

Foundational Virtual Network Lab

Complete Step-by-Step Implementation Guide

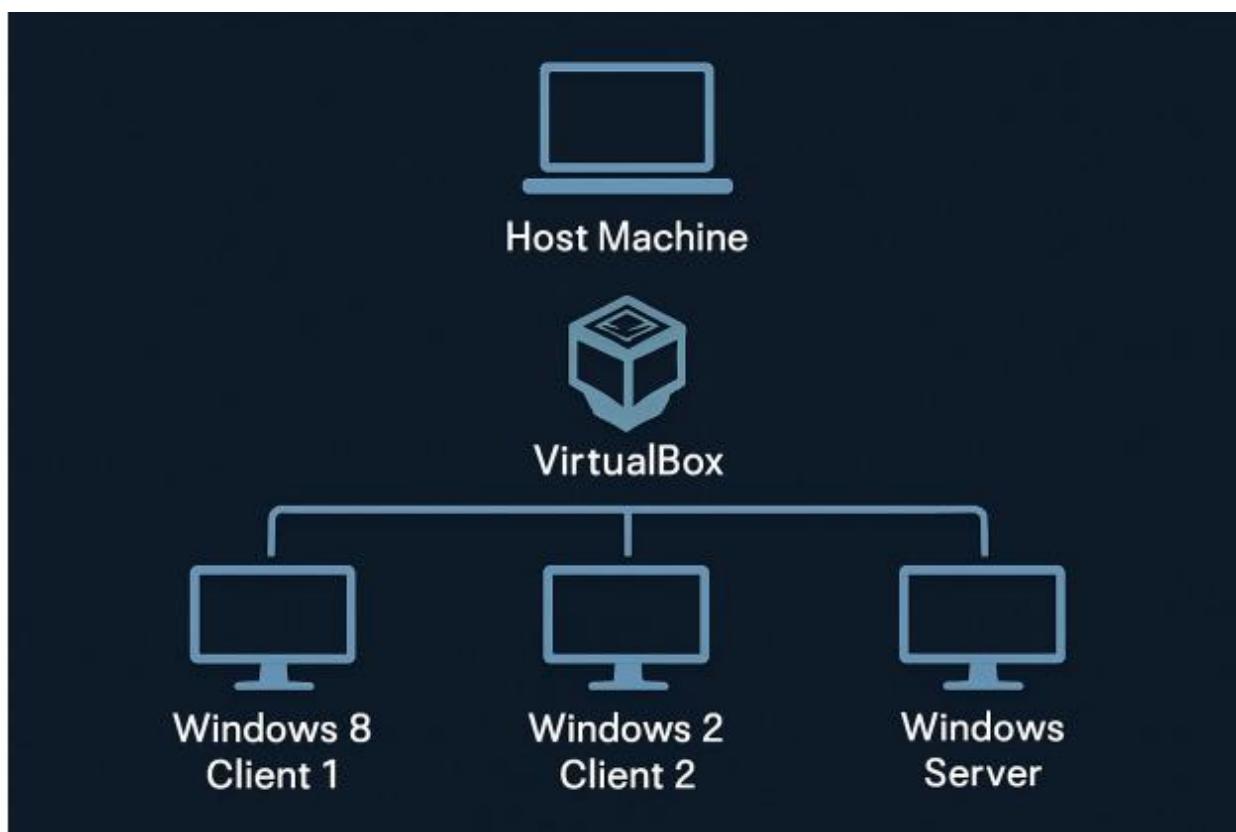
1. Lab Overview

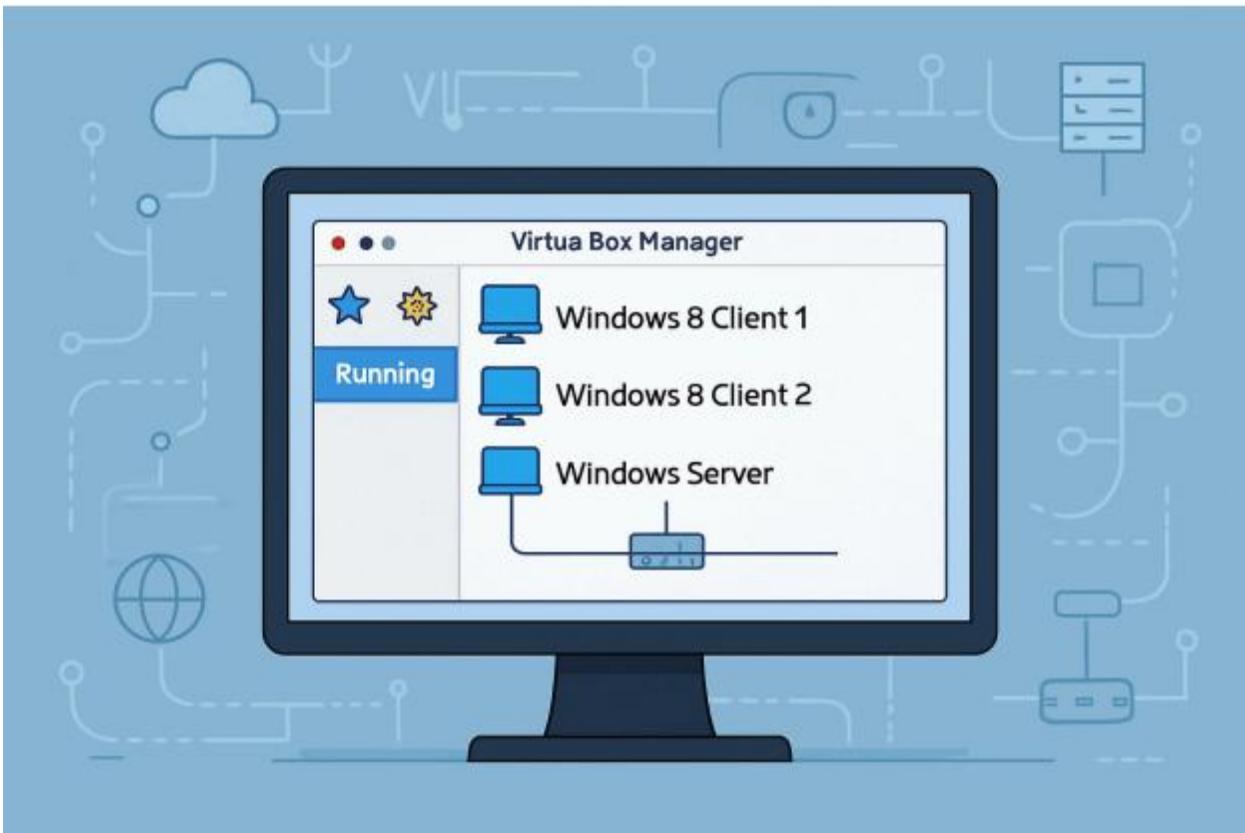
This lab establishes a foundational virtual network environment designed for hands-on cybersecurity training. The objective is to create a safe, isolated environment where system administration, monitoring, and security concepts can be practiced without affecting production systems.

The environment consists of:

- **Host Machine**
- **Oracle VirtualBox (Hypervisor)**
- **1 Windows Server 2022 VM**
- **2 Windows 8 Client VMs**

This setup simulates a basic enterprise office network where clients communicate with a centralized server.





Phase 1: Installing Oracle VirtualBox

Step 1: Download VirtualBox

1. Navigate to the official Oracle VirtualBox website.
2. Click on **Downloads**.
3. Scroll to the **VirtualBox Platform Packages** section.
4. Select the installer that matches your host operating system.
 - In this case: **Windows Hosts**
5. Download the .exe file.

