DHCP Relay Setup with FortiGate + Windows Server

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🔹 DHCP Relay Agent – Use Case in Enterprise Networks

What it is:
A DHCP Relay Agent is used when DHCP clients and the DHCP server are on different networks or VLANs.

👉 Normally, DHCP works with broadcasts (UDP 67/68), but broadcasts do not cross routers or firewalls.
👉 The relay agent solves this by:

- Listening for client broadcast requests
- Forwarding them as unicast packets to the DHCP server
- Relaying the server's reply back to the correct client

📍 Real-Time Use Case

- In large **enterprise networks** or **branch office setups**, DHCP servers are centralized in the datacenter.
- Instead of deploying a separate DHCP server for every subnet/VLAN, **routers, firewalls (FortiGate, Cisco, etc.), or Windows servers** act as relay agents.
- This ensures all devices get IPs seamlessly from the central pool.

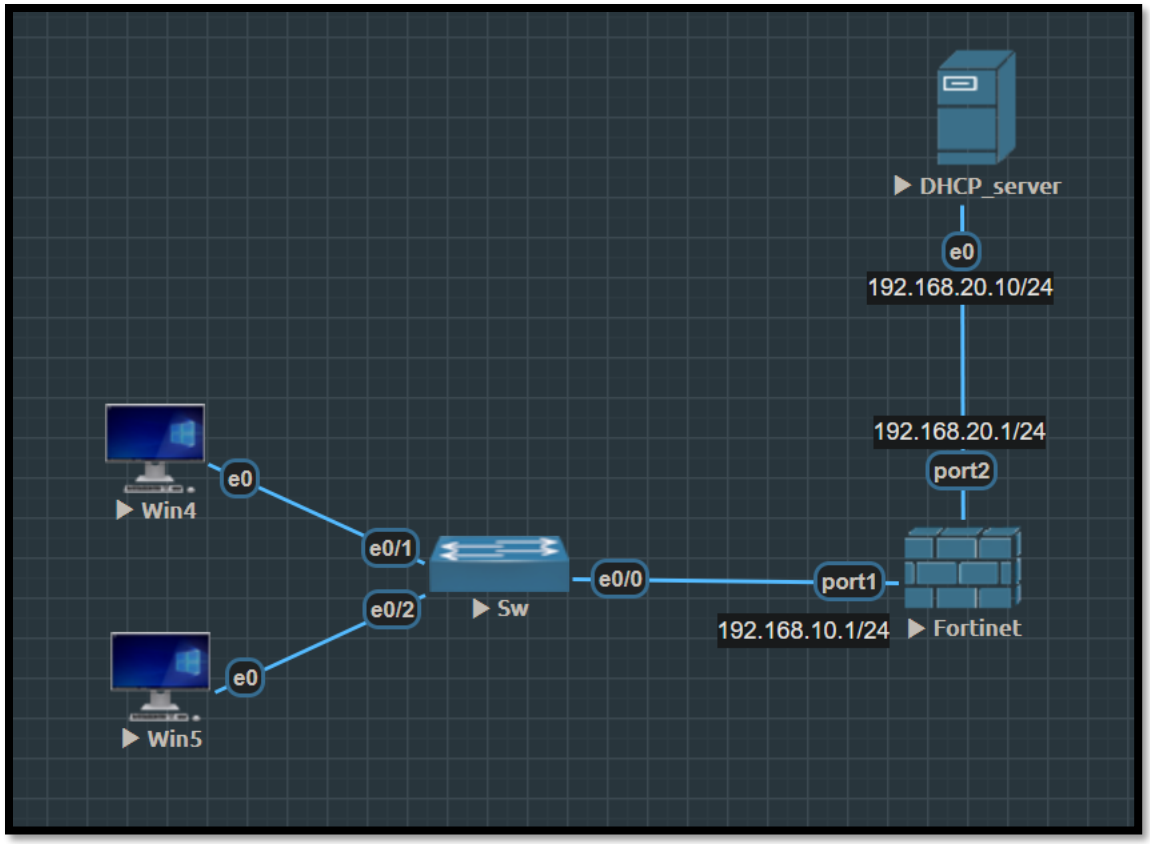
🔑 Key Benefits

- **Centralized IP management** → Easier to monitor and control
- **Cost-effective** → No need for multiple DHCP servers
- **Scalable** → Works smoothly across many VLANs and remote sites

