Exercise 1 - Installing and Configuring iSCSI Storage

Expanding system storage with *Internet protocol over Small Computer System Interface* (iSCSI) is a cost-effective approach. The Internet Protocol (IP) stack is used to create communication between the iSCSI devices in this software-based storage extension method **iSCSI Target Server** and **initiator**. **CHAP**, which contains a technique to prevent cleartext passwords from appearing on the wire, is used by iSCSI initiators and targets to prove their identities to each other.

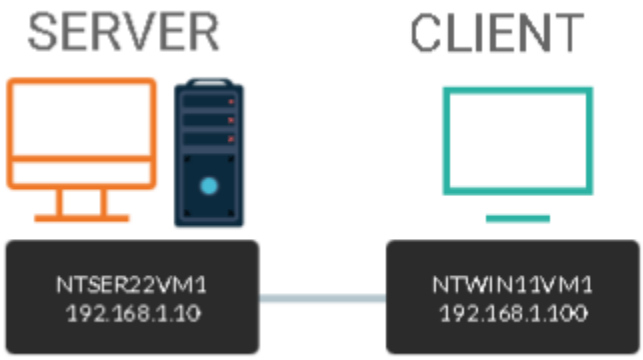
The SCSI Logical Unit, also known as a collection of storage drives, is hosted by the iSCSI Target Server and contains *hard disks*, *virtual hard disks*, *solid state drives*, and *tapes*. To refer to a RAID set, a single drive or partition, or several drives or partitions, these storage drives are numbered (Logical Unit Number or LUN).

In a situation of where physical disk resources are limited or exceeded; Windows Server iSCSI Target Server supports Virtual Hard Disks (.vhdx) to enlist as iSCSI Virtual Disks.

In this exercise,

1. we will learn how to install iSCSI Target Server with Windows PowerShell.
2. You will set up the iSCSI Target Server to designate the target server and similarly the initiators (clients) that will connect to the server.

Topology



DOMAIN = networktute.com

NTSER22VM1 = Windows Server 2022 – Domain Controller

NTWIN11VM1 = Windows 11 – Domain Member

Prerequisite

- *VMware Workstation 16 Pro*
    - When making this tutorial, we used the “Windows Server 2019” VM Template and “Windows 10 & later” VM Template. Since VMware didn’t have the updated templates.
- *Microsoft Windows Server 2022*
- *Microsoft Windows 11*

Task 1: Install iSCSI Server

The iSCSI Target Service is a feature in Windows Server 2012 and later that keeps track of virtual disk inventory. File and Storage Services is used to provision these virtual disks, which are then assigned to an iSCSI Target Server. The iSCSI initiators use SCSI Logical Units to access virtual disks (clients).

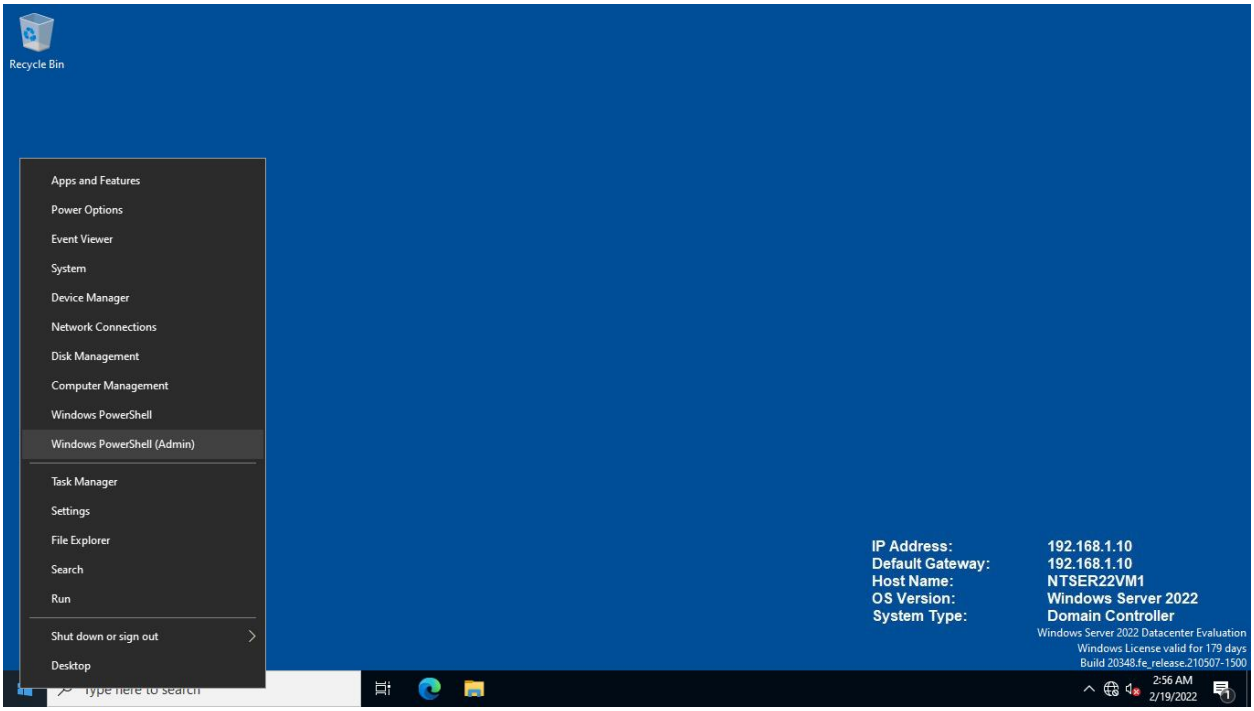
In this task, we will use Windows PowerShell to install iSCSI Target Server on Windows Server 2022.

Step 1:

Note: Ensure your *Windows Server 2022* is compatible with your devices and powered on. In my case its NTSER22VM1 and connected successfully.

Since we are using the PowerShell for configuration

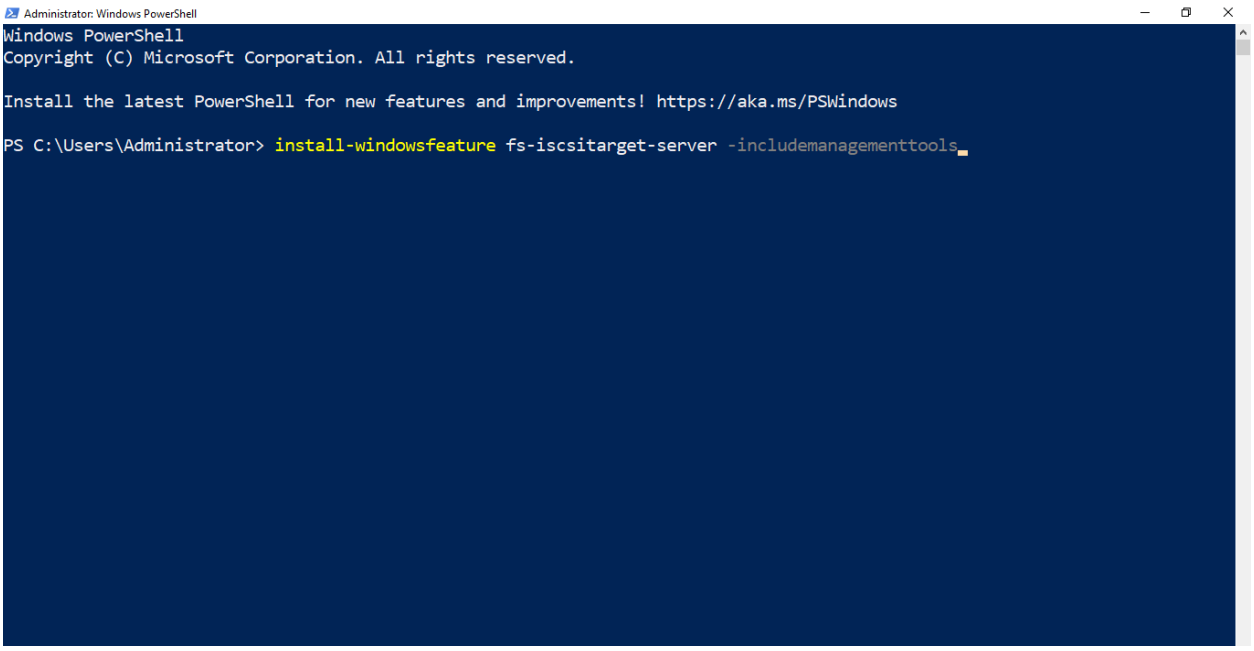
Right-click the **Start** icon and select **Windows PowerShell (Admin)**



On the **Windows PowerShell** prompt, type the following commands to install the iSCSI Target Server:

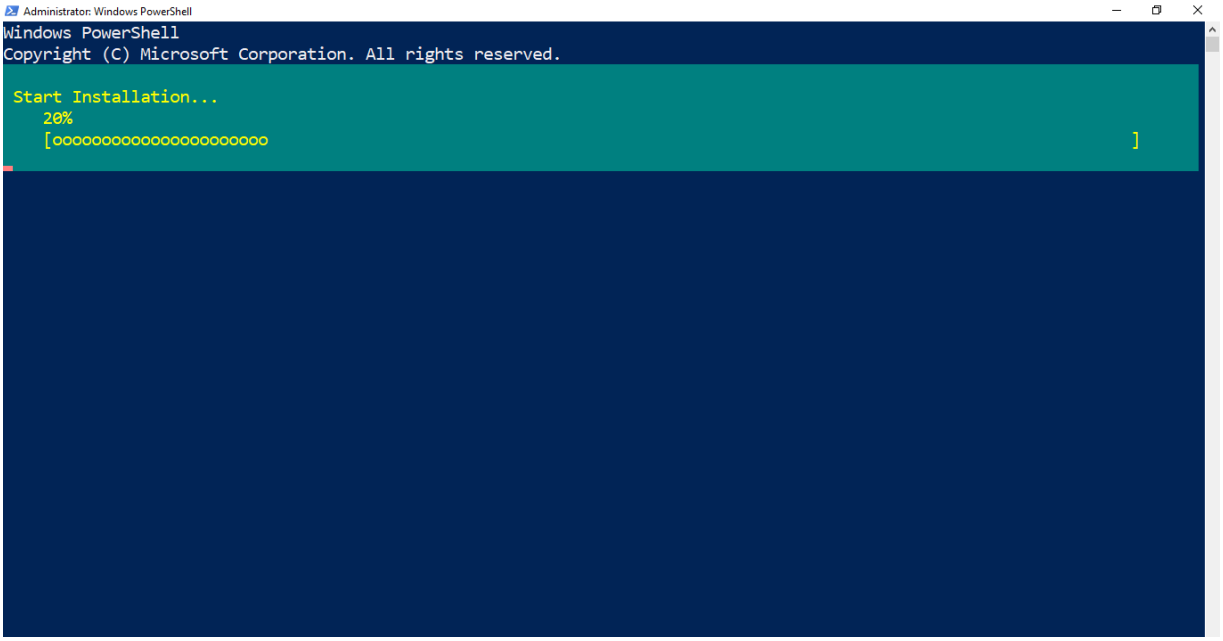
```
install-windowsfeature fs-iscsitarget-server -includemanagementtools
```

Press **Enter**.



Step 2:

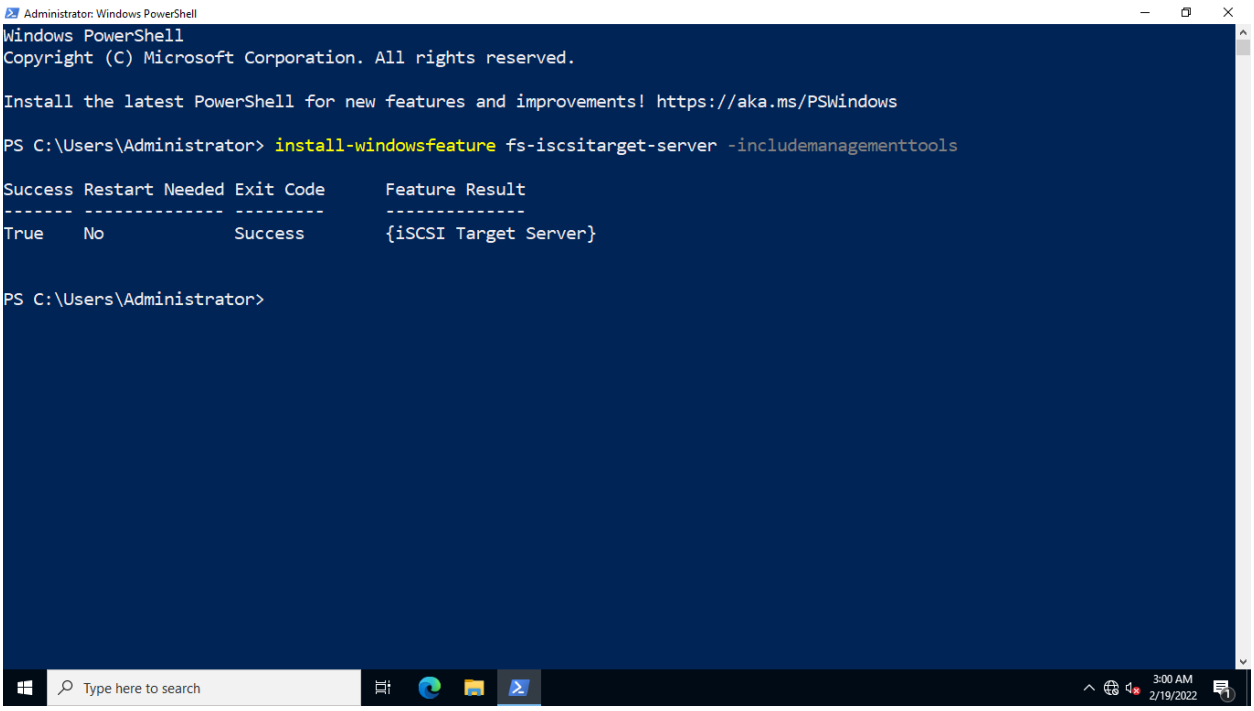
Please wait while the **iSCSI Target Server** is installed.



Step 3:

A confirmation will appear confirming the success of the installation of **iSCSI Target Server** feature.

Close the **Windows PowerShell** window.



Task 2: Configure iSCSI Target Server

You must provide virtual disks and assign them to an iSCSI Target Server after installing the iSCSI Target functionality.

Let's use File and Storage Services component of Server Manager to configure the virtual disks for an iSCSI Target Server.

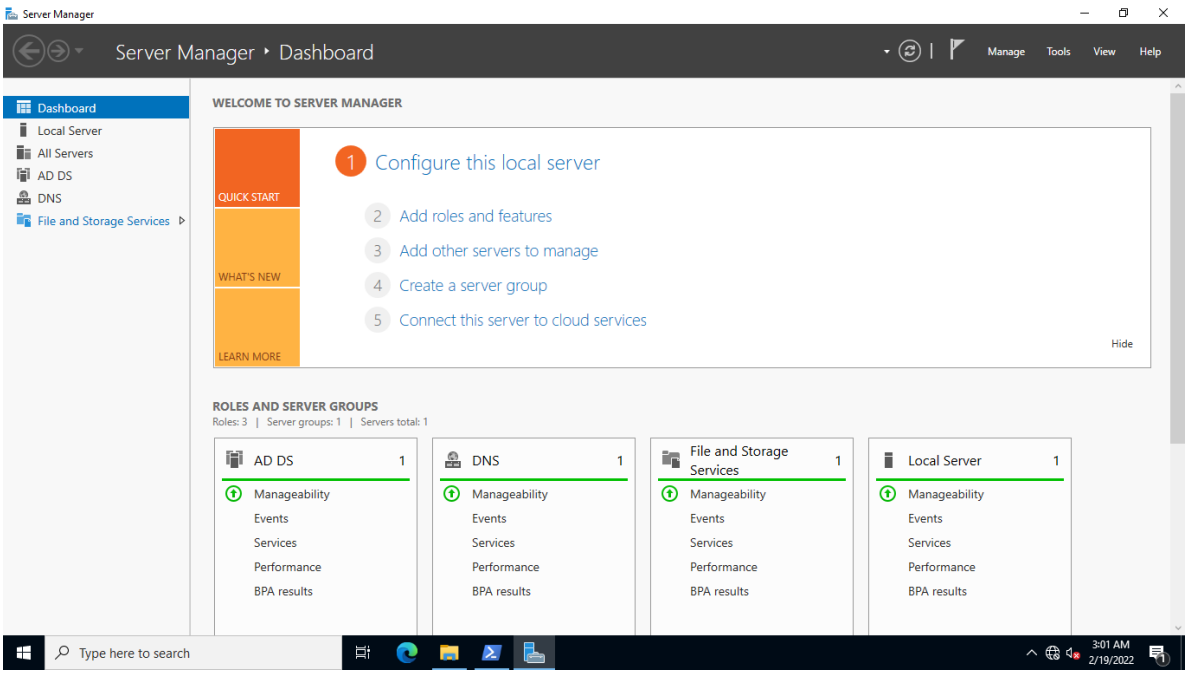
Step 1:

Note: Ensure your *Windows Server 2022* is powered on and *Server Manager > Dashboard* window is opened.

