

# IT 236 Project Report Form

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Date:	11/14/2025
Project Phase	Implementing DHCP and High Availability for IP Address Management

## Section 1: Executive Summary (12 Points)

This phase of the NewVue Health Infrastructure Modernization Project focused on deploying and configuring Dynamic Host Configuration Protocol (DHCP) services to automate IP address management within the internal network.

The activity involved disabling the external VirtualBox DHCP service, installing and authorizing the DHCP Server role on both NV-DC1 and NV-DC2, and creating a primary scope named *NewVue\_Internal* on NV-DC1. An exclusion range was applied to reserve addresses for infrastructure components, and both domain controllers were added as DNS servers to ensure name resolution consistency.

A DHCP failover relationship was configured between NV-DC1 and NV-DC2 using load balancing, providing redundancy and lease replication between servers. The client system NV-CL1 was then used to verify automatic lease assignment and validate failover functionality during simulated service interruptions.

Collectively, this configuration enhances the resiliency, manageability, and continuity of NewVue Health's IP address management infrastructure.

### Scope of Configuration

The DHCP Scope was configured as shown in the table below.

Component	Description
DHCP Scope Name	<b>NewVue_Internal</b>
Network Subnet	255.255.255.0
Exclusion Range	10.0.2.1 – 10.0.2.20
Dynamic Pool	10.0.2.21 – 10.0.2.100
Default Gateway	10.0.2.1
Failover Relationship	NewVue_DHCP_Failover

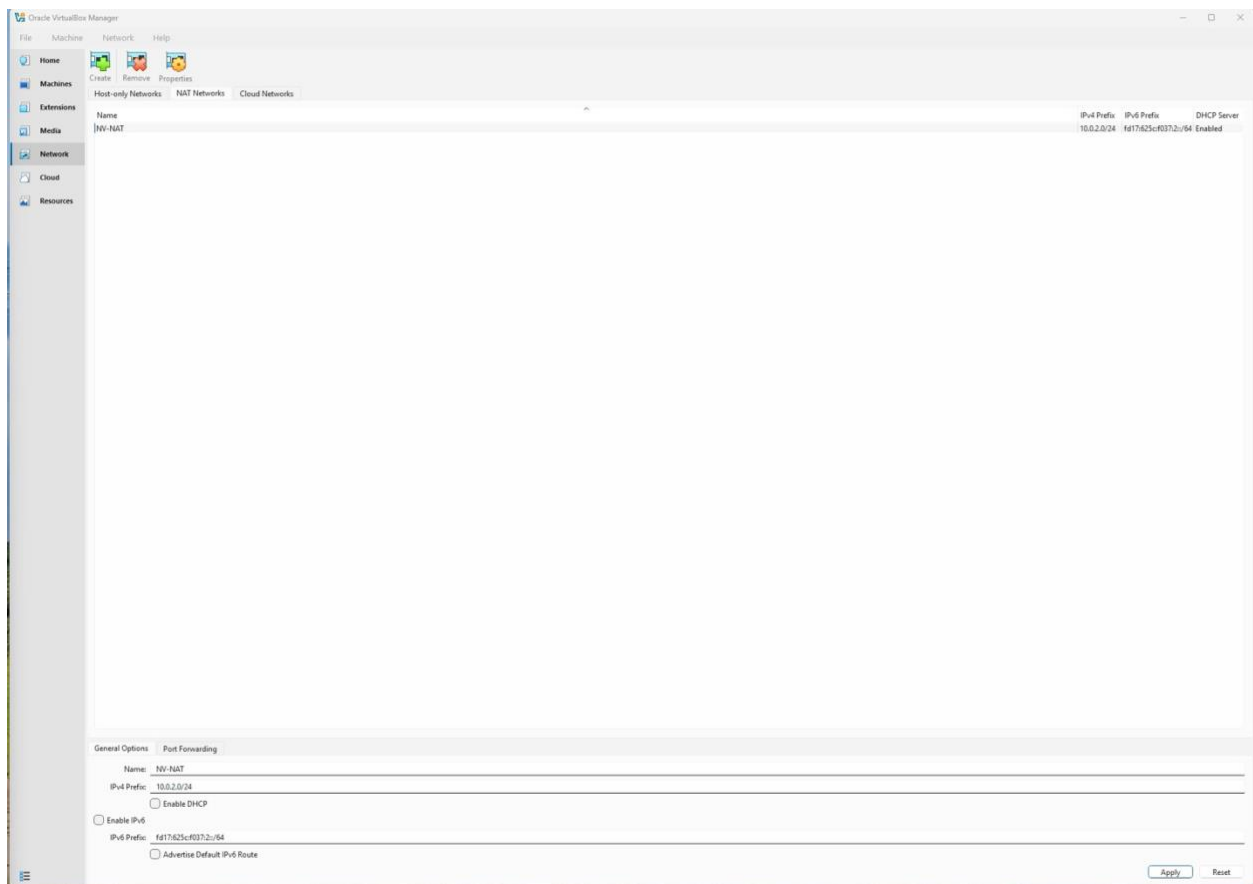
## Section 2: Implementation & Verification Evidence

Each step completed in the DHCP configuration must be documented with relevant screenshots as evidence of successful implementation. All screenshots should be labeled and inserted below their respective evidence sections.

### Task 1-Disable VirtualBox DHCP (5 pts)

The external VirtualBox NAT DHCP service was disabled to prevent IP conflicts and allow the internal DHCP configuration to take over. This ensured Windows Server 2022 became the authoritative address distributor for the virtual network.

