

# IT 236 Project Report Form

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Date:	September 29, 2025
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](http://www.bing.com).

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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.)*

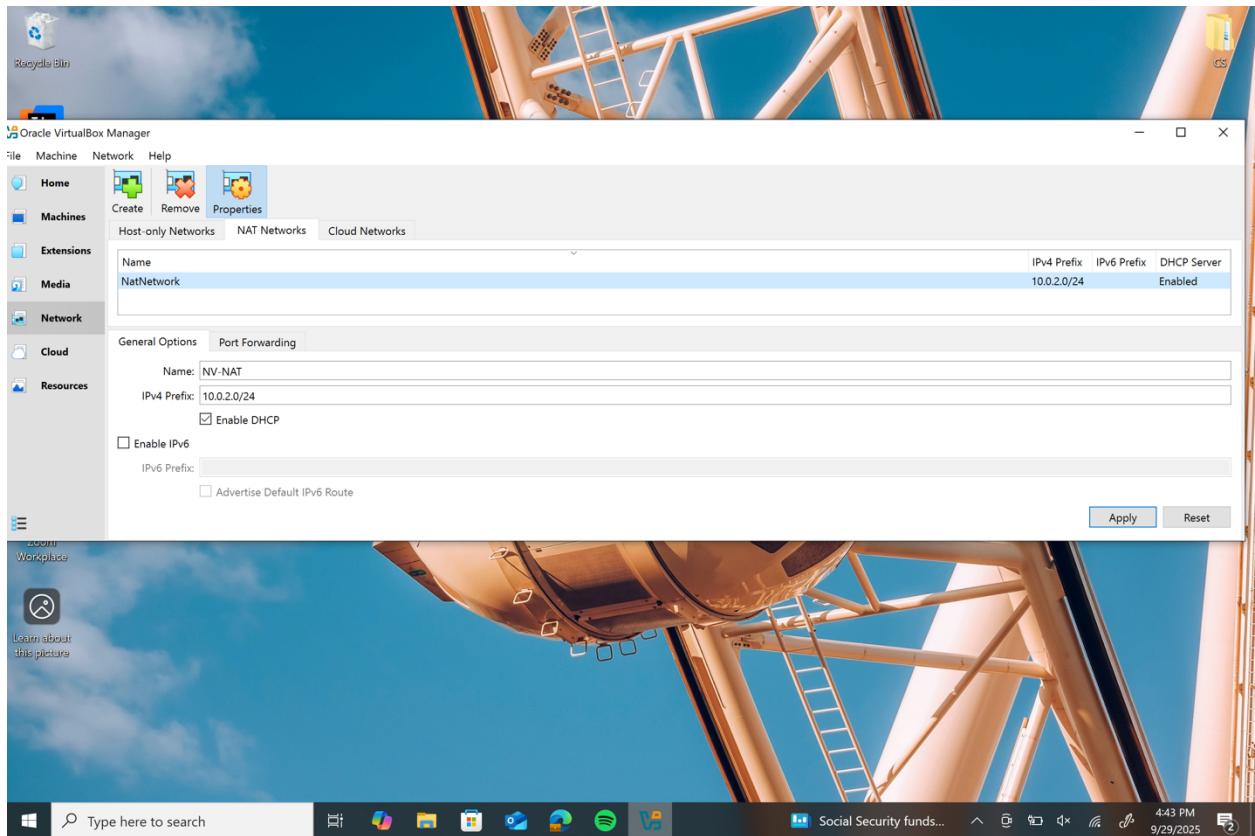
VM Name	Operating System	RAM	CPU Cores	IP Address
NV-DC1	Windows Server 2022 (64-bit)	4096	2	10.0.2.15/24
NV-DC2	Windows Server 2022 (64-bit)	4096	2	10.0.2.16/24
NV-FS1	Windows Server 2022 (64-bit)	4096	2	10.0.2.17/24
NV-CL1	Window 11(64-bit)	4096	2	None

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

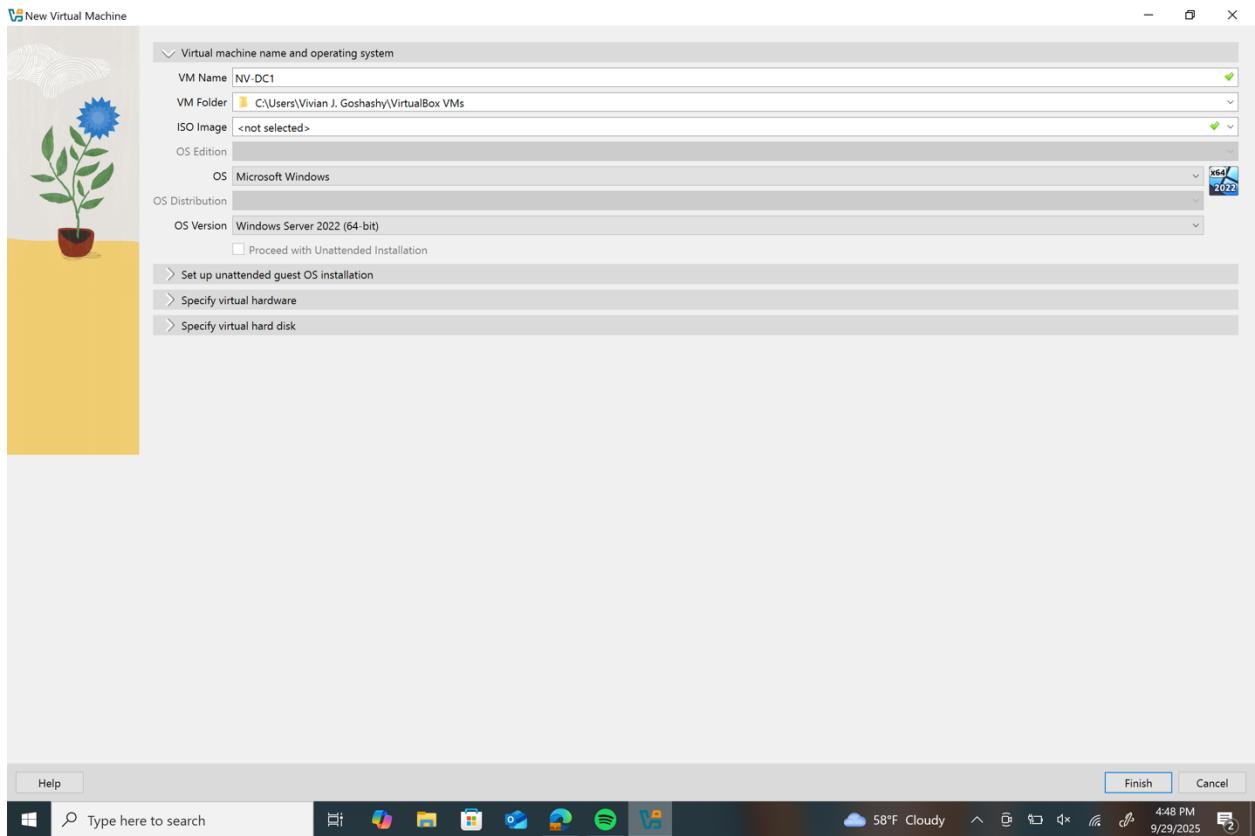
I began by creating a NAT Network in VirtualBox to allow communication between all virtual machines as well as access to the internet. Once the network was in place, I created NV-DC1, the first Windows Server 2022 machine. This server acted as the base system for later cloning and served as the foundation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

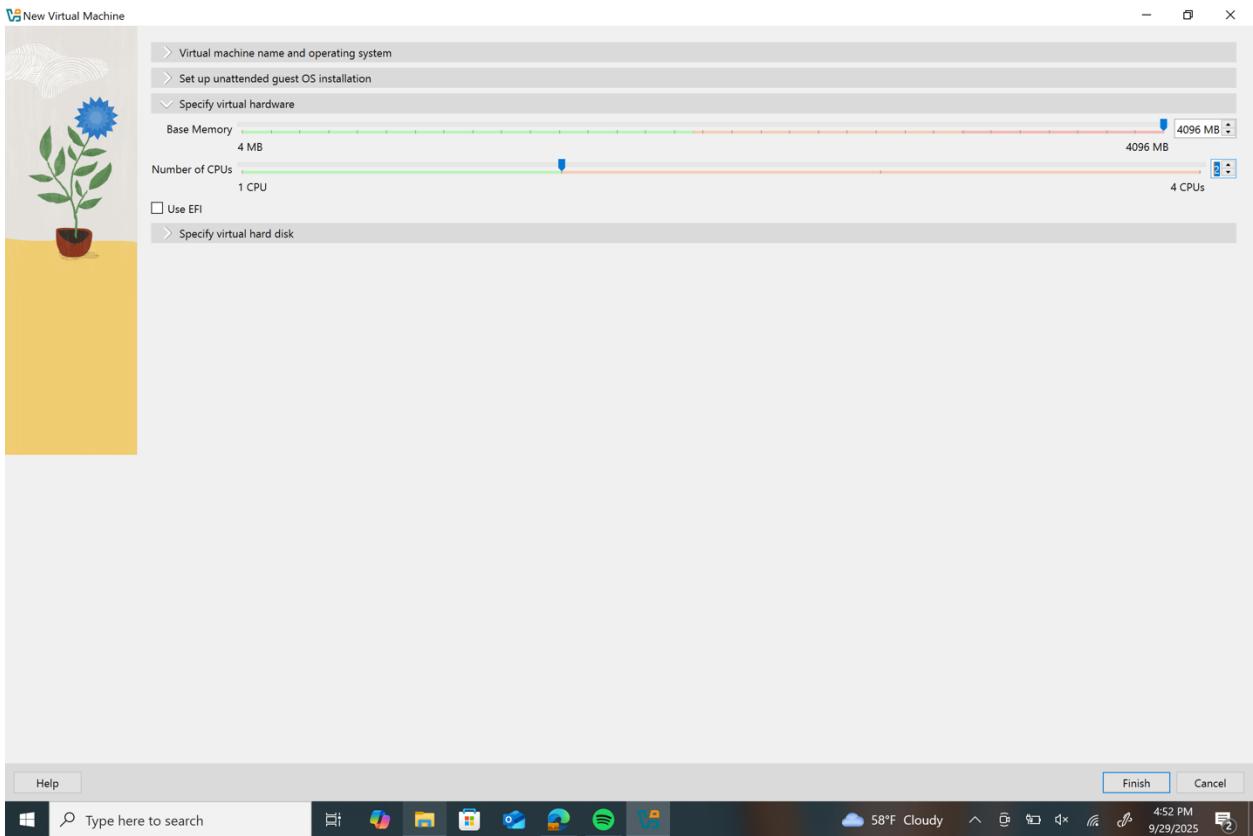
### 1. NAT Network settings (NV-NAT with DHCP enabled)

