Configurar e verificar o DHCP em uma estrutura VxLAN para o Nexus 9000 com NX-OS e Windows Server 2022

Contents

Introdução

Este documento descreve como configurar e solucionar problemas de DHCP em uma estrutura VxLAN com switches Nexus 9000.

Pré-requisitos

Requisitos

A Cisco recomenda que você tenha conhecimento destes tópicos:

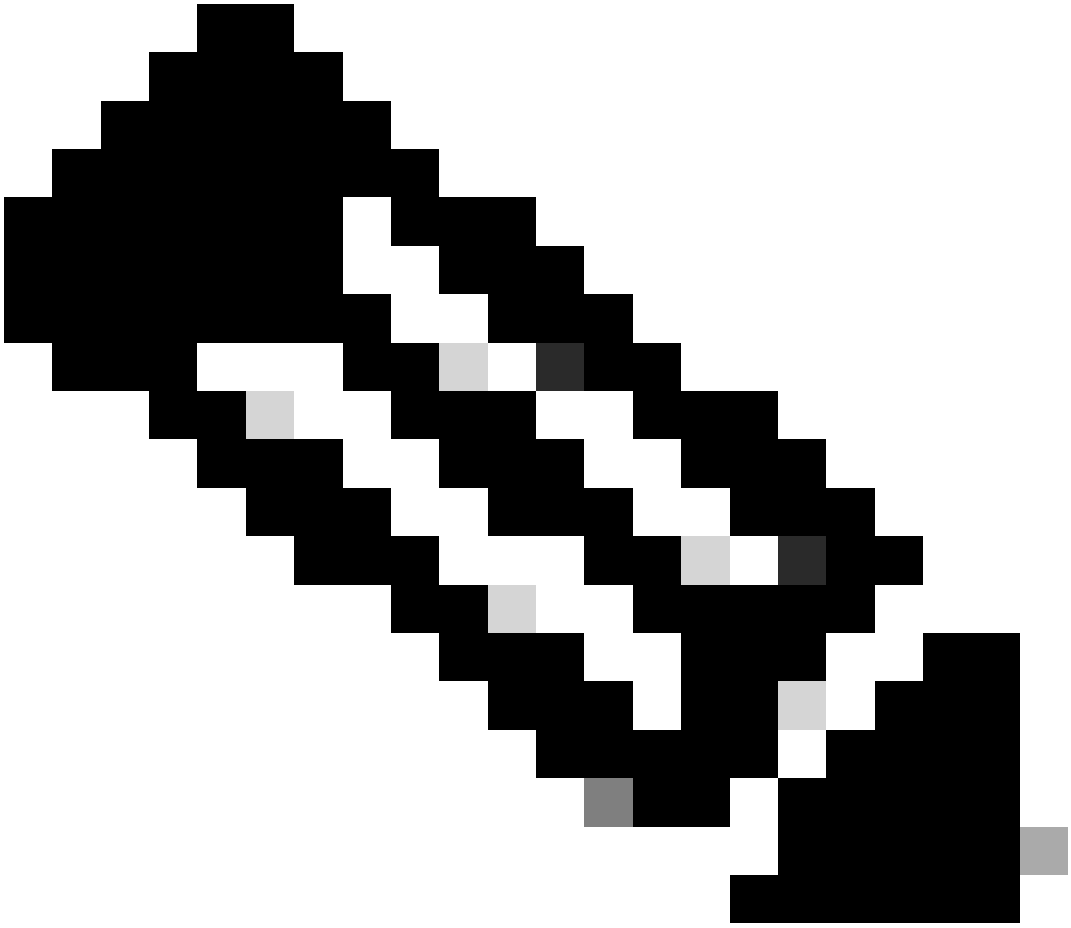
- Software NX-OS Nexus.
- Virtual Port Channel (vPC).
- VxLAN BGP L2VPN EVPN
- BGP address-family IPv4
- OSPF
- PIM multicast (modo escasso)
- DHCP

Componentes Utilizados

As informações neste documento são baseadas nestas versões de software e hardware:

- Cisco Nexus 9000 com Cisco NX-OS.
  - N9K-C93180YC-EX
  - N9K-C93180YC-FX
  - NX-OS 10.3(4a)
- Data center do Windows Server 2022

As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se a rede estiver ativa, certifique-se de que você entenda o impacto potencial de qualquer comando.



Observação: qualquer dúvida sobre a configuração e a integrabilidade de software ou hardware de terceiros está fora do suporte da Cisco. O uso de ferramentas de terceiros é o melhor esforço para demonstrar sua configuração e operação com o equipamento da Cisco para o cliente.

Informações de Apoio

Configuração de Sobreposição e Sobreposição para VxLAN em Laboratório

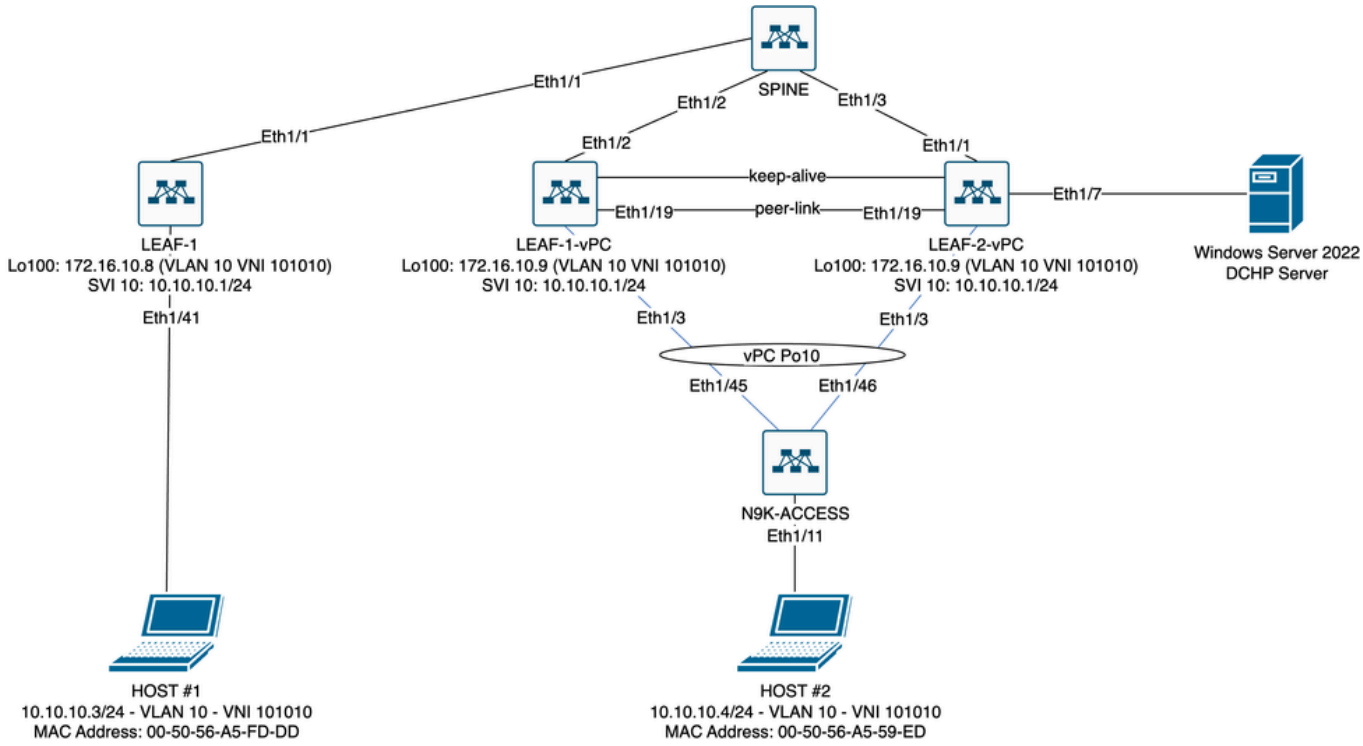


Diagrama de estrutura VxLAN no laboratório

- COLUNA:
  - Esse switch Nexus envia pacotes DHCP (Discover, Offer, Request, Ack) sem ser desencapsulado nesse cenário. Somente o cabeçalho externo é usado.
  - Atua como os pontos de roteamento centrais na estrutura de rede.
  - Responsável por interconectar todos os switches LEAF e facilitar o fluxo de dados entre eles.
  - Participa do BGP para distribuir rotas EVPN aos switches LEAF.
  - Executa o roteamento IP e pode rotear o tráfego entre diferentes sub-redes ou segmentos VxLAN observando os cabeçalhos IP externos.
  - Separa a rede de sobreposição (VxLAN) da rede física subjacente.
  - Gerencia a subjacência com protocolos de roteamento IP tradicionais, enquanto a sobreposição é gerenciada por VxLAN com BGP EVPN, fornecendo uma arquitetura de rede escalável e flexível.

- FOLHA-1:
  - Os switches LEAF fornecem conectividade física para endpoints como servidores, dispositivos de armazenamento e outros dispositivos de rede.
  - Os switches LEAF atuam como VTEPs, o que significa que encapsulam e desencapsulam os pacotes VxLAN.
  - Neste cenário, o HOST 1 faz a solicitação de endereço IP.
  - A LEAF-1 é responsável por encapsular os pacotes DHCP dentro do cabeçalho VxLAN.
  - O HOST 1 recebe pacotes DHCP de forma transparente como Ethernet clássica.

- LEAF-1-vPC e LEAF-2-vPC:
  - Os switches LEAF participam do plano de controle EVPN executando o BGP e trocando informações de rota. Isso permite a distribuição de informações de endereço

MAC e IP, garantindo que o tráfego possa ser roteado eficientemente através da estrutura VxLAN.
    - Neste cenário, o servidor DHCP é associado à VLAN 10 com 101010 VNI como é HOST#1. Isso significa que é apenas VxLAN Bridging.
    - Se o servidor DHCP foi associado a um VNI diferente do HOST#1, então um L3VNI seria estritamente necessário para o roteamento. O VNI de origem e de destino deve ser criado.
    - O servidor DHCP recebe pacotes DHCP de forma transparente como Ethernet clássica.
    - O tráfego de BUM é recebido por ambos os switches Nexus no vPC, mas somente o switch Nexus operacionalmente primário no vPC envia o tráfego. O switch Nexus secundário interrompe o tráfego. Neste cenário, LEAF-1-vPC é operacionalmente primário.
    - O uso de infra-vlans é obrigatório porque se a interface em LEAF-2-vPC para SPINE cair, os pacotes DHCP não poderão ser enviados. Para enviar o tráfego encapsulado de VxLAN para LEAF-1-vPC, essa VLAN de backup é necessária. Dessa forma, LEAF-1-vPC poderia enviar pacotes DHCP para SPINE.

- N9K-ACCESS
    - Esse switch Nexus fornece conectividade apenas para ambos os Leafs usando um canal de porta vPC para fins de redundância em relação ao HOST 2

COLUNA

```
nv overlay evpn
feature ospf
feature bgp
feature pim
feature netconf
feature nv overlay

ip pim rp-address 192.168.11.11 group-list 224.10.10.0/24
ip pim ssm range 232.0.0.0/8
ip pim anycast-rp 192.168.11.11 192.168.0.11

ip prefix-list direct_routes seq 5 permit 10.104.11.0/30 le 32
route-map redistribution permit 10
  match ip address prefix-list direct_routes

interface Ethernet1/1
  speed 1000
  ip address 10.104.11.1/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no shutdown

interface Ethernet1/2
  ip address 10.102.11.1/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
```

```
  no shutdown

interface Ethernet1/3
  speed 1000
  ip address 10.103.11.1/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no shutdown

interface loopback0
  description ANYCAST-RP
  ip address 192.168.0.11/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback1
  description ANYCAST-RP-CANDIDATE
  ip address 192.168.11.11/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

router ospf 1

router bgp 65000
  neighbor 192.168.3.3
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
      route-reflector-client
  neighbor 192.168.4.4
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
      route-reflector-client
  neighbor 192.168.5.5
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
      route-reflector-client
```

FOLHA-1

```
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature dhcp
feature nv overlay
```

```
fabric forwarding anycast-gateway-mac 0000.0a0a.0a0a

ip pim rp-address 192.168.11.11 group-list 224.10.10.0/24
ip pim ssm range 232.0.0.0/8

vlan 1,10,20,300
vlan 10
  vn-segment 101010
vlan 20
  vn-segment 202020
vlan 300
  vn-segment 303030

spanning-tree vlan 10 priority 4096

ip prefix-list host_subnets seq 5 permit 10.10.10.0/24 le 32
ip prefix-list host_subnets seq 10 permit 192.168.20.0/24 le 32
ip prefix-list host_subnets seq 15 permit 172.16.10.8/32
route-map direct_routes_tenant-a permit 10
  match ip address prefix-list host_subnets

vrf context tenant-a
  vni 303030
  rd auto
  address-family ipv4 unicast
    route-target both auto
    route-target both auto evpn

interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100

interface Vlan20
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 192.168.20.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway

interface Vlan300
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip forward
  no ipv6 redirects

interface nve1
  no shutdown
  host-reachability protocol bgp
  source-interface loopback0
  member vni 101010
    suppress-arp
    mcast-group 224.10.10.10
  member vni 202020
```

```
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf

interface Ethernet1/1
  ip address 10.104.11.2/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no shutdown

interface loopback0
  description UNDERLAY-VERIFICATION
  ip address 192.168.5.5/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback100
  vrf member tenant-a
  ip address 172.16.10.8/32

router ospf 1

router bgp 65000
  address-family ipv4 unicast
  neighbor 192.168.0.11
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
  vrf tenant-a
    address-family ipv4 unicast
      redistribute direct route-map direct_routes_tenant-a
evpn
  vni 101010 l2
    rd auto
    route-target import auto
    route-target export auto
  vni 202020 l2
    rd auto
    route-target import auto
    route-target export auto
```

LEAF-1-vPC

```
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature dhcp
feature vpc
feature nv overlay
```

```
fabric forwarding anycast-gateway-mac 0000.0a0a.0a0a

ip pim rp-address 192.168.11.11 group-list 224.10.10.0/24
ip pim ssm range 232.0.0.0/8

vlan 1,10,300,777
vlan 10
  vn-segment 101010
vlan 300
  vn-segment 303030
vlan 777
  name BACKUP_VLAN_ROUTING_NVE_INFRA
spanning-tree vlan 1,10,300 hello-time 4

ip prefix-list host_subnets seq 5 permit 10.10.10.0/24 le 32
ip prefix-list host_subnets seq 15 permit 172.16.10.9/32
route-map direct_routes_tenant-a permit 10
  match ip address prefix-list host_subnets

vrf context tenant-a
  vni 303030
  rd auto
  address-family ipv4 unicast
    route-target both auto
    route-target both auto evpn
system nve infra-vlans 777

vpc domain 1
  peer-switch
  peer-keepalive destination 10.88.238.195
  peer-gateway
  layer3 peer-router
  ip arp synchronize

interface Ethernet1/3
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 1,10,20
  channel-group 10 mode active
  no shutdown

interface Ethernet1/19
  switchport
  switchport mode trunk
  channel-group 1 mode active
  no shutdown

interface port-channel1
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link

interface port-channel10
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 1,10
  vpc 10

interface mgmt0
  vrf member management
  ip address 10.88.238.194/29
```

```
interface loopback0
  description UNDERLAY-VERIFICATION
  ip address 192.168.3.3/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback1
  description OVERLAY-NVE
  ip address 192.168.13.1/32
  ip address 192.168.13.254/32 secondary
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback10
  vrf member tenant-a
  ip address 172.16.10.1/32

interface loopback100
  vrf member tenant-a
  ip address 172.16.10.9/32

interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100

interface Vlan300
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip forward
  no ipv6 redirects

interface Vlan777
  description BACKUP_UNDERLAY_INFRA-VLAN
  no shutdown
  no ip redirects
  ip address 10.255.77.1/30
  no ipv6 redirects
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface Ethernet1/2
  ip address 10.102.11.2/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no shutdown

interface nve1
  no shutdown
  host-reachability protocol bgp
  advertise virtual-rmac
  source-interface loopback1
  member vni 101010
```

```
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf

router ospf 1

router bgp 65000
  address-family ipv4 unicast
  address-family l2vpn evpn
    advertise-pip
  neighbor 192.168.0.11
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
  neighbor 192.168.88.2
    remote-as 65000
    description OVERLAY_BACKUP
    update-source Vlan888
    address-family l2vpn evpn
      send-community
      send-community extended
  vrf tenant-a
    address-family ipv4 unicast
      redistribute direct route-map direct_routes_tenant-a
evpn
  vni 101010 l2
    rd auto
    route-target import auto
    route-target export auto
  vni 202020 l2
    rd auto
    route-target import auto
    route-target export auto
```

LEAF-2-vPC

```
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature dhcp
feature vpc
feature nv overlay

fabric forwarding anycast-gateway-mac 0000.0a0a.0a0a

ip pim rp-address 192.168.11.11 group-list 224.10.10.0/24
ip pim ssm range 232.0.0.0/8

vlan 1,10,20,300,777
vlan 10
  vn-segment 101010
```

```
vlan 20
  vn-segment 202020
vlan 300
  vn-segment 303030
vlan 777
  name BACKUP_VLAN_ROUTING_NVE_INFRA

spanning-tree vlan 1,10,20,300 hello-time 4

ip prefix-list host_subnets seq 5 permit 10.10.10.0/24 le 32
ip prefix-list host_subnets seq 10 permit 192.168.20.0/24 le 32
ip prefix-list host_subnets seq 15 permit 172.16.10.10/32
route-map direct_routes_tenant-a permit 10
  match ip address prefix-list host_subnets

vrf context tenant-a
  vni 303030
  rd auto
  address-family ipv4 unicast
    route-target both auto
    route-target both auto evpn

system nve infra-vlans 777

vpc domain 1
  peer-switch
  peer-keepalive destination 10.88.238.194
  peer-gateway
  layer3 peer-router
  ip arp synchronize

interface Ethernet1/1
  ip address 10.103.11.2/30
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no shutdown

interface Ethernet1/19
  switchport
  switchport mode trunk
  channel-group 1 mode active
  no shutdown
interface port-channel1
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link

interface port-channel10
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 1,10,20
  vpc 10

interface mgmt0
  vrf member management
  ip address 10.88.238.195/29

interface loopback0
  description UNDERLAY-VERIFICATION
  ip address 192.168.4.4/32
```

```
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback1
  description OVERLAY-NVE
  ip address 192.168.13.2/32
  ip address 192.168.13.254/32 secondary
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface loopback10
  vrf member tenant-a
  ip address 172.16.10.2/32

interface loopback100
  vrf member tenant-a
  ip address 172.16.10.10/32

interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100

interface Vlan20
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 192.168.20.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway

interface Vlan300
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip forward
  no ipv6 redirects

interface Vlan777
  description BACKUP_UNDERLAY_INFRA-VLAN
  no shutdown
  no ip redirects
  ip address 10.255.77.2/30
  no ipv6 redirects
  ip ospf network point-to-point
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

interface nve1
  no shutdown
  host-reachability protocol bgp
  advertise virtual-rmac
  source-interface loopback1
  member vni 101010
    suppress-arp
    mcast-group 224.10.10.10
  member vni 202020
```

```
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf

router ospf 1

router bgp 65000
  address-family ipv4 unicast
  address-family l2vpn evpn
    advertise-pip
  neighbor 192.168.0.11
    remote-as 65000
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
  neighbor 192.168.88.1
    remote-as 65000
    description OVERLAY_BACKUP
    update-source Vlan888
    address-family l2vpn evpn
      send-community
      send-community extended
  vrf tenant-a
    address-family ipv4 unicast
      redistribute direct route-map direct_routes_tenant-a
evpn
  vni 101010 l2
    rd auto
    route-target import auto
    route-target export auto
  vni 202020 l2
    rd auto
    route-target import auto
    route-target export auto
```

N9K-ACCESS

```
feature lacp

vlan 1,10

interface port-channel10
  switchport
  switchport mode trunk

interface Ethernet1/11
  switchport
  switchport access vlan 10
  no shutdown

interface Ethernet1/45
  switchport
  switchport mode trunk
  channel-group 10 mode active
  no shutdown
```

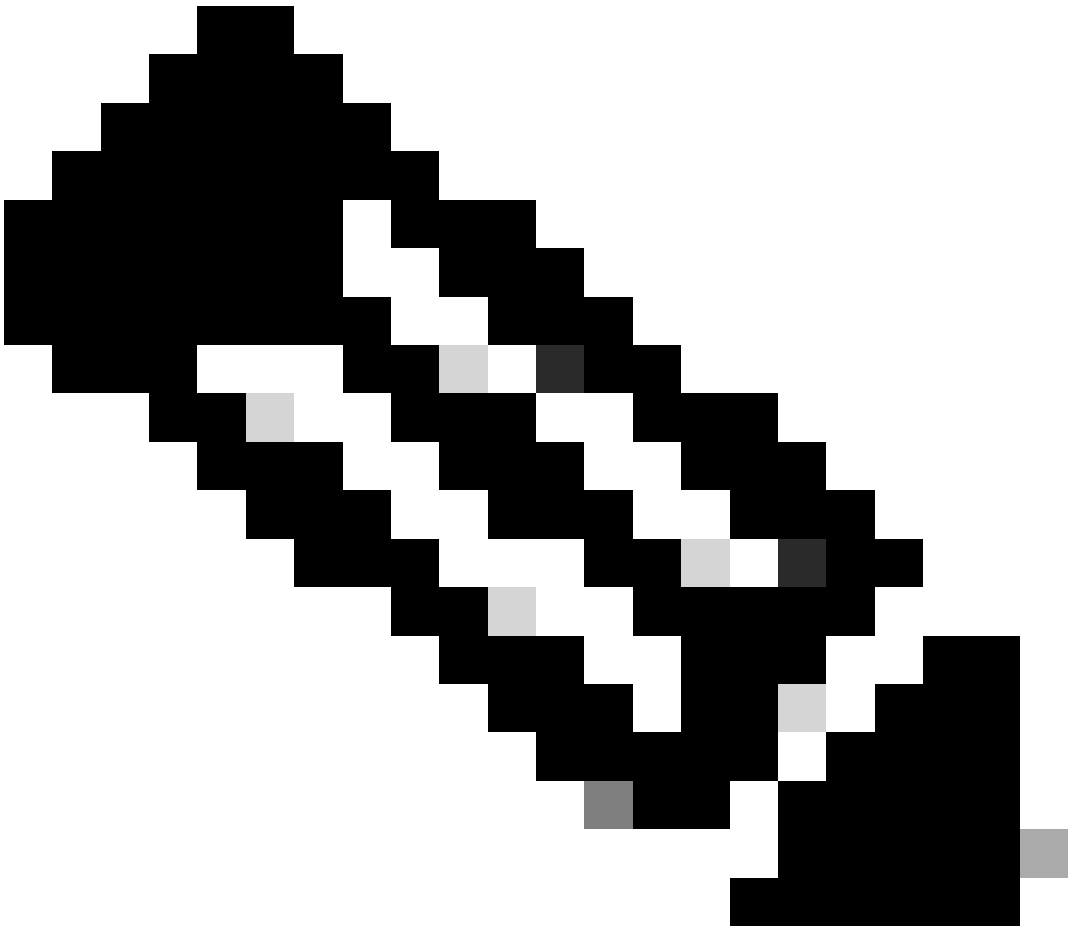
```
interface Ethernet1/46
  switchport
  switchport mode trunk
  channel-group 10 mode active
  no shutdown
```

Configuração DHCP em switches Nexus

FOLHA-1

Etapa 1. Ative o recurso DHCP.