Step 2: Install VirtualBox

1. Locate the downloaded .exe file.
2. Double-click to launch the installer.
3. The **Oracle VM VirtualBox Setup Wizard** opens.
4. Click **Next**.
5. Accept the License Agreement.
6. Click **Next**.
7. Leave the installation directory as default (recommended).
8. Click **Next**.
9. Review any network interface warnings.
 - Approve network driver installation.
10. Click **Install**.
11. Allow Windows to install required dependencies.
12. When installation completes, click **Finish**.
13. Launch VirtualBox to confirm successful installation.

VirtualBox Manager should now display an empty VM environment ready for configuration.

Powerful open source virtualization

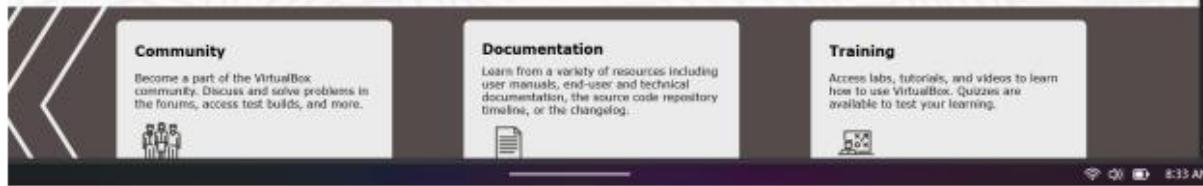
For personal and enterprise use

VirtualBox is a general-purpose full virtualization software for x86_64 hardware (with version 7.1 additionally for macOS/Arm and with version 7.2 also for Windows/Arm), targeted at laptop, desktop, server and embedded use.

Get Started

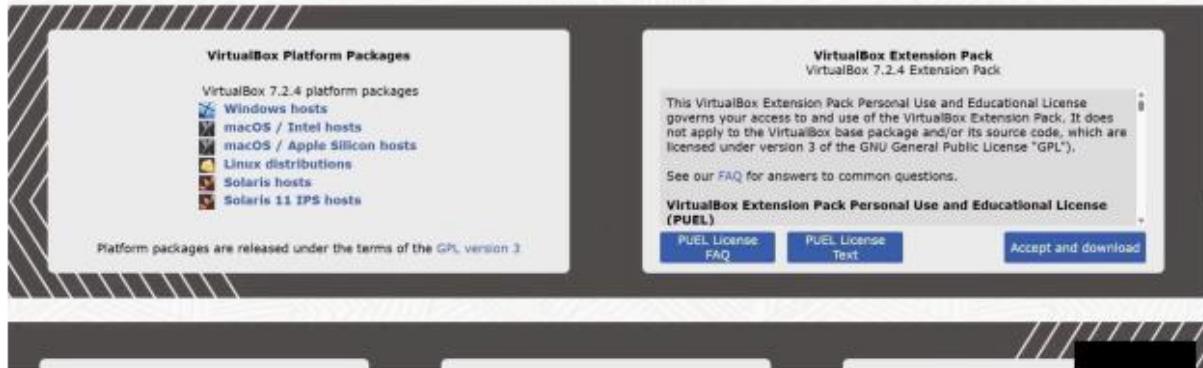
[Download](#)

Download VirtualBox binaries and platform packages

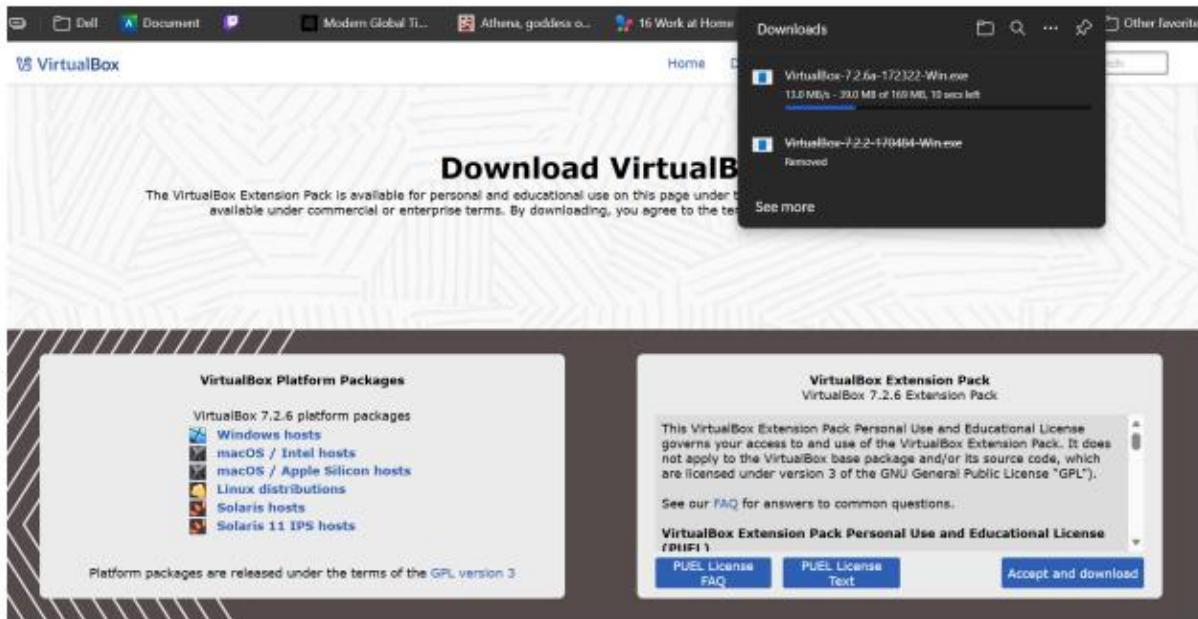


And scroll down the page to select the installer that matches my primary computer.

The VirtualBox Extension Pack is available for personal and educational use on this page under the PUEL license. The VirtualBox Extension Pack is also available under commercial or enterprise terms. By downloading, you agree to the terms and conditions of the respective license.



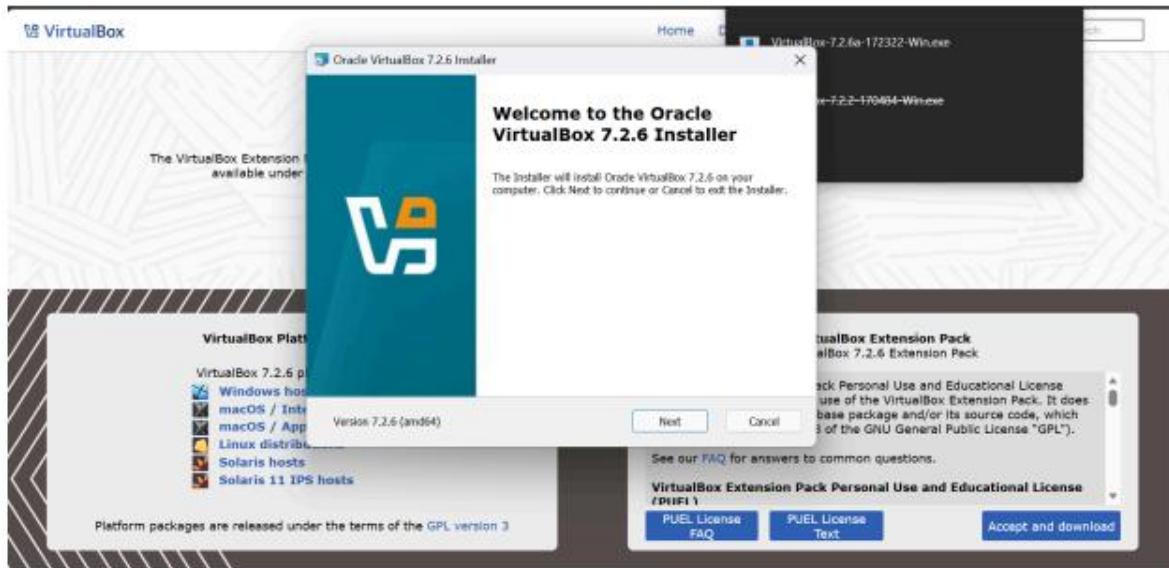
I selected the **Windows hosts** option, which initiated the download of the VirtualBox executable (.exe) file. This package serves as the core component for building my virtual lab environment.



