Exercise 1 - Managing Disk Drive Optimization and Error Check.

On traditional hard disks, disk fragmentation happens as the operating system, applications, and users add and remove folders/files. As input and output activities cause disk latency, fragmented disk storage lowers the performance of a hard drive.

A defragmentation tool is included in Windows 11 to improve disk speed by reorganizing non-adjacent disk clusters to improve data retrieval.

Users now have access to fast read and write times that were previously only available on server-based SCSI storage systems, thanks to the growing usage of Solid-State Drives (SSDs). Stacks of spinning disks mounted on a spindle spin at high speeds are used in traditional hard drives.

Solid-state drives (SSDs) store data permanently using integrated circuit assemblies and flash memory. Defragmenting an SSD drive is not recommended by hardware suppliers because there is no benefit in terms of input-output optimization and it merely costs disk write cycles.

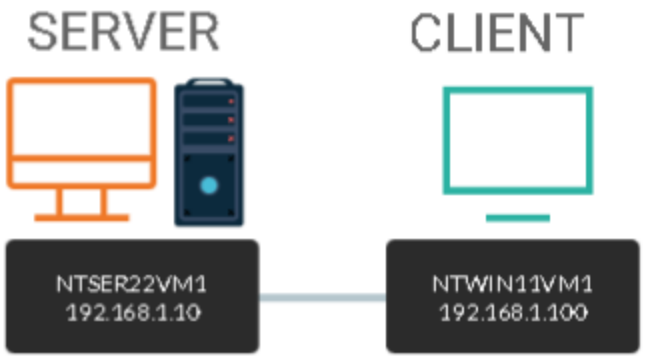
Windows 11 comes with programs that help you get the most out of your computer's disk storage system. Drive Optimization, for example, analyzes disk volumes and makes recommendations for improving performance.

The Disk Cleanup program identifies unnecessary, transient files that are taking up disk space and may be securely erased without compromising performance or stability.

In this exercise,

1. Set up disk performance enhancement
    a. Disk defragmenter
    b. Disk cleanup.
2. Task Scheduler to automate these tools.

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: Create a Checkpoint

Blank sectors are left behind in the disk cluster as a user adds and removes files or directories from the hard drive. As a result, a stored file may take up non-adjacent sectors, fragmenting the file.

When reading from or writing to a file, fragmentation lengthens the time it takes to search these regions. A disk defragmenter combines file fragments to speed up read and write times on the hard drive. Optimize and defragment disks, a Windows tool, is one such example.

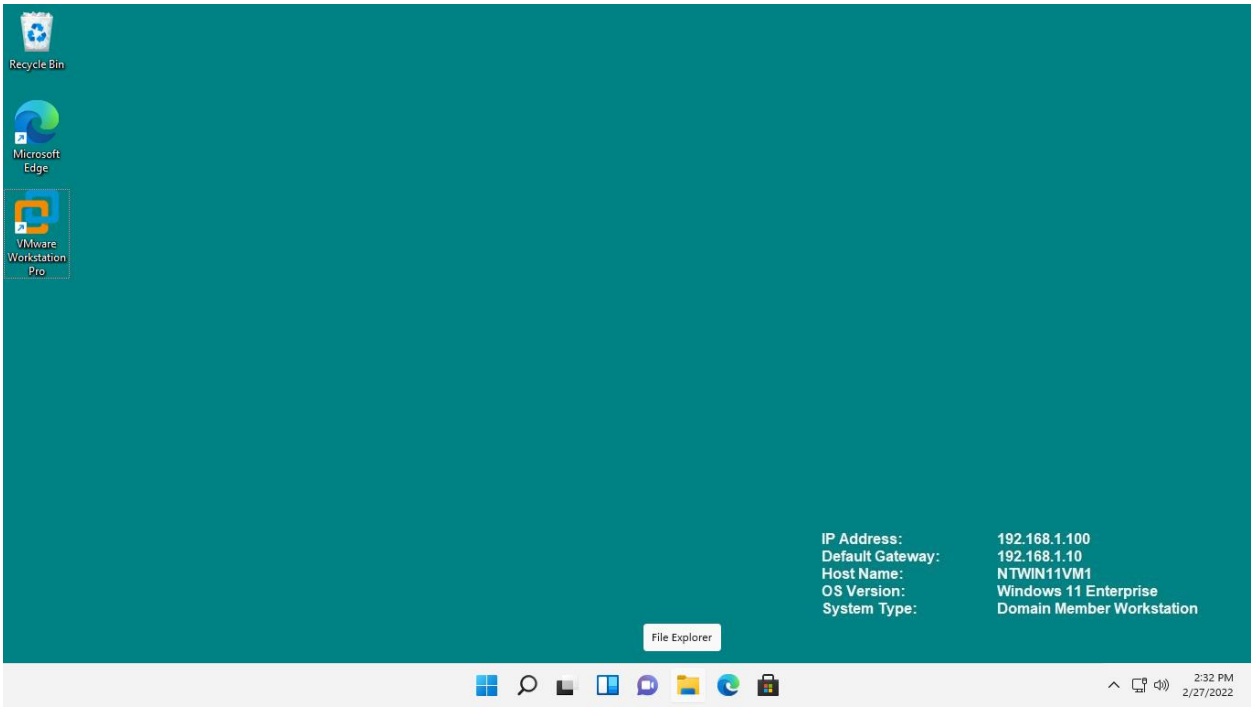
In this task, we will use the Optimize and defragment drives application to analyze and defragment the hard disks in **NTWIN11VM1** - a Windows 11 computer.

Note: In my case the **Local Disk (C:)** will be **Windows (C:).** So please don't get panic both are same. Therefore, I will be talking in your point of view by mentioning **Local Disk (C:)**

Step 1:

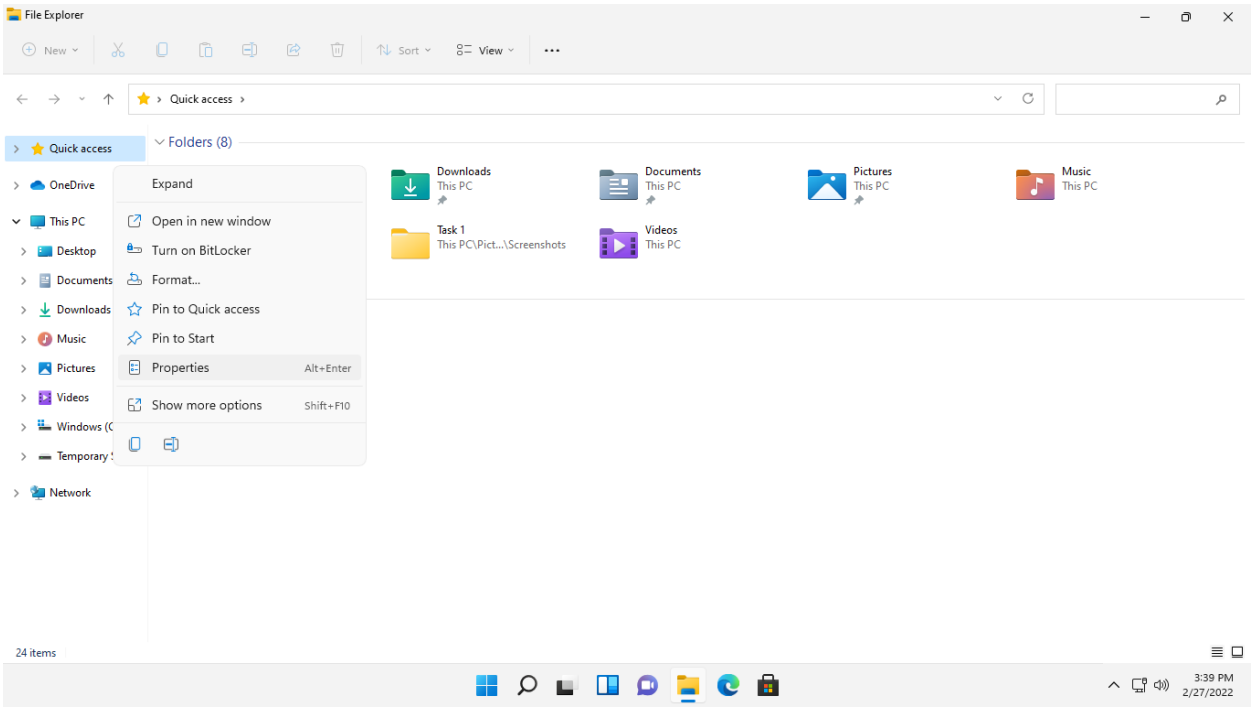
Make sure you have powered on the required devices and connect to **NTWIN11VM1**.

