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LAB 3

EXERCISE 1: PLANNING IP ADDRESSES FOR THE NETWORK

- IPv4 Network: 172.35.10.0/24
- Subnet Mask: 255.255.255.0
- Gateway: 172.35.10.1
- IP address for Servers: DC1, DC2, Web, VPN, DNS, DHCP, File,...
 - DC1: 172.35.10.11
 - DC2: 172.35.10.12
 - Win 10 Workstation: 172.35.10.13
 - Others: 172.35.10.14 – 172.35.10.30
- IP address for special devices: Printer, scanner, switch, routers,...
 - Switch: 172.35.10.2
 - Router 1: 172.35.10.3
 - Router 2: 172.35.10.4
 - Others: 172.35.10.5 – 172.35.10.10
- IP range for DHCP: 172.35.10.31 - 172.35.10.240
- Reservation IP:
 - 172.35.10.5 – 172.35.10.10
 - 172.35.10.14 – 172.35.10.30
 - 172.35.10.241 - 172.35.10.254

EXERCISE 2: MANUALLY CONFIGURING TCP/IP

	DC1	DC2	Win 10 Workstation
IP Address	172.35.10.11	172.35.10.12	172.35.10.13
Subnet Mask	255.255.255.0	255.255.255.0	255.255.255.0
Preferred DNS Server	172.35.10.11	172.35.10.12	172.35.10.11

```
Administrator: Windows PowerShell
PS C:\Windows\system32> ping -n 3 172.35.10.11

Pinging 172.35.10.11 with 32 bytes of data:
Reply from 172.35.10.11: bytes=32 time<1ms TTL=128
Reply from 172.35.10.11: bytes=32 time<1ms TTL=128
Reply from 172.35.10.11: bytes=32 time<1ms TTL=128

Ping statistics for 172.35.10.11:
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
PS C:\Windows\system32> ipconfig

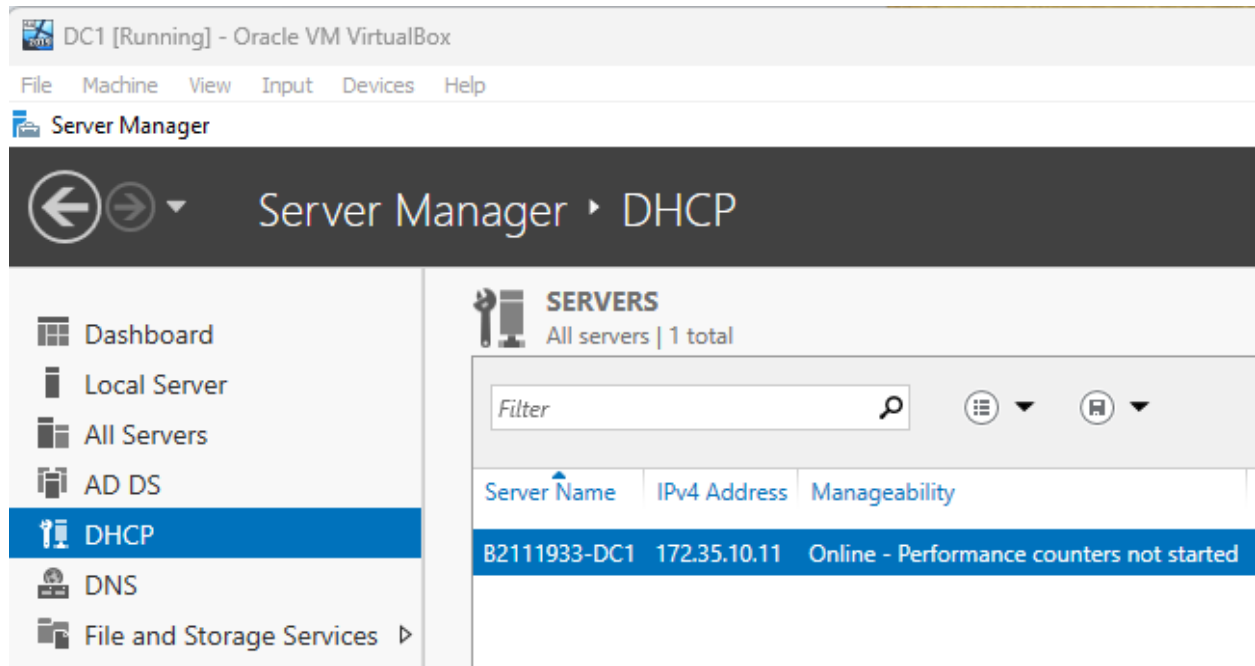
Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::ac86:e6e0:8558:ce6e%11
    IPv4 Address. . . . . : 172.35.10.13
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 172.35.10.1
PS C:\Windows\system32> 
```

