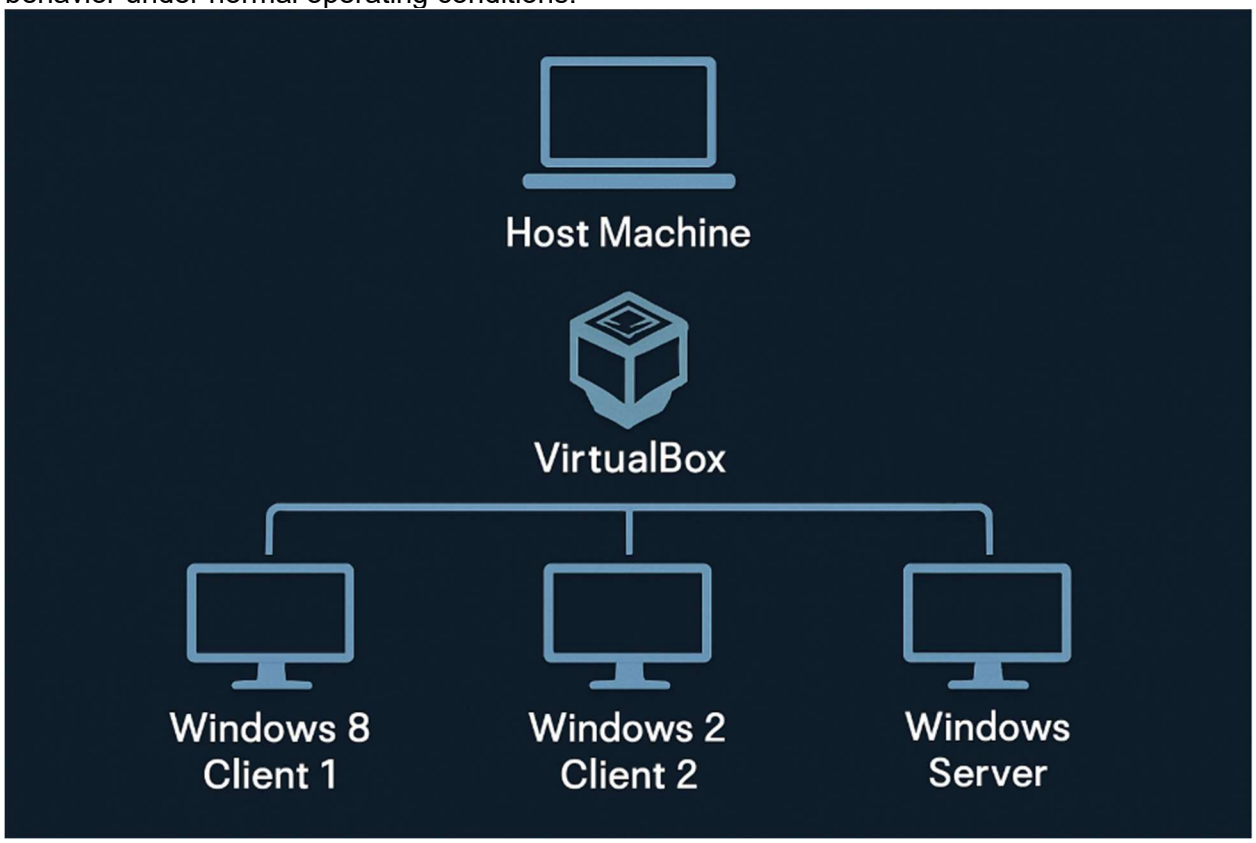
Setting Up the Foundational Virtual Network Lab:

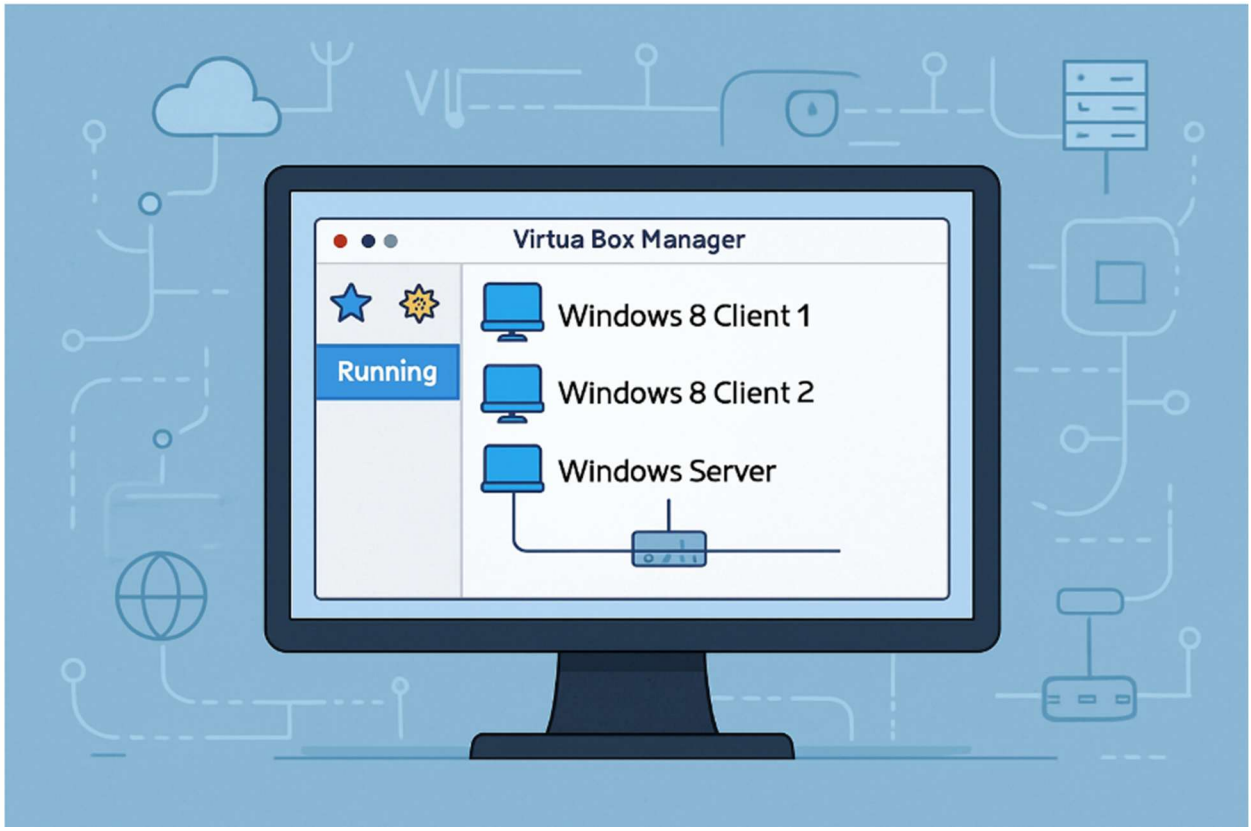
Overview

I am currently in the initial phase of developing a fully functional virtual network lab designed to support structured, hands-on cybersecurity training. The objective is to establish a controlled and isolated environment where security concepts, threat detection, and system monitoring can be exercised without impacting production systems.

The lab is being built using VirtualBox as the hypervisor platform. At this stage, I have successfully provisioned three core assets: two Windows 8 workstations and one Windows Server instance.

The next phase will focus on integrating these systems into a unified virtual network, simulating a baseline enterprise office environment. This will enable deeper analysis of host-to-host communication, access control implementation, authentication flows, and overall network behavior under normal operating conditions.





Let me walk you through how the downloads and installations were done;

Phase 1: Downloading the VirtualBox Platform Package

The first step is to visit the official VirtualBox download page and select the appropriate platform package.

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

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.

