Final Project – Part I (CIS 216 Spring 2026)

Michael Nobles

Task 1: Explain and demonstrate with screenshots the difference between Education, Professional and Home versions of a Windows installation. Using screenshots (you can use your previous lab screenshots) – show when you make this decision in the installation process.

Explanation:

Home is for personal use (no domain join, no Group Policy, no BitLocker, no Hyper-V).

Professional adds business features (domain join, Group Policy, BitLocker, Remote Desktop host, Hyper-V).

Education matches Pro with extra academic/volume-licensing features for schools.

The choice appears on the "Which edition of Windows do you want to install?" screen during clean setup (when ISO/media contains multiple editions).

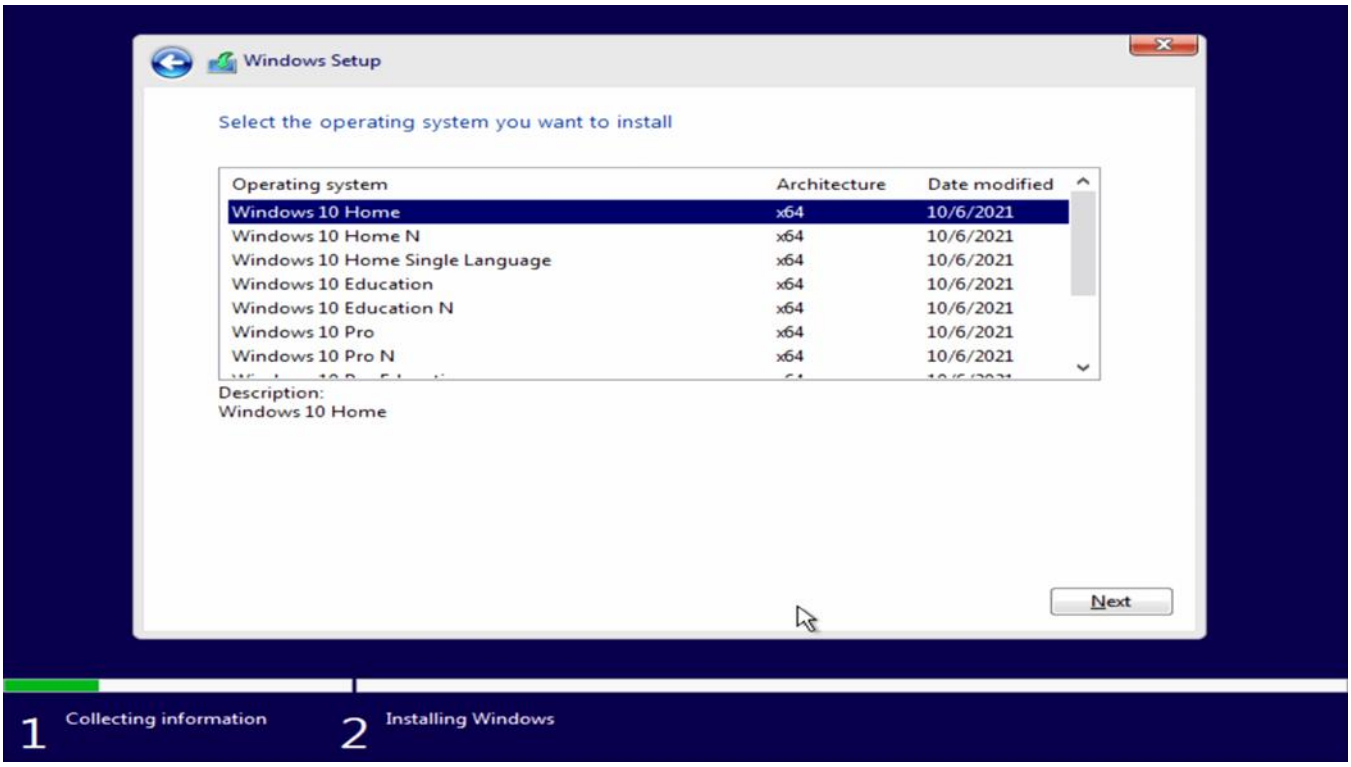

Figure 1 – Windows Setup Edition Selection Screen

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Reference: Microsoft. (2026). Compare Windows 11 versions: Windows 11 Home & Pro vs. Windows 10. https://www.microsoft.com/en-us/windows/compare-windows-11-home-vs-pro-versions

Task 2: Explain why you should not install your VMs on the OneDrive and why you were directed to install on the C: drive in a new folder instead. Provide screenshots of how to identify where your VM is located (using your VMWare).