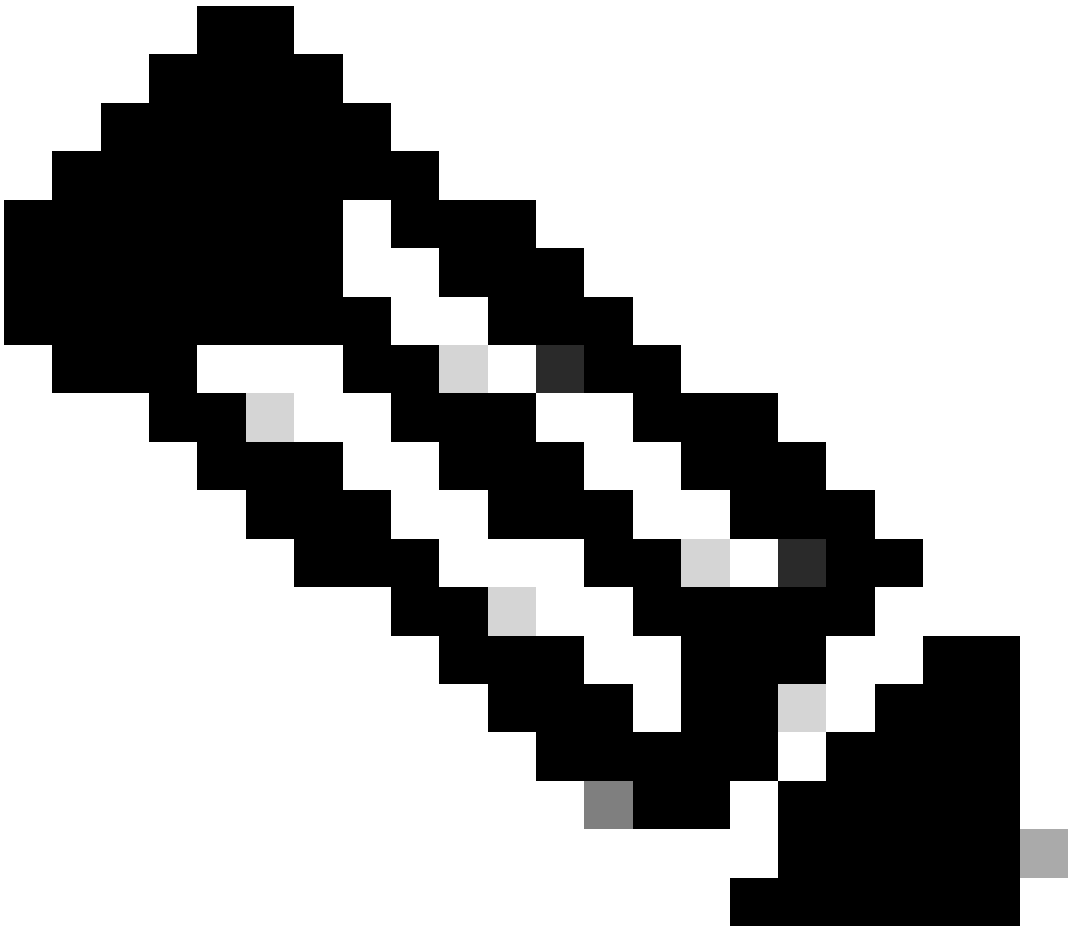
```
LEAF-1(config)# feature dhcp
```



Observação: o servidor DHCP e o comando do agente de retransmissão service dhcp, ip dhcp relay e ipv6 dhcp relay estão habilitados por padrão desde o NX-OS 7.x.

Etapa 2. Aplique o comando ip dhcp relay information option.

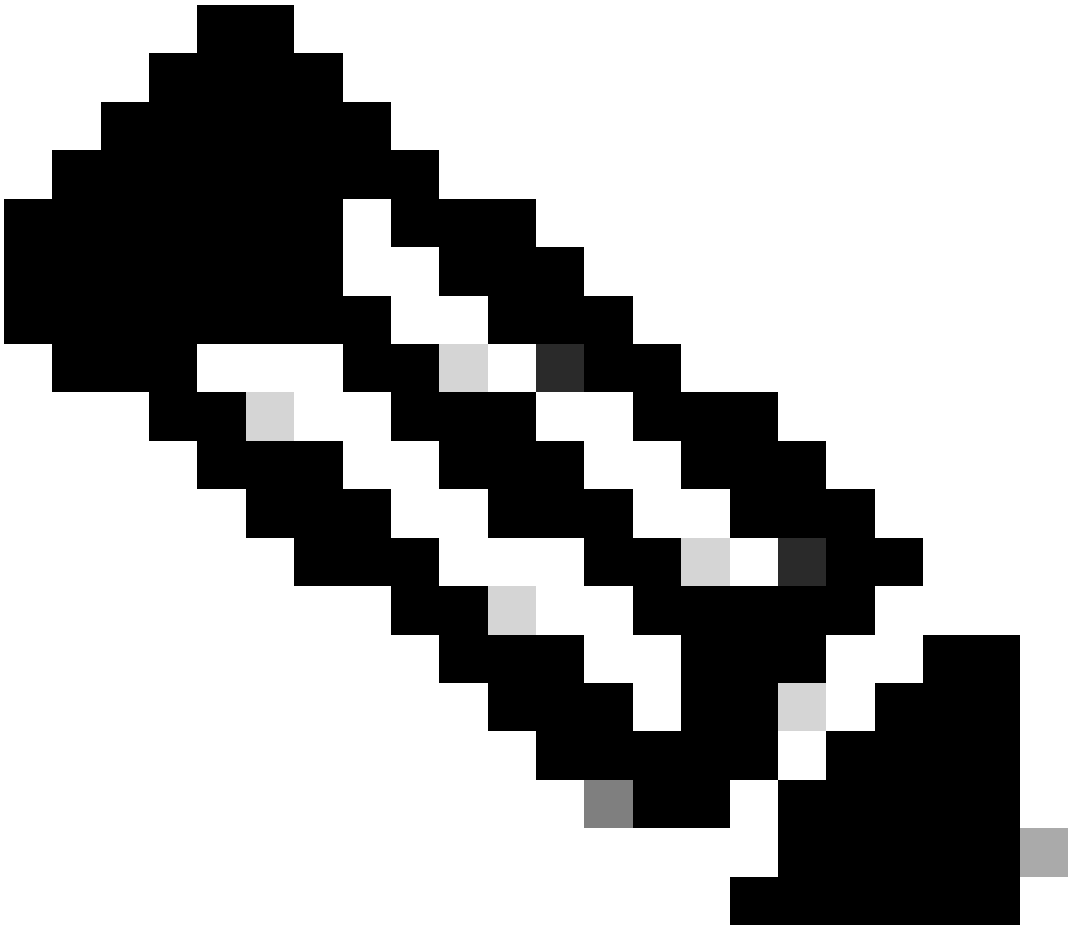
```
LEAF-1(config)# ip dhcp relay information option
```



Observação: esse comando permite que o agente de retransmissão DHCP insira e remova informações da Opção 82 nos pacotes encaminhados.

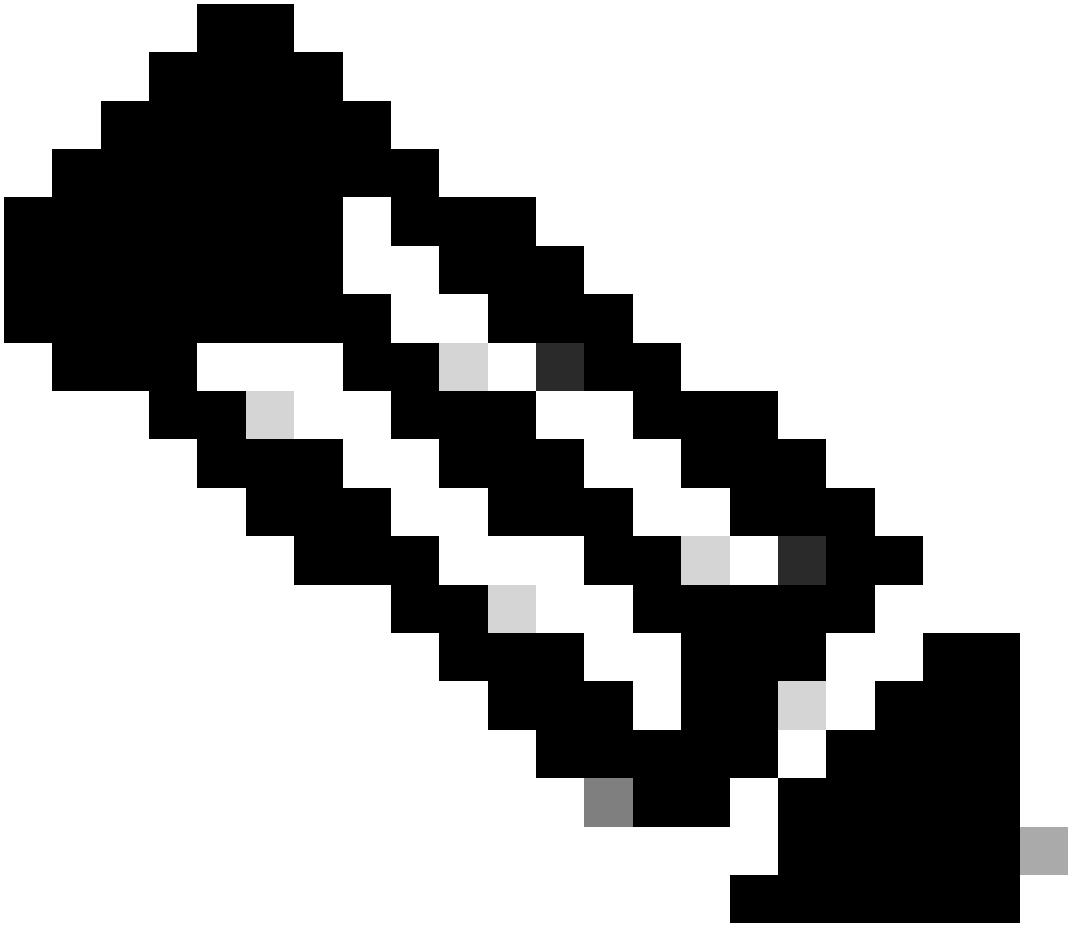
Etapa 3. Aplique o comando ip dhcp relay information option vpn.

```
LEAF-1(config)# ip dhcp relay information option vpn
```



Observação: esse comando ativa as solicitações de retransmissão de DHCP que chegam em VRF diferentes, ao qual o servidor DHCP pertence.

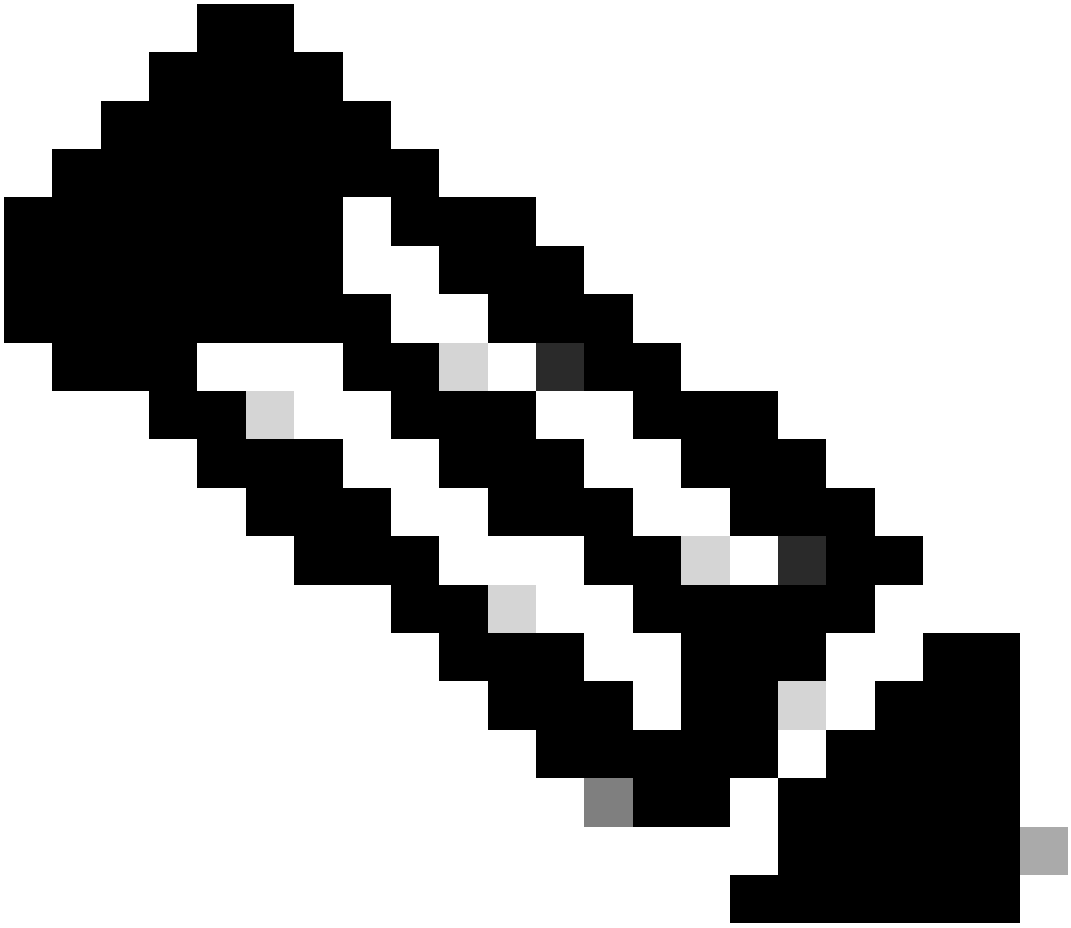
Etapa 4. Aplique o comando "ip dhcp relay address [ip address of DCHP server]".



Observação: neste exemplo, o endereço IP do servidor DHCP é 10.10.10.150.

```
LEAF-1(config)# interface vlan 10
LEAF-1(config-if)# ip dhcp relay address 10.10.10.150
```

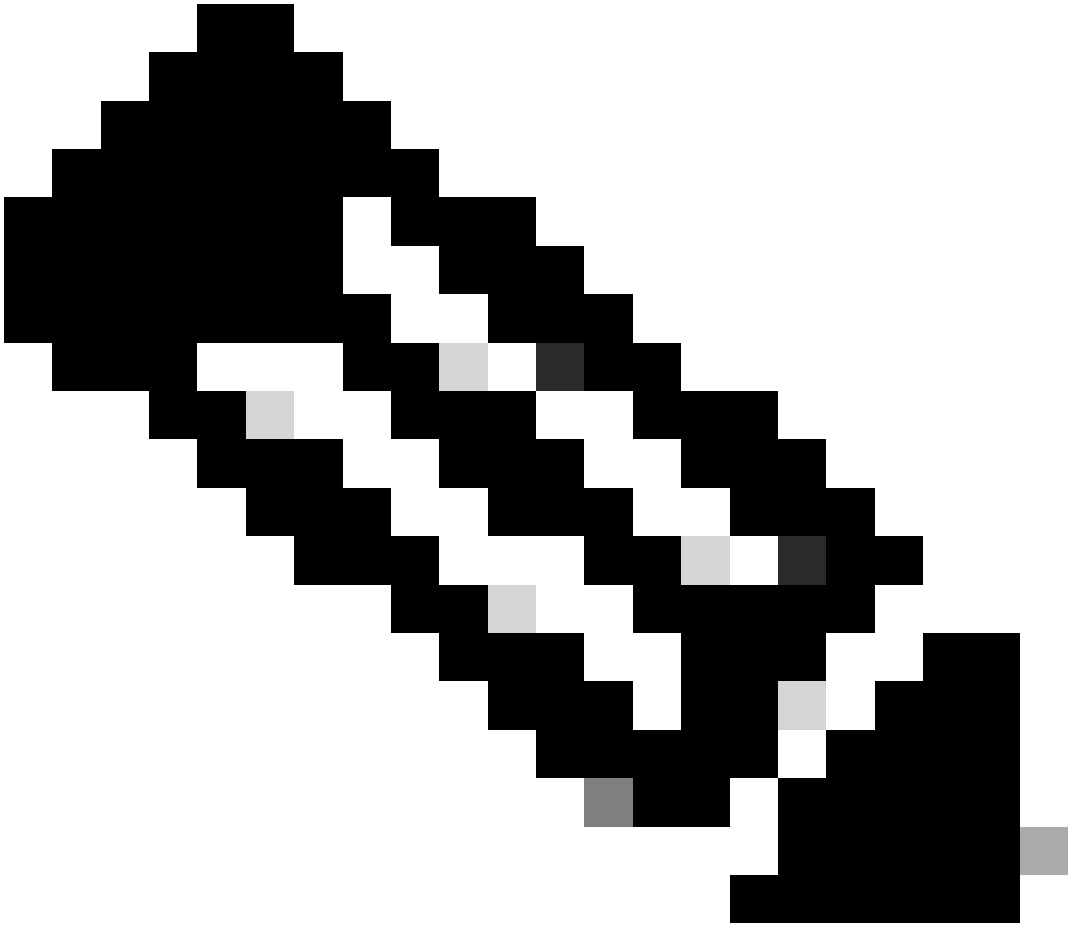
Etapa 5. Aplique o comando "ip dhcp relay source-interface [unique loopback]".



Observação: esse comando configura o endereço IP de origem para que o agente de retransmissão DHCP manipule Discover, Offer, Request e ACK, para comunicação unicast que o agente de retransmissão DHCP usa o endereço IP do SVI como endereço IP de origem para o agente de retransmissão DHCP. Isso não é desejado porque esse endereço IP é compartilhado por vários VTEPs e pode ocorrer o buraco negro de pacotes DHCP. Para evitar isso, um endereço IP exclusivo (usando uma interface de loopback) é necessário para diferenciar cada VTEP.

```
LEAF-1(config)# interface vlan 10
LEAF-1(config-if)# ip dhcp relay source-interface loopback100
```

Etapa 6. No locatário correspondente do VRF dentro do BGP, redistribuição de rota direta com uma lista de prefixos e um mapa de rota que inclui o endereço IP da interface de loopback.



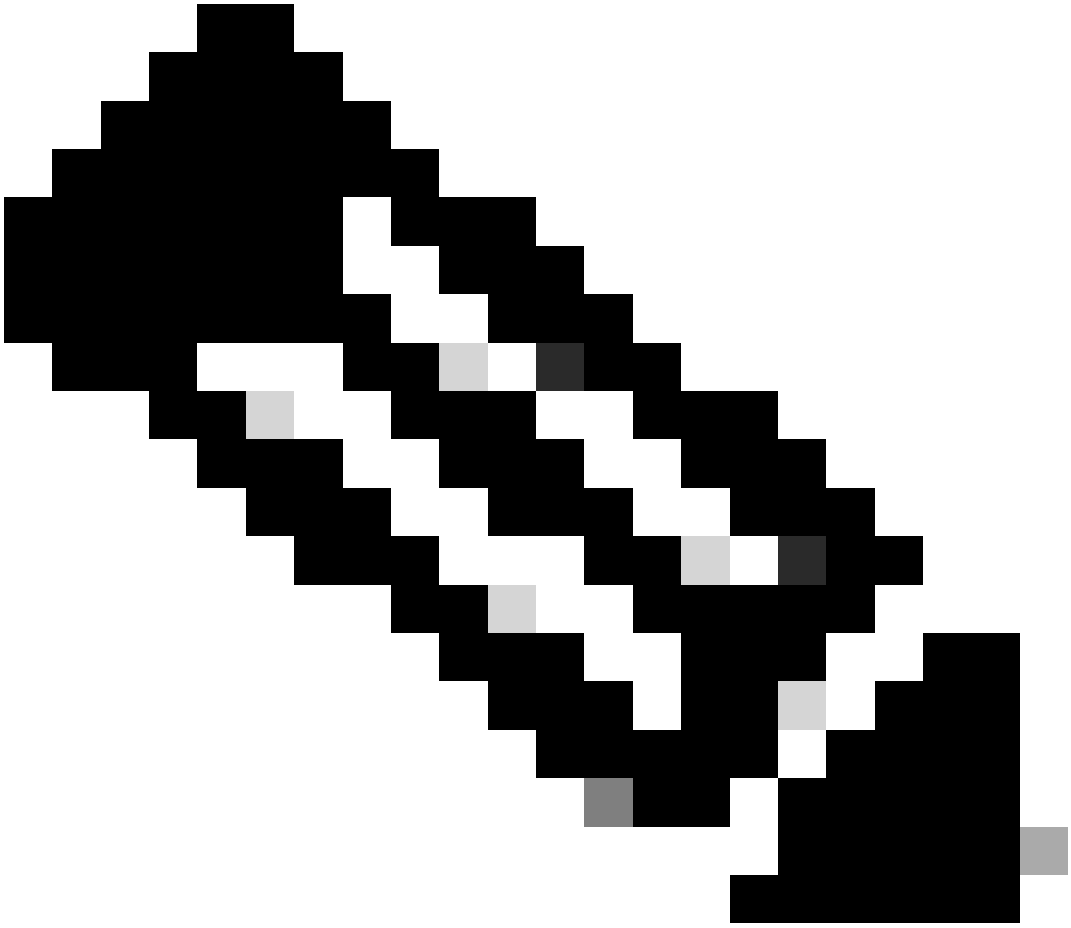
Observação: essa interface de loopback pertence ao espaço do SVI.

```
LEAF-1(config)# show running-config interface loopback 100
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.8/32

LEAF-1(config)# ip prefix-list host_subnets seq 15 permit 172.16.10.8/32
LEAF-1(config)# route-map direct_routes_tenant-a permit 10
LEAF-1(config-route-map)# match ip address prefix-list host_subnets
LEAF-1(config-route-map)# router bgp 65000
LEAF-1(config-router)# vrf tenant-a
LEAF-1(config-router-vrf)# address-family ipv4 unicast
LEAF-1(config-router-vrf-af)# redistribute direct route-map direct_routes_tenant-a
```

Passo 7. Verifique se o endereço IP da interface de loopback é anunciado no BGP L2VPN EVPN para os Spines com o comando: show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

```
LEAF-1(config)# show bgp l2vpn evpn 172.16.10.8 vrf tenant-a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.5.5:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.8]/224, version 421
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    192.168.5.5 (metric 0) from 0.0.0.0 (192.168.5.5)
      Origin incomplete, MED 0, localpref 100, weight 32768
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:707d.b9b8.4daf

  Path-id 1 advertised to peers:
    192.168.0.11 <<<< Spine
```

Etapa 8. Verifique se o endereço IP da interface de loopback foi injetado no BGP L2VPN EVPN onde o servidor DHCP está localizado.