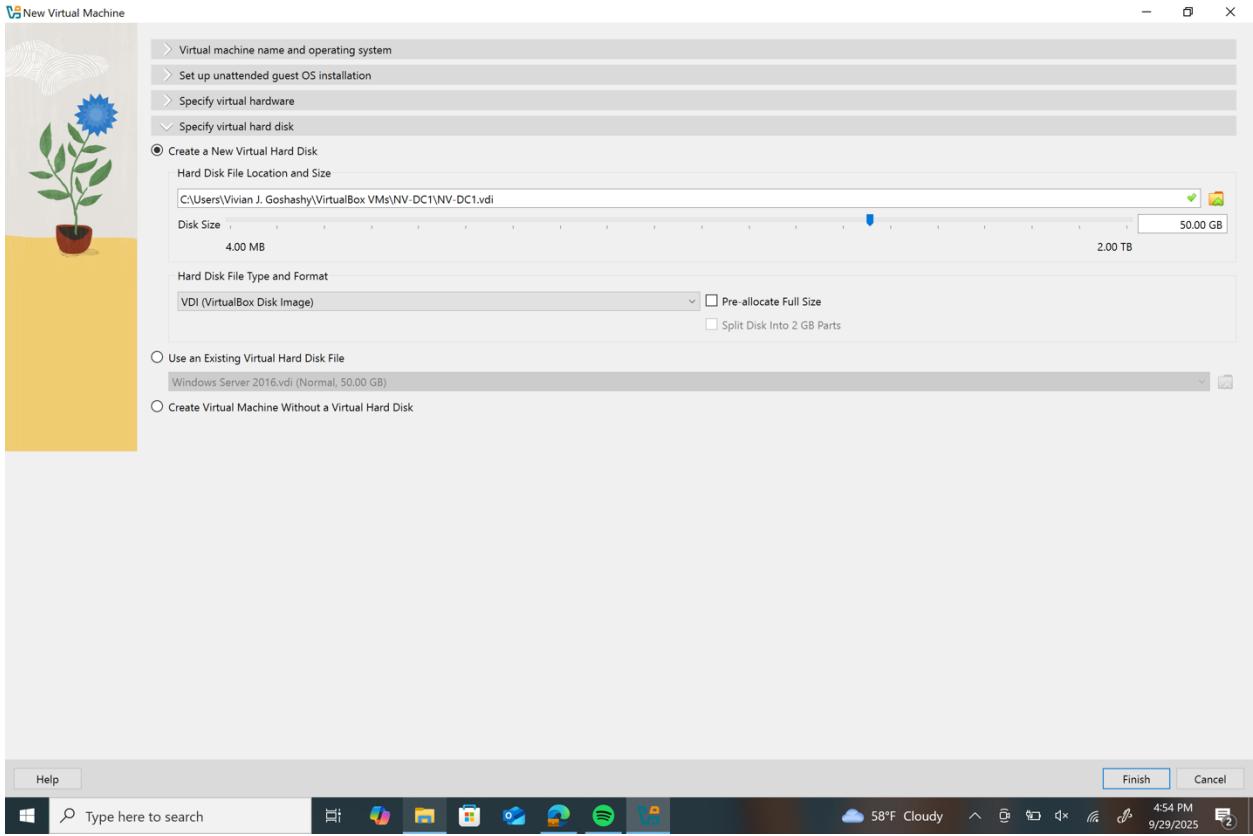


## 2. NV-DC1 New VM dialog (name + OS version)



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





#### 4. NV-DC1 Storage settings (ISO attached)

**Machines**

- New
- Open
- Settings
- Discard
- Show

**General**

Name: NV-DC1  
Operating System: Windows Server 2022 (64-bit)

**System**

Base Memory: 4096 MB  
Processors: 2  
Boot Order: Floppy, Optical, Hard Disk  
Acceleration: Nested Paging, Hyper-V Paravirtualization

**Display**

Video Memory: 128 MB  
Graphics Controller: VBoxSVGA  
Remote Desktop Server: Disabled  
Recording: Disabled

**Storage**

Controller: SATA  
SATA Port 0: NV-DC1.vdi (Normal, 50.00 GB)  
SATA Port 1: [Optical Drive] SERVER\_EVAL\_x64FRE\_en-us.iso (4.70 GB)

**Audio**

Host Driver: Default  
Controller: Intel HD Audio

**Network**

Adapter 1: Intel PRO/1000 MT Desktop (NAT)

**USB**

USB Controller: xHCI  
Device Filters: 0 (0 active)

