

Project Background

This project is focused on developing practical skills in diagnosing and repairing network connectivity issues in a Windows environment. The tasks included observing NIC adapter LED indicators, using PowerShell and command-line tools for network testing, running the Windows Network Troubleshooter, reinstalling network drivers, resetting network configurations, and using third-party repair tools. The goal was to understand how different layers of the network stack behave during faults, learn common troubleshooting methods, and practice applying real-world fixes to restore network connectivity.

1. Demonstrate your understanding of LED lights on the NIC adapter. Reproduce the LED off-on combinations. Take pictures and explain.

NIC adapters have LED lights that show network status: Link Light, Activity Light, and Speed Indicator, usually near the Ethernet port.

The Link Light (green) indicates connection status. If it's off, there's no connection or the NIC is disabled. A solid light means a successful connection, while blinking shows active data transfer.

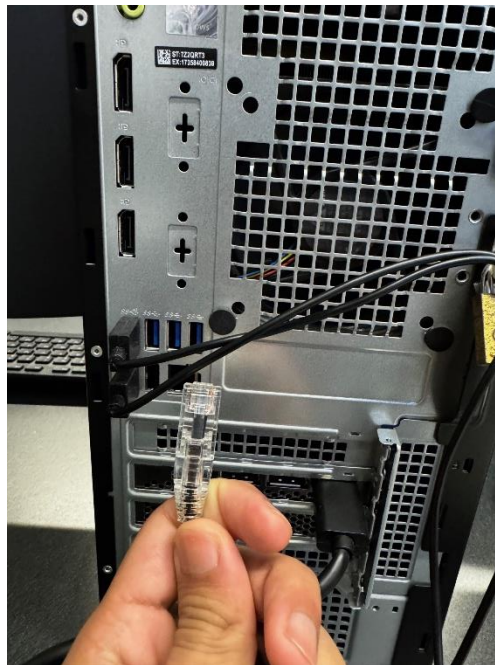
The Activity Light (amber/green) displays data transmission. It's off when idle and blinks during data transfer, confirming communication with the network.

The Speed Indicator shows connection speed. If off, the NIC is disconnected or at its lowest speed. Green indicates 100 Mbps, while amber signals 1 Gbps.

To check these LEDs, I check near the Ethernet port. Test by unplugging/plugging cables or transferring files to see how the lights respond. They're a simple yet effective way to diagnose network issues.



Successful Connection of the ethernet cable



Ethernet cable diconnected

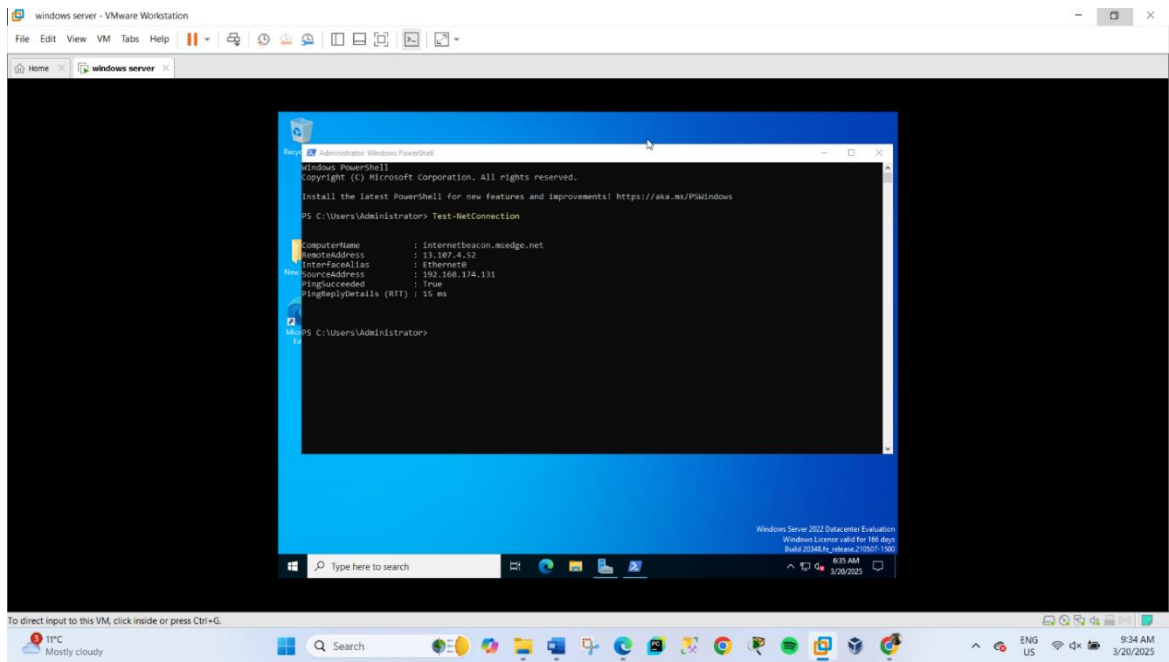


Blinking during data transfer

2. Open PowerShell ISE in Admin mode, and run the following cmdlets, and take screenshots, and write about them

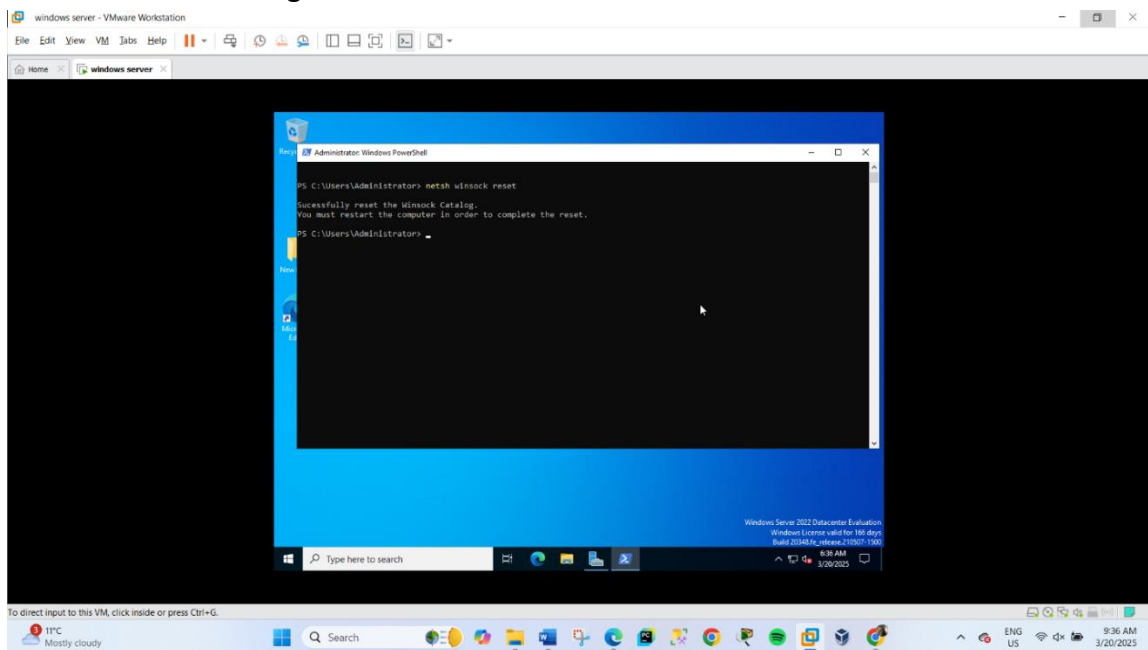
- **Test-NetConnection**

Tests if your device can connect to a specific network or website.



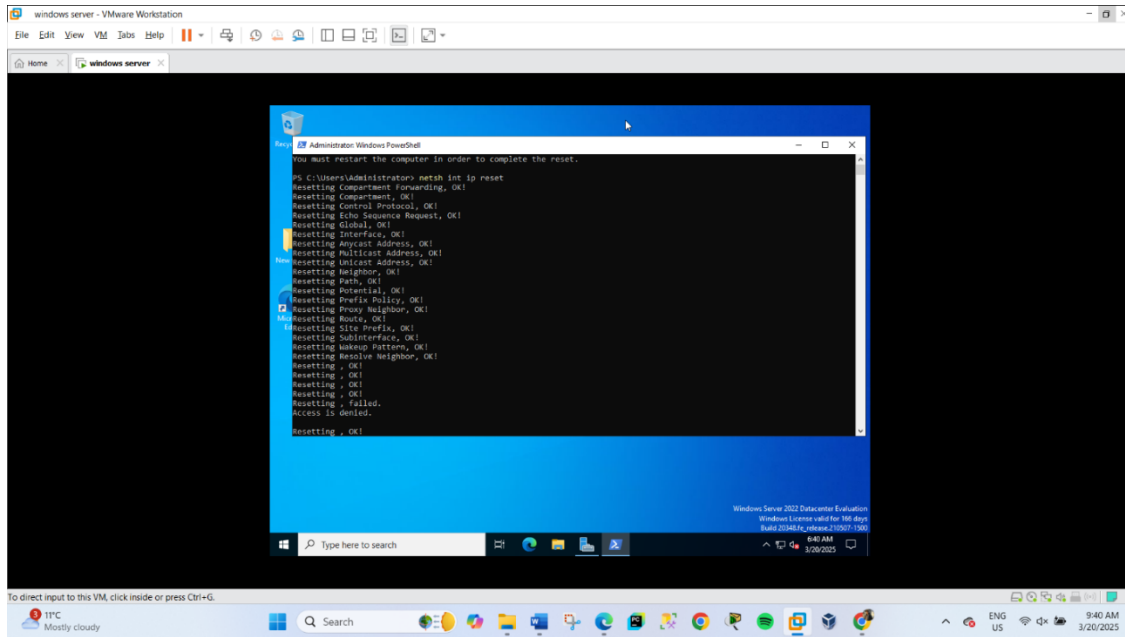
netsh winsock reset

Resets network settings to fix issues with network connections.



