IT 236 Project Report Form

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Project Phase	Creating The NewVUE Infrastructure

Section 1: Executive Summary (10 Points)

This lab exercise involved the creation of a proof-of-concept virtual network infrastructure for NewVue Health. The infrastructure includes two domain controllers (NV-DC1 and NV-DC2), one file server (NV-FS1), and one Windows 11 client (NV-CL1).

All virtual machines were configured using VirtualBox and connected via a NAT Network to ensure both inter-VM communication and internet access. NV-DC1 and NV-CL1 were created from scratch, while NV-DC2 and NV-FS1 were cloned from the base server (NV-DC1). After setup, network connectivity was tested between all servers and the internet. The results showed that; initial connectivity tests revealed that while outbound communication was functioning, inbound traffic was being blocked by Windows Firewall on the target servers. This was evidenced by "Request Timed Out" messages during ping tests between NV-DC1 and NV-DC2, indicating that ICMP (ping) requests were being blocked on the inbound side.

To resolve this, the appropriate ICMP firewall rules were enabled on all servers (NV-DC1, NV-DC2, and NV-FS1) to allow echo requests. After configuring these rules, all subsequent ping tests between servers were successful, confirming full bidirectional network connectivity across the virtual infrastructure.

Additionally, all servers successfully communicated with the NAT gateway and established internet connectivity, as verified by pinging external resources like www.bing.com.

This proof of concept demonstrates that the proposed design can operate successfully in a virtualized environment and lays the foundation for future Active Directory and file service configuration.

Virtual Machine Summary

(Complete the table below with the details of the virtual machines created.)

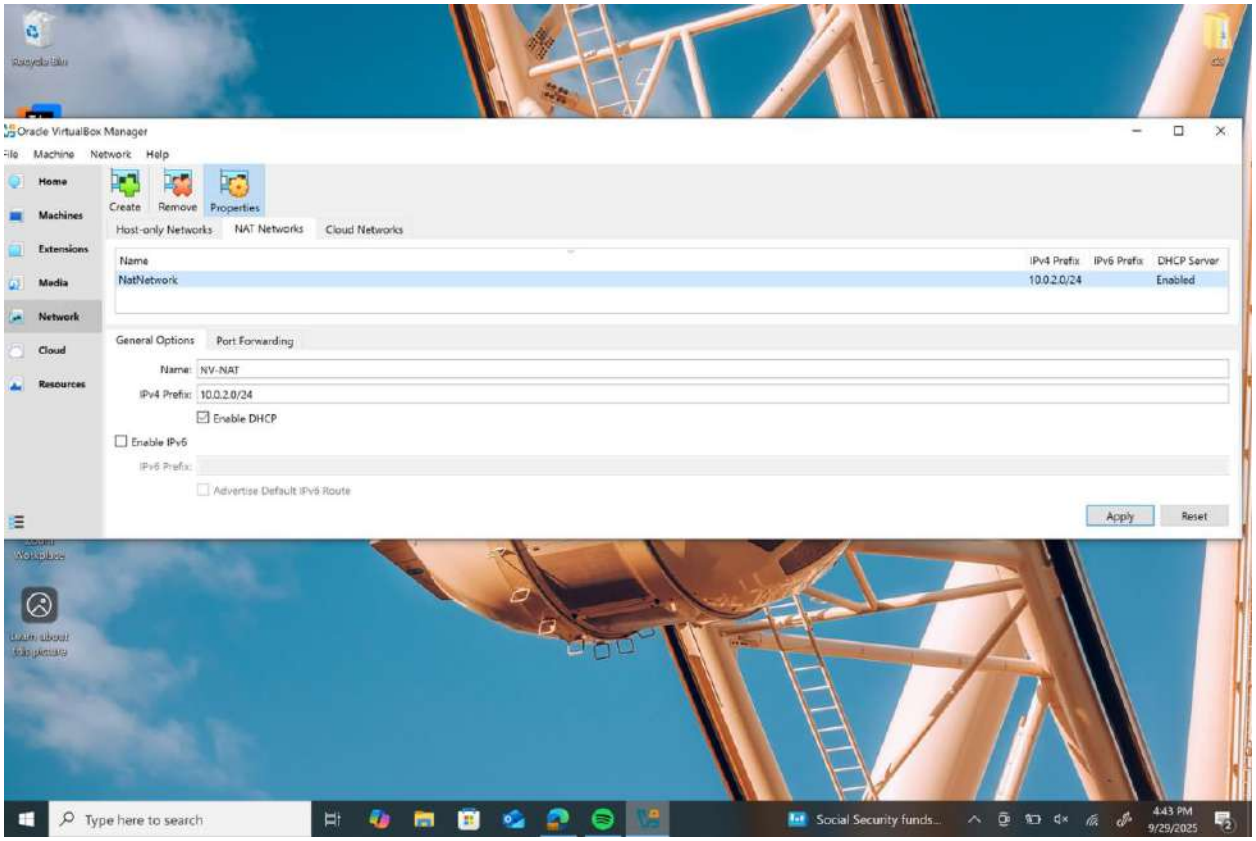
VM Name	Operating System	RAM	CPU Cores	IP Address
NV-DC1	Windows Server 2022 (64-but)	4096	2	10.0.2.15/24
NV-DC2	Windows Server 2022 (64-but)	4096	2	10.0.2.16/24
NV-FS1	Windows Server 2022 (64-but)	4096	2	10.0.2.17/24
NV-CL1	Window 11(64-bit)	4096	2	None

Section 2: Creation of NAT Network and NV-DC1 (16 Points)

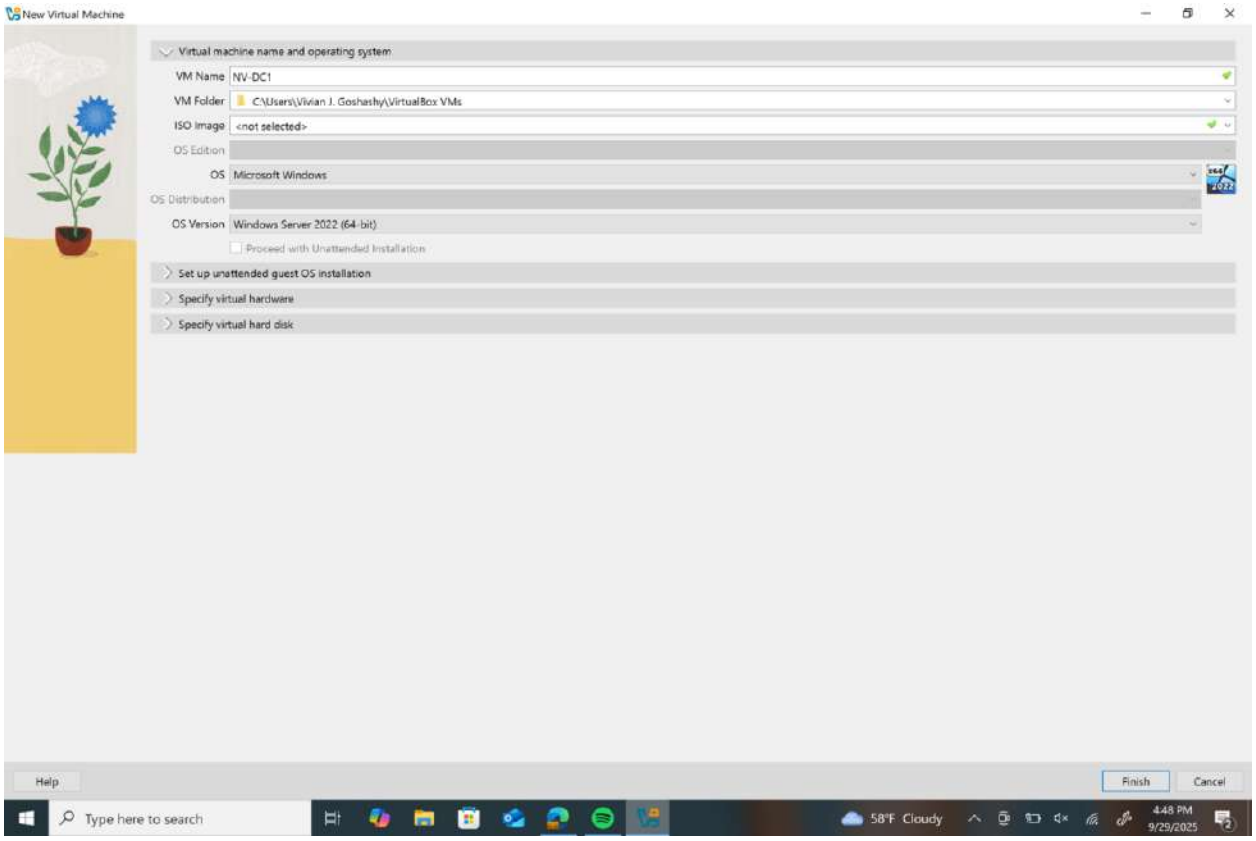
I began by creating a NAT Network in VirtualBox to allow communication between all virtual machines as well as access to the internet. Once the network was in place, I created NV-DC1, the first Windows Server 2022 machine. This server acted as the base system for later cloning and served as the foundation of the virtual infrastructure.

Evidence: (*For each required screenshot, insert the screenshot in the space below the title.)* The screenshots below show the NAT Network I created and the successful setup of NV-DC1.

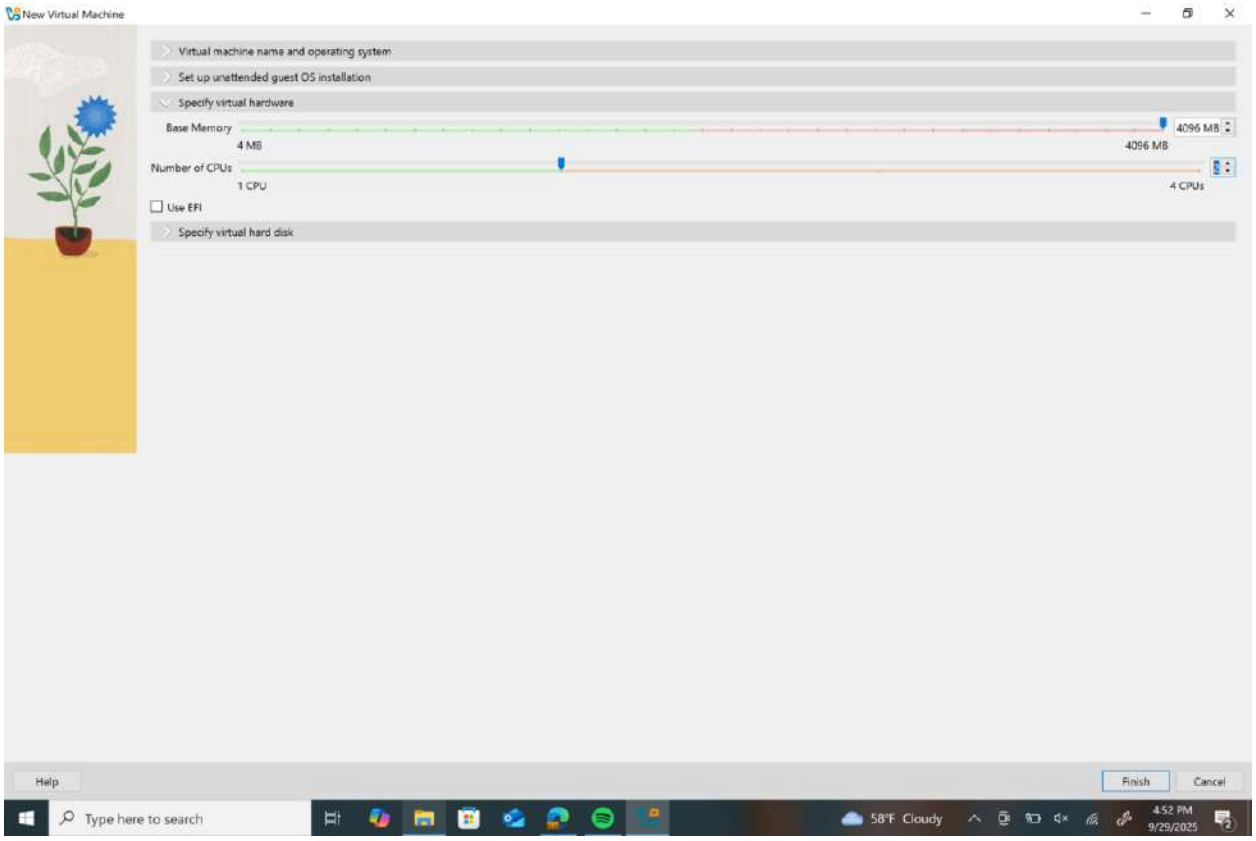
1. NAT Network settings (NV-NAT with DHCP enabled)