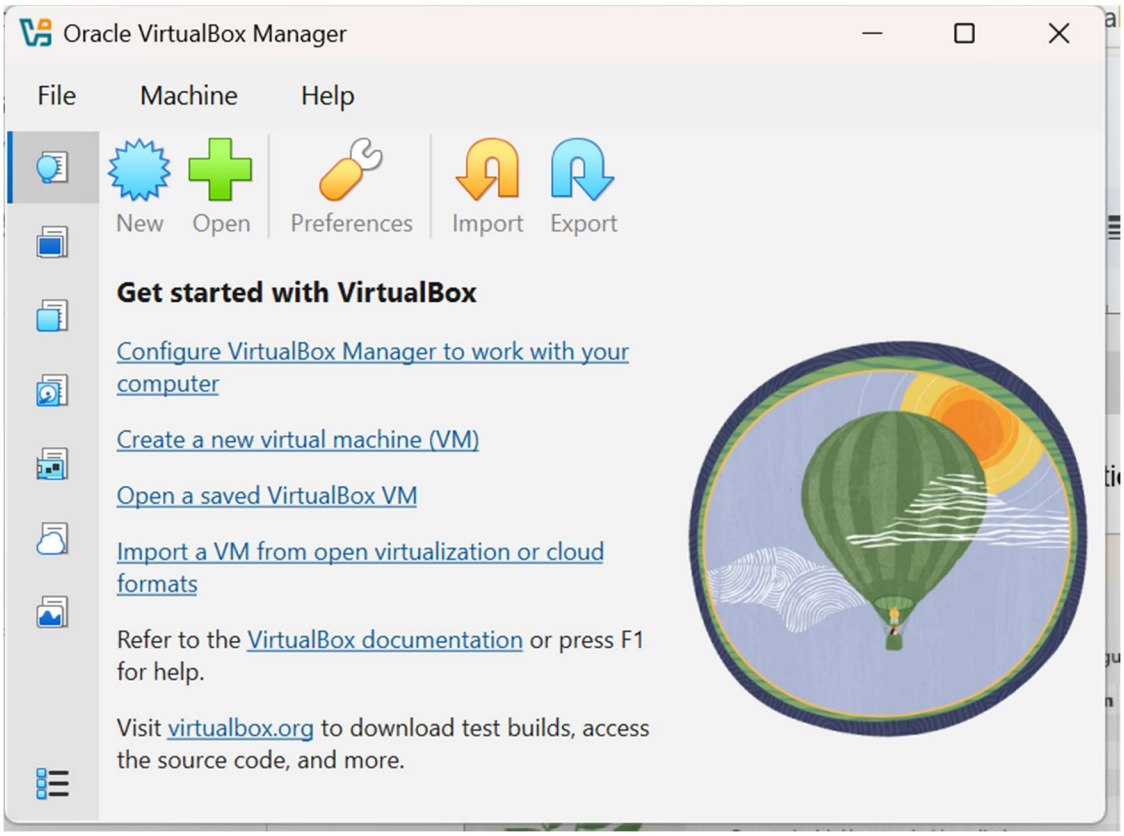
I got the warning page and after going through it, I clicked yes.

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

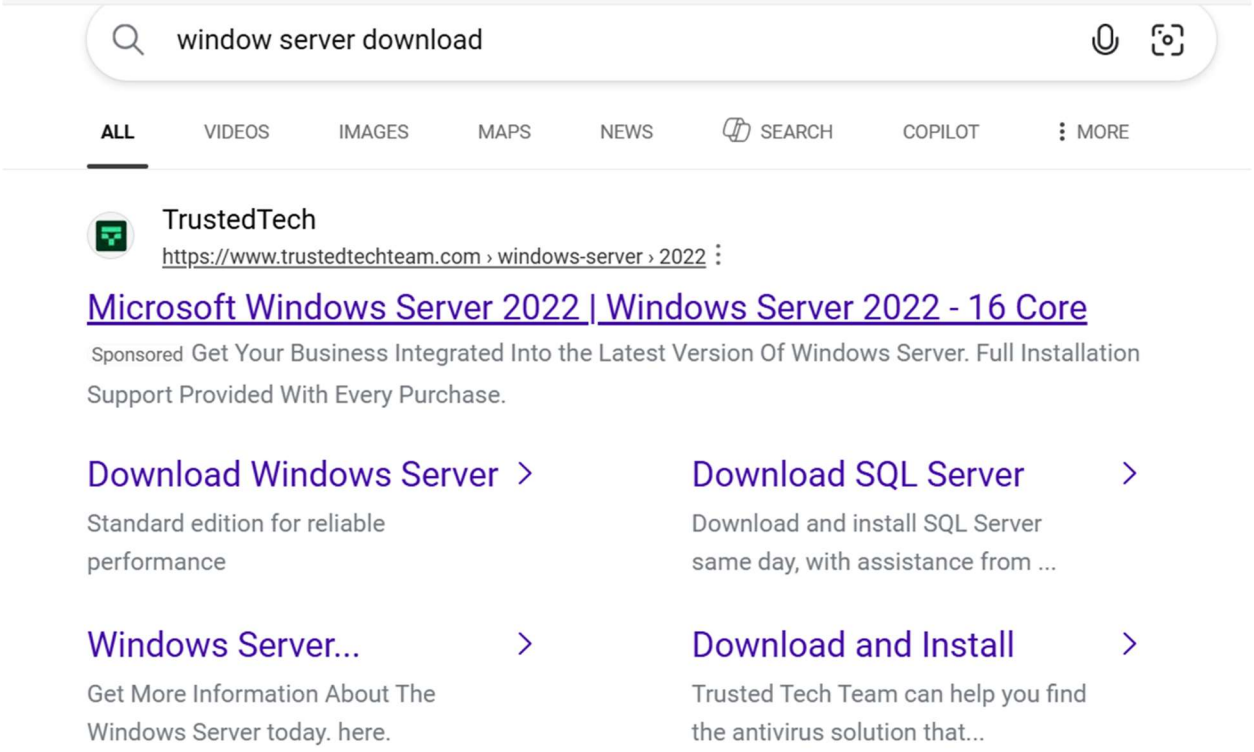
Then the installation of the VirtualBox was completed and I clicked finish.



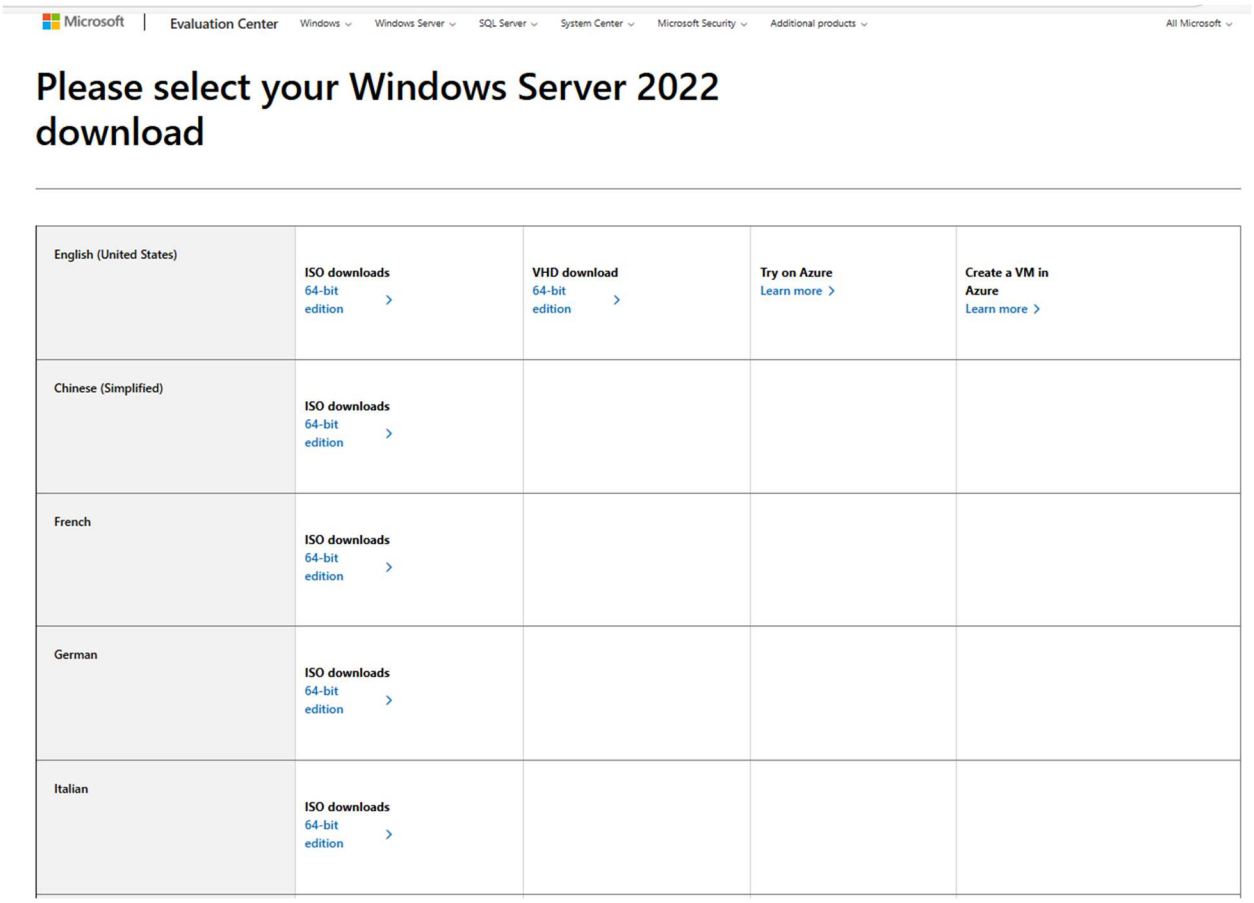
This was the preview after launching the software