Click the **Refresh** icon (two curved arrows in a circle shape) from the top toolbar.

> **Alert**: Refreshing the servers is necessary to activate the iSCSI service after installing it.

Once the **Server Manager** is refreshed, click the **File and Storage Services** option on the left navigation bar.

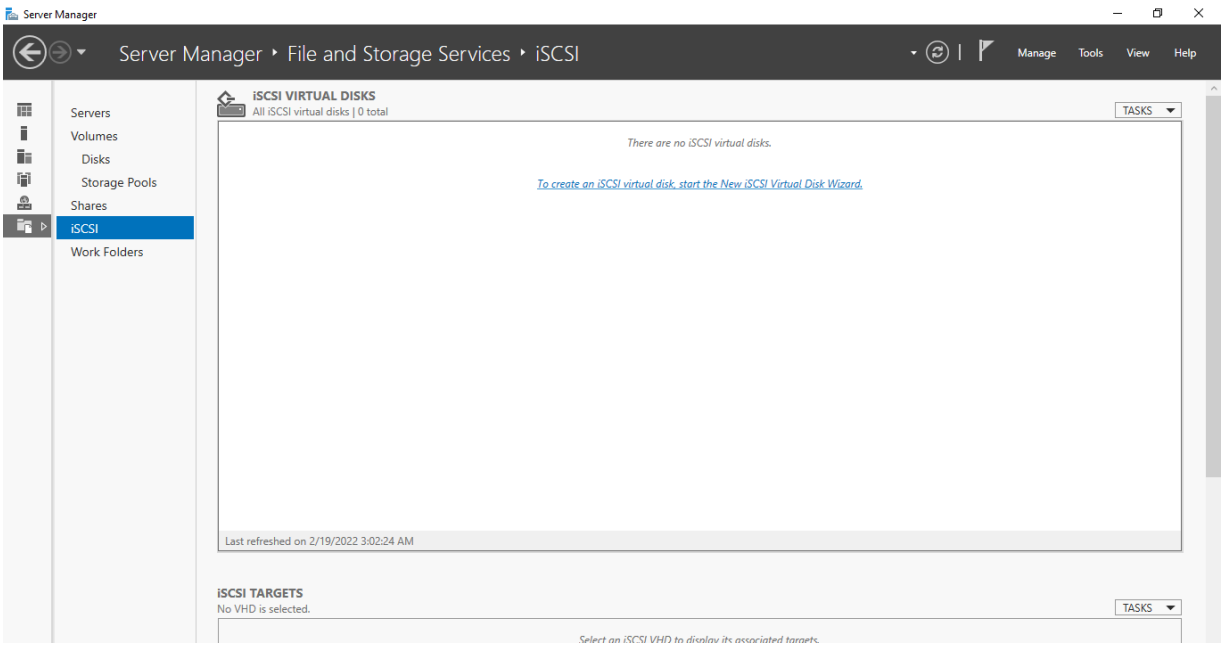


Step 2:

On the **File and Storage Services** window, select **iSCSI** from the navigation pane on the left.

Select the blue web link from the **iSCSI VIRTUAL DISKS** pane to open the New **iSCSI Virtual Disk Wizard**

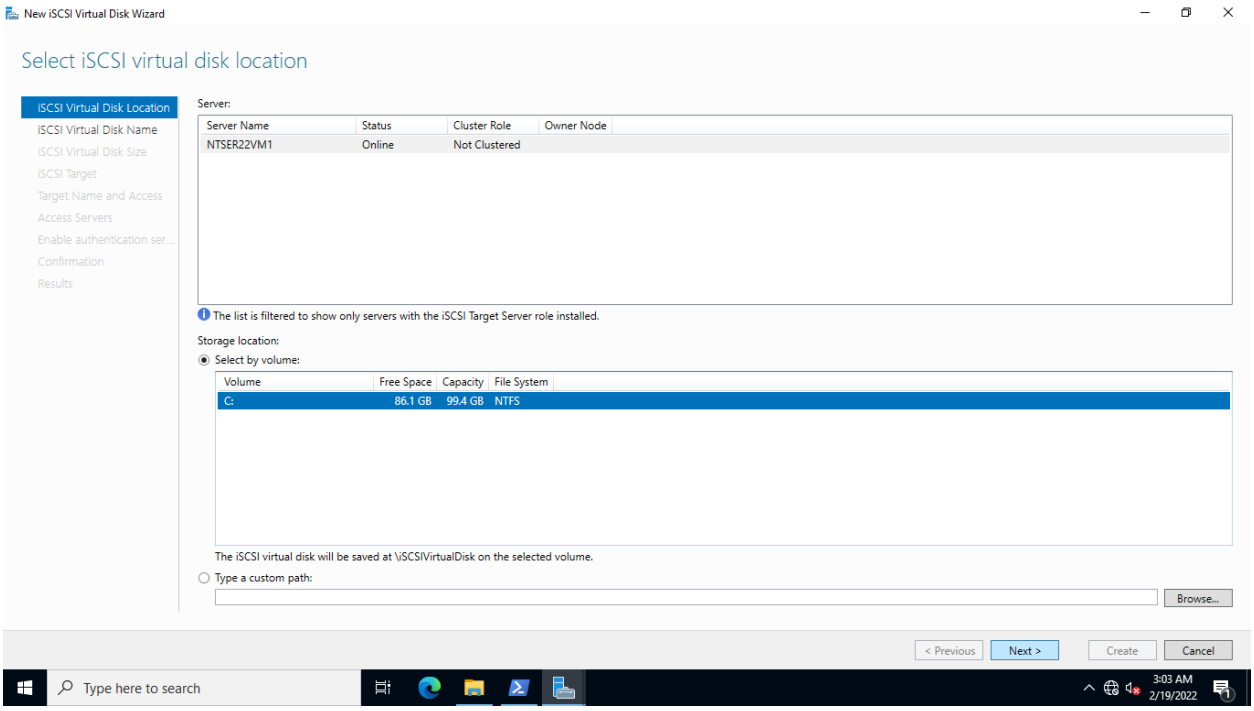
> **Note**: If you don't see the web link indicated above, click the Refresh button (two curved arrows in a circle shape) beside the flag icon at the top toolbar.



Step 3:

The **New iSCSI Virtual Disk Wizard** is displayed

On the **Select iSCSI virtual disk location** page, keep the default settings and click **Next**



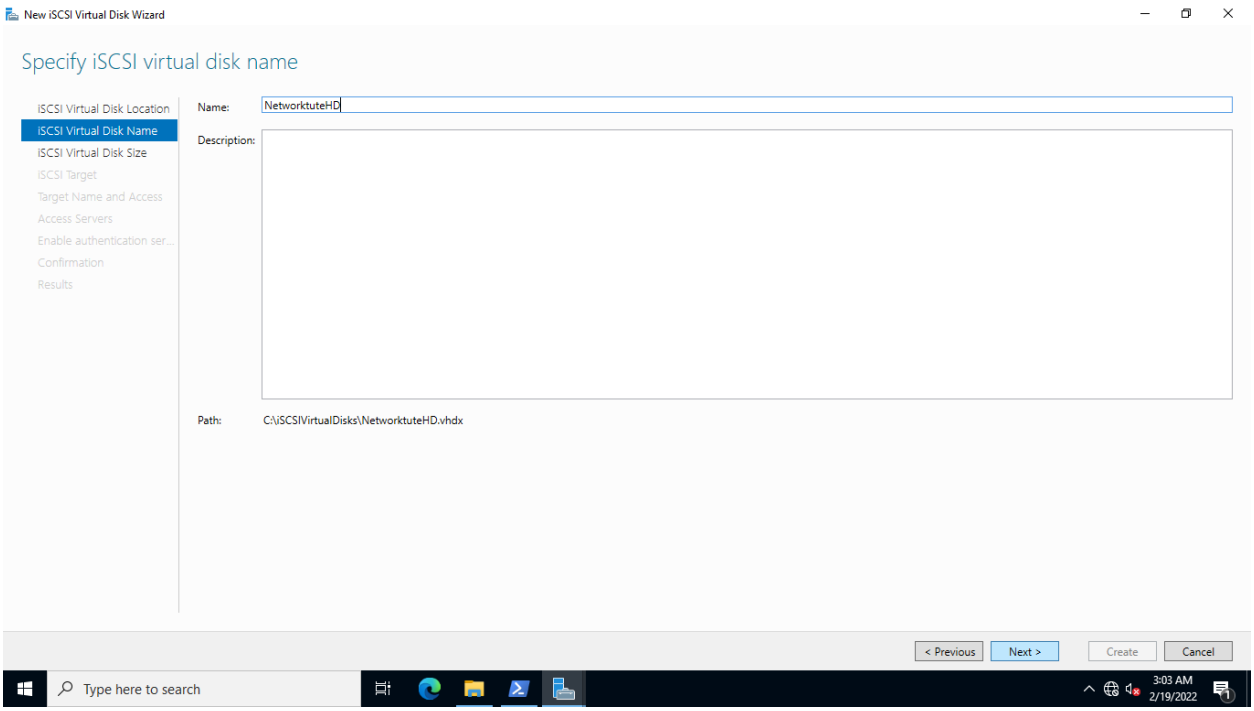
Step 4:

On the **Specify iSCSI virtual disk name** page, in the **Name** text box, type

NetworktuteHD

Notice that in the **Path** section, **NetworktuteHD.vhdx**, a virtual hard disk is created and saved under the filepath **C:\iSCSIVirtualDisks\ NetworktuteHD.vhdx**.

Click **Next**.



Step 5:

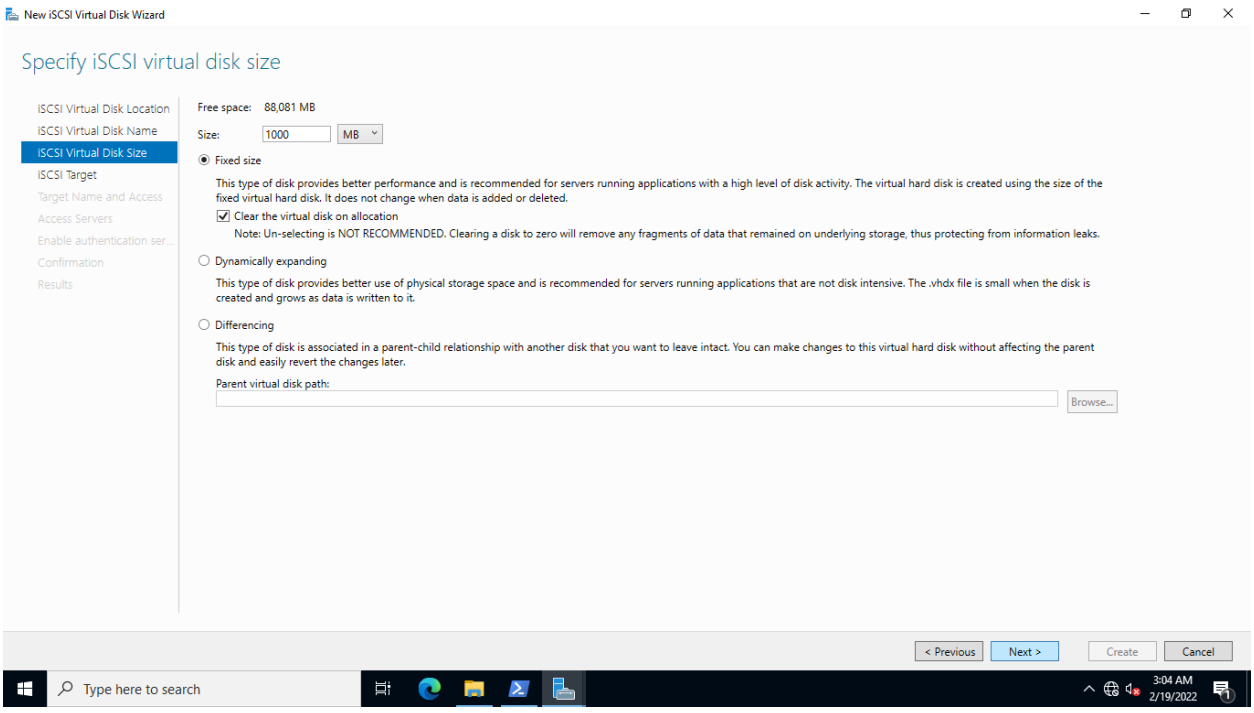
On the **Specify iSCSI virtual disk size** page, in the **Size** text box, type:

1000

On the drop-down menu, select the units as **MB**.

Ensure that the **Fixed size** radio button is selected.

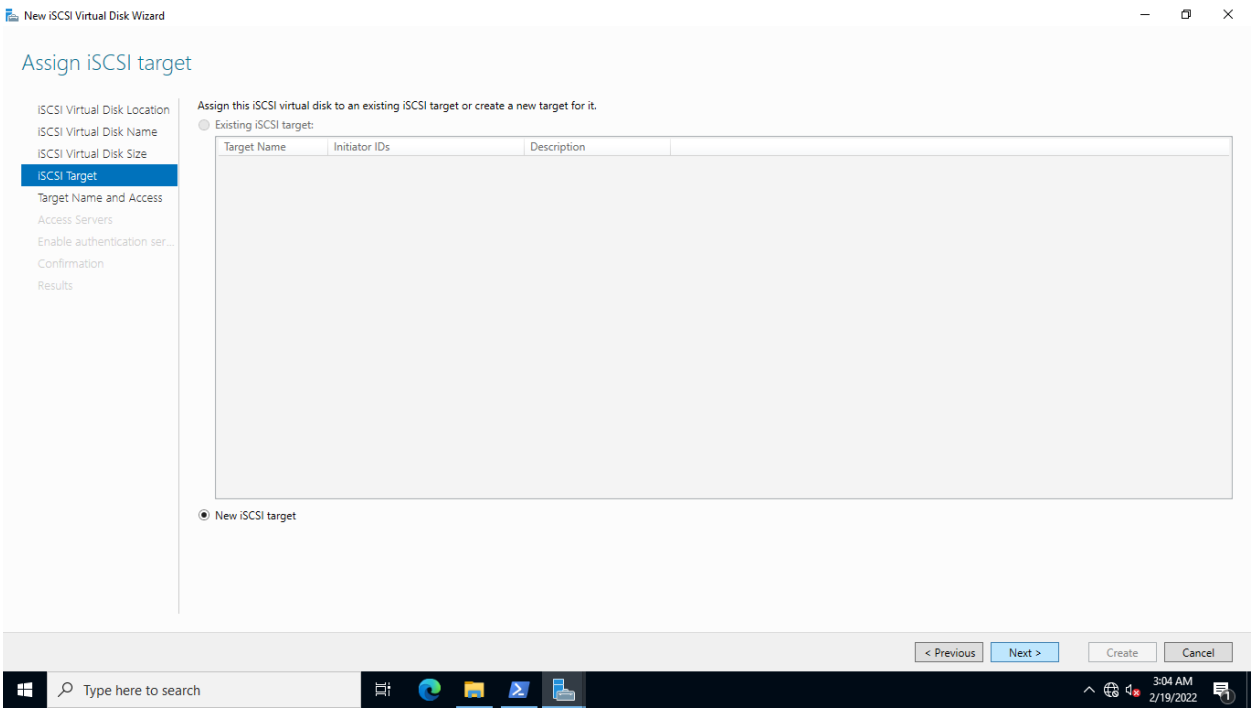
Click **Next.**



Step 6:

On the **Assign iSCSI target** page, keep the default selection of the **New iSCSI target** radio button.

Click **Next**.