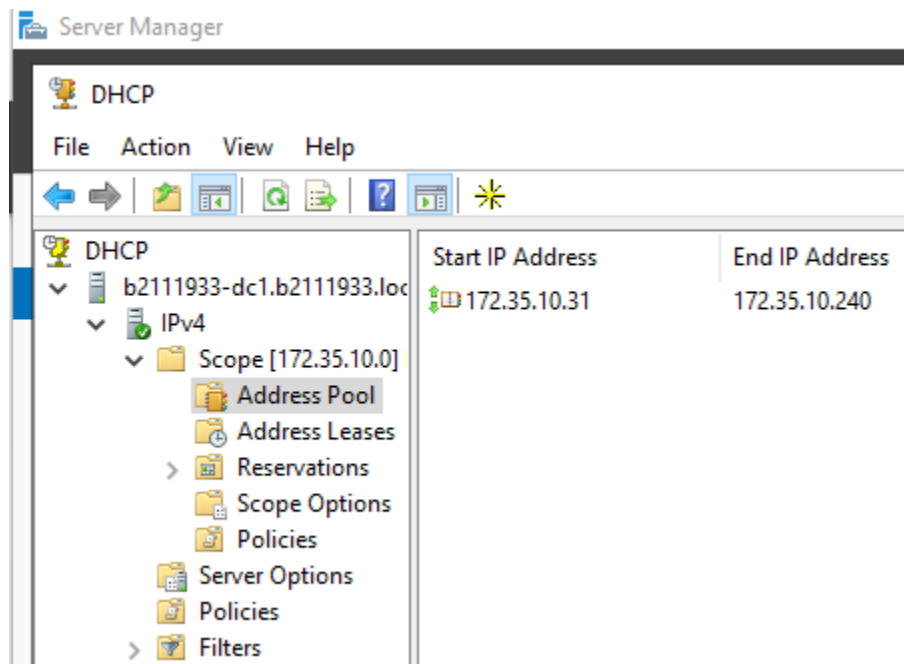
Test connectivity between DC1 and Win 10 Workstation

EXERCISE 3: INSTALLING DHCP SERVER ROLE

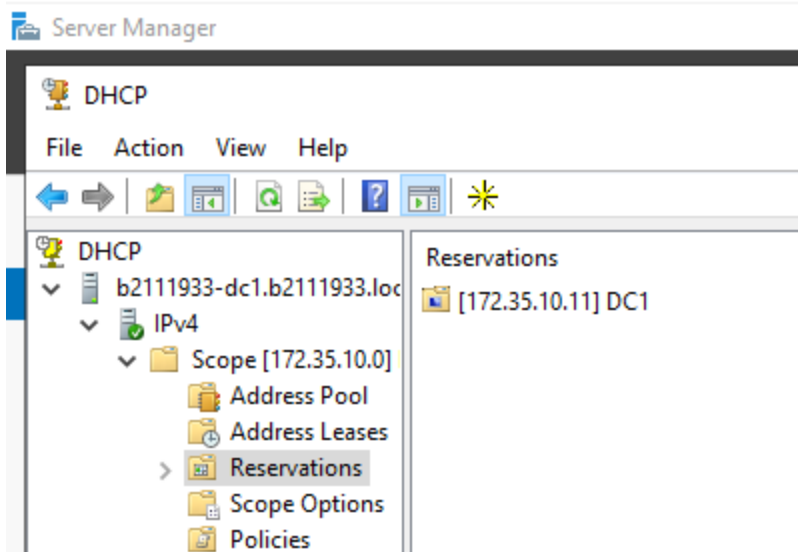


DHCP installed

EXERCISE 4: CREATING A DHCPV4 SCOPE



Create DHCPV4 Scope



Add DC1 as Reservation (just for practice, IPv4 of DC1 is not in DHCP Scope)