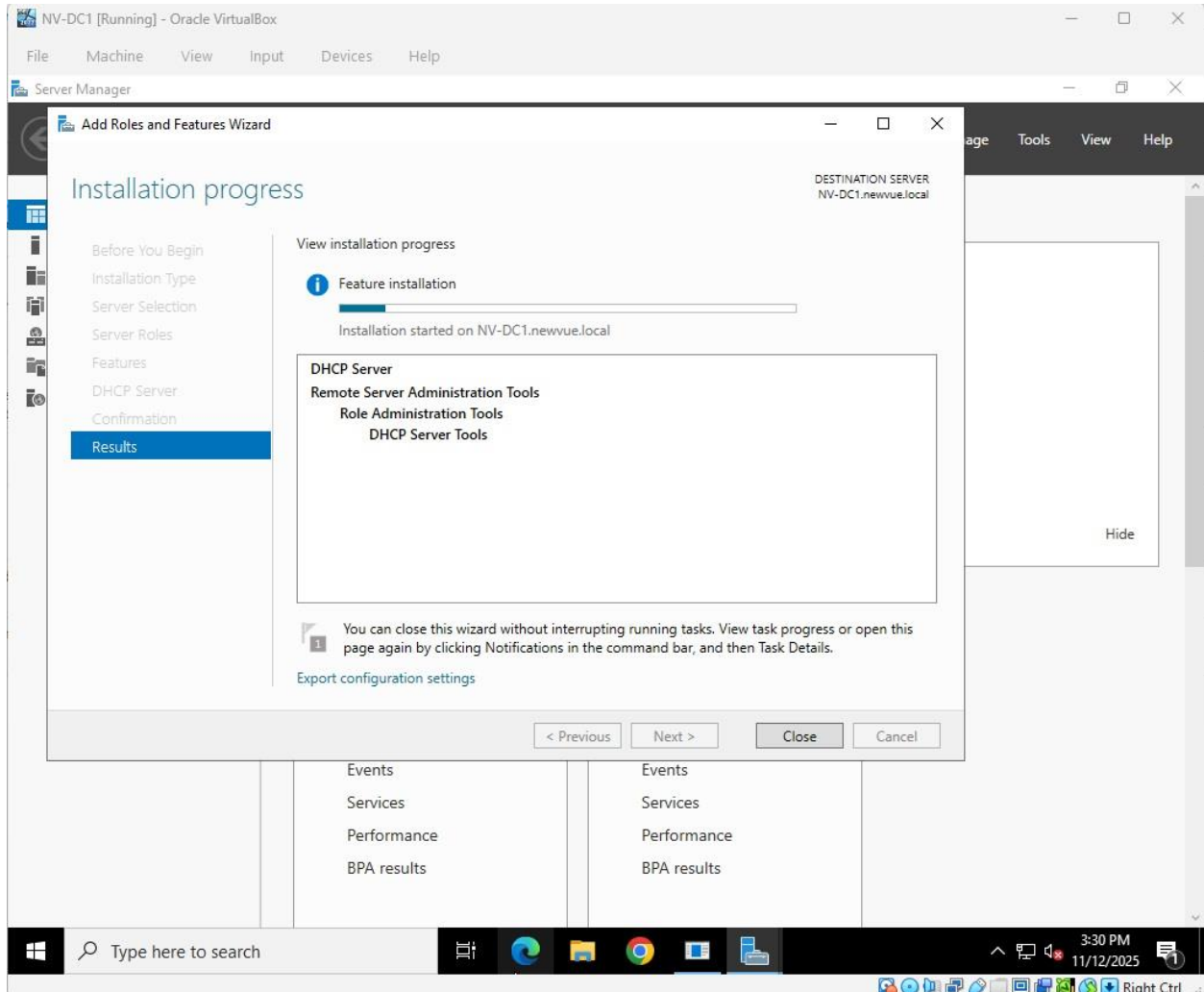
**Evidence 1:** Screenshot showing the VirtualBox NAT Network settings with DHCP disabled.

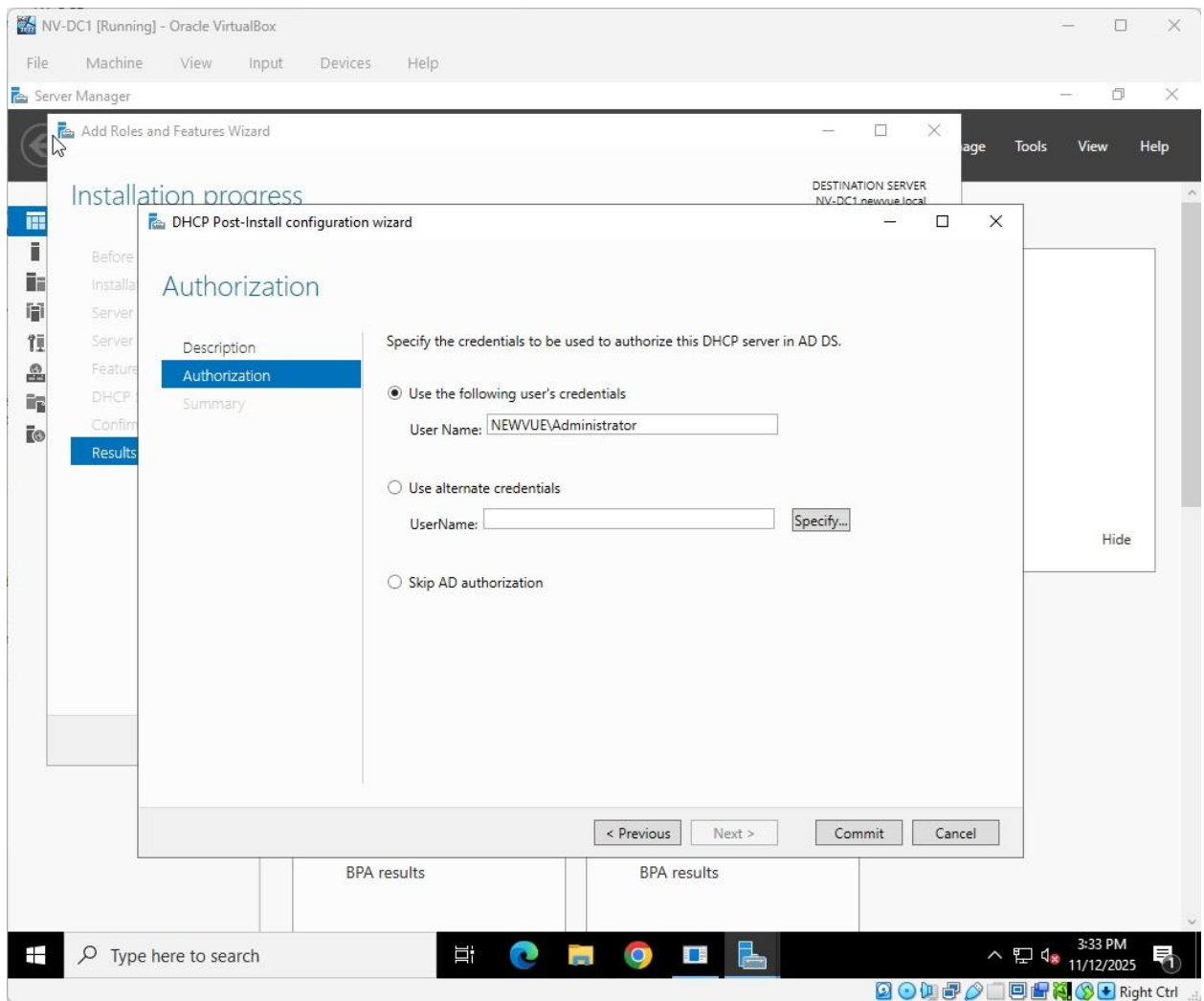


## Task 2— Install and Authorize DHCP on NV-DC1 (5 pts)

The DHCP Server role was installed on **NV-DC1** and authorized in Active Directory. This allowed NV-DC1 to issue and manage leases within the domain under administrative control.