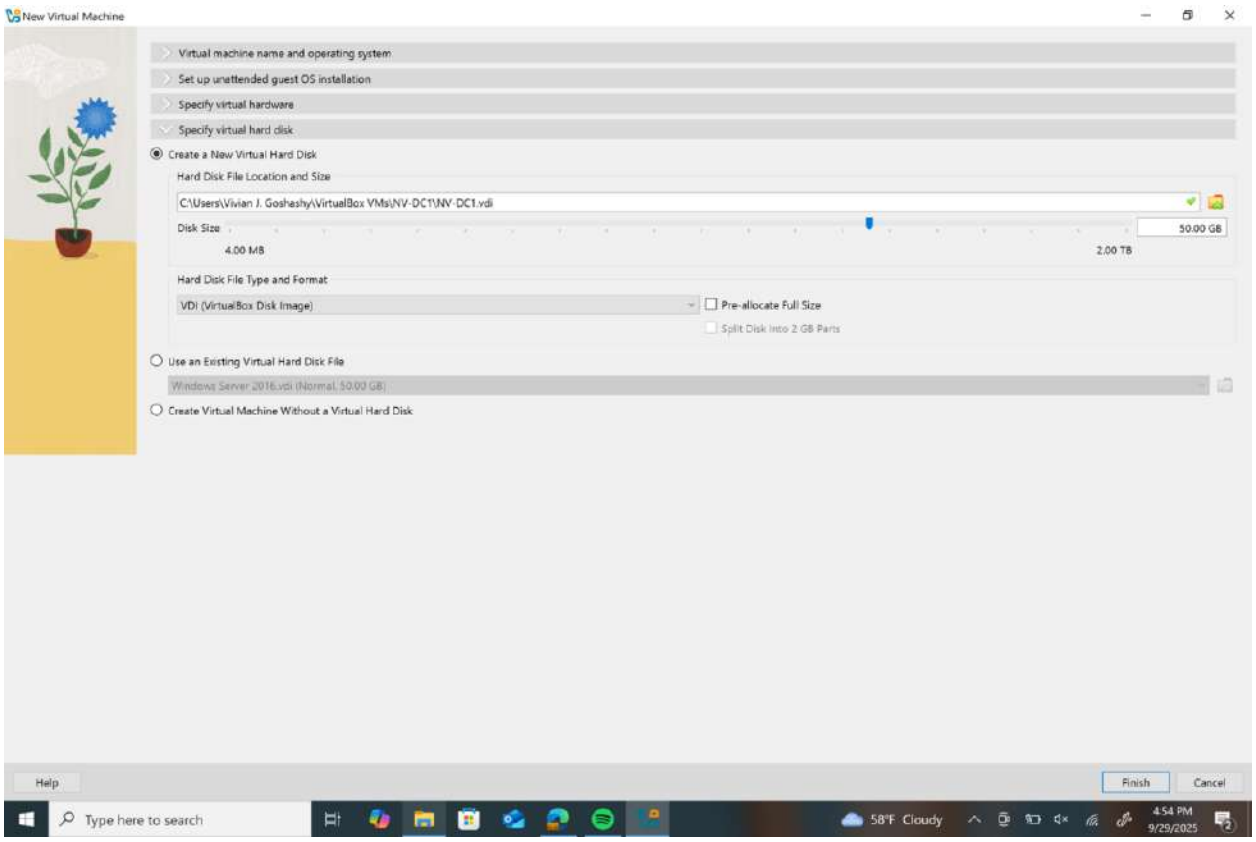


2. NV-DC1 New VM dialog (name + OS version)

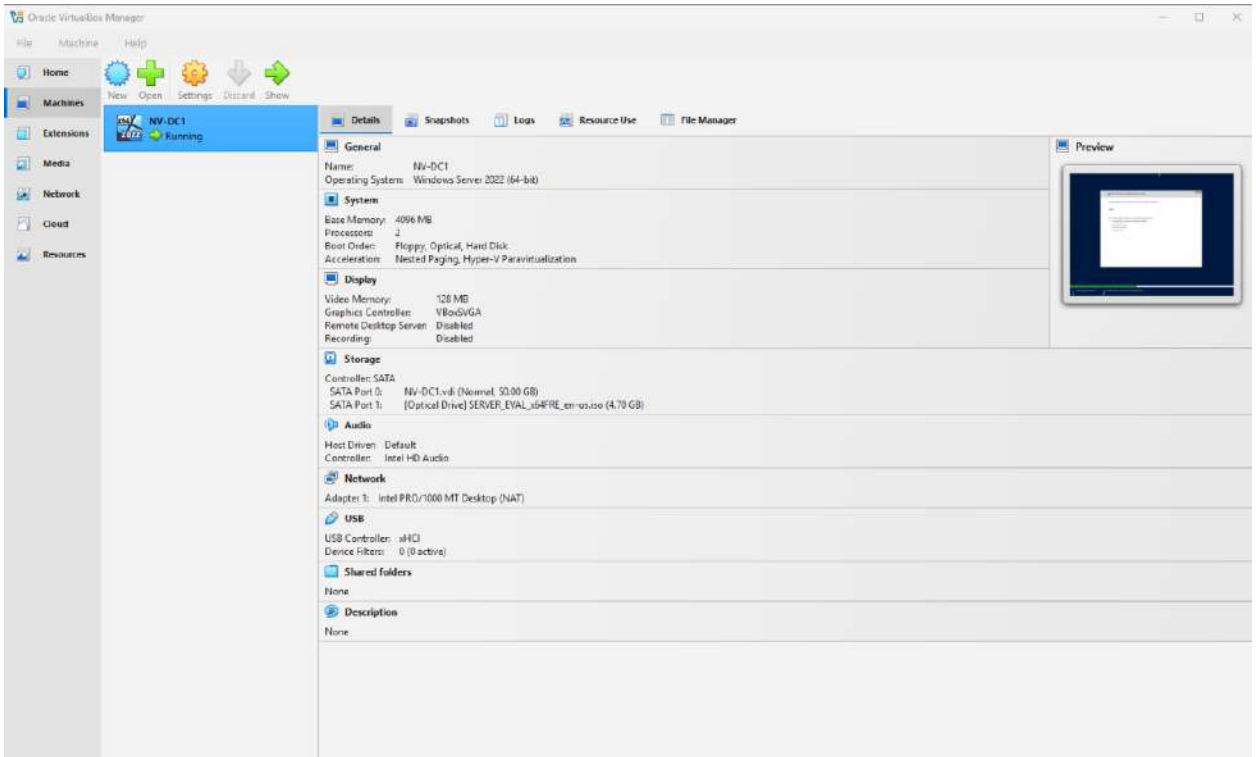


3. NV-DC1 resources (RAM, CPU, disk)

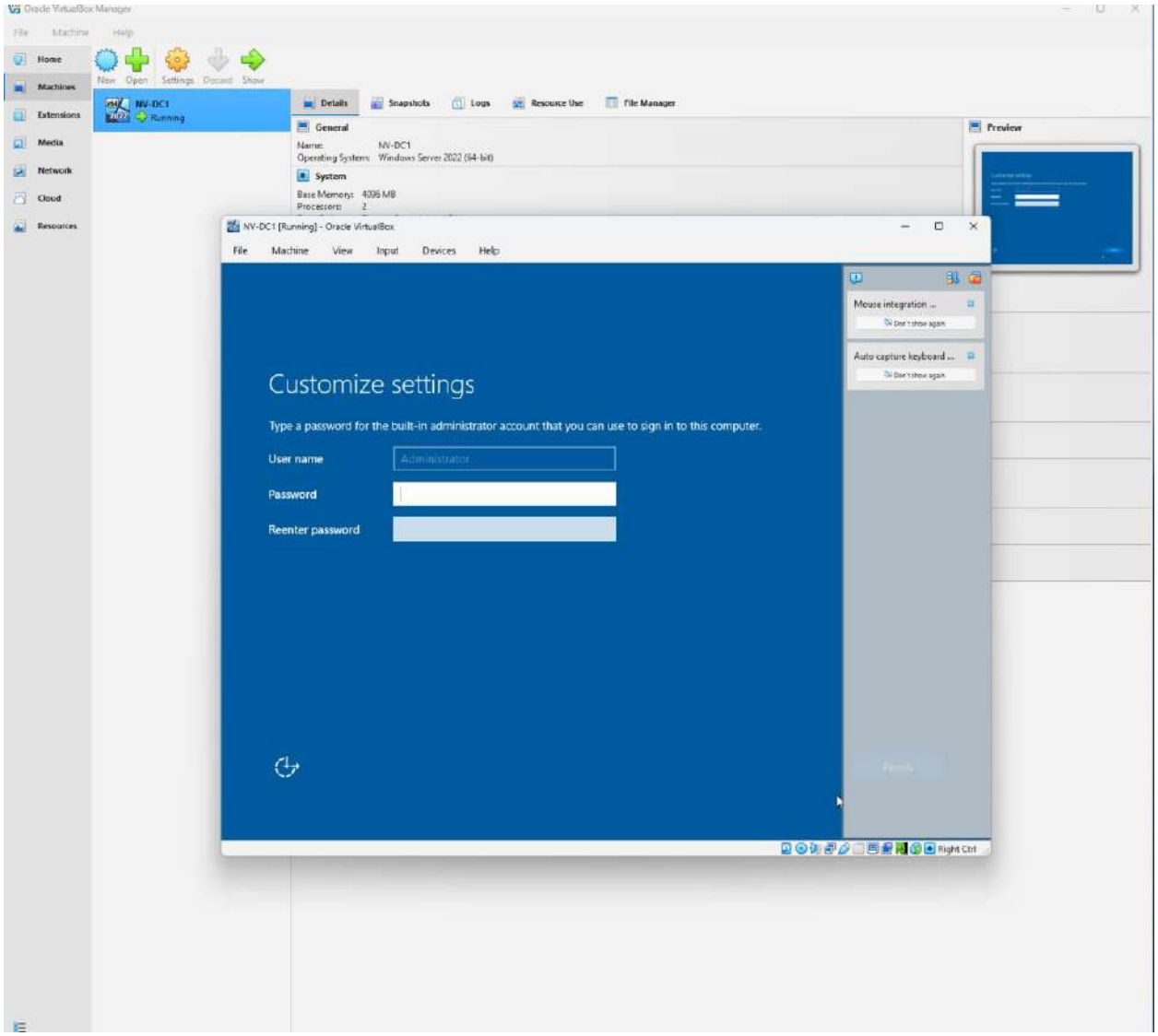




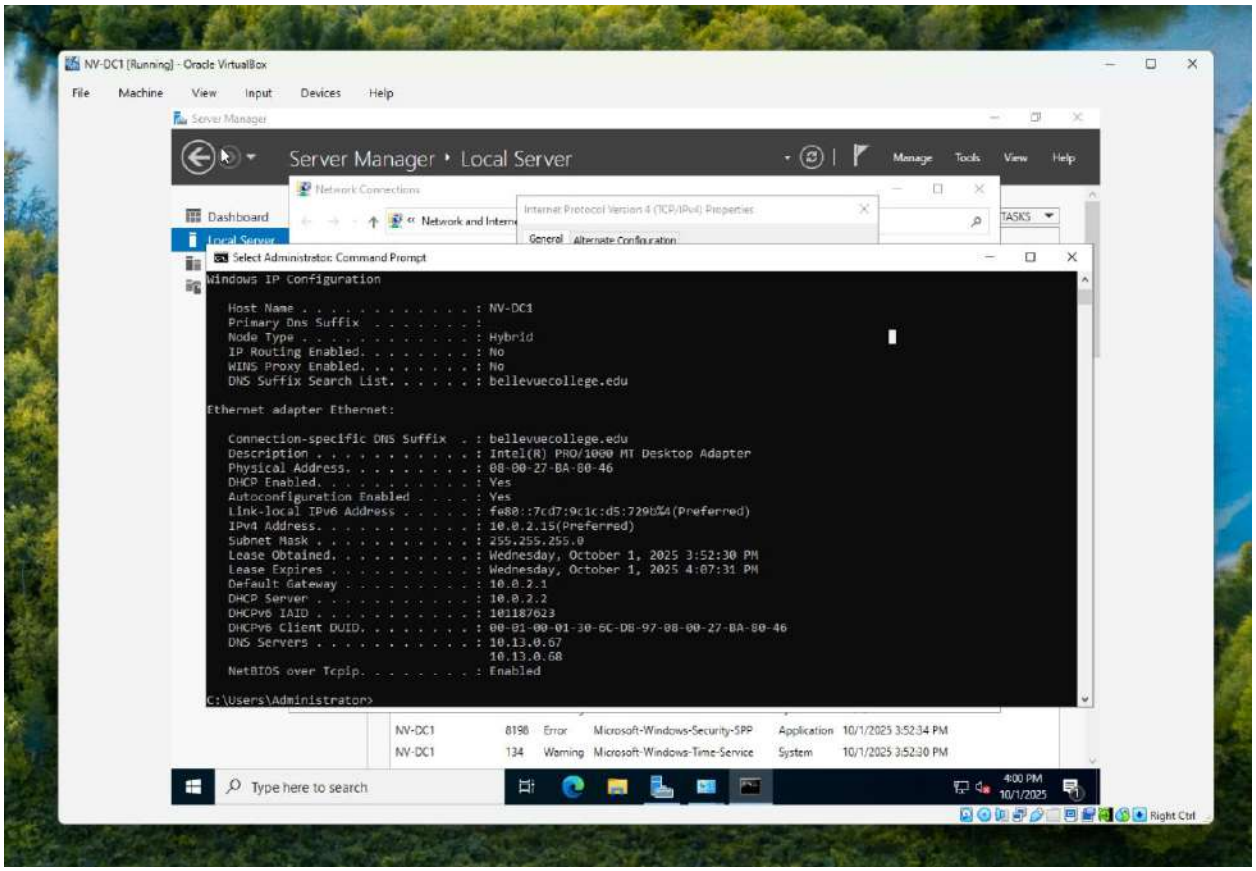