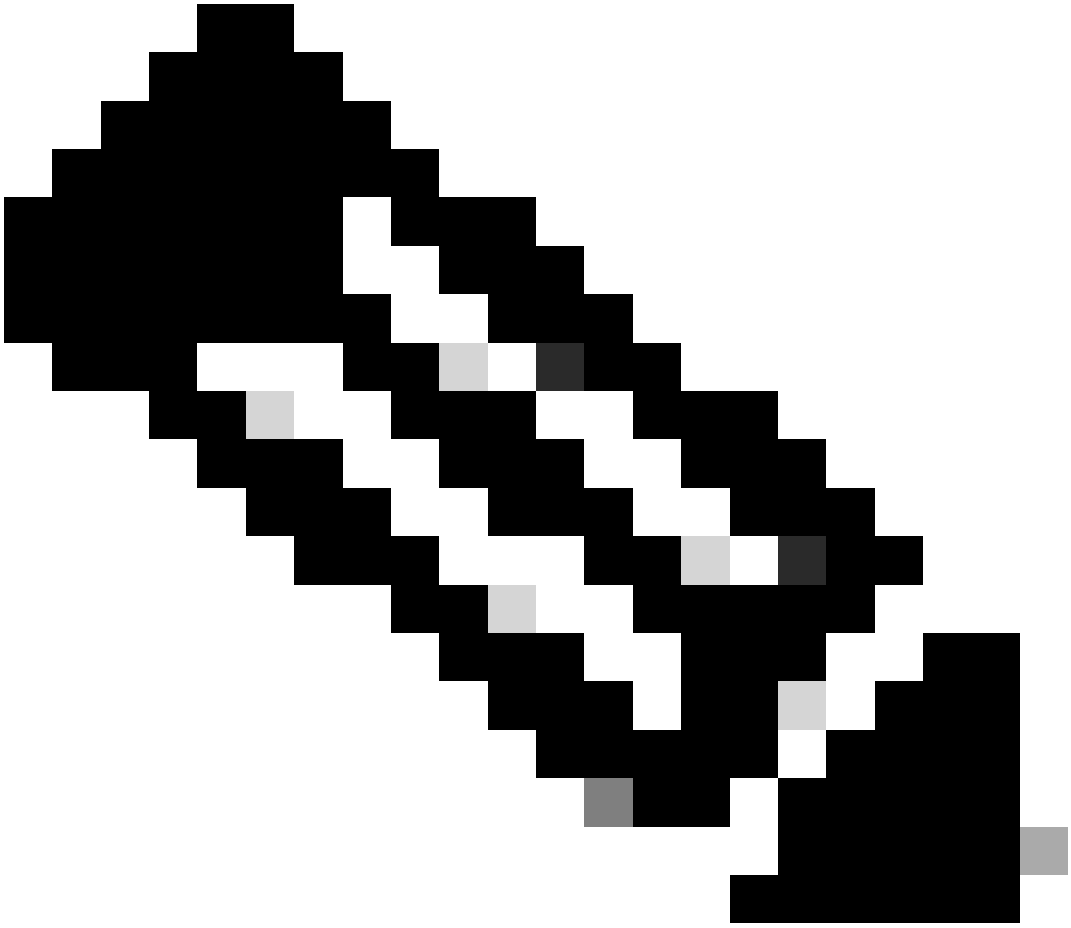


Observação: se houver switches Nexus no vPC, verifique se ambos aprendem o endereço IP da interface de loopback no BGP L2VPN EVPN.

```
LEAF-1# show bgp l2vpn evpn 172.16.10.8
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.5.5:4
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.8]/224, version 754
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn, is not in HW

  Advertised path-id 1
  Path type: internal, path is valid, is best path, no labeled nexthop
             Imported to 2 destination(s)
             Imported paths list: tenant-a L3-303030
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path sourced internal to AS
    192.168.5.5 (metric 45) from 192.168.0.11 (192.168.0.11)
      Origin incomplete, MED 0, localpref 100, weight 0
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:707d.b9b8.4daf
      Originator: 192.168.5.5 Cluster list: 192.168.0.11
```

```
  Path-id 1 not advertised to any peer

Route Distinguisher: 192.168.3.3:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.8]/224, version 761
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn, is not in HW

  Advertised path-id 1
  Path type: internal, path is valid, is best path, no labeled nexthop
             Imported from 192.168.5.5:4:[5]:[0]:[0]:[32]:[172.16.10.8]/224
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path sourced internal to AS
    192.168.5.5 (metric 45) from 192.168.0.11 (192.168.0.11)
      Origin incomplete, MED 0, localpref 100, weight 0
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:707d.b9b8.4daf
      Originator: 192.168.5.5 Cluster list: 192.168.0.11

  Path-id 1 not advertised to any peer
```

Etapa 9. Verifique se há uma rota para o servidor DHCP no locatário de origem com o comando show ip route [DHCP server IP] vrf [tenant vrf].



Observação: a entrada de rota a ser usada deve ser do VxLAN para o VRF padrão. Se não houver rota disponível, verifique se o VTEP localmente sabe o endereço IP do servidor DHCP.

```
LEAF-1# show running-config interface vlan 10
interface Vlan10
  no shutdown
  vrf member tenant-a <<<< source tenant
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150 <<<< DHCP server
  ip dhcp relay source-interface loopback100

LEAF-1# show ip route 10.10.10.150 vrf tenant-a
10.10.10.150/32, ubest/mbest: 1/0
    *via 192.168.13.254%default, [200/0], 2w0d, bgp-65000, internal, tag 65000, segid: 303030 tunnelid:
```

Etapa 10. Verifique se o IP do servidor DHCP pode ser alcançado usando a interface de loopback e o VRF correspondente como uma origem VRF com o comando ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf].

```
LEAF-1# ping 10.10.10.150 source-interface loopback 100 vrf tenant-a
PING 10.10.10.150 (10.10.10.150): 56 data bytes
64 bytes from 10.10.10.150: icmp_seq=0 ttl=126 time=1.262 ms
64 bytes from 10.10.10.150: icmp_seq=1 ttl=126 time=0.833 ms
64 bytes from 10.10.10.150: icmp_seq=2 ttl=126 time=0.808 ms
64 bytes from 10.10.10.150: icmp_seq=3 ttl=126 time=0.795 ms
64 bytes from 10.10.10.150: icmp_seq=4 ttl=126 time=0.78 ms

--- 10.10.10.150 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
```

Etapa 11. Verifique o status do agente de retransmissão DHCP.

```
LEAF-1# show ip dhcp status
Current CLI Operation: show ip dhcp status
Last CLI Operation: DME: ip dhcp relay information option enable
Last CLI Operation Status: SUCCESS
```

Etapa 12. Verifique a opção 82, como a opção vpn e o endereço IP de retransmissão correto no agente de retransmissão.

```
LEAF-1# show ip dhcp relay
DHCP relay service is enabled   <<<<<<
Insertion of option 82 is enabled  <<<<<<
Insertion of option 82 customize circuitid is disabled
TLV format in CircuitId and RemoteId suboptions is enabled
Insertion of VPN suboptions is enabled  <<<<<<<
Insertion of cisco suboptions is disabled
Global smart-relay is disabled
Relay Trusted functionality is disabled
Relay Trusted Port is Globally disabled
V4 Relay Source Address HSRP is Globally disabled
Server-ID-override-disable is disabled

Smart-relay is enabled on the following interfaces:
-----------------------------------------------------


Subnet-broadcast is enabled on the following interfaces:
-----------------------------------------------------


Relay Trusted Port is enabled on the following interfaces:
-----------------------------------------------------------
```

```
Relay Source Address HSRP is enabled on the following interfaces:
-----------------------------------------------------------------

Helper addresses are configured on the following interfaces:
 Interface        Relay Address     VRF Name
 -------------    -------------     --------
 Vlan10            10.10.10.150   <<<<<<<<<
```

Etapa 13. Verifique as estatísticas dos pacotes processados e encaminhados.

```
LEAF-1# show ip dhcp global statistics
Packets processed 1297177
Packets received through cfsoe 0
Packets forwarded 1297175
Packets forwarded on cfsoe 0
Total packets dropped 0
Packets dropped from untrusted ports 0
Packets dropped due to MAC address check failure 0
Packets dropped due to Option 82 insertion failure 0
Packets dropped due to o/p intf unknown 0
Packets dropped which were unknown 0
Packets dropped due to no trusted ports 0
Packets dropped due to dhcp relay not enabled 0
Packets dropped due to no binding entry 0
Packets dropped due to interface error/no interface 0
Packets dropped due to max hops exceeded 0
Packets dropped due to Queue full 0
```

Etapa 14. Verifique as estatísticas dos pacotes de retransmissão.

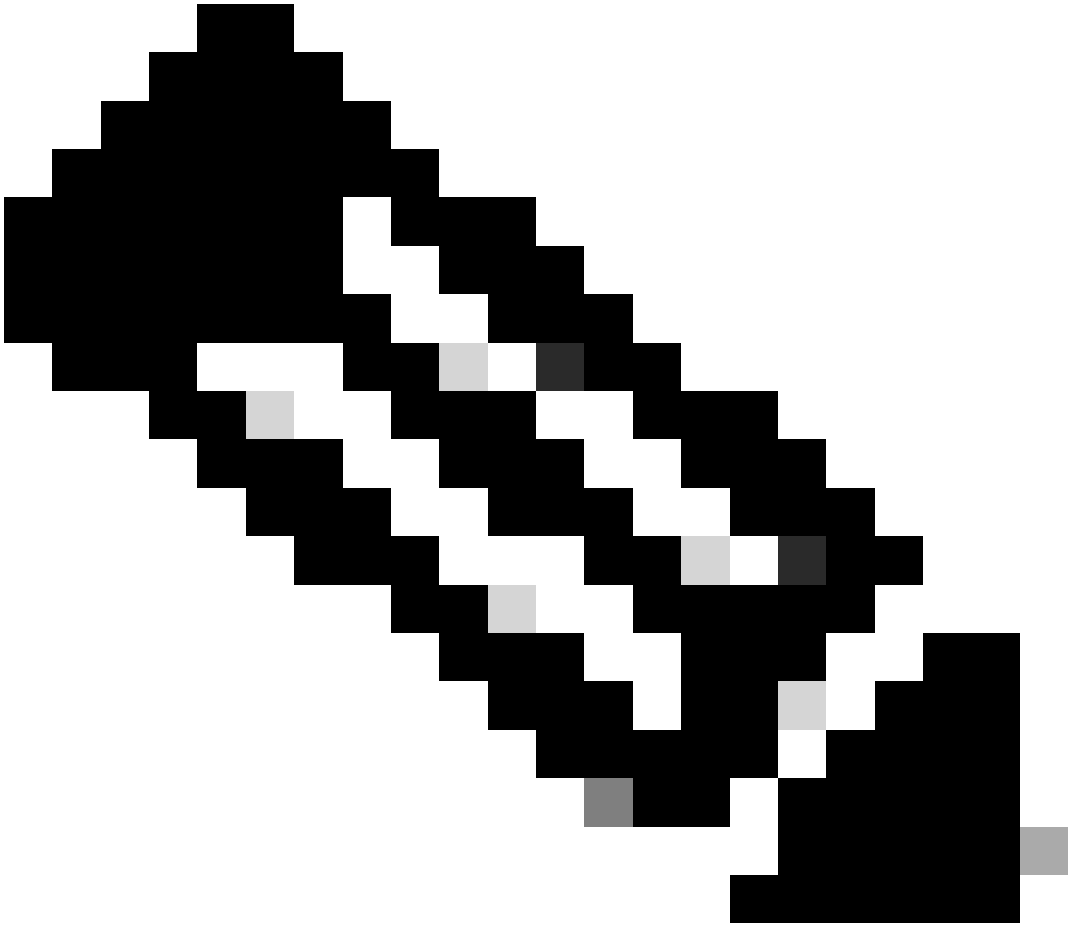
```
LEAF-1# show ip dhcp relay statistics
---------------------------------------------------------------------
Message Type             Rx              Tx           Drops
---------------------------------------------------------------------
Discover             260521          260520               0
Offer                289330          289330               0
Request(*)           267162          267161               0
Ack                    8322            8322               0
Release(*)           181121          181121               0
Decline                   1               1               0
Inform(*)                 0               0               0
Nack                 289280          289280               0
---------------------------------------------------------------------
Total               1295737         1295735               0
---------------------------------------------------------------------

DHCP L3 FWD:
Total Packets Received                          :         0
Total Packets Forwarded                         :         0
Total Packets Dropped                           :         0
Non DHCP:
Total Packets Received                          :         0
Total Packets Forwarded                         :         0
```

```
Total Packets Dropped                          :         0
DROP:
DHCP Relay not enabled                         :         0
Invalid DHCP message type                      :         0
Interface error                                :         0
Tx failure towards server                      :         0
Tx failure towards client                      :         0
Unknown output interface                       :         0
Unknown vrf or interface for server            :         0
Max hops exceeded                              :         0
Option 82 validation failed                    :         0
Packet Malformed                               :         0
DHCP Request dropped on MCT                    :         0
Relay Trusted port not configured              :         0
*  -  These counters will show correct value when switch
receives DHCP request packet with destination ip as broadcast
address. If request is unicast it will be HW switched
```

LEAF-1-vPC DHCP

Etapa 1. Ative o recurso DHCP.

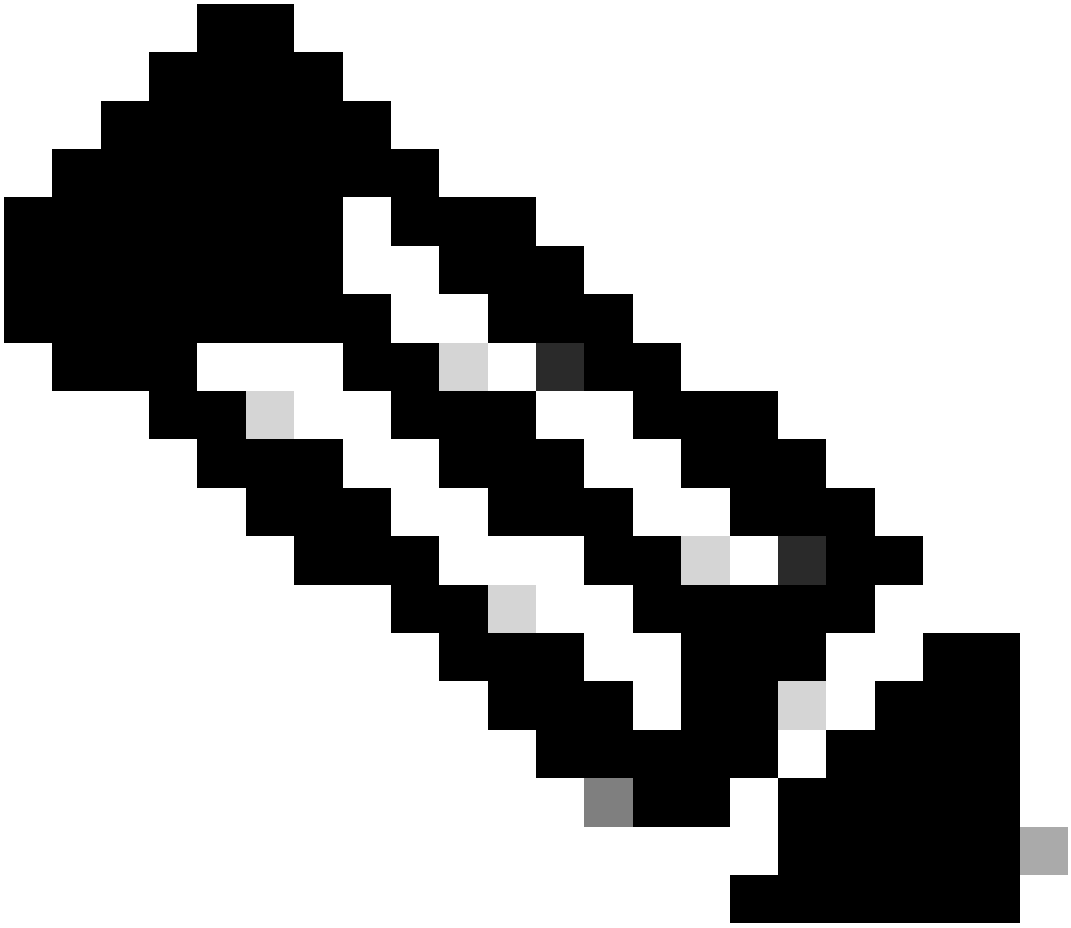
```
LEAF-1-VPC(config)#feature dhcp
```



Observação: o servidor DHCP e o comando do agente de retransmissão service dhcp, ip dhcp relay e ipv6 dhcp relay estão habilitados por padrão desde o NX-OS 7.x.

Etapa 2. Aplique o comando ip dhcp relay information option.

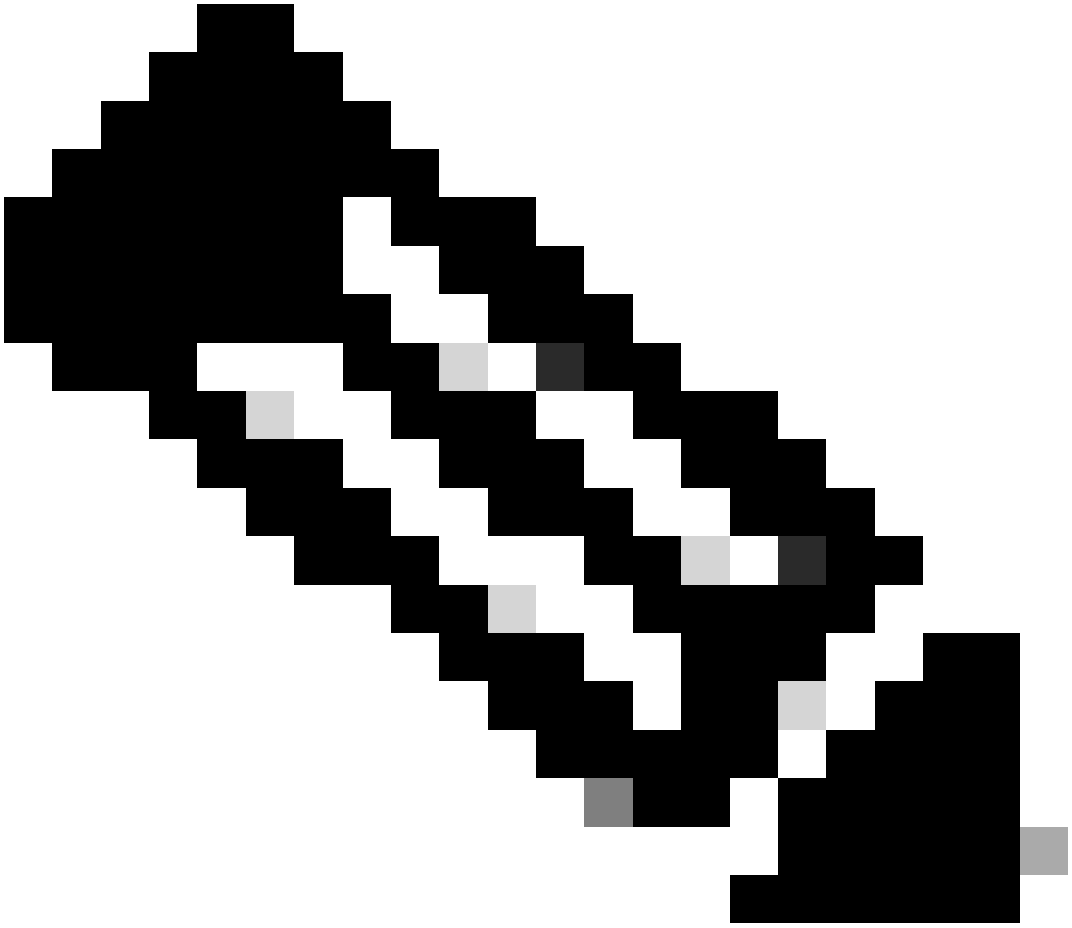
```
LEAF-1-VPC(config)#ip dhcp relay information option
```



Observação: esse comando permite que o agente de retransmissão DHCP insira e remova informações da Opção 82 nos pacotes encaminhados.

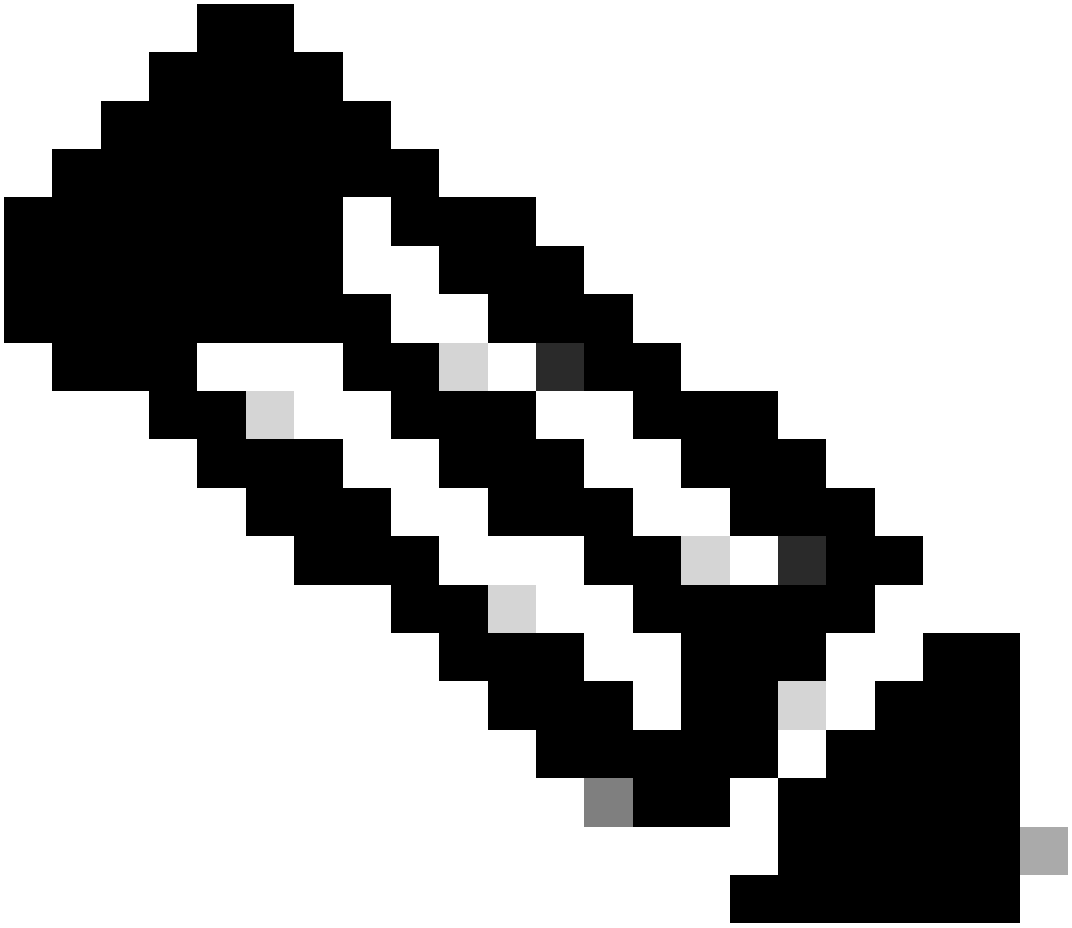
Etapa 3. Aplique o comando "ip dhcp relay information option vpn".

```
LEAF-1-VPC(config)# ip dhcp relay information option vpn
```



Observação: esse comando ativa as solicitações de retransmissão de DHCP que chegam em VRF diferentes, ao qual o servidor DHCP pertence.