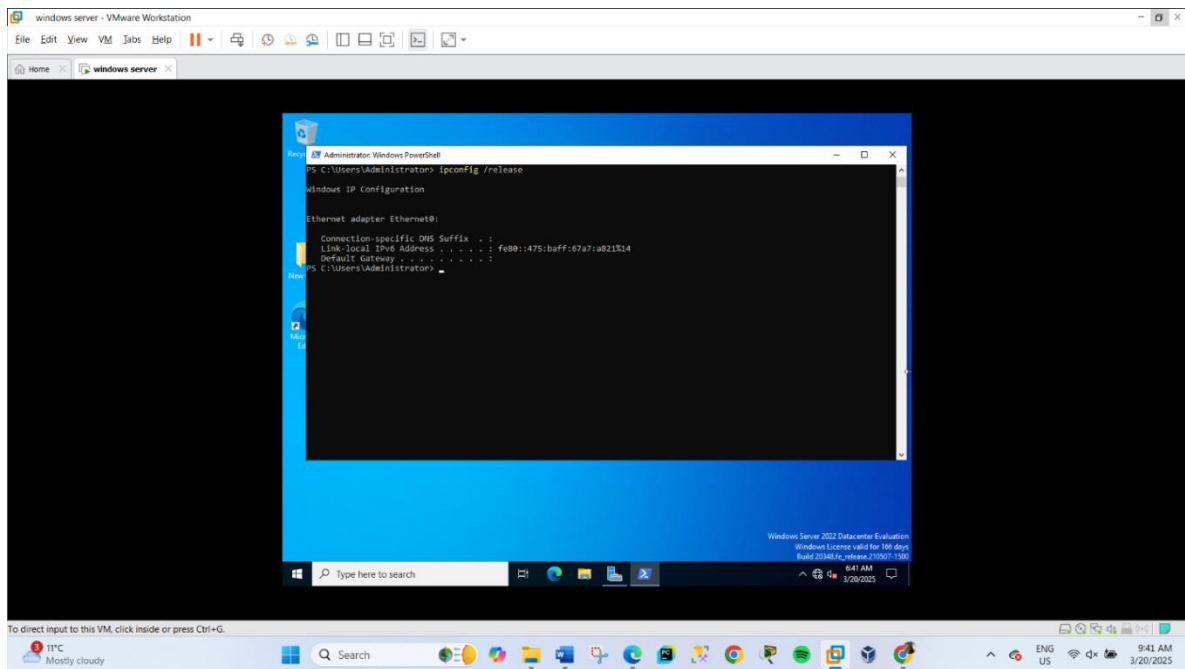
- **netsh int ip reset**

Resets network settings related to TCP/IP for better connectivity.