4. NV-DC1 Storage settings (ISO attached)



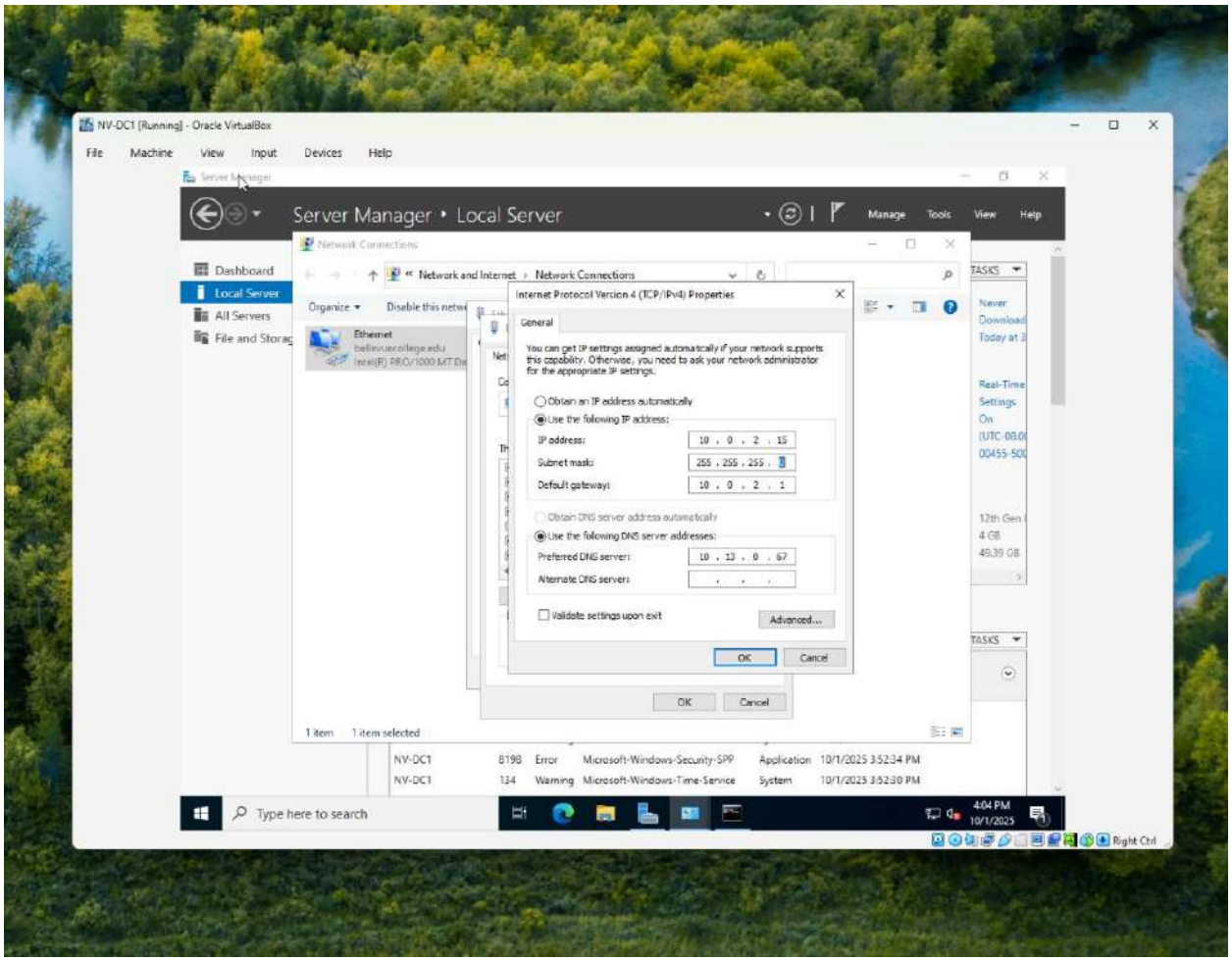
5. Installation screen or login screen after setup



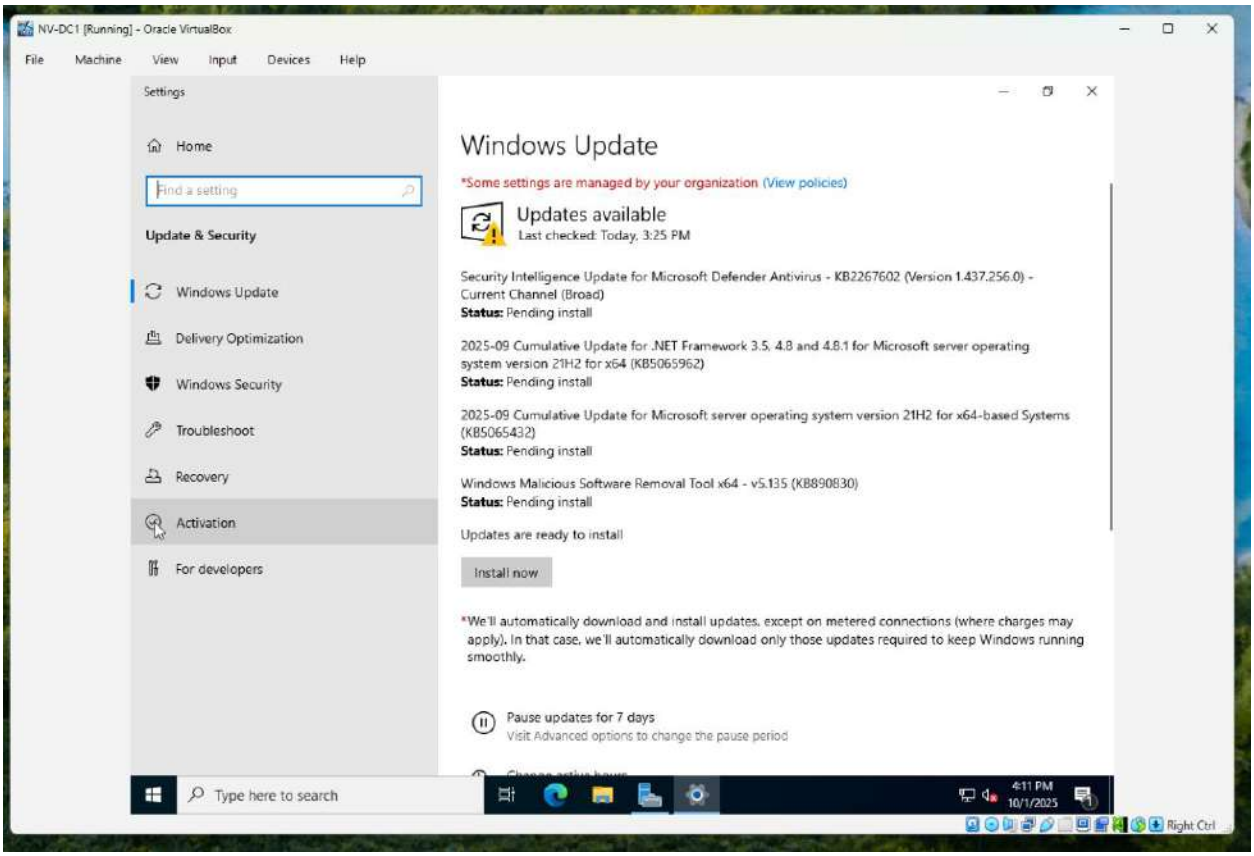
6. ipconfig output (DHCP address)