Explanation:

OneDrive syncs constantly; large, changing VM files (.vmdk, .vmx) cause high CPU/memory use, slow performance, and risk of corruption or incomplete sync. Local C: drive folder gives fast direct I/O with no cloud overhead.

To identify where your VM is stored in VMware Workstation: right-click the VM → Settings → Options tab → Working Directory. The file path shown is where all VM files are saved.

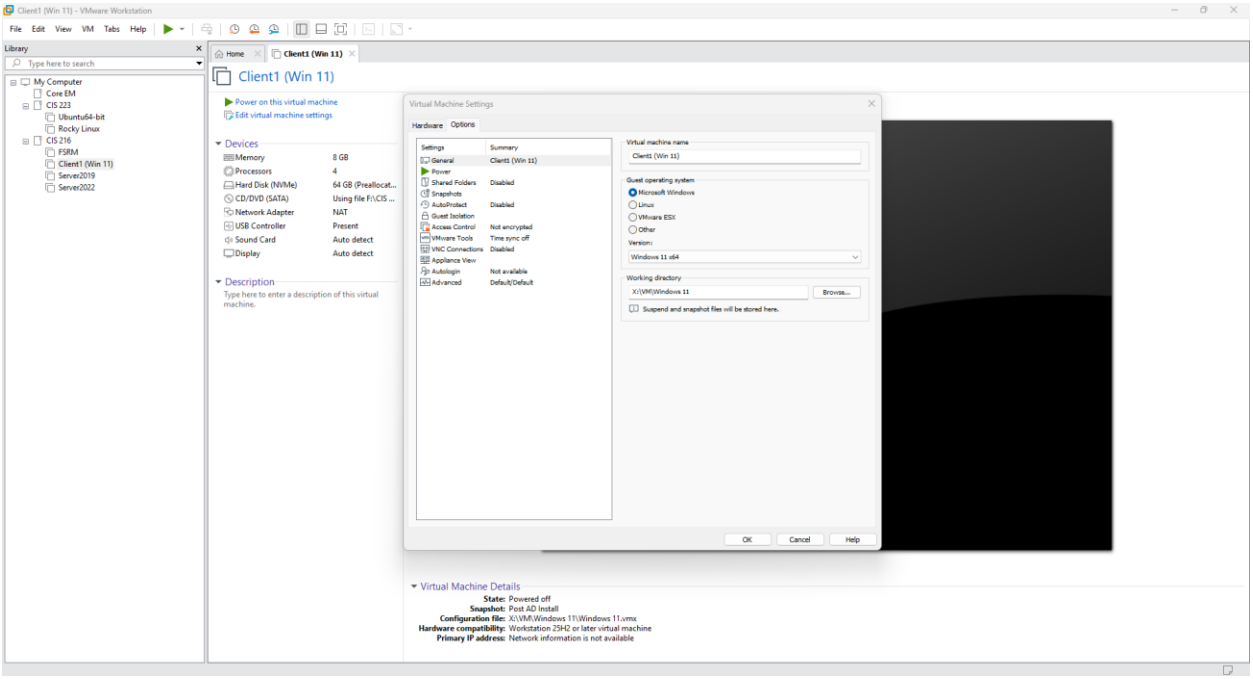

Figure 2 – VMware Workstation Showing The Working Directory Path of Client1's VM

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Reference: VMware by Broadcom. (2024). Using VMware Workstation Pro. https://techdocs.broadcom.com/us/en/vmware-cis/desktop-hypervisors/workstation-pro/17-0/using-vmware-workstation-pro.html

Task 3: Explain the difference between a static and a dynamic IP address. Show how you can determine whether your server has a dynamic or static IP address on your VMs. Provide a screenshot.

Explanation:

Static = manually set fixed address (no DHCP).

Dynamic = automatically assigned by DHCP server (can change).

Determine with ipconfig /all: “DHCP Enabled: No” = static; “Yes” = dynamic.

