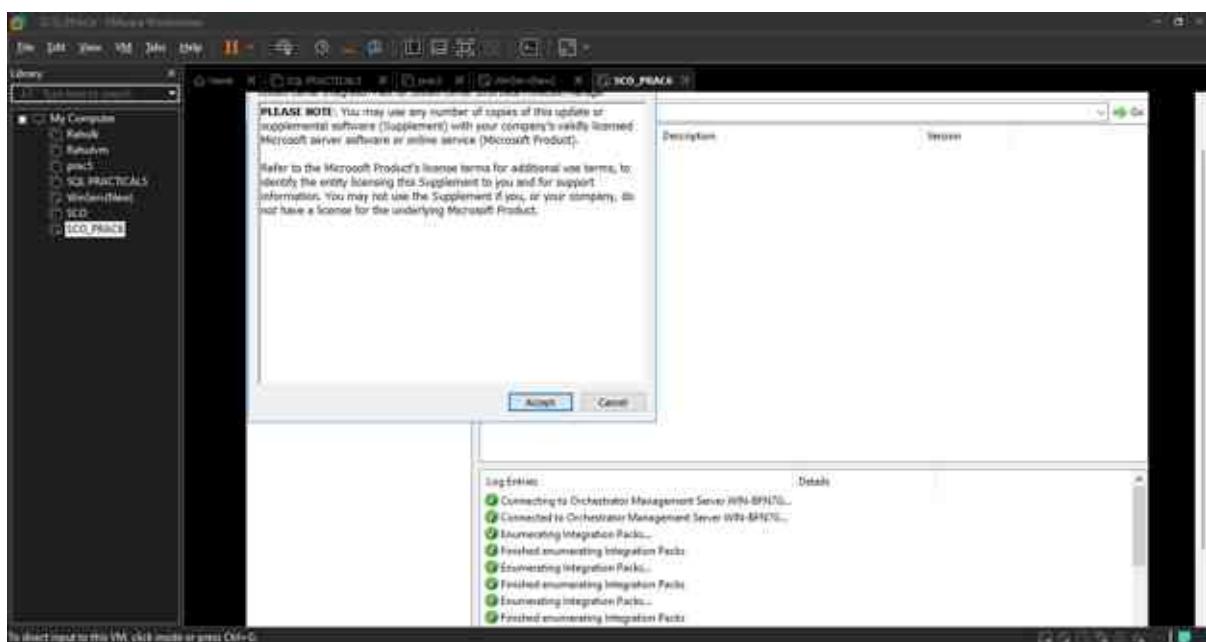
- Click on Next



- In the Completing the Integration Pack Wizard dialog, select Finish.

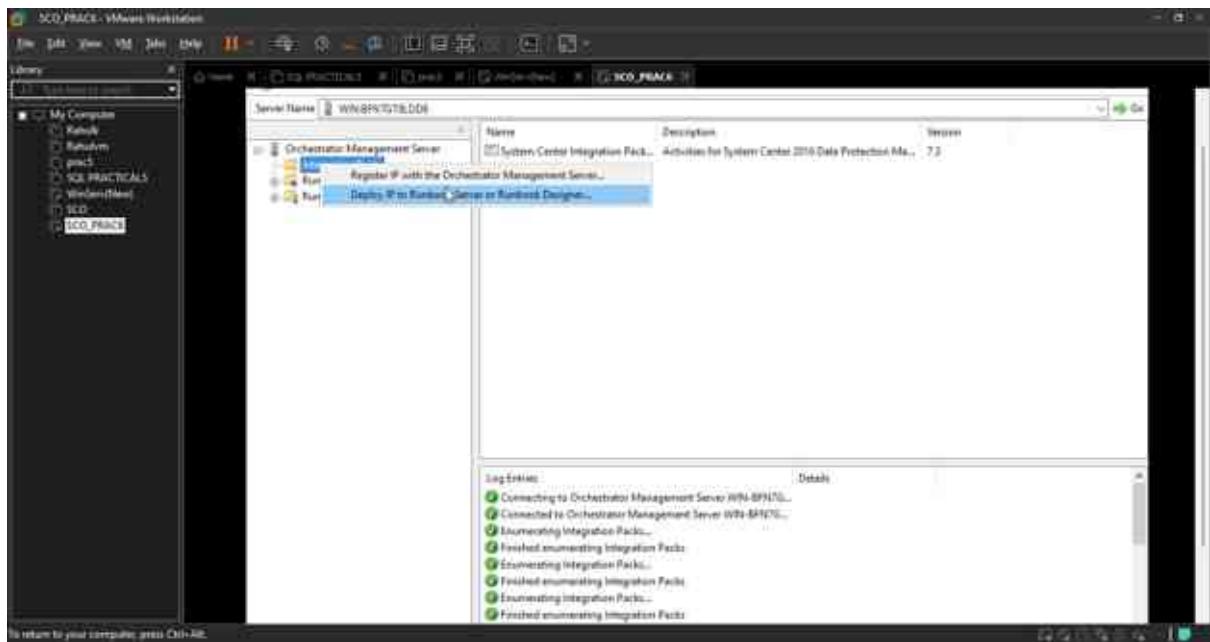


- On the End User Agreement dialog, read the Microsoft Software License Terms, and select Accept.

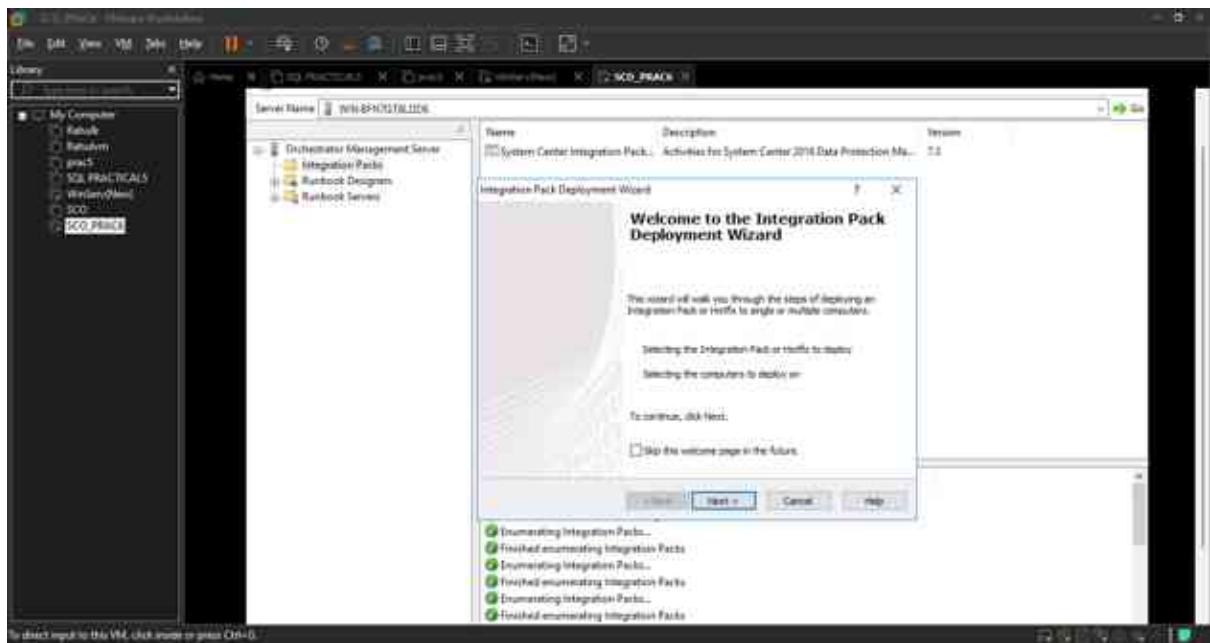


Step 8: deploy an integration pack

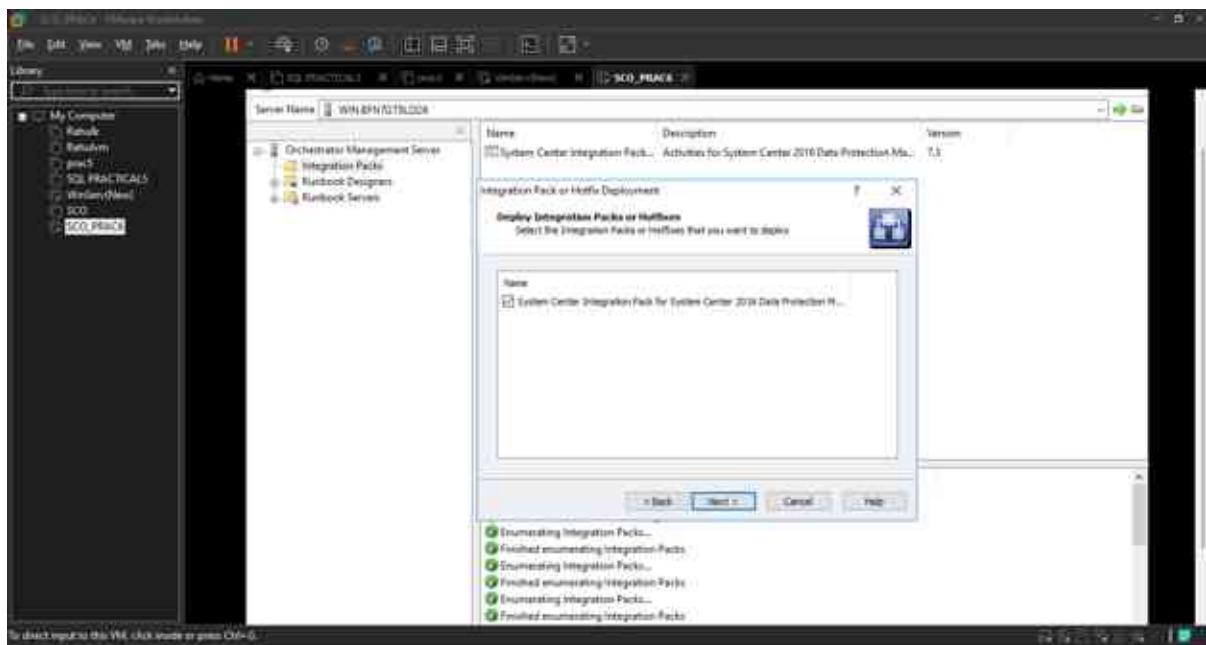
- right-click Integration Packs, select Deploy IP to Runbook or Runbook Designer.



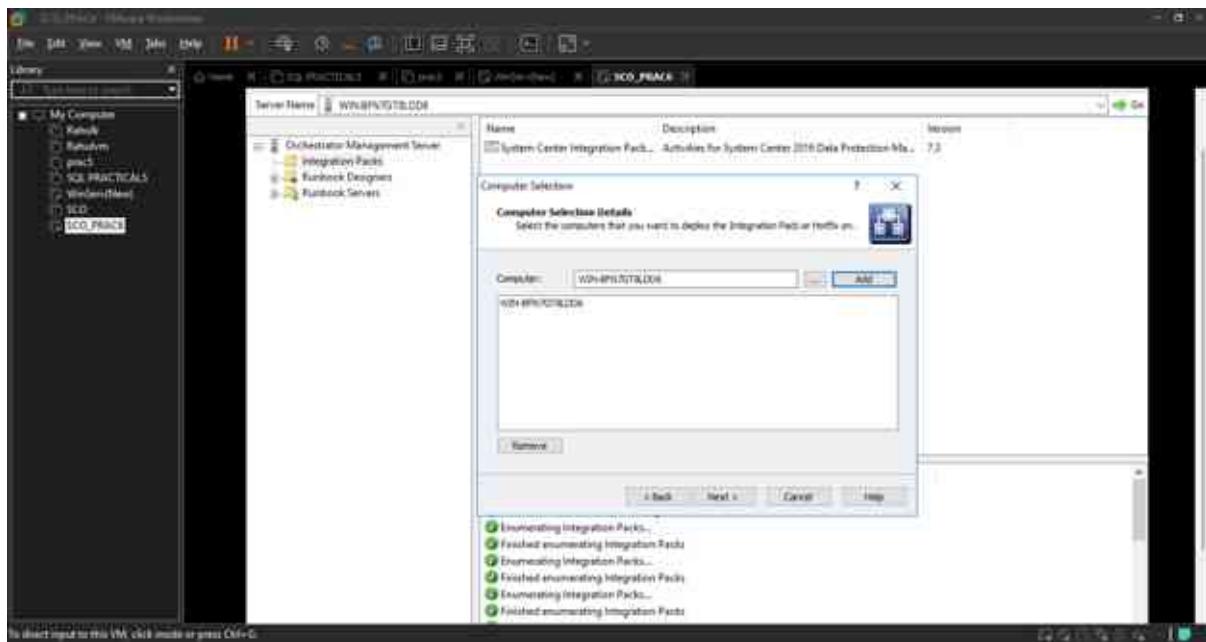
- Click on Next



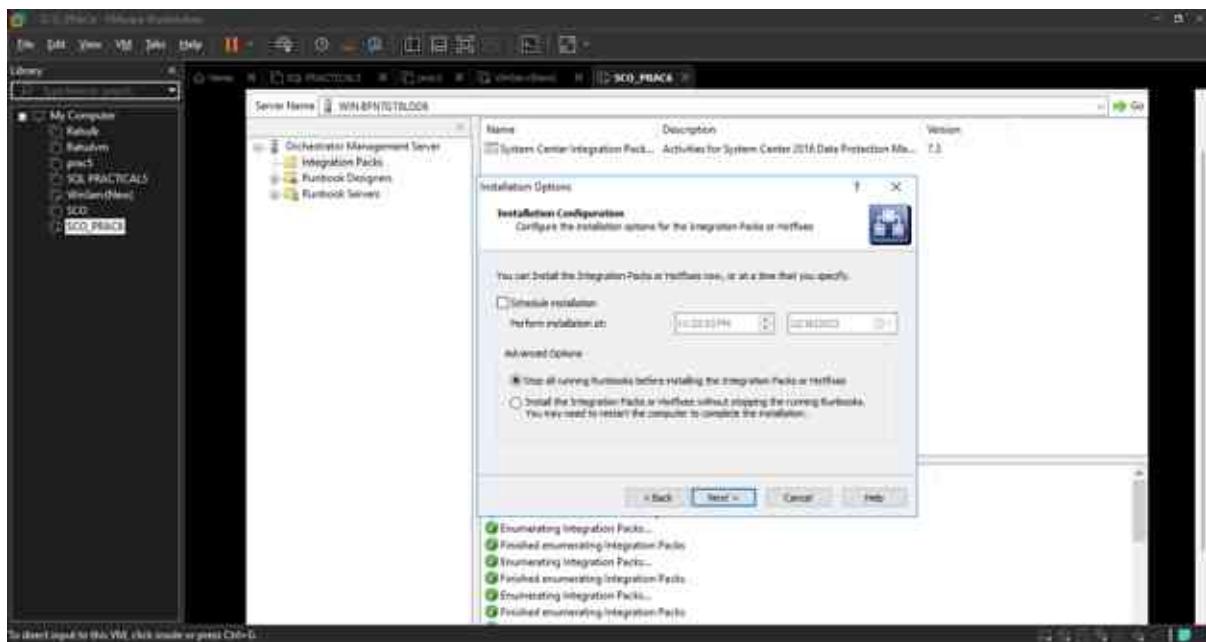
- Click on Check-box And Click on Next



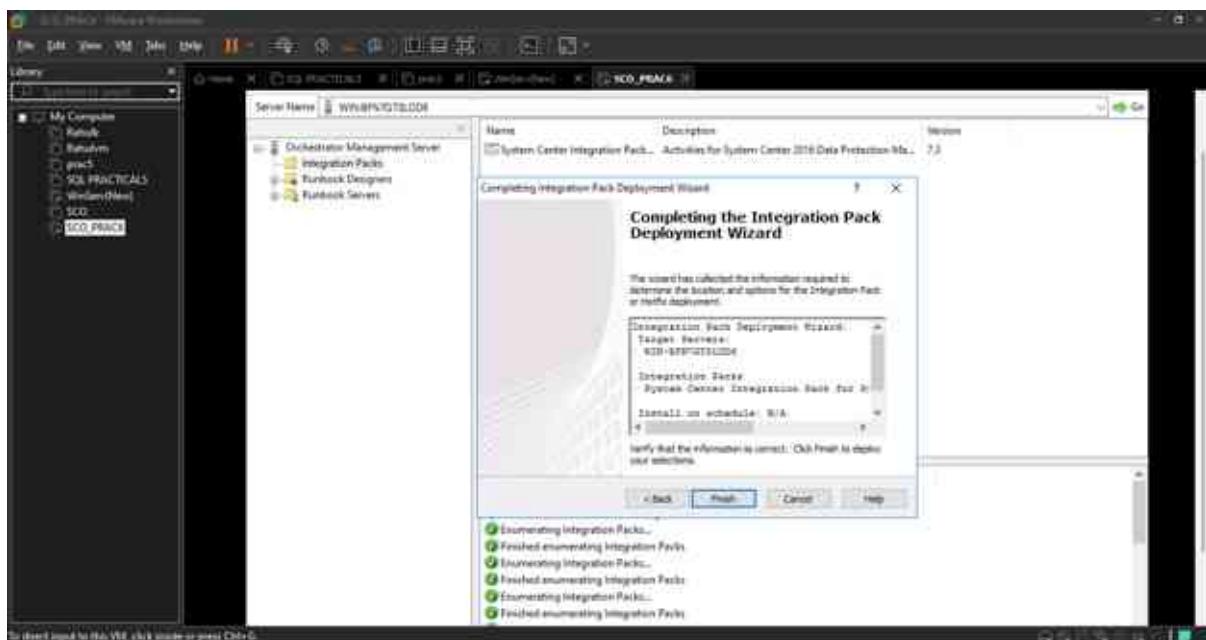
- Enter Computer Name (Here Computer Name: WIN-BFN7GT8LDD6) After Enter Computer Name Click Add
- Click on Next



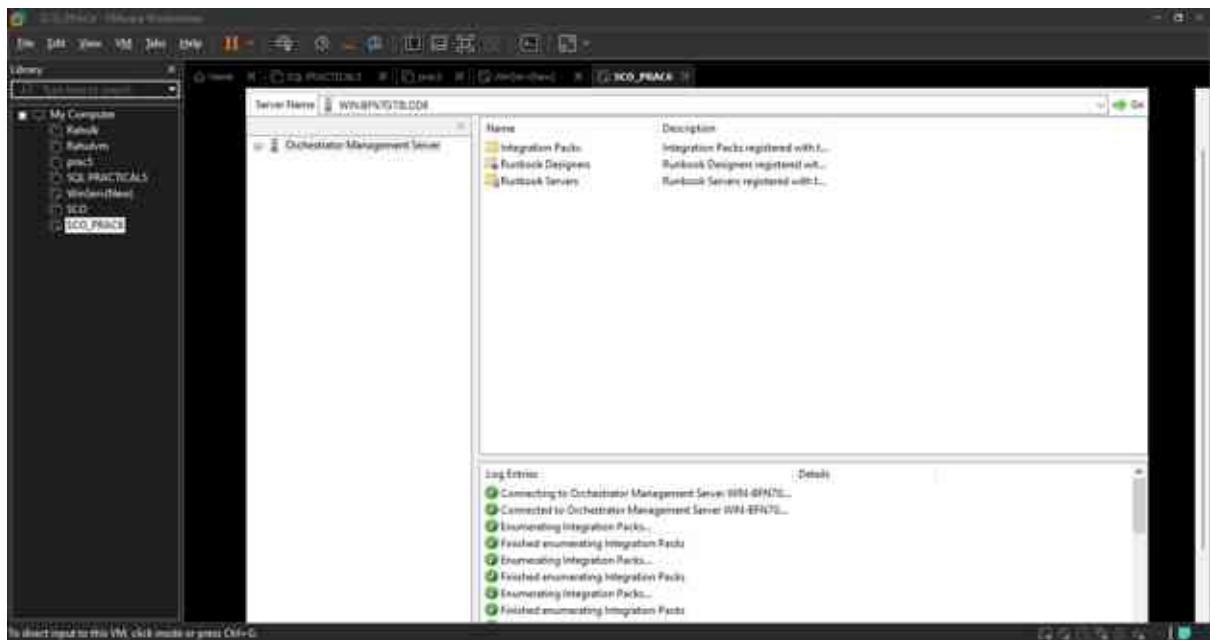
- Keep default values and Click on Next



- In the Completing Integration Pack Deployment Wizard dialog, select Finish.



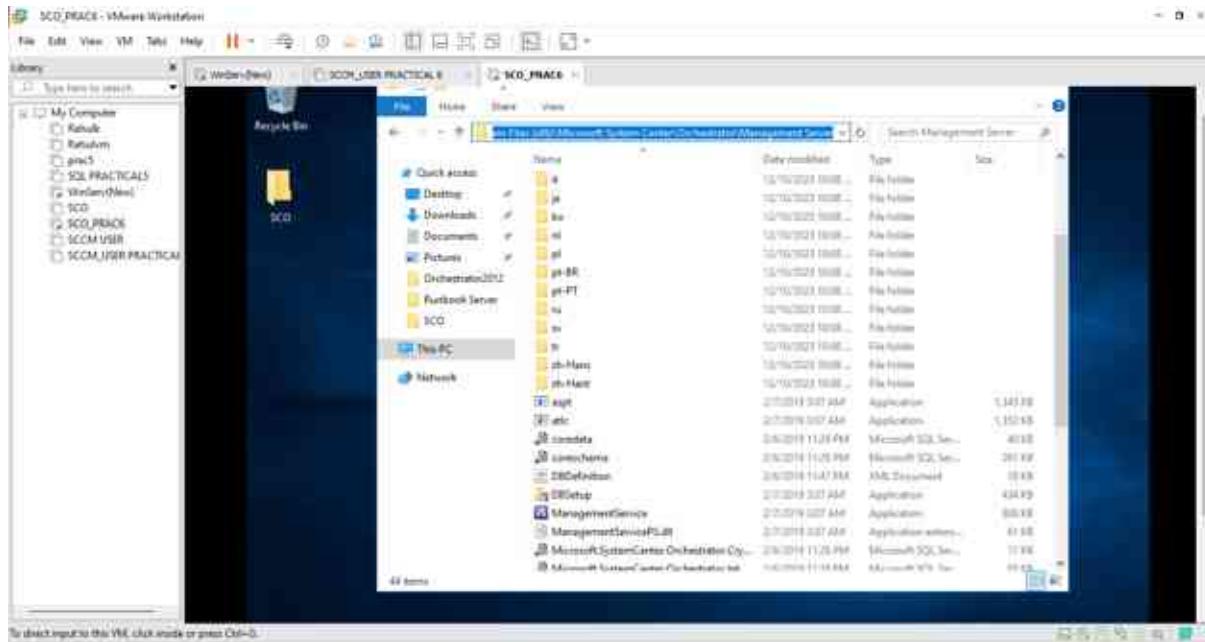
- When the integration pack is deployed, the Log Entries dialog displays a confirmation message.



6B-3: Change Orchestrator user groups

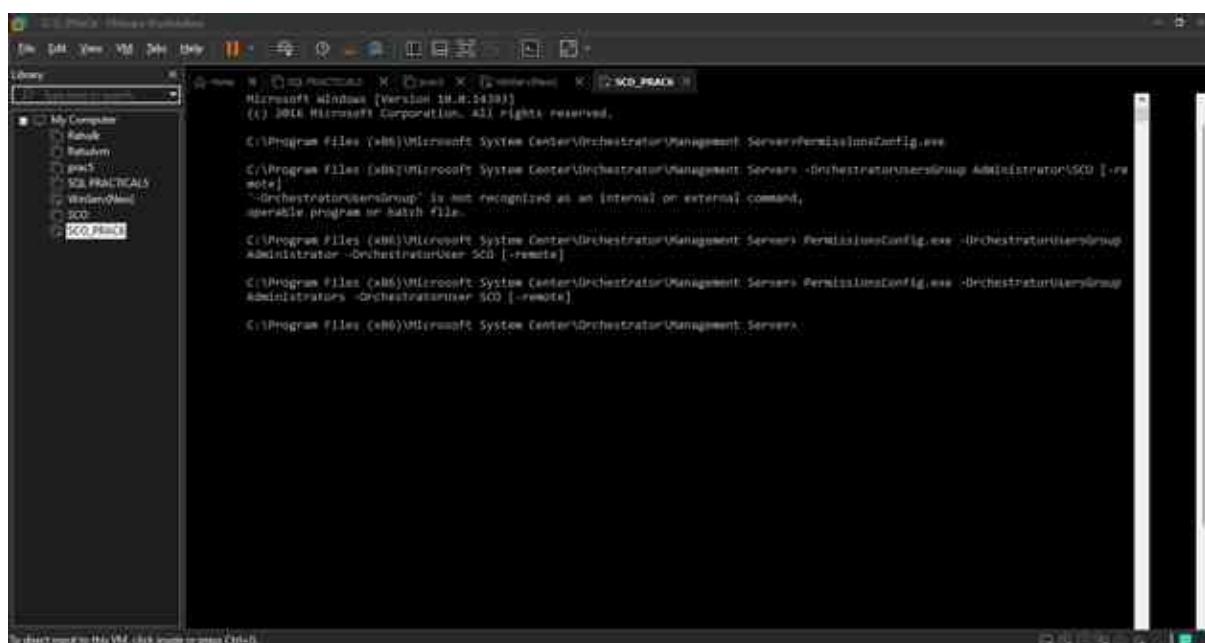
Step 9: We can change the Orchestrator Users group by using the PermissionsConfig tool, which is located on the management server in <InstallDir>\Management Server.

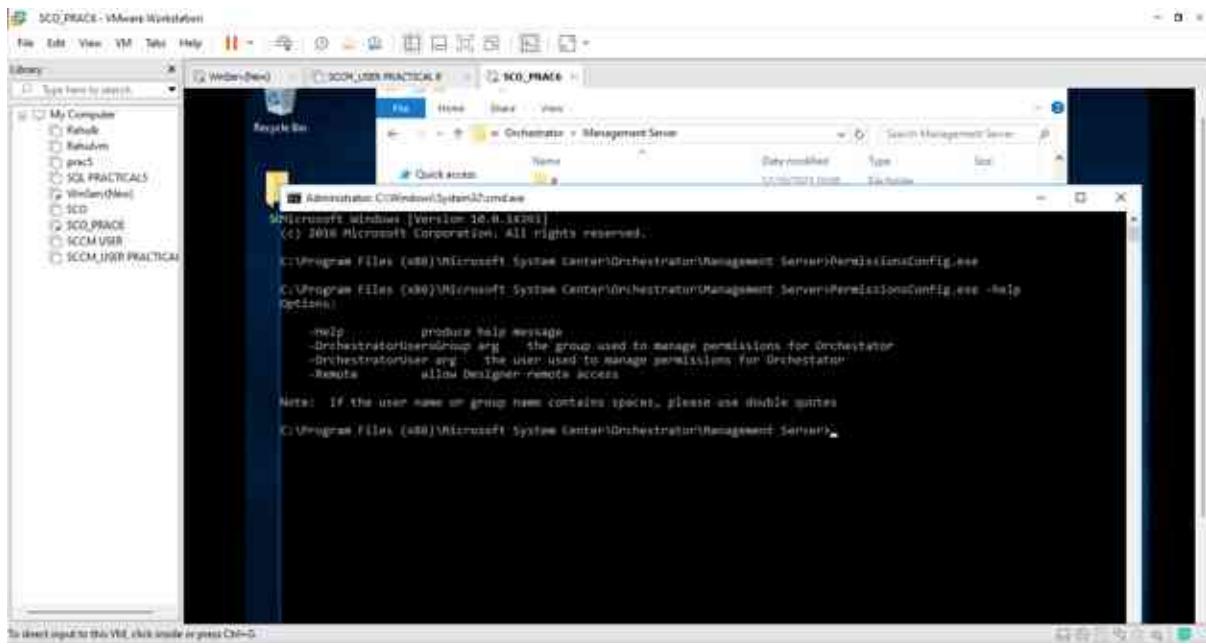
- Open Management Server File On CMD



Type Following Code:

- PermissionsConfig.exe
- PermissionsConfig -OrchestratorUsersGroup Administrator -OrchestratorUser SCO [-remote]
- PermissionsConfig.exe -help

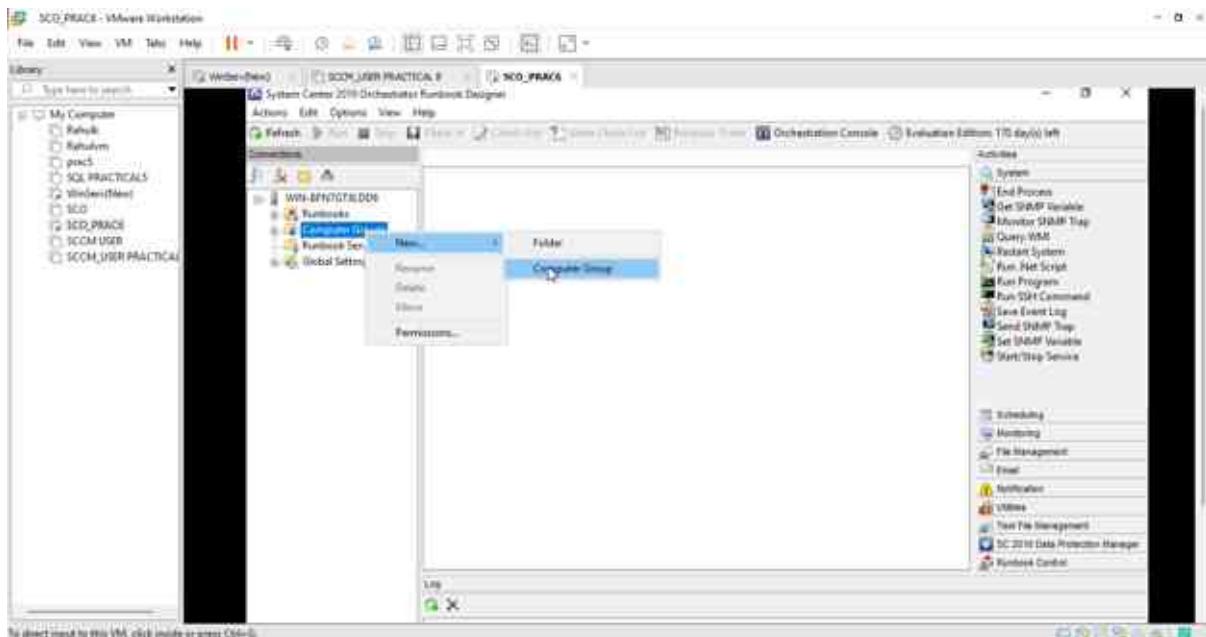




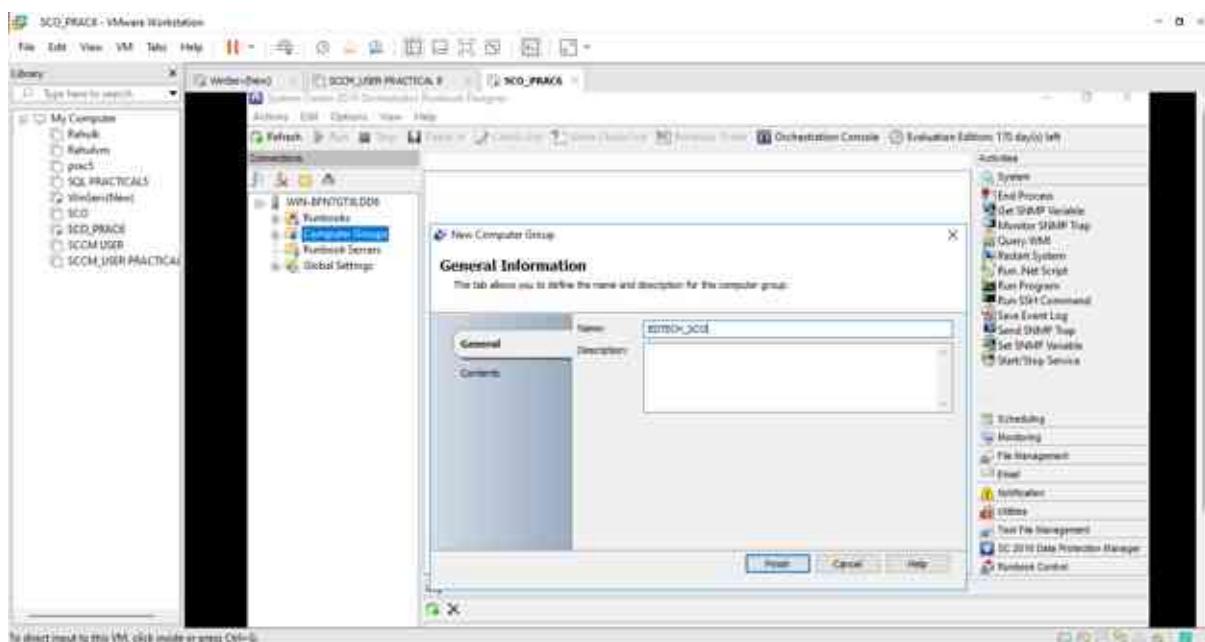
6B-4: Computer groups

Step 10: Add a computer group

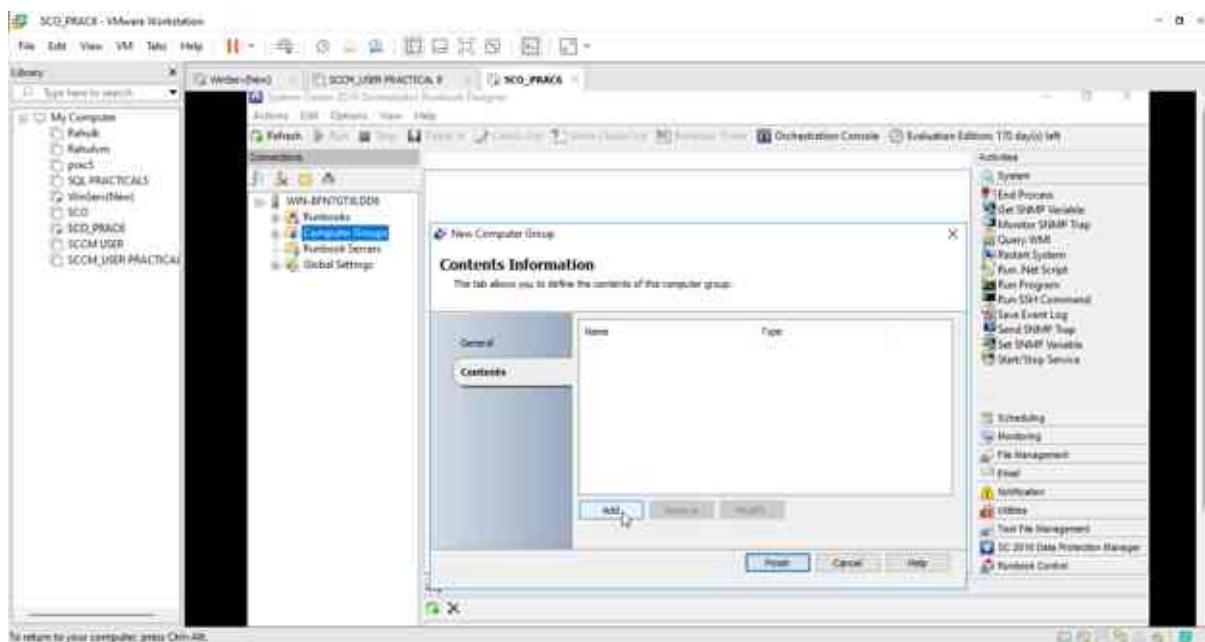
- Open Runbook and then Right-Click on Computer Groups and Click on New then Select Computer Groups



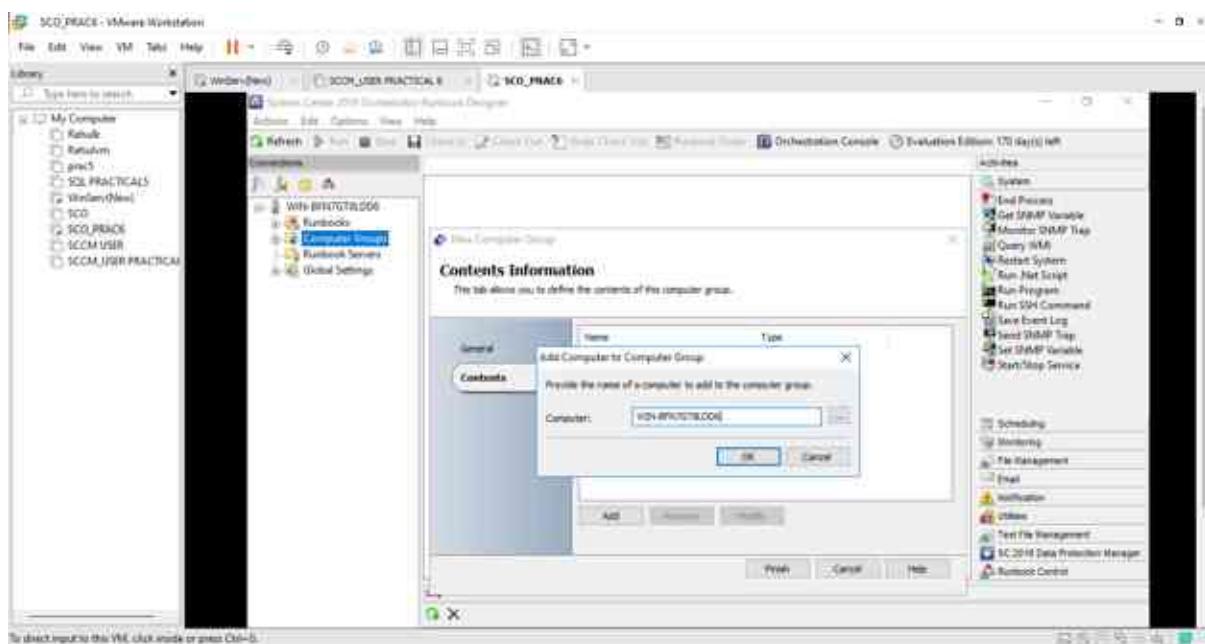
- In the New Computer Group dialog box, on the General tab, in the Name and Description boxes, type a **EDTECH_SCO**



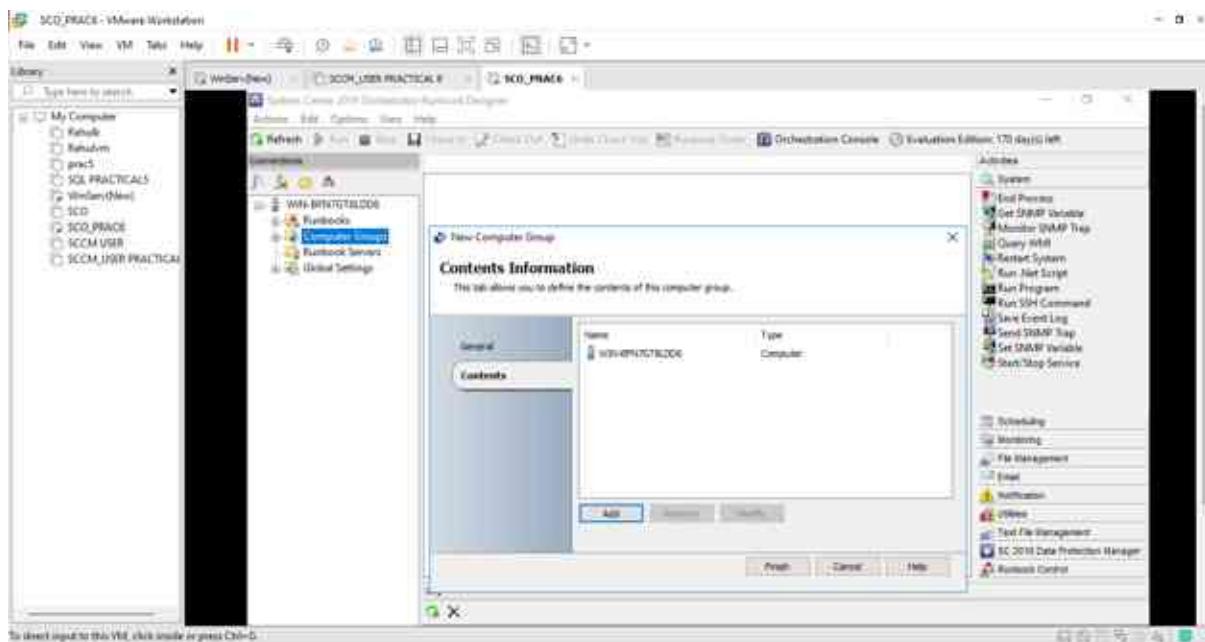
- Click on Contents tab and then Click on Add**



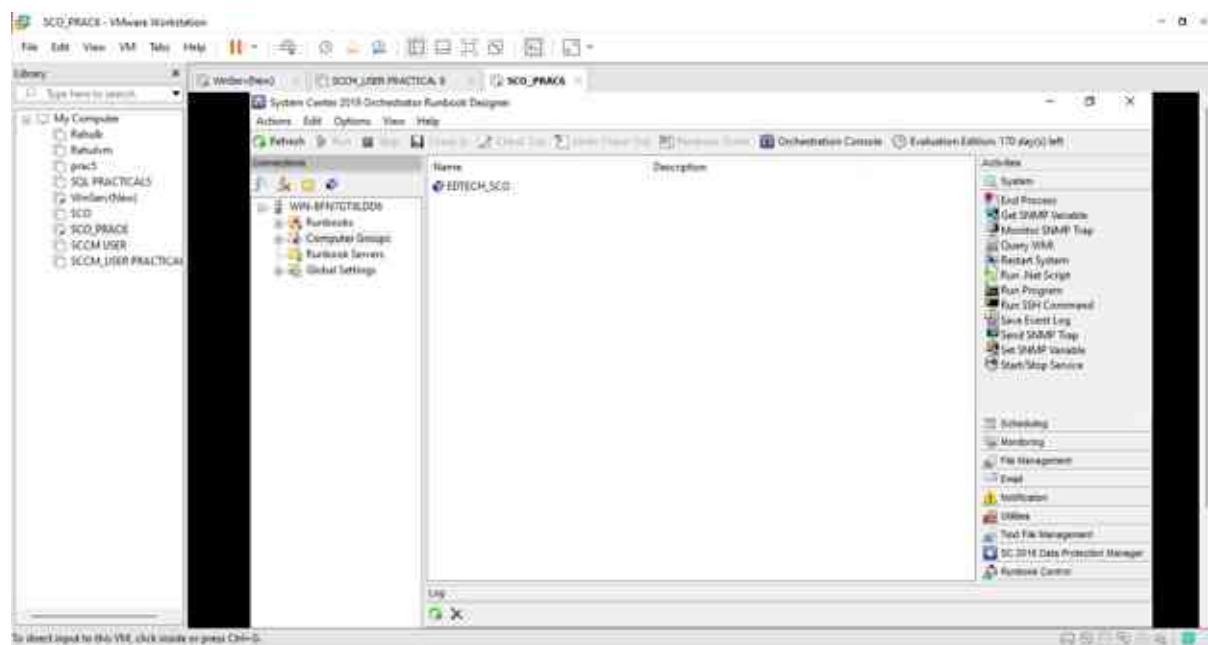
- Enter the name of the computer that you are adding (Here Computer Name WIN-BFN7GT8LDD6). Click OK to add the computer.



- Click on Finish



- We Successfully Add New Computer Groups



Practical: 7

Aim: Protect Workloads Using Data Protection Manager.

Pre-requisites:

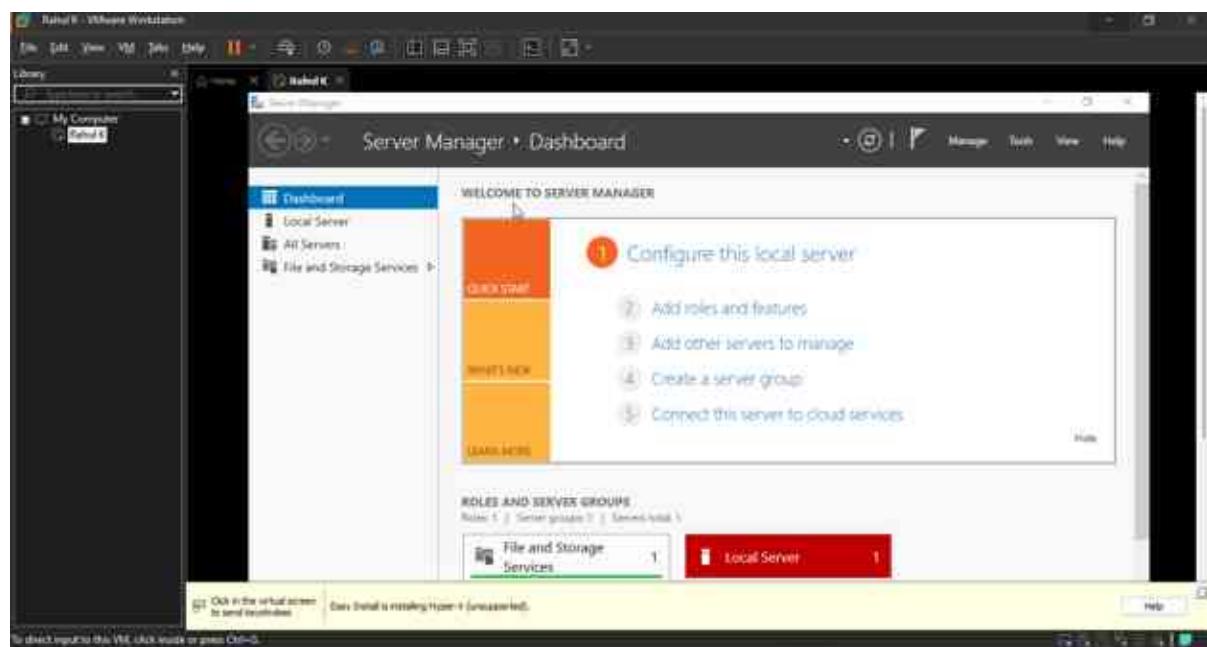
Hyper-V

Domain Controller (Here Domain Controller Name is: **prac5**)

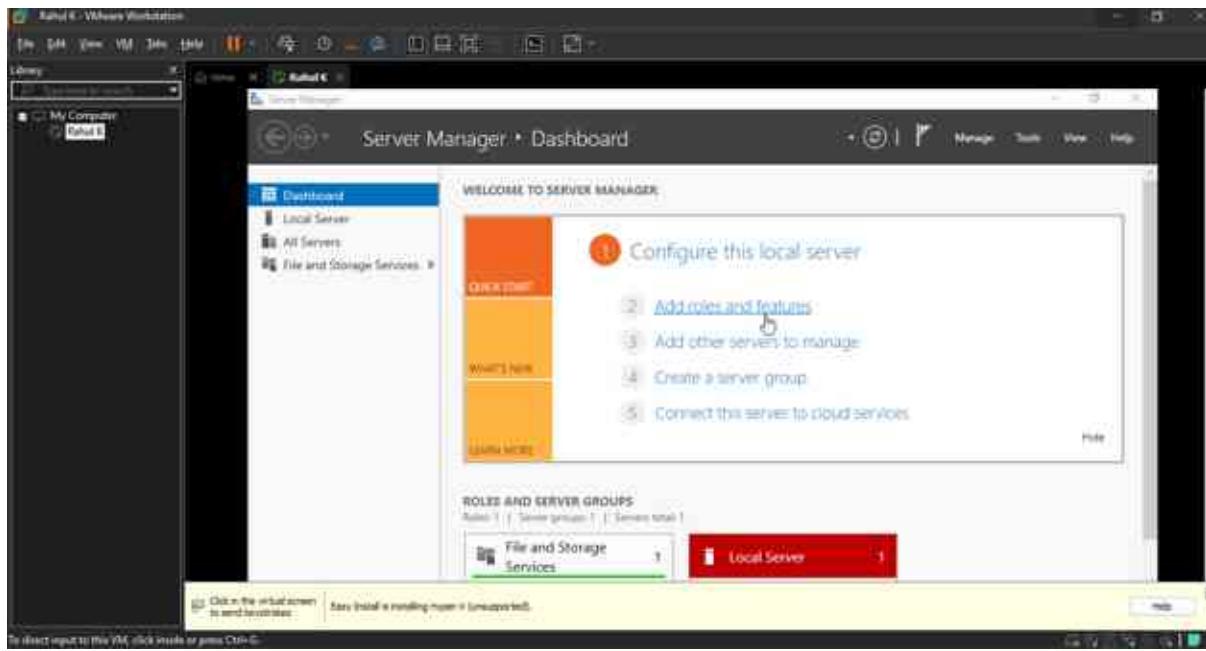
User (Here User Name is: **SQLPRACTICAL**)

Step 1: Installing Hyper-V

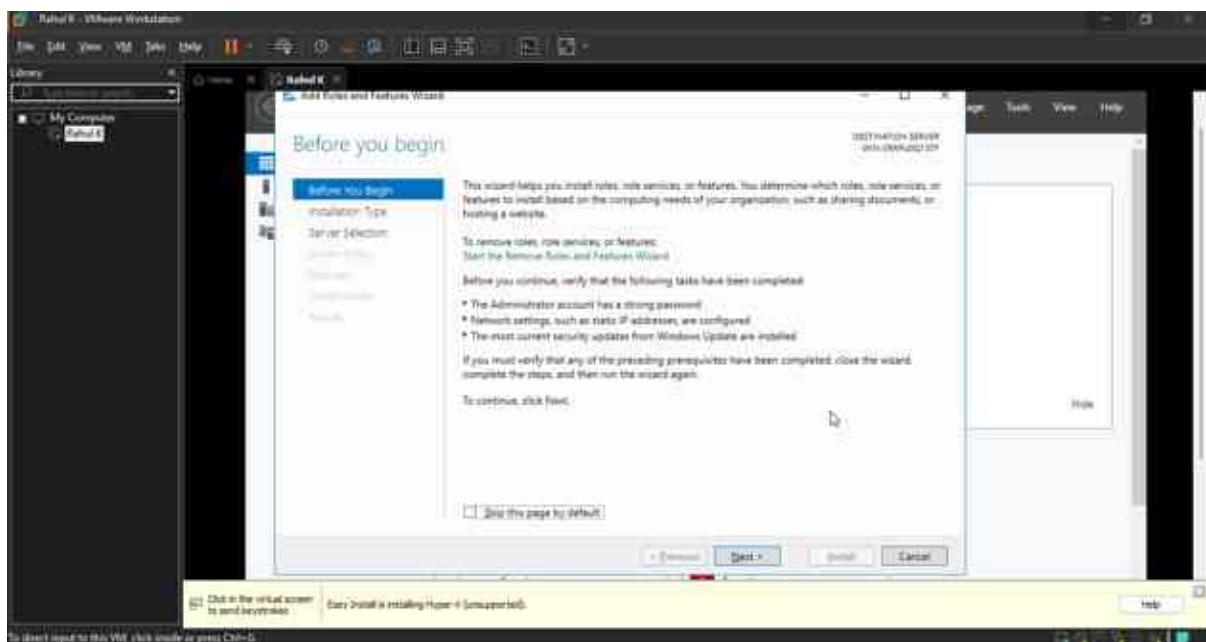
- open Server Manager



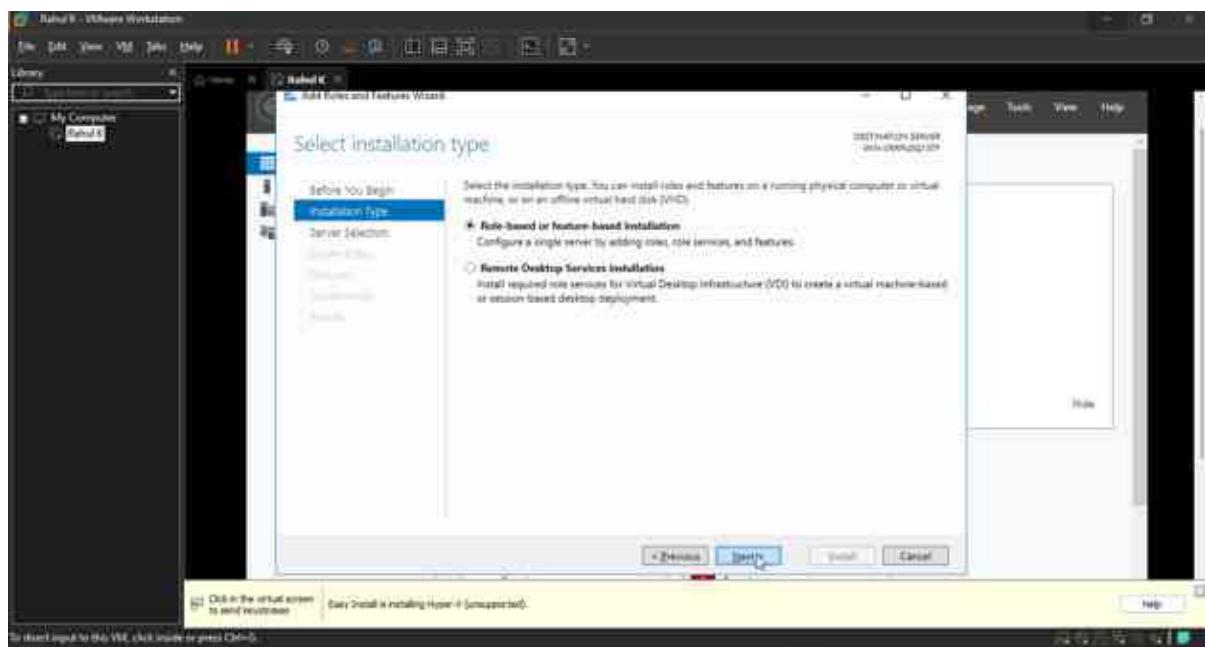
- Within Server Manager Click on Add roles and features



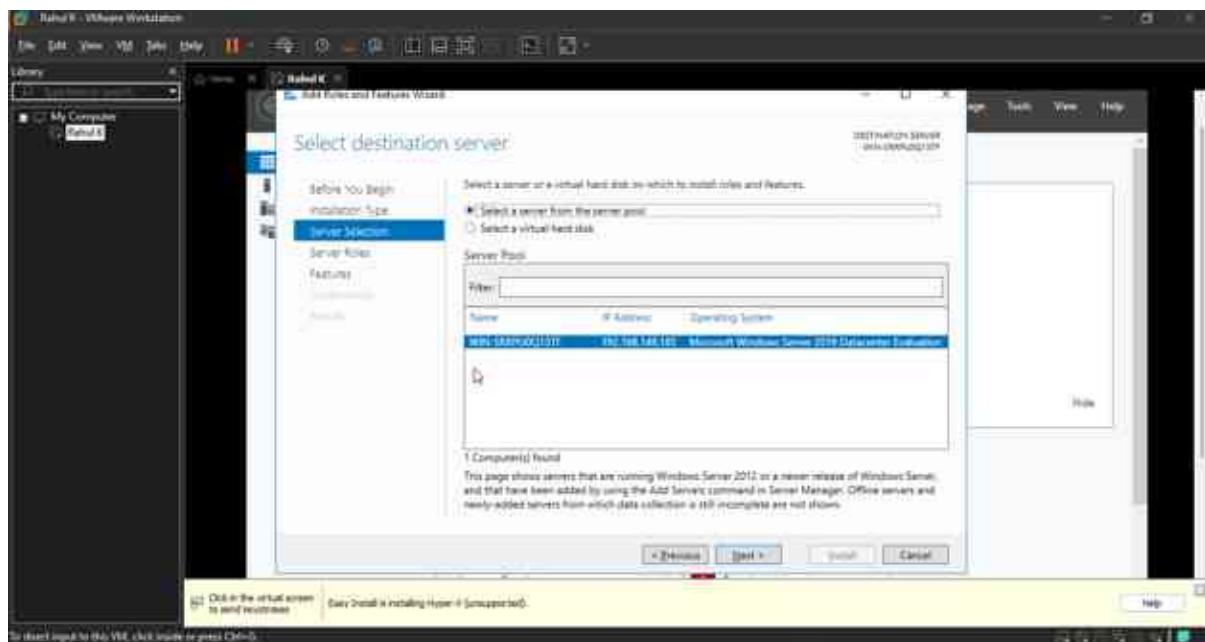
- Click On Next



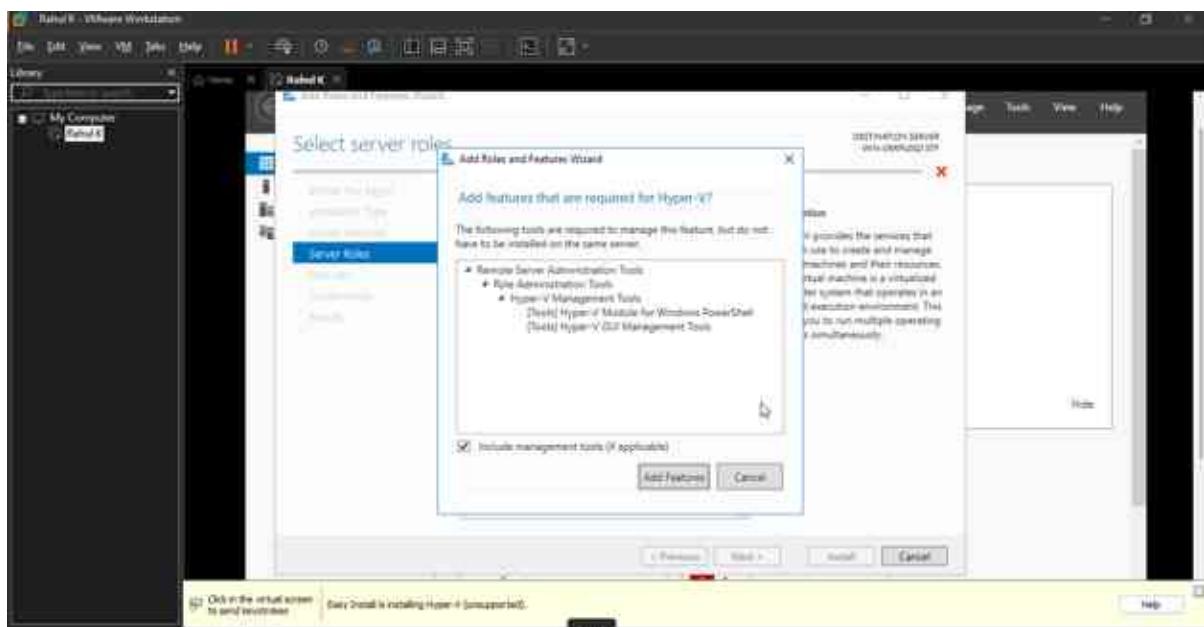
- In Installation Type Select **Role-based or feature-based installation**



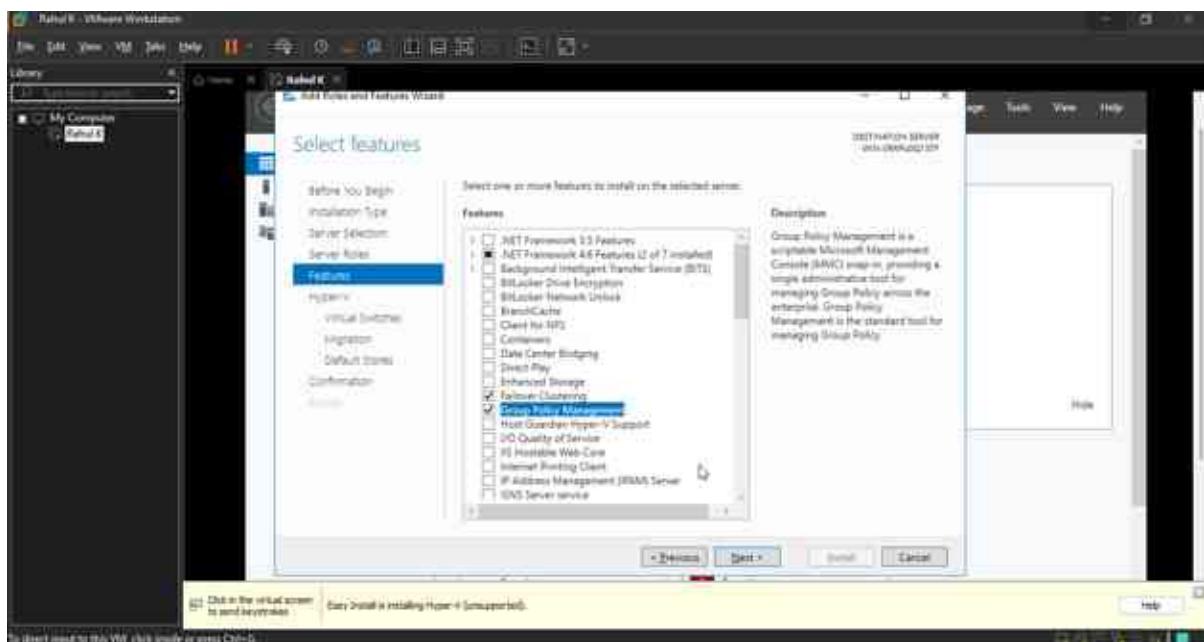
- Keep default setting and **click on Next**



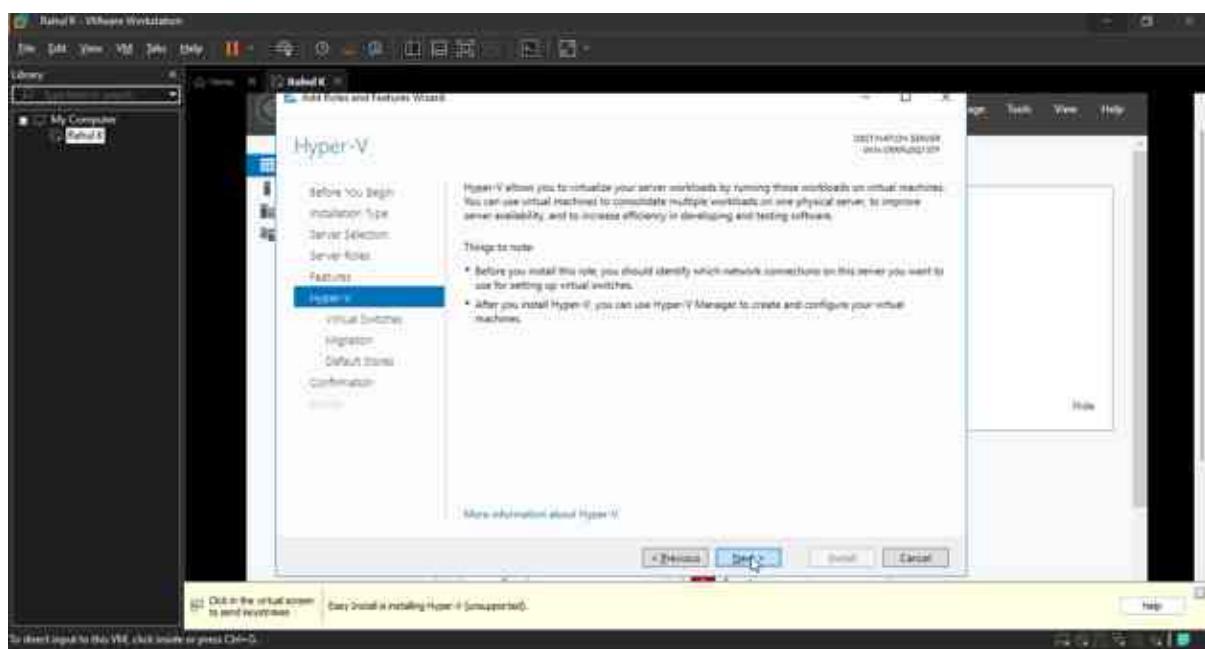
- Select **Hyper-V** and **Click Add Features and Click Next**



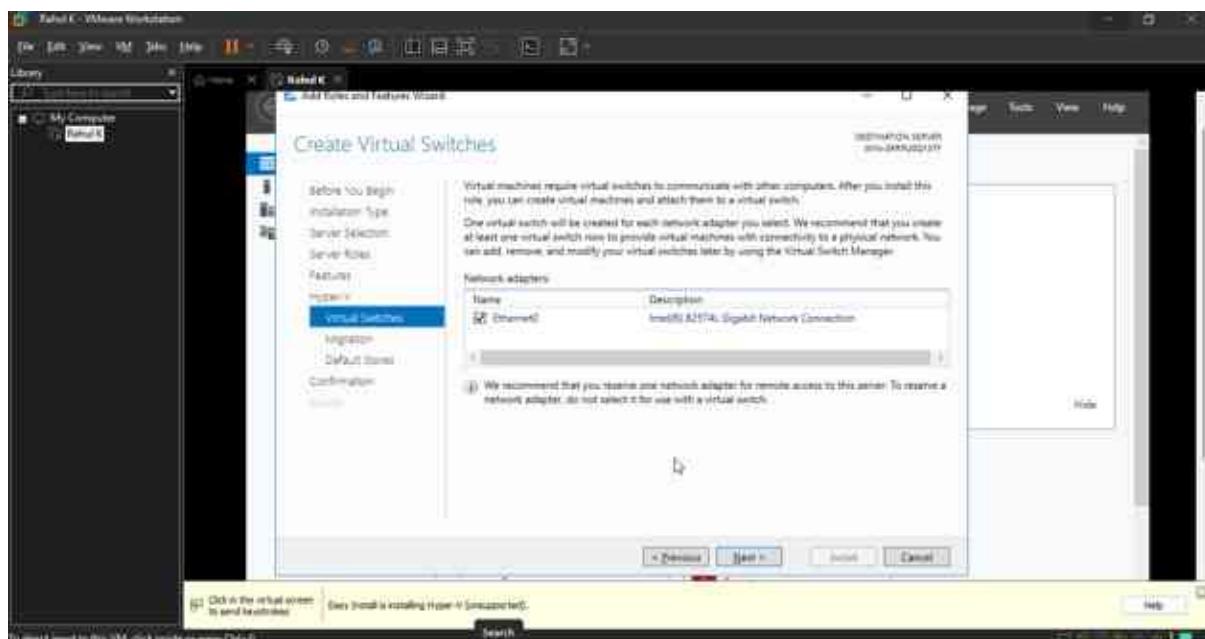
- Select **Failover Clustering** and click on **add feature** and click **Next**
- Make sure **Group Policy Management** also selected



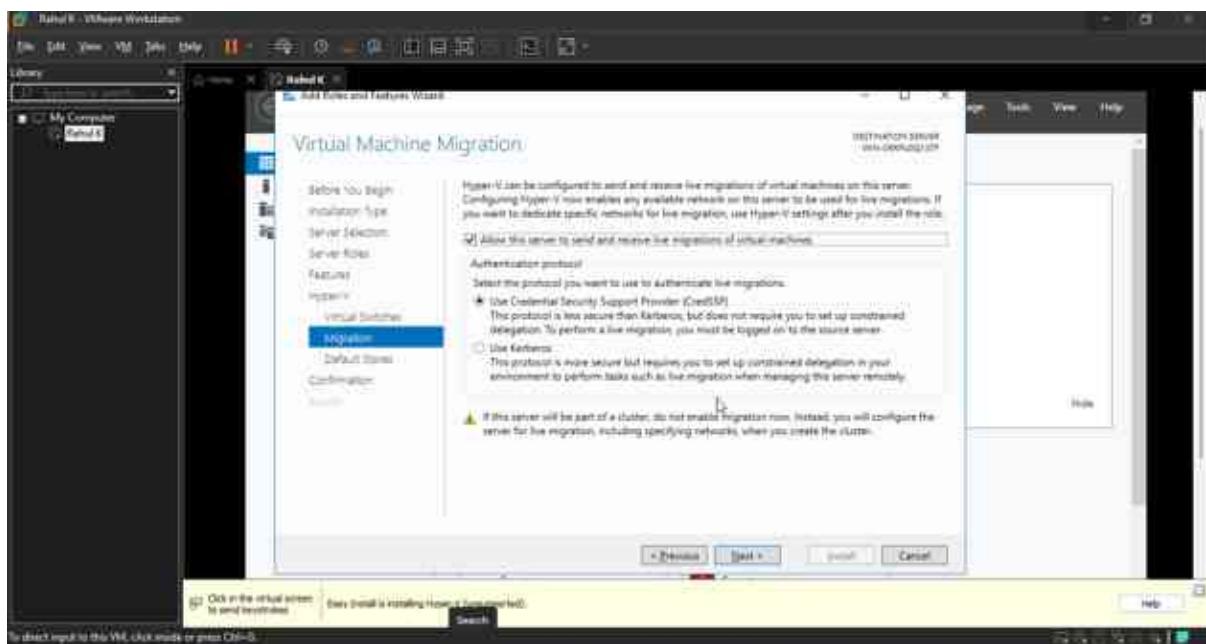
- **Click Next**



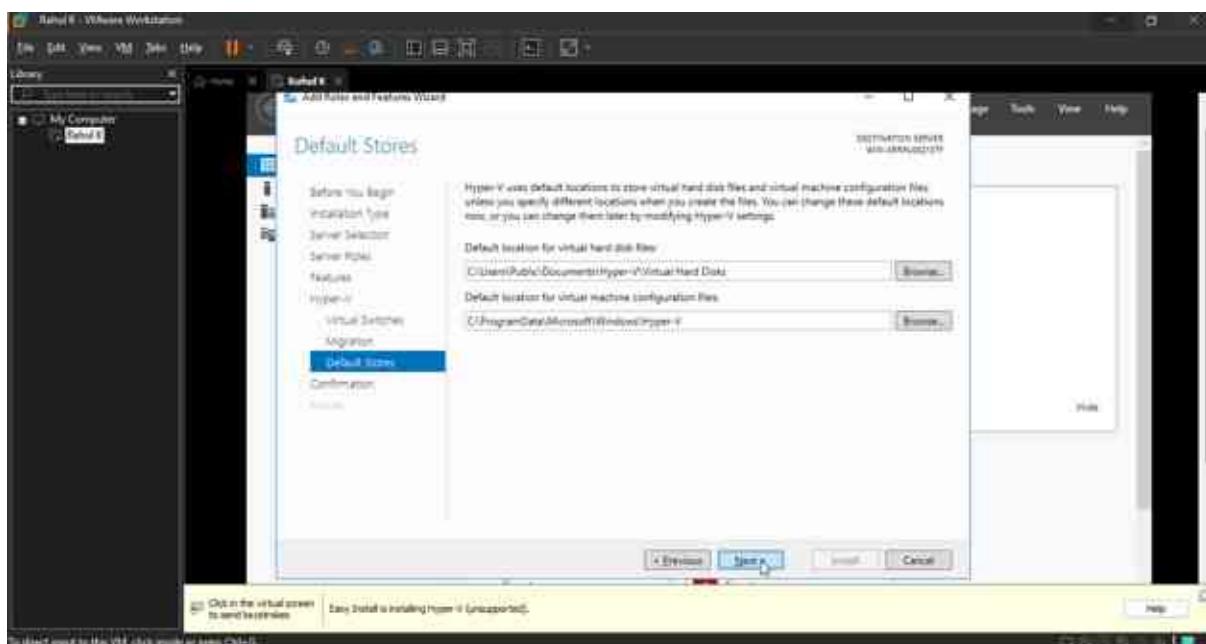
- In Network adapters: check **Ethernet0** and click **Next**



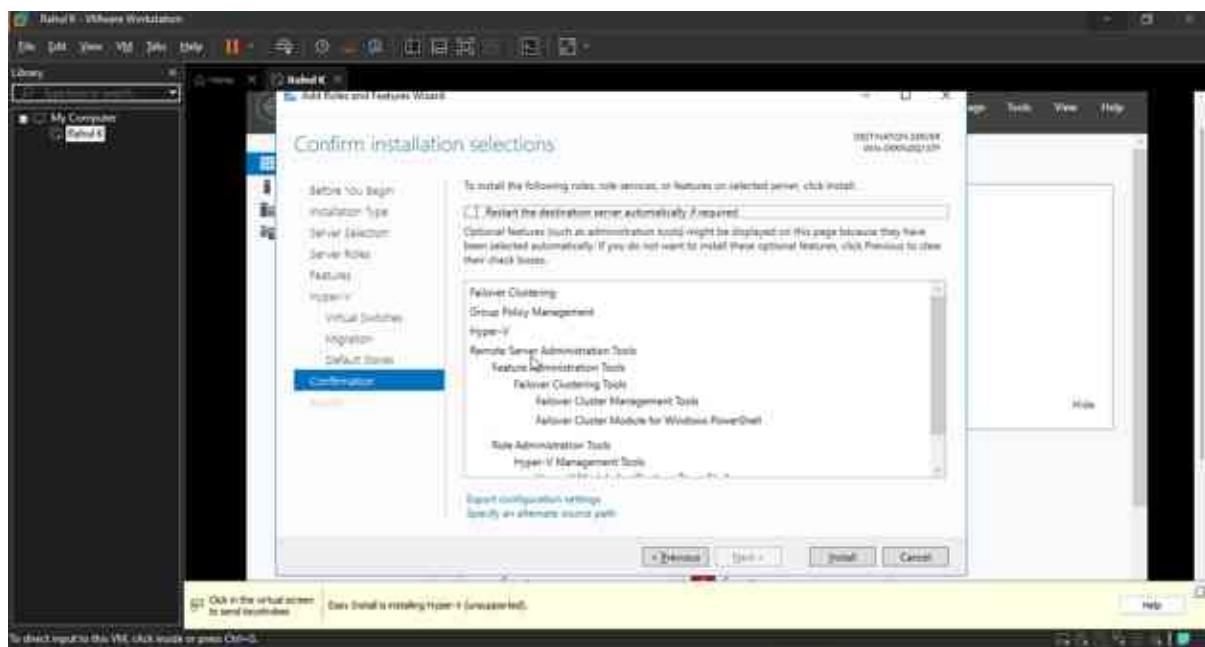
- Select **Allow this server to send and receive live migrations of virtual machines** And **Click Next**



- Keep default and **click on Next**

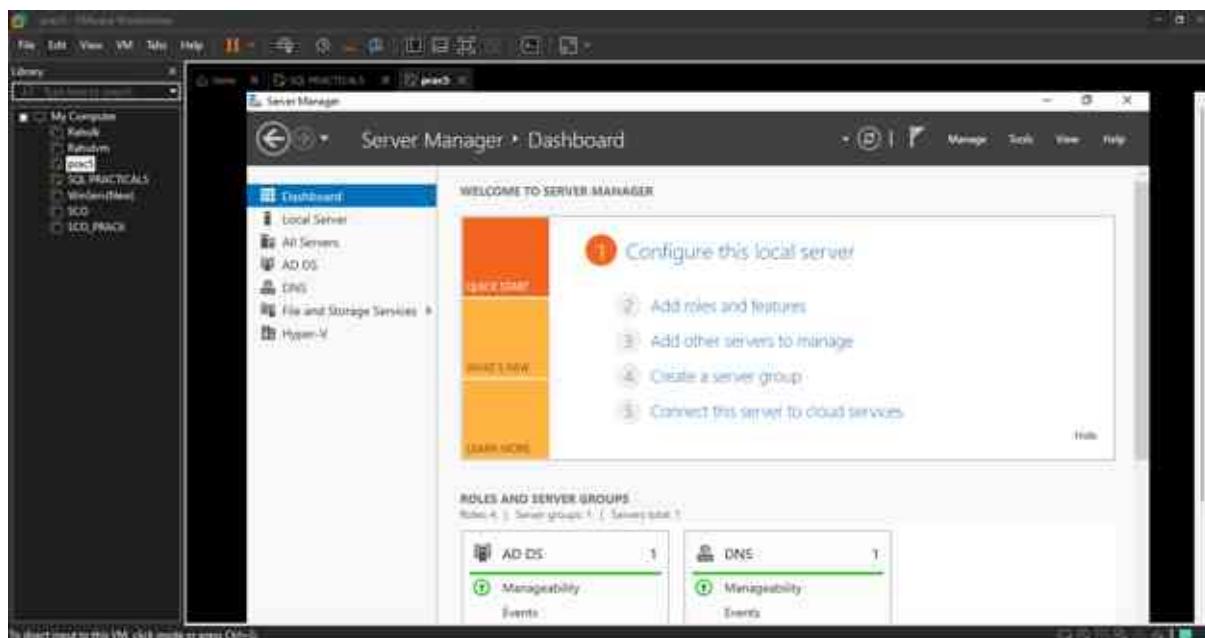


- Click **install** after installation of hyper-v restart the virtual machine.



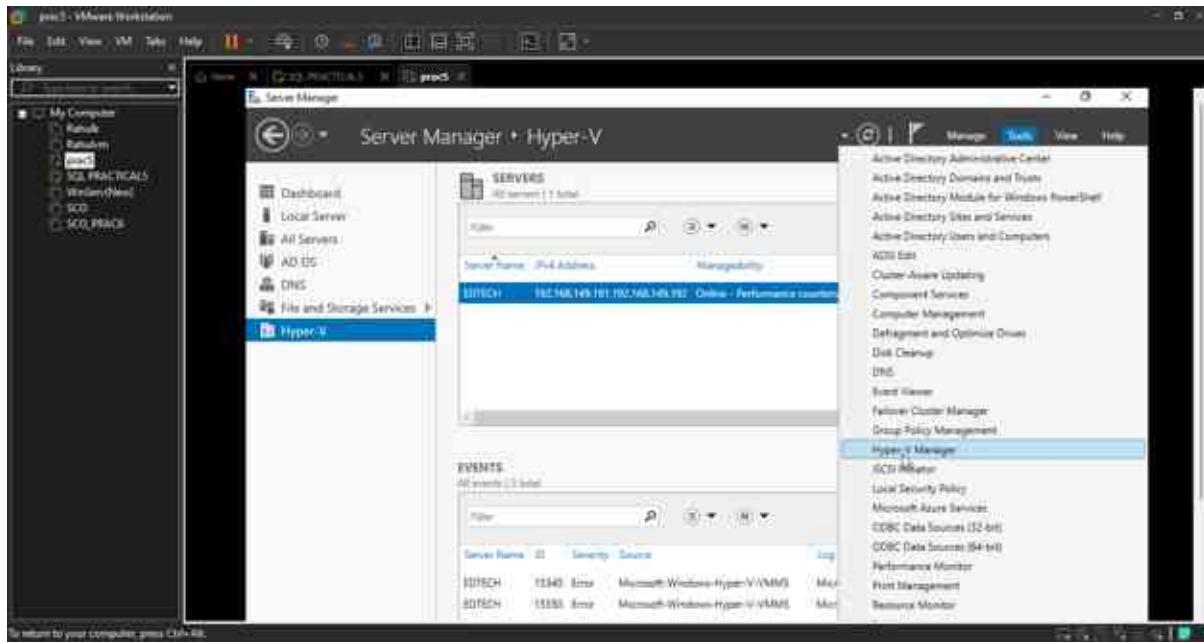
Step 2: Back up Hyper-V virtual machines

- Open Server Manager

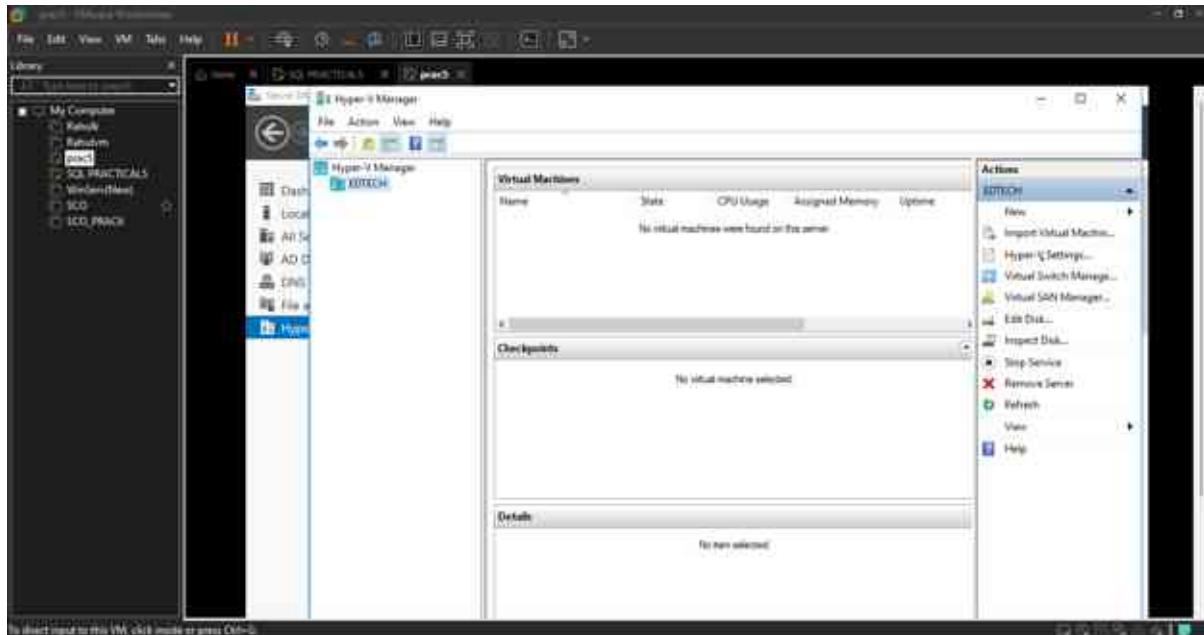


- Within Server Manager Click on Hyper-V and Click on Tools

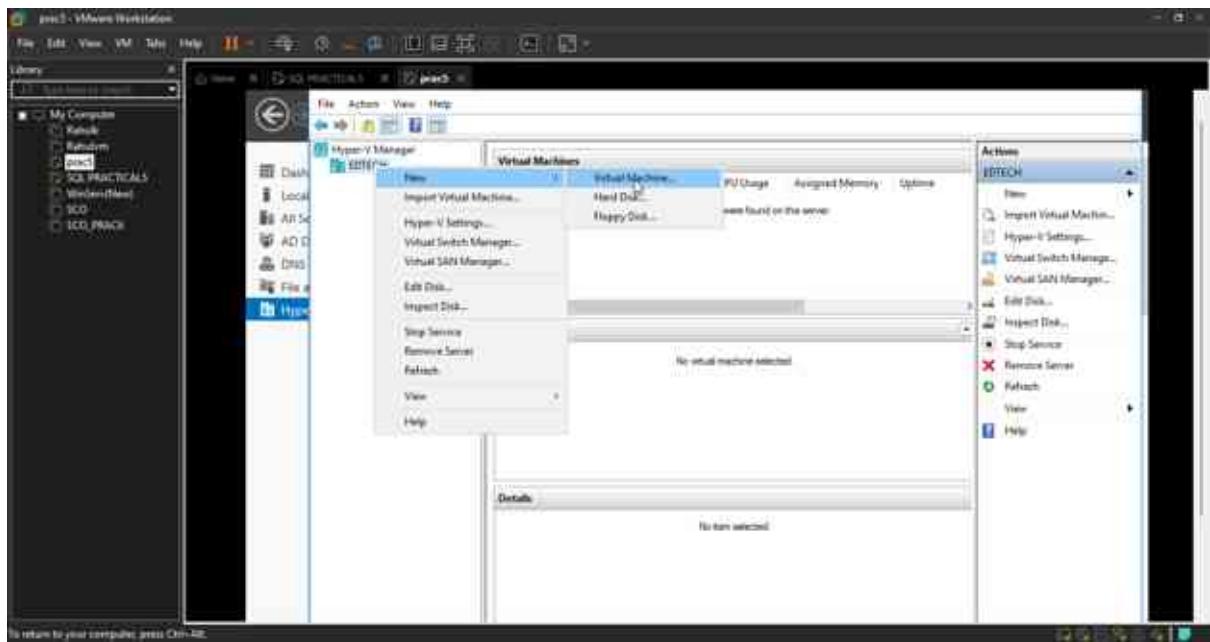
- Within Tools Click on Hyper-V Manager



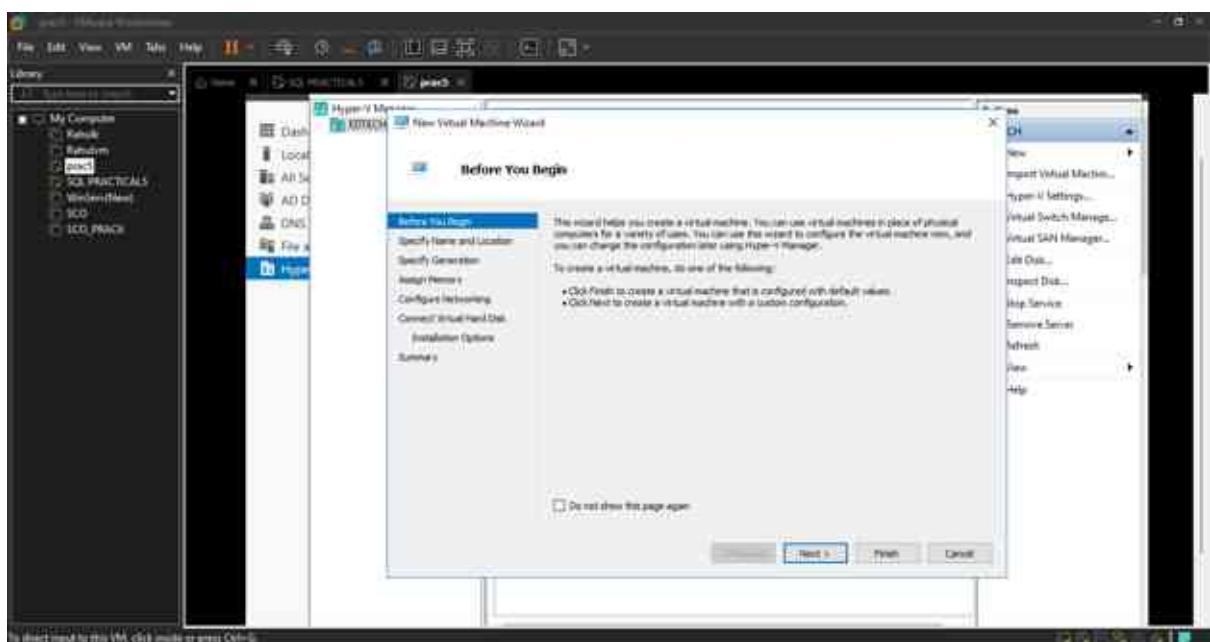
- Hyper-V Manager Window Open



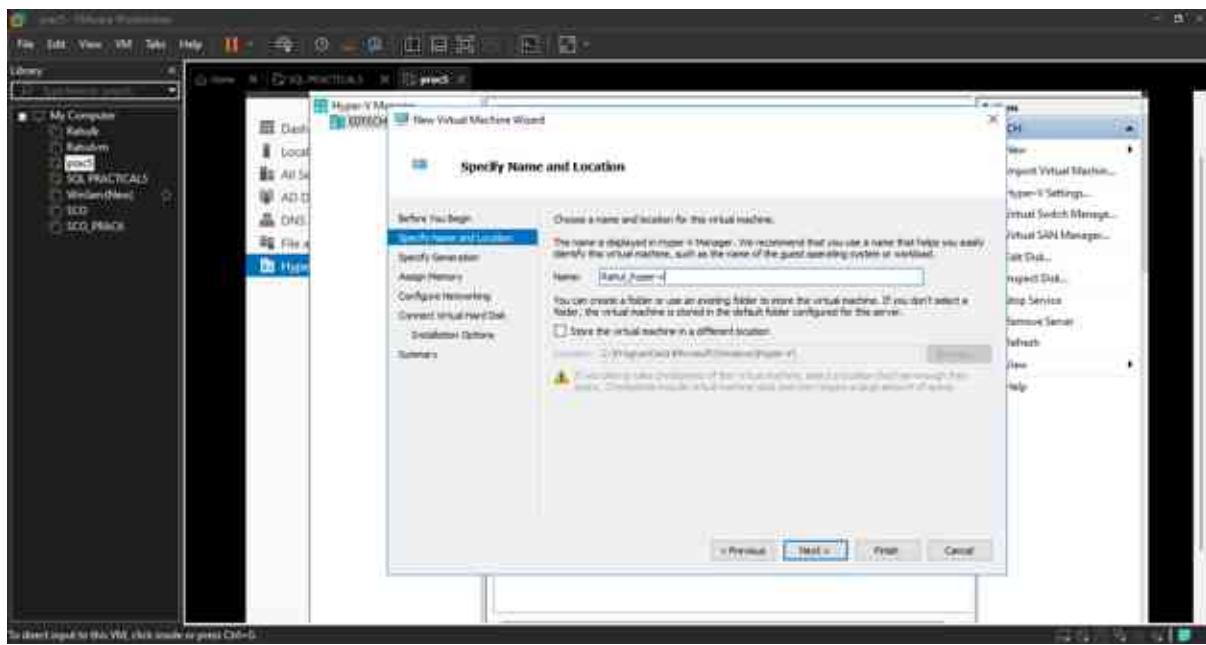
- Right-Click on EDTECH and Click on New and Select Virtual Machine