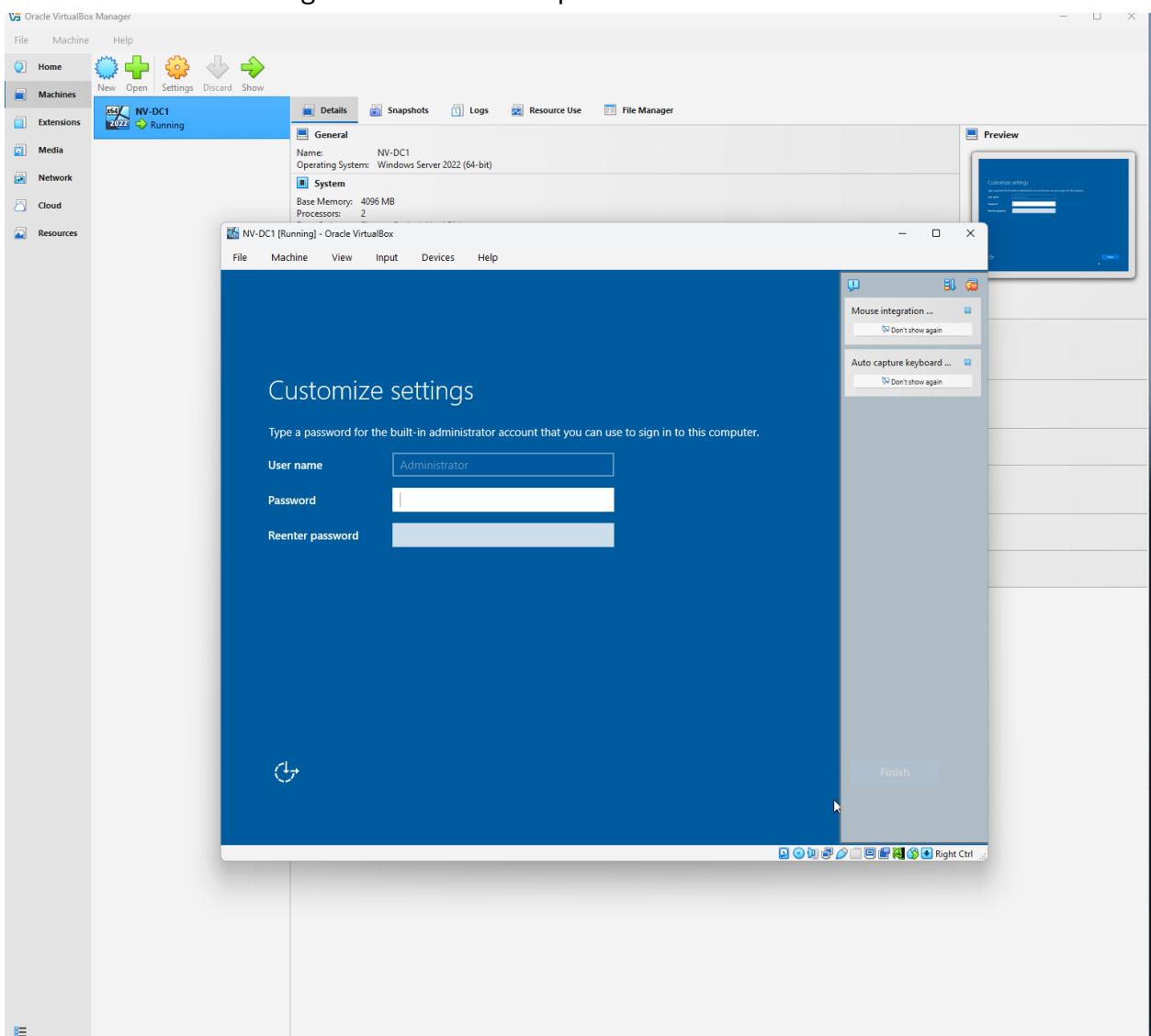
**Shared folders**

None

**Description**

None

## 5. Installation screen or login screen after setup



## 6. ipconfig output (DHCP address)

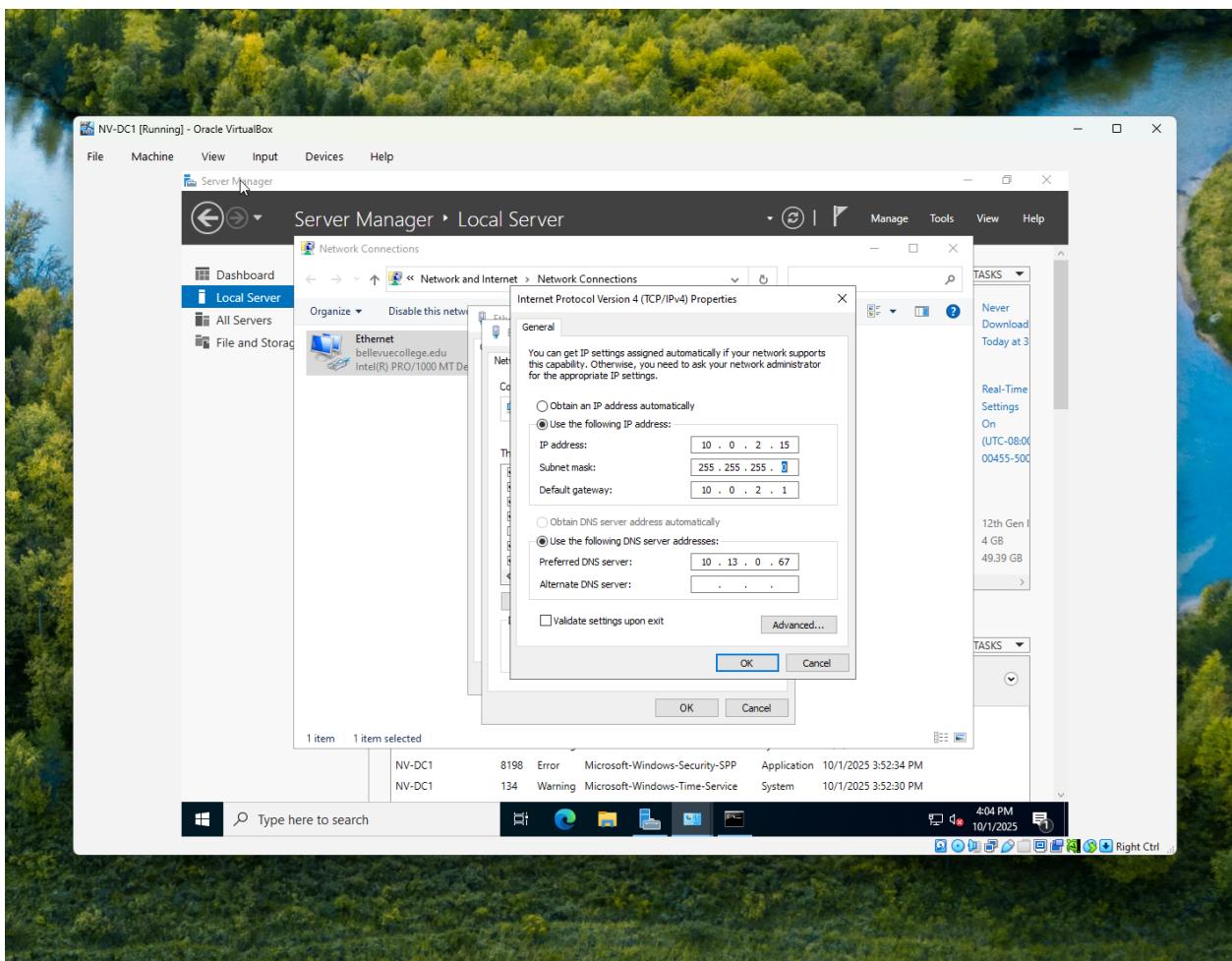
The screenshot shows a Windows Server 2022 desktop environment. In the center, a command prompt window is open, displaying the output of the `ipconfig` command. The output details the system's network configuration, including the host name, primary DNS suffix, node type, and various IP settings for the Ethernet adapter. The adapter is identified as an Intel(R) PRO/1000 MT Desktop Adapter with a physical address of 08-00-27-BA-80-46. It is using DHCP for IPv4 and IPv6, with a link-local IPv6 address of fe80::7cd7:9c1c:d5:729b%4 (Preferred). The subnet mask is 255.255.255.0, and the default gateway is 10.0.2.1. The lease obtained is for Wednesday, October 1, 2025, 3:52:30 PM, and the lease expires on Wednesday, October 1, 2025, 4:07:31 PM. The DHCP server is 10.0.2.2, and the DHCPv6 IAID is 101187623. The DNS servers are 10.0.2.67 and 10.0.2.68. NetBIOS over Tcpip is enabled. The command prompt also shows the current directory as C:\Users\Administrator>.

```
Host Name . . . . . : NV-DC1
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : bellevuecollege.edu

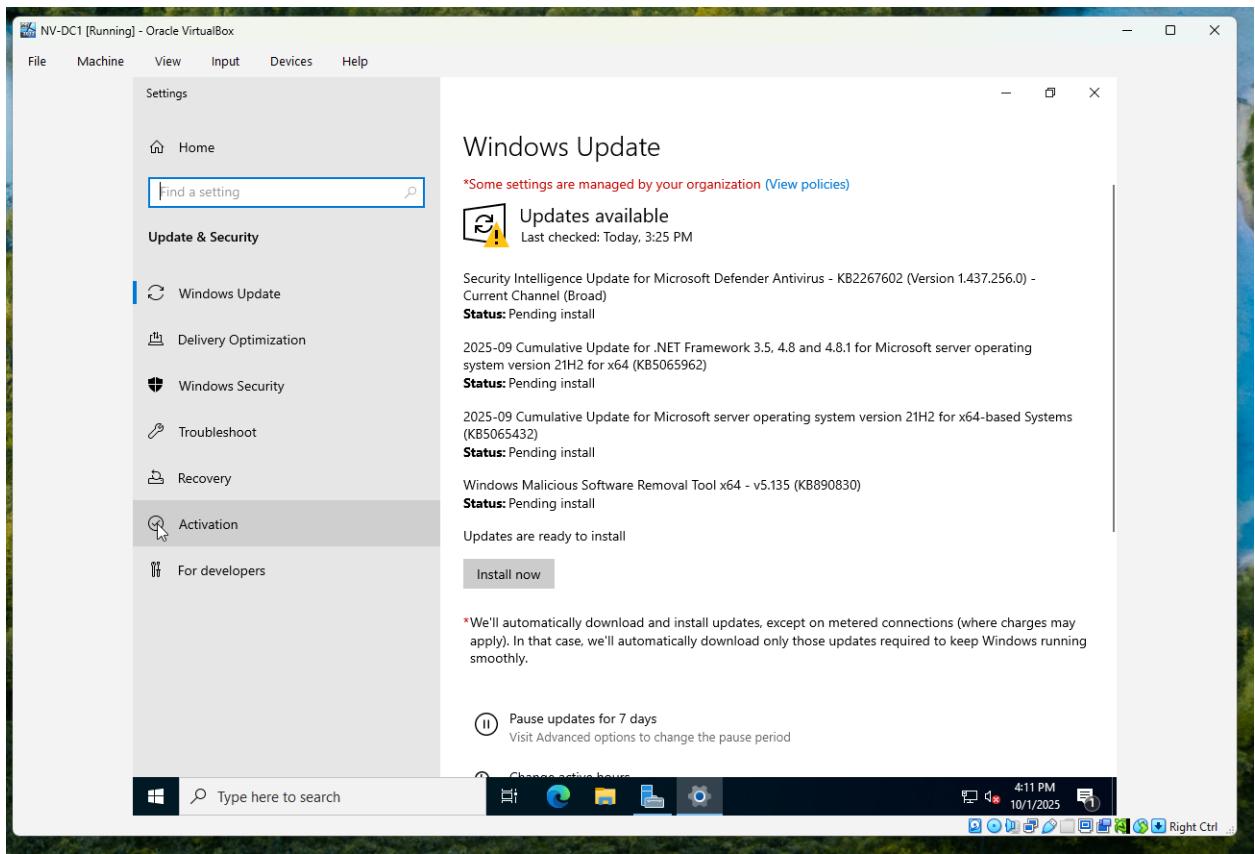
Ethernet adapter Ethernet:

Connection-specific DNS Suffix . : bellevuecollege.edu
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address . . . . . : 08-00-27-BA-80-46
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::7cd7:9c1c:d5:729b%4(PREFERRED)
IPv4 Address . . . . . : 10.0.2.15(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained . . . . . : Wednesday, October 1, 2025 3:52:30 PM
Lease Expires . . . . . : Wednesday, October 1, 2025 4:07:31 PM
Default Gateway . . . . . : 10.0.2.1
DHCP Server . . . . . : 10.0.2.2
DHCPv6 IAID . . . . . : 101187623
DHCPv6 Client DUID. . . . . : 00-01-00-01-30-6C-D8-97-08-00-27-BA-80-46
DNS Servers . . . . . : 10.0.2.67
                           10.0.2.68
NetBIOS over Tcpip. . . . . : Enabled
```