**Evidence 2:** Screenshot showing DHCP installation summary and authorization confirmation on NV-DC1.

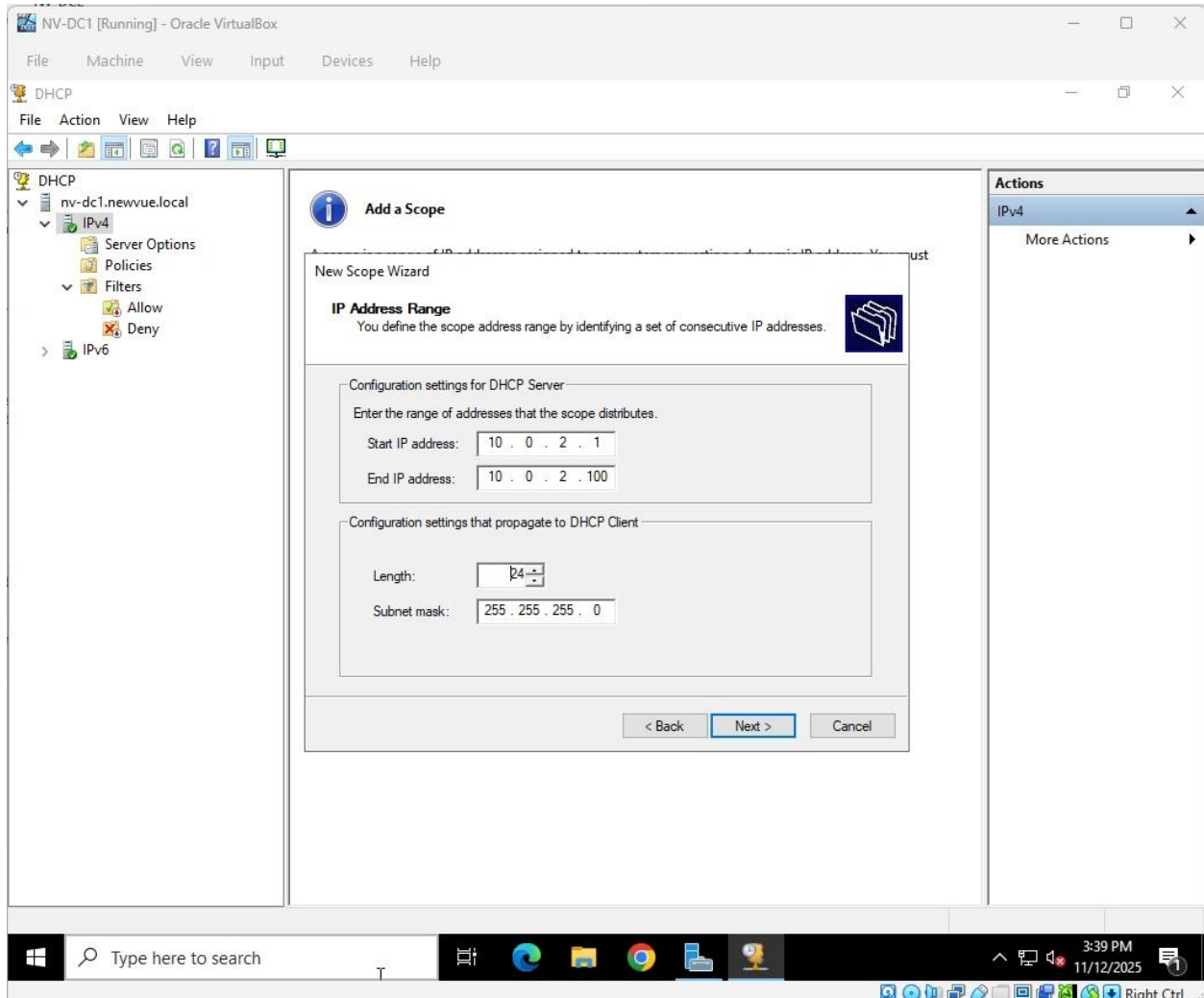




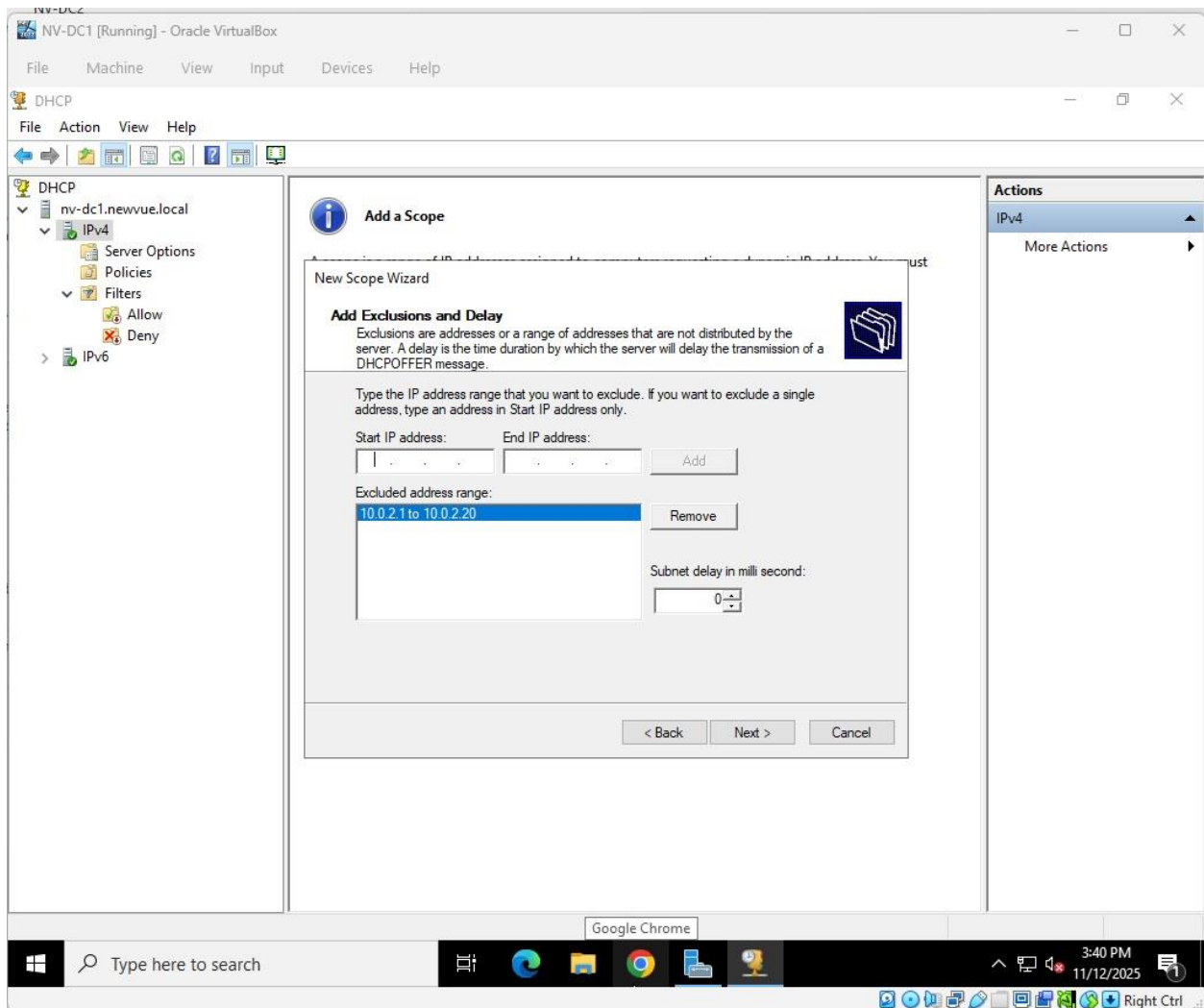
### Task 3— Create and Configure DHCP Scope (15 points)

A new scope named **NewVue\_Internal** was created on NV-DC1 using subnet 10.0.2.0/24. The dynamic pool spanned 10.0.2.21–10.0.2.200, with an exclusion range of 10.0.2.1–10.0.2.20 reserved for static devices. Both NV-DC1 and NV-DC2 were added as DNS servers to ensure name resolution consistency.