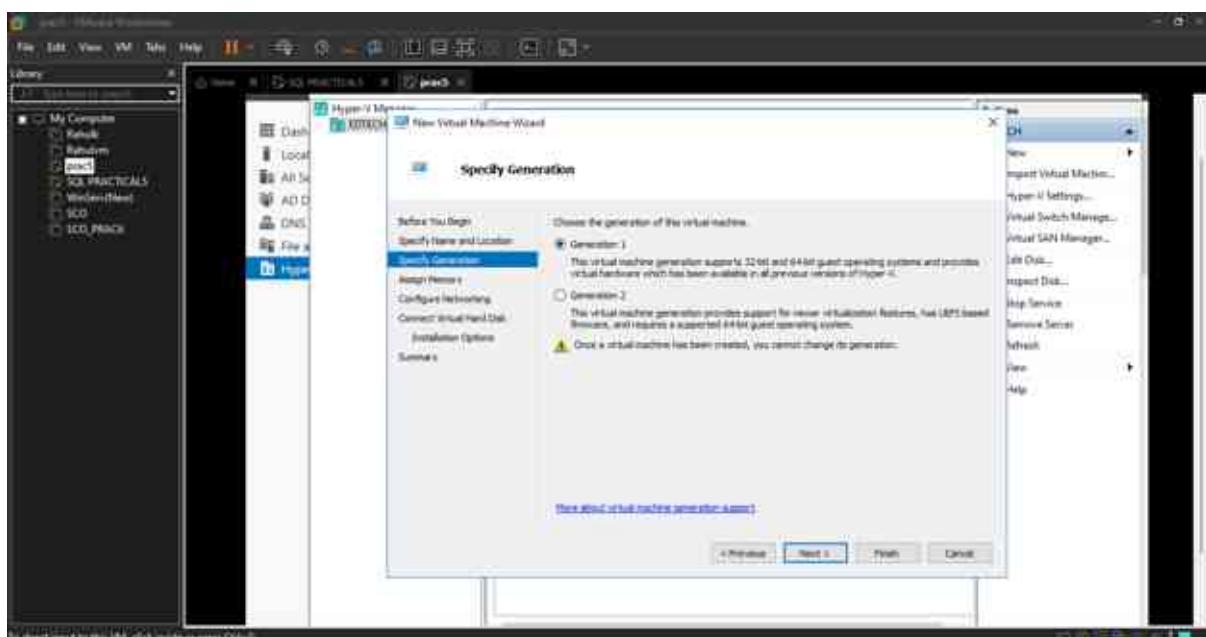
- Click Next



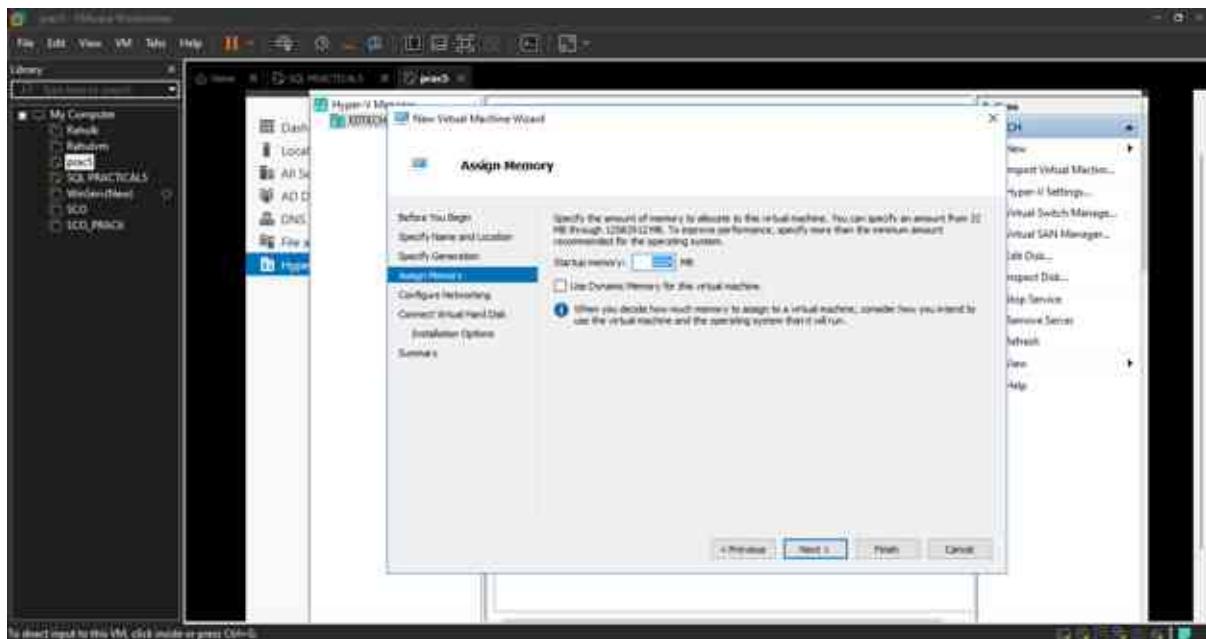
- Specify Name For Your Virtual Machine (Here Virtual Machine Name: **Rahul_hyper-v**)
- Click Next



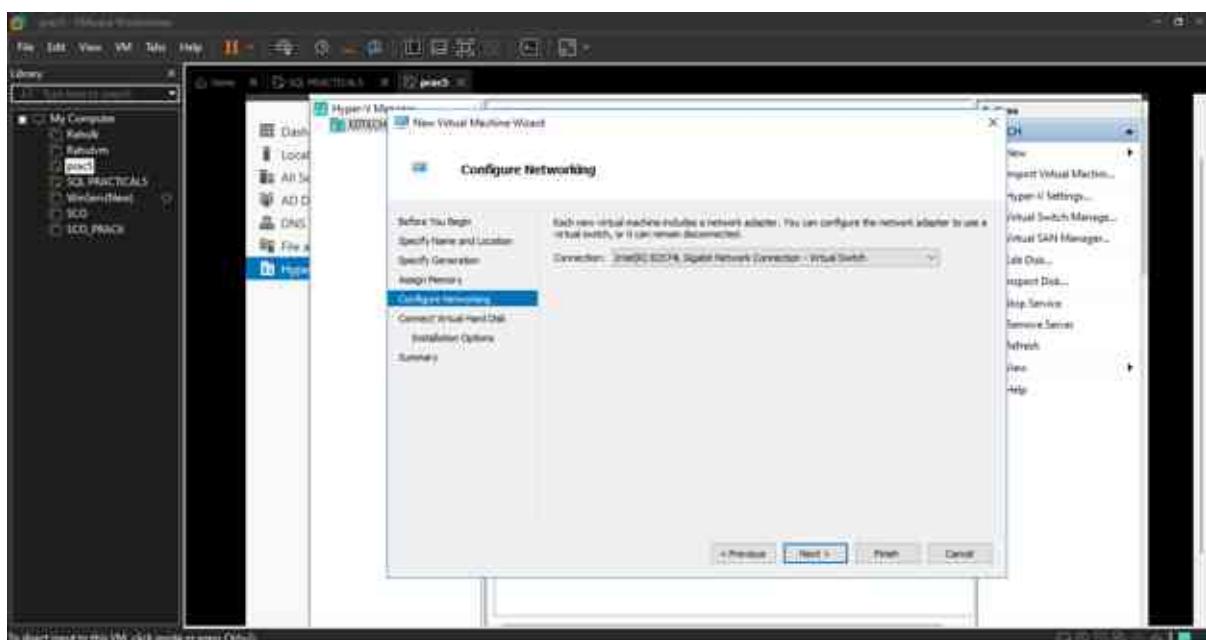
- Select Generation 1
- Click Next



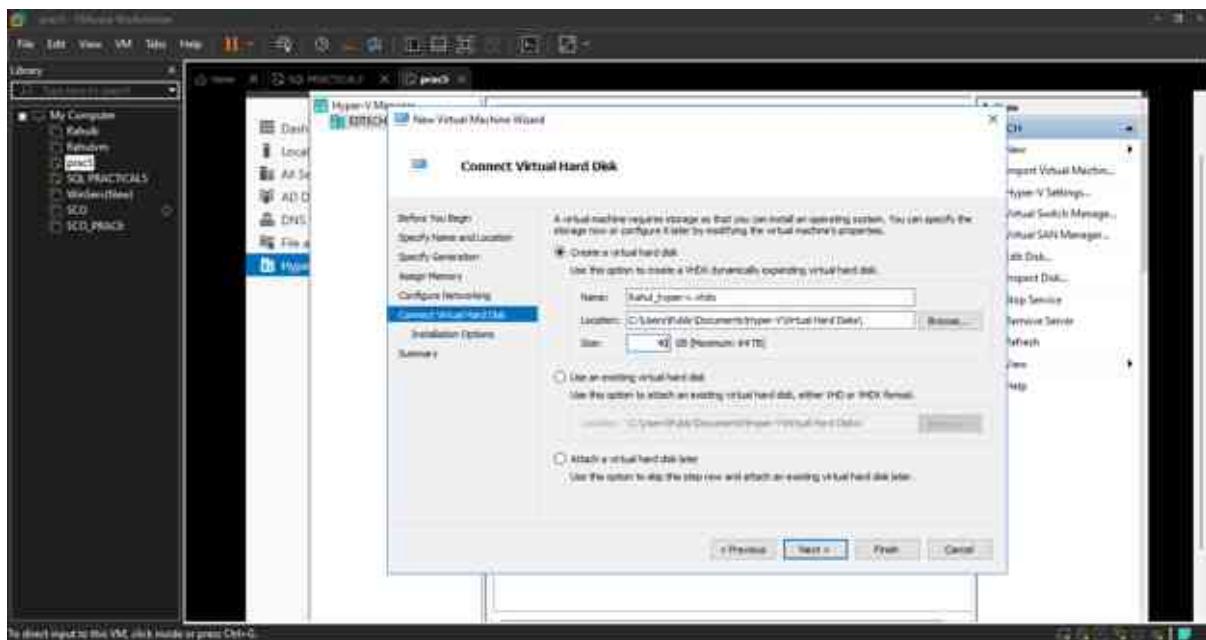
- Keep Default Setting and Click on Next



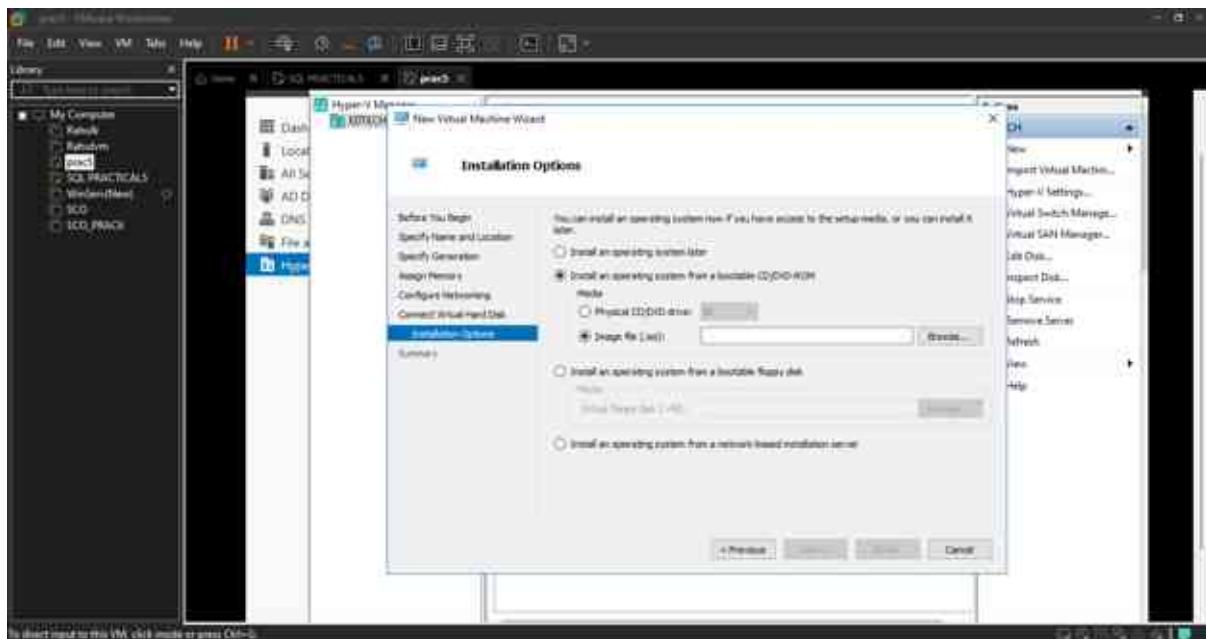
- Within Connection Select Intel® 82574L Gigabit Network Connection-Virtual Switch
- Click Next



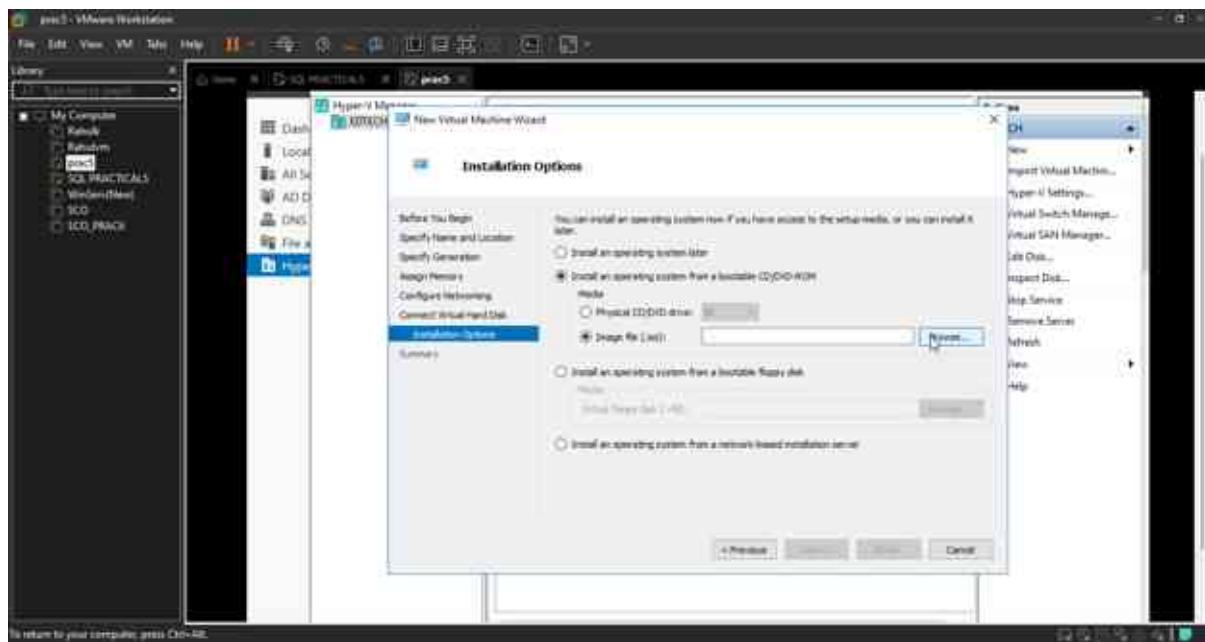
- Specify Disk Size 40GB and Click on Next



- Click on Install an operating system from a bootable CD/DVD-ROM
- Within Media Click on Image file (.iso)



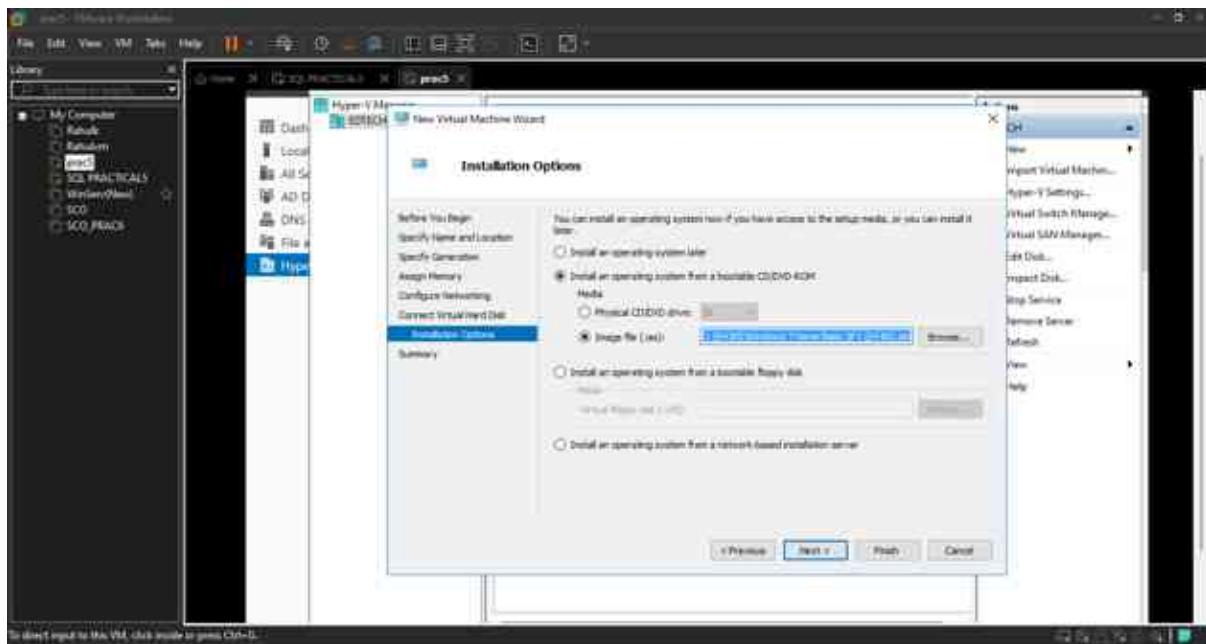
- Click on Browse



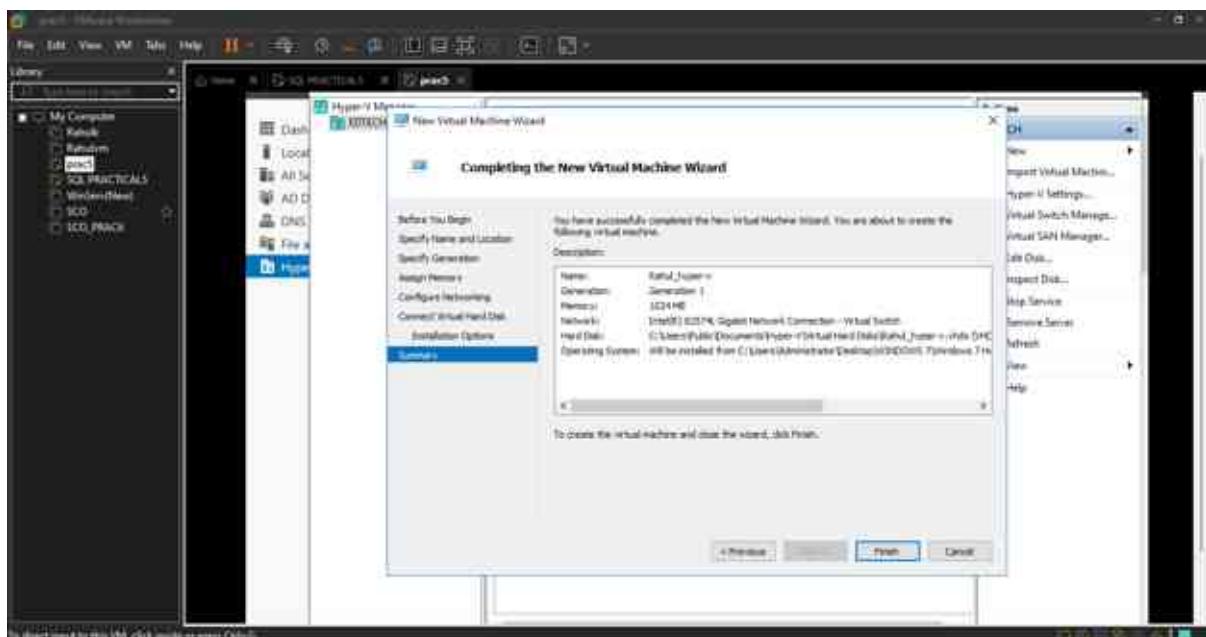
- Select Windows 7 Home Basic SP1 (64 Bit) and Click on Open



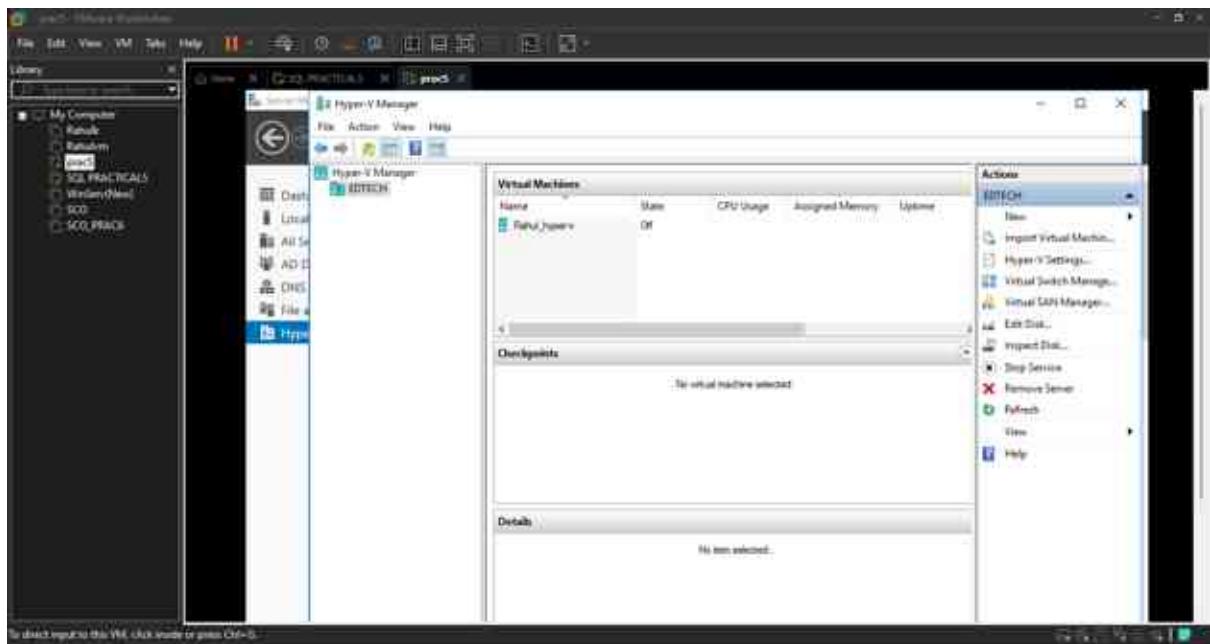
- Click Next



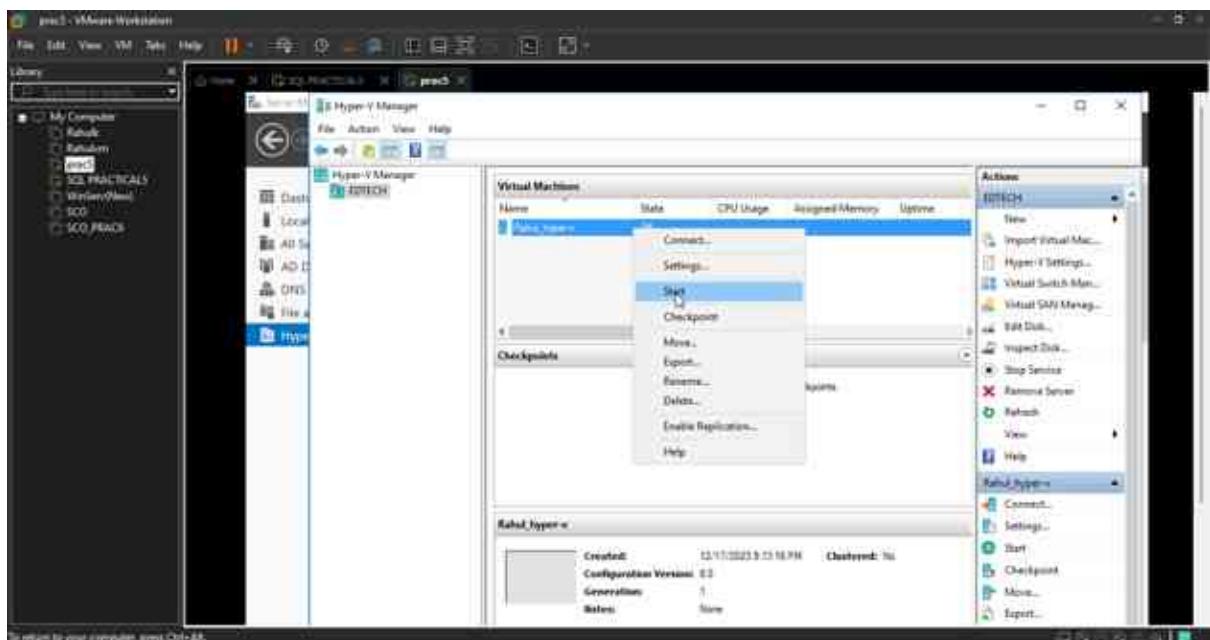
- Click on Finish



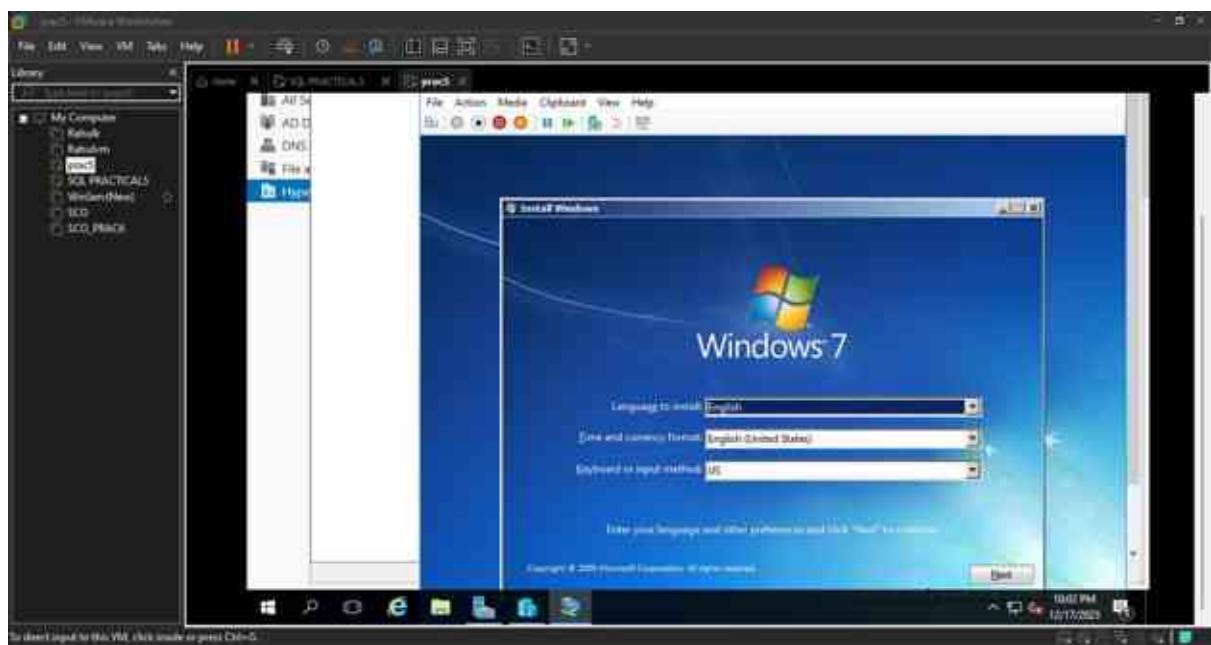
- New Virtual Machine Created



- Right-Click on Rahul_hyper-v and Click on Start



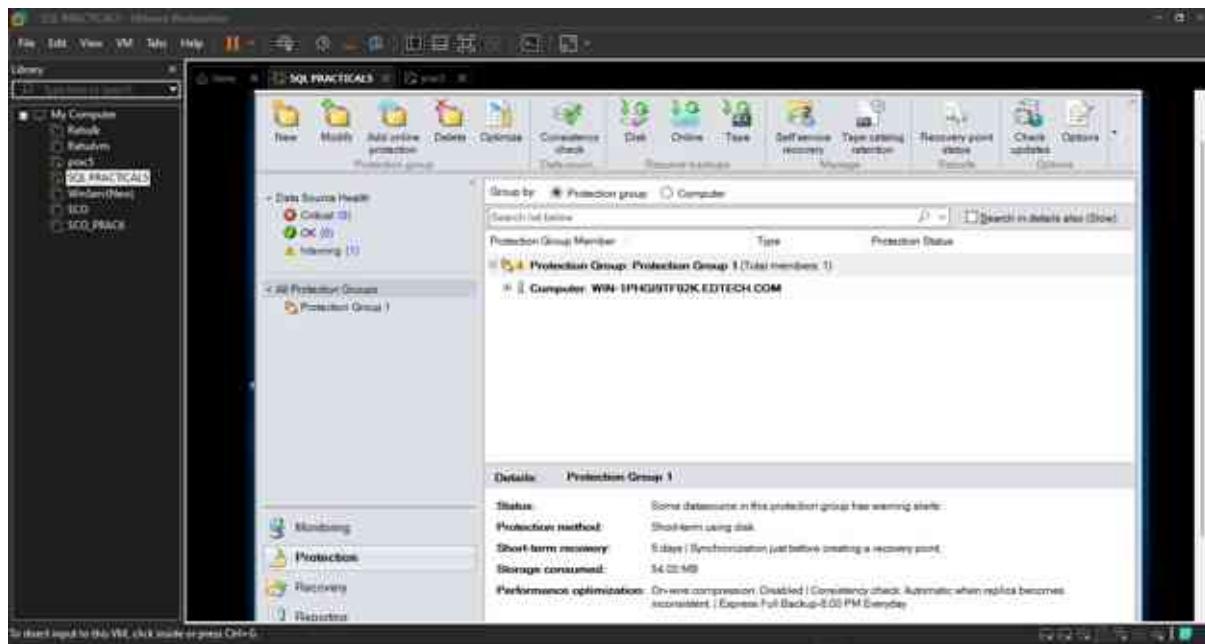
- Virtual Machine Start



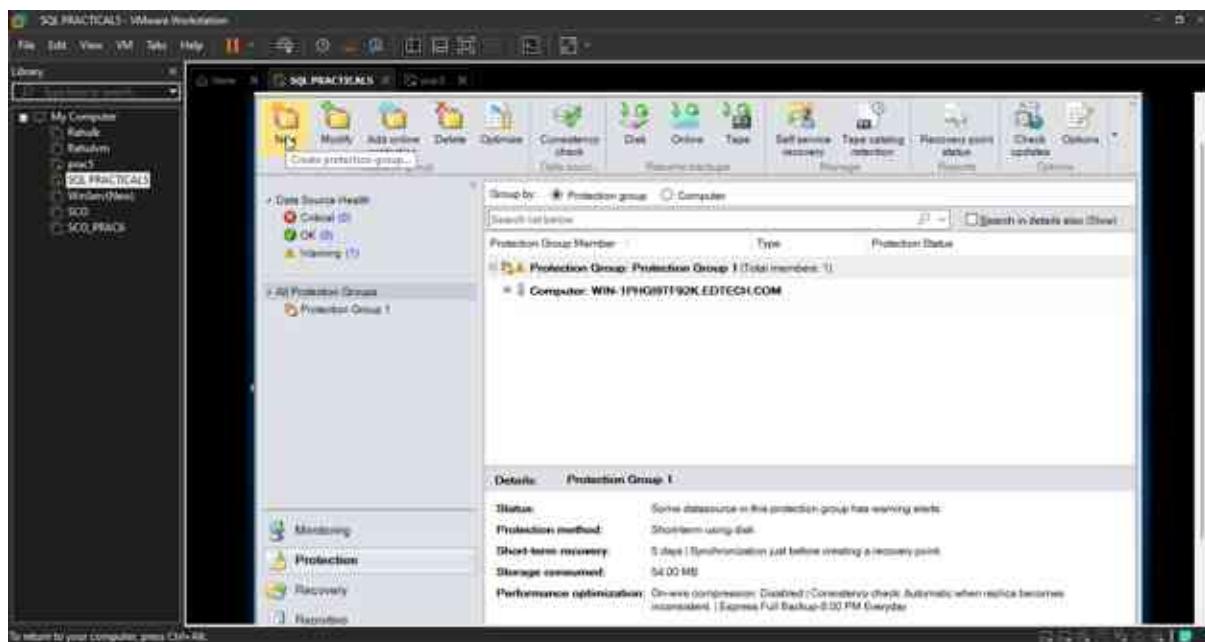
Step 3: Within User Server Click on System Center Data Protection Manager (DPM)



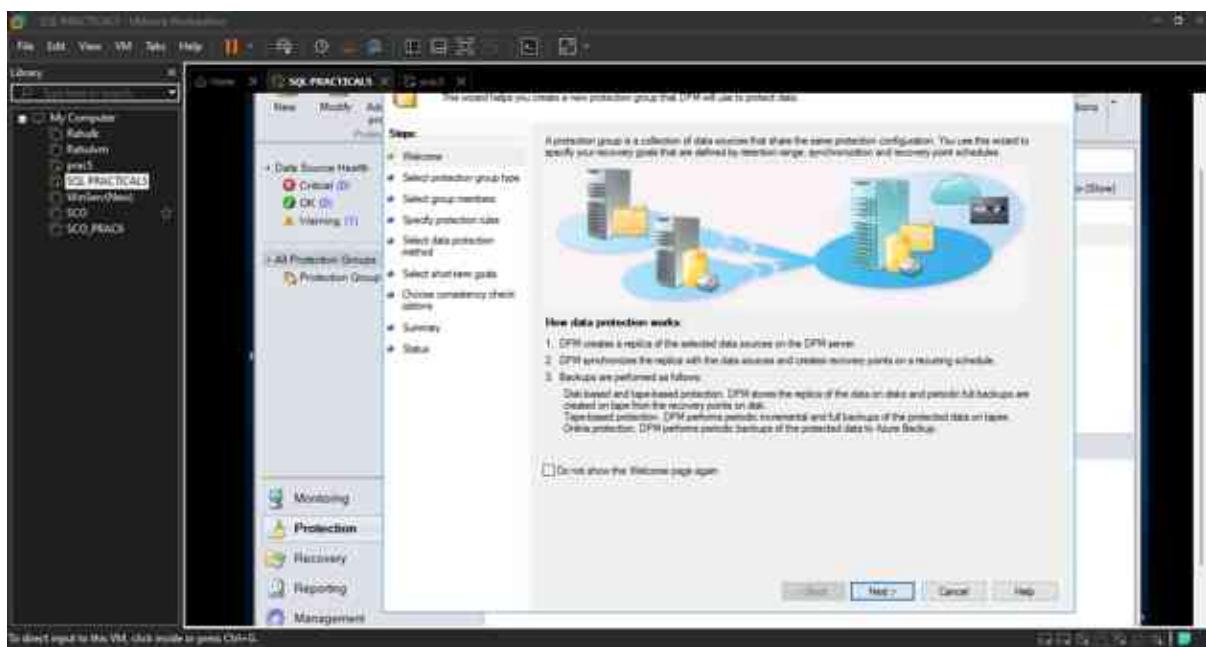
- Click on Protection



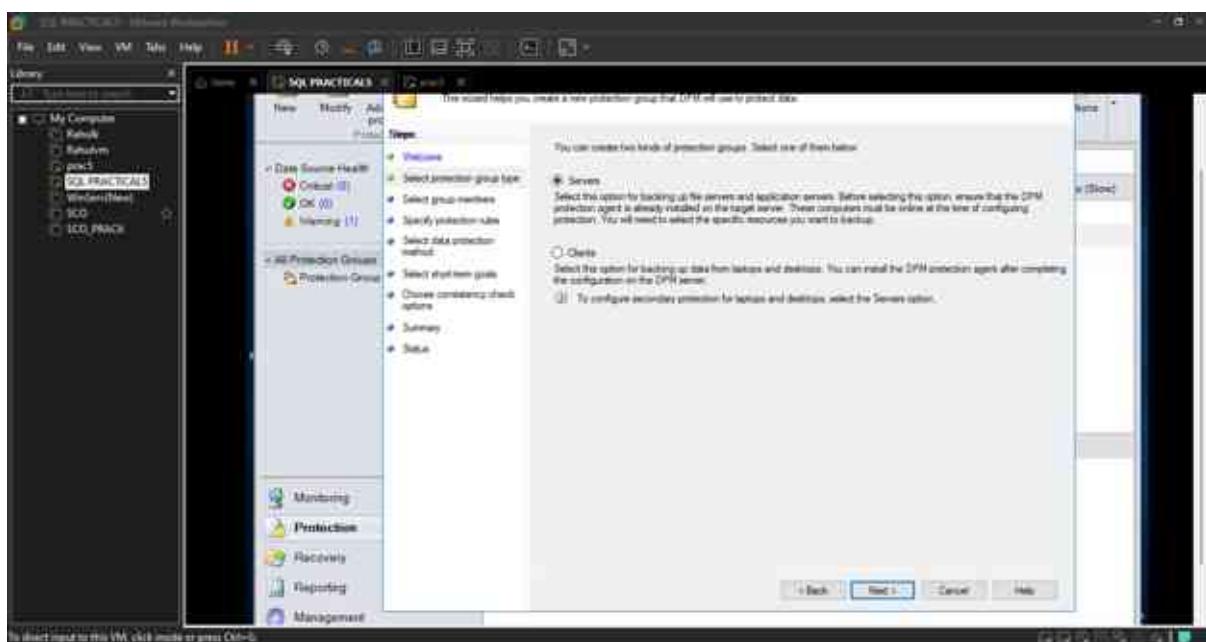
- Click on New to Create Protection Group



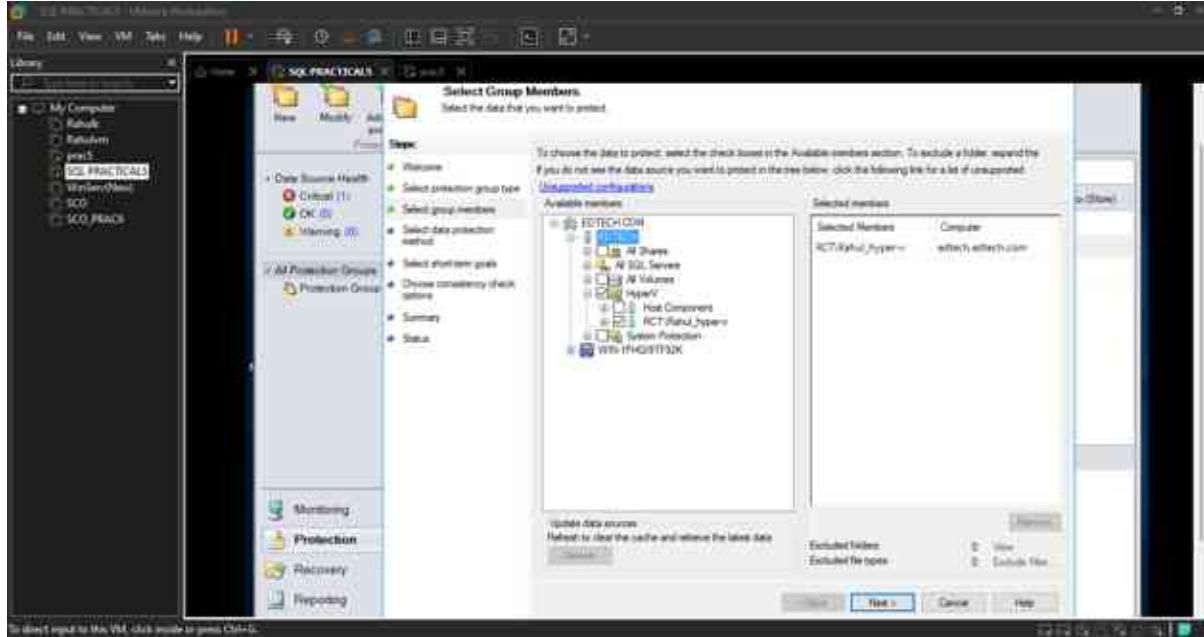
- Click on Next



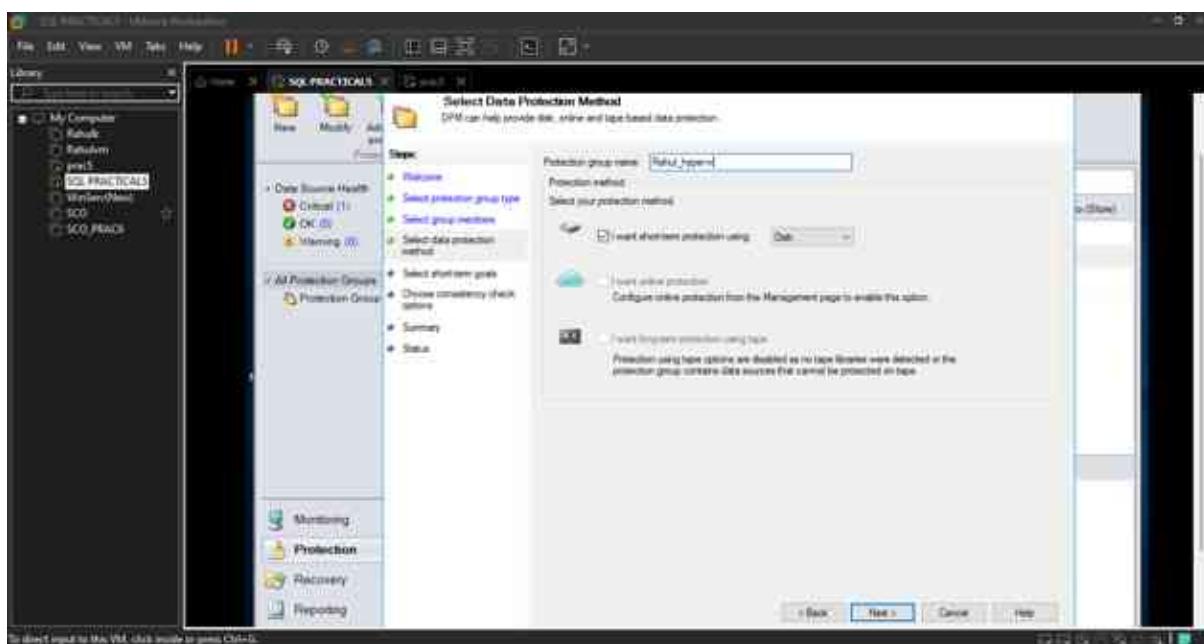
- Select Server and Click on Next



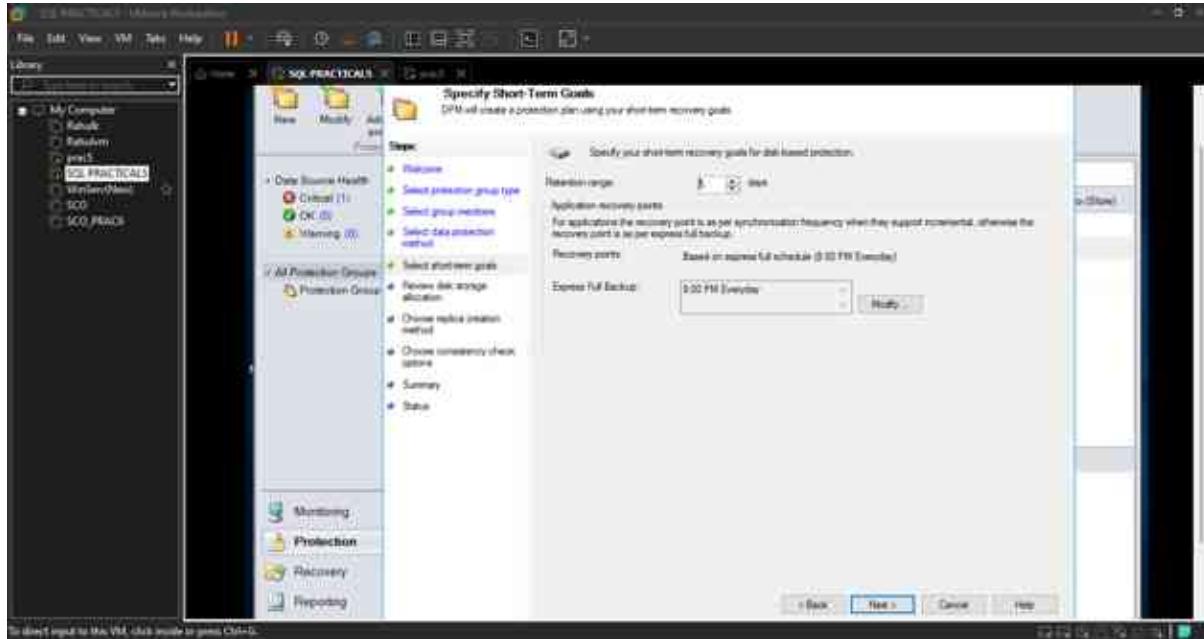
- On the Select Group Members page, **Click on EDETCHE** and **Click on HyperV** Within HyperV select the **RCT\Rahul_hyper-v VM** to protect from the **Hyper-V host servers** on which they're located.
- Click on Next**



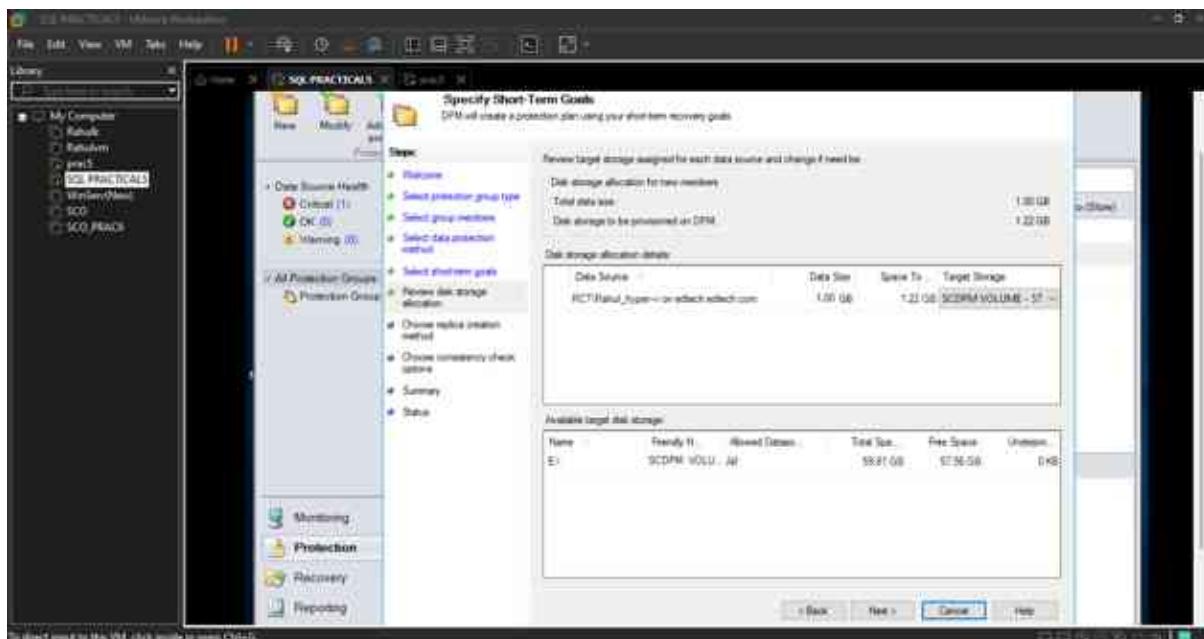
- Type Protection group name** (Here Protection group name: **Rahul_hyper-v**)
- Click on Next**



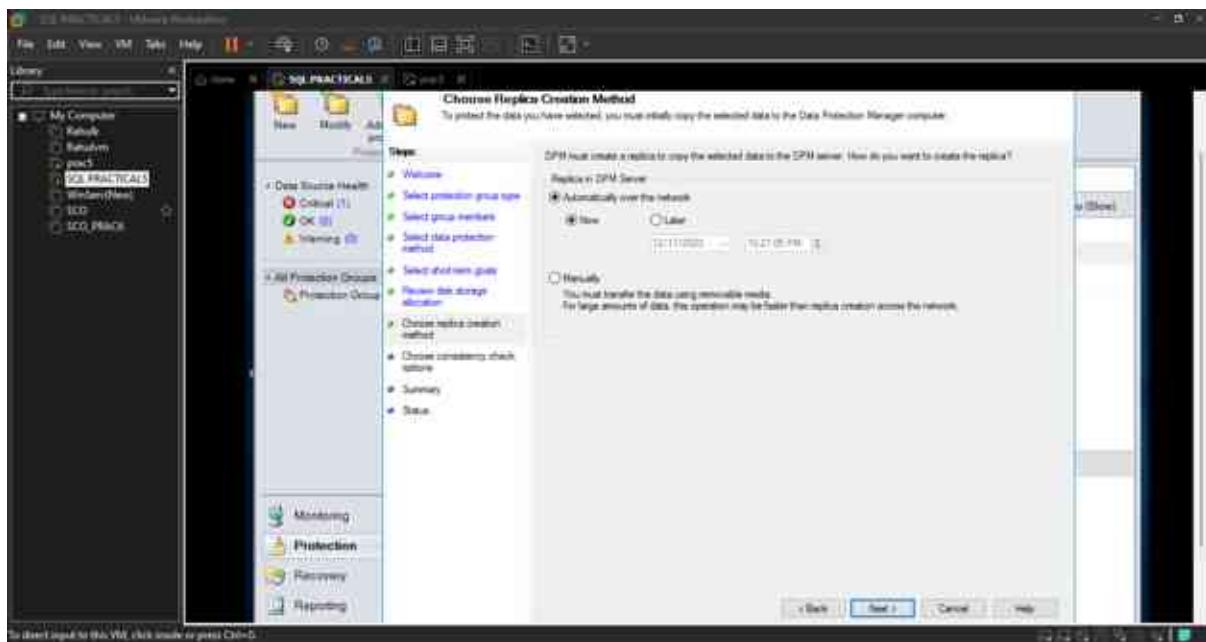
- Keep the default values and Click on Next



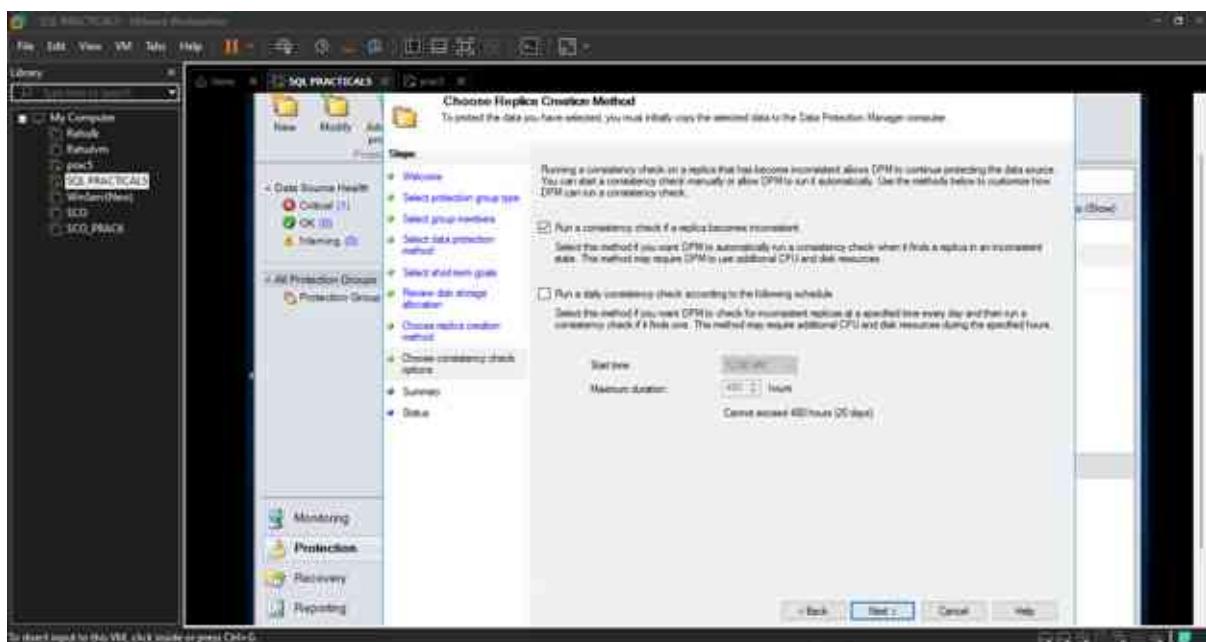
- Click on Next



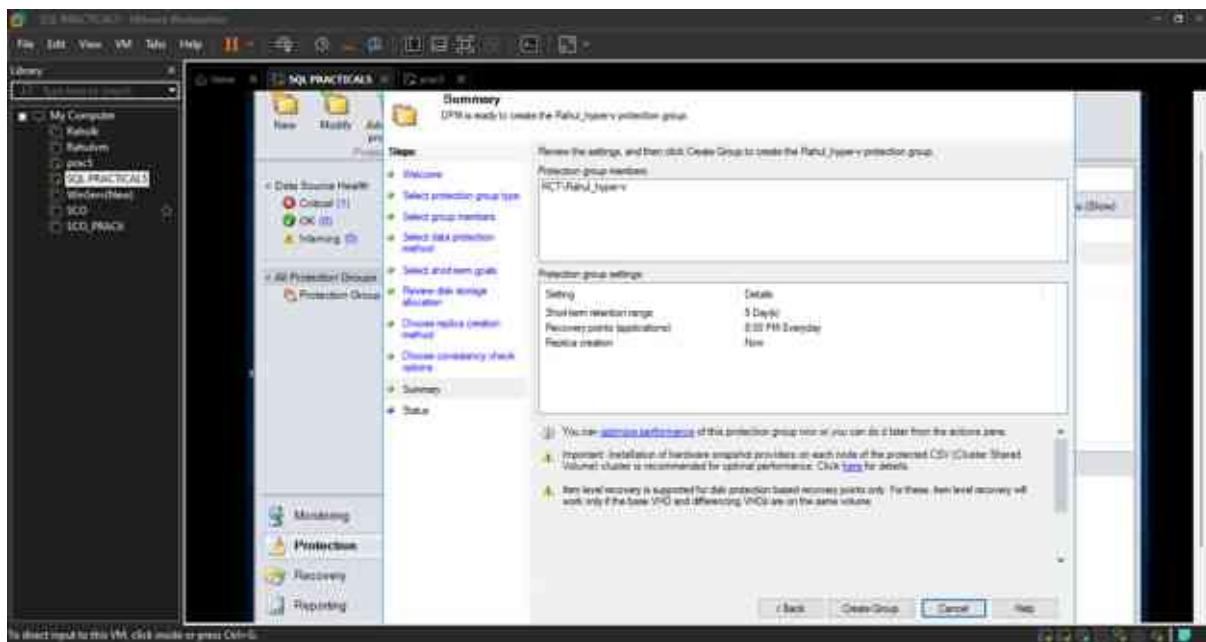
- Keep the default setting and Click on Next



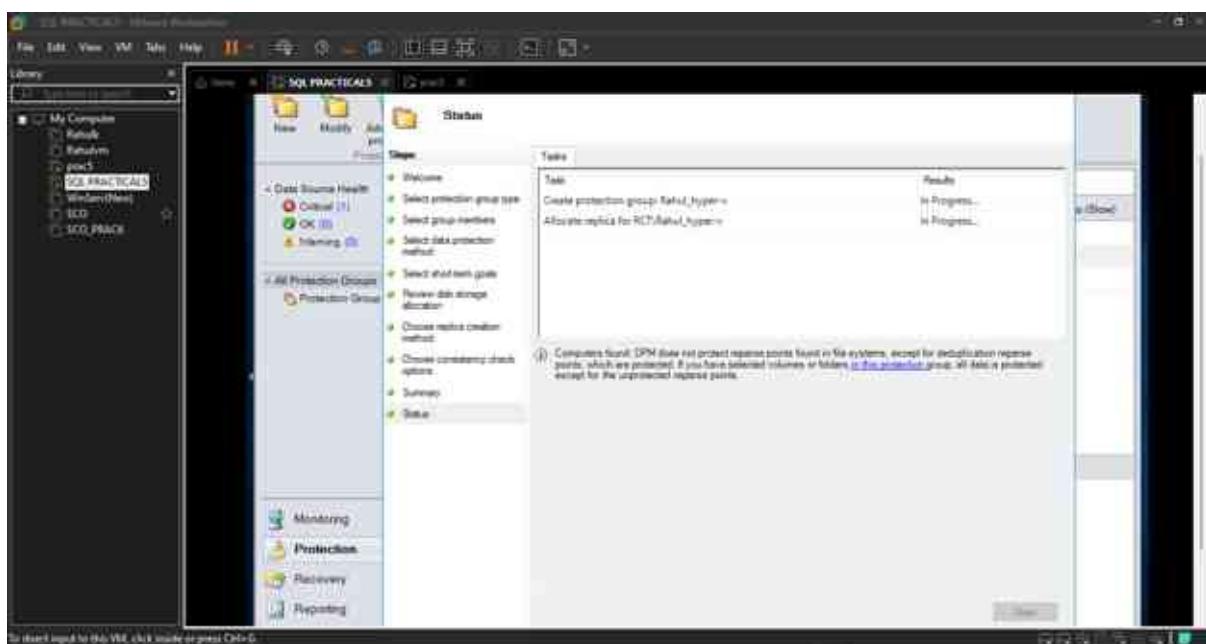
- Keep the default setting and Click on Next



- Click on Create Group

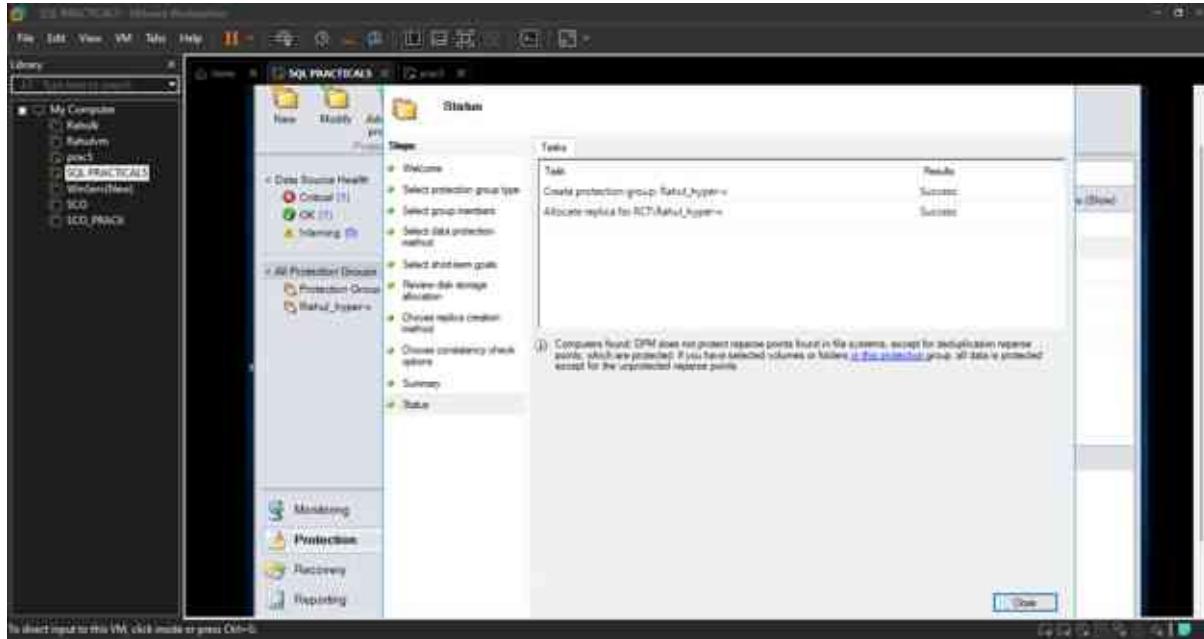


- It will start creation of protection group

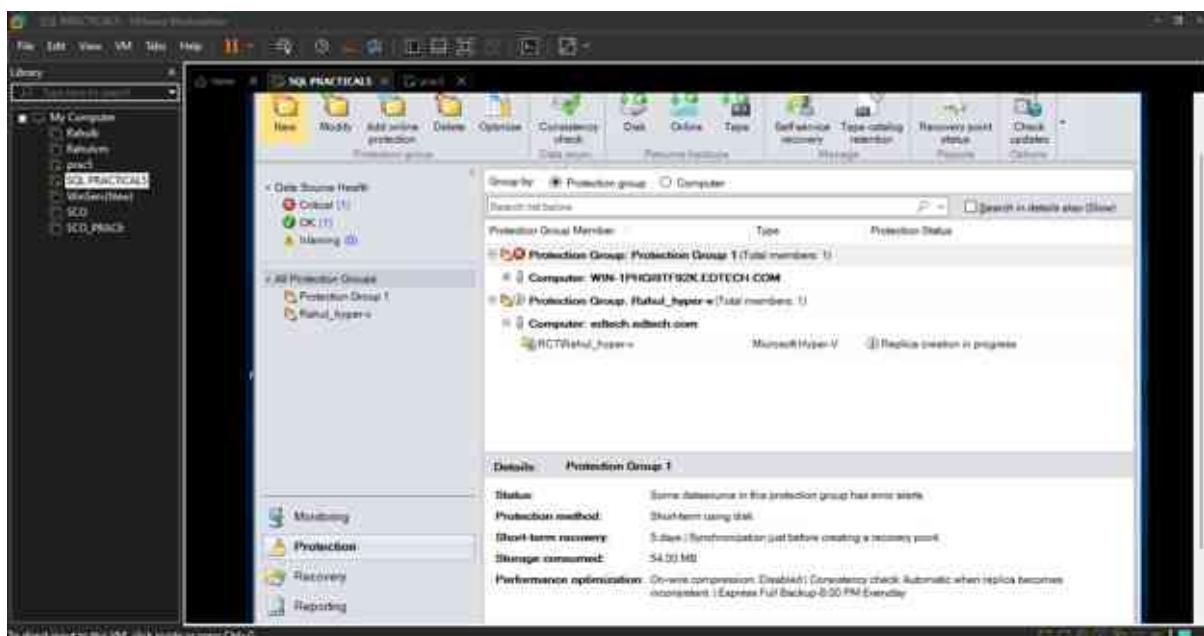


- Creation of Protection Group Succeeded

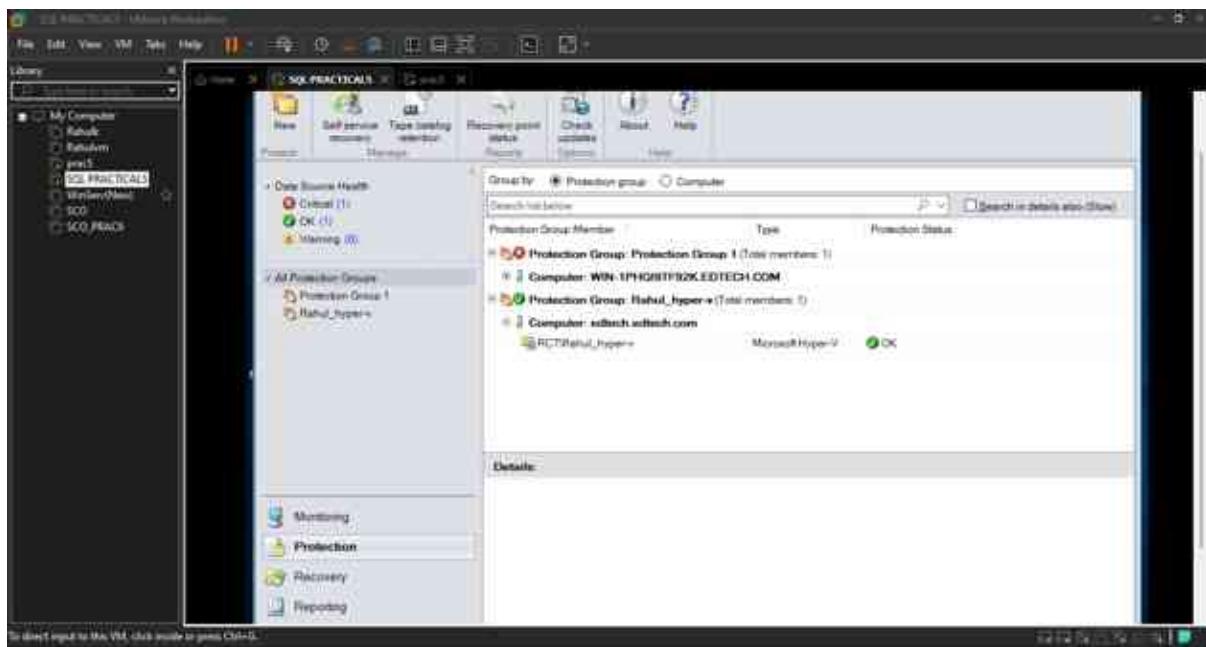
- Click on Close



- Here we can see Replica creation Rahul_Hyper-V in progress



- Replication created

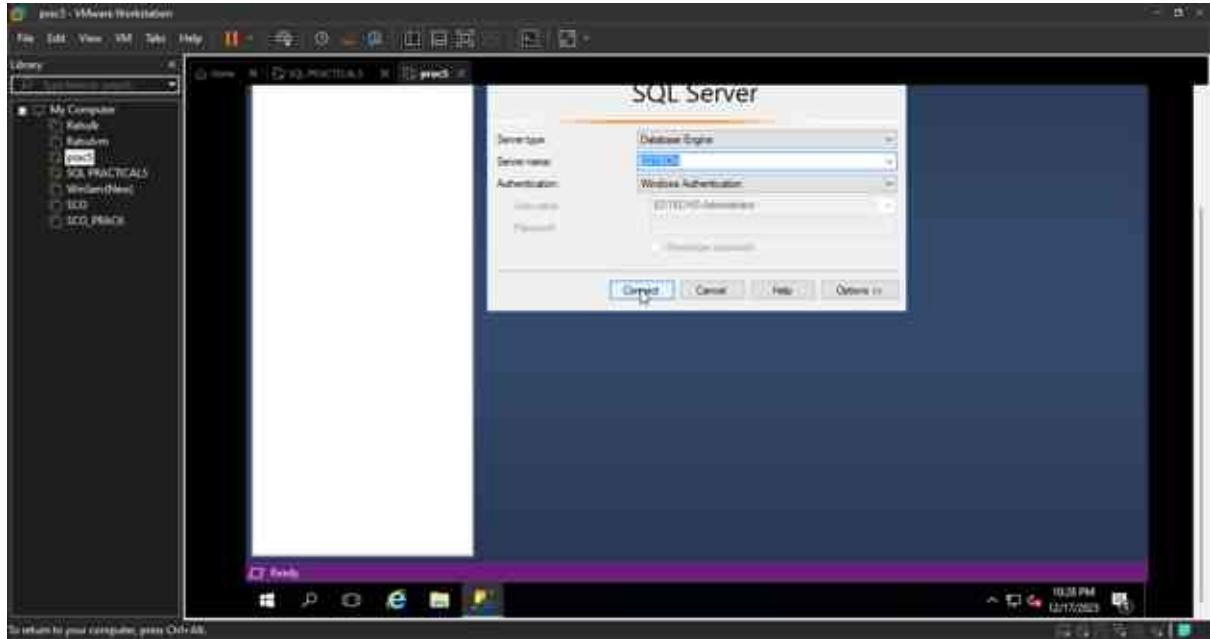


Step 3: Back up SQL Server with DPM

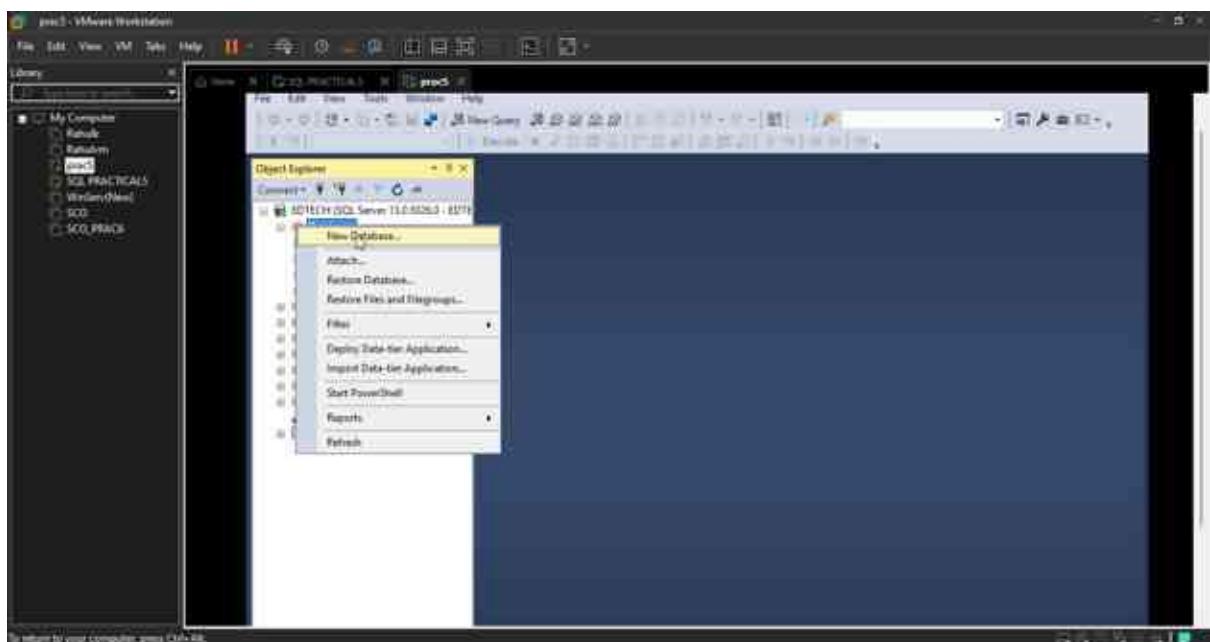
- Open SQL Server Manager Studio



- Click on Connect

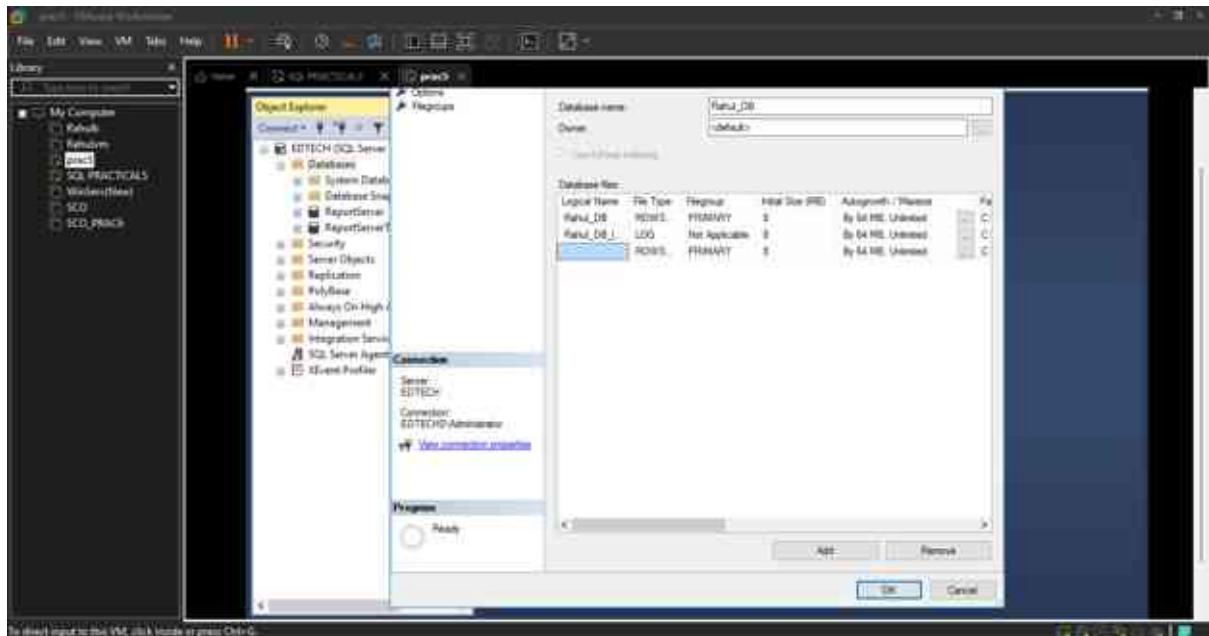


- Right-Click on Database and Select New Database

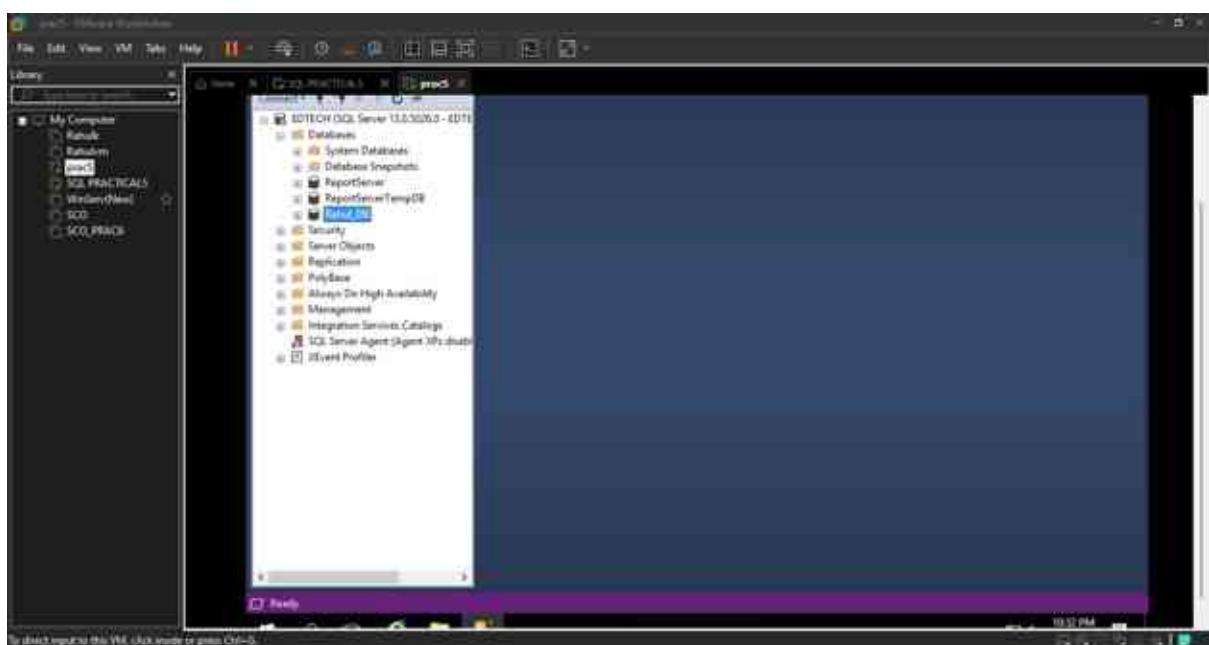


- Type Database Name (Here Database Name: Rahul_DB)

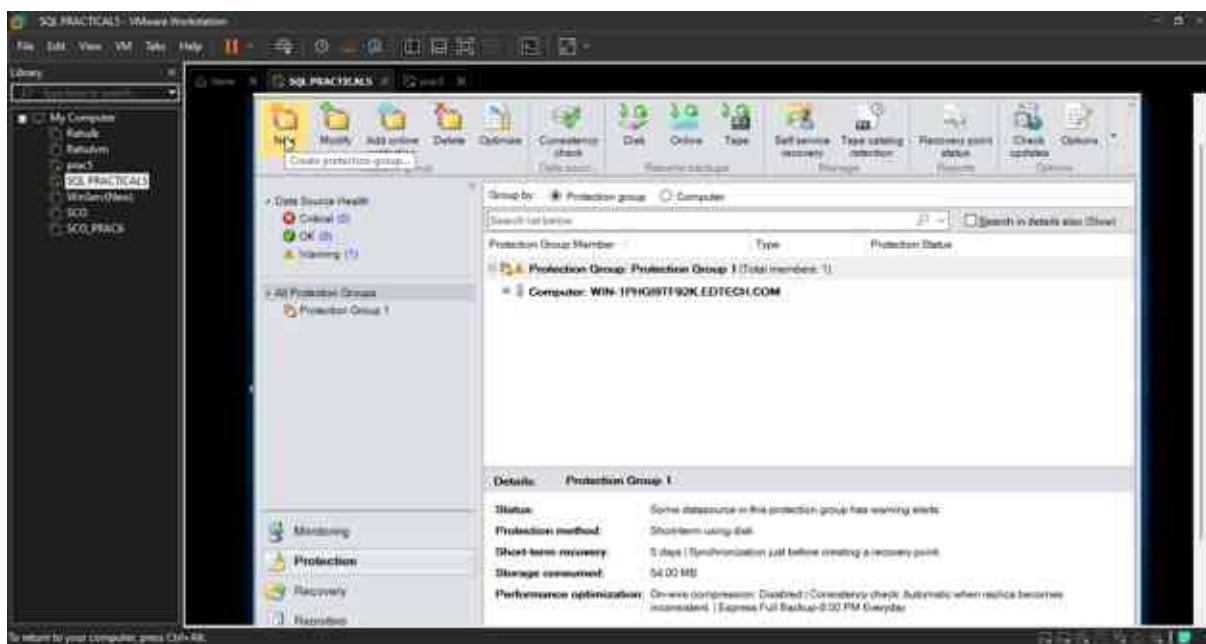
- Click on Ok



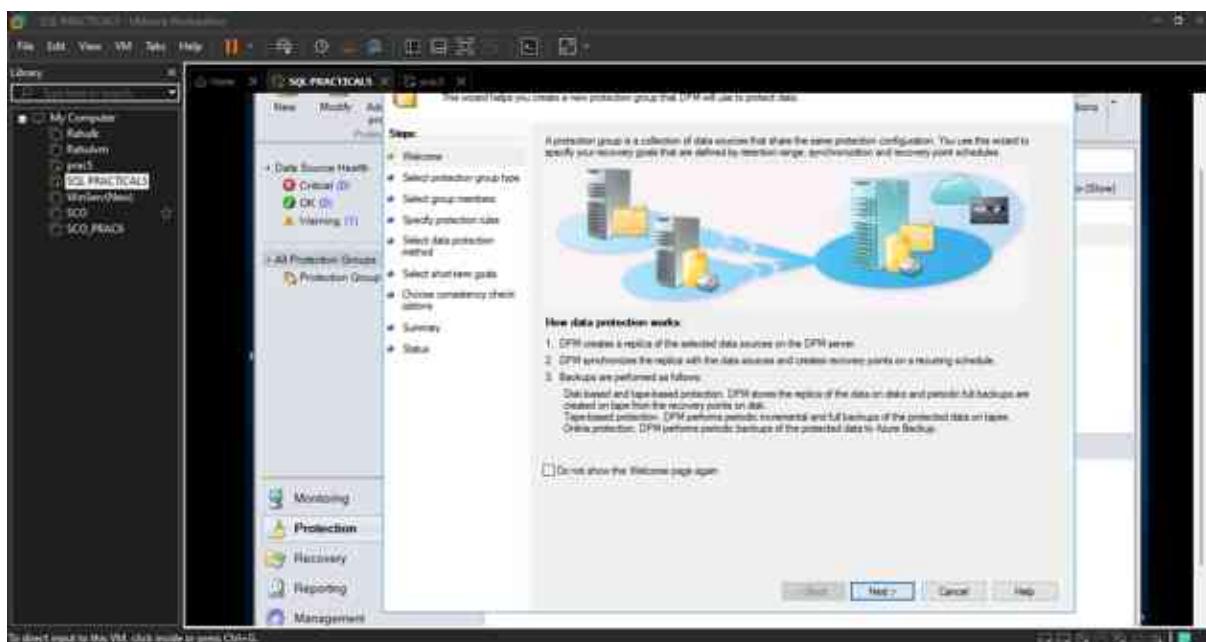
- Database Created



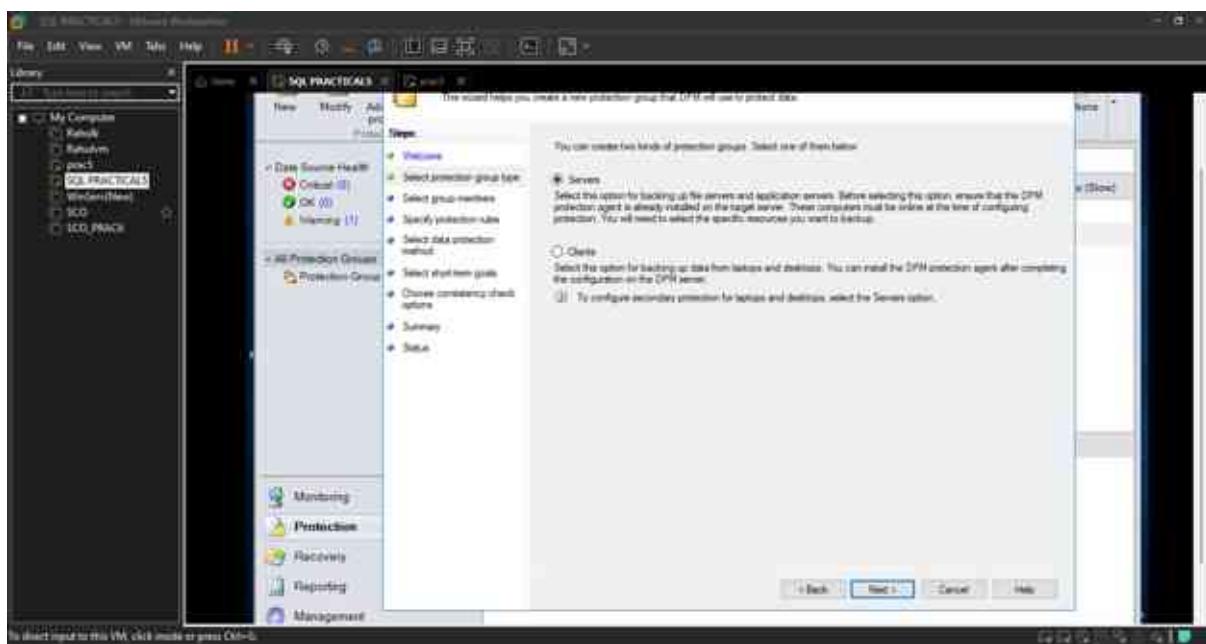
- Click on New to Create Protection Group



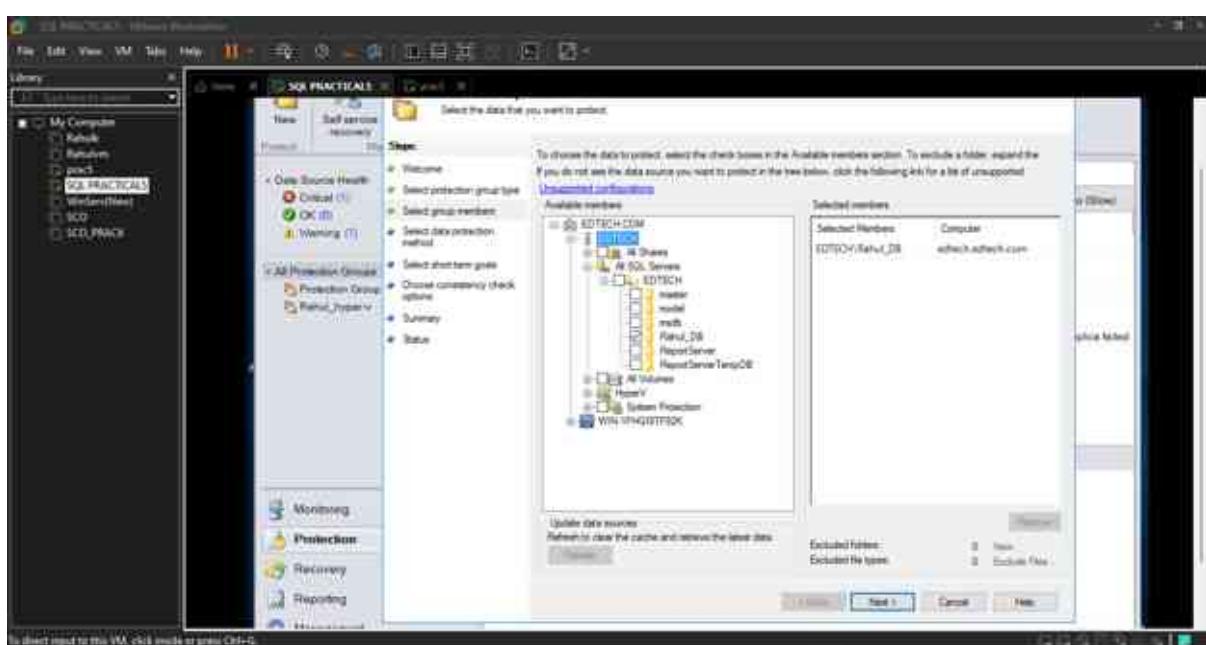
- Click on Next



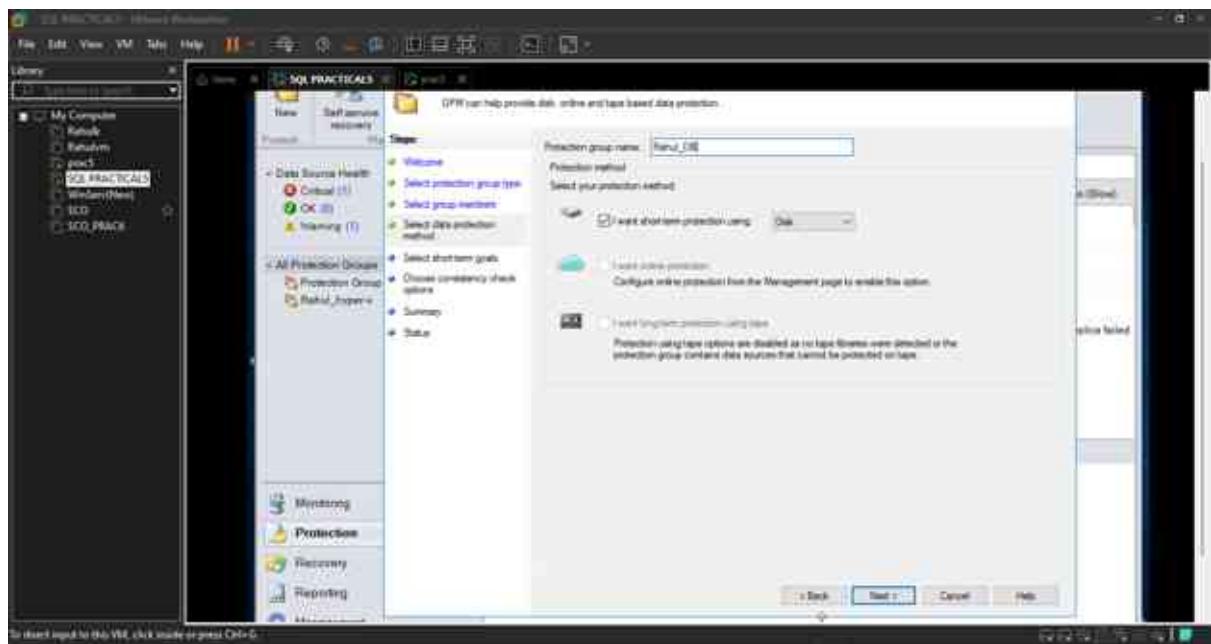
- Select Server and Click on Next



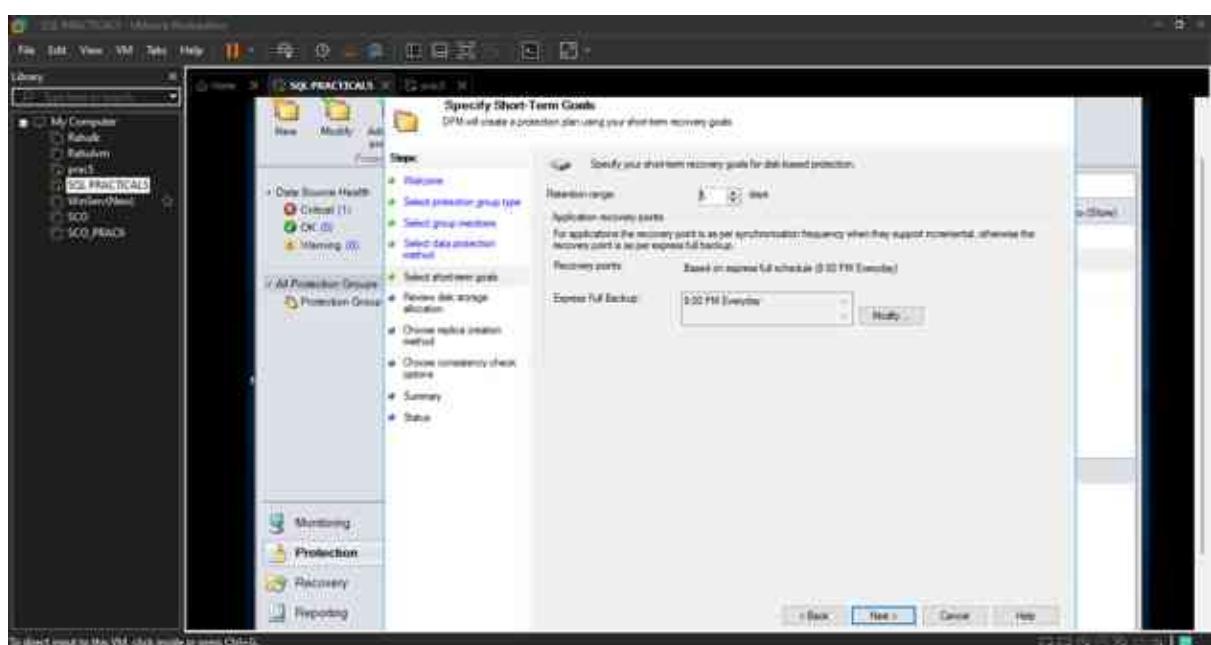
- Select Group Members, select the SQL Server instances on the server you want to Protect **Here Click on EDTECH and Click on ALL SQL Servers Within ALL SQL Servers Select Rahul_DB.**
- **Click on Next**