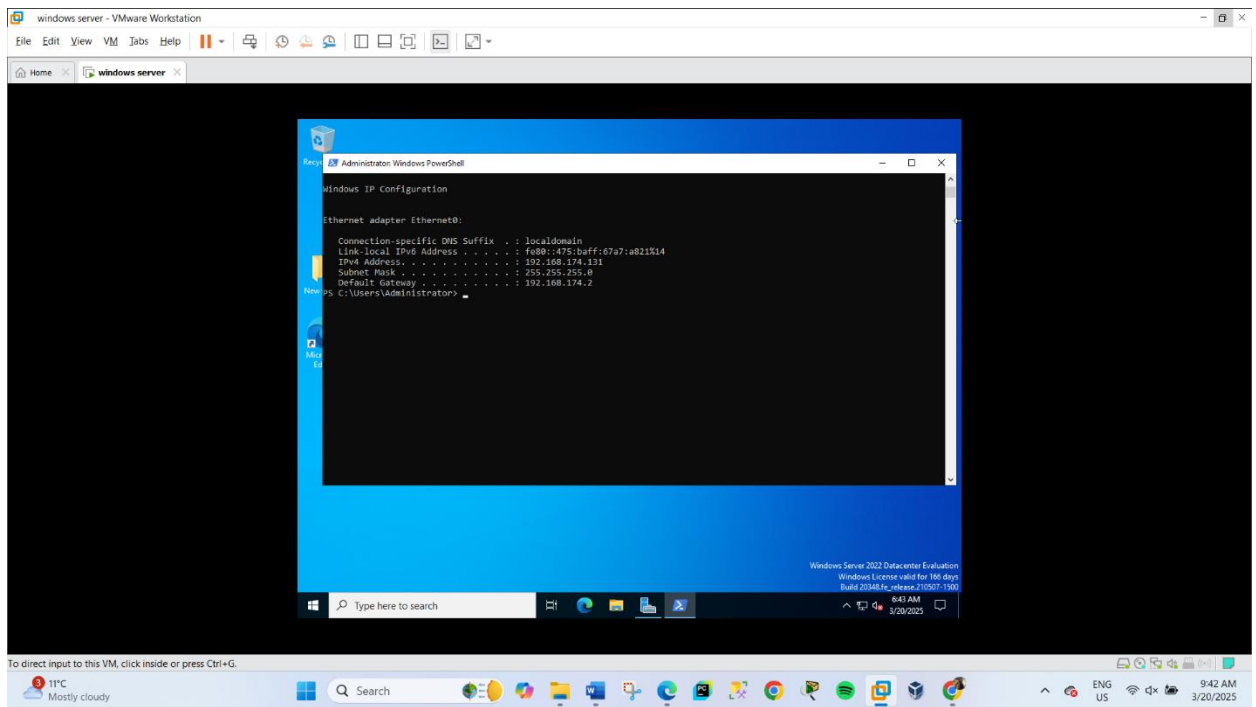
- **ipconfig /release**

Releases our current IP address, disconnecting us from the network

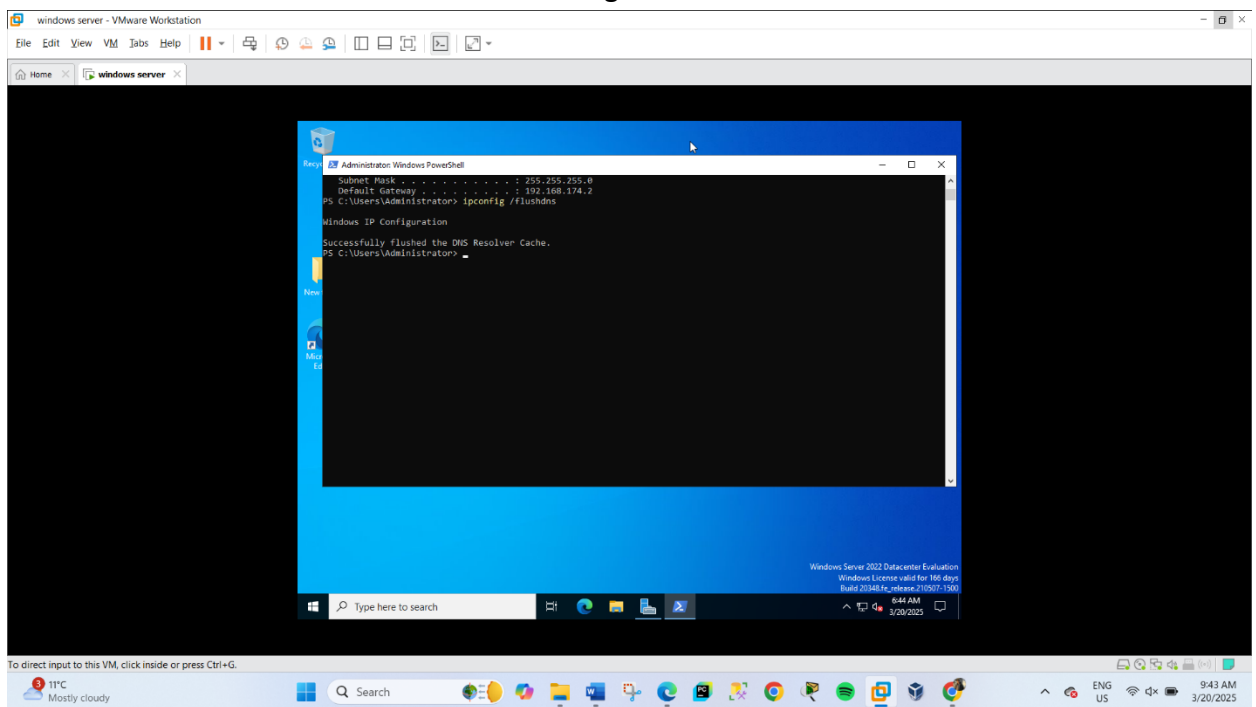


- **ipconfig /renew**

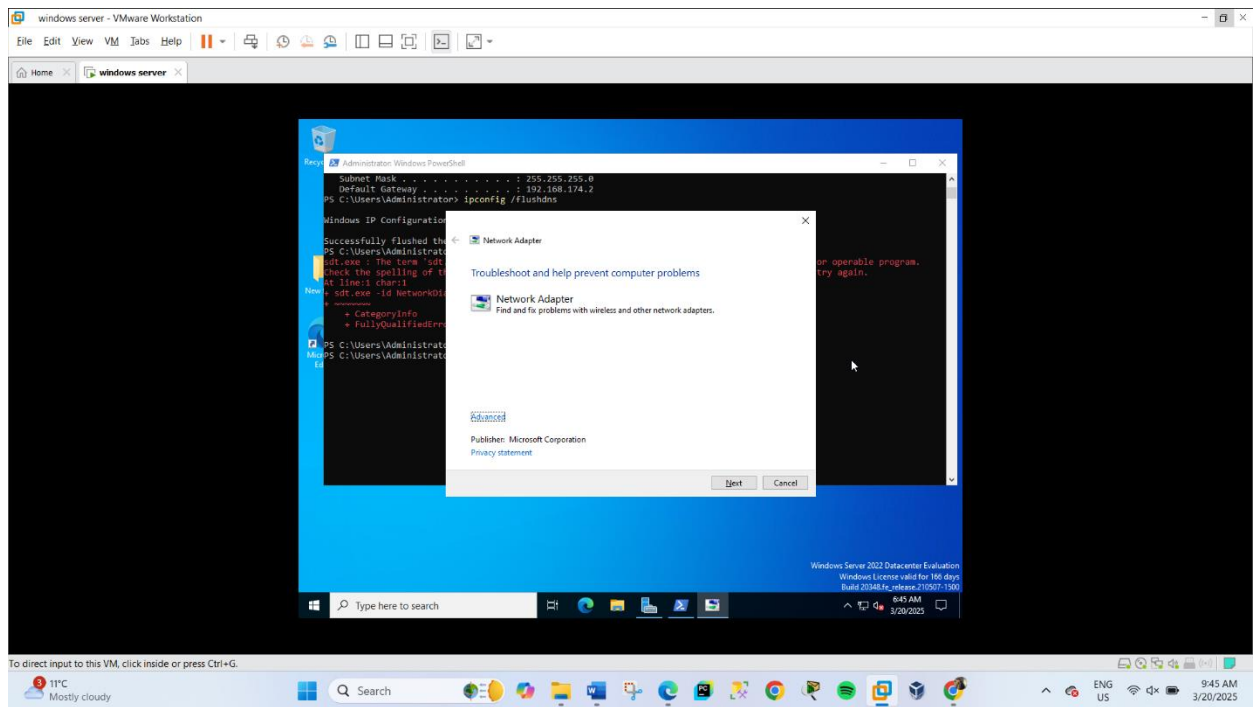
Requests a new IP address to reconnect to the network.



- **ipconfig /flushdns**
Clears stored website addresses to fix browsing issues.



- **msdt.exe -id NetworkDiagnosticsNetworkAdapter**
Opens the network adapter troubleshooter to find and fix problems.



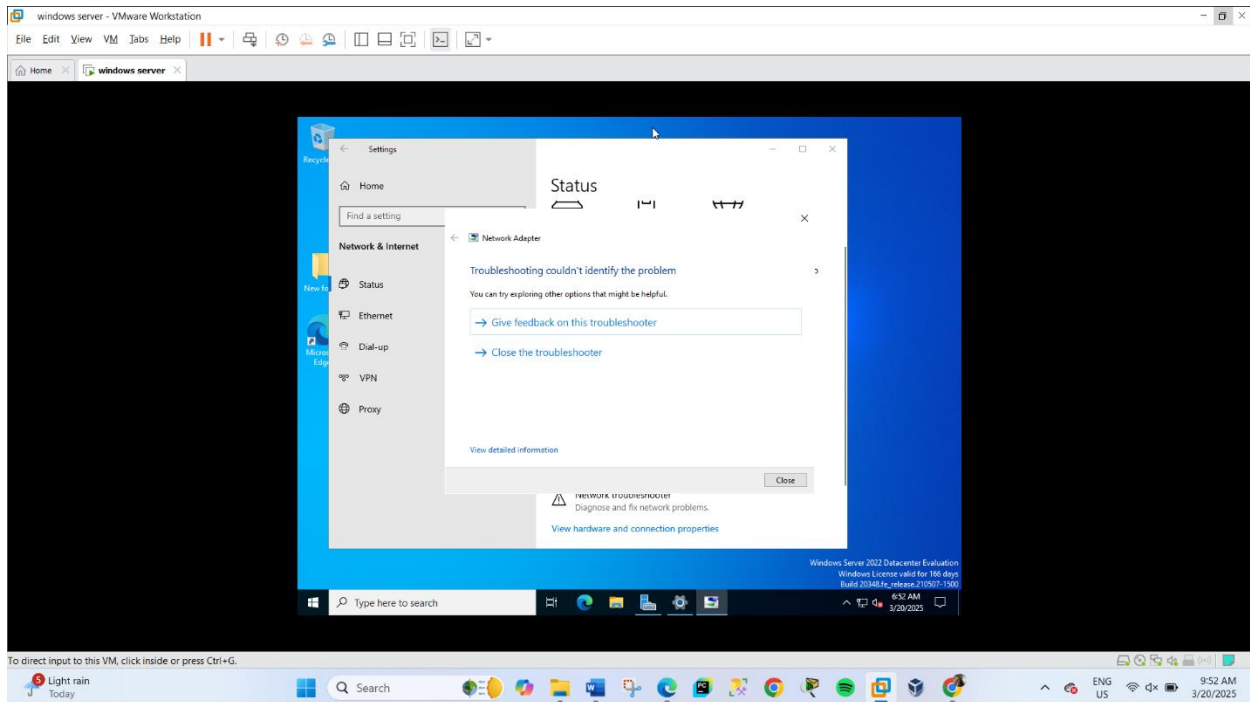
3. In your Windows VM, run the Windows Network troubleshooter. Take screenshots of each step and explain step-by-step.

Step 1: Open Network Troubleshooter

- I. Press Windows Key + I to open Settings, then go to Network & Internet > Status.
- II. Scroll down and click Network Troubleshooter under Advanced network settings

Step 2: Run the Troubleshooter

Let Windows scan for issues with your connection. If problems are found, click Apply this fix to automatically resolve them.



Step 3: Follow Further Instructions

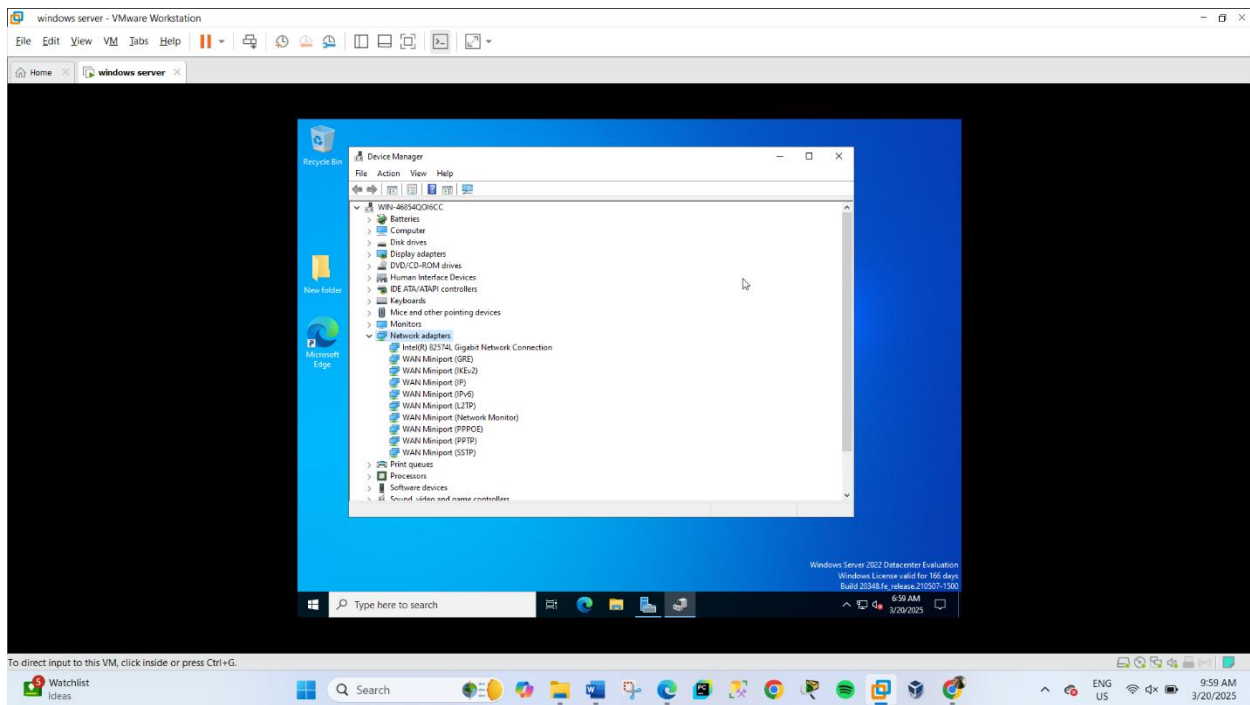
If prompted, follow additional steps like restarting the adapter or checking cables, then check if the issue is fixed.