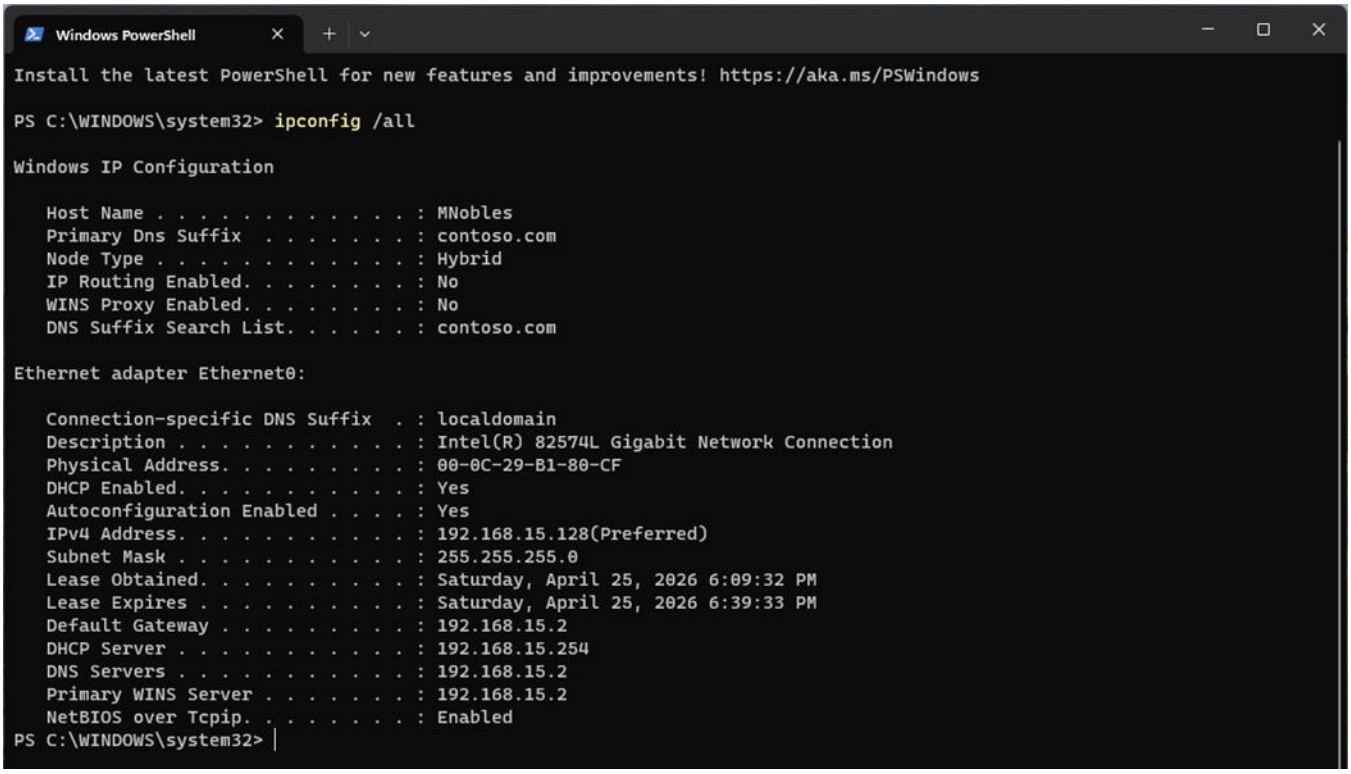

Figure 3 – ipconfig /all Results Showing Client IP is Dynamic

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Reference: Microsoft. (2025). What is DHCP Server in Windows Server? https://learn.microsoft.com/en-us/windows-server/networking/technologies/dhcp/dhcp-top

Task 4: You are testing your network for communication. You receive a Destination Host Unreachable error. What are the most likely issues and how do you resolve them? Provide a screenshot.

Explanation:

Most likely causes: no route to host (wrong gateway/subnet), firewall blocking ICMP, VMware virtual NIC disconnected, or NAT misconfiguration.

Resolution:

- Ping gateway first.
- Verify IP/subnet/gateway match on both VMs..
- Check VMware Network Editor (VMnet8 connected).
- Temporarily disable Windows Firewall.