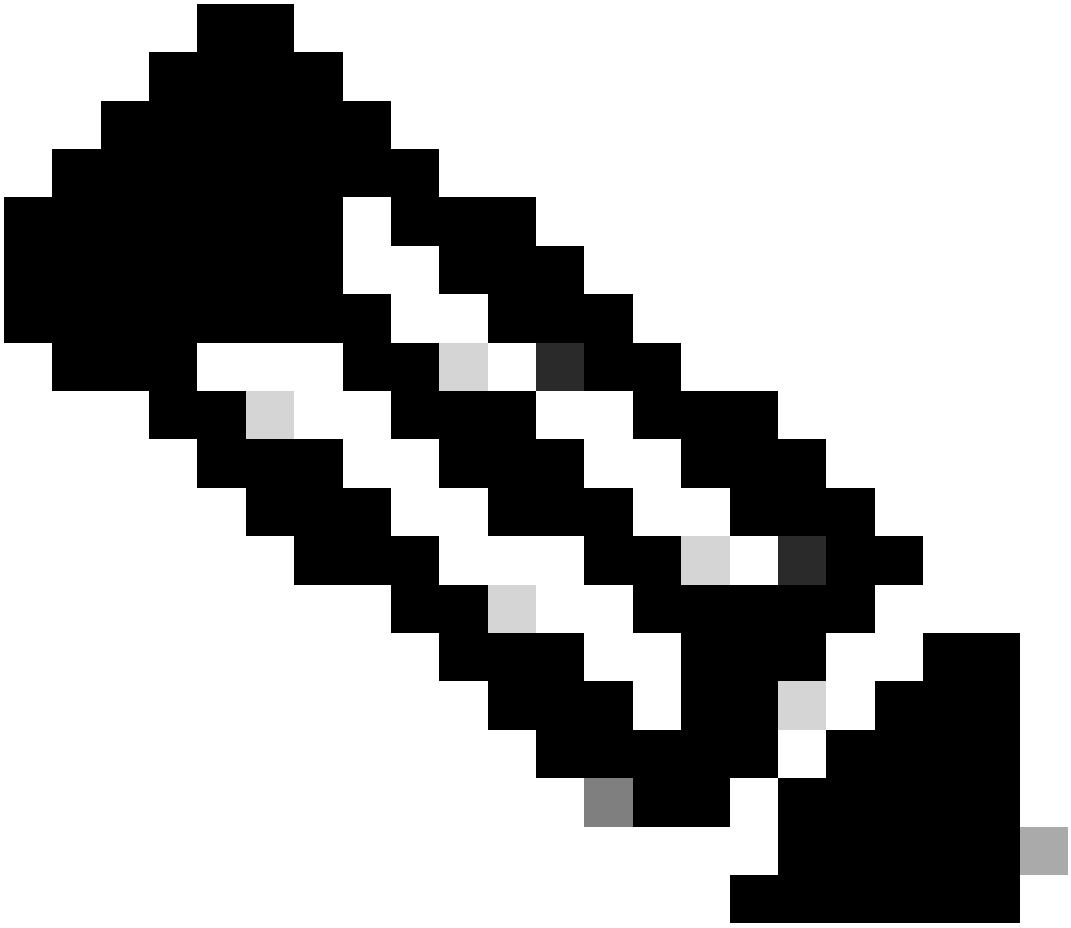
Etapa 4. Aplique o comando ip dhcp relay address [ip address of DCHP server].



Observação: neste exemplo, o endereço IP do servidor DHCP é 10.10.10.150.

```
LEAF-1-VPC(config)#interface vlan 10
LEAF-1-VPC(config-if)#ip dhcp relay address 10.10.10.150
```

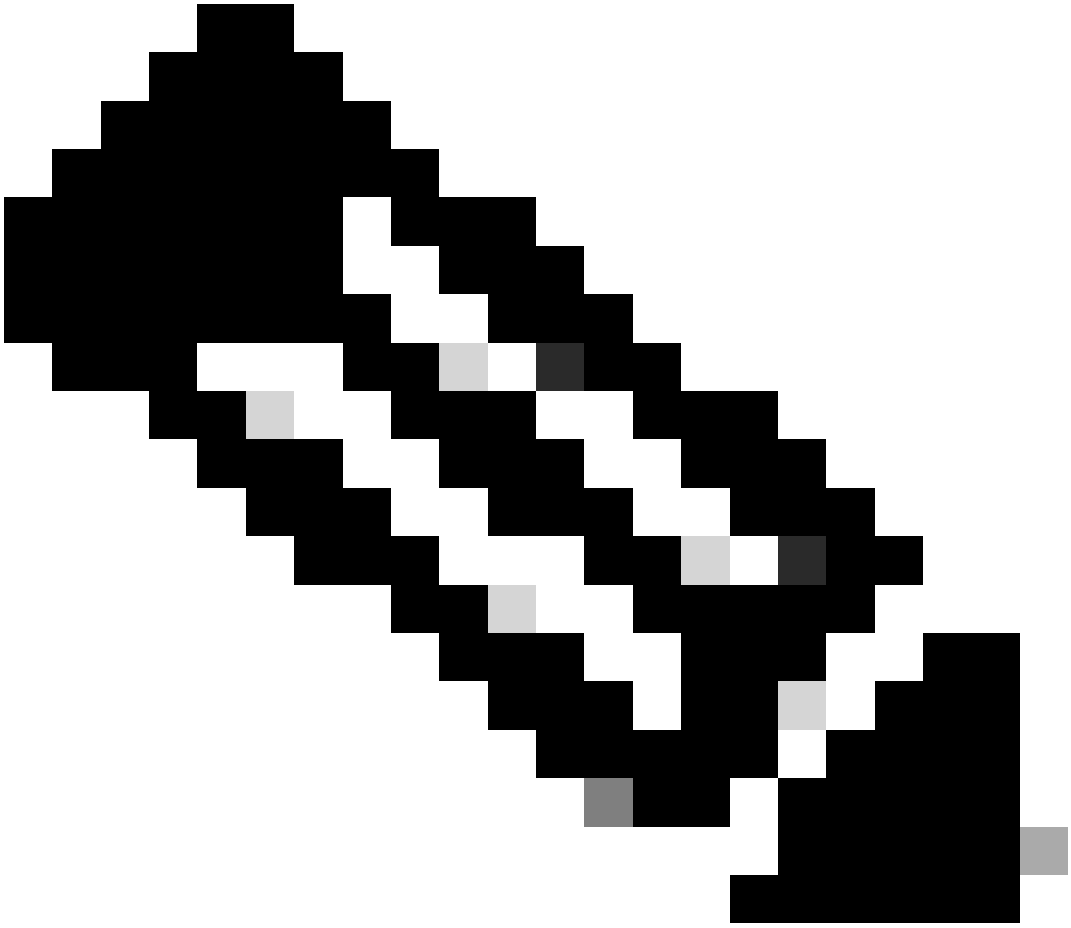
Etapa 5. Aplique o comando "ip dhcp relay source-interface [unique loopback]".



Observação: esse comando configura o endereço IP de origem para que o agente de retransmissão DHCP manipule Discover, Offer, Request e ACK, para comunicação unicast que o agente de retransmissão DHCP usa o endereço IP do SVI como endereço IP de origem para o agente de retransmissão DHCP. Isso não é desejado porque esse endereço IP é compartilhado por vários VTEPs e pode ocorrer o buraco negro de pacotes DHCP. Para evitar isso, um endereço IP exclusivo (usando uma interface de loopback) é necessário para diferenciar cada VTEP.

```
LEAF-1-VPC(config)#interface vlan 10
LEAF-1-VPC(config-if)# ip dhcp relay source-interface loopback100
```

Etapa 6. No locatário correspondente do VRF dentro do BGP, redistribuição de rota direta com uma lista de prefixos e um mapa de rota que inclui o endereço IP da interface de loopback.



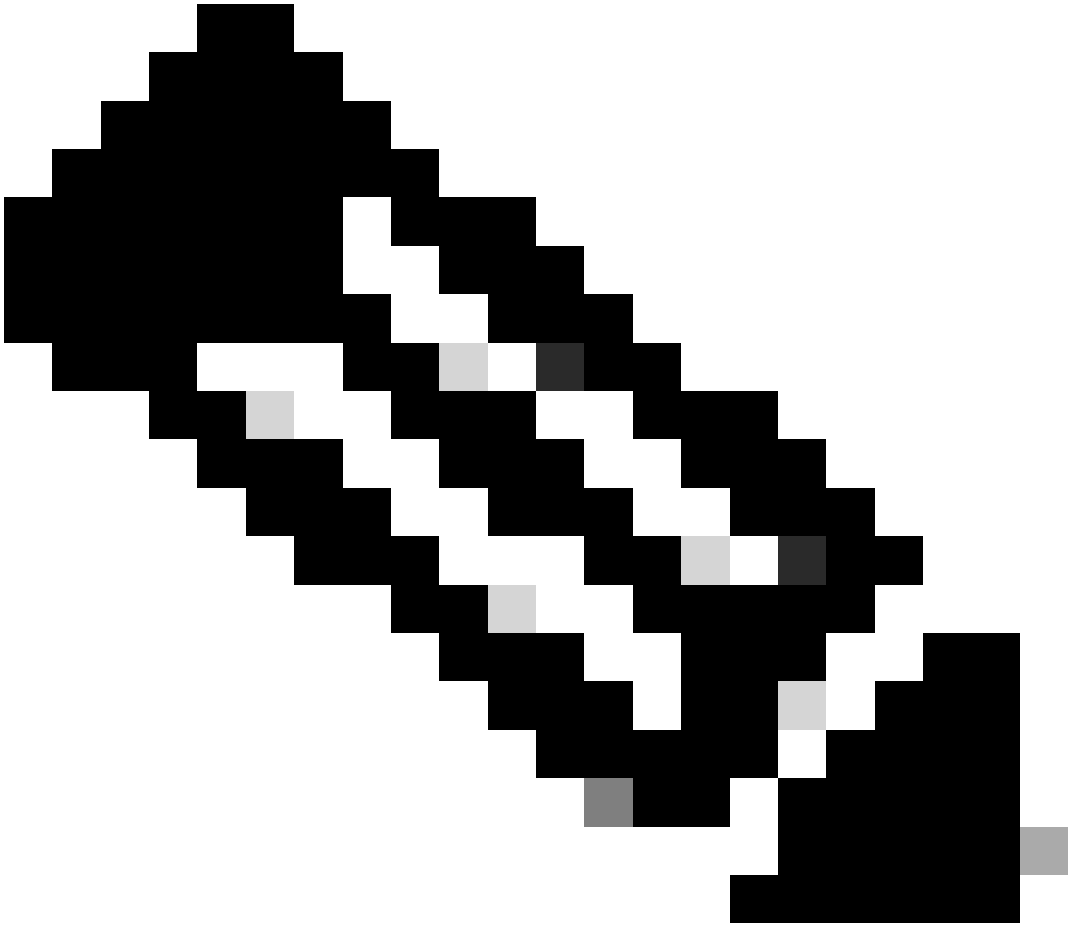
Observação: essa interface de loopback pertence ao espaço do SVI.

```
LEAF-1-VPC(config)# show running-config interface loopback 100
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.9/32

LEAF-1-VPC(config)# ip prefix-list host_subnets seq 15 permit 172.16.10.9/32
LEAF-1-VPC(config)# route-map direct_routes_tenant-a permit 10
LEAF-1-VPC(config-route-map)# match ip address prefix-list host_subnets
LEAF-1-VPC(config-route-map)# router bgp 65000
LEAF-1-VPC(config-router)# vrf tenant-a
LEAF-1-VPC(config-router-vrf)# address-family ipv4 unicast
LEAF-1-VPC(config-router-vrf-af)# redistribute direct route-map direct_routes_tenant-a
```

Passo 7. Verifique se o endereço IP da interface de loopback é anunciado no BGP L2VPN EVPN para os Spines com o comando: show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

```
LEAF-1-VPC# show bgp l2vpn evpn 172.16.10.9 vrf tenant-a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.3.3:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.9]/224, version 637
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    192.168.13.1 (metric 0) from 0.0.0.0 (192.168.3.3)
      Origin incomplete, MED 0, localpref 100, weight 32768
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:6026.aa85.9887

  Path-id 1 advertised to peers:
    192.168.0.11
```

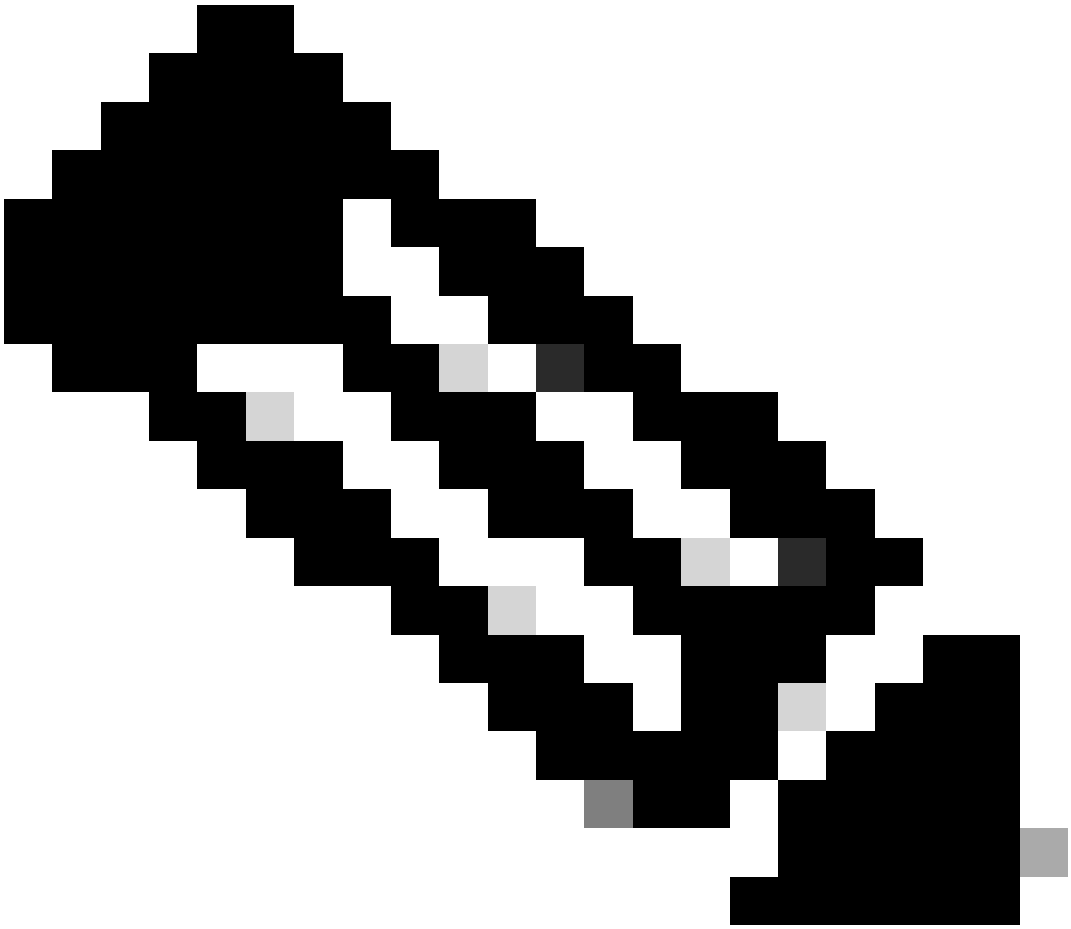
Etapa 8. Verifique se o endereço IP da interface de loopback foi injetado no BGP L2VPN EVPN onde o servidor DHCP está localizado.



Observação: se houver switches Nexus no vPC, verifique se ambos aprendem o endereço IP da interface de loopback no BGP L2VPN EVPN.

```
LEAF-1-VPC# show bgp l2vpn evpn 172.16.10.9
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.3.3:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.9]/224, version 637
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    192.168.13.1 (metric 0) from 0.0.0.0 (192.168.3.3)
      Origin incomplete, MED 0, localpref 100, weight 32768
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:6026.aa85.9887

  Path-id 1 advertised to peers:
    192.168.0.11
```

Etapa 9. Verifique se há uma rota para o servidor DHCP no locatário de origem com o comando show ip route [DHCP server IP] vrf[tenant vrf].



Observação: a entrada de rota a ser usada deve ser do VxLAN para o VRF padrão. Se não houver rota disponível, verifique se o VTEP localmente sabe o endereço IP do servidor DHCP.

```
LEAF-1-VPC# show running-config interface vlan 10
interface Vlan10
  no shutdown
  vrf member tenant-a  <<<< source tenant
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100
```

```
LEAF-1-VPC# show ip route 10.10.10.150 vrf tenant-a
10.10.10.150/32, ubest/mbest: 1/0, attached
    *via 10.10.10.150, Vlan10, [190/0], 6d07h, hmm
```

Etapa 10. Verifique se o IP do servidor DHCP pode ser alcançado usando a interface de loopback e o VRF correspondente como uma origem VRF com o comando ping [DHCP server IP] source-interface loopback [x] vrf [tenvrf].

```
LEAF-1-VPC# ping 10.10.10.150 source-interface loopback 100 vrf tenant-a
PING 10.10.10.150 (10.10.10.150): 56 data bytes
64 bytes from 10.10.10.150: icmp_seq=0 ttl=126 time=0.965 ms
64 bytes from 10.10.10.150: icmp_seq=1 ttl=126 time=0.57 ms
64 bytes from 10.10.10.150: icmp_seq=2 ttl=126 time=0.488 ms
64 bytes from 10.10.10.150: icmp_seq=3 ttl=126 time=0.524 ms
64 bytes from 10.10.10.150: icmp_seq=4 ttl=126 time=0.502 ms

--- 10.10.10.150 ping statistics ---
```

Etapa 11. Verifique o status do agente de retransmissão DHCP.

```
LEAF-1-VPC# show ip dhcp status
Current CLI Operation: show ip dhcp status
Last CLI Operation: DME: ip dhcp relay information option vpn enable
Last CLI Operation Status: SUCCESS
```

Etapa 12. Verifique a opção 82, como a opção vpn e o endereço IP de retransmissão correto no agente de retransmissão.

```
LEAF-1-VPC# show ip dhcp relay
DHCP relay service is enabled  <<<<<<
Insertion of option 82 is enabled  <<<<<<<
Insertion of option 82 customize circuitid is disabled
TLV format in CircuitId and RemoteId suboptions is enabled
Insertion of VPN suboptions is enabled  <<<<<<<
Insertion of cisco suboptions is disabled
Global smart-relay is disabled
Relay Trusted functionality is disabled
Relay Trusted Port is Globally disabled
V4 Relay Source Address HSRP is Globally disabled
Server-ID-override-disable is disabled

Smart-relay is enabled on the following interfaces:
-----------------------------------------------------


Subnet-broadcast is enabled on the following interfaces:
-----------------------------------------------------
```

```
Relay Trusted Port is enabled on the following interfaces:
-----------------------------------------------------------


Relay Source Address HSRP is enabled on the following interfaces:
-------------------------------------------------------------------

Helper addresses are configured on the following interfaces:
 Interface        Relay Address     VRF Name
 -------------    -------------     --------
 Vlan10            10.10.10.150      <<<<<<<<<
```

Etapa 13. Verifique as estatísticas dos pacotes processados e encaminhados.

```
LEAF-1-VPC# show ip dhcp global statistics
Packets processed 263162
Packets received through cfsoe 0
Packets forwarded 263161
Packets forwarded on cfsoe 0
Total packets dropped 0
Packets dropped from untrusted ports 0
Packets dropped due to MAC address check failure 0
Packets dropped due to Option 82 insertion failure 0
Packets dropped due to o/p intf unknown 0
Packets dropped which were unknown 0
Packets dropped due to no trusted ports 0
Packets dropped due to dhcp relay not enabled 0
Packets dropped due to no binding entry 0
Packets dropped due to interface error/no interface 0
Packets dropped due to max hops exceeded 0
Packets dropped due to Queue full 0
```

Etapa 14. Verifique as estatísticas dos pacotes de retransmissão.