## 7. Static IP configuration



## 8. Windows Update screen

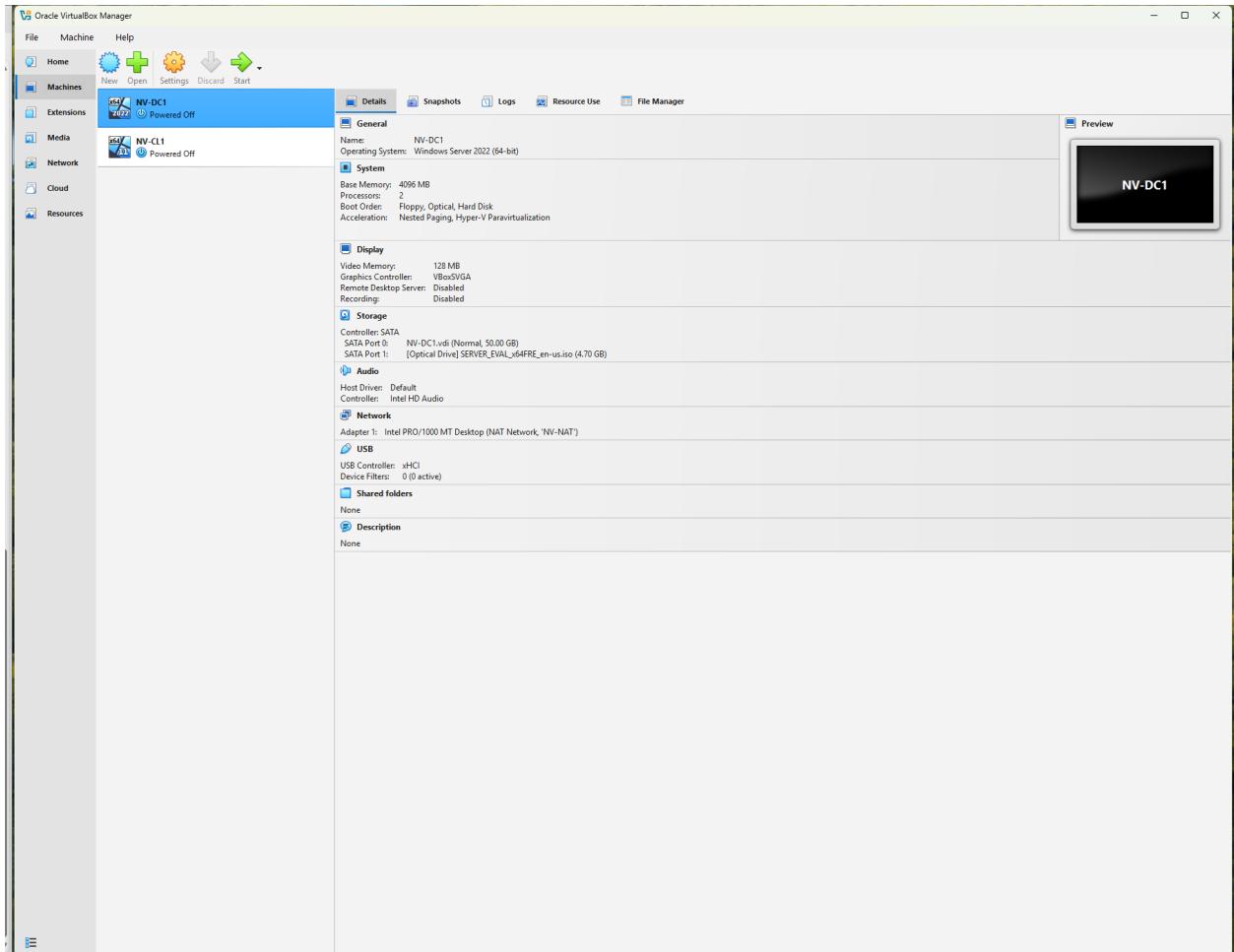


## Section 3: Task — Cloning NV-DC1 to NV-DC2 and NV-FS1 (10pts)

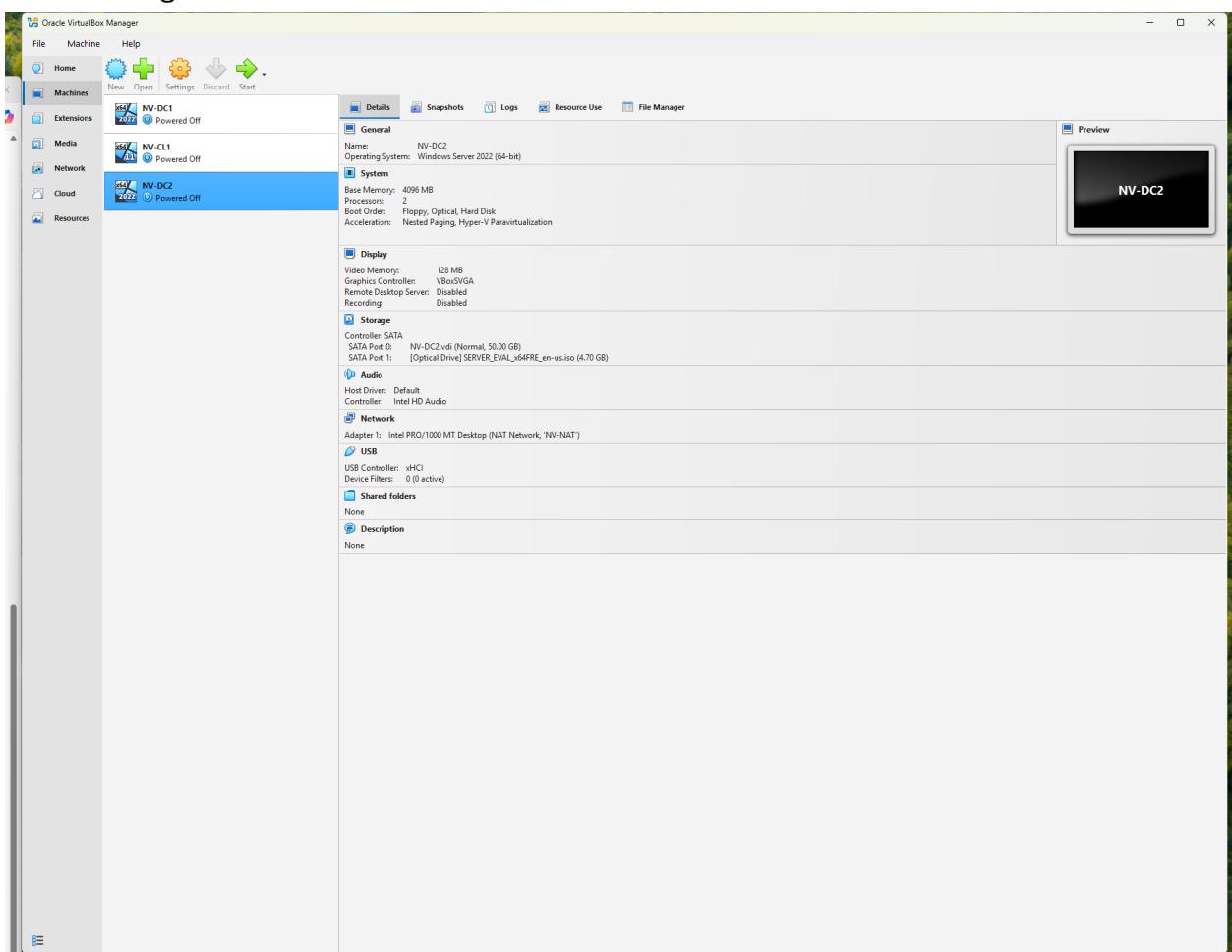
Building on the base server, I created two additional machines by cloning NV-DC1. These became NV-DC2 and NV-FS1. After cloning, I renamed the servers and reconfigured their IP addresses to static values.

**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.

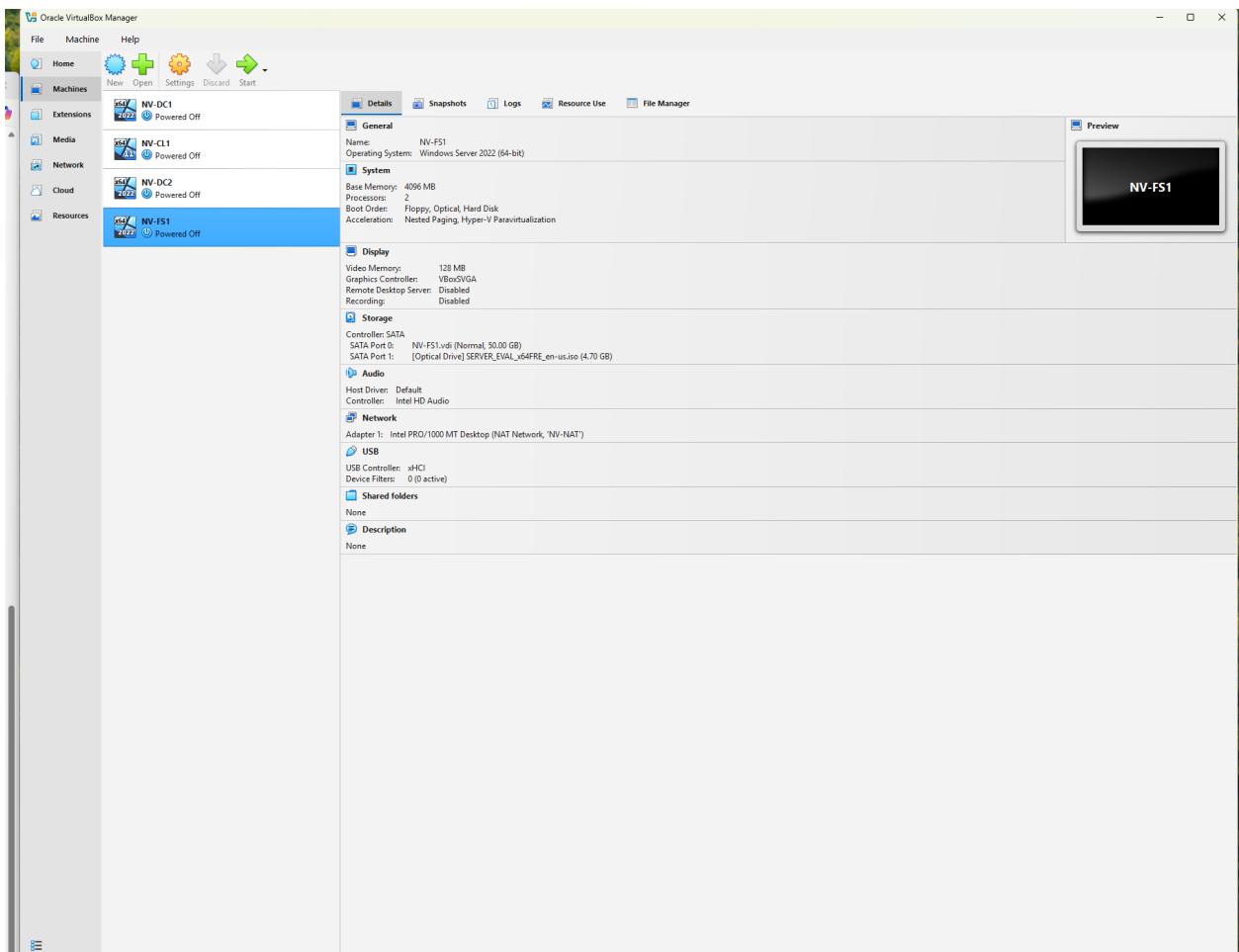
### 1. NV-DC1 powered off before cloning