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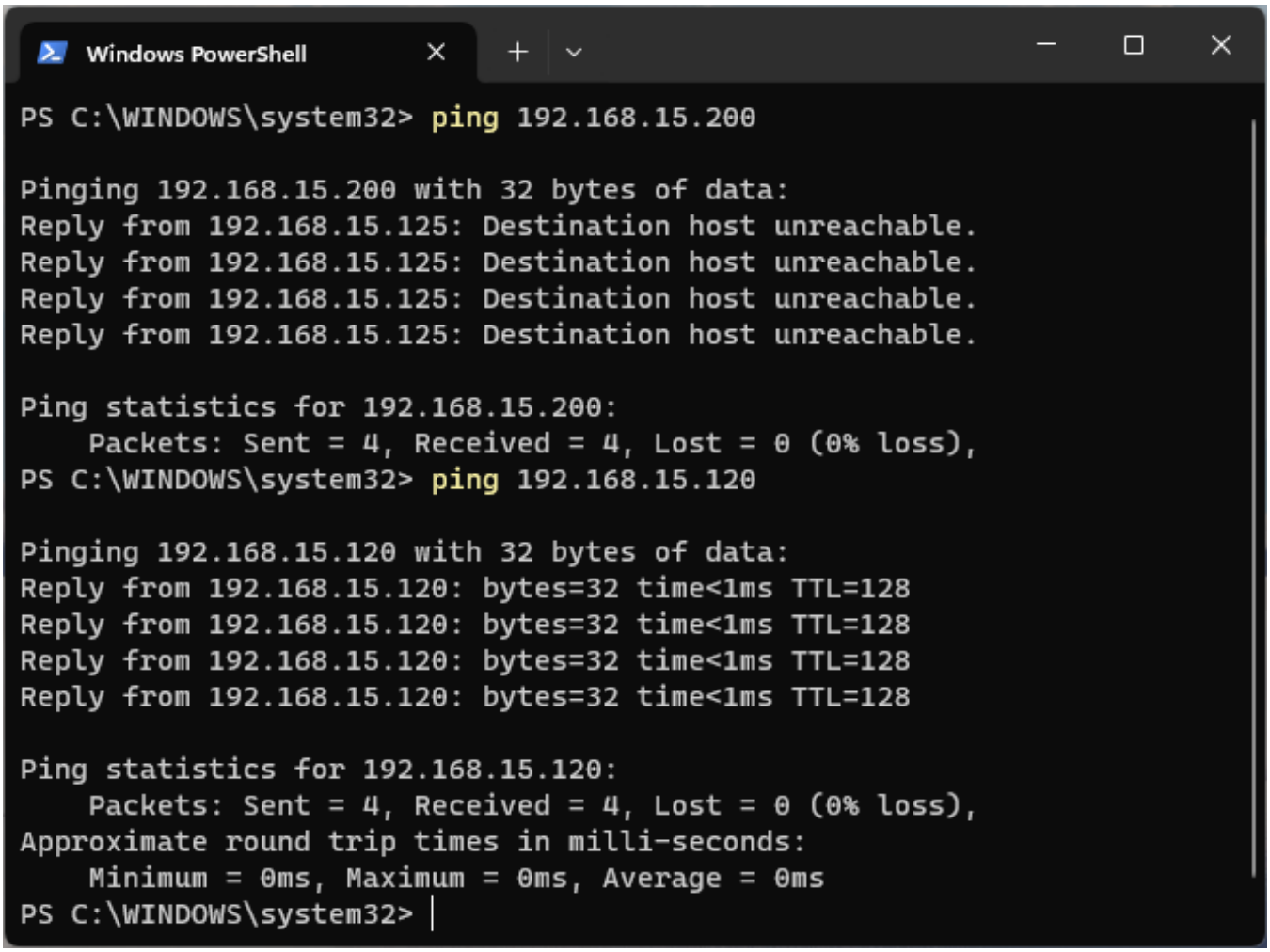

Figure 4 – Command Prompt showing "Destination host unreachable" error (top) and successful ping to Server (192.168.15.120) (bottom).

Reference: Microsoft. (2025). ping. https://learn.microsoft.com/en-us/windows-server/administration/windows-commands/ping

Task 5: You are testing your network for communication. Your results show an IP address starting in 169.xxx.xxx.xxx – what is the issue and how can you resolve it? Provide a screenshot.

Explanation:

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A 169.254.x.x address is called an APIPA (Automatic Private IP Addressing) address. Windows automatically assigns it when the computer is configured to get an IP address from DHCP but cannot find a DHCP server.

Resolution:

- Start the DHCP Server service on the Windows Server.
- Make sure the DHCP scope is activated.
- Re-enable VMware NAT DHCP service if it was disabled.
- Run ipconfig /release then ipconfig /renew.