7. Static IP configuration



8. Windows Update screen

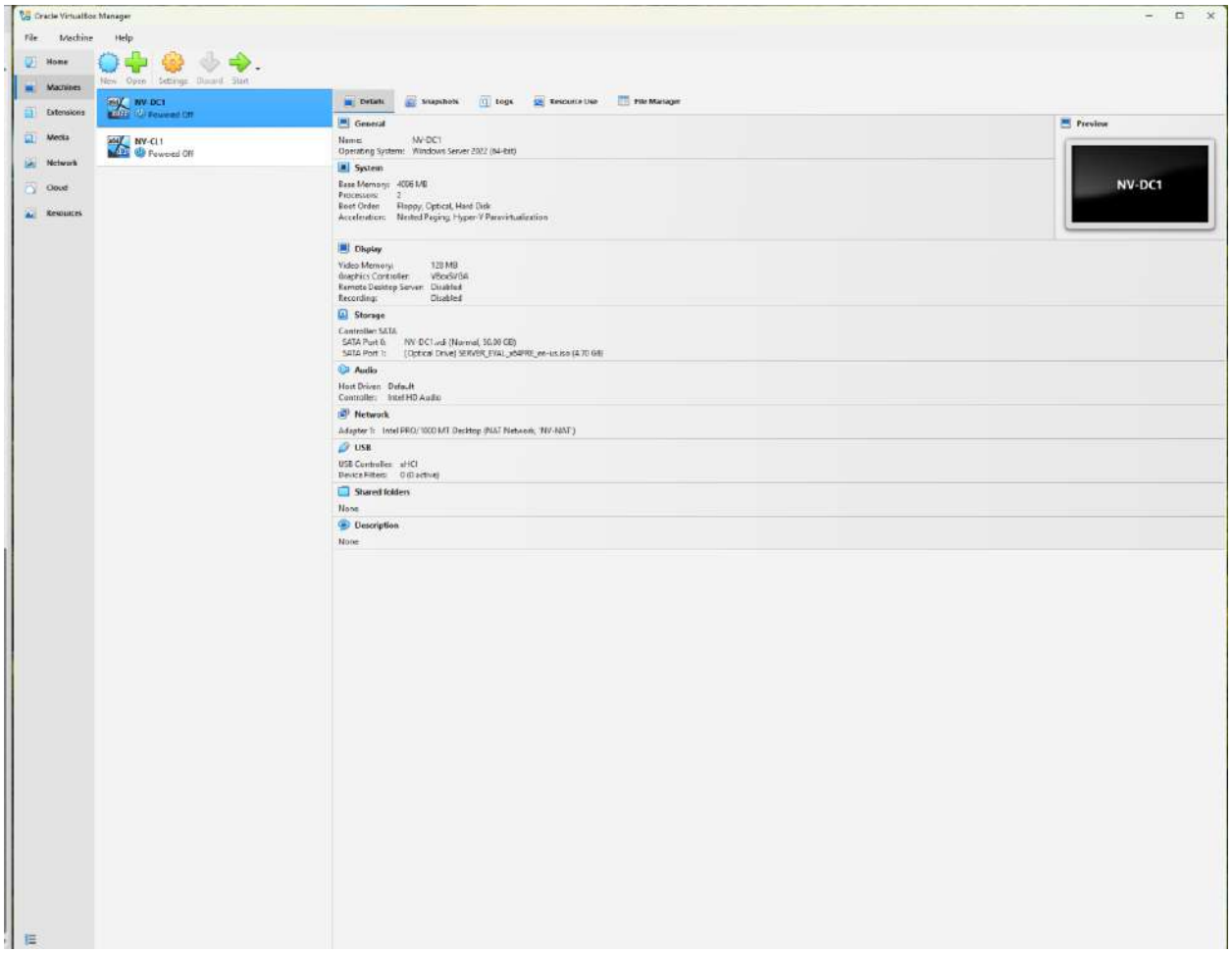


Section 3: Task — Cloning NV-DC1 to NV-DC2 and NV-FS1 (10pts)

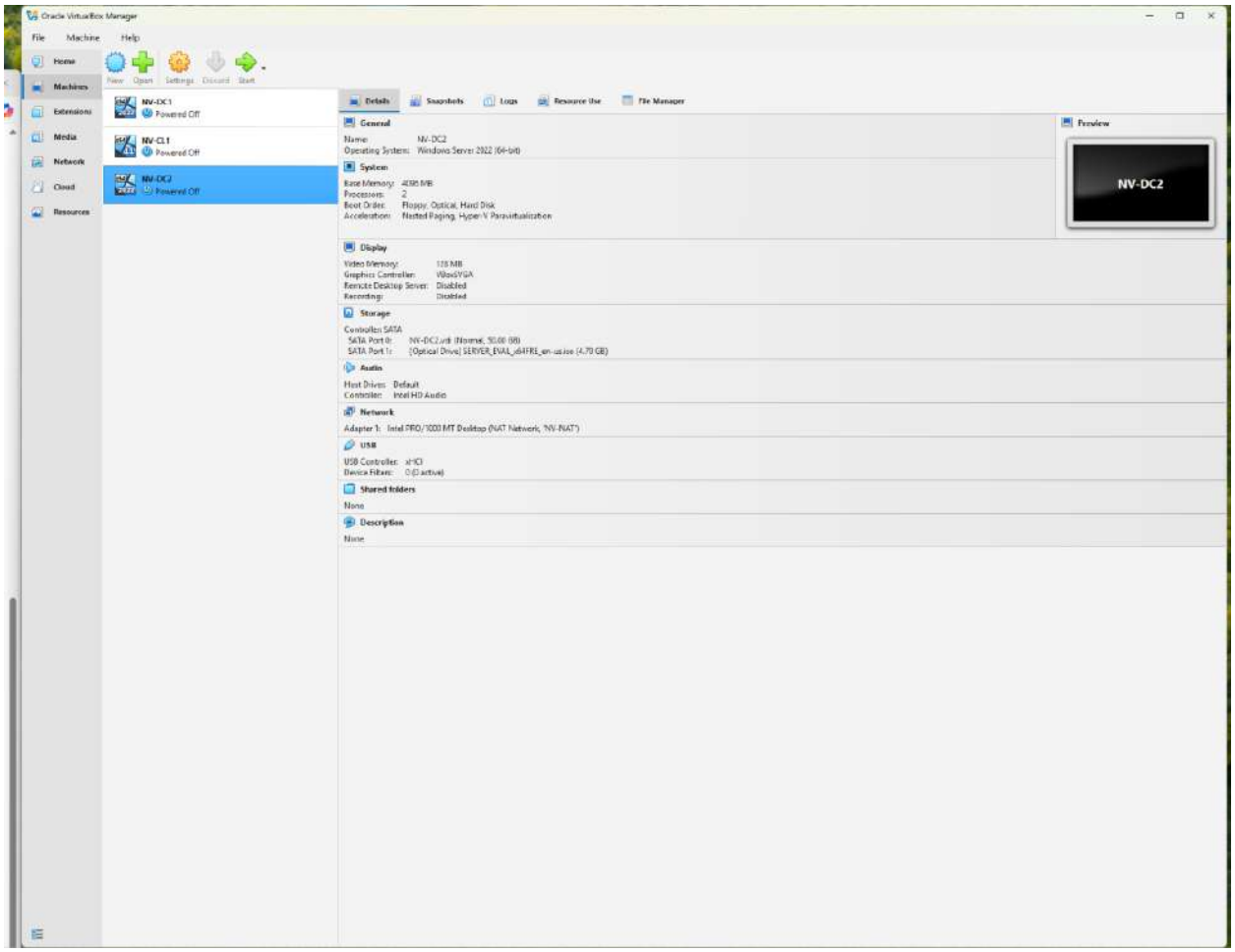
Building on the base server, I created two additional machines by cloning NV-DC1. These became NV-DC2 and NV-FS1. After cloning, I renamed the servers and reconfigured their IP addresses to static values.

Evidence: (*For each required screenshot, insert the screenshot in the space below the title.)* The screenshots below show the cloning process, hostname and IP changes.