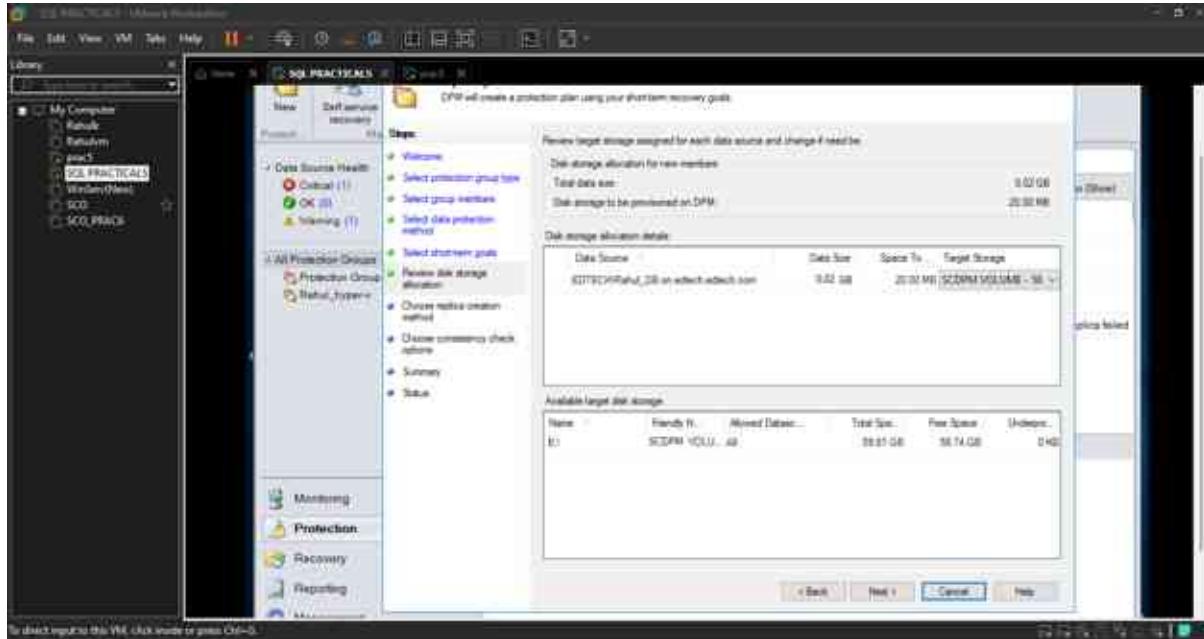
- Type Protection group name (Here Protection group name: **Rahul_DB**)
- Click on Next



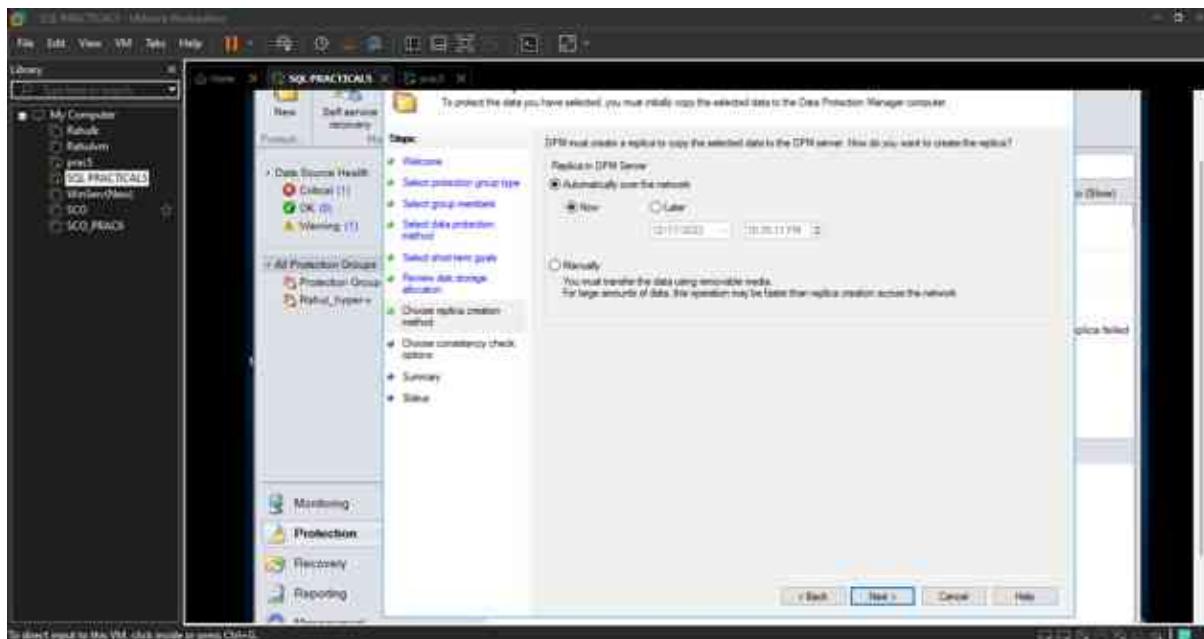
- Keep the default values and Click on Next



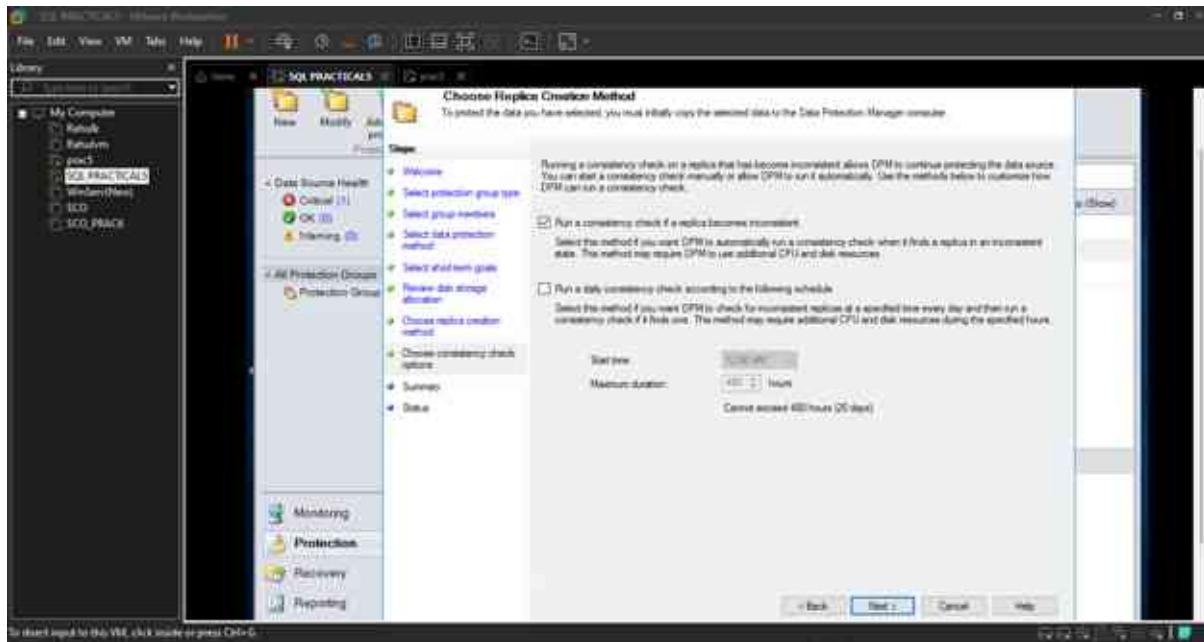
- Click on Next



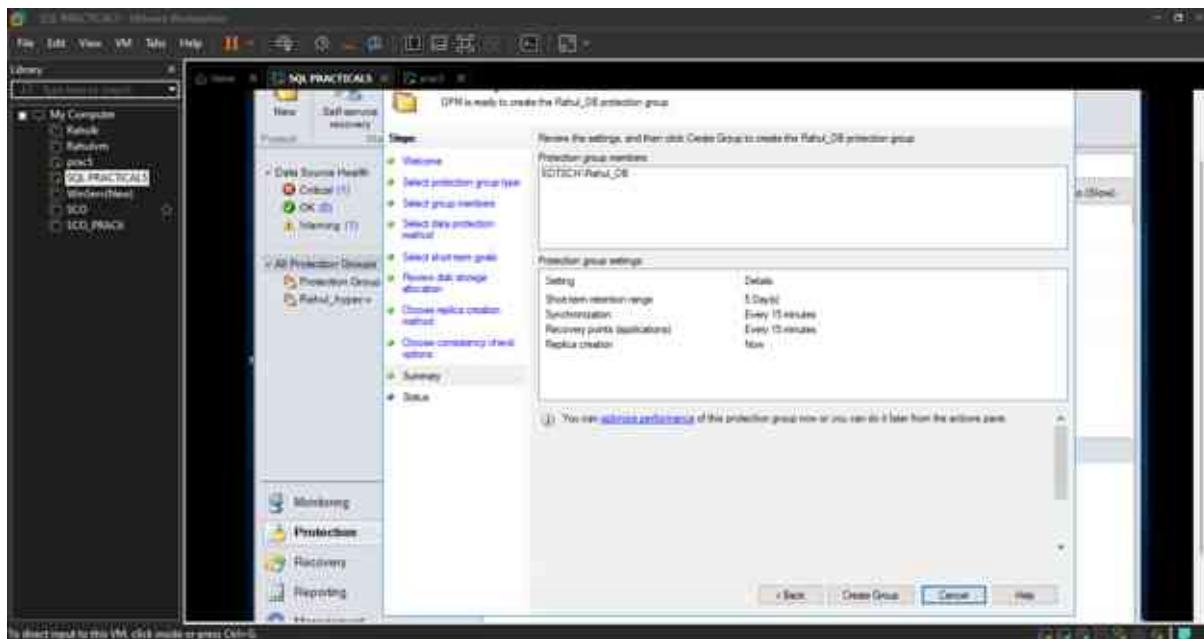
- Keep the default setting and Click on Next



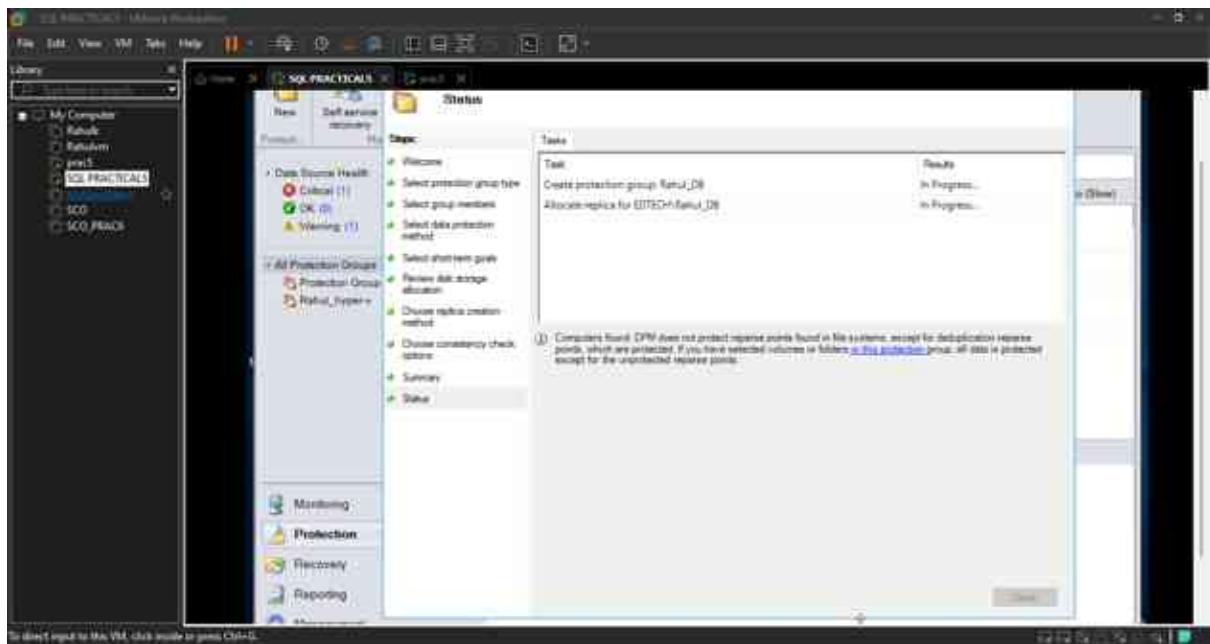
- Keep the default setting and Click on Next



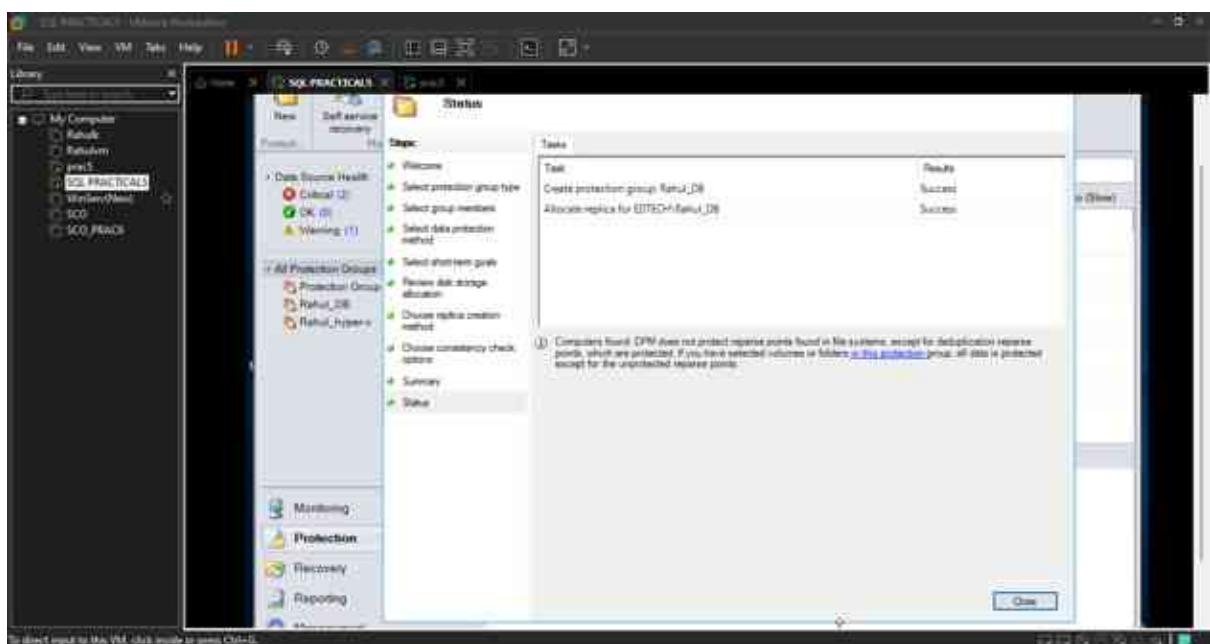
- Click on Create Group



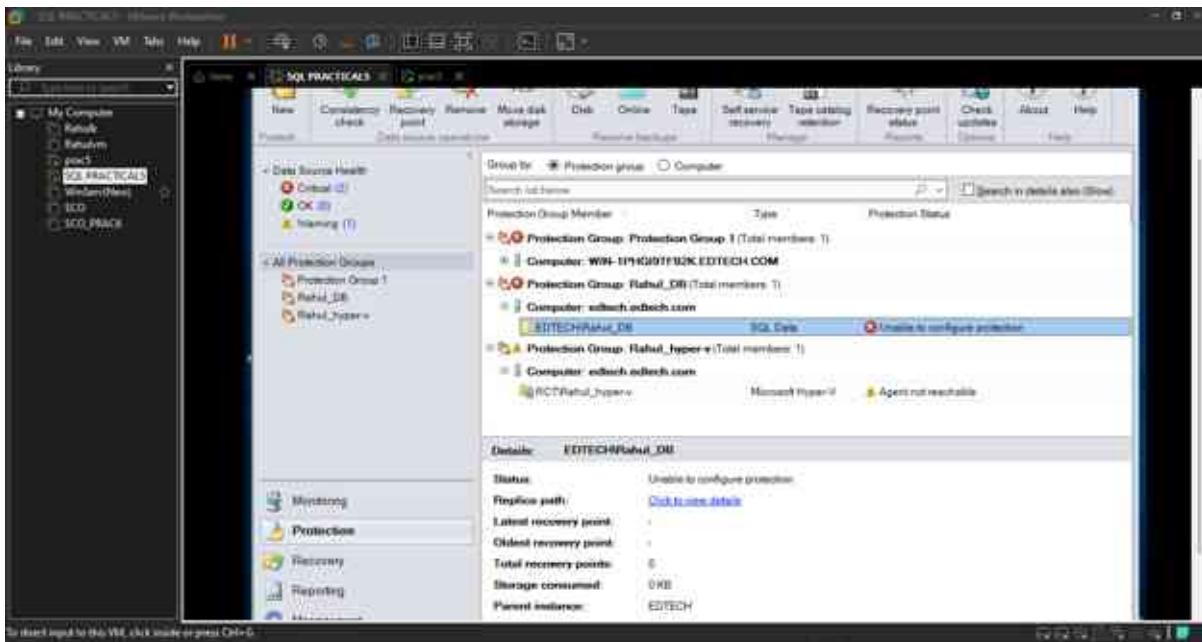
- It will start creation of protection group



- Creation of Protection Group Succeeded
- Click on Close

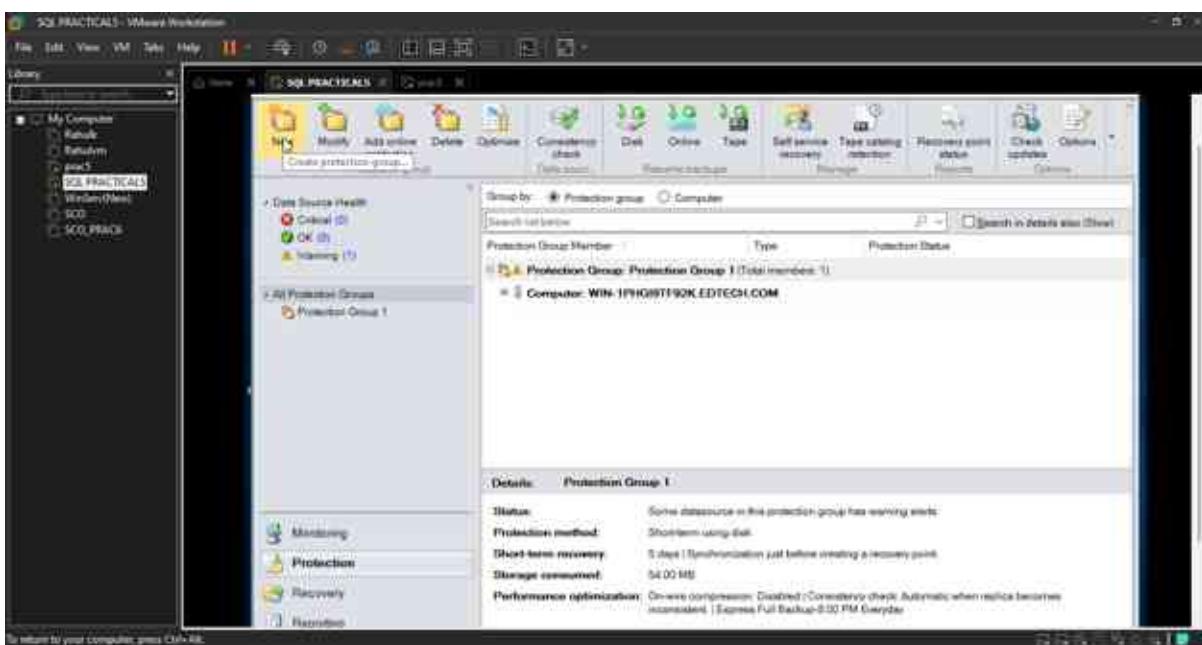


- Here we can see Replica creation in progress

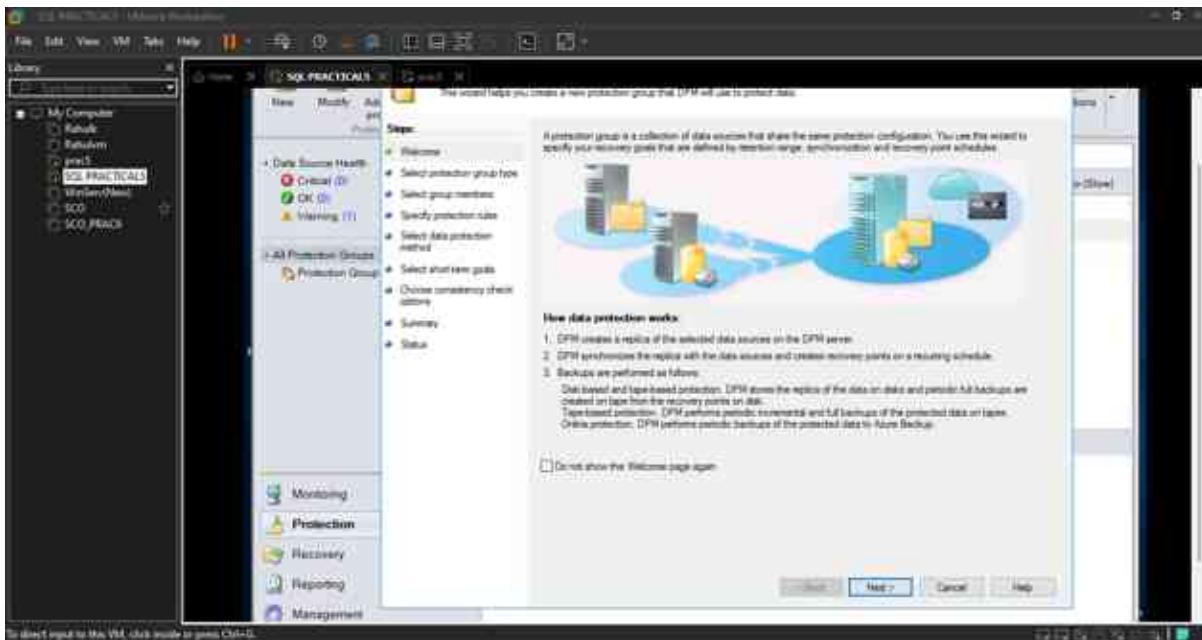


Step 4: Backup system state

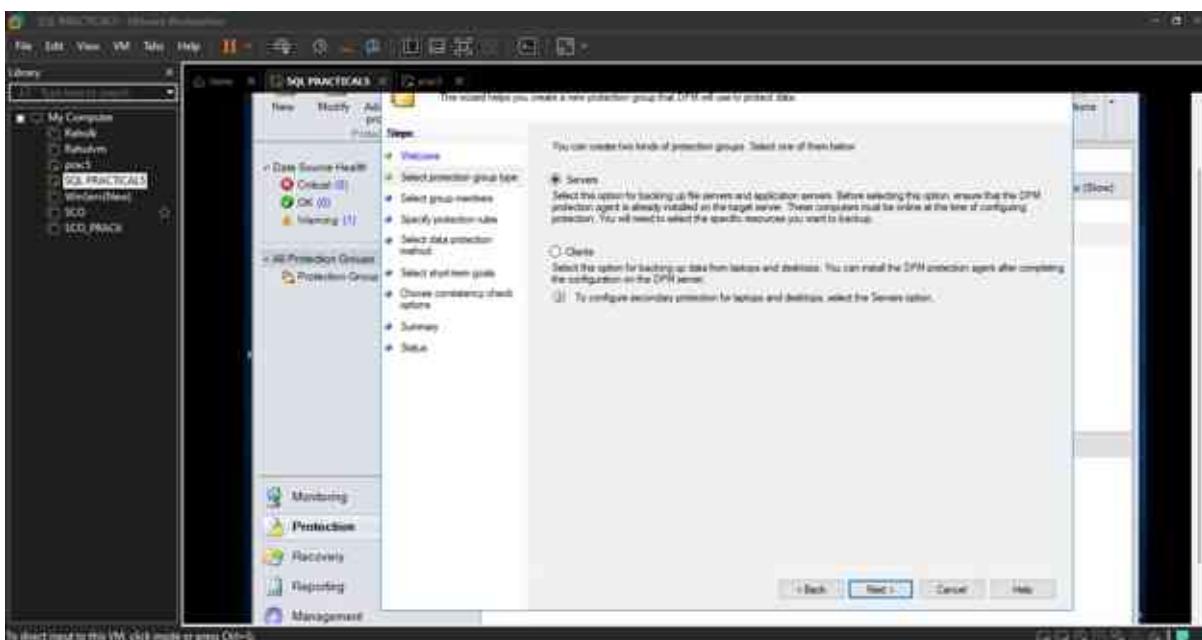
- Click on New to Create Protection Group



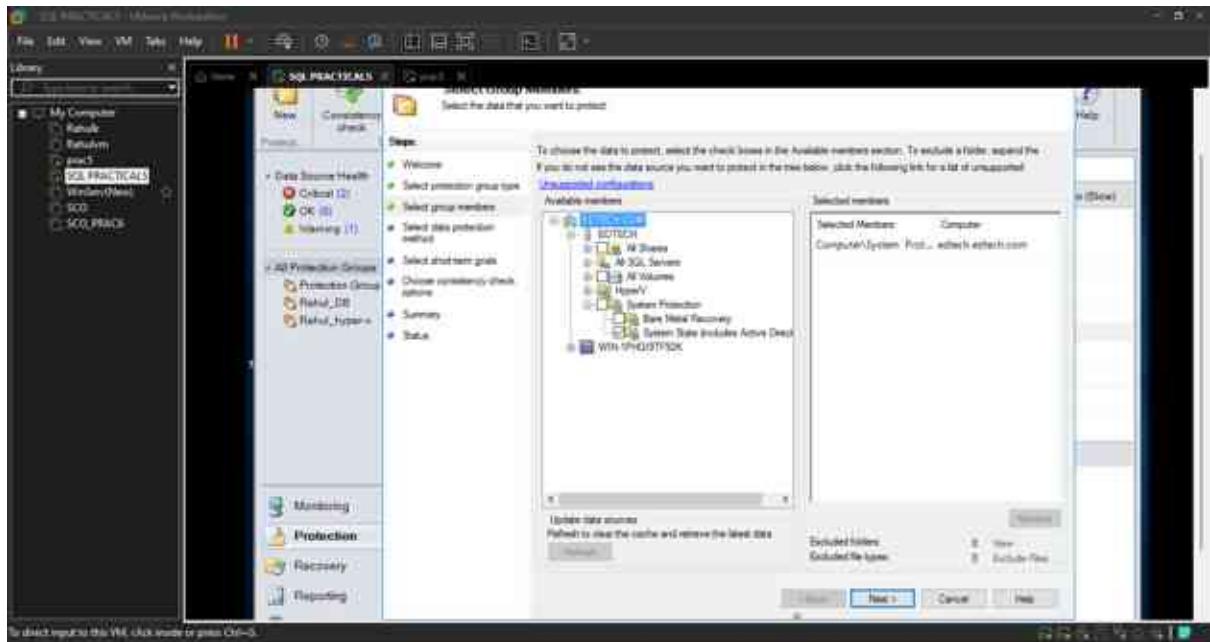
- Click on Next



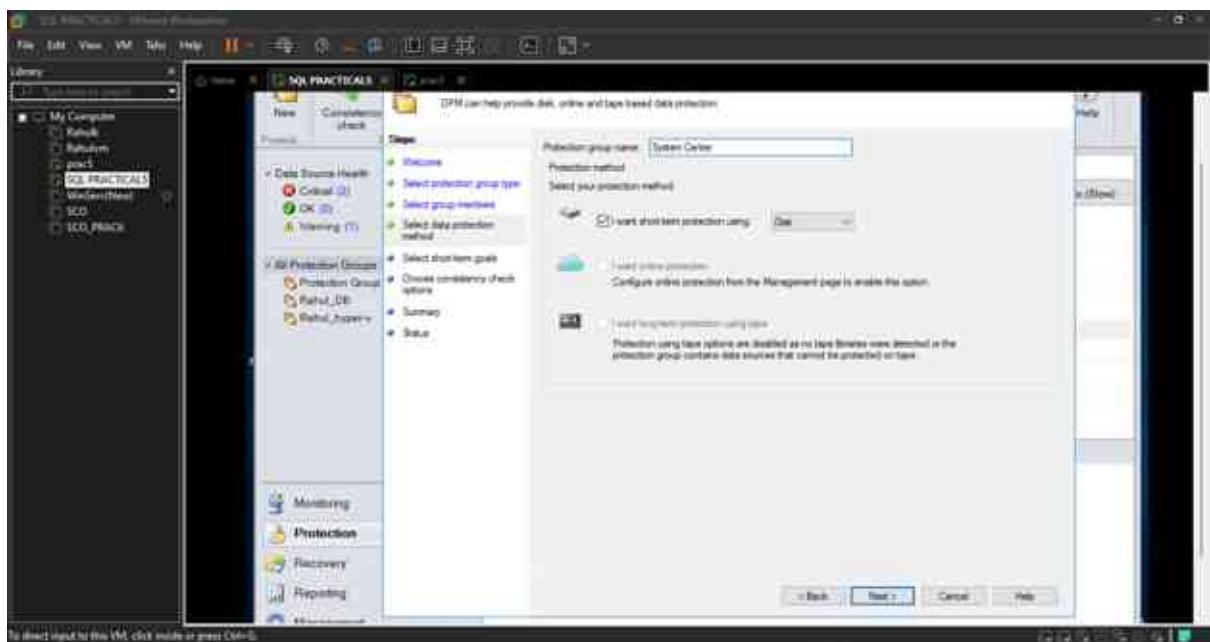
- Select Server and Click on Next



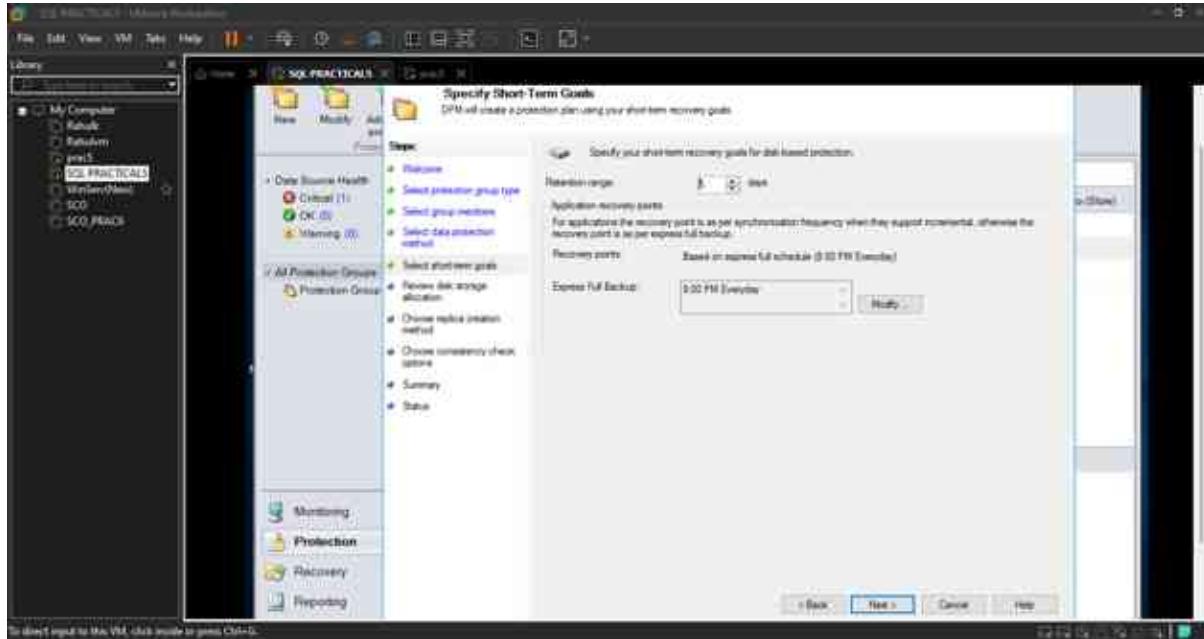
- In **Select Group Members**, expand the **System Protection** and select **System State**.
- Click on **Next**



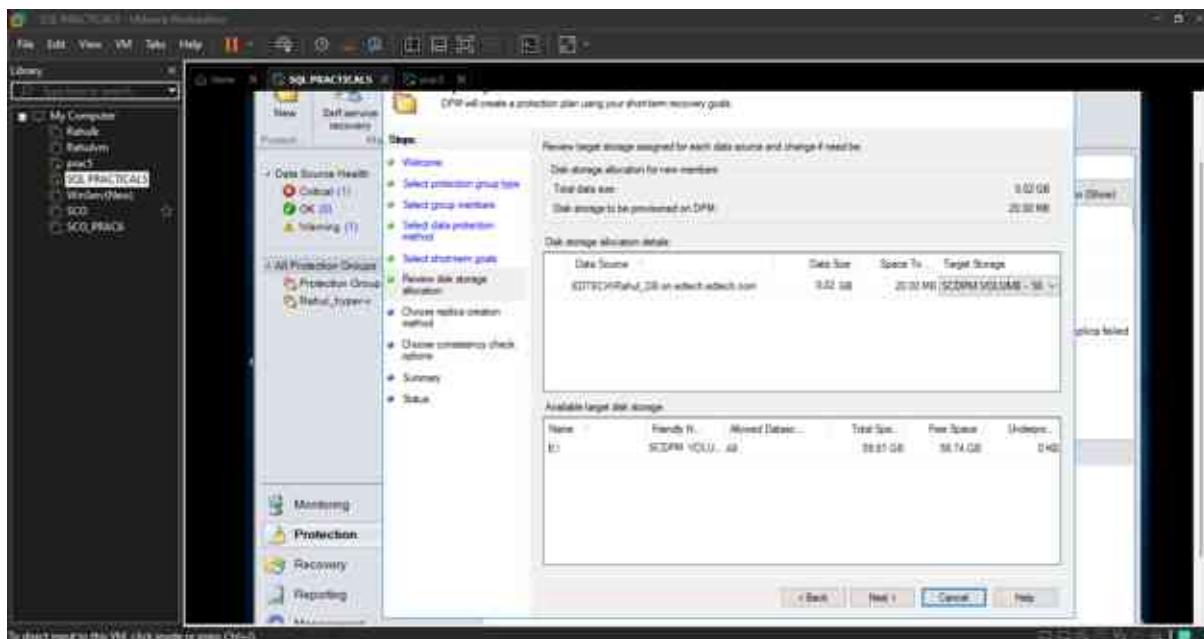
- Type **Protection group name** (Here Protection group name: **System Center**)
- Click on **Next**



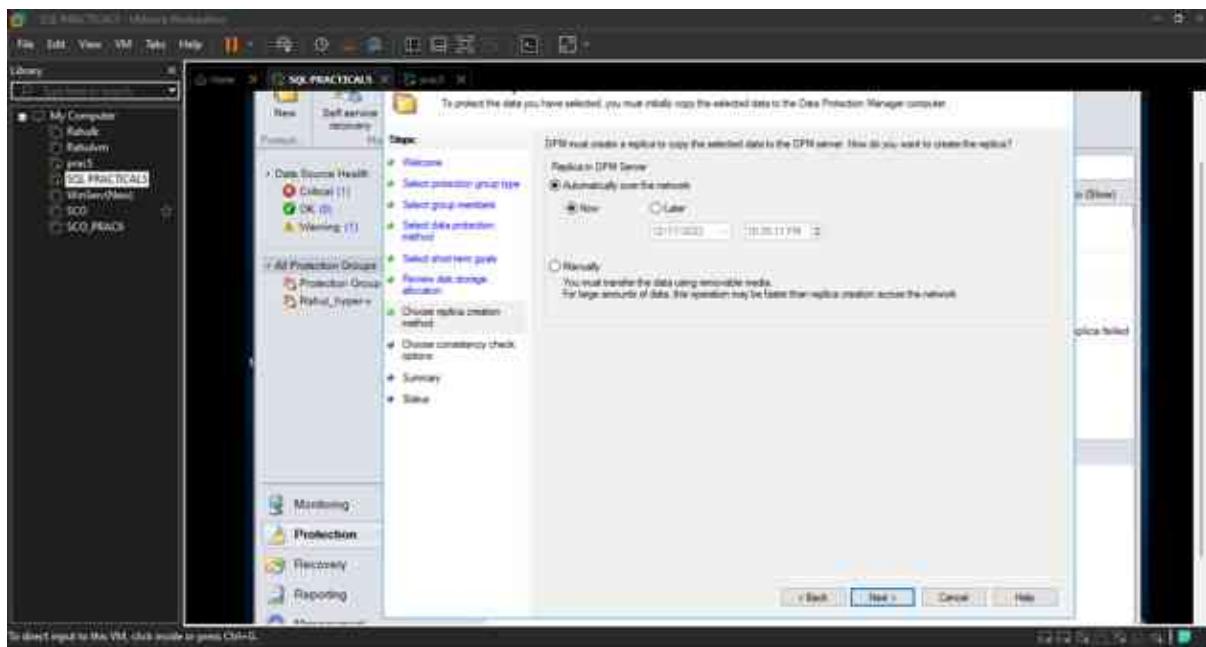
- Keep the default values and Click on Next



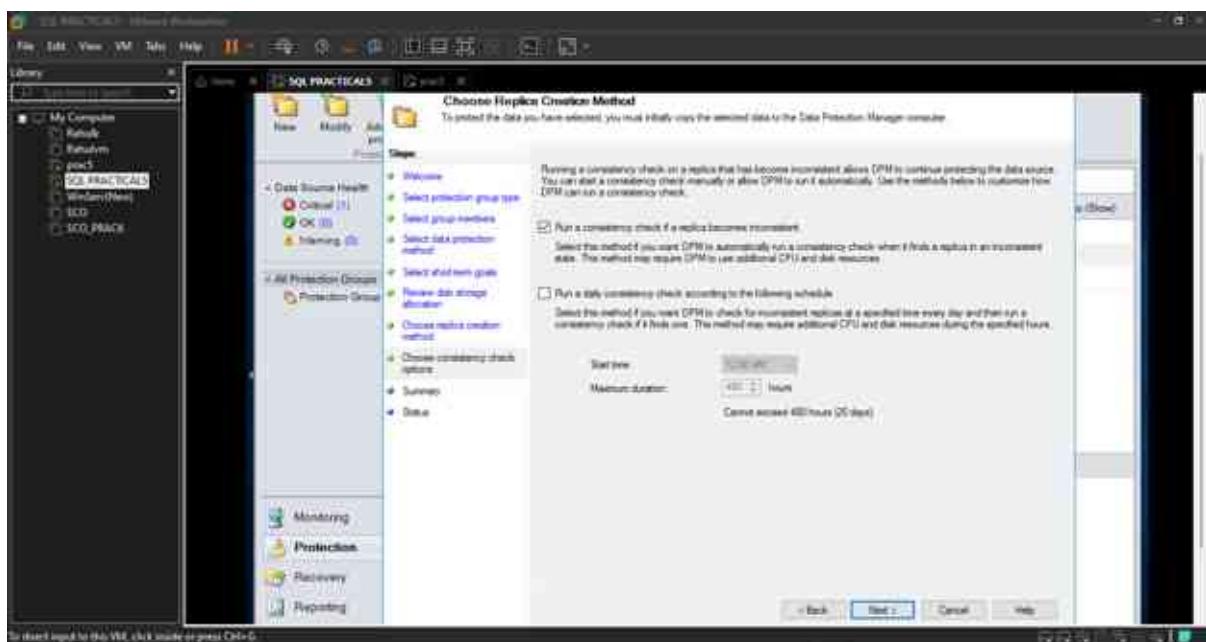
- Click on Next



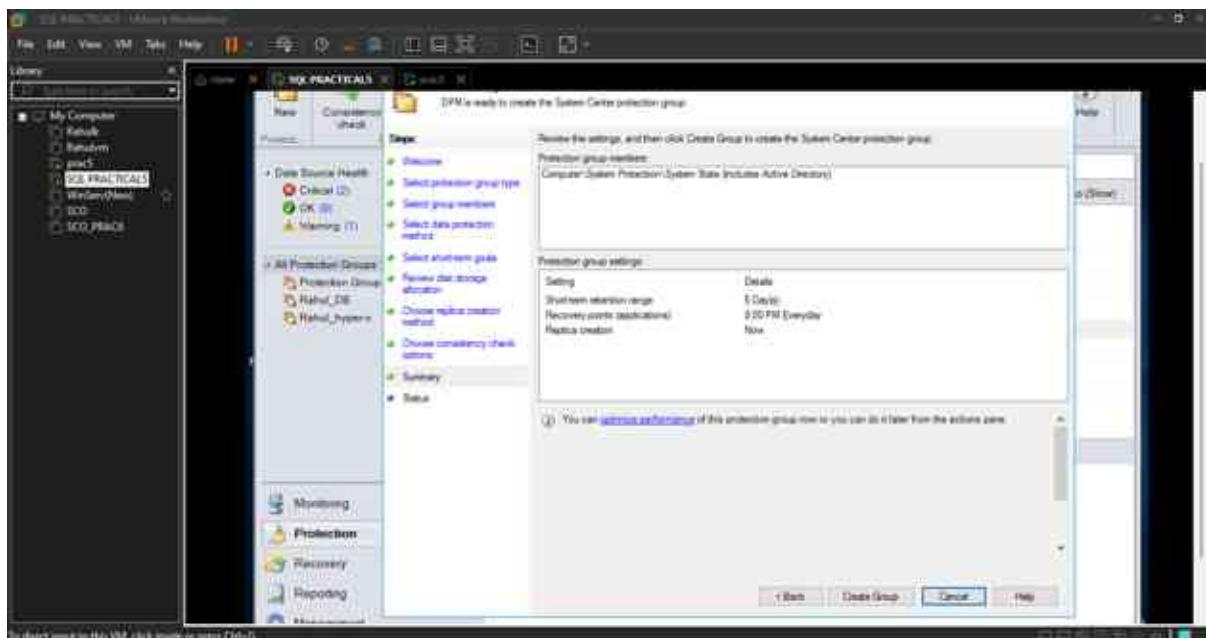
- Keep the default setting and Click on Next



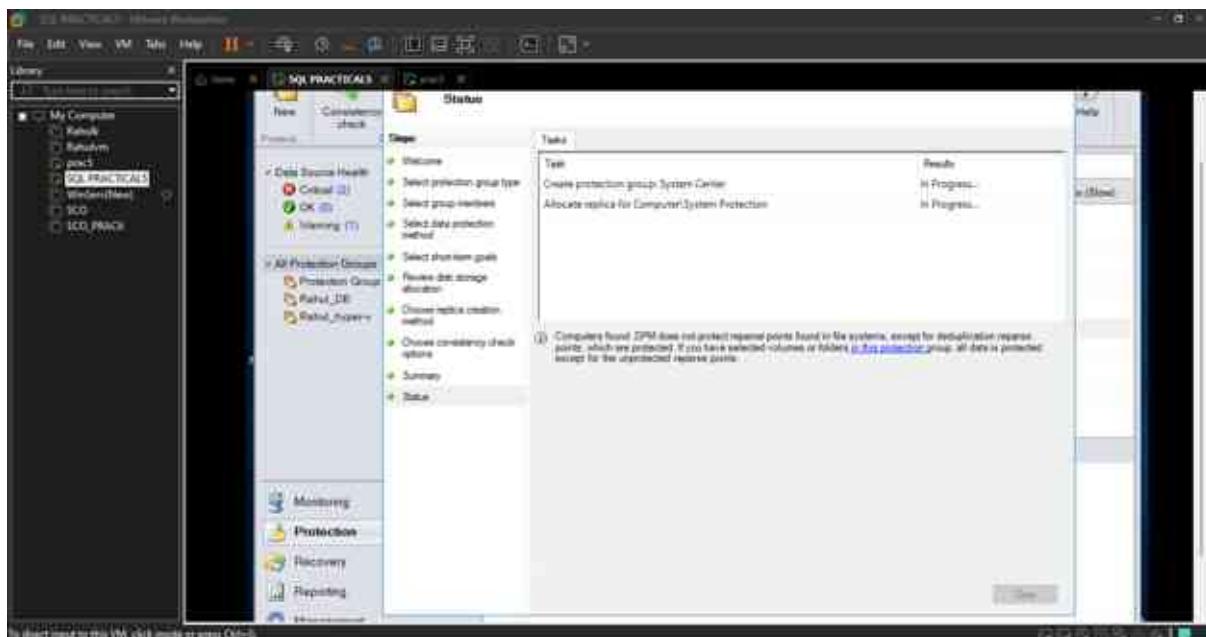
- Keep the default setting and Click on Next



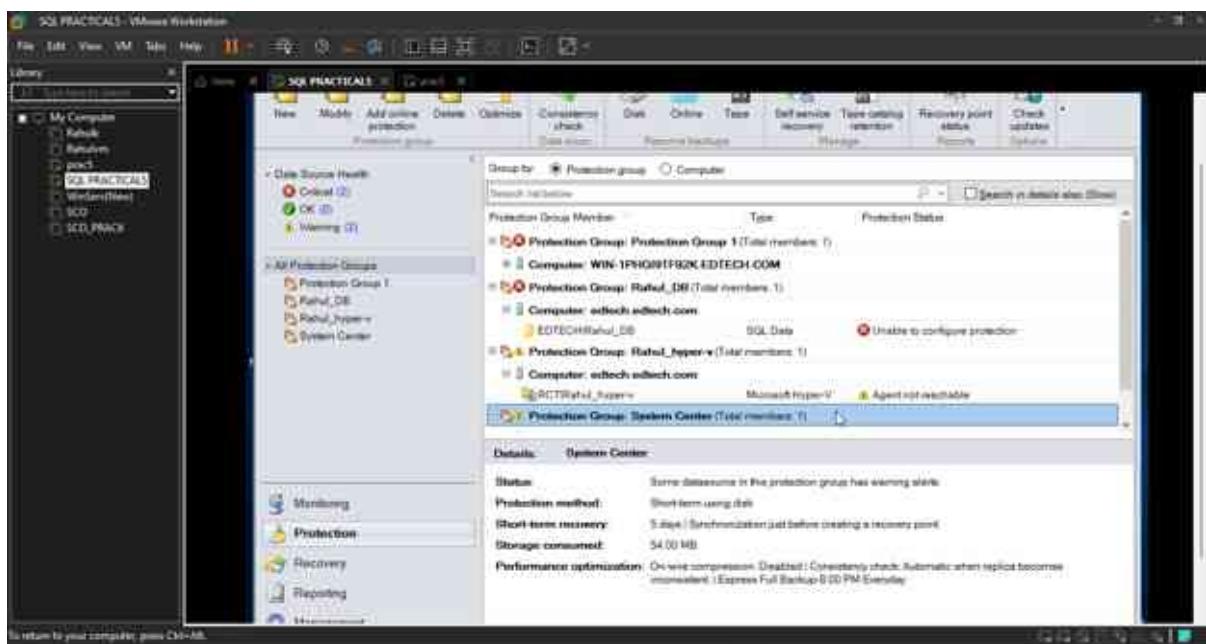
- Click on Create Group



- It will start creation of protection group



- Here we can see Replica of System State Created

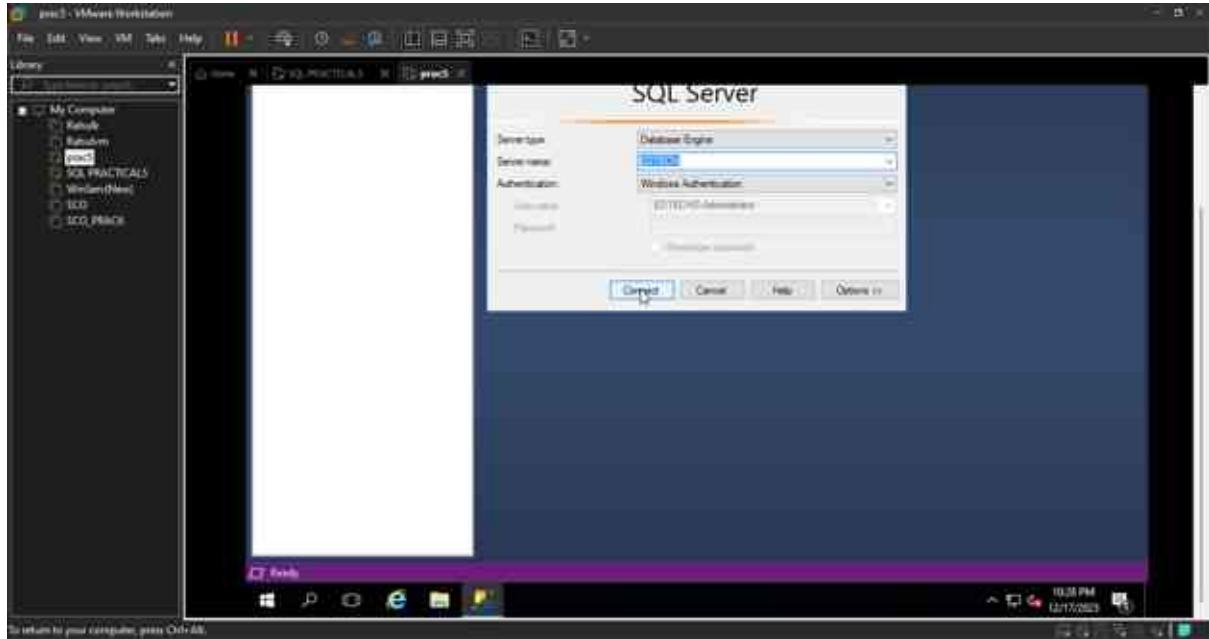


Step 5: Back up file data with DPM

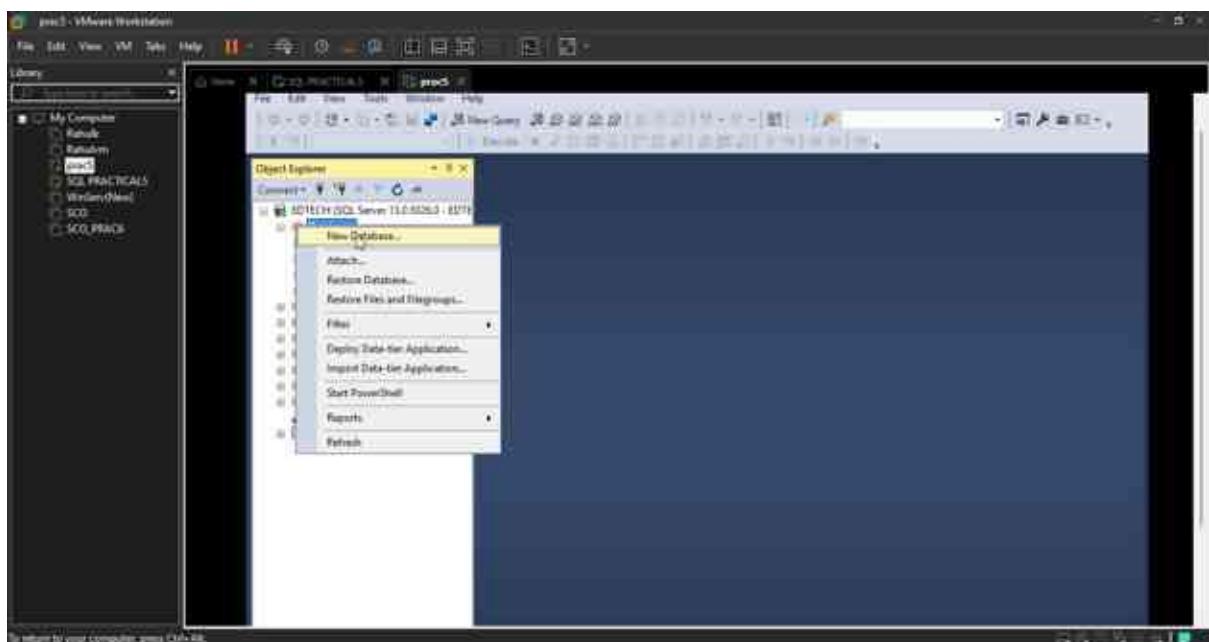
- Open SQL Server Manager Studio



- Click on Connect

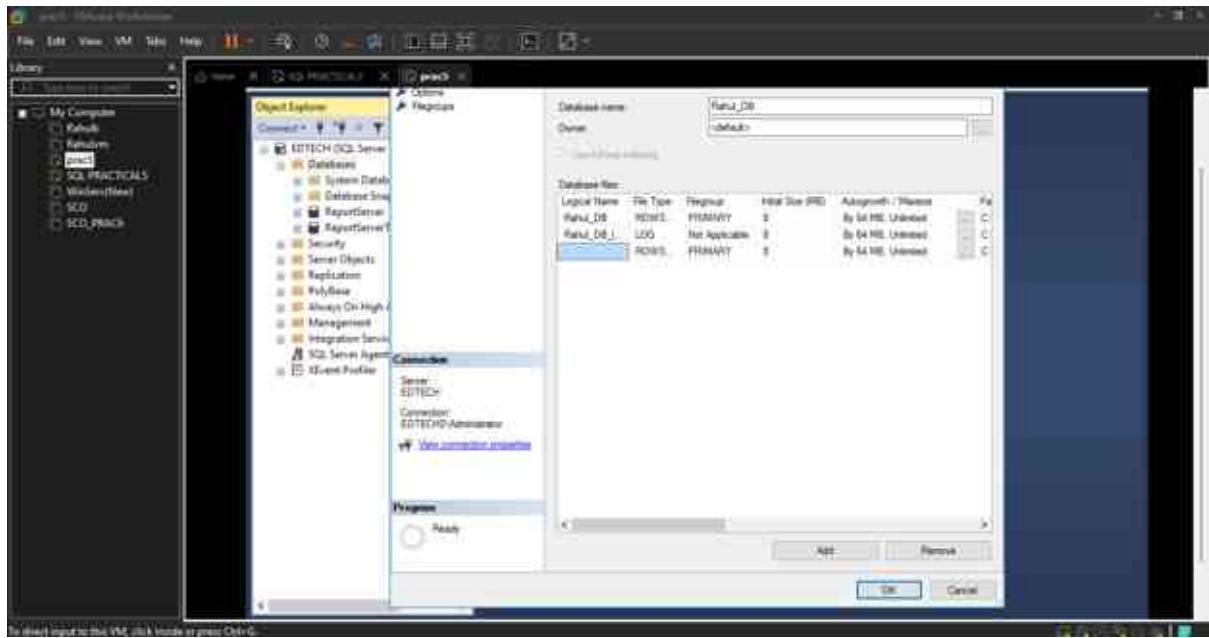


- Right-Click on Database and Select New Database

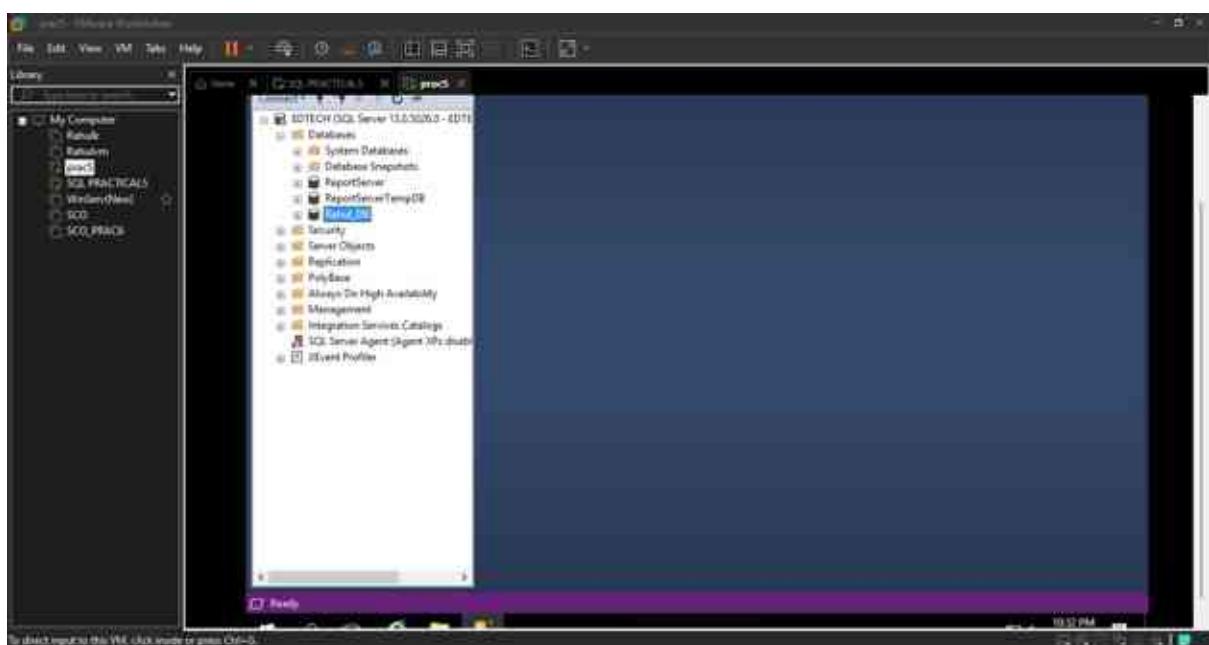


- Type Database Name (Here Database Name: Rahul_DB)

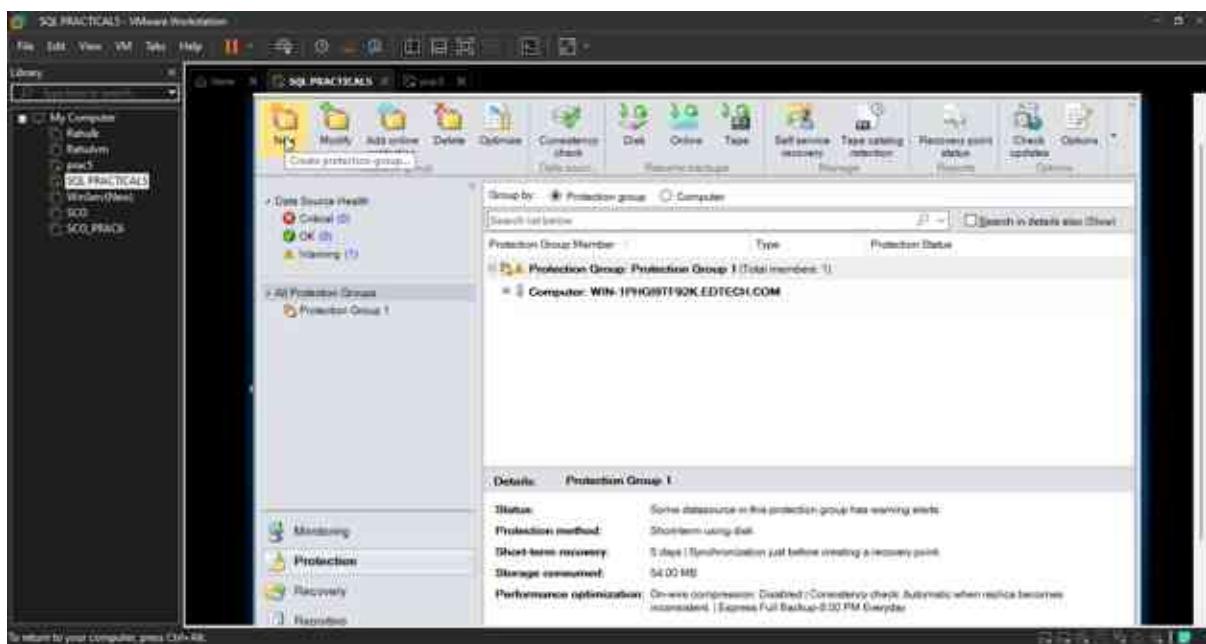
- Click on Ok



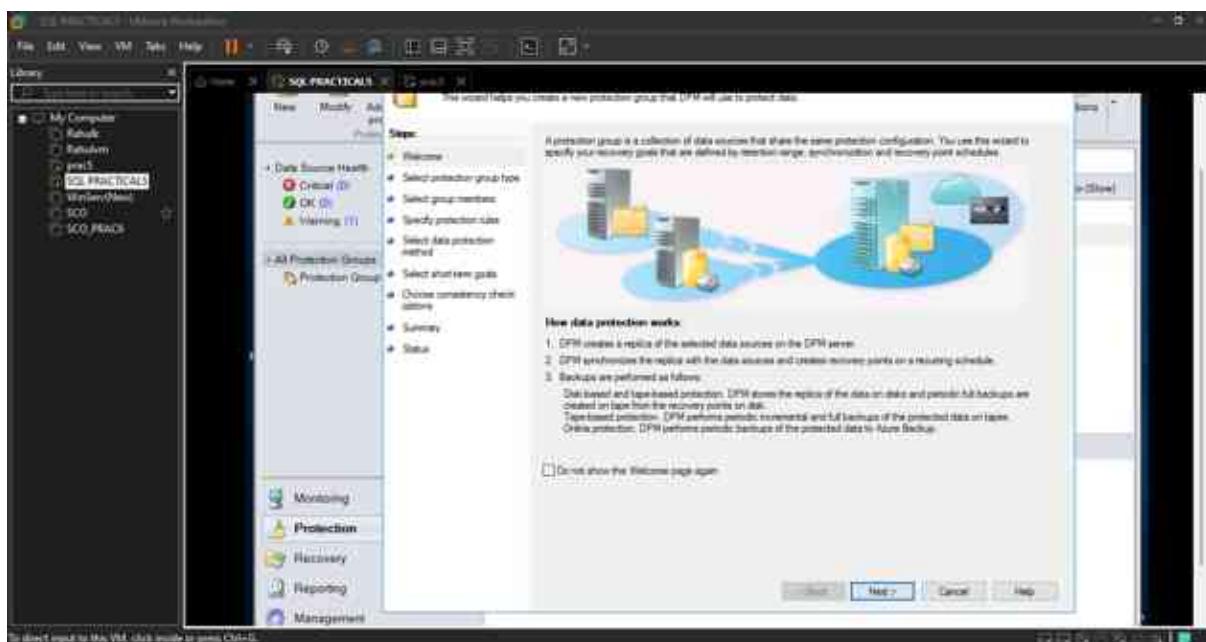
- Database Created



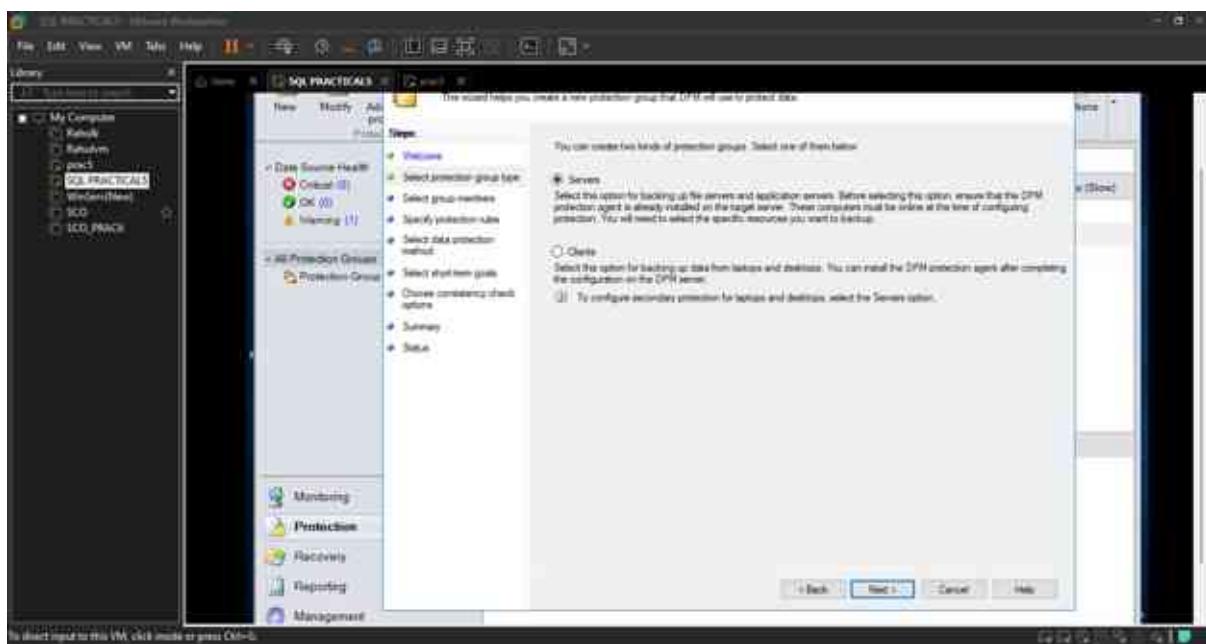
- Click on New to Create Protection Group



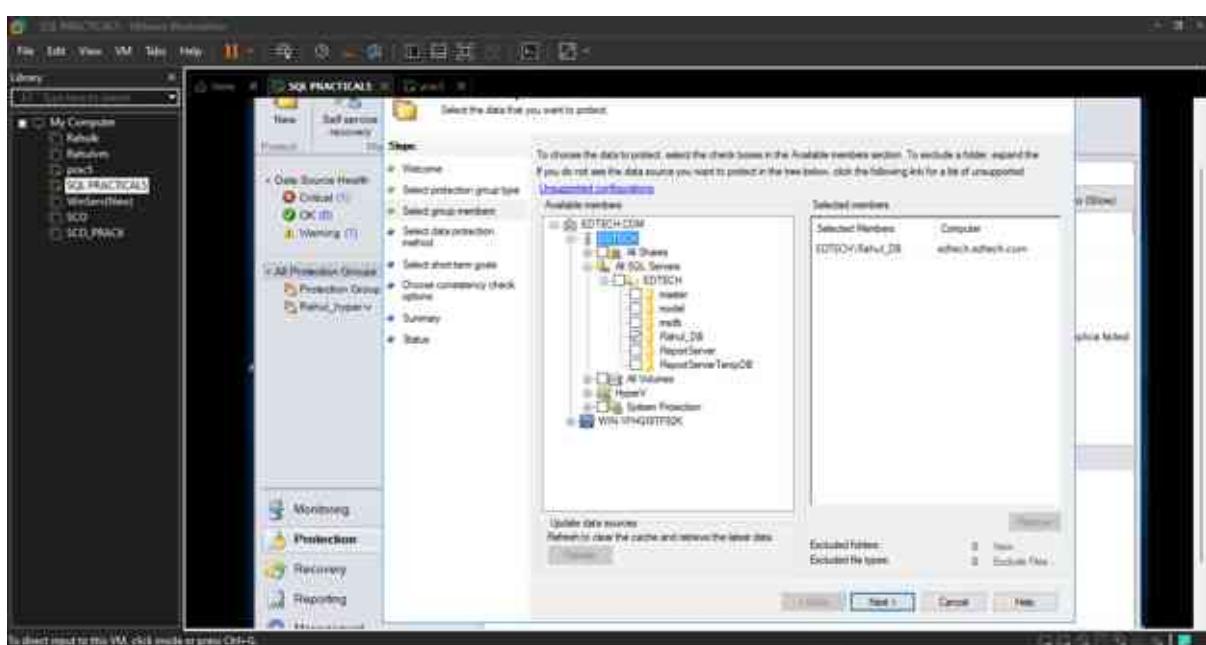
- Click on Next



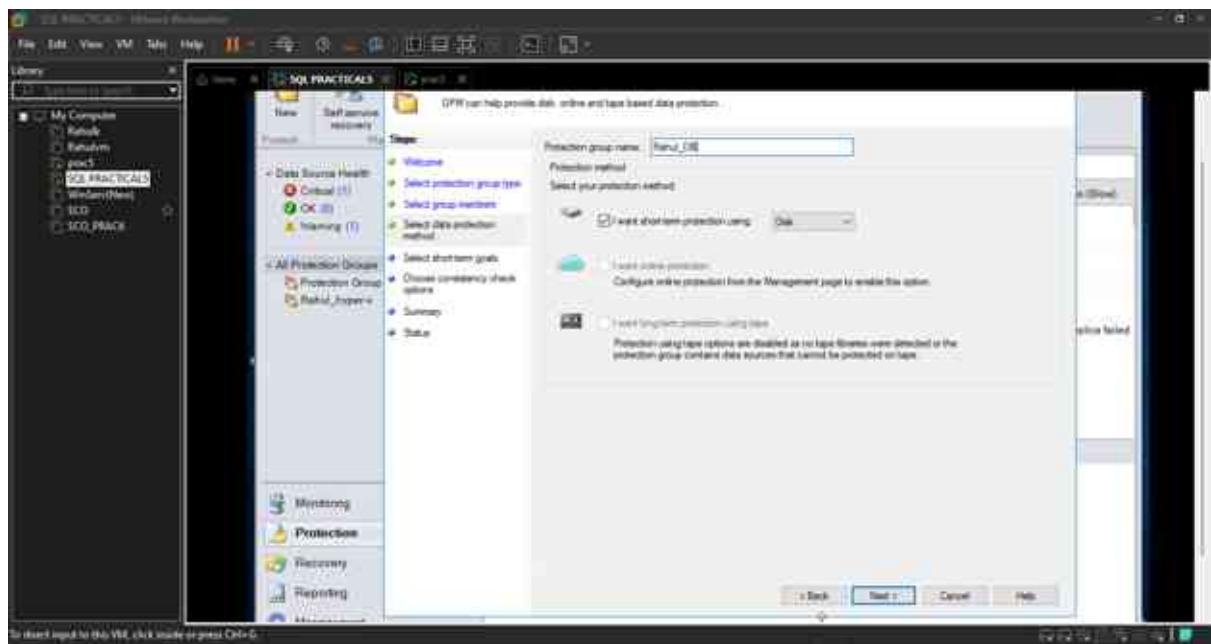
- Select Server and Click on Next



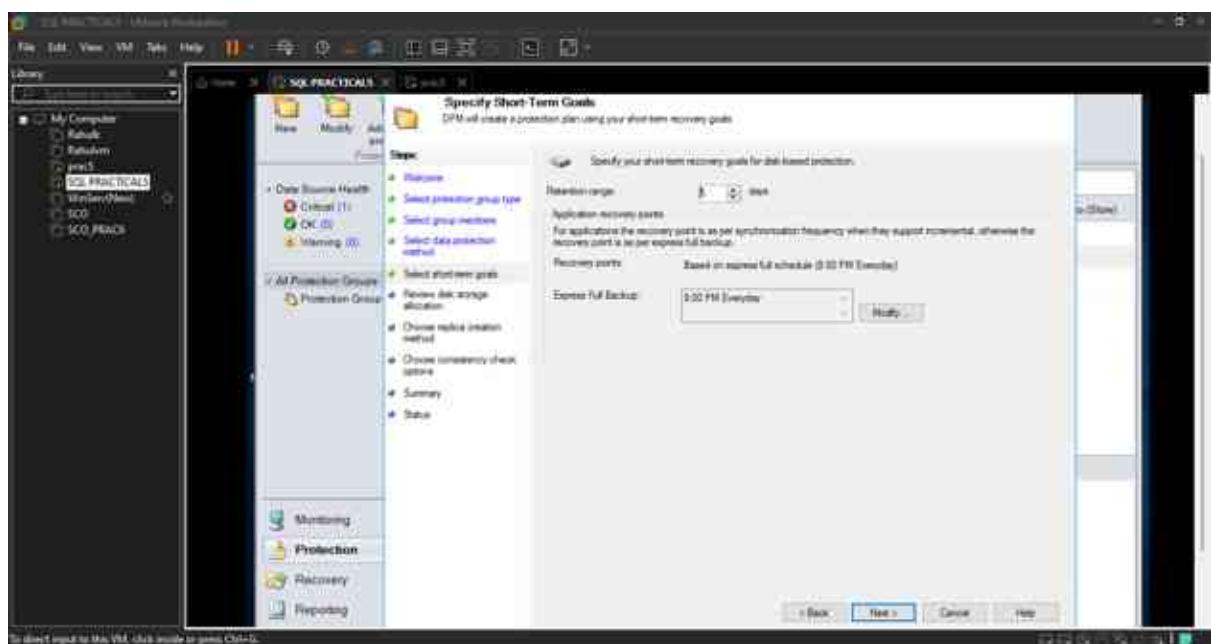
- Select Group Members, select the SQL Server instances on the server you want to Protect **Here Click on EDTECH and Click on ALL SQL Servers Within ALL SQL Servers Select Rahul_DB.**
- **Click on Next**



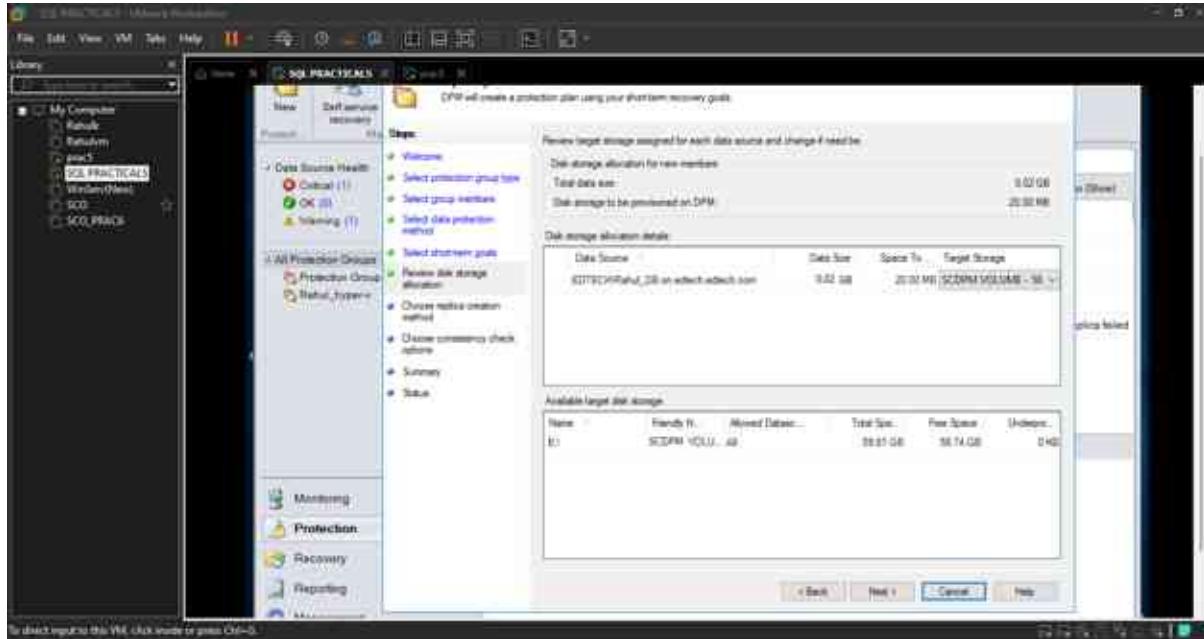
- Type Protection group name (Here Protection group name: **Rahul_DB**)
- Click on Next



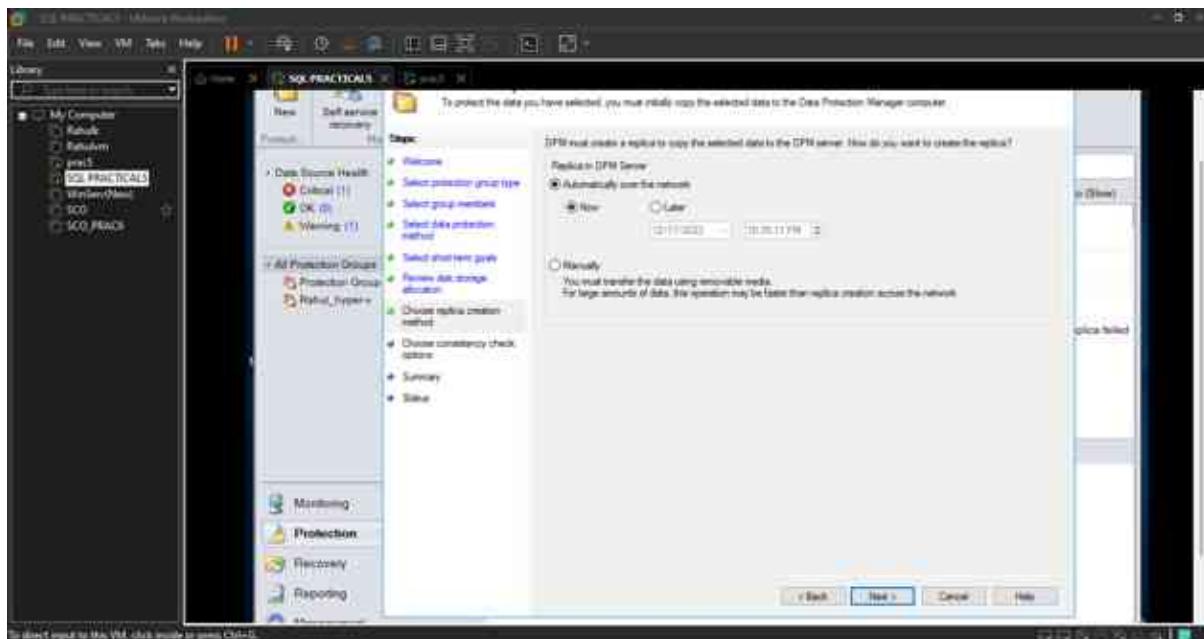
- Keep the default values and Click on Next



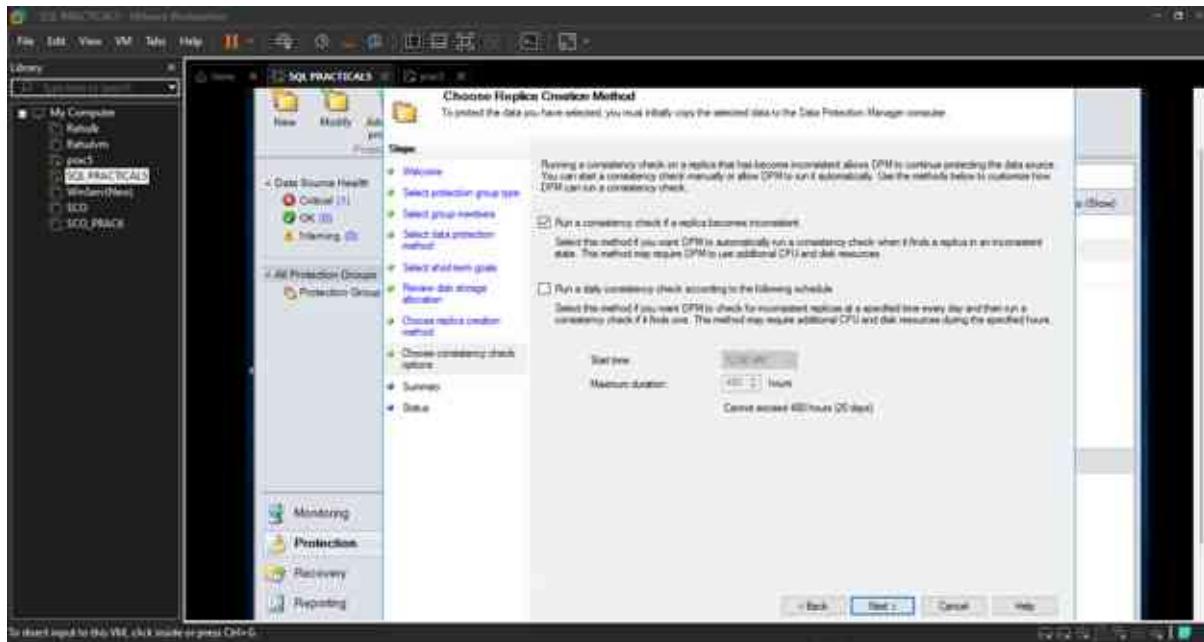
- Click on Next



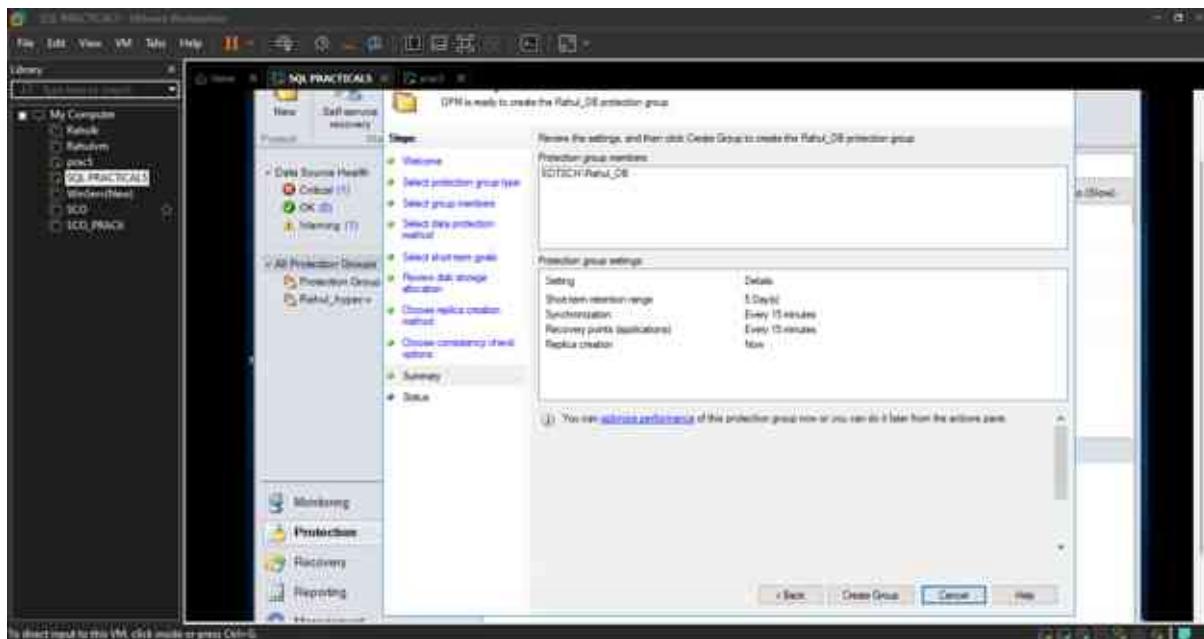
- Keep the default setting and Click on Next



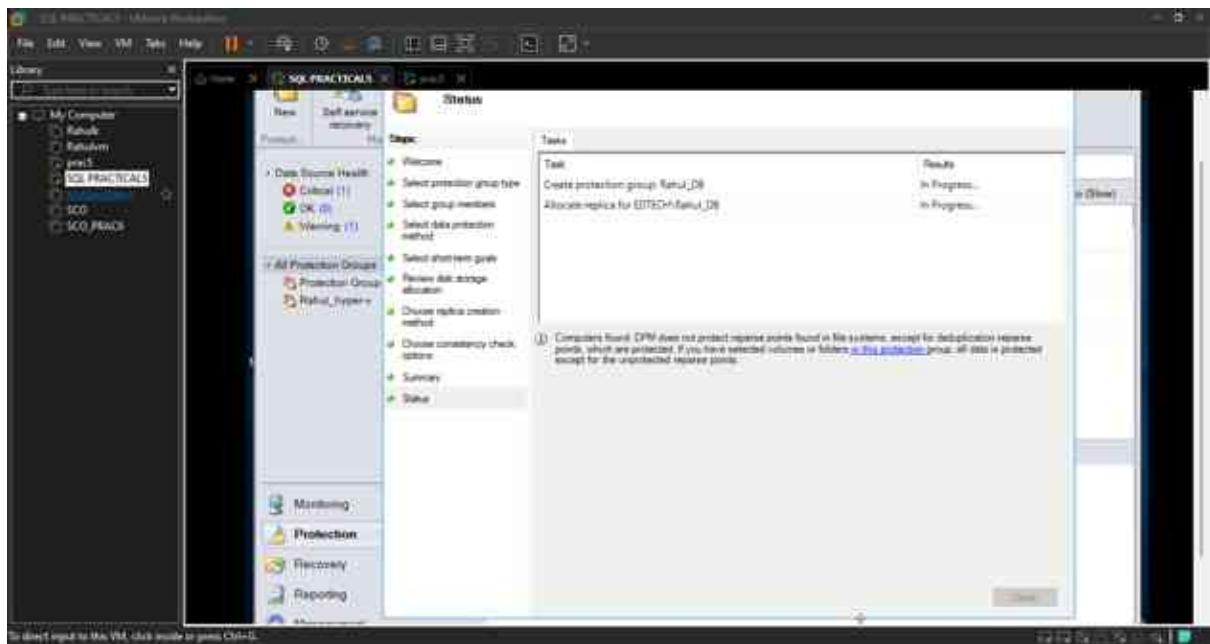
- Keep the default setting and Click on Next



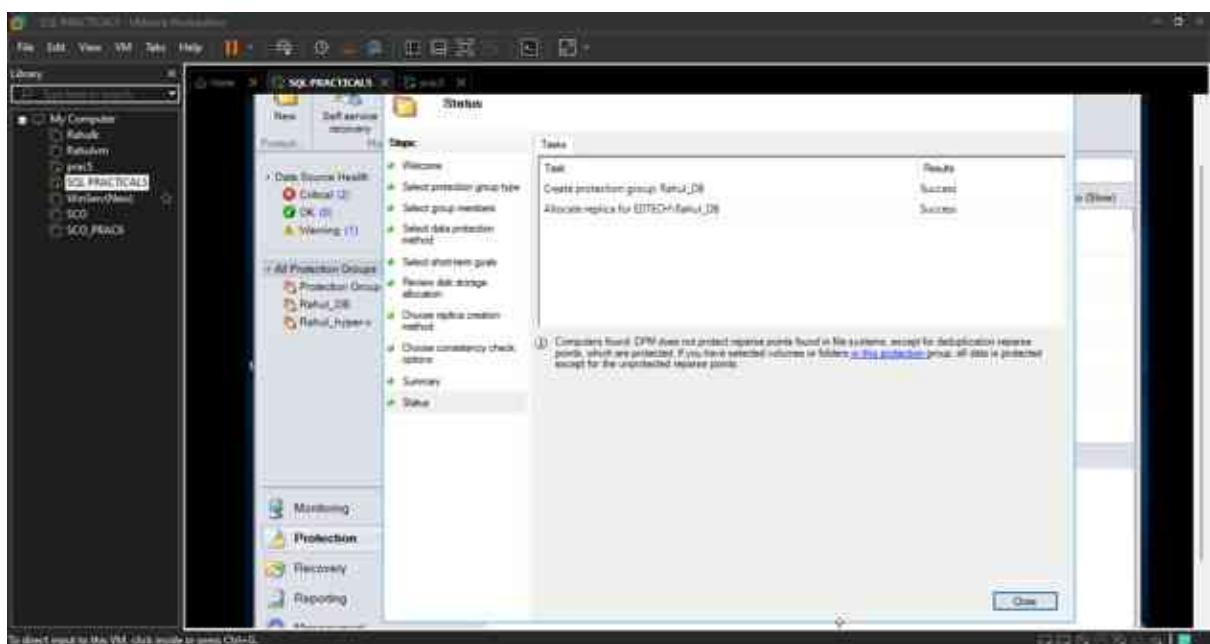
- Click on Create Group



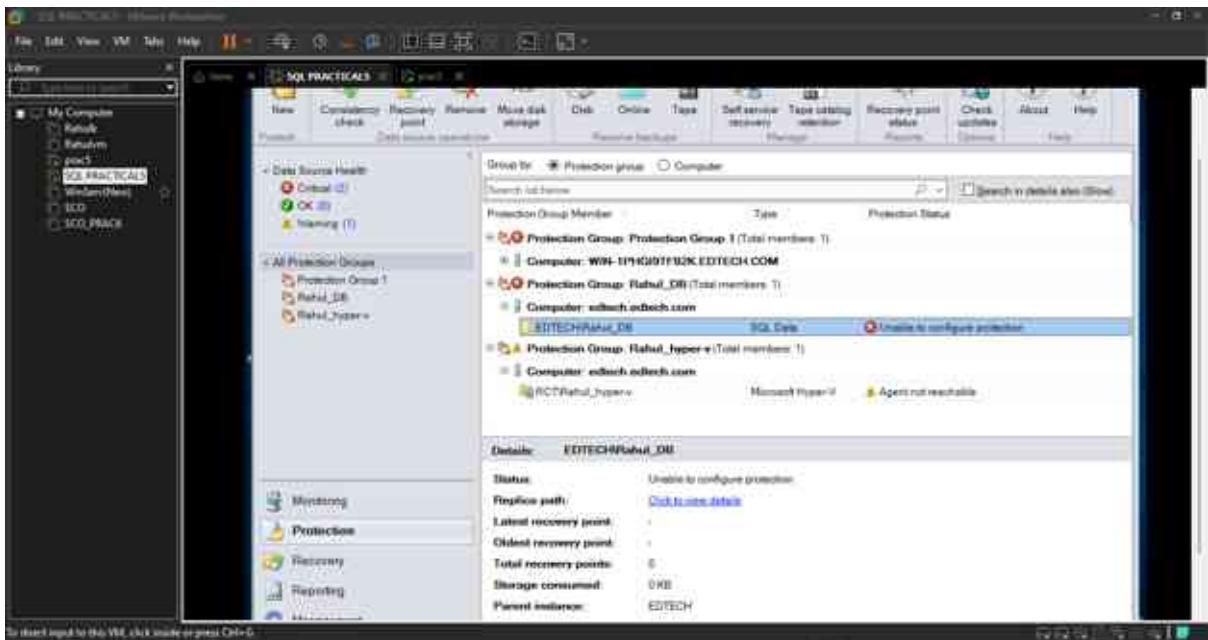
- It will start creation of protection group