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



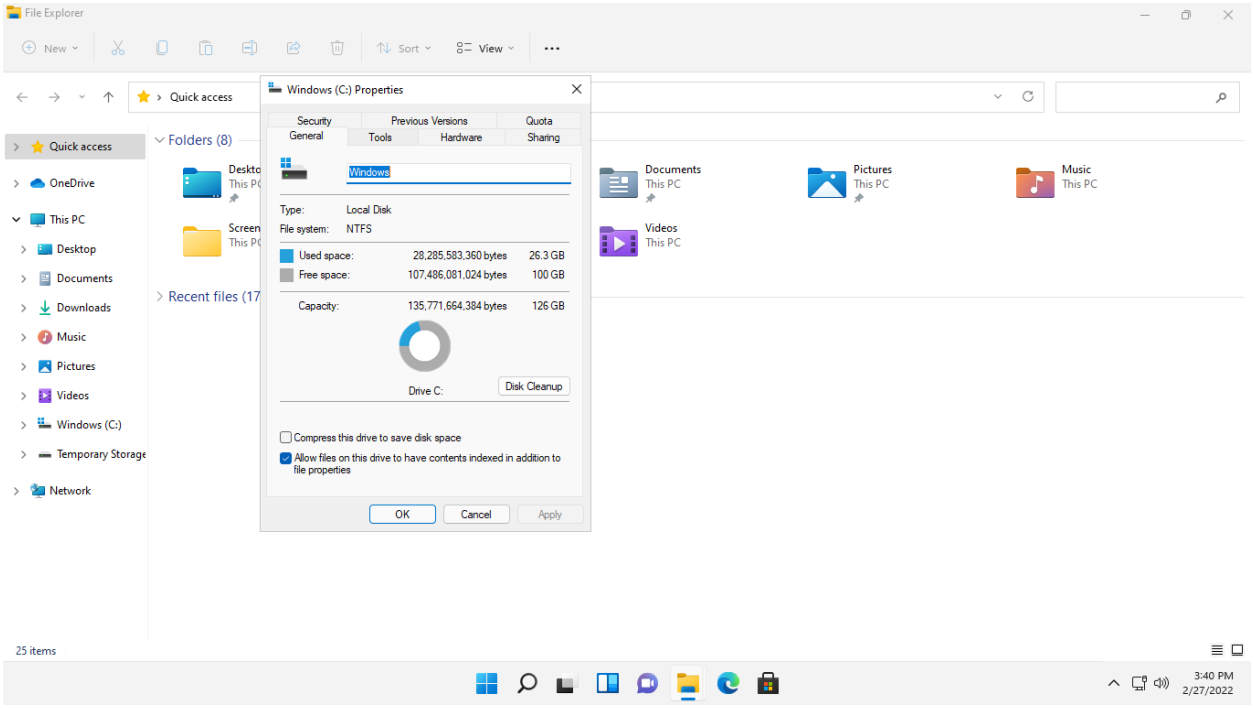
Step 2:

Expand the **This PC** node, right-click **Local Disk C** (In my case its Windows (C:))and select **Properties**.



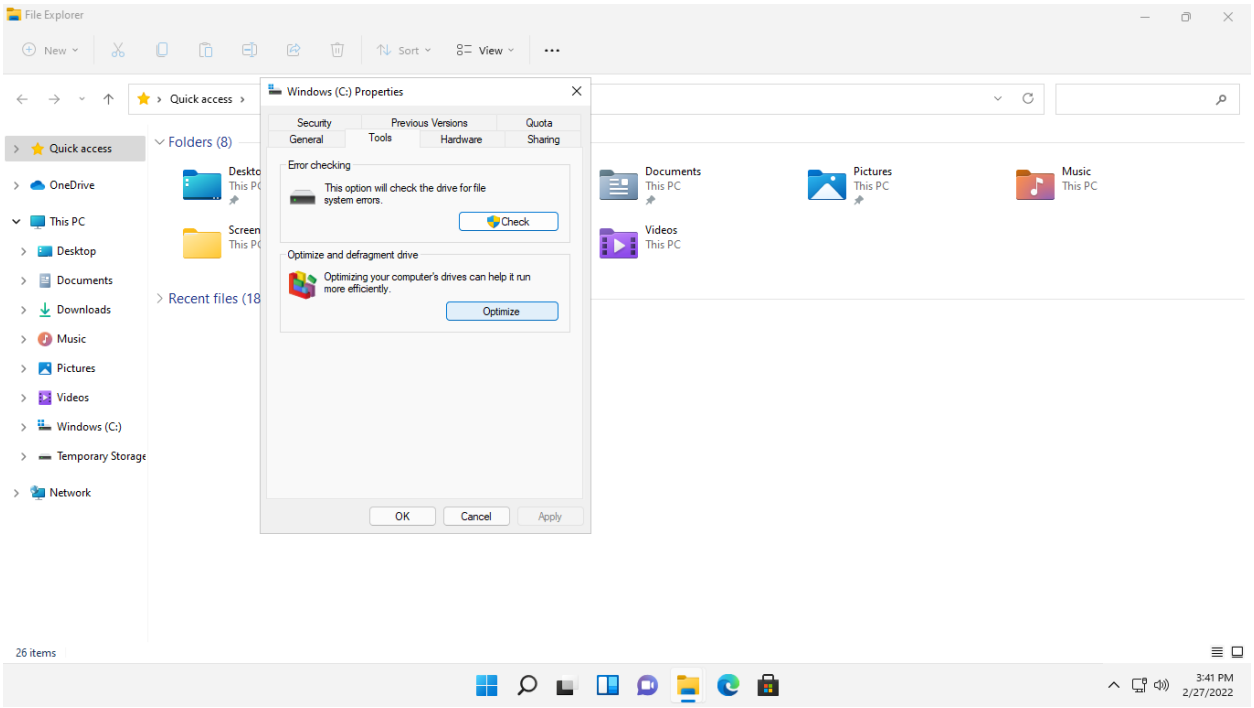
Step 3:

On the **Local Disk C Properties** dialog box, access the **Tools** tab.



Step 4:

Under the **Optimize** and **defragment drive** section, click **Optimize**.

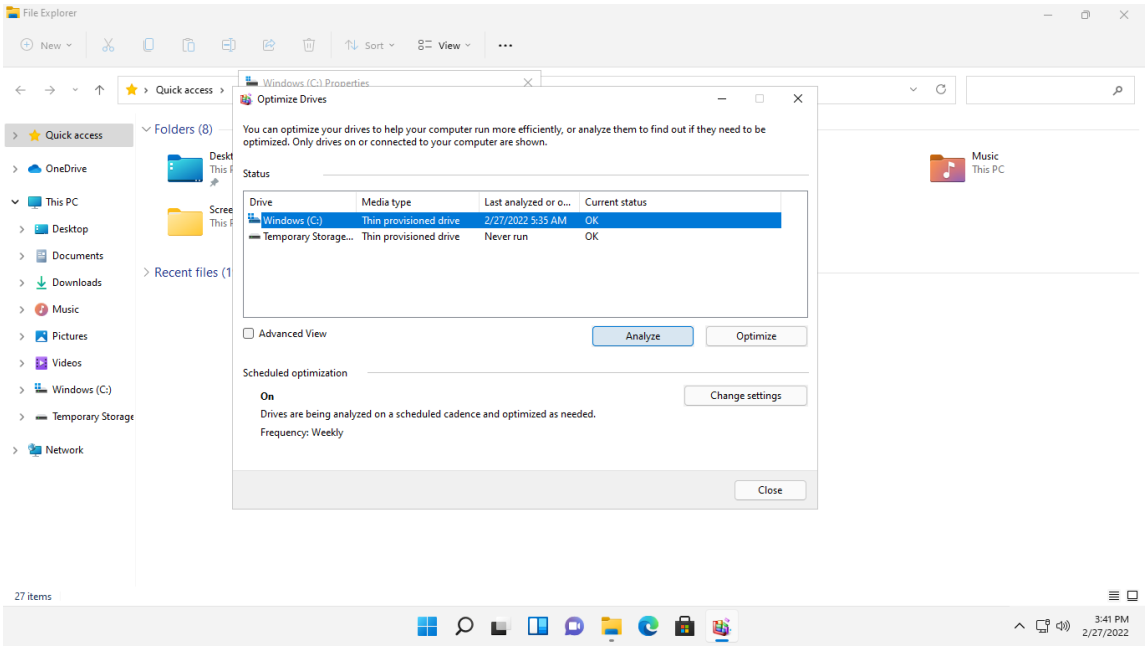


Step 5:

On the **Optimize Drives** screen, verify the current status of the drives.

Since this is a computer in a lab environment, no optimization is required.