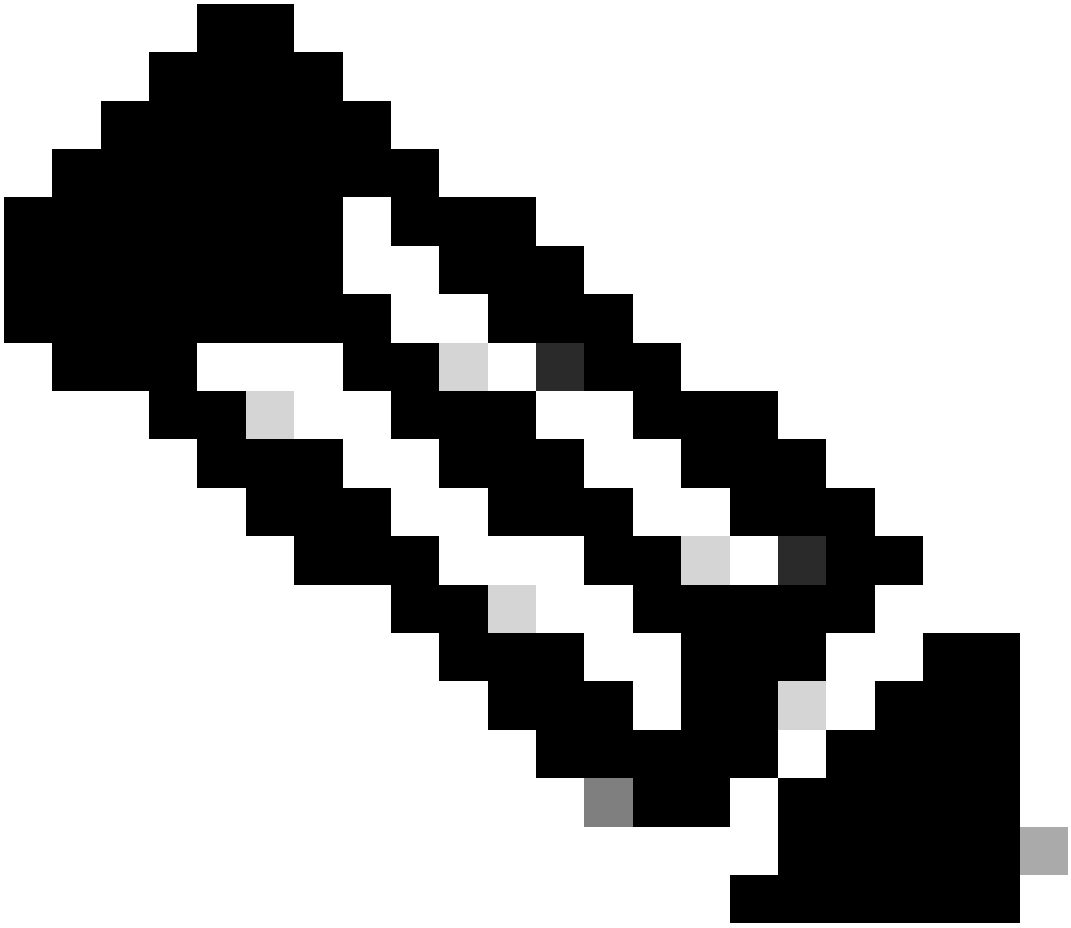
```
LEAF-1-VPC# show ip dhcp relay statistics
--------------------------------------------------------------------------
Message Type             Rx              Tx           Drops
--------------------------------------------------------------------------
Discover                  8               7               0
Offer                 29304           29304               0
Request(*)             5029            5029               0
Ack                    6535            6535               0
Release(*)           191482          191482               0
Decline                   0               0               0
Inform(*)                 3               3               0
Nack                  29281           29281               0
--------------------------------------------------------------------------
Total                261642          261641               0
--------------------------------------------------------------------------

DHCP L3 FWD:
Total Packets Received                          :         0
```

```
Total Packets Forwarded                          :         0
Total Packets Dropped                            :         0
Non DHCP:
Total Packets Received                           :         0
Total Packets Forwarded                          :         0
Total Packets Dropped                            :         0
DROP:
DHCP Relay not enabled                           :         0
Invalid DHCP message type                        :         0
Interface error                                  :         0
Tx failure towards server                        :         0
Tx failure towards client                        :         0
Unknown output interface                         :         0
Unknown vrf or interface for server              :         0
Max hops exceeded                                :         0
Option 82 validation failed                      :         0
Packet Malformed                                 :         0
DHCP Request dropped on MCT                      :         0
Relay Trusted port not configured                :         0
*  -  These counters will show correct value when switch
receives DHCP request packet with destination ip as broadcast
address. If request is unicast it will be HW switched
```

DHCP LEAF-2-vPC

Etapa 1. Ative o recurso DHCP.

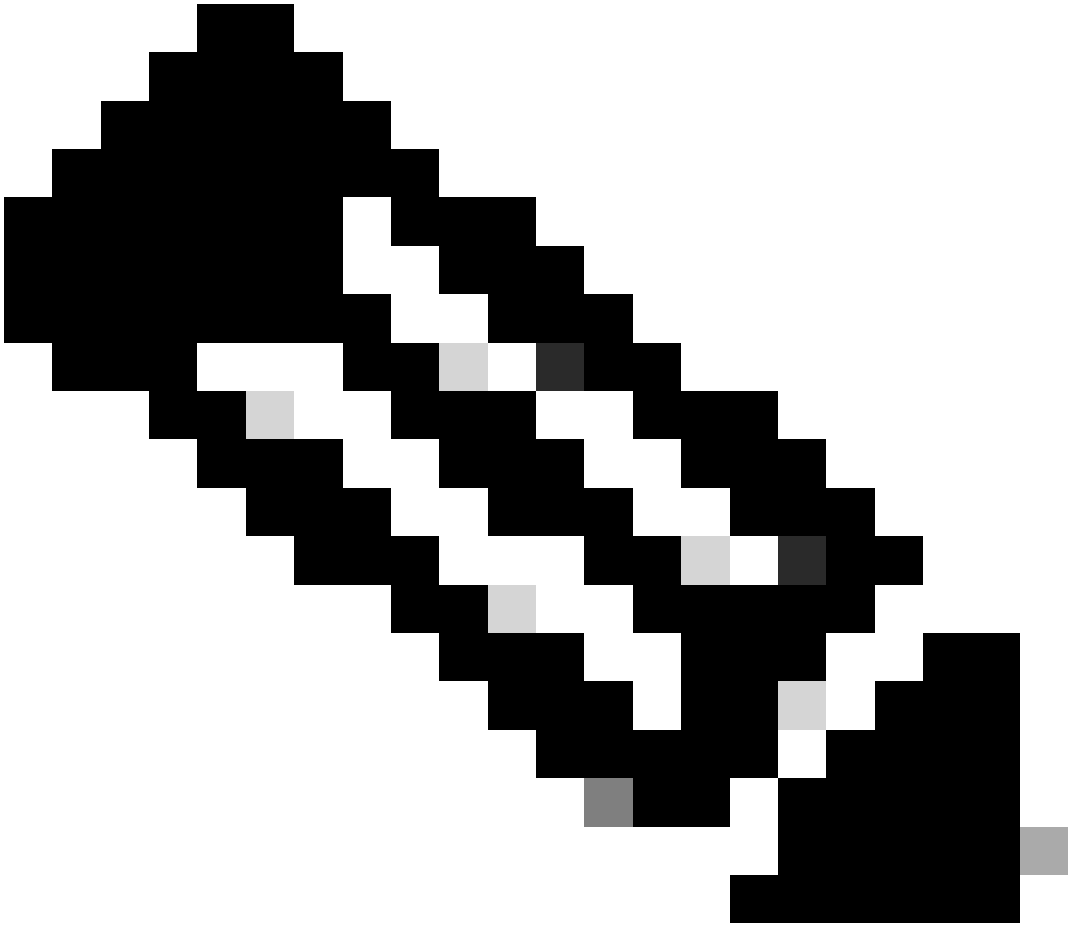
```
LEAF-2-VPC(config)# feature dhcp
```



Observação: o servidor DHCP e o comando do agente de retransmissão service dhcp, ip dhcp relay e ipv6 dhcp relay estão habilitados por padrão desde o NX-OS 7.x.

Etapa 2. Aplique o comando "ip dhcp relay information option".

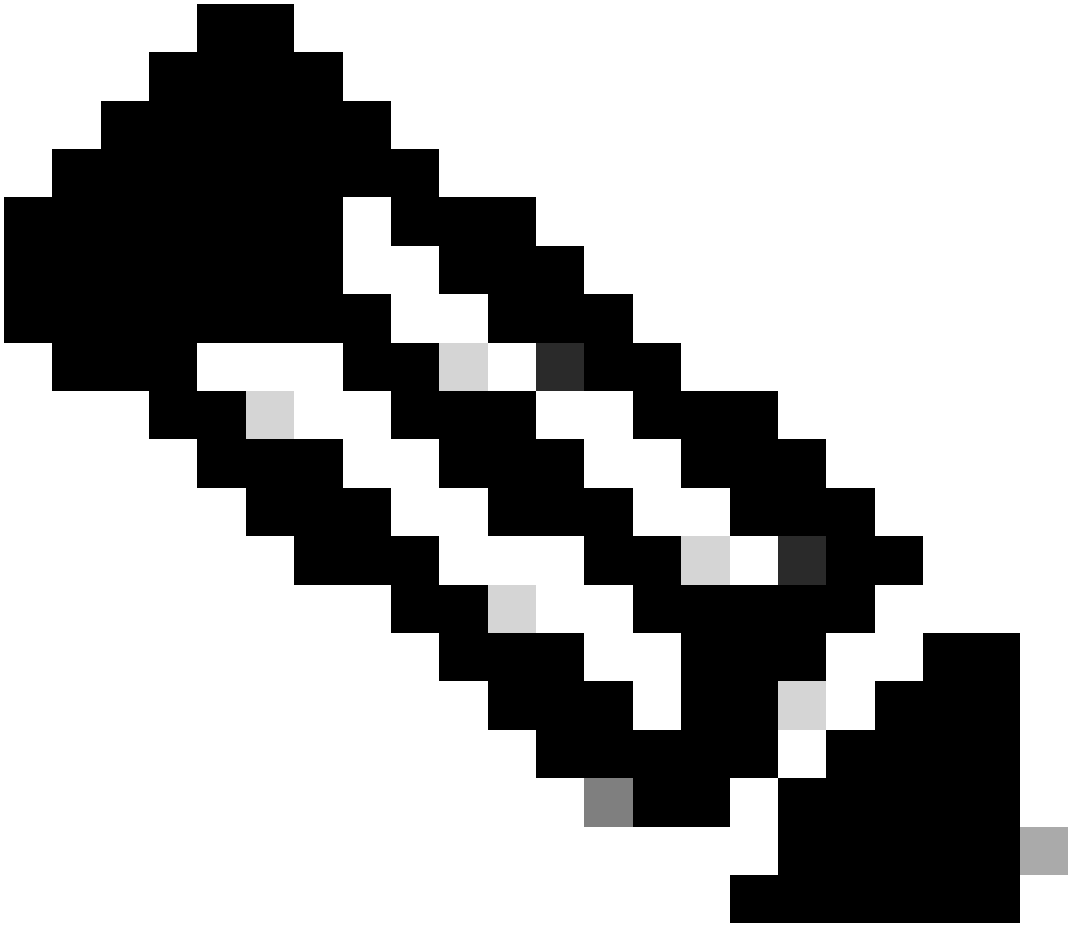
```
LEAF-2-VPC(config)# ip dhcp relay information option
```



Observação: esse comando permite que o agente de retransmissão DHCP insira e remova informações da Opção 82 nos pacotes encaminhados.

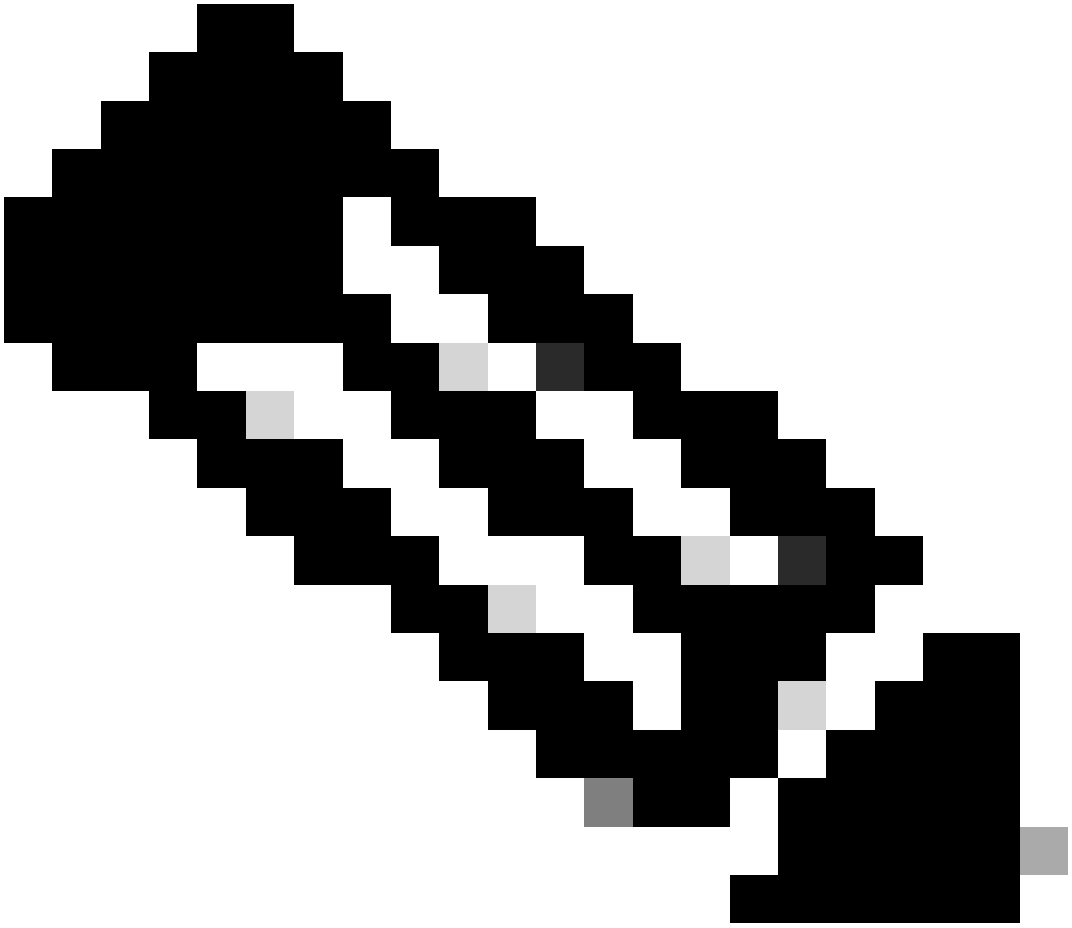
Etapa 3. Aplique o comando "ip dhcp relay information option vpn".

```
LEAF-2-VPC(config)# ip dhcp relay information option vpn
```



Observação: esse comando ativa as solicitações de retransmissão de DHCP que chegam em VRF diferentes, ao qual o servidor DHCP pertence.

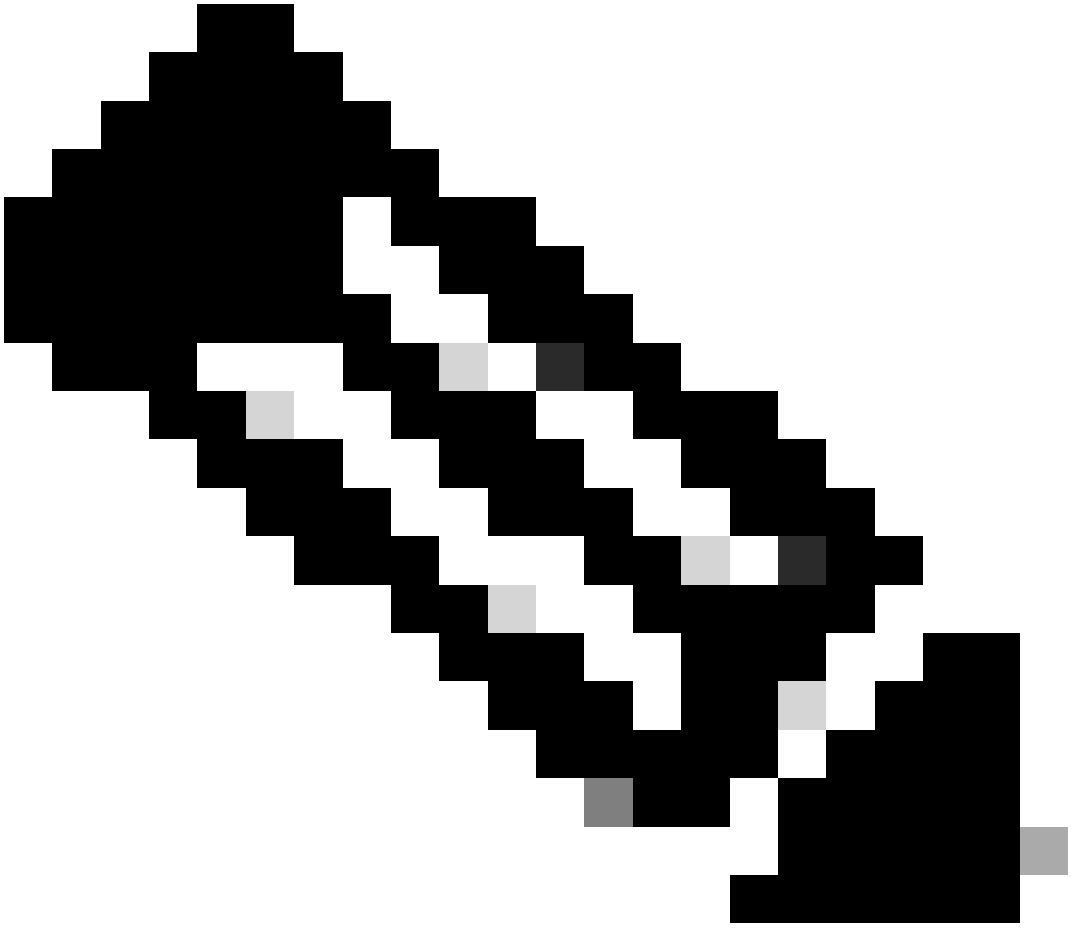
Etapa 4. Aplique o comando "ip dhcp relay address [ip address of DCHP server]".



Observação: neste exemplo, o endereço IP do servidor DHCP é 10.10.10.150.

```
LEAF-2-VPC(config)# interface vlan 10
LEAF-2-VPC(config-if)# ip dhcp relay address 10.10.10.150
```

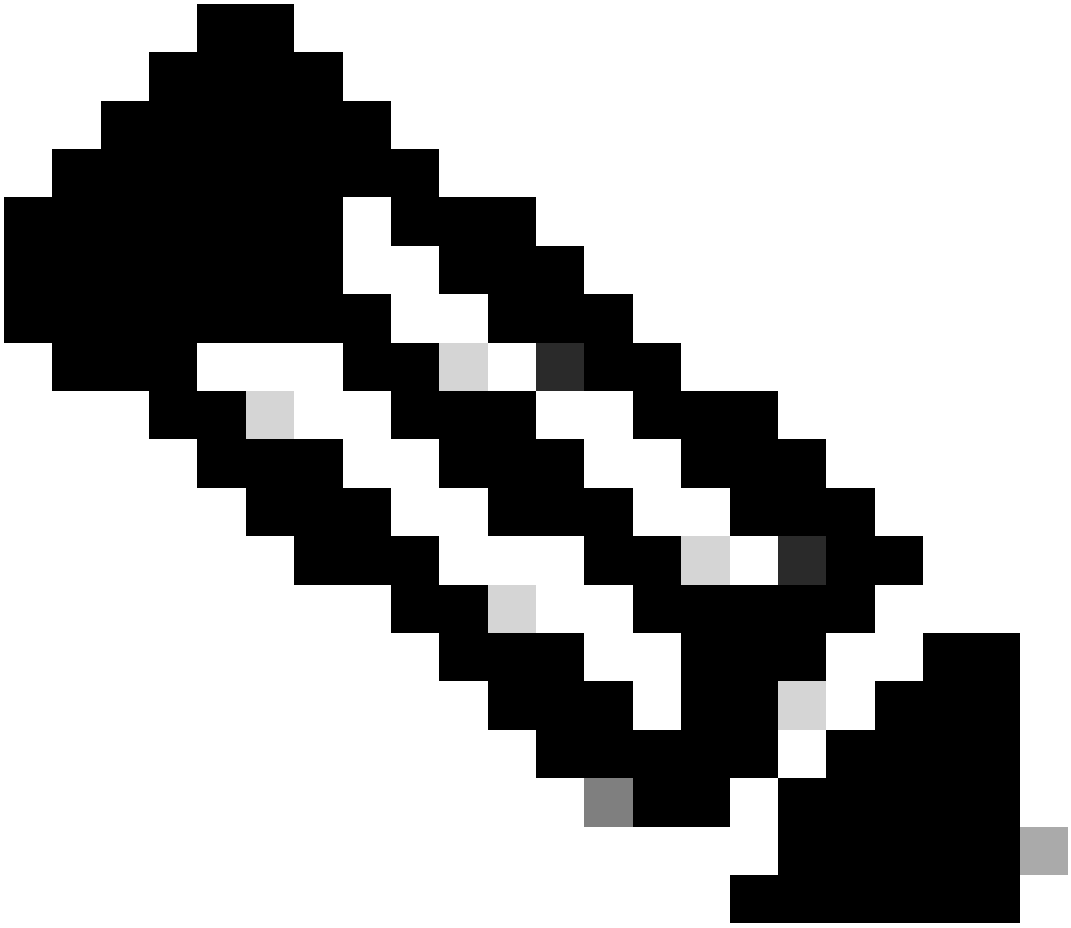
Etapa 5. Aplique o comando "ip dhcp relay source-interface [unique loopback]".



Observação: esse comando configura o endereço IP de origem para que o agente de retransmissão DHCP manipule Discover, Offer, Request e ACK, para comunicação unicast que o agente de retransmissão DHCP usa o endereço IP do SVI como endereço IP de origem para o agente de retransmissão DHCP. Isso não é desejado porque esse endereço IP é compartilhado por vários VTEPs e pode ocorrer o buraco negro de pacotes DHCP. Para evitar isso, um endereço IP exclusivo (usando uma interface de loopback) é necessário para diferenciar cada VTEP.

```
LEAF-2-VPC(config)# interface vlan 10
LEAF-2-VPC(config-if)# ip dhcp relay source-interface loopback 100
```

Etapa 6. No locatário correspondente do VRF dentro do BGP, redistribuição de rota direta com uma lista de prefixos e um mapa de rota que inclui o endereço IP da interface de loopback.