The below APIPA was forced via VMWare's Virtual Network Editor by unchecking "Use local DHCP service to distribute IP address to VMs.

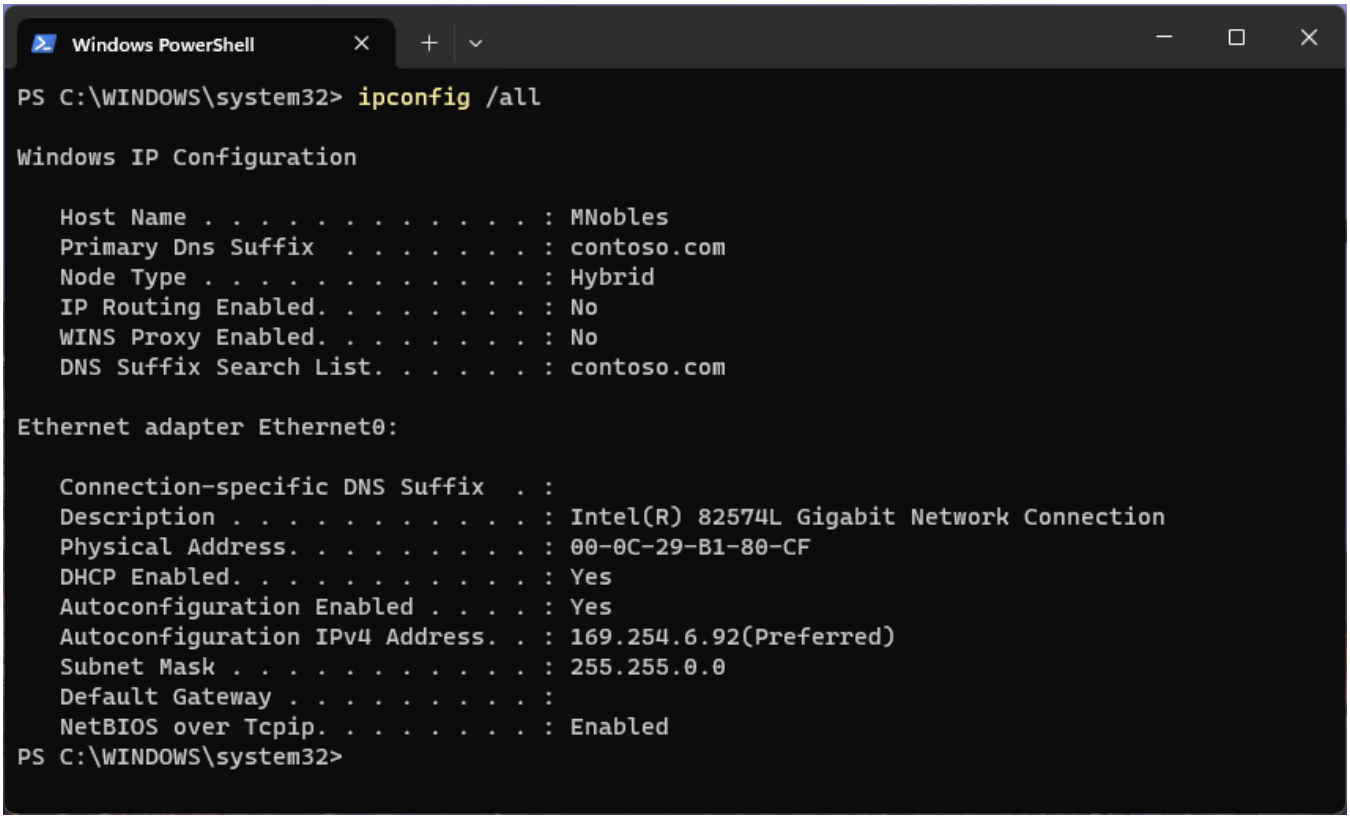

Figure 5 - Client 1 ipconfig /all output showing the client automatically assigned an APIPA address (169.254.6.92) due to no DHCP server response.

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Reference: Microsoft. (2021). How to use automatic TCP/IP addressing without a DHCP server. https://learn.microsoft.com/en-us/windows-server/troubleshoot/how-to-use-automatic-tcpip-addressing-without-a-dh

Task 6: You are testing your network for communication. Your ping results show an FE80:: address instead of IPv4 address. What is the issues and how can you resolve this temporarily? How can you resolve this permanently? Provide a screenshot.