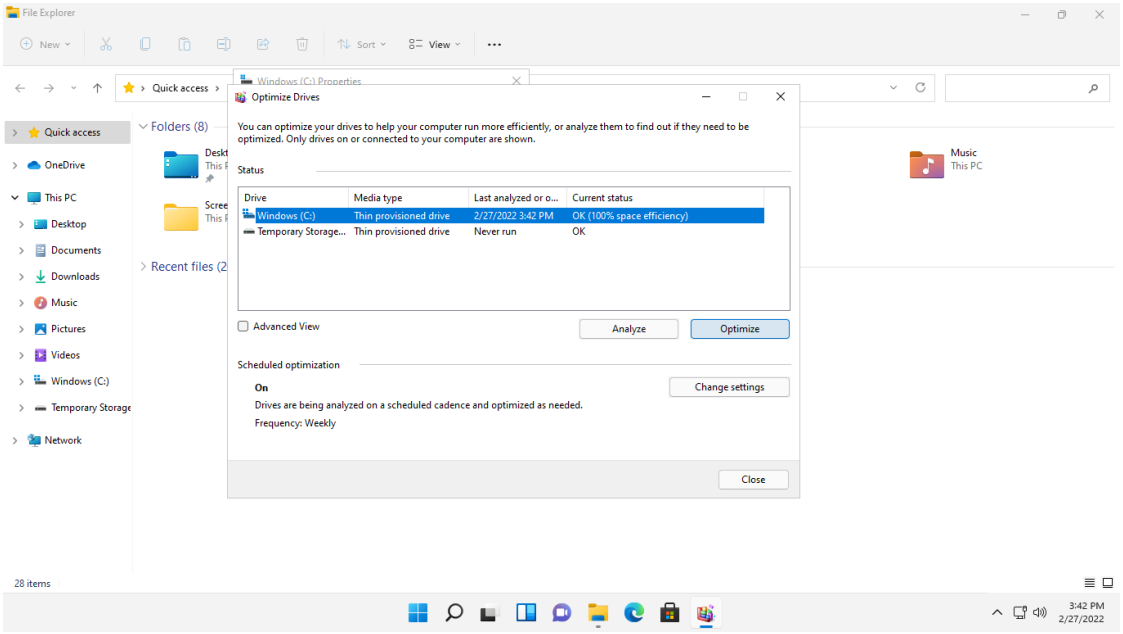
Select **(C:)** and click **Analyze**.



Step 6:

Notice that no activity occurs as the drive **(C:)** is **OK**.

Again, select **(C:)** drive and click **Optimize**



Step 7:

After optimizing the **(C:)** drive, notice the **Current status** indicate **100% space efficiency.**

Keep the windows open for the next task.

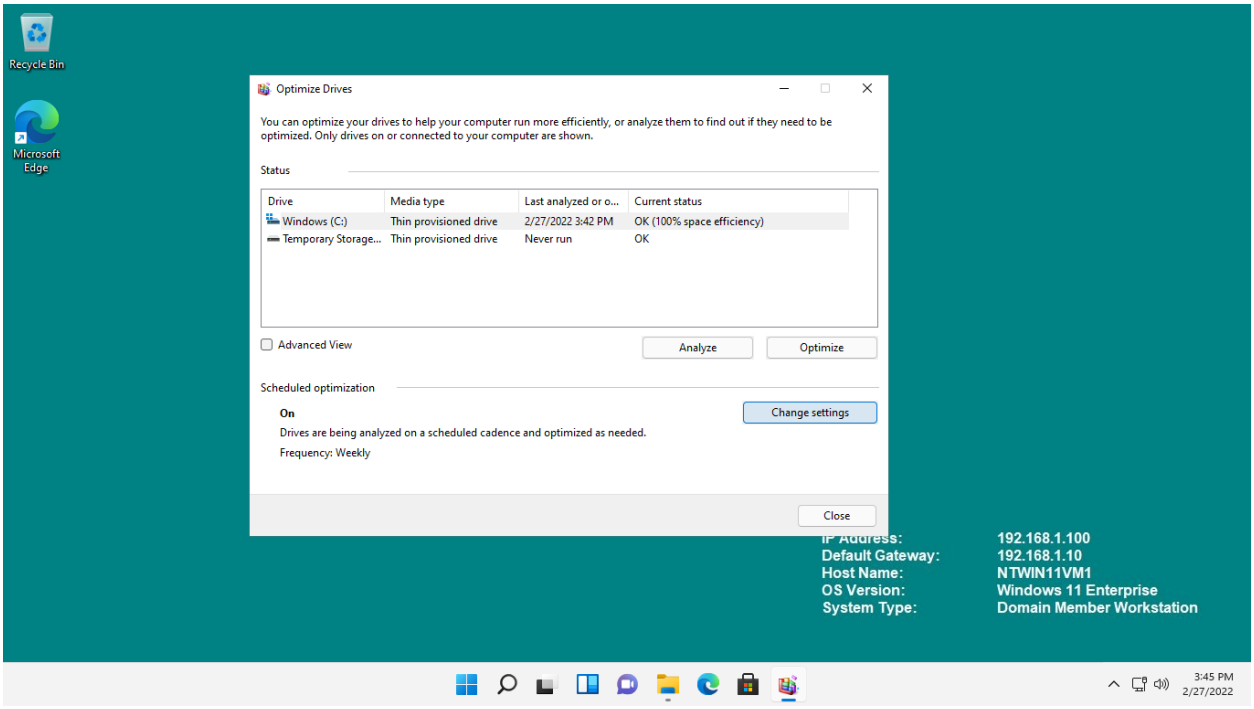
Task 2: Automate Optimization of Drives

The optimize and defragment drives utility automates the disk drive analysis and optimization. In this task, we will use the Optimize and defragment drives tool to automate disk optimization on **NTWIN11VM1**.

Step 1:

Make sure that **Optimize Drives** window is displayed on **NTWIN11VM1**.

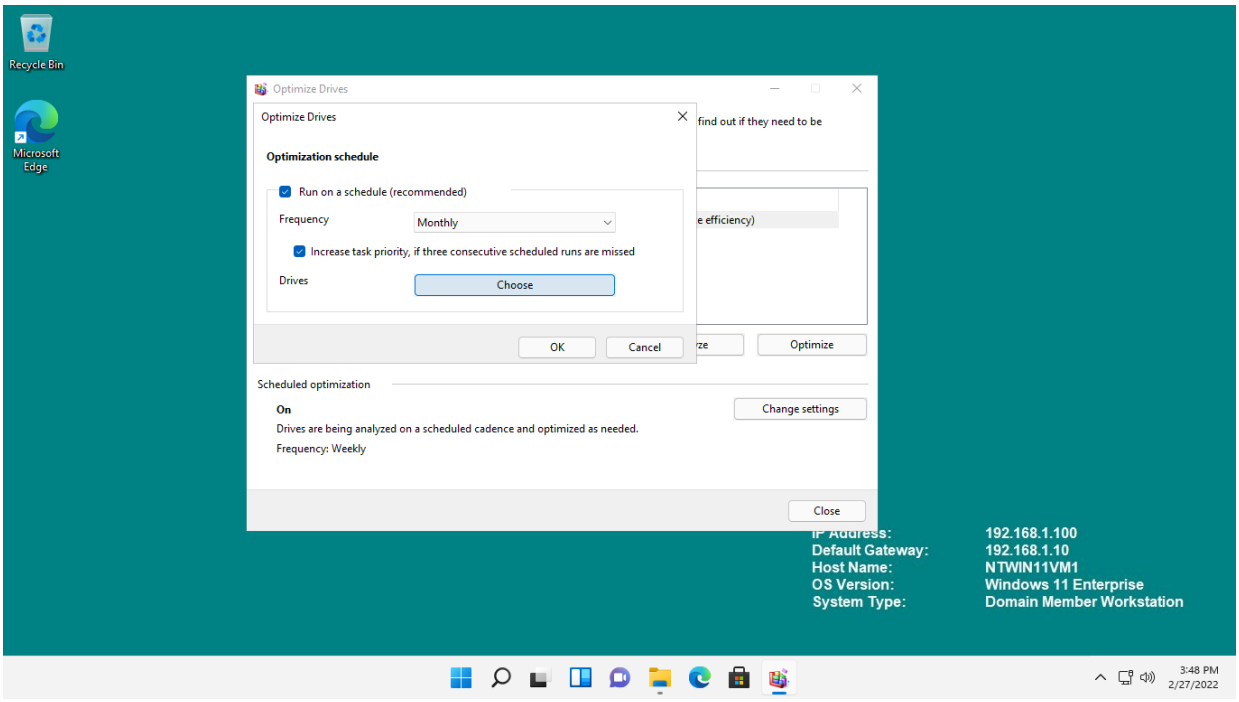
In the **Scheduled optimization** section, click **Change settings.**



Step 2:

On the **Optimization schedule** dialog box, access the **Frequency** drop-down list and select **Monthly**.

Next to the **Drives** section, click **Choose**.