Phase 2: **downloading and installing the Windows Server on the VM**

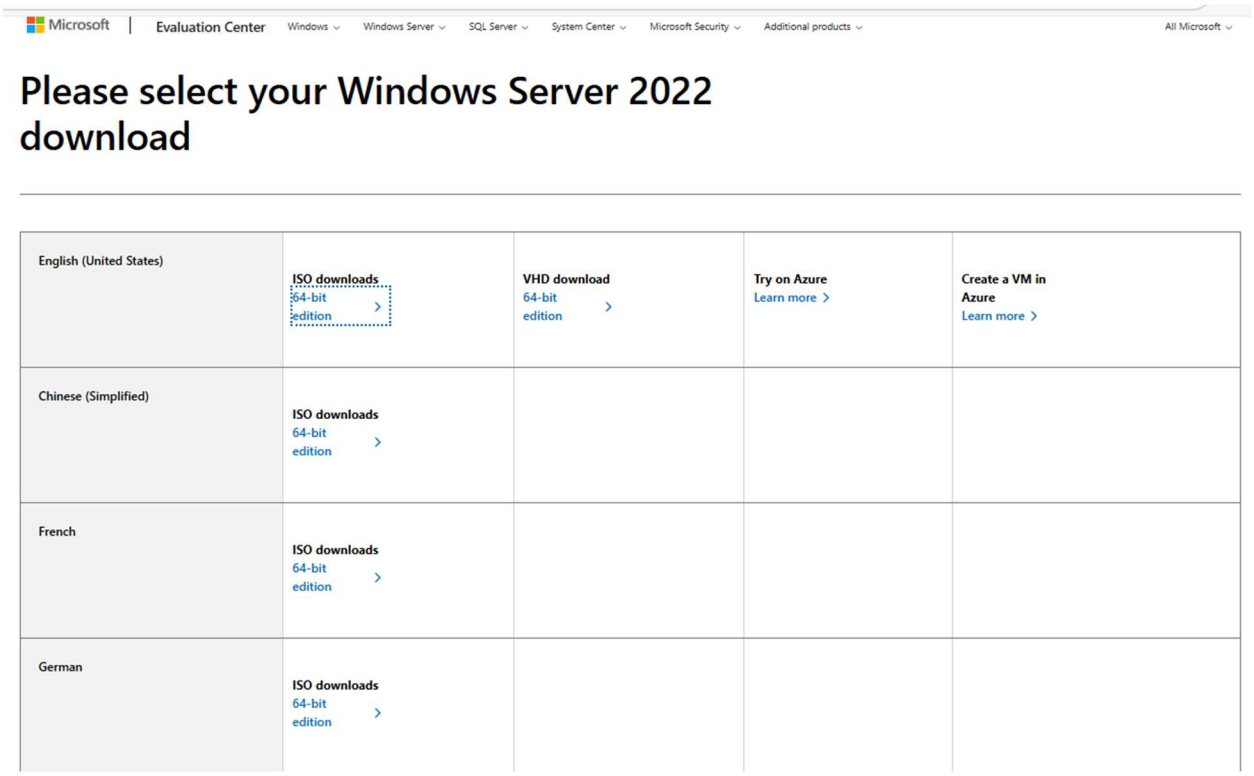
Stage 1: I utilized Google Search to find the installation media for a modern, relevant operating system, selecting Windows Server 2022.



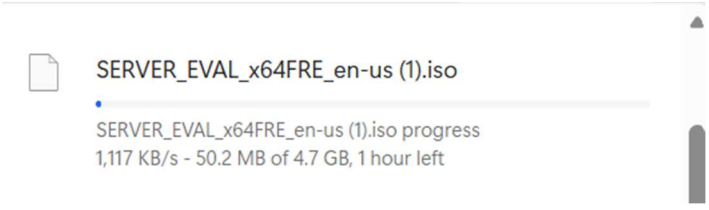
Upon reaching the download page,



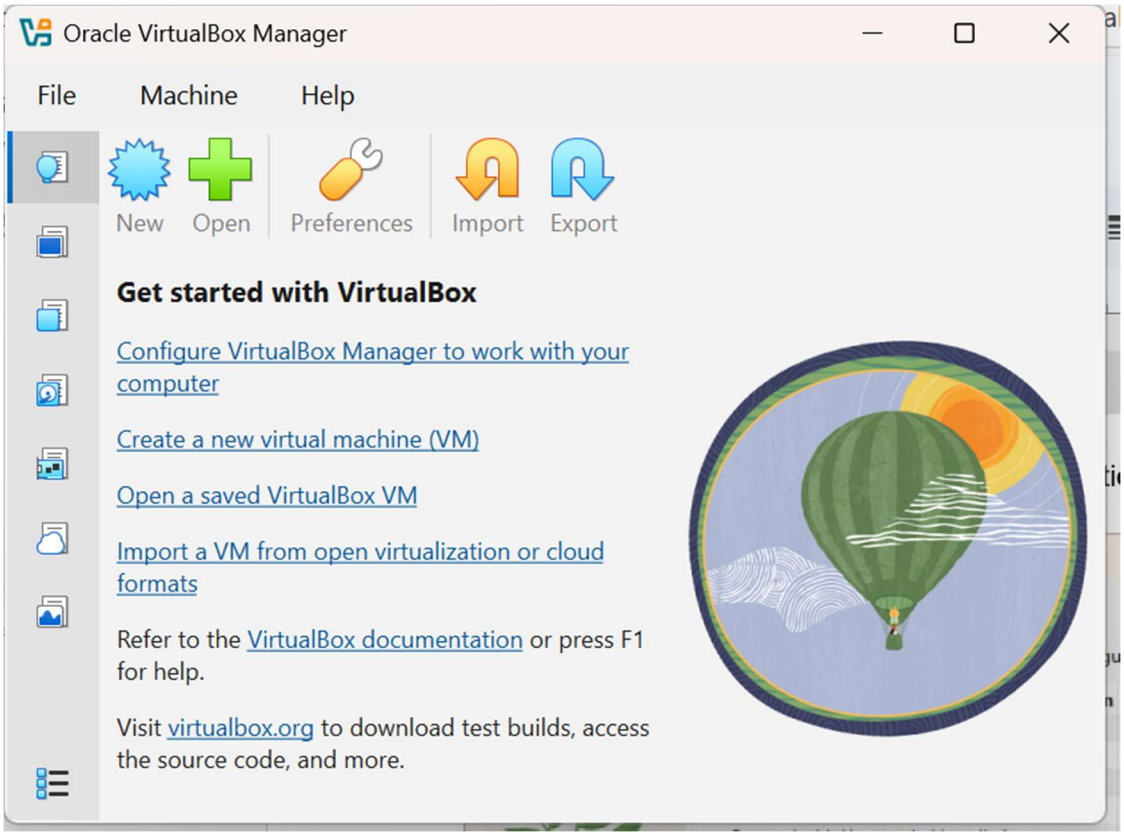
I selected the 64-bit edition.