- Creation of Protection Group Succeeded
- Click on Close

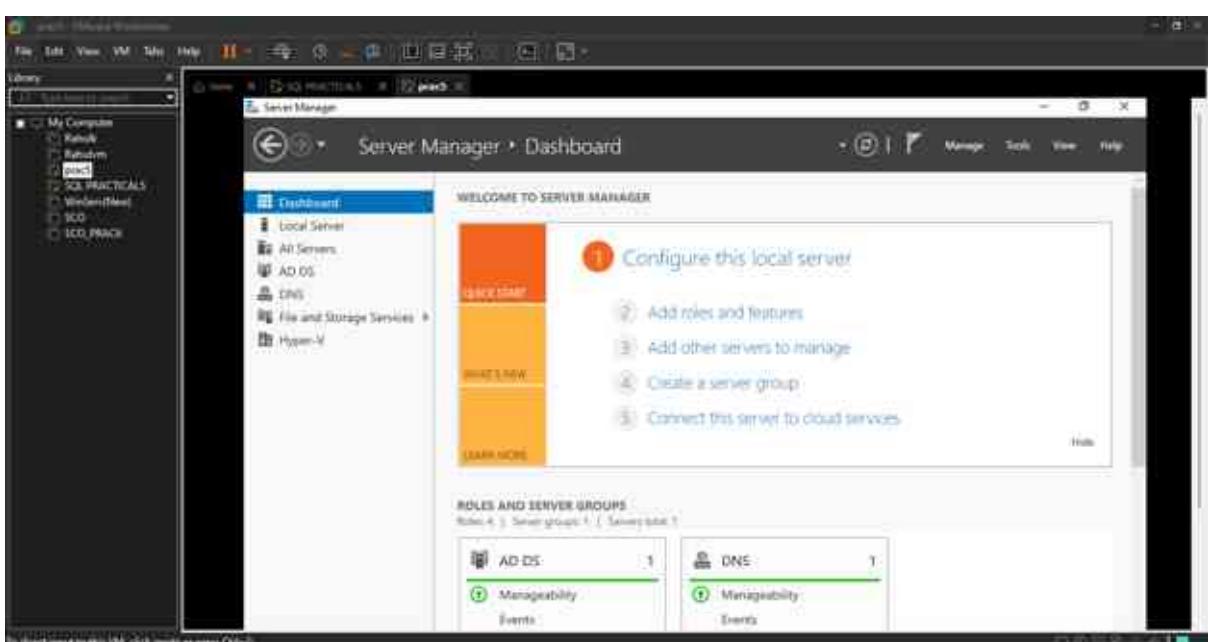


- Here we can see Replica creation of EDTECH\Rahul_DB in progress

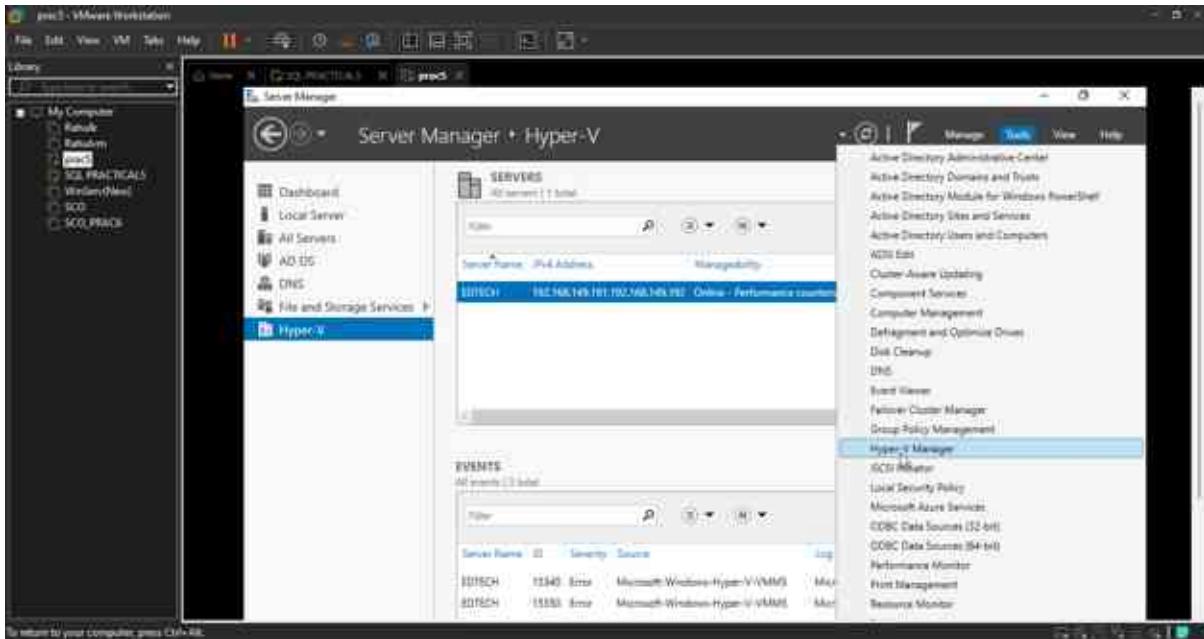


Step 6: Backup and restore VMware servers

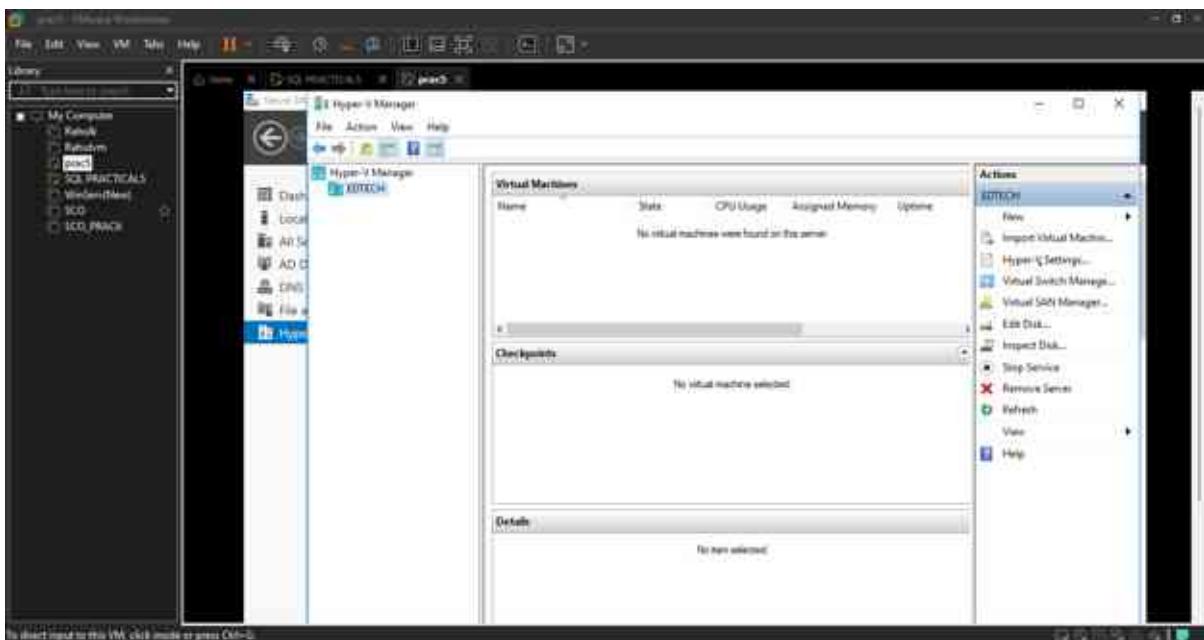
- Open Server Manager



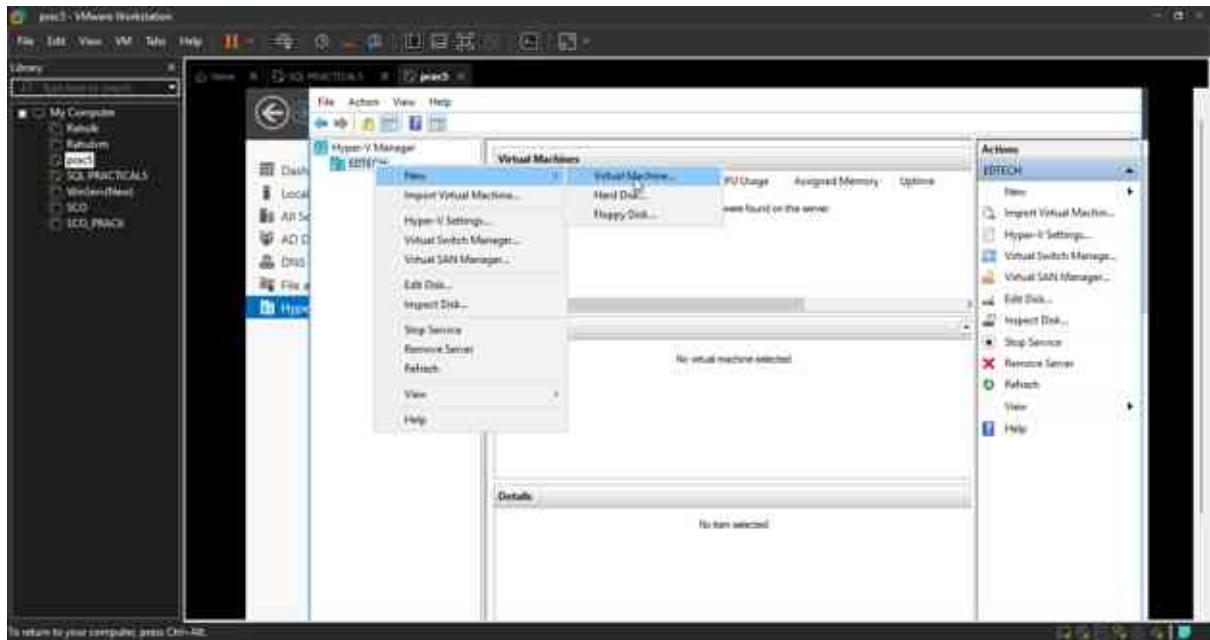
- Within Server Manager Click on Hyper-V and Click on Tools
- Within Tools Click on Hyper-V Manager



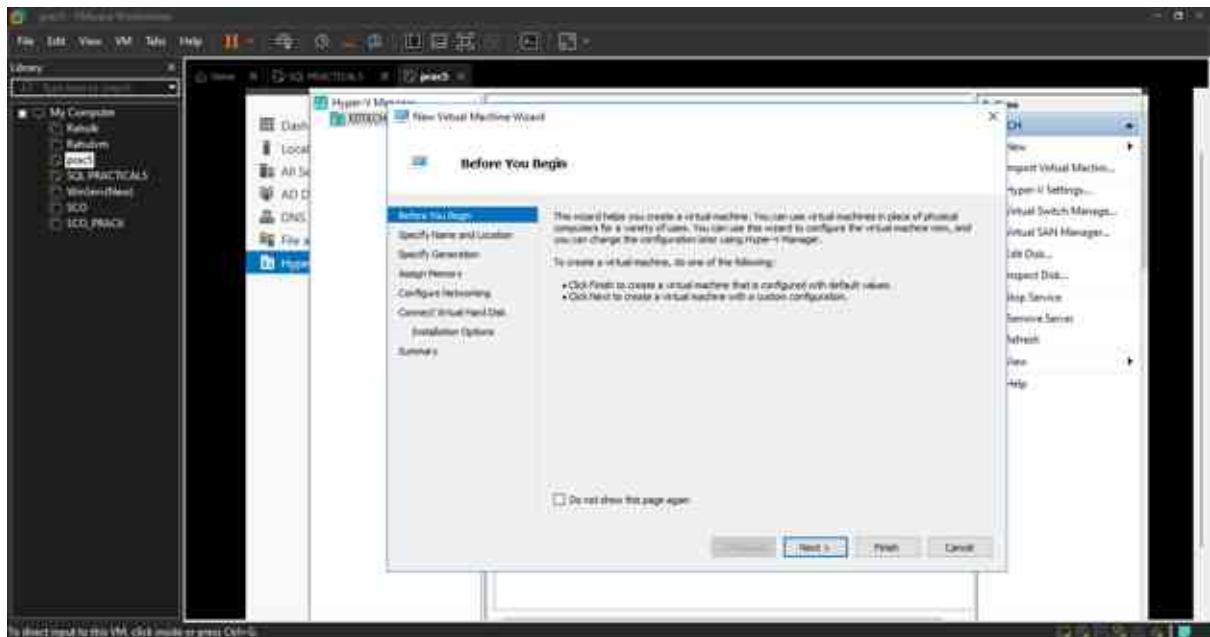
- Hyper-V Manager Window Open



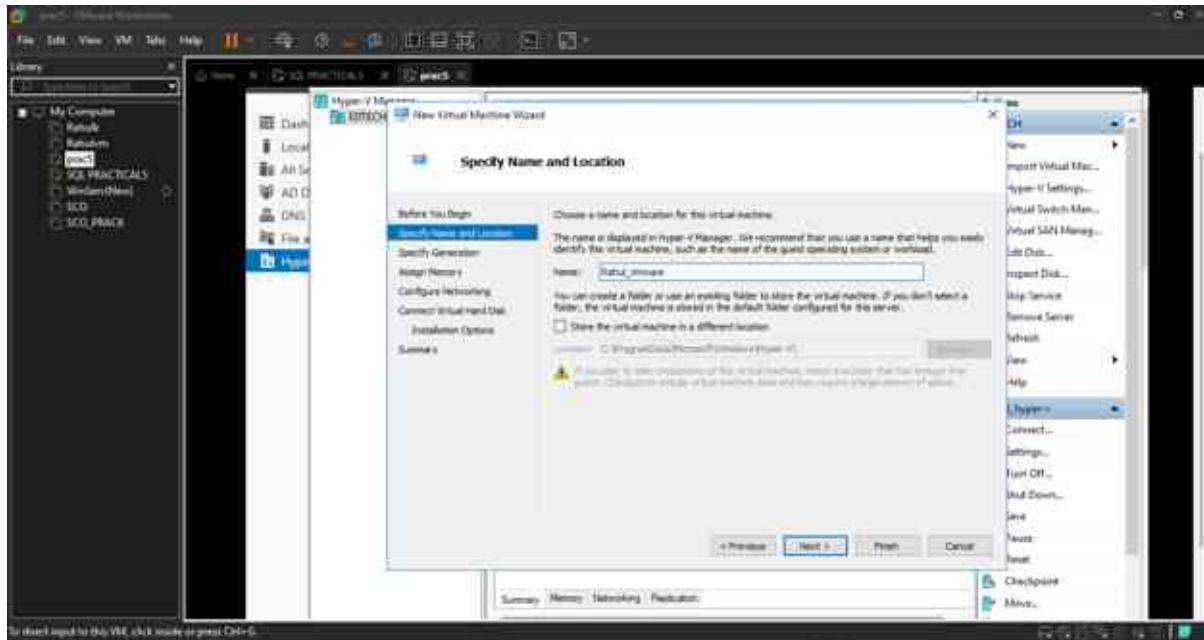
- Right-Click on EDTECH and Click on New and Select Virtual Machine



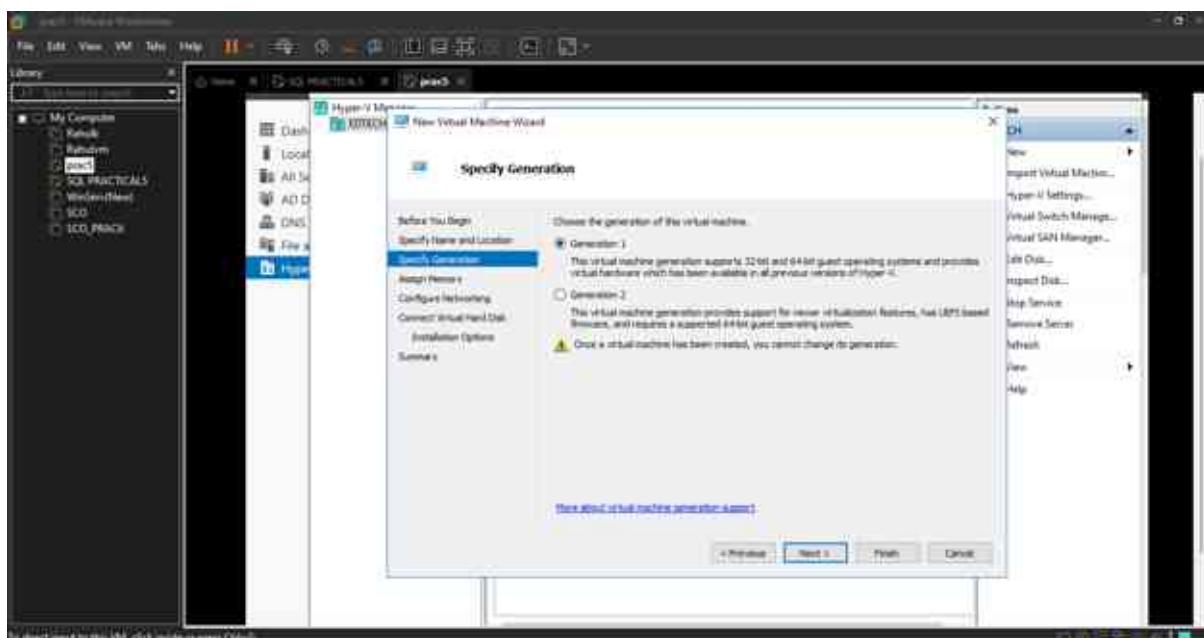
- Click Next



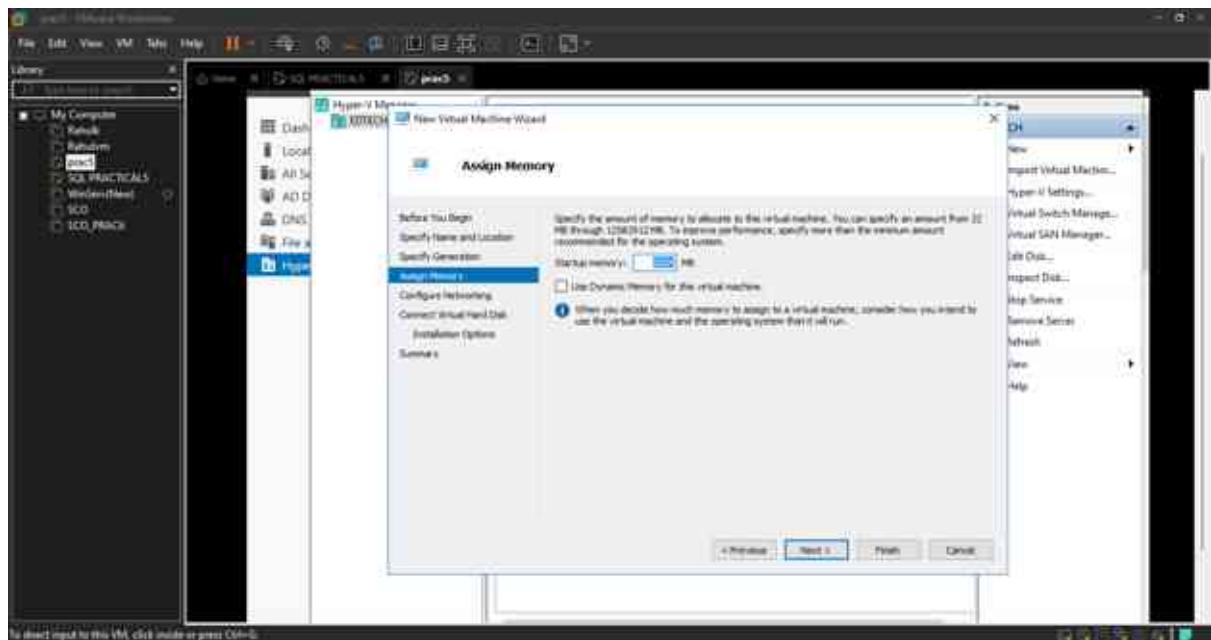
- Specify Name For Your Virtual Machine (Here Virtual Machine Name: **Rahul_Vmware**)
- Click Next



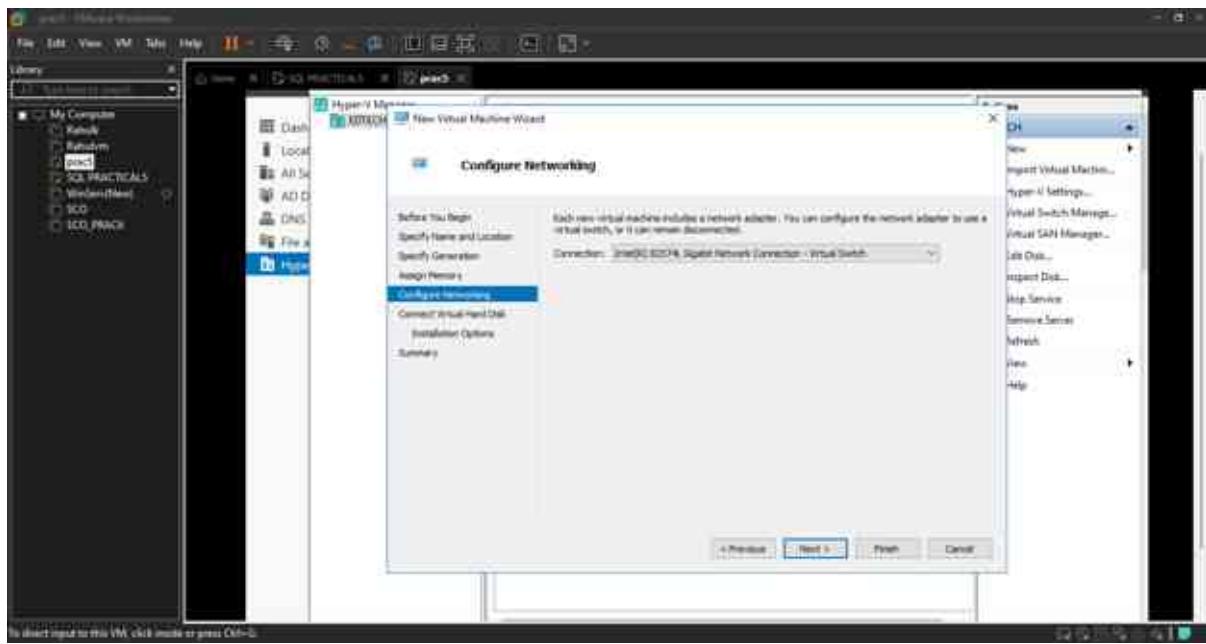
- Select Generation 1
- Click Next



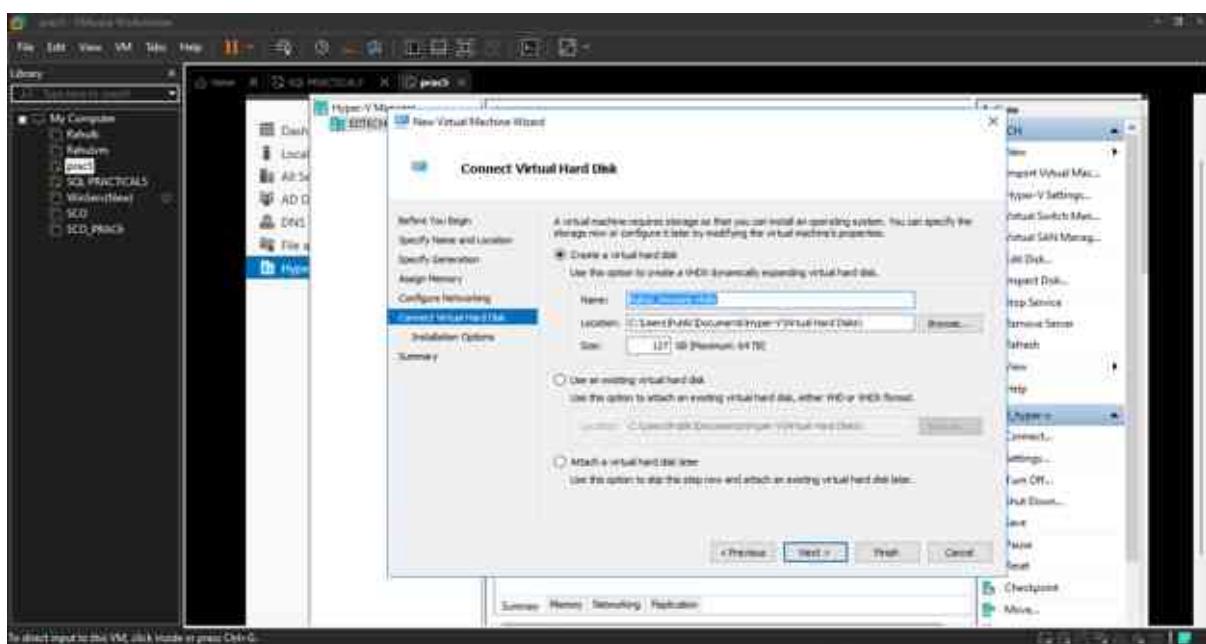
- Keep Default Setting and Click on Next



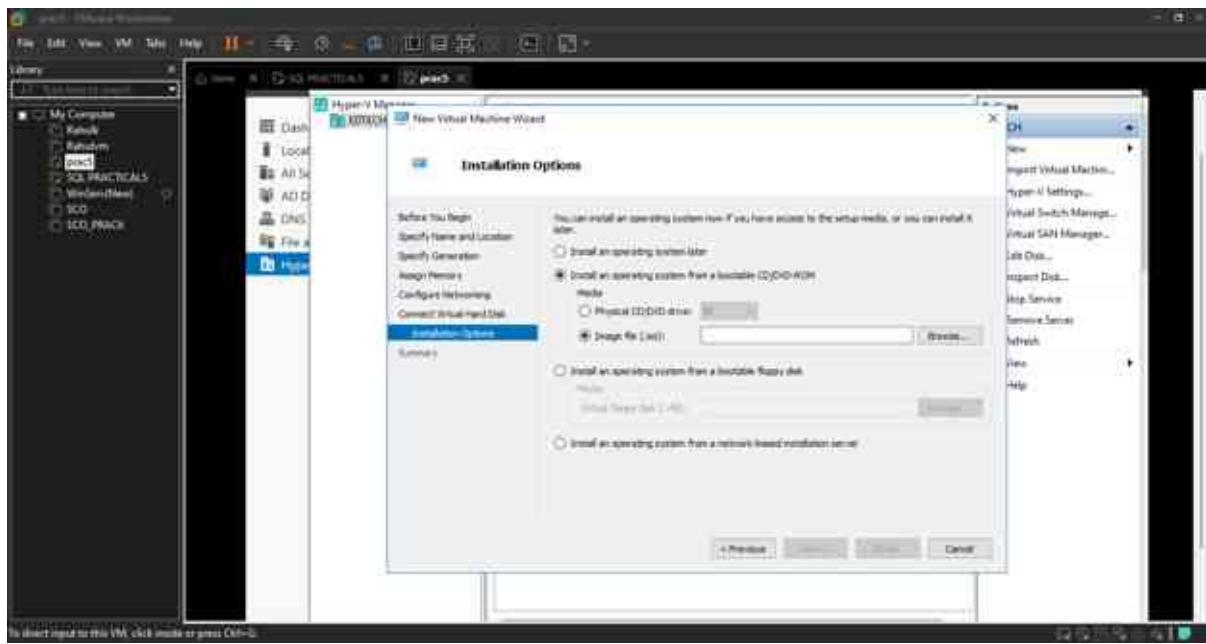
- Within Connection Select Intel® 82574L Gigabit Network Connection-Virtual Switch
- Click Next



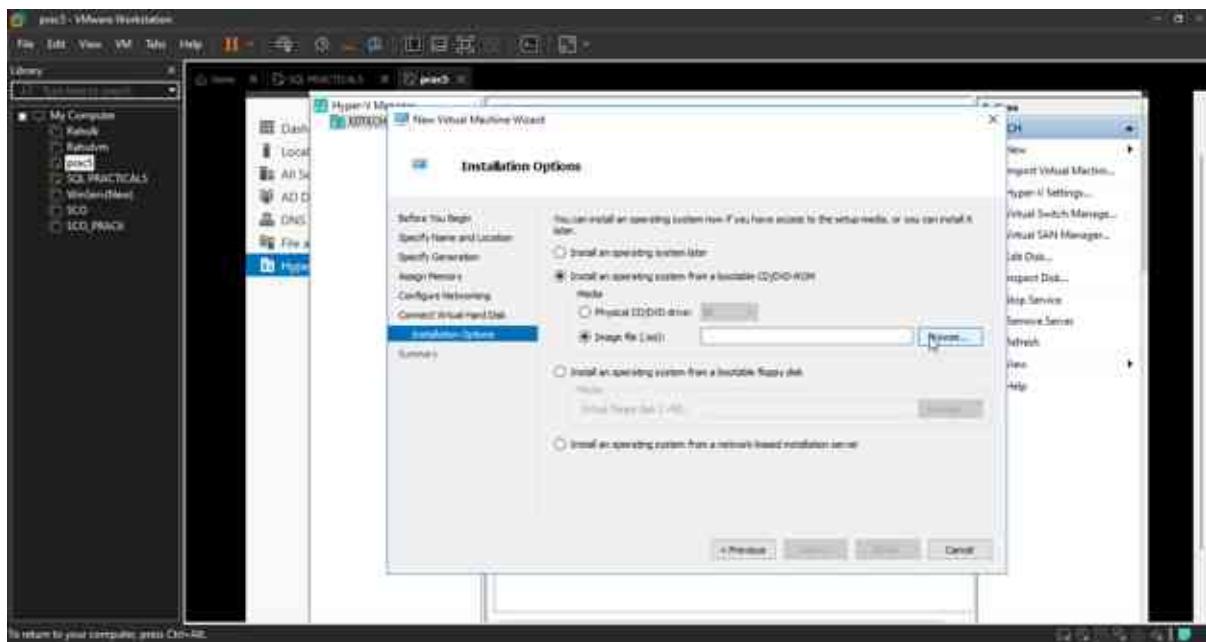
- Keep Default Setting and Click on Next



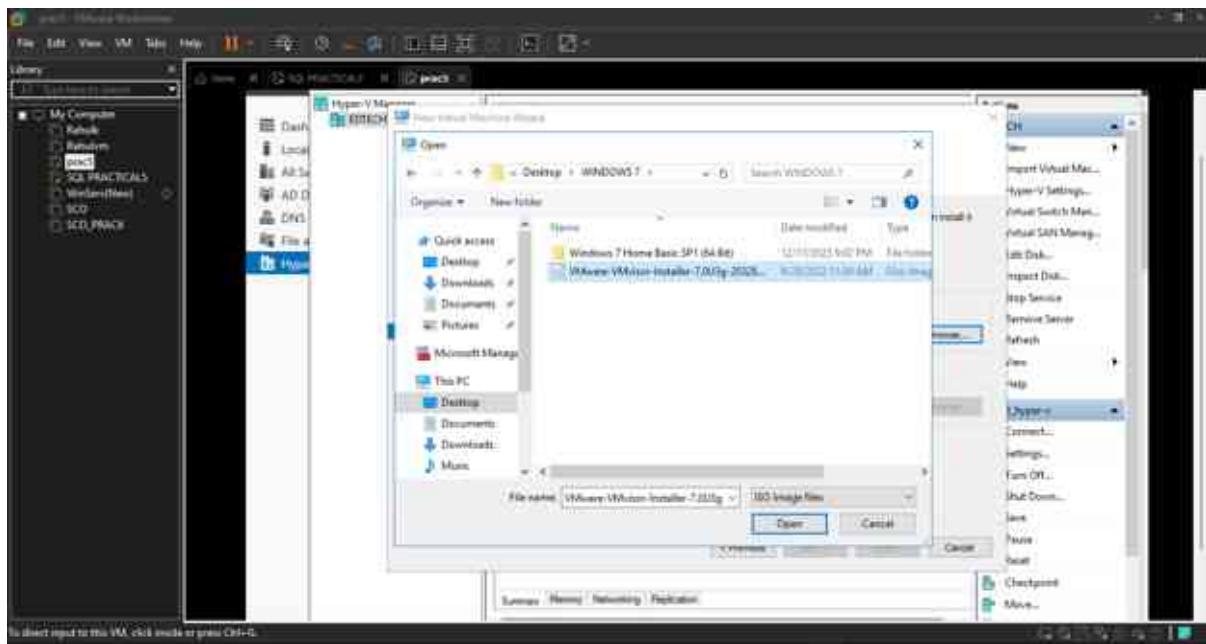
- Click on Install an operating system from a bootable CD/DVD-ROM
- Within Media Click on Image file (.iso)



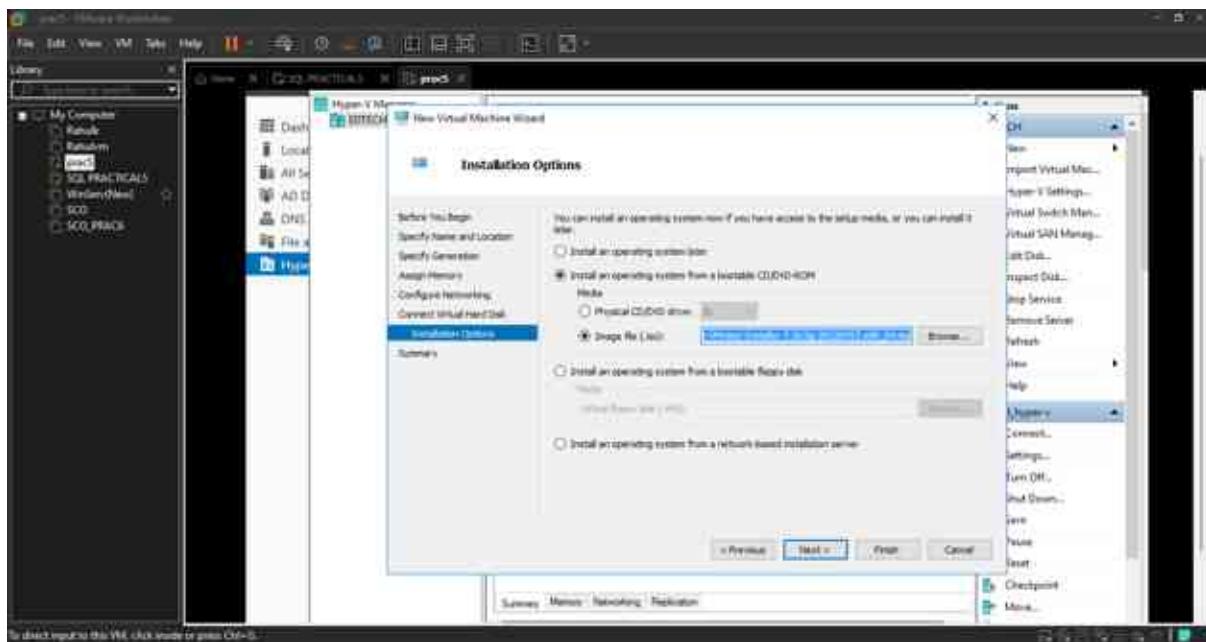
- Click on Browse



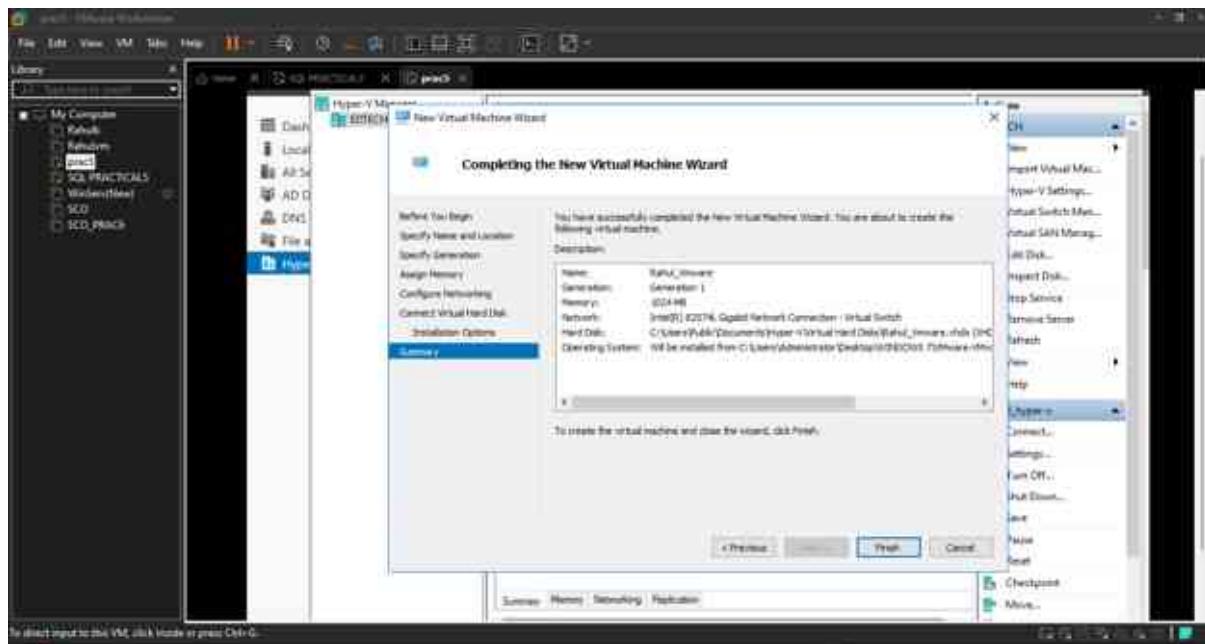
- Select VMware-VMvisor-Insaller-7 and Click on Open



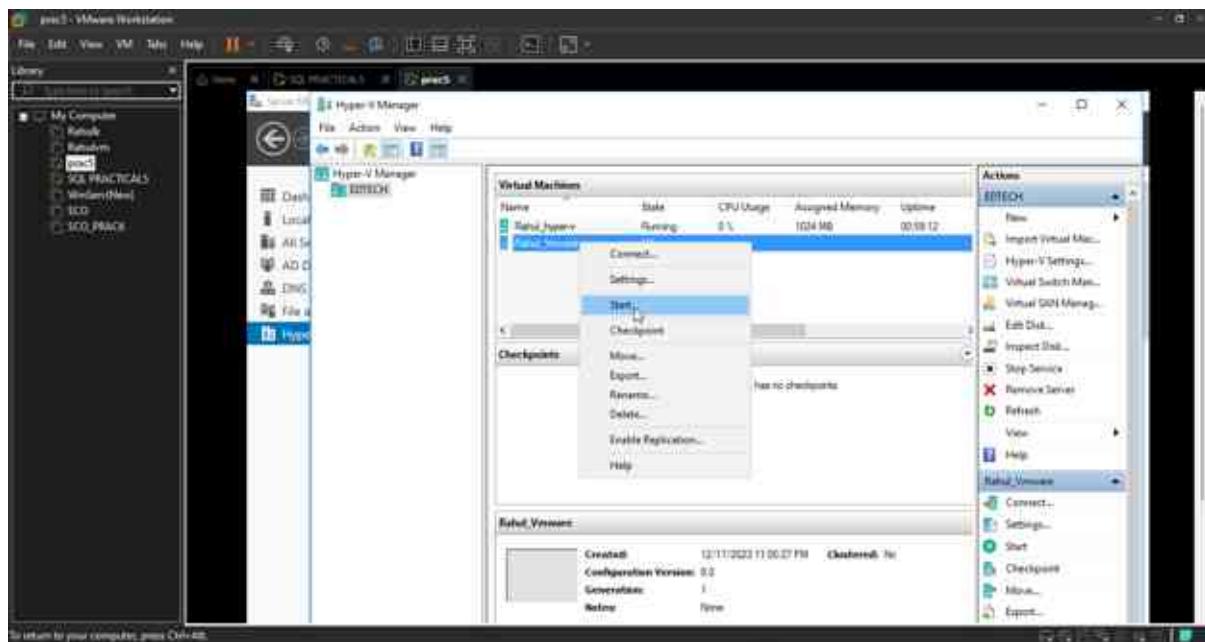
- Click Next



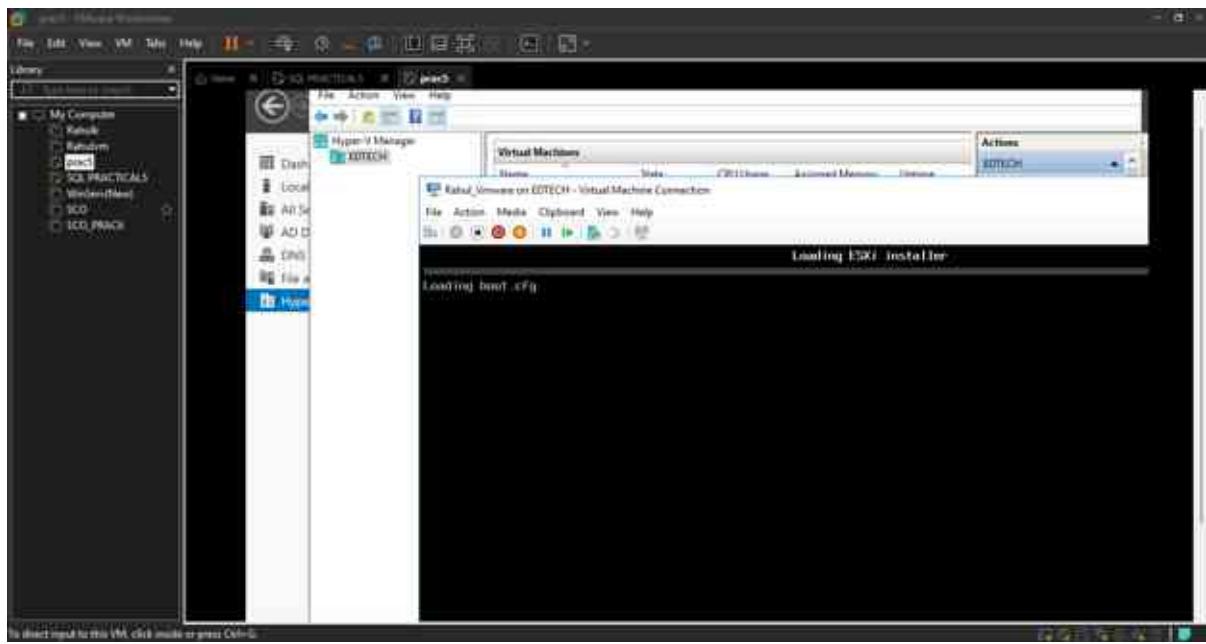
- Click on Finish



- Right-Click on **Rahul_Vmware** and Click on Start



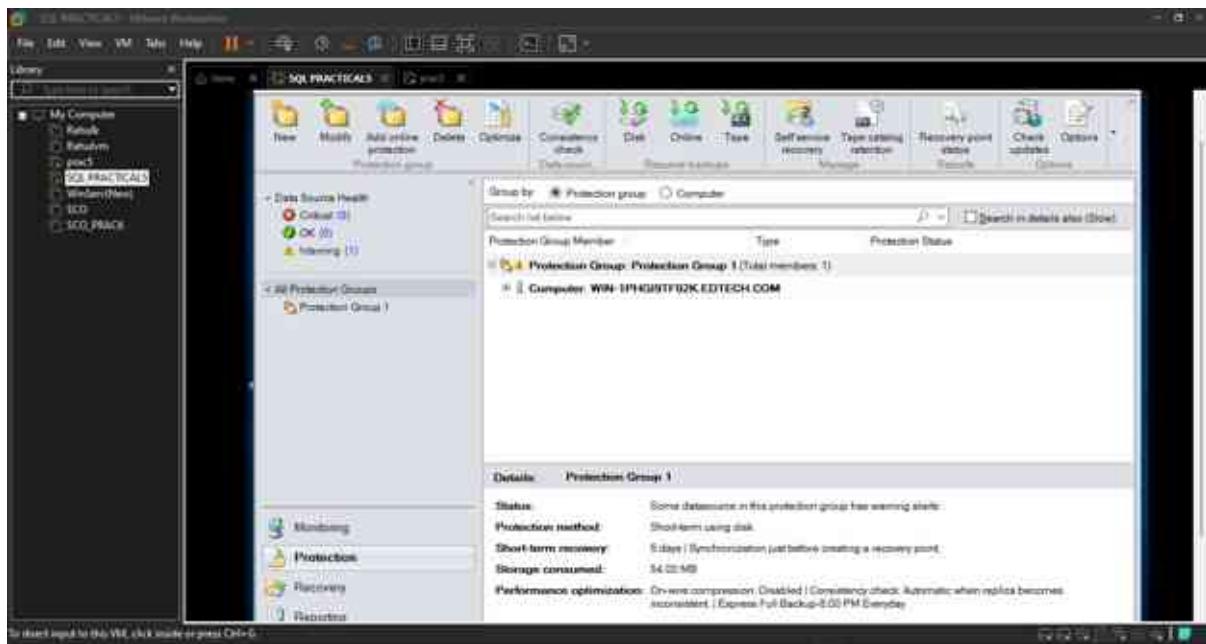
- Virtual Machine Start



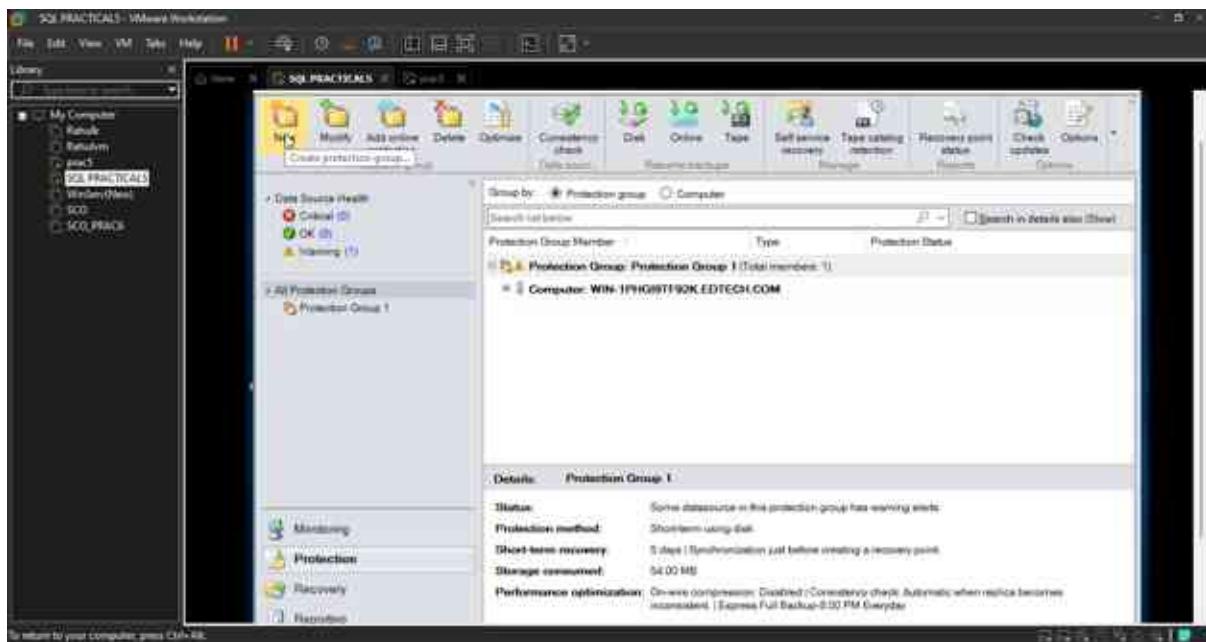
Step 7: Within User Server Click on System Center Data Protection Manager (DPM)



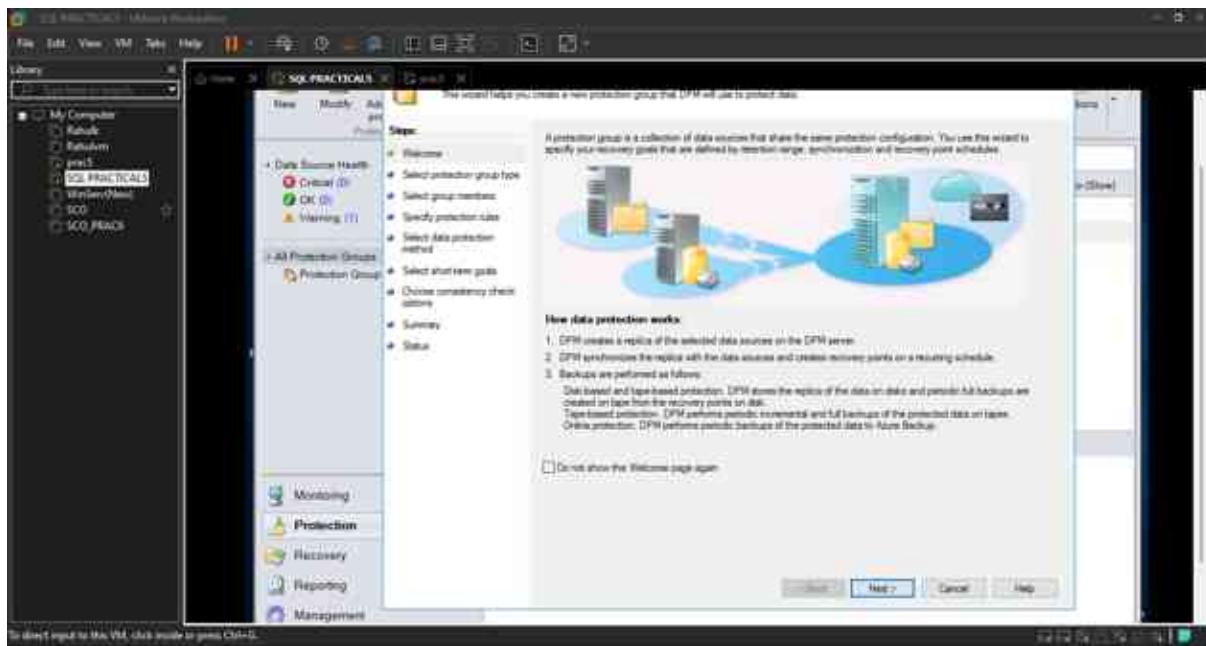
- **Click on Protection**



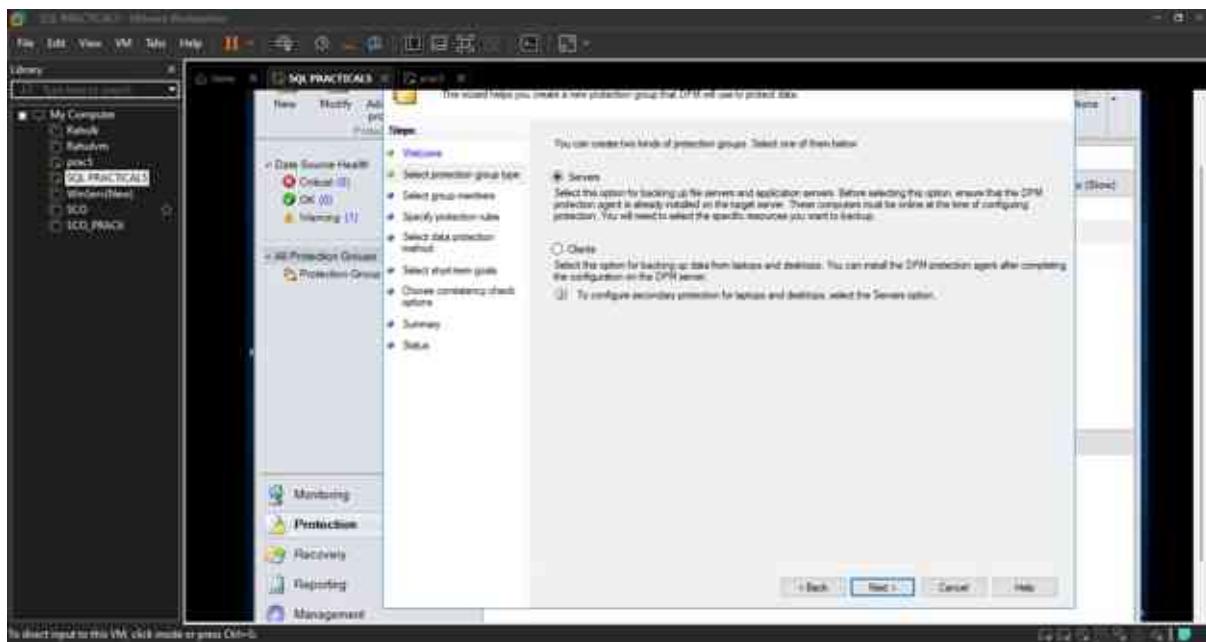
- Click on New to Create Protection Group



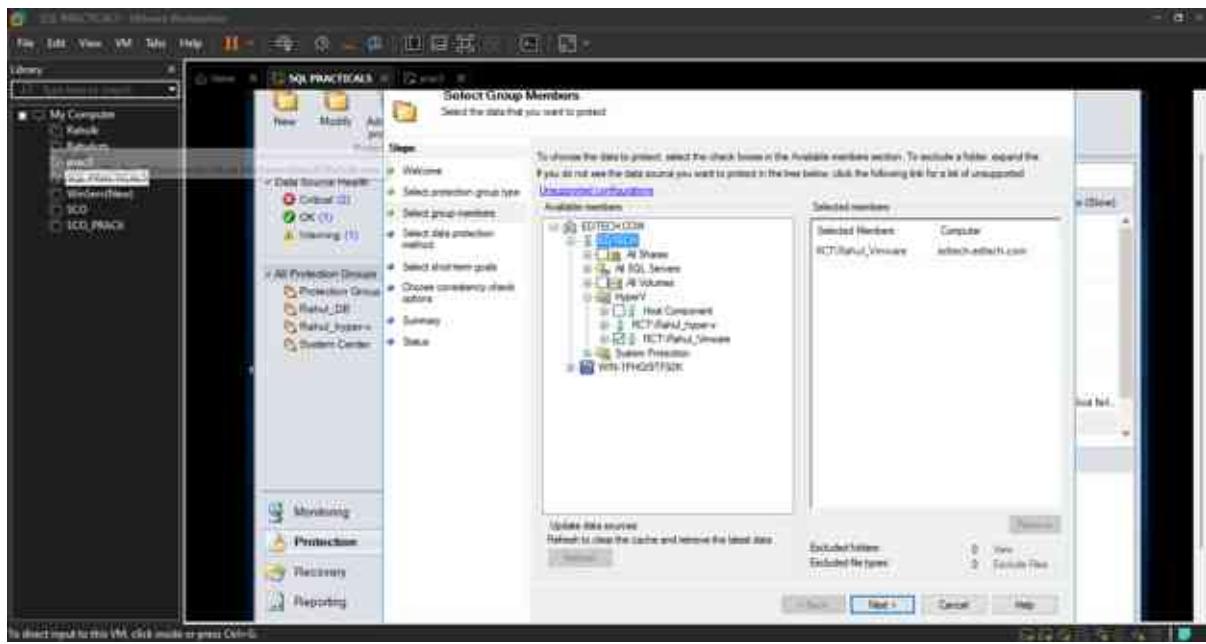
- Click on Next



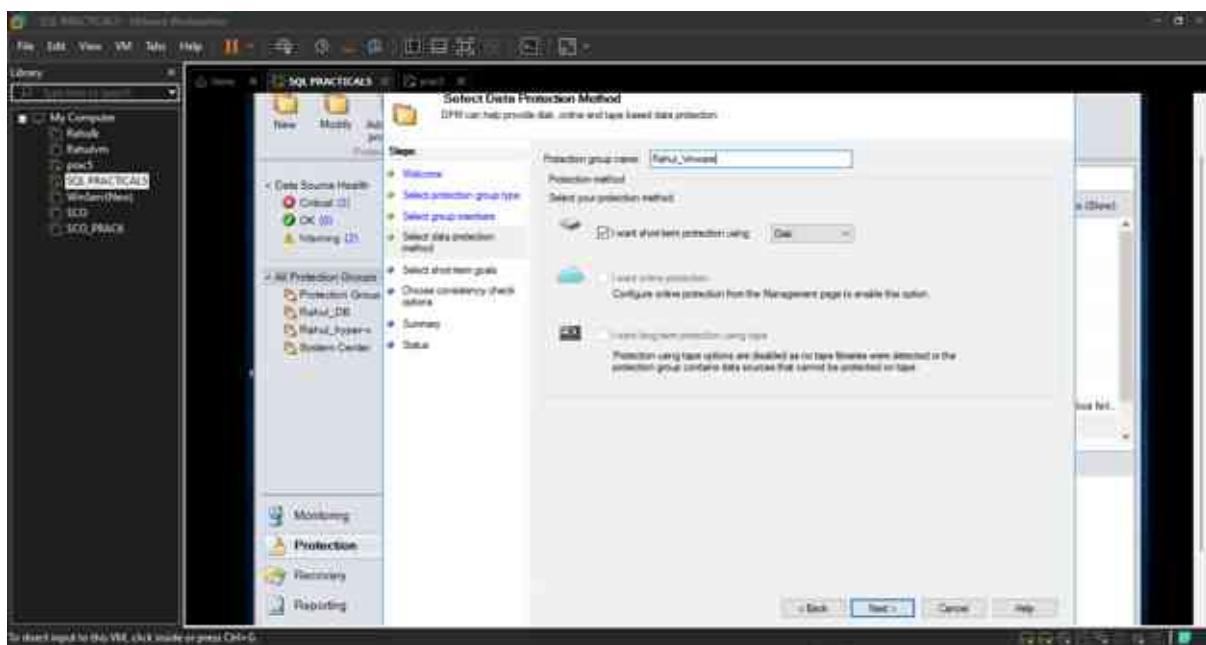
- Select Server and Click on Next



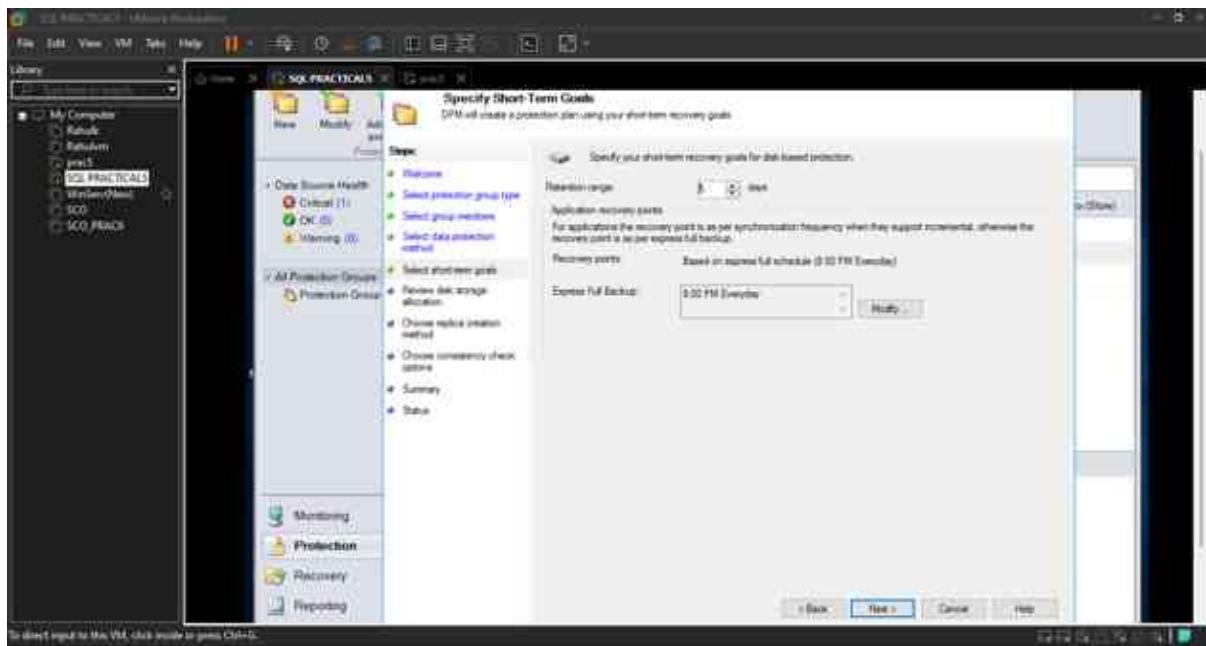
- On the Select Group Members page, Click on EDETCHE and Click on HyperV Within HyperV select the RCT\Rahul_Vmware to protect from the Hyper-V host servers on which they're located.
- Click on Next



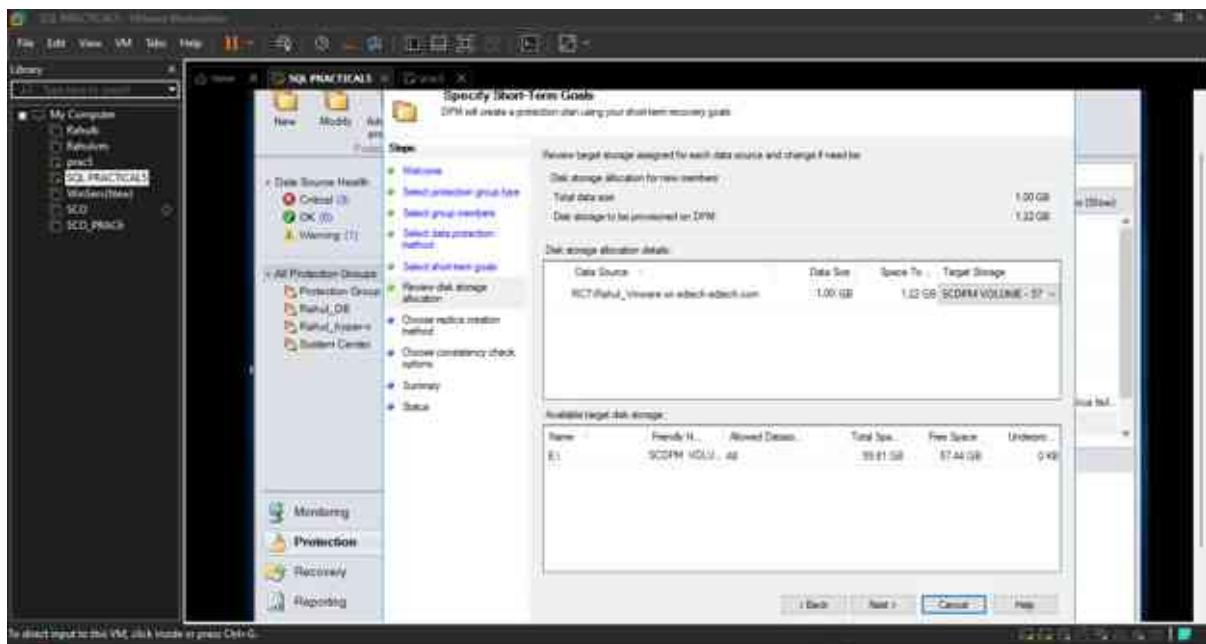
- Type Protection group name (Here Protection group name: **Rahul_Vmware**)
- Click on Next



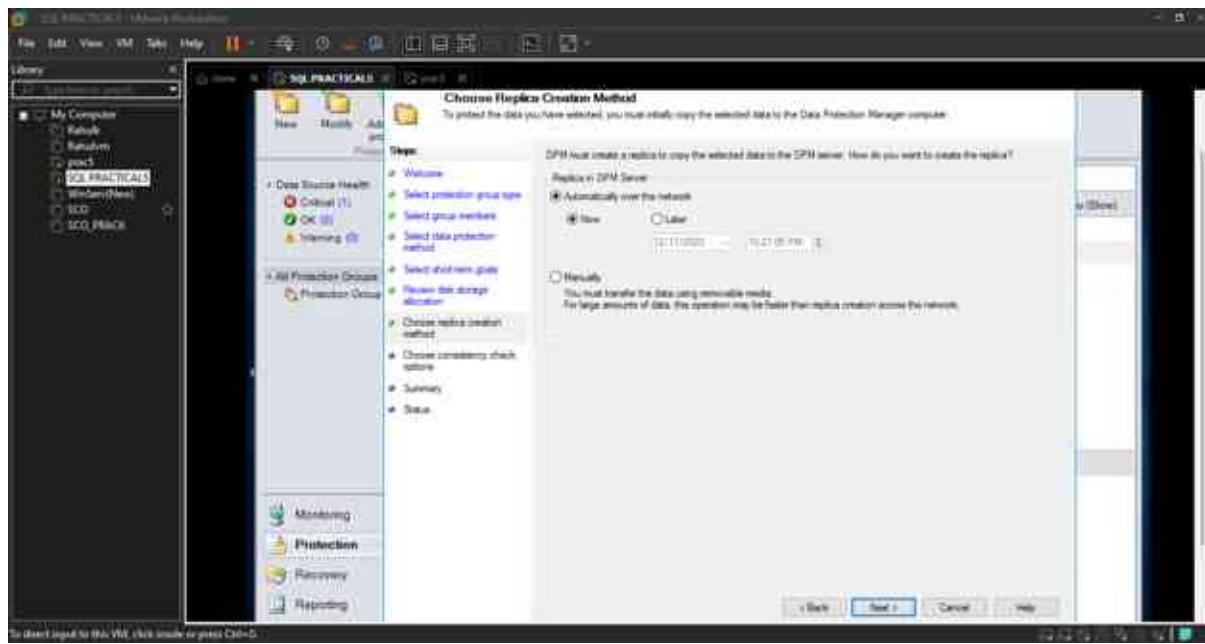
- Keep the default values and Click on Next



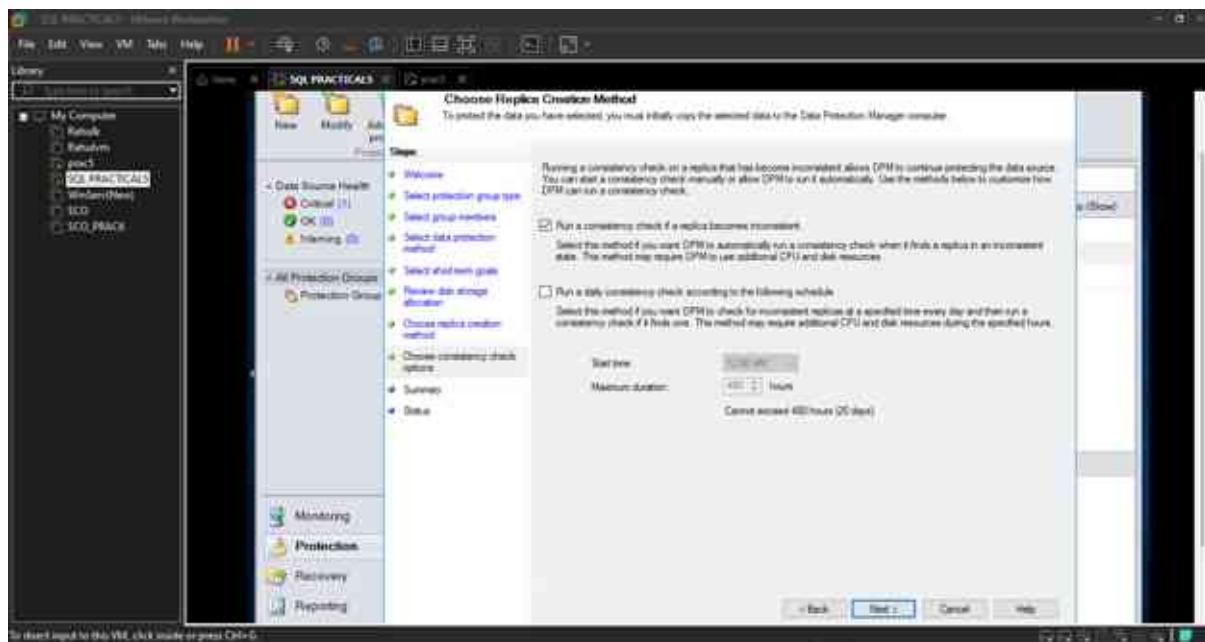
- Click on Next



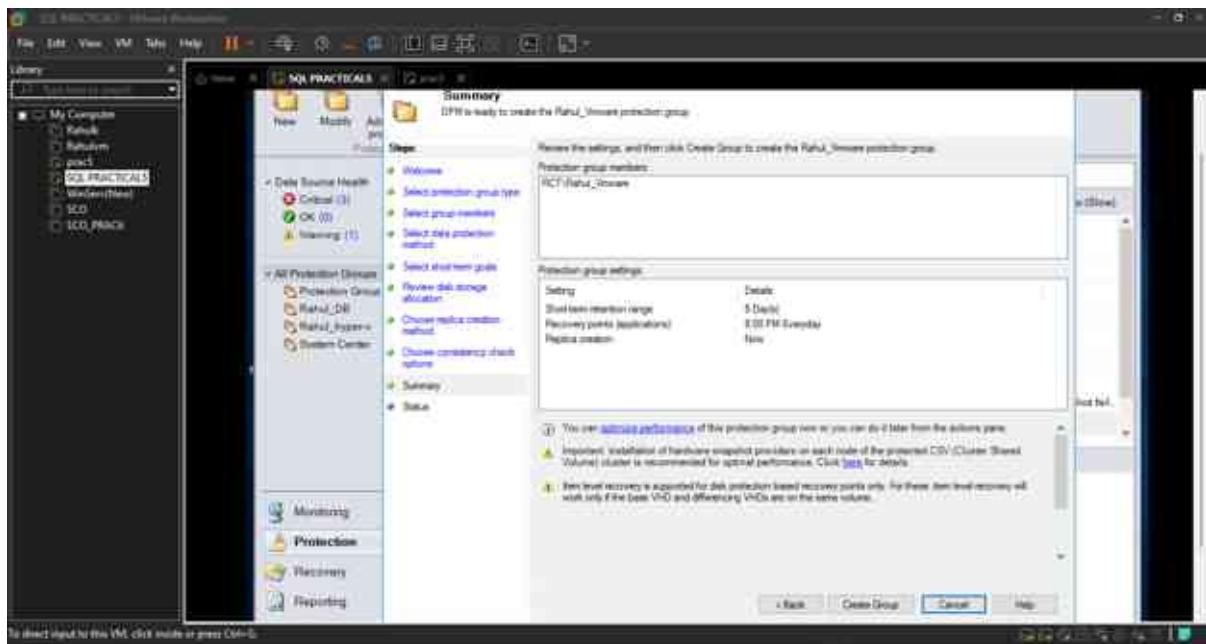
- Keep the default setting and Click on Next



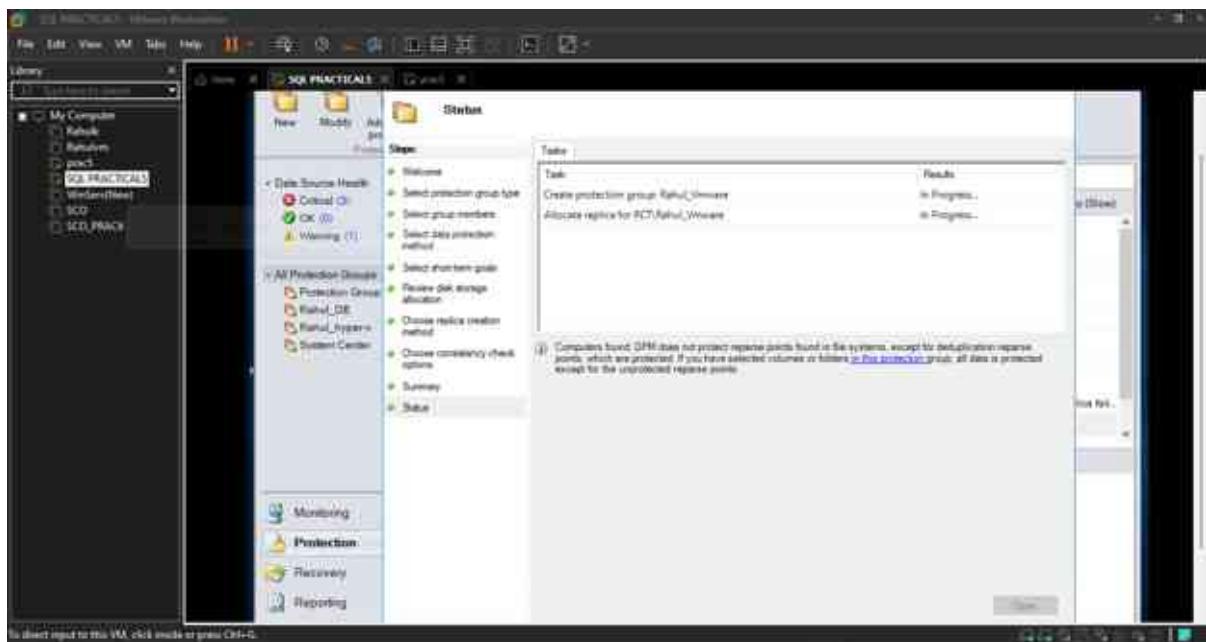
- Keep the default setting and Click on Next



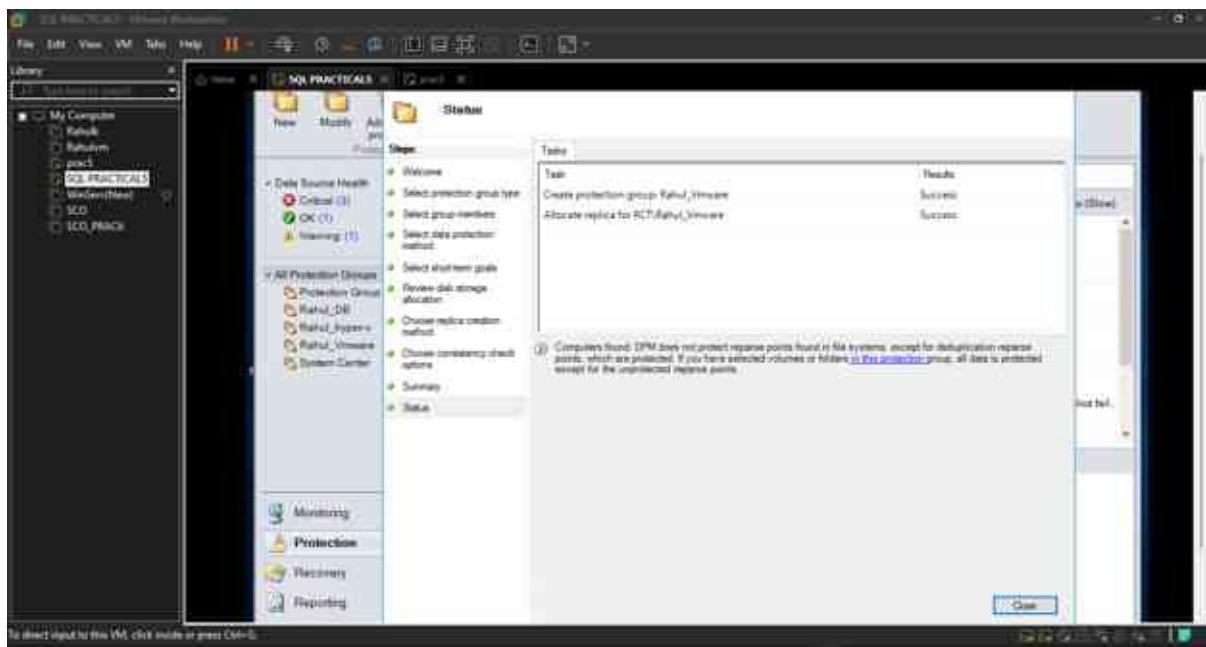
- Click on Create Group



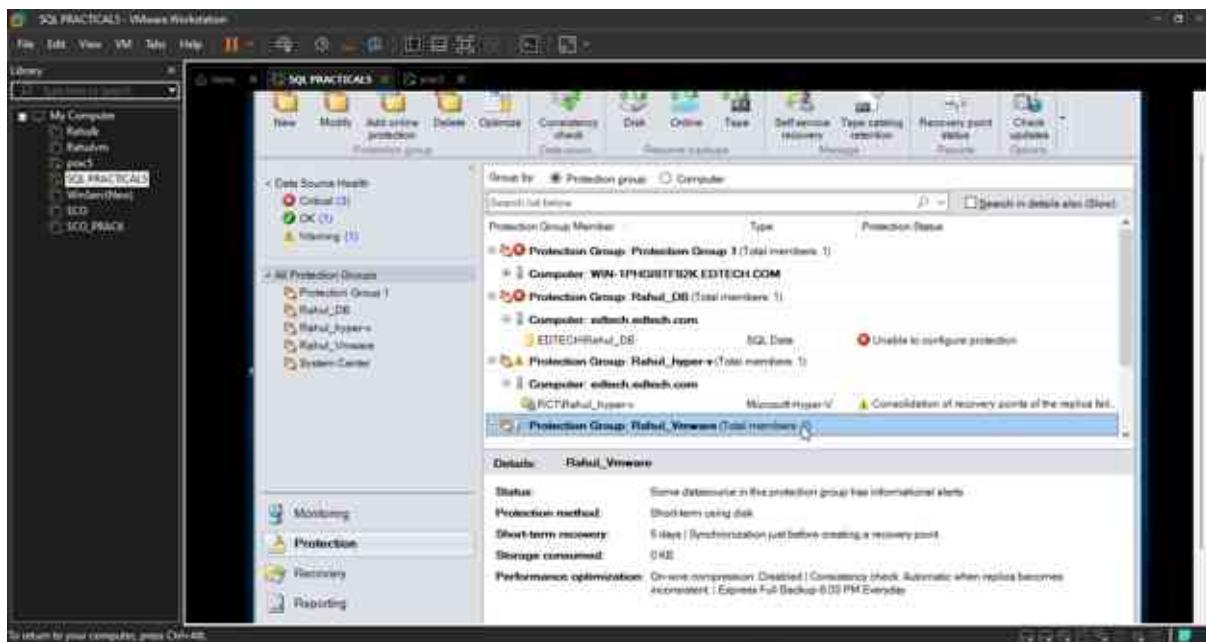
- It will start creation of protection group



- Creation of Protection Group Succeeded
- Click on Close



- Here we can see Replica creation of **Rahul_Vmware** in progress



Practical: 8

Aim: Managing Services with Configuration manager and Designing a Hierarchy of sites using Microsoft End Point Configuration Manager

Pre-requisites:

Domain Controller (Here Domain Controller Name: **Winser (New)**)

User Server (Here User Server Name: **SCCM_USER PRACTICAL 8**)

System Center Configuration Manager

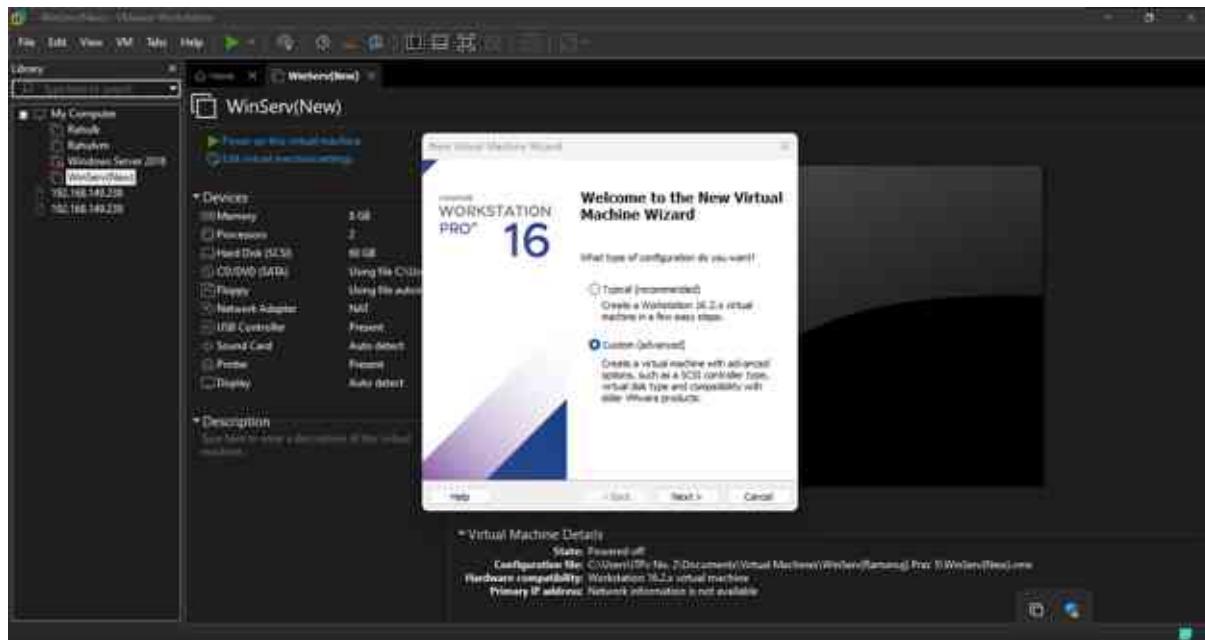
SQL Server 2016

MS SQL Management Studio

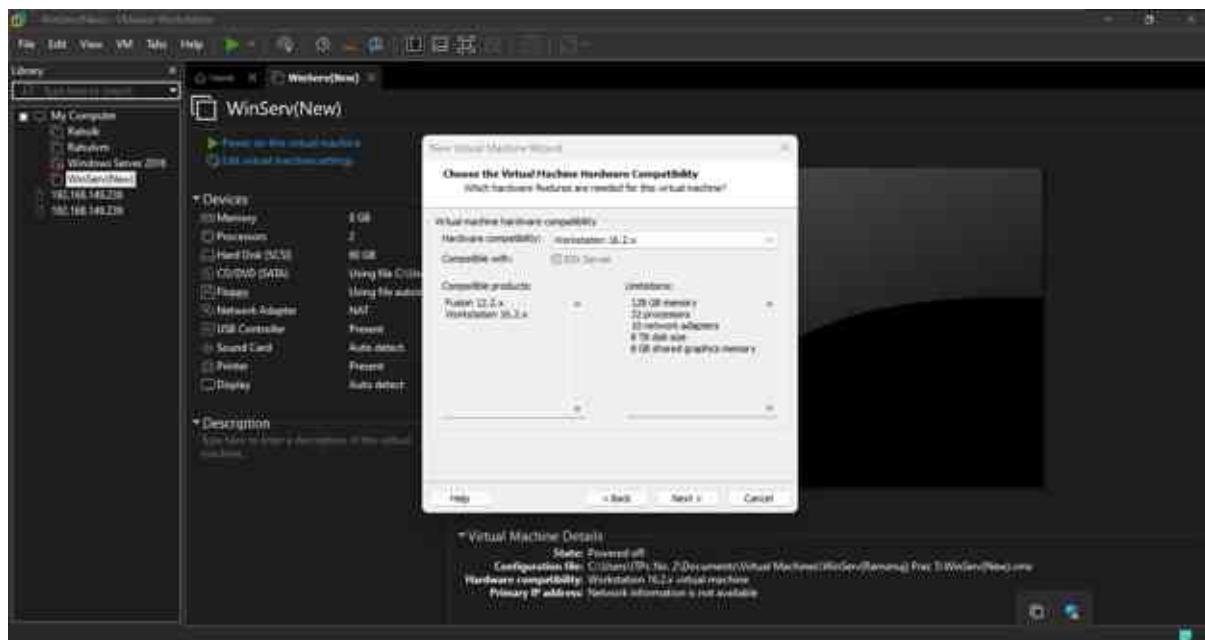
Windows ADK 1903 and Windows PE add-on

Step 1: Step 1: We will be using the same Domain Controller created in Practical 2 and only have to create a new User VM.

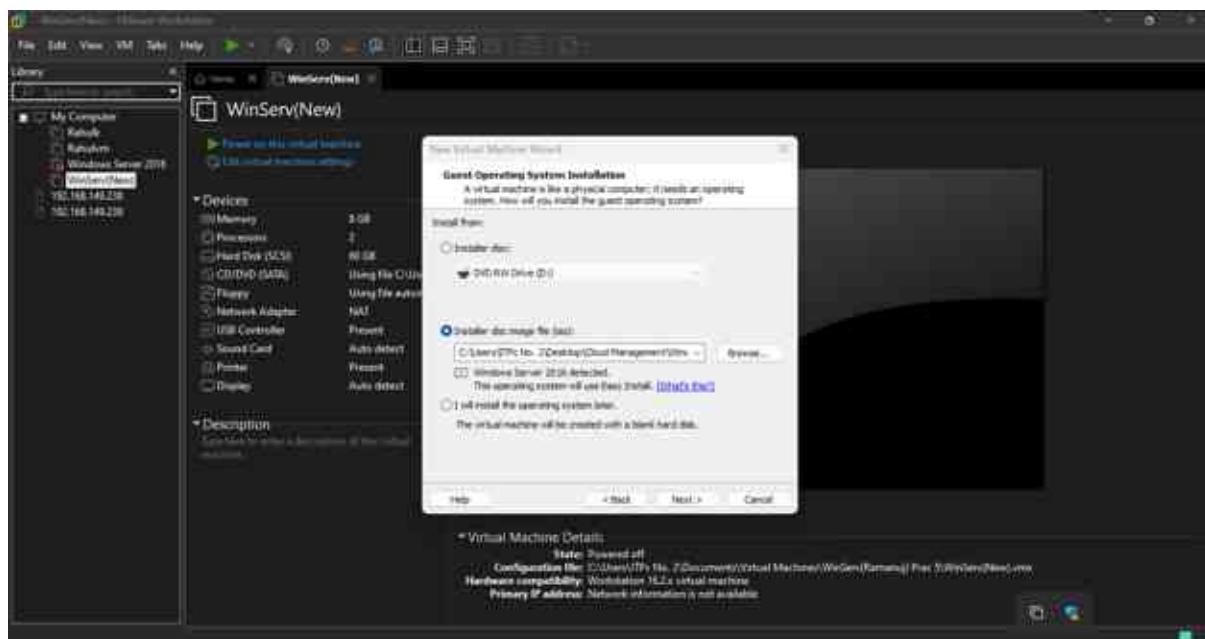
- Open VMware Workstation and **Click on Create a New Virtual Machine**.
- Select **Custom** and **Click on Next**.