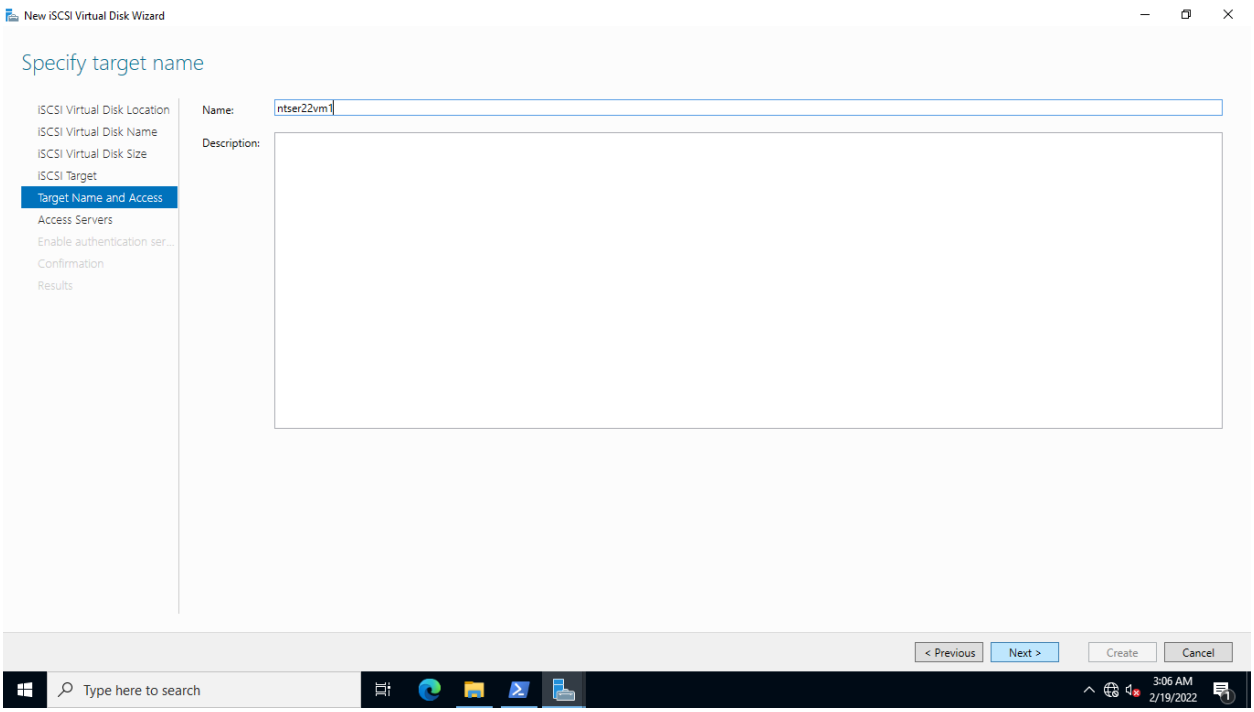


Step 7:

On the **Specify target name** page, in the **Name** text box, type

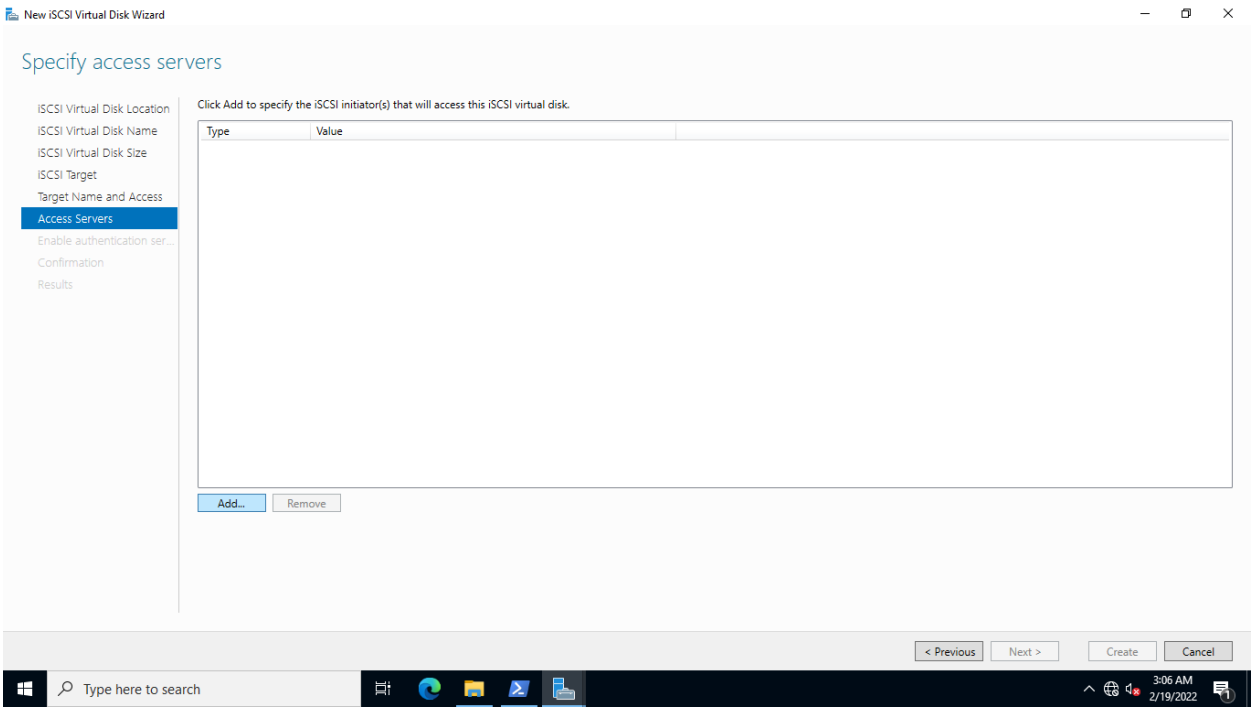
ntser22vm1

Click **Next**.



Step 8:

On the **Specify access servers** page, click **Add**.



Step 9:

On the **Select a method to identify the initiator**.

Select the **Enter a value for the selected typ**e radio button.

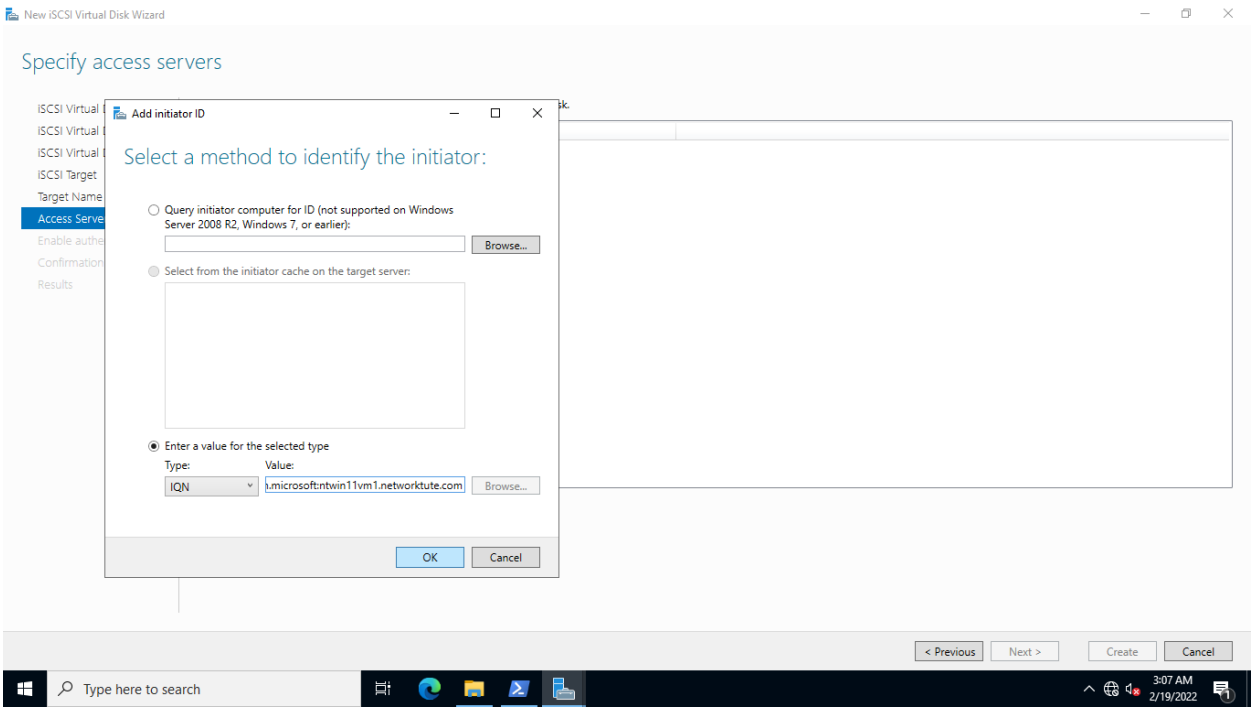
Ensure that the **Type** drop-down list indicates **IQN** (short for iSCSI Qualified Name).

Click in the **Value** text box and type:

In my case its

iqn.1991-05.com.microsoft:ntwin11vm1.networktute.com

Click **OK.**



Note: iSCSI uses a name to identify an iSCSI node which is either a target or initiator. The format takes the name of iqn.yyyy-mm.domain name:fully qualified domain name of initiator.

iqn - is the iSCSI Qualified Name, typically used as a prefix.

yyyy-mm - indicates the year and month when the naming authority was established for example year 2022, 02 of Feb, the Second month of the year.

Domain.name - this is written backward. It starts with the top-level domain such as com followed by the name of the organization such as **Microsoft**.

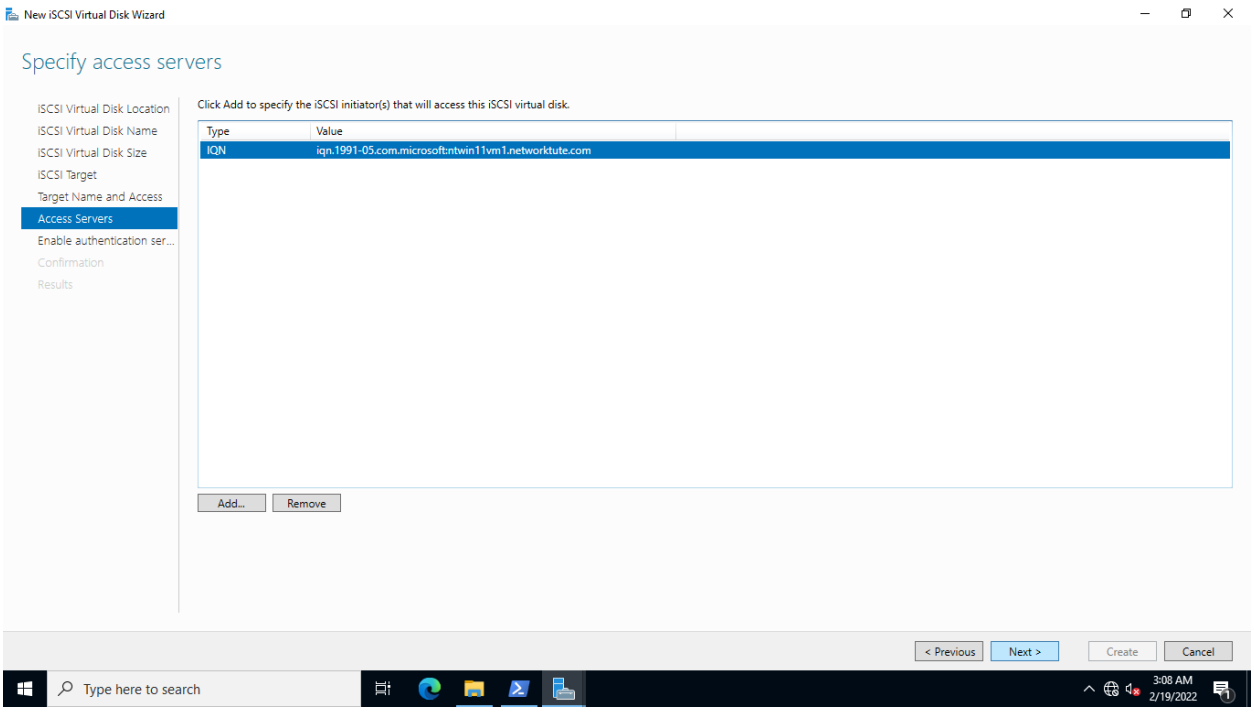
"**:**" - the colon is the separator

Fully qualified domain name - the complete **DNS** name of the iSCSI initiator, such as **ntwin11vm1. networktute.com**

Step 10:

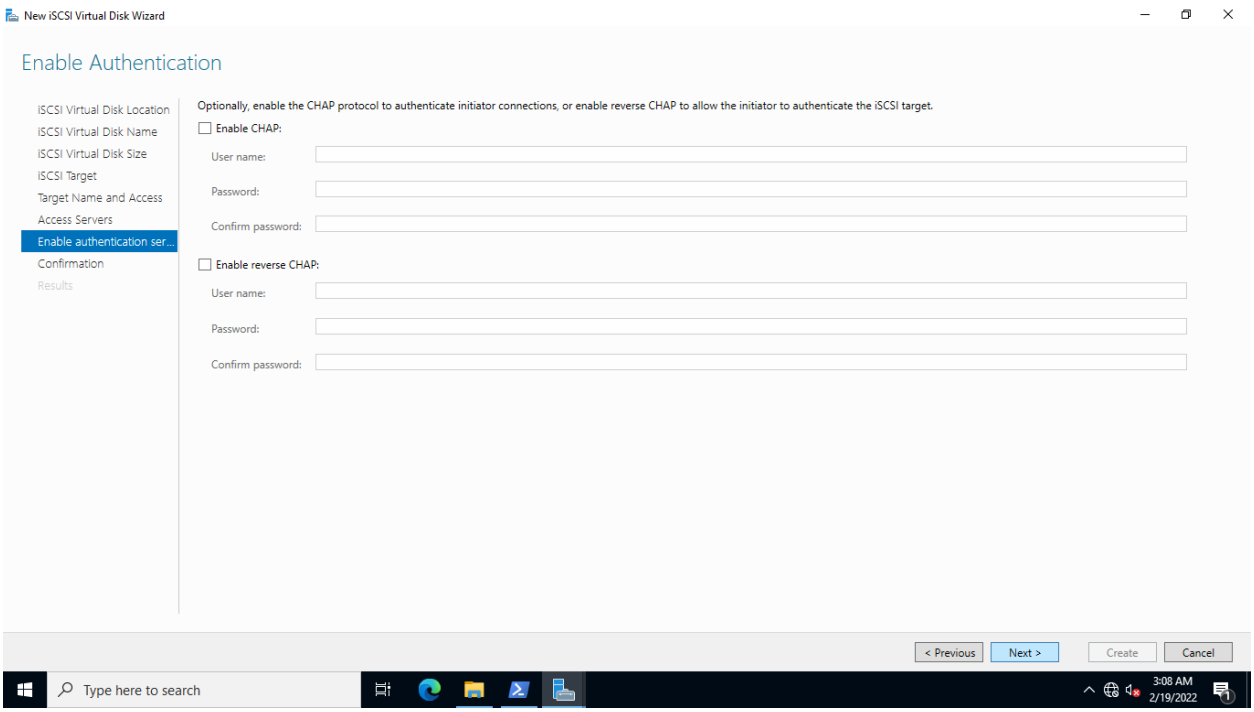
Back on the **Specify access servers** page, notice that the **iSCSI Initiator** iqn.1991-05.com.microsoft:ntwin11vm1. networktute.com is successfully added.

Click **Next**.



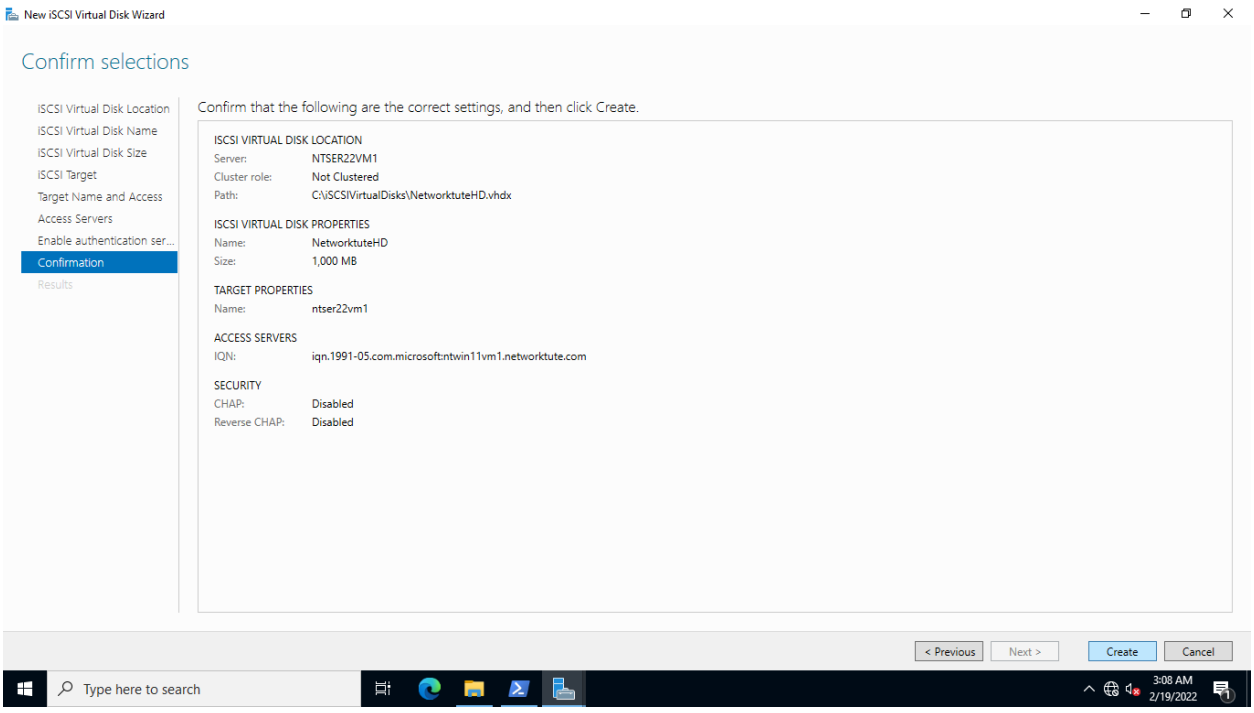
Step 11:

On the **Enable Authentication** page, keep the default selections and click **Next**.



