Vulnerability Scanning with Nessus on Windows VM

This project showcases the complete process of setting up a deliberately vulnerable Windows virtual machine and scanning it using **Nessus**. The primary objective is to gain hands-on experience with both **basic** and **credentialed vulnerability scans**, allowing you to identify real-world security flaws in a controlled, risk-free lab environment. In addition to discovering vulnerabilities, this project emphasizes the importance of analyzing scan results and implementing effective **remediation strategies**, which are essential skills for any aspiring cybersecurity professional.

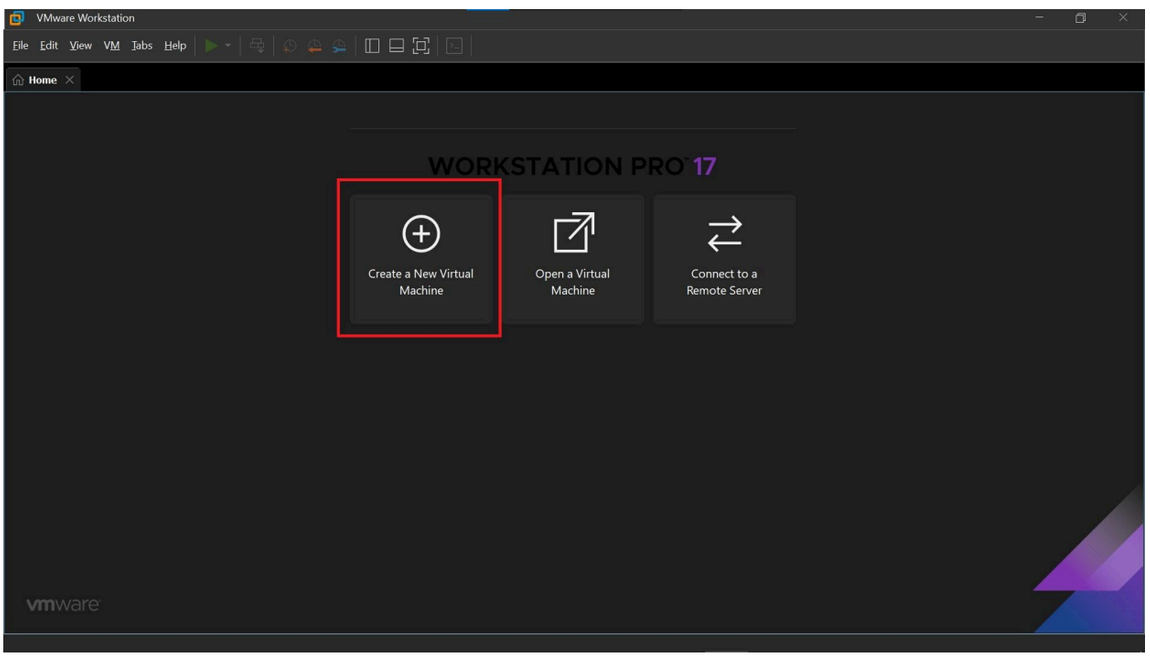
🧰 Prerequisites

Before starting, ensure you have the following:

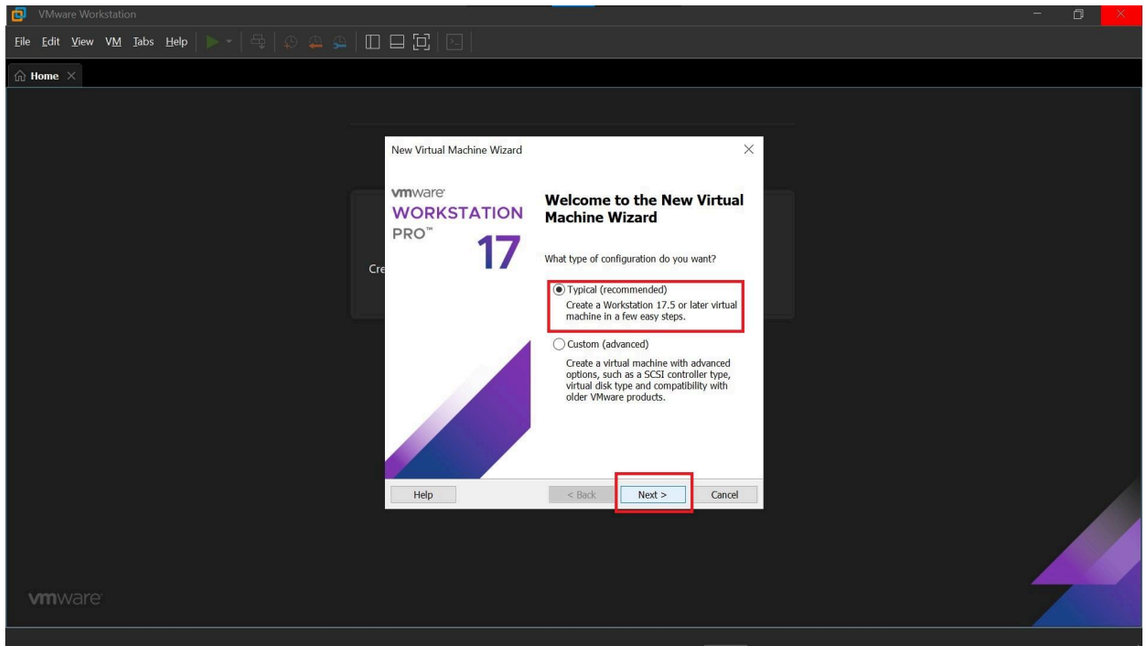
- ➔ VMware Workstation Pro (or VMware Player)
- ➔ Windows 10 ISO image
- ➔ Internet access (for downloading Nessus and software)
- ➔ [Optional] Temporary email (for Nessus activation)
- ➔ Nessus installer: [Download from Tenable]

Setting up a Windows VM in VMware

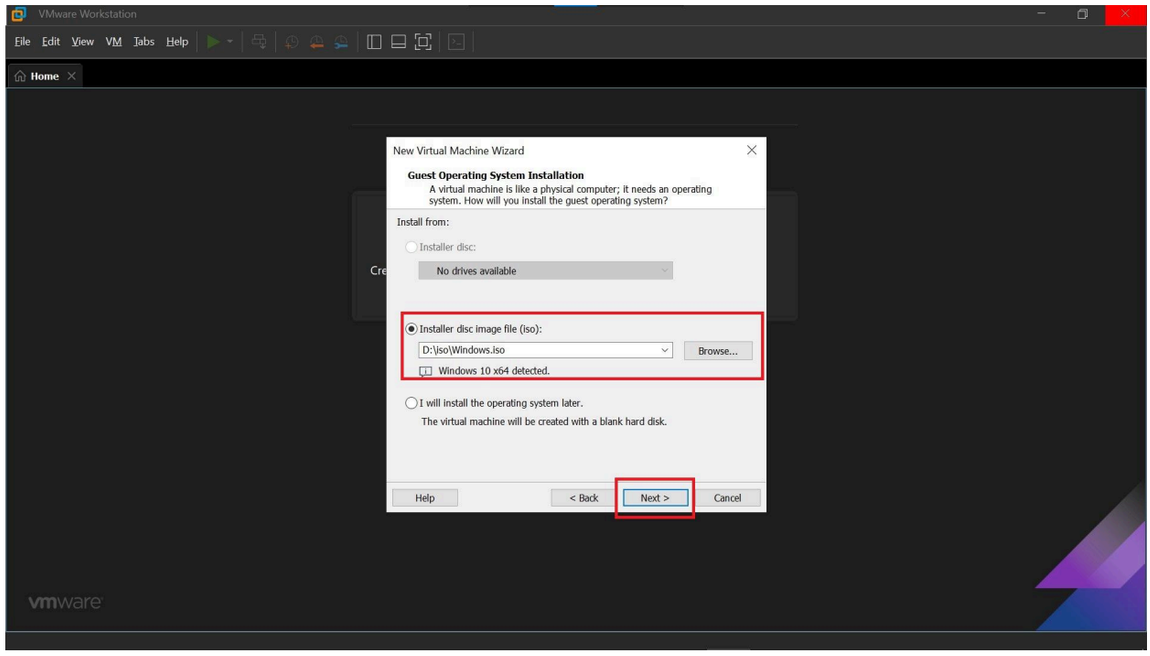
Once you have your image locally saved on your computer, **Launch VMware Workstation Pro** and click **"Create a New Virtual Machine"**.



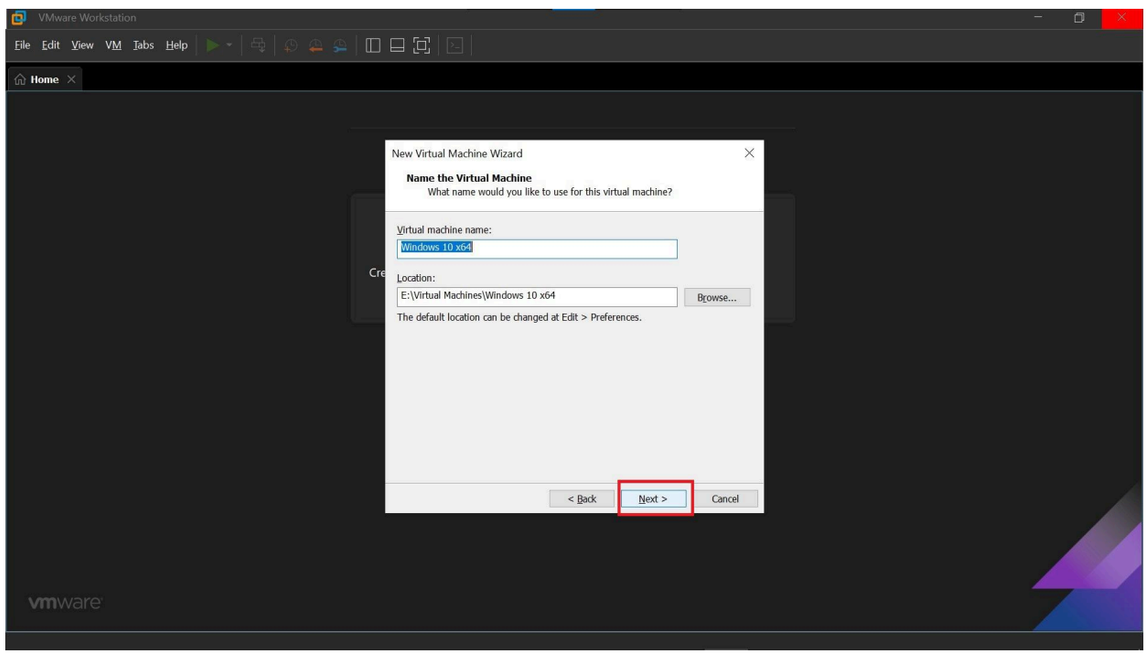
Select **Typical (recommended)** and proceed.