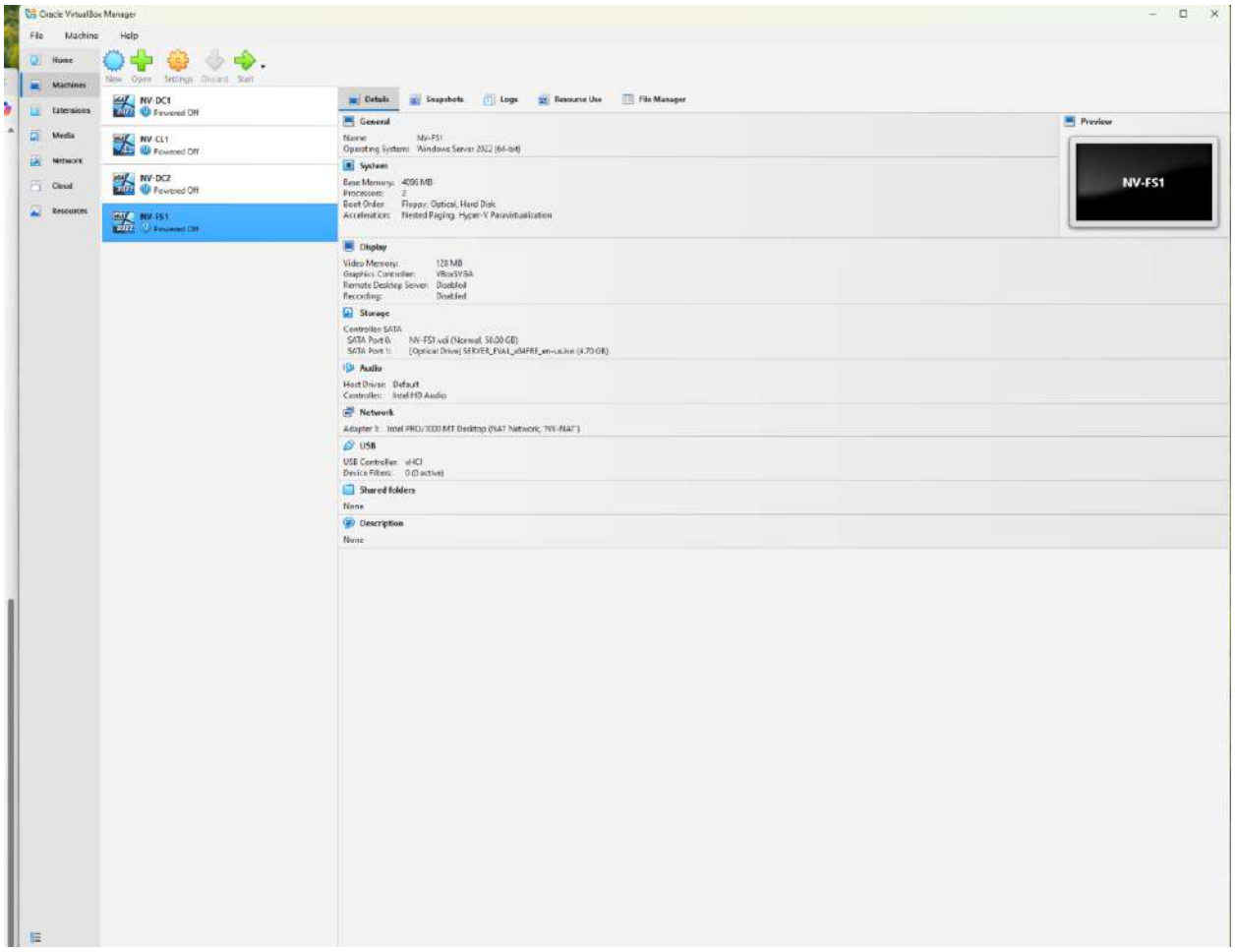
1. NV-DC1 powered off before cloning



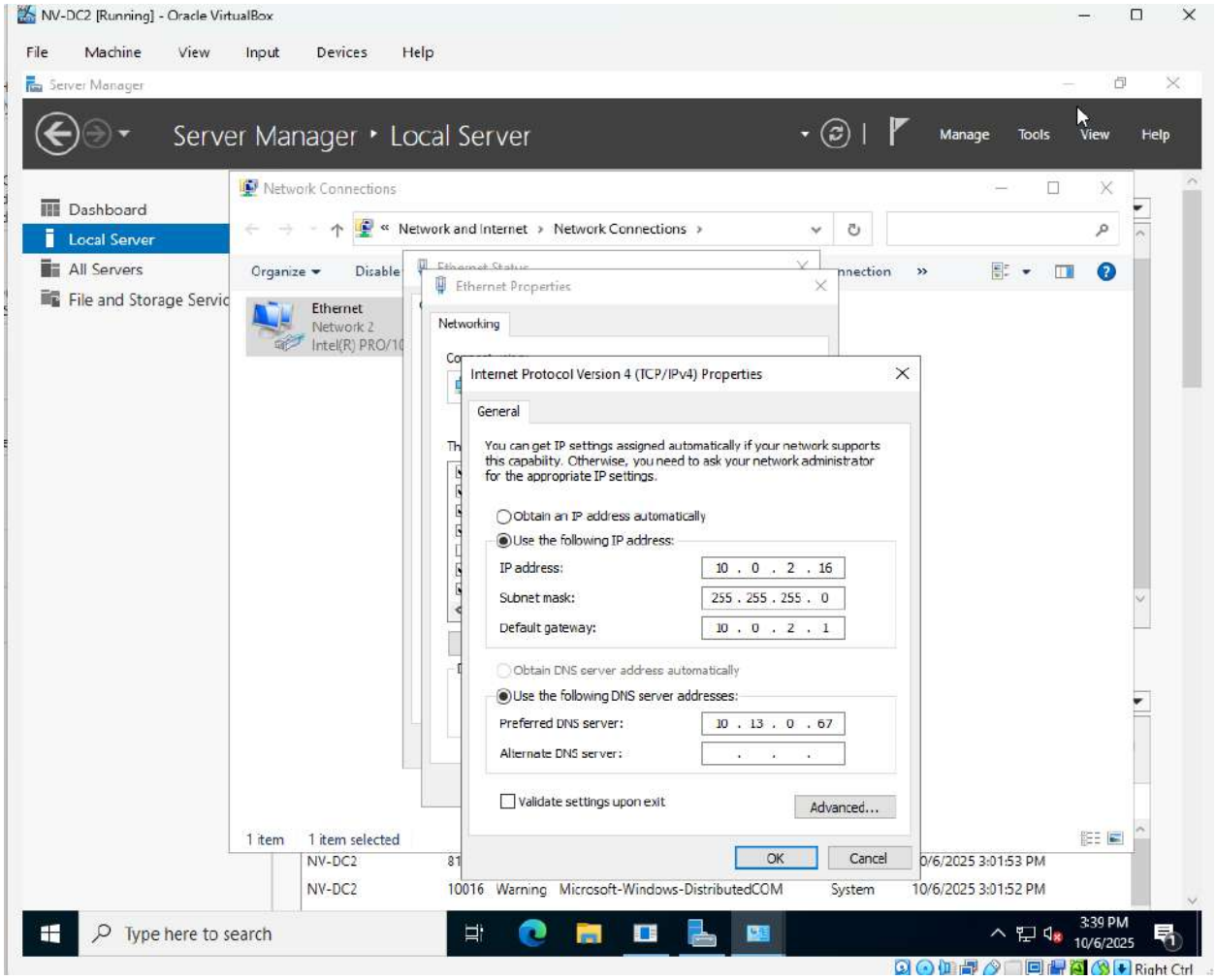
2. Clone dialog / NV-DC2 created



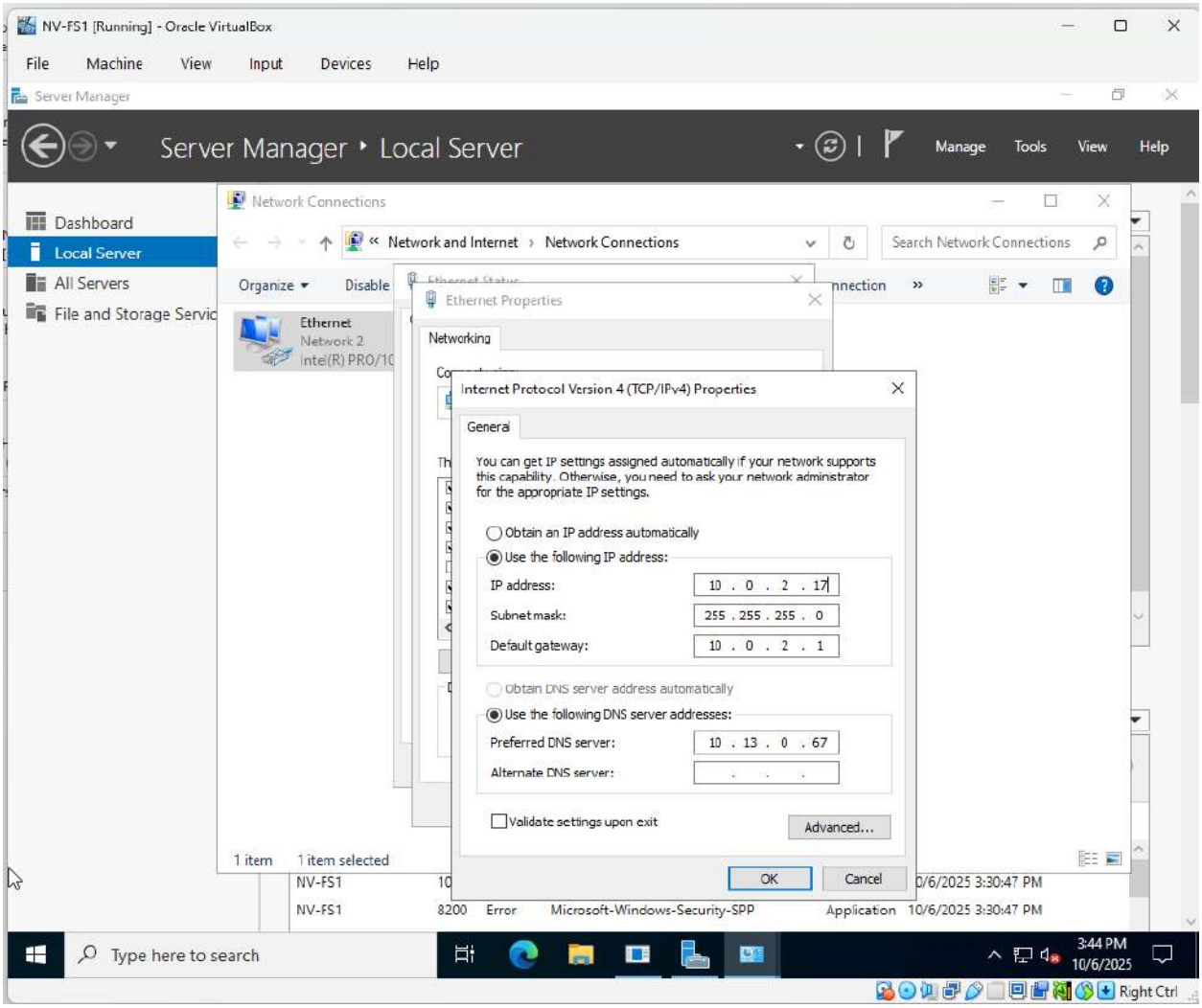
3. Clone dialog / NV-FS1 created



4. Static IP Settings for NV-DC2



5. static IP config for NV-FS1

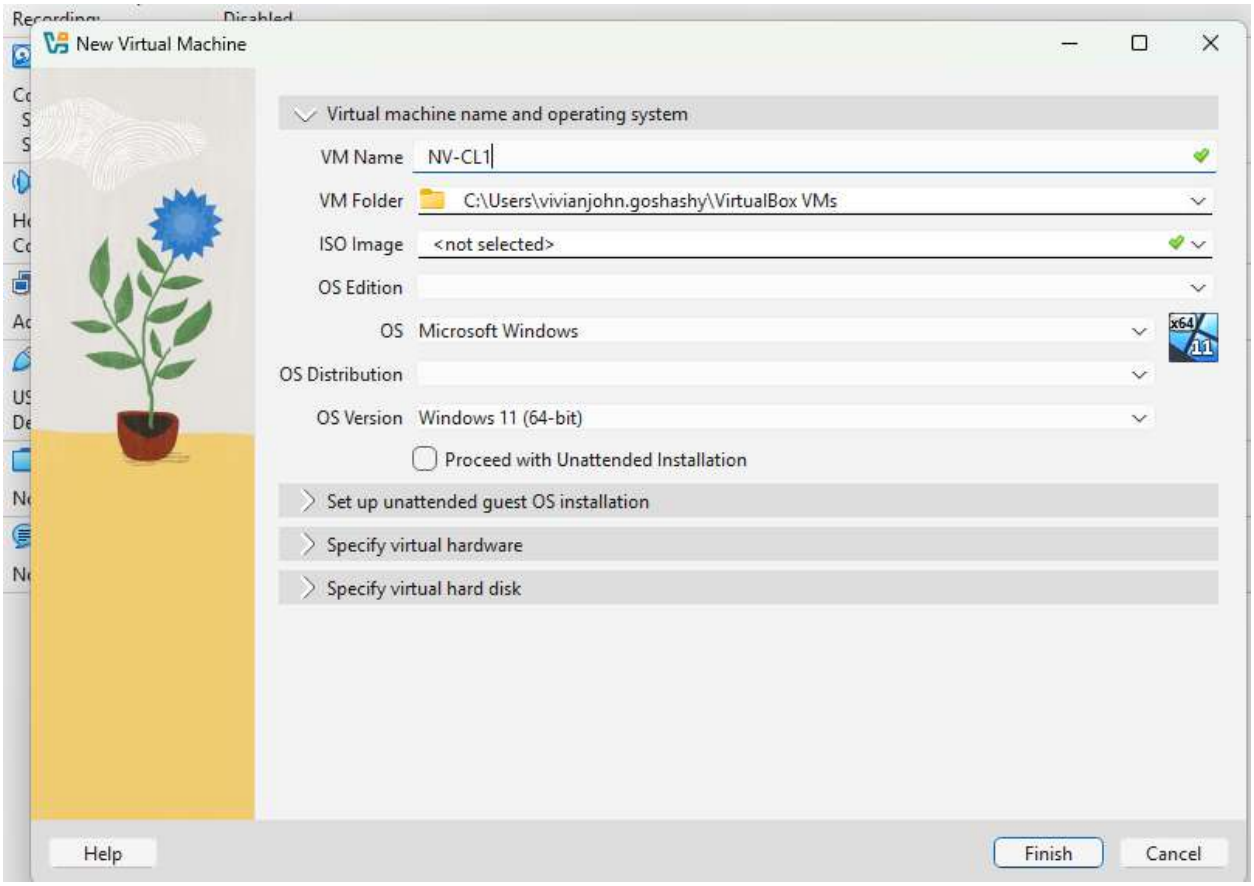


Section 4: Task — Creation of Windows 11 Client (NV-CL1) (8pts)