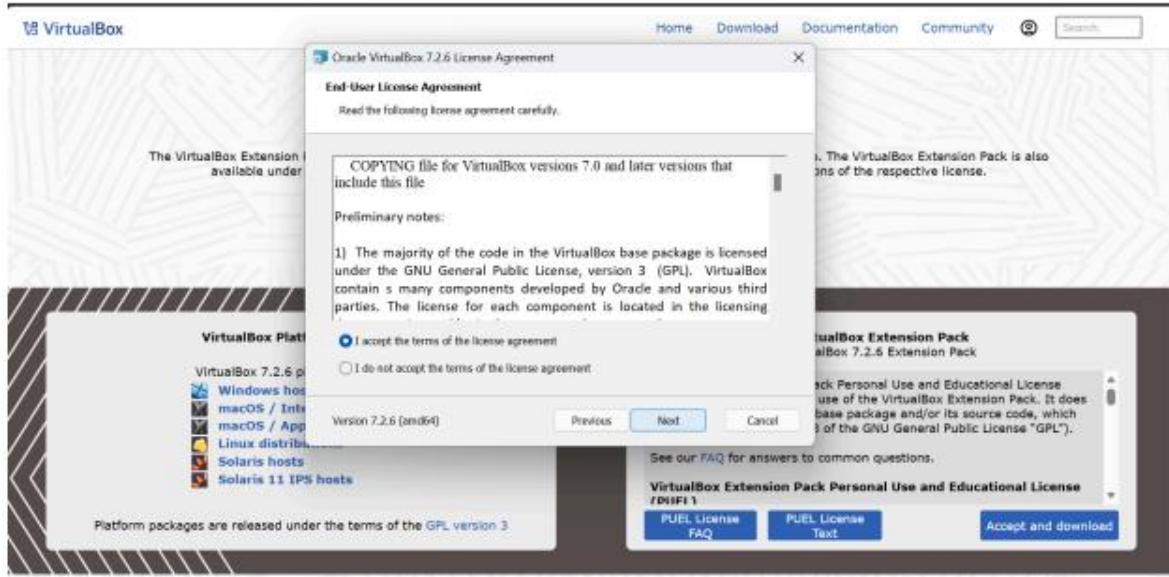
Once the download is complete,



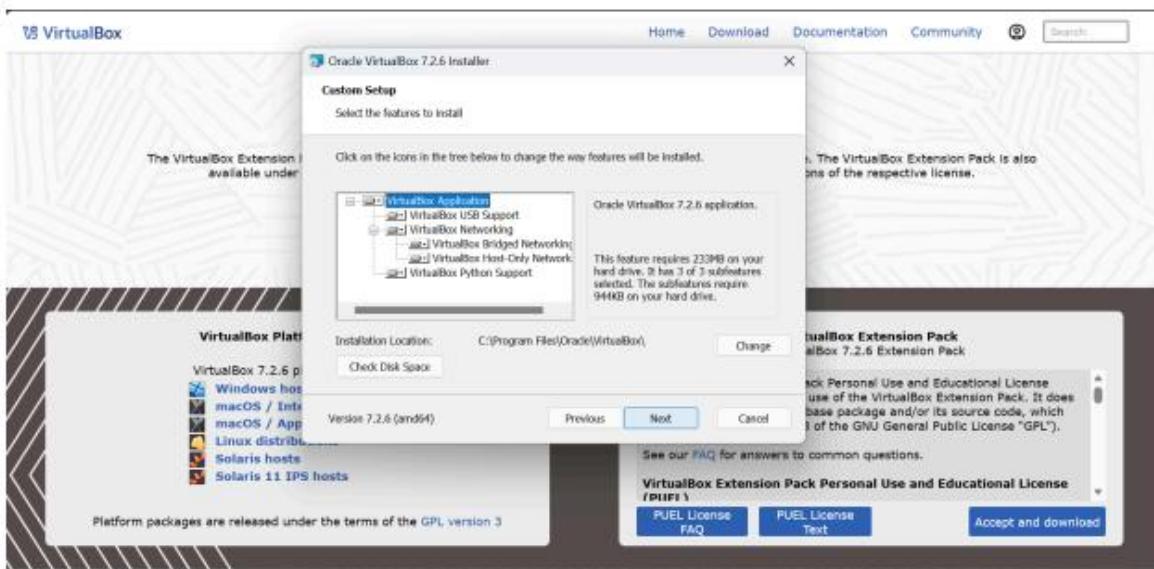
I launched the executable to begin the installation process, which opened the screen titled “Welcome to the Oracle VM VirtualBox Setup Wizard.”



Then, I clicked next and I got the license agreement page.



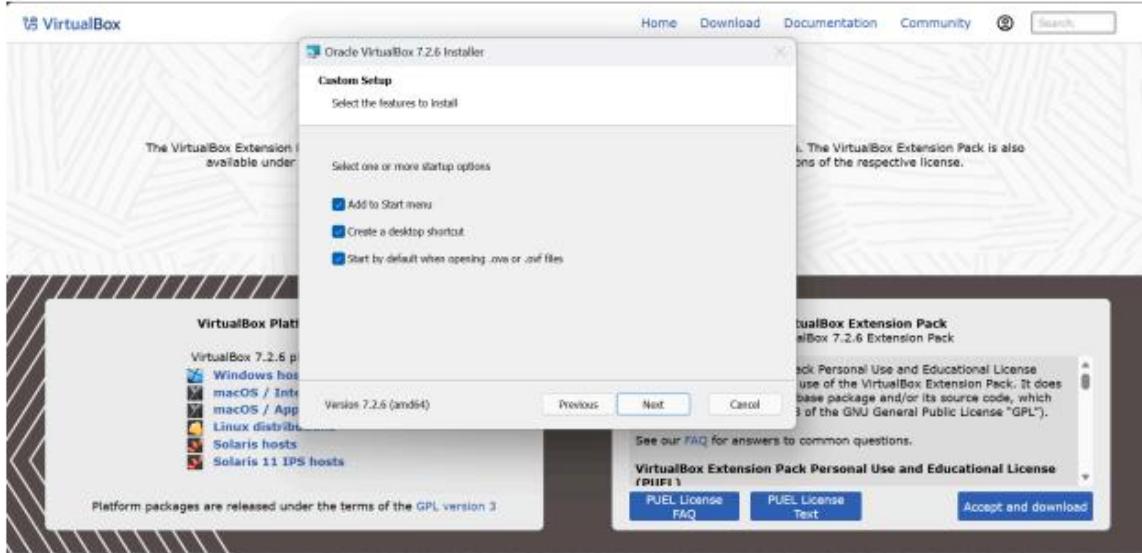
I accepted the prompt and proceeded by clicking **Next**. On the following screen, I was given the option to change the installation directory, but I kept the default location and continued by selecting **Next** again.