Explanation:

Even though IPv4 is configured and working (as shown in ipconfig /all), Windows prefers IPv6 when it is enabled. This causes ping to return an IPv6 address (::1 loopback or FE80:: link-local) instead of the expected IPv4 address.

Resolution:

- Temporary fix: Force IPv4 with the -4 switch: **ping -4 MNobles** or **ping -4 192.168.15.120**
- Permanent fix: Disable IPv6 on the Ethernet0 adapter (Network Connections → Ethernet0 Properties → uncheck Internet Protocol Version 6).

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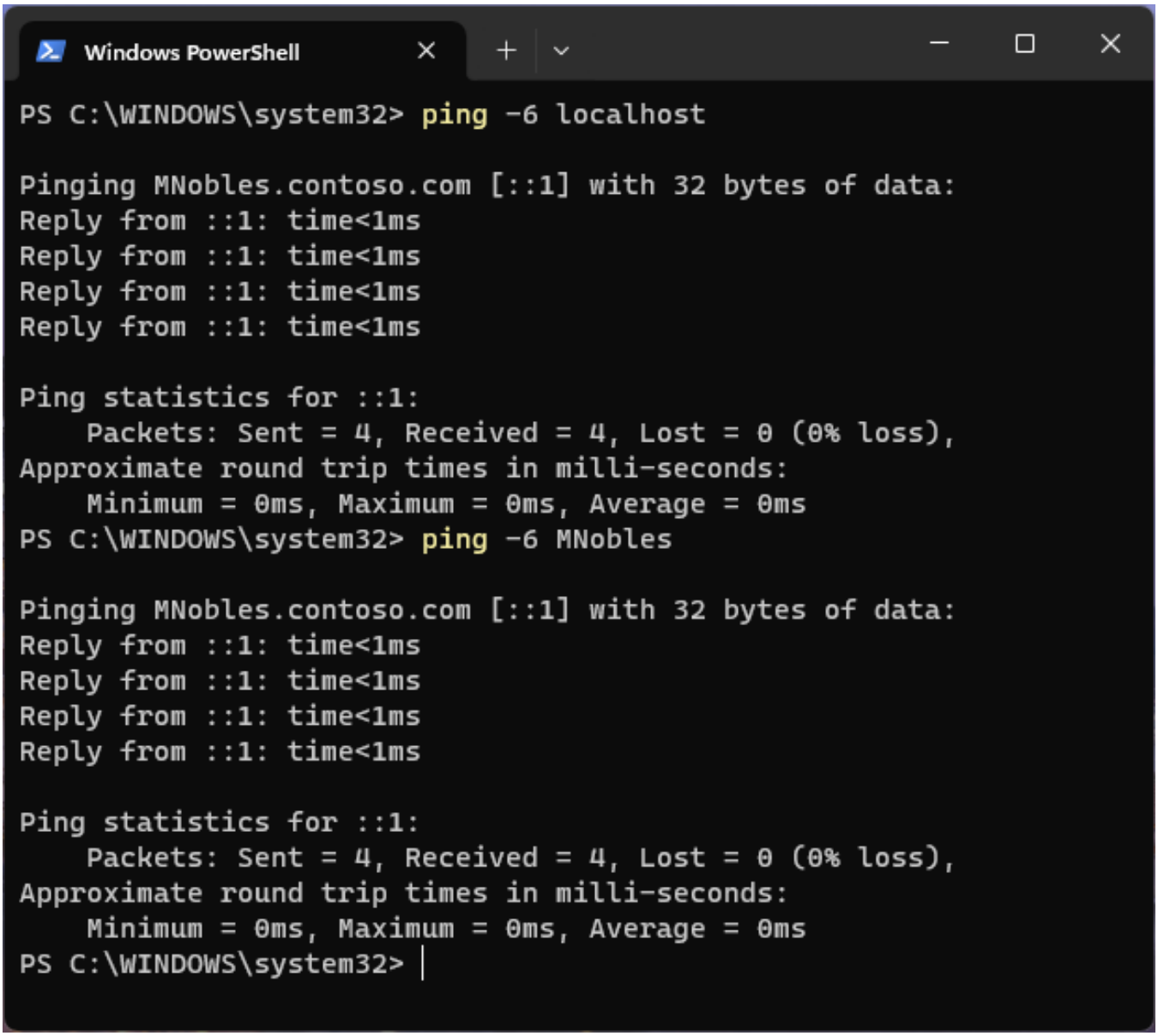

Figure 6 - Command Prompt showing ping -6 localhost and ping -6 MNobles returning IPv6 address (::1), even though IPv4 is assigned.