Flow Example:

Client → Firewall/Router (Relay) → DHCP Server → Firewall/Router → Client

🌐 Network Overview



Our network is designed with two zones:

1️⃣ LAN Zone – where end-user devices are connected (192.168.10.x/24)

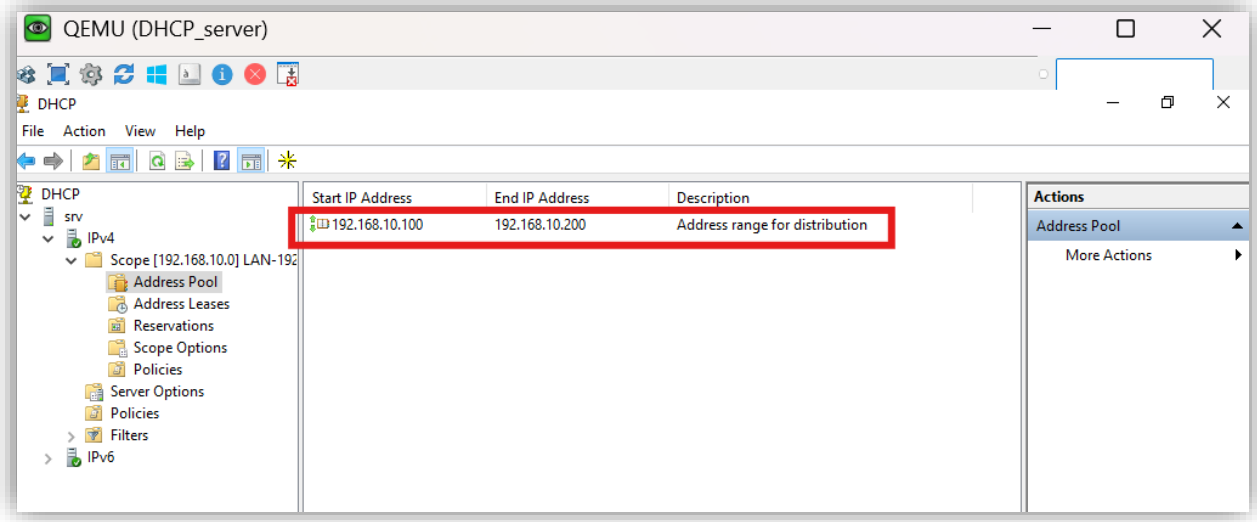
2️⃣ DHCP Zone – where the centralized DHCP server is installed (192.168.20.x/24)

According to our topology, the firewall is configured to act as a DHCP Relay Agent, ensuring that DHCP requests from the LAN zone are forwarded to the DHCP server in the DHCP zone.