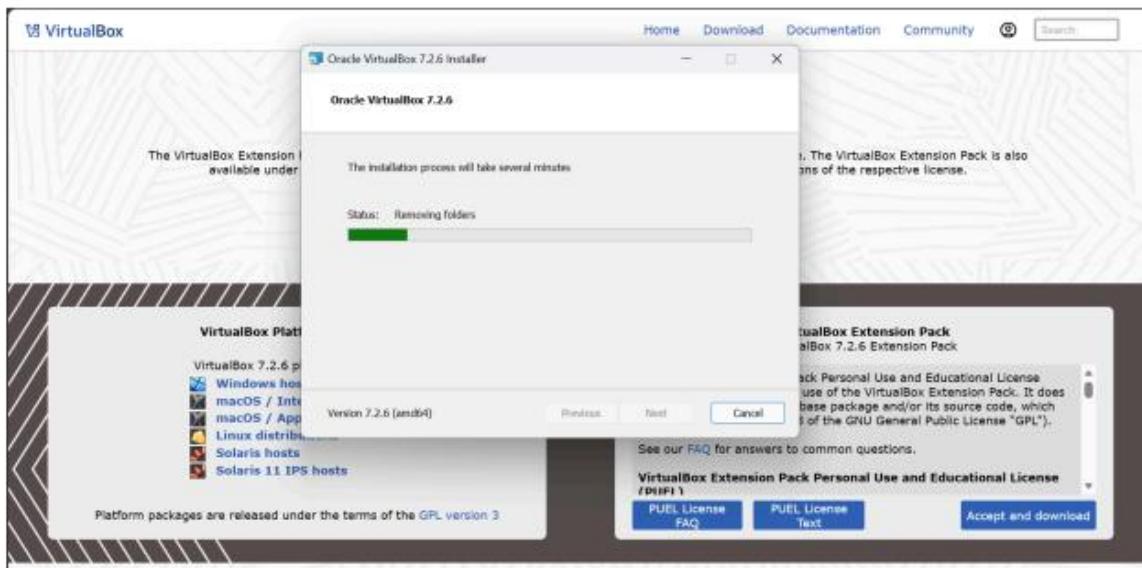
I got the warning page and after going through it, I clicked yes.



The next screen appeared, and after reviewing the information, I selected Yes to allow the installation of the required dependencies.

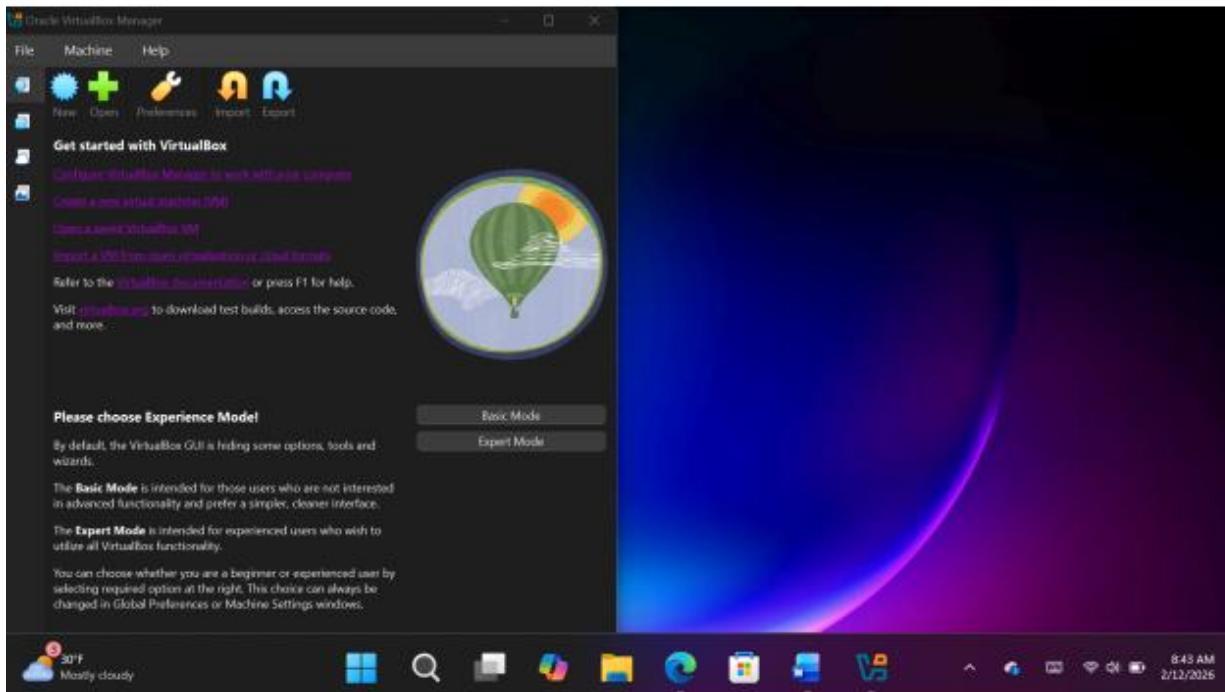


I was then taken to the final installation screen, where I clicked **Install** to begin the setup process.



I clicked next and the installation began

Then the installation of the VirtualBox was completed and I clicked finish.



This was the preview after launching the software.

Phase 2: Downloading and Installing Windows Server 2022

Stage 1: Download Windows Server ISO

1. Open a web browser.
2. Search for **Windows Server 2022 download**.
3. Navigate to the Microsoft Evaluation Center.
4. Select:
 - **ISO download**
 - **64-bit edition**
5. Confirm language selection.
6. Download the ISO file.
7. Wait for the download to complete.

The ISO file will be used as the installation media for the virtual machine.

A screenshot of a web browser window with a dark theme. The search bar at the top contains the query "window server download". Below the search bar, there are several navigation links: AI Mode, All, Videos, Images, News, Shopping, Short videos, More, and Tools. The main content area displays search results for "windows server download". A snippet from Microsoft's Windows Server 2022 Evaluation Center page is shown, featuring the Microsoft logo, a link to "Windows Server 2022 | Microsoft Evaluation Center", and a brief description: "Select your Windows Server 2022 download. Prerequisites, Installation Guidelines, After installation, install the latest servicing package. [Read more](#)".

Please select your Windows Server 2022 download

English (United States)	ISO downloads 64-bit edition >	VHD download 64-bit edition >	Try on Azure Learn more >	Create a VM in Azure Learn more >
Chinese (Simplified)	ISO downloads 64-bit >			

I selected the 64-bit edition.

Please select your Windows Server 2022 download

English (United States)	ISO downloads 64-bit edition >	VHD download 64-bit edition >	Try on Azure Learn more >	Create a VM in Azure Learn more >
Chinese (Simplified)	ISO downloads 64-bit >			

After confirming my selections, the download of the Windows Server 2022 ISO image began and completed successfully.

Please select your Windows Server 2022 download

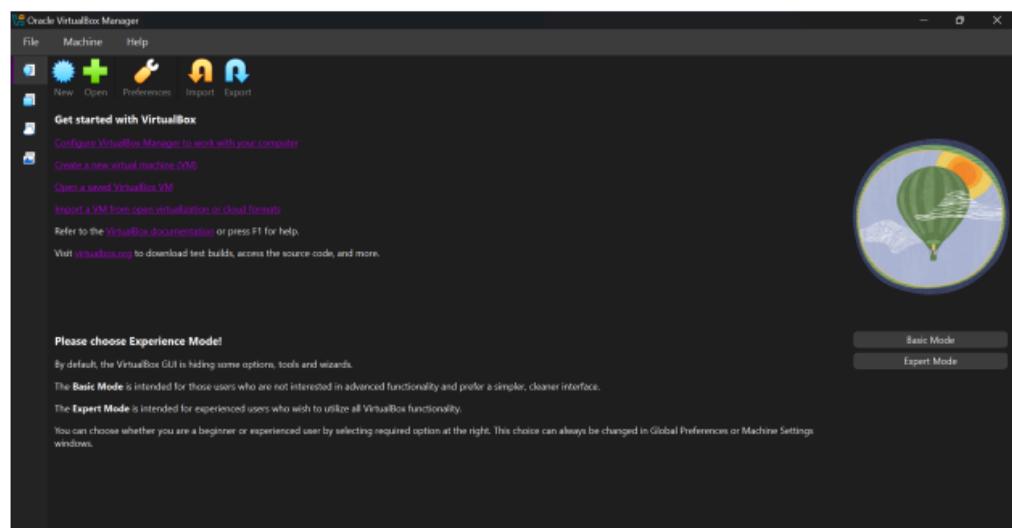
English (United States)	ISO downloads 64-bit edition >	VHD download 64-bit edition >	Try on Azure Learn more >	Create a VM in Azure Learn more >
Chinese (Simplified)	ISO downloads 64-bit >			