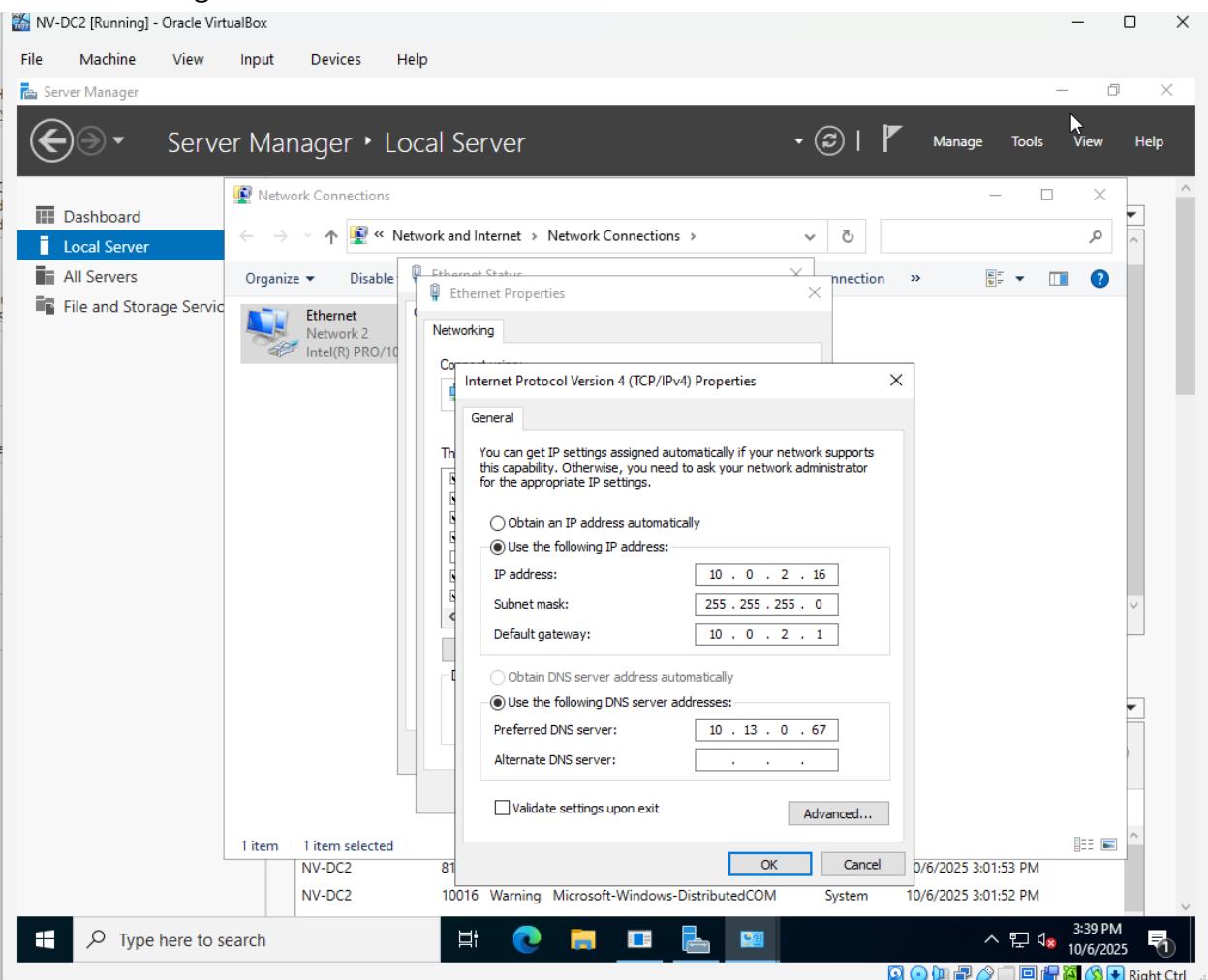
## 2. Clone dialog / NV-DC2 created



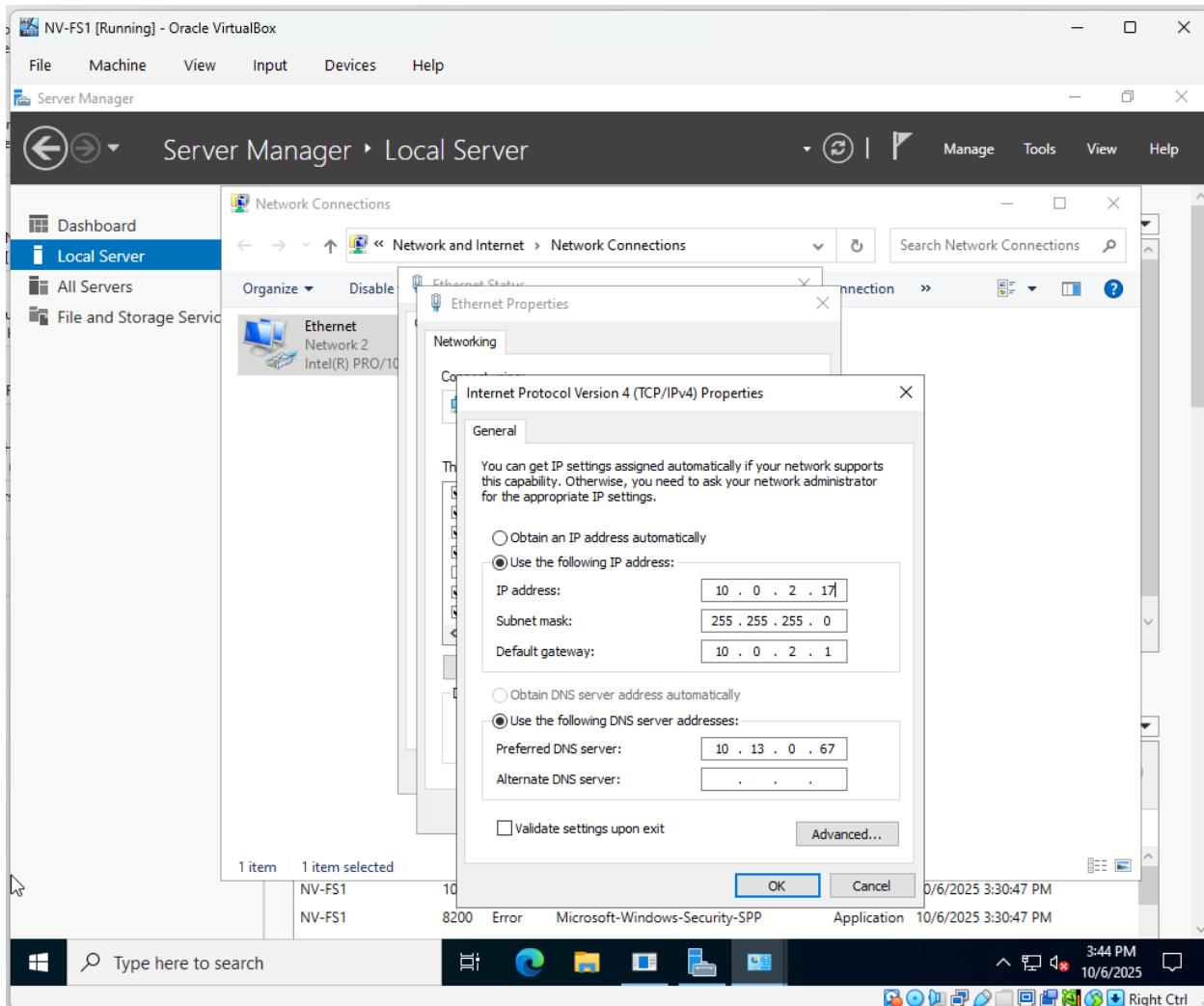
### 3. Clone dialog / NV-FS1 created



#### 4. Static IP Settings for NV-DC2



## 5. static IP config for NV-FS1

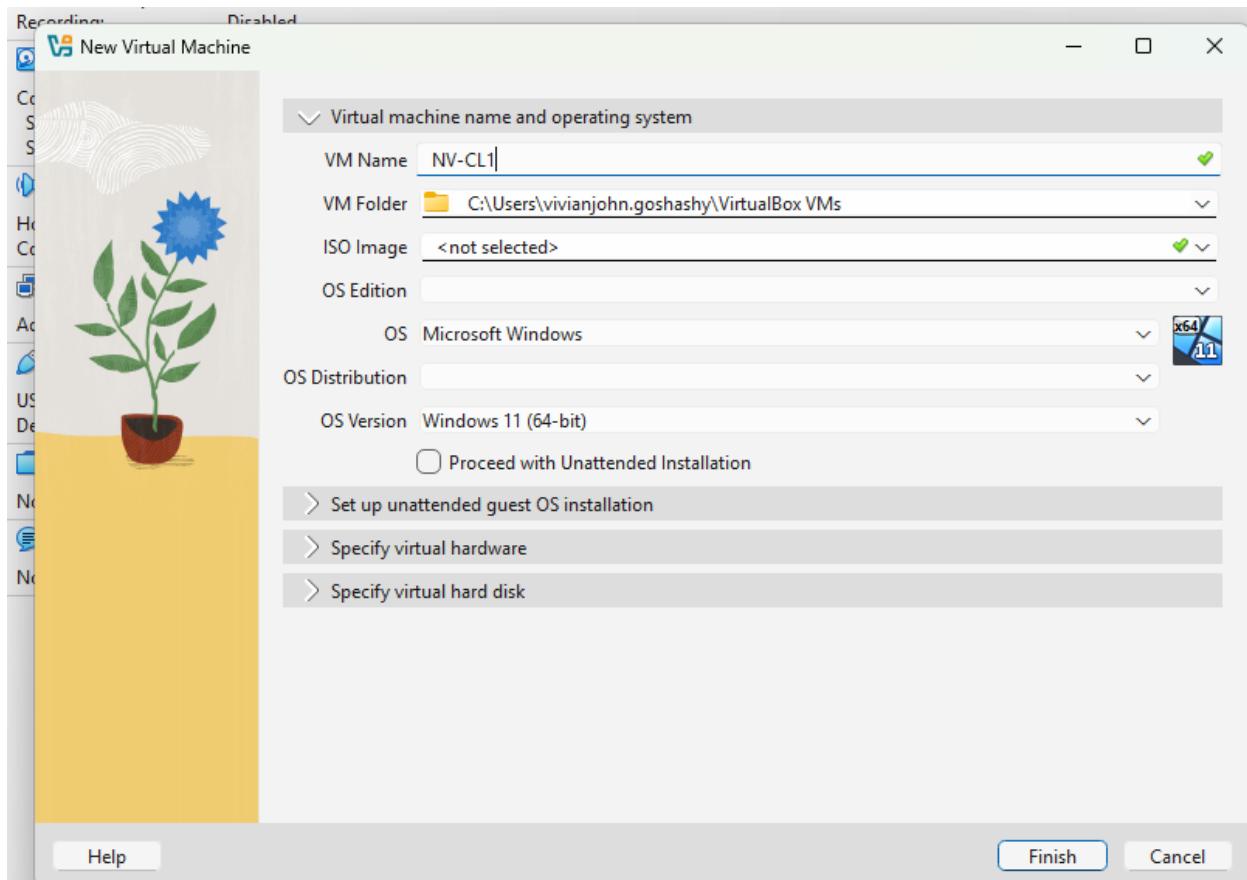


## Section 4: Task — Creation of Windows 11 Client (NV-CL1) (8pts)

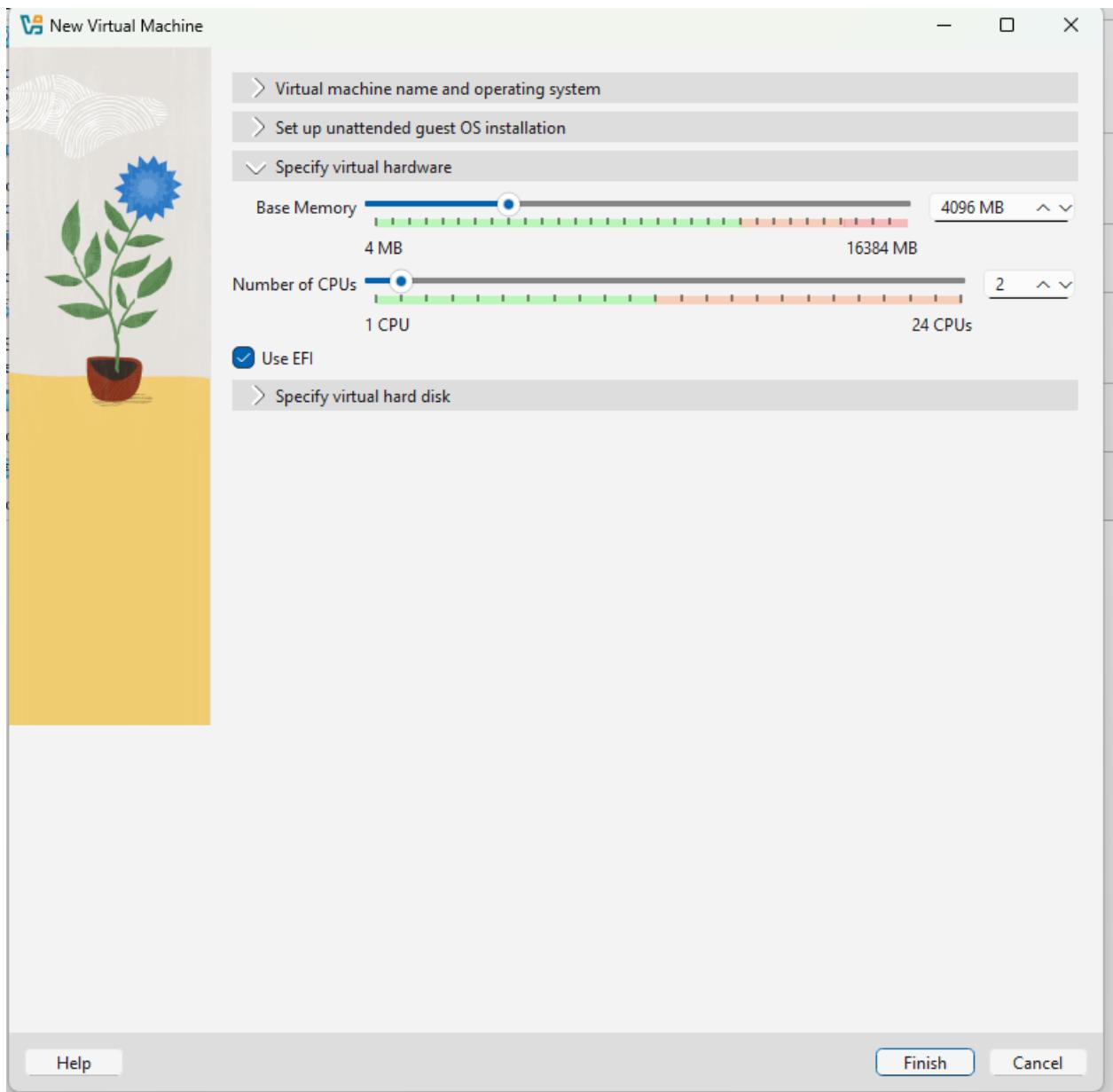