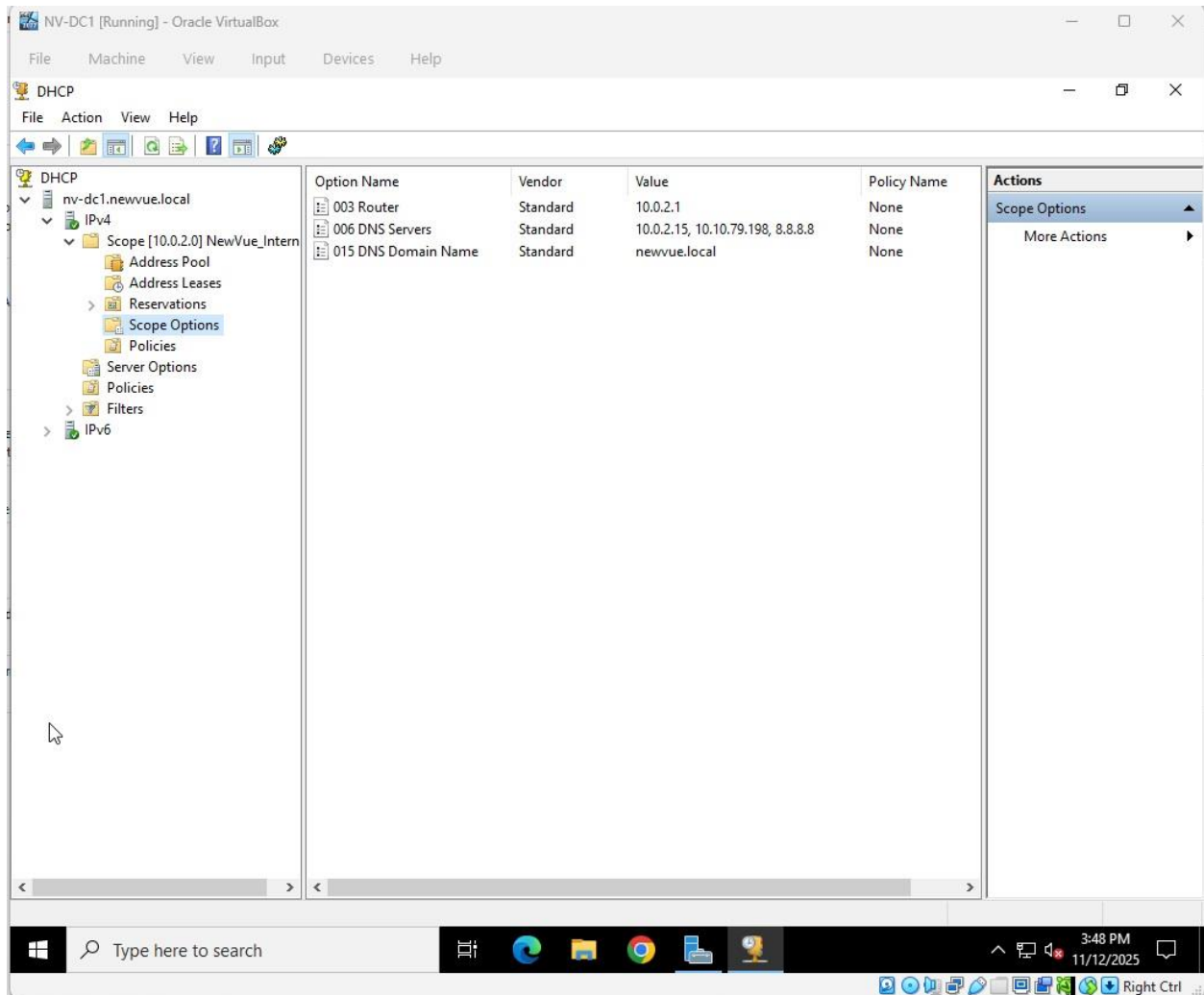
**Evidence 3a:** Screenshot showing DHCP scope range (10.0.2.1 – 10.0.2.200).



**Evidence 3b:** Screenshot showing exclusion range (10.0.2.1 – 10.0.2.20).



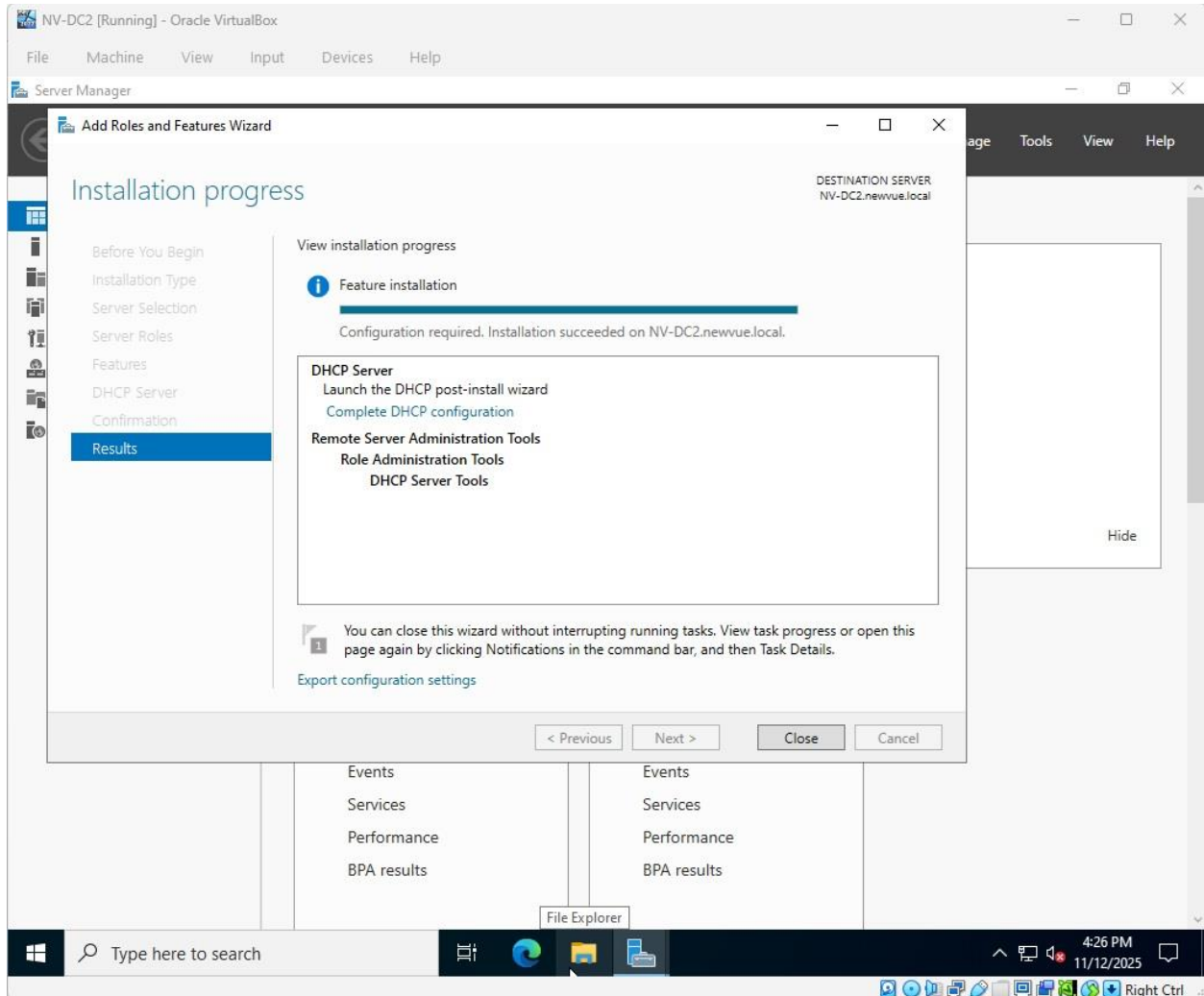
**Evidence 3c:** Screenshot showing both DNS servers (NV-DC1 and NV-DC2) under scope options.