Stage 2: Create and Configure Windows Server VM

Step 1: Create New VM

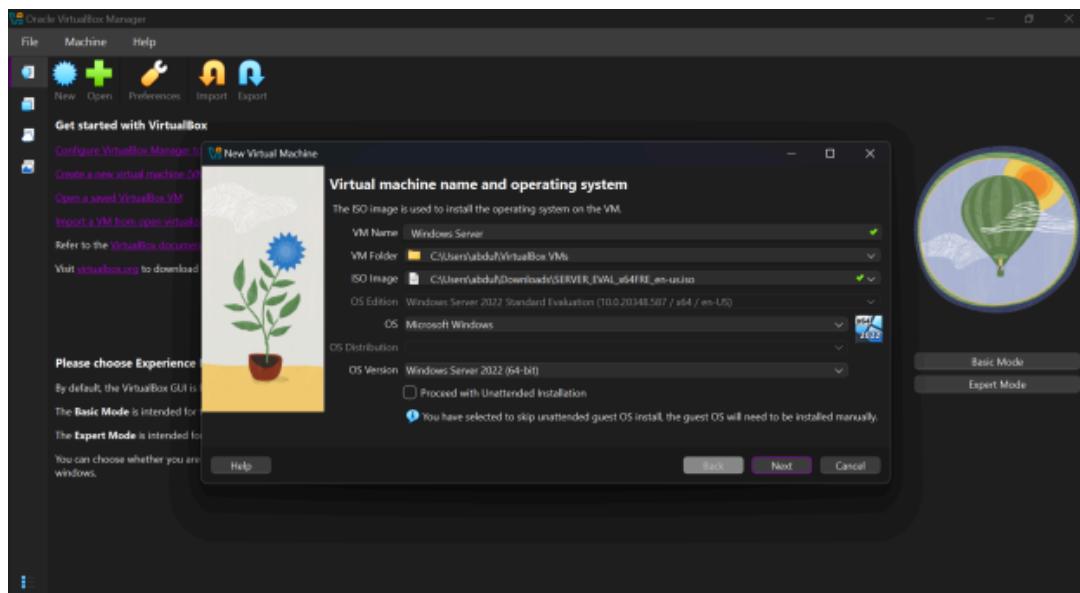
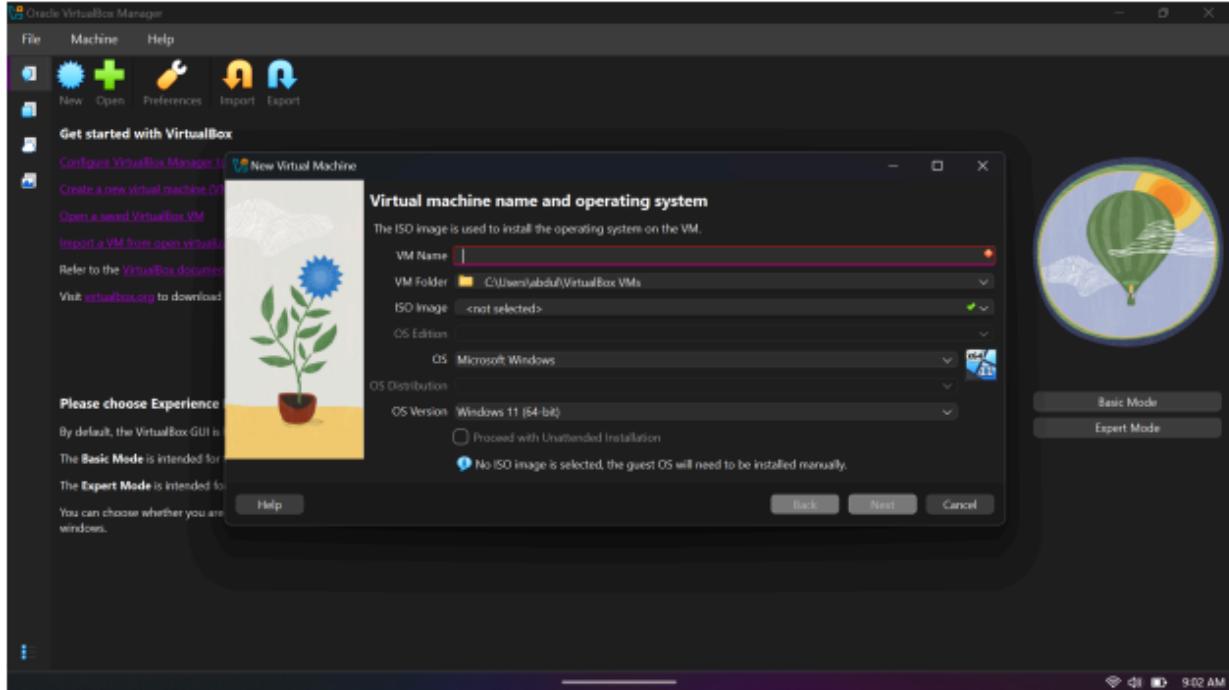
1. Open VirtualBox Manager.
2. Click **New**.
3. Enter VM Name:
 - o Windows Server
4. Select:
 - o Type: Microsoft Windows
 - o Version: Windows Server (64-bit)

5. Click **Next**.



Step 2: Attach ISO File

1. Select the downloaded Windows Server ISO file.
2. Browse to the file location (Downloads folder).
3. Attach the ISO.
4. Disable **Unattended Installation** (to manually control setup).