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

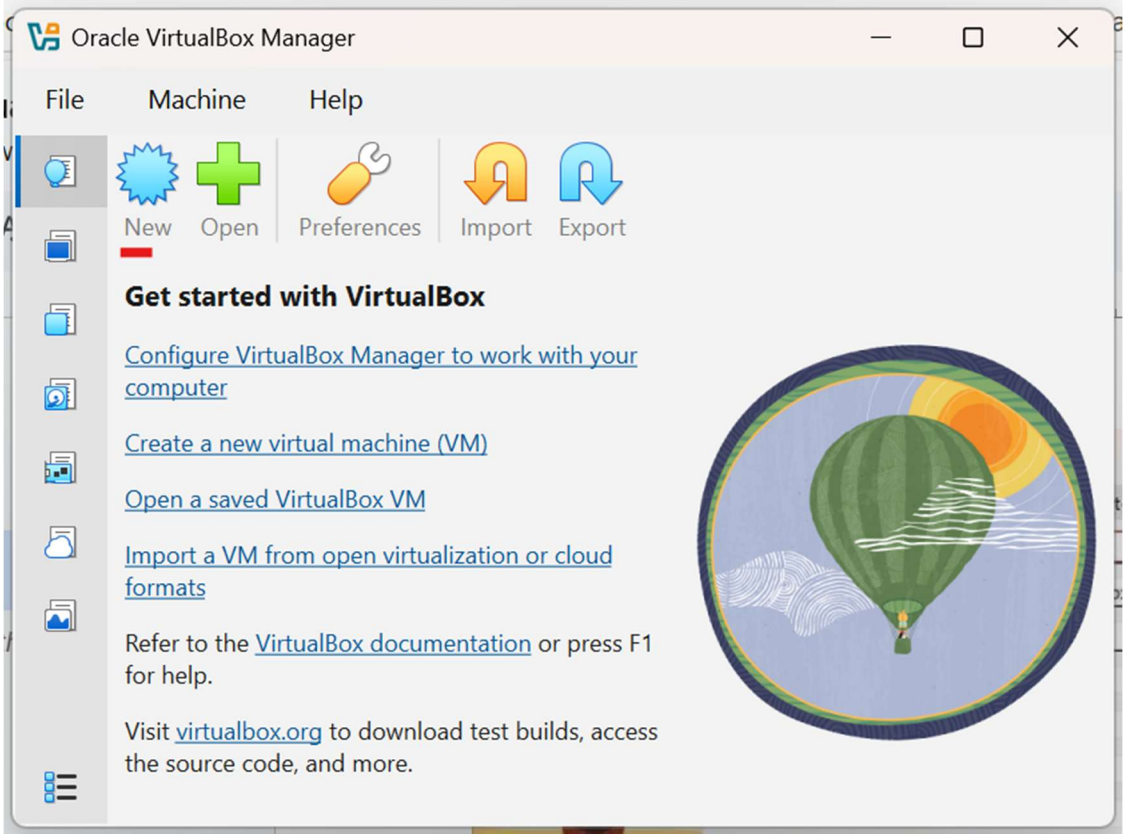


Stage 2: With the server software downloaded, the next step was to return to VirtualBox to create the virtual machine. In the VirtualBox Manager, I selected the **"New"** button, which initiated the setup process. From there, I began assigning virtual resources, including the amount of RAM and hard disk space needed for the new Windows Server system.

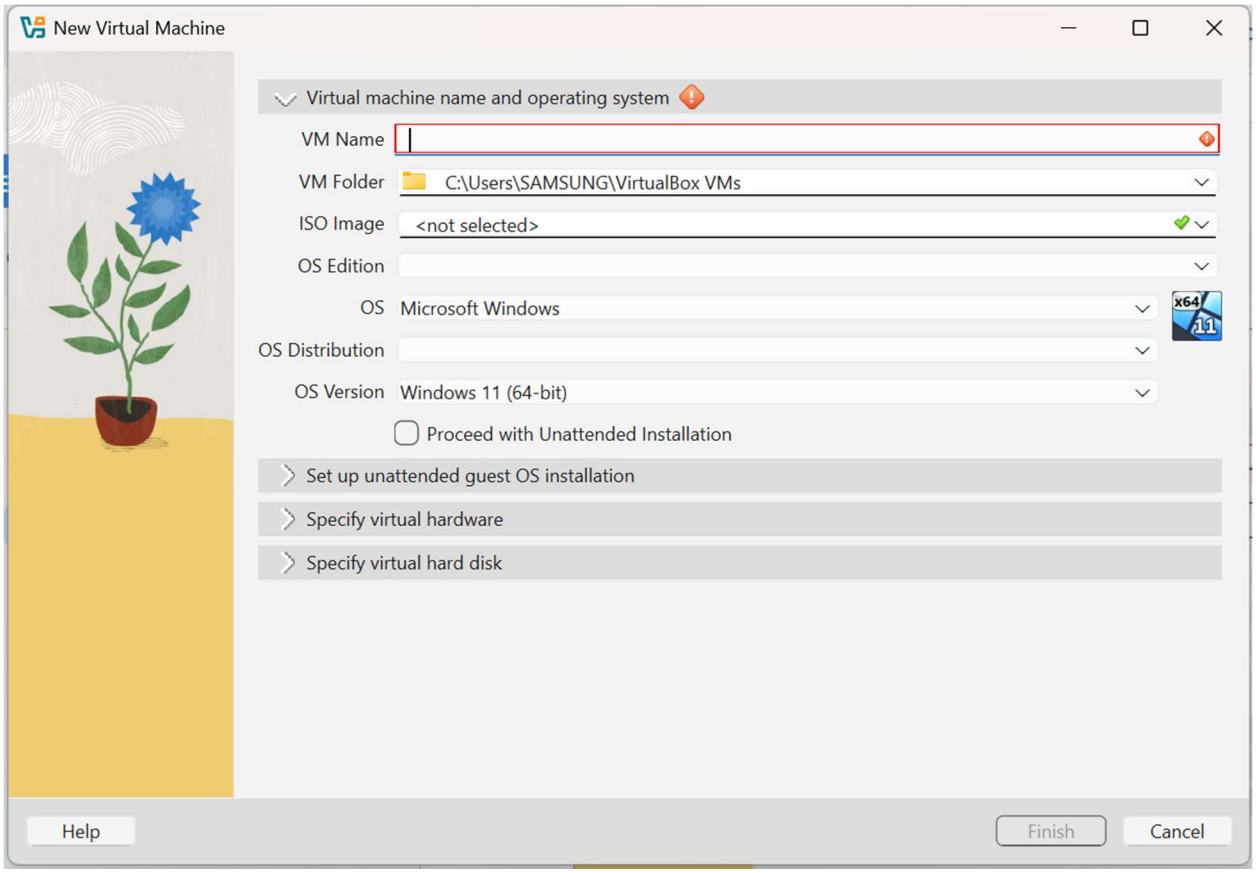


Here's a refined version:

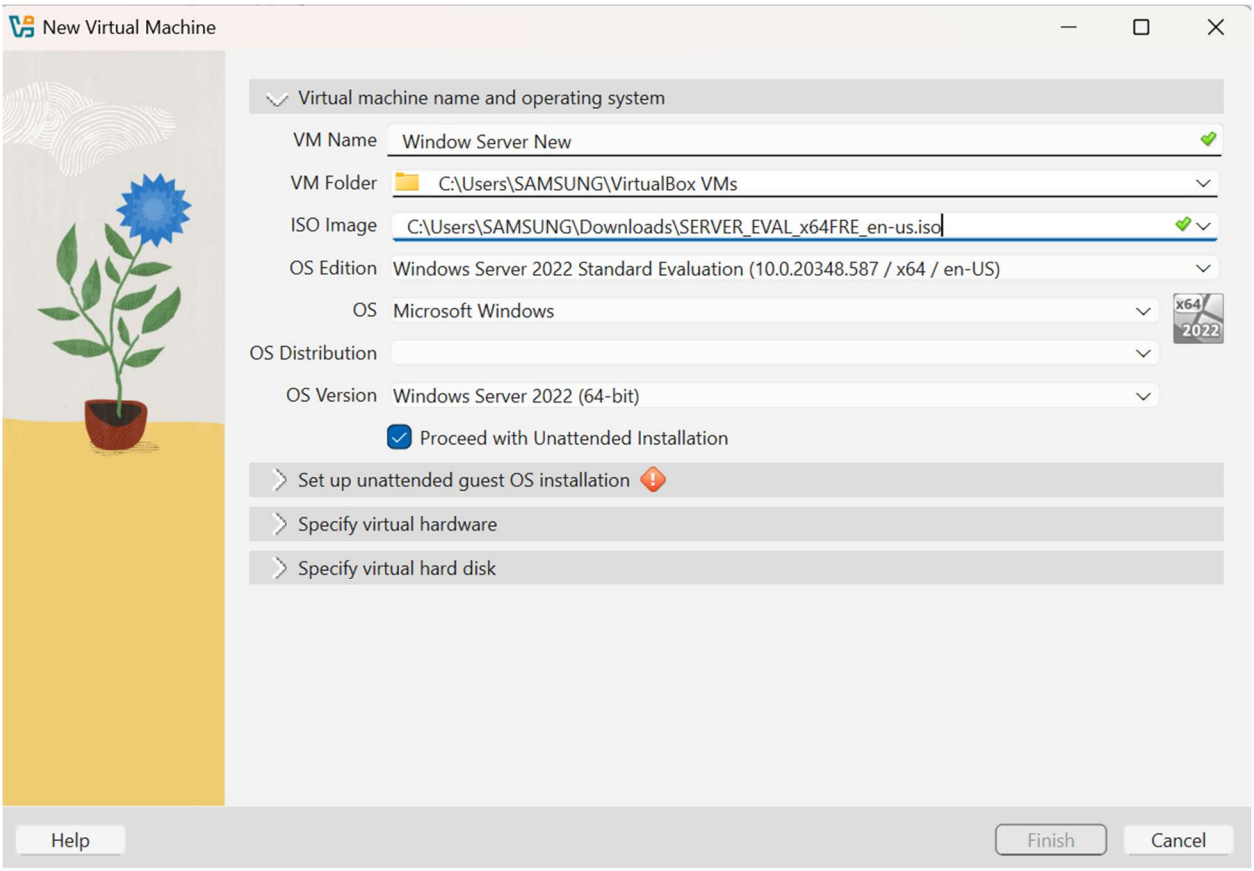
The final step in this stage was to mount the newly downloaded Windows Server 2022 ISO file. Mounting simply means attaching the ISO essentially to a virtual DVD to the virtual machine I created. This enables the VM to detect the operating system installer and begin the setup process once it is powered on.

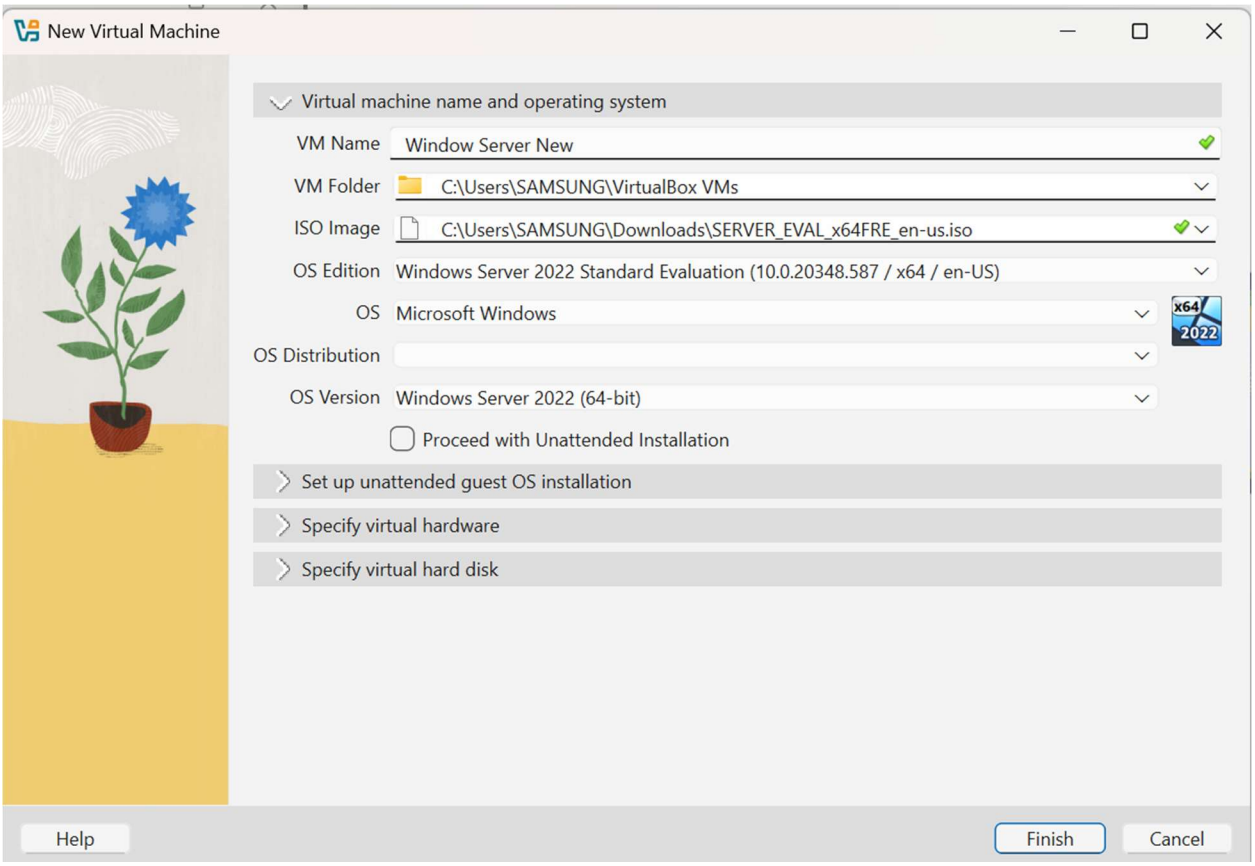


After clicking the “new”, I have a page that involves dedicating specific virtual hardware resources to the new server.