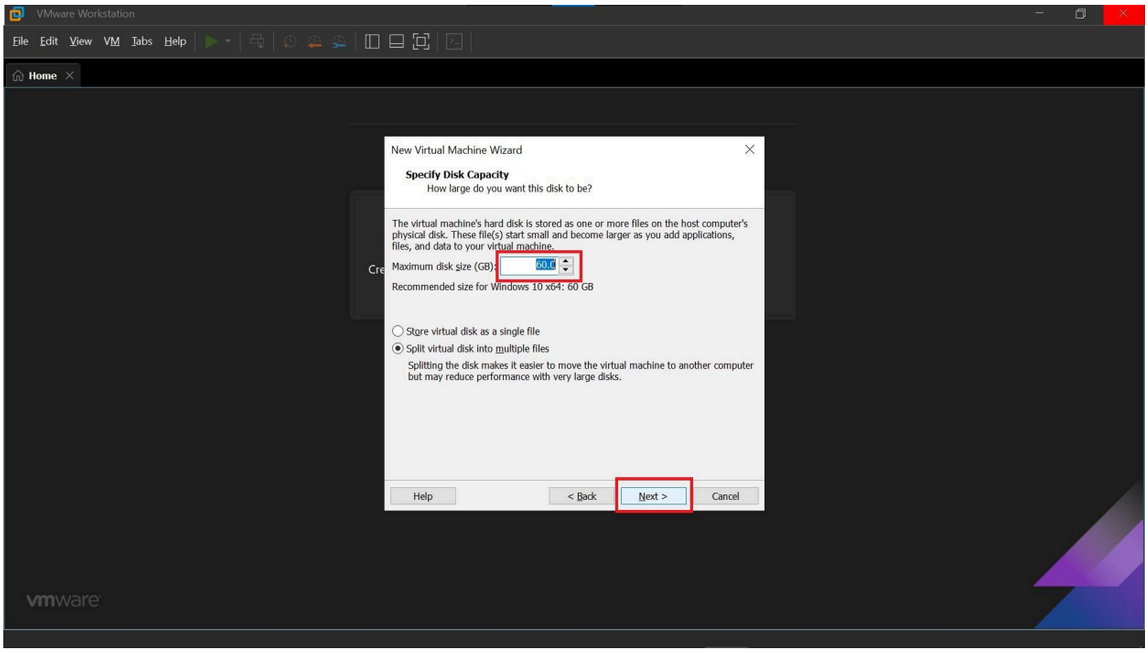
Browse and select your Windows 10 ISO file.



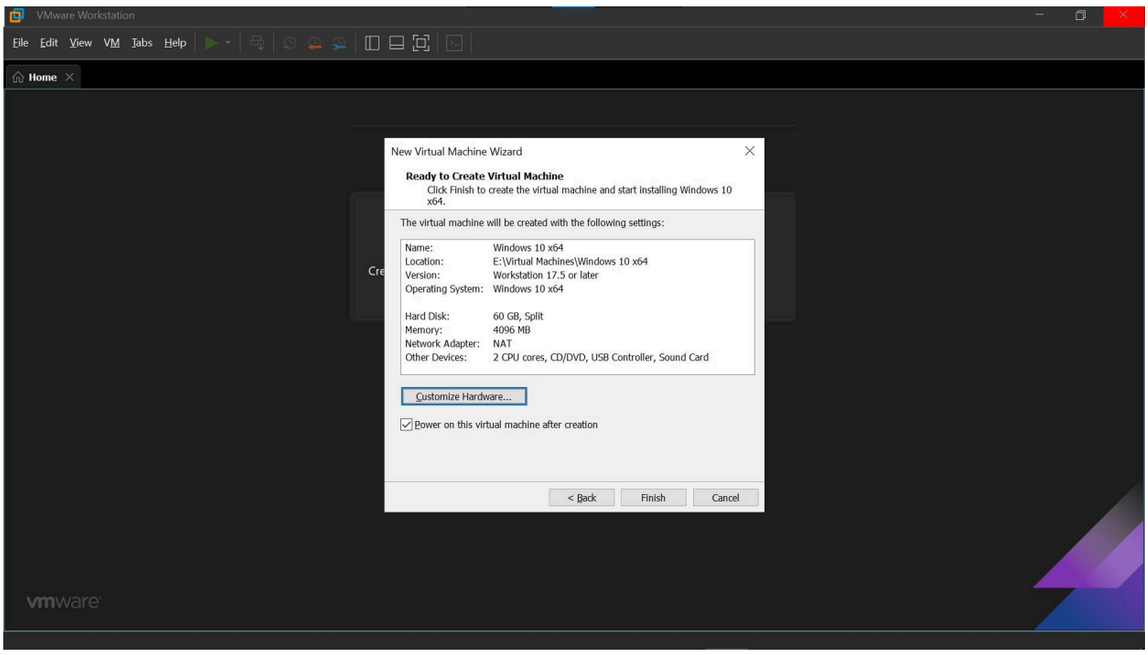
Name the VM and choose a location with sufficient disk space.



Use default settings or allocate at least **40 GB** of disk space



You can adjust CPU cores, memory, and other settings via **Customize Hardware**.

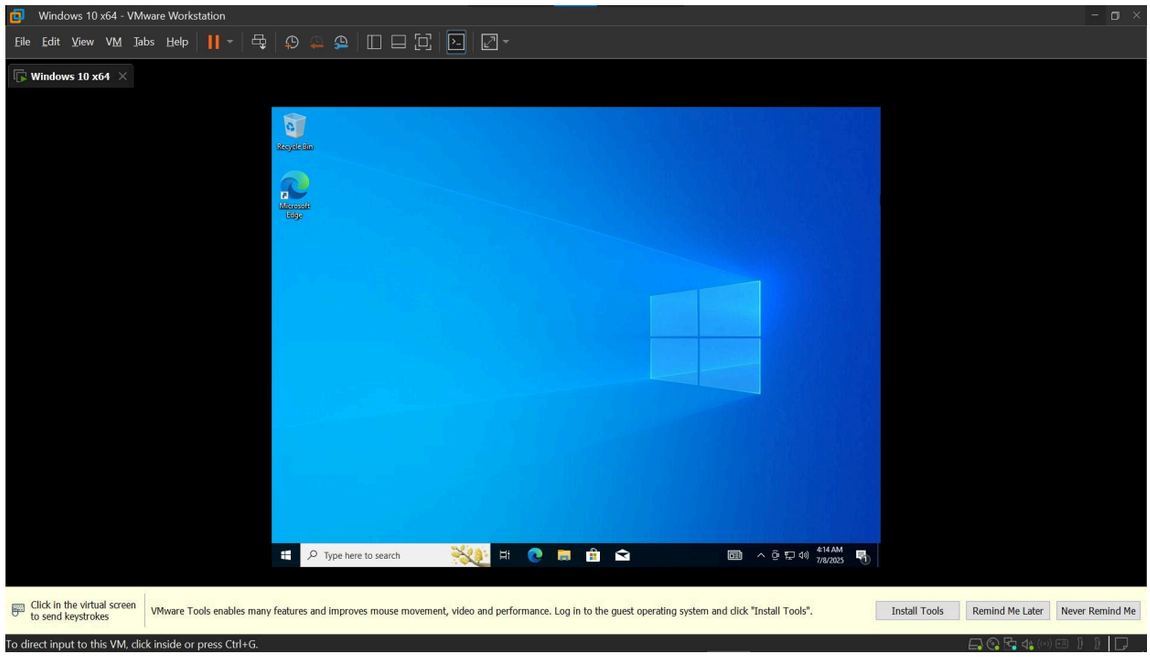


Finish and begin the Windows installation process.

Select:

- **Windows 10 Pro**
- **Custom: Install Windows only**

The process may take around **15–20 minutes**.



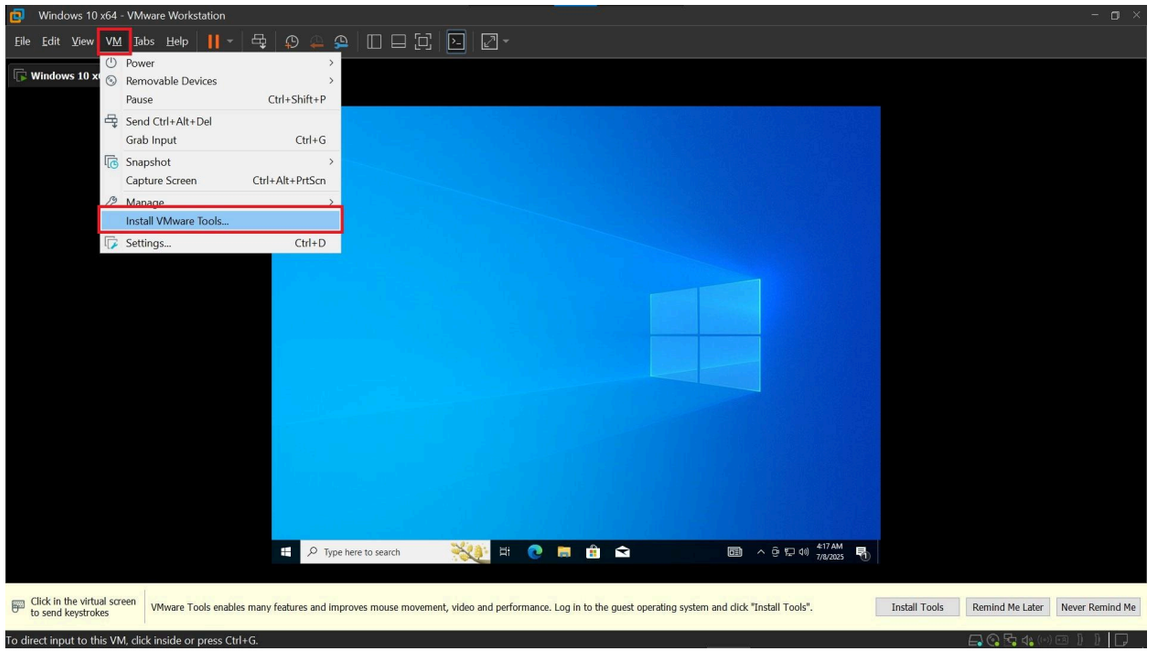
After installation, you might notice the screen resolution can't be changed. This usually happens if **VMware Tools (Guest Additions)** are not installed.