Reference: Microsoft. (2022). IPv6 link-local and site-local addresses. https://learn.microsoft.com/en-us/windows/win32/winsock/link-local-and-site-local-addresses-2

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Task 7: You can ping by IP address but not the computer name. What is the most likely cause and what can you do to resolve this? How can you check? Which command? Provide a screenshot.

Explanation:

The most likely cause is incorrect DNS server configuration. The client is pointing to 192.168.15.2 (VMware router) instead of the Windows DNS server at 192.168.15.120. This prevents proper name resolution.

How to Check:

Use ipconfig /all (shows DNS Servers) and nslookup (shows Default Server).

Resolution:

Set DNS server to 192.168.15.120 (requires admin rights) and ensure the DNS suffix is contoso.com.

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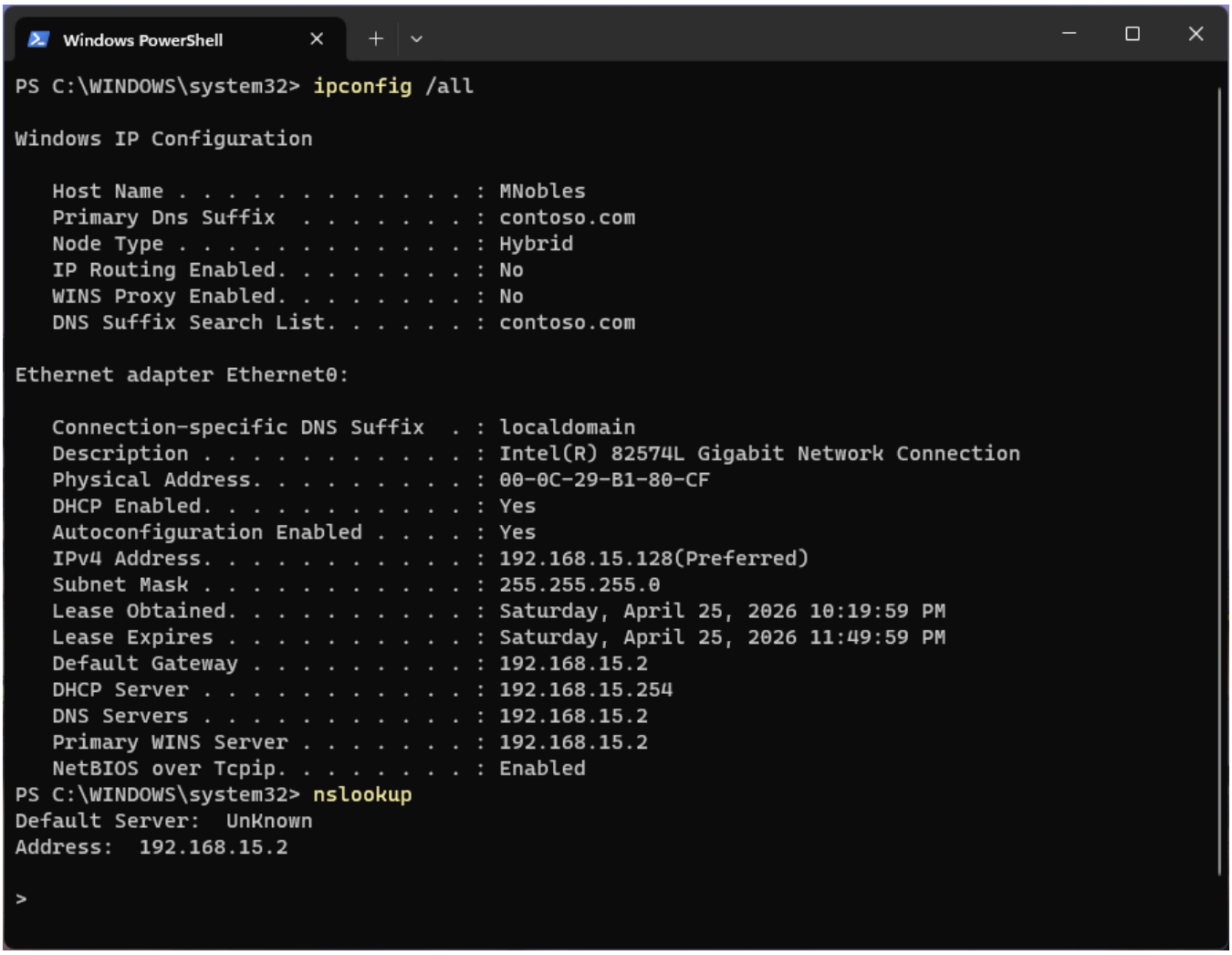

Figure 7 - Output showing DNS Servers set to 192.168.15.2 and nslookup returning "UnKnown" — demonstrating why name resolution fails even though IPv4 connectivity works.