Challenge:

- **Confirming that DHCP work: demonstrate that a computer can automatically obtain IP from DHCP.**

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Win 10 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Command Prompt

Windows IP Configuration

Host Name . . . . . : DESKTOP-RMR3FNG
Primary Dns Suffix . . . . . : B2111933.local
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : B2111933.local

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . : B2111933.local
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address. . . . . : 08-00-27-F6-14-4A
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ac86:e6e0:8558:ce6e%11(Preferred)
IPv4 Address. . . . . : 172.35.10.31(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Saturday, September 14, 2024 12:38:44 PM
Lease Expires . . . . . : Saturday, September 21, 2024 12:38:44 PM
Default Gateway . . . . . : 172.35.10.1
DHCP Server . . . . . : 172.35.10.11
DHCPv6 IAID . . . . . : 101187623
DHCPv6 Client DUID. . . . . : 00-01-00-01-2E-65-CA-39-08-00-27-F6-14-4A
DNS Servers . . . . . : 172.35.10.11
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\LS>

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A Windows 10 VM can automatically obtain IP from DHCP

- Creating a DHCPv6 Scope

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Administrator: Command Prompt

C:\Users\Administrator>ipconfig /all

Windows IP Configuration

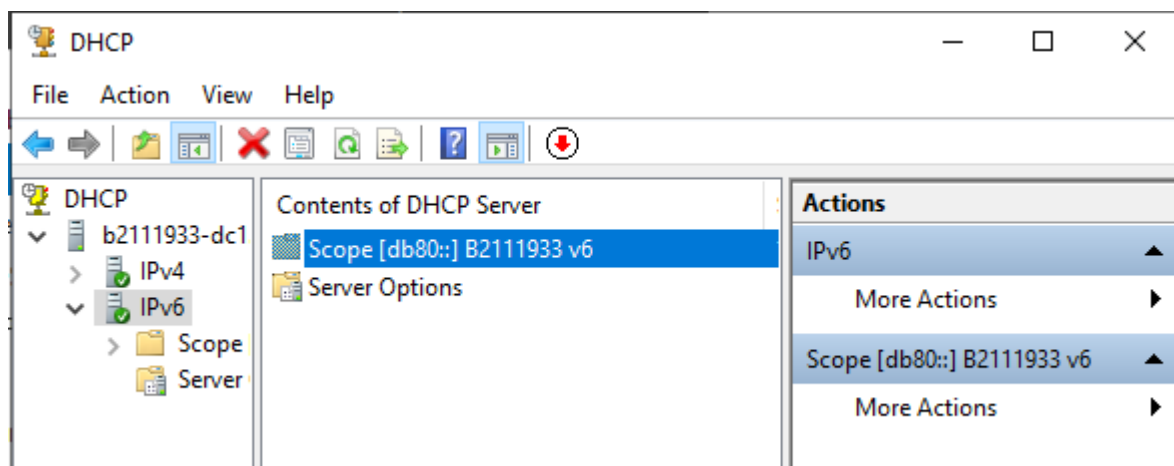
Host Name . . . . . : B2111933-DC1
Primary Dns Suffix . . . . . : B2111933.local
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : B2111933.local