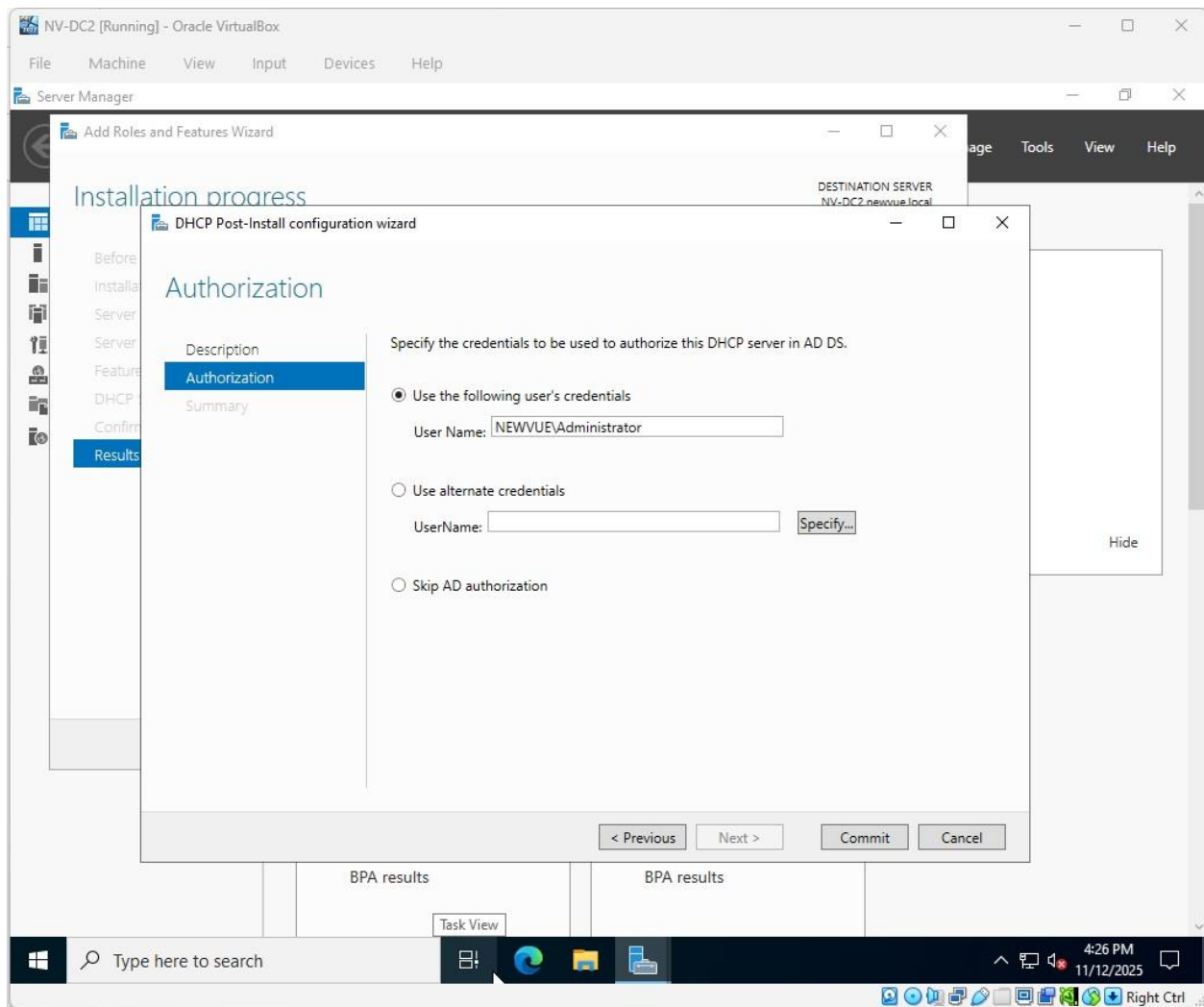


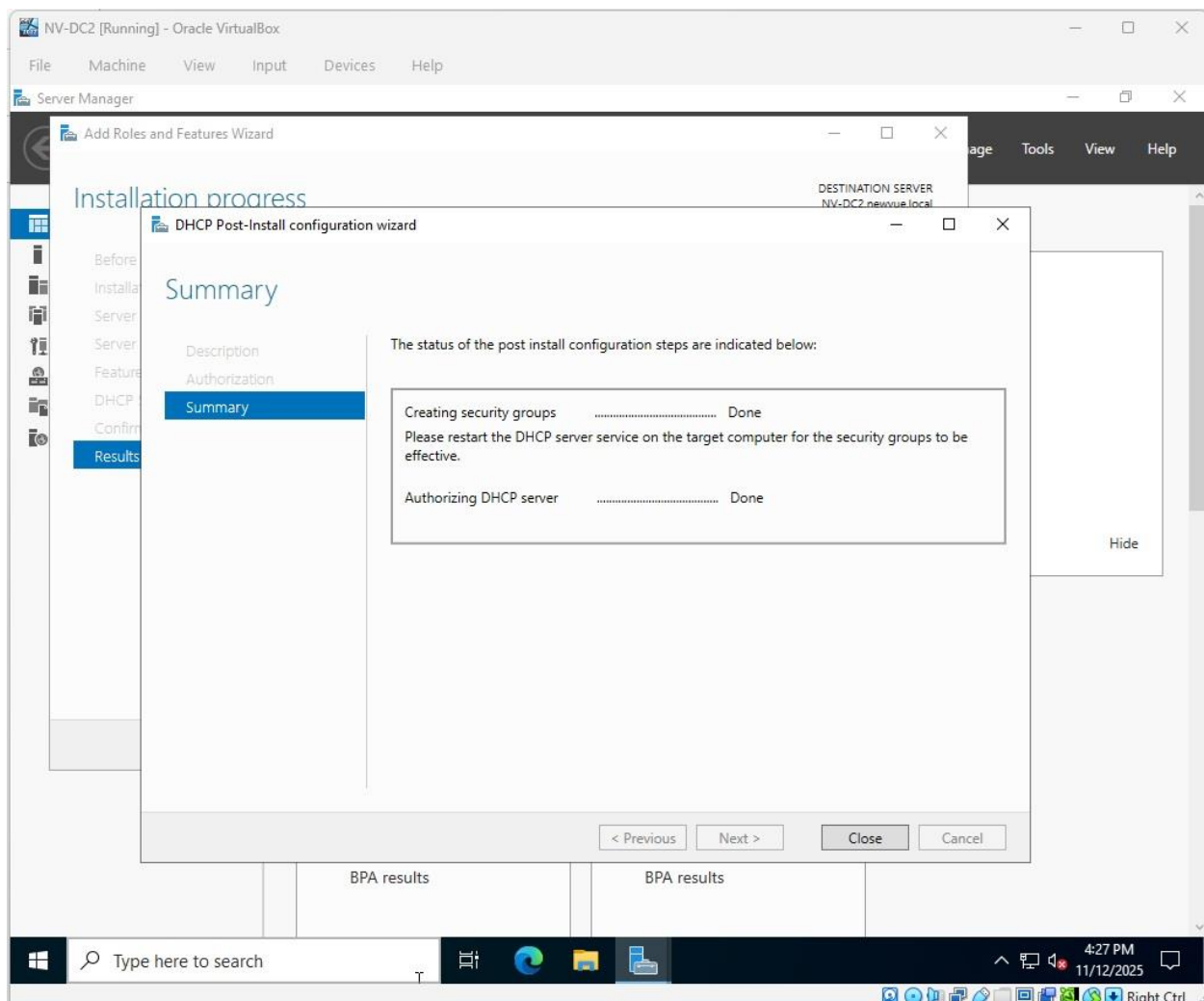
## Task 4 - Install and Authorize DHCP on NV-DC2 (5 pts)