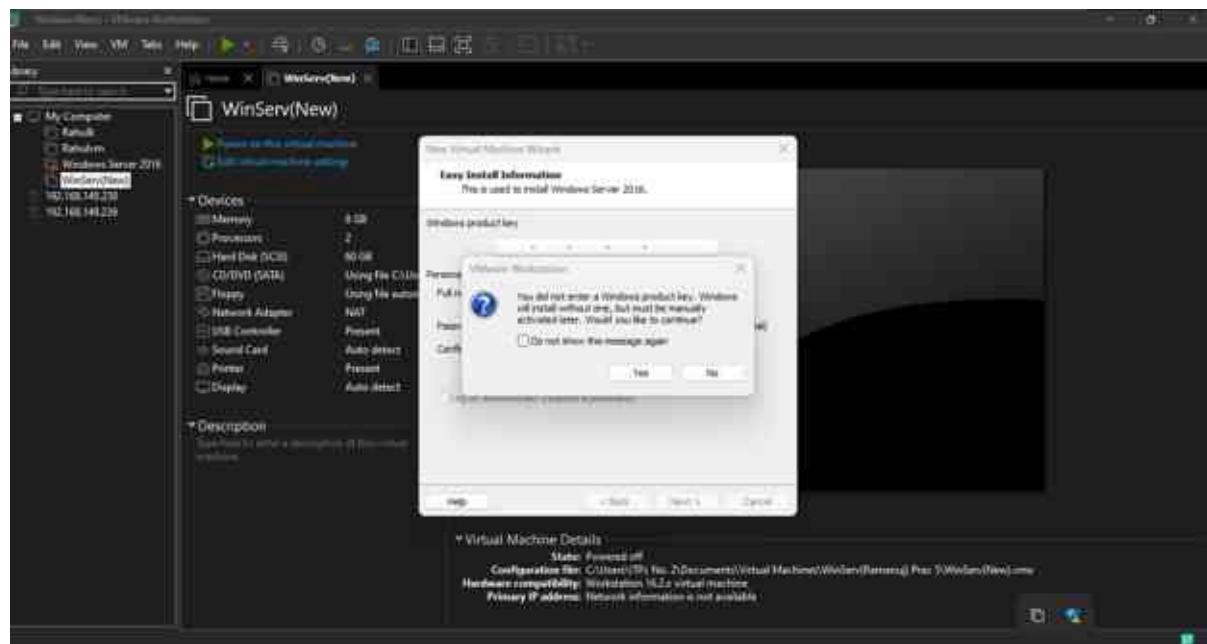
- Keep default values and Click Next



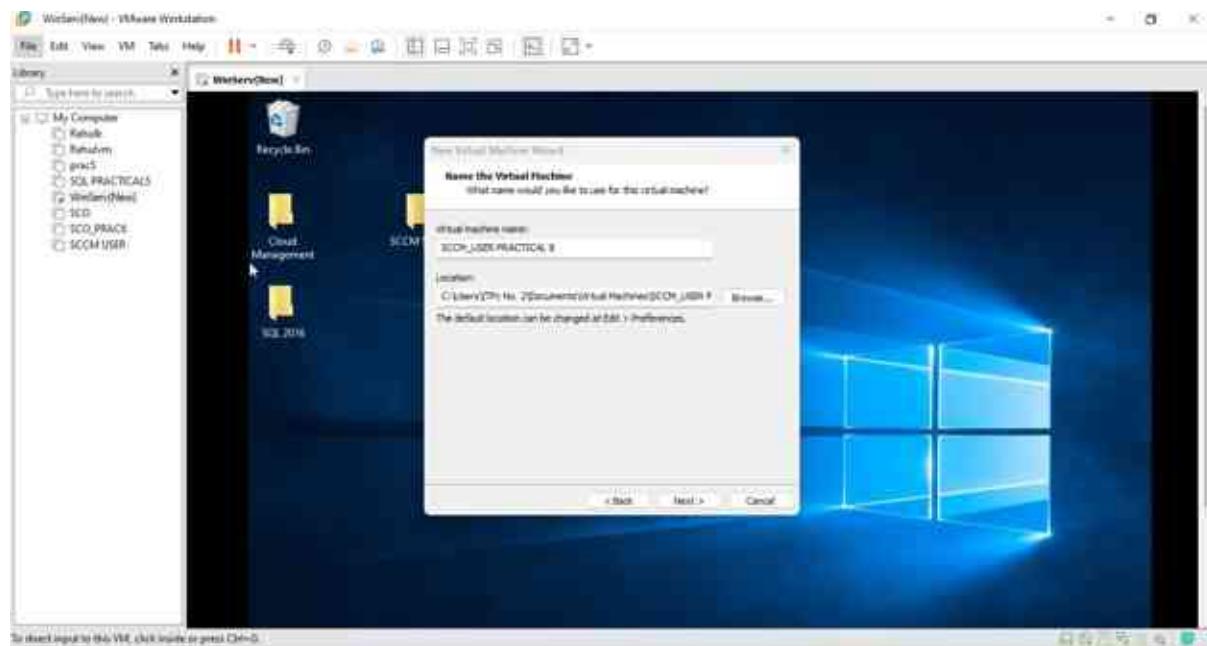
- Select Installer disc image file (iso): Click on Browser and Select Windows Server 2016 and Click on Next



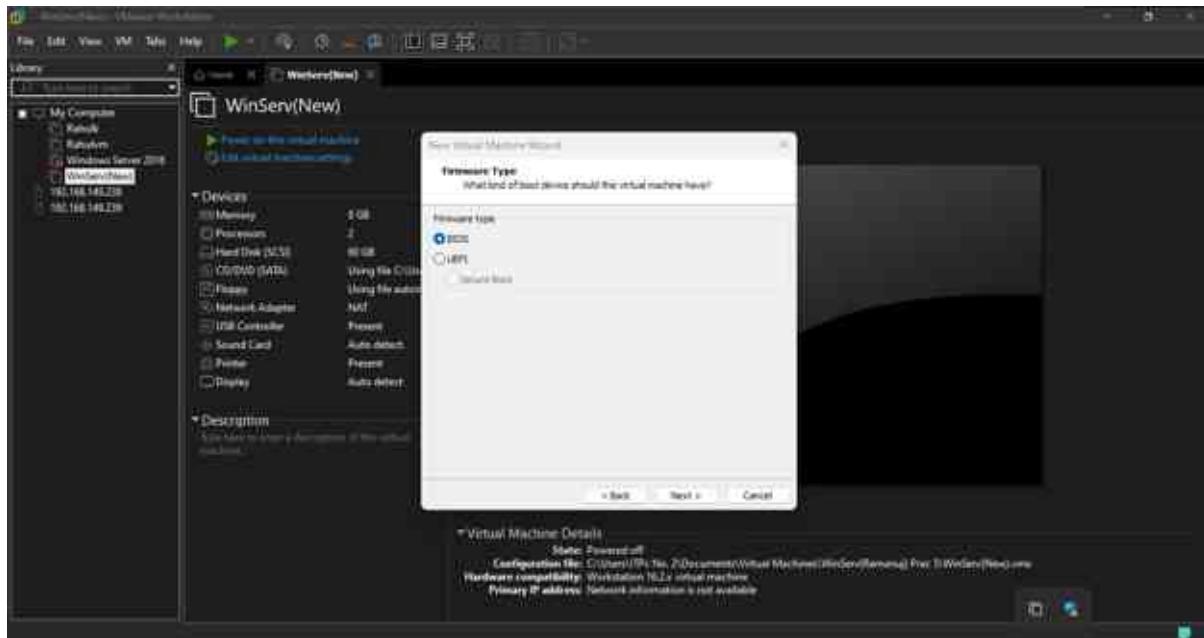
- Click Yes and Click on Next



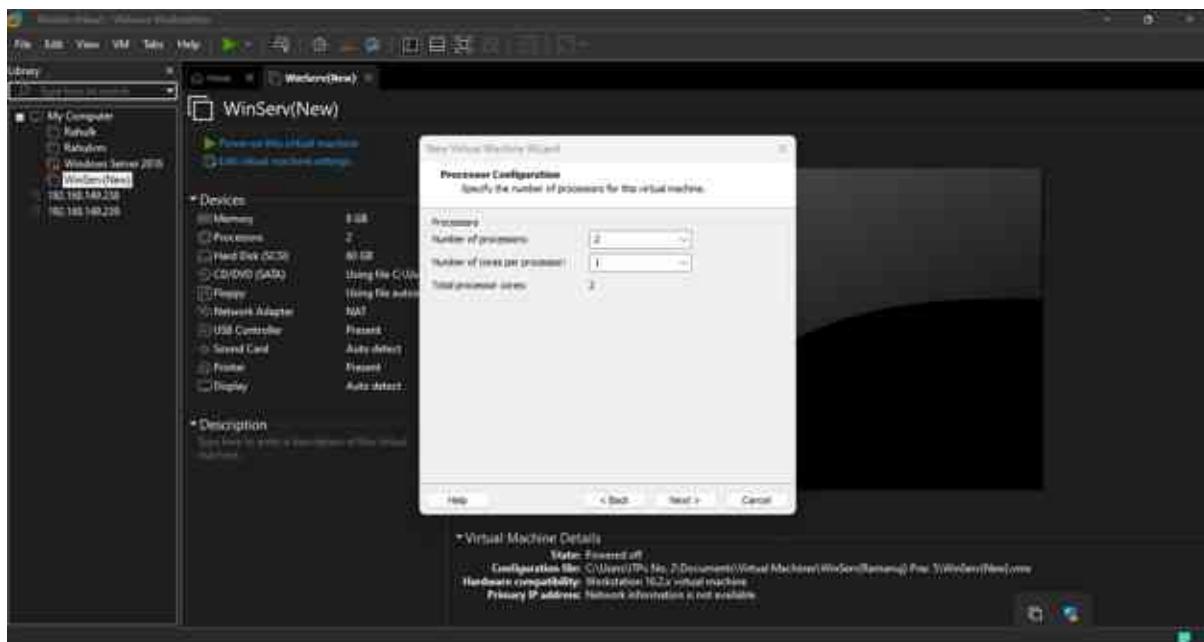
- Give Virtual Machine Name (Here it is **SCCM_USER PRACTICAL 8**) and Click on Next



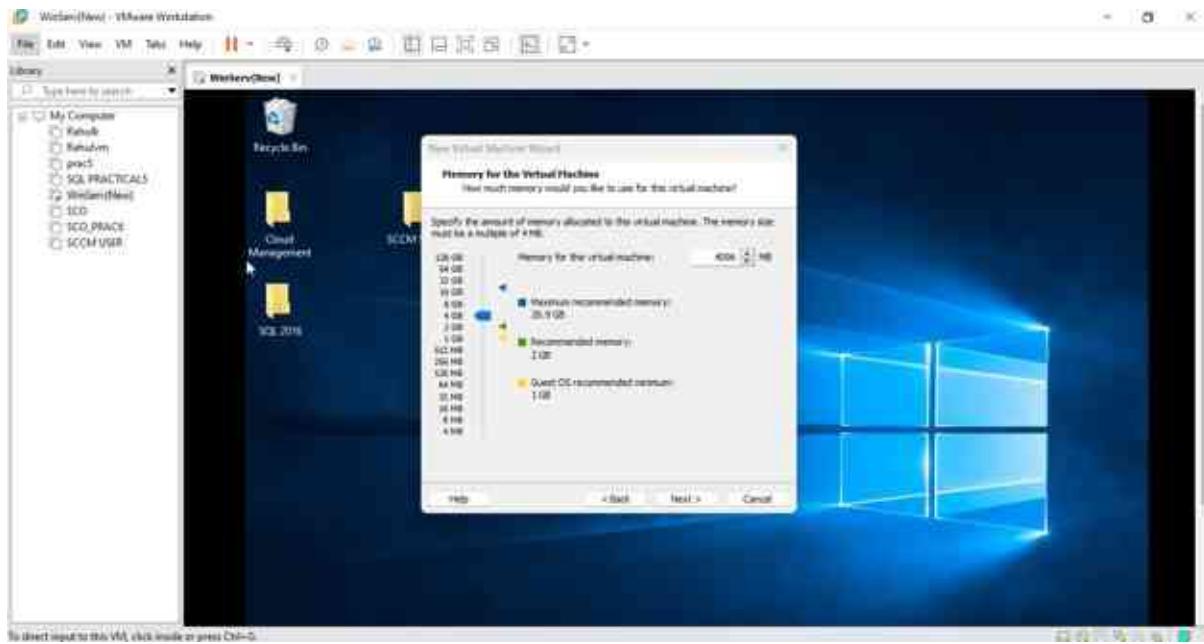
- Select BIOS and Click on Next



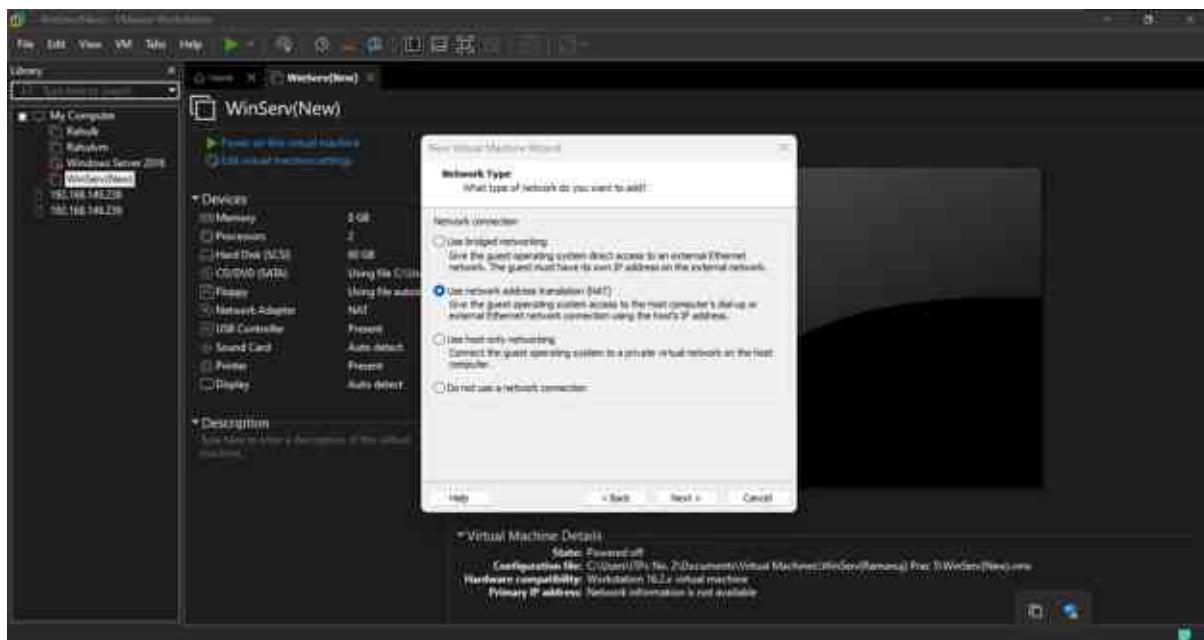
- Keep default values and Click on Next



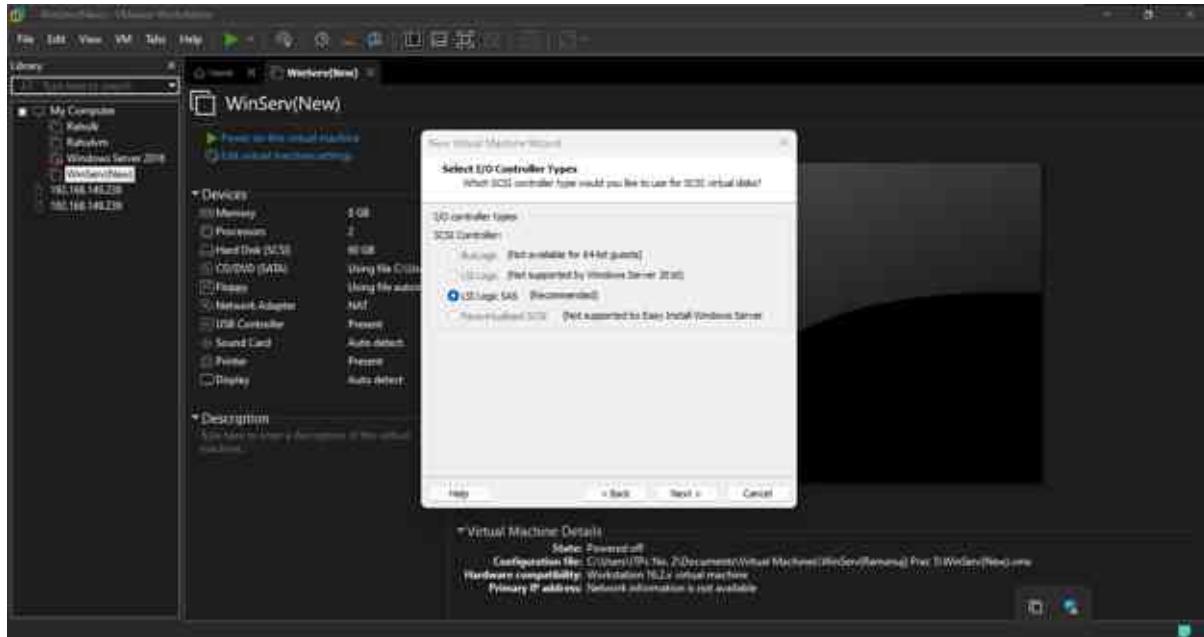
- Change the RAM value to 4096 MB and Click Next



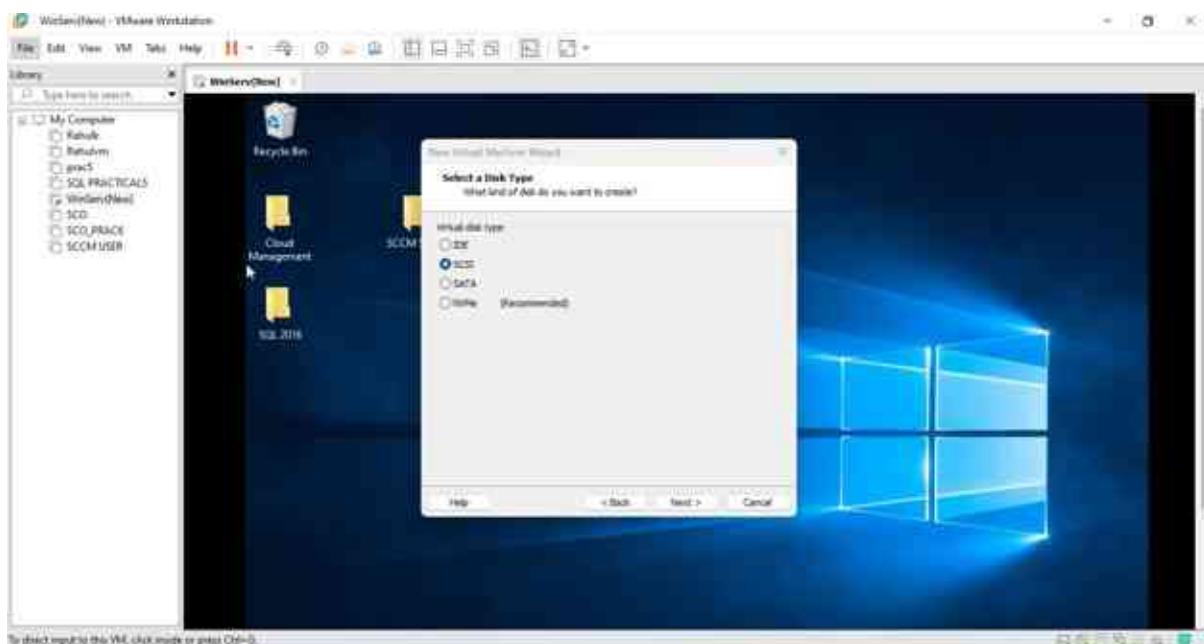
- Keep default values and Click on Next



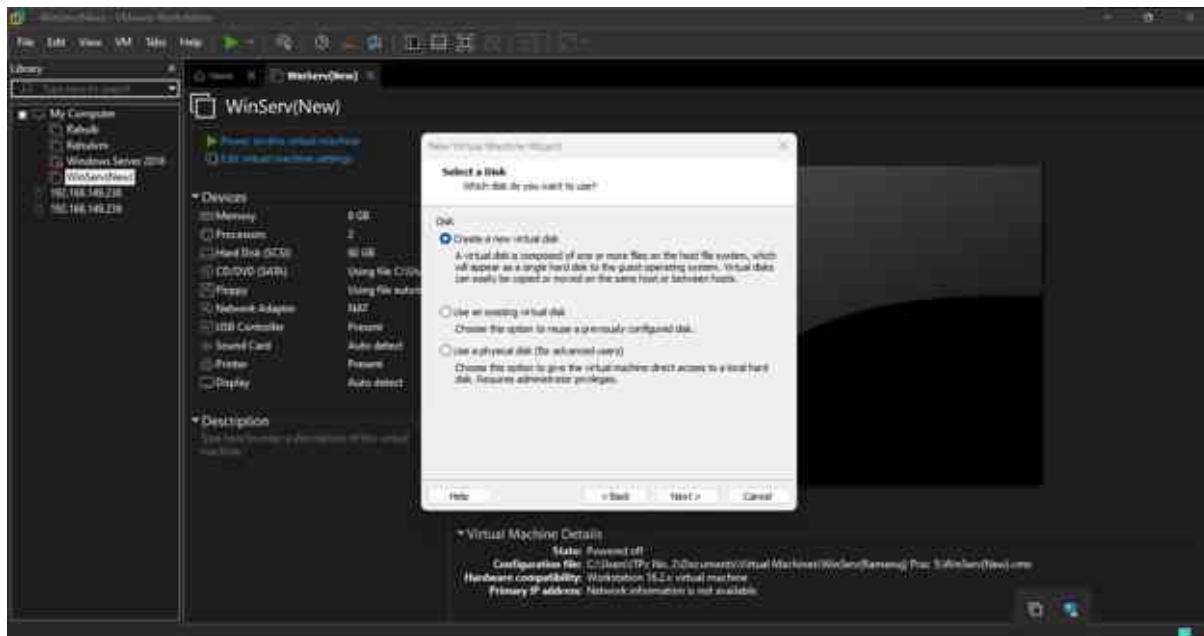
- Keep default values and Click on Next



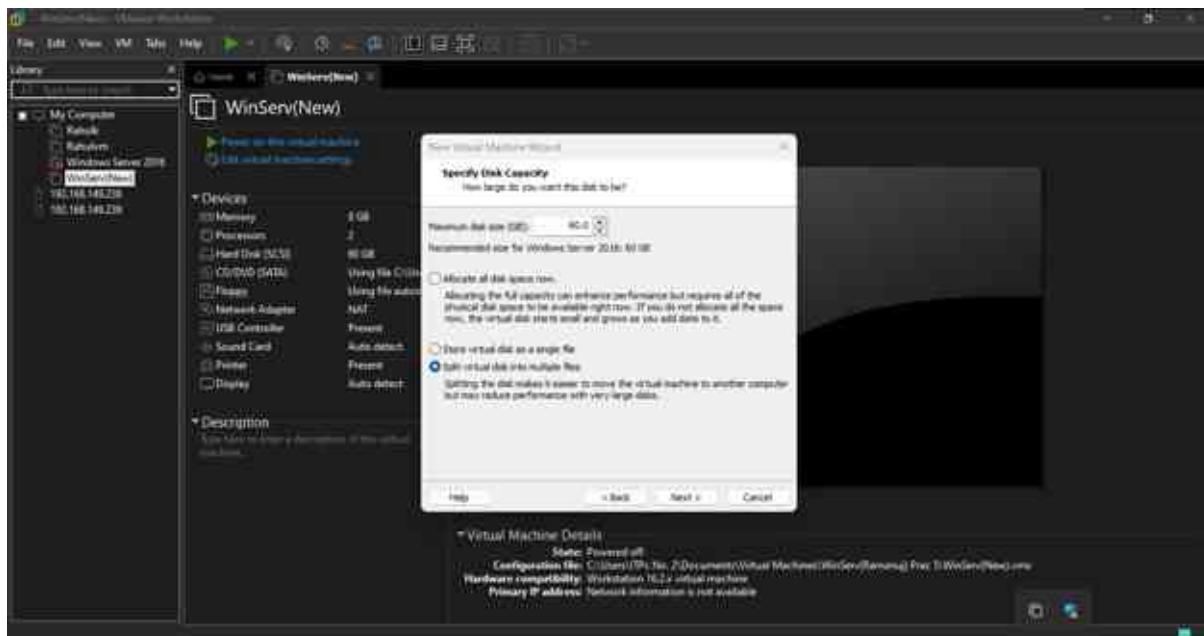
- Select SCSI and Click on Next



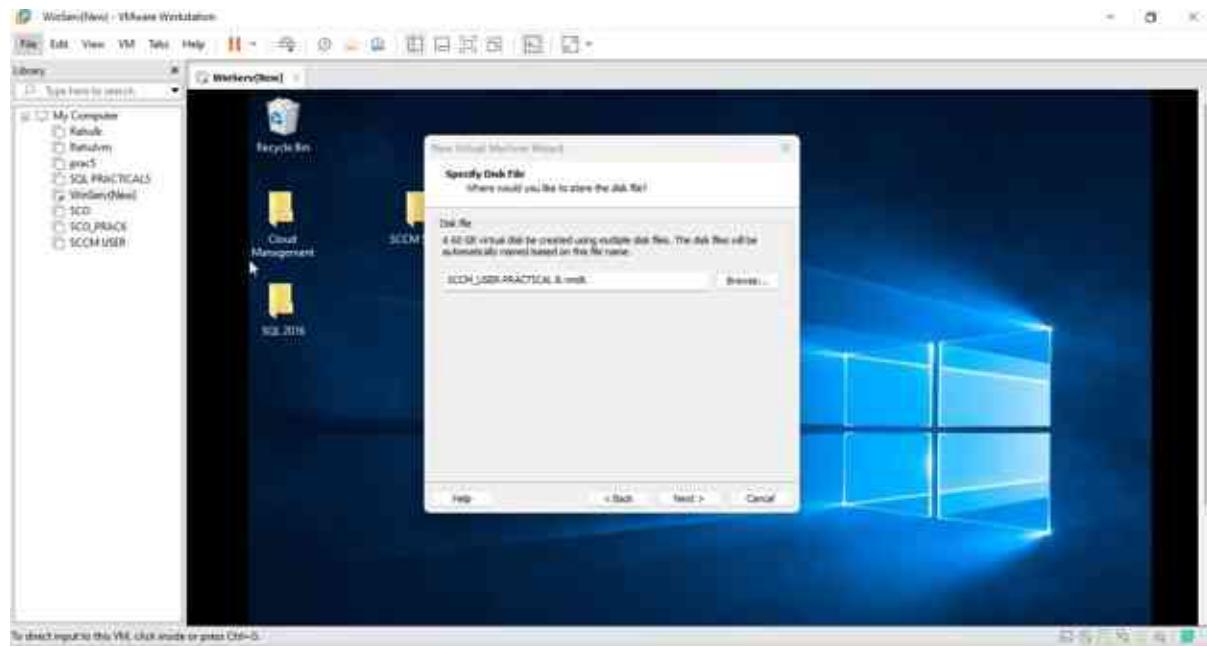
- Keep default values and Click on Next



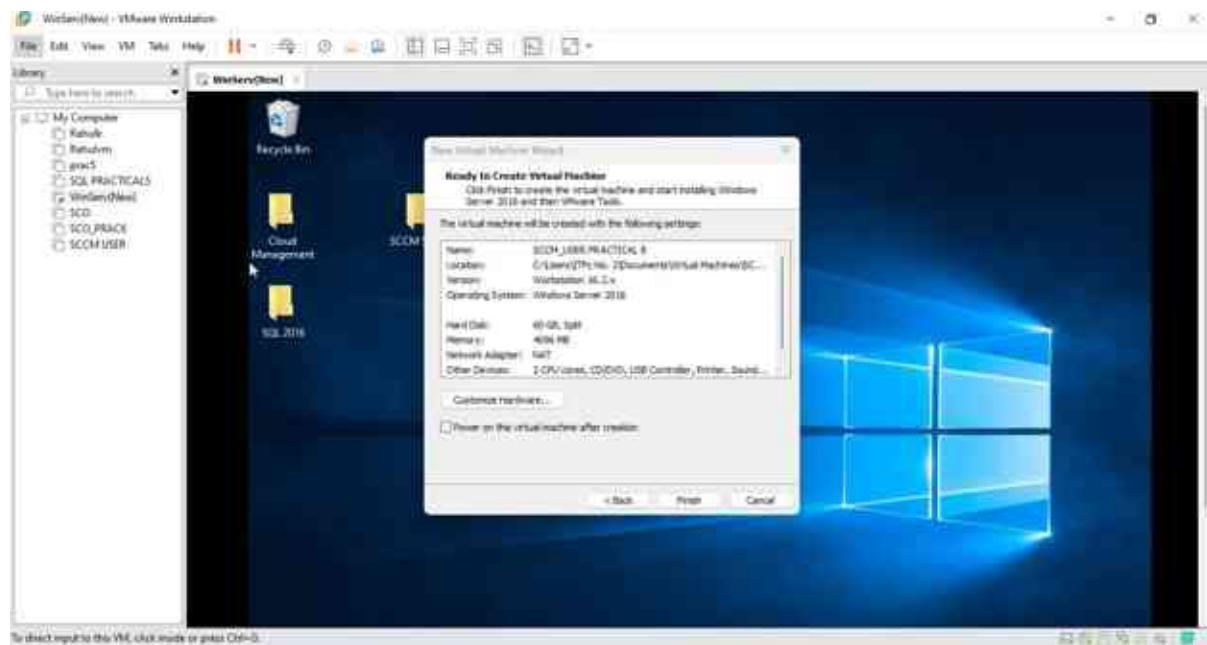
- Keep default values and Click on Next



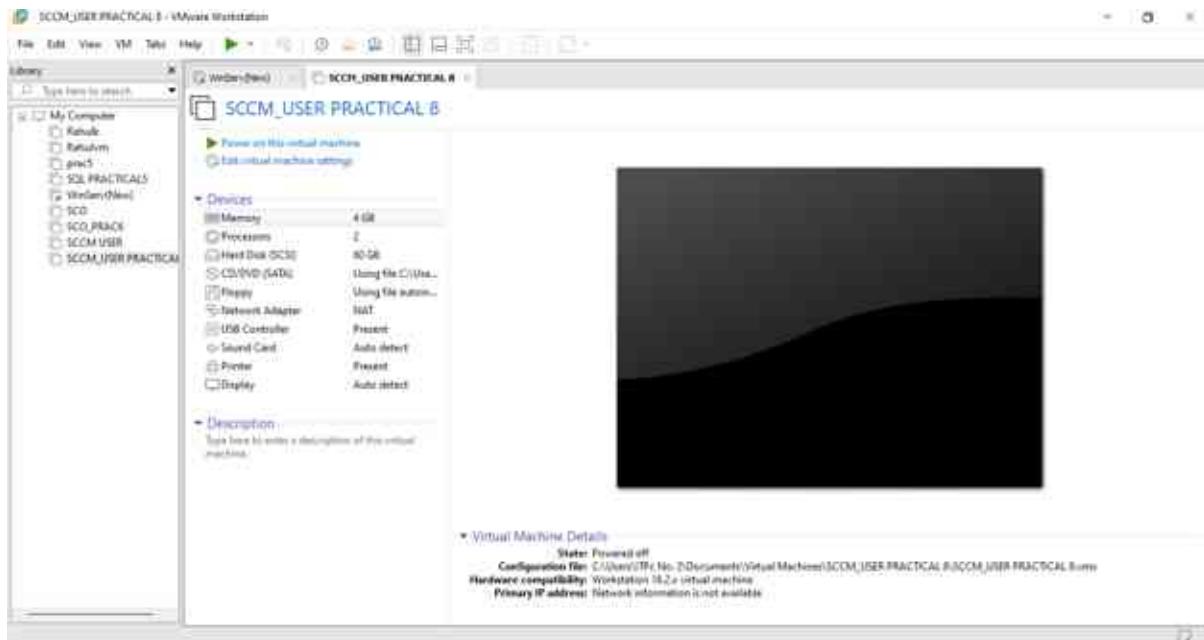
- Keep default values and Click on Next



- Click on Finish

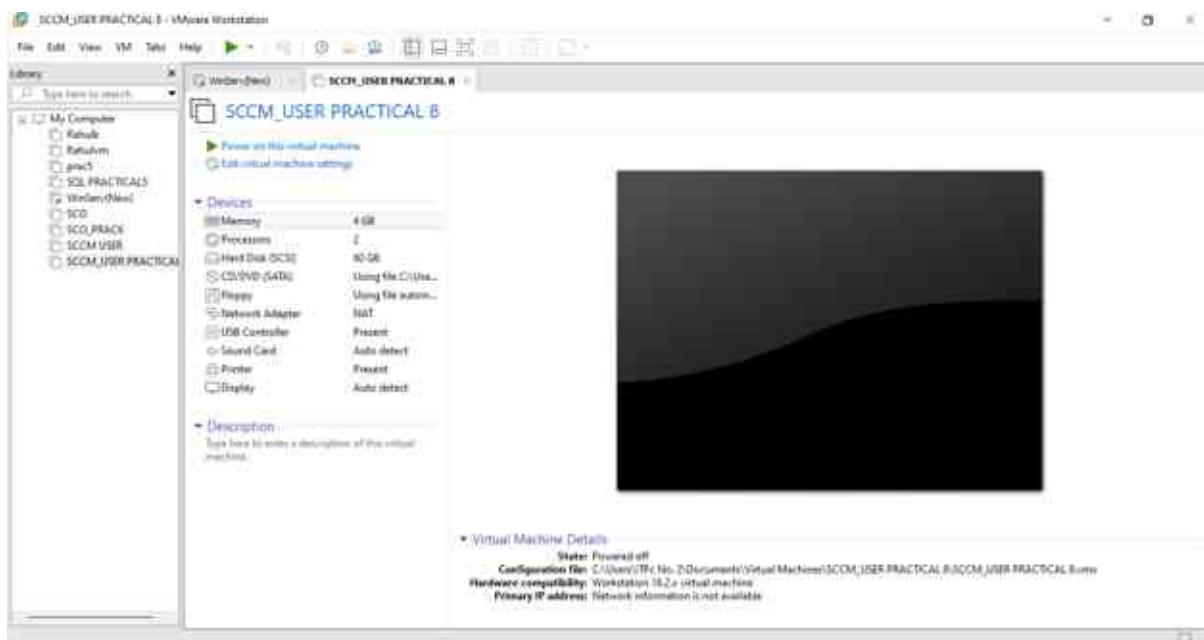


- Your Virtual Machine Has Been Created

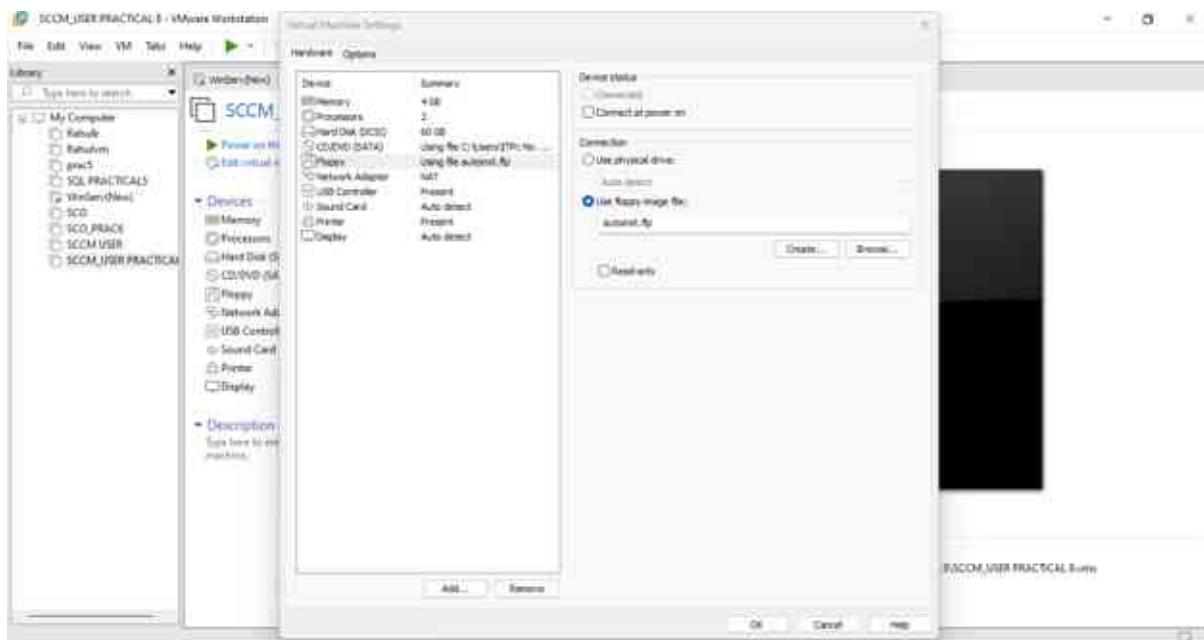


Step 2: Before Power on this virtual machine a few changes need to be in this **virtual machine settings**.

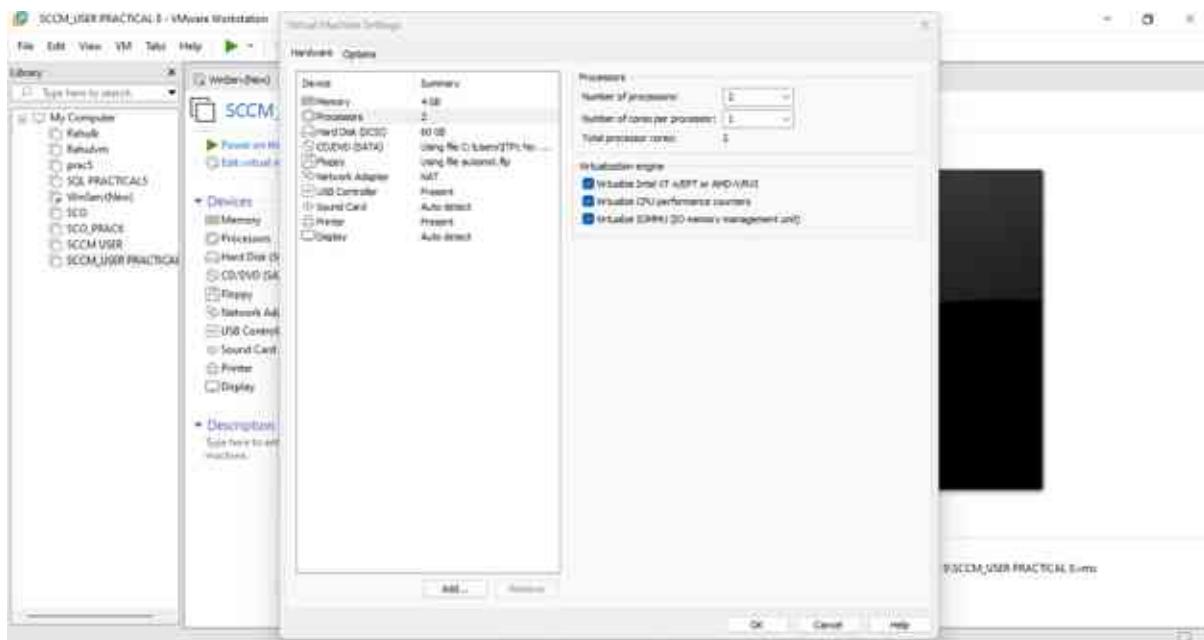
- Click on Edit virtual machine settings



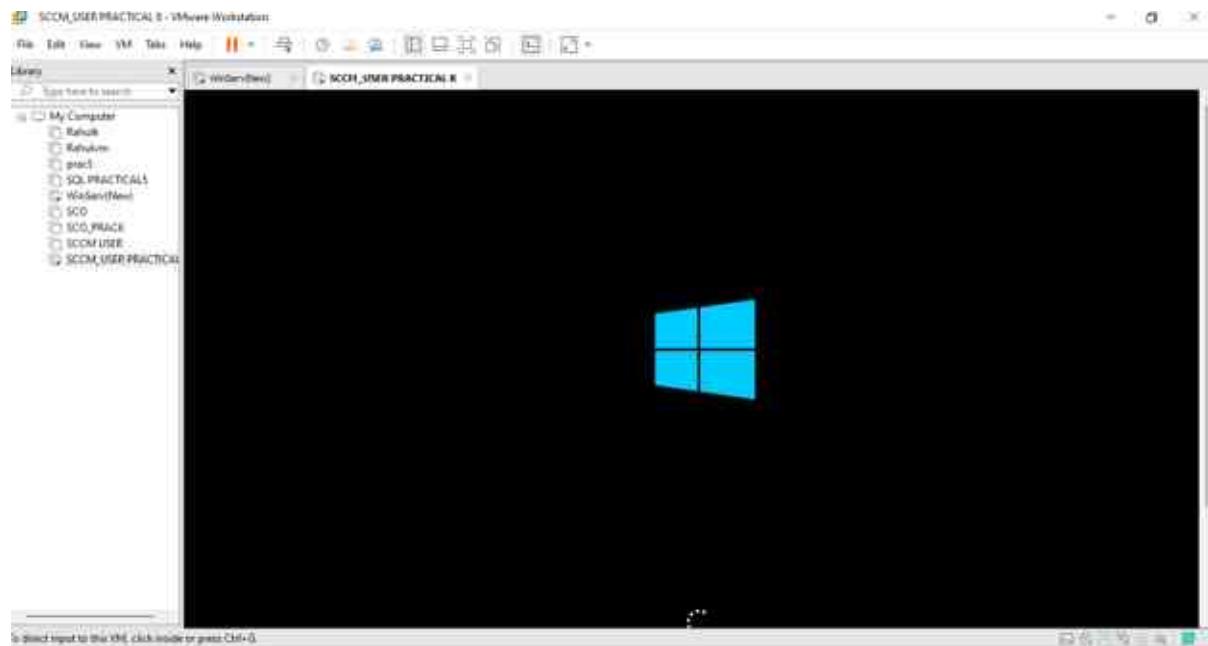
- Within virtual machine settings Select Floppy and Un-Click Connect on Power on and Click on OK



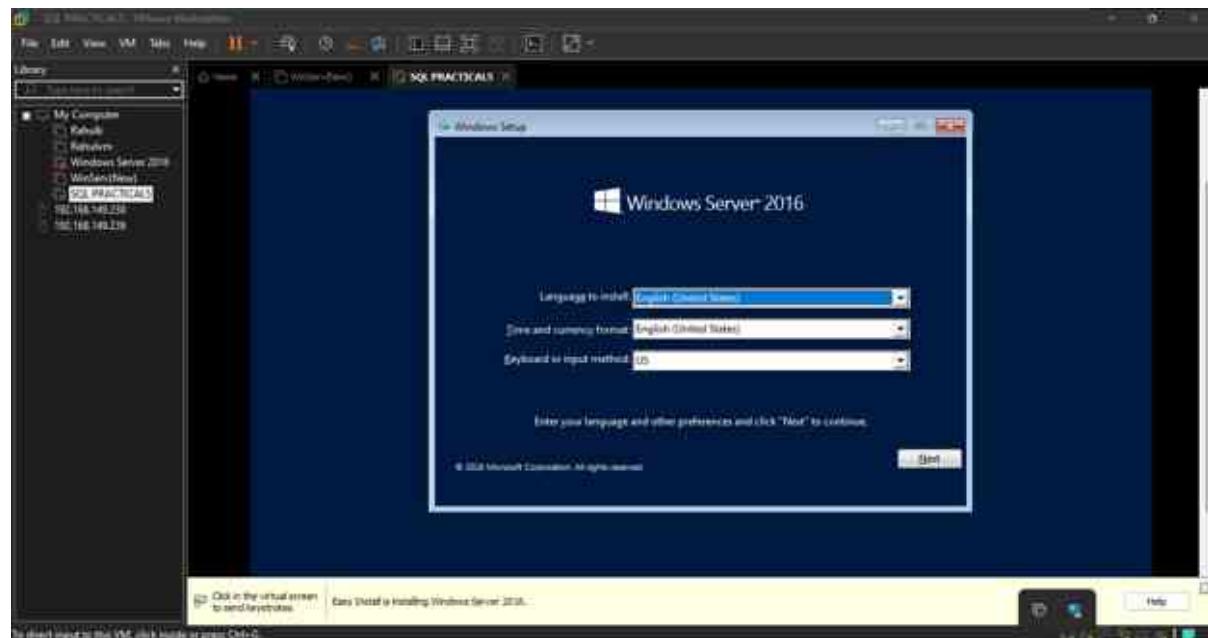
- Click on Processors Within Virtualization engine Check following features and Click on Ok



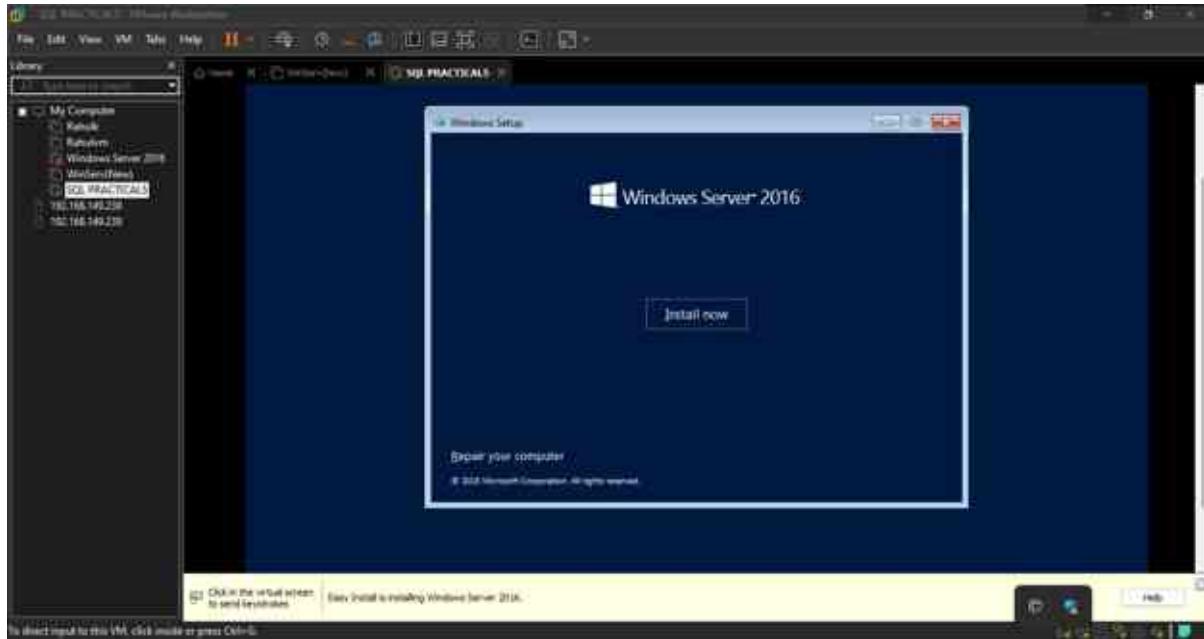
- Now Power On your virtual machine



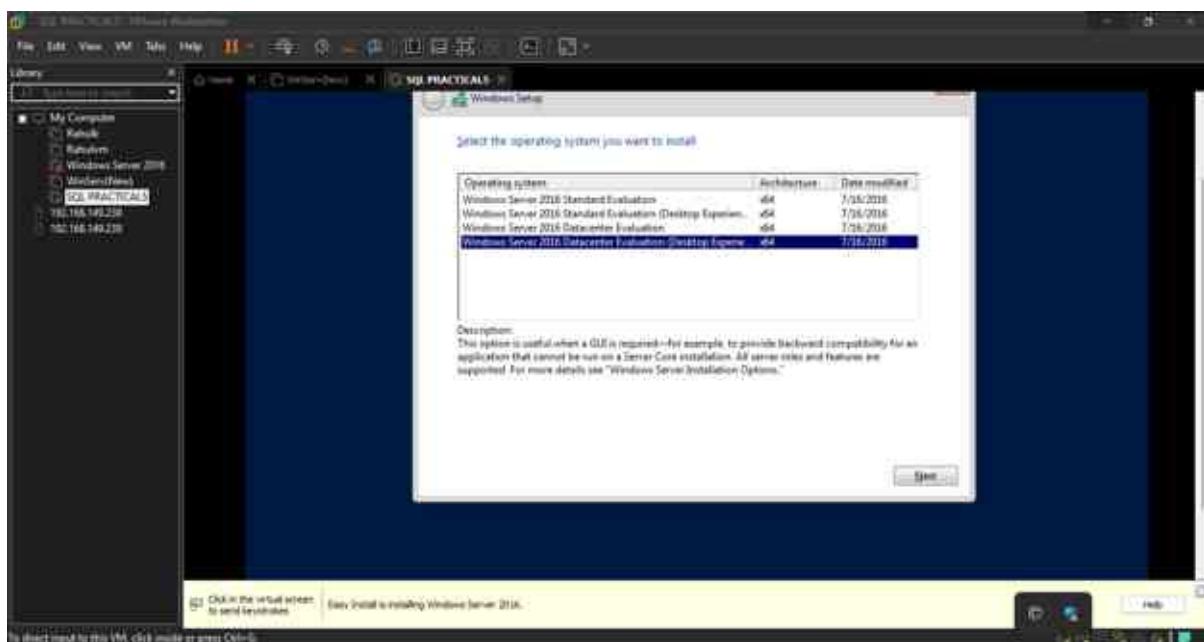
- Click on Next



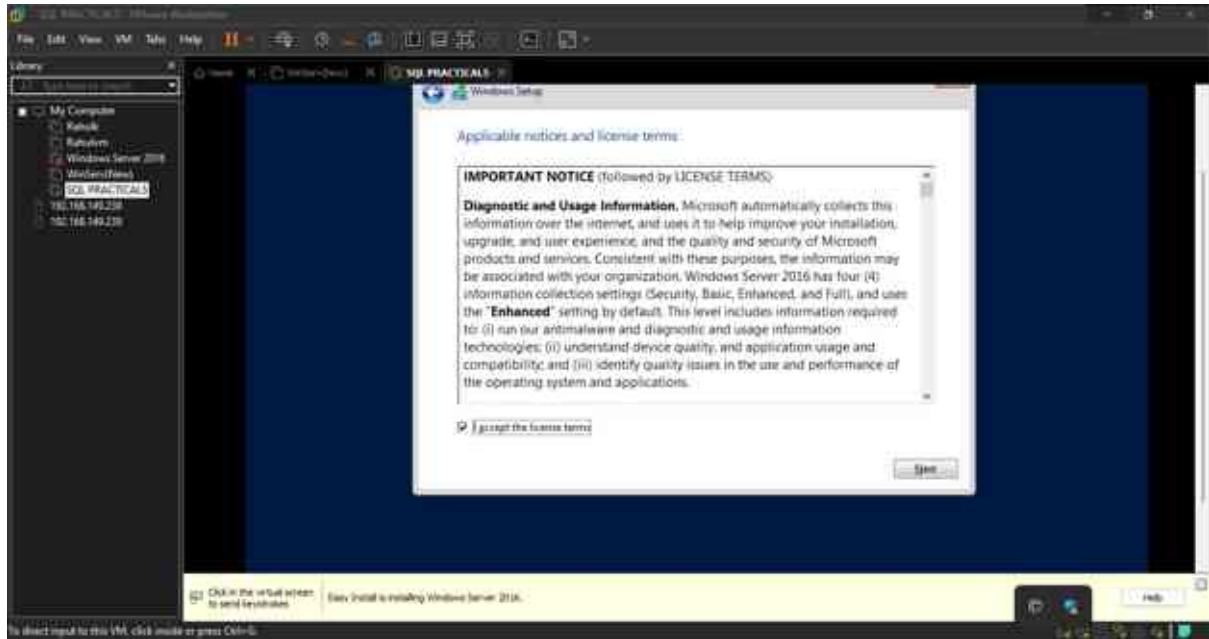
- Click on Install Now



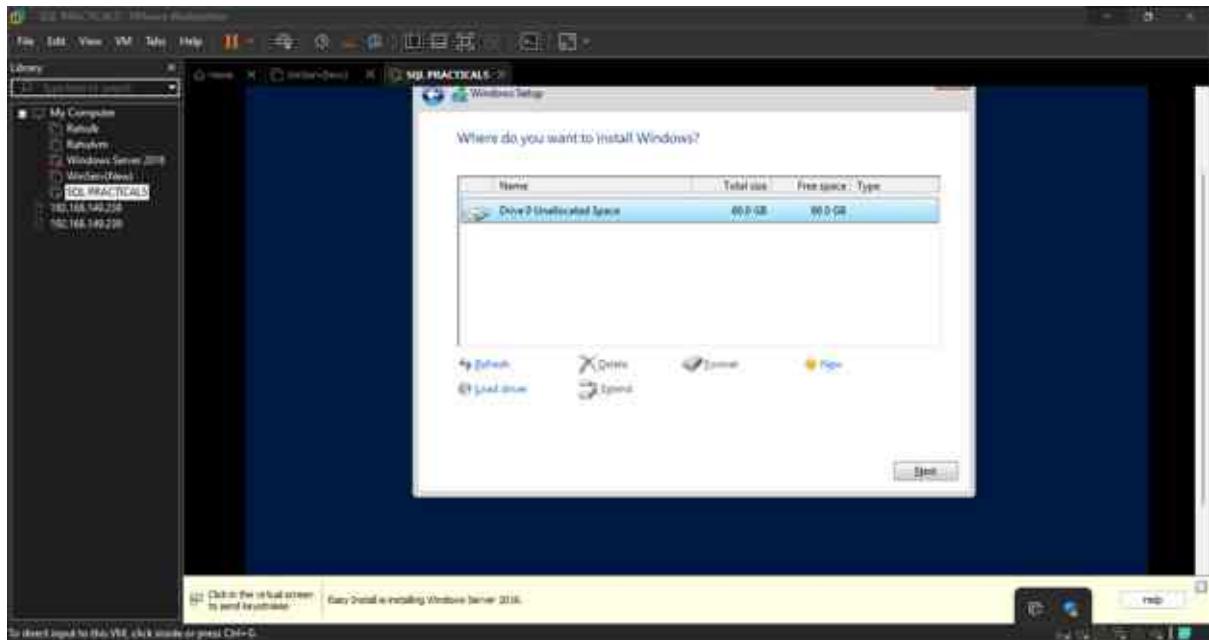
- Select Window Server 2016 Datacenter Evaluation (Desktop Experience) and Click on Next



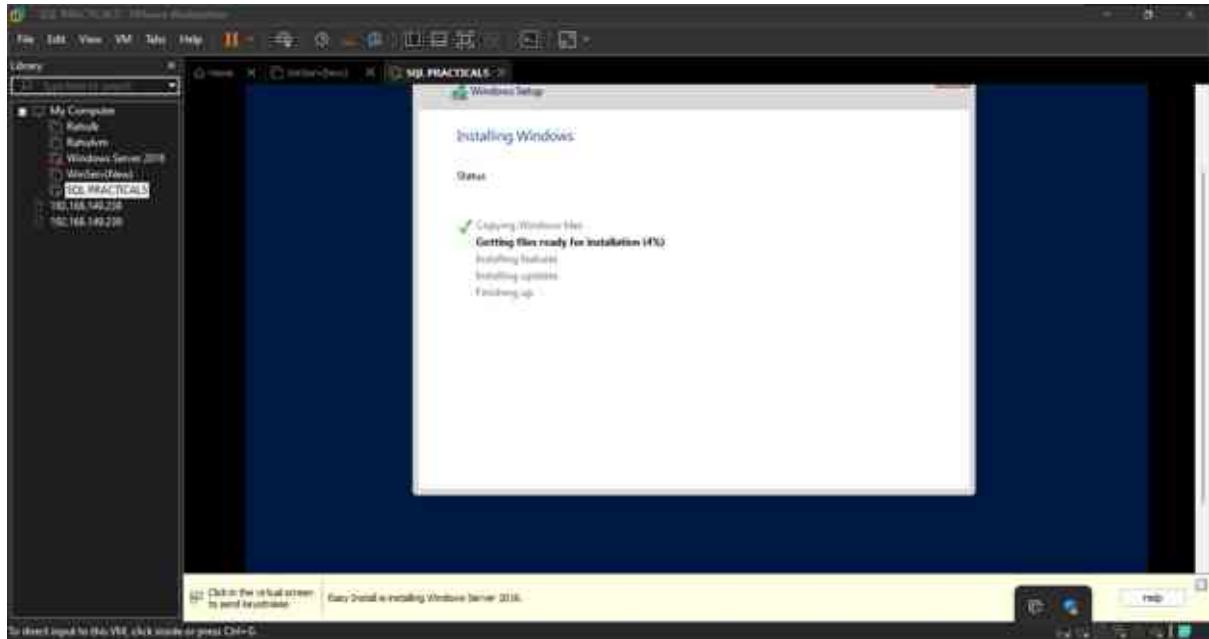
- Select I accept the license and Click on Next



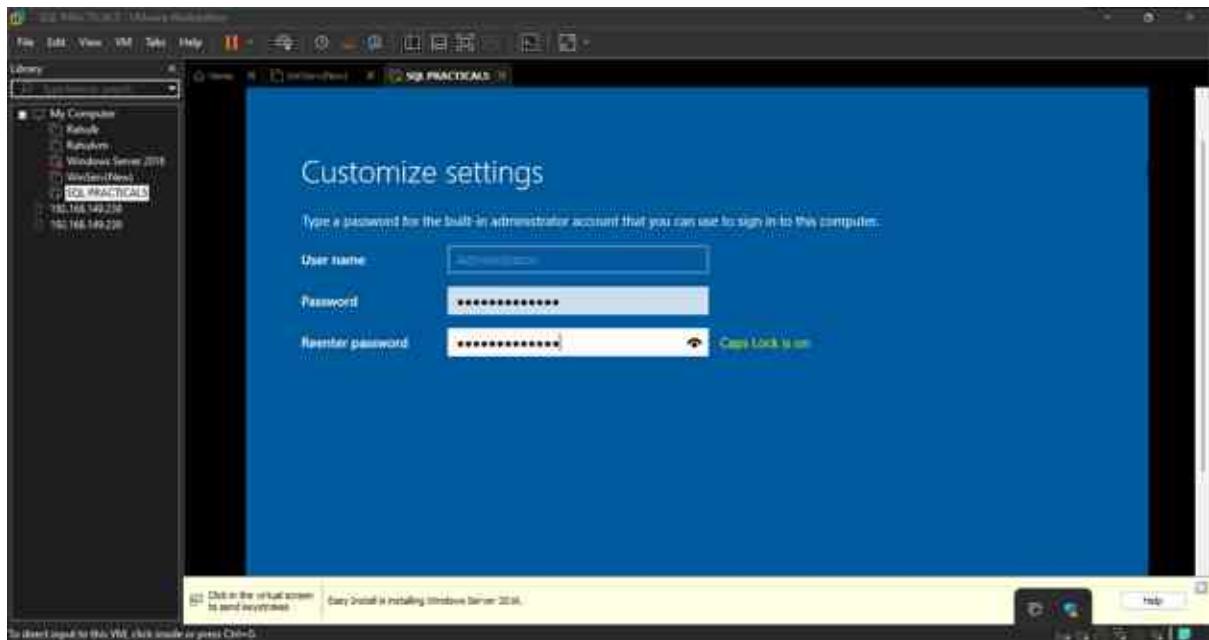
- Keep default settings and Click on Next



- Windows Server will begin installing



- After installation type in a password for the Windows Server and Click Finish

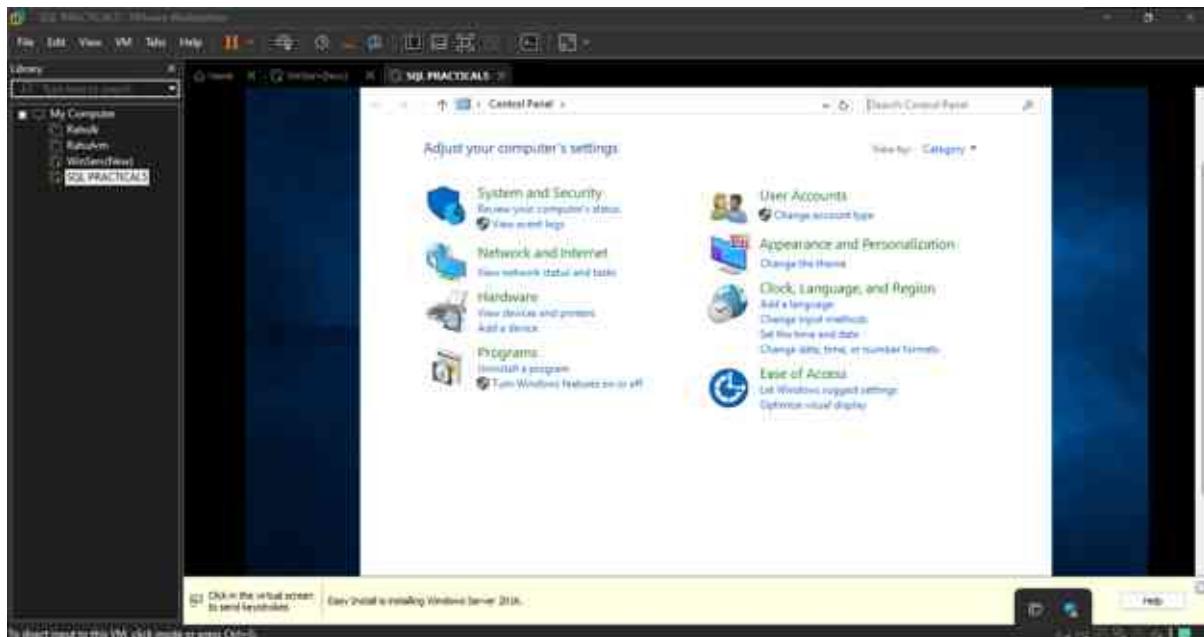


- Your Windows Server has now been successfully created

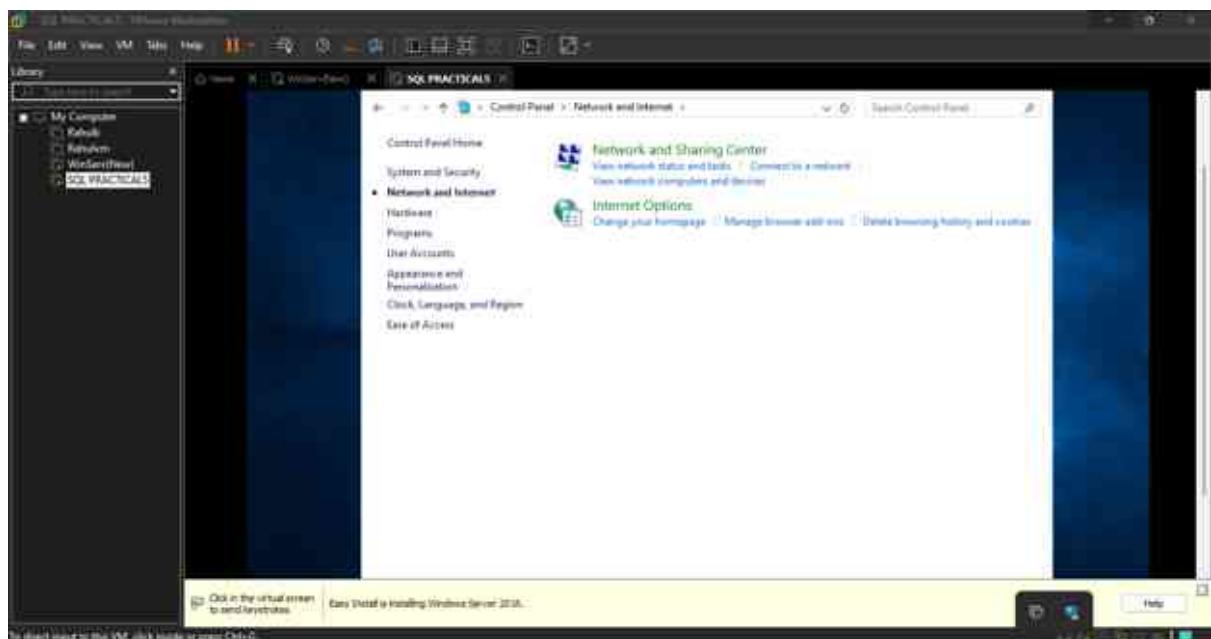


Step 3: Establishing a connection with the User VM and Domain Controller by connecting the User VM to the Domain Controller's Workgroup

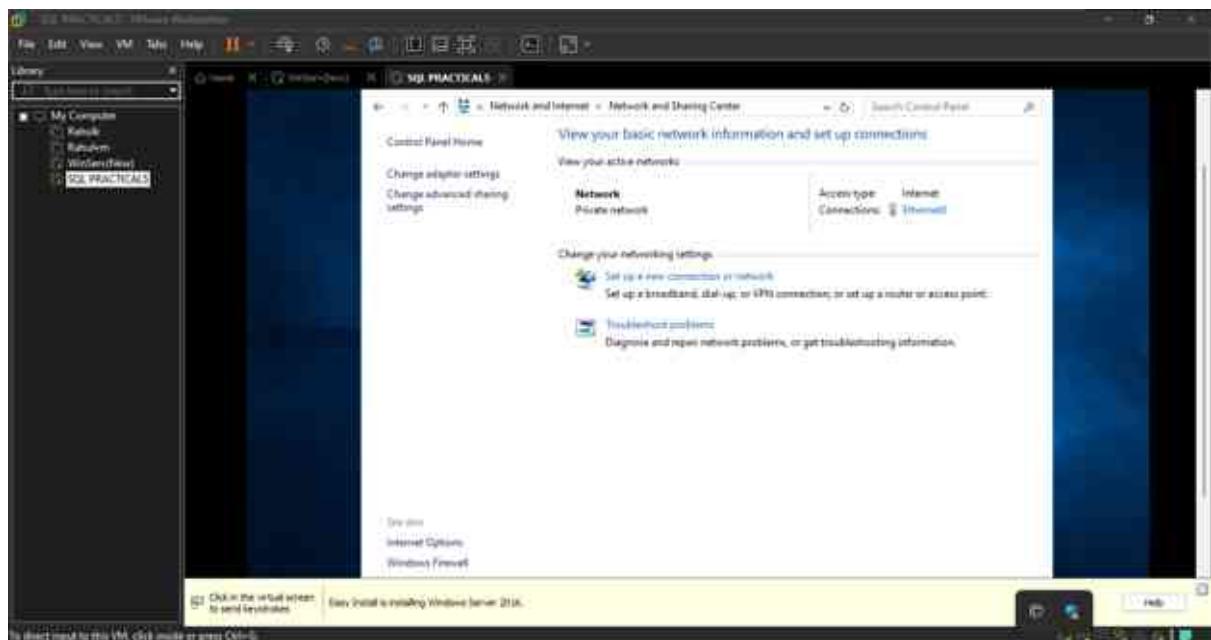
- Open **Control Panel** and **Click on Network and Internet**



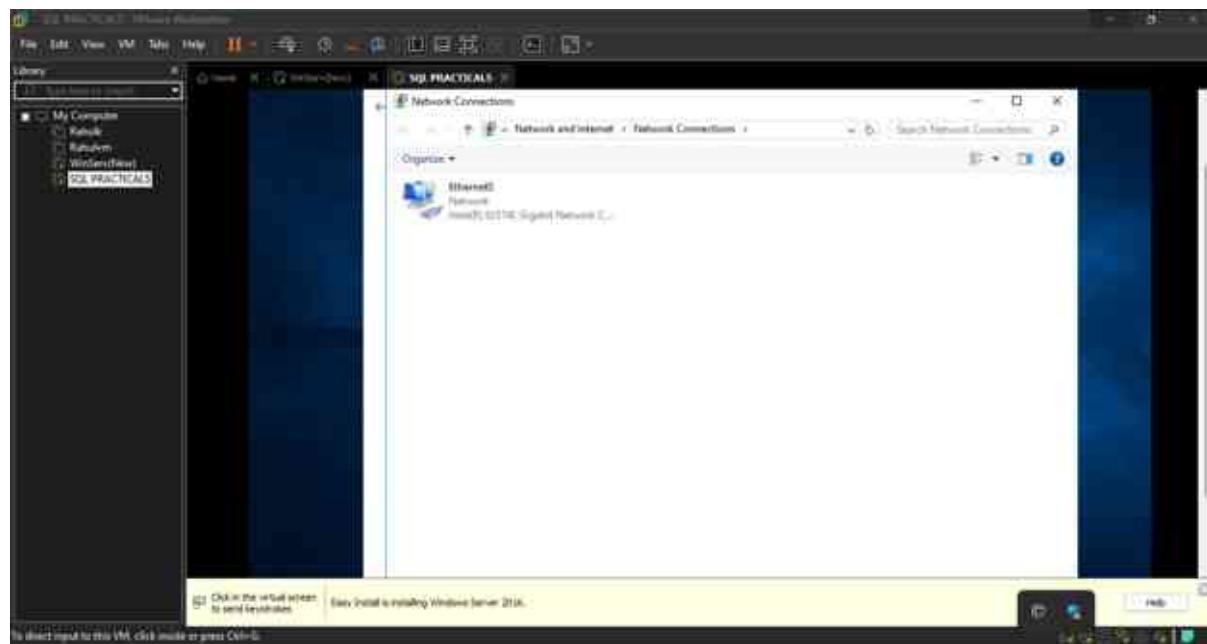
- Click on Network and Sharing Center



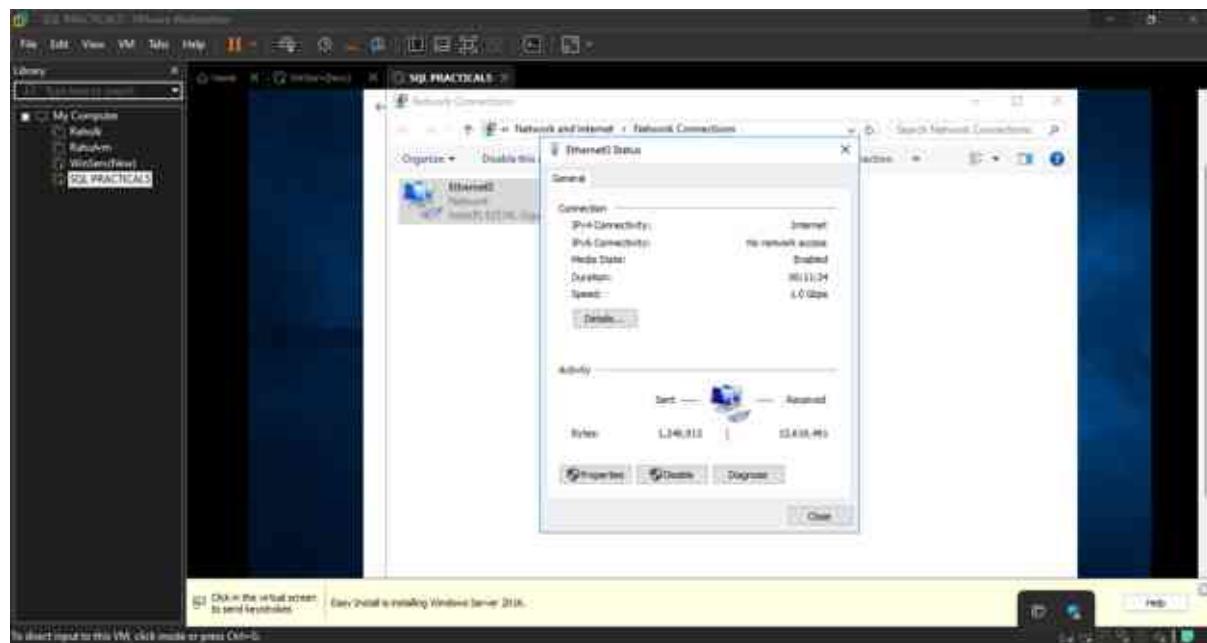
- Click on Change adapter settings



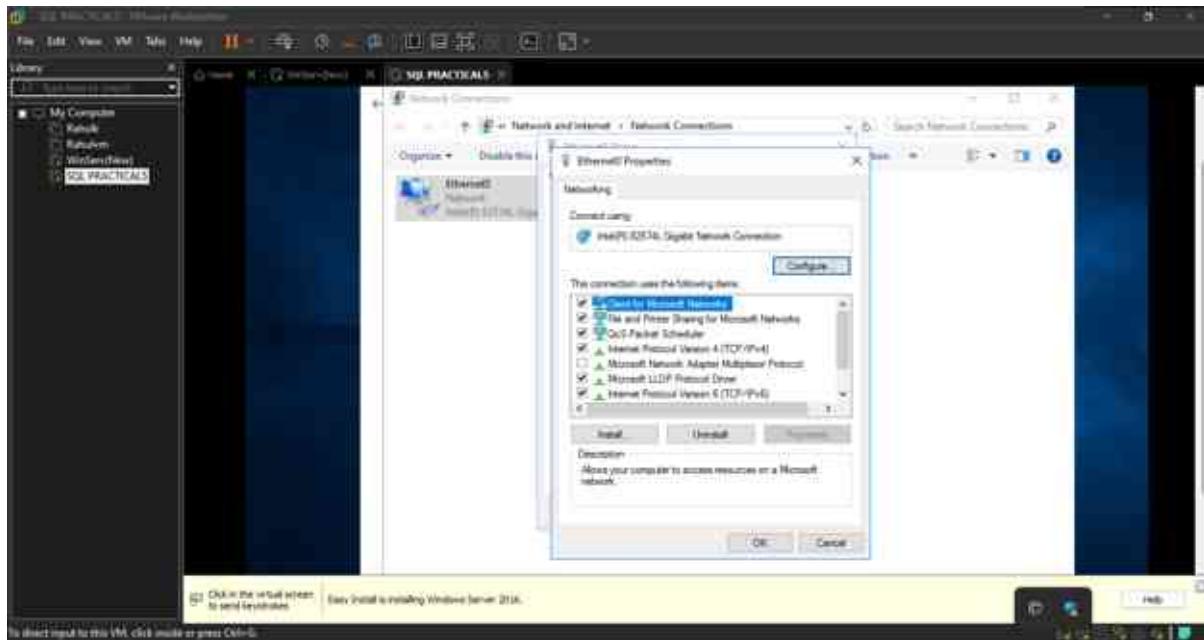
- Right Click on Ethernet0 and Select Properties



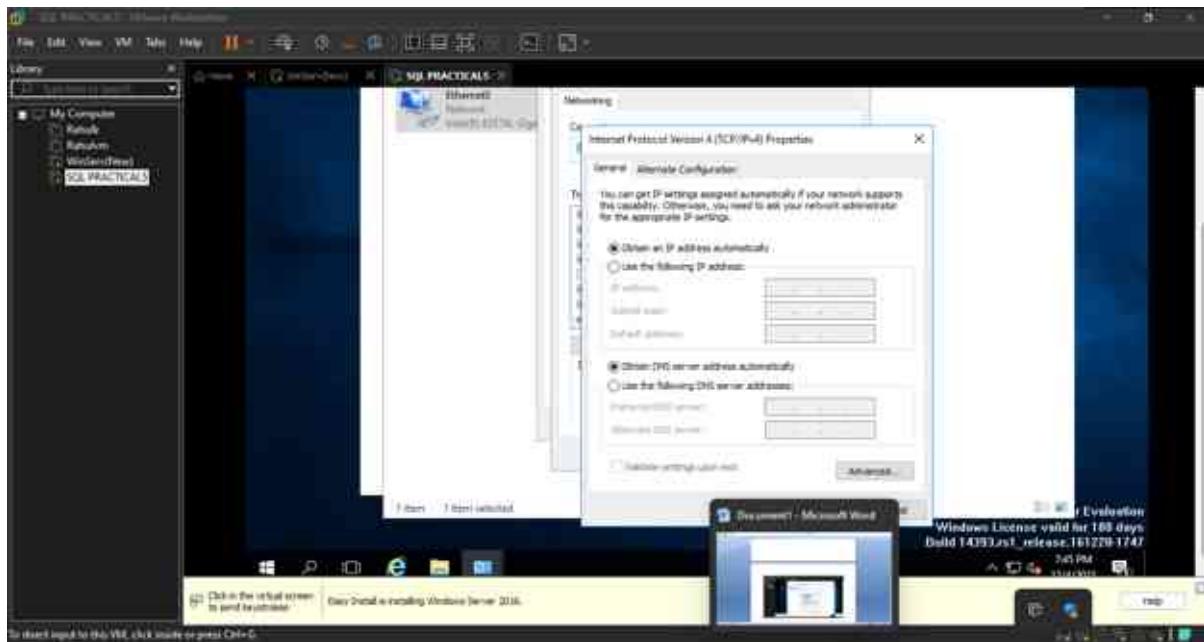
- Within Ethernet0 Status Click on Properties



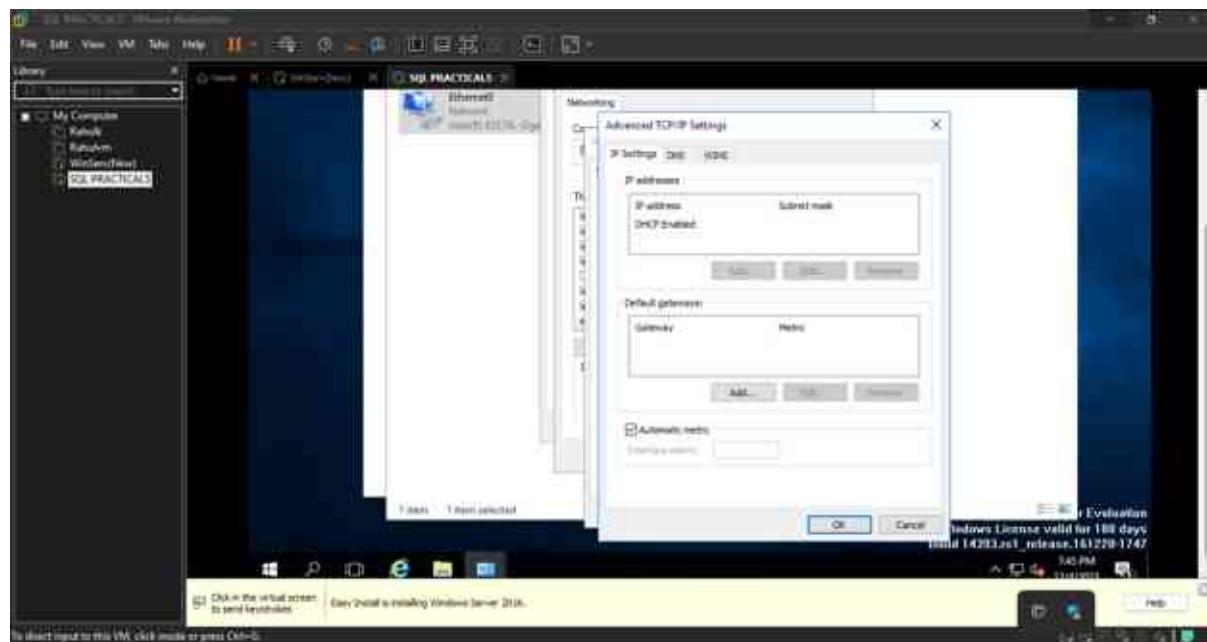
- Click on Internet Protocol Version 4



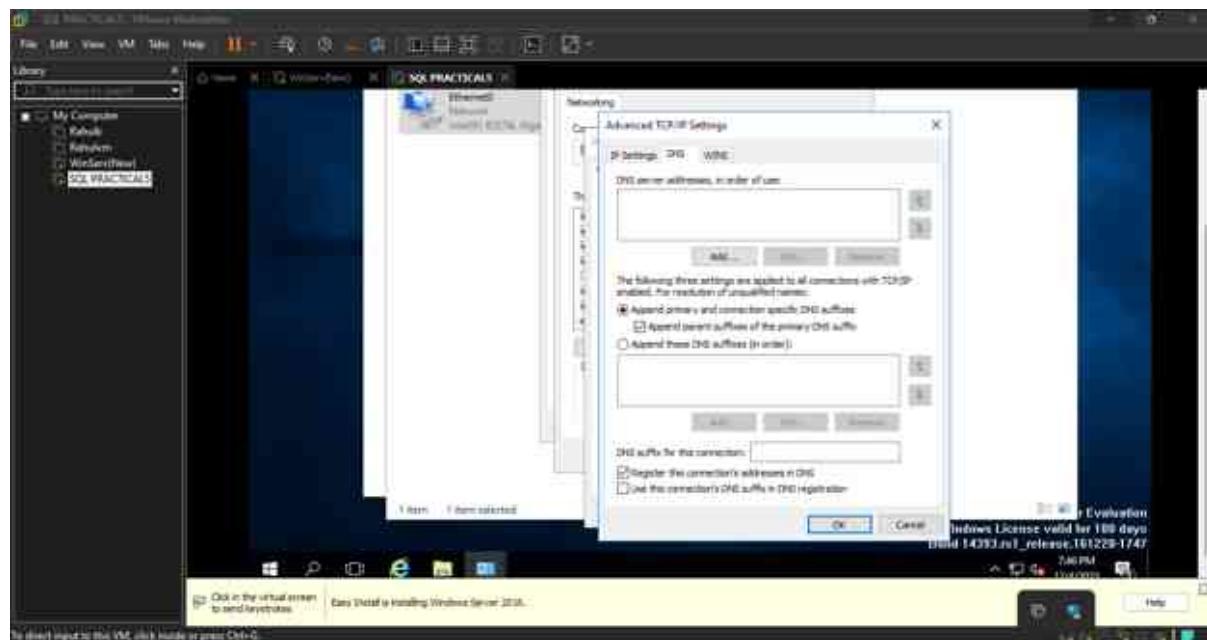
- Click on Advanced



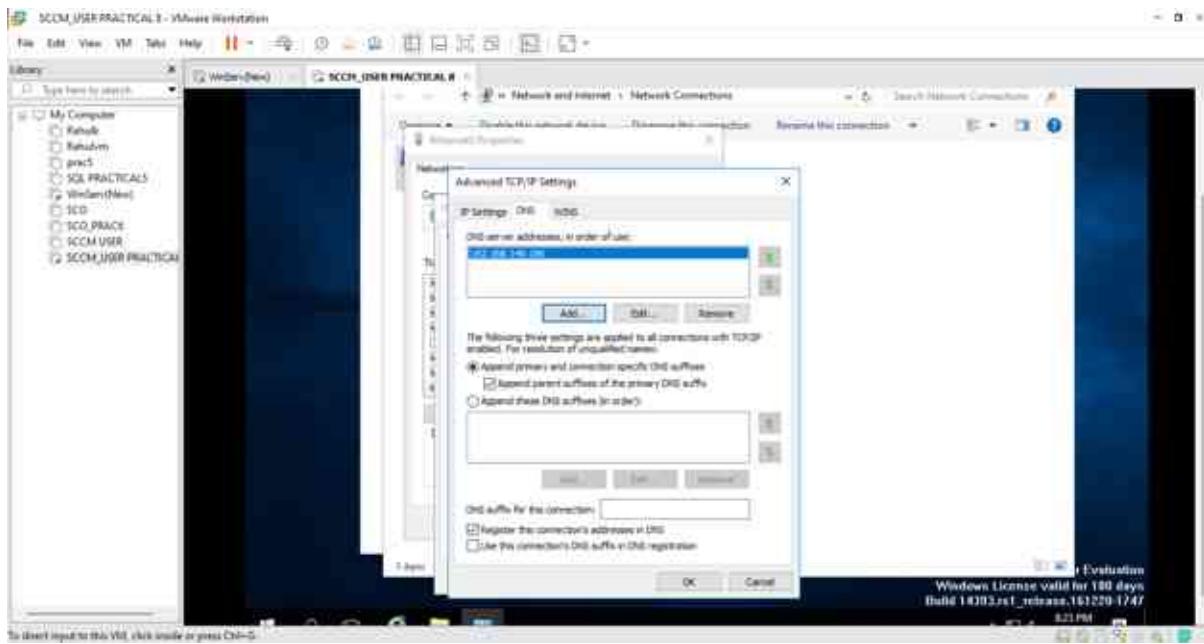
- Click on DNS



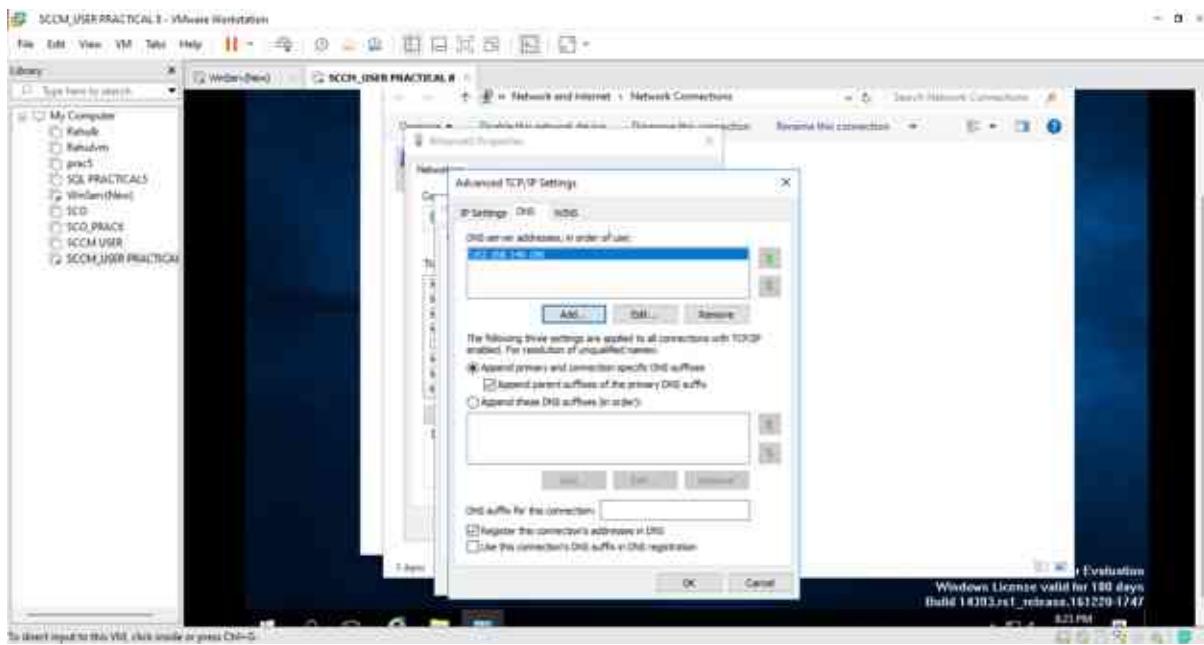
- Click on Add



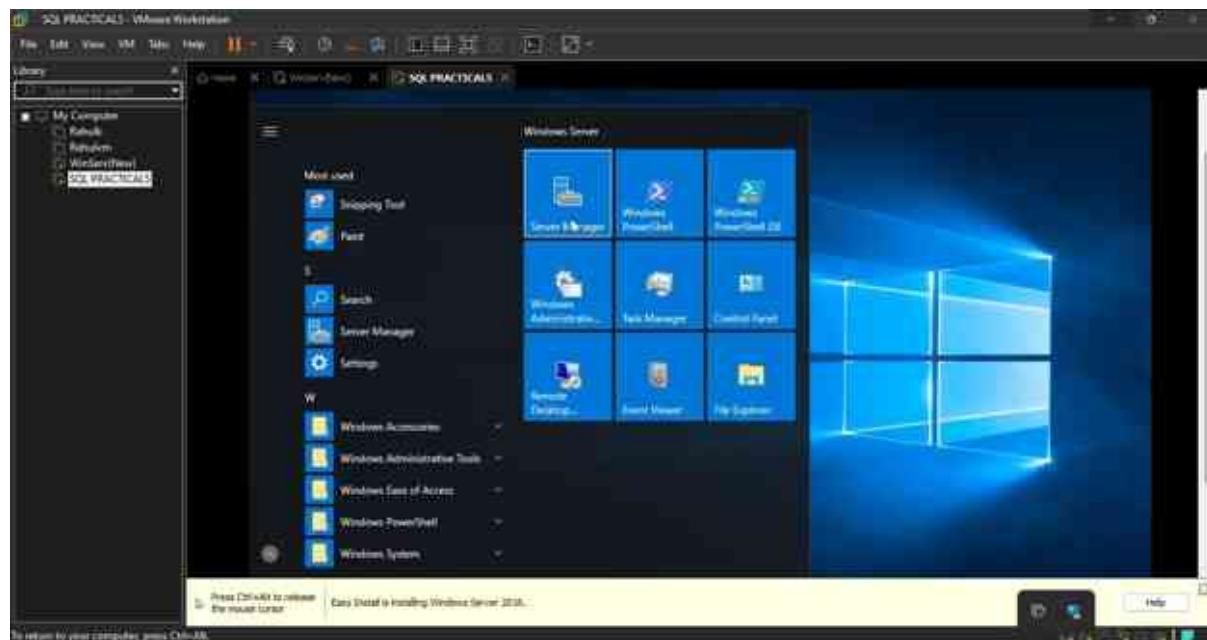
- Add the IP Address of the Domain Controller and Click Ok



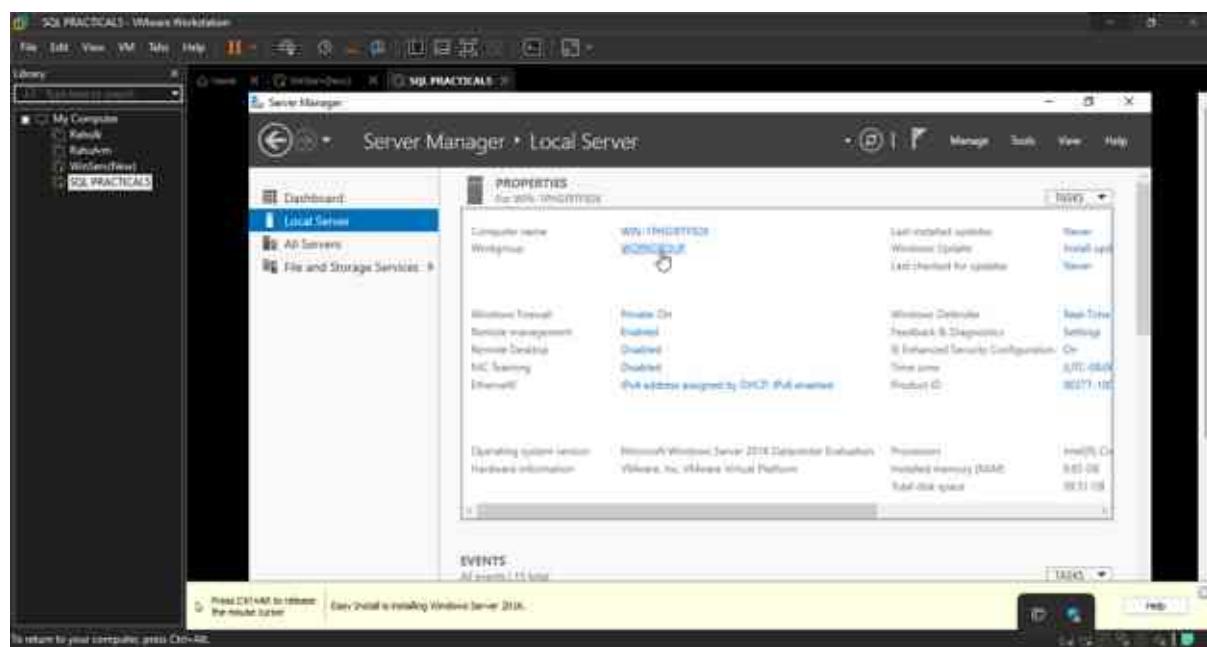
- Click on Ok



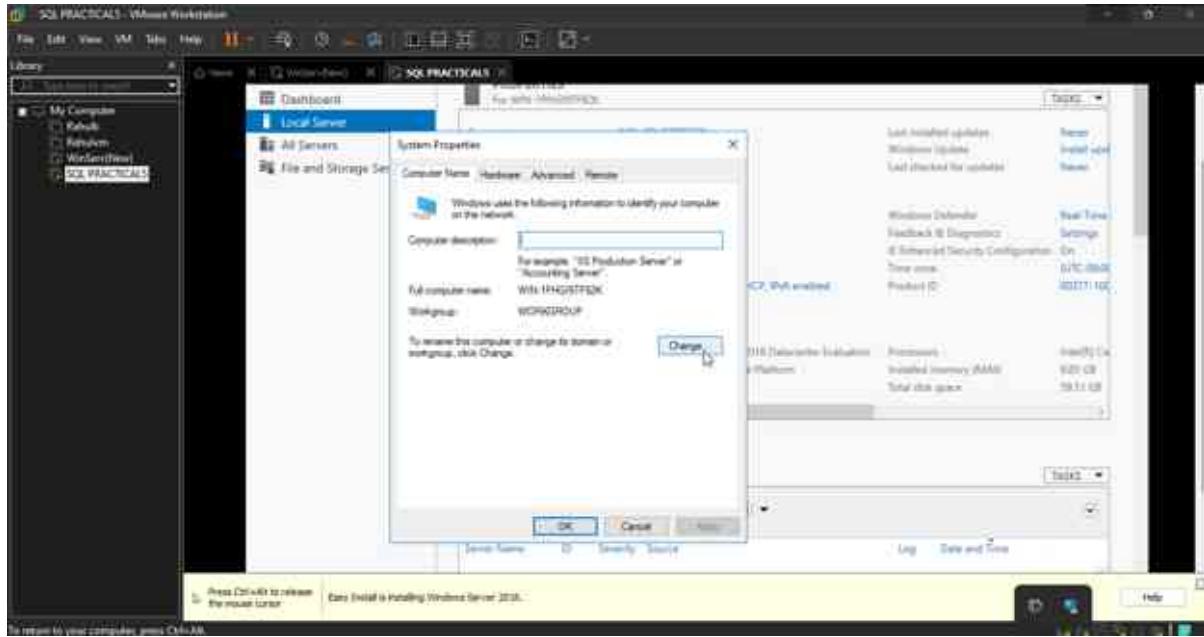
- Now Exit out of **network settings** and Click on **Server Manager**



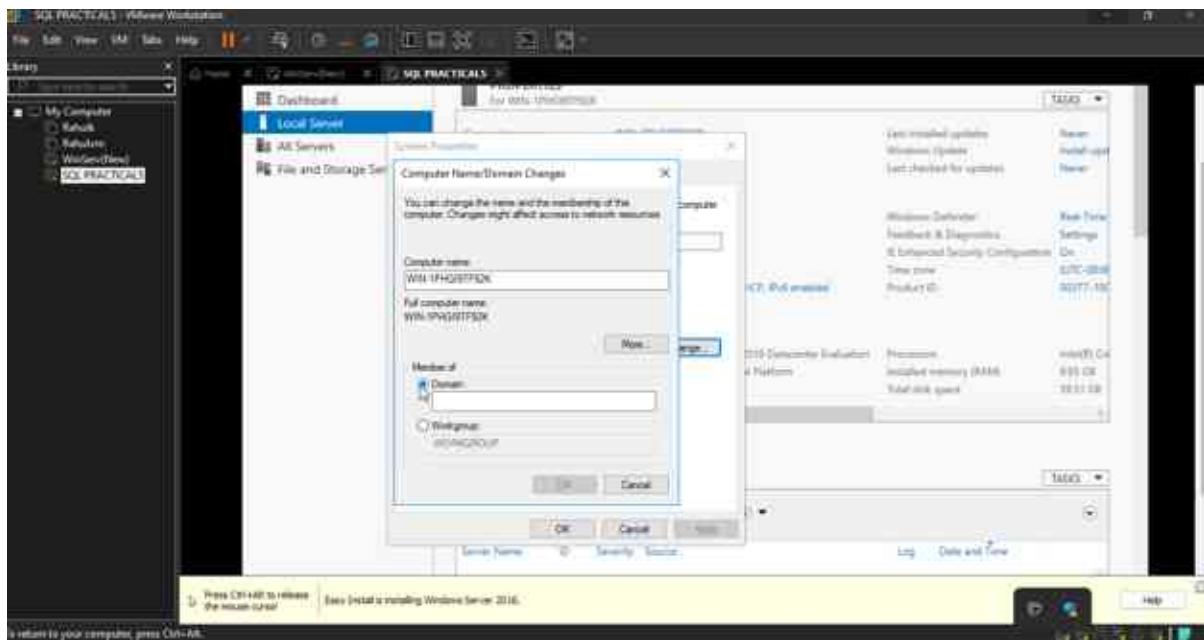
- Within **Server Manager** Click on **Local Server** and Select **Workgroup**