4. Download the Driver for your Network adapter from the manufacturer's support website. Uninstall the network adapter driver and then restart your computer. Install the Network driver manually. Take screenshots and explain in your own words.

Step 1: Identify Your Network Adapter

Open Device Manager (Windows Key + X → Device Manager).

Expand Network adapters and note your network adapter model.

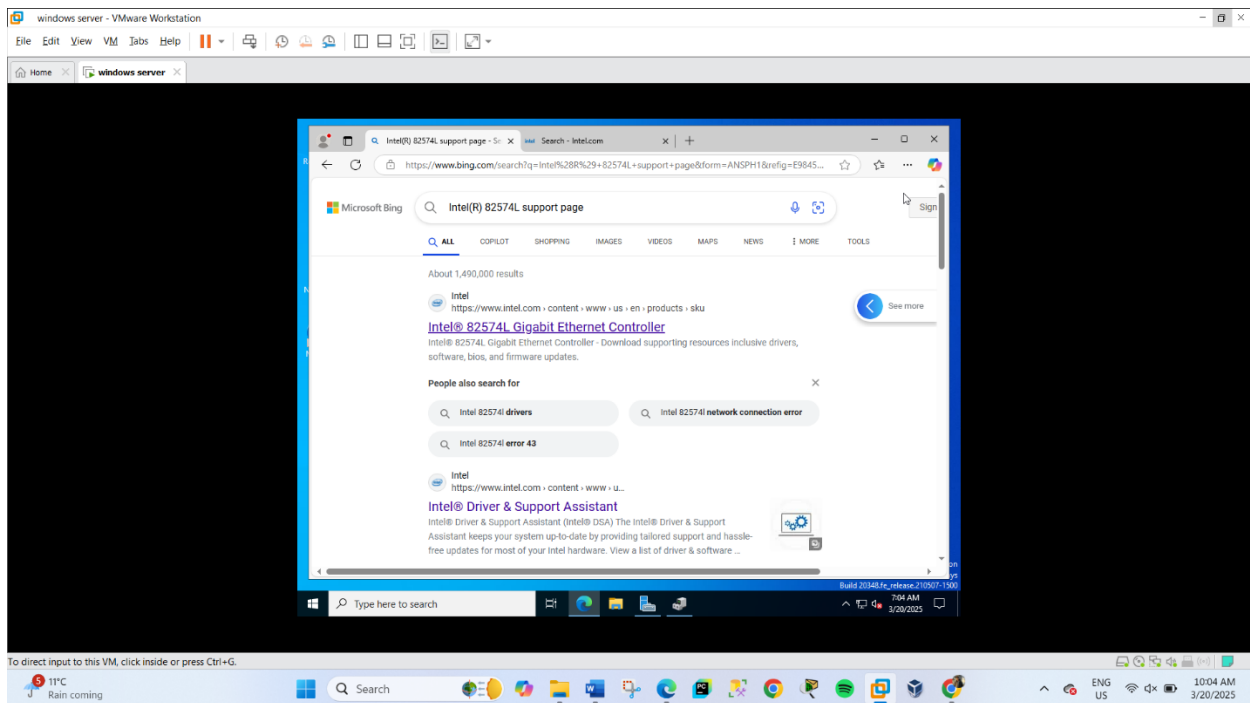


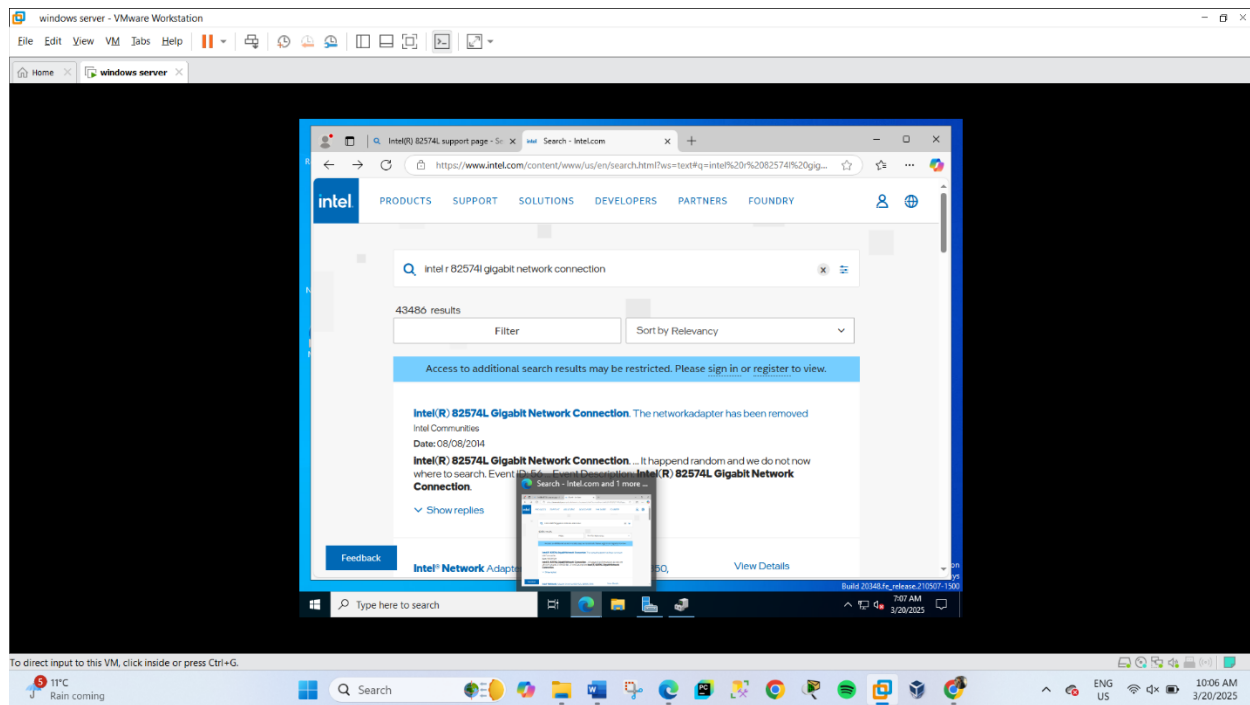
Step 2: Download the Latest Driver

Go to the manufacturer's website (e.g., Intel, Realtek).

Search for your network adapter model and download the latest driver.

Save the file to your desktop.

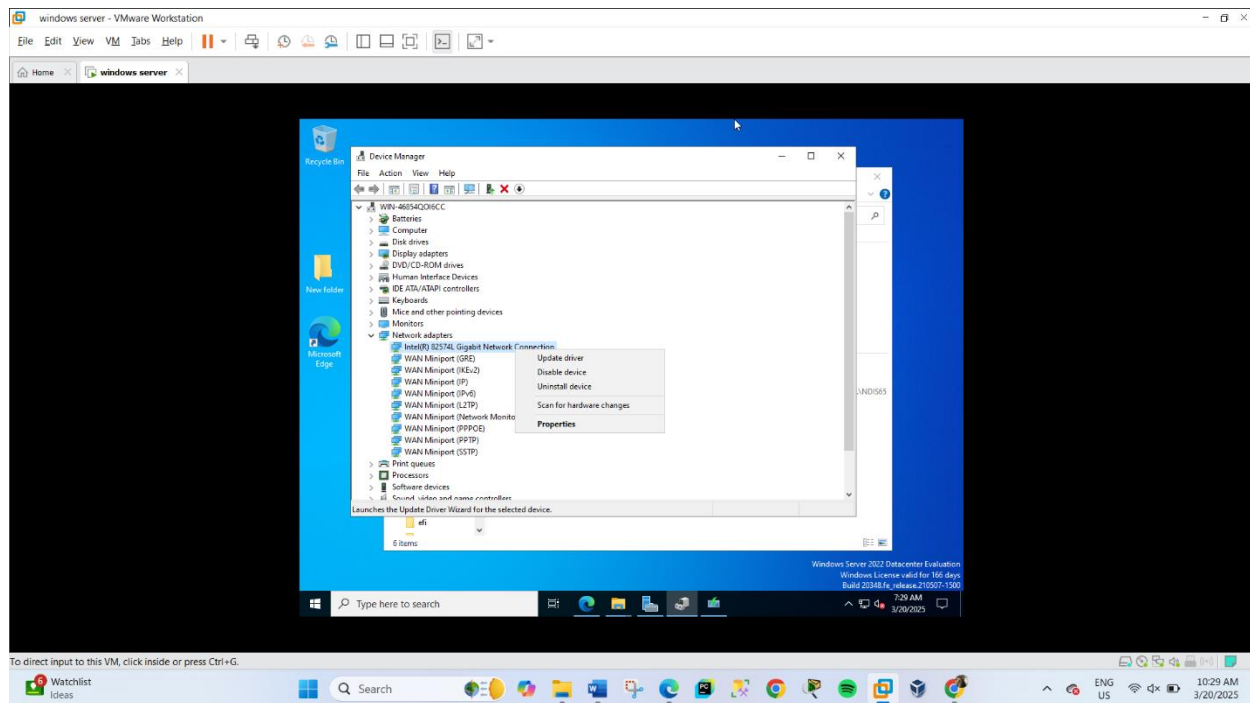




Step 3: Uninstall the Current Driver and restart your computer

In Device Manager, right-click your network adapter and select Uninstall device.