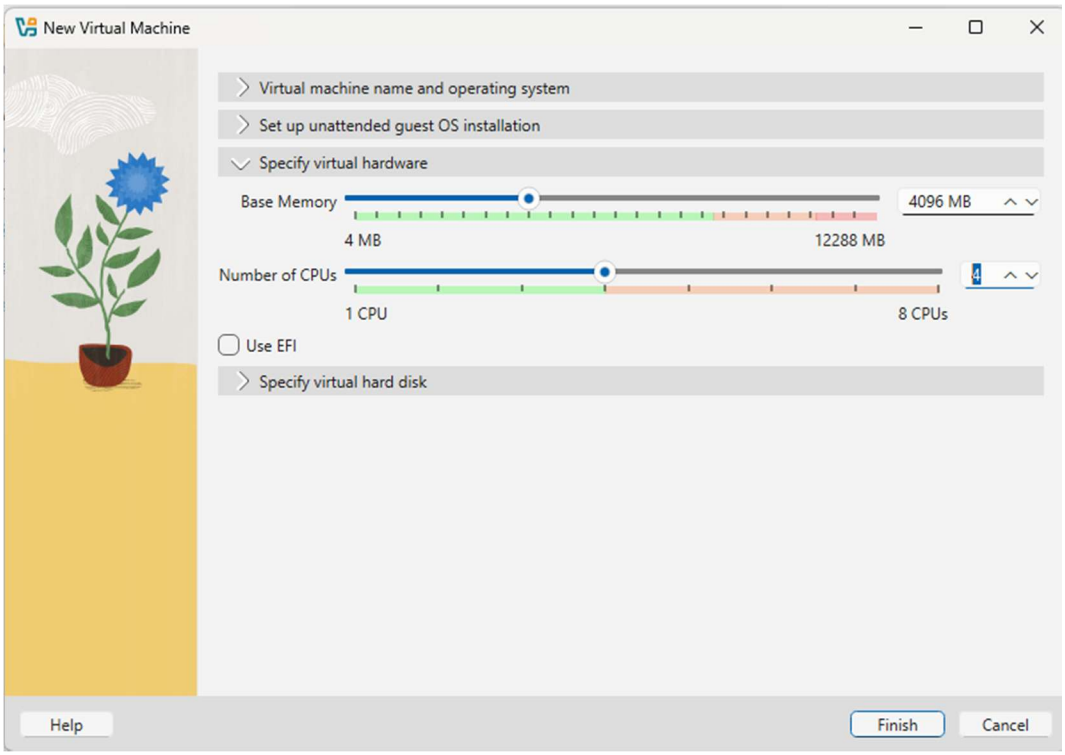


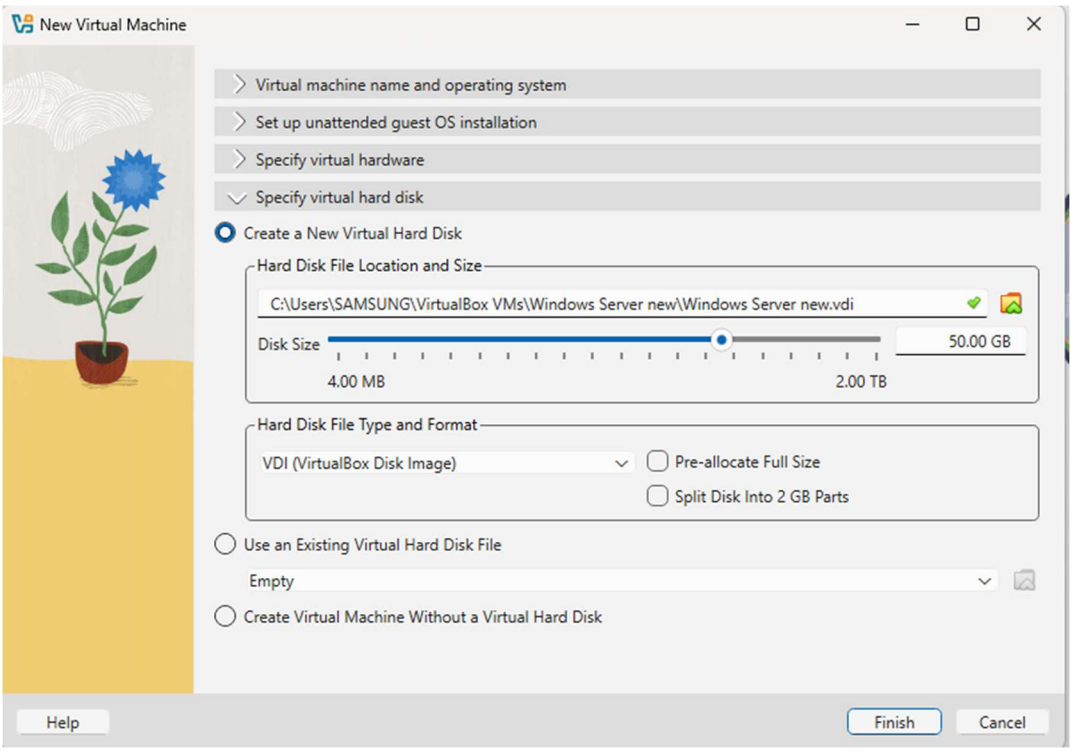
I started by assigning a logical name to the virtual machine, which I labeled **“Windows Server new.”** I then selected the ISO Image option, located the file named **“SERVER_EVAL_x64FRE_en-us (1)”** in my downloads folder, and attached it. I chose not to enable the unattended installation option.

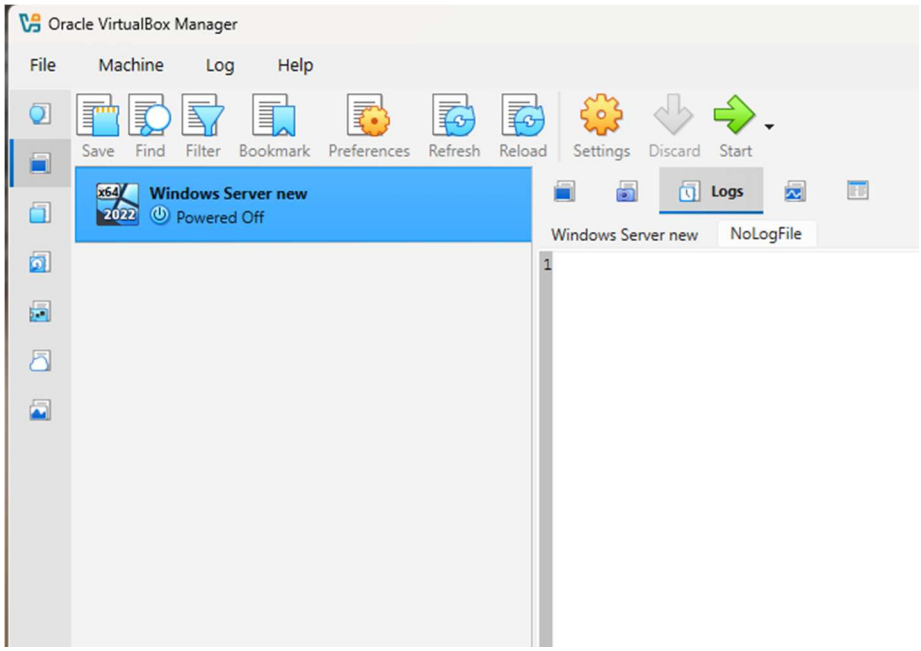

New Virtual Machine
Virtual machine name and operating system
VM Name
Window Server New
VM Folder
C:\Users\SAMSUNG\VirtualBox VMs
ISO Image
C:\Users\SAMSUNG\Downloads\SERVER_EVAL_x64FRE_en-us.iso
OS Edition
Windows Server 2022 Standard Evaluation (10.0.20348.587 / x64 / en-US)
OS
Microsoft Windows
OS Distribution
OS Version
Windows Server 2022 (64-bit)
Proceed with Unattended Installation
Set up unattended guest OS installation
Specify virtual hardware
Specify virtual hard disk
Help
Finish
Cancel



Next is configuration of the virtual hardware parameters, where I assigned 4096 GB (Gigabytes), for the Virtual Processors (CPUs), I assigned 4 processors, for the Virtual Hard Disk: I allocated 50 GB of virtual storage,


New Virtual Machine
Virtual machine name and operating system
Set up unattended guest OS installation
Specify virtual hardware
Base Memory
4096 MB
4 MB
12288 MB
Number of CPUs
4
1 CPU
8 CPUs
Use EFI
Specify virtual hard disk
Help
Finish
Cancel


New Virtual Machine
Virtual machine name and operating system
Set up unattended guest OS installation
Specify virtual hardware
Specify virtual hard disk
Create a New Virtual Hard Disk
Hard Disk File Location and Size
C:\Users\SAMSUNG\VirtualBox VMs\Windows Server new\Windows Server new.vdi
Disk Size
50.00 GB
4.00 MB
2.00 TB
Hard Disk File Type and Format
VDI (VirtualBox Disk Image)
Pre-allocate Full Size
Split Disk Into 2 GB Parts
Use an Existing Virtual Hard Disk File
Empty
Create Virtual Machine Without a Virtual Hard Disk
Help
Finish
Cancel



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 the Windows 8 file on VMs

This phase focuses on acquiring and configuring the standard client operating systems.

Stage 1: Downloading of Windows 8 file

I initiated a search to find the iso file for Windows 8.