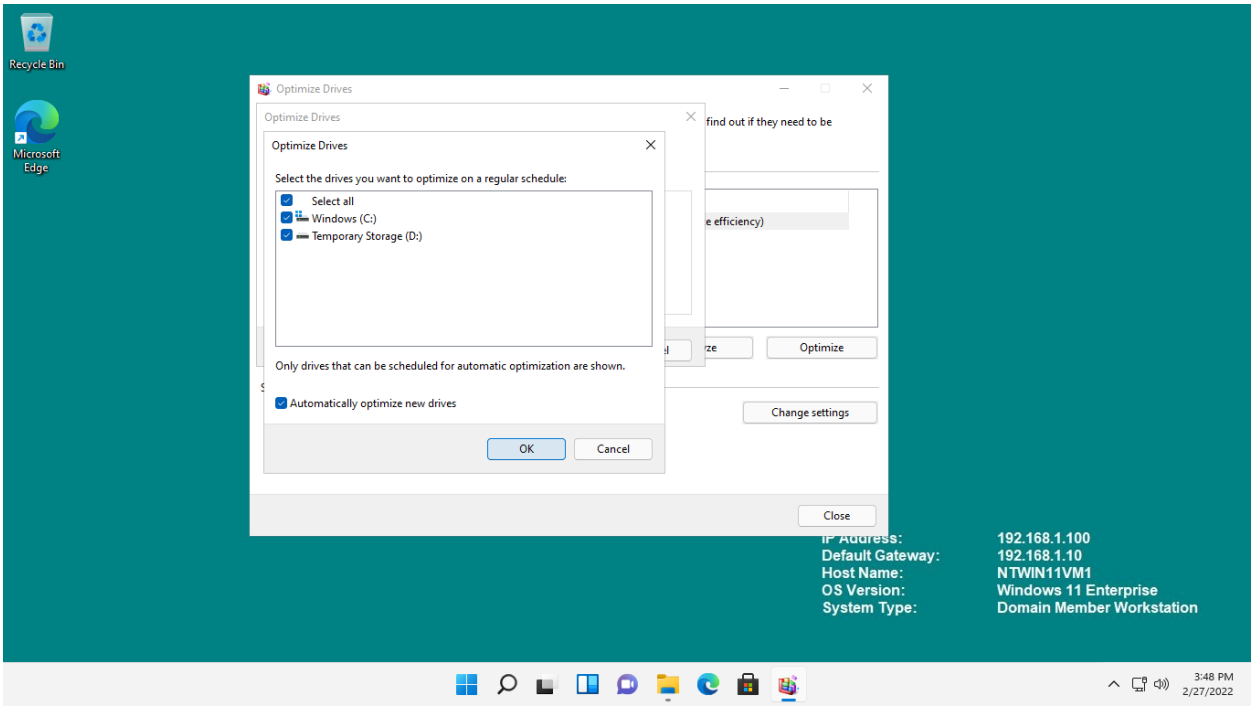
Step 3:

On the **Optimize Drives** dialog box, ensure **Select all** checkbox is ticked.

You may need to untick and retick the checkbox if the **OK** button is greyed out.

Check that the **Automatically optimize new drives** checkbox is also ticked.

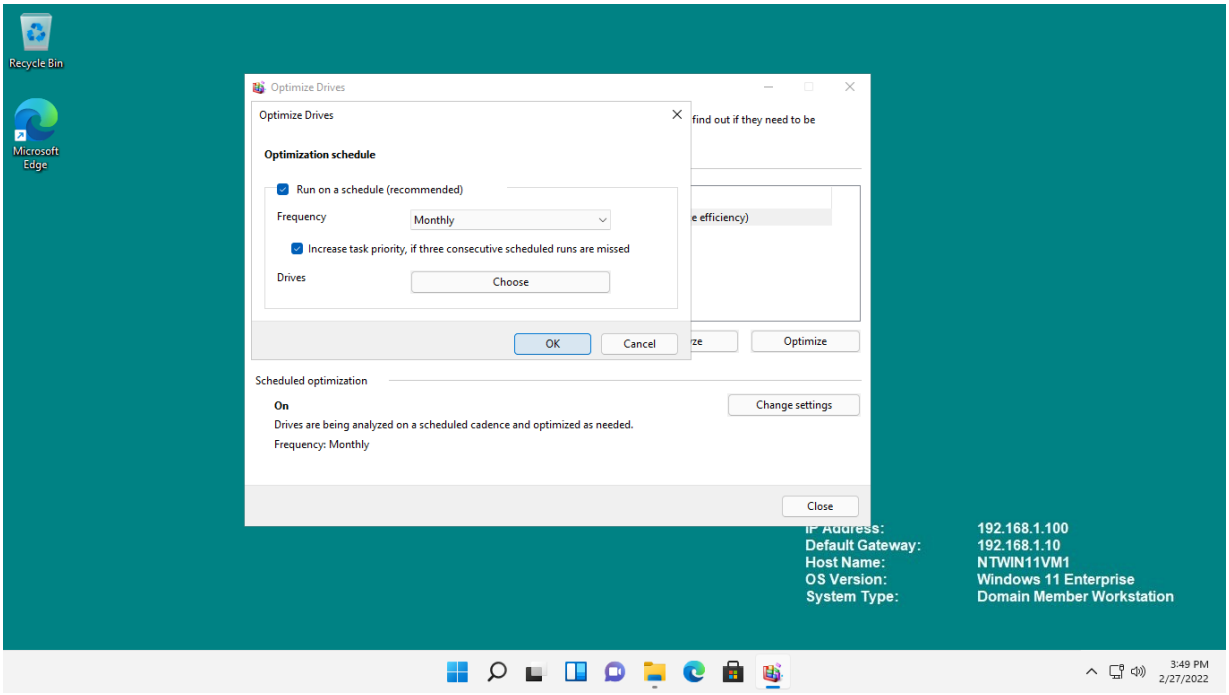
Click **OK**



Step 4:

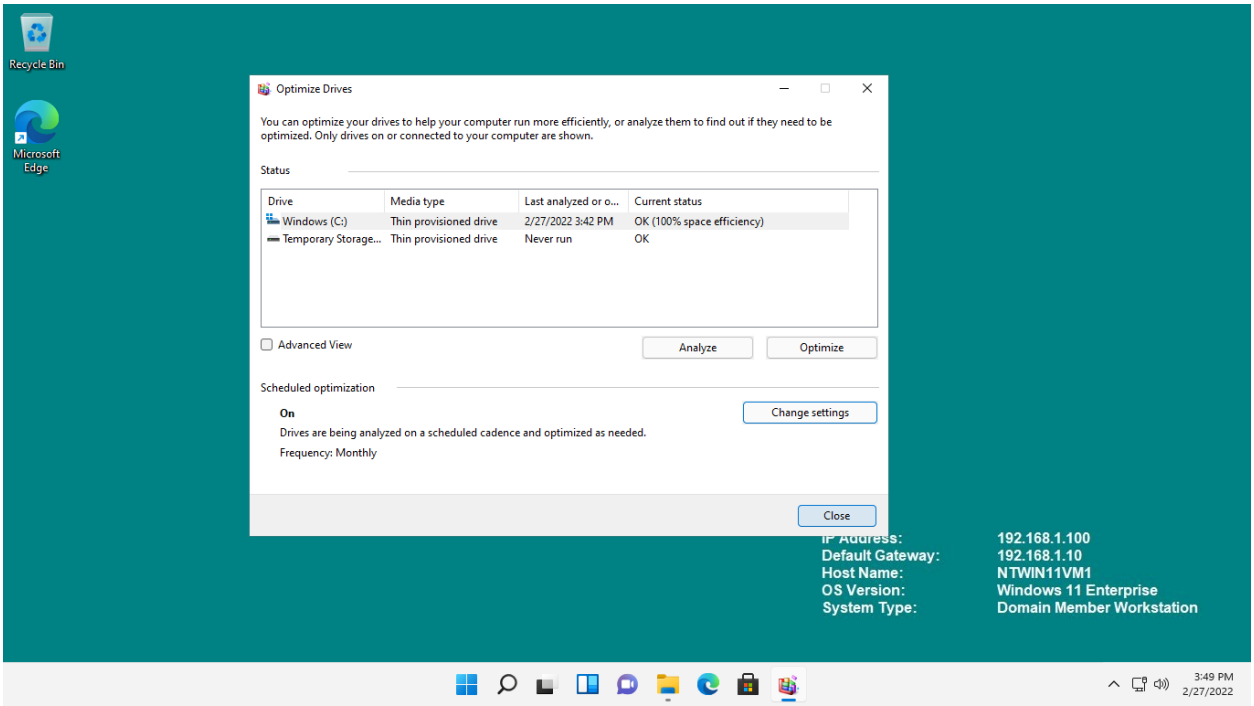
Back on the **Optimization schedule** dialog box, click **OK.**

Now your computer is scheduled for monthly analysis and optimization on all drives.



Step 5:

On the **Optimize Drives** window, click **Close**.