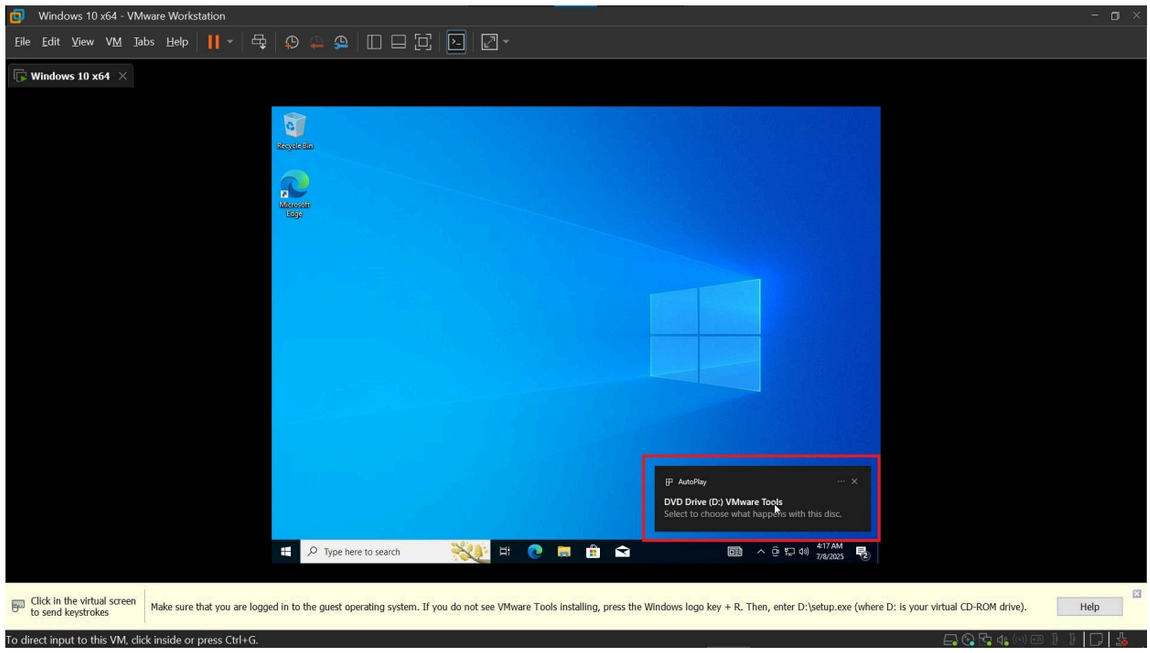
To fix it:

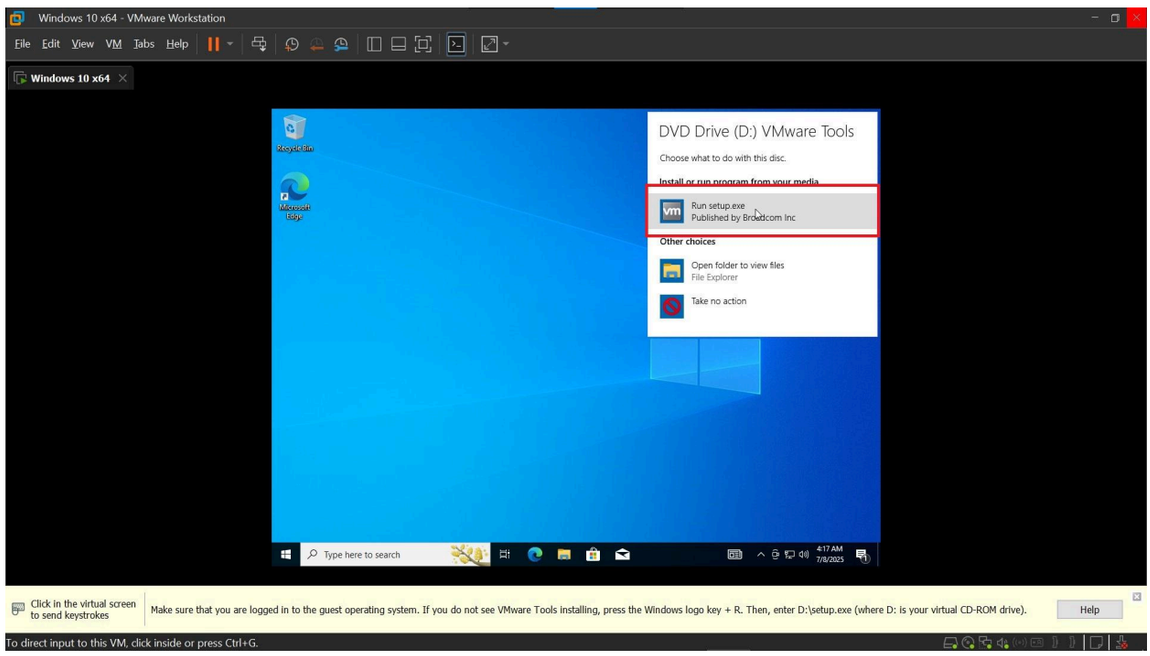
1. In the VM window, go to **VM > Install VMware Tools**.

2. A virtual CD will mount inside the VM. Click the **popup notification** or open **File Explorer**.

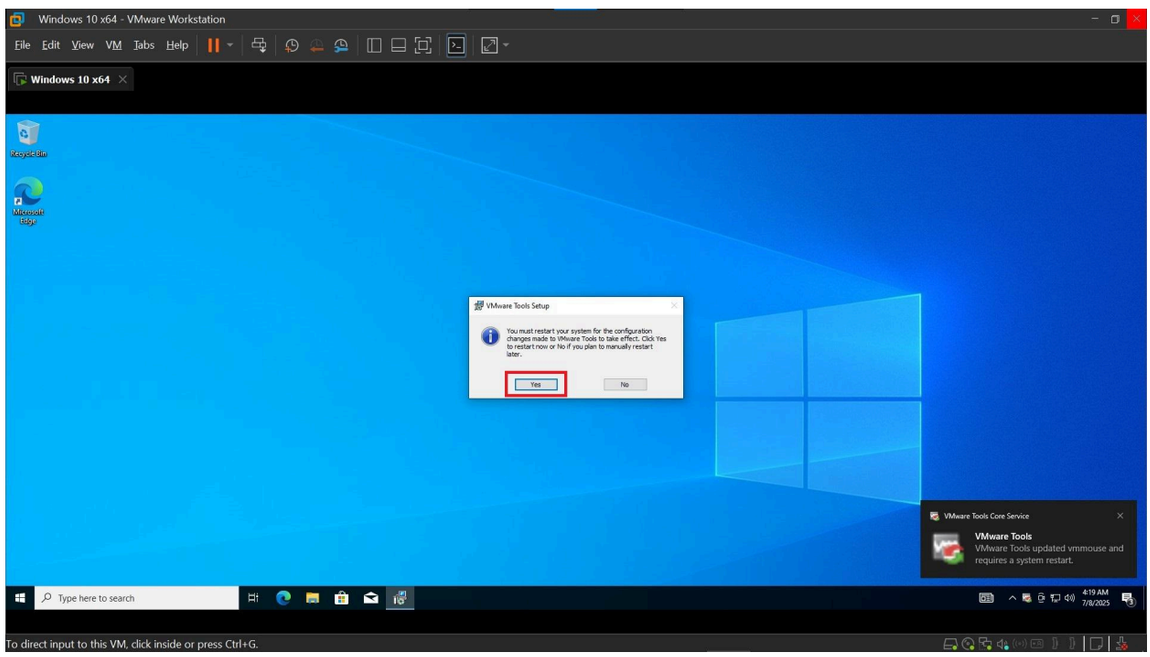
3. Run setup.exe and complete the installation.







After installation and a reboot, your screen resolution should be adjustable.



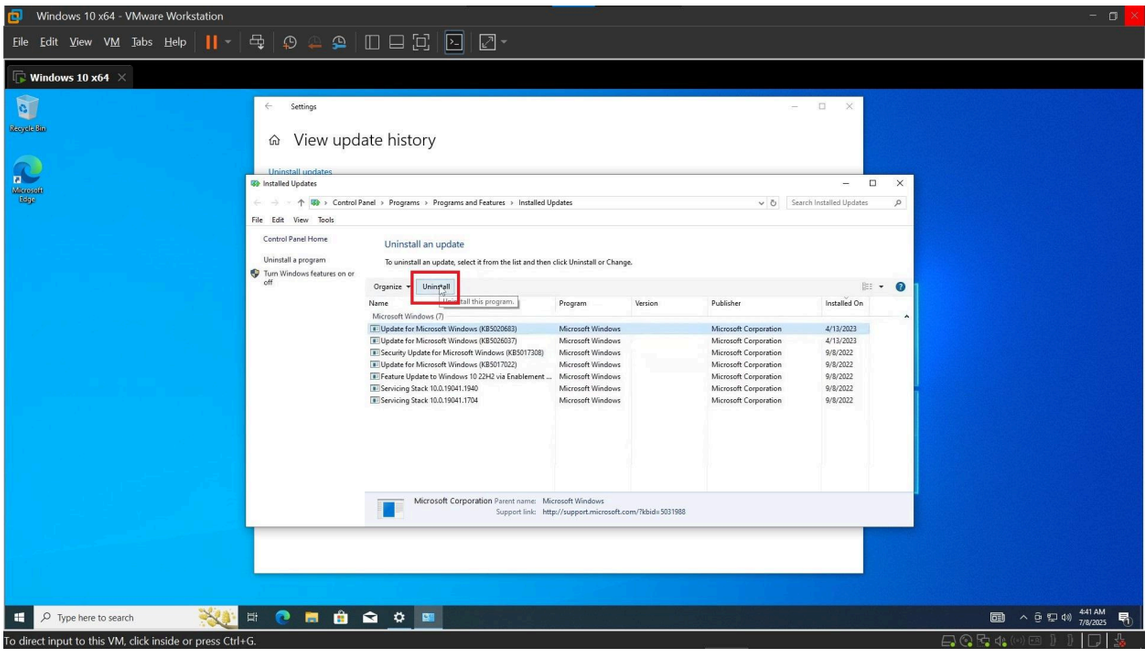
Preparing the Windows VM for Vulnerability Scanning

Before scanning with Nessus, it's important to **intentionally reduce certain security features** to make the VM more vulnerable for testing purposes. This ensures that Nessus can effectively identify common misconfigurations and weaknesses — valuable for learning in a controlled lab environment.

> ⚠️ **Note**: Perform these steps **only in a lab/test environment**. Never expose a weakened system to the internet.

🛑 Disable Windows Updates

1. Go to **Start > Settings > Update & Security**.
2. Click **Pause updates for 7 days**. Click again to extend (up to a certain limit).
3. Click **View update history > Uninstall updates**.
4. In the new window, attempt to uninstall listed updates (if the option is available).