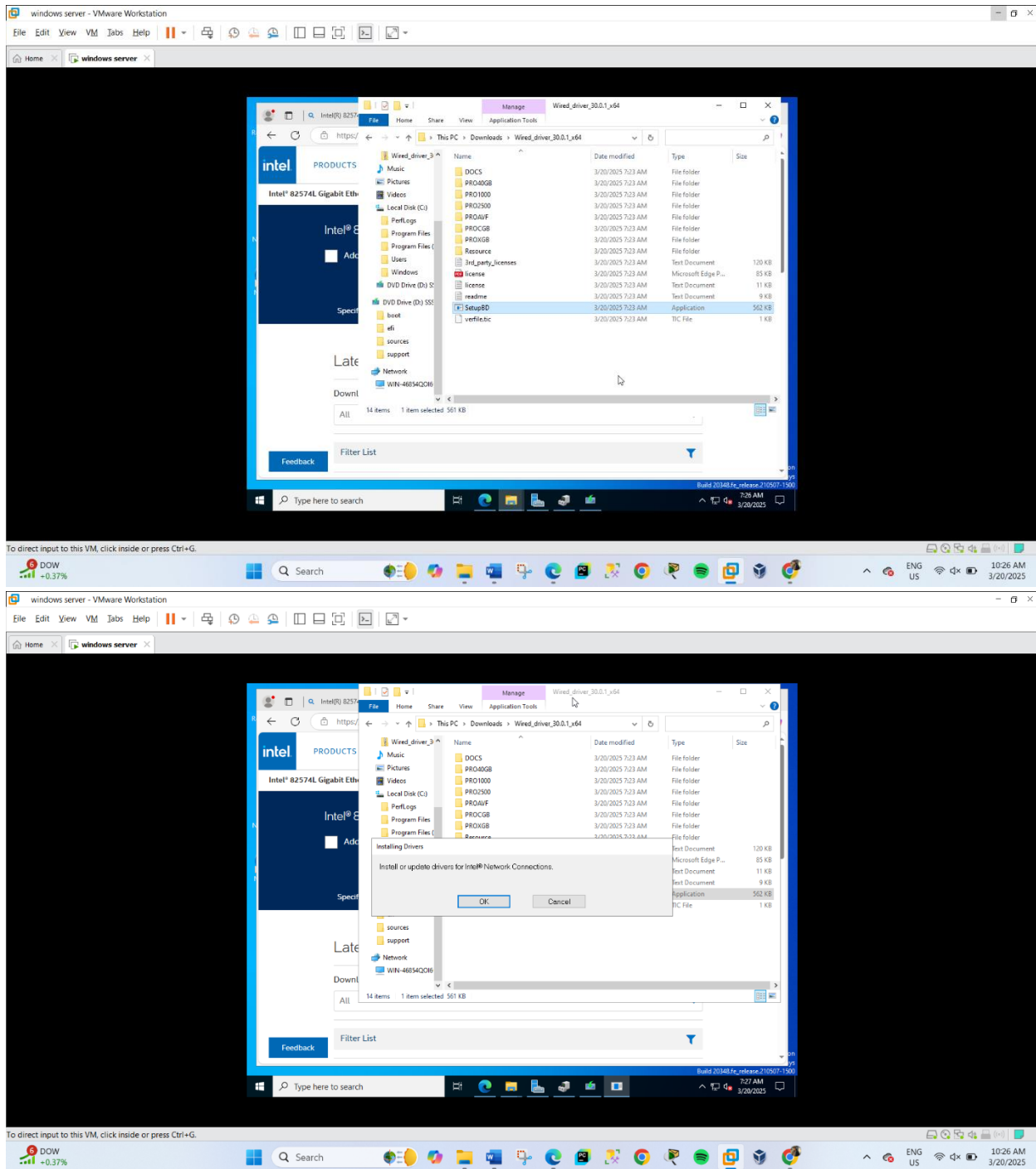
Scroll down and click Network Troubleshooter under Advanced network settings



Step 4: Install the New Driver

Double-click the downloaded driver file.

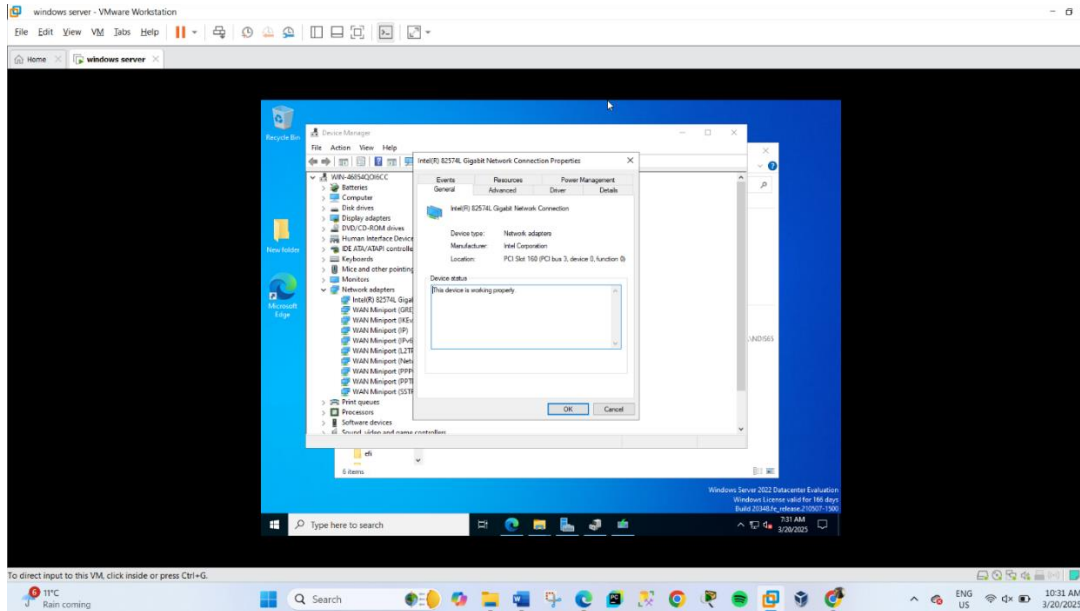
Follow the installation instructions.



Step 5: Verify Installation

In Device Manager, check if your adapter is listed correctly.

Test the connection to verify it works.

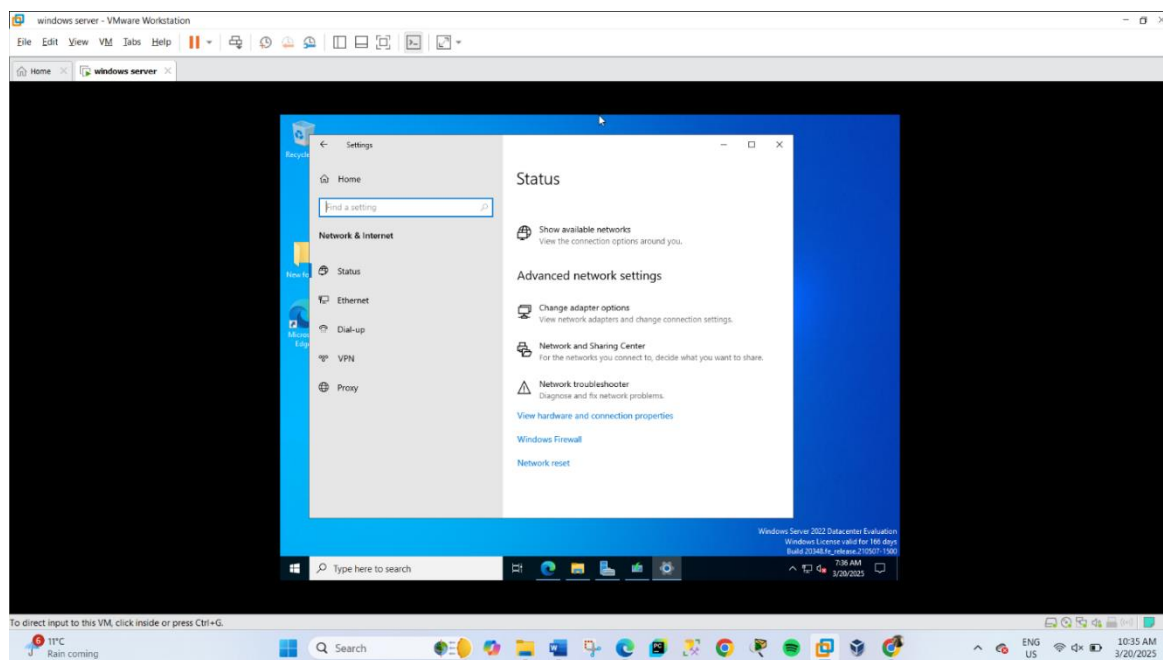
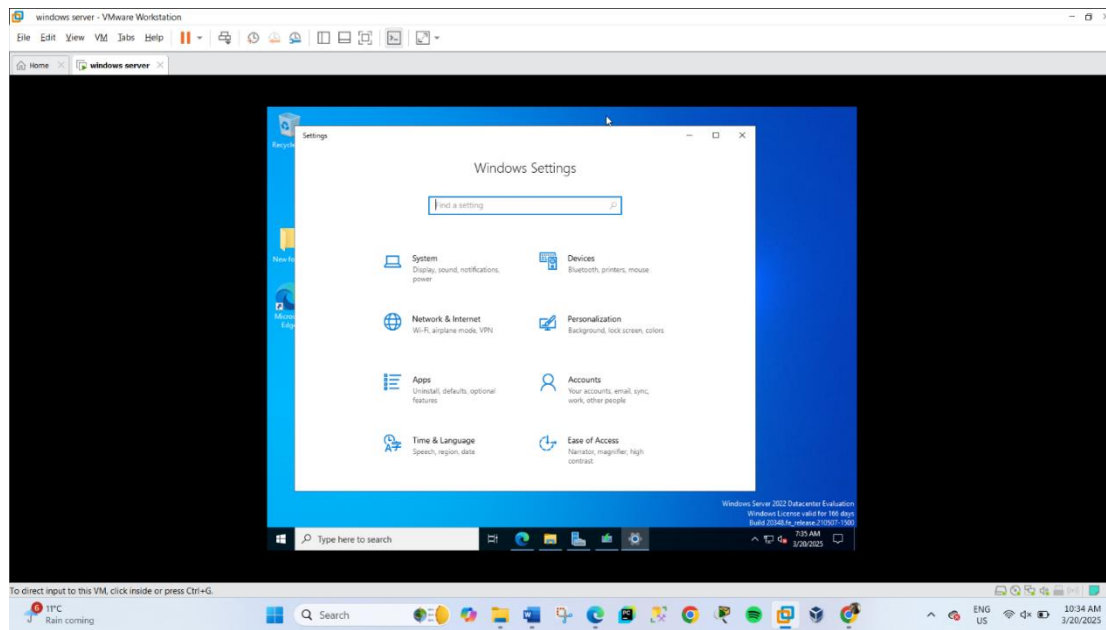