Task 3: Check Disk Errors

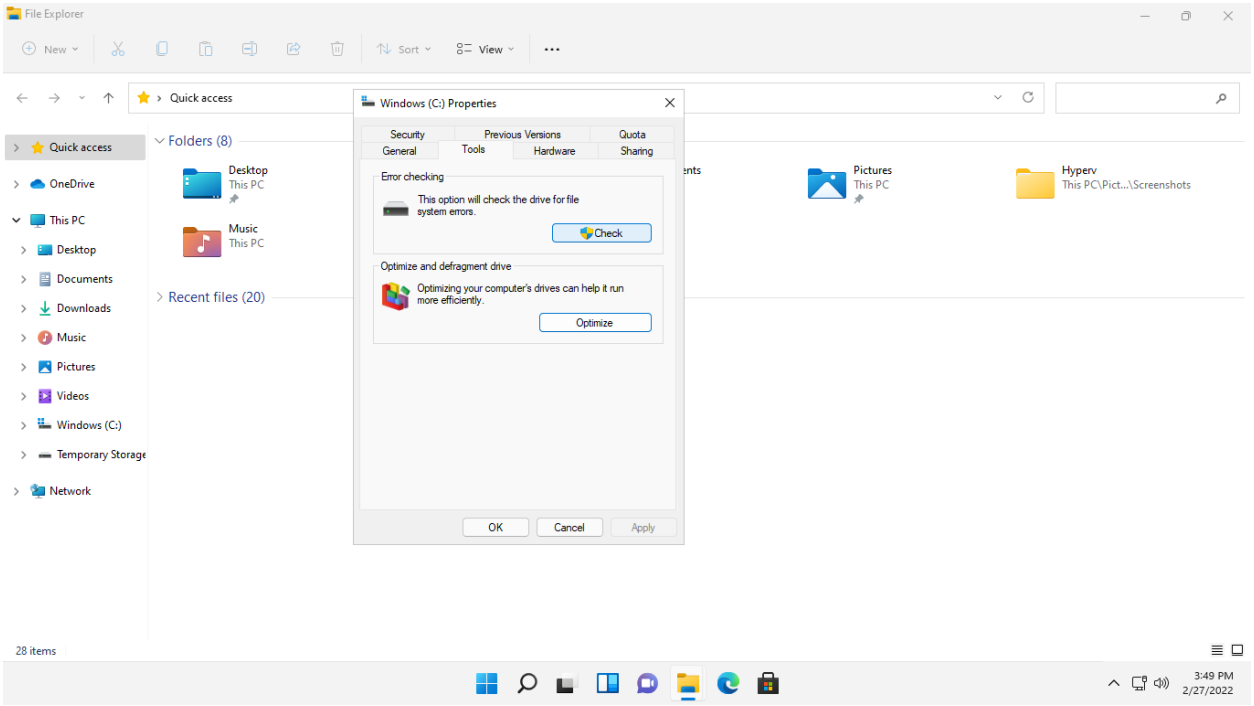
The Error Checking tool in Windows 11 can also be used to check for disk issues or faulty sectors.

Now let's, use the Error checking tool to check for disk errors or bad sectors on **NTWIN11VM1**.

Step 1:

You are back on the **Local Disk (C:)** Properties dialog box on **NTWIN11VM1**.

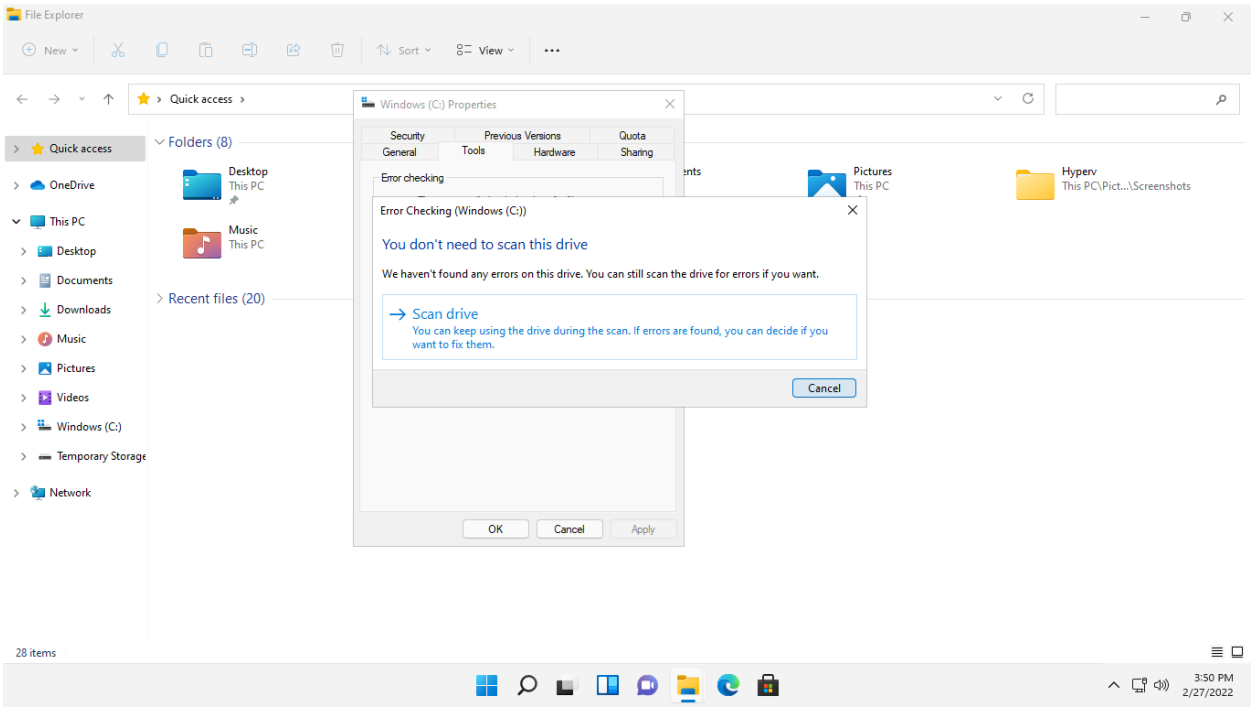
On the **Tools** tab, in the **Error checking** section, click **Check**.



Step 2:

An **Error Checking (Local Disk (C:))** message box suggests that a scan is not required at this time.

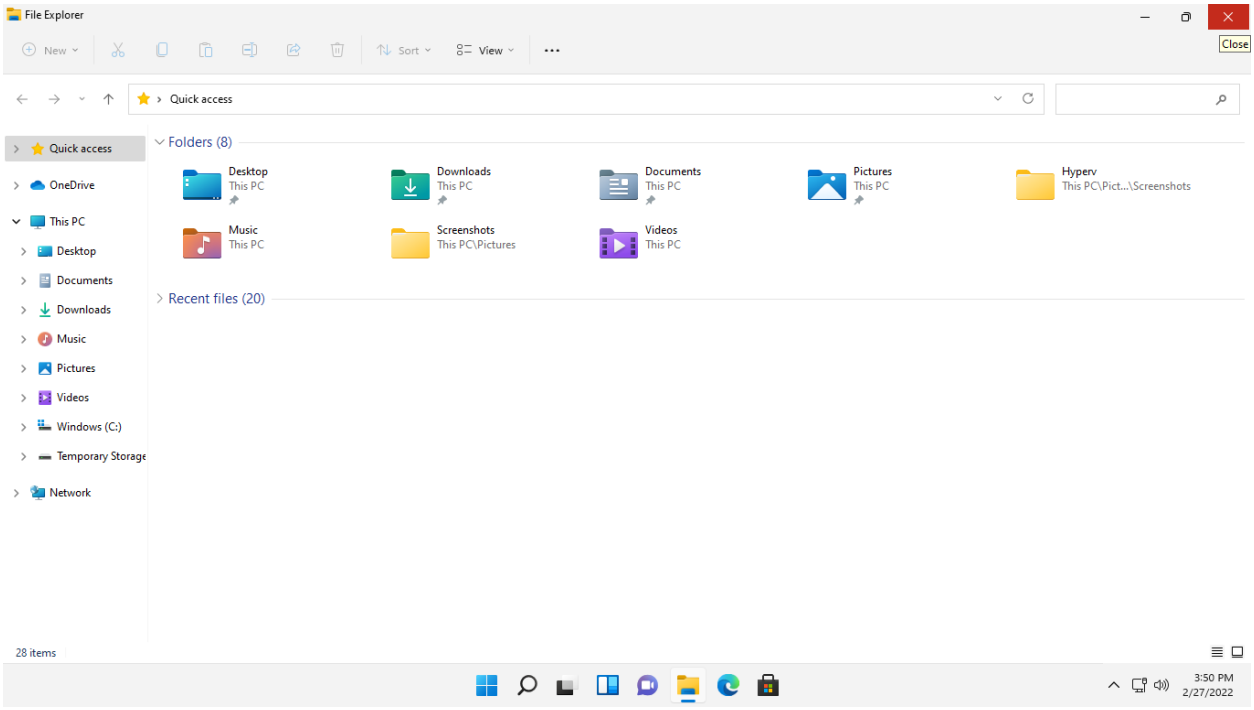
Click **Cancel**.



Step 3:

Back on the **Local Disk (C:) Properties** dialog box, click **OK** to close.

Close the **File Explorer** window.



Task 4: Use Command Line to Run the Defrag Tool

The Optimize and defragment drives program, like other GUI-based tools, has a command-line equivalent that can be used in the command prompt window.