The DHCP Server role was also installed and authorized on **NV-DC2**, preparing it to participate in a load-balanced failover configuration. Authorization confirmed both servers were recognized within the Active Directory domain.

**Evidence 4:** Screenshot showing DHCP role installation and authorization summary on NV-DC2.



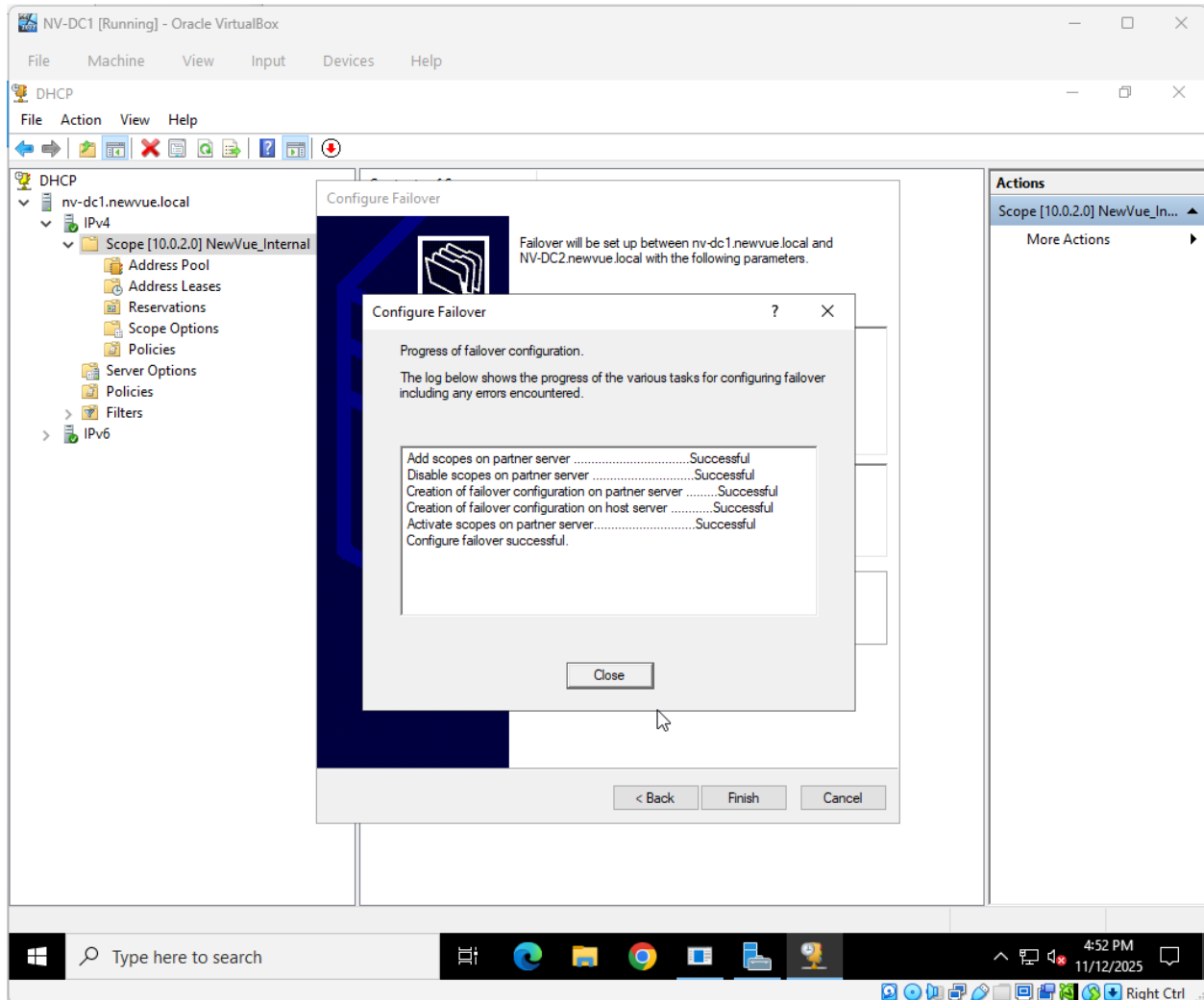




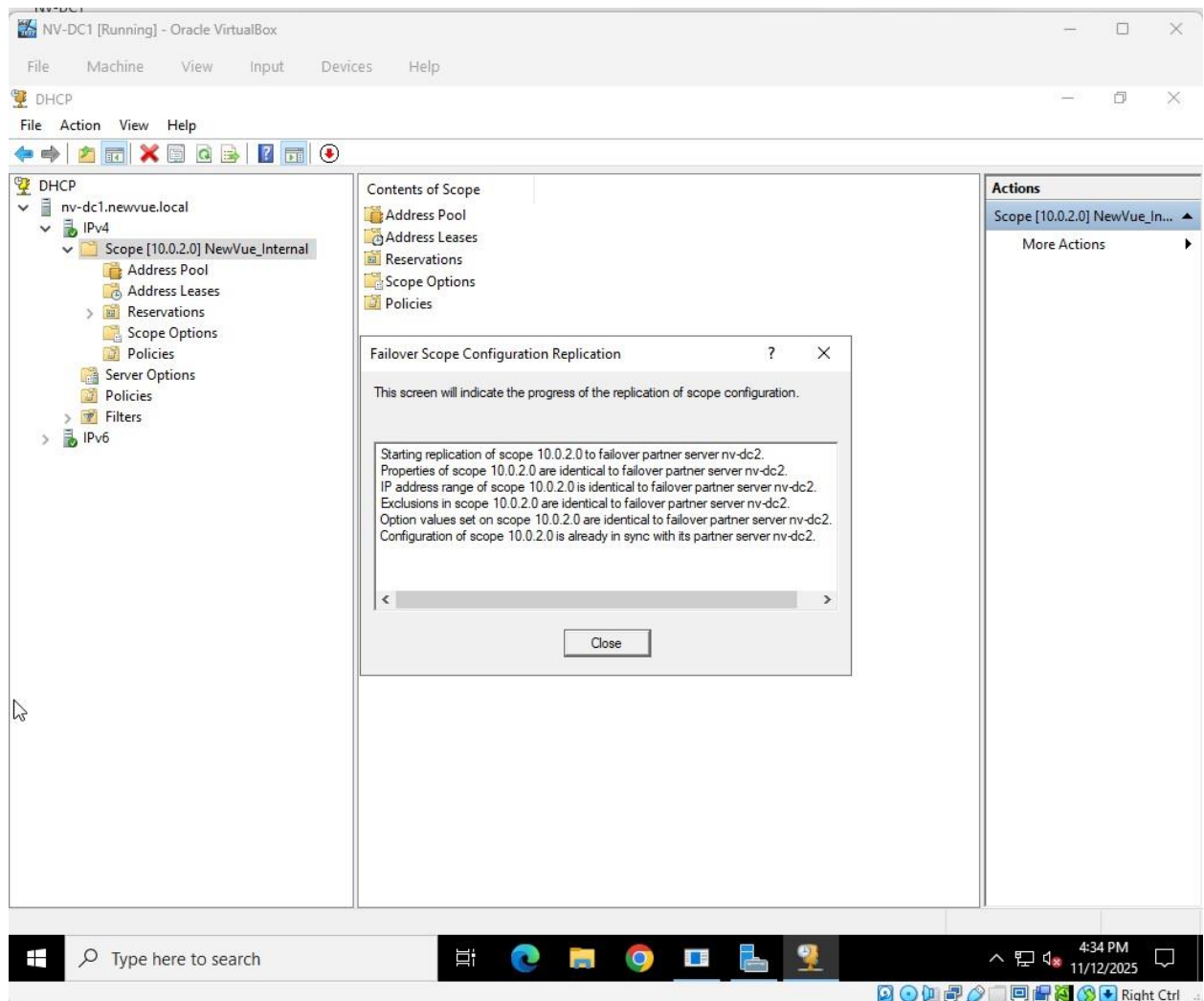
## Task 5 - Configure DHCP Failover (10 pts)

A **DHCP failover relationship** was created between NV-DC1 and NV-DC2 under a load-balance mode (50/50). This ensured that both servers actively shared lease distribution and synchronized client lease data for redundancy.