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
Physical Address. . . . . : 08-00-27-E6-D2-8E
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . : fe80::d4b2:6739:8531:b05d%6(Preferred)
IPv4 Address. . . . . : 172.35.10.11(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 172.35.10.1
DHCPv6 IAID . . . . . : 101187623
DHCPv6 Client DUID. . . . . : 00-01-00-01-2E-52-DF-45-08-00-27-E6-D2-8E
DNS Servers . . . . . : ::1
                        172.35.10.11
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\Administrator>
```

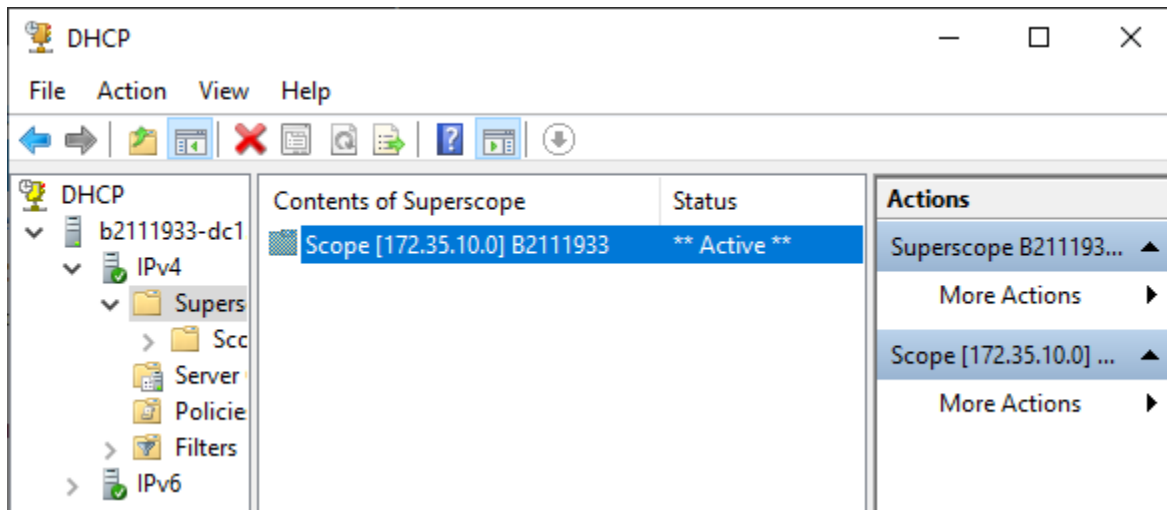
Ipv6 of DC1



Create a DHCPv6 Scope

- What is DHCP superscope? Installing and configuring a superscope

A DHCP superscope is a collection of individual scopes that are grouped together for administrative purposes. It allows a DHCP