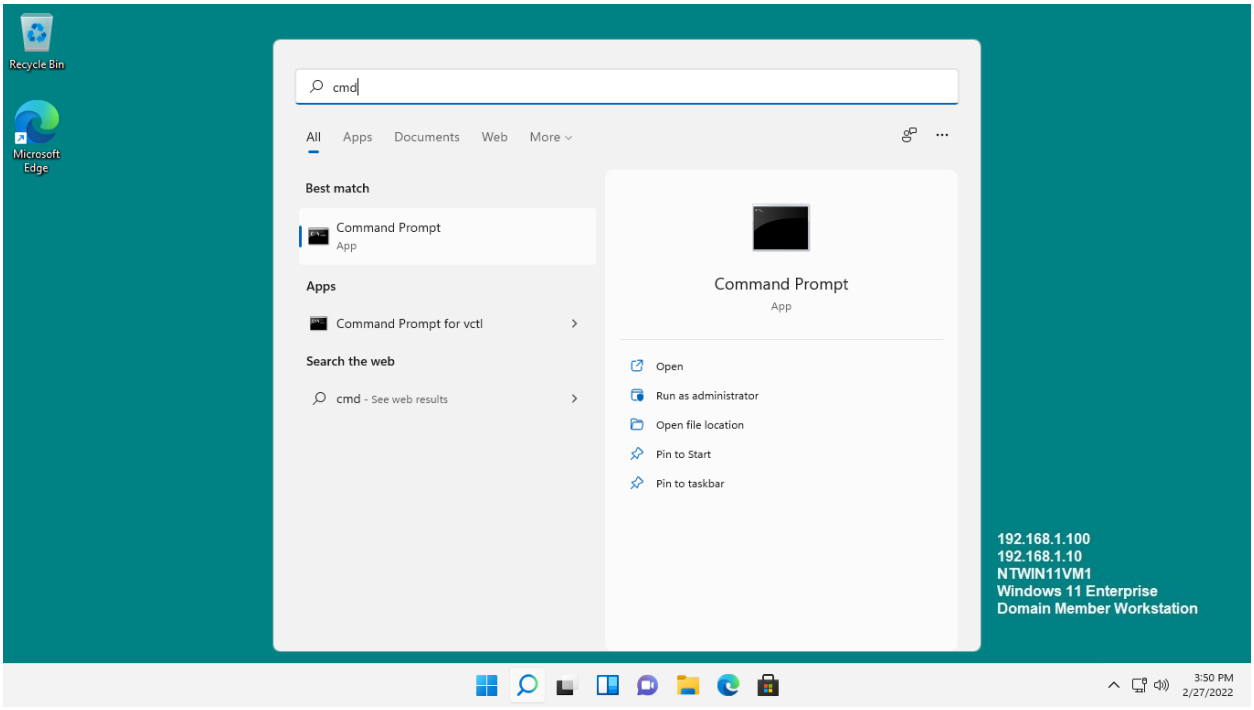
Now let's use run the Optimize and defragment drives tool in the command prompt window on **NTWIN11VM1**.

Step 1:

Make sure you are connected to **NTWIN11VM1**.

Click the **Type here to search box** and type: ***CMD***

Press **Enter.**

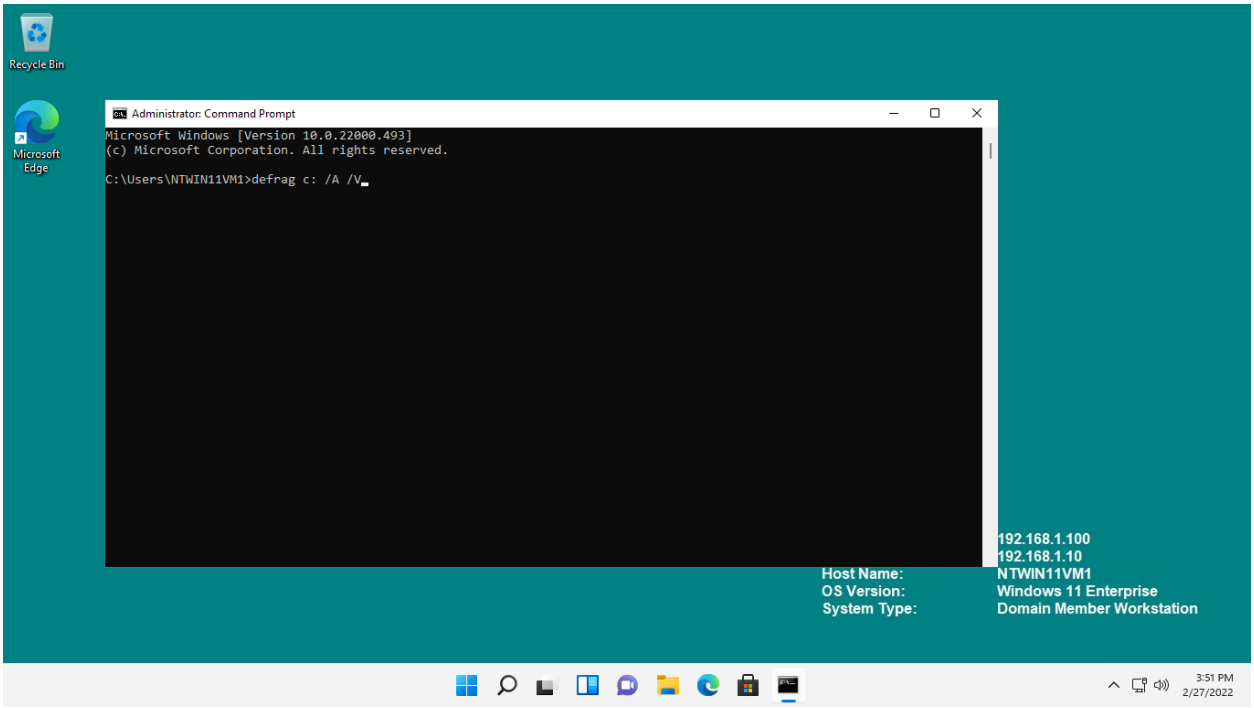


Step 2:

Click the Type here to search box and type: ***defrag c: /A /V***

- **Defrag-** This command Settles and consolidates fragmented files on local volumes to improve system performance.
- **/A** - Perform analysis on the specified volumes
- **/V** - Print verbose output containing the fragmentation statistics

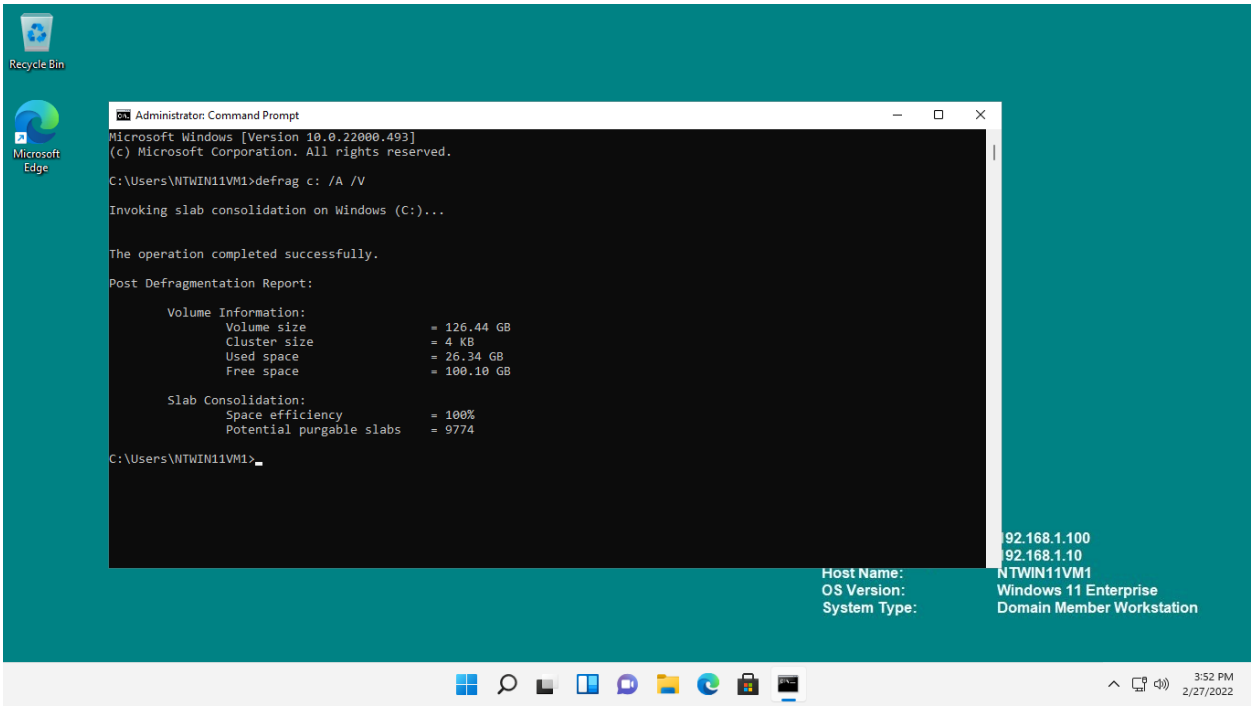
Press **Enter.**



Step 3:

The slab consolidation runs.

Once the operation is completed, detailed post defrag report is displayed listing details of the disk volume



Task 5: Use Disk Cleanup Tool

Non-essential files accumulate on your computer over time. These files eat up disk space and cause the machine to slow down. To safely remove the files, utilize the Disk Cleanup utility. Disk Cleanup is a disk management application for Windows 11.