**Evidence 5a:** Screenshot of the DHCP failover relationship summary showing NV-DC1 and NV-DC2 paired.



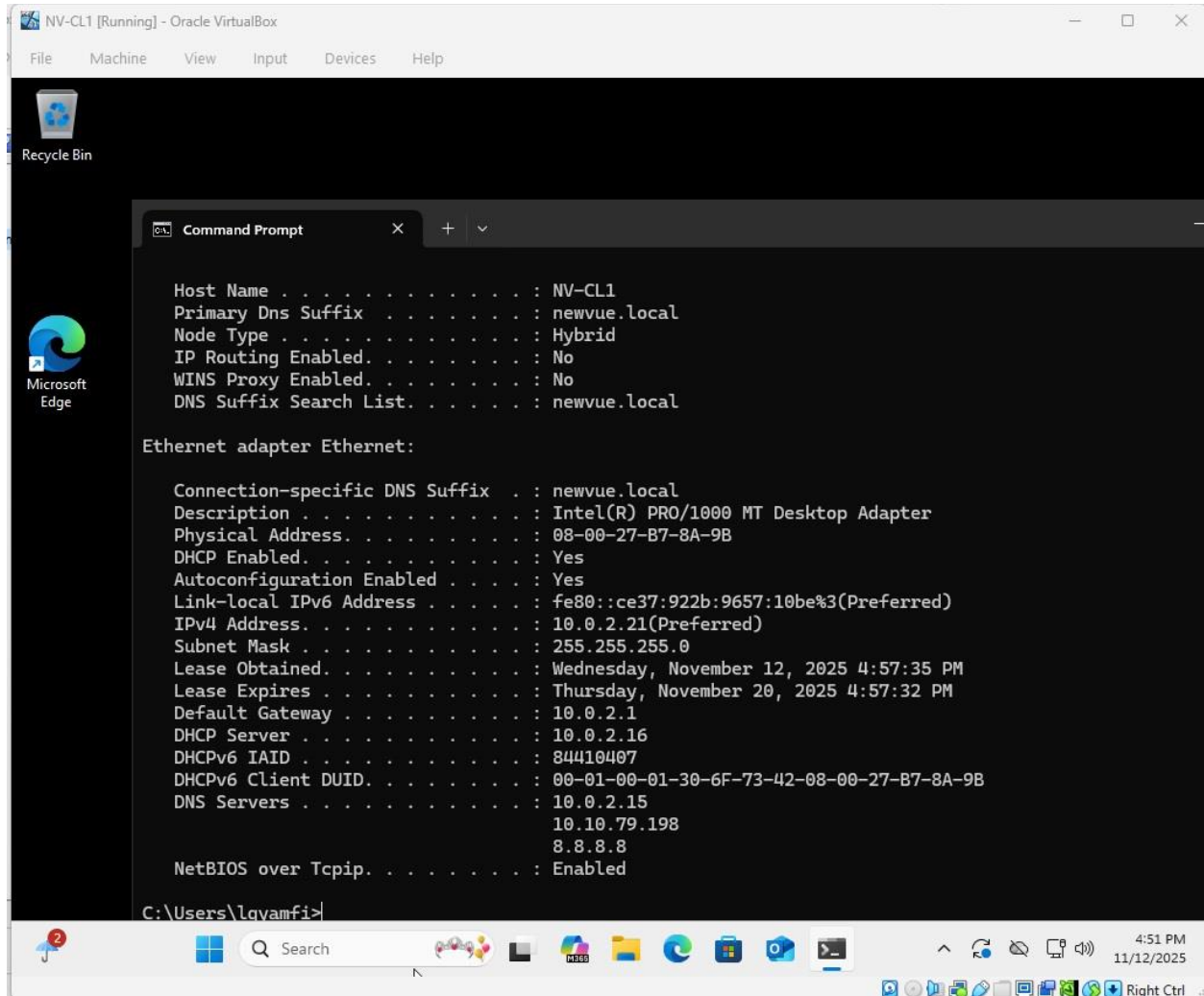
**Evidence 5b:** Screenshot from NV-DC2 confirming the replicated scope and active partner relationship.



## Task 6 - Verify DHCP Client Lease (10 pts)

The client workstation **NV-CL1** was used to verify DHCP operations. After releasing and renewing its IP configuration, the system received a valid lease from the configured pool and resolved DNS queries using both domain controllers.