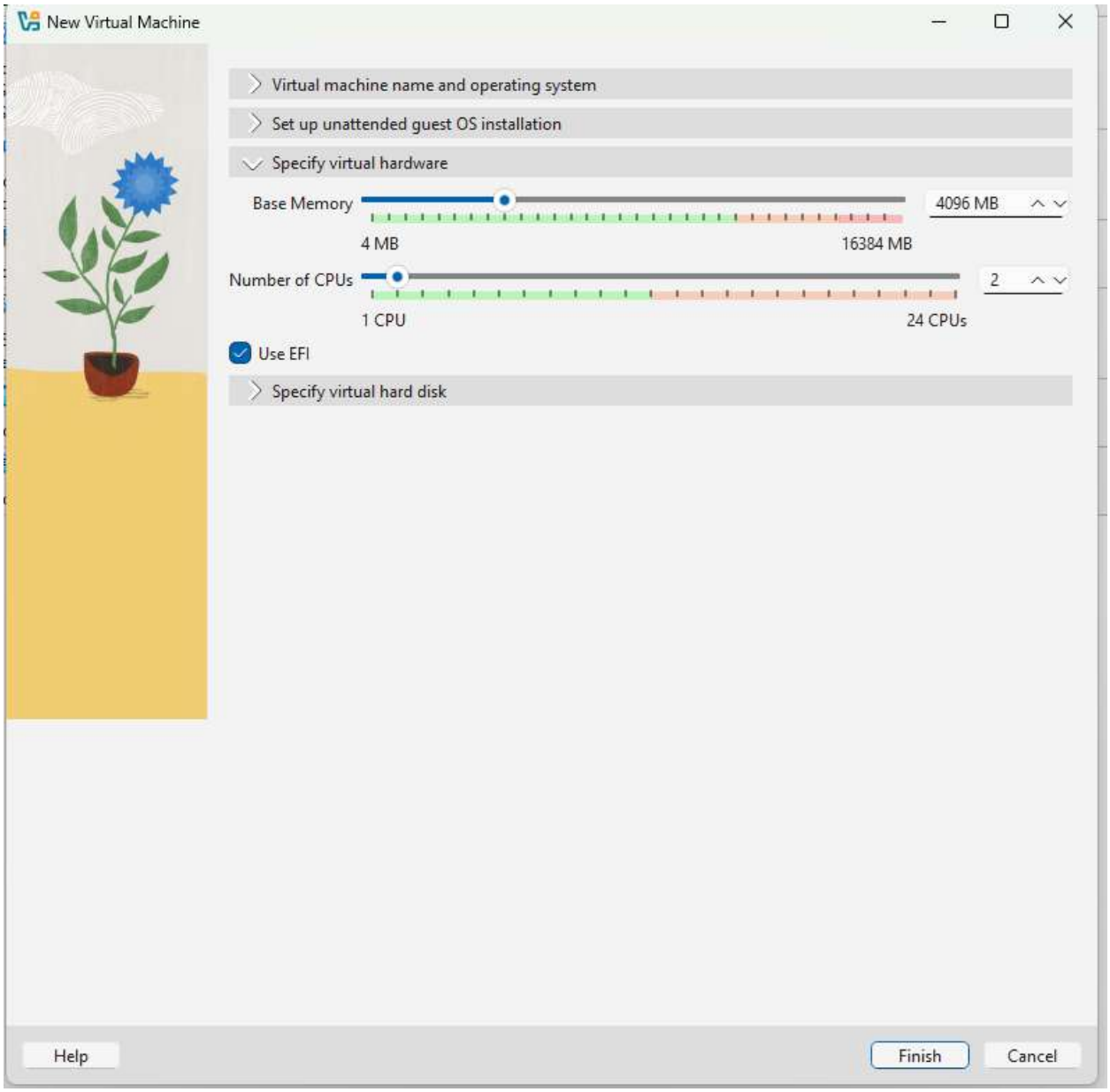
After completing the server setup, I created a Windows 11 client named NV-CL1. This client was designed to act as a workstation for testing and to ensure that endpoints could communicate effectively with the servers and access external resources.

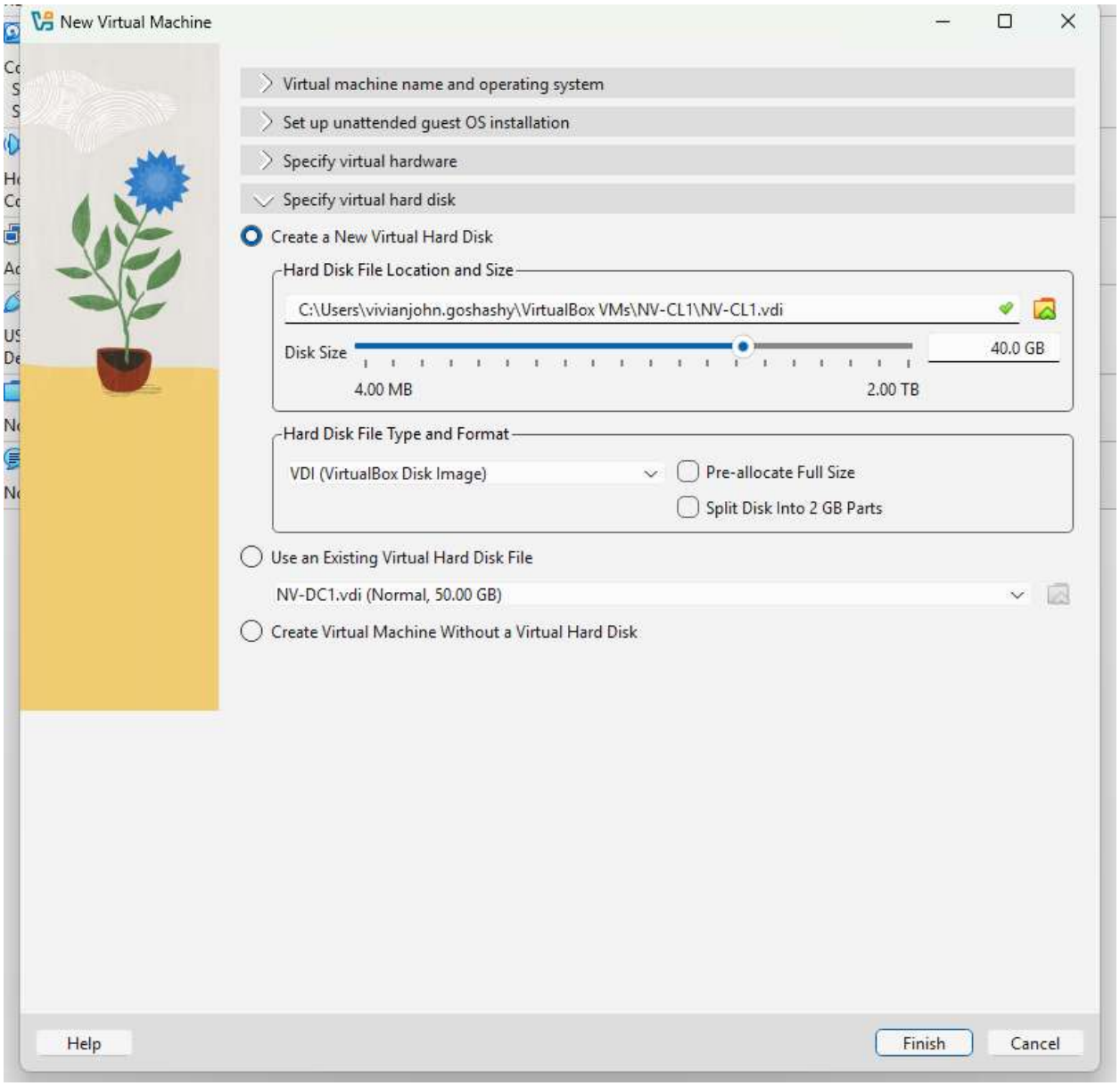
Evidence: (*For each required screenshot, insert the screenshot in the space below the title.)* The screenshots below show the creation and configuration of NV-CL1.