Step 3: Allocate Hardware Resources

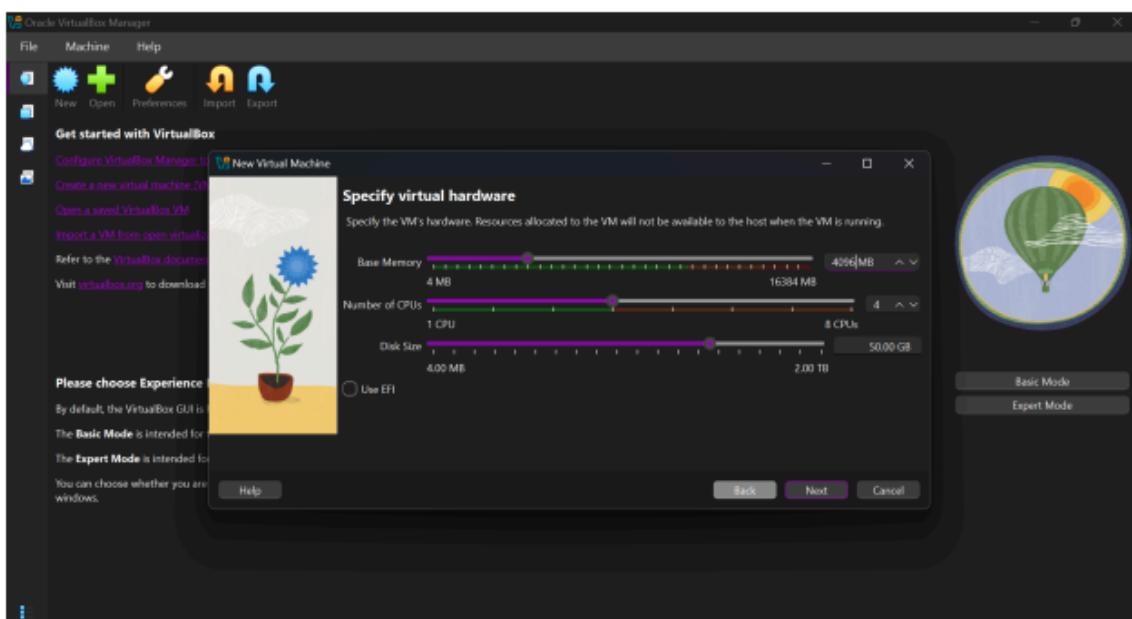
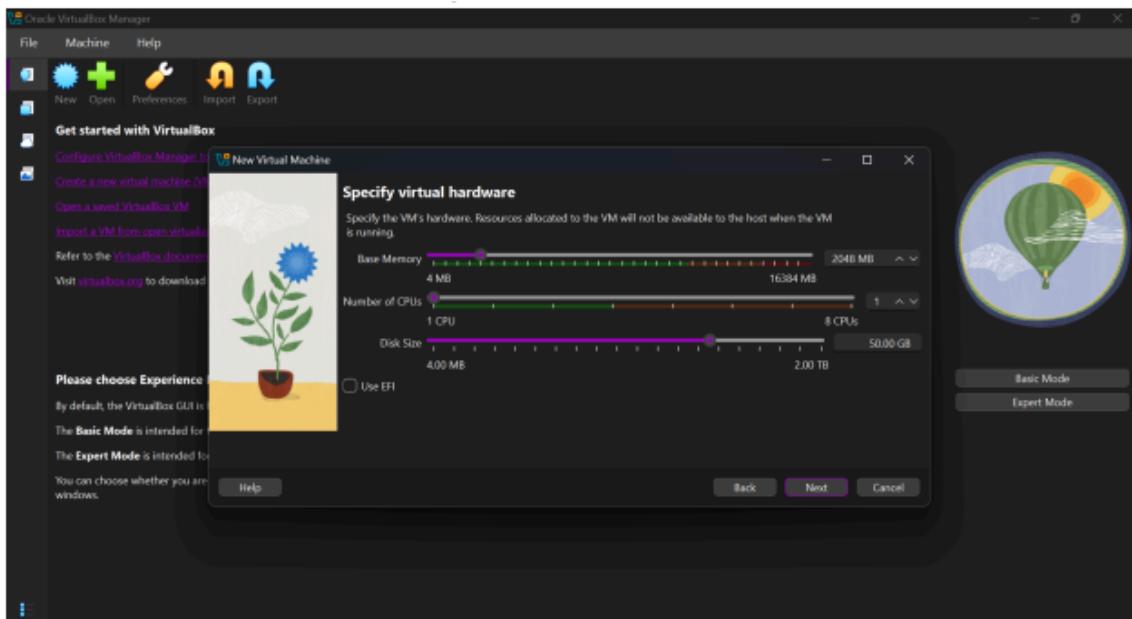
Configure the virtual hardware:

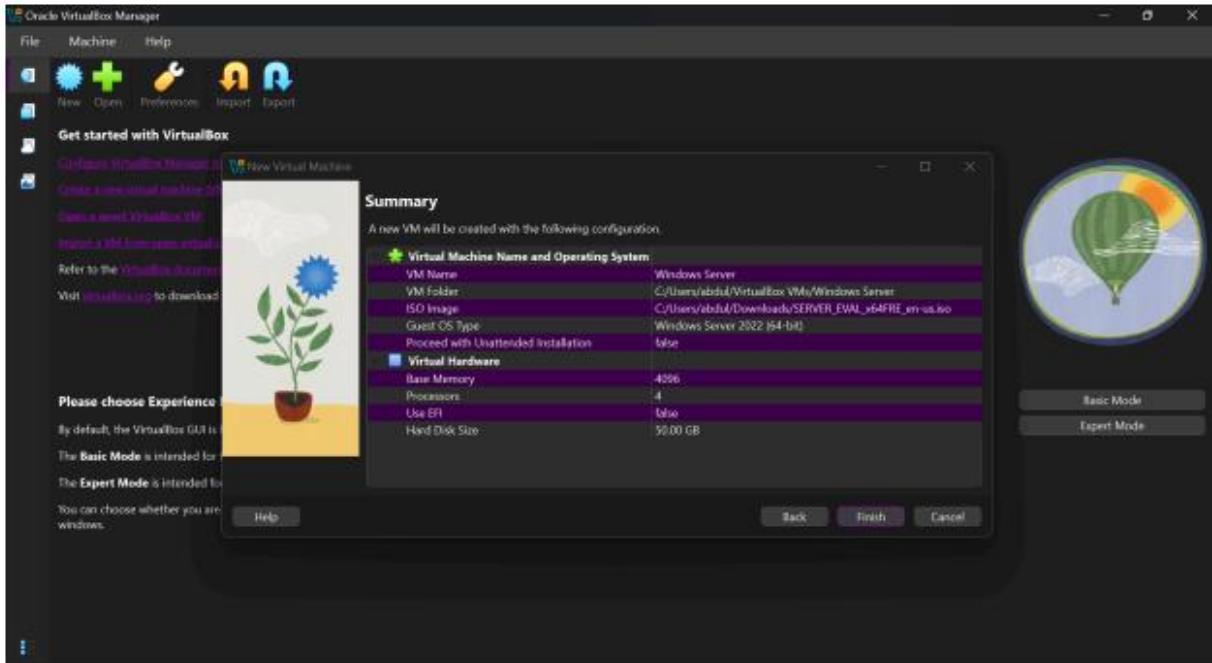
- **Memory (RAM):** 4 GB (4096 MB)
- **Processors (CPU):** 4
- **Virtual Hard Disk:** 50 GB

Note: 4096 GB would be incorrect — the correct allocation is 4096 MB (4 GB).

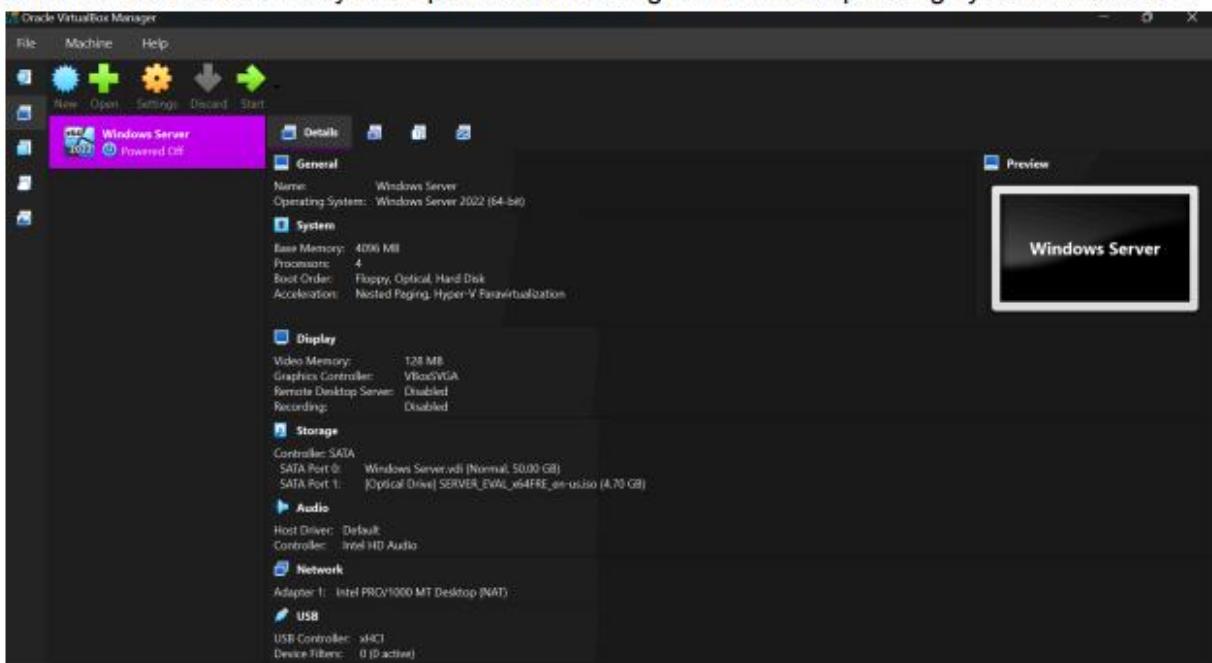
Click **Next**, then **Finish**.