5. Reset your Network. Configure the Network. Take screenshots and explain in your own words.

Step 1: Open Settings

Press Windows Key + I to open Settings.

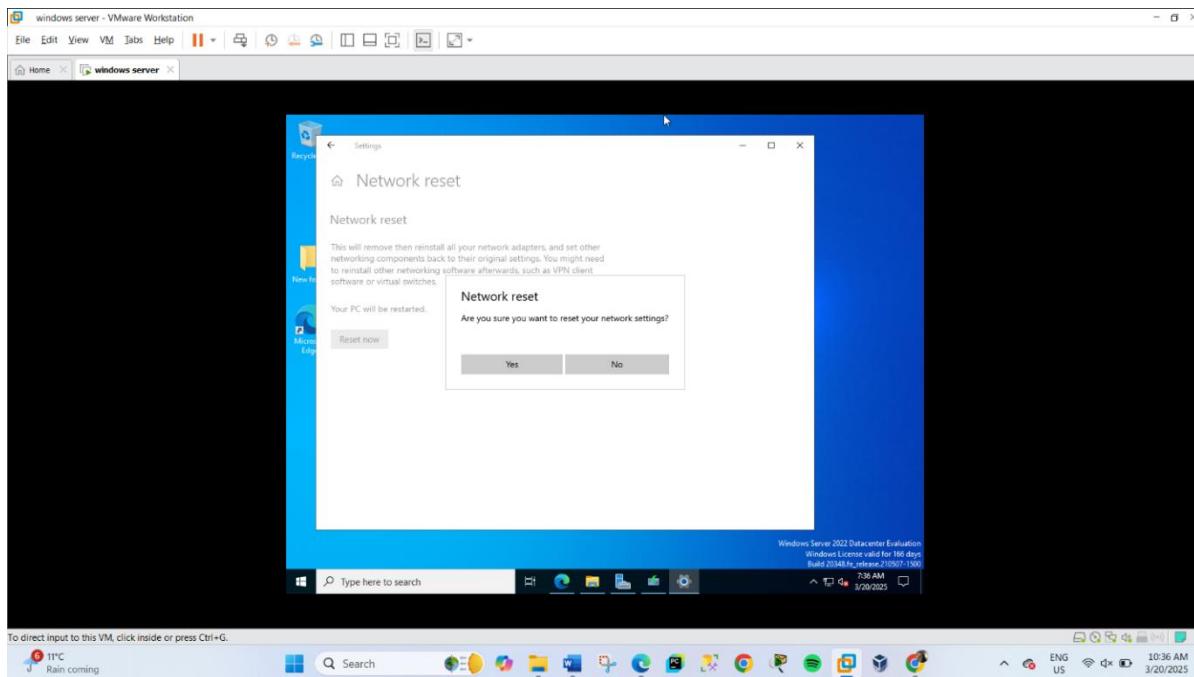
Click on Network & Internet.



Step 2: Reset Network

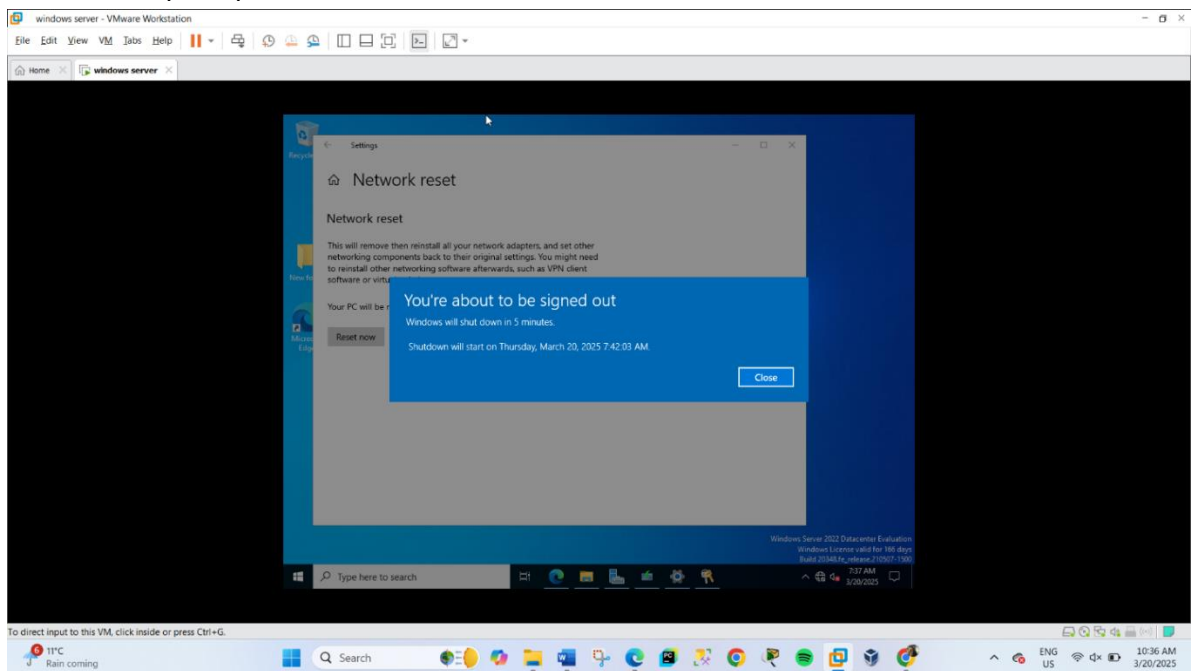
In Status, scroll down and click on Network Reset.

Click Reset now and confirm.



Step 3: Restart Your Computer

Your PC will prompt to restart. Click Yes to restart.

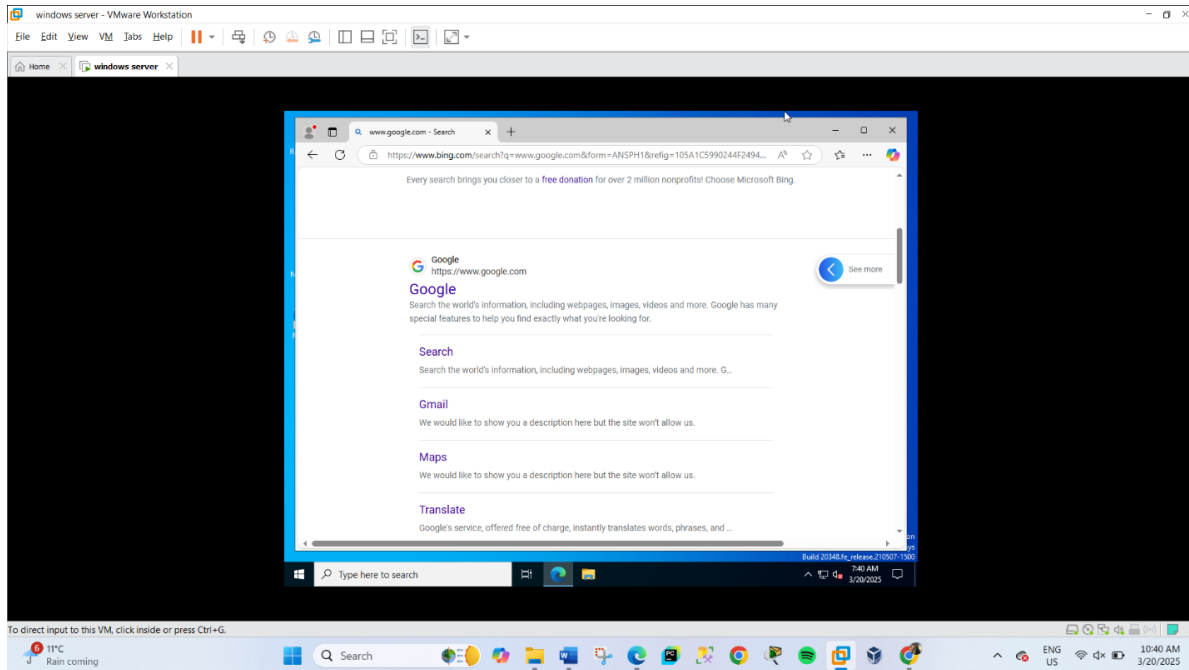


Step 4: Reconnect to Network and check the connection

After restart, go to Settings → Network & Internet.