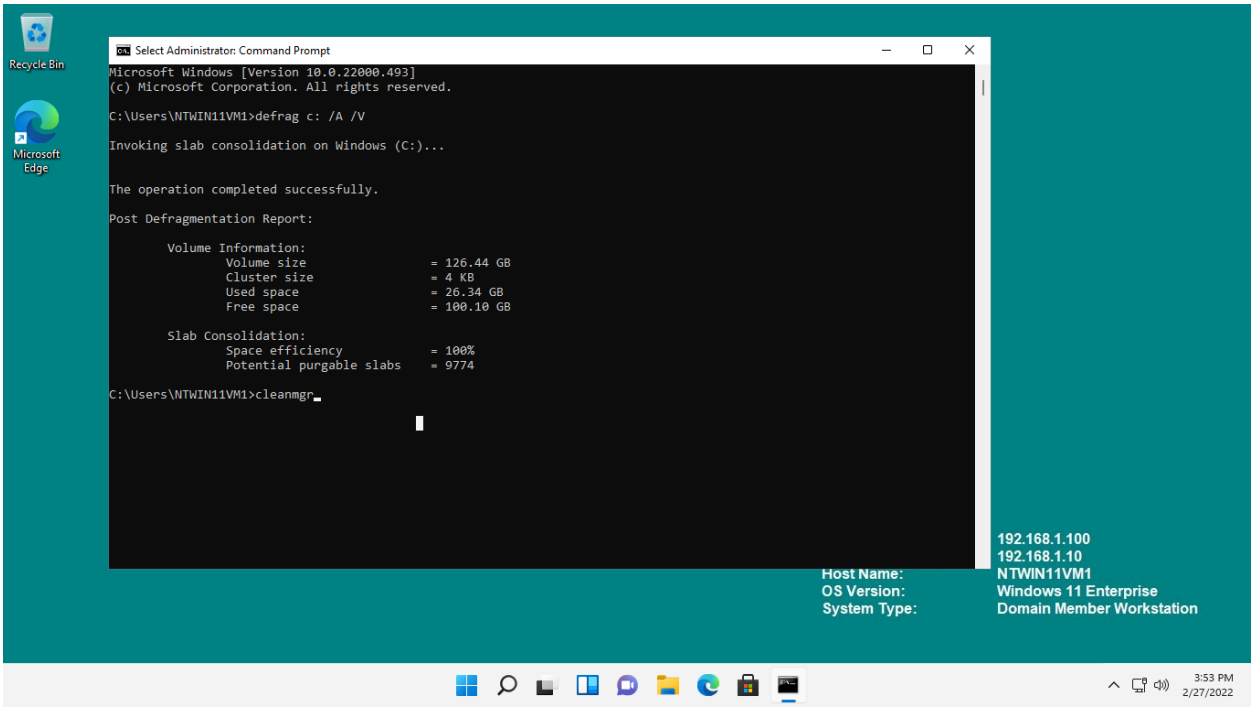
Now let's use command prompt window to run the disk clean-up tool on the **NTWIN11VM1** disk.

Step 1:

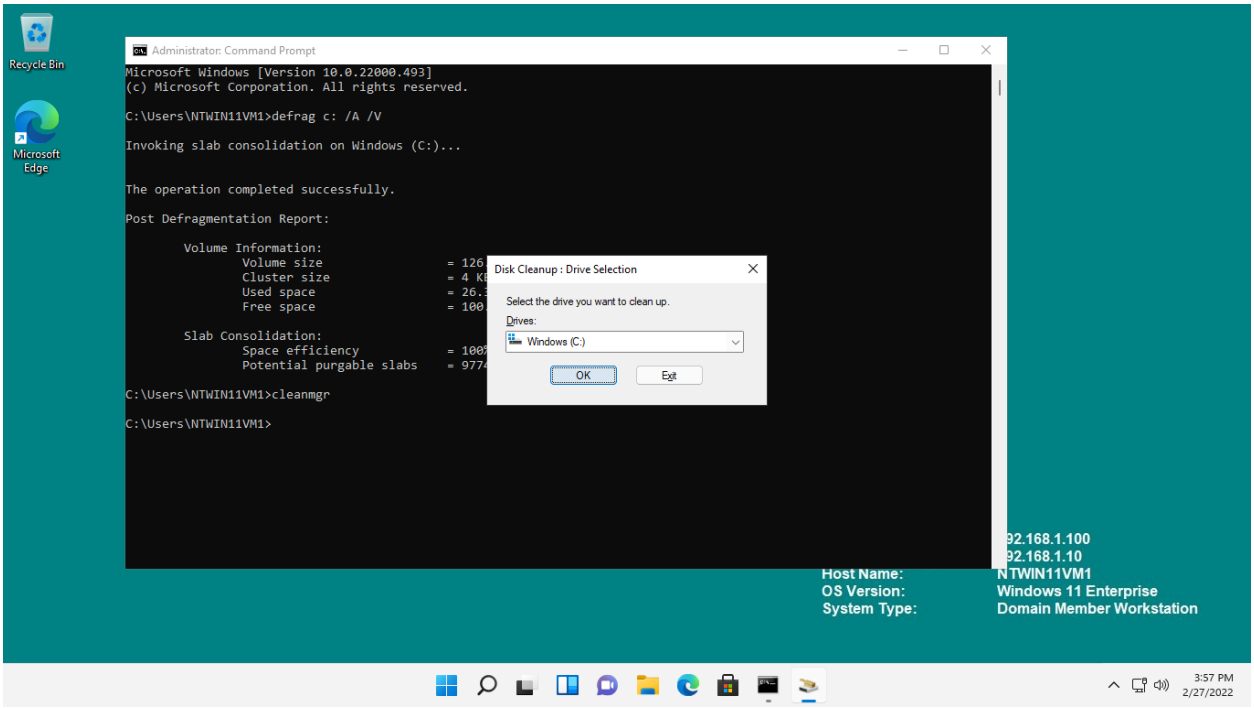
On **NTWIN11VM1**, the **Command Prompt** window is open.

To launch the disk clean-up tool, type: ***cleanmgr***

Press **Enter.**



If any dialog box appears asking to choose the partition, Select local disk (C:)

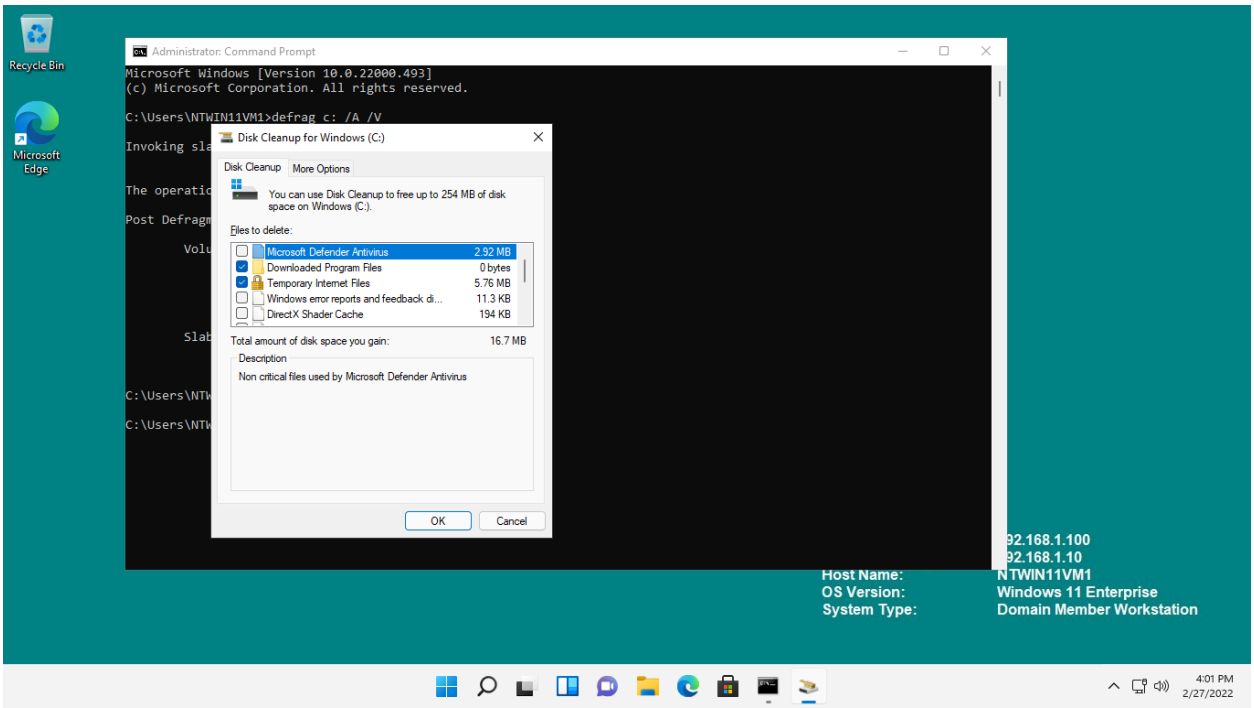


Step 2:

Please wait while **Disk Cleanup** runs and calculates how much space will free-up on the **Local Drive (C:).**

This process will take a minute to finish.

After the process if over. The **Disk Cleanup for (C:)** tool will pop up.