server to provide leases from more than one scope to clients on a single physical network, making it useful in multinet configurations where multiple logical networks exist on a single physical network. Superscopes simplify management, improve scalability, and offer increased flexibility in IP address allocation.



Install and configure a superscope

- What is DHCP Relay agent?

DHCP Relay Agent is a network device that acts as a middleman between DHCP clients (like computers, smartphones, and tablets) and DHCP servers. When a client needs an IP address, it sends a DHCP Discover message to the relay agent. The relay agent then forwards the message to the DHCP server. Once the server assigns an IP address, it sends it back to the relay agent, which then passes it on to the client. This process ensures that clients can obtain IP addresses even when they are physically distant from the DHCP server.

Server Manager ▸ DNS

- Dashboard
- Local Server
- All Servers
- AD DS
- DNS**
- File and Storage Services ▾

SERVICES

All services | 1 total

Service Name	Path	Status	Last Update	Can Stop	Can Start
Base Filtering Engine	\System\BFE	Running	9/6/2024 9:15:56 PM	Yes	No

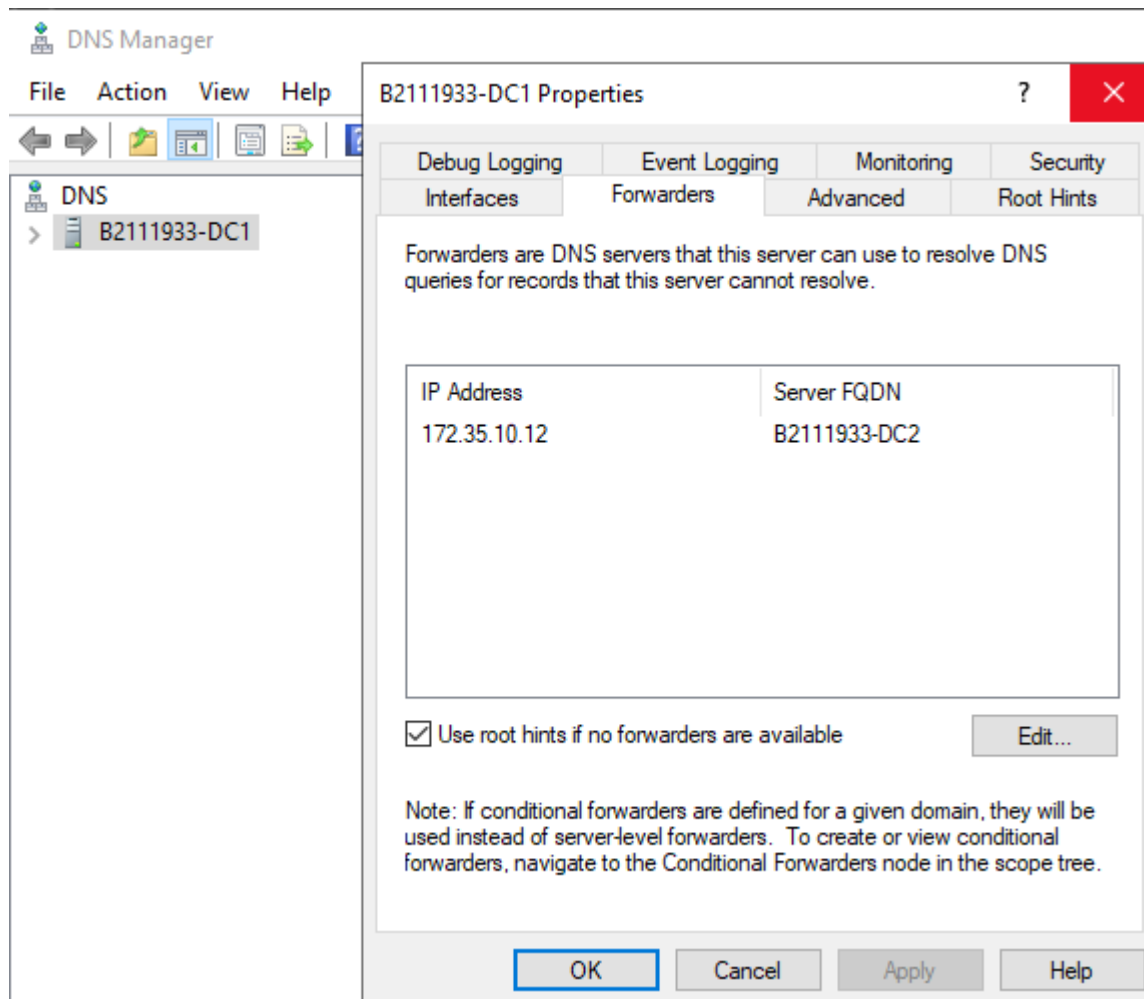
EVENTS

All events | 1 total

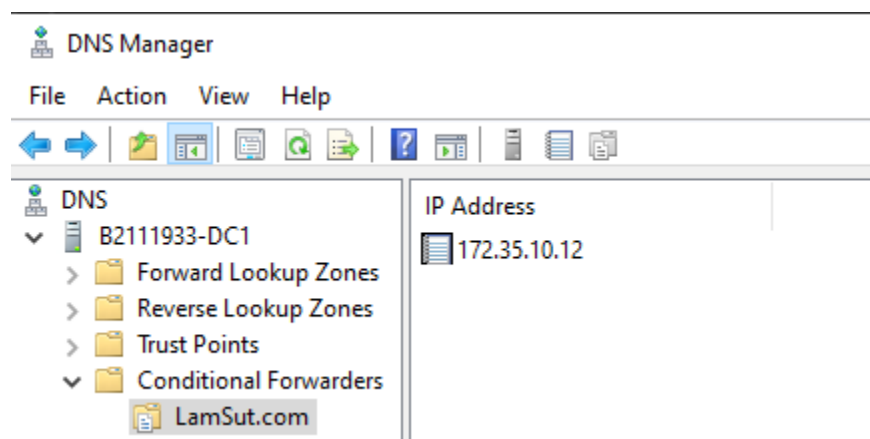
Event ID	Source	Severity	Date and Time
4013	Microsoft-Windows-DNS-Server-Service	Warning	9/6/2024 9:03:59 PM

Install DNS server

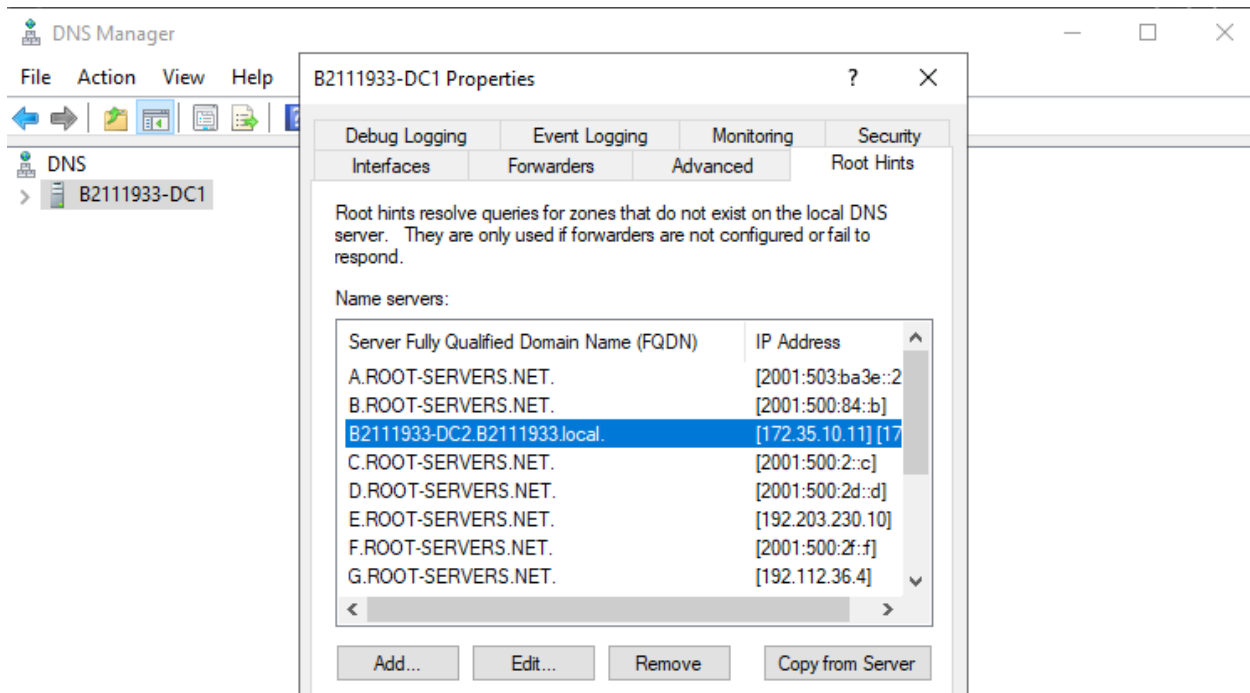
EXERCISE 6: CONFIGURE FORWARDERS, ROOT HINTS, AND RECURSION



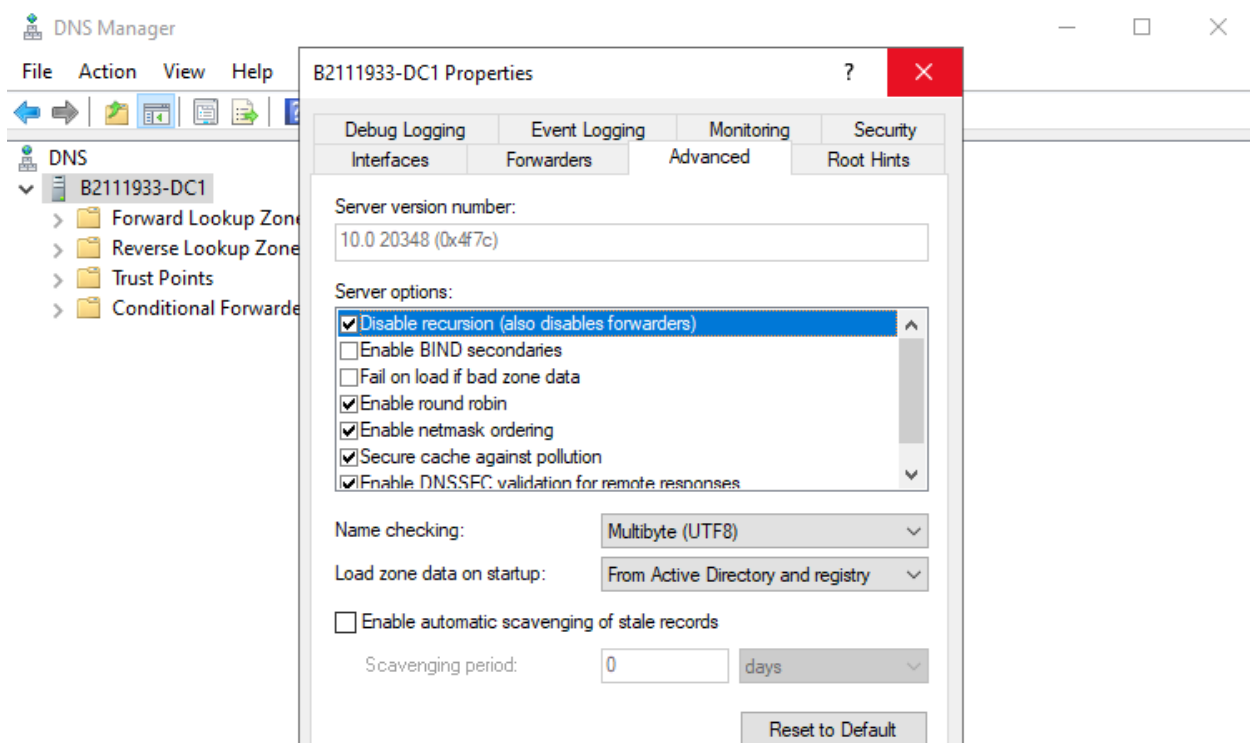
Add the IP Address of DC2 as forwarder



Configure conditional forwarding