Select Wi-Fi or Ethernet and reconnect to your network (enter Wi-Fi password if needed).

Open a browser and check if your internet is working.

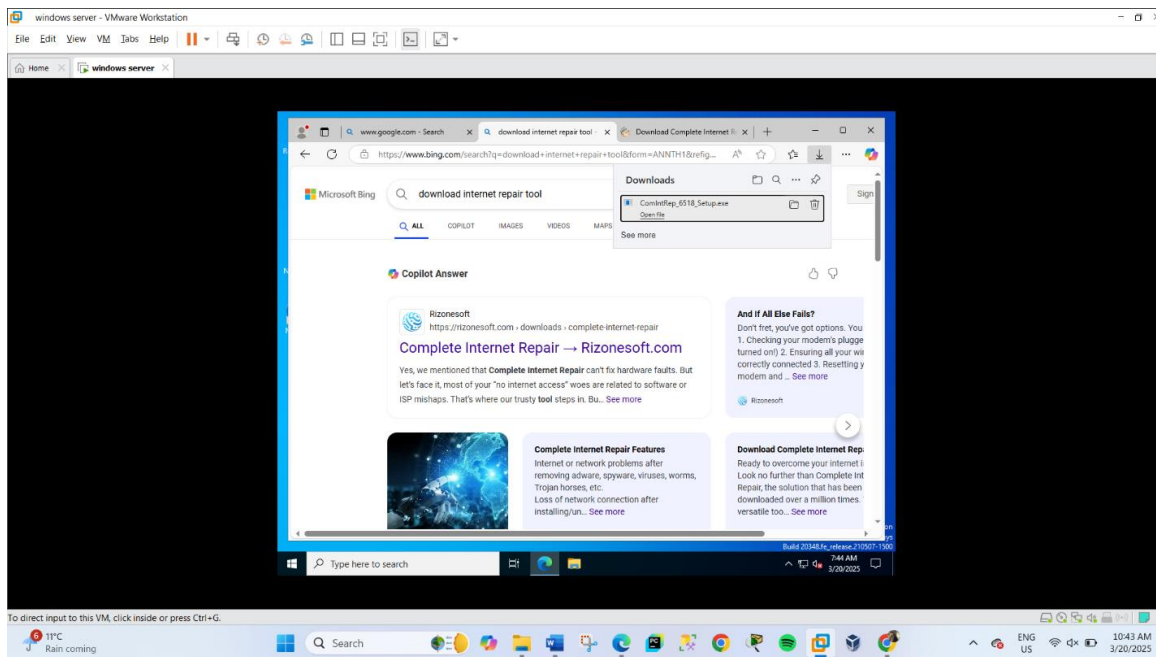


6. Download and run the 'Internet Repair tool'. Try to troubleshoot a Network issue. Take screenshots and explain in your own words.

Step 1: Download the Internet Repair Tool

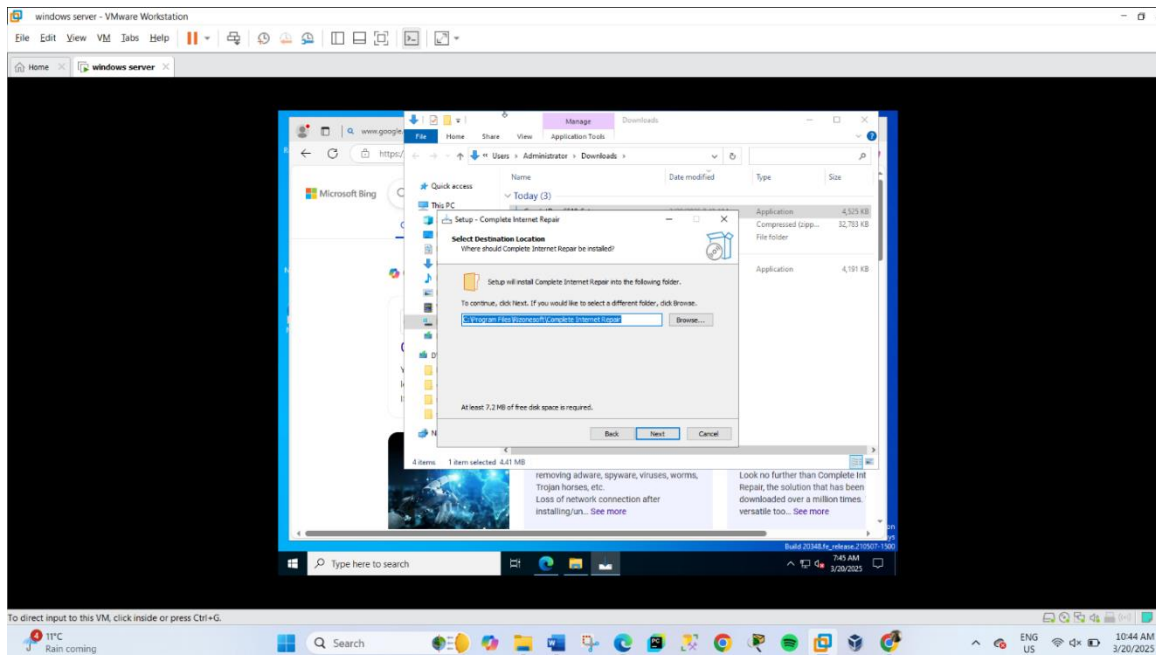
Go to a trusted website to download the Internet Repair Tool.

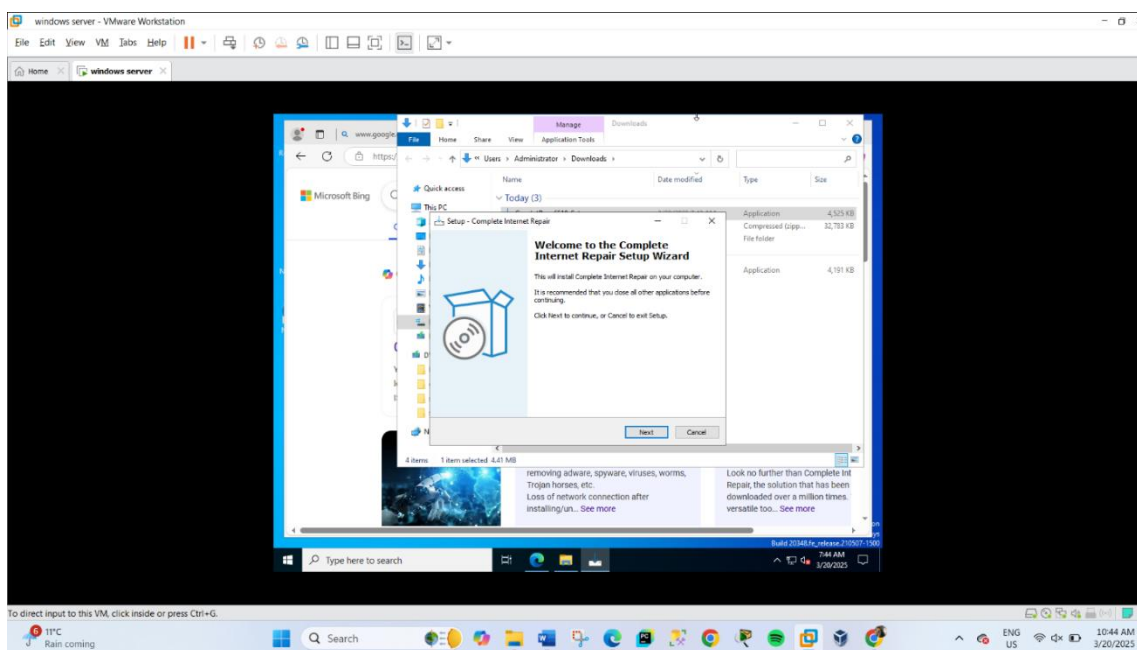
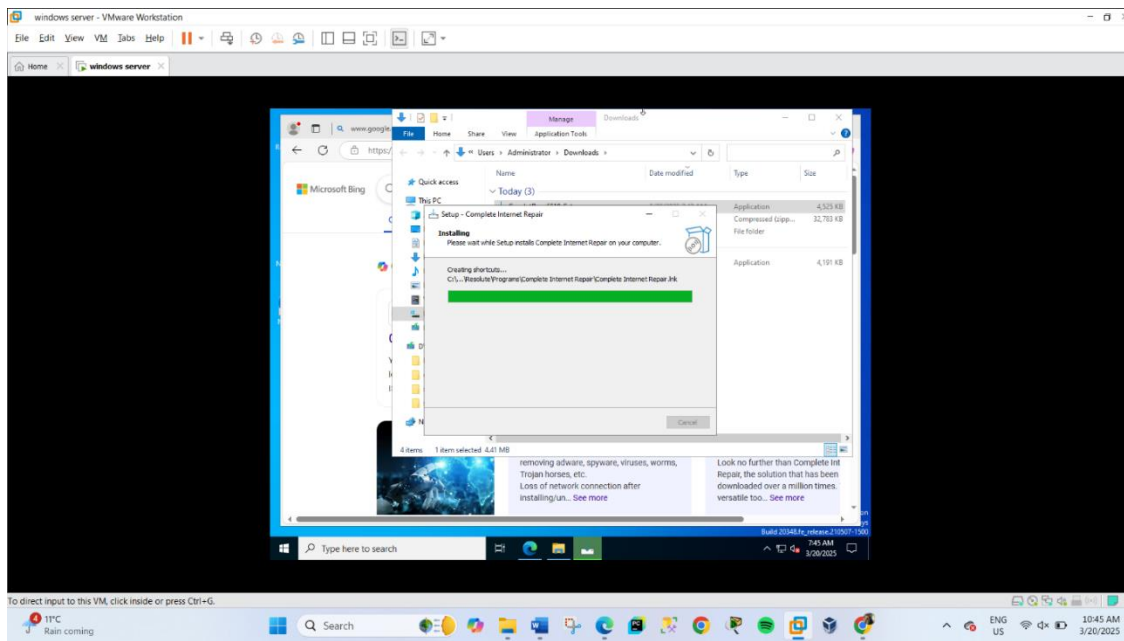
Search for "Internet Repair Tool" and download the software.