Disable Windows Firewall

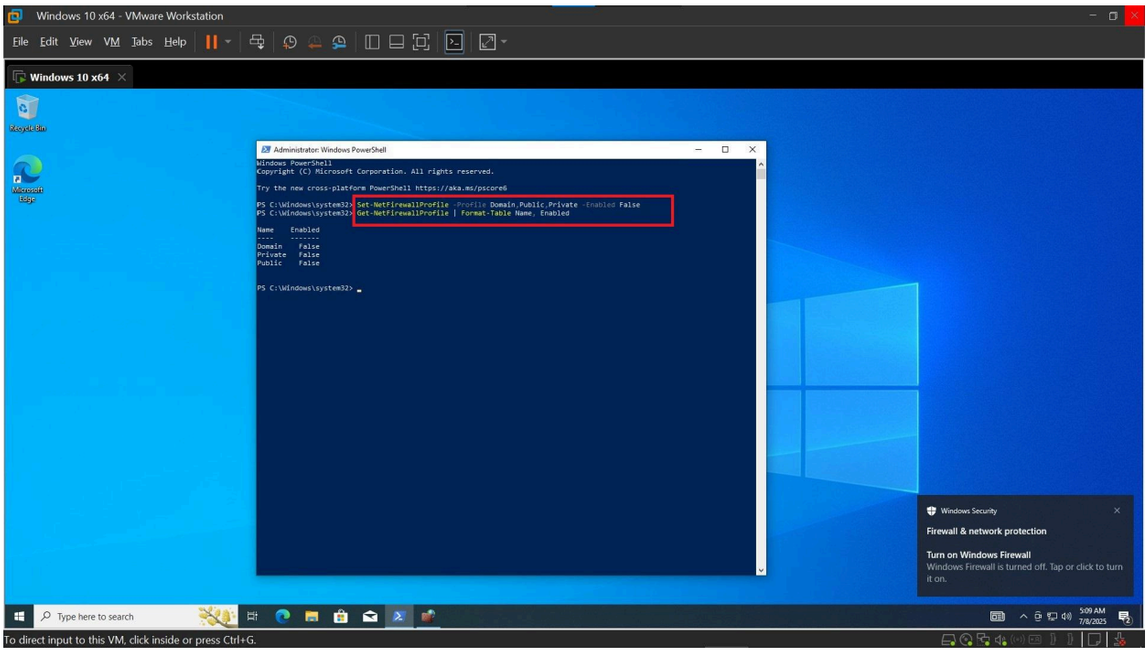
Open **PowerShell as Administrator** and run the following commands:

```
Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False

# Verify firewall status

Get-NetFirewallProfile | Format-Table Name, Enabled
```

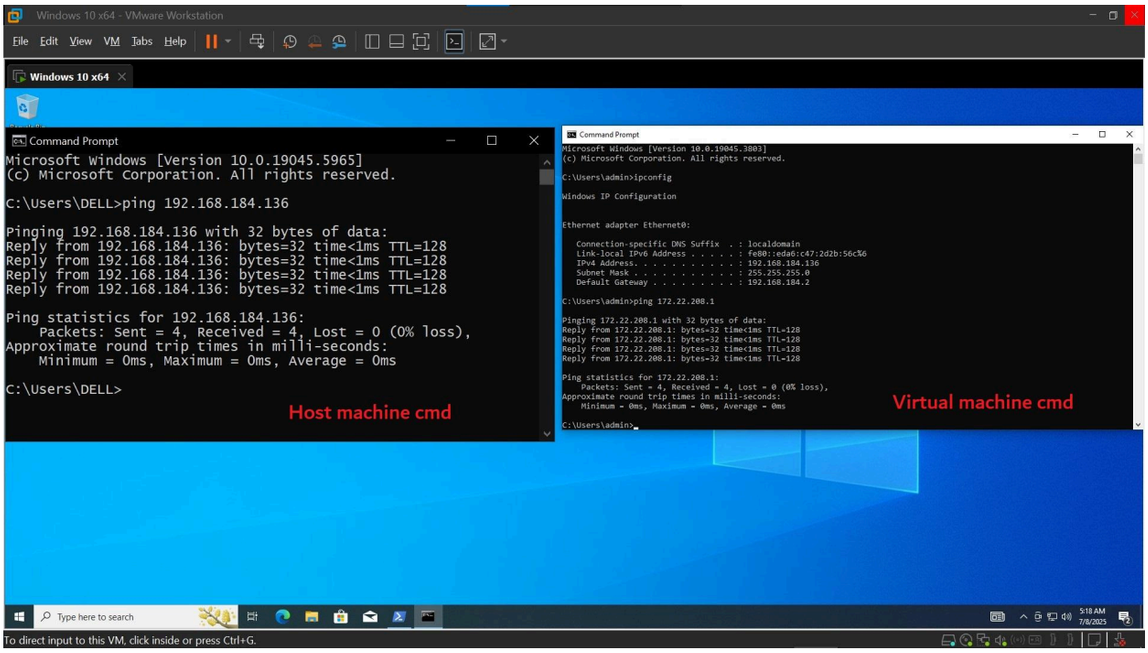
This step is necessary to ensure Nessus can reach the VM over the network.



Verify Network Connectivity (Ping Test)
To confirm both systems are on the same network:

1. Open **Command Prompt (Admin)** inside the VM and run:
   Note the IP address.
2. On your host system, open Command Prompt and run:
   ping <VM_IP_Address>

Successful replies confirm that the VM is reachable for scanning.



If the **ping is successful**, your VM is properly configured and reachable — you're good to go!

> ❗ If the ping fails:

- Double-check that **Windows Firewall** is disabled.

- Ensure the **network adapter** is correctly set (e.g., **NAT** or **Bridged** mode depending on your setup).

- Confirm both host and VM are on the same subnet.

Tweaking the windows so that nessus credential scan can pass authentication and do the scan

Preparing Windows for Nessus Credentialed Scanning

To allow Nessus to perform authenticated scans on your Windows VM, some Windows services and settings must be adjusted.

> ⚠️ **Important**: These changes reduce system security. Only apply them in **isolated lab environments**.

Enable Remote Registry Service

```
# Set the service to start automatically
Set-Service -Name RemoteRegistry -StartupType Automatic

# Start the service
Start-Service -Name RemoteRegistry

# Confirm it's running
Get-Service -Name RemoteRegistry
```

Disable UAC Prompts (for local admin credential access)

```
# Disable consent prompts for administrators

Set-ItemProperty -Path
"HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System" `
-Name "ConsentPromptBehaviorAdmin" -Value 0

# Disable secure desktop overlay for UAC

Set-ItemProperty -Path
"HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System" `
-Name "PromptOnSecureDesktop" -Value 0
```

Enable Remote Use of Local Admin Account

```
reg add "HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System" `
/v LocalAccountTokenFilterPolicy /t REG_DWORD /d 1 /f
```

Open SMB Port for Nessus
Enable the **File and Printer Sharing** rule to open TCP port 445:

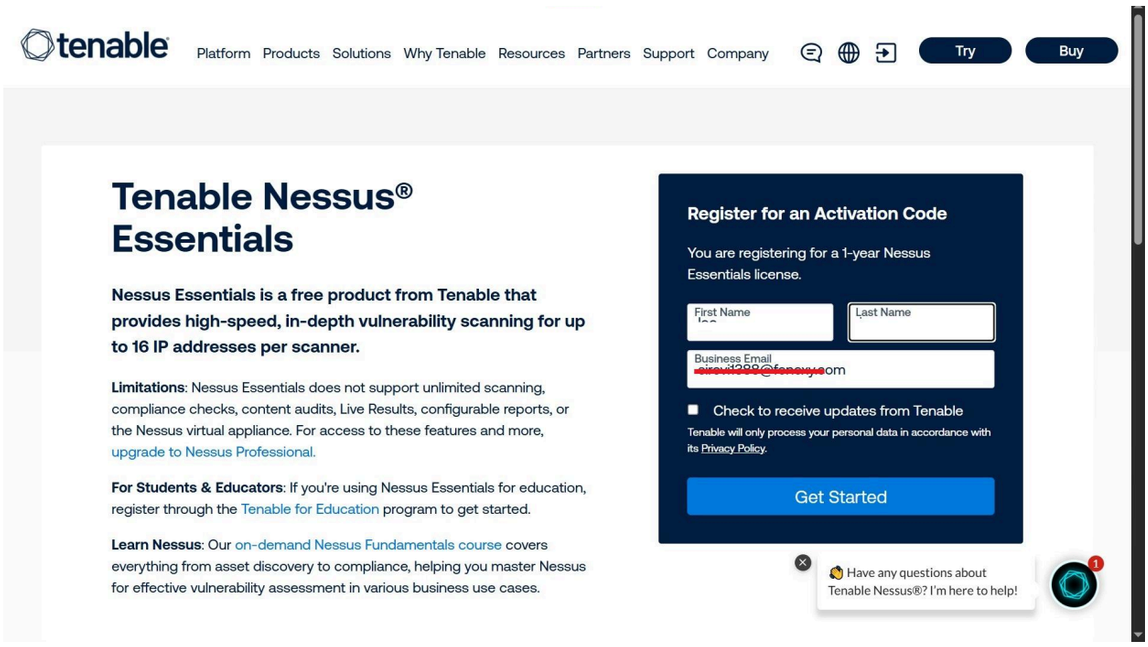
```
Enable-NetFirewallRule -DisplayGroup "File and Printer Sharing"
```

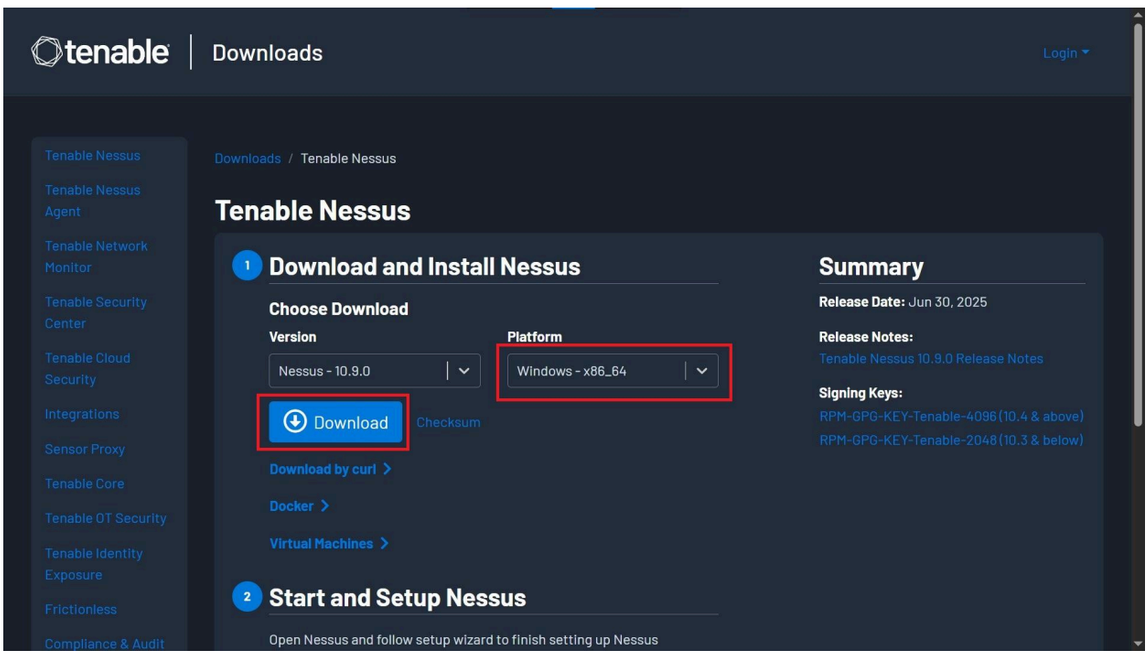
🧠 **Note**: Without this, Nessus cannot authenticate or access admin shares.