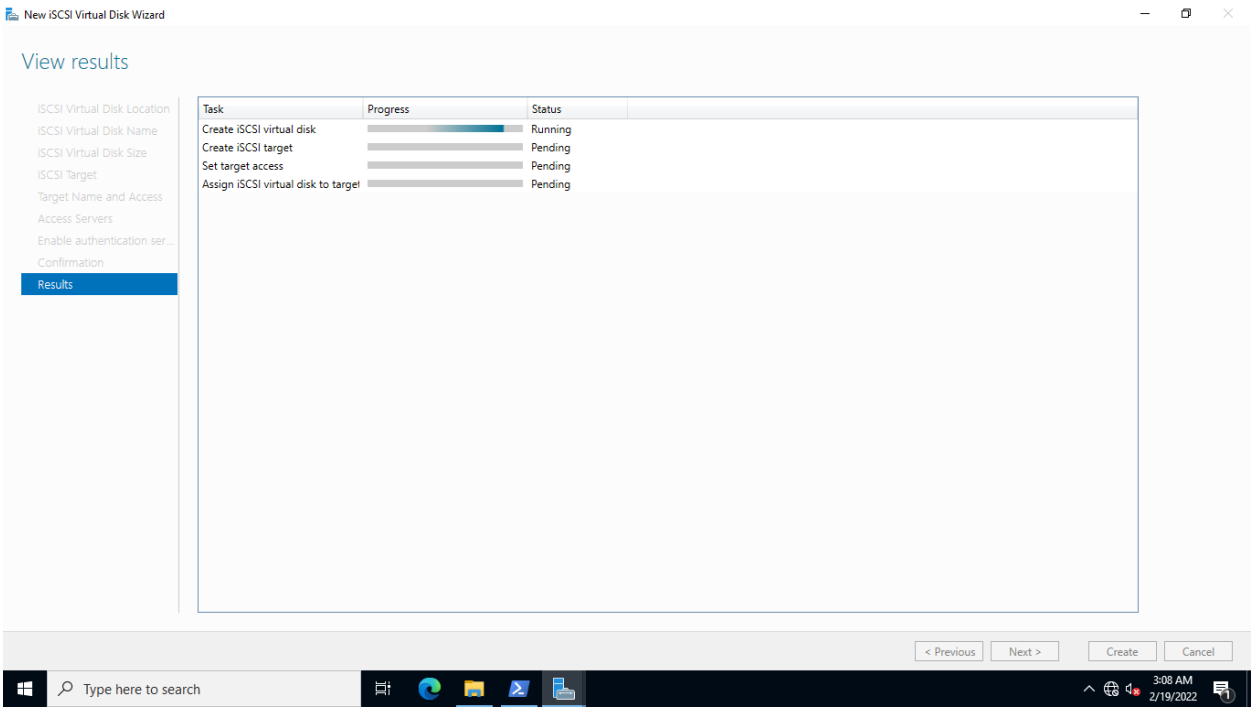
Step 12:

On the **Confirm selections** page, click **Create**.



Step 13:

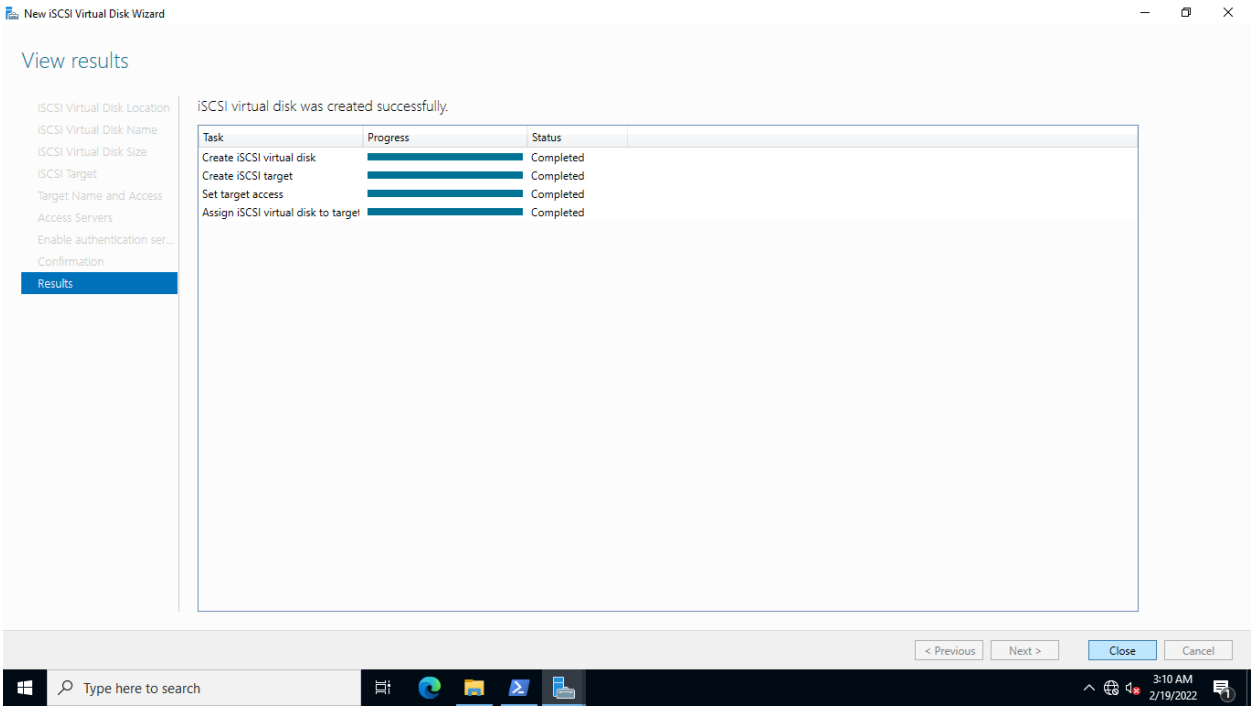
Please wait while the relevant tasks are performed to configure the **iSCSI Virtual Disk.**



Step 14:

On the **View results** page, verify that all tasks are completed.

Click **Close**.



While moving to next task make sure to,

*Keep the **Server Manager** - **File Storage Services** > **iSCSI window** open.*

Task 3: Configure iSCSI Initiator

After you've assigned the iSCSI initiator to the virtual storage disk, you'll need to connect it to the storage disk so it can interact with it.

In this task, we will define the properties of the NTWIN11VM1 initiator to enable it to access the NetworktuteHD virtual storage disk.

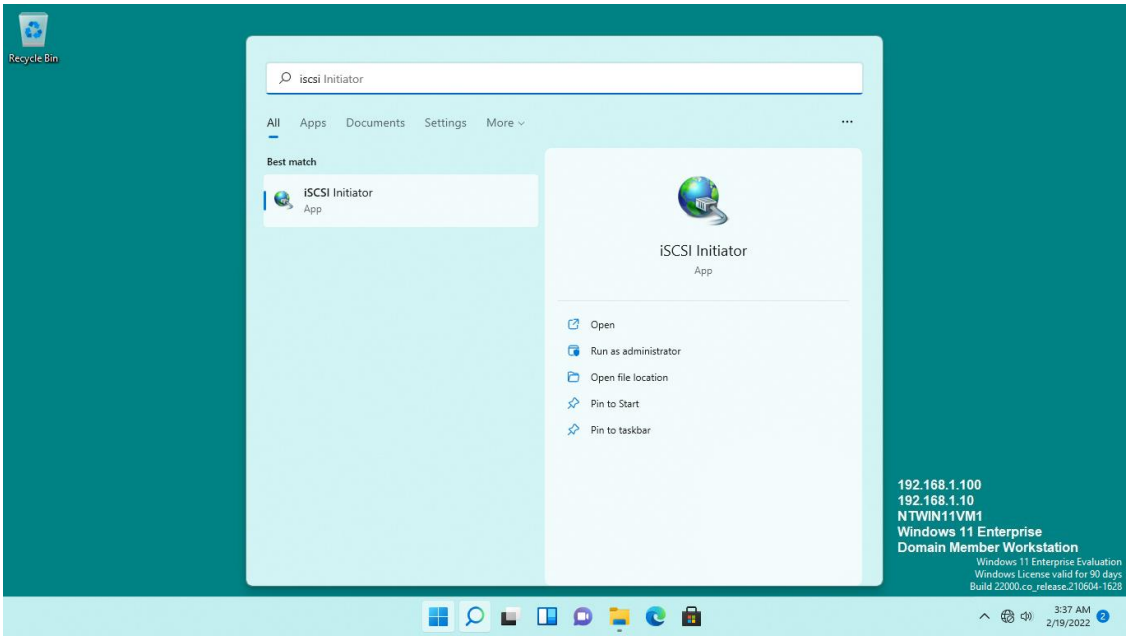
Step 1:

Connect to **NTWIN11VM1**

Click in the **Search Icon** and type:

iscsi

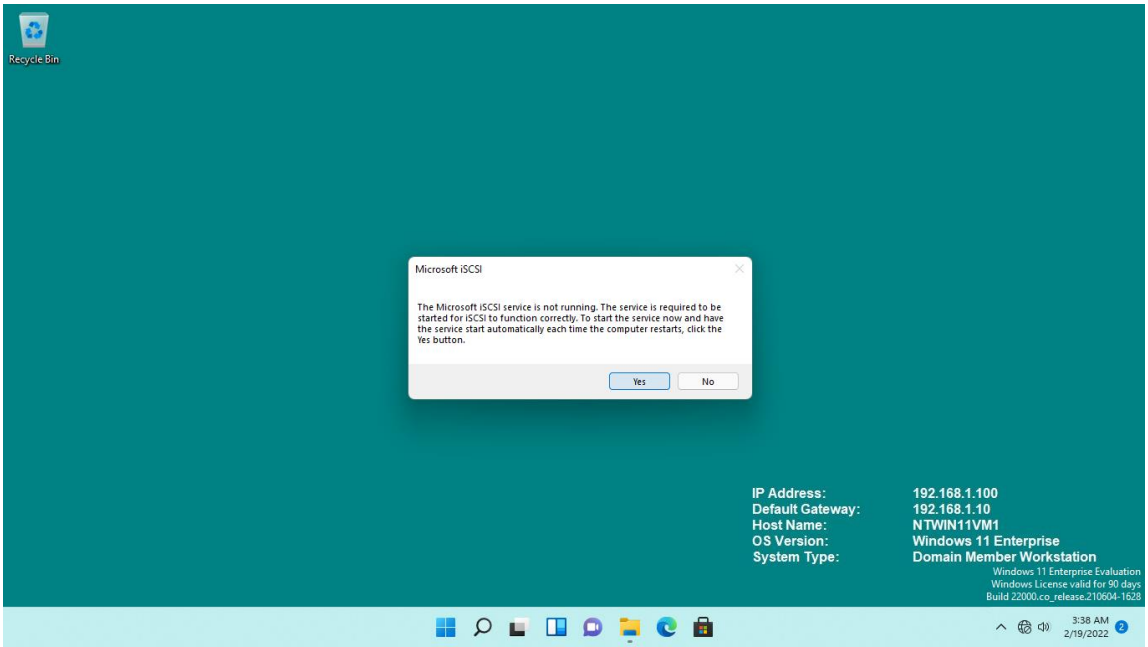
Select **iSCSI Initiator** in the **Best match** pop-up menu.



Step 2:

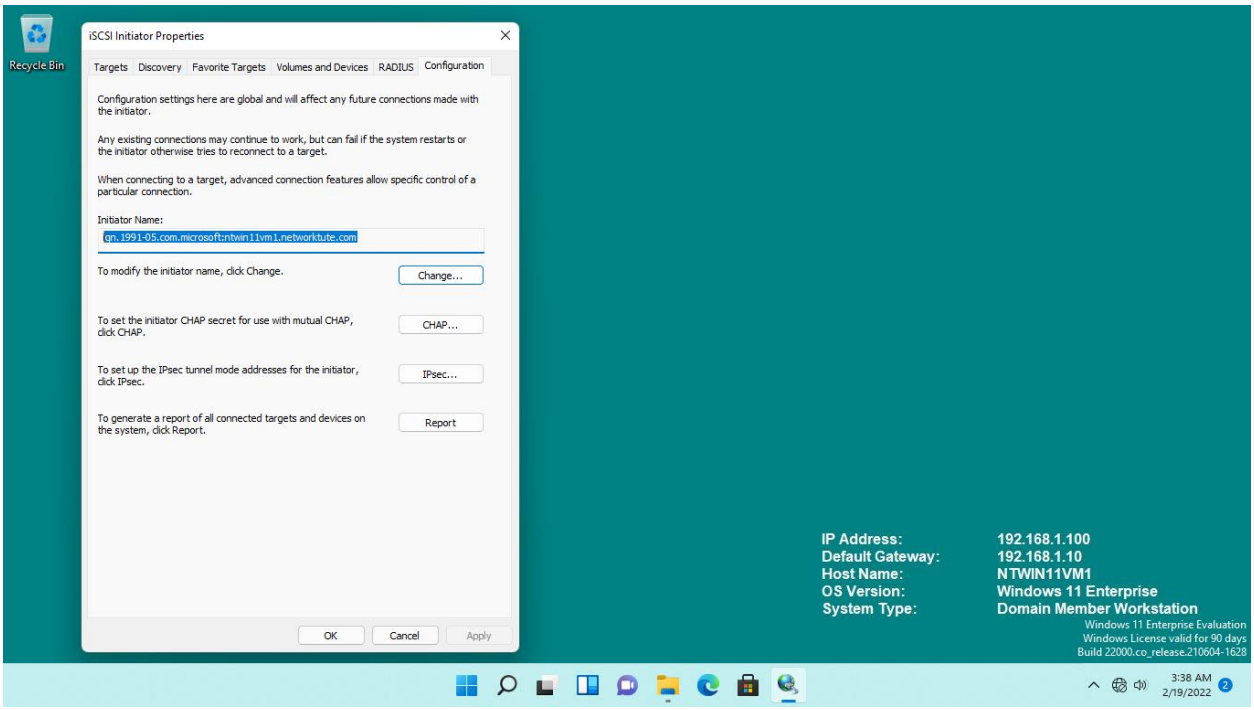
On the **Microsoft iSCS**I message box.

Click **Yes**.



In Addition, you can check your “INITIATOR NAME”

On the **iSCSI Initiator Properties** dialog box, Click **Configuration** Tab.