After completing the server setup, I created a Windows 11 client named NV-CL1. This client was designed to act as a workstation for testing and to ensure that endpoints could communicate effectively with the servers and access external resources.

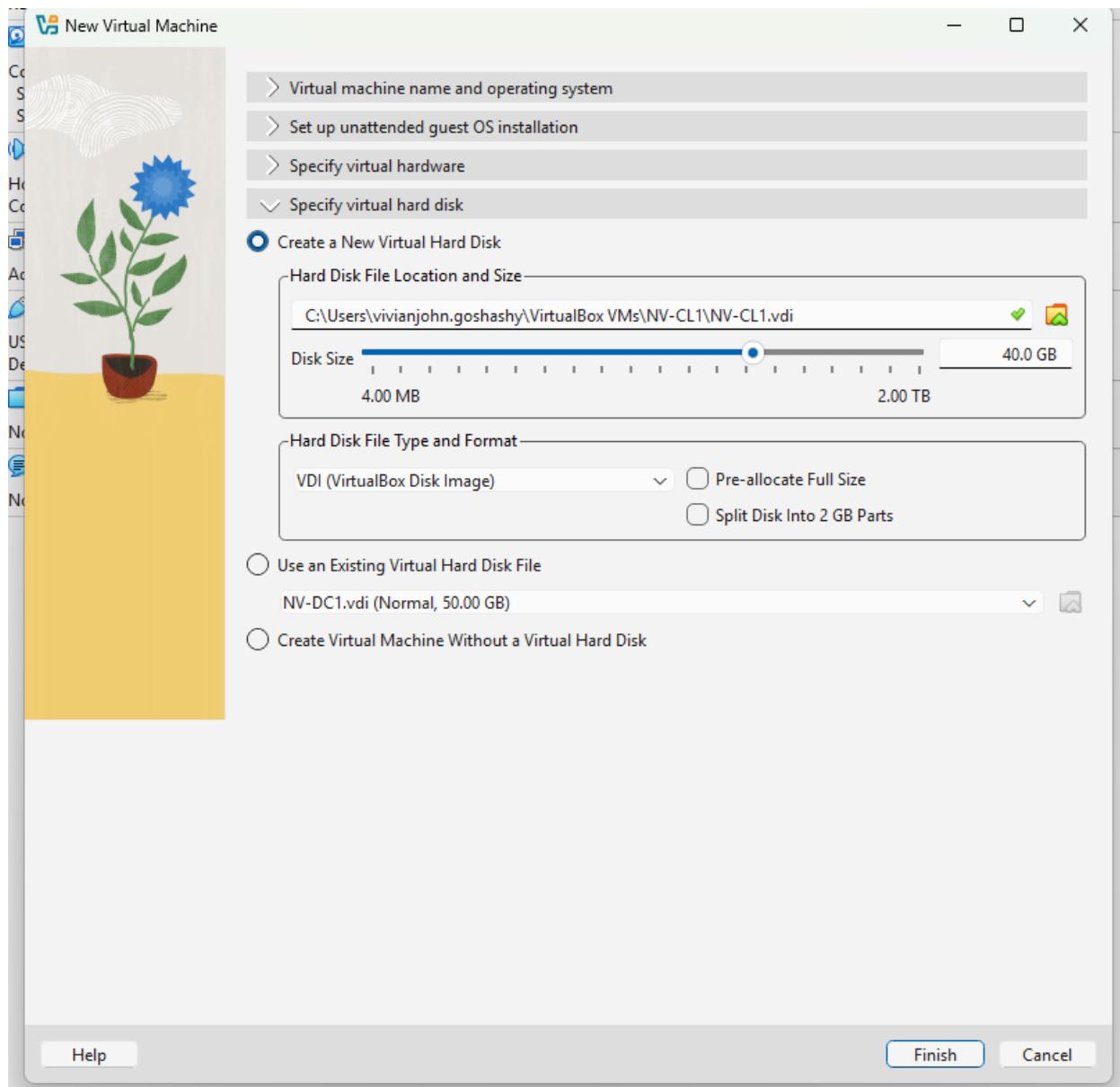
**Evidence:** (For each required screenshot, insert the screenshot in the space below the title.)  
The screenshots below show the creation and configuration of NV-CL1.