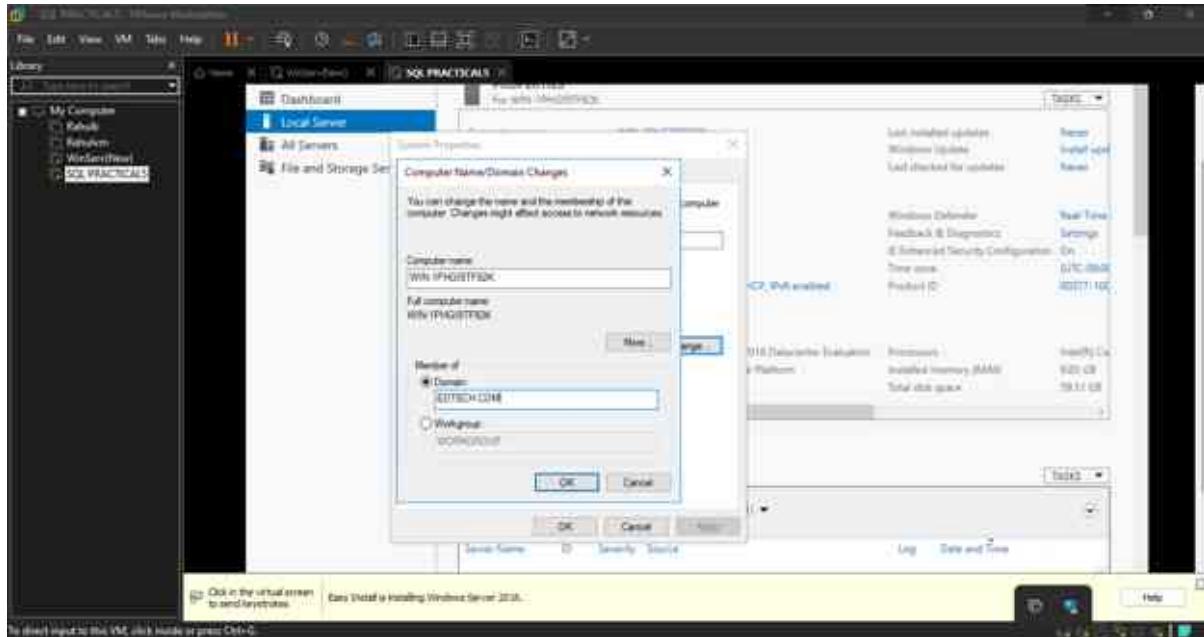
- Click on Change



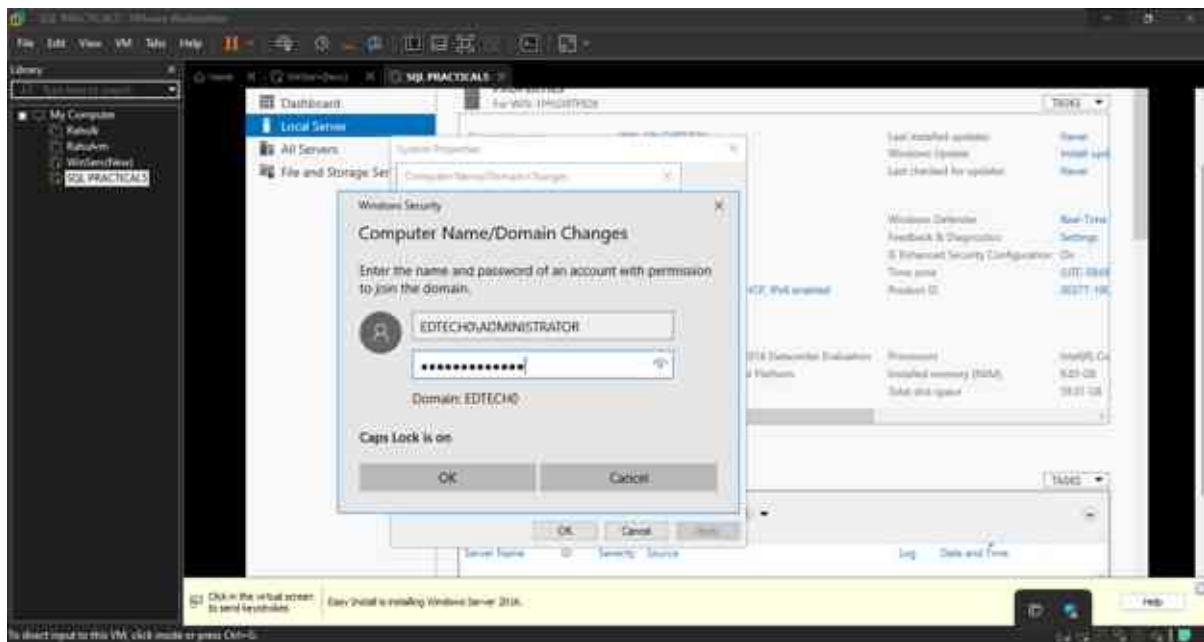
- Click on Domain



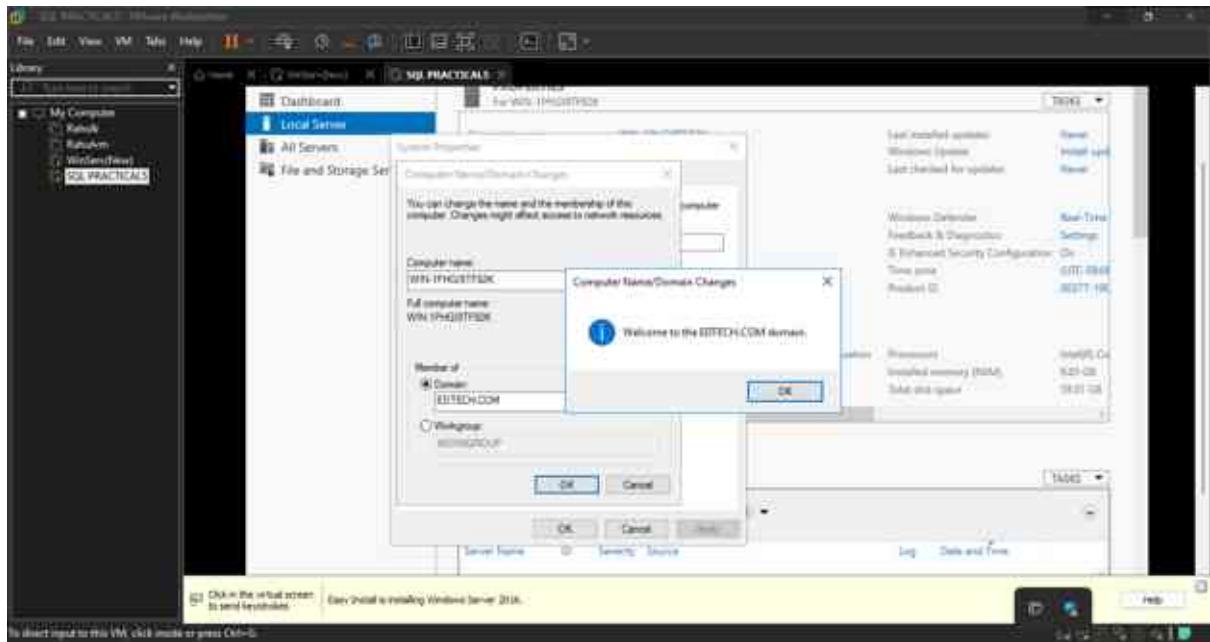
- Type the **Domain name** (here it is **EDTECH.COM**) and **Click Ok**



- Enter the **credentials of the Domain Controller** and **Click on Ok**

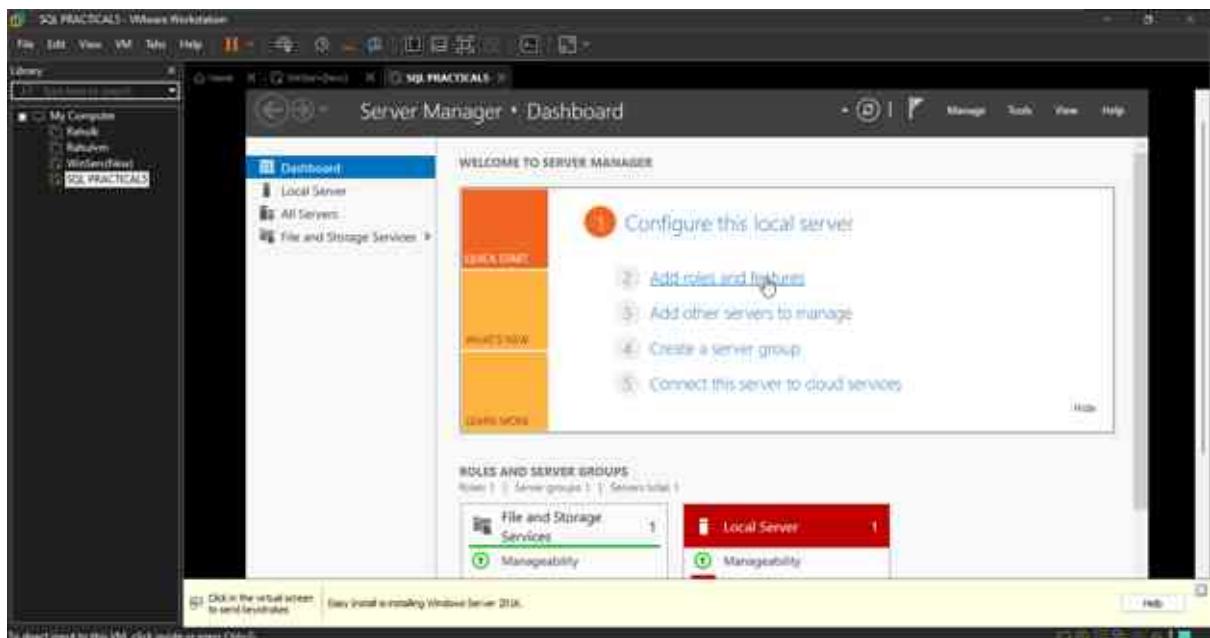


- The User VM is now in the same Domain as the Domain Controller and the system will require a restart for the changes to take effect

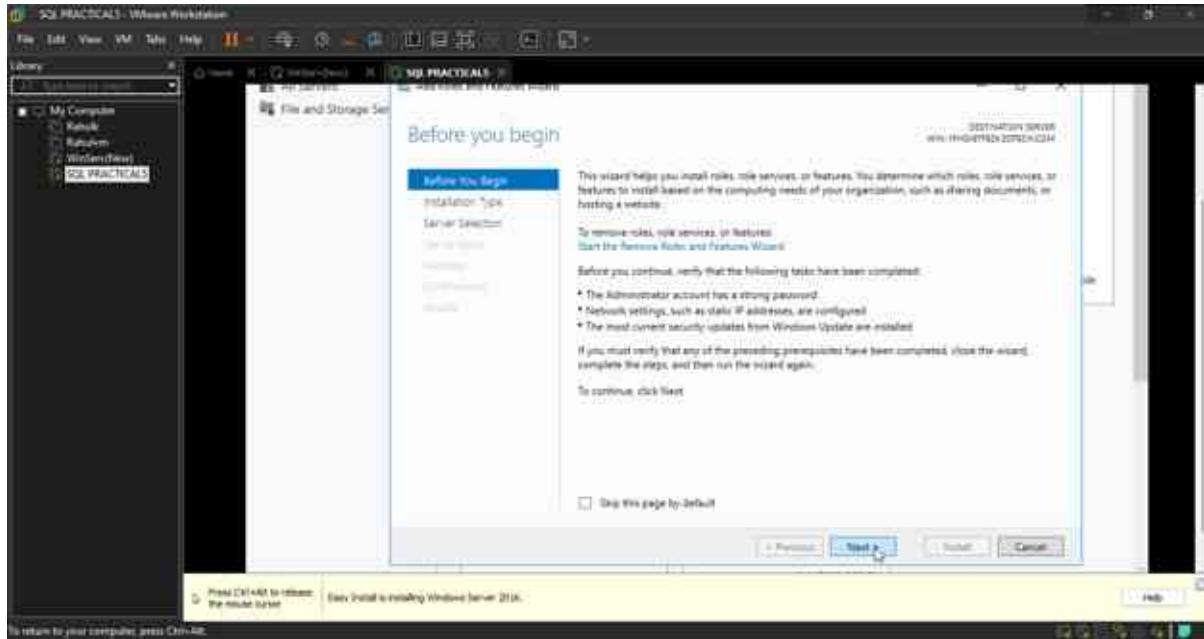


Step 4: Creation of User (SCCM_USER PRACTICAL 8)

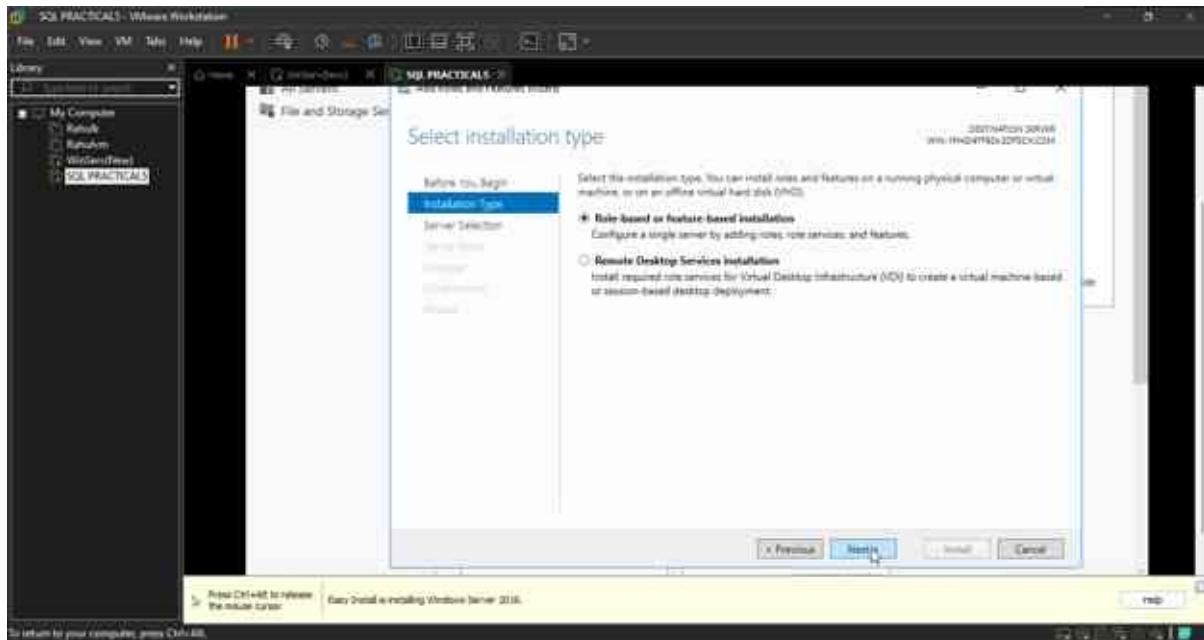
- To create a User first we require the Active Directory Domain Service which can be added through the Server Manager
- Open Server Manager and Click on Add Roles and Features**



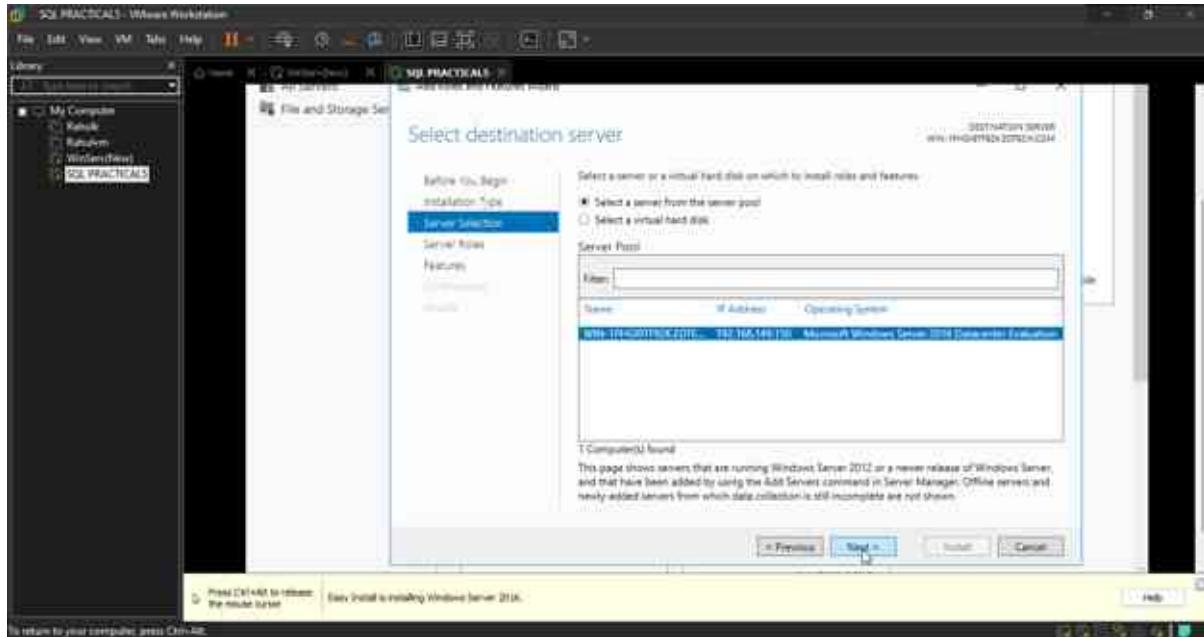
- Click on Next



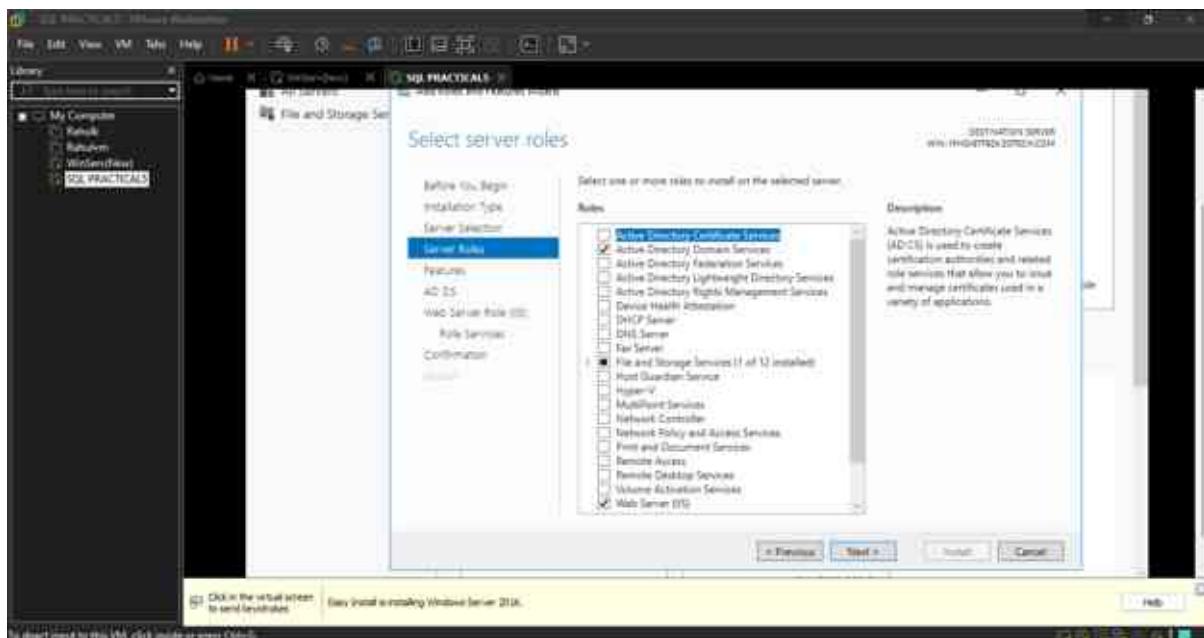
- Select Role-based or Feature-based installation and Click Next



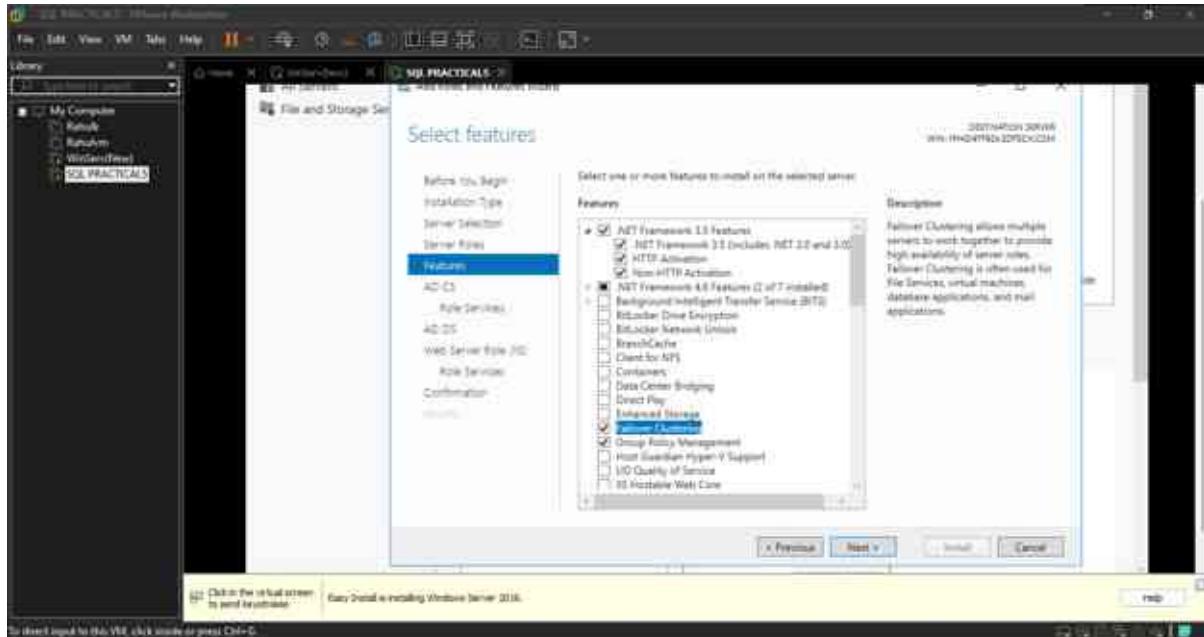
- Keep default settings and Click on Next



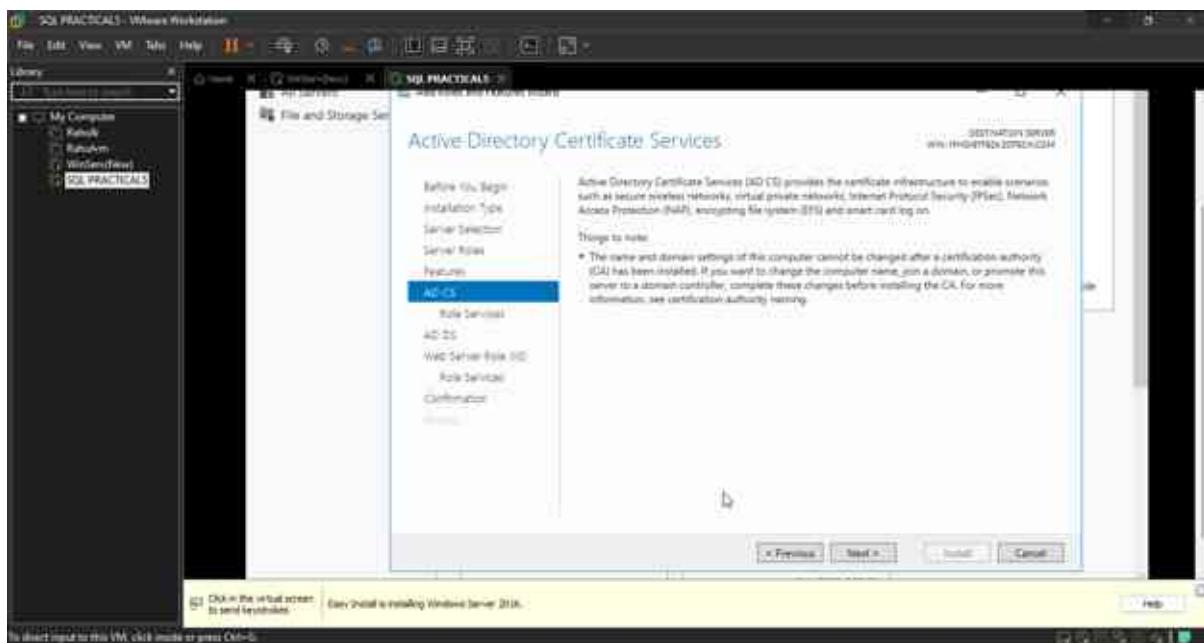
- Select Active Directory Domain Service and Click on Add Feature and Click on Next



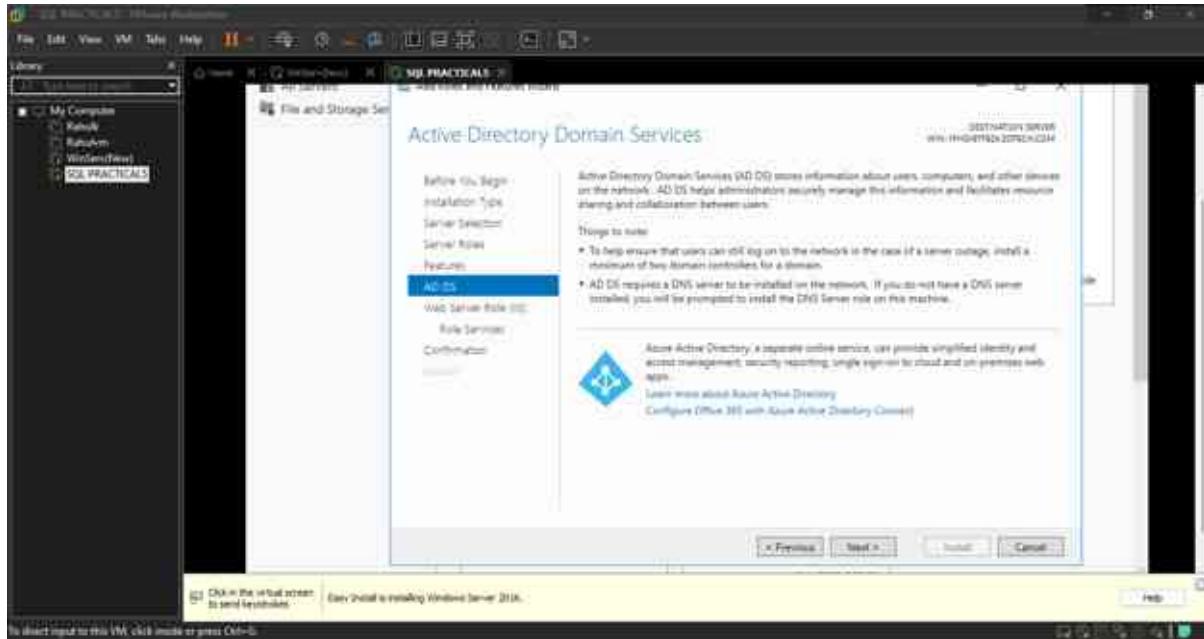
- Select the following feature and Click on Next



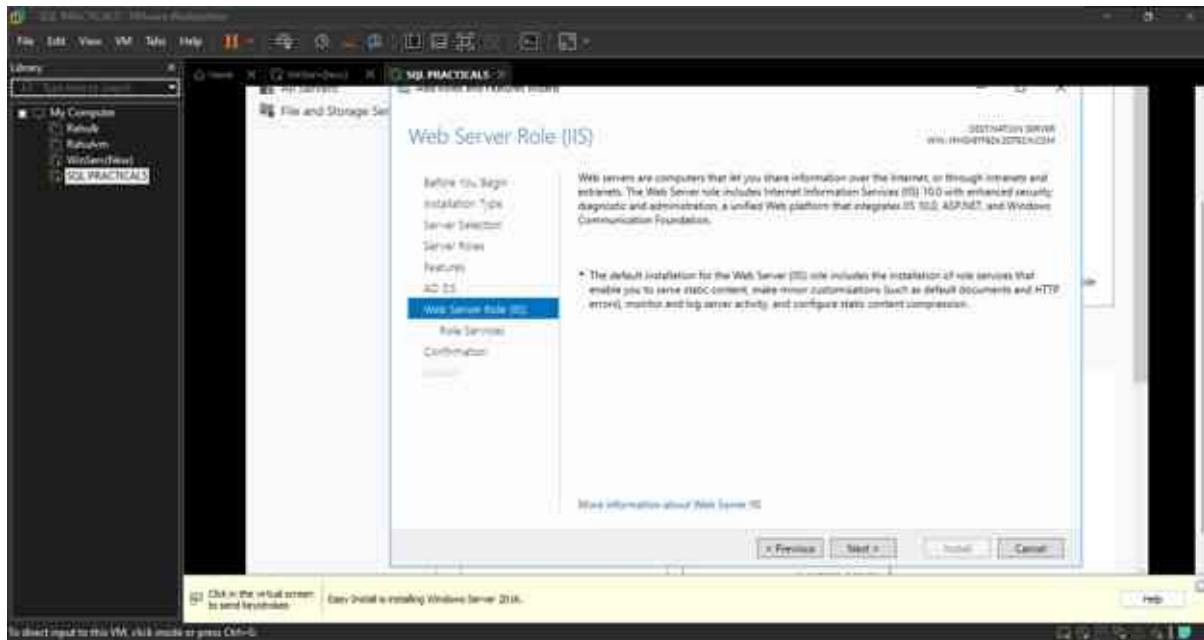
- Click on Next



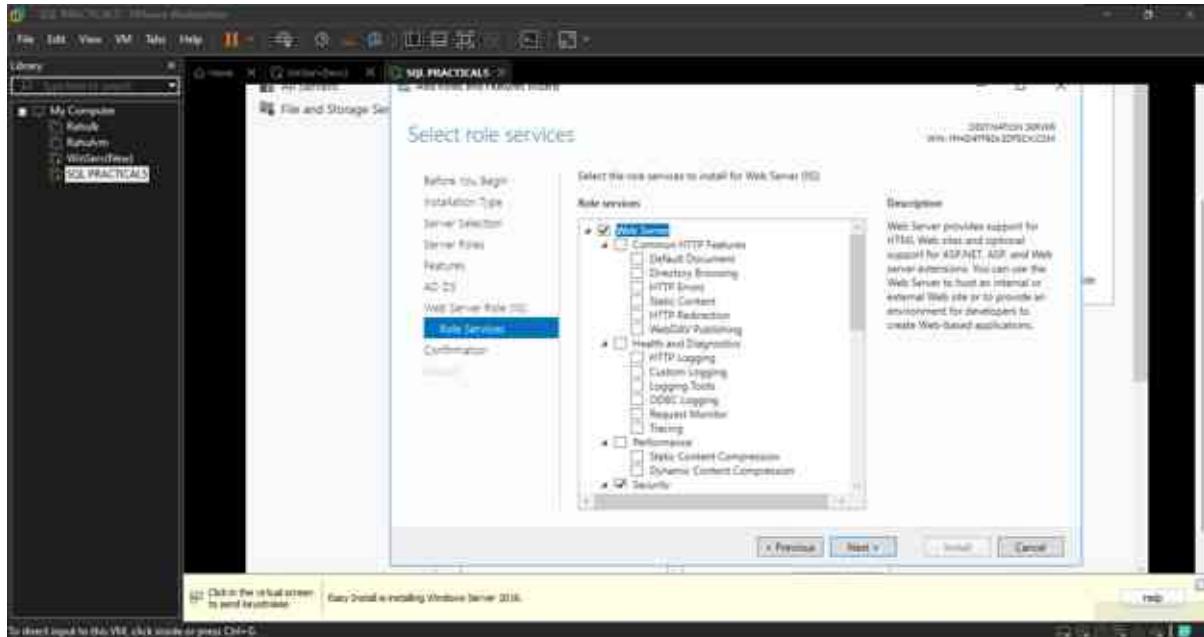
- Click on Next



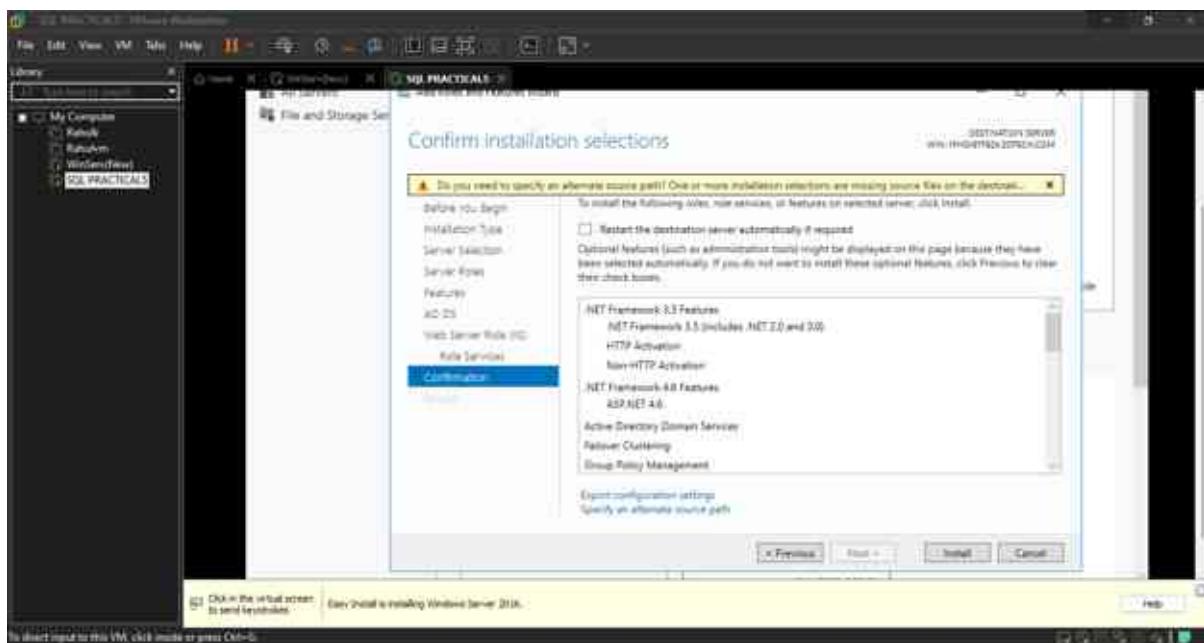
- Click on Next



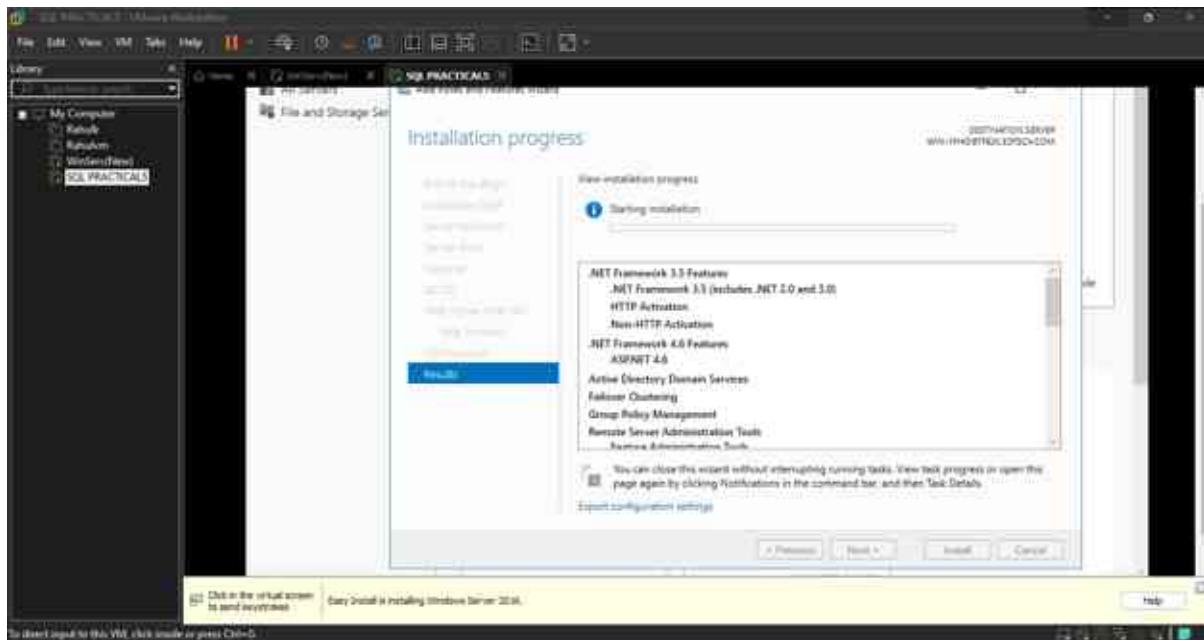
- Click on Next



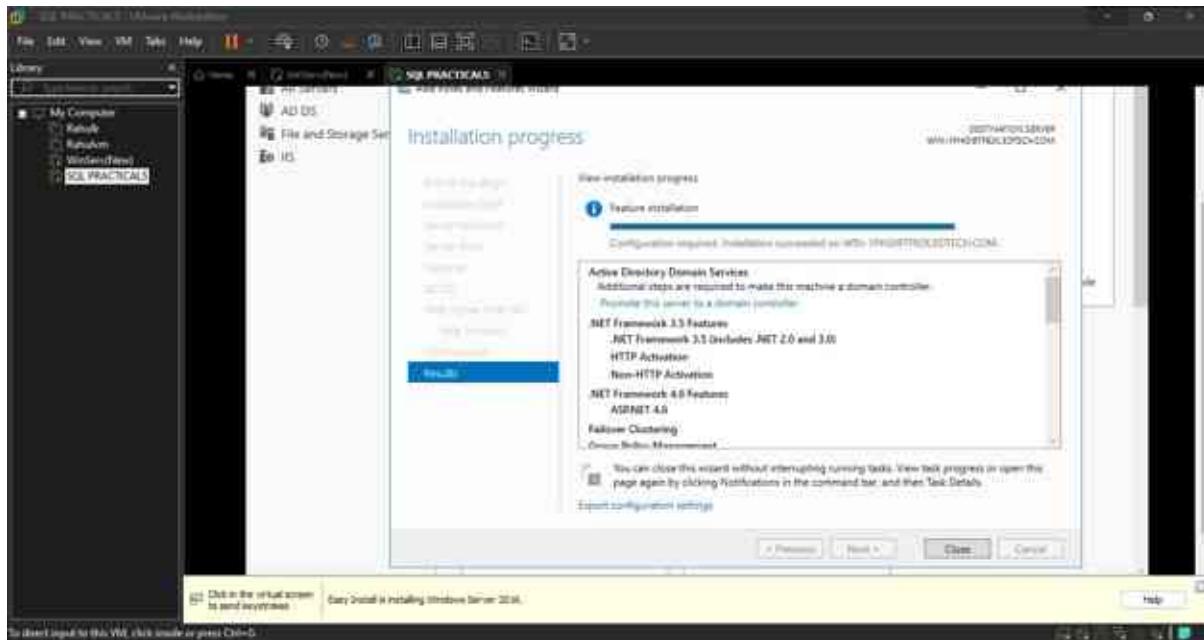
- Click on Install



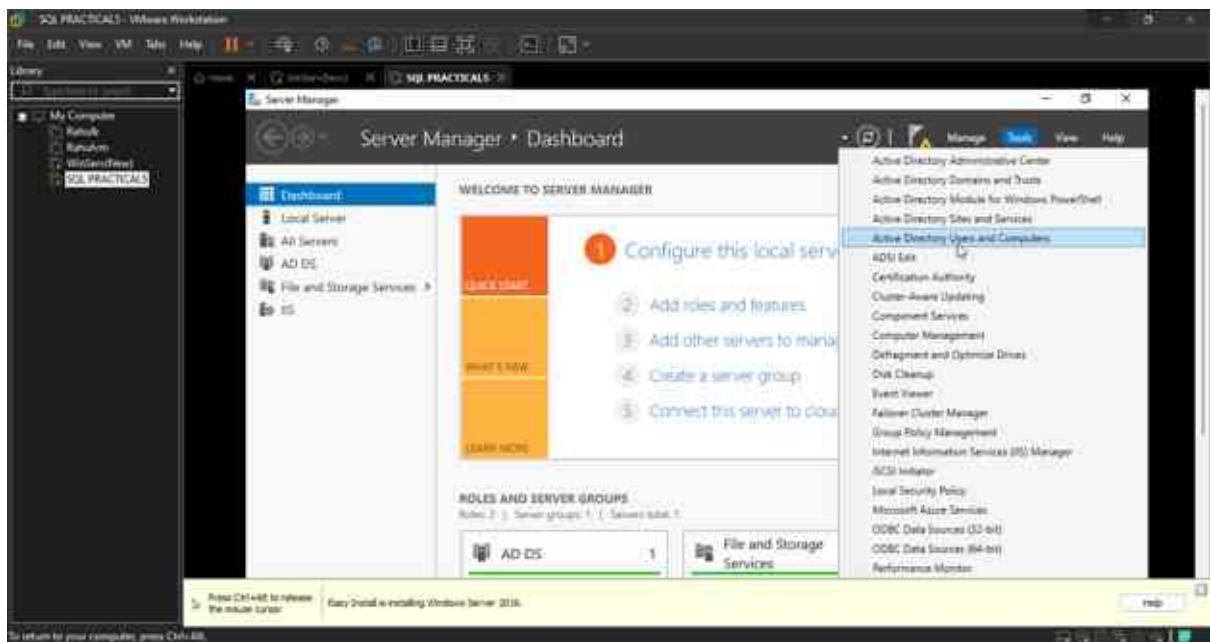
- Installation Process Start



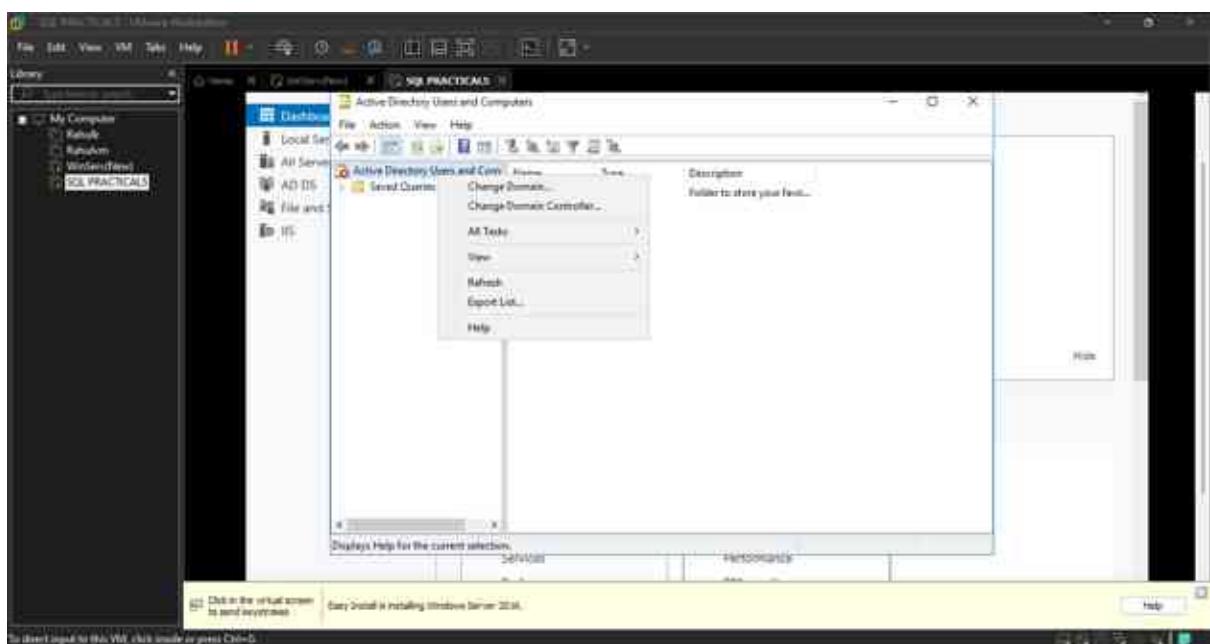
- After Installation Click on Close



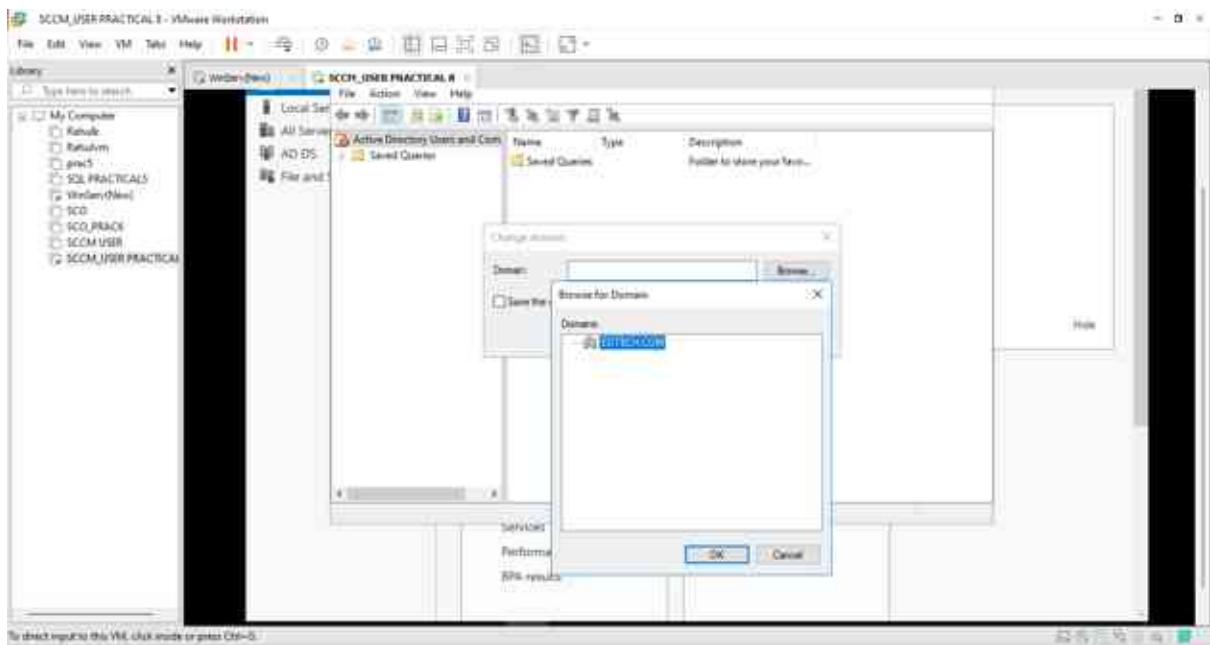
- After installation, within **Server Manager** Click on **Tools** and Select **Active Directory User and Computers**



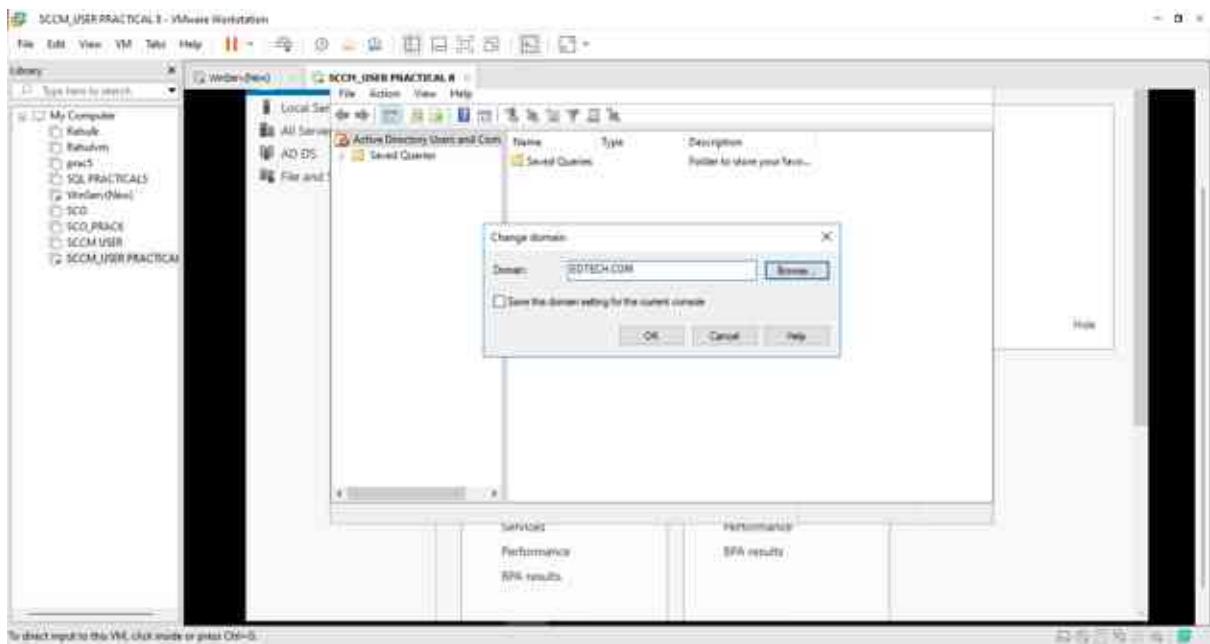
- Within **Active Directory Users and Computers**, Click on **Action** and Select **Change Domain**



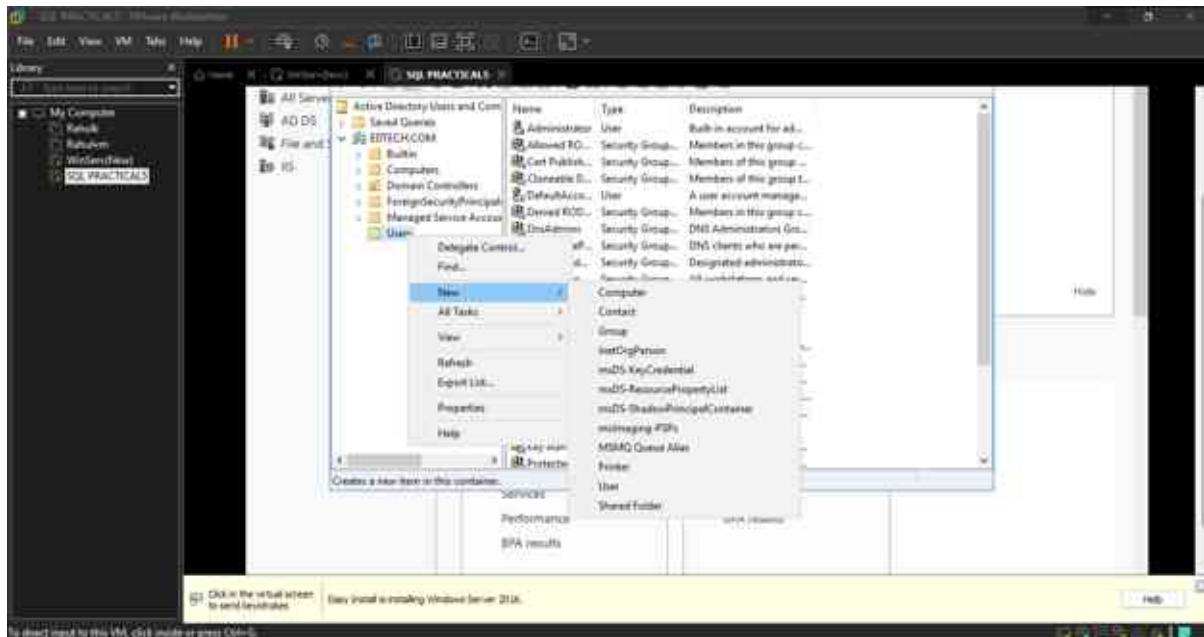
- Click on Browse and Select the Domain Controller (Here it is EDTECH.COM) and Click Ok



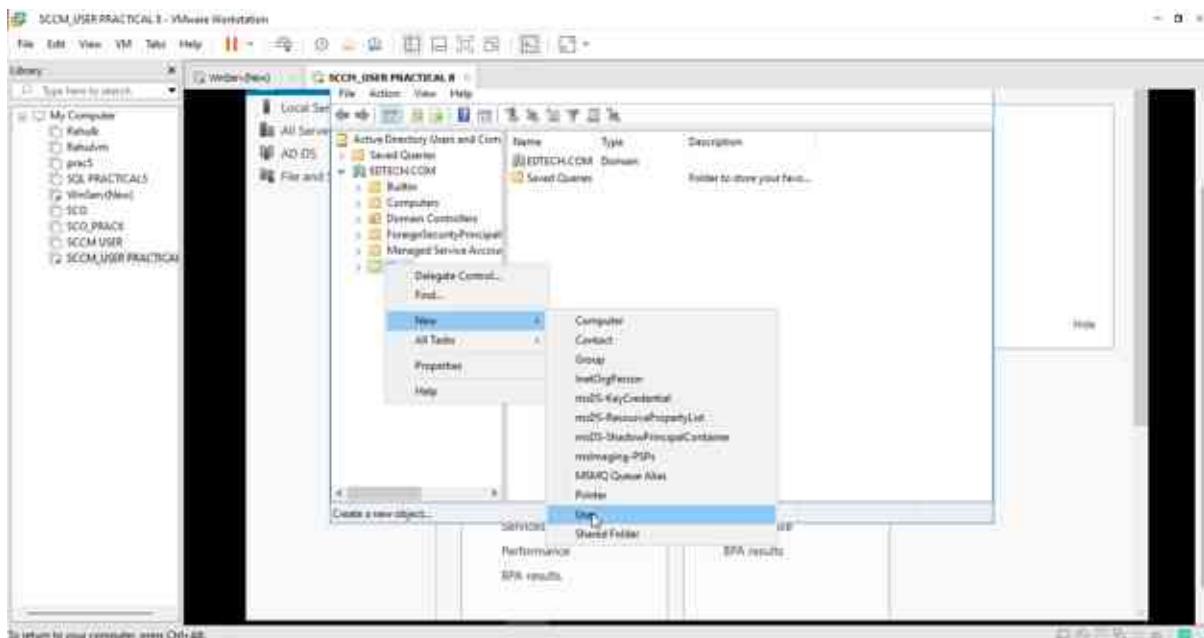
- Click on OK



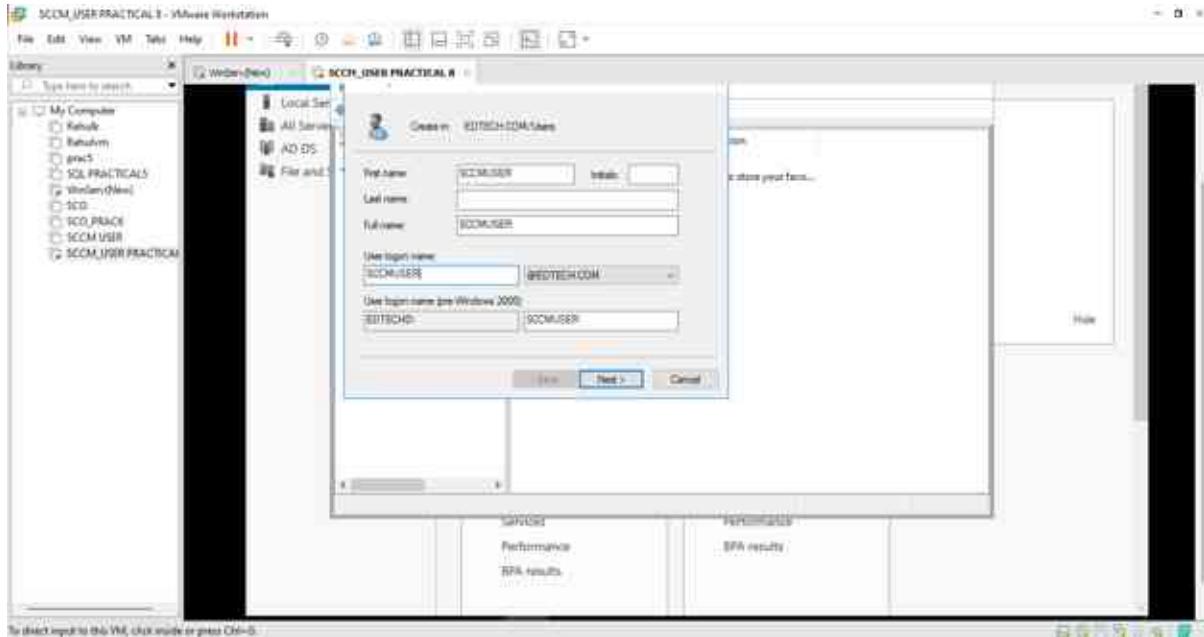
- Now the **Domain Controller** will be added, **Click on the Domain Controller** and **Click on Users**



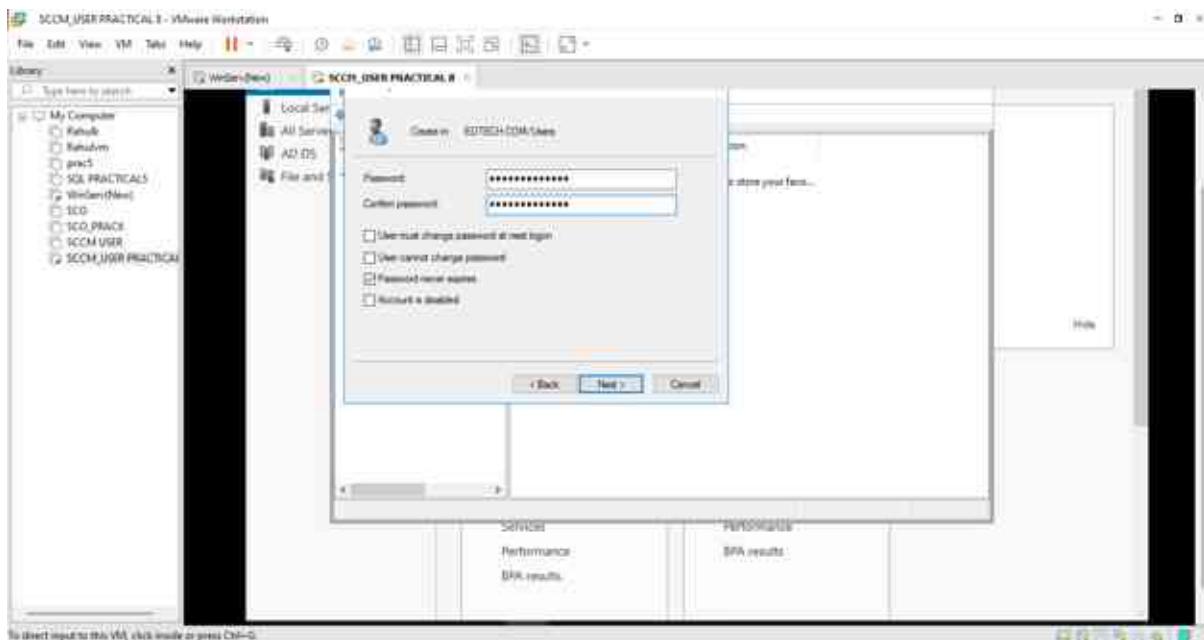
- Right **Click on Users** and **Click New and User**



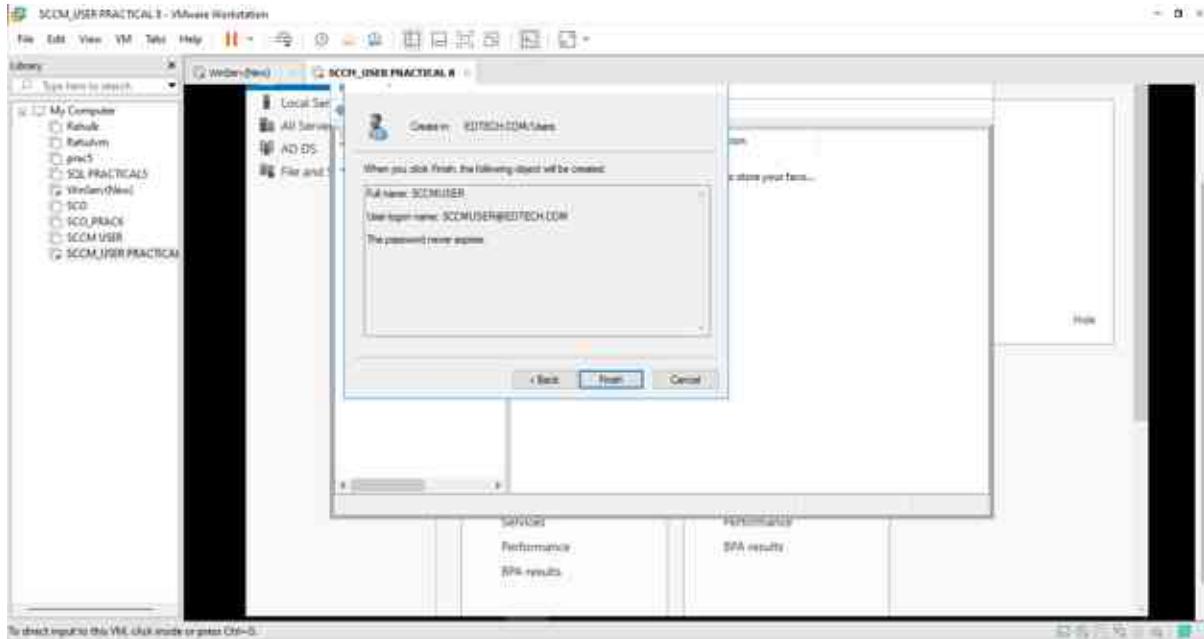
- Type in a new User name (here it is **SCCMUSER**) and Click Next



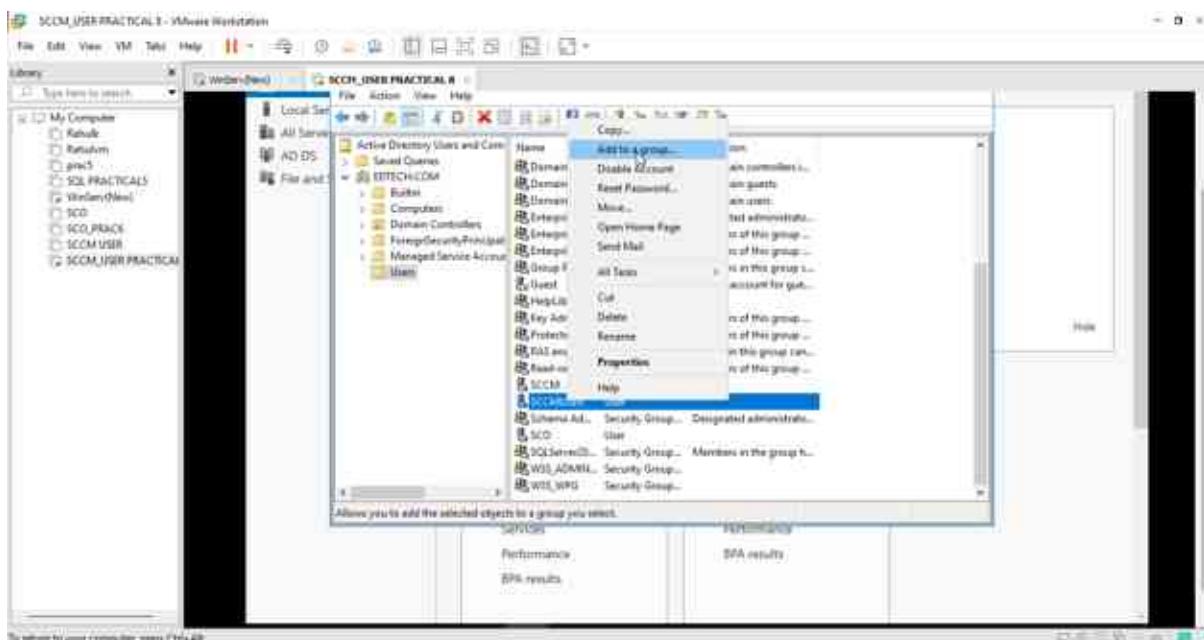
- Type in a password and Select Password never expires and Click Next



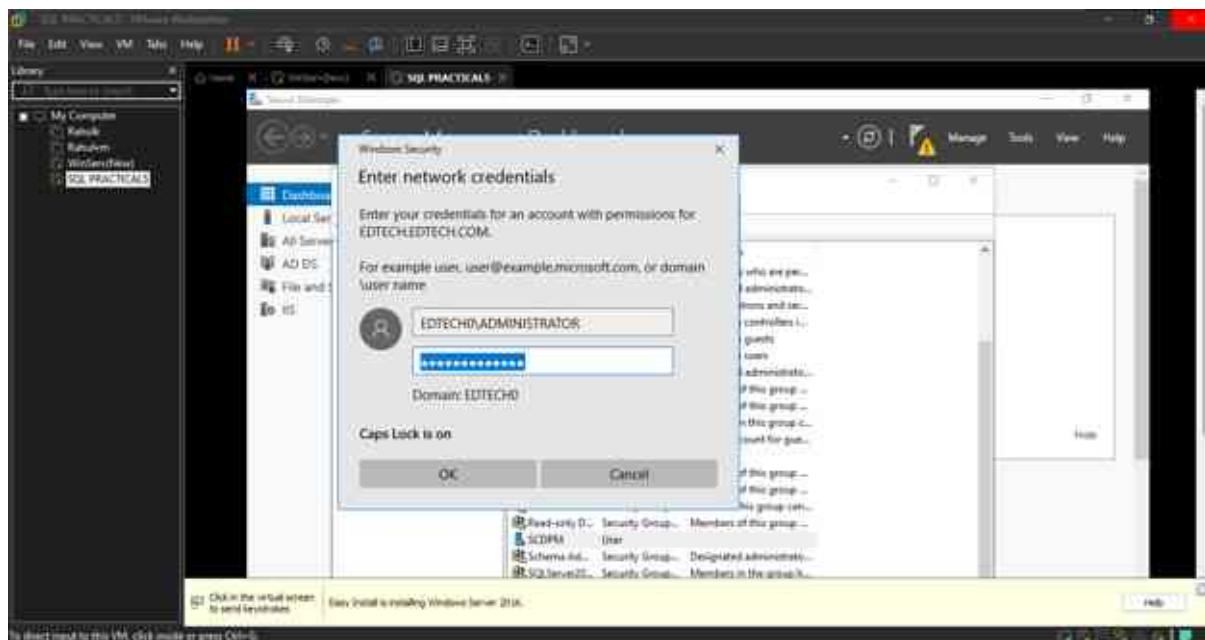
- Click on Finish



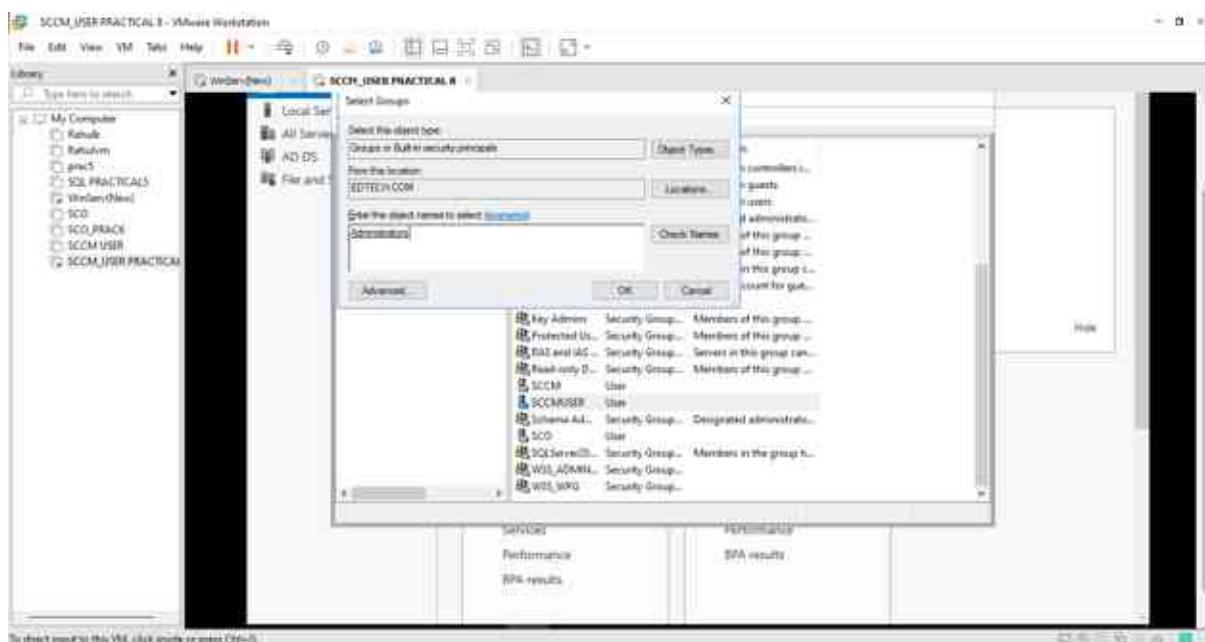
- Add the User to the Domain Group, Right Click on SCCMUSER and Select Add to a group



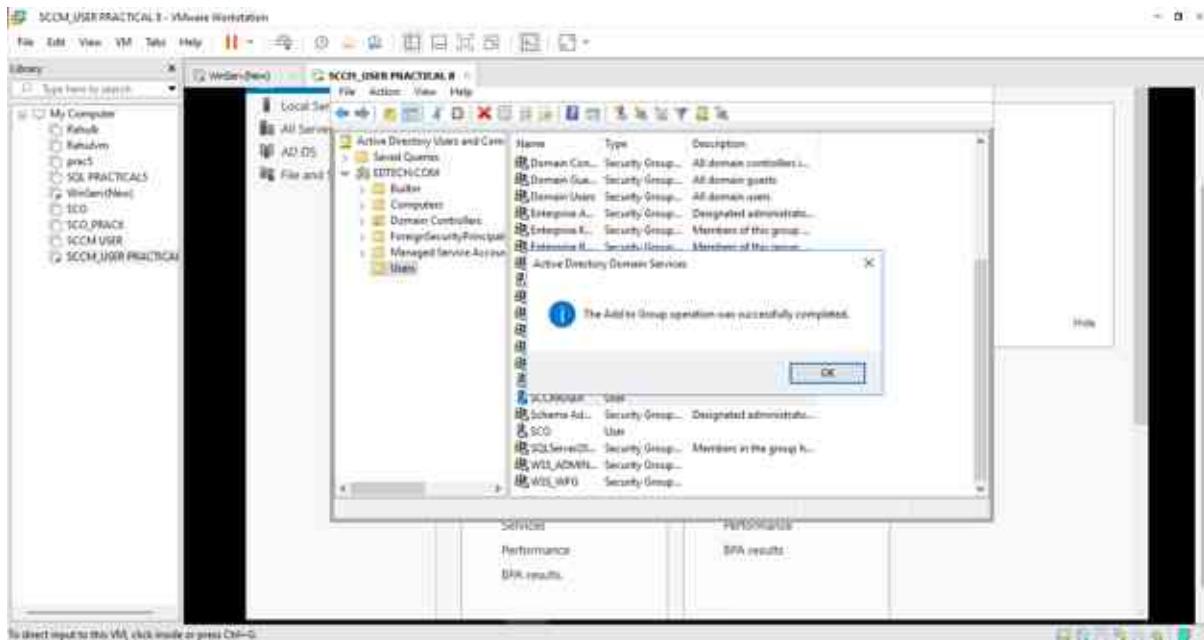
- Enter your credentials for an account with permissions for **EDTECH.EDTECH.COM**



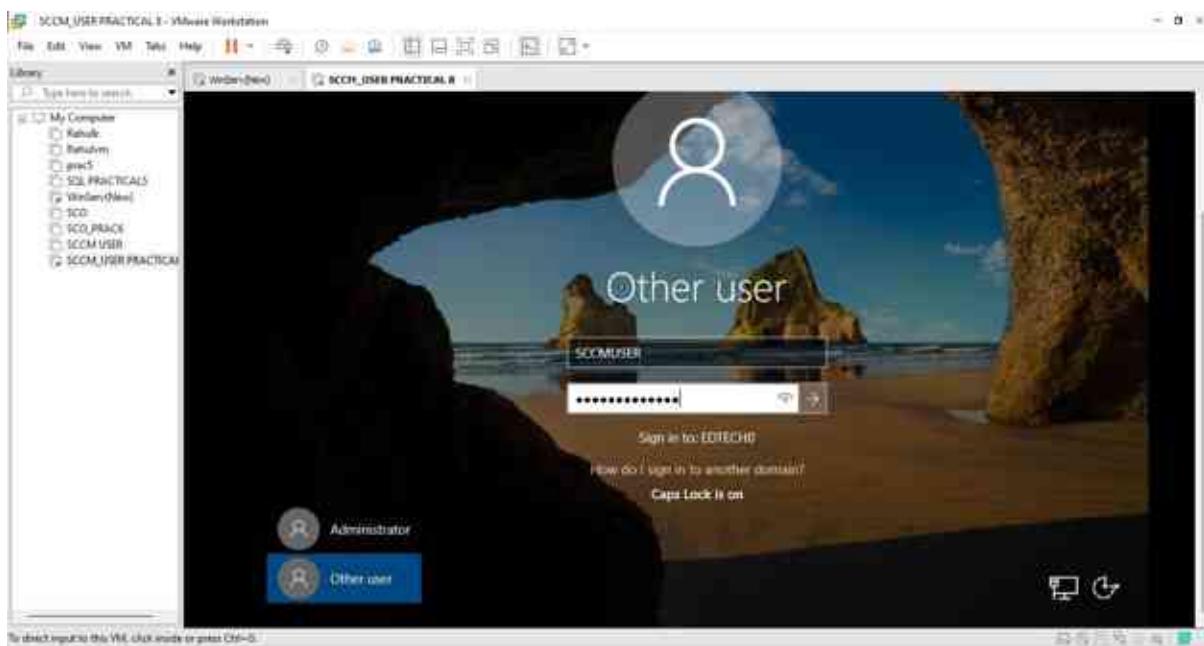
- Type in **Administrator** and Click on **Check Names** and Click on **Ok**



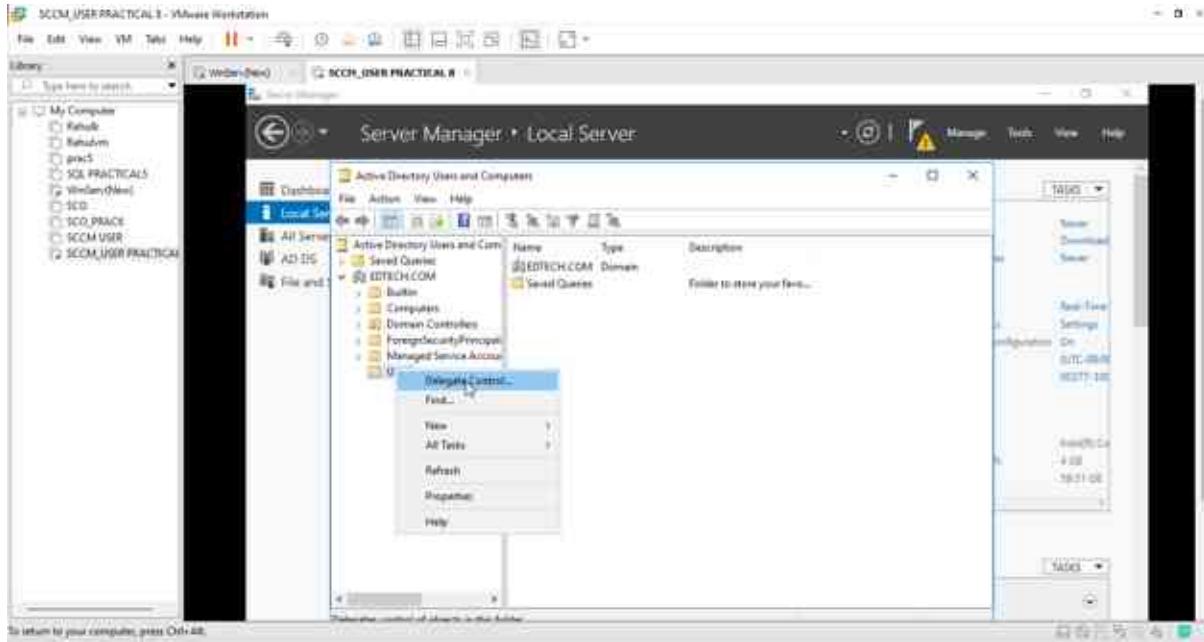
- Click on OK



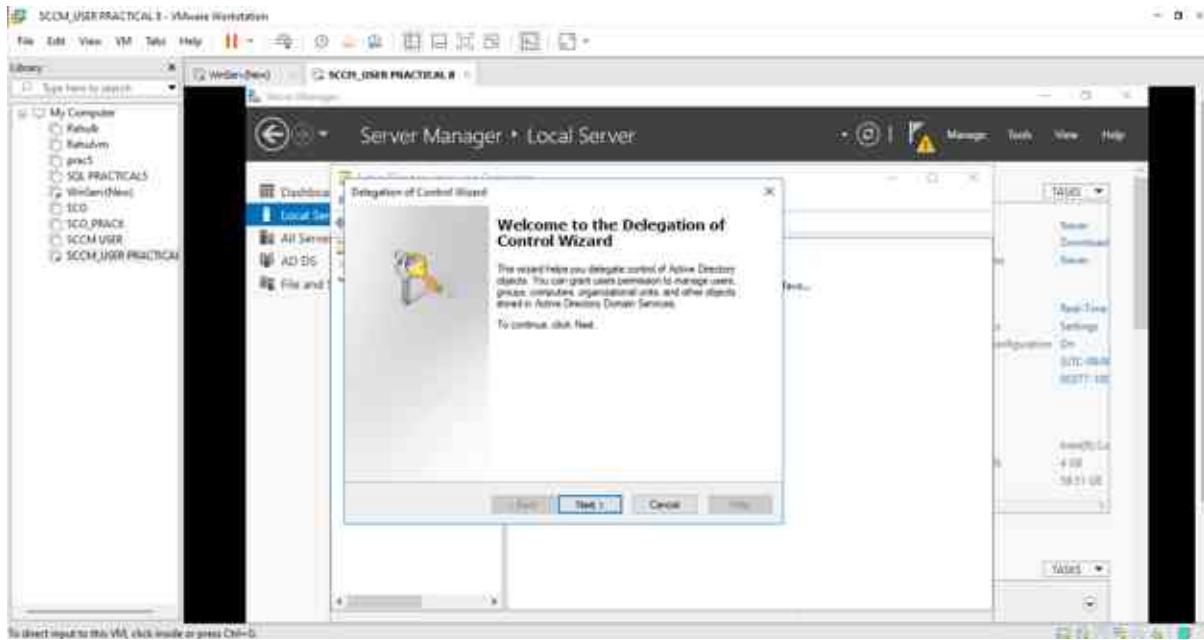
- Now Login as SCCMUSER



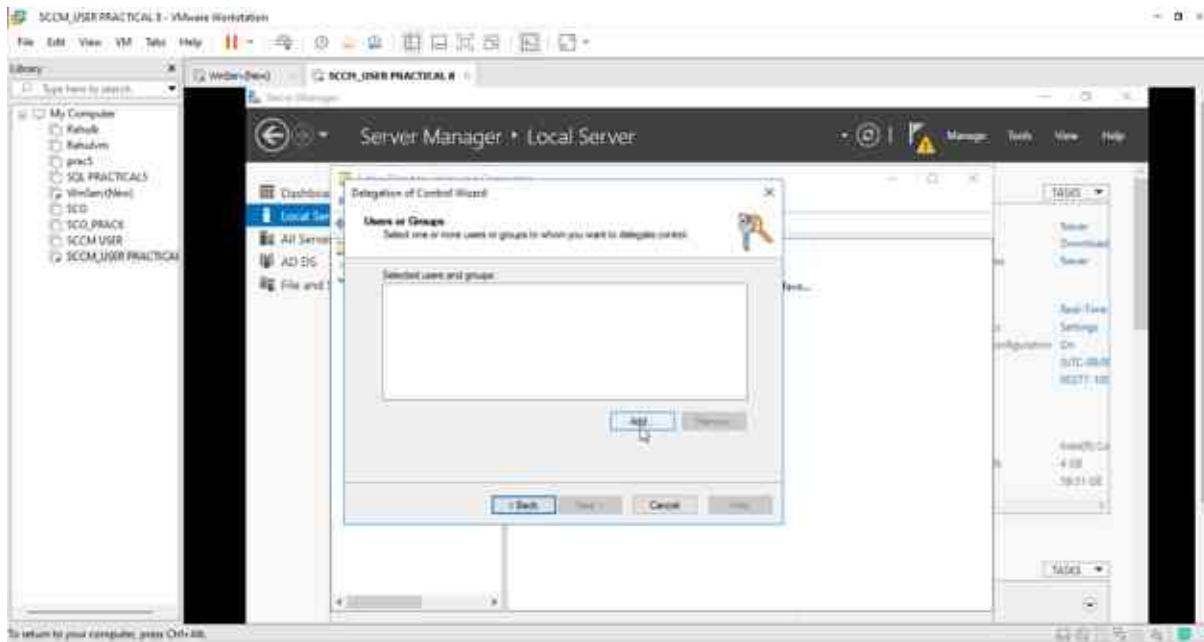
- Now Right-Click on Users and Select Delegate Control



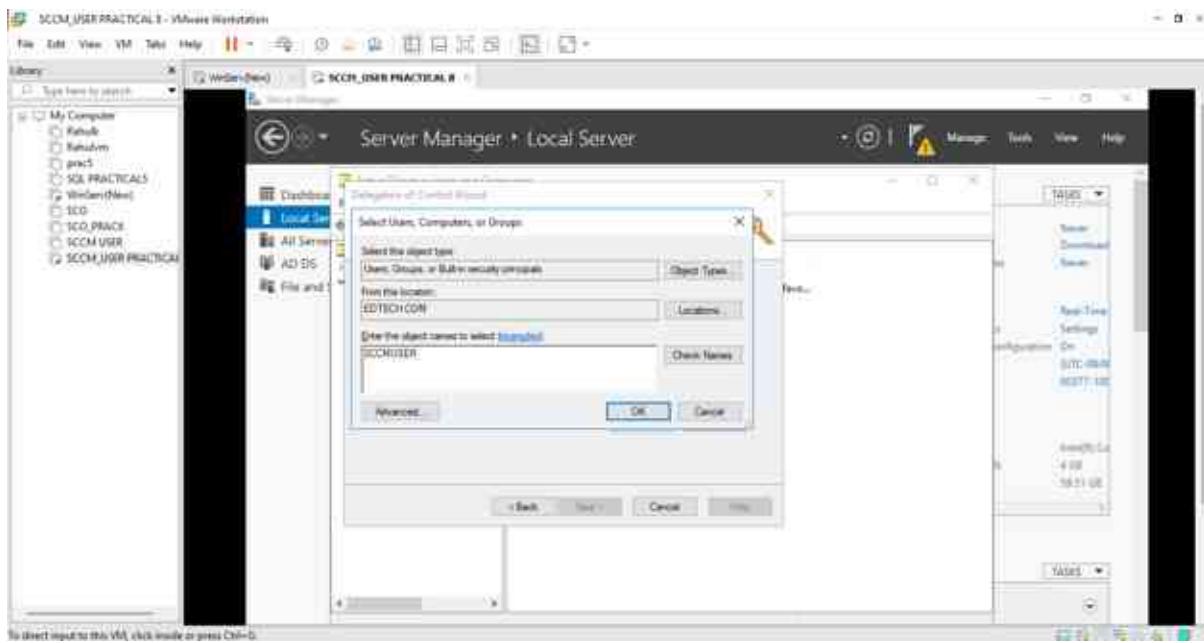
- Click on Next



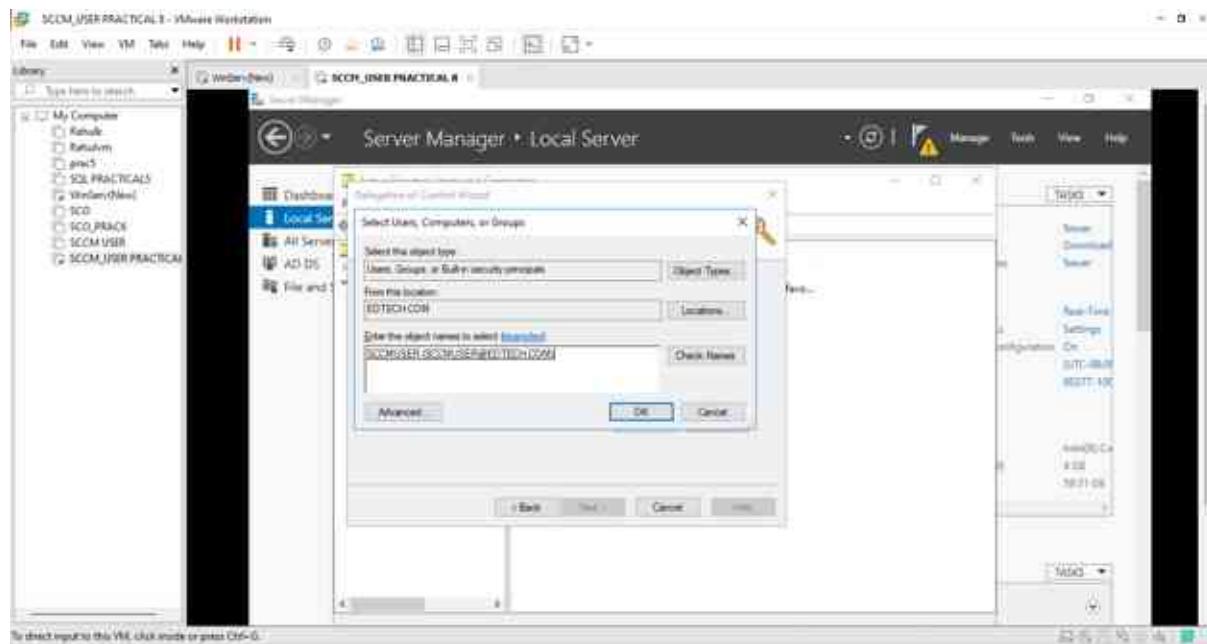
- Click on Add



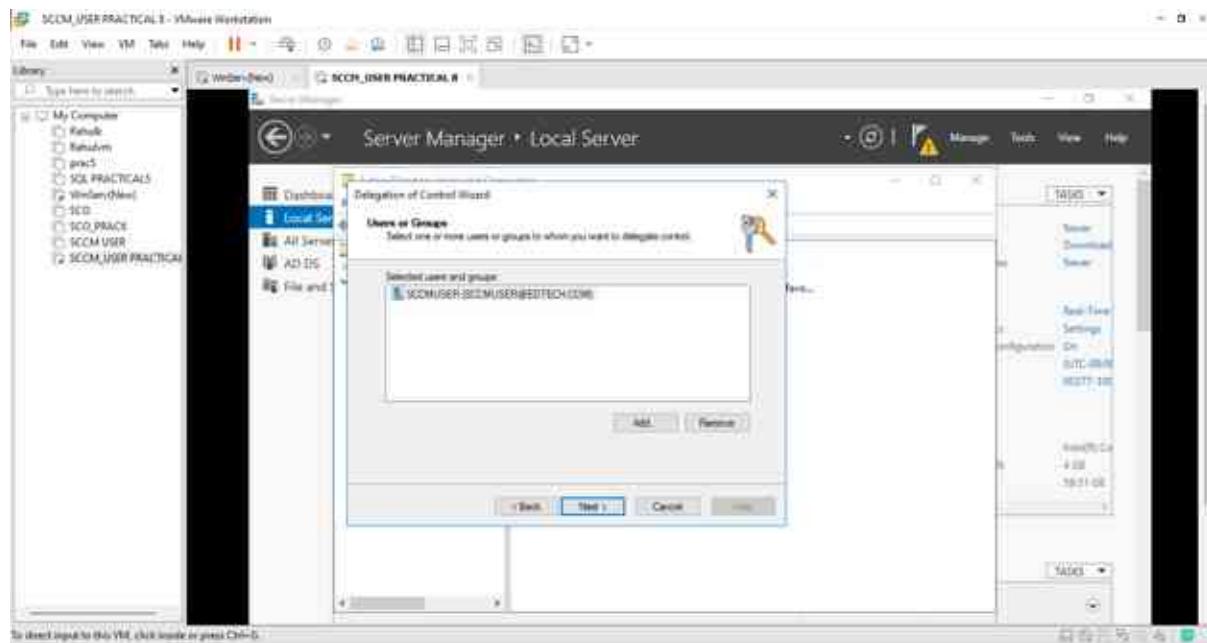
- Type SCCMUSER and Click on Check Names



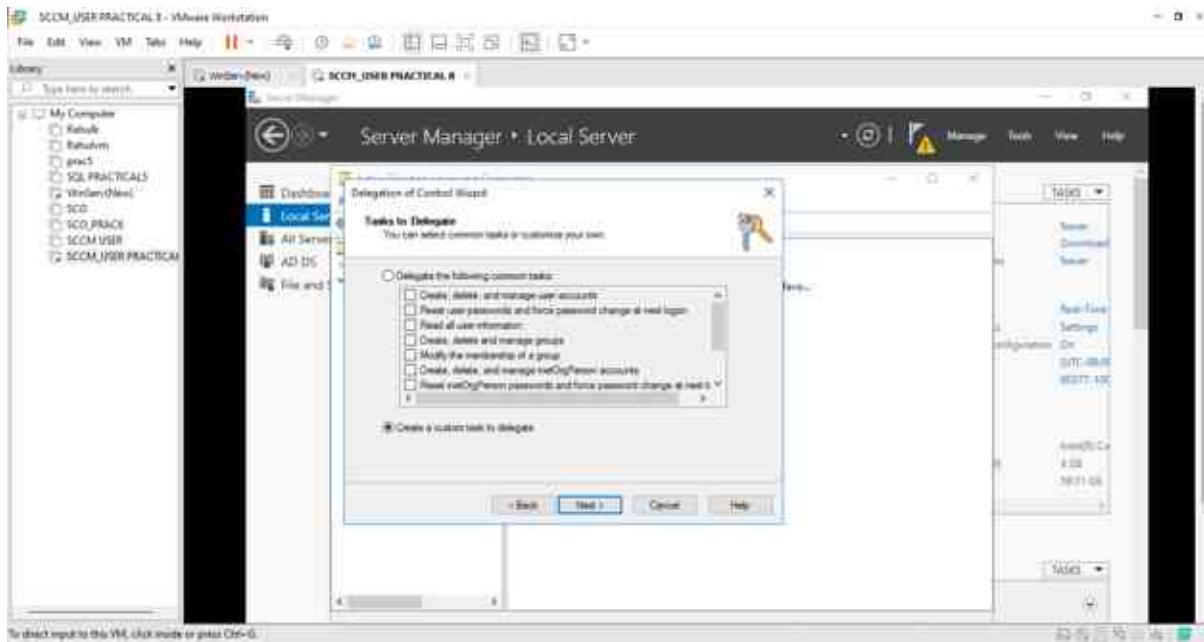
- Click on Ok



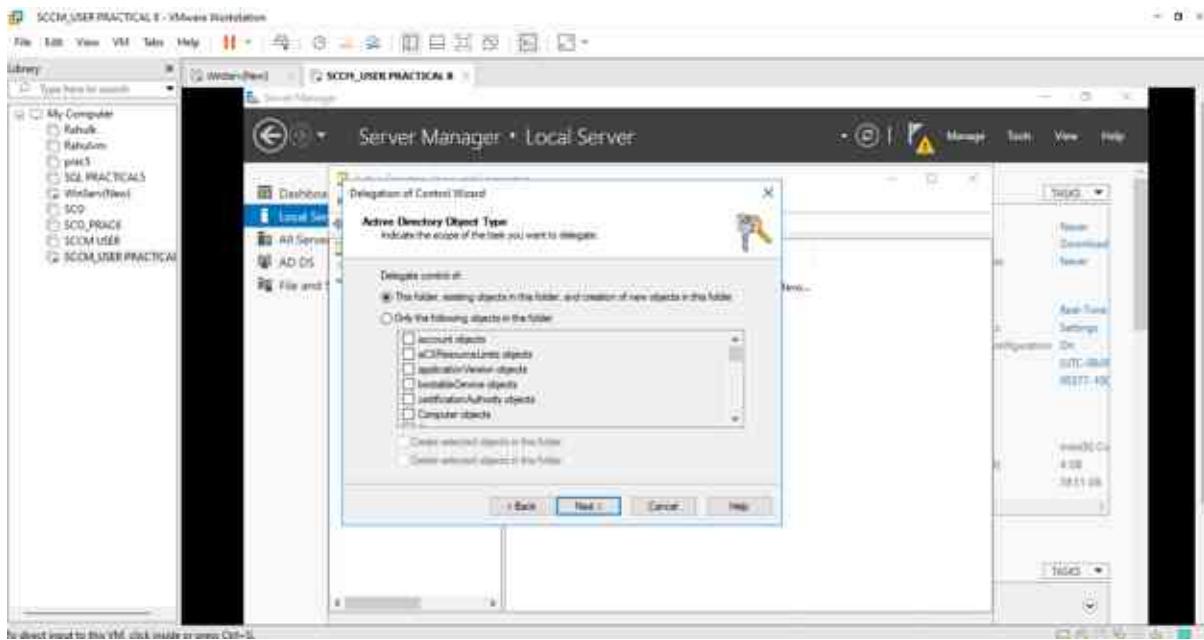
- Click on Next



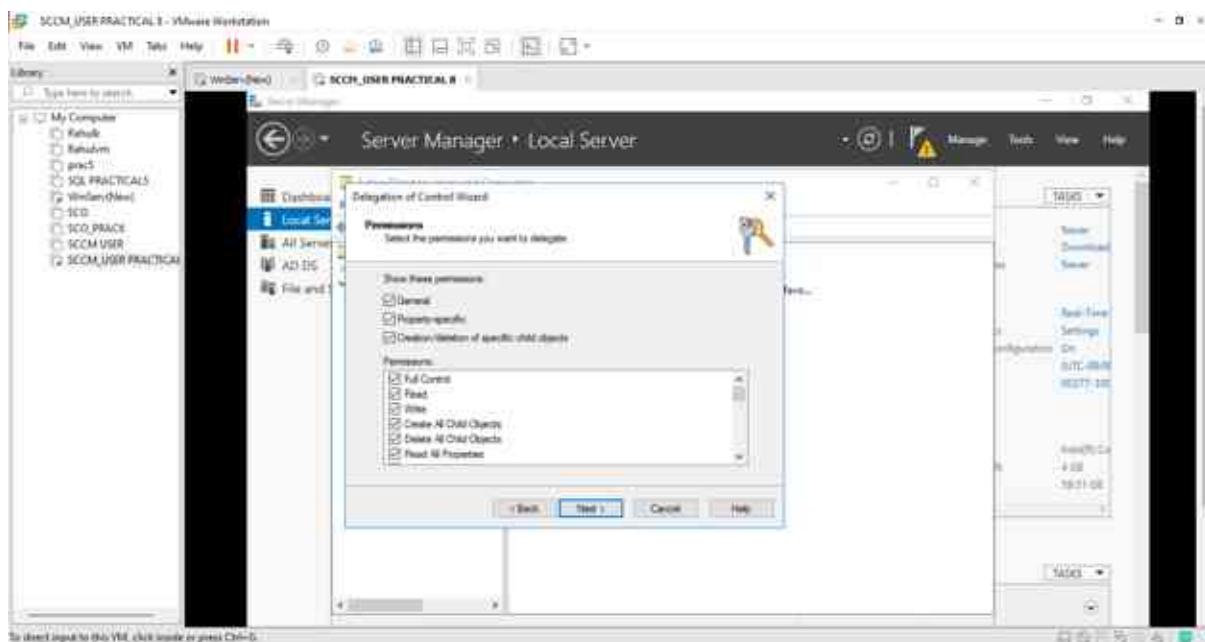
- In the Task to Delegate, select Create a custom task to delegate click Next.