1. New VM dialog for NV-CL1

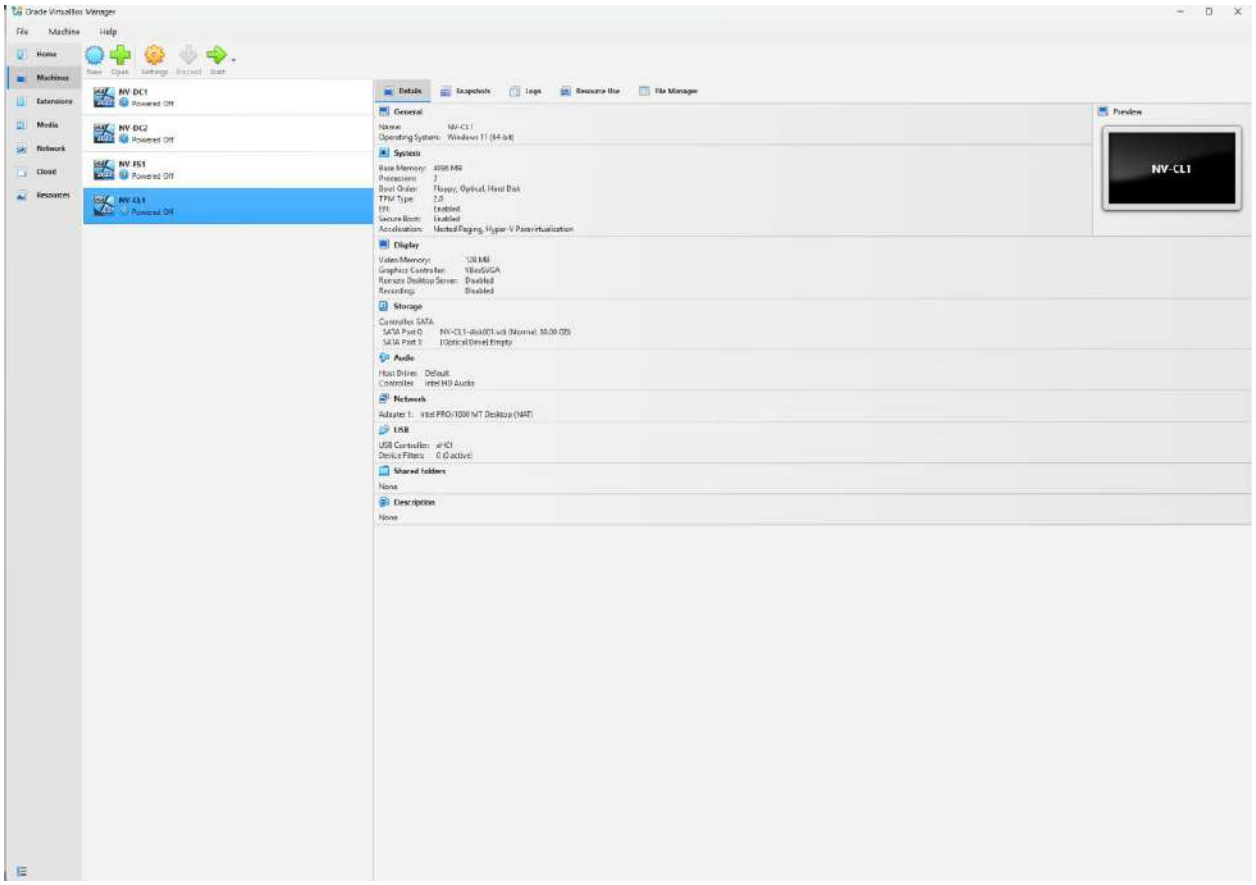


2. Resource settings (RAM, CPU, disk)

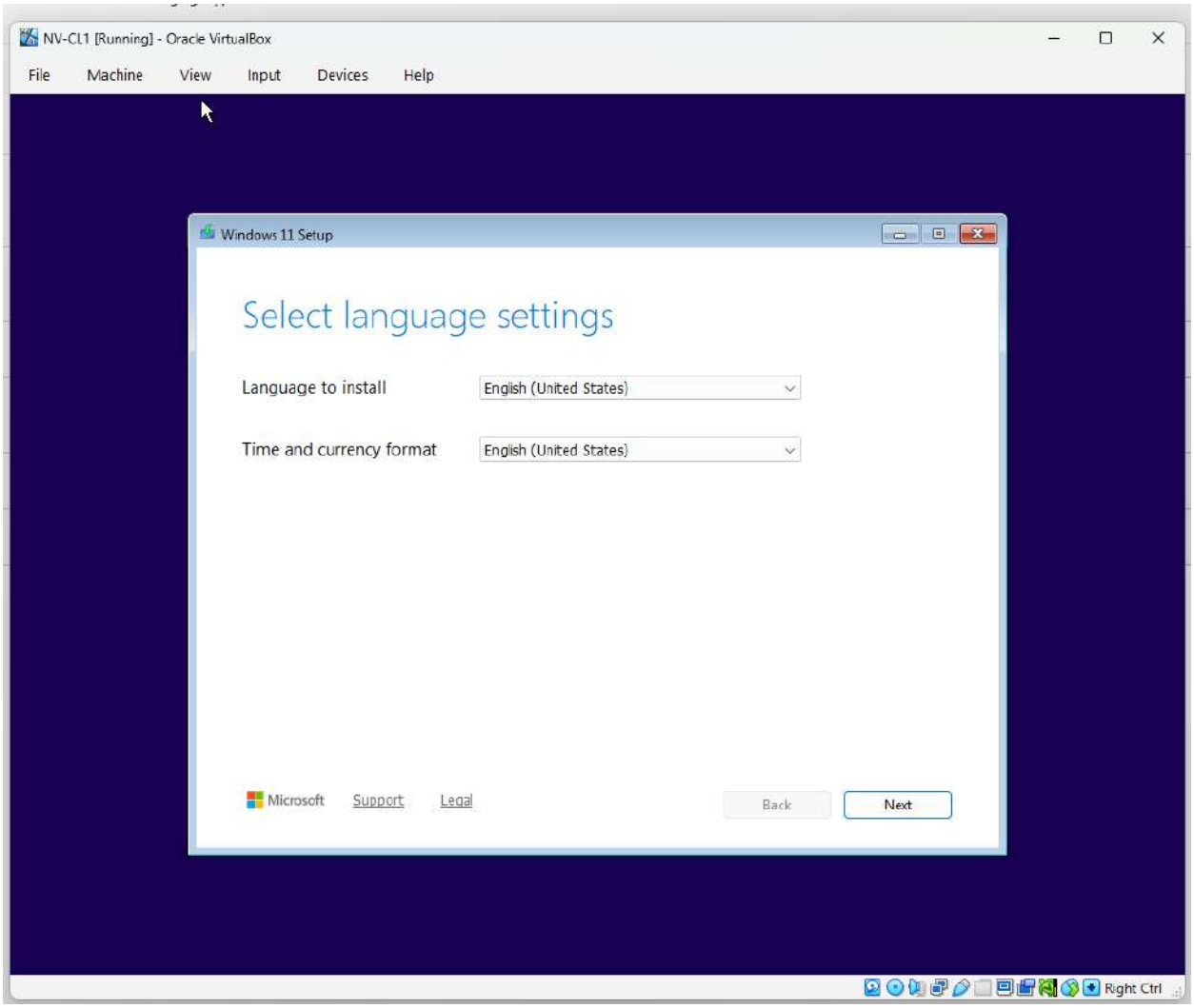



New Virtual Machine
Virtual machine name and operating system
Set up unattended guest OS installation
Specify virtual hardware
Specify virtual hard disk
Create a New Virtual Hard Disk
Hard Disk File Location and Size
C:\Users\vivianjohn.goshashy\VirtualBox VMs\NV-CL1\NV-CL1.vdi
Disk Size
40.0 GB
4.00 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
NV-DC1.vdi (Normal, 50.00 GB)
Create Virtual Machine Without a Virtual Hard Disk
Help
Finish
Cancel

3. ISO attached (Windows 11)



4. Desktop view



Section 5: Task — Network Connectivity Tests (15pts)

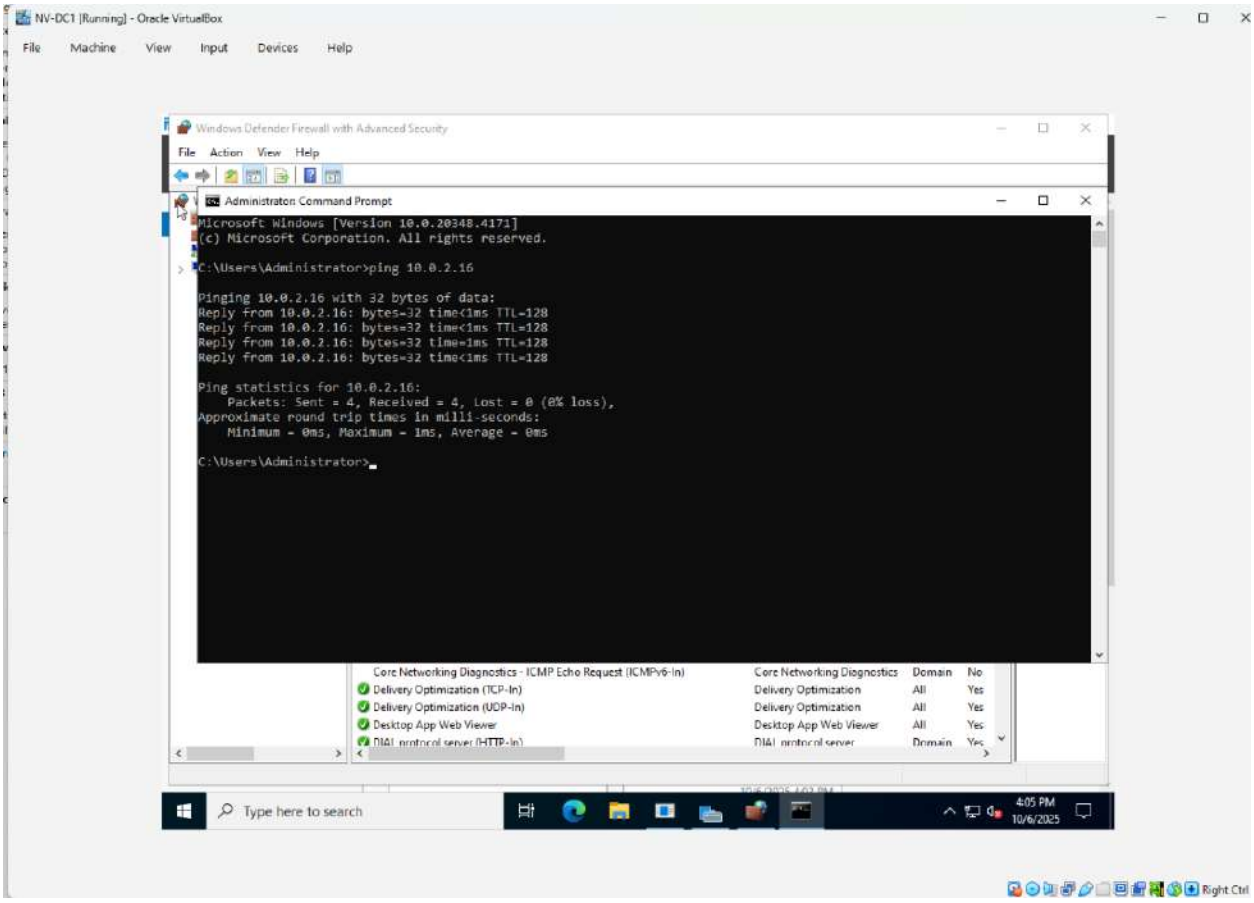
Finally, I tested network connectivity across the environment to confirm that all machines could communicate with one another and reach the internet. These tests verified both inter-VM communication and external access through the NAT Network. The table below shows the various ping tests and the outcomes.

(Complete the table with the results of the network test.)