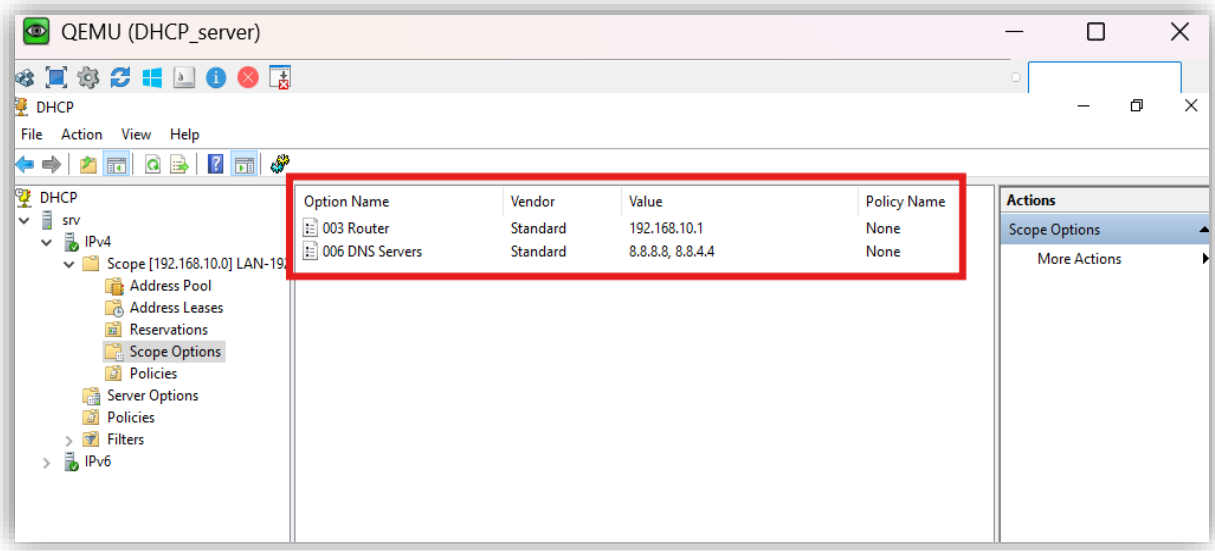
📝 Steps to Configure DHCP with Relay

1. Install and Configure DHCP Server (Windows Server)

- Installed the DHCP Server role on Windows Server.
- Configured a DHCP scope:
    - IP Range: 192.168.10.100 – 192.168.10.200