### 1. New VM dialog for NV-CL1

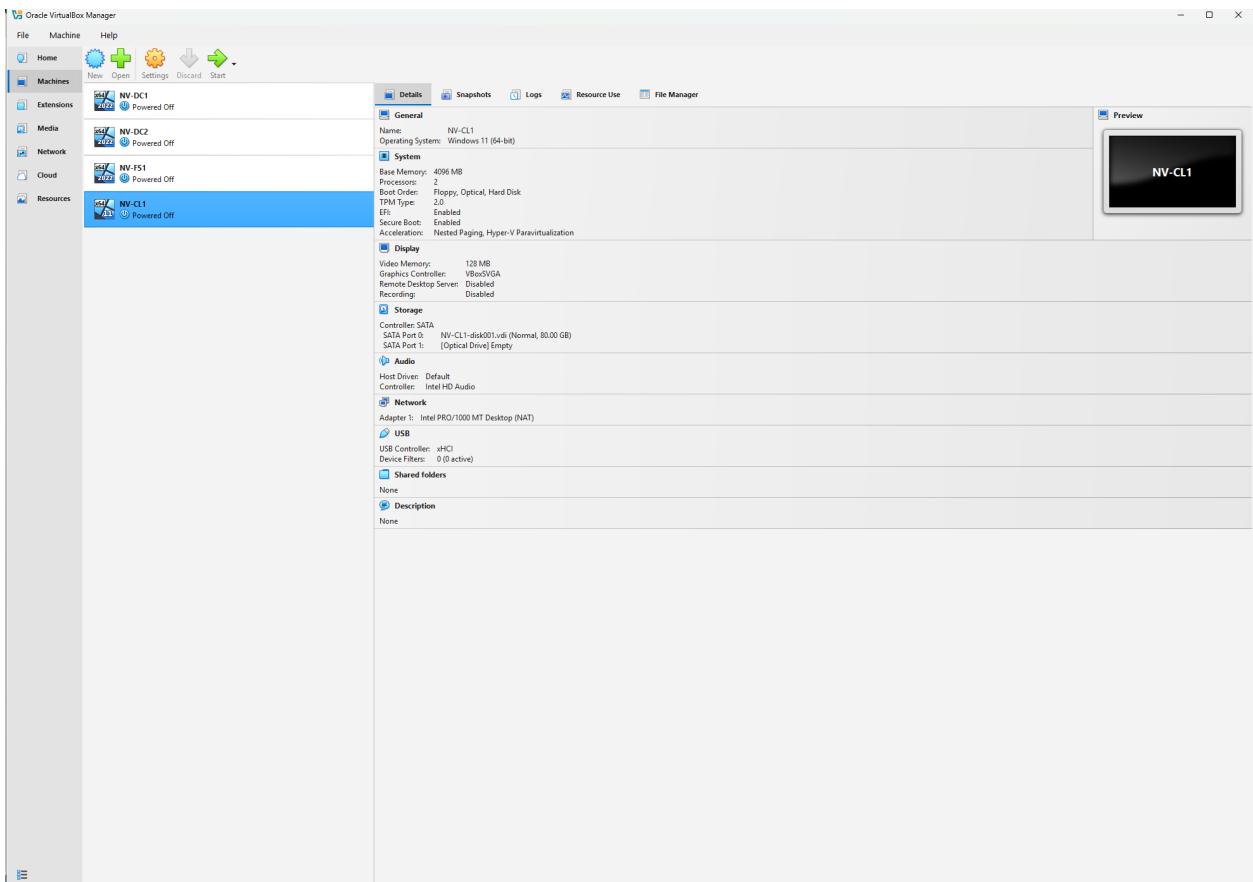


## 2. Resource settings (RAM, CPU, disk)

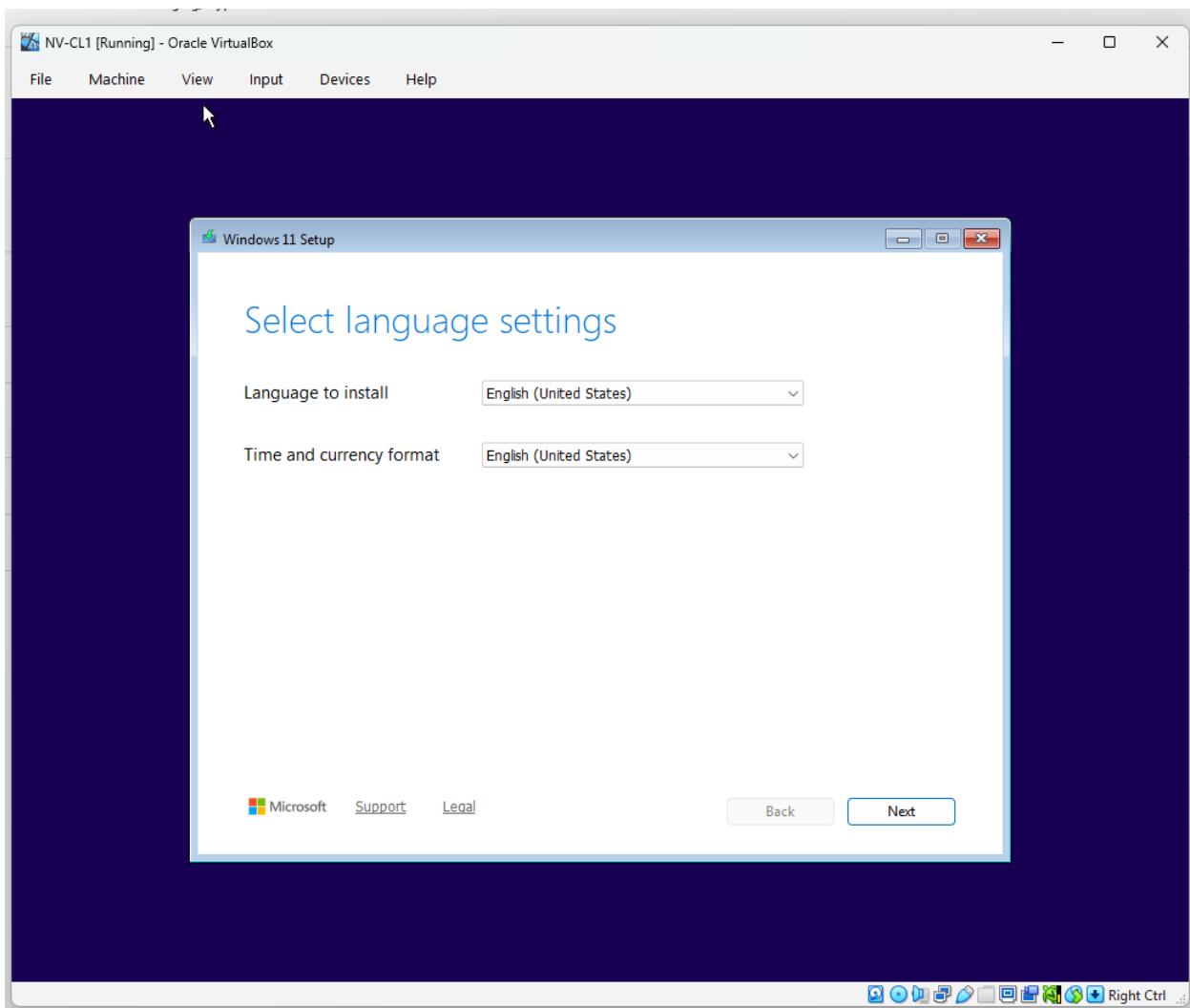




### 3. ISO attached (Windows 11)



#### 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.

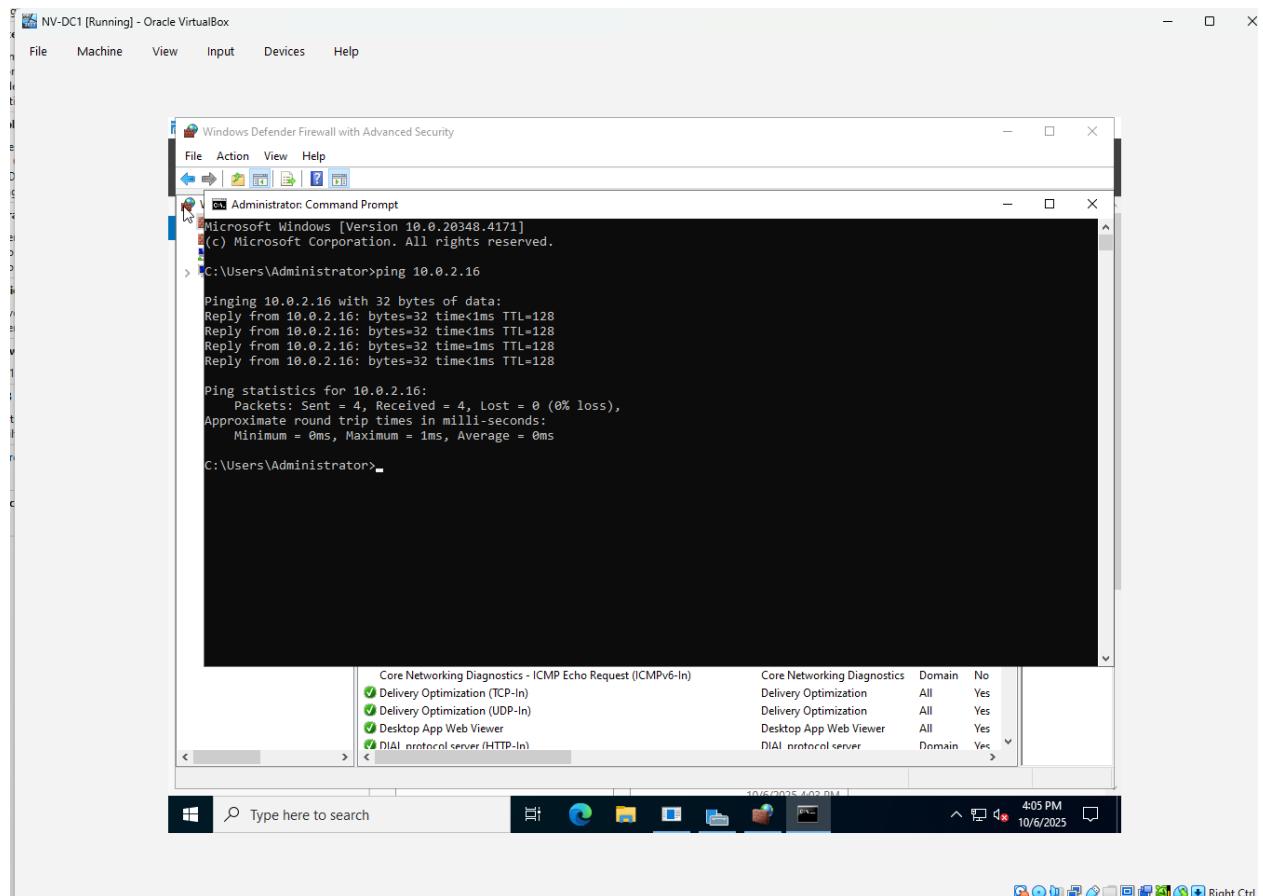
(Complete the table with the results of the network test.)