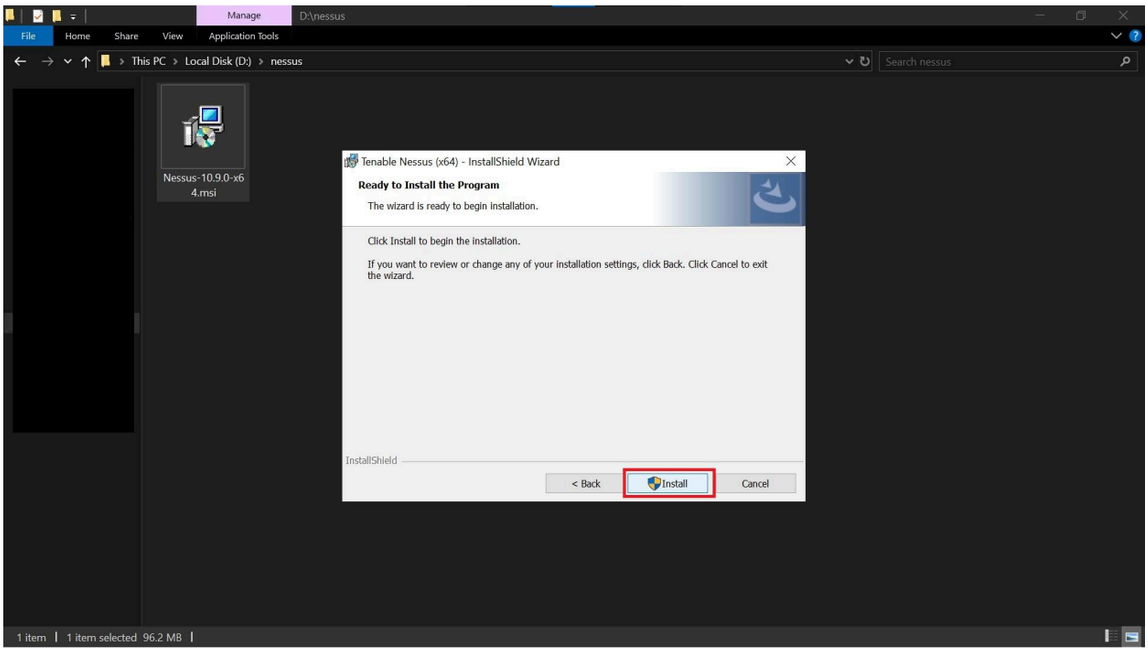
Reboot the VM:A restart is recommended after making these system changes.

Installing Nessus on Host Machine

1. Go to the Tenable Nessus Download Page
2. Fill in basic details (name, email — a temporary email works).
3. You'll receive an **activation code** via email.
4. Download the **Windows** version and install it.







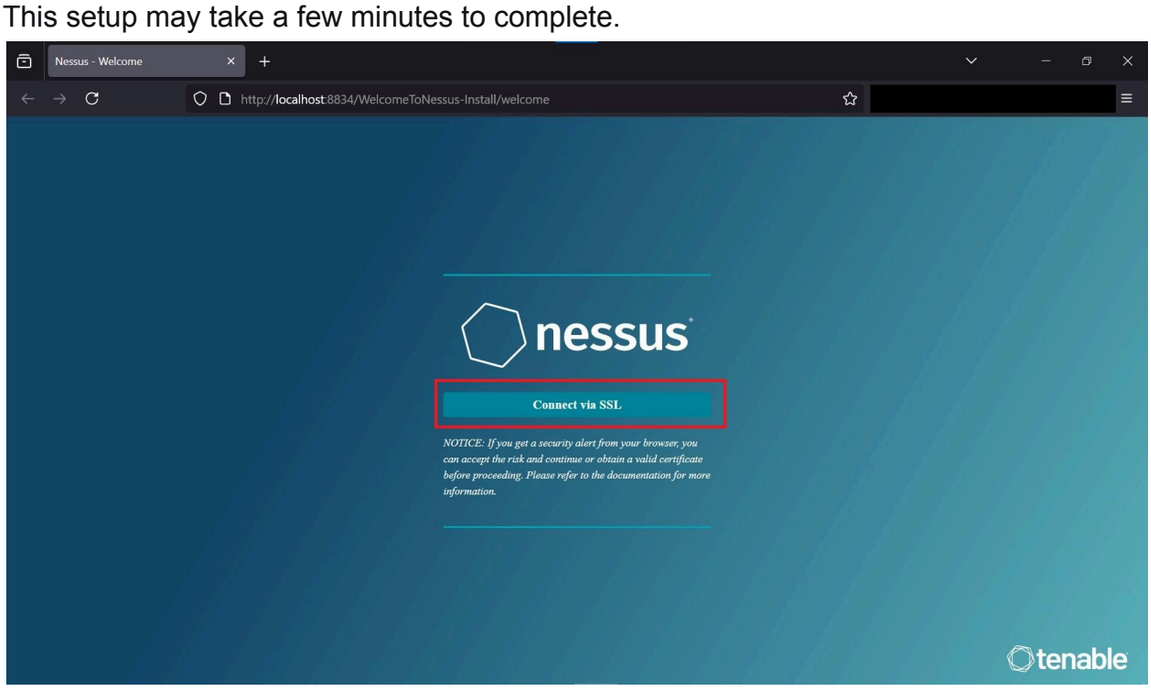
Follow the installation wizard:

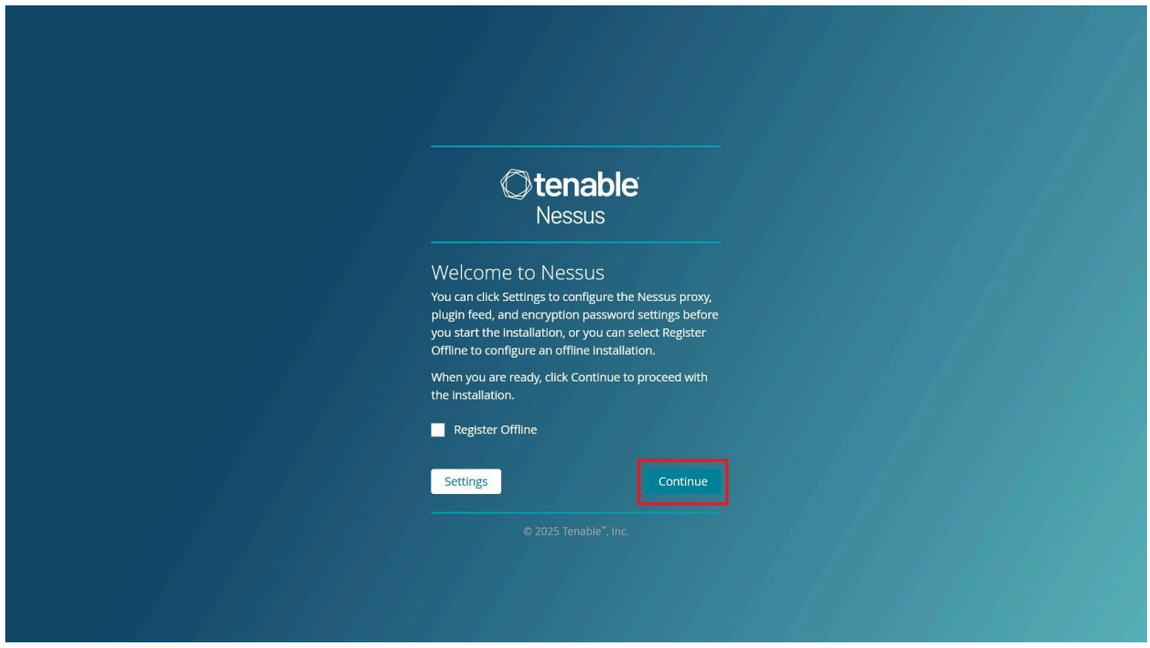
- Accept terms, click **Next** through the prompts.
- Once complete, a browser window opens on: `https://localhost:8834`
- If warned about security risk, click **Advanced > Proceed**.

Nessus Setup in Browser

1. Choose **Nessus Essentials** and click **Continue**
2. If prompted to register, click **Skip** (you already have the activation code)
3. Paste the activation code and proceed
4. Create a Nessus admin account

This setup may take a few minutes to complete.