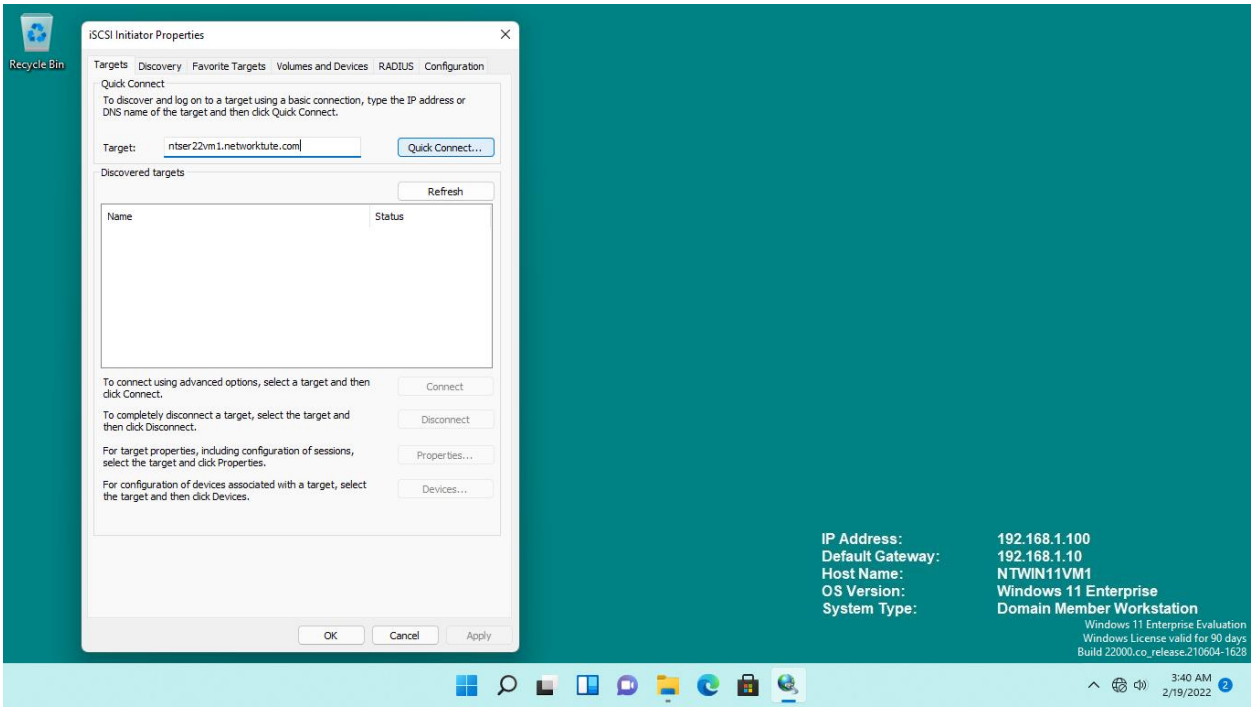


Step 3:

On the **iSCSI Initiator Properties** dialog box, type the following in the **Target** text box:

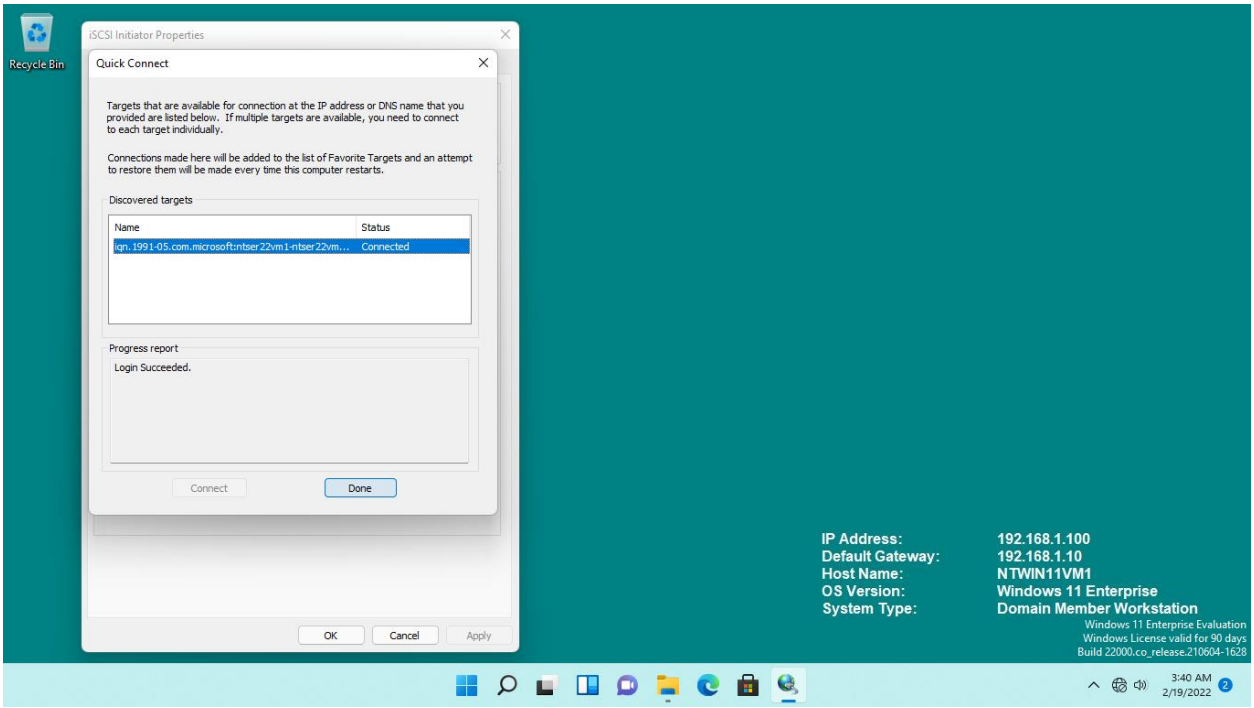
ntser22vm1. networktute.com

Click **Quick Connect.**



Step 4:

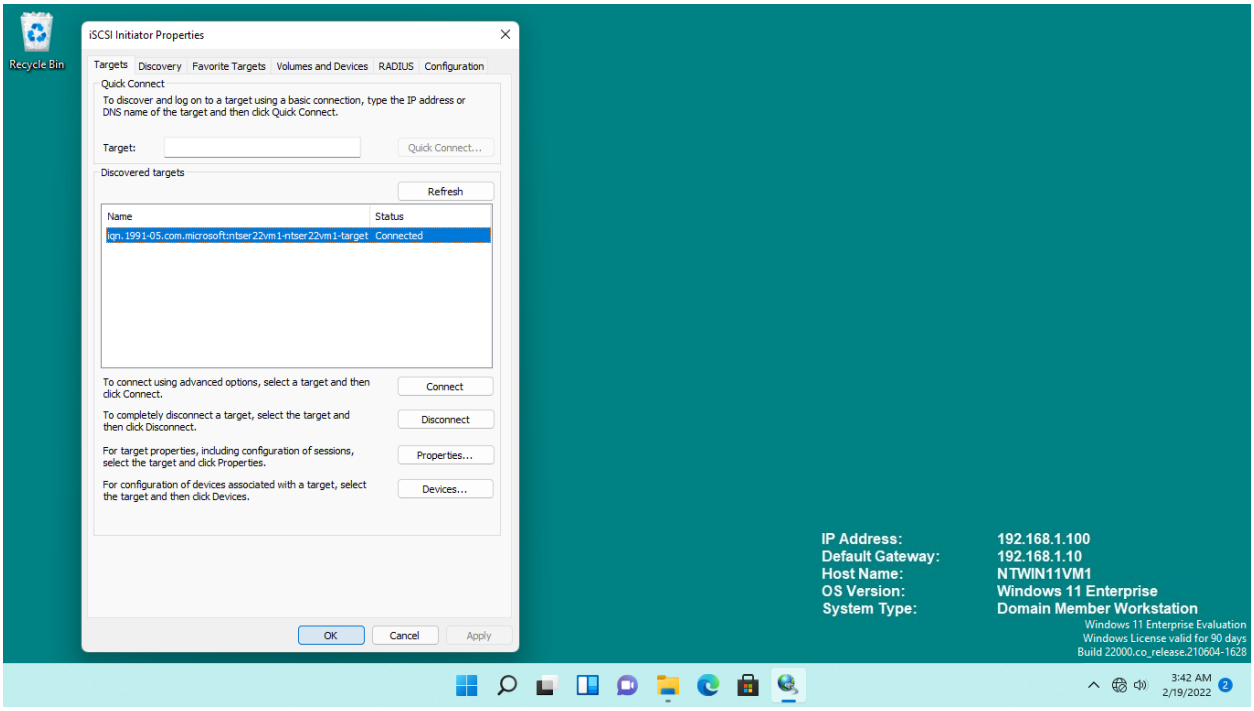
On the **Quick Connect** dialog box, click **Done** after the discovered target appears.



Step 5:

Back on the **iSCSI Initiator Properties** dialog box,

Click **OK** when NTWIN11VM1 is shown as connected to **iqn.2022-02.lk.cybergen: ntser22vm1. networktute.com-target**



Task 4: Configure Remote Disk Storage

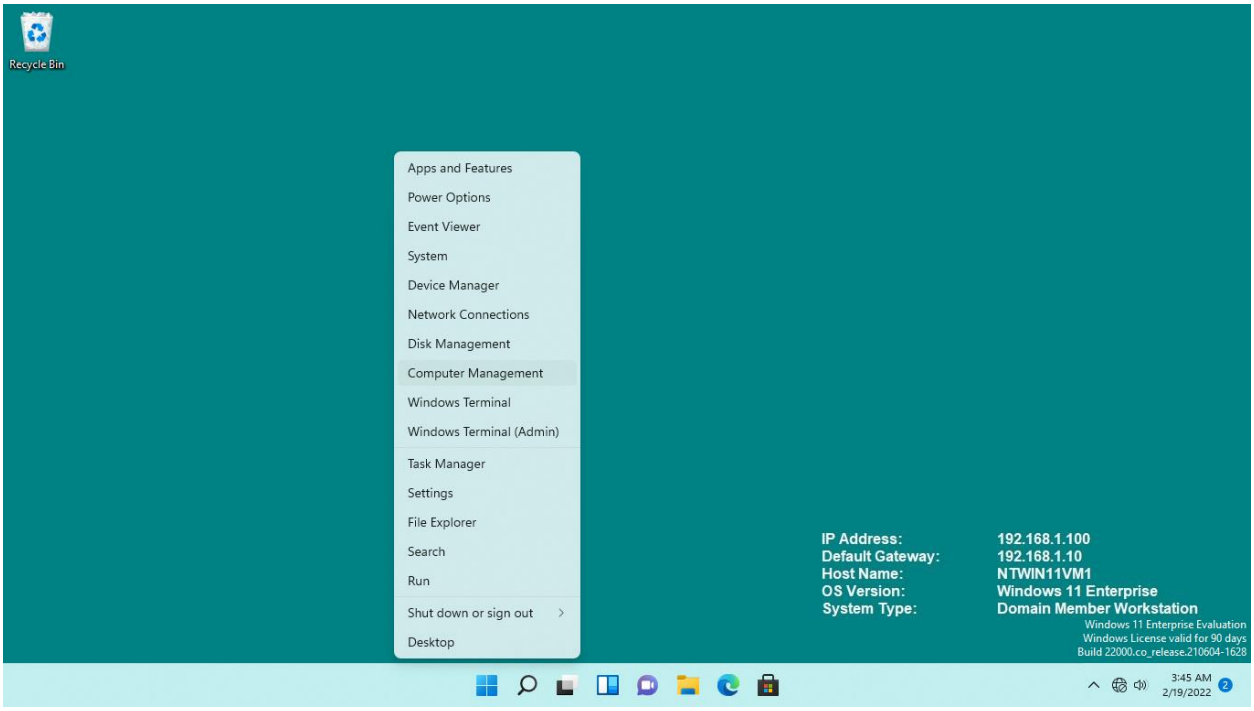
You have successfully connected NTWIN11VM1 to the NetworktuteHD virtual disk coming from the iSCSI Target Server.

For this task, we will initialize and format the remote disk as if it were a locally attached disk volume

Step 1:

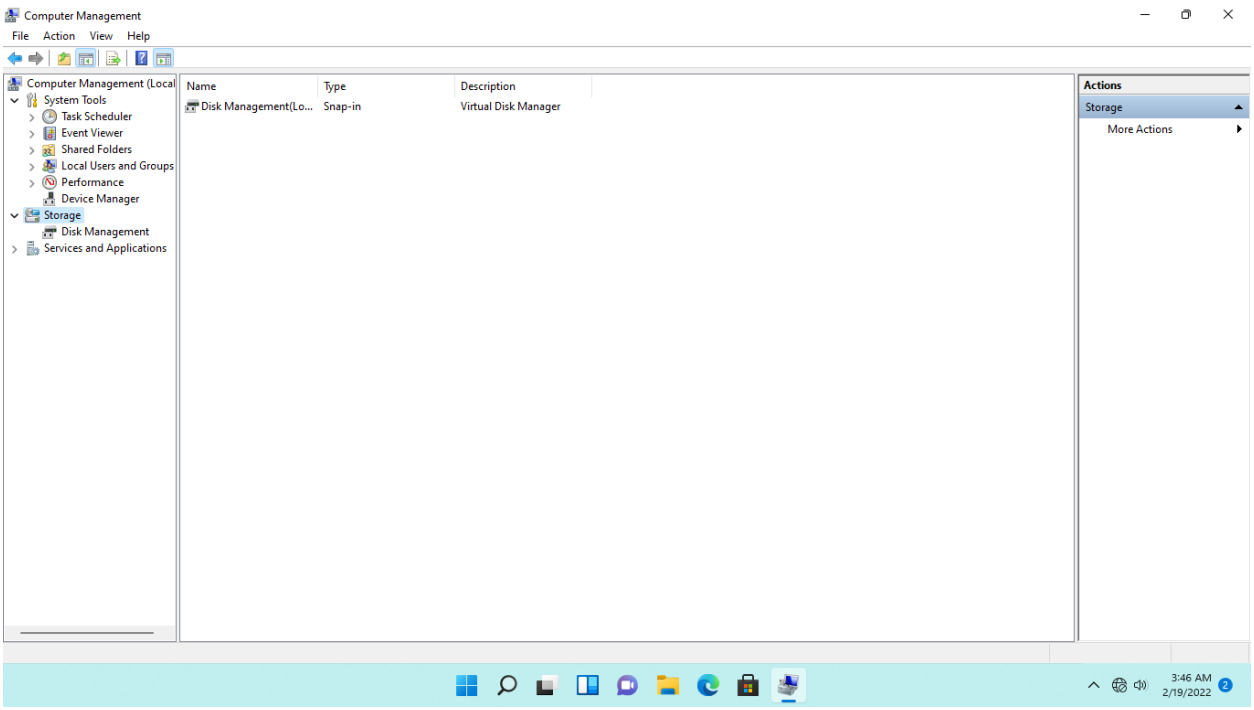
Connect to **NTWIN11VM1**

Right-click the **Start** icon and select **Computer Management**.



Step 2:

On the **Computer Management** window, access the navigation pane on the left and select the **Disk Management** node under the **Storage** node.

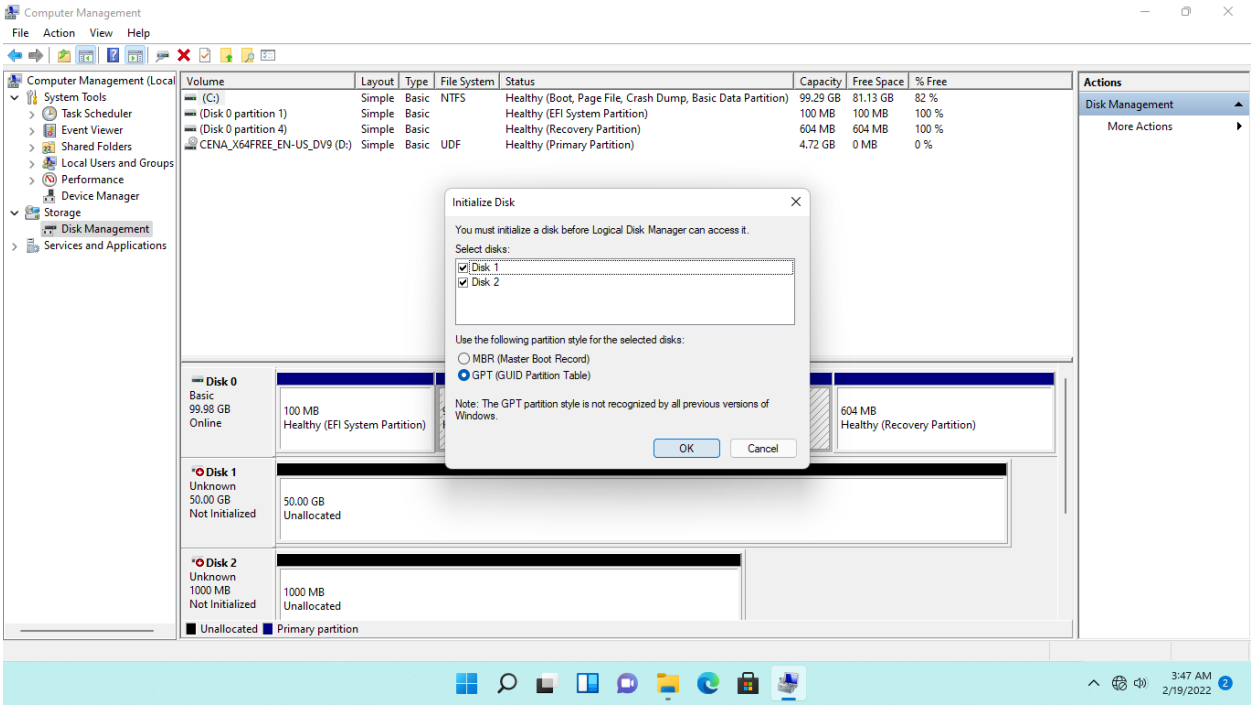


Step 3:

On the **Initialize Disk** dialog box, keep the default settings.

On the **Computer Management** window, notice that the status of **Disk 1** currently shows as **Not Initialized**.