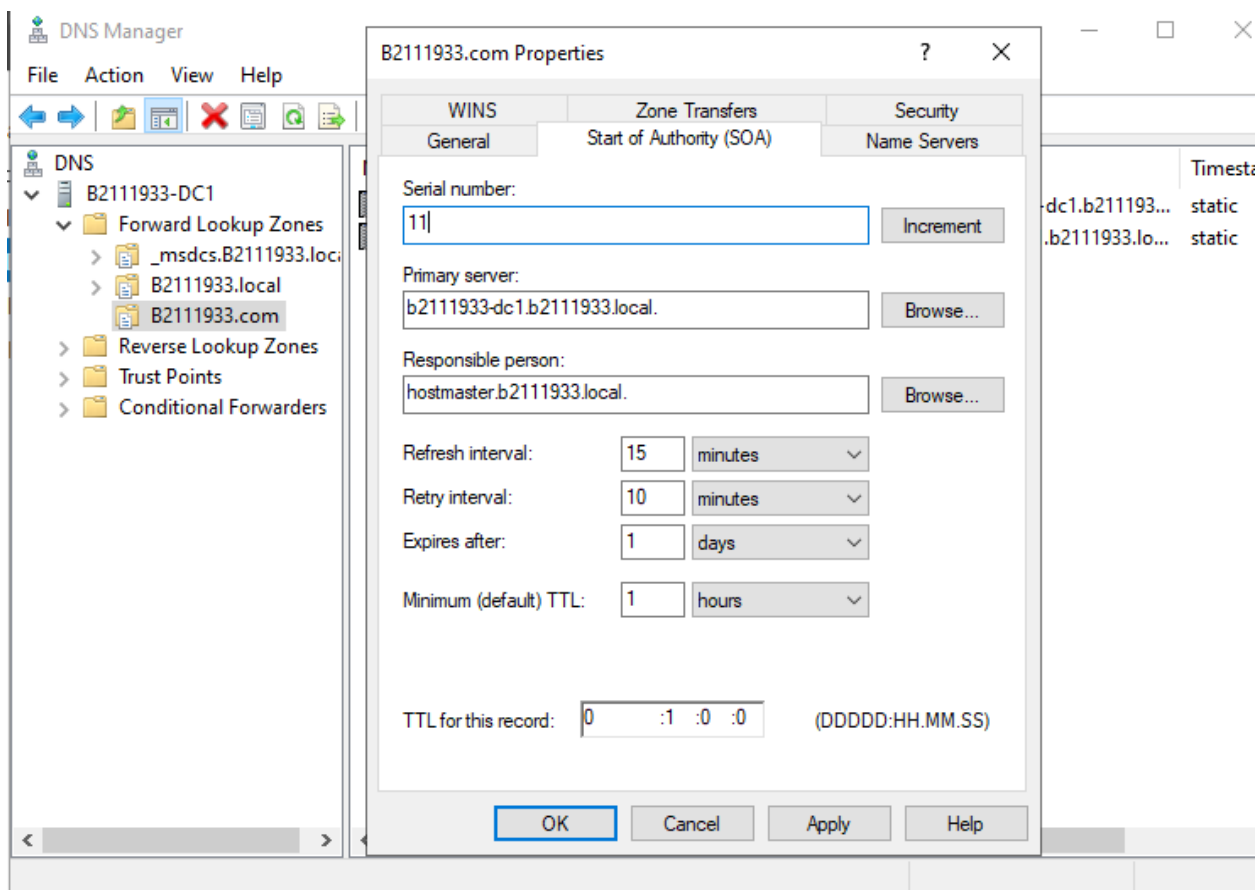


Edit root hints



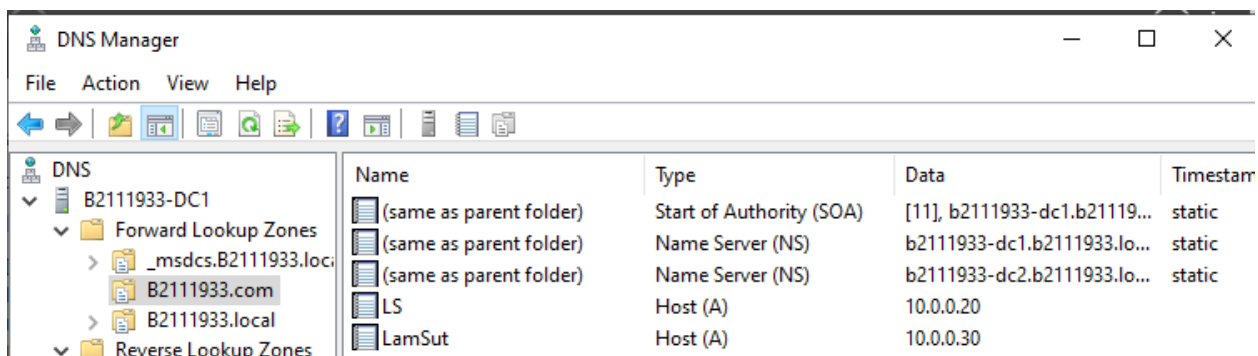
Disable recursion in DNS can enhance the security aspect (limit the potential for our DNS server to be used for malicious activities like DDoS attacks).

EXERCISE 7: CREATE AND CONFIGURE DNS ZONES AND RECORDS



Create a primary zone and reconfigure the SOA record

EXERCISE 8. CREATING DNS RESOURCE RECORDS



Create DNS resource records

Challenges: Configure the DNS server to perform reverse name resolutions for all of the resource records you created in previous exercise. List the basic tasks you performed to complete the challenge and then take a screen shot of the DNS Manager console.

New Zone Wizard X

Reverse Lookup Zone Name
A reverse lookup zone translates IP addresses into DNS names.

To identify the reverse lookup zone, type the network ID or the name of the zone.

☒ Network ID:

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

☐ Reverse lookup zone name:

Create a reverse lookup zone

DNS Manager _ □ X

File Action View Help

	Name	Type	Data	Timestam
DNS				
B2111933-DC1				
Forward Lookup Zones				
_msdc.B2111933.loc	(same as parent folder)	Start of Authority (SOA)	[3], b2111933-dc1.b211193...	static
B2111933.com	(same as parent folder)	Name Server (NS)	b2111933-dc1.b2111933.lo...	static
B2111933.local	10.0.0.20	Pointer (PTR)	LS.b2111933.com.	static
B2111933.local	10.0.0.30	Pointer (PTR)	lamsut.b2111933.com.	static
Reverse Lookup Zones				
0.0.10.in-addr.arpa				
Trust Points				
Conditional Forwarders				

It will perform reverse name resolutions for all of the resource records we have created