tenable
Nessus
Welcome to Nessus
You can click Settings to configure the Nessus proxy, plugin feed, and encryption password settings before you start the installation, or you can select Register Offline to configure an offline installation.
When you are ready, click Continue to proceed with the installation.
Register Offline
Settings
Continue
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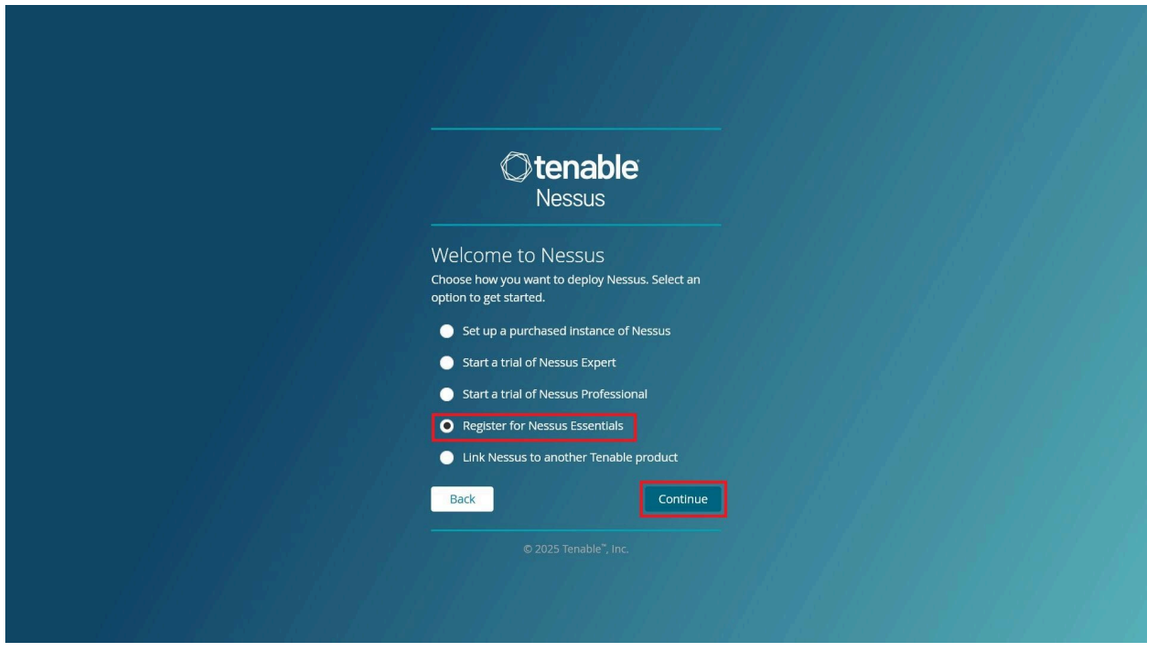
tenable
Nessus
Welcome to Nessus
Choose how you want to deploy Nessus. Select an option to get started.
Set up a purchased instance of Nessus
Start a trial of Nessus Expert
Start a trial of Nessus Professional
Register for Nessus Essentials
Link Nessus to another Tenable product
Back
Continue
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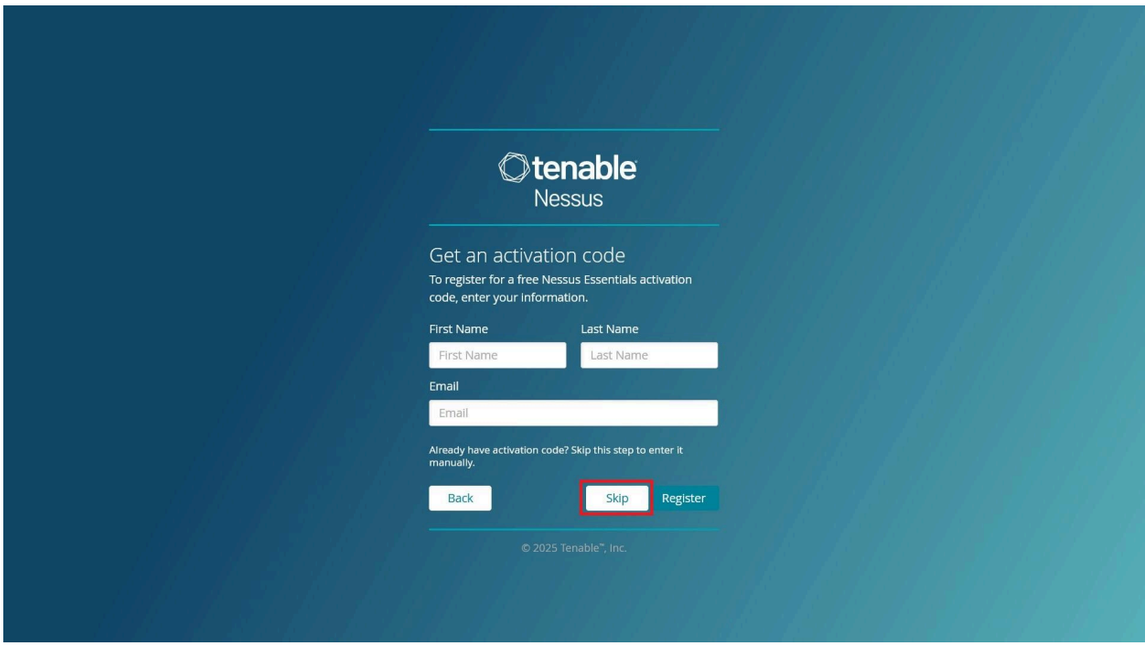
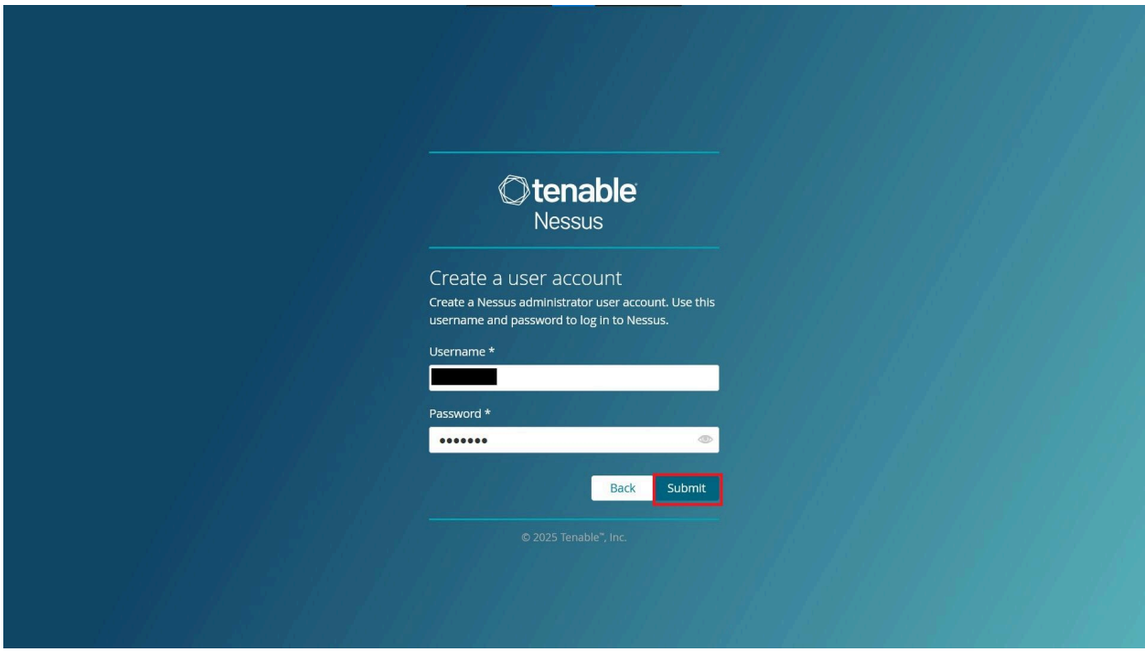
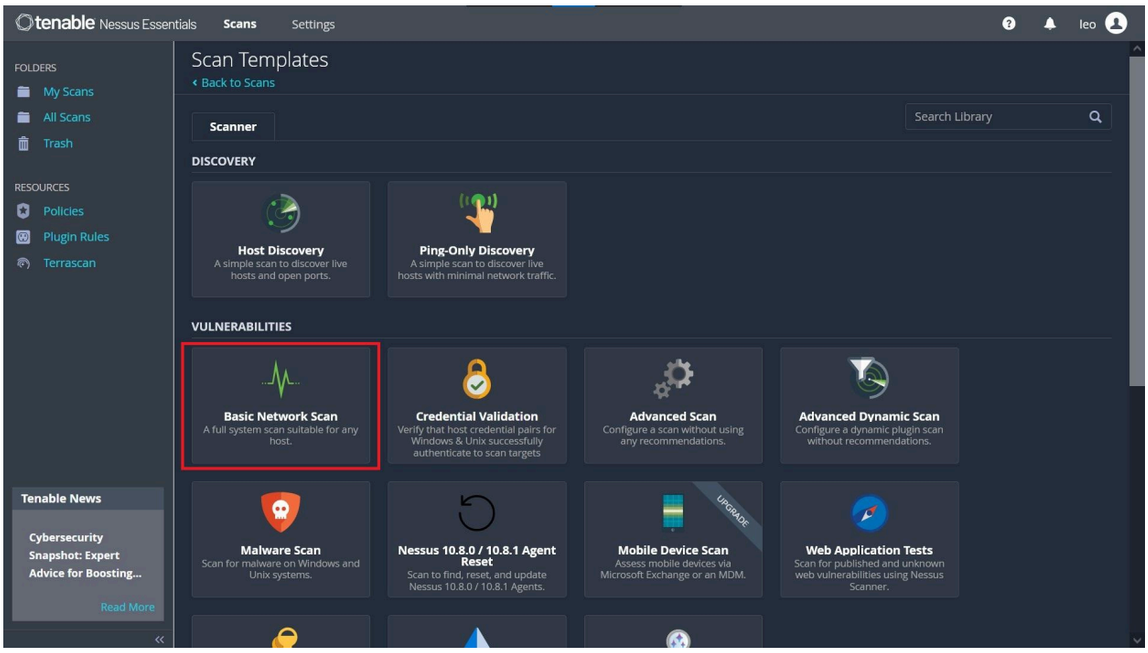