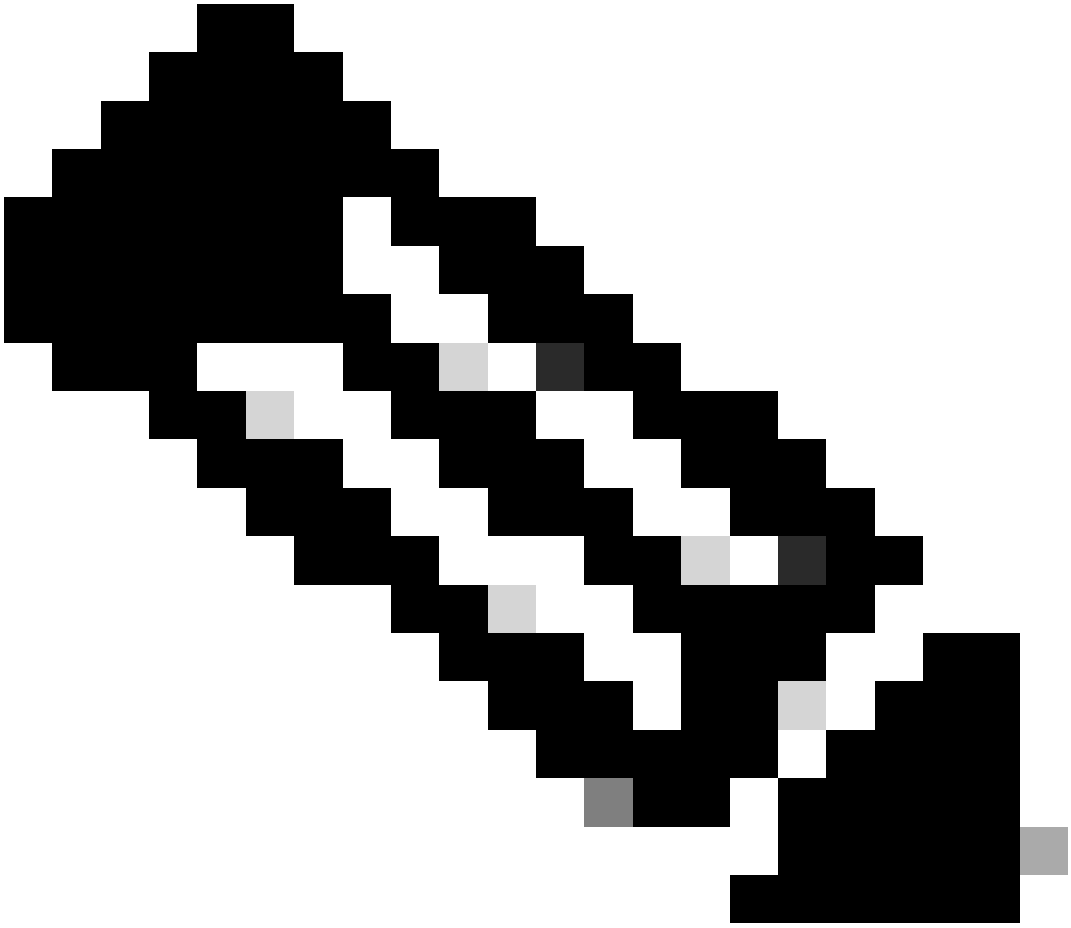
Observação: essa interface de loopback pertence ao espaço do SVI.

```
LEAF-2-VPC(config-if)# show running-config interface loopback 100
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.10/32

LEAF-2-VPC(config)# ip prefix-list host_subnets seq 15 permit 172.16.10.10/32
LEAF-2-VPC(config)# route-map direct_routes_tenant-a permit 10
LEAF-2-VPC(config-route-map)# match ip address prefix-list host_subnets
LEAF-2-VPC(config-route-map)# router bgp 65000
LEAF-2-VPC(config-router)# vrf tenant-a
LEAF-2-VPC(config-router-vrf)# address-family ipv4 unicast
LEAF-2-VPC(config-router-vrf-af)# redistribute direct route-map direct_routes_tenant-a
```

Passo 7. Verifique se o endereço IP da interface de loopback é anunciado no BGP L2VPN EVPN para os Spines com o comando: show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

```
LEAF-2-VPC(config-if)# show bgp l2vpn evpn 172.16.10.10 vrf tenant-a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.4.4:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.10]/224, version 49
5
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    192.168.13.2 (metric 0) from 0.0.0.0 (192.168.4.4)
      Origin incomplete, MED 0, localpref 100, weight 32768
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:6026.aa85.9587

  Path-id 1 advertised to peers:
    192.168.0.11 <<<<< Spine
```

Etapa 8. Verifique se o endereço IP da interface de loopback foi injetado no BGP L2VPN EVPN onde o servidor DHCP está localizado.

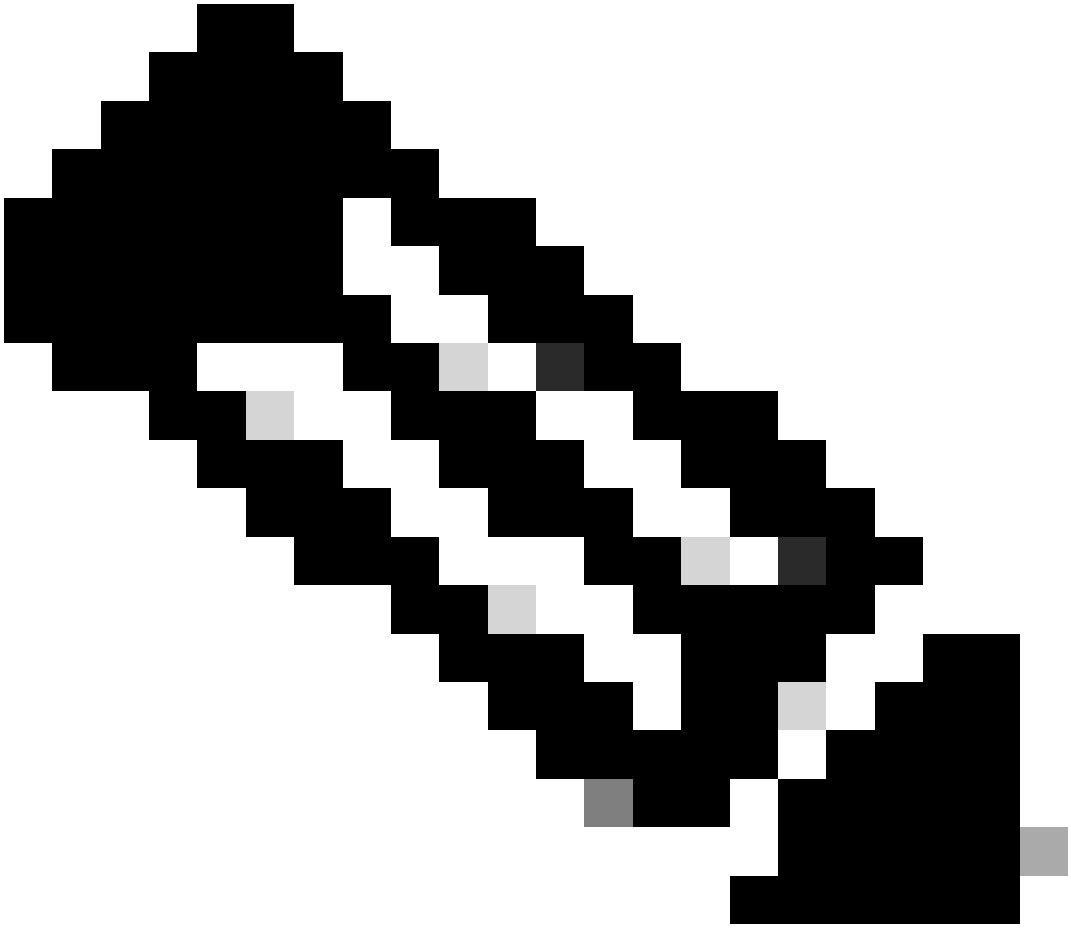


Observação: se houver switches Nexus no vPC, verifique se ambos aprendem o endereço IP da interface de loopback no BGP L2VPN EVPN.

```
LEAF-2-VPC(config-if)# show bgp l2vpn evpn 172.16.10.10
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.4.4:4    (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.10]/224, version 49
5
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    192.168.13.2 (metric 0) from 0.0.0.0 (192.168.4.4)
      Origin incomplete, MED 0, localpref 100, weight 32768
      Received label 303030
      Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:6026.aa85.9587

  Path-id 1 advertised to peers:
```

```
    192.168.0.11
```

Etapa 9. Verifique se há uma rota para o servidor DHCP no locatário de origem com o comando show ip route [DHCP server IP] vrf[tenvrf].



Observação: a entrada de rota a ser usada deve ser do VxLAN para o VRF padrão. Se não houver rota disponível, verifique se o VTEP localmente sabe o endereço IP do servidor DHCP.

```
LEAF-2-VPC(config-if)# show running-config interface vlan 10
interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
```

```
  ip dhcp relay source-interface loopback100

LEAF-2-VPC(config-if)# show ip route 10.10.10.150 vrf tenant-a
10.10.10.150/32, ubest/mbest: 1/0, attached
    *via 10.10.10.150, Vlan10, [190/0], 01:01:28, hmm
```

Etapa 10. Verifique se o IP do servidor DHCP pode ser alcançado usando a interface de loopback e o VRF correspondente como uma origem VRF com o comando ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf].

```
LEAF-2-VPC(config-if)# ping 10.10.10.150 source-interface loopback 100 vrf tenant-a
PING 10.10.10.150 (10.10.10.150): 56 data bytes
64 bytes from 10.10.10.150: icmp_seq=0 ttl=127 time=0.928 ms
64 bytes from 10.10.10.150: icmp_seq=1 ttl=127 time=0.475 ms
64 bytes from 10.10.10.150: icmp_seq=2 ttl=127 time=0.455 ms
64 bytes from 10.10.10.150: icmp_seq=3 ttl=127 time=0.409 ms
64 bytes from 10.10.10.150: icmp_seq=4 ttl=127 time=0.465 ms

--- 10.10.10.150 ping statistics ---
```

Etapa 11. Verifique o status do agente de retransmissão DHCP.

```
LEAF-2-VPC(config)# show ip dhcp status
Current CLI Operation: show ip dhcp status
Last CLI Operation: DME: ip dhcp relay information option vpn enable
Last CLI Operation Status: SUCCESS
```

Etapa 12. Verifique a opção 82, como a opção vpn e o endereço IP de retransmissão correto no agente de retransmissão.

```
LEAF-2-VPC(config)# show ip dhcp relay
DHCP relay service is enabled    <<<<<<<
Insertion of option 82 is enabled   <<<<<<<<<
Insertion of option 82 customize circuitid is disabled
TLV format in CircuitId and RemoteId suboptions is enabled
Insertion of VPN suboptions is enabled  <<<<<<<
Insertion of cisco suboptions is disabled
Global smart-relay is disabled
Relay Trusted functionality is disabled
Relay Trusted Port is Globally disabled
V4 Relay Source Address HSRP is Globally disabled
Server-ID-override-disable is disabled

Smart-relay is enabled on the following interfaces:
-----------------------------------------------------


Subnet-broadcast is enabled on the following interfaces:
```

```
-------------------------------------------------------


Relay Trusted Port is enabled on the following interfaces:
-------------------------------------------------------


Relay Source Address HSRP is enabled on the following interfaces:
-------------------------------------------------------------------

Helper addresses are configured on the following interfaces:
 Interface        Relay Address     VRF Name
 -------------    -------------     --------
 Vlan10            10.10.10.150 <<<<
```

Etapa 13. Verifique as estatísticas dos pacotes processados e encaminhados.

```
LEAF-2-VPC(config)# show ip dhcp global statistics
Packets processed 103030
Packets received through cfsoe 0
Packets forwarded 103030
Packets forwarded on cfsoe 0
Total packets dropped 0
Packets dropped from untrusted ports 0
Packets dropped due to MAC address check failure 0
Packets dropped due to Option 82 insertion failure 0
Packets dropped due to o/p intf unknown 0
Packets dropped which were unknown 0
Packets dropped due to no trusted ports 0
Packets dropped due to dhcp relay not enabled 0
Packets dropped due to no binding entry 0
Packets dropped due to interface error/no interface 0
Packets dropped due to max hops exceeded 0
Packets dropped due to Queue full 0
```

Etapa 14. Verifique as estatísticas dos pacotes de retransmissão.

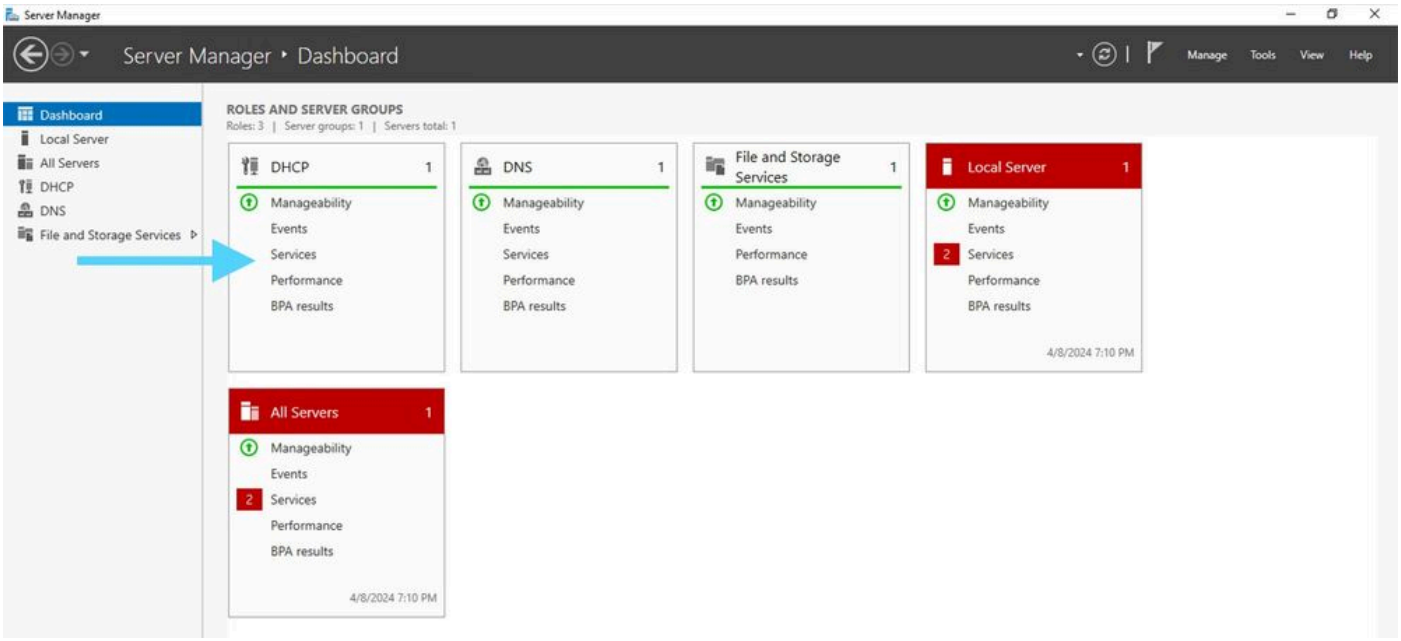
```
LEAF-2-VPC# show ip dhcp relay statistics
------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
------------------------------------------------------------------------
Discover               29312           29311               0
Offer                 300001          300001               0
Request(*)             29324           29324               0
Ack                     1574            1574               0
Release(*)            191493          191493               0
Decline                    0               0               0
Inform(*)              1540            1540               0
Nack                  472890          472890               0
------------------------------------------------------------------------
Total                1026134         1026133               0
------------------------------------------------------------------------
```

```
DHCP L3 FWD:
Total Packets Received                          :          0
Total Packets Forwarded                         :          0
Total Packets Dropped                           :          0
Non DHCP:
Total Packets Received                          :          0
Total Packets Forwarded                         :          0
Total Packets Dropped                           :          0
DROP:
DHCP Relay not enabled                          :          0
Invalid DHCP message type                       :          0
Interface error                                 :          0
Tx failure towards server                       :          0
Tx failure towards client                       :          0
Unknown output interface                        :          0
Unknown vrf or interface for server             :          0
Max hops exceeded                               :          0
Option 82 validation failed                     :          0
Packet Malformed                                :          0
DHCP Request dropped on MCT                     :          0
Relay Trusted port not configured               :          0
*  -  These counters will show correct value when switch
receives DHCP request packet with destination ip as broadcast
address. If request is unicast it will be HW switched
```

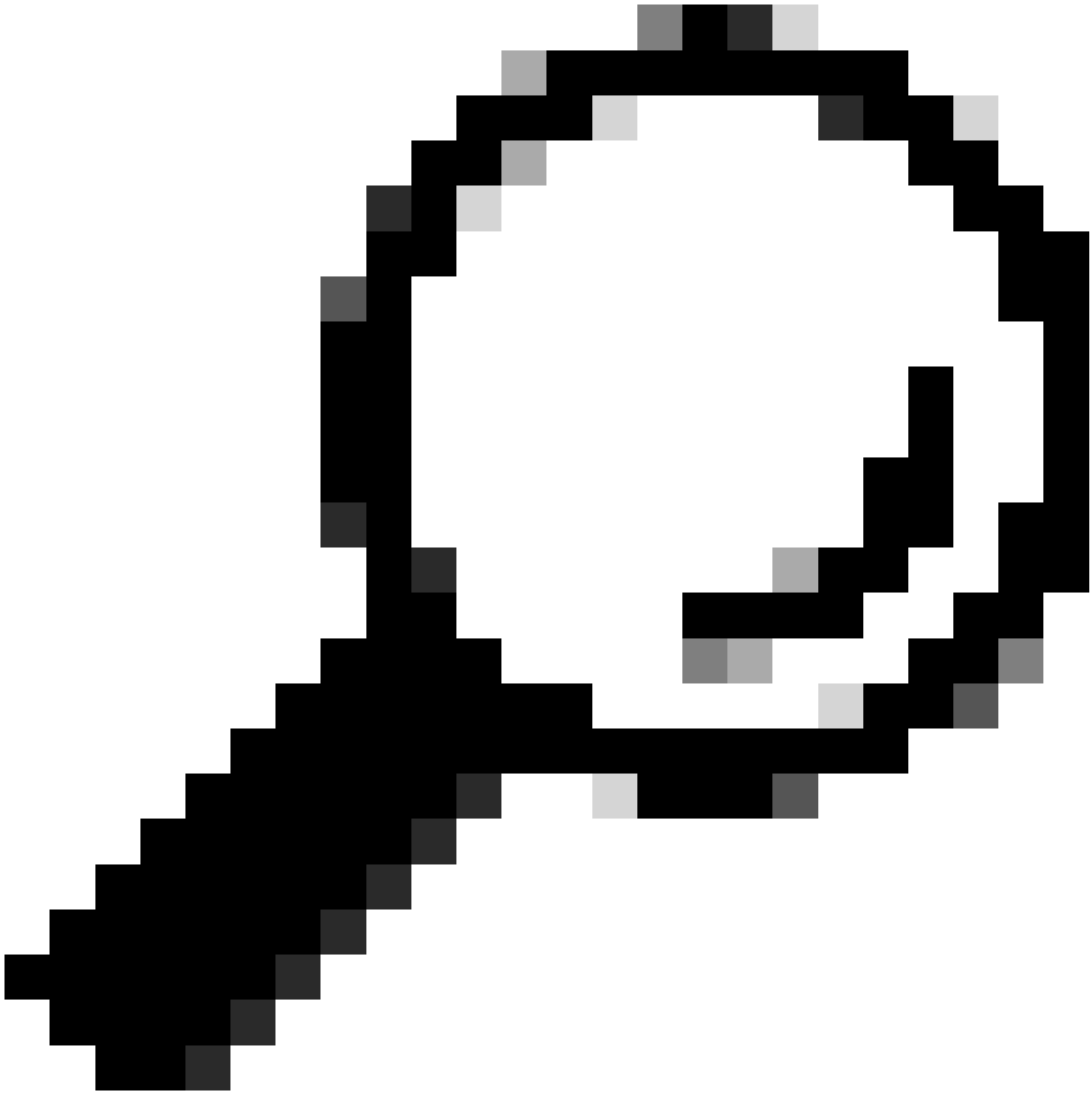
Configuração do servidor DHCP no Windows Server 2022

Configuração de escopo de endereçamento IP para hosts.

Etapa 1. Abra o Gerenciador do Servidor e confirme se não há alarmes no Servidor DHCP no Painel.

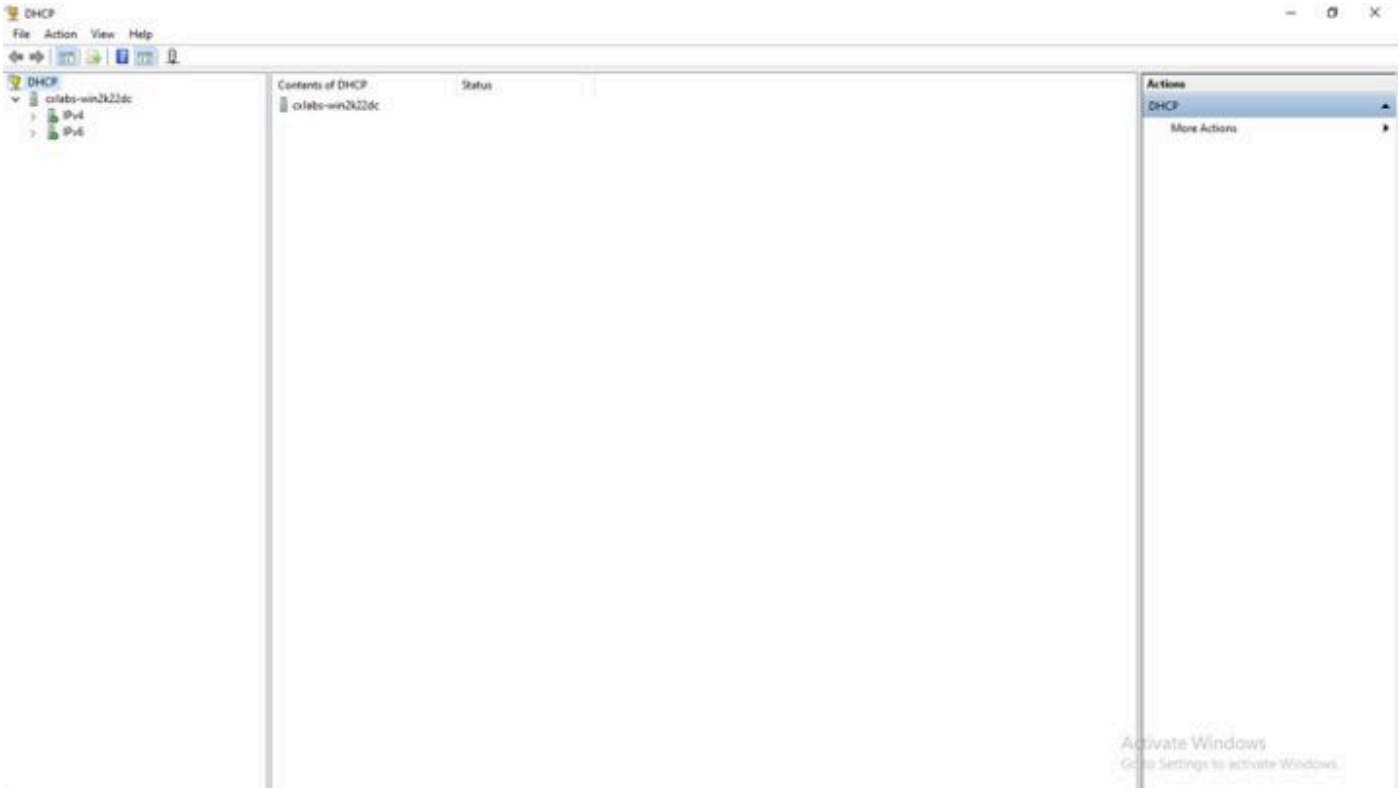


Painel do Gerenciador de Servidores no Windows Server 2022



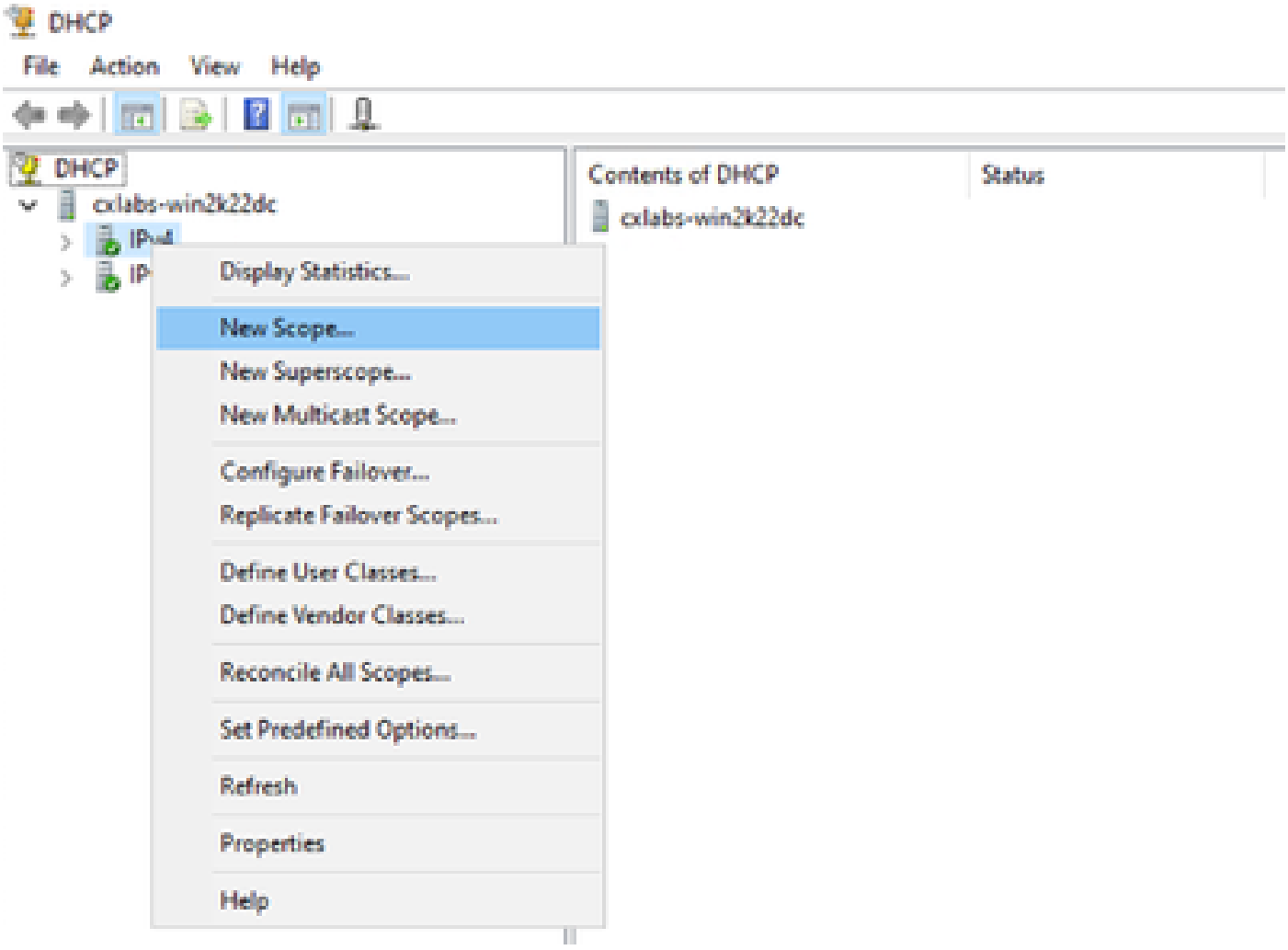
Dica: a imagem é ampliada quando você clica duas vezes.