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

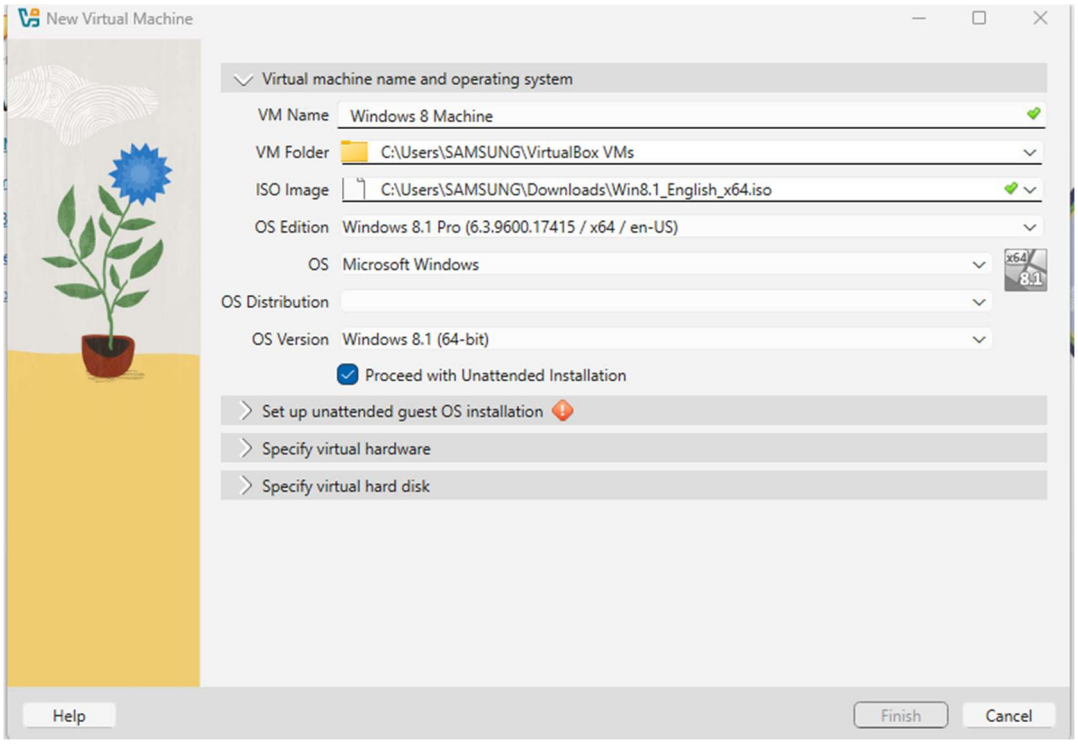
The process concluded with the successful download of the Windows 8 image file (the ISO file), making the software ready for use in VirtualBox.

Stage 2: Creating and Configuring the Windows 8 VM

With the Windows 8 software ready, you returned to the VirtualBox Manager to define the machine that will run it. This process was then repeated for the second Windows 8 VM.

I clicked "New" in VirtualBox and initiated the setup process for the first window 8

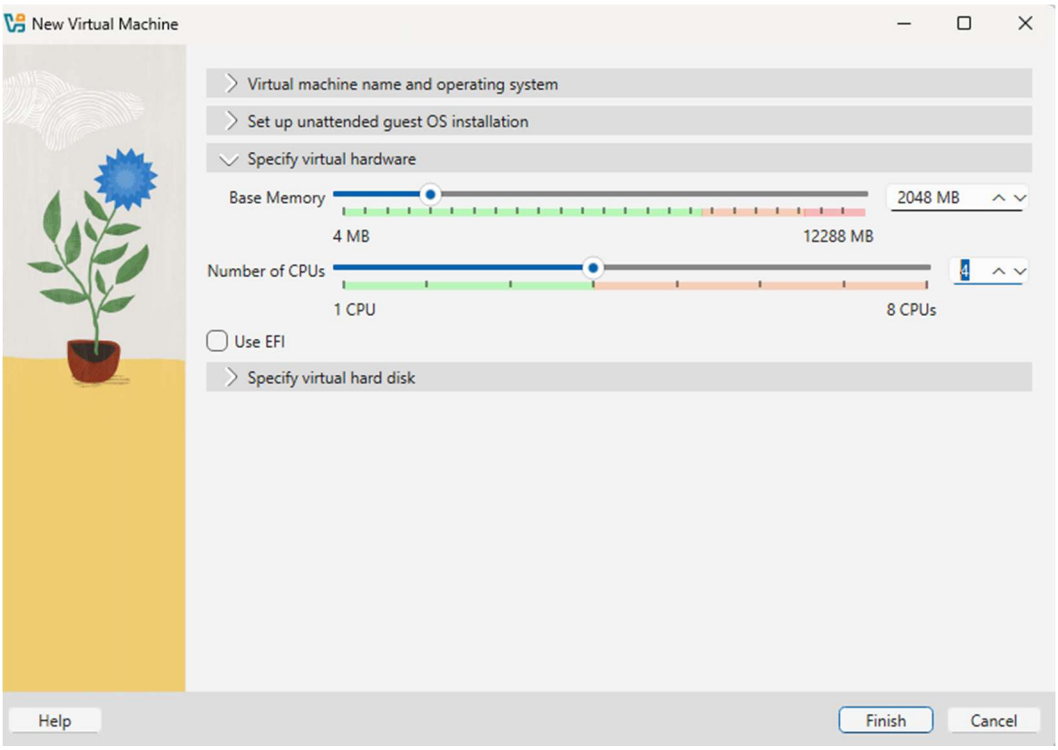
I assigned a virtual Name for the first client to be “Windows 8 New”



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

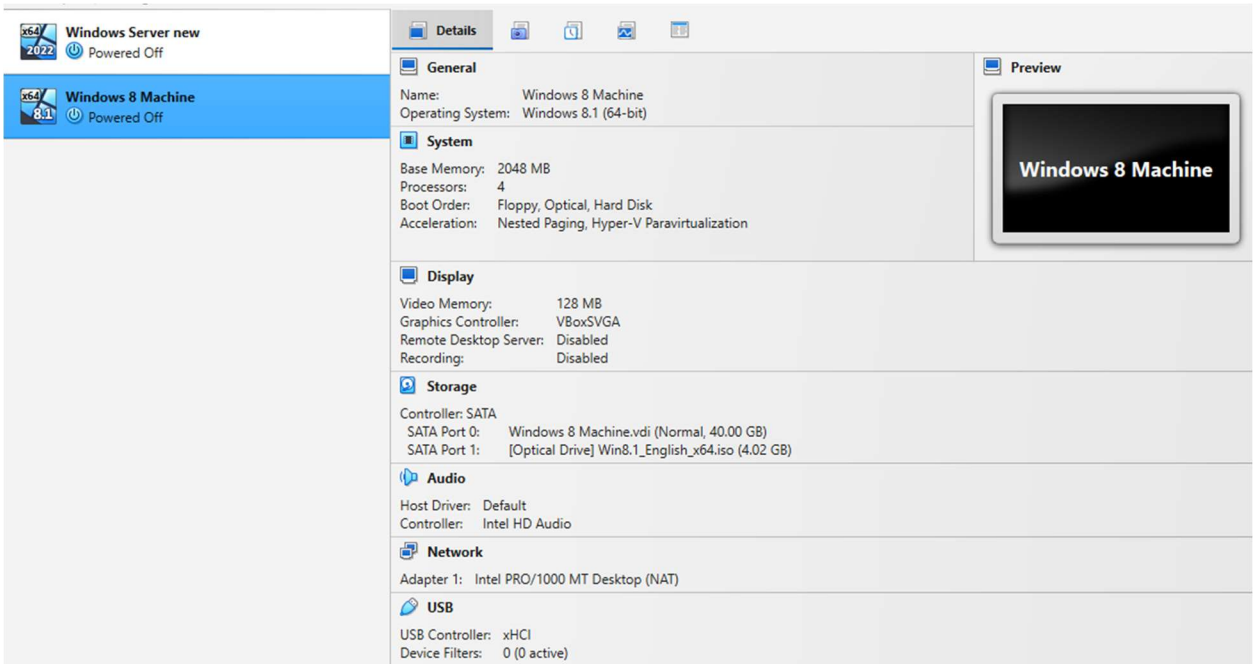
I correctly chose to Skip Unattended Installation to maintain full control over the setup.