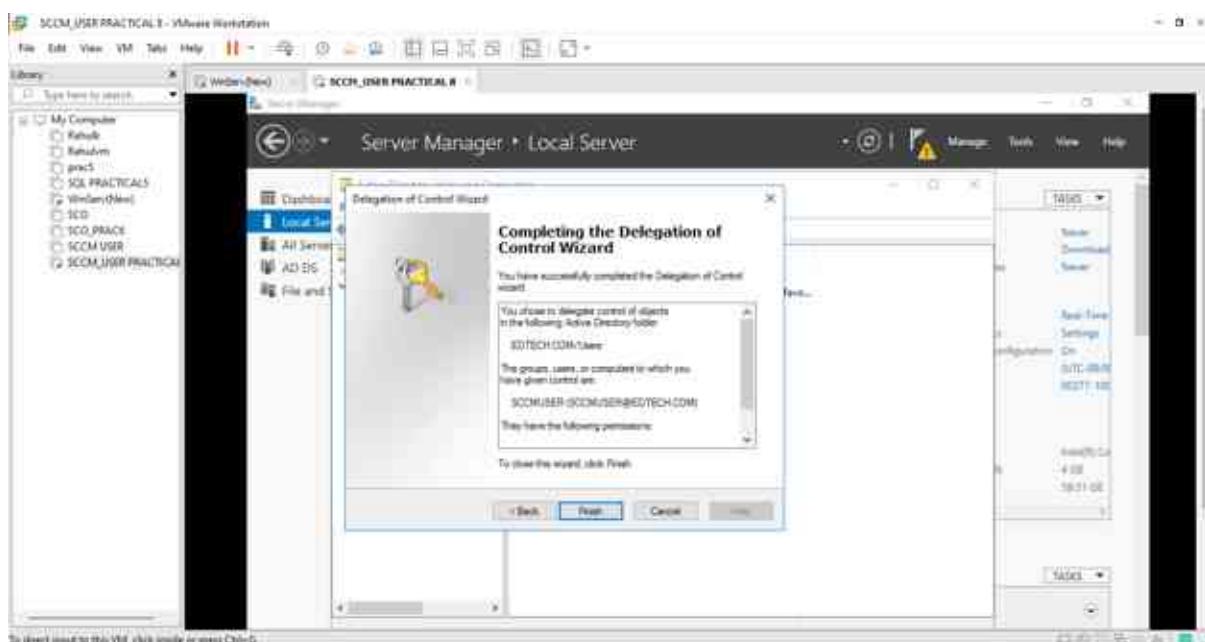
- In the Active Directory Object Type select **This folder, existing objects in this folder, and creation of new objects in this folder** and click Next.



- Tick on the 3 permissions **General**, **Property-specific** and **Creation/deletion of specific child objects**. Under Permissions tick on **Full Control** and click **Next**.

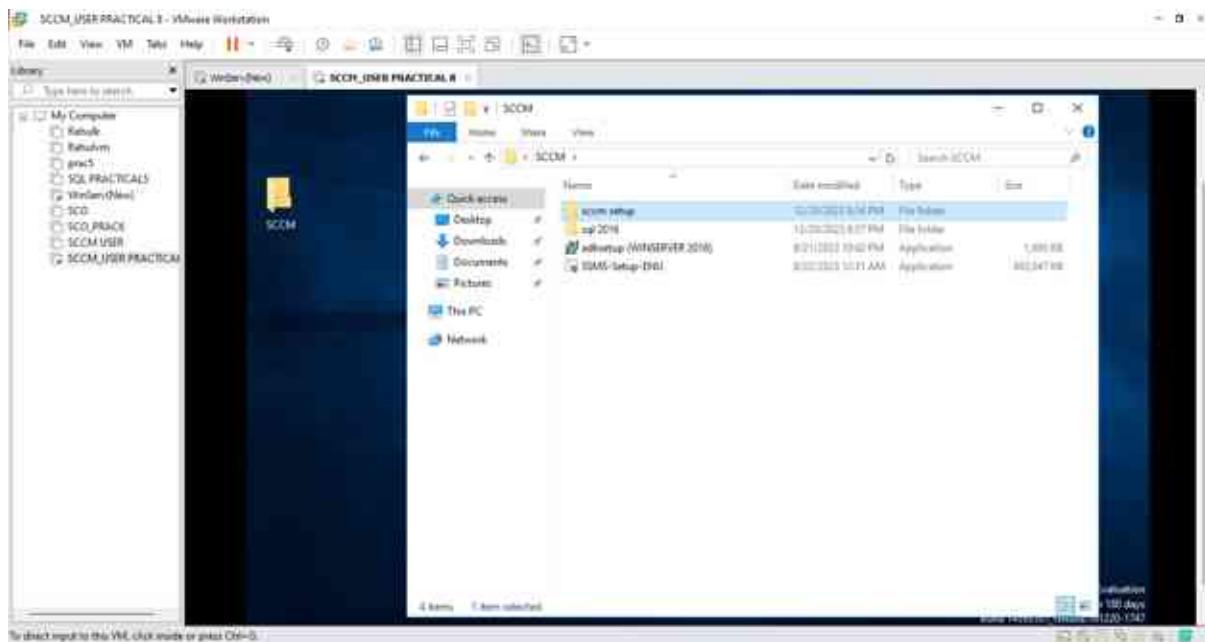


- Click **Finish** to close the wizard.

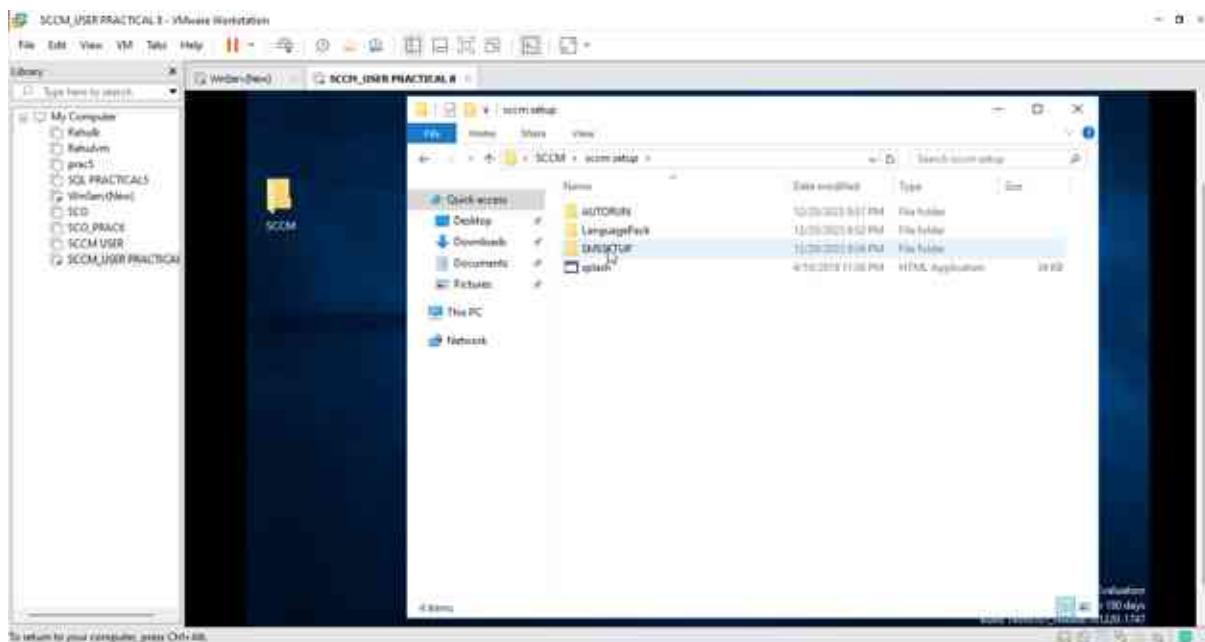


Step 5: Extending Active Directory Schema for SCCM_USER PRACTICAL 8

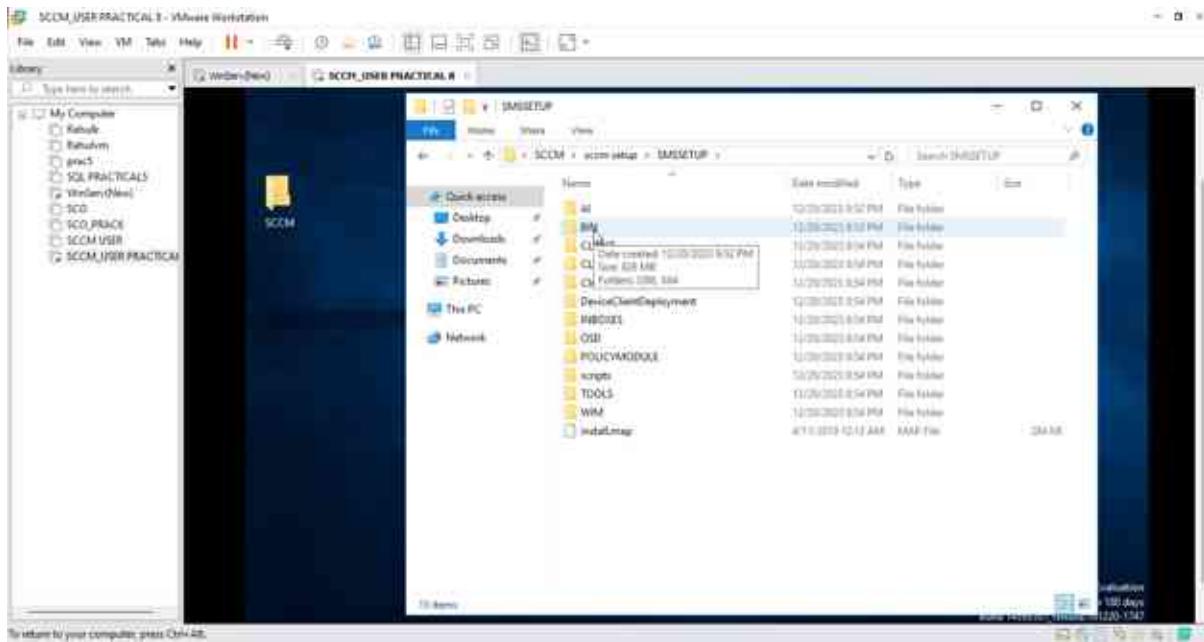
- Open you **SCCM Folder** and Select the **sccm setup** Folder



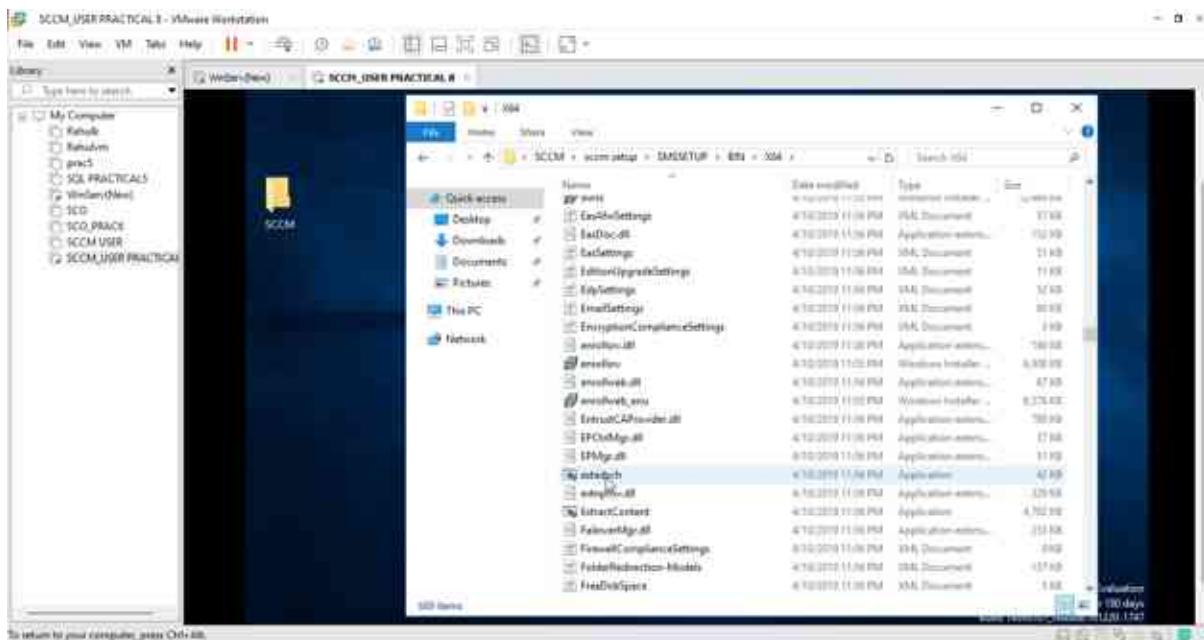
- Open **SMSSETUP**



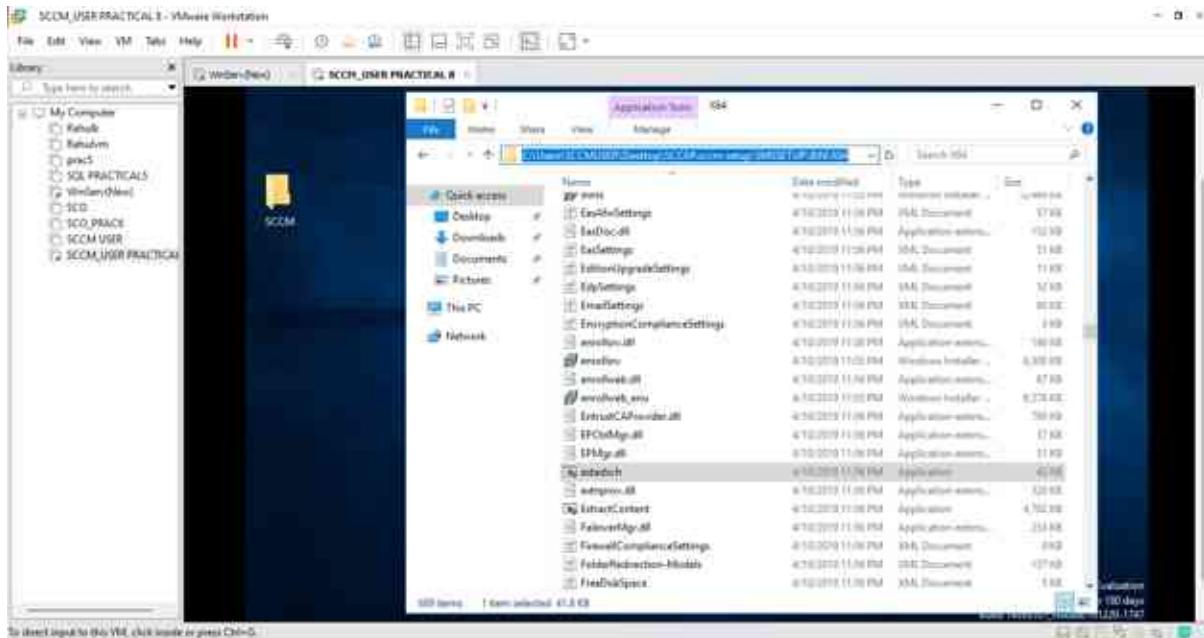
- Click on BIN



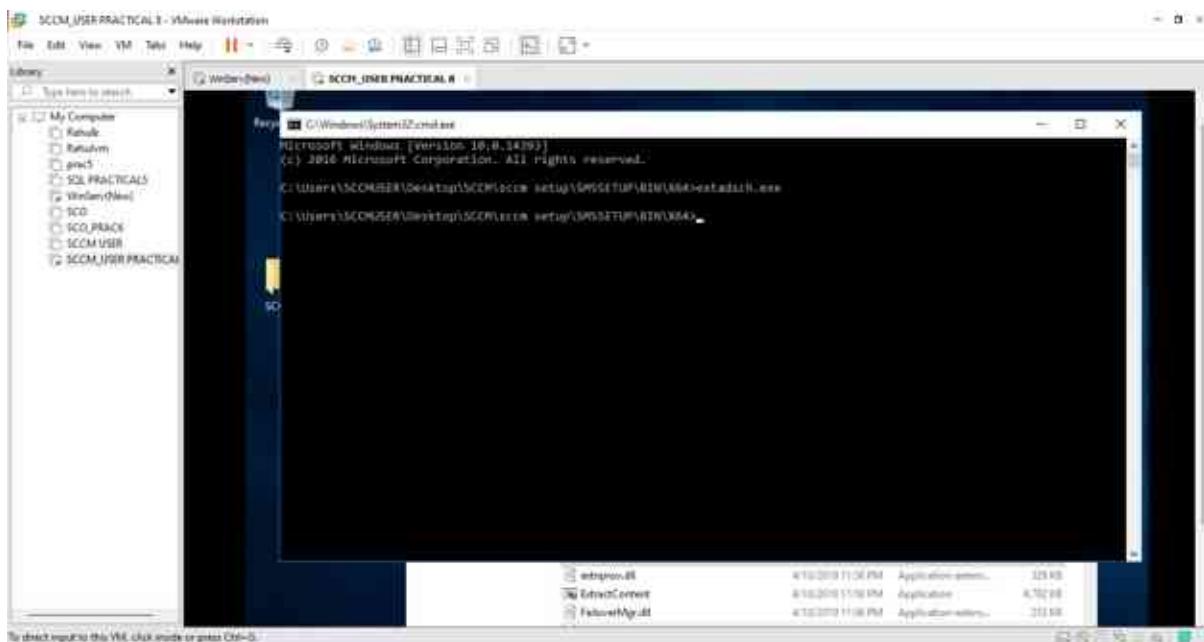
- Within BIN Select the x64 folder, Now within the x64 folder Select Extadsch.exe



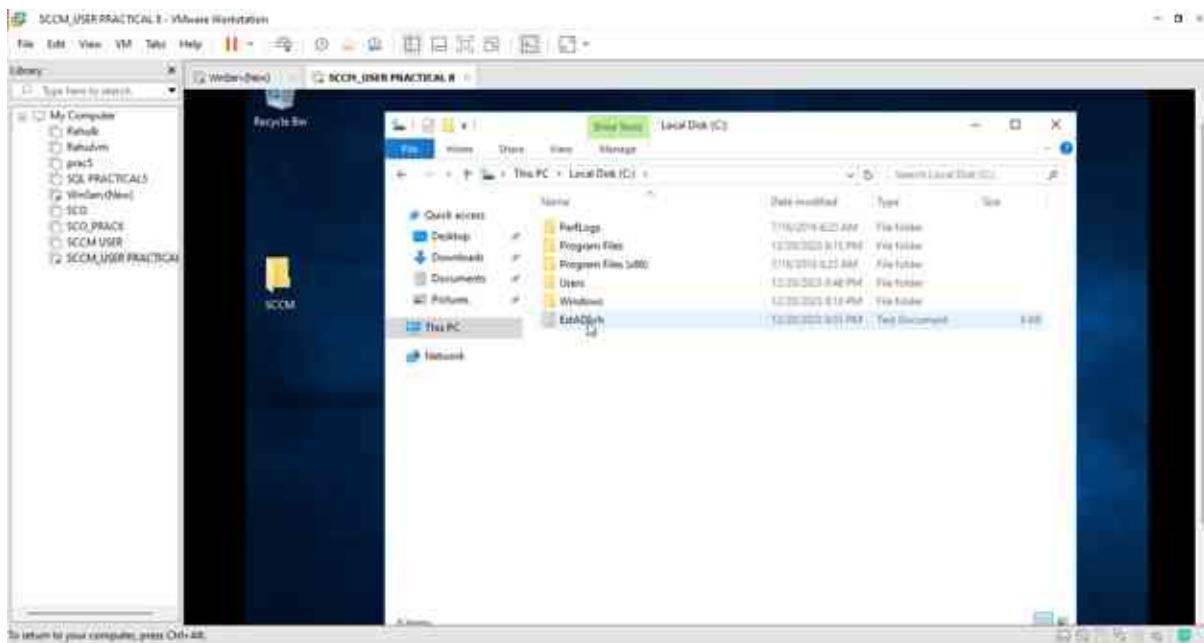
- Type CMD



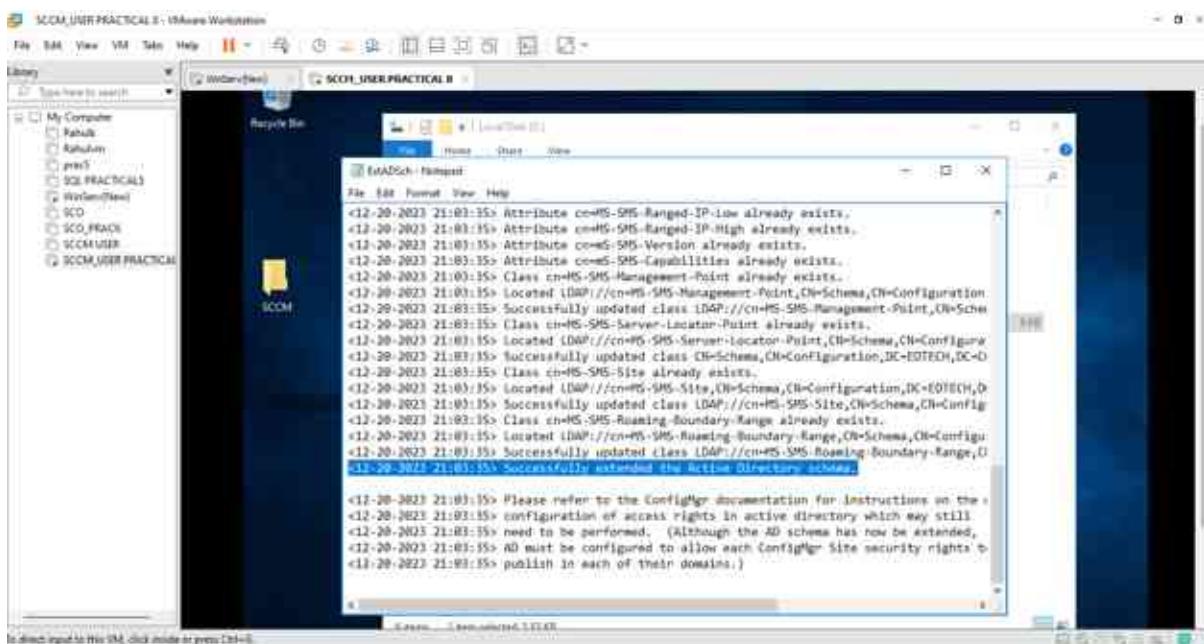
- Open the file using command prompt



- To confirm the extension, go to your C: Directory and Open the ExtADSch.txt file

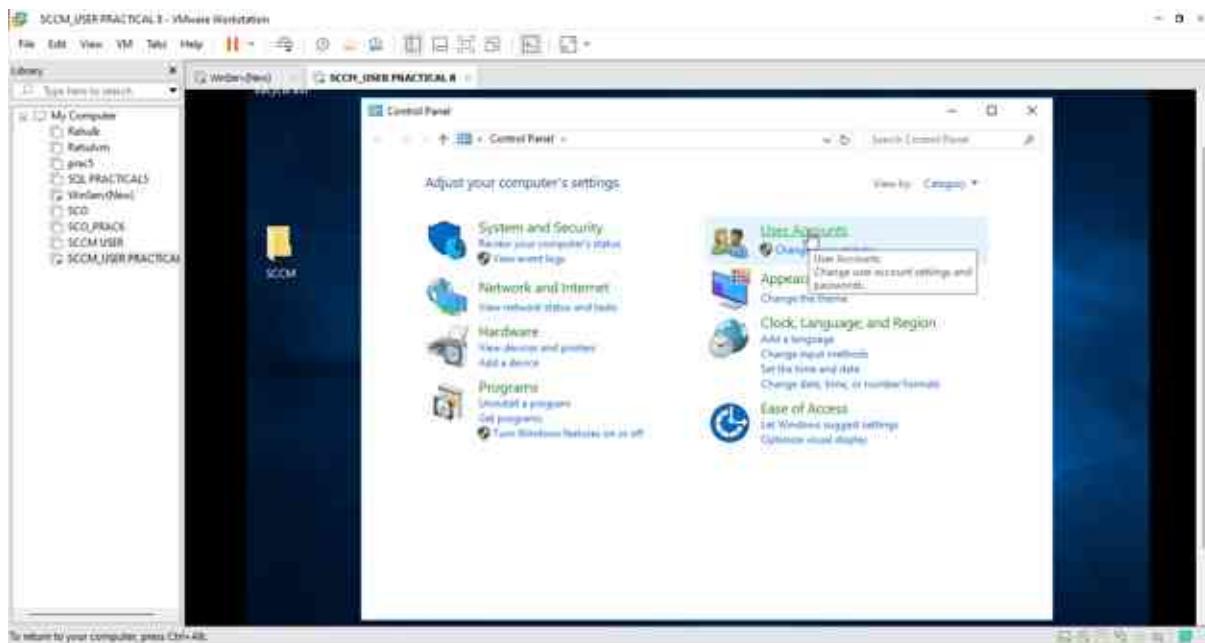


- when you open ExtADSch file, you'll find the line: Successfully extended the Active Directory schema.

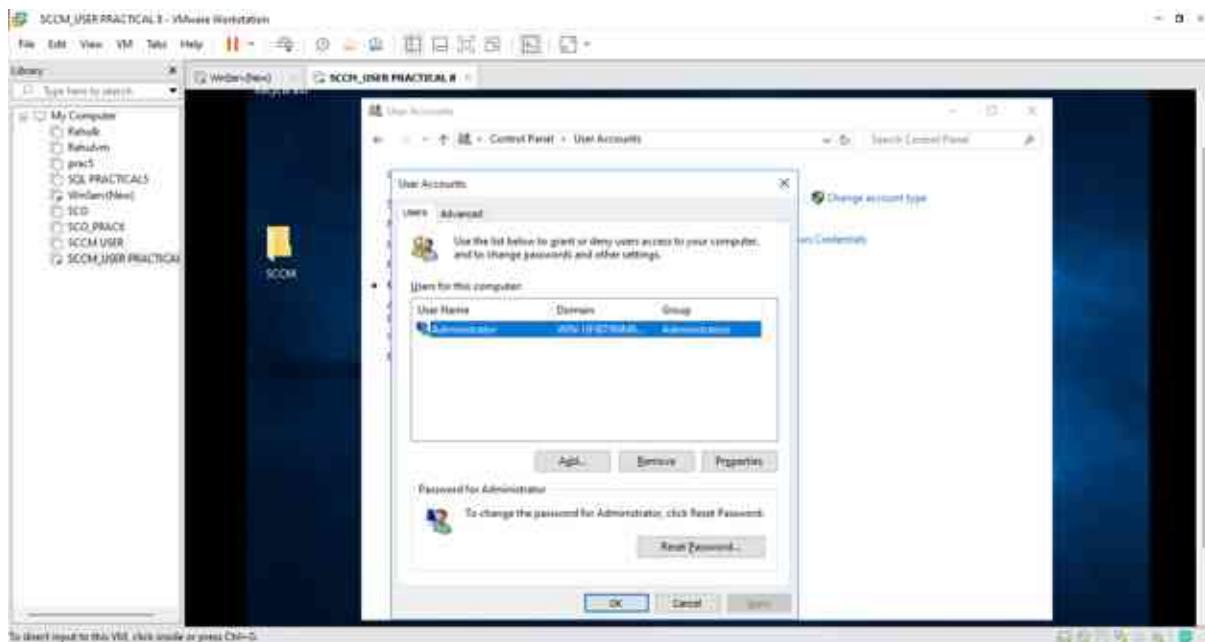


Step 6: Upgrade your current user with Administrative Rights

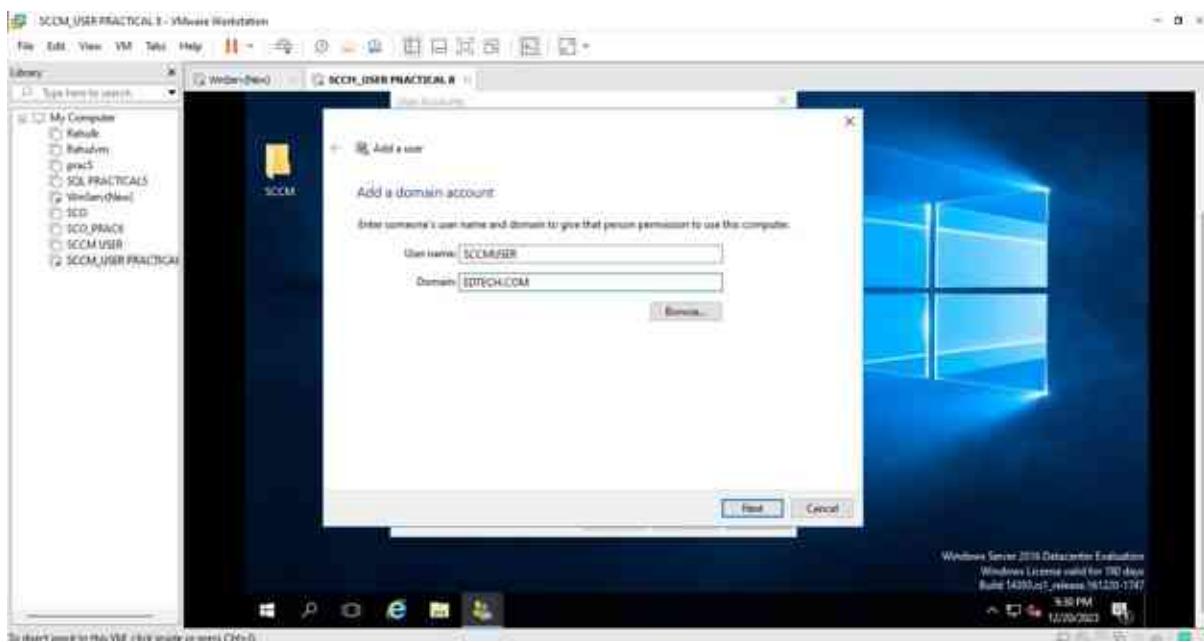
- Open Control Panel and Click on User Account



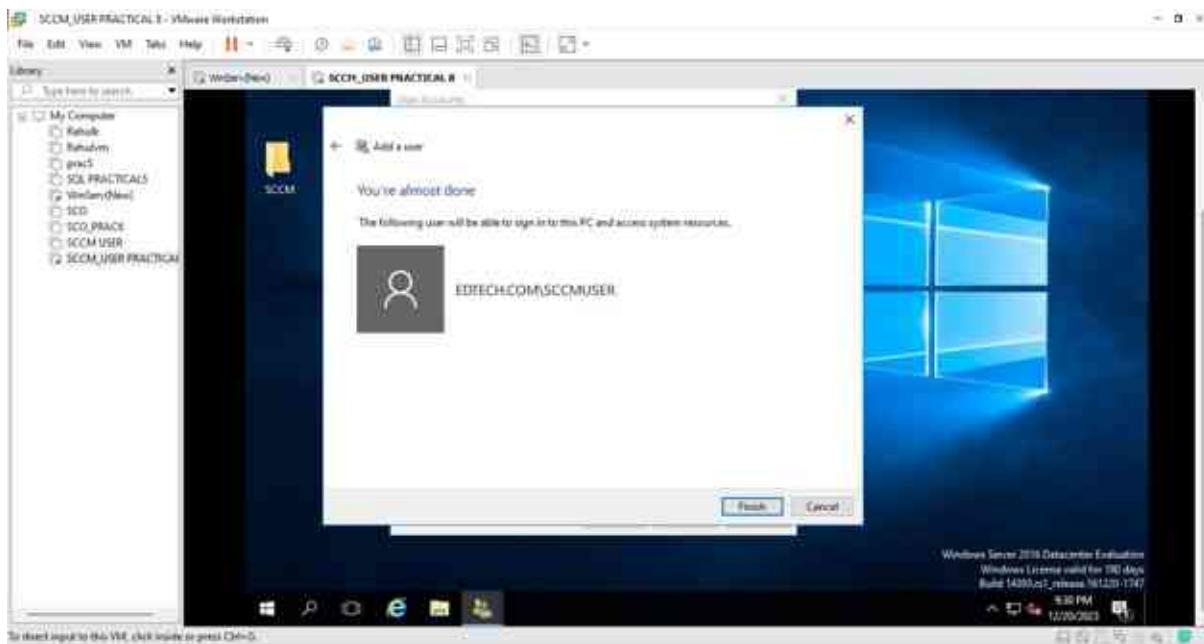
- Click on Add



- Enter User Name Here User Name Type SCCM
- Enter Domain Name Here Domain Name EDTECH.COM
- Click on Next



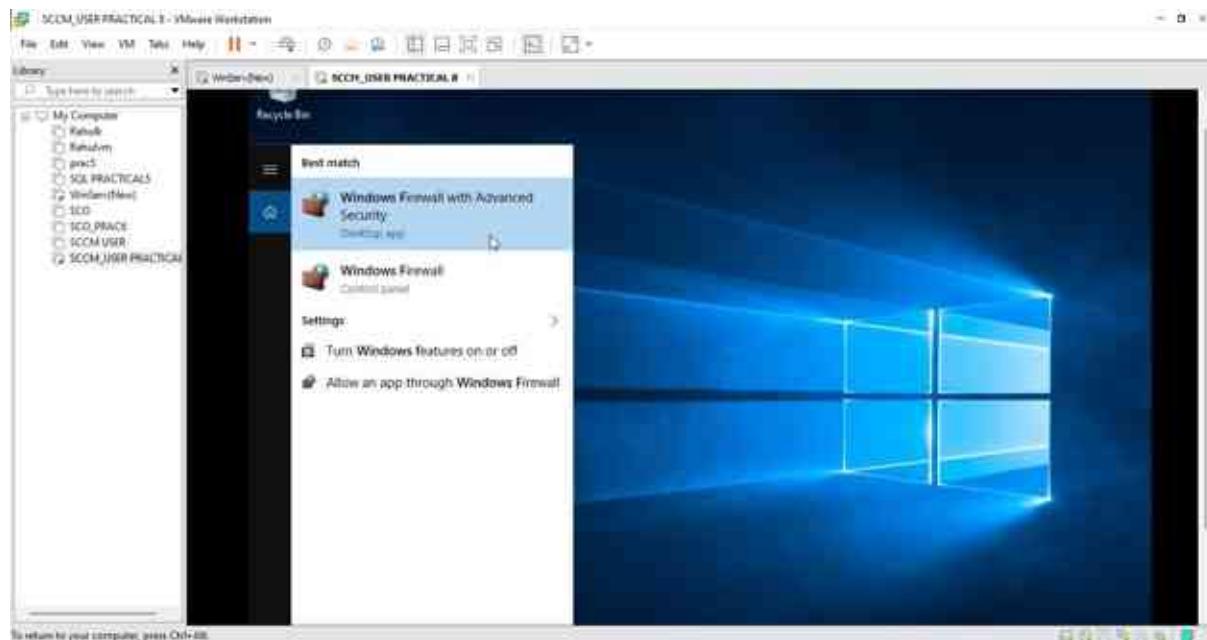
- Click on Finish



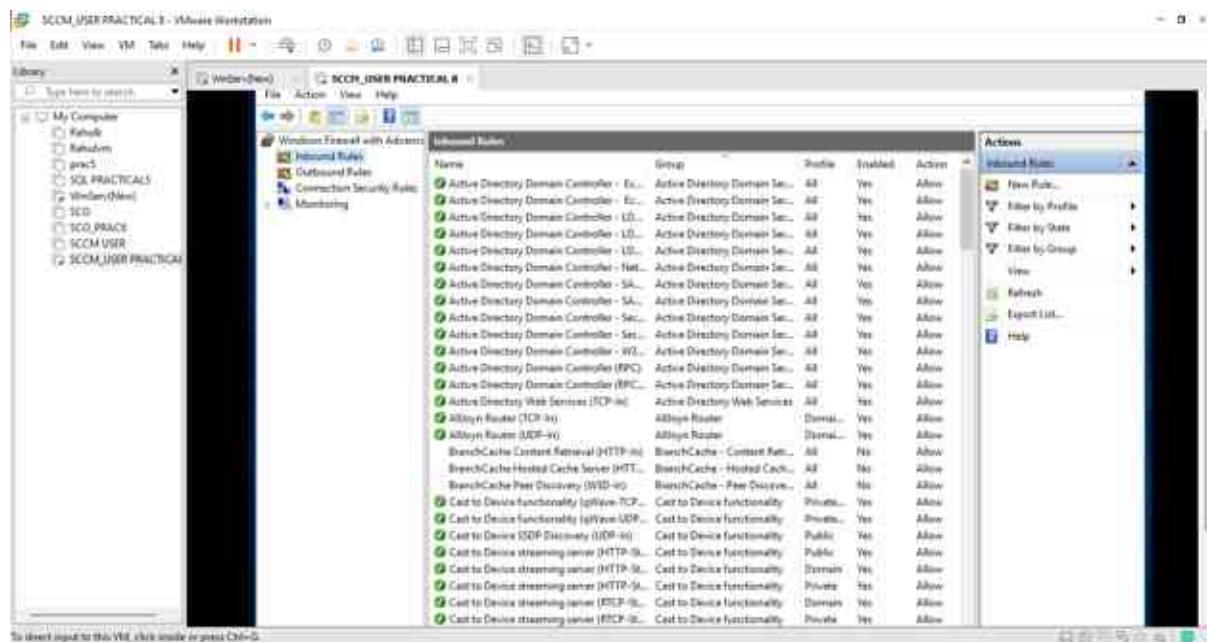
Note: After Upgrade your current user with Administrative Rights login with EDTECH.COM\SCCMUSER

Step 7: Configure Windows Firewall

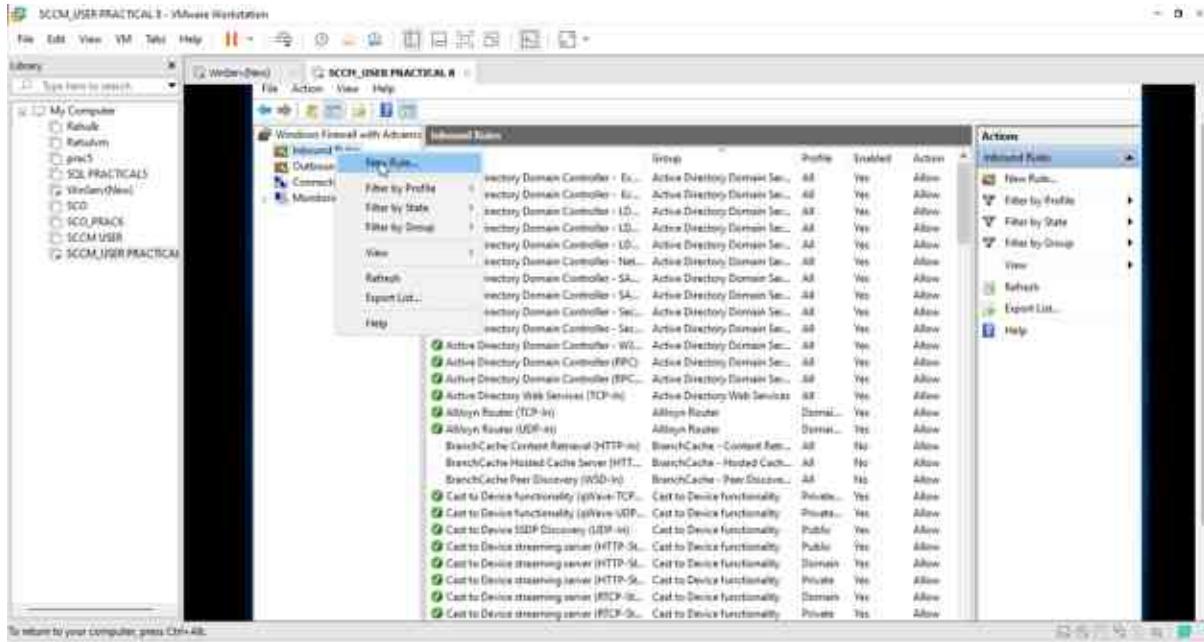
- Open Windows Firewall with Advanced Security



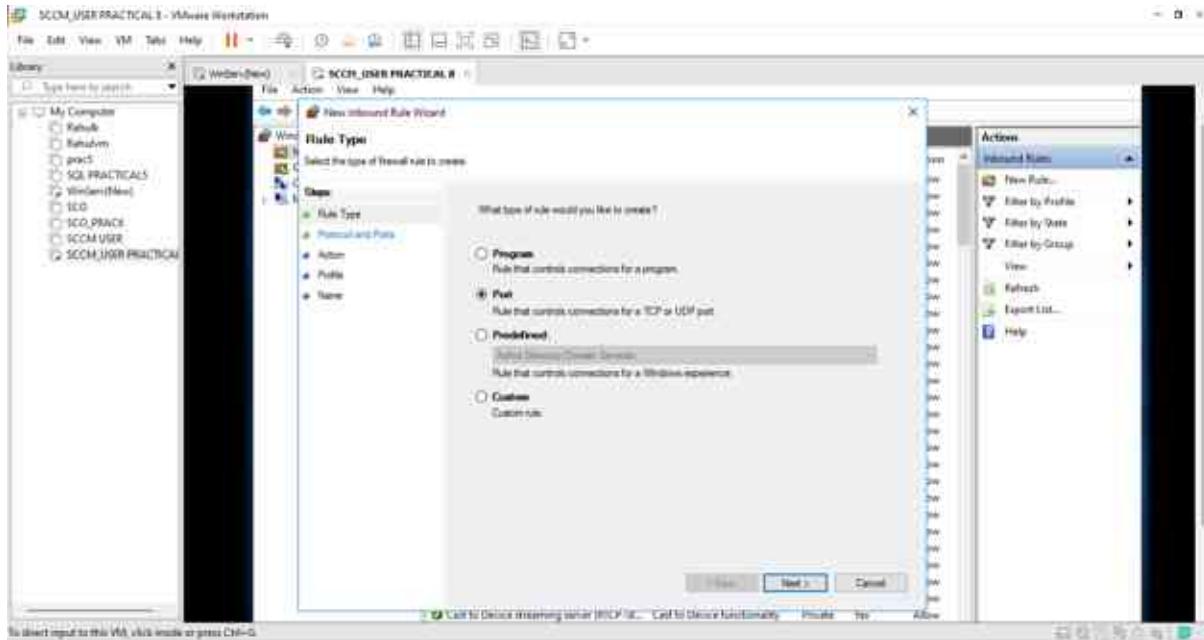
- Click on Inbound Rules



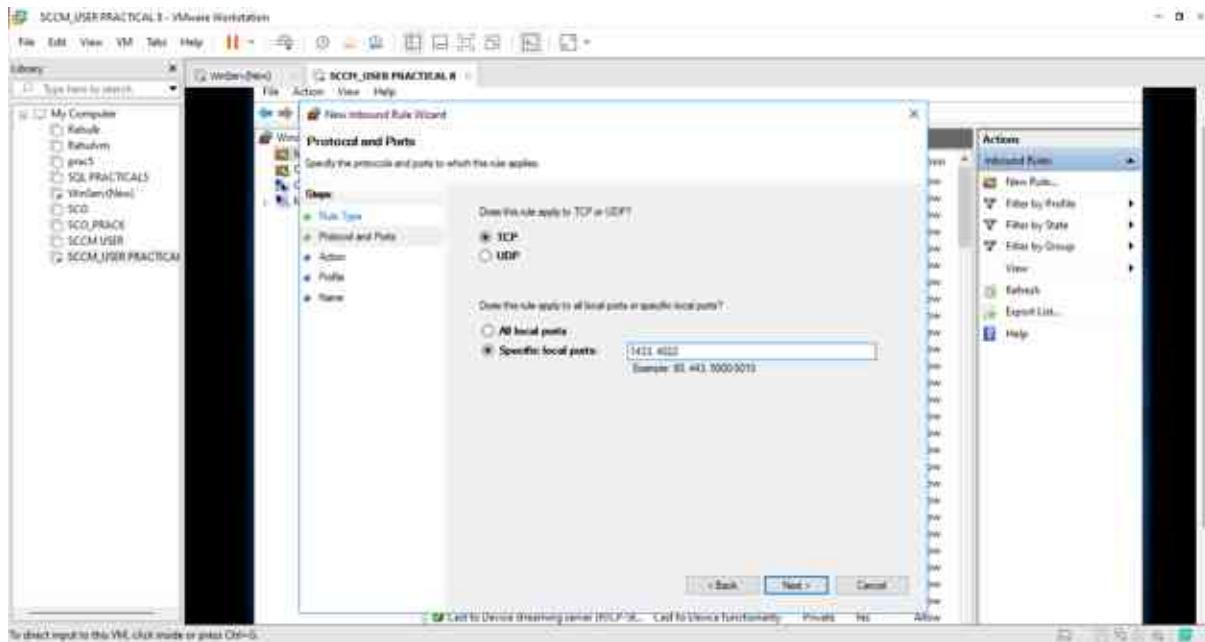
- Right-Click on Inbound Rule and Select New Rule



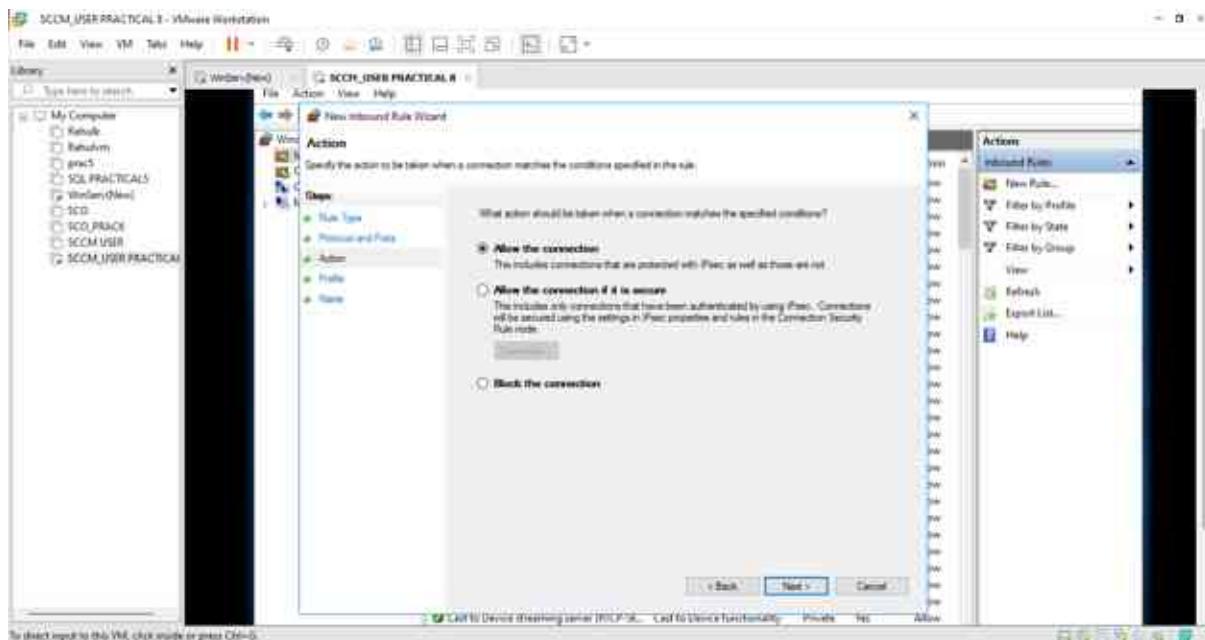
- Select Port and Click on Next



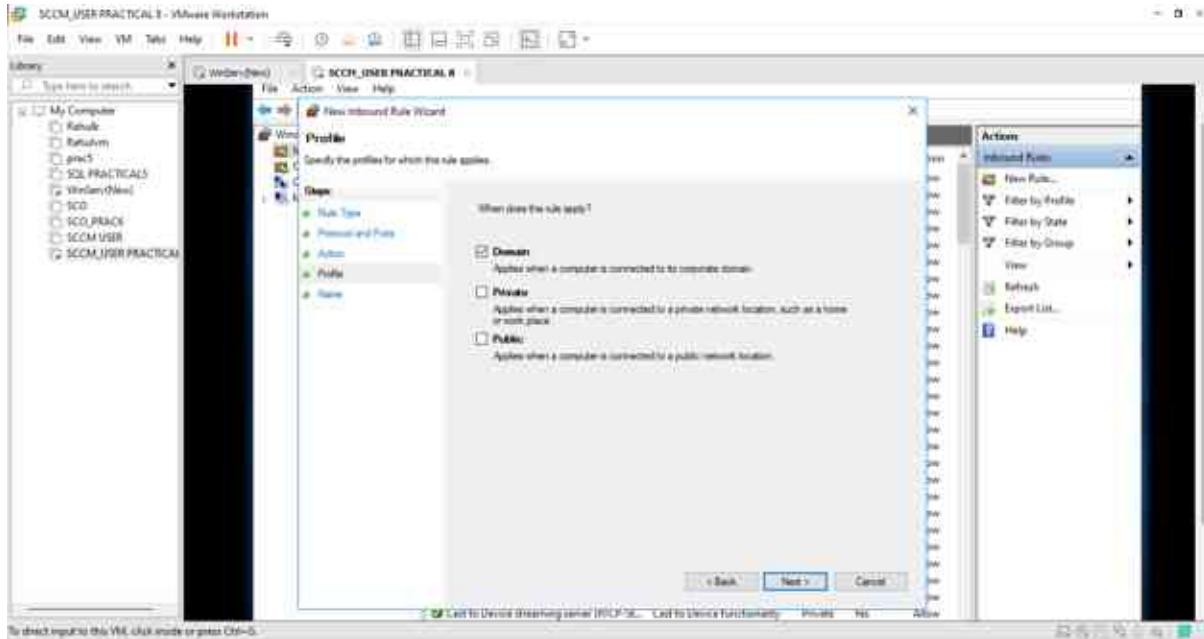
- In the Protocol and Ports dialog box, select **TCP**. Select Specific local ports, and then type port numbers **1433** for SQL Server default instance and **4022** for Inter-site communications use the SQL Server Service Broker. Click **Next**.



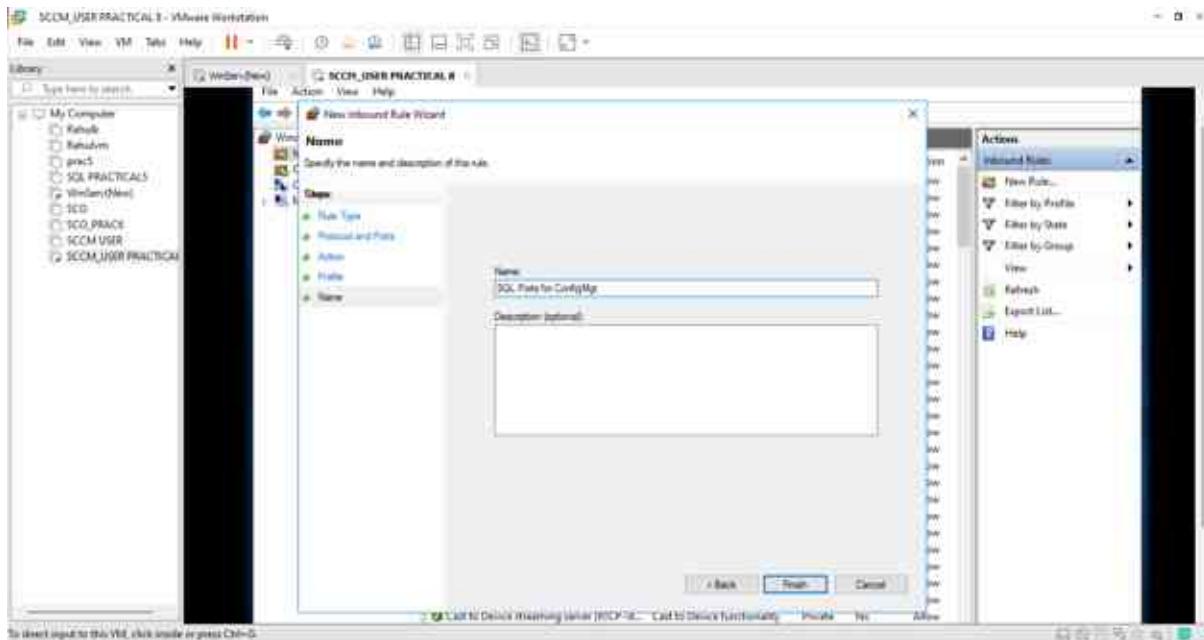
- In the Action dialog box, select **Allow the connection**, and then click **Next**.



- In the Profile dialog box, select **Domain** and then click **Next**.

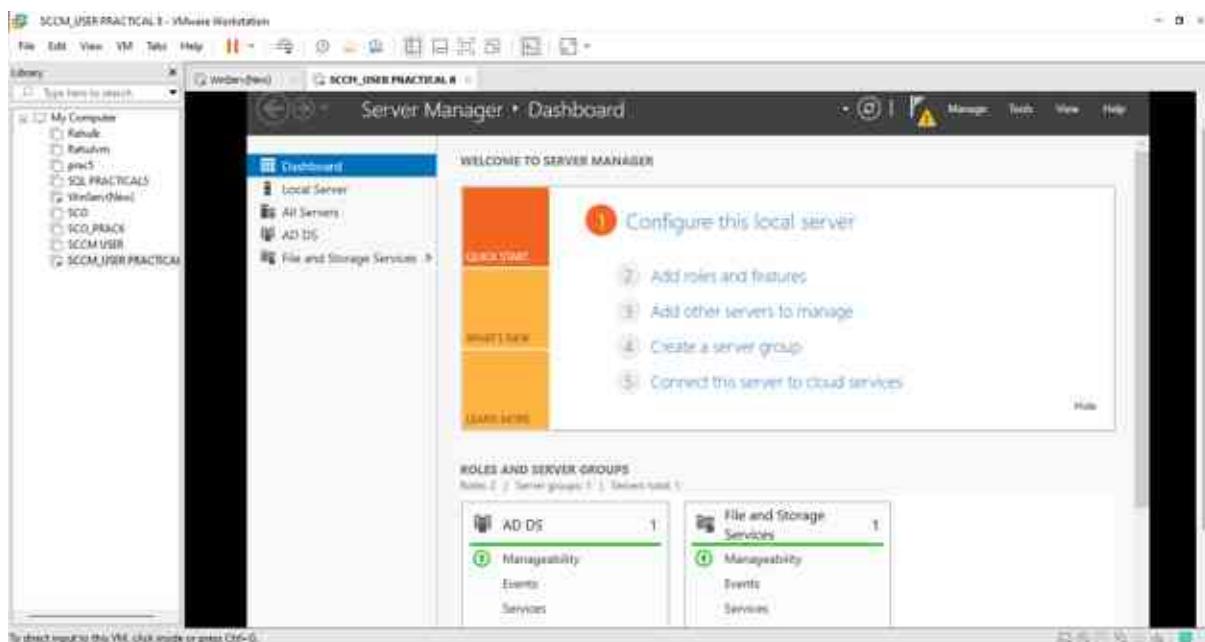


- In the Name dialog box, type a profile name, like **SQL ports for ConfigMgr** and then click **Finish**.

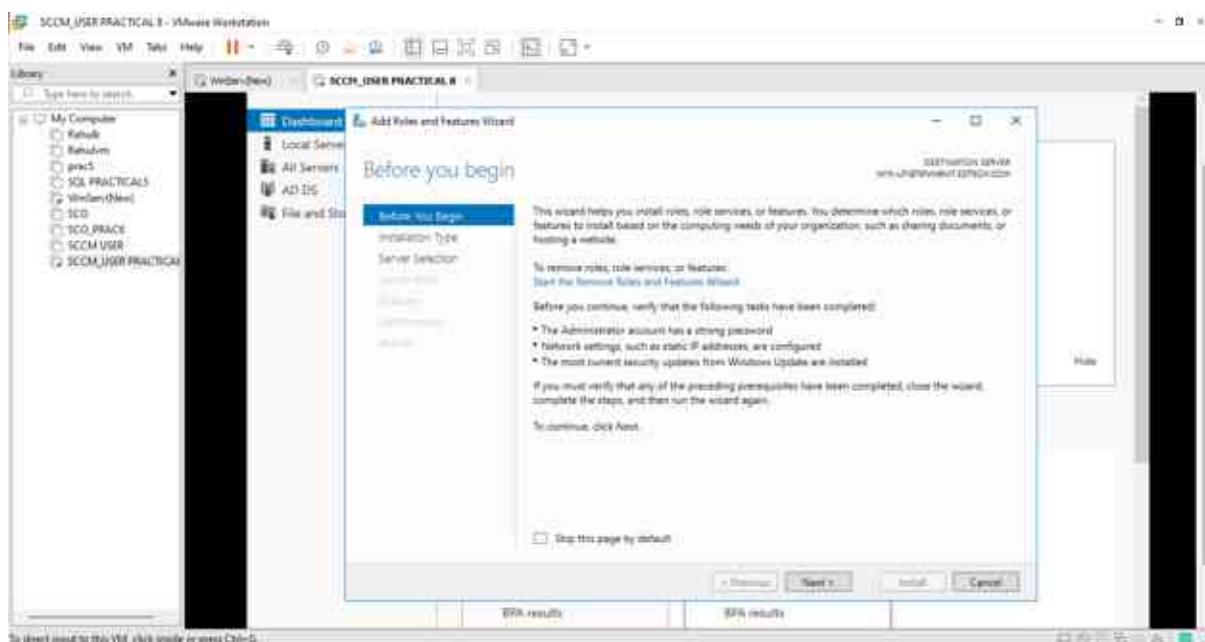


Step 8: Install Web Server (IIS) Role and other Features

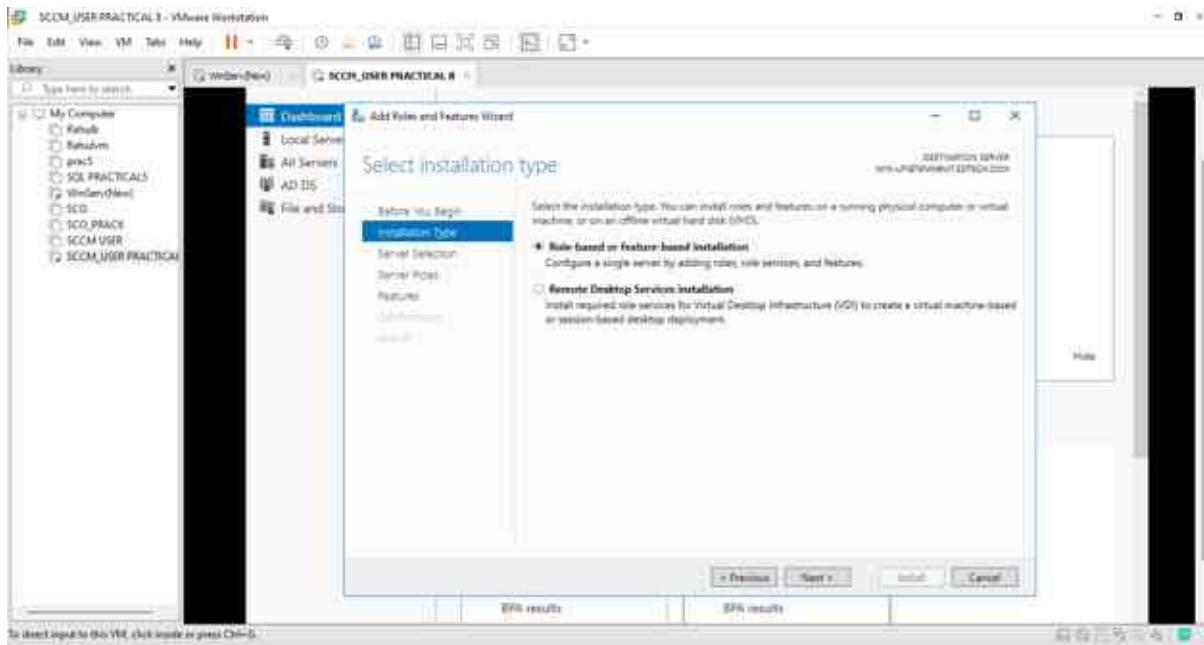
- Open Server Manager and then Click on Add roles and features



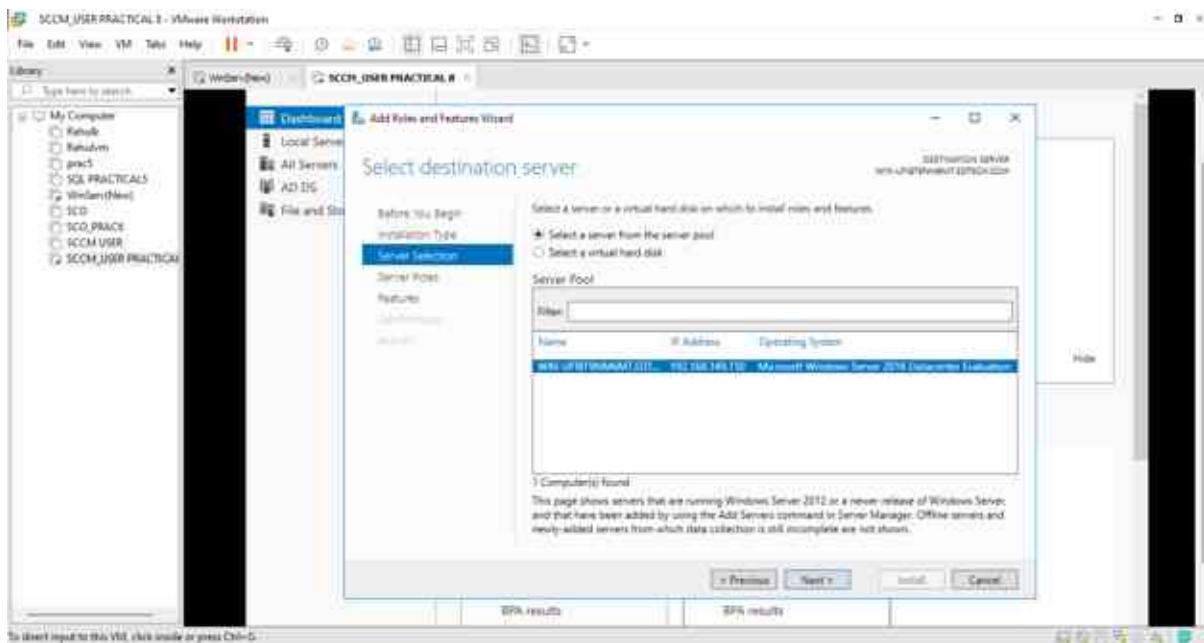
- Click Next



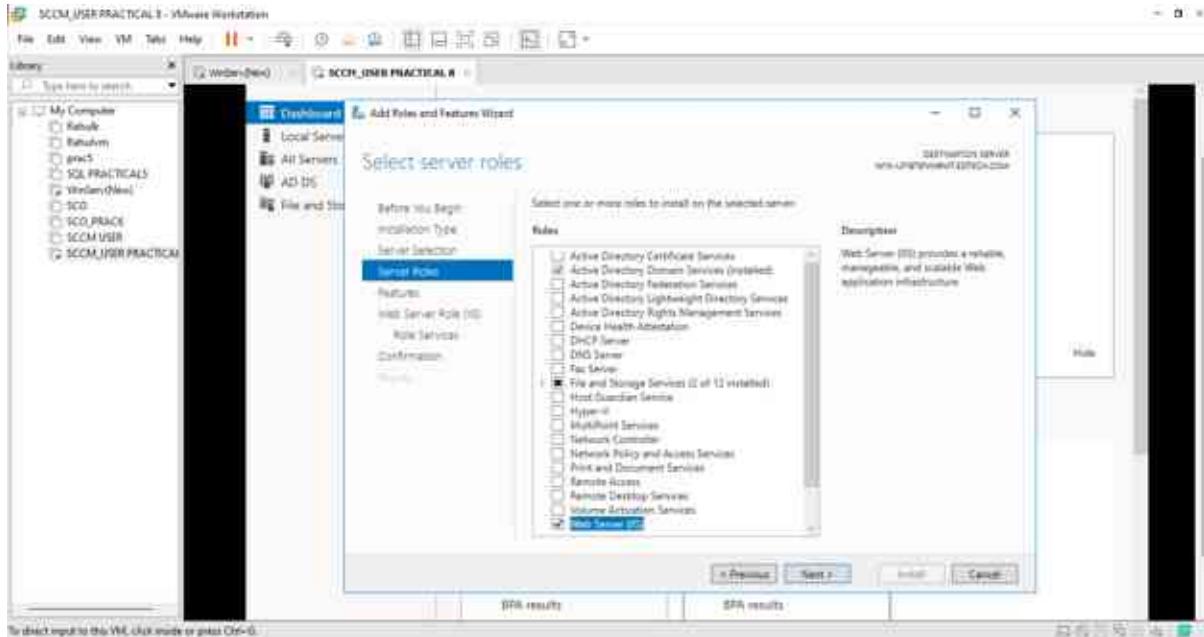
- Select **Role-based or Feature-based installation** and Click **Next**



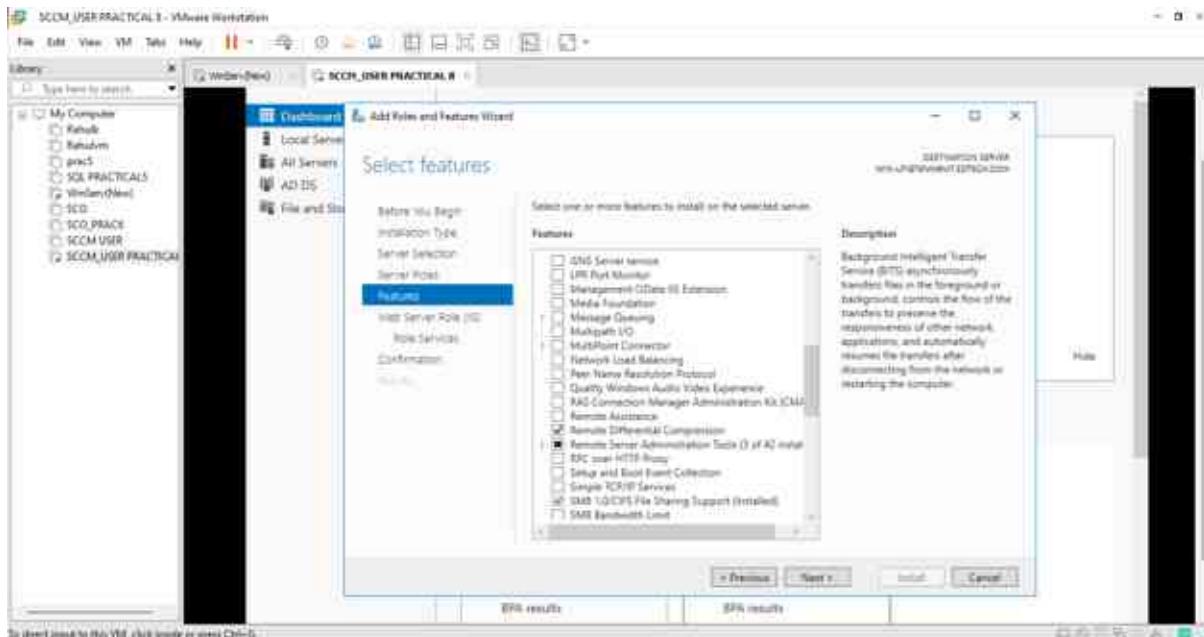
- Keep default values and Click **Next**



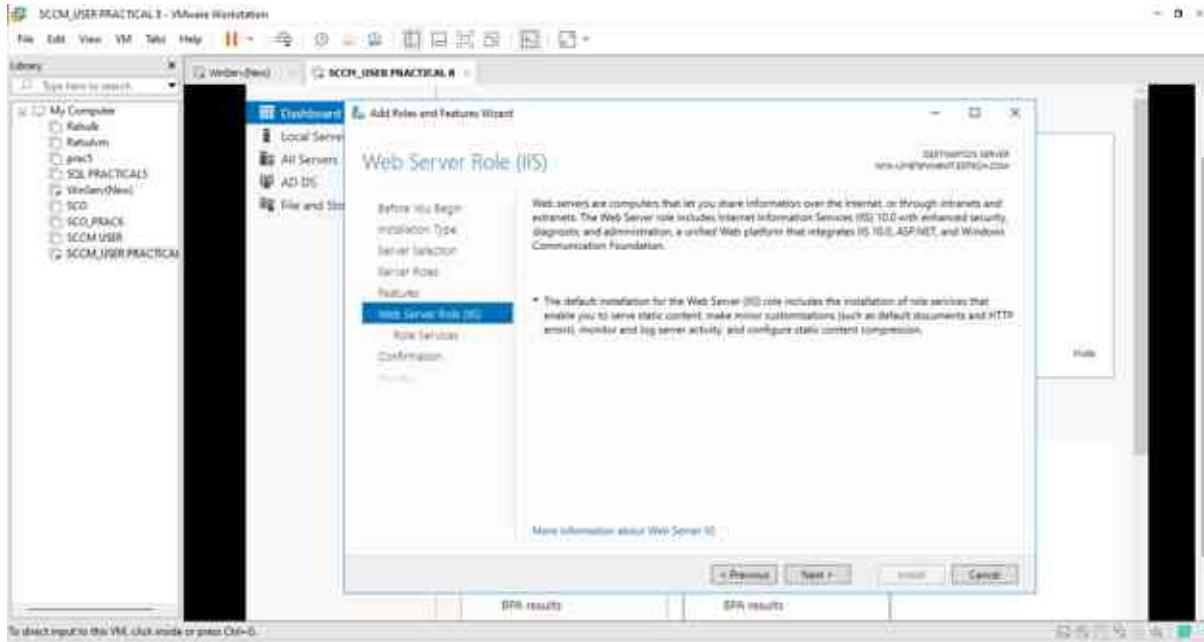
- Select Web Server (IIS) and Click Add Feature and Click Next



- Select .NET Framework 3.5 and Background Intelligent Transfer Service (BITS) and Remote Differential Compression Click Next



- Click Next



In the Web Server Role (IIS) > Role Services select the following:

Web Server (IIS)

Web Server

- **Common HTTP Features:** Default Document, Directory Browsing, HTTP Errors, Static Content, HTTP Redirection
- **Health and Diagnostics:** HTTP logging, Logging tools, Request Monitor Tracing, Tracing
- **Performance:** Static Content Compression
- **Security:** Windows Authentication
- **Application Development:** .NET Extensibility 3.5, .NET Extensibility 4.7, ASP.NET 3.5, ASP.NET 4.7, ISAPI Extensions, ISAPI Filters

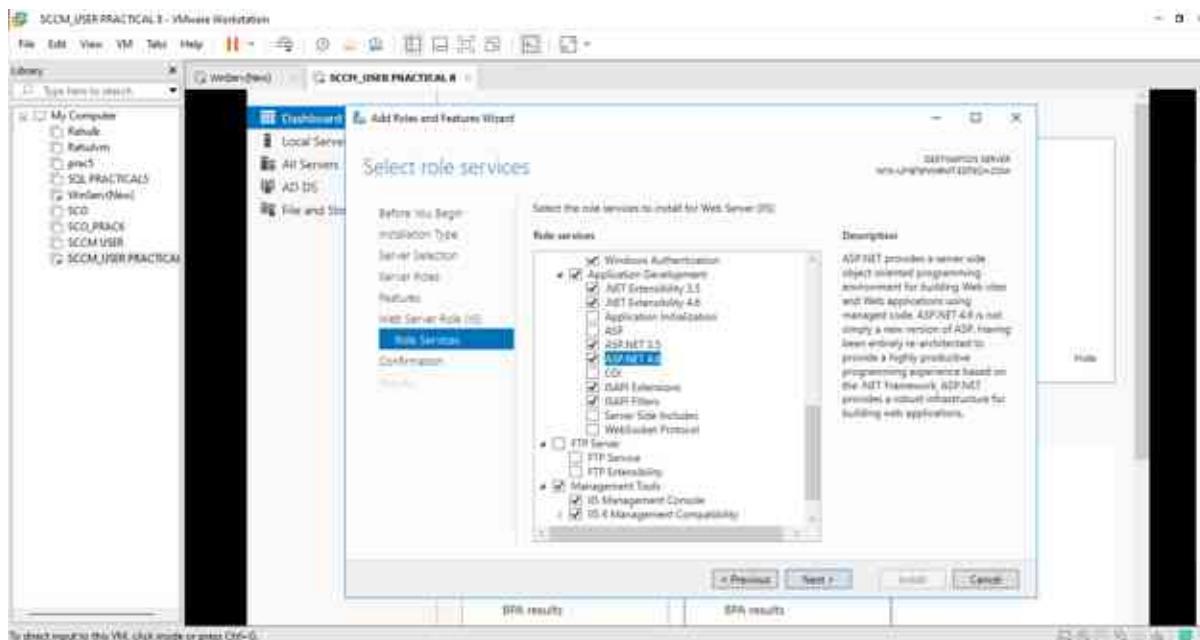
Management Tools

- **IIS Management Console**
- **IIS 6 Management Compatibility: IIS 6 Metabase Compatibility, IIS 6 WMI Compatibility**
- **IIS Management Scripts and Tools**

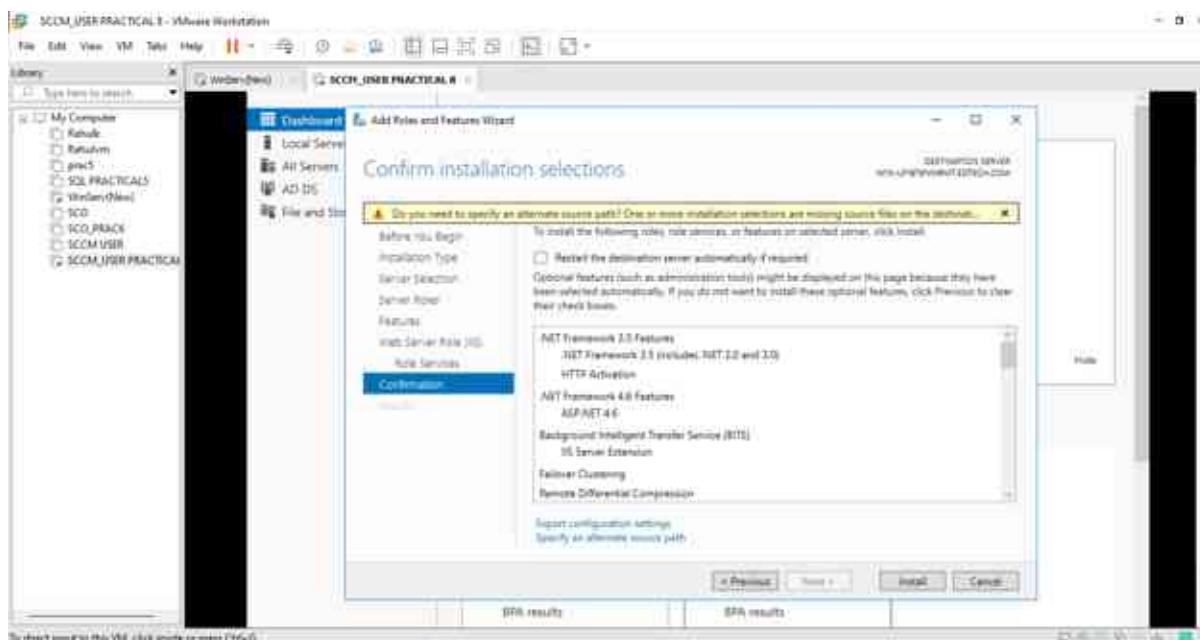
In the **Add Roles and Feature Wizard > Confirm installation selection** page, review the **Roles and Features selected:**

- **.NET Framework 3.5 Features**
- **.NET Framework 4.7 Features**
- **Background Intelligent Transfer (BITS)**
- **Remote Differential Compression**
- **Web Server (IIS)**

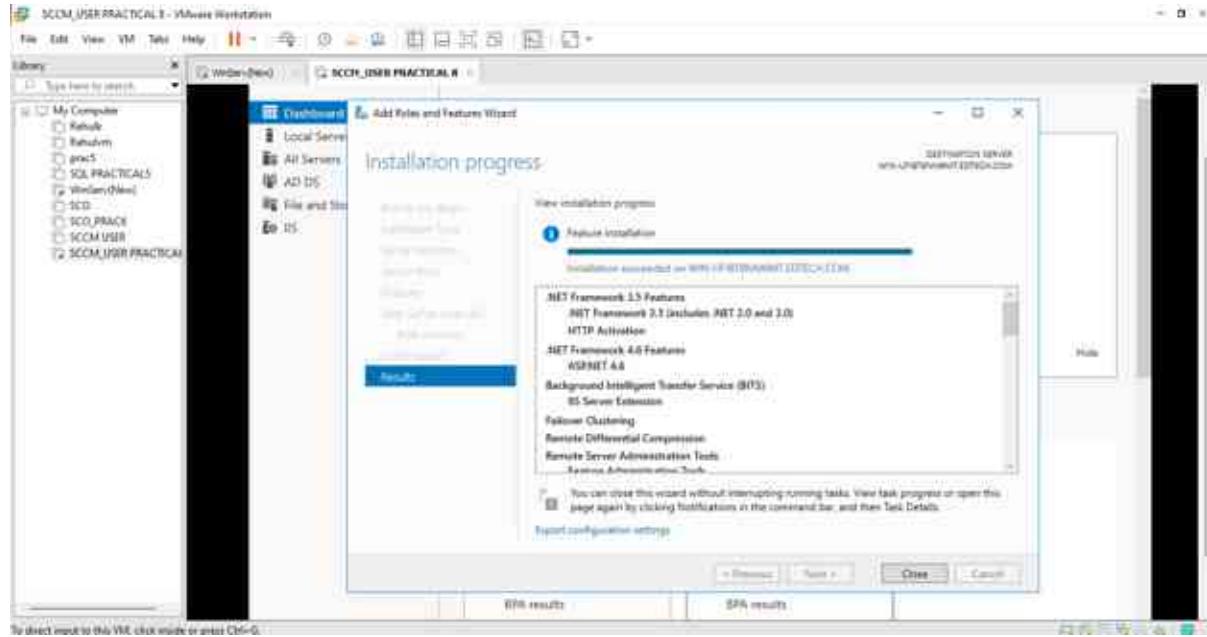
After Selecting Above Feature Click on Next