Etapa 2. Abra o aplicativo DHCP Server.

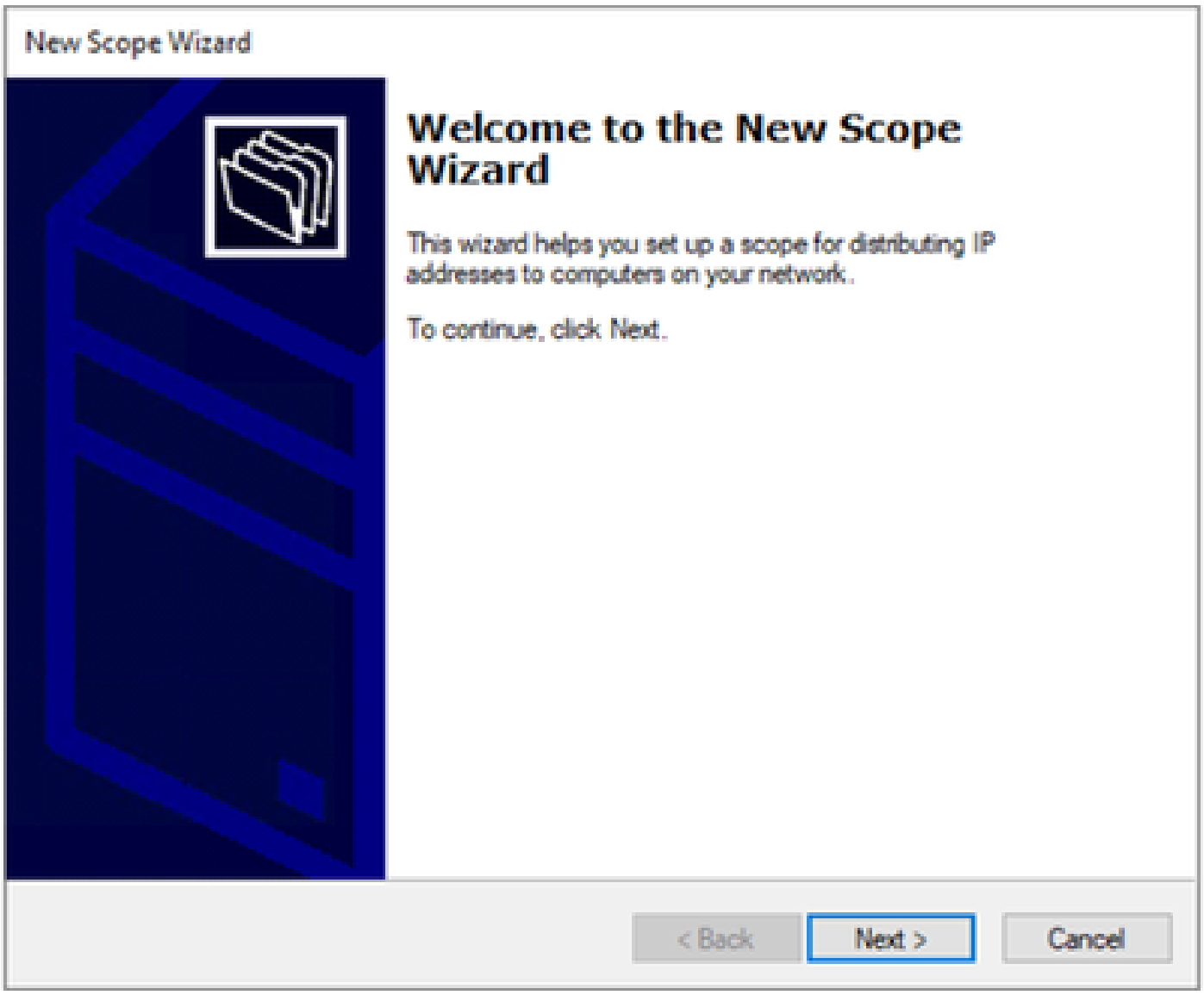


Servidor DHCP no Windows Server 2022

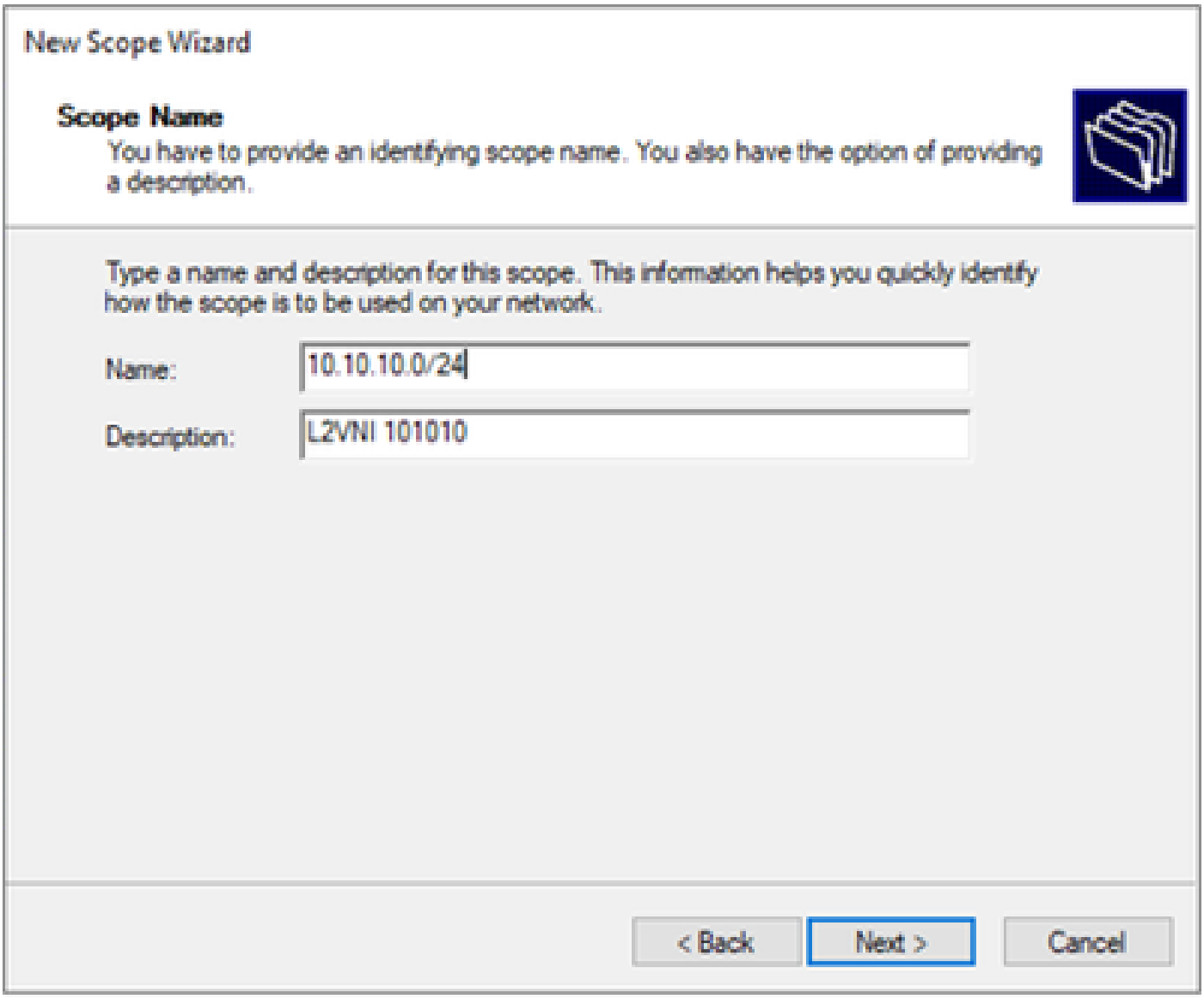
Etapa 3. Clique com o botão direito do mouse em IPv4 e clique em Novo escopo.



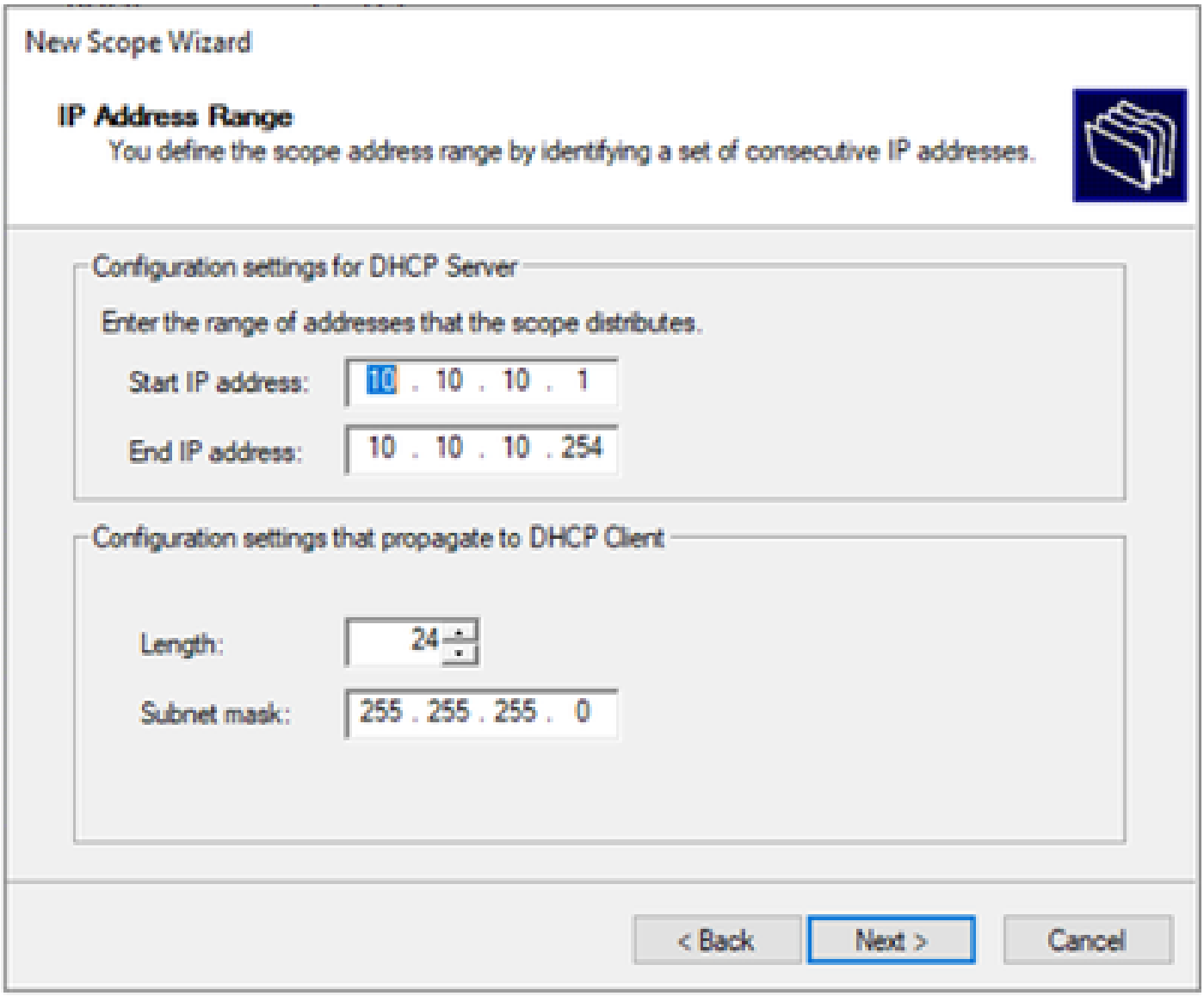
Etapa 4. Clique em Next.



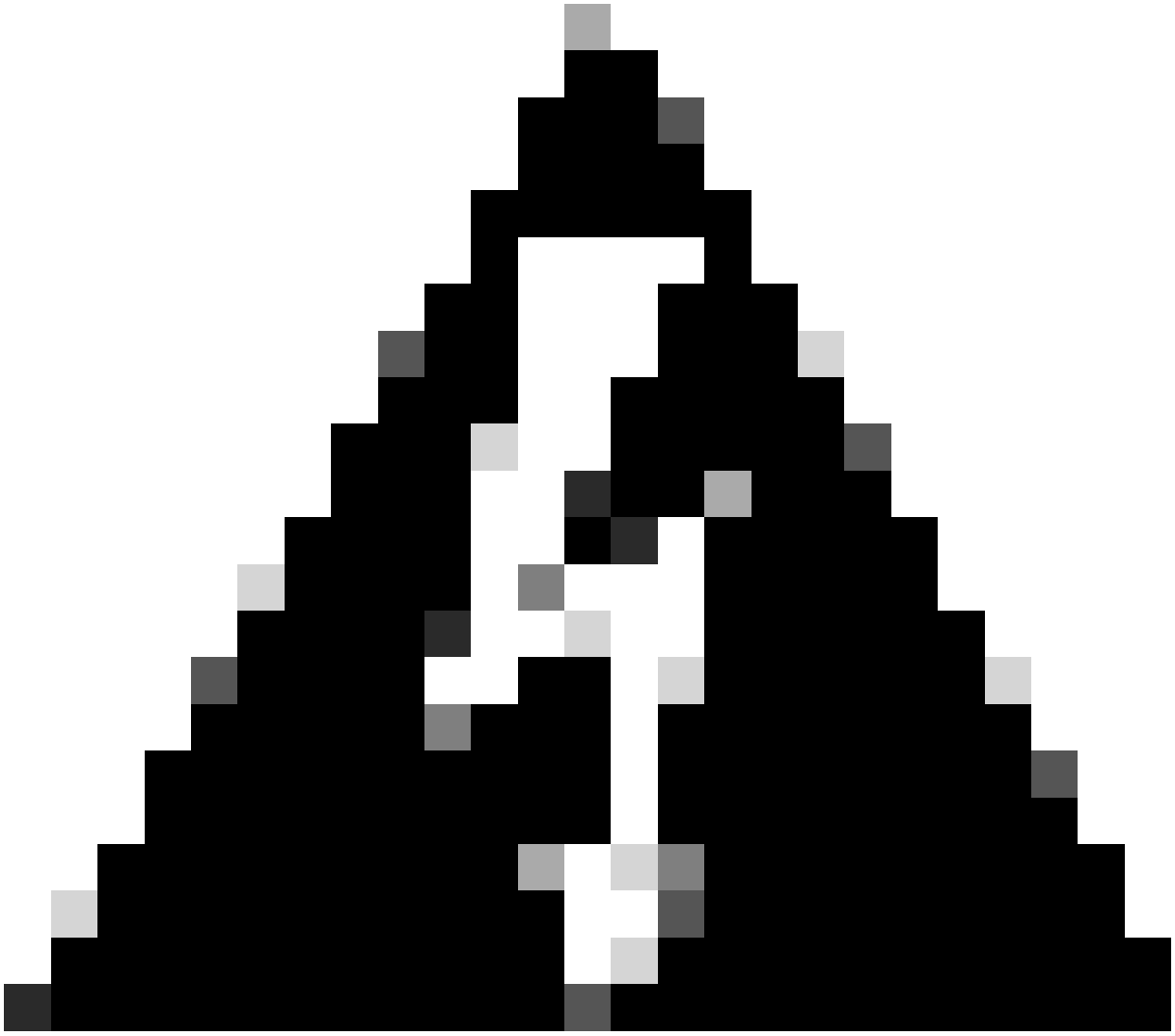
Etapa 5. Escreva um Nome e uma Descrição. Neste exemplo, o nome é a sub-rede que pertence à VLAN 10 e a descrição é o L2VNI como L2VNI listado na VLAN 10.



Etapa 6. Configure o intervalo de endereços IP. Este é o pool para hosts.

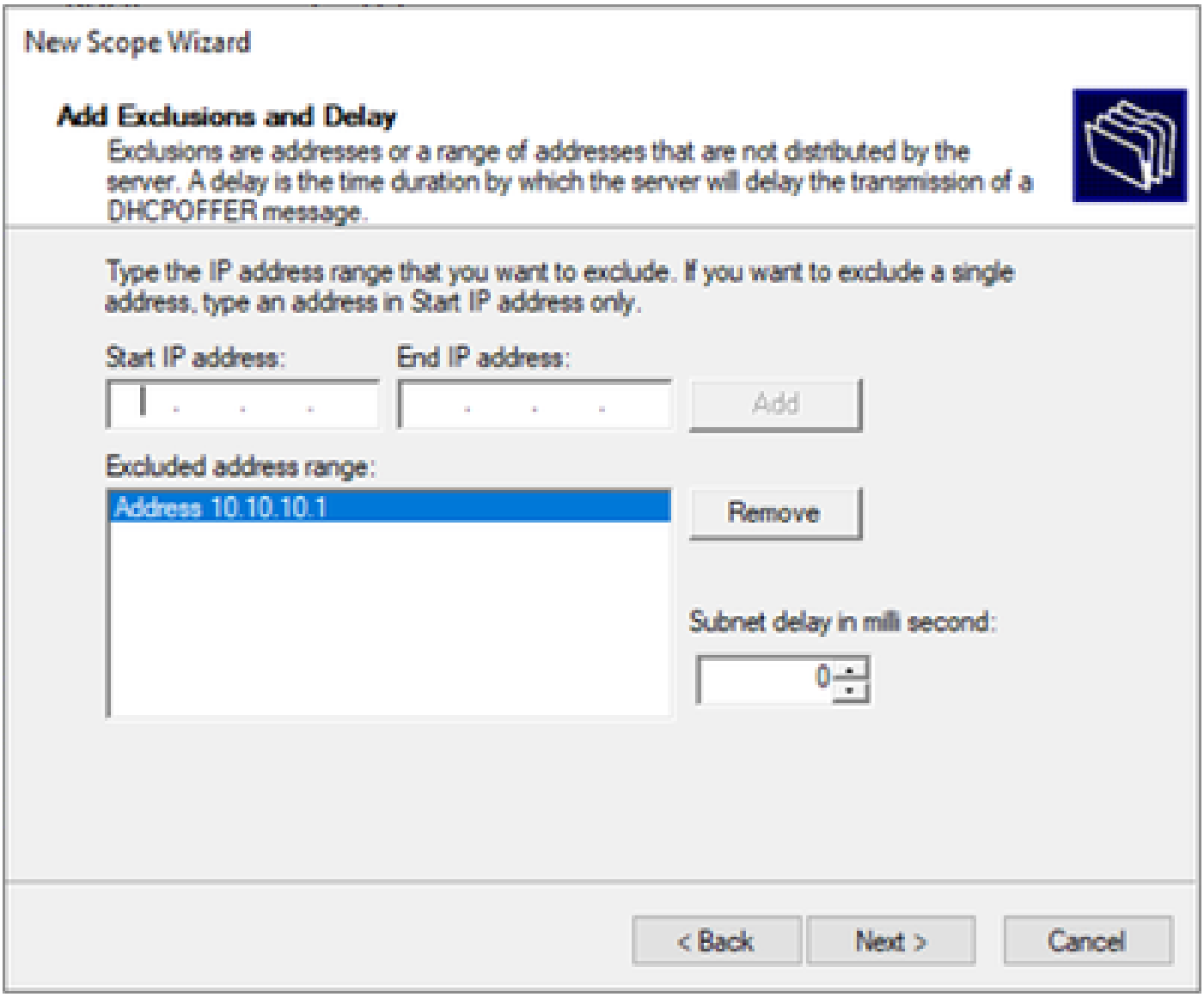


Etapa 6. Exclua o endereço IP compartilhado da configuração do SVI nos VTEPs. Neste exemplo, a interface VLAN 10 tem o endereço IP.10.10.1/24.