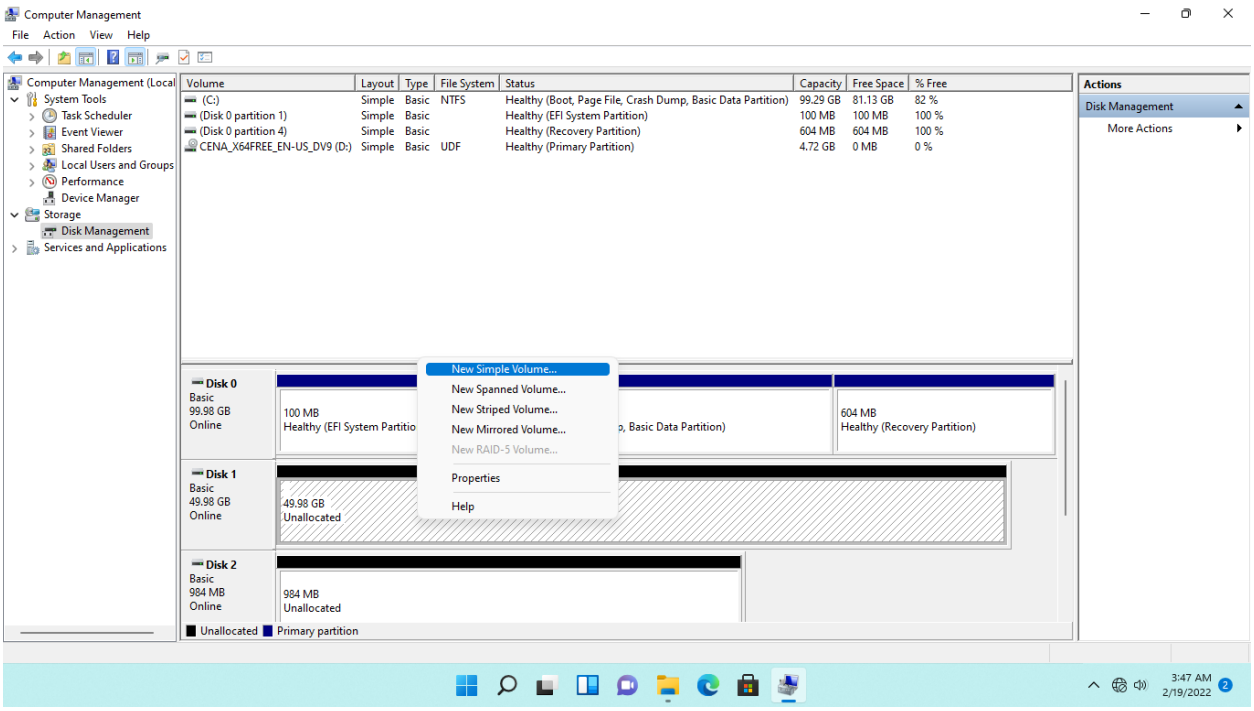
Click **OK**.



Step 4:

Notice the status of **Disk 1** changes to **Online**.

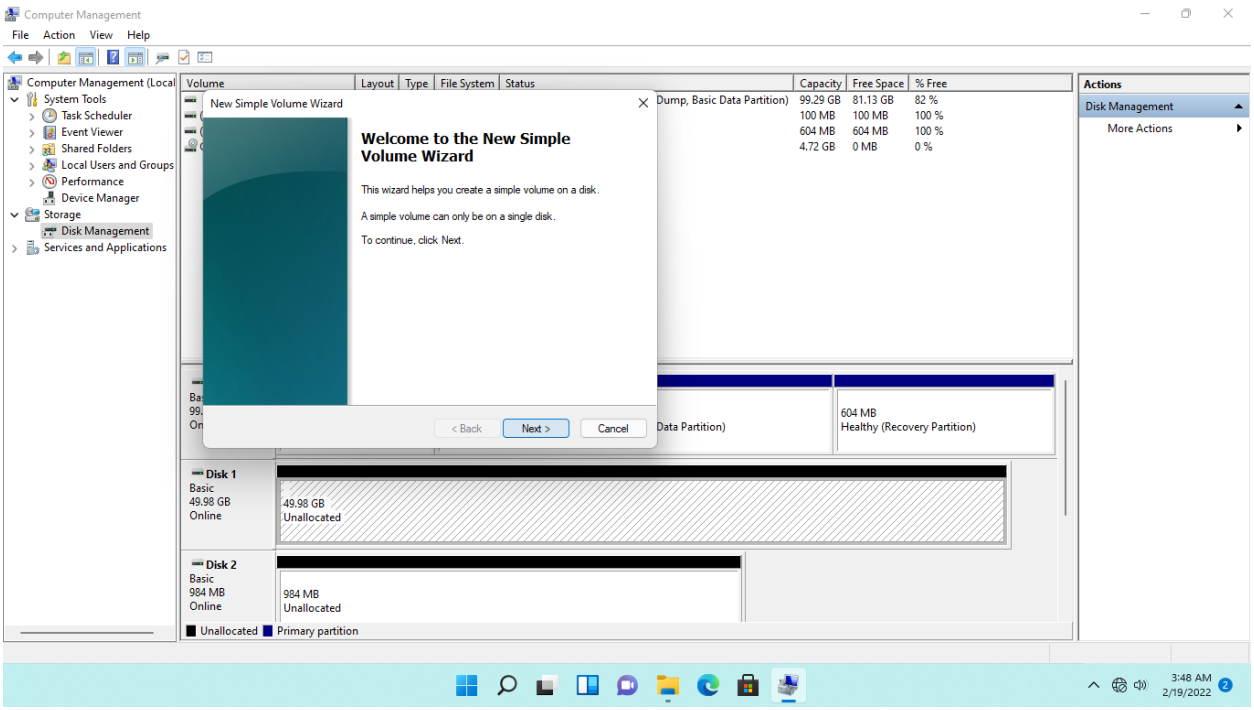
Right-click the **Disk 1** pane marked **Unallocated** and select **New Simple Volume**



Step 5:

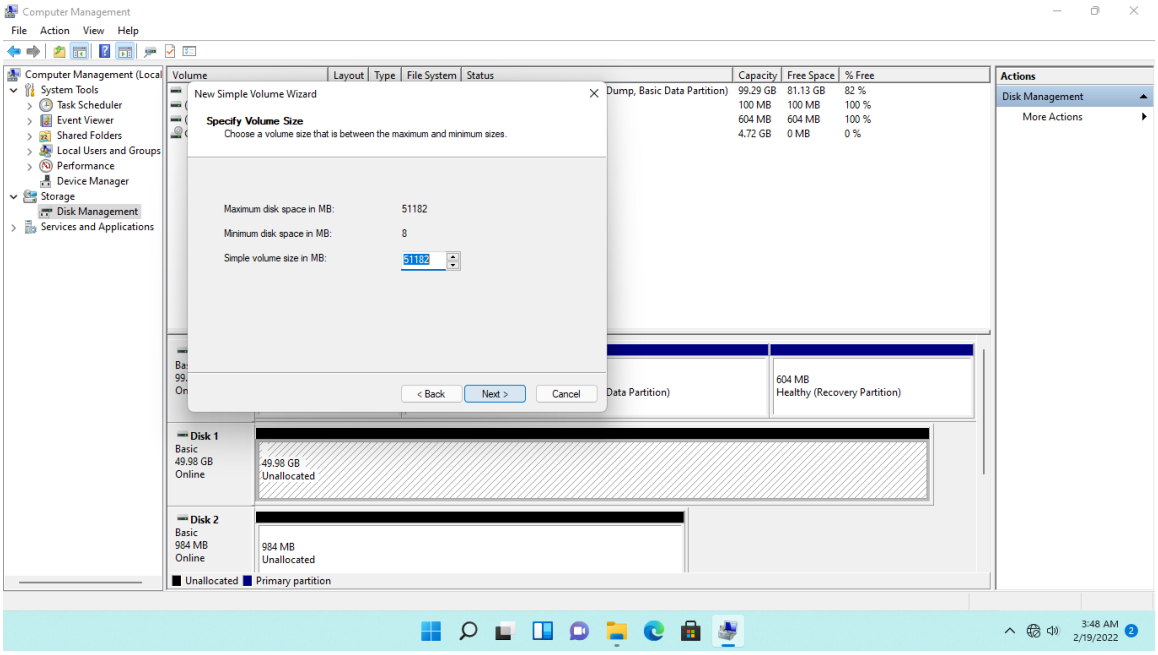
The New Simple Volume Wizard is displayed.

On the **Welcome to the New Simple Volume Wizard** page, click **Next**



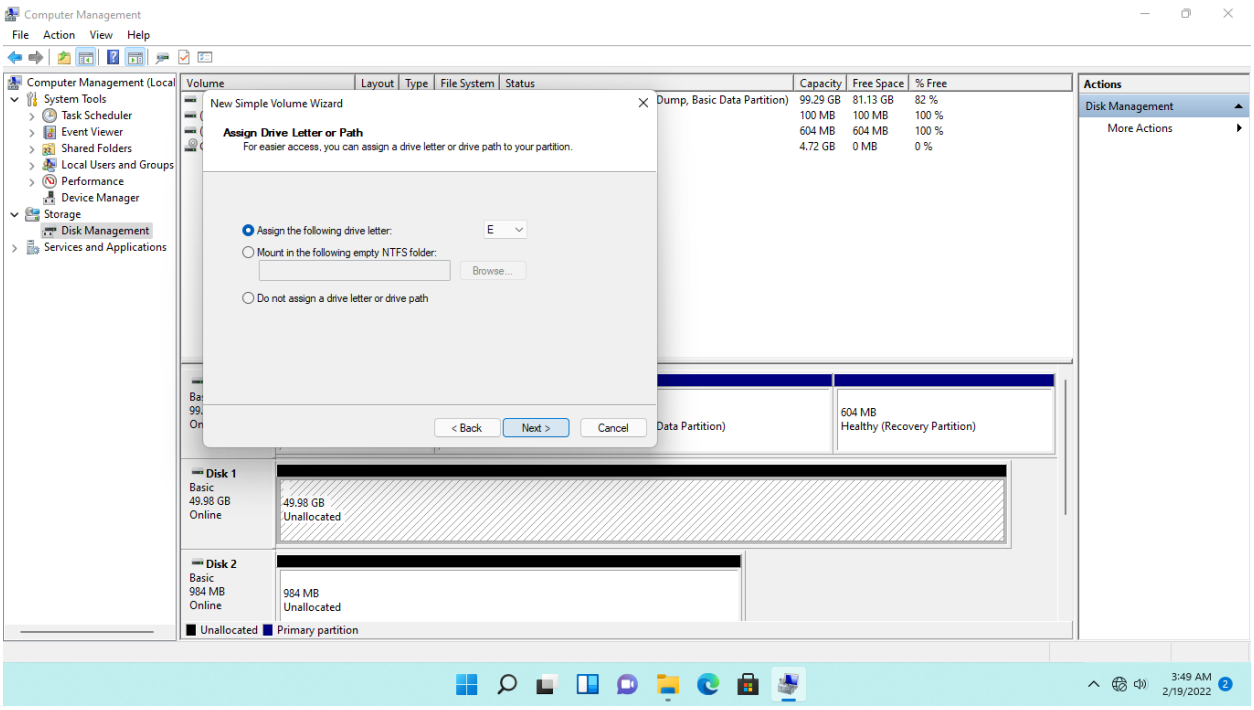
Step 6:

On the **Specify Volume Size** page, keep the default selections and click **Next**



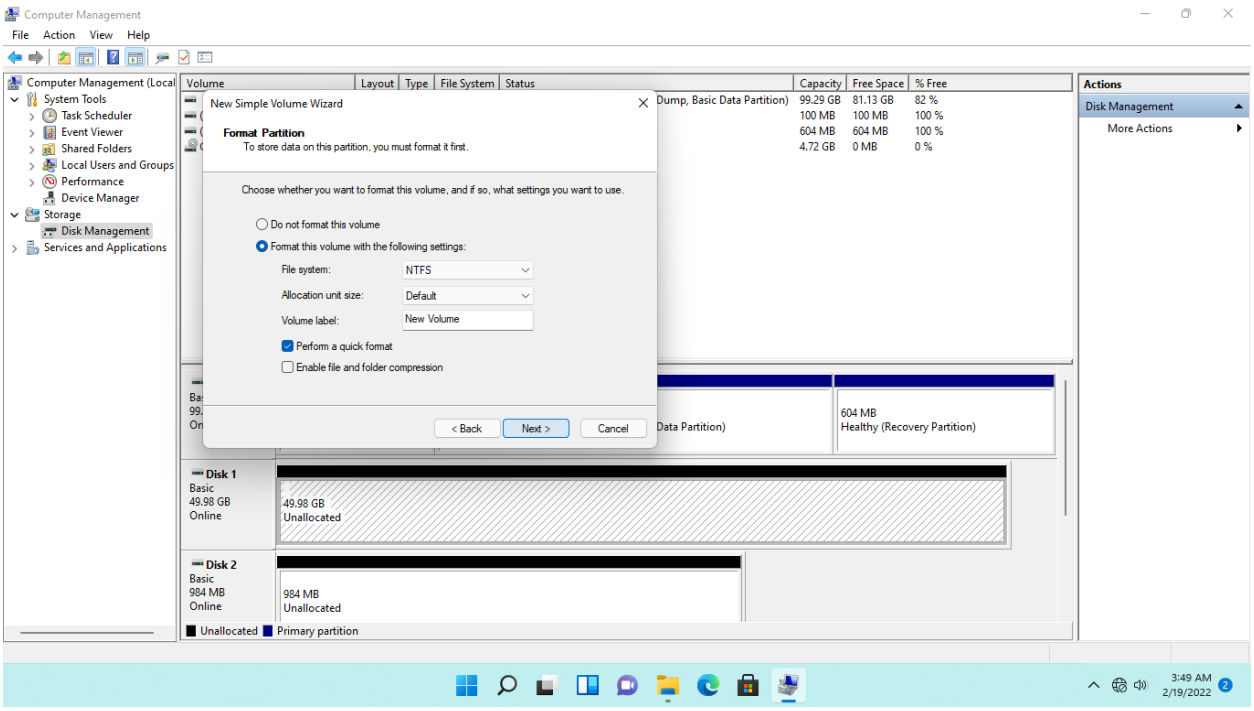
Step 7:

On the **Assign Drive Letter or Path** page, ensure **E** is selected as the drive letter and click **Next**



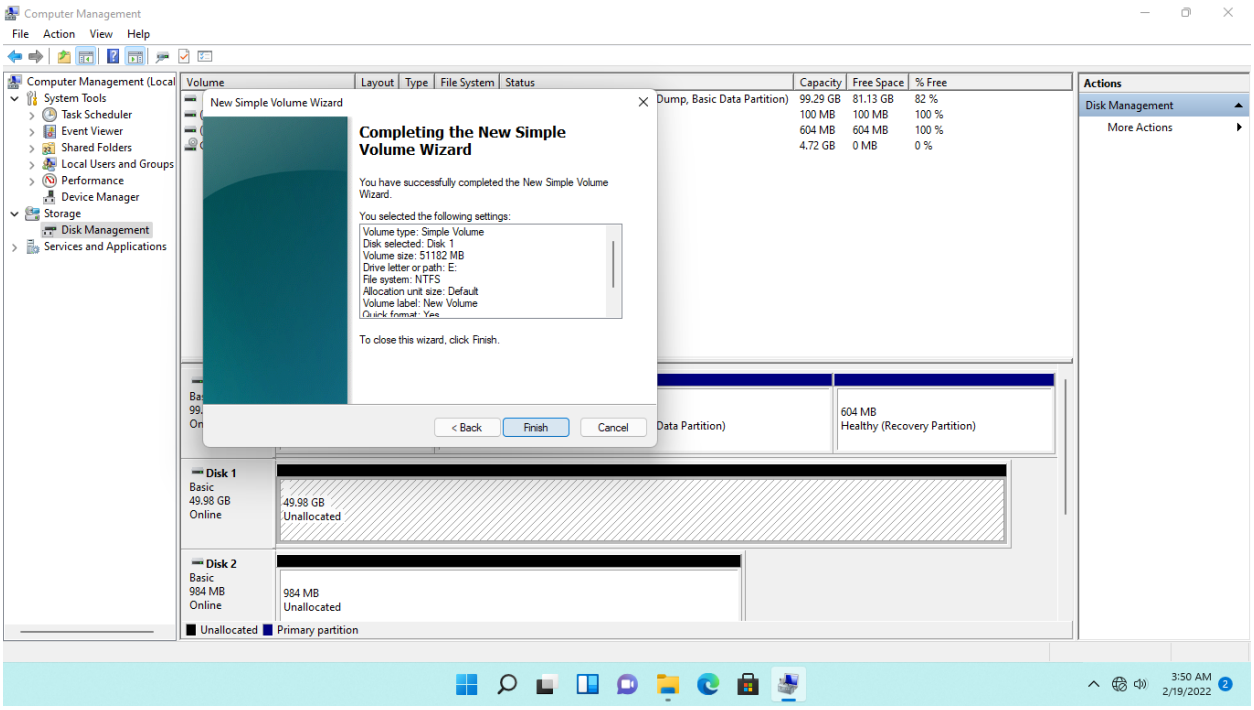
Step 8:

On the **Format Partition** page, keep the default settings and click **Next**.