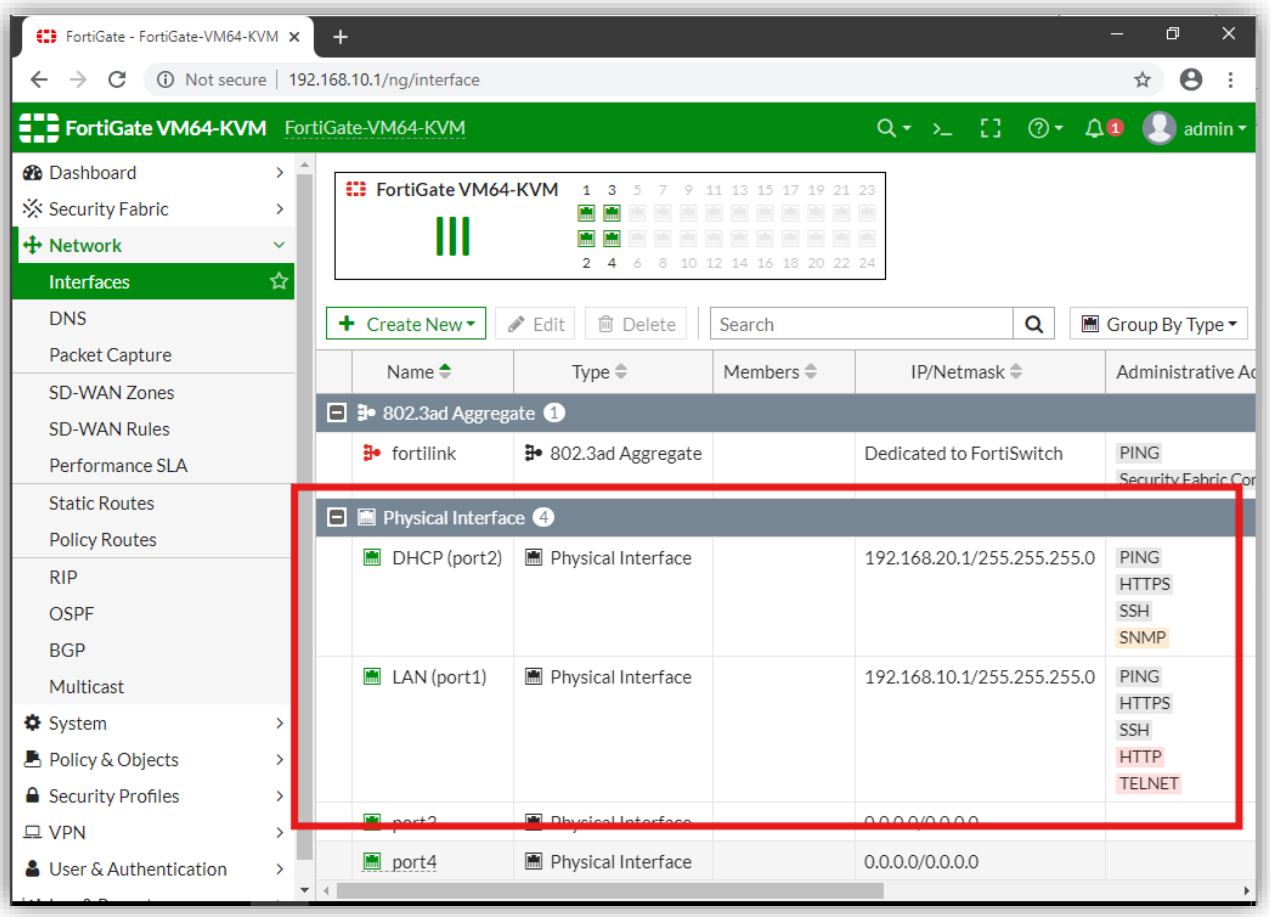


    - Gateway: 192.168.10.1
    - DNS Servers: 8.8.8.8, 8.8.4.4

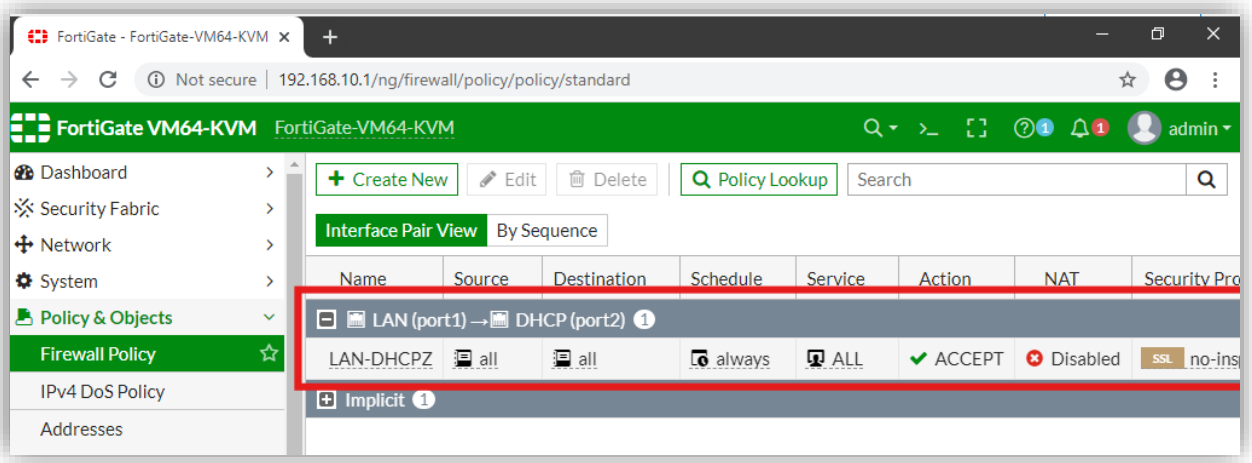


2. Configure Firewall for DHCP Relay

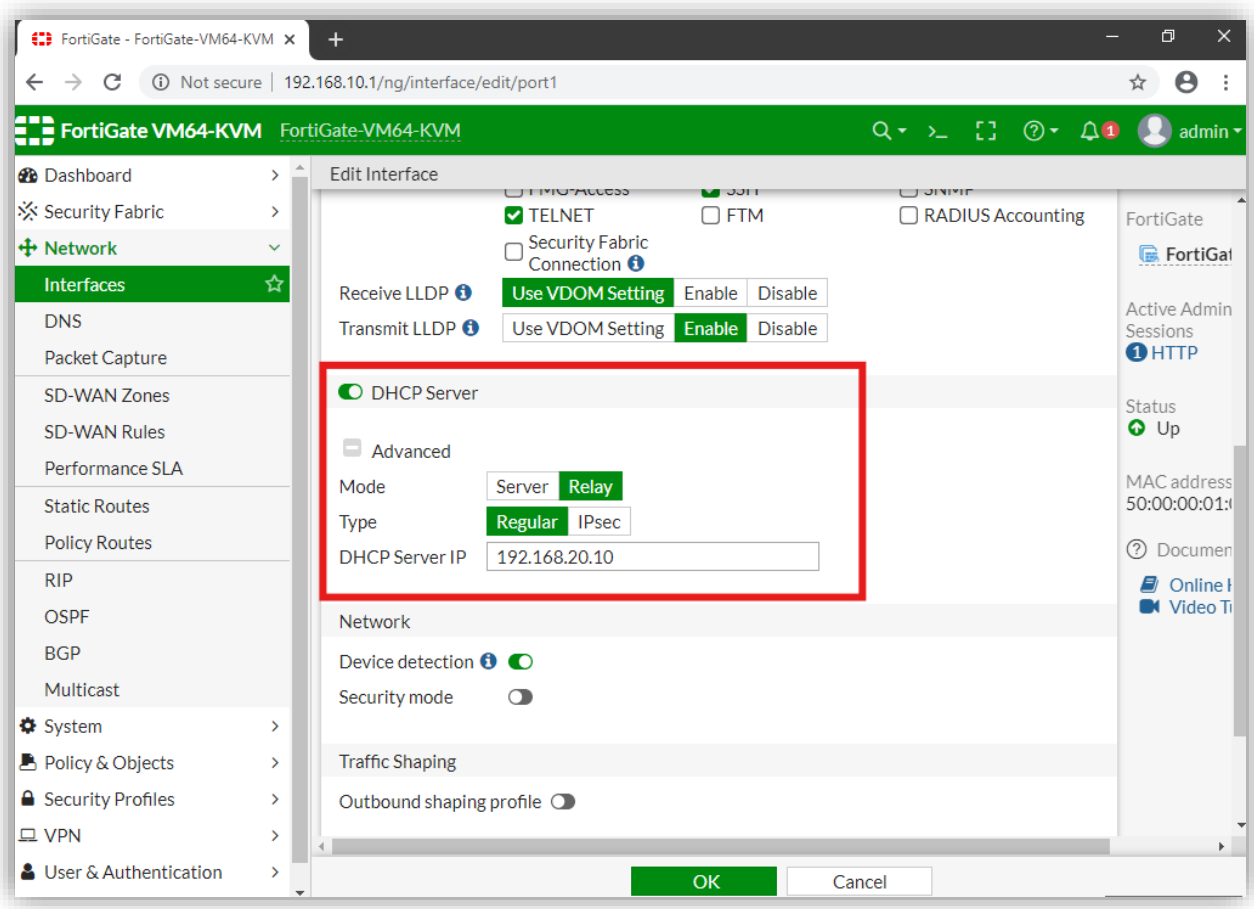
- Set up firewall interfaces: LAN and DHCP Zone.