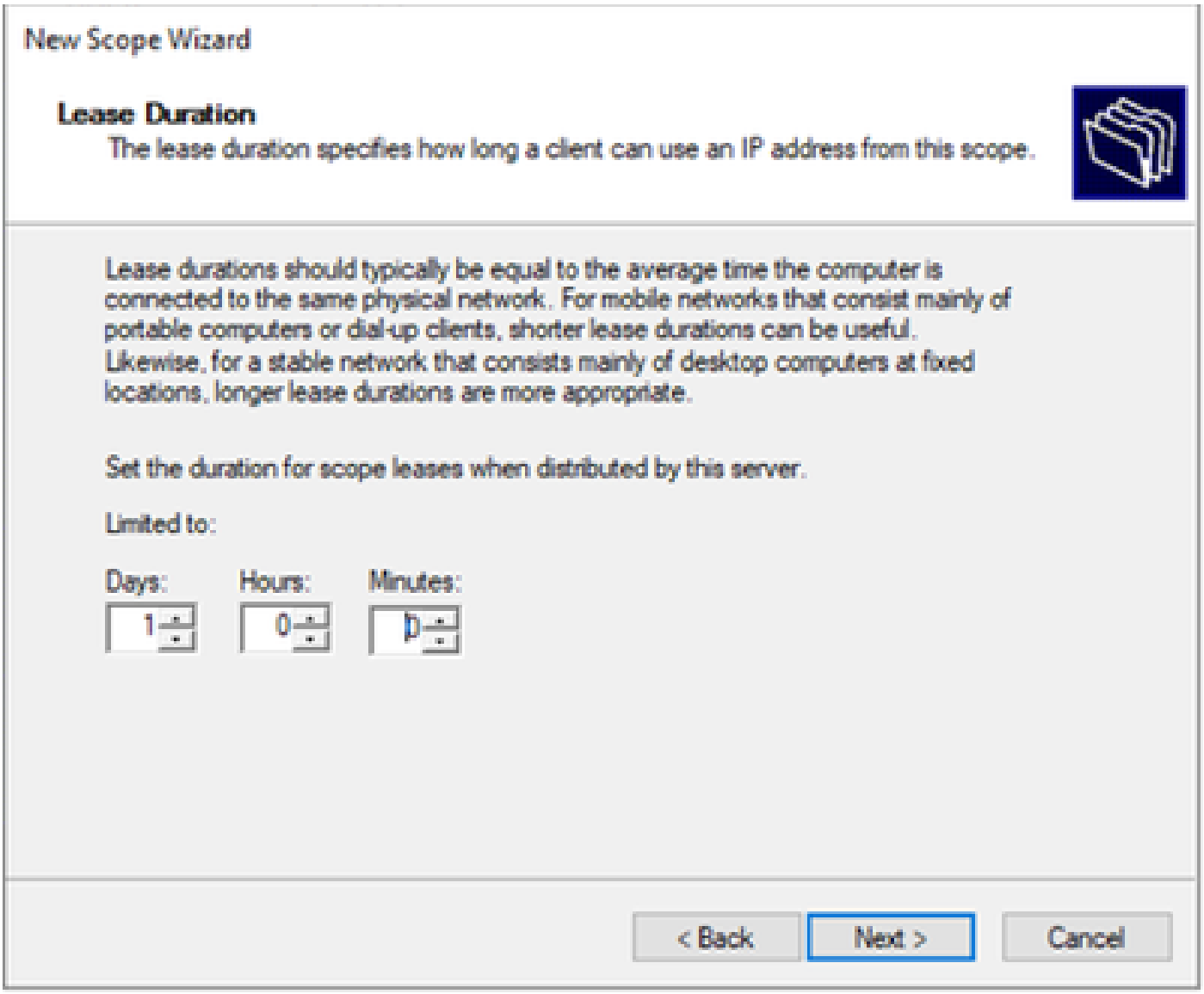


Aviso: a falha em excluir o endereço IP do SVI (ou gateway padrão) pode causar a duplicação de endereços IP e afetar a entrega do tráfego.

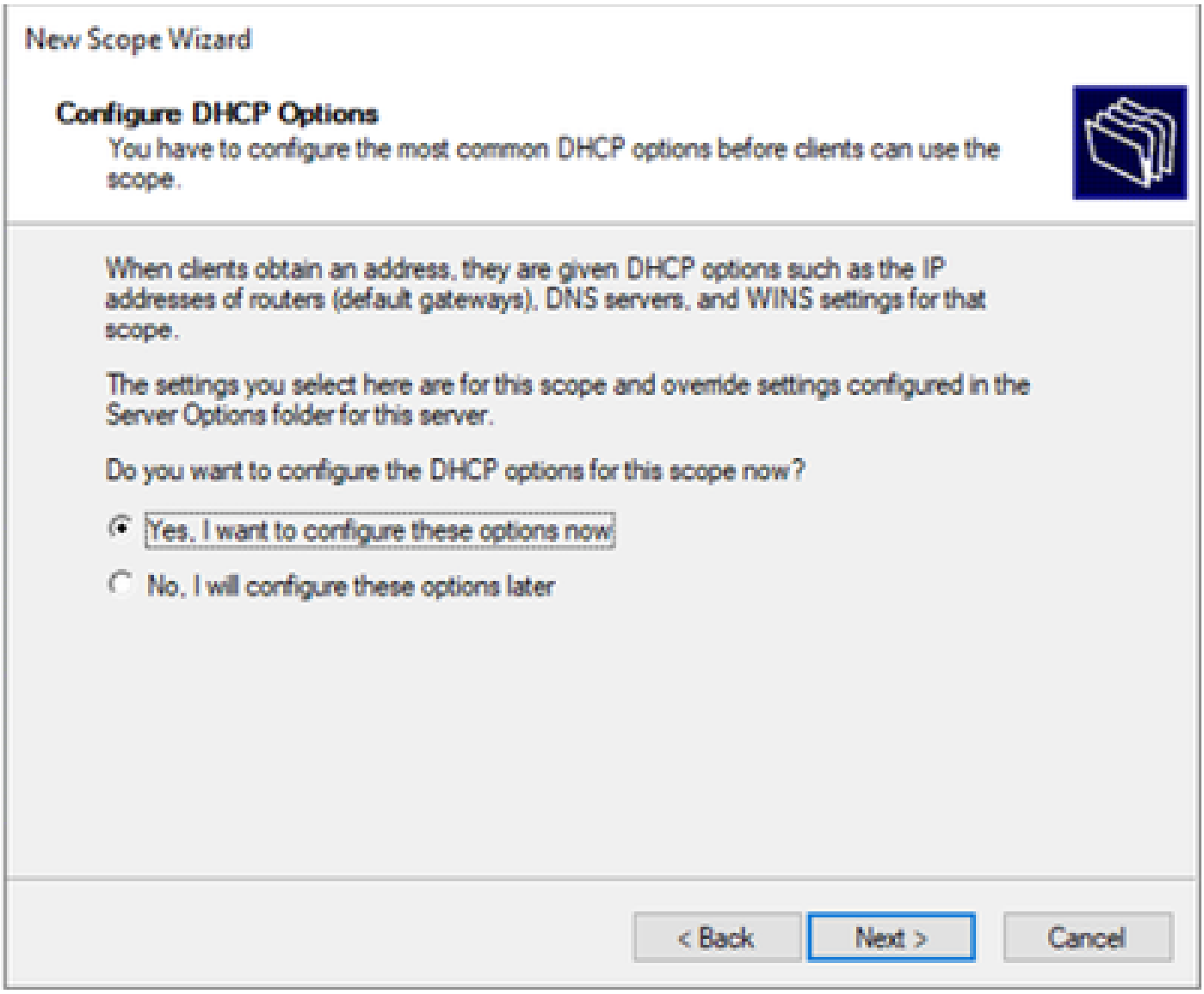
```
LEAF-1# show running-config interface vlan 10
<snip>
interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100
```



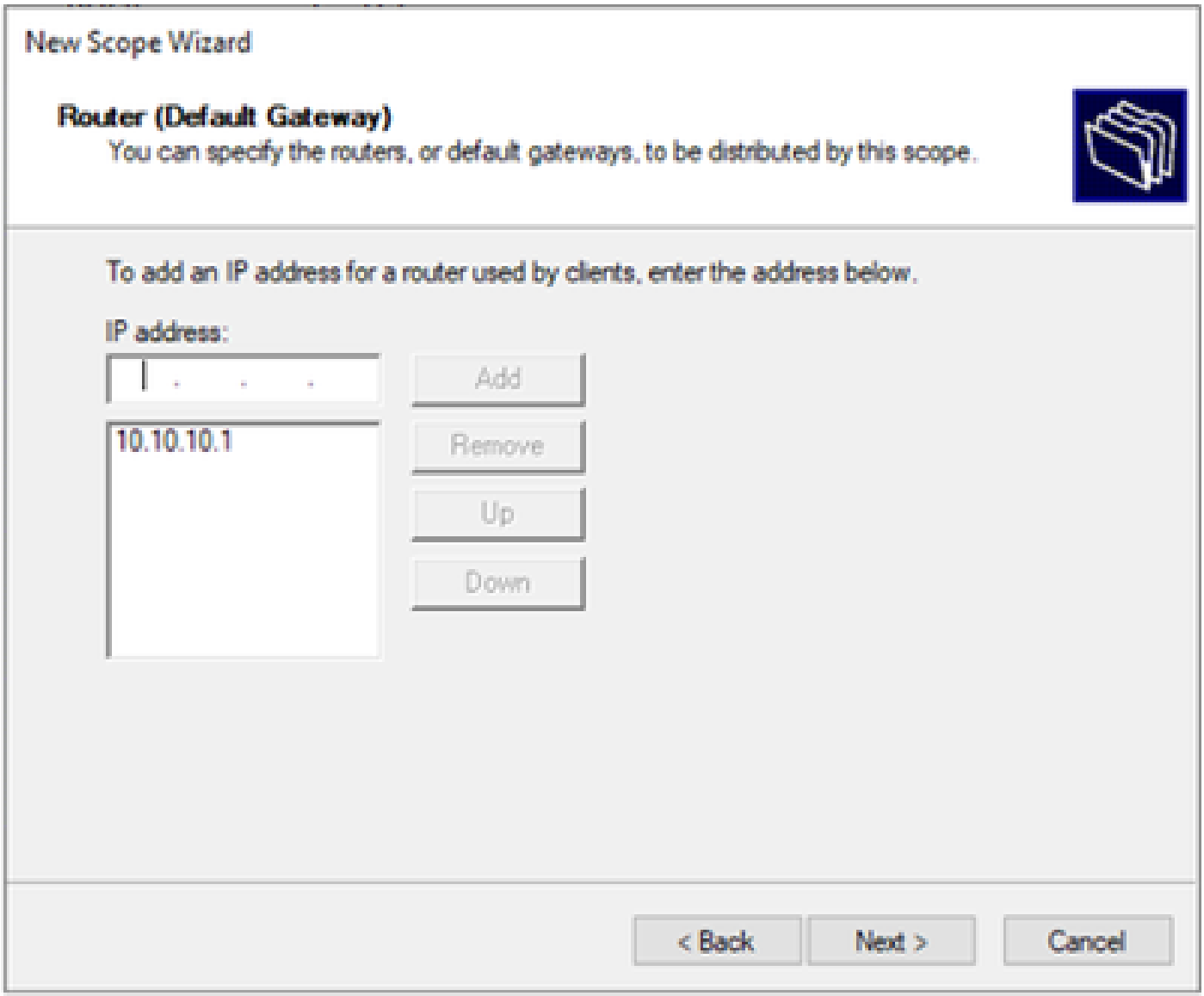
Passo 7. Configure a duração da concessão do endereço IP. Refere-se à quantidade de tempo que um host pode usar o endereço IP atribuído antes de renová-lo.



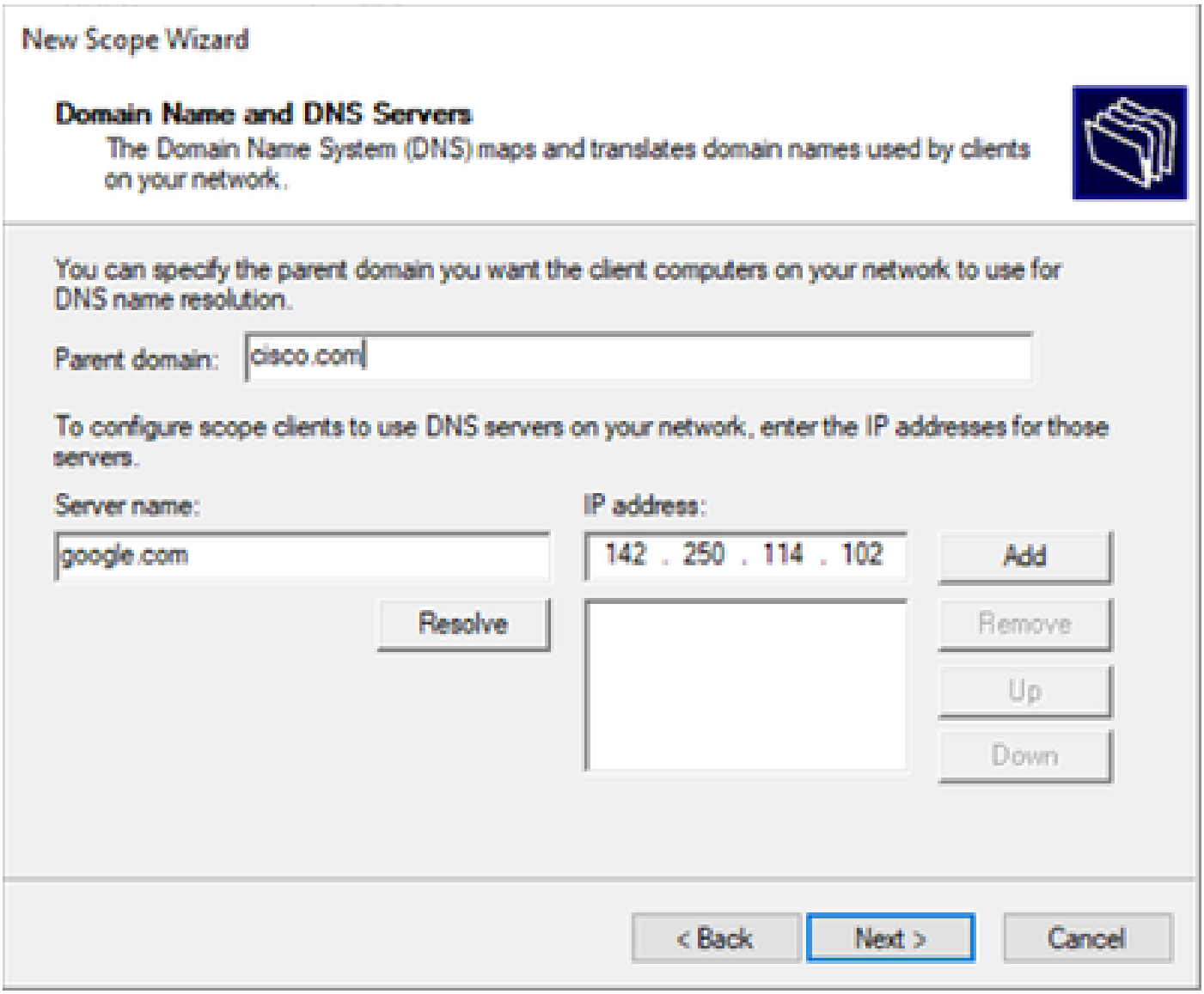
Etapa 8. Selecione Yes, I want to configure these options now.



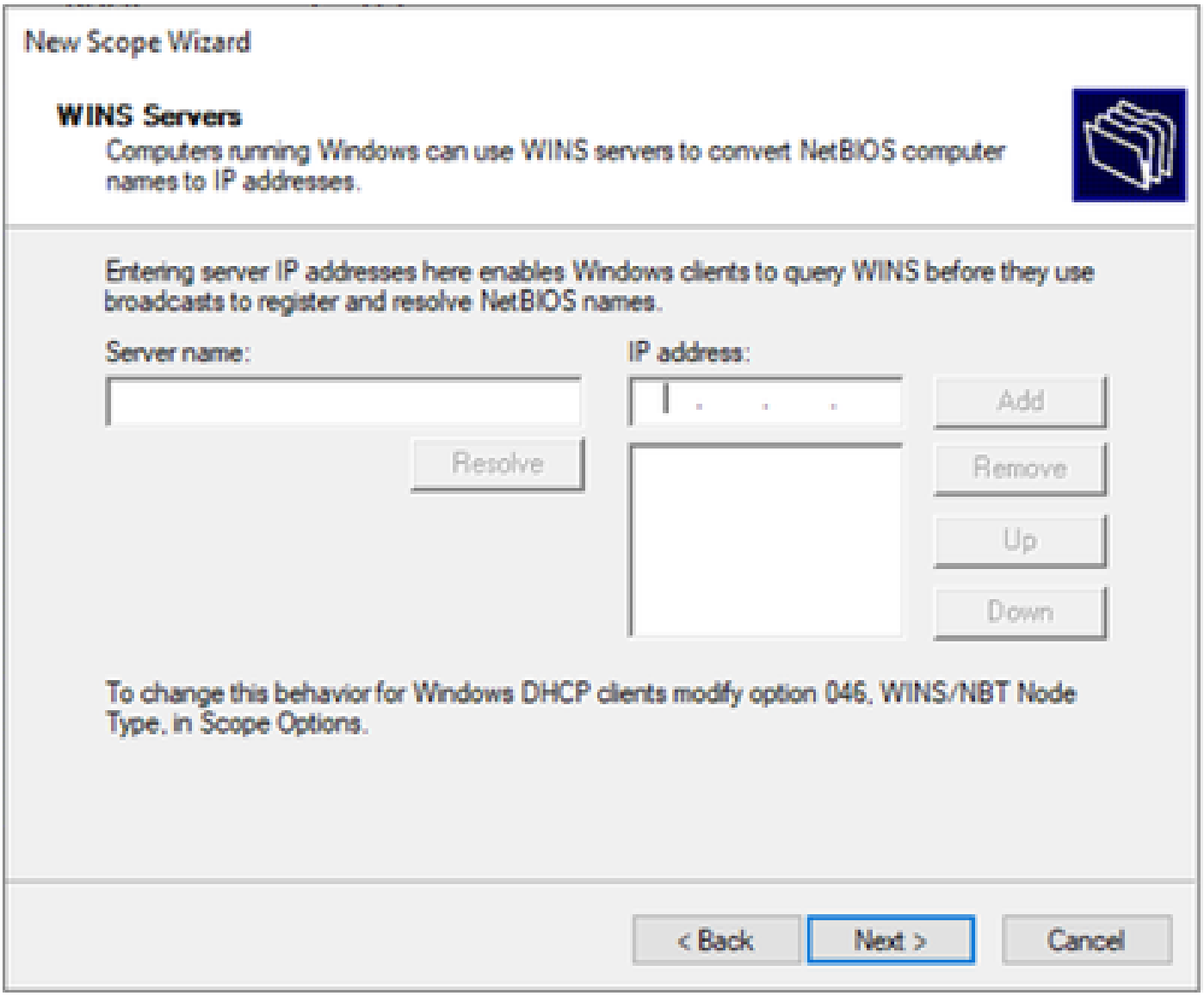
Etapa 9. Configure o endereço IP do gateway padrão.



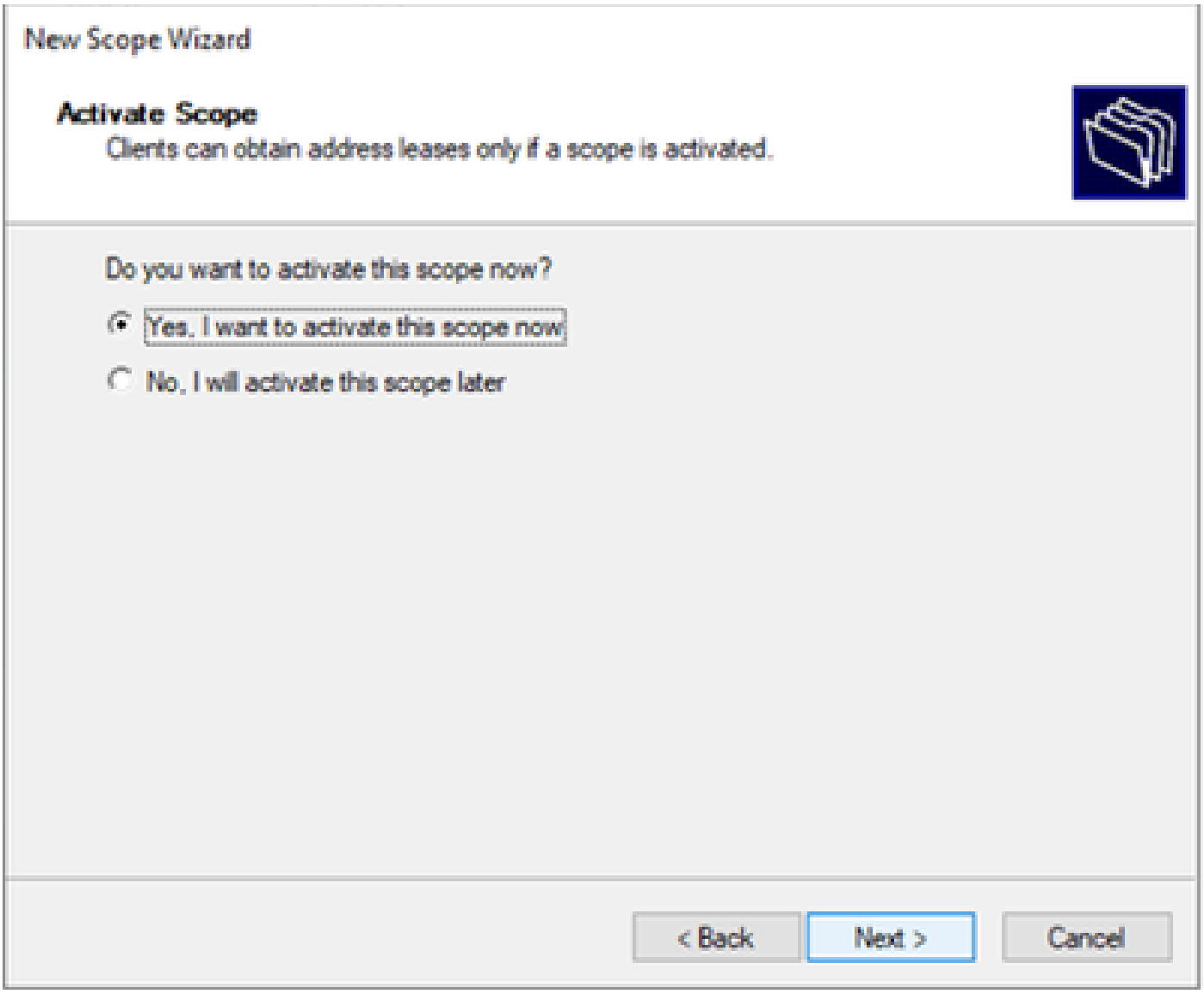
Etapa 10. Configure o nome de domínio e o servidor DNS.



Etapa 11. Configure o servidor WINS, se aplicável. Isso pode ser ignorado se a informação não for conhecida.