Step 9:

On the **Completing the New Simple Volume Wizard** page, click **Finish**

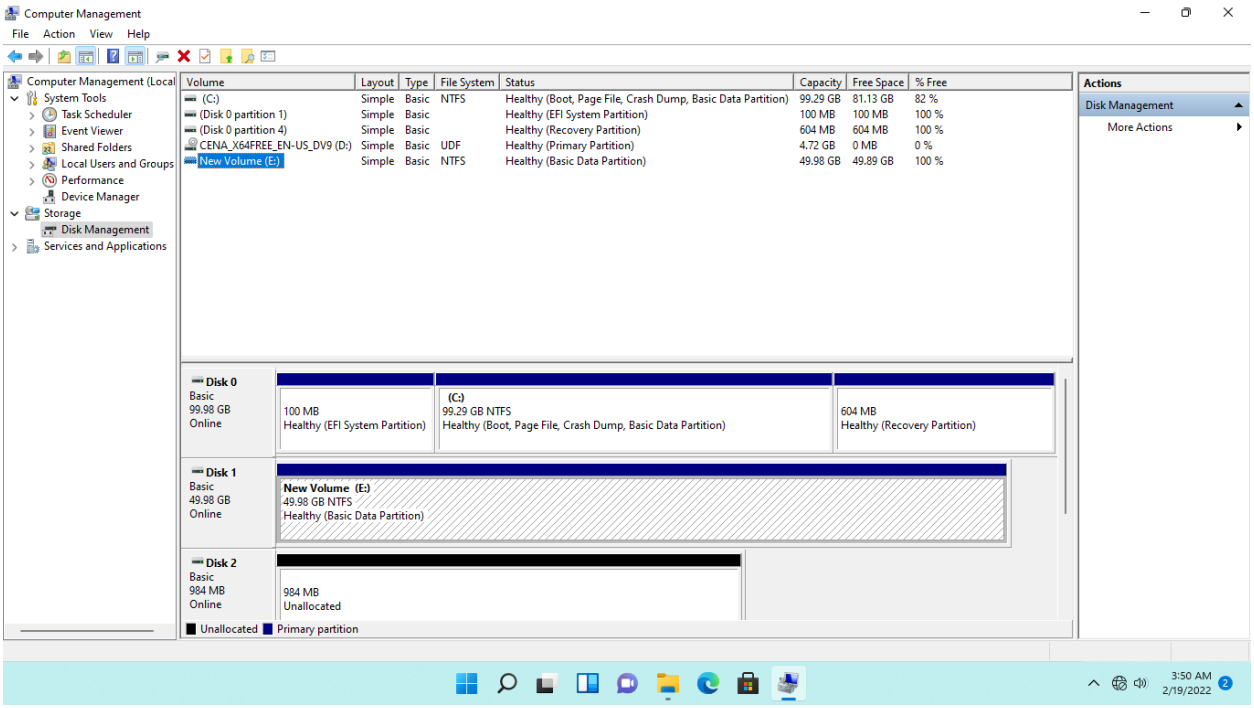


Step 10:

The **New Volume (E:)** that you just created now appears on the **NTWIN11VM1** computer.

Note: Click Cancel to ignore any system prompt about formatting a new disk **E:**

Minimize the **Computer Management** window.



Task 5: Manage Remote Disk

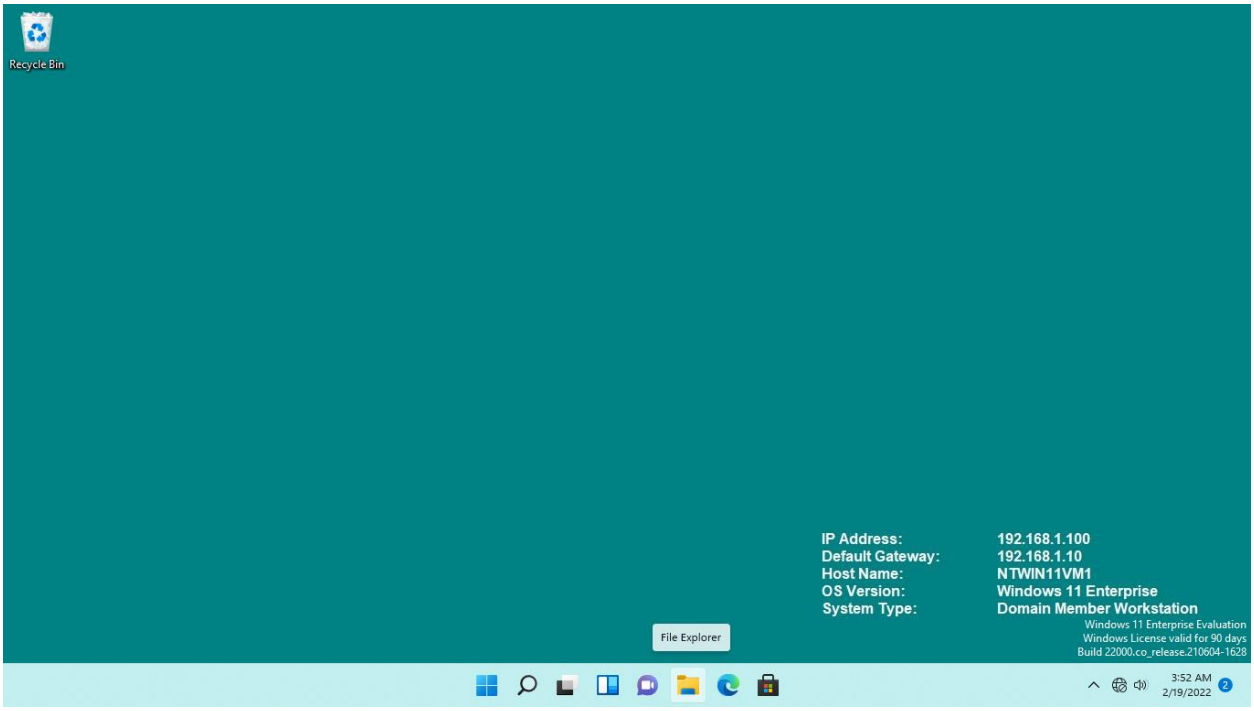
You have successfully initialized and formatted the remote disk on the iSCSI initiator.

In this task, you will manage the new disk volume for data storage

Step 1:

Connect to **NTWIN11VM1**

Click **File Explorer** on the **Taskbar**.

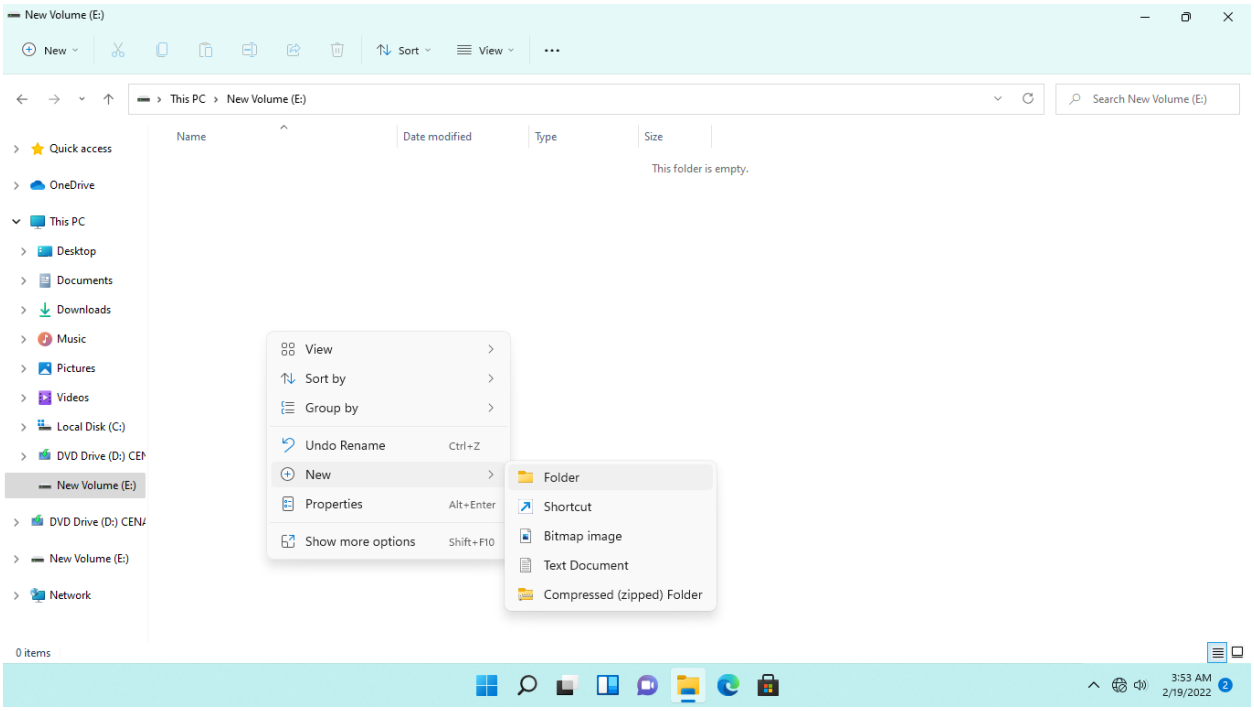


Step 2:

Expand **This PC** and notice that the **New Volume (E:)** appears like a local disk.

This is a virtual disk originating from **NTSER22VM1** running the iSCSI target service.

Right-click the **New Volume (E:)**, click New and select **Folder**.



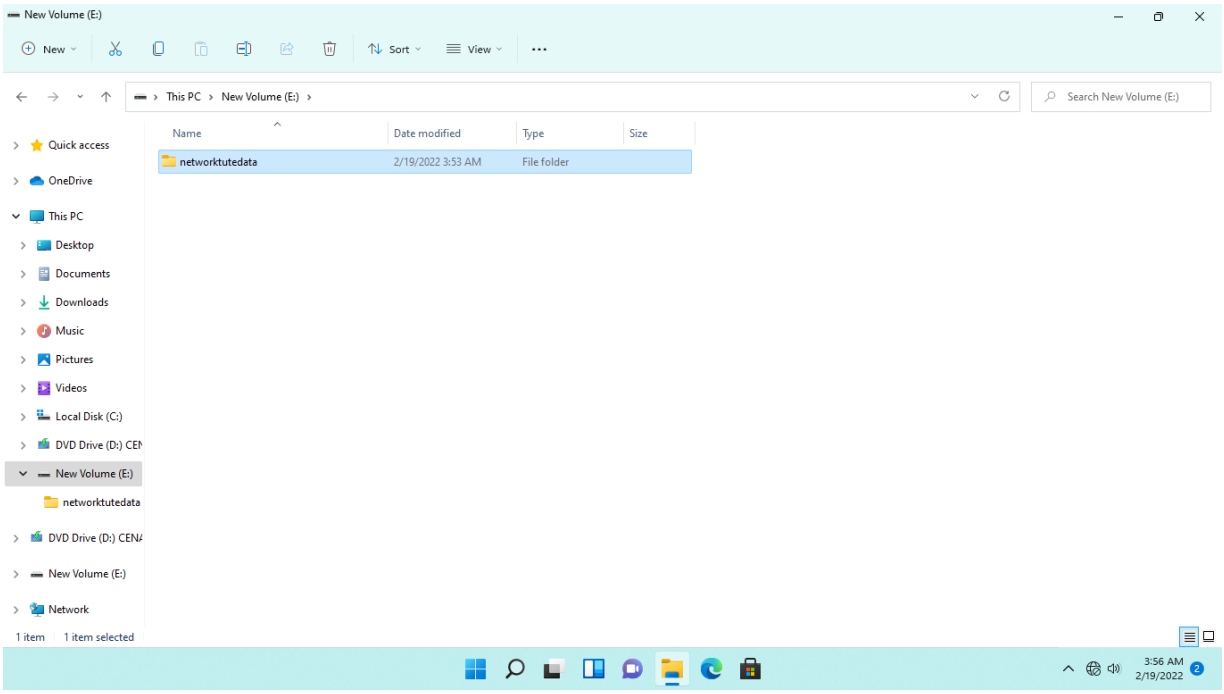
Step 3:

Click the **New folder** and press **F2** to rename the folder.

Rename the folder to:

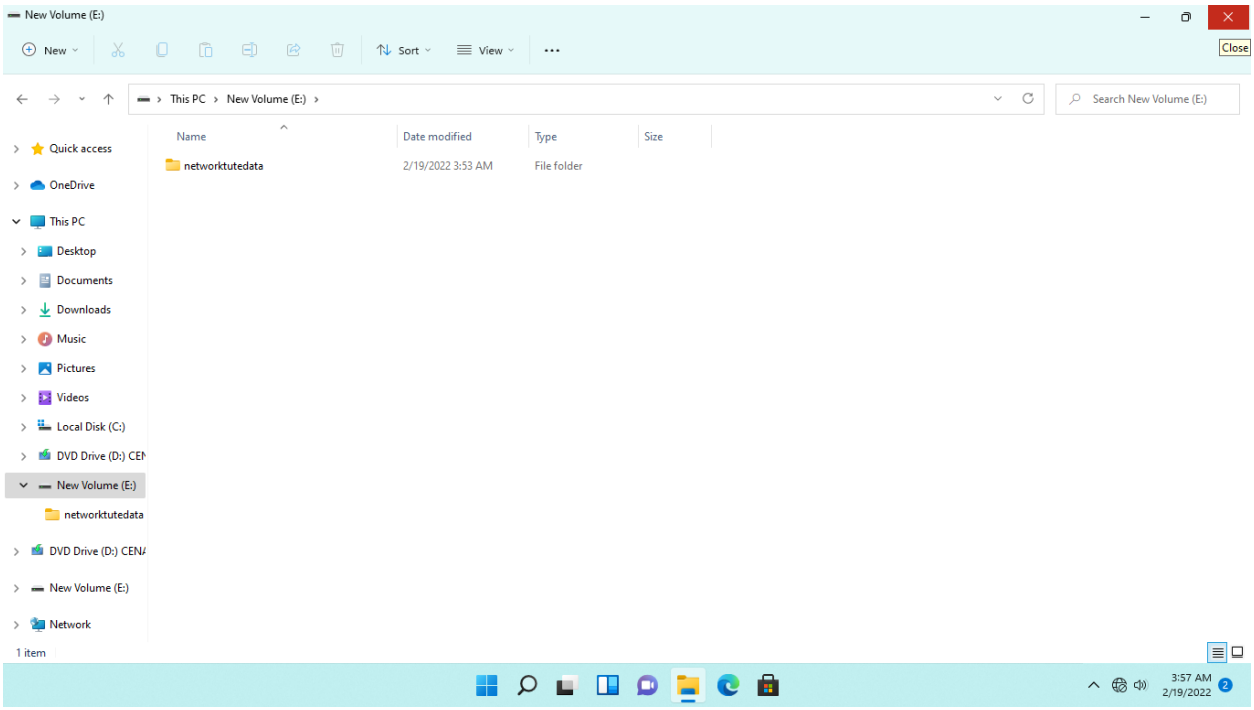
networktutedata

Press **Enter**.



Step 4:

Close the **File Explorer** window.



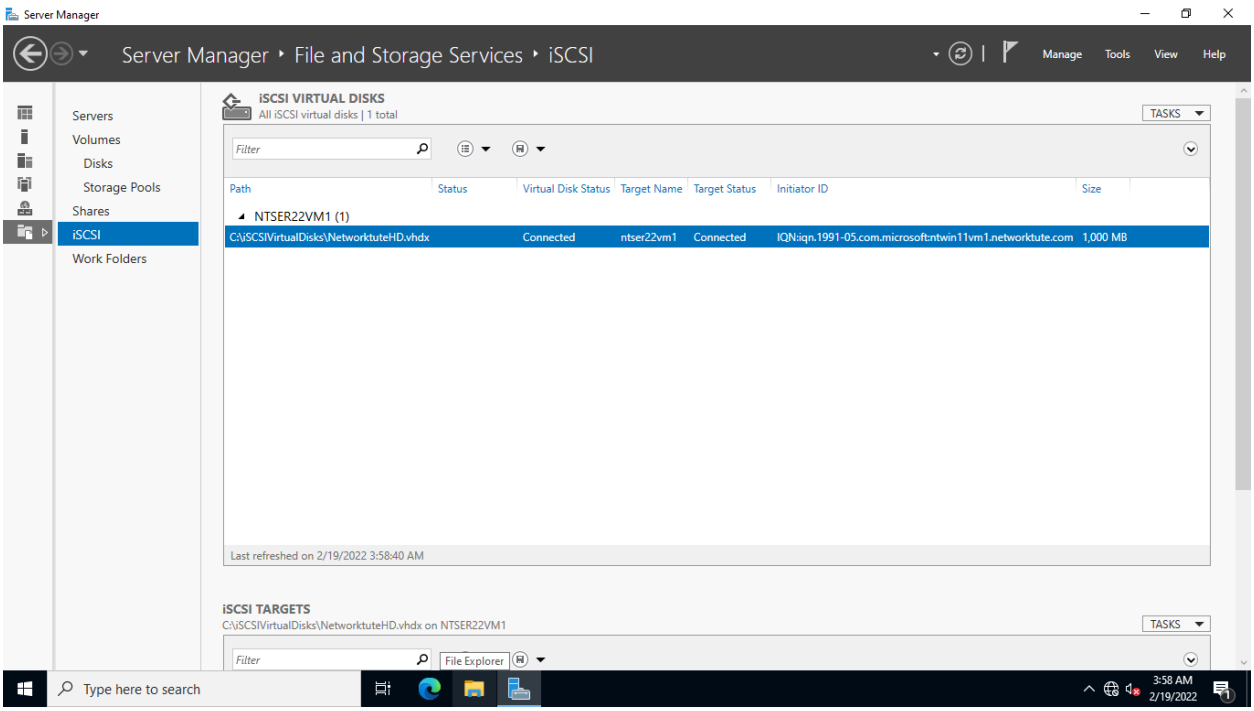
Task 6 - View the iSCSI Disk of the iSCSI Server

The Windows Server iSCSI Target Virtual Disk was successfully provisioned in an earlier activity.