- Created a policy from LAN → DHCP Zone.



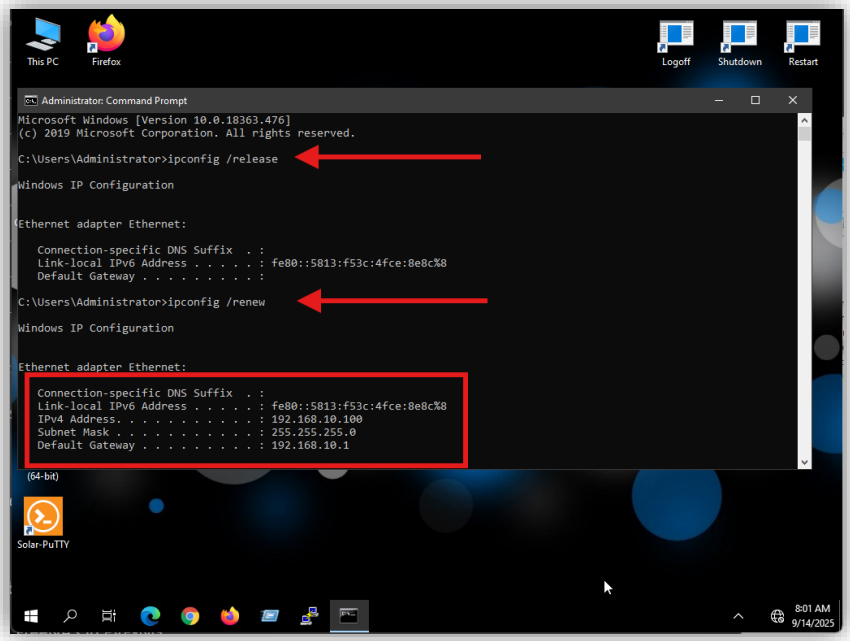
- On the LAN-side interface, enabled DHCP Relay instead of DHCP Server.