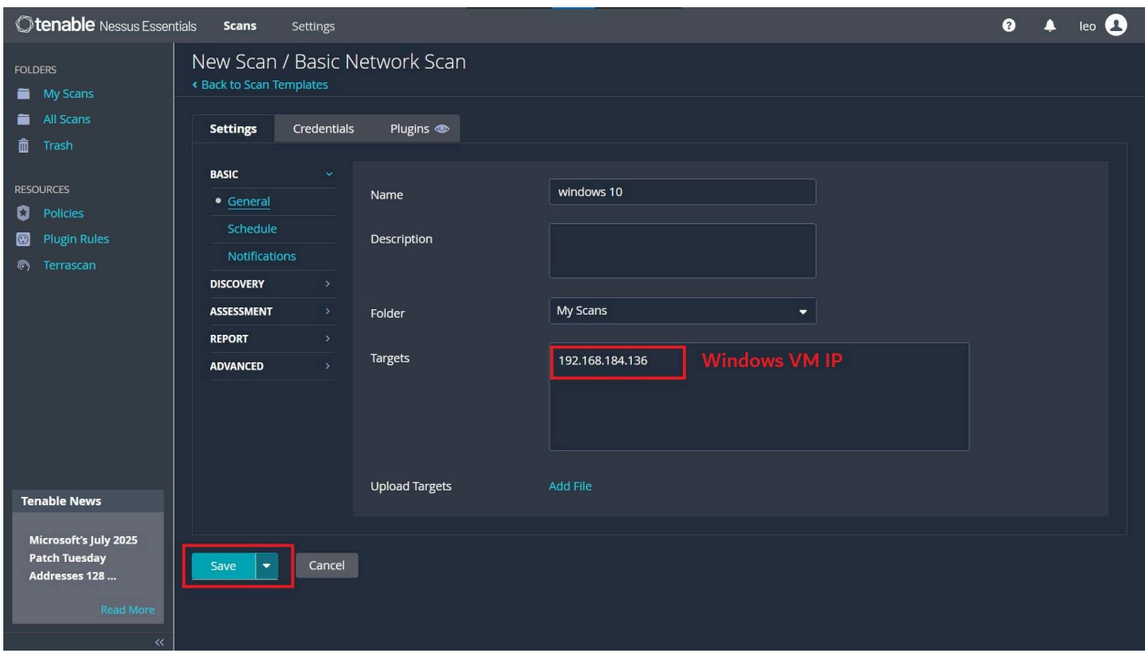


Running a basic (non-credentialed) scan

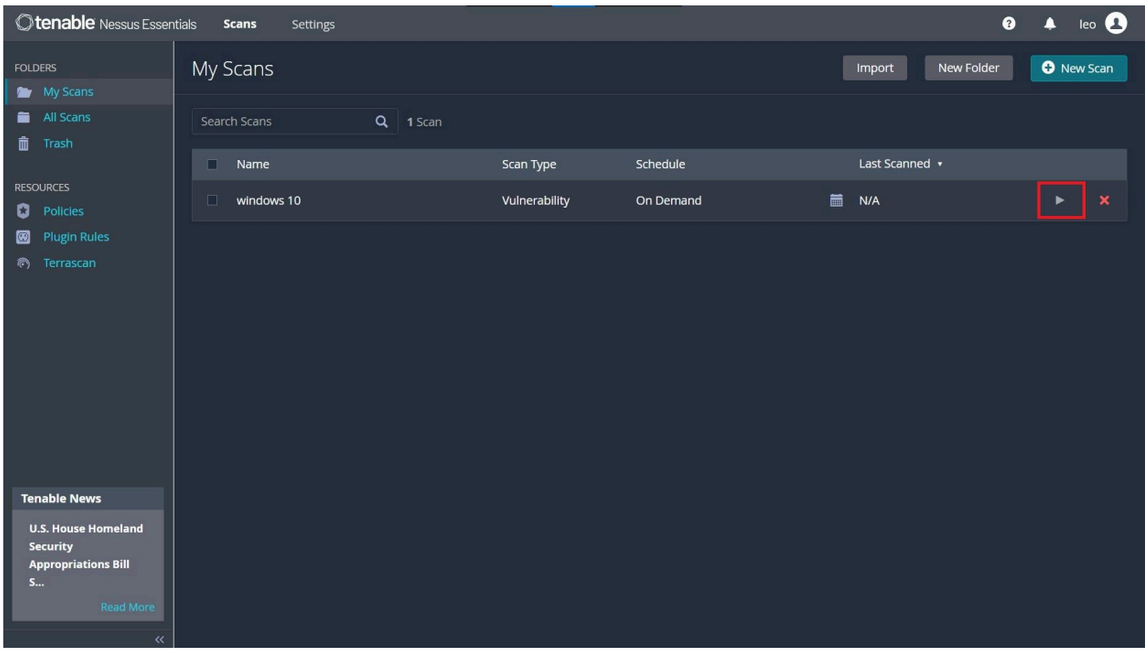
1. Once setup completes, go to **My Scans**
2. Click **Create a New Scan**
3. Choose **Basic Network Scan**



4. Enter target details (e.g., IP of the Windows VM)



5. Launch the scan

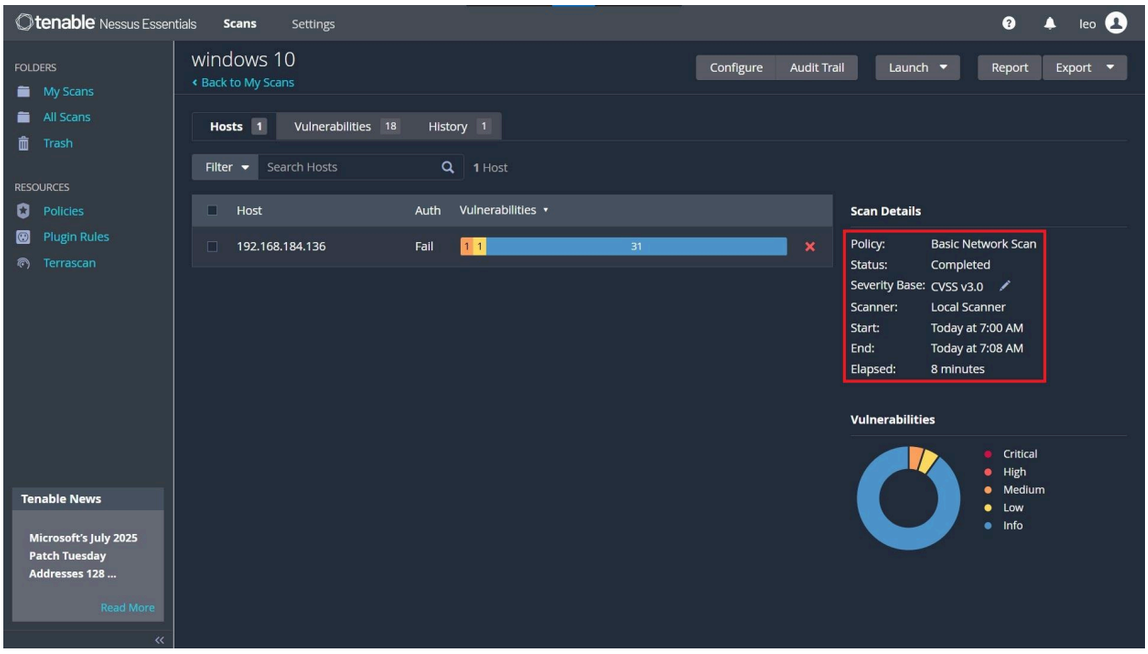


Launching the Initial Basic Scan

Once your scan is configured and launched, Nessus will begin scanning the specified IP. In this case, the scan took **approximately 8 minutes**.

After completion:

- The scan status will show **"Completed"**
- Click the **IP address** to view detailed findings.



Reviewing the Findings

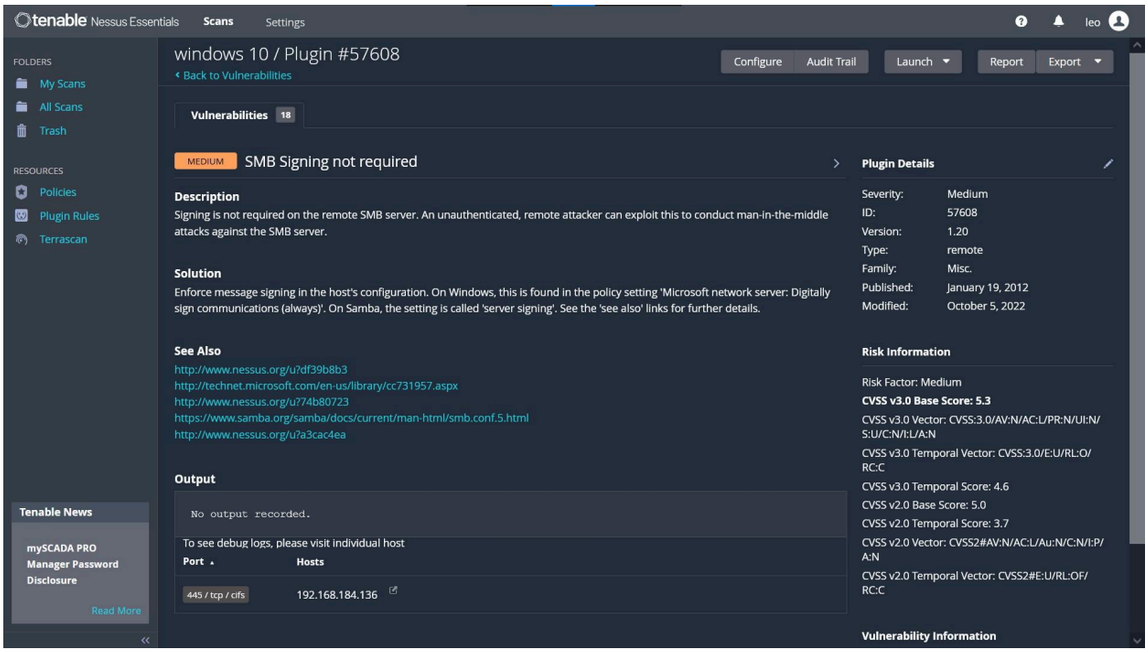
Click on any listed vulnerability to view:

- A description of the issue
- Risk level

- Recommended solution
- Reference URLs (under **See Also**) for further reading

These insights help guide the remediation process for the identified vulnerabilities.

Nessus stores each scan under the **History tab**, allowing you to revisit past results at any time.



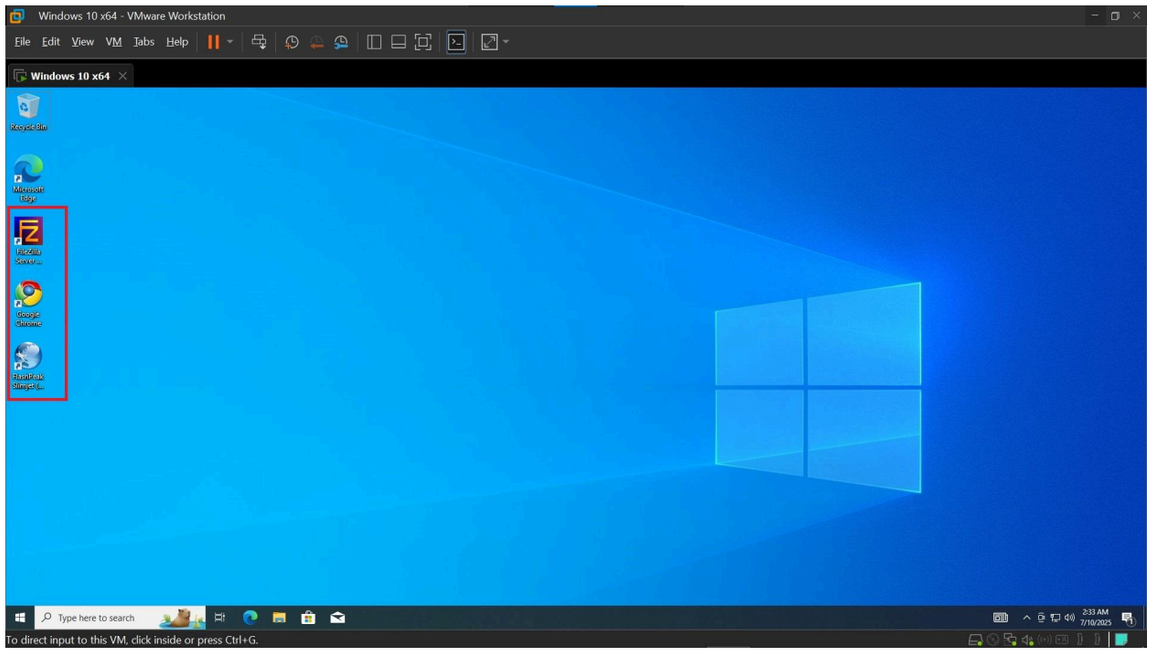
Installing outdated software to simulate vulnerabilities

The initial scan detected only a **medium-severity vulnerability**. To get deeper insights, we'll perform a **credentialed scan**, which allows Nessus to:

- Identify **installed software**
- Review **missing patches**
- Detect **configuration risks**