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 → <a href="http://www.bing.com">www.bing.com</a>	Success

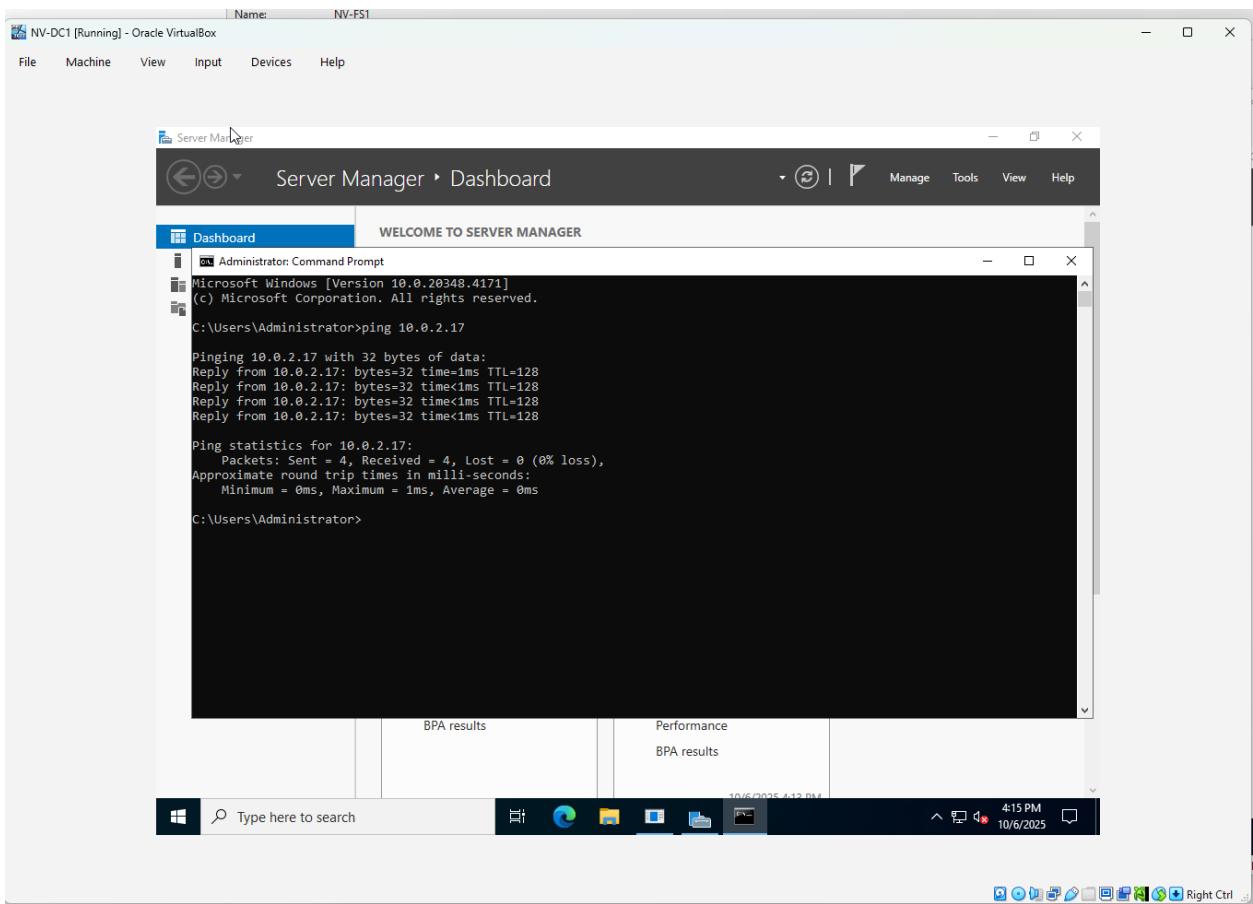
**Evidence:** (For each required screenshot, insert the screenshot in the space below the title.)

The screenshots below show the ping results between servers, the NAT gateway, and the internet.

1. Ping results NV-DC1 ↔ NV-DC2.



## 2. Ping results NV-DC1 ⇄ NV-FS1



### 3. Ping results NV-DC2 ⇄ NV-FS1

The screenshot shows a Windows Server 2022 desktop environment within Oracle VirtualBox. A Command Prompt window titled "Administrator: Command Prompt" is open, displaying the output of a ping command. The ping results show four successful replies from the target IP address 10.0.2.17. Below the ping results, the Command Prompt prompt "C:\Users\Administrator>" is visible.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.20348.4171]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping 10.0.2.17

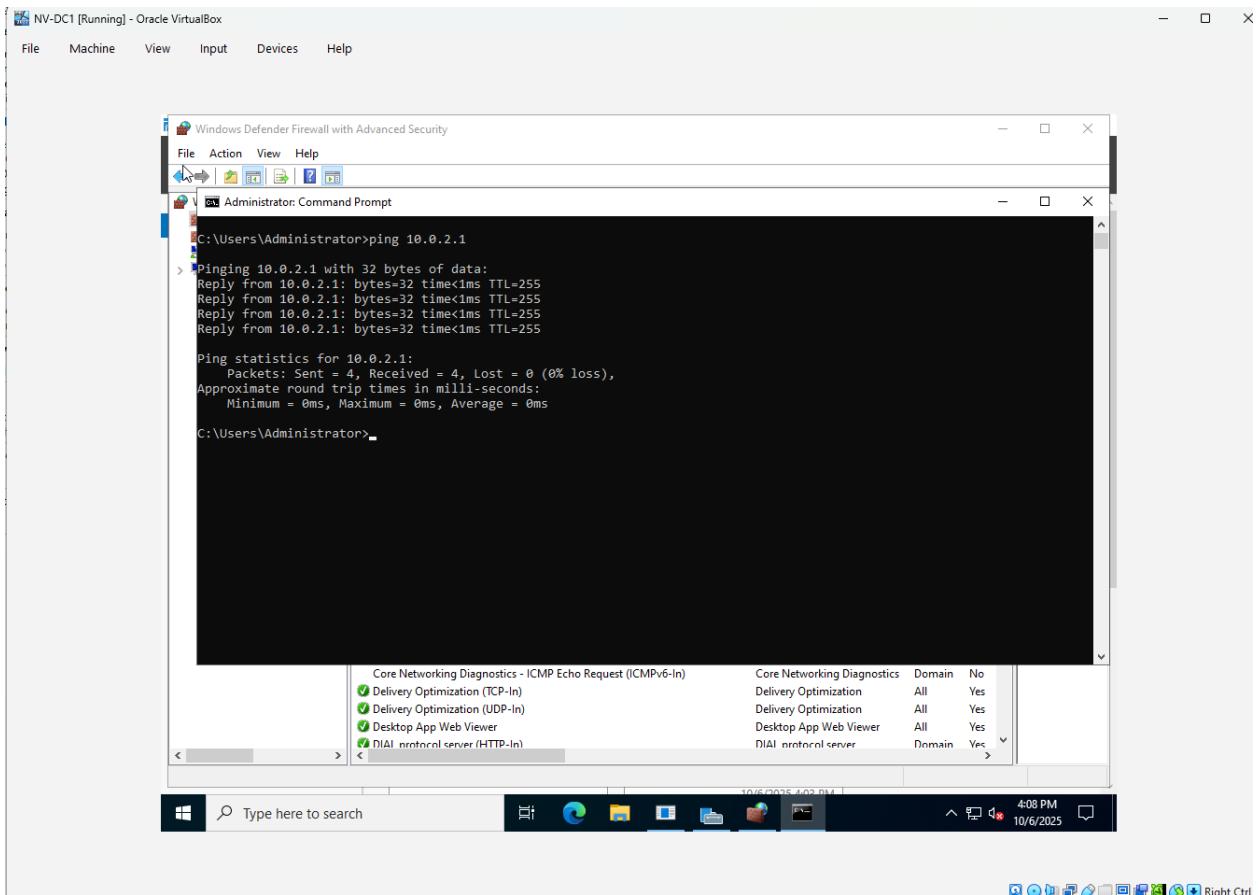
Pinging 10.0.2.17 with 32 bytes of data:
Reply from 10.0.2.17: bytes=32 time=1ms TTL=128
Reply from 10.0.2.17: bytes=32 time=1ms TTL=128
Reply from 10.0.2.17: bytes=32 time=1ms TTL=128
Reply from 10.0.2.17: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.2.17:
    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>
```

A context menu is open over the Command Prompt window, showing options like "Auto capture keyboard ..." and "Mouse integration ...". The taskbar at the bottom shows the Start button, a search bar with placeholder text "Type here to search", and several pinned icons. The system tray shows the date and time as "10/6/2025 4:18 PM".

#### 4. Ping results to NAT gateway



## 5. Internet access (ping or browser test)