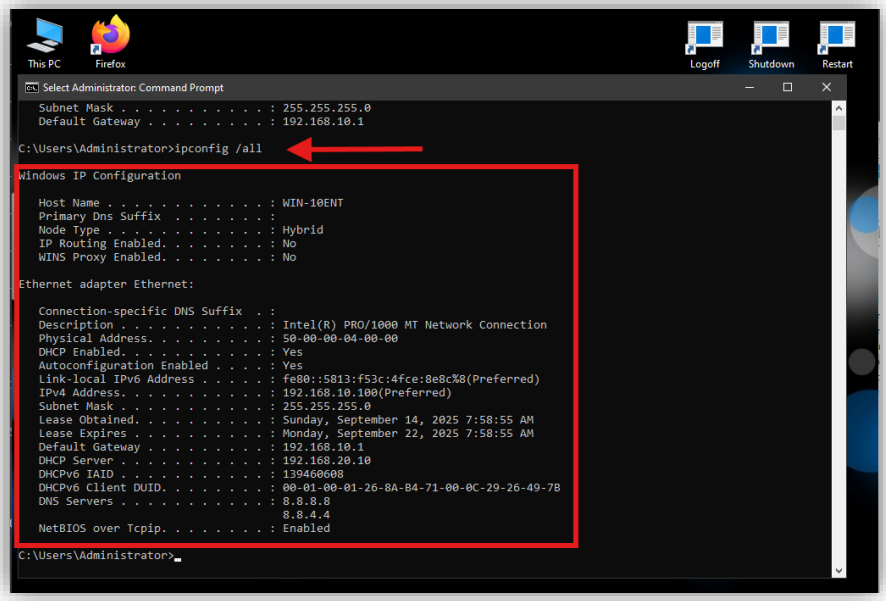
- Added the DHCP Server IP address as the relay target.

3. Verify DHCP Functionality

- On a LAN client PC:
    - Run ipconfig /release and ipconfig /renew to request a new IP.