In this task, we will view the VHD that was assigned to the iSCSI Target Server.

Step 1:

Connect to the **NTSER22VM1** server, then launch **File Explorer**.

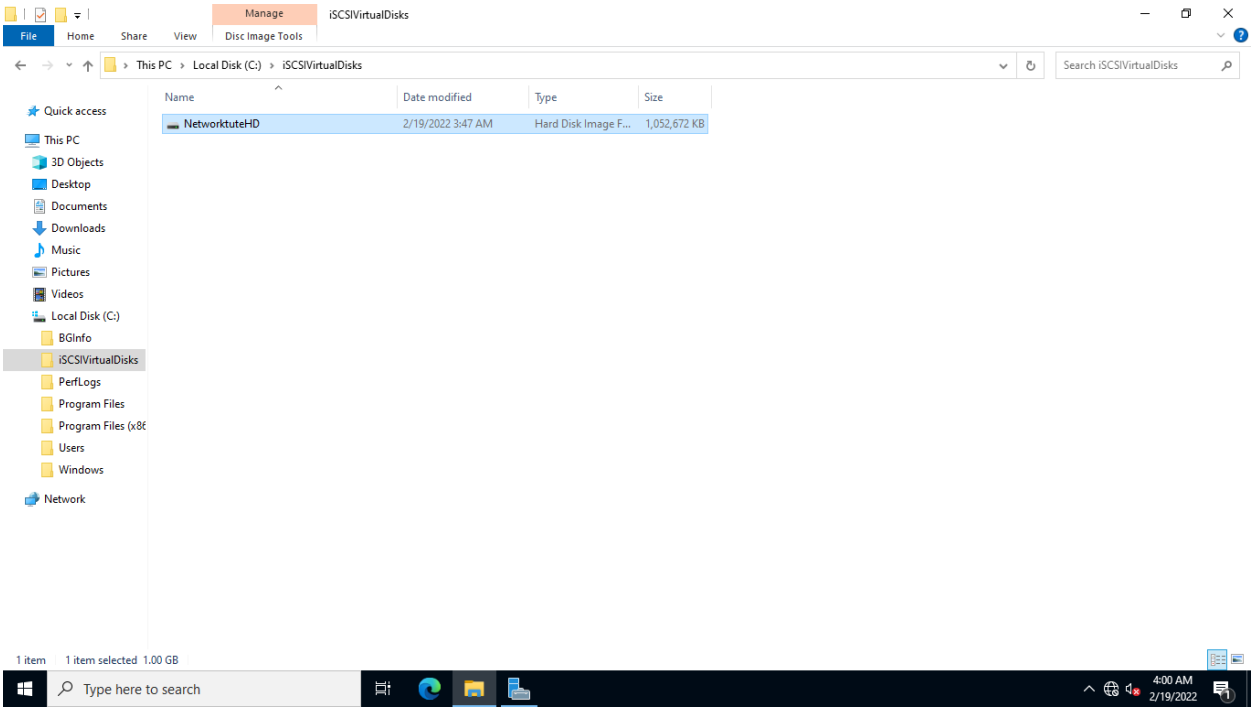


Step 2:

Expand **Local Disk (C:)**, then click the **iSCSIVirtualDisks** folder.

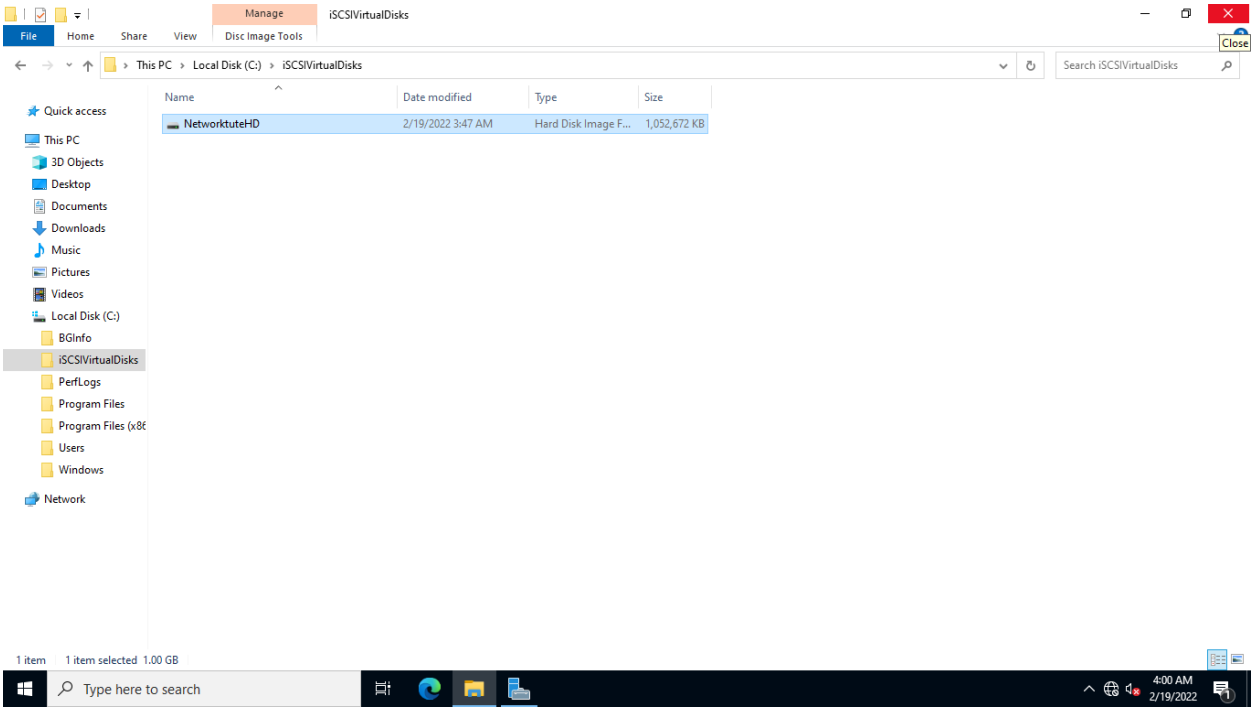
You can now access the **NetworktuteHD** virtual disk file.

Important: NetworktuteHD.vhdx file is a disk image format used for Microsoft virtualization platform like Hyper-V. You need to have Hyper-V installed to be able to open this file by attaching it to a virtual machine



Step 3:

Close the **File Explorer** window.



Task 7 - Monitor the iSCSI Initiator's Connection to iSCSI Server

File Storage Services - The Server Manager The iSCSI Component provides a management console for monitoring the iSCSI Target Server connection.

In this task, we will use the Server Manager - File Storage Services iSCSI to view the active connections of iSCSI Initiators.

Step 1:

On **NTSER22VM1**, ensure the **Server Manager** window > **File and Storage Services** > **iSCSI** page is open.

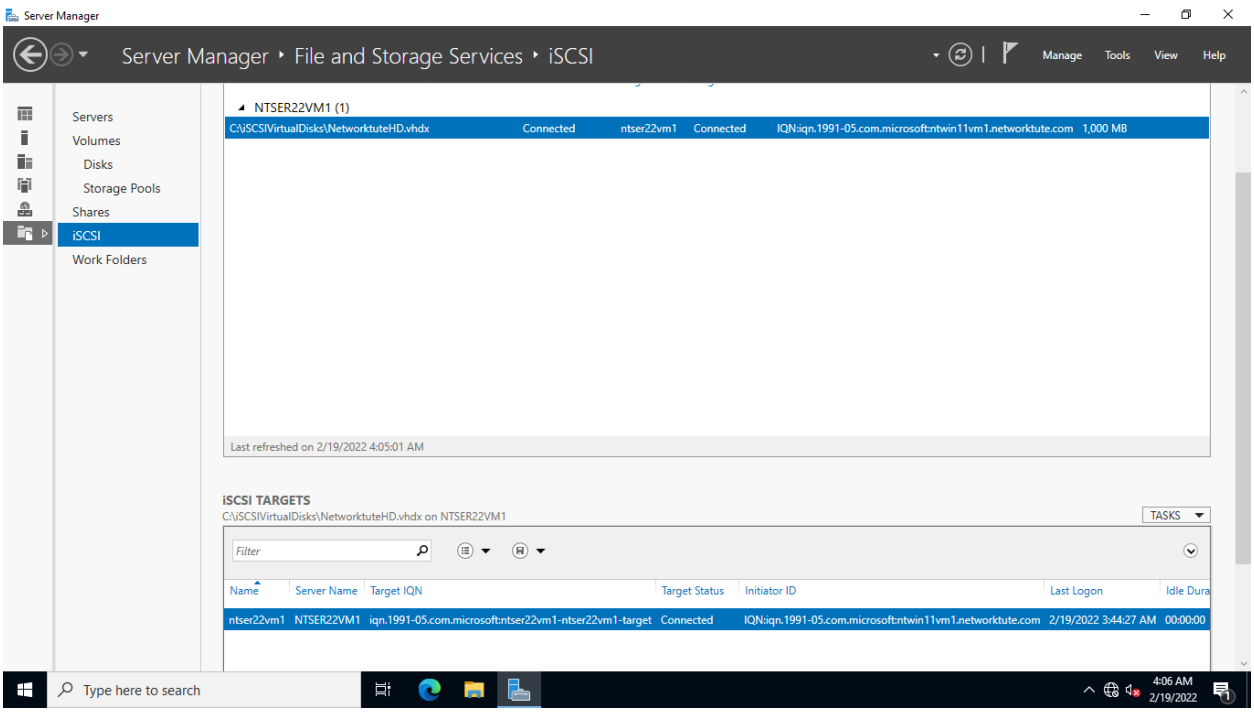
Step 2:

Under the **iSCSI VIRTUAL DISKS** section, click on **c:\iSCSIVirtualDisks\CorpHD.vhdx**

Click the **Refresh** icon (two curved arrows in a circle shape) at the top toolbar.

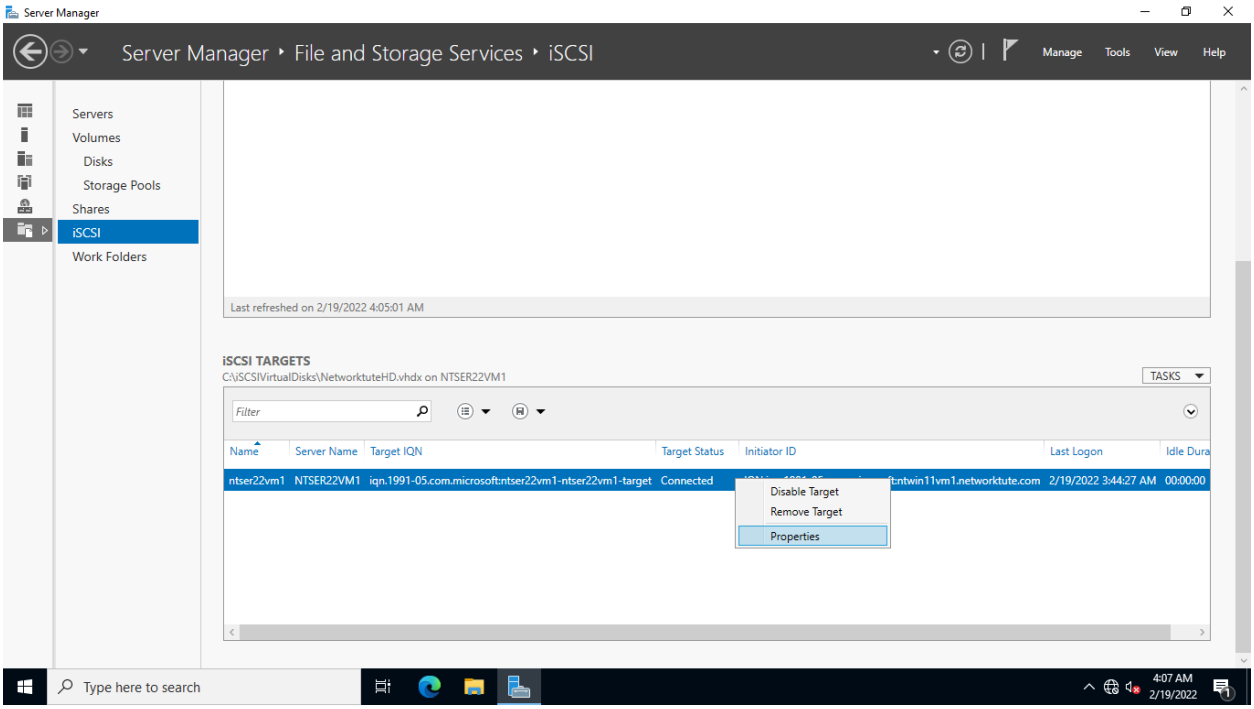
Scroll down to the **iSCSI TARGETS** section and verify the status of **iSCSI Initiators** as **Connected**.

> **Note**: If the Target Status is not connected, keep clicking the **Refresh** button (two curved arrows in a circular shape) next to the flag icon in the top toolbar until the status changes to Connected.



Step 3:

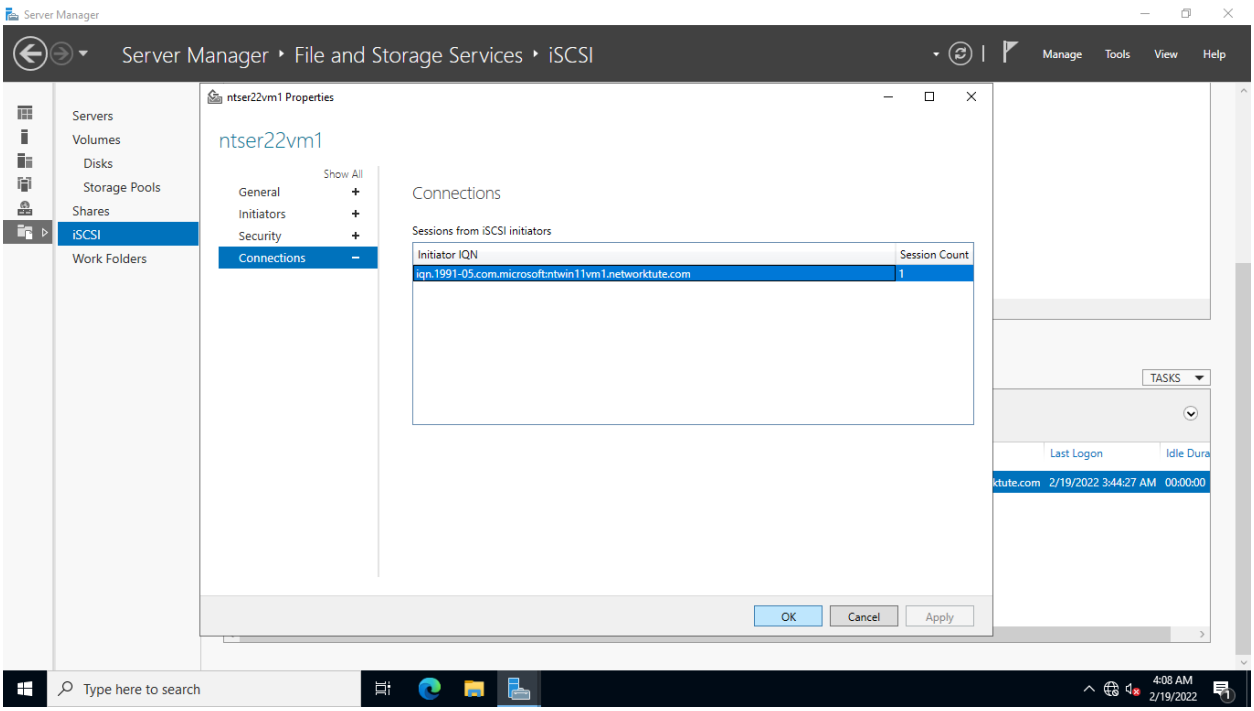
On the **iSCSI TARGETS** section, right-click the listed target **ntser22vm1** and select **Properties**.



Step 4:

In the **ntser22vm1 Properties** dialog box, explore the settings on the left pane.

Click **Connections** and notice the **Sessions from iSCSI initiators** are active


Server Manager
Server Manager ‣ File and Storage Services ‣ iSCSI
Manage
Tools
View
Help
Servers
Volumes
Disks
Storage Pools
Shares
iSCSI
Work Folders
ntser22vm1 Properties
ntser22vm1
Show All
General
Initiators
Security
Connections
Connections
Sessions from iSCSI initiators
Initiator IQN
Session Count
iqn.1991-05.com.microsoft:ntwin11vm1.networktute.com
1
OK
Cancel
Apply
TASKS
Last Logon
Idle Dura
ktute.com 2/19/2022 3:44:27 AM 00:00:00
Type here to search
4:08 AM
2/19/2022