The Windows Server VM is now defined and ready to be powered on for OS installation.





After Completion: By clicking "Finish," the definition of the Windows Server VM was complete, and the machine was ready to be powered on to begin the formal operating system installation.



Phase 3: Downloading and Installing Windows 8 Client Machines

This phase provisions the client systems that will later connect to the server.

Stage 1: Download Windows 8 ISO

1. Search for a Windows 8 ISO file.
2. Ensure you select:
 - o 64-bit version.
3. Download the ISO file.
4. Confirm the file has successfully downloaded.

The screenshot shows the Internet Archive homepage with a search bar at the top. Below it, a search result for "Windows 8 ISO" is displayed. The result title is "Windows 8.1 Professional Original ISOs with Update 3 (x64 and x86)" by Microsoft. It includes a "Show all files" button, a "Favorite" button, a "Share" button, and a "Flag" button. To the right, there are statistics: 350,057 Views, 92 Favorites, and 67 Reviews. A note at the bottom states: "I just noticed that Microsoft recently took down the download link for the Windows 8.1 ISOs; clicking on the link from Google when you search for the windows 8.1 iso will redirect you to some other page on their site".

Upon locating the download source, I ensured the selection was the 64-bit edition. Then I clicked download

The screenshot shows the same search result for Windows 8 ISO files. On the right side, a download progress bar for "Win8.1_English_x64.iso" is visible, showing "2.1 MB/s - 54.7 MB of 4.0 GB, 22 min left". Below the progress bar, there are links to other files: "SERVER_EVAL_x64FRE_en-usiso", "VirtualBox-7.2.6a-172322-Win.exe", and "VirtualBox-7.2.2-170404-Win.exe". There is also a "See more" link. At the bottom, there is a "Search" bar and a "Show all files" button.

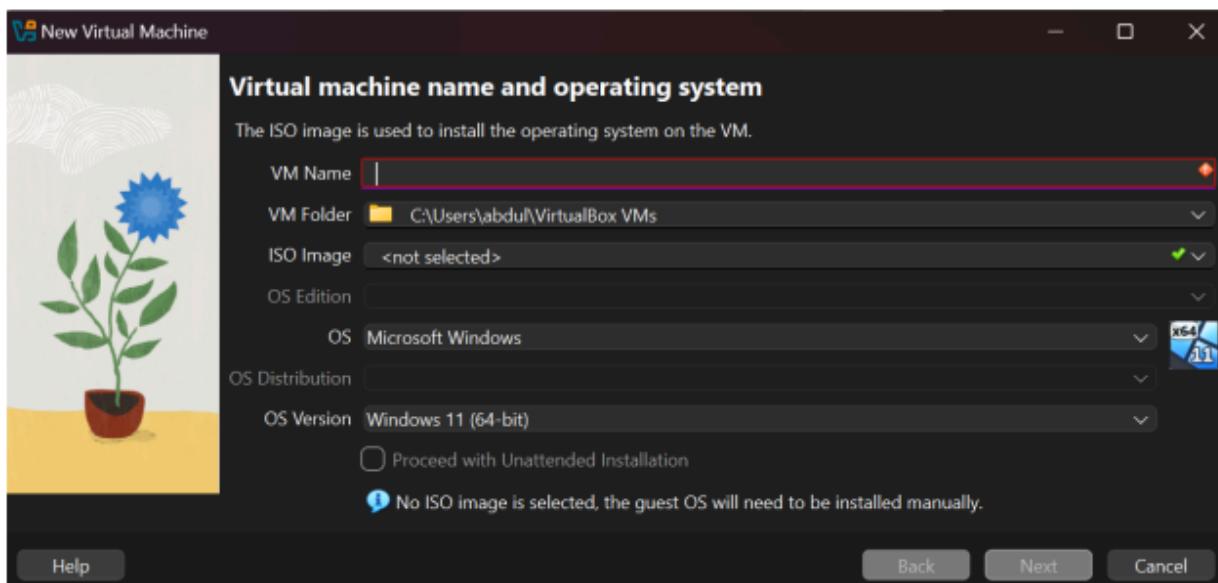
The process concluded with the successful download of the Windows 8 image file (the ISO file), making the software ready for use in VirtualBox.

Name	Date modified	Type
▼ Today		
Win8.1_English_x64.iso	2/12/2026 10:55 AM	Disc Image File
SERVER_EVAL_x64FRE_en-us.iso	2/12/2026 8:59 AM	Disc Image File
VirtualBox-7.2.6a-172322-Win.exe	2/12/2026 8:35 AM	Application

Stage 2: Create Windows 8 Client VM (Repeat for Two Clients)

Step 1: Create New VM

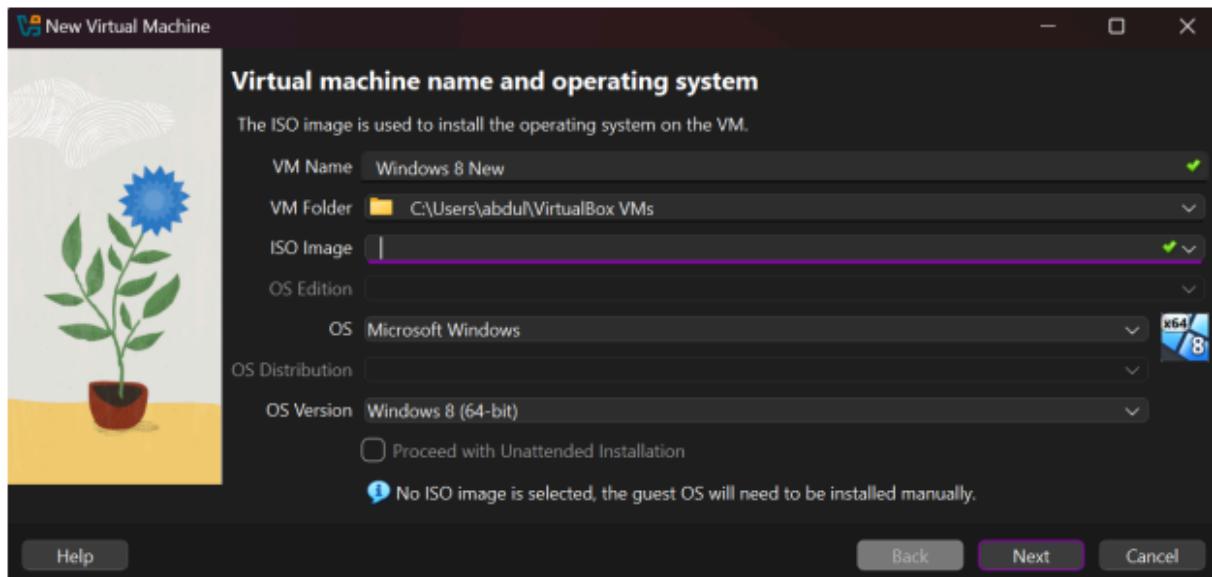
1. Open VirtualBox.
2. Click **New**.
3. Enter VM Name:
 - Windows 8 Client 1
4. Type: Microsoft Windows
5. Version: Windows 8 (64-bit)
6. Click **Next**.