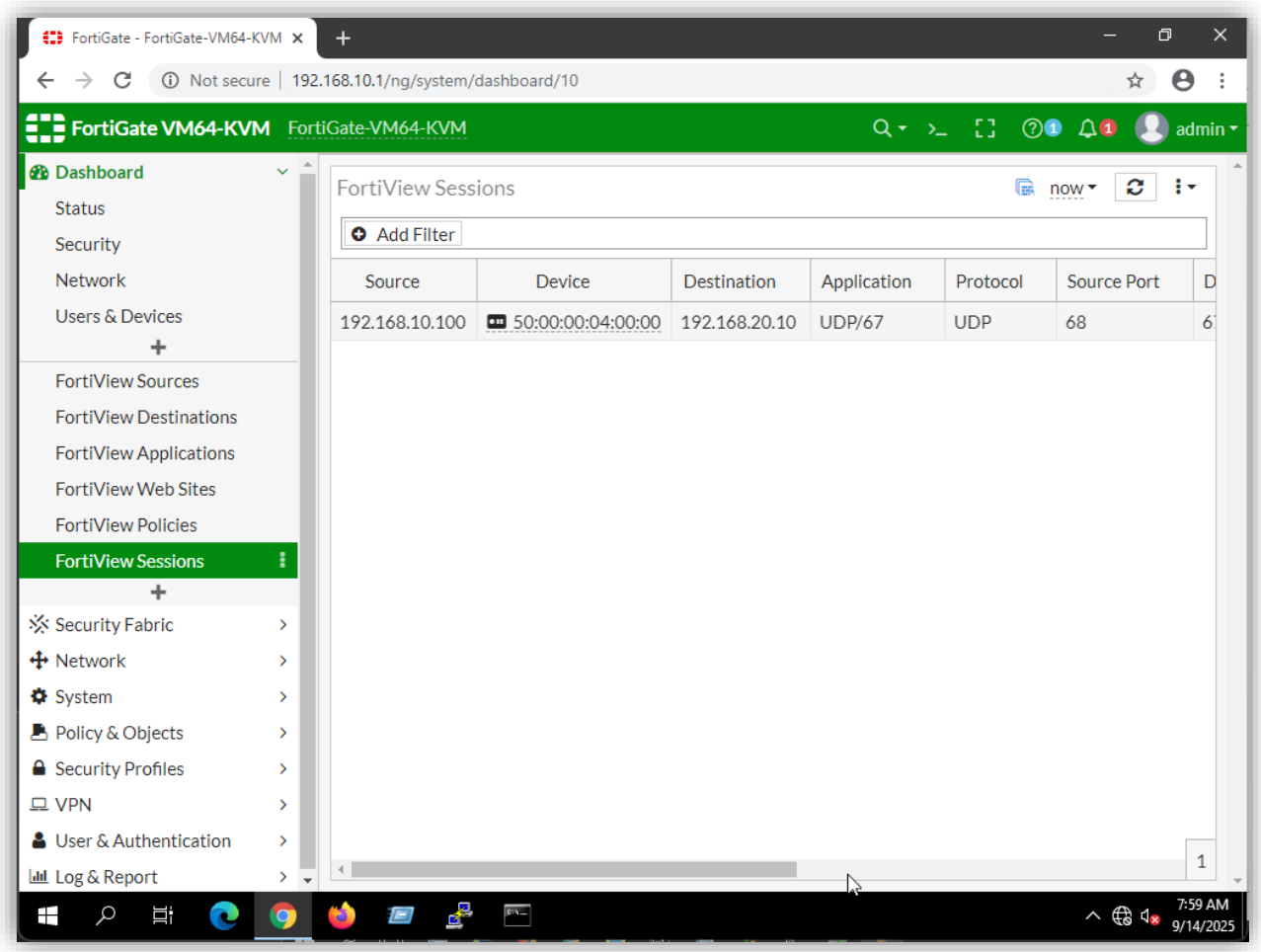


- Used ipconfig /all to confirm the client received:
  - IP address from 192.168.10.100–200 range
  - Correct Gateway (192.168.10.1)
  - DNS servers (8.8.8.8, 8.8.4.4)



4. DHCP Relay Traffic Verification in Firewall

While monitoring the network using **FortiView**, we observed DHCP traffic passing through the firewall configured as a relay agent:



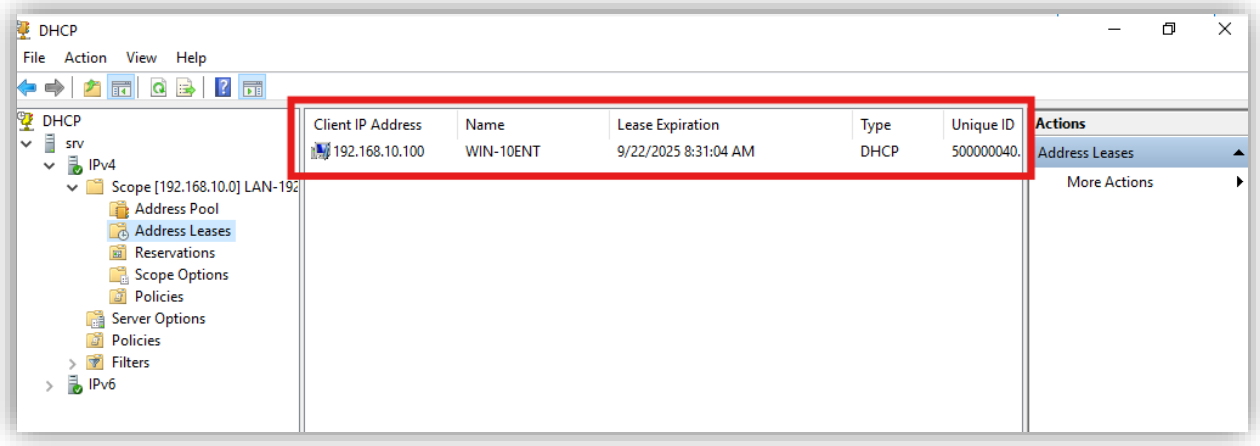
This confirms that the **client's DHCP request** from the LAN zone is successfully forwarded by the **firewall acting as a DHCP Relay Agent** to the DHCP server in the DHCP zone.

5. DHCP Leased Address Verification on Server

While checking the DHCP server leases, we verified that the assigned IP addresses for client PCs are correctly listed.

- This confirms that the DHCP server is successfully issuing IPs to clients through the firewall relay.

- Ensures that clients in the LAN zone receive valid IP configuration for network connectivity.



🔹 Conclusion

In this lab, we successfully demonstrated the use of a **firewall as a DHCP Relay Agent** to forward client requests from the LAN zone to a centralized DHCP server in a different network zone.

Key takeaways:

- DHCP Relay allows **centralized IP management** across multiple subnets without deploying DHCP servers on every network.
- FortiView verification confirmed that **client requests are correctly reaching the DHCP server** and responses are returned properly.
- Checking the DHCP server leases verified that **clients received valid IP addresses**, ensuring network connectivity.

This exercise highlights the importance of **relay agents in enterprise networks** for efficient, secure, and centralized DHCP management.

Thanks for your time!

Keep learning, and keep growing!....