I defined the robust virtual hardware settings for the client VM to ensure smooth operation. I allocated 2 GB of RAM and 4 processors.And for the virtual hard disk, I allocated 40 GB of virtual storage space.

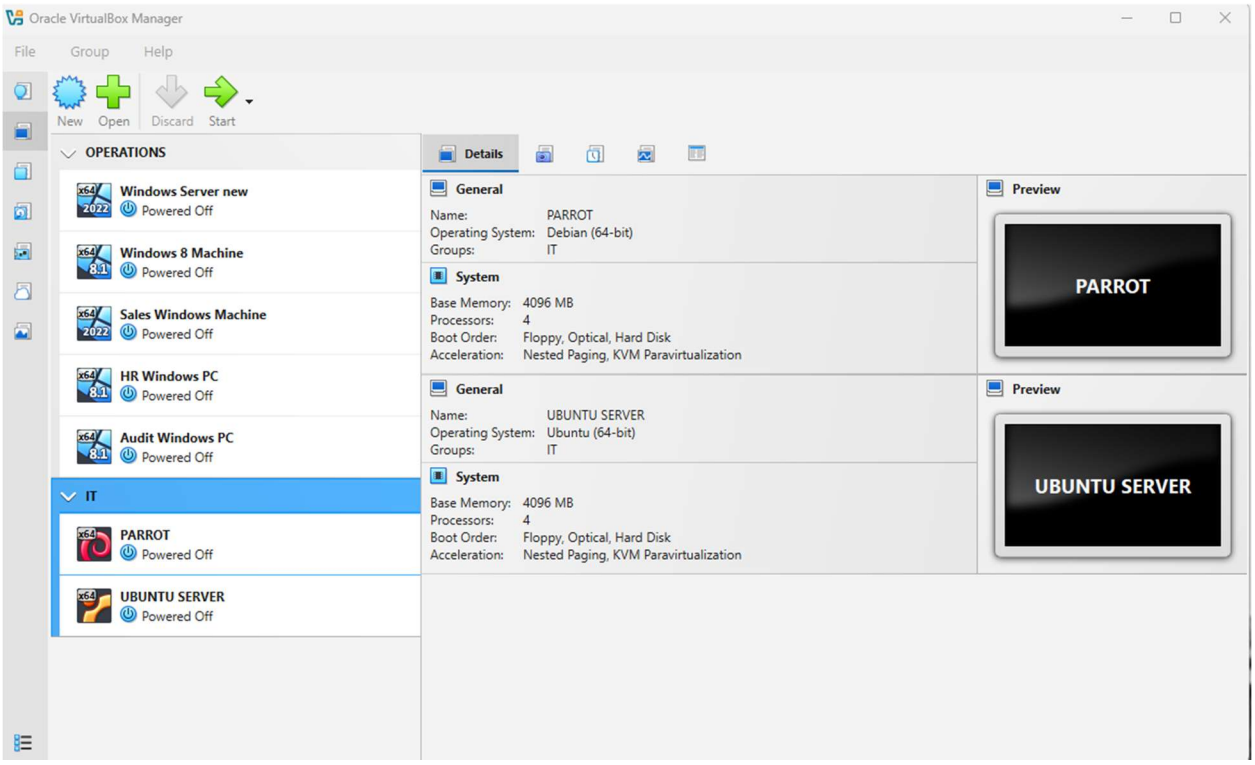


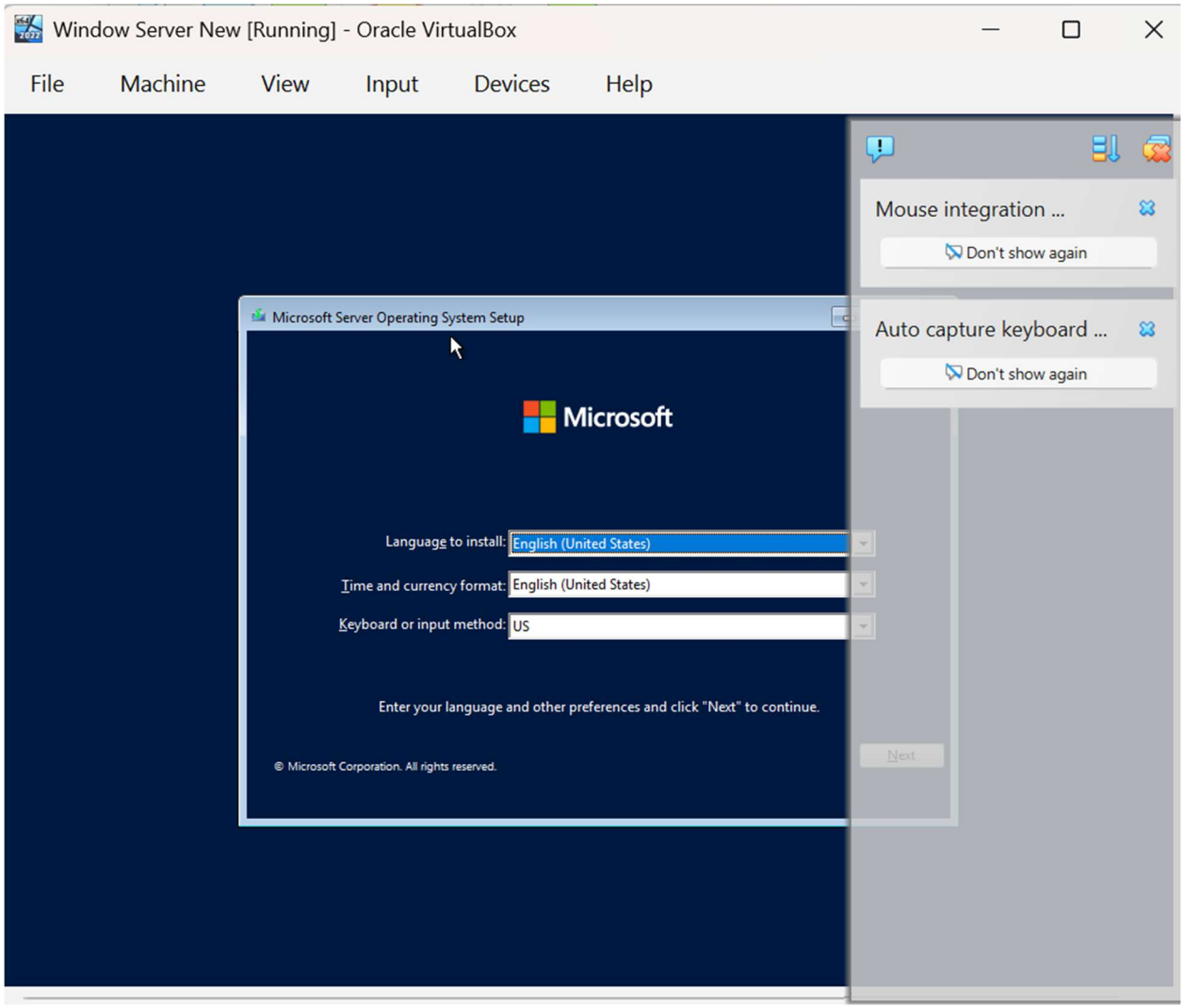
By clicking “Next” and then "Finish," the configuration for the first Windows 8 VM was saved.

Windows 8 key: XWCHQ CDMYC 9WN2C BWWTV YY2KV



I repeated the whole process for “Windows 8 New 2 “. I have now documented the successful acquisition and provisioning of all four virtual machines, Windows Server, and both Windows 8 clients.




Window Server New [Running] - Oracle VirtualBox
File
Machine
View
Input
Devices
Help
Mouse integration ...
Don't show again
Auto capture keyboard ...
Don't show again
Microsoft Server Operating System Setup
Microsoft
Language to install: English (United States)
Time and currency format: English (United States)
Keyboard or input method: US
Enter your language and other preferences and click "Next" to continue.
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