Simulating Real-World Vulnerabilities with Outdated Software

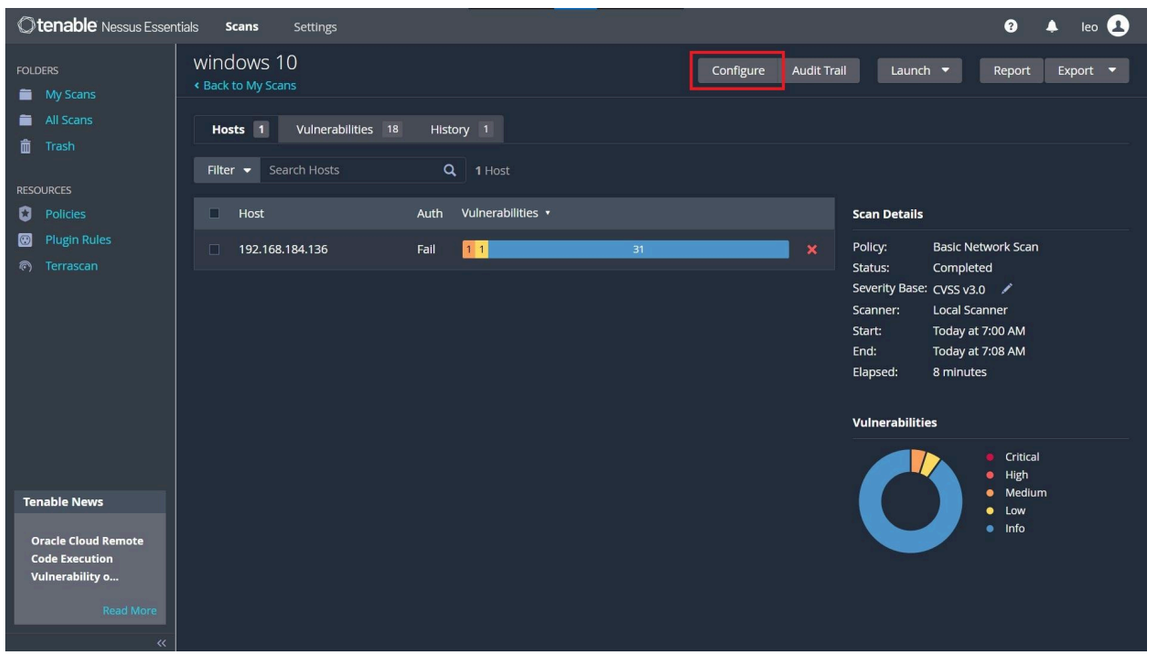
- Installed legacy versions of commonly used applications:
    - **Google Chrome**
    - **Slimjet**
    - **FileZilla**

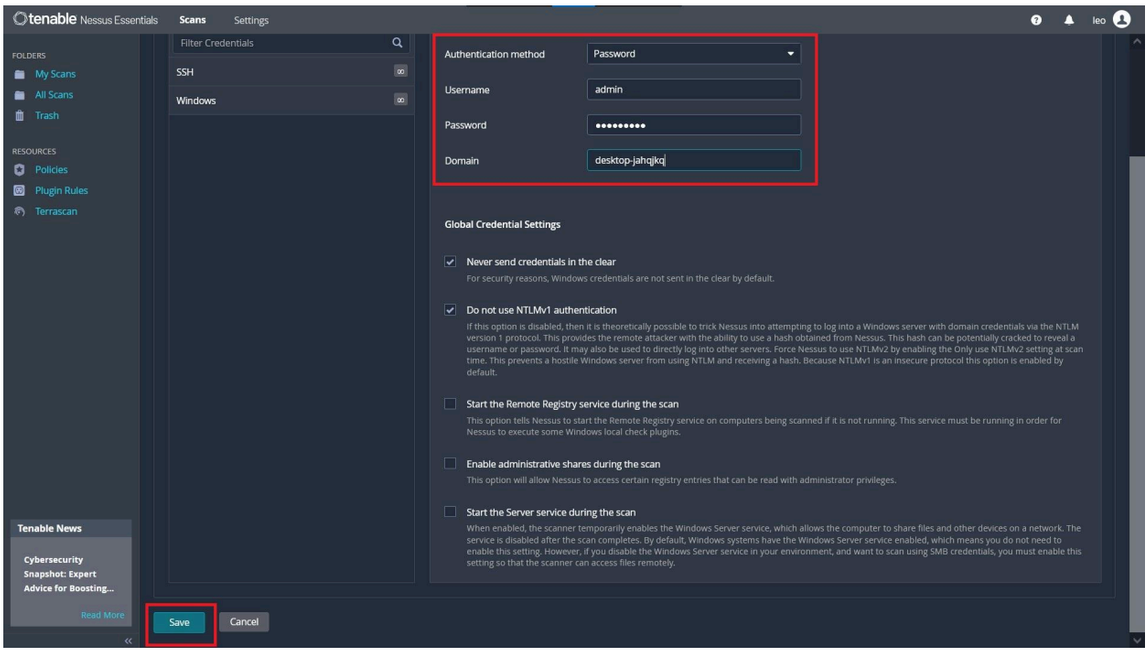


Performing a credentialed scan

To configure credentials for your existing scan:

1. Go to **My Scans**
2. Click the **three-dot menu > Configure**
3. Navigate to the **Credentials** tab
4. Under **Windows**, provide:
    - Username
    - Password
    - Domain name





💡 Use **`whoami`** in Command Prompt inside the VM to find your credentials:
Format: **`DESKTOP-XYZ\admin`**

- **`DESKTOP-XYZ`** = Domain
- **`admin`** = Username

Click **Save**, then **Launch** the scan.

Fixing Authentication Failures

If Nessus shows **"Authentication Failed"**, it likely means:

- You're using a **non-default admin account** that lacks the required permissions.

Ensure the following configurations are applied during VM setup:

➔ **Remote Registry:** Enabled

➔ **UAC Prompts:** Disabled for smoother remote access

➔ **LocalAccountTokenFilterPolicy:** Modified to allow full remote administrative rights

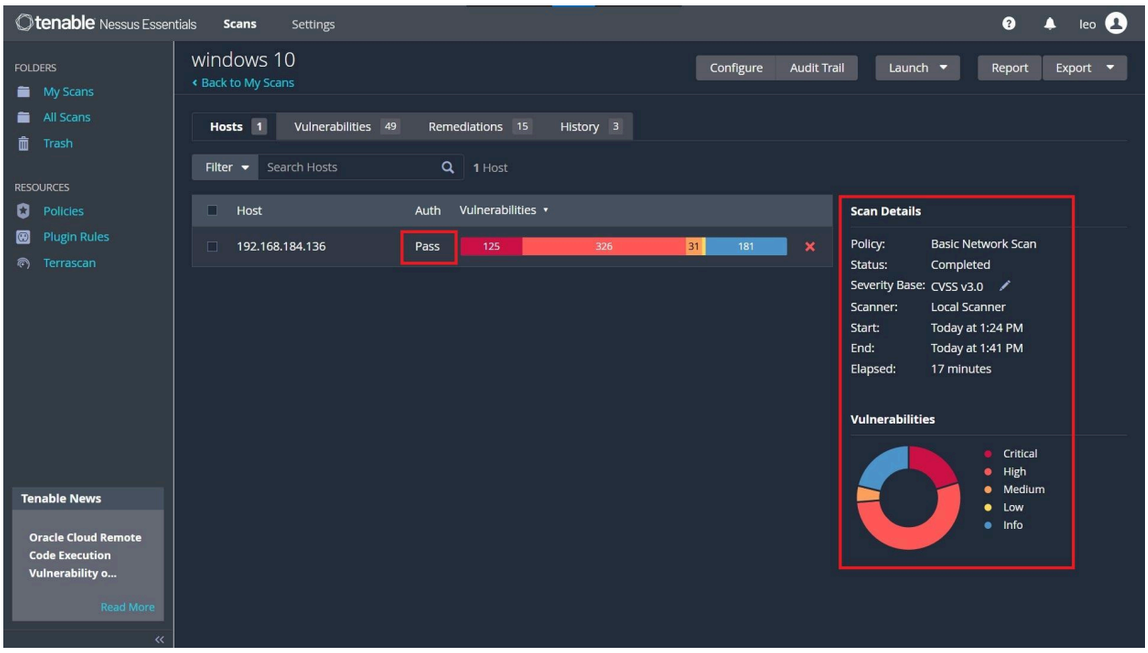
➔ **File and Printer Sharing:** Firewall rules enabled

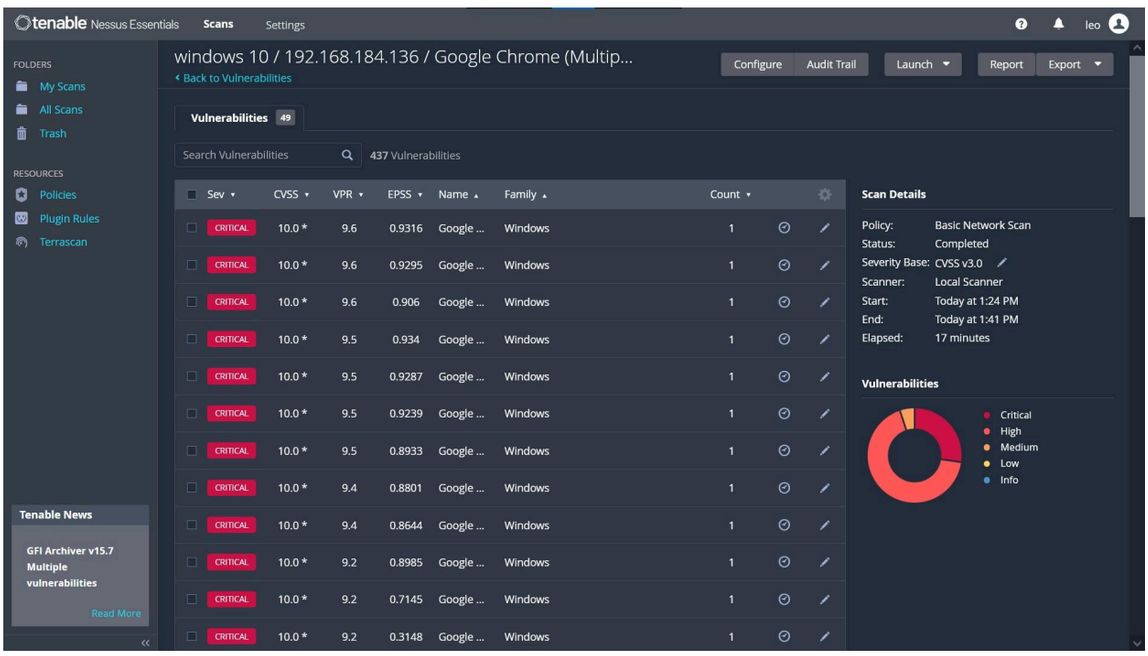
Reviewing results and remediation steps

After scanning, Nessus reported:

- **49 vulnerabilities**, including **Critical**, **High**, and **Medium** severity issues
- Several related to **Google Chrome** missing updates

Use the listed **CVE IDs** to search for more info online — they provide detailed technical references and write-ups.





To remediate vulnerabilities:

- ❖ **Resume Windows Updates**:
  - ➢ Go to **Settings > Windows Update > Resume Updates**
- ❖ **Update vulnerable software**:
  - ➢ Open outdated apps (e.g., Chrome)
  - ➢ Navigate to **Settings > About** and check for updates
- ❖ **Remove intentionally outdated software** once testing is complete

After applying patches and updates, run a **final credentialed scan** to confirm improvements and validate that vulnerabilities have been mitigated.

🎉 Vulnerability Remediation Completed

Congratulations you've successfully completed this vulnerability detection and remediation exercise!

After applying the necessary remediation steps,

Throughout this hands-on project, you've learned to:

- Use **Nessus** for vulnerability scanning
- Interpret scan results effectively
- Remediate discovered vulnerabilities
- Validate fixes with a follow-up scan