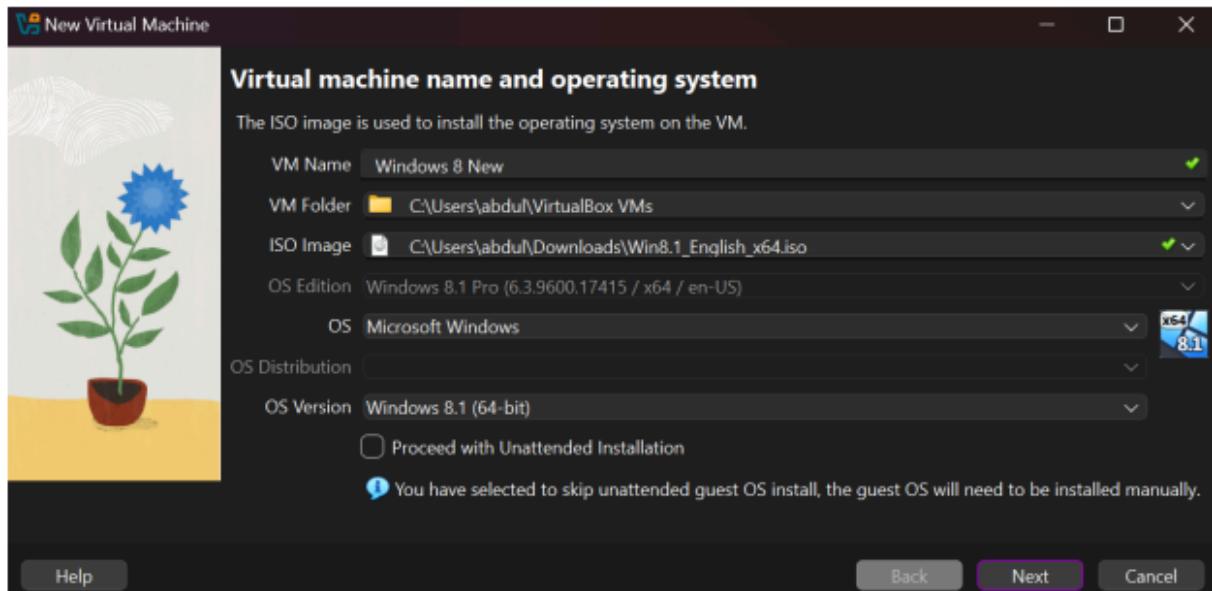
I assigned a virtual Name for the first client to be "Windows 8

Step 2: Attach ISO

1. Select the Windows 8 ISO file.
2. Attach it to the VM.
3. Choose **Skip Unattended Installation** to manually configure setup.



and successfully mounted (connected) the downloaded Windows 8 ISO file to the new virtual machine.



I correctly chose to Skip Unattended Installation to maintain full control over the setup.

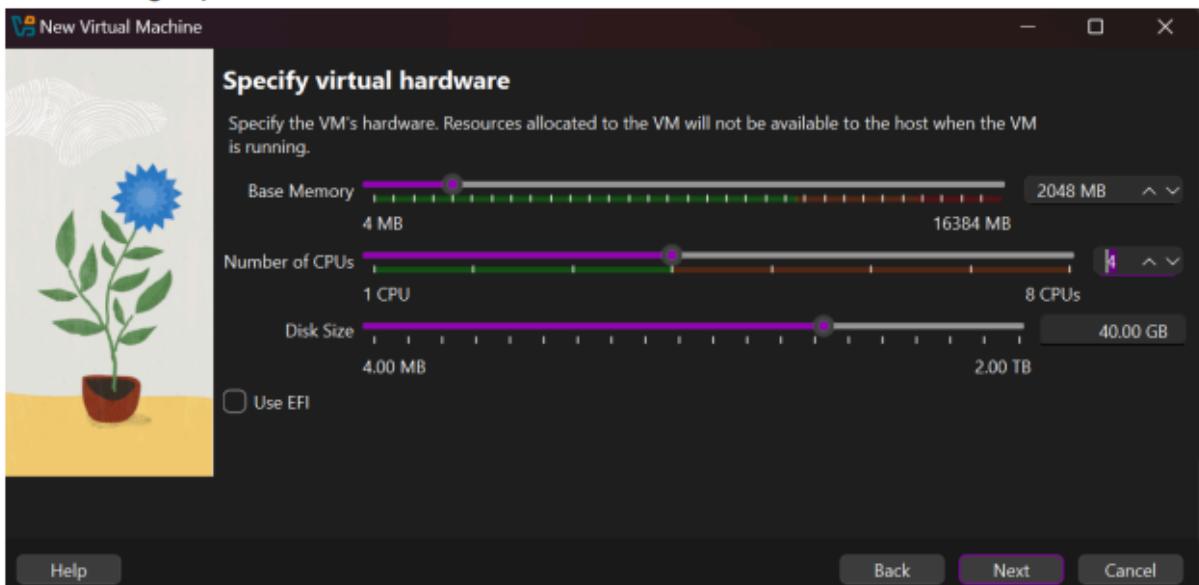
Step 3: Configure Hardware

Allocate resources as follows:

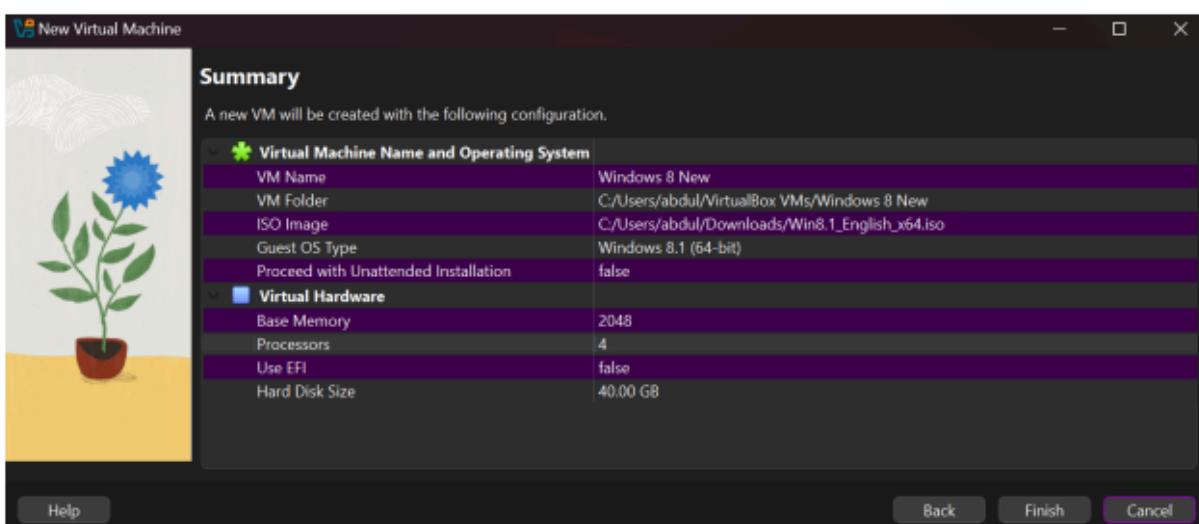
- **Memory (RAM):** 1 GB (1024 MB)
- **Processors (CPU):** 4
- **Virtual Hard Disk:** 40 GB

Click **Next** → **Finish**

virtual storage space.



By clicking "Next" and then "Finish," the configuration for the first Windows 8 VM was saved.



Step 4: Repeat for Second Client

Repeat the same configuration process to create:

- Windows 8 Client 2