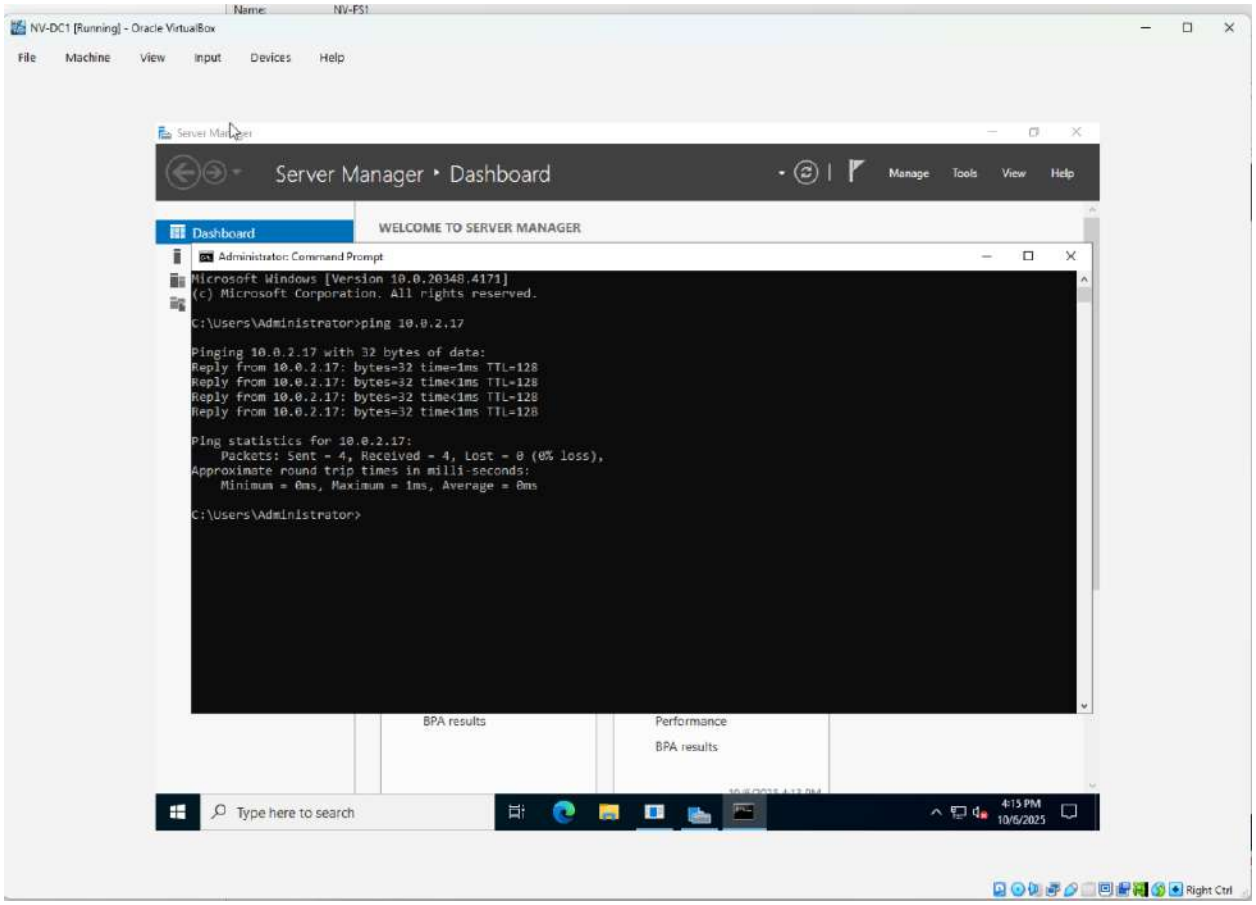
Test (From → To)	Outcome (Success/Fail)
NV-DC1 → NV-DC2	Success
NV-DC1 → NV-FS1	Success
NV-DC2 → NV-FS1	Success
NV-DC1 → Gateway	Success
NV-DC1 → www.bing.com	Success

Evidence: (*For each required screenshot, insert the screenshot in the space below the title.)* The screenshots below show the ping results between servers, the NAT gateway, and the internet.

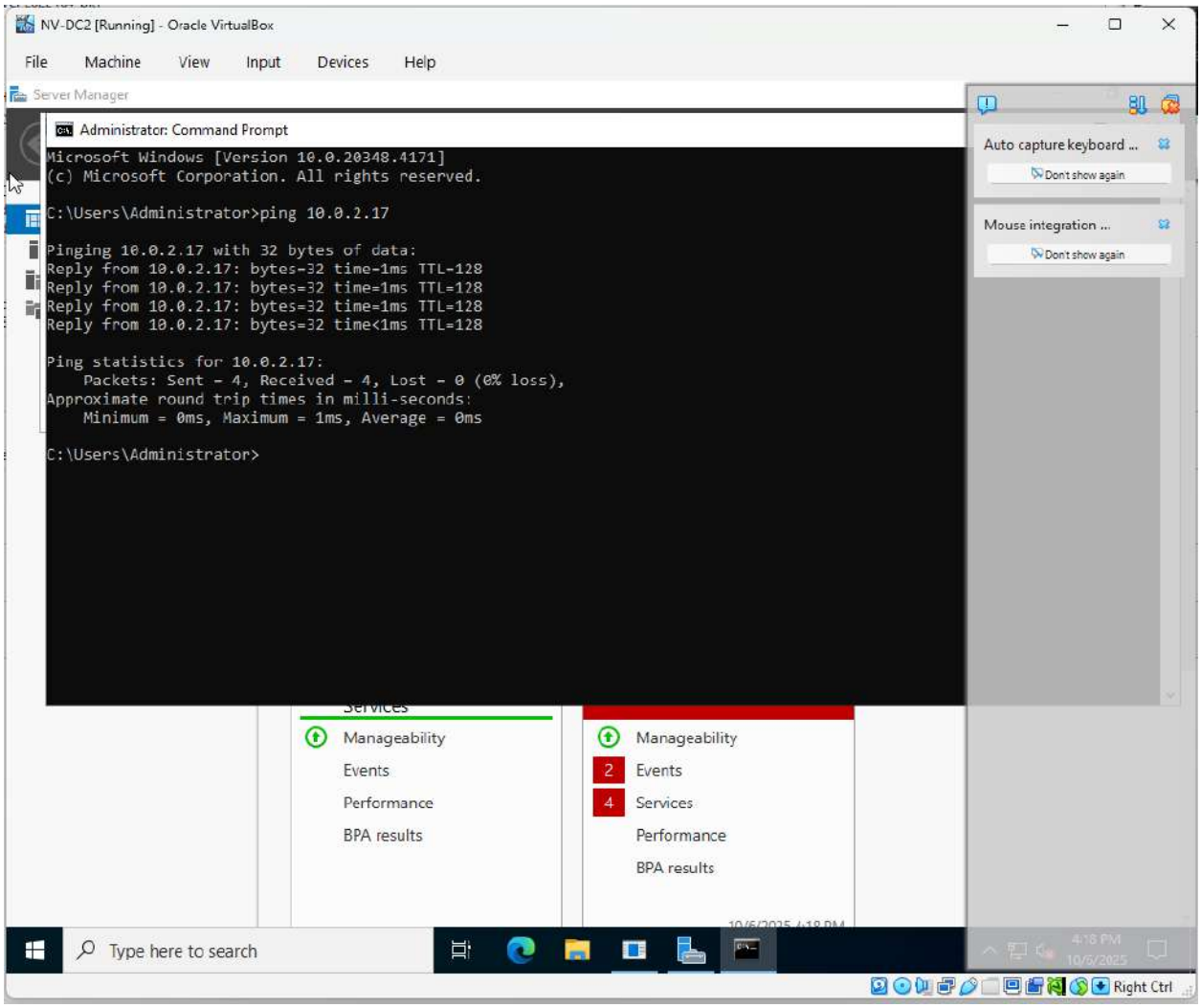
1. Ping results NV-DC1 ↔ NV-DC2.


NV-DC1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Windows Defender Firewall with Advanced Security
File Action View Help
Administrator: Command Prompt
Microsoft Windows [Version 10.0.20348.4171]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Administrator>ping 10.0.2.16
Pinging 10.0.2.16 with 32 bytes of data:
Reply from 10.0.2.16: bytes=32 time<1ms TTL=128
Reply from 10.0.2.16: bytes=32 time<1ms TTL=128
Reply from 10.0.2.16: bytes=32 time=1ms TTL=128
Reply from 10.0.2.16: bytes=32 time<1ms TTL=128
Ping statistics for 10.0.2.16:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\Users\Administrator>
Core Networking Diagnostics - ICMP Echo Request (ICMPv6-In) Core Networking Diagnostics Domain No
Delivery Optimization (TCP-In) Delivery Optimization All Yes
Delivery Optimization (UDP-In) Delivery Optimization All Yes
Desktop App Web Viewer Desktop App Web Viewer All Yes
Type here to search
4:05 PM
10/6/2025
Right Ctrl

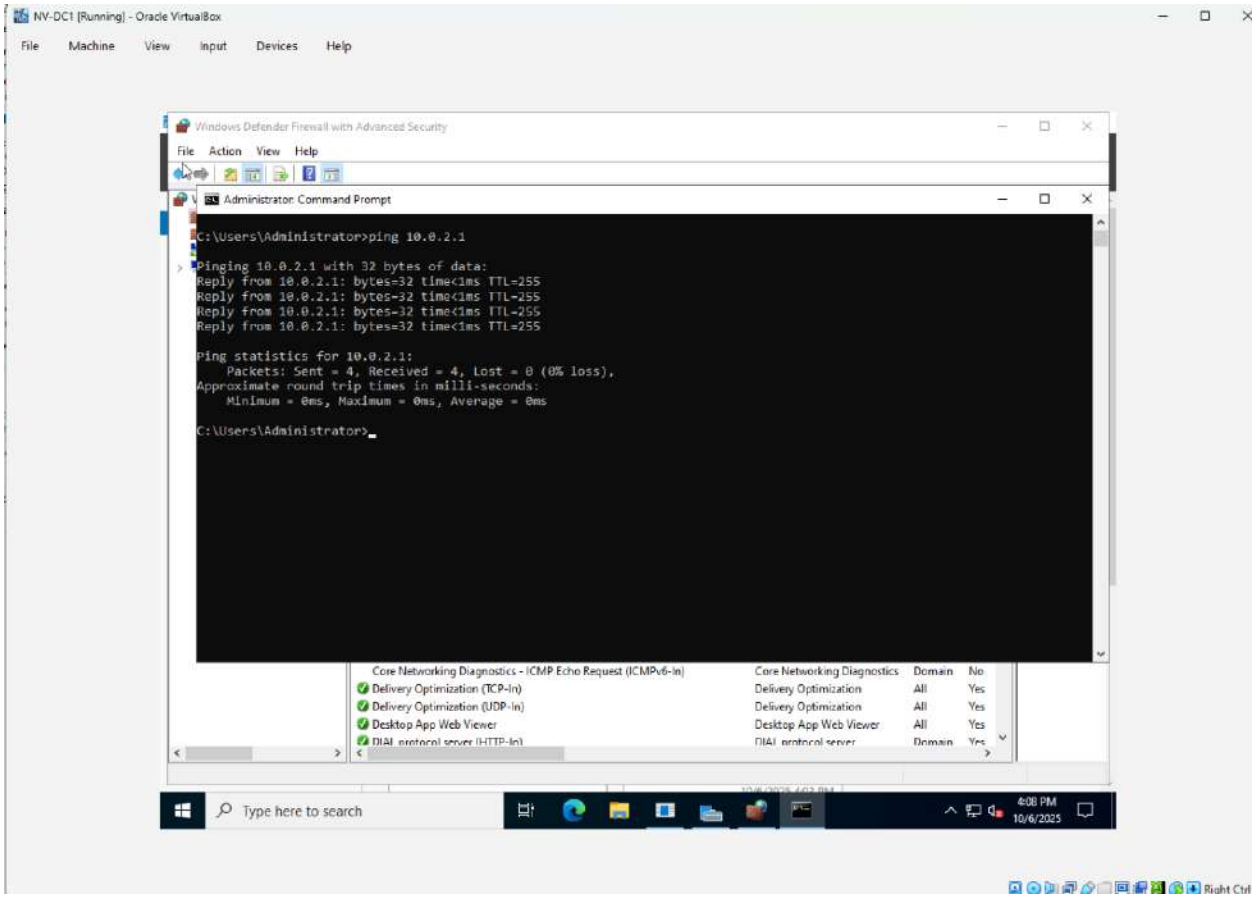
2. Ping results NV-DC1 ↔ NV-FS1



3. Ping results NV-DC2 ↔ NV-FS1



4. Ping results to NAT gateway



5. Internet access (ping or browser test)