Step 2: Install the Tool

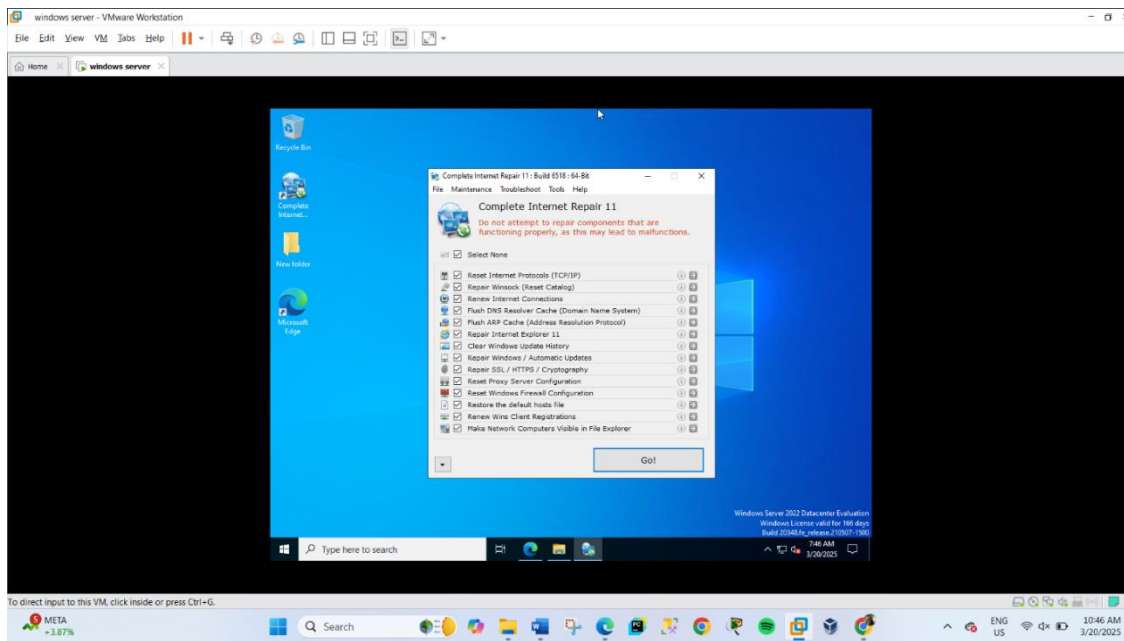
Open the downloaded file and follow the installation prompts to install the tool.





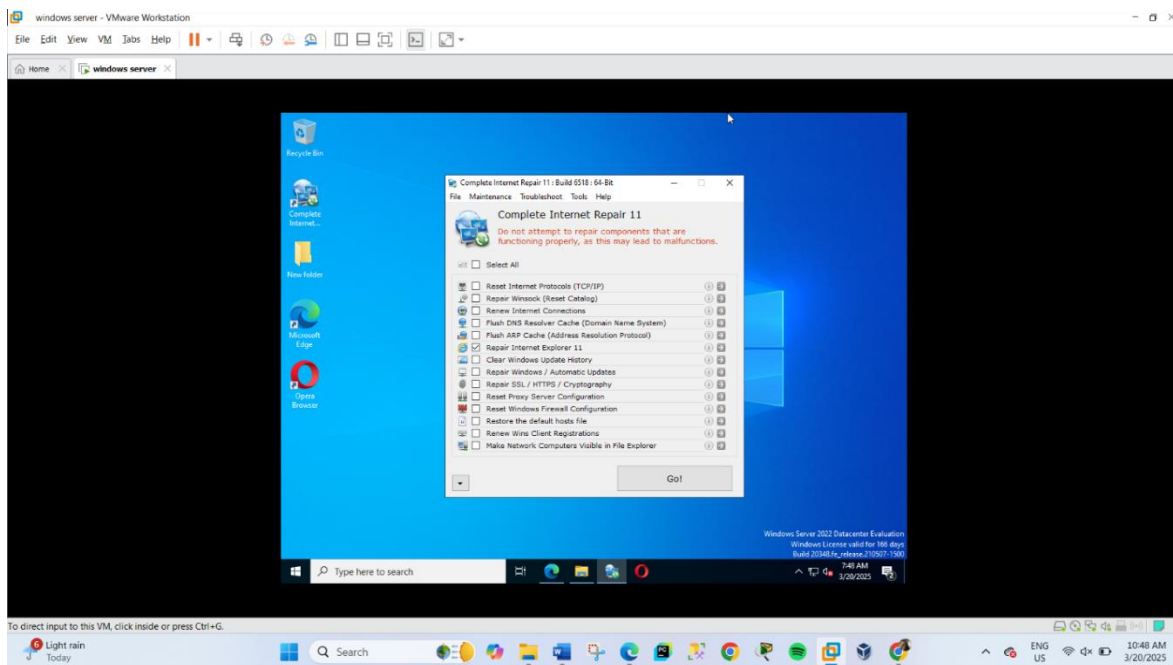
Step 3: Launch the Tool

After installation, open the Internet Repair Tool.



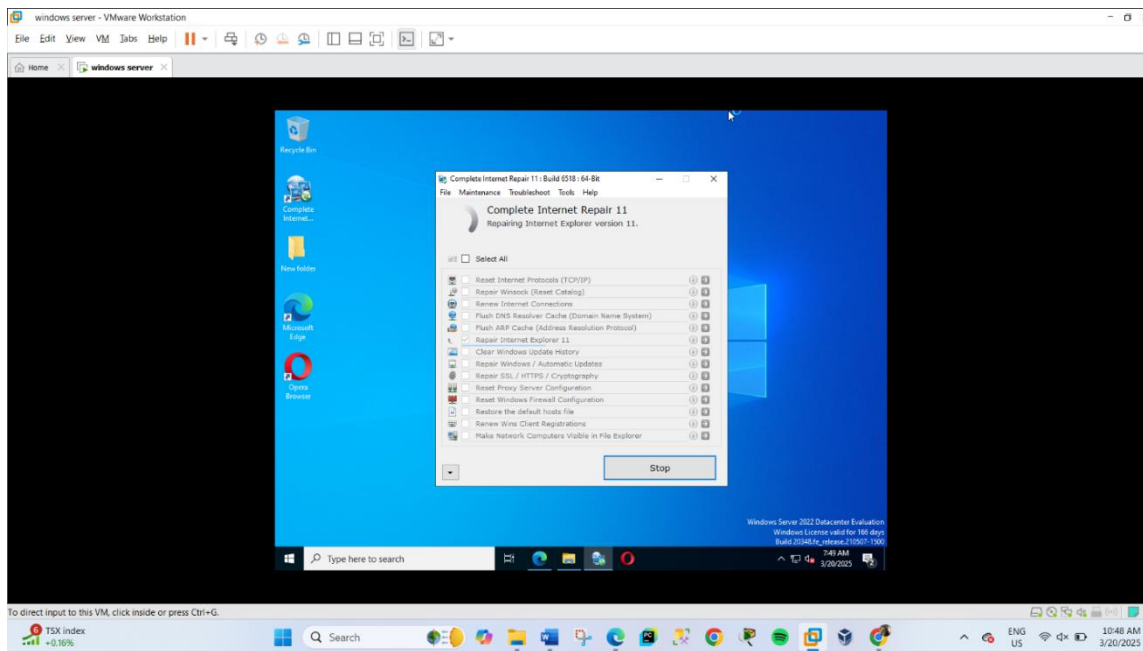
Step 4: Choose the Network Issue

The tool will detect possible network issues. Select the specific issue you want to fix (e.g., no internet connection).



Step 5: Run the Repair

Click Start Repair to begin the troubleshooting process.



Wait for the tool to attempt fixes.

Step 6: Check Results

After the tool finishes, it will show you if the problem was fixed or provide suggestions for further troubleshooting.