**Evidence 6a:** Screenshot of ipconfig /all on NV-CL1 showing IP assignment within 10.0.2.21–10.0.2.200 and correct DNS settings.



```
Host Name . . . . . : NV-CL1
Primary Dns Suffix . . . . . : newvue.local
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : newvue.local

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . : newvue.local
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address. . . . . : 08-00-27-B7-8A-9B
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . : fe80::ce37:922b:9657:10be%3(Preferred)
IPv4 Address. . . . . : 10.0.2.21(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Wednesday, November 12, 2025 4:57:35 PM
Lease Expires . . . . . : Thursday, November 20, 2025 4:57:32 PM
Default Gateway . . . . . : 10.0.2.1
DHCP Server . . . . . : 10.0.2.16
DHCPv6 IAID . . . . . : 84410407
DHCPv6 Client DUID. . . . . : 00-01-00-01-30-6F-73-42-08-00-27-B7-8A-9B
DNS Servers . . . . . : 10.0.2.15
                        10.10.79.198
                        8.8.8.8
NetBIOS over Tcpi. . . . . : Enabled

C:\Users\lqvamfi>
```

**Evidence 6b:** Screenshot from NV-DC1 DHCP console showing the client lease details listed under *Address Leases*.

The screenshot displays the NV-DC1 DHCP console interface within an Oracle VM VirtualBox window. The console has a menu bar (File, Action, View, Help) and a toolbar. On the left, a tree view shows the DHCP configuration hierarchy: DHCP > nv-dc1.newvue.local > IPv4 > Scope [10.0.2.0] NewVue\_Ir > Address Leases. The main area is a table with the following columns: Client IP Address, Name, Lease Expiration, Type, Unique ID, and Actions. A single lease is listed with the following details:

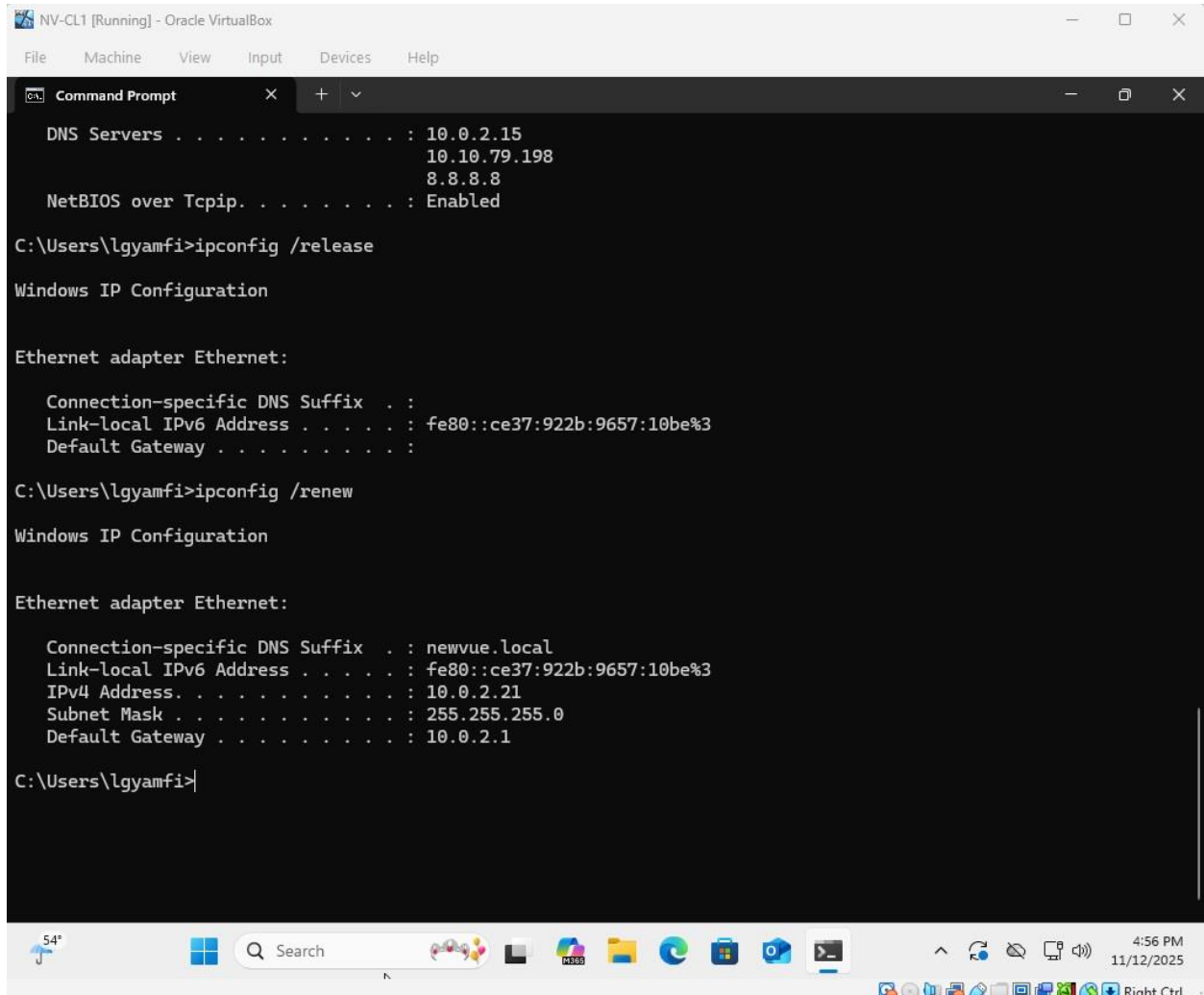
Client IP Address	Name	Lease Expiration	Type	Unique ID	Actions
10.0.2.21	NV-CL1.newvue.local	11/12/2025 5:40:07 PM	DHCP	080027b78...	Address Leases More Actions

The Windows taskbar at the bottom shows the search bar, taskbar icons, and system clock (4:52 PM, 11/12/2025).

## Task 7 - Install and Authorize DHCP on NV-DC2 (10 pts)

DHCP failover functionality was validated by temporarily stopping the DHCP service on NV-DC1. During this test, NV-DC2 successfully issued new leases without interruption. Once NV-DC1 was restored, lease replication resumed automatically.

**Evidence 7a:** Screenshot of NV-CL1 receiving a lease from NV-DC2 during NV-DC1 downtime.



The screenshot shows a Windows Command Prompt window titled "NV-CL1 [Running] - Oracle VirtualBox". The window displays the following text:

```
File Machine View Input Devices Help
Command Prompt
DNS Servers . . . . . : 10.0.2.15
                        10.10.79.198
                        8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\lgyamfi>ipconfig /release

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::ce37:922b:9657:10be%3
    Default Gateway . . . . . : 

C:\Users\lgyamfi>ipconfig /renew

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : newvue.local
    Link-local IPv6 Address . . . . . : fe80::ce37:922b:9657:10be%3
    IPv4 Address. . . . . : 10.0.2.21
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.2.1

C:\Users\lgyamfi>
```

The taskbar at the bottom shows the system clock as 4:56 PM on 11/12/2025, and the temperature as 54°.

**Evidence 7b:** Screenshot showing synchronization restored after NV-DC1 was restarted.