- **Click Install**

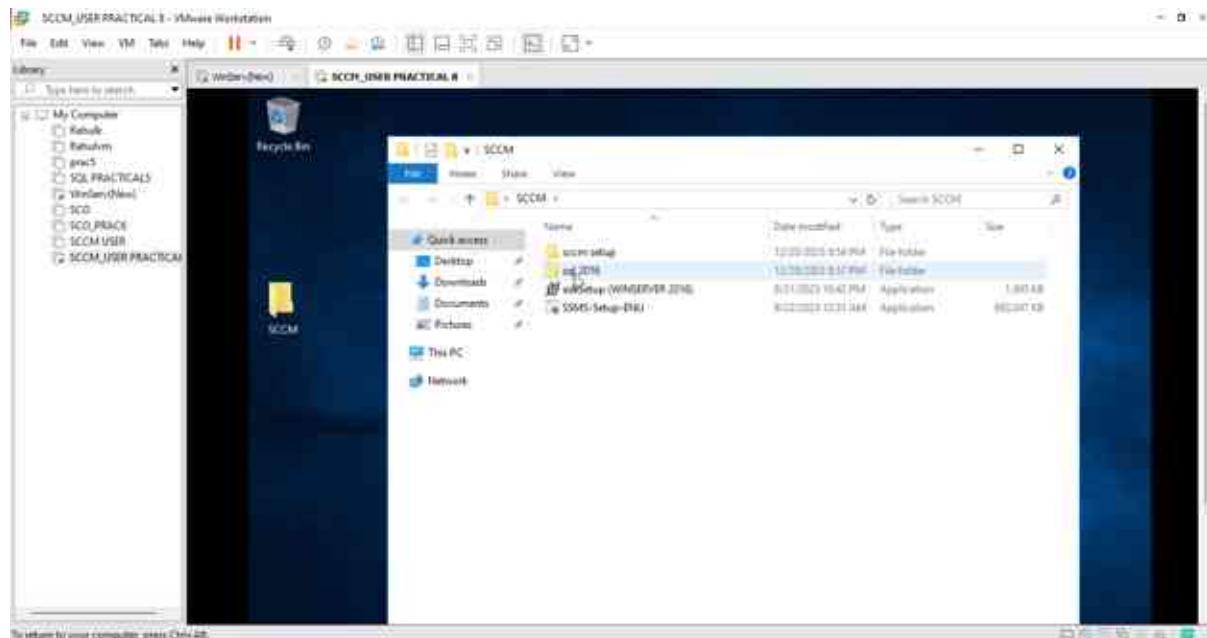


- After the Installation of feature Click on Close

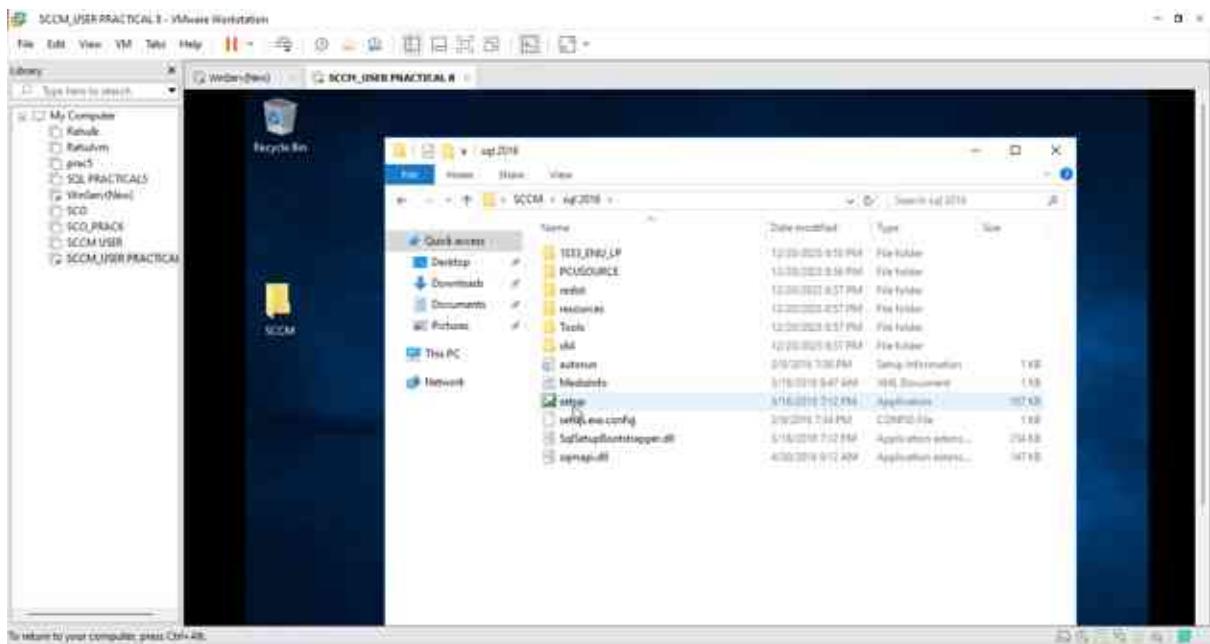


Step 9: Installing and Configuring SQL Server 2016

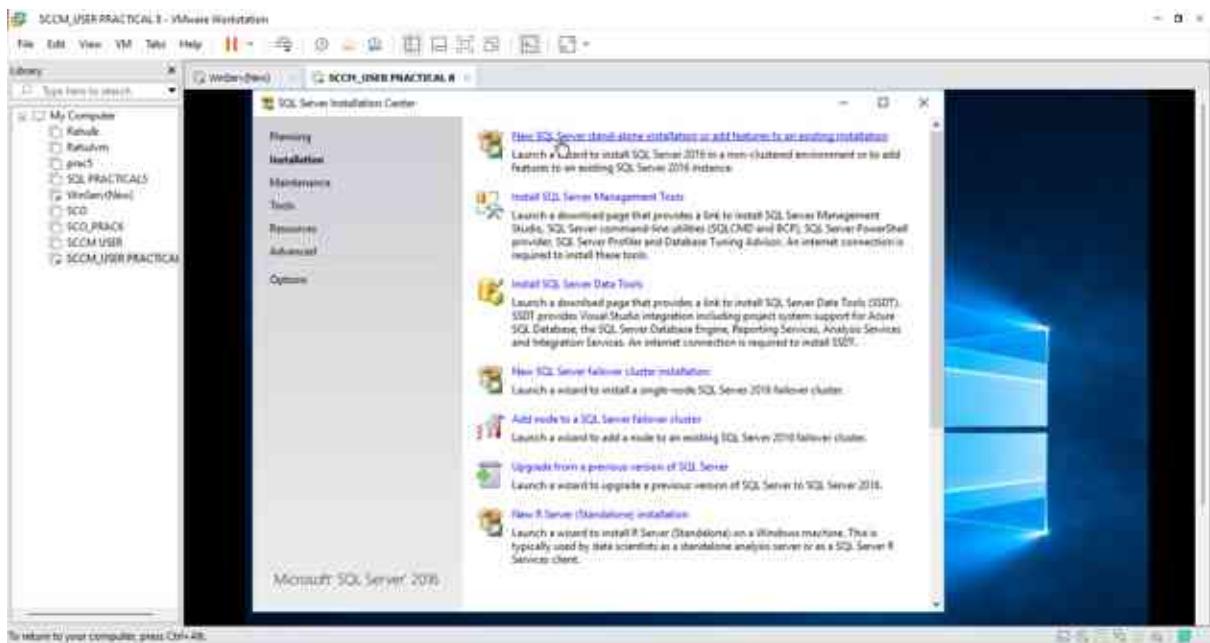
- Open your sql 2016 folder



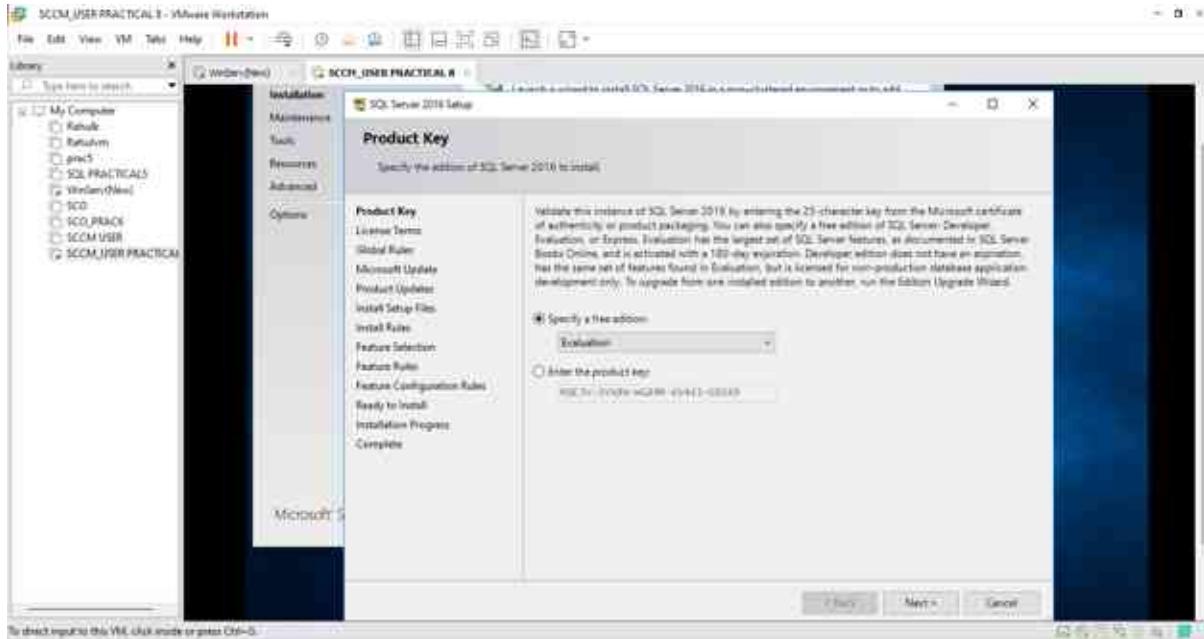
- Click on setup



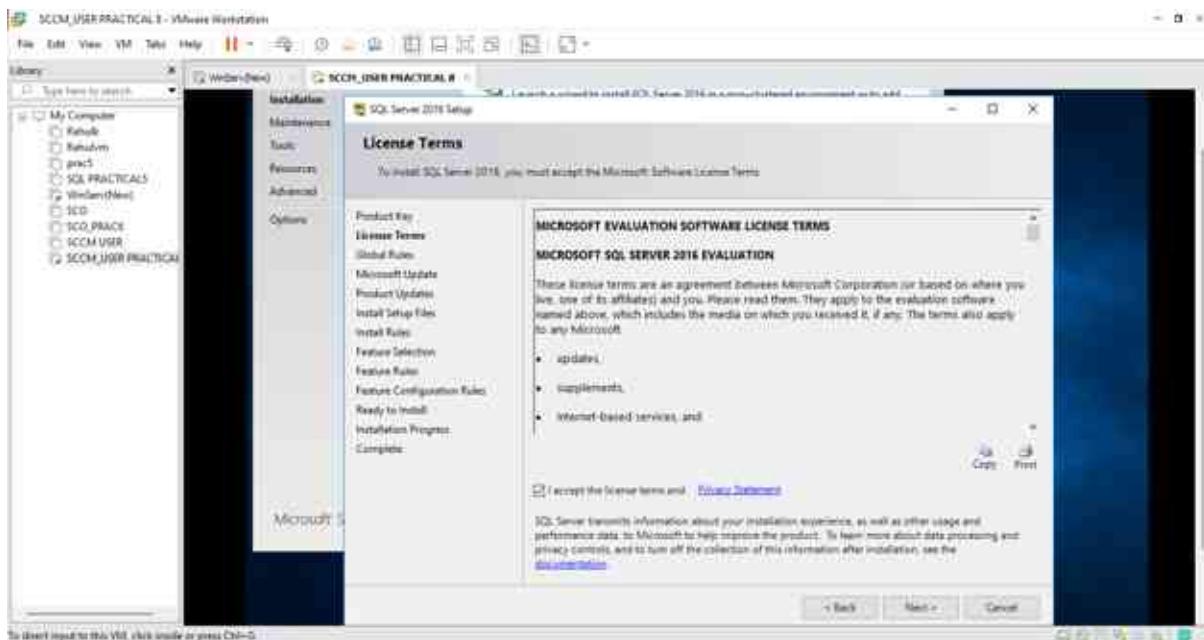
- Click on Installation and Select New SQL Server stand-alone installation



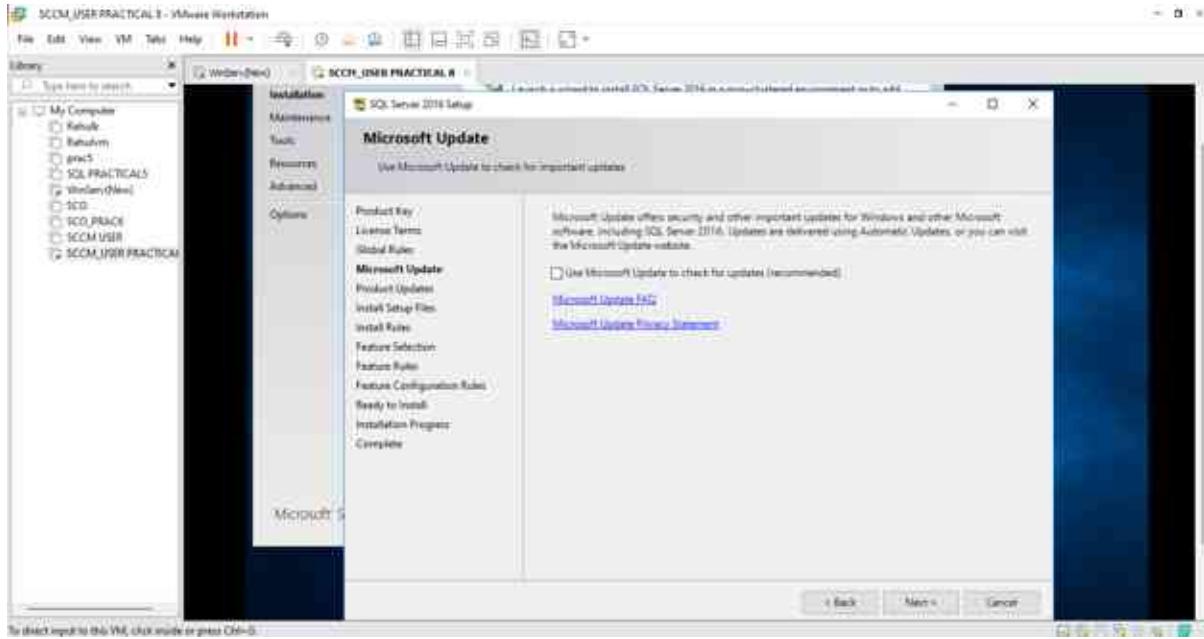
- Select Specify a free edition and Click on Evaluation and Click Next



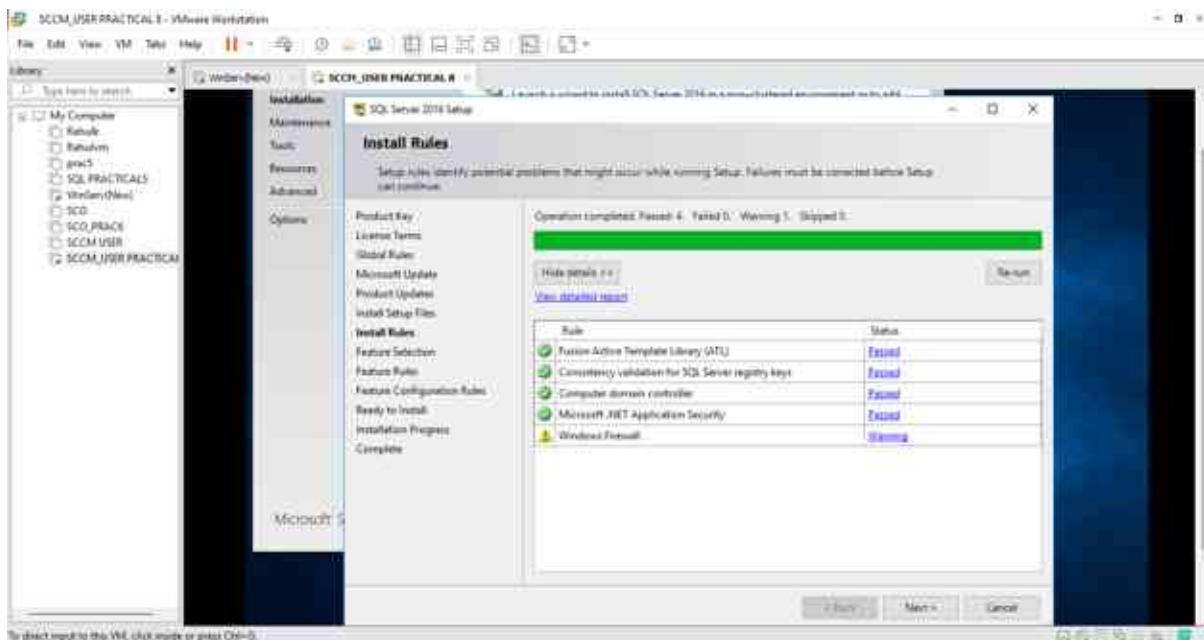
- Select I accept these license terms and Click Next



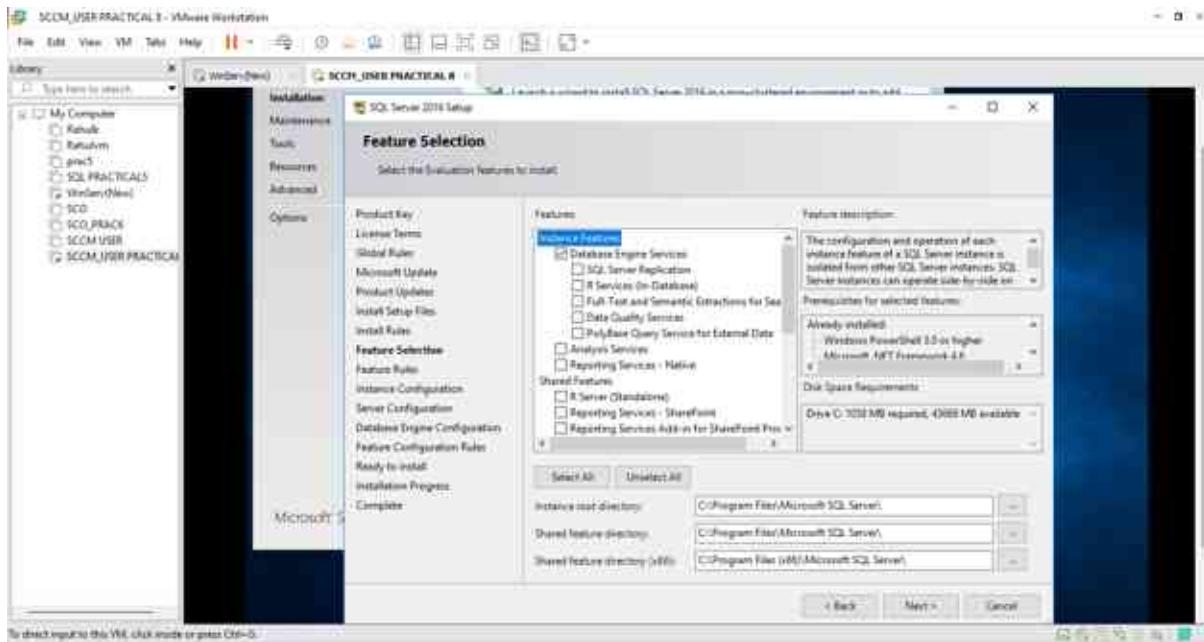
- Click Next



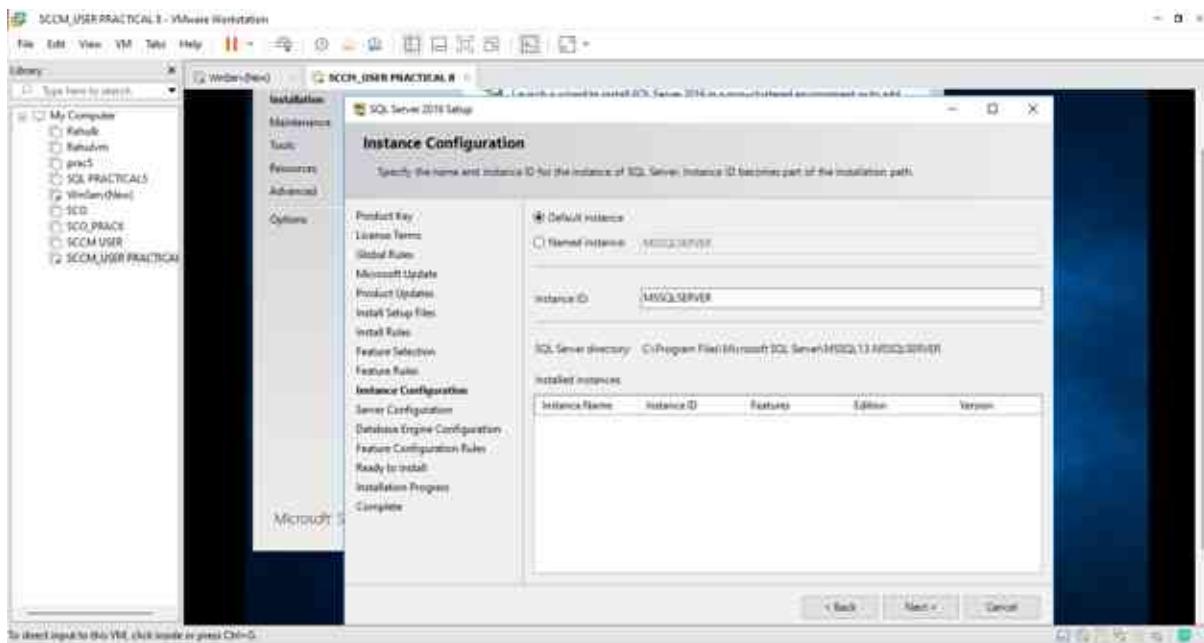
- Click Next



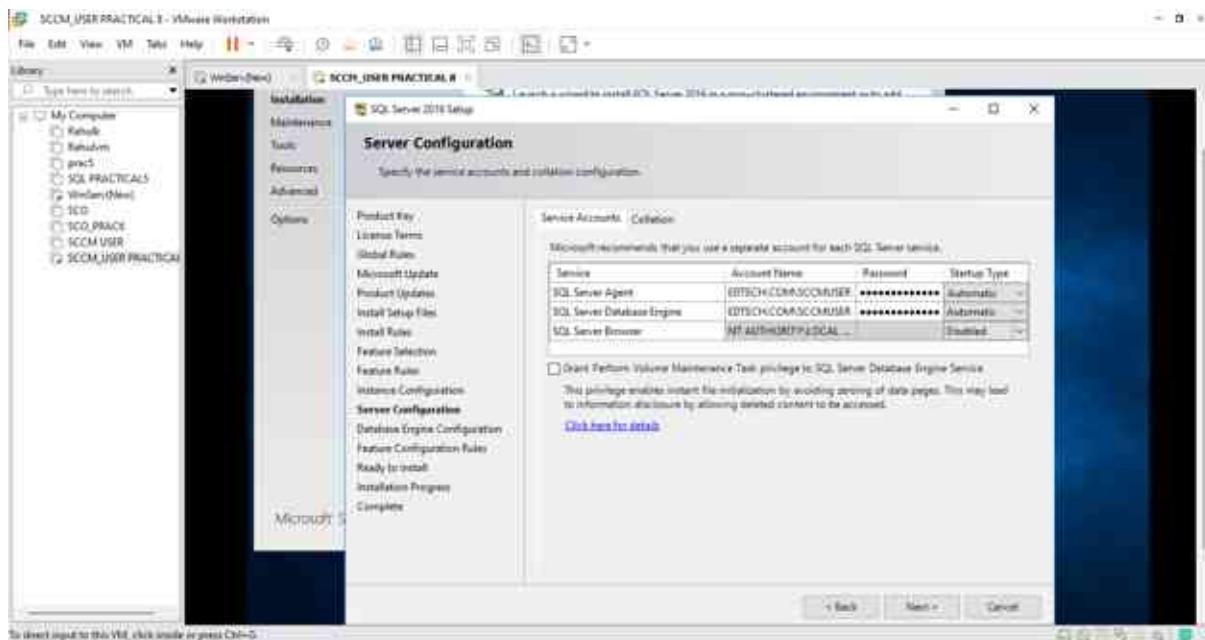
- In Feature Selection Click on Database Engine Services and Click Next



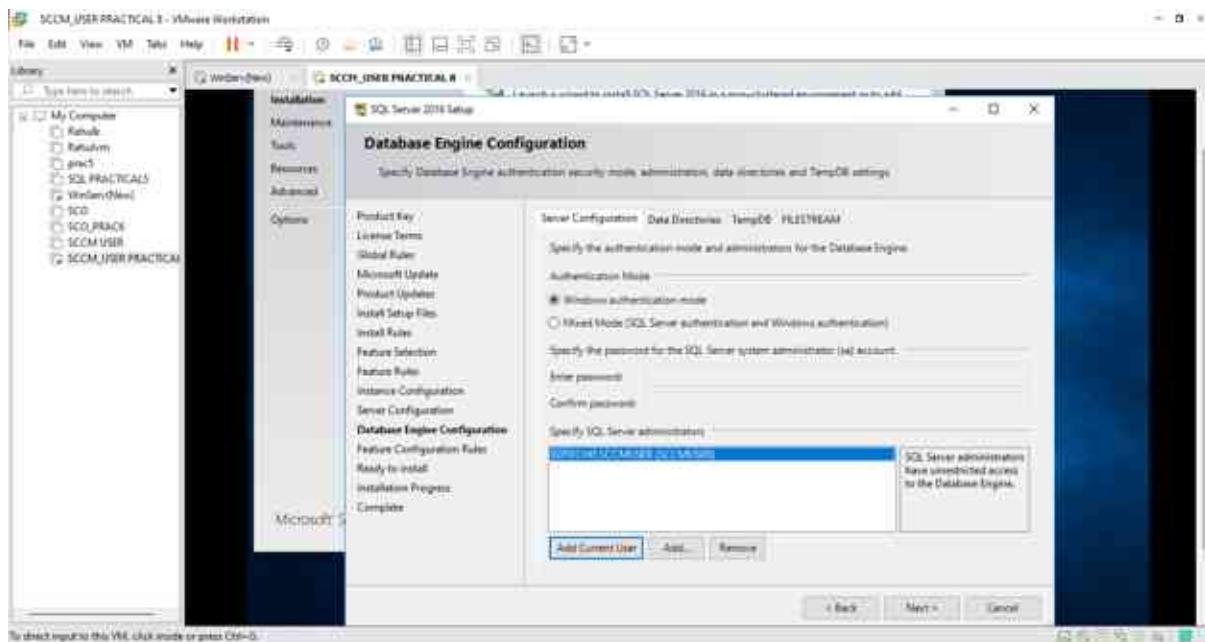
- Keep default values and Click Next



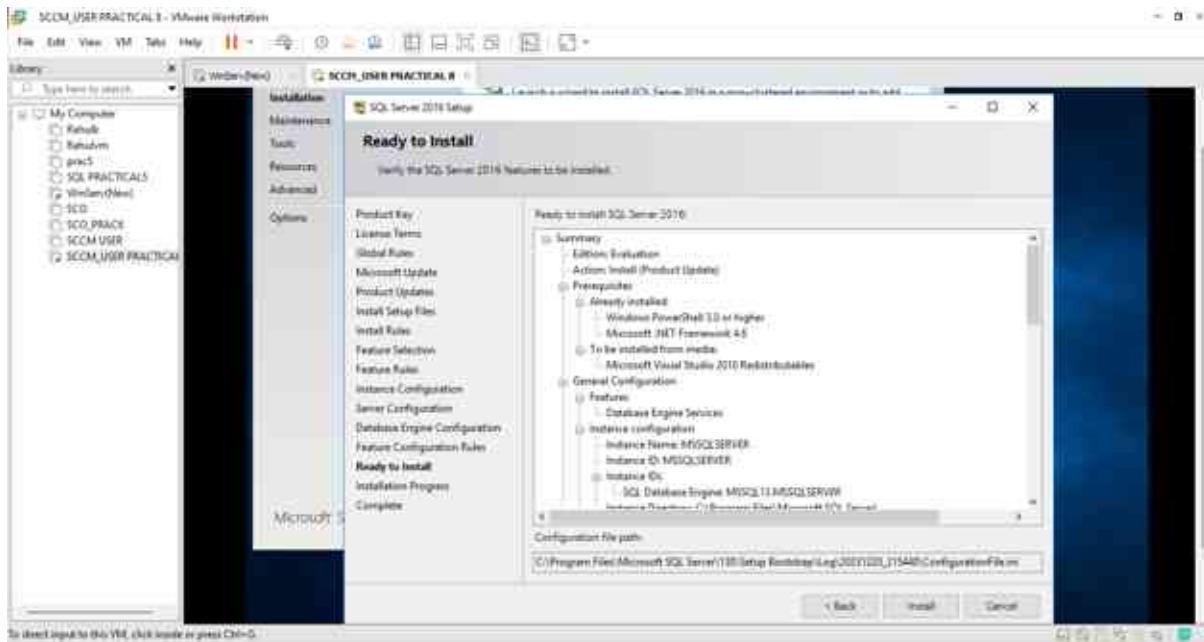
- Type in the credentials of your User account (Here User account name: **EDTECH.COM\SCCMUSER**) and Click Next



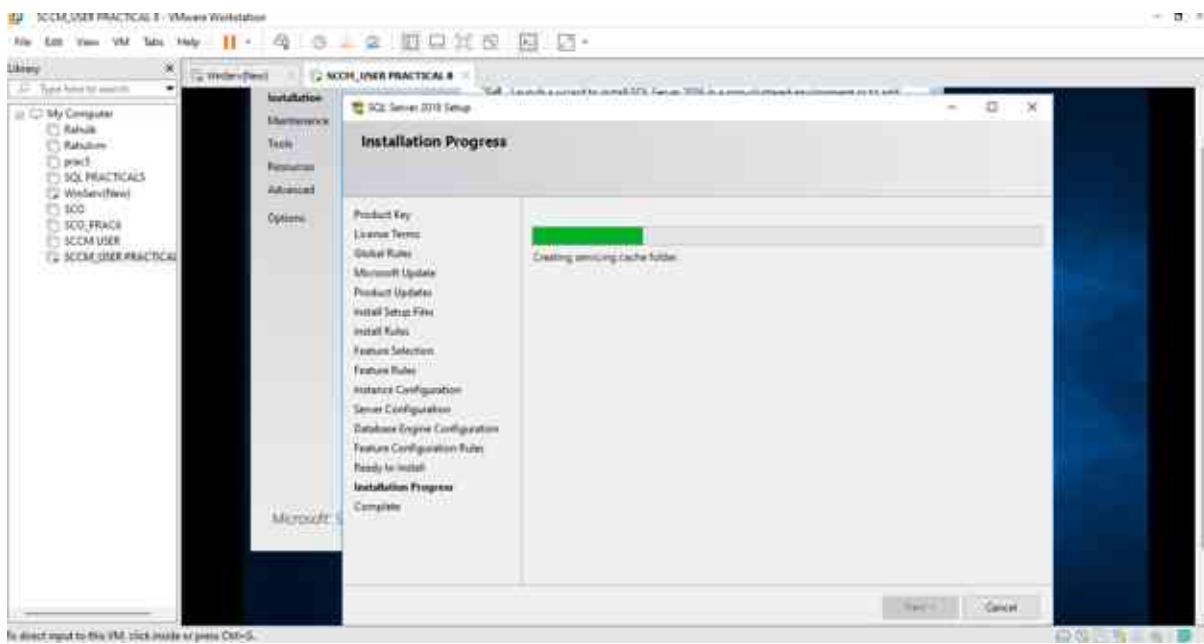
- Click on Add Current User and Click Next



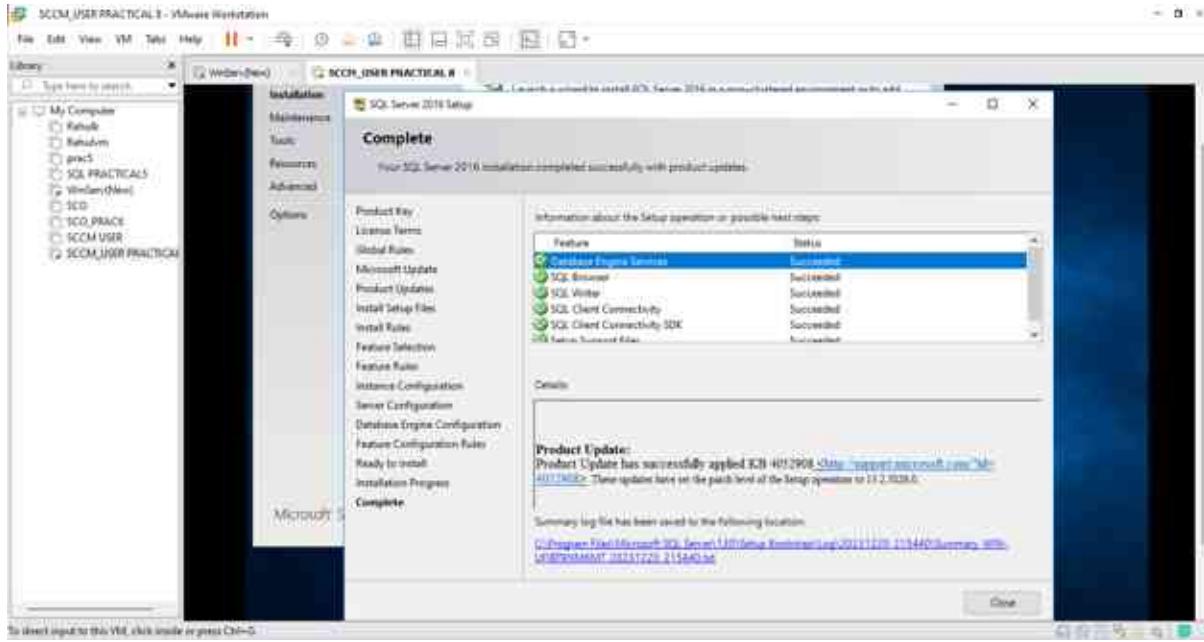
- Click Install



- Installation start

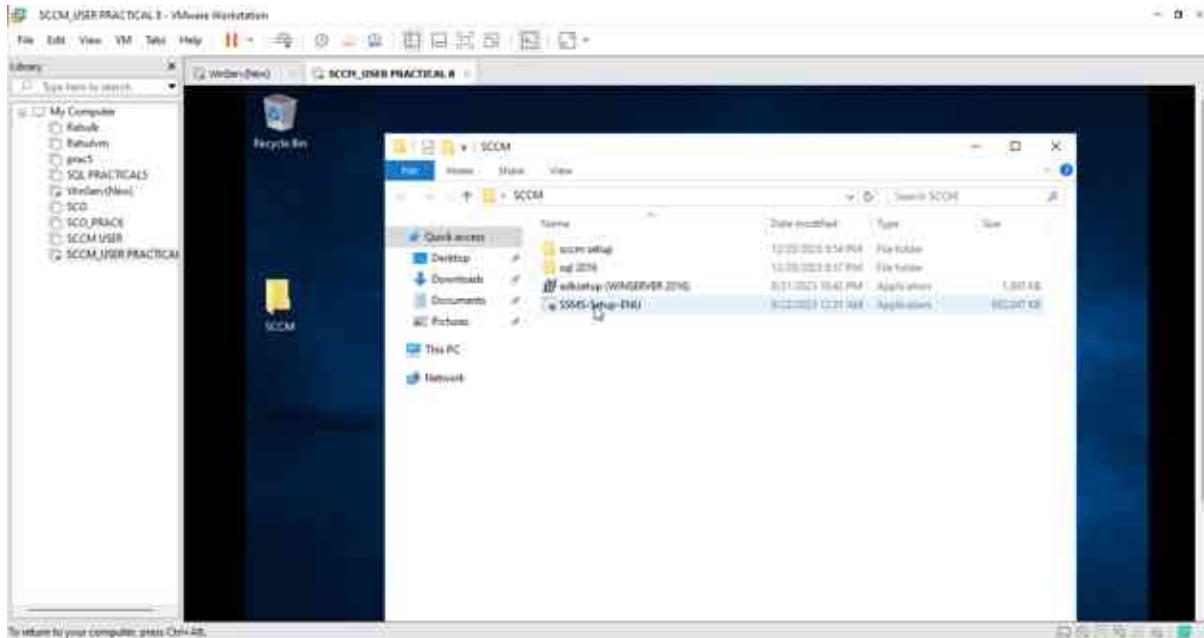


- Click Close

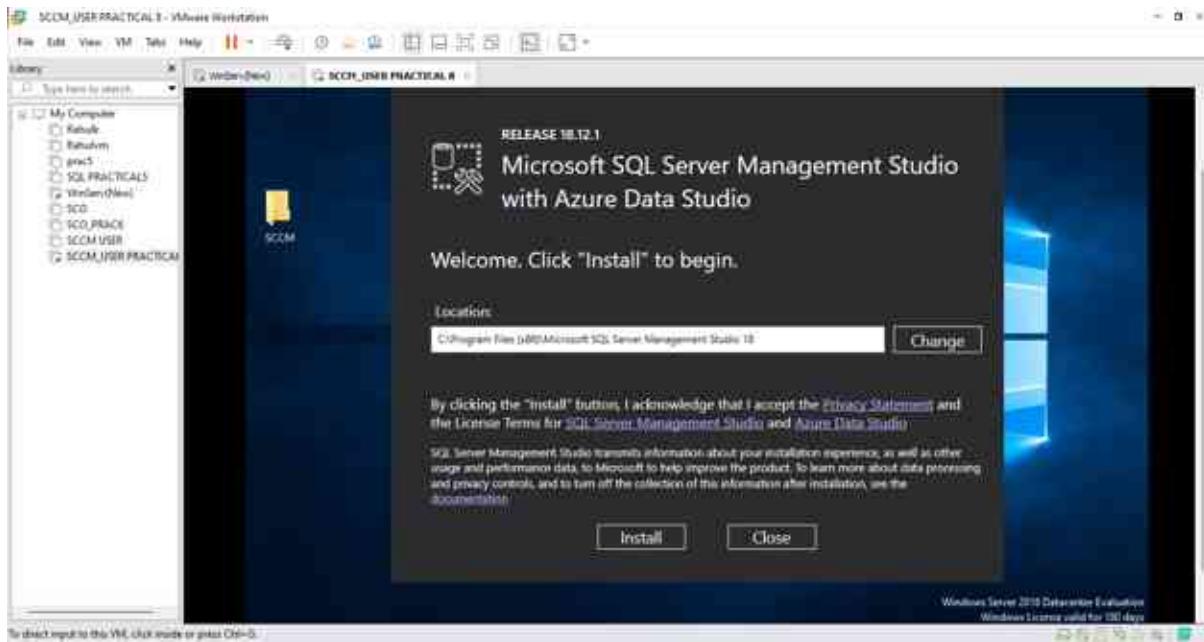


Step 10: Installing SQL Server Management Studio 18

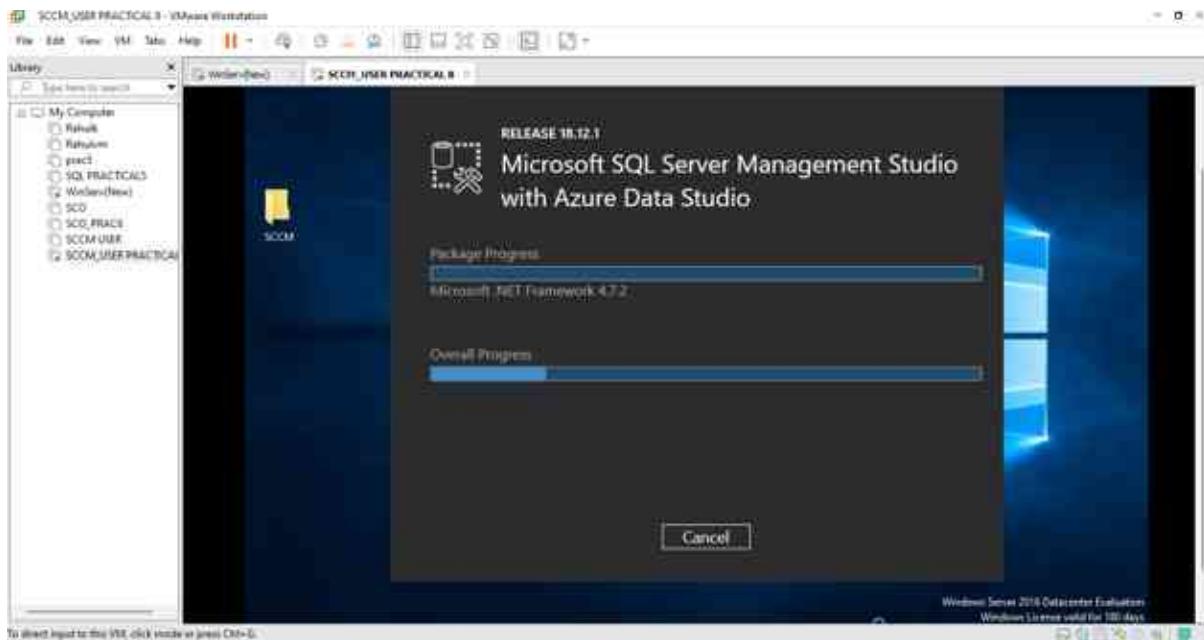
- Within Your SCCM Folder Double-Click on SSMS-Setup-ENU



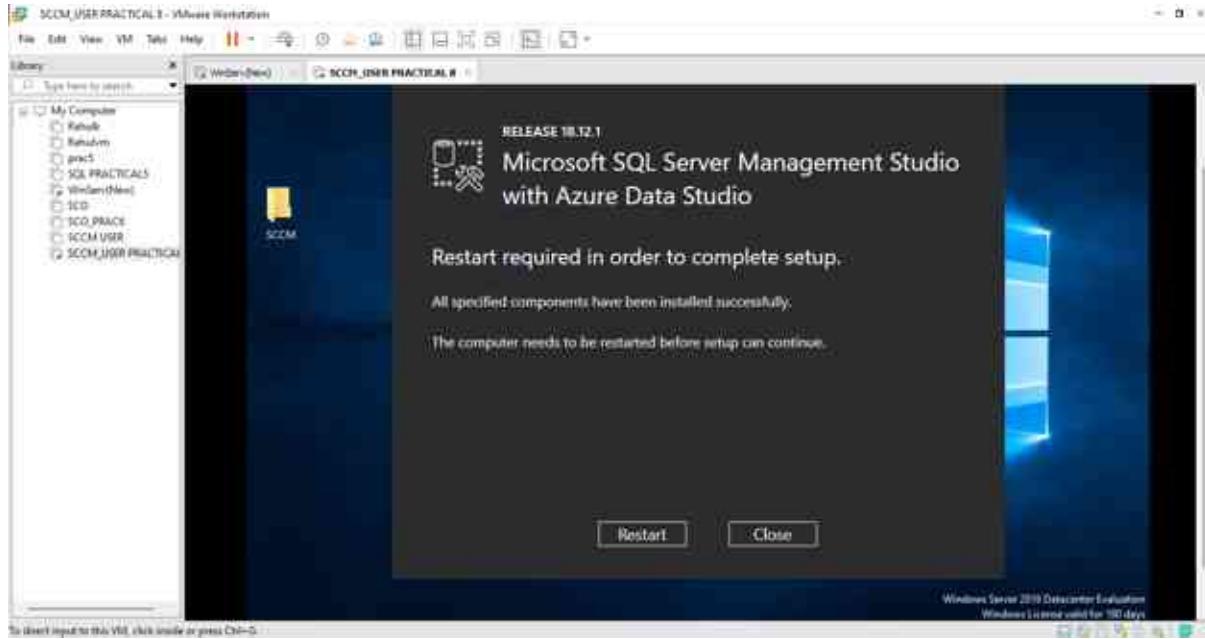
- Click Install



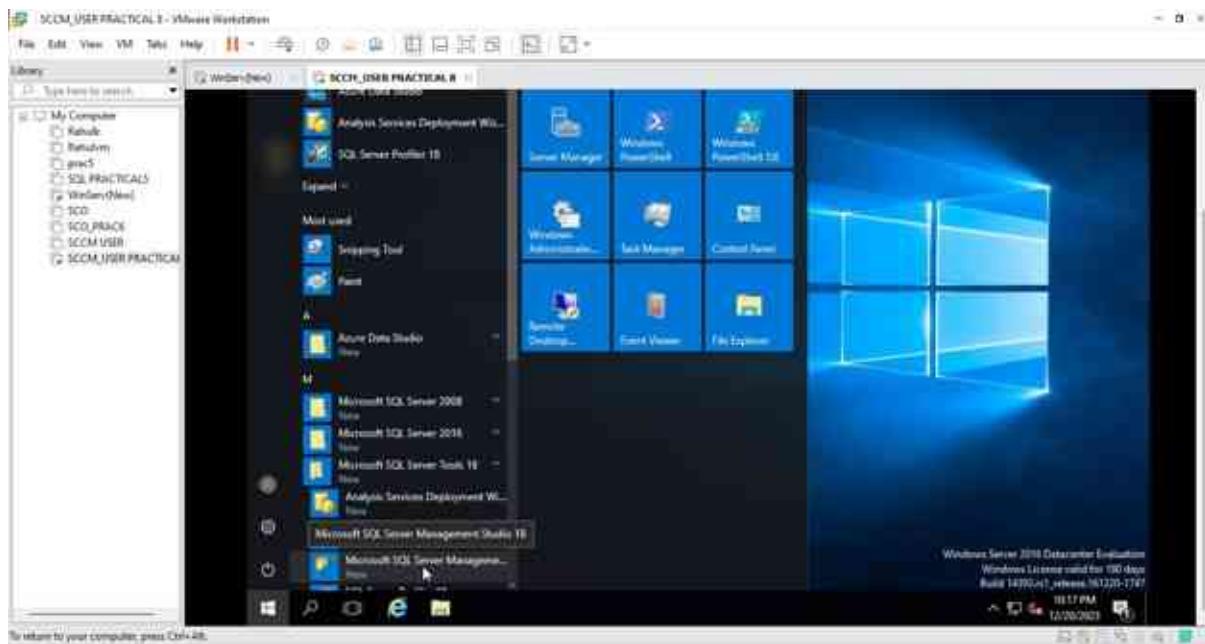
- It will start installing necessary file



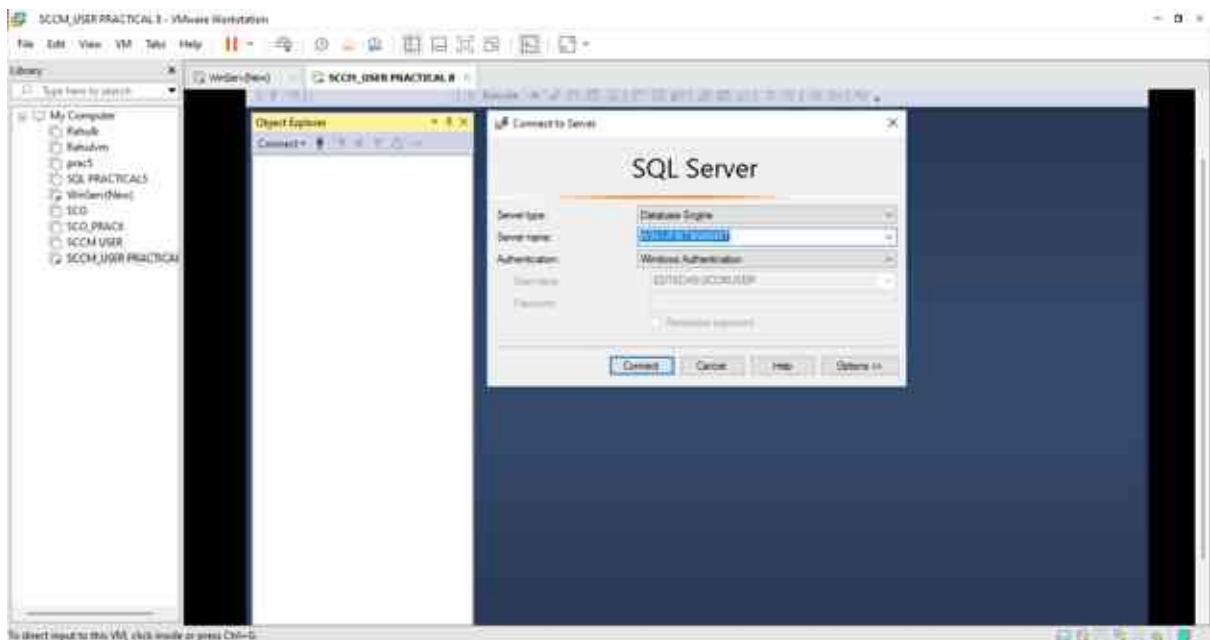
- Click on Restart



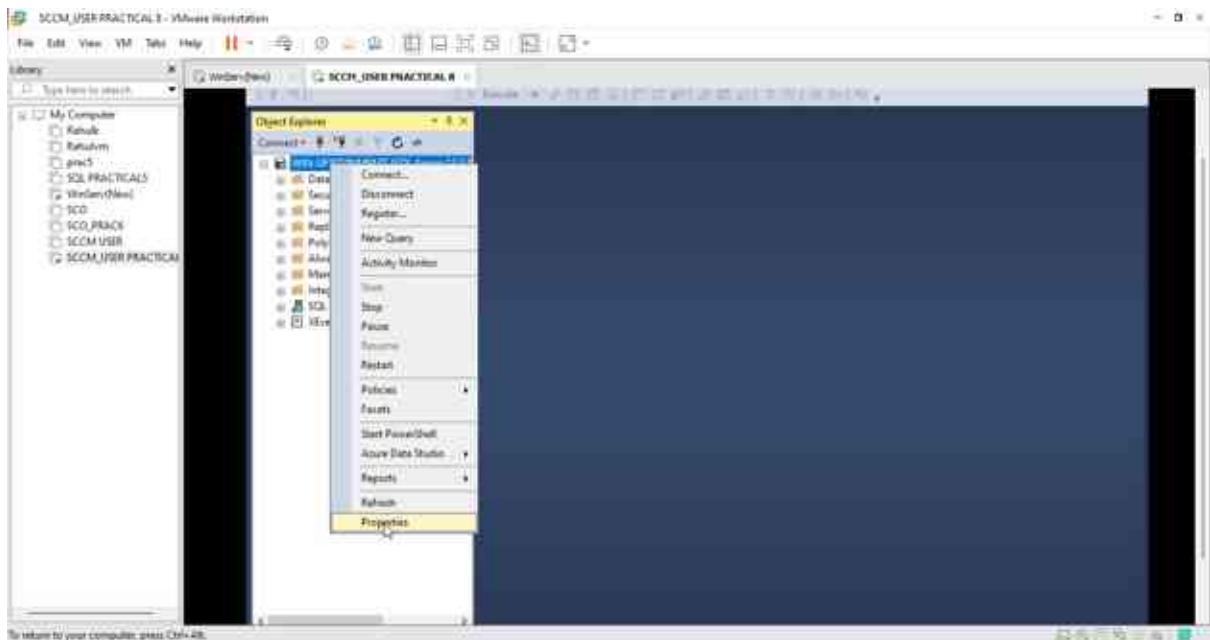
- Open Microsoft SQL Server Management Studio 18



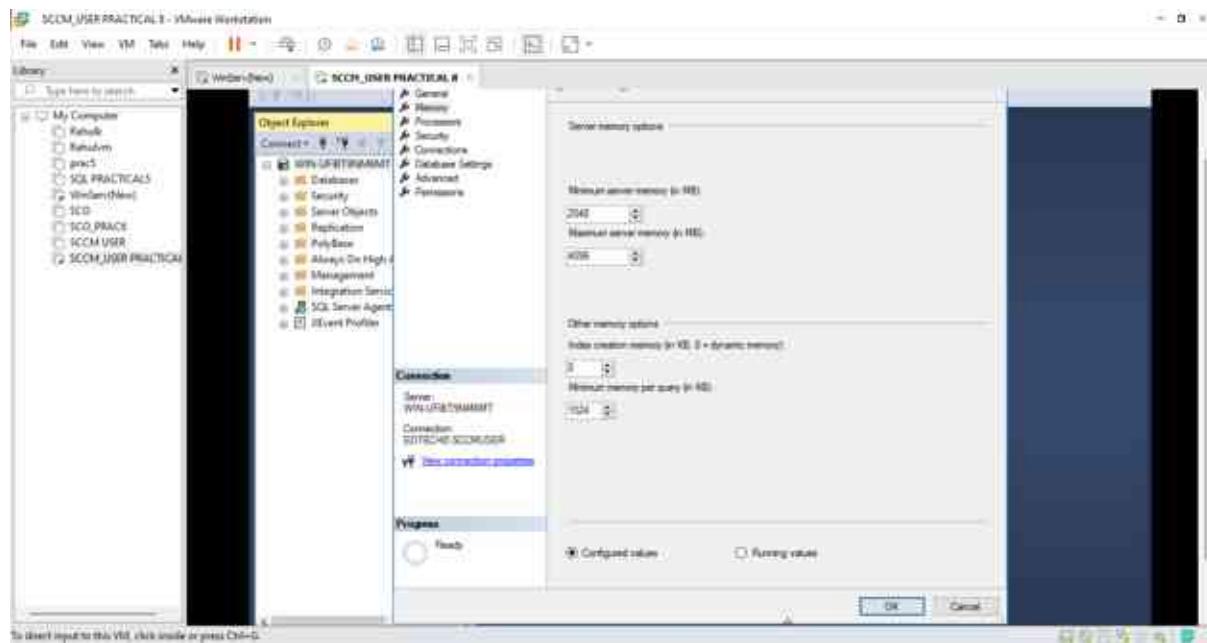
- After restarting the system Launch SQL Server Management Studio 18 and Click Connect



- Right-click on the WIN-UFIBT9NM6MT (SQL Server) and select Properties.

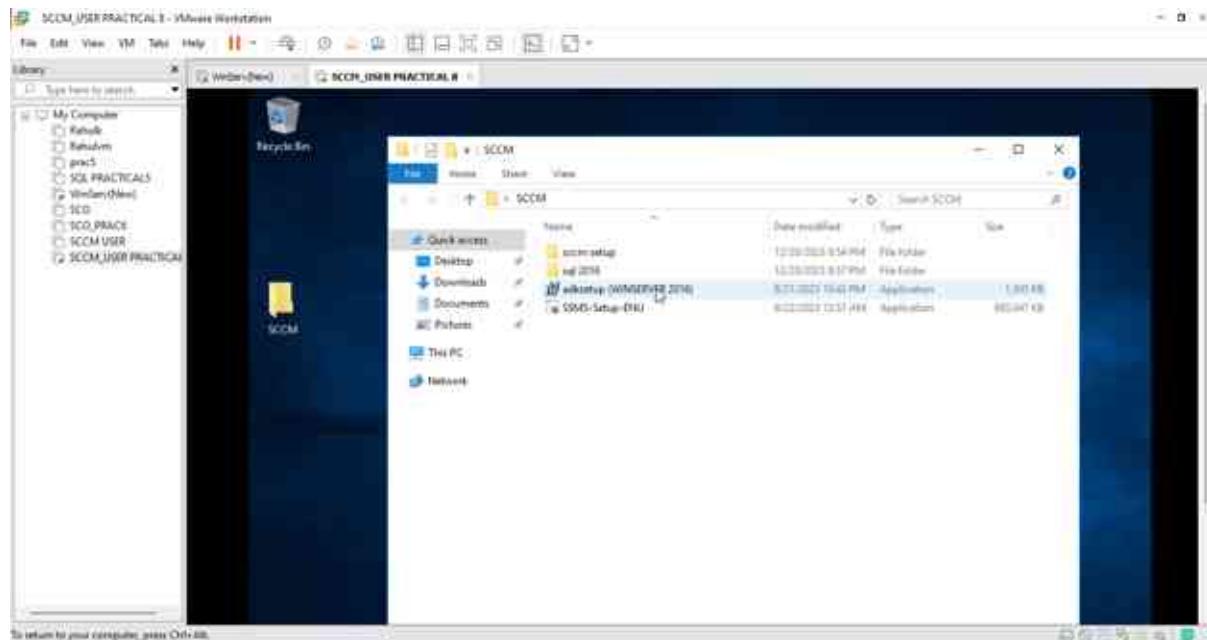


- Select Memory and Edit the Minimum Server Memory to 2048 MB and the Maximum Server Memory to 4096 MB and Click Ok

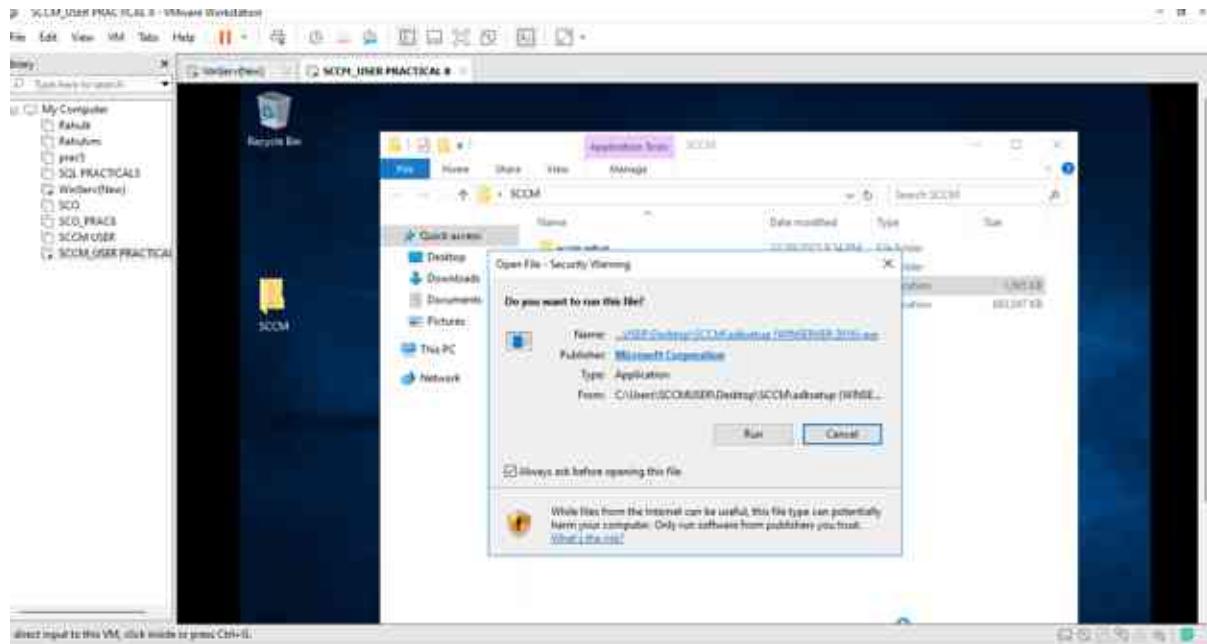


Step 11: Windows ADK Installation

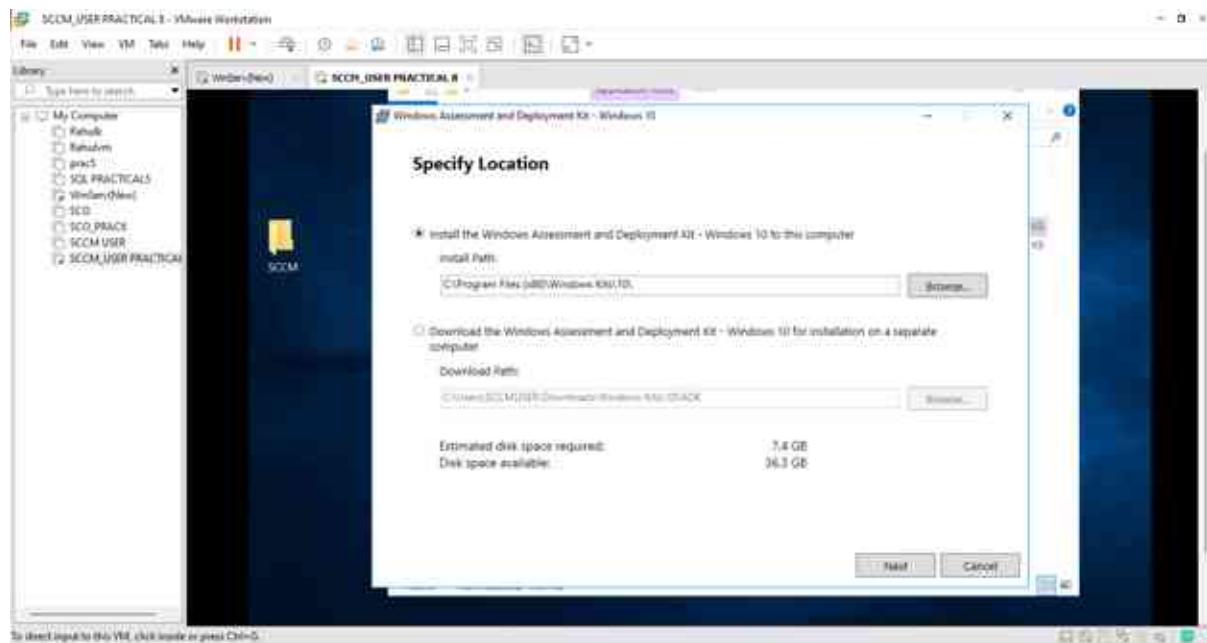
- Open SCCM Folder and then Double-Click on adksetup



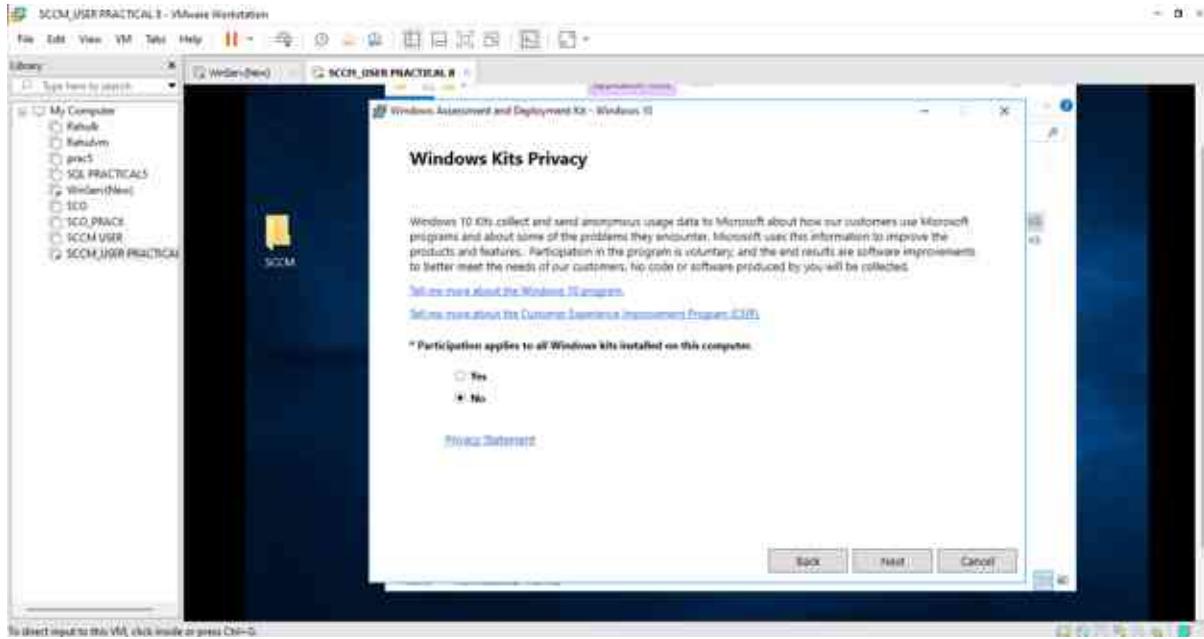
- Click on Run



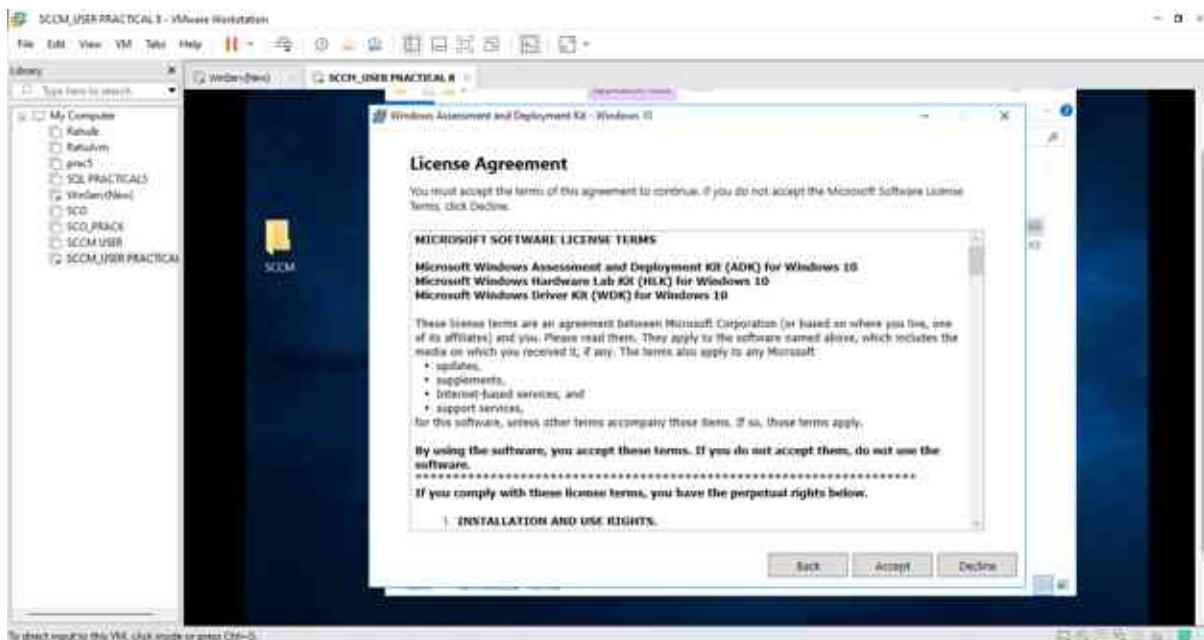
- Click on Next



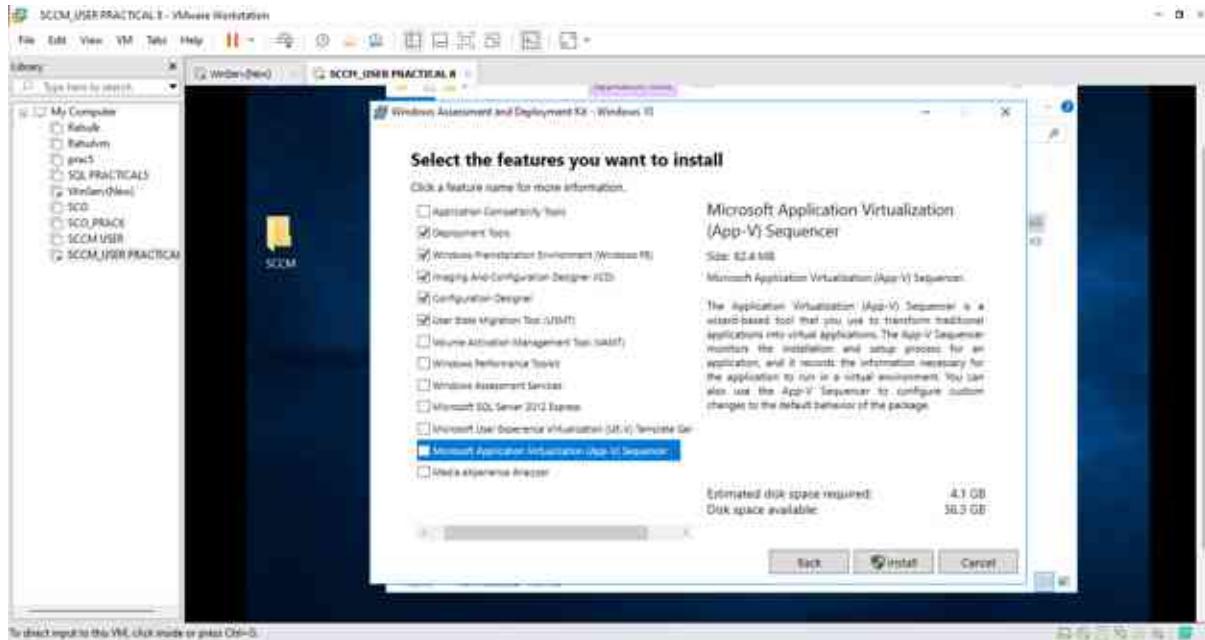
- Select No and then Click on Next



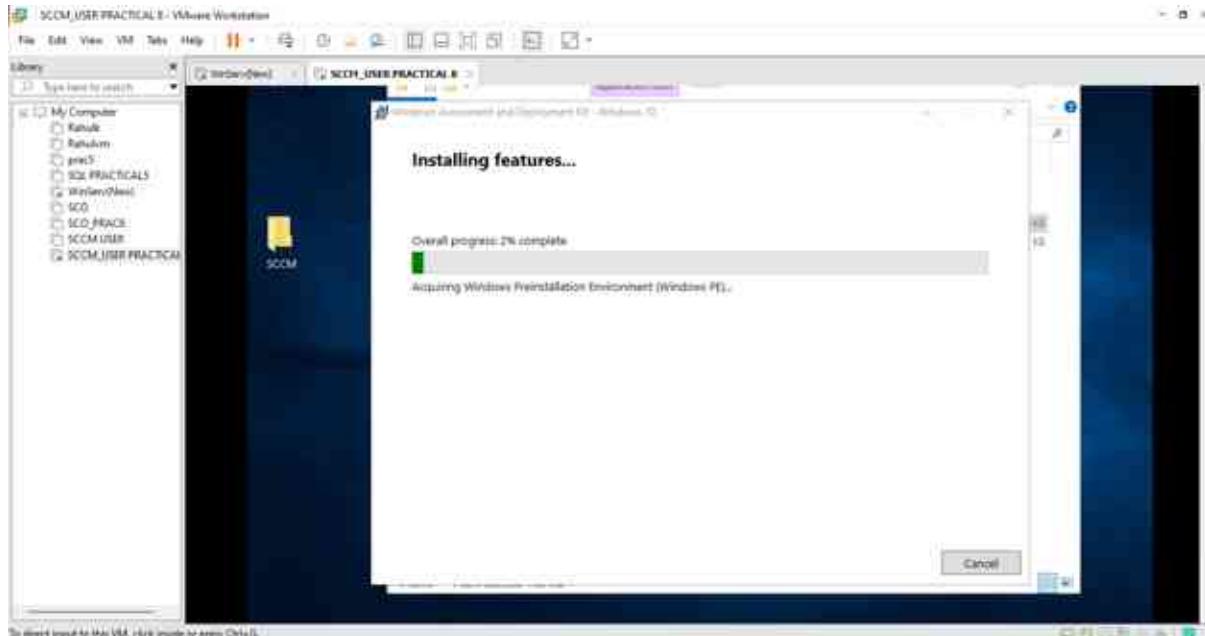
- Click on Accept and then Click Next



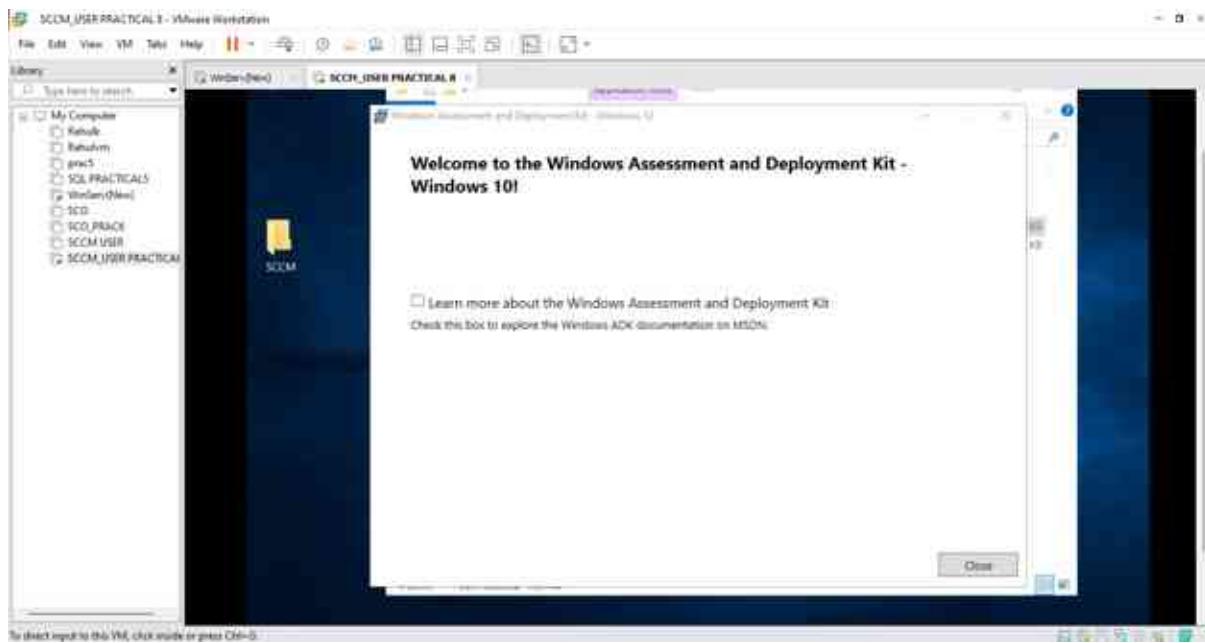
- Select the Following features (**Deployment Tools, Imaging and Configuration Designer, Configuration Designer and User State Migration Tool**) and Click **Install**



- It will start installing features

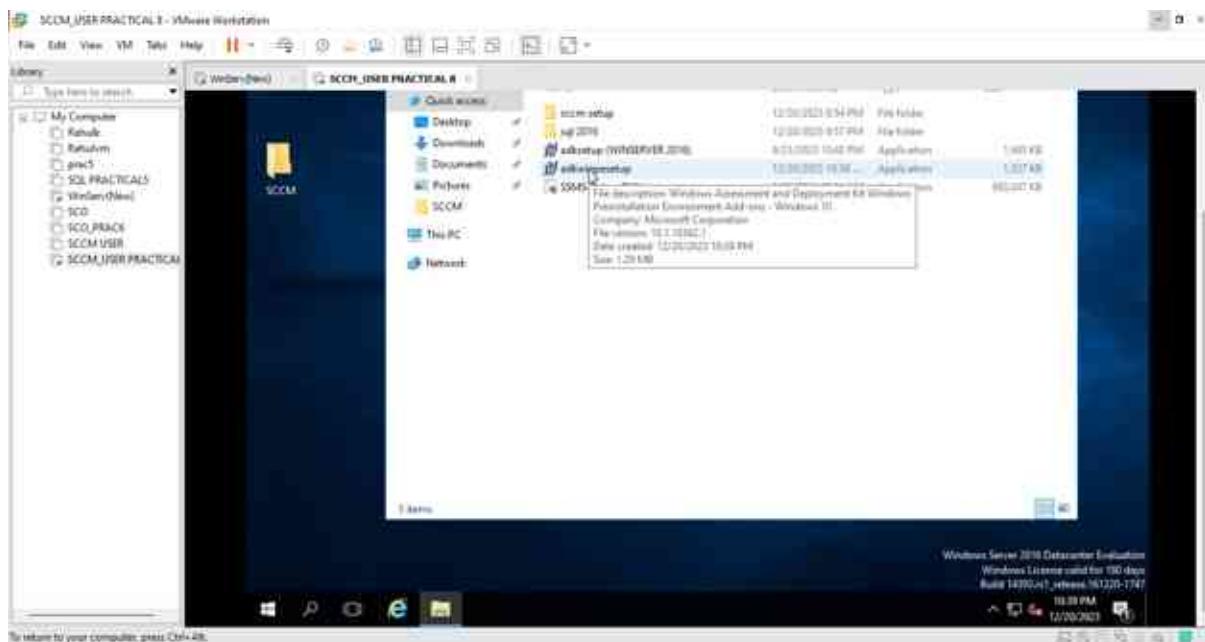


- You'll get the Welcome screen to Windows 10 ADK once the installation is completed. **Click Close** to finish the installation.

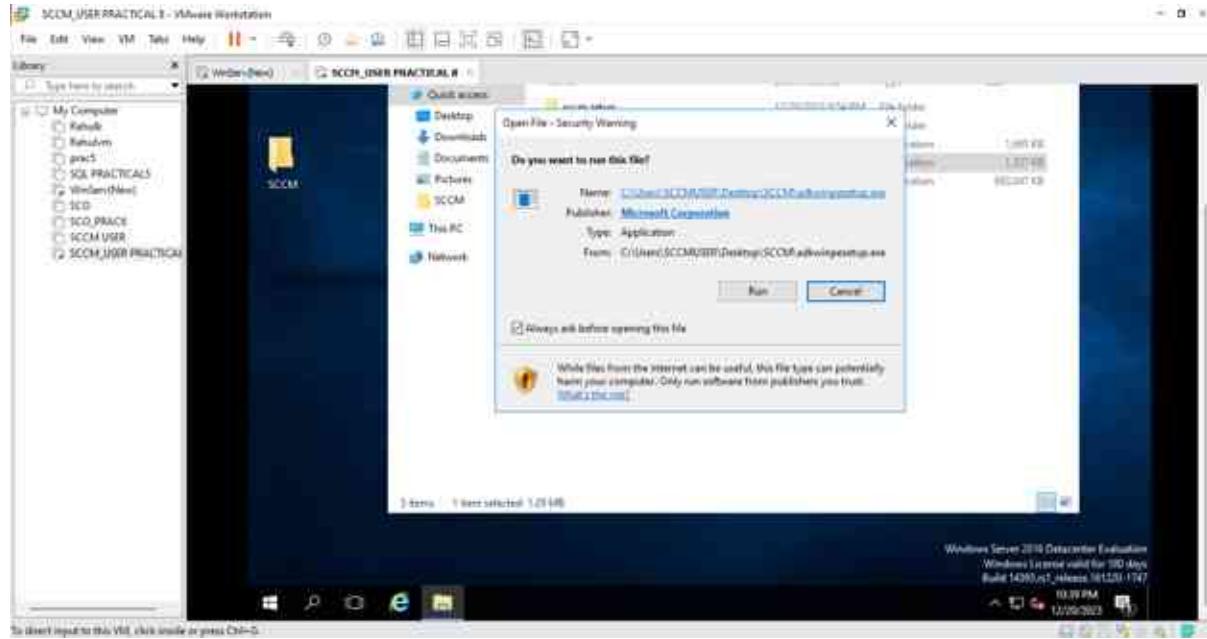


Step 12: Installing Windows PE add-on

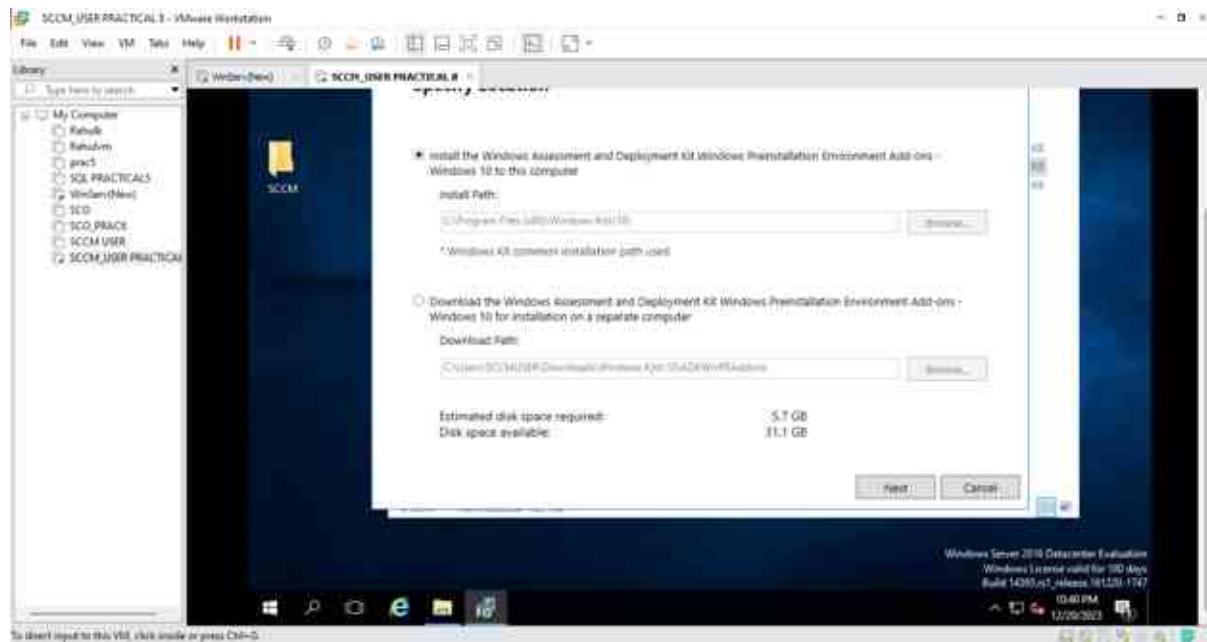
- Open SCCM Folder and then **Double-Click on adkwinpesetup**



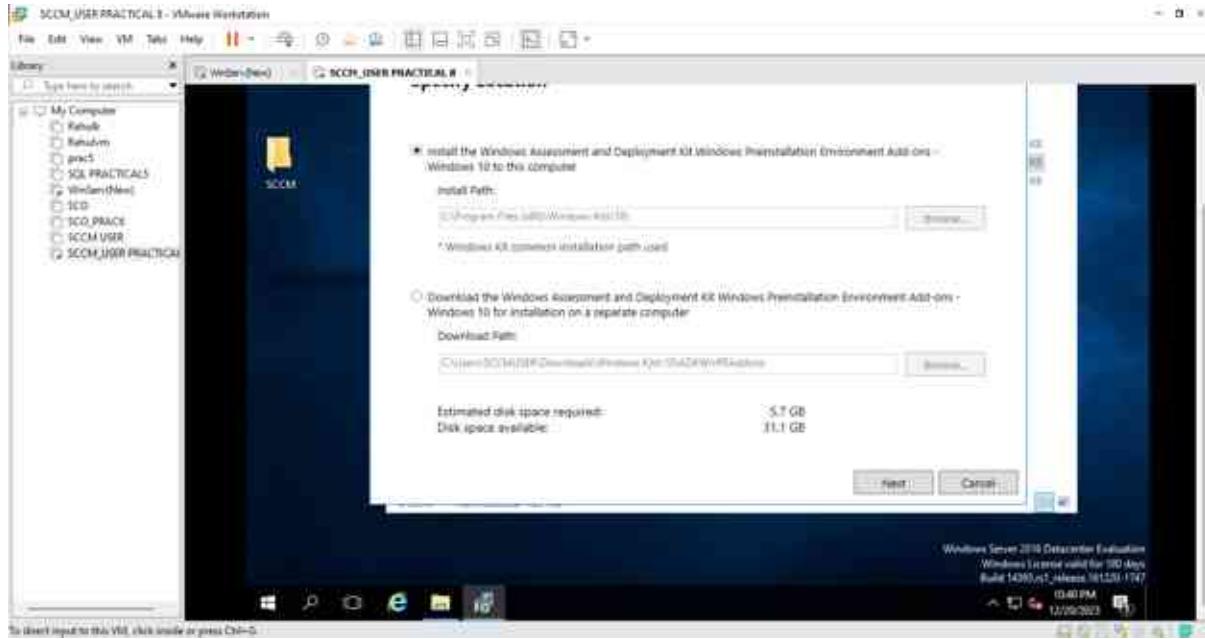
- Click Run



- Click Next



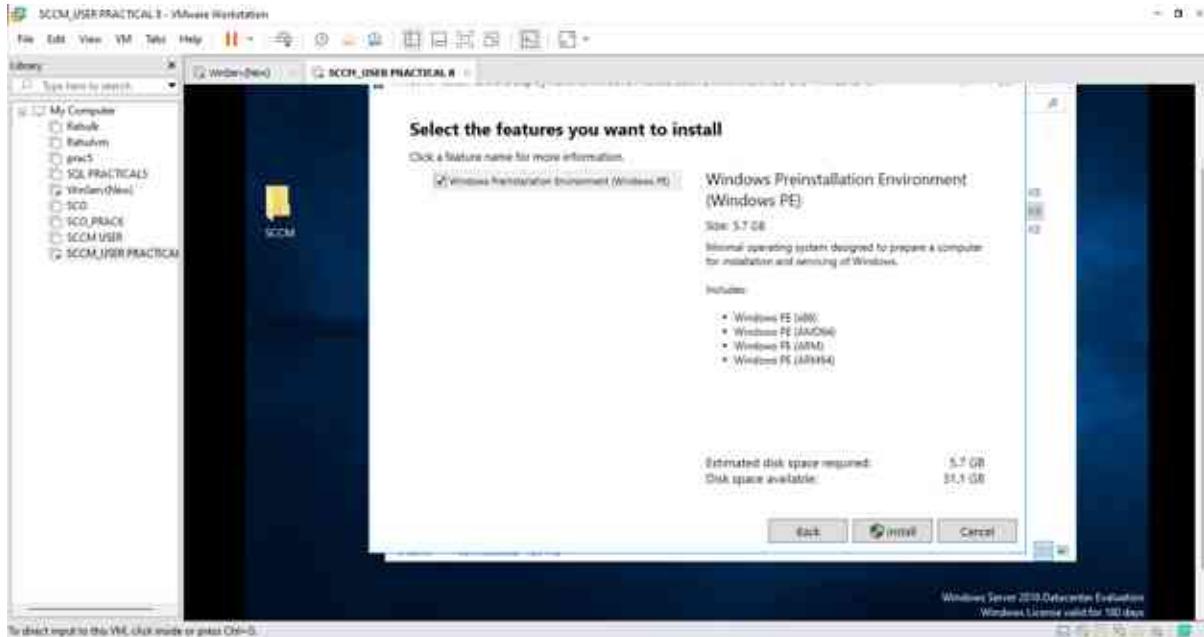
- Select No and then Click Next



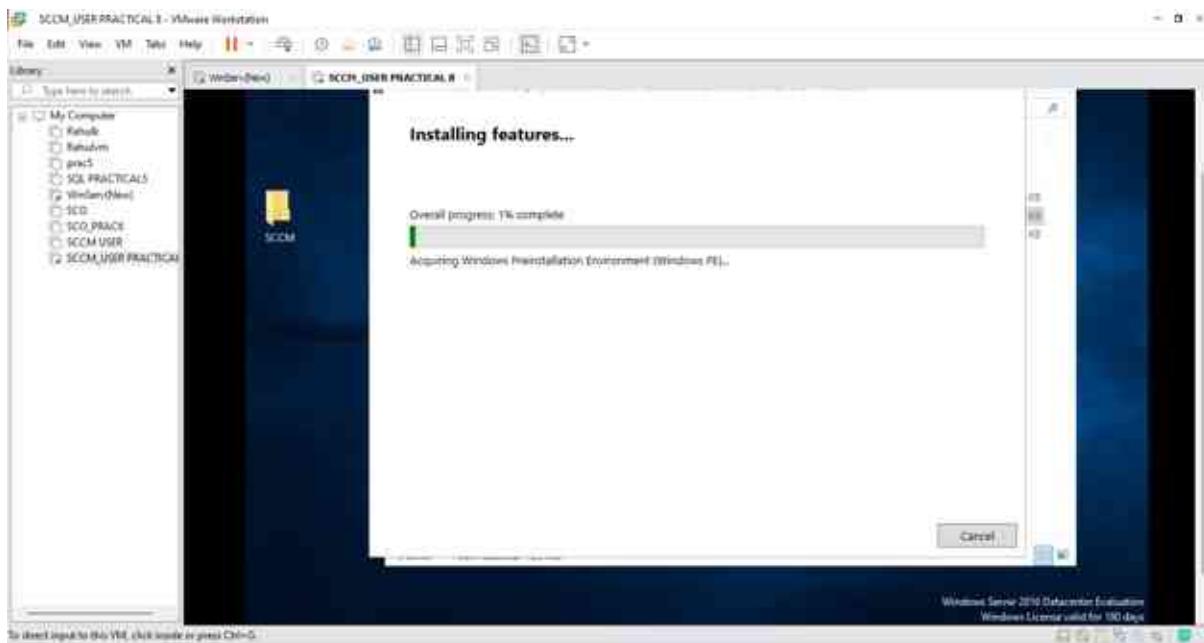
- Click Accept



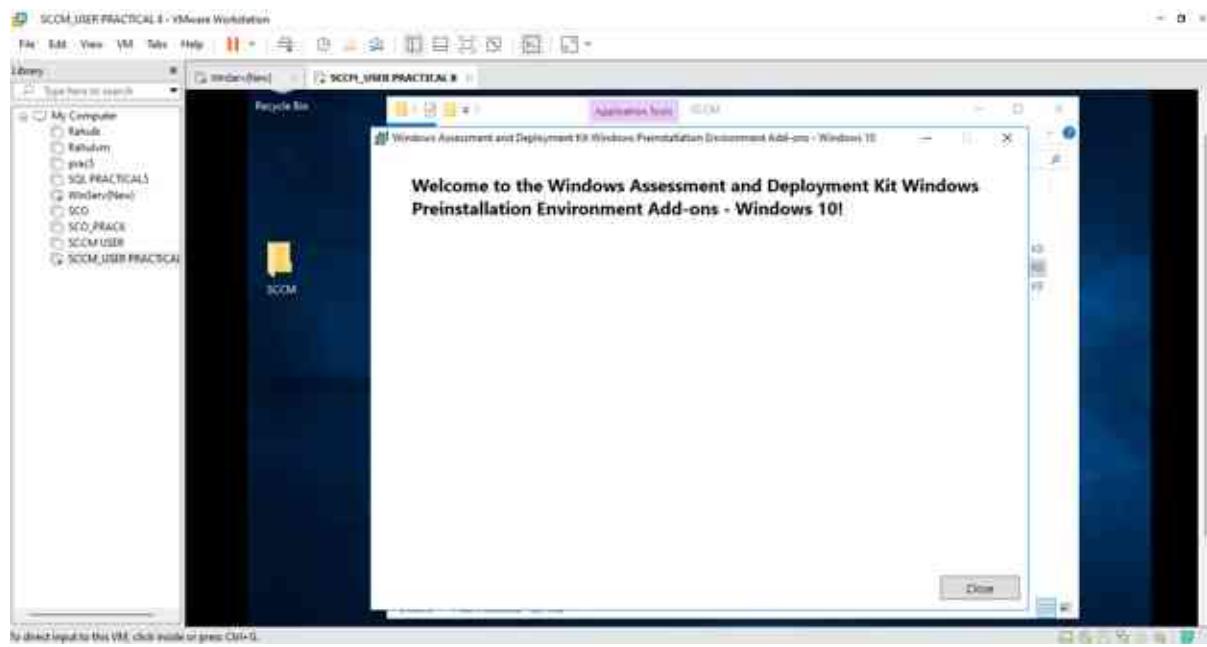
- Click on Install



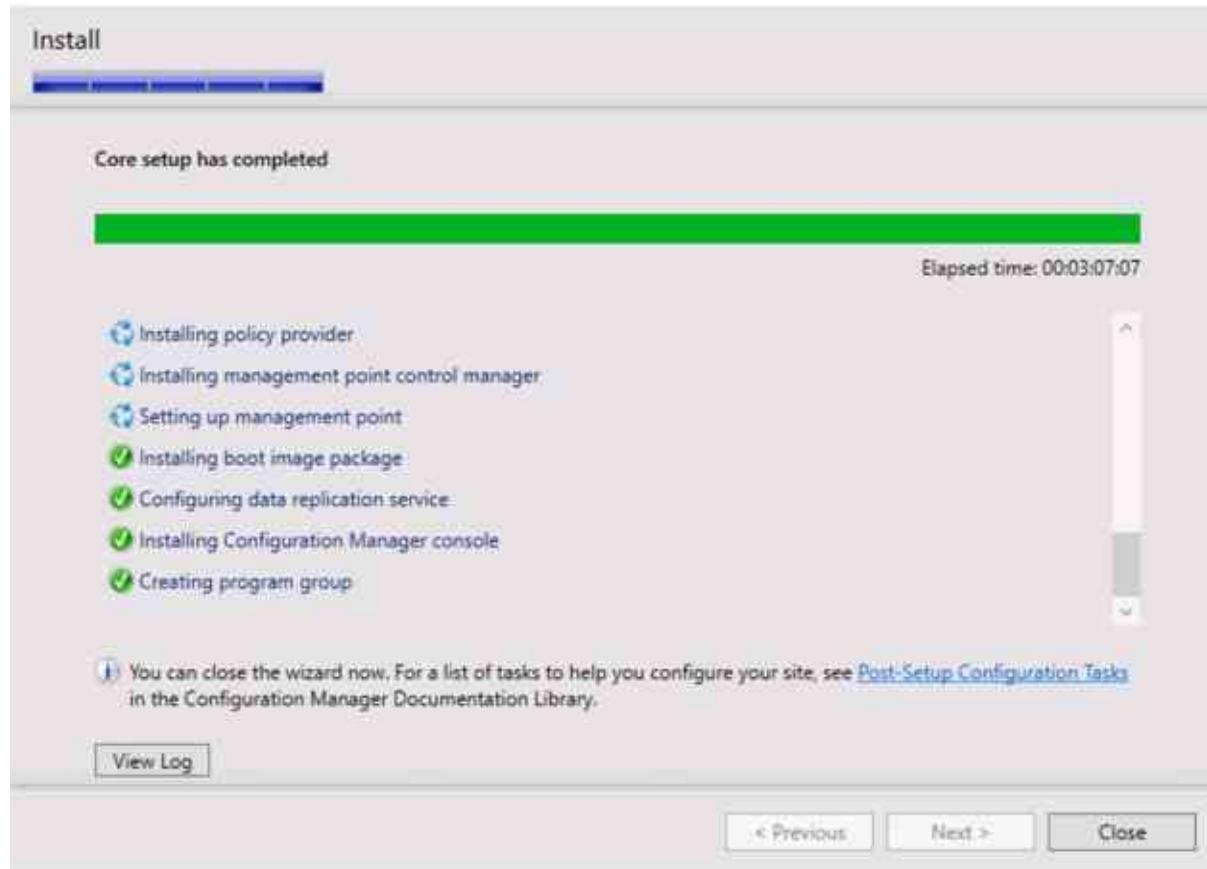
- It will start installing features



- Click on Close



After Setting up Click **Install**, Once the installation is complete Click on **Close**



Now it show on the SCCM Dashboard