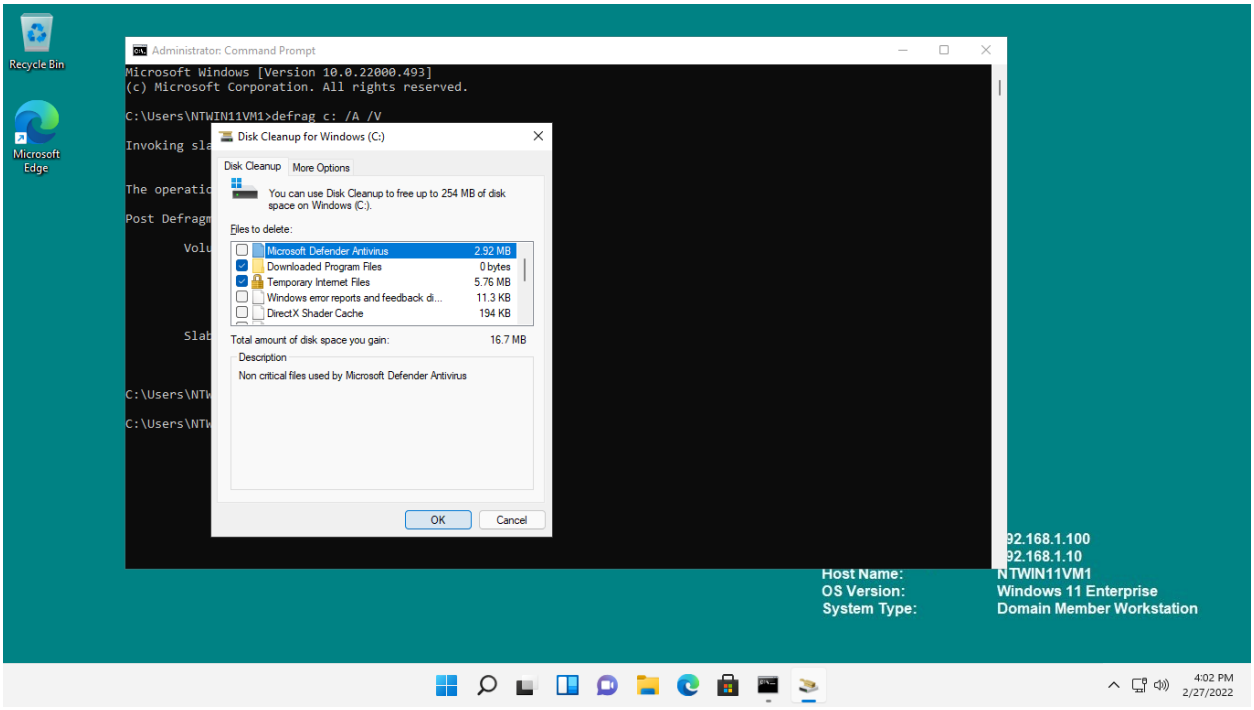


Step 3:

When the disk cleanup is successfully completed, on the **Disk Cleanup for (C:)** dialog box, ensure that the **Temporary Internet Files** checkbox is ticked.

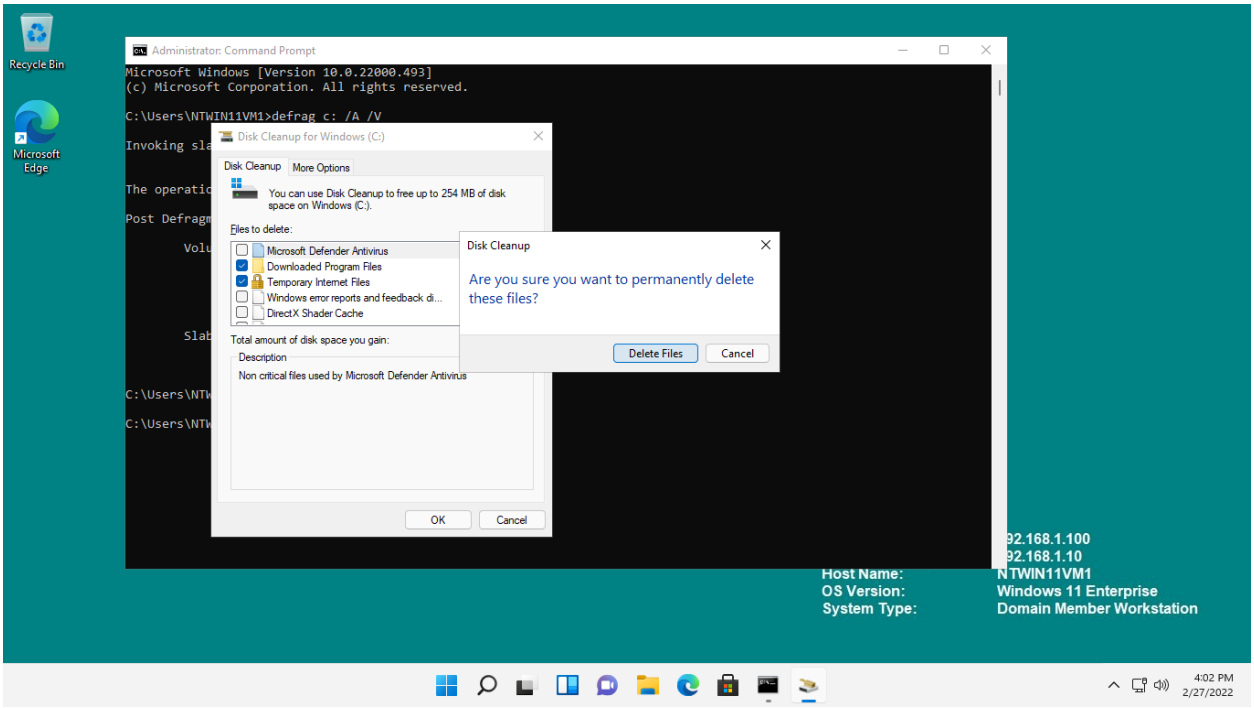
Keep the other default selections.

Click **OK.**



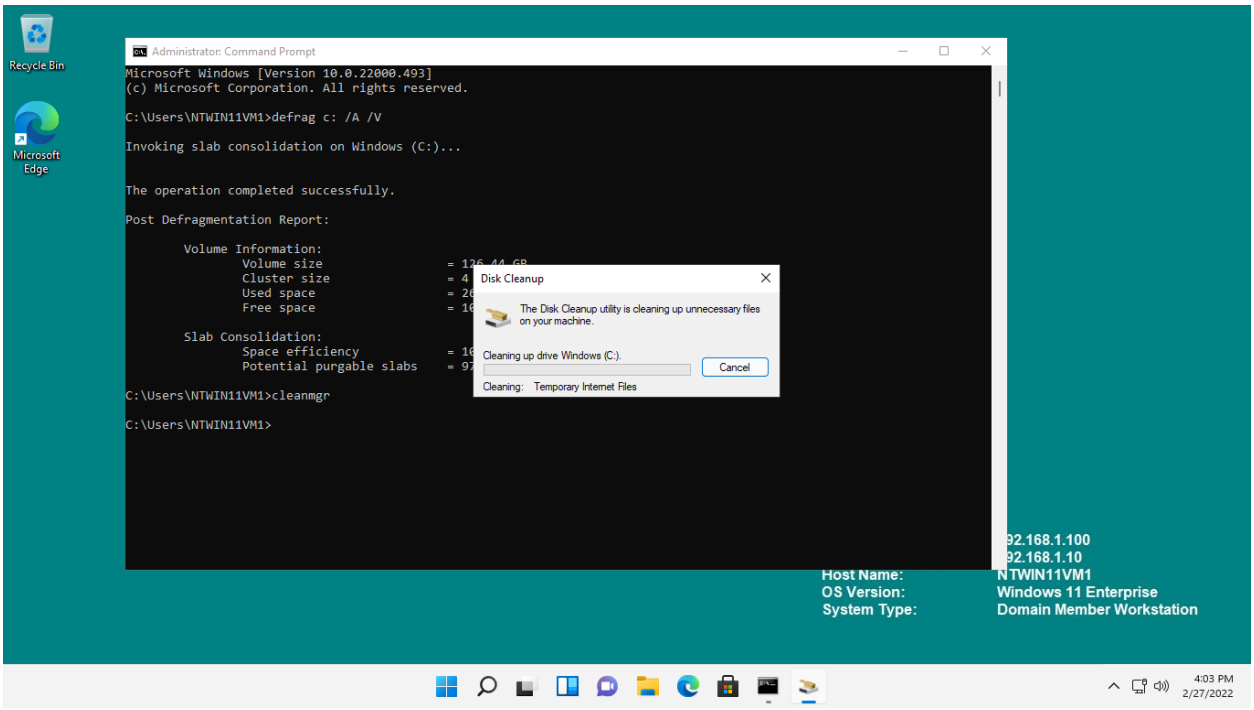
Step 4:

On the **Disk Cleanup** message box, click **Delete Files.**



Step 5:

Please wait while **Disk Cleanup** does its work.



Step 6:

The application closes automatically.