Reference: Microsoft. (2025). nslookup. https://learn.microsoft.com/en-us/windows-server/administration/windows-commands/nslookup

Task 8: You are using VMWare and have installed DHCP to your server. However, your server does not use the range of IP addresses you have identified. What is the issue and how is it resolved? Provide a screenshot.

Explanation:

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The server uses a static IP address (192.168.15.120) that is intentionally outside the DHCP scope (192.168.15.121–127). This is standard practice so the server always has a consistent, reliable address.

Resolution:

- Manually configure a static IP on the server outside the DHCP scope.
- Activate the scope in the DHCP console.
- Disable VMware's built-in DHCP service.

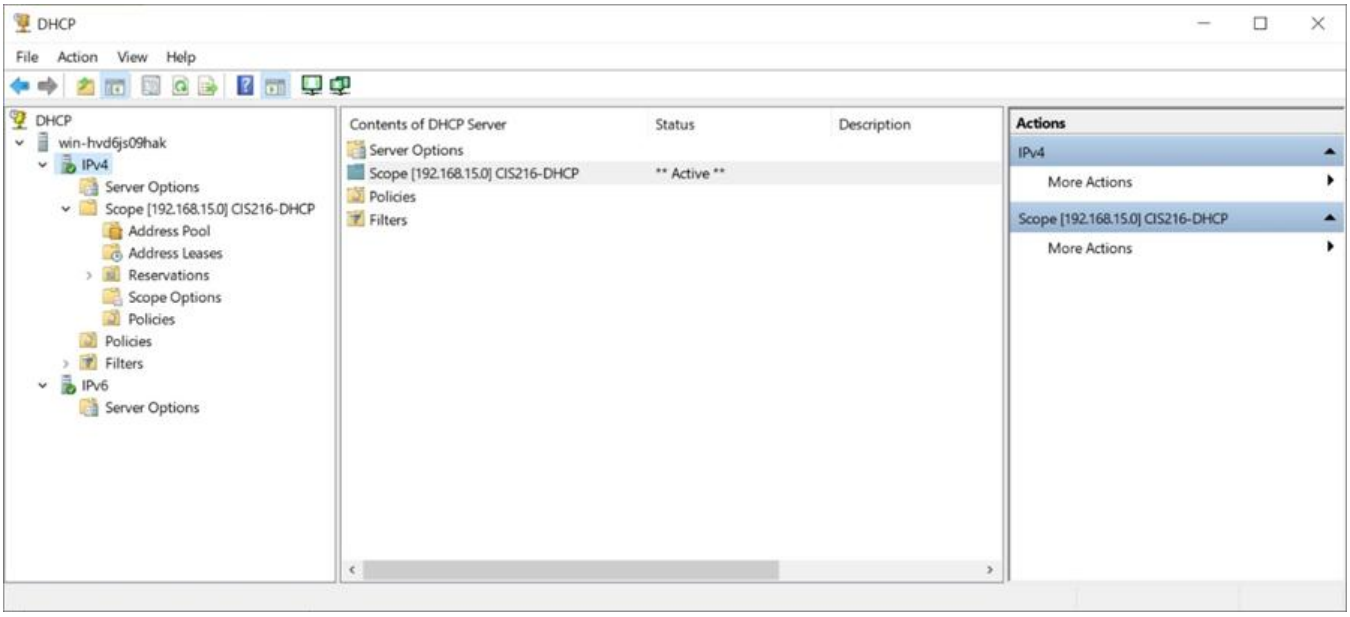

Figure 8 - DHCP console showing activated scope

Reference: VMware by Broadcom. (2024). Using VMware Workstation Pro. https://techdocs.broadcom.com/us/en/vmware-cis/desktop-hypervisors/workstation-pro/17-0/using-vmware-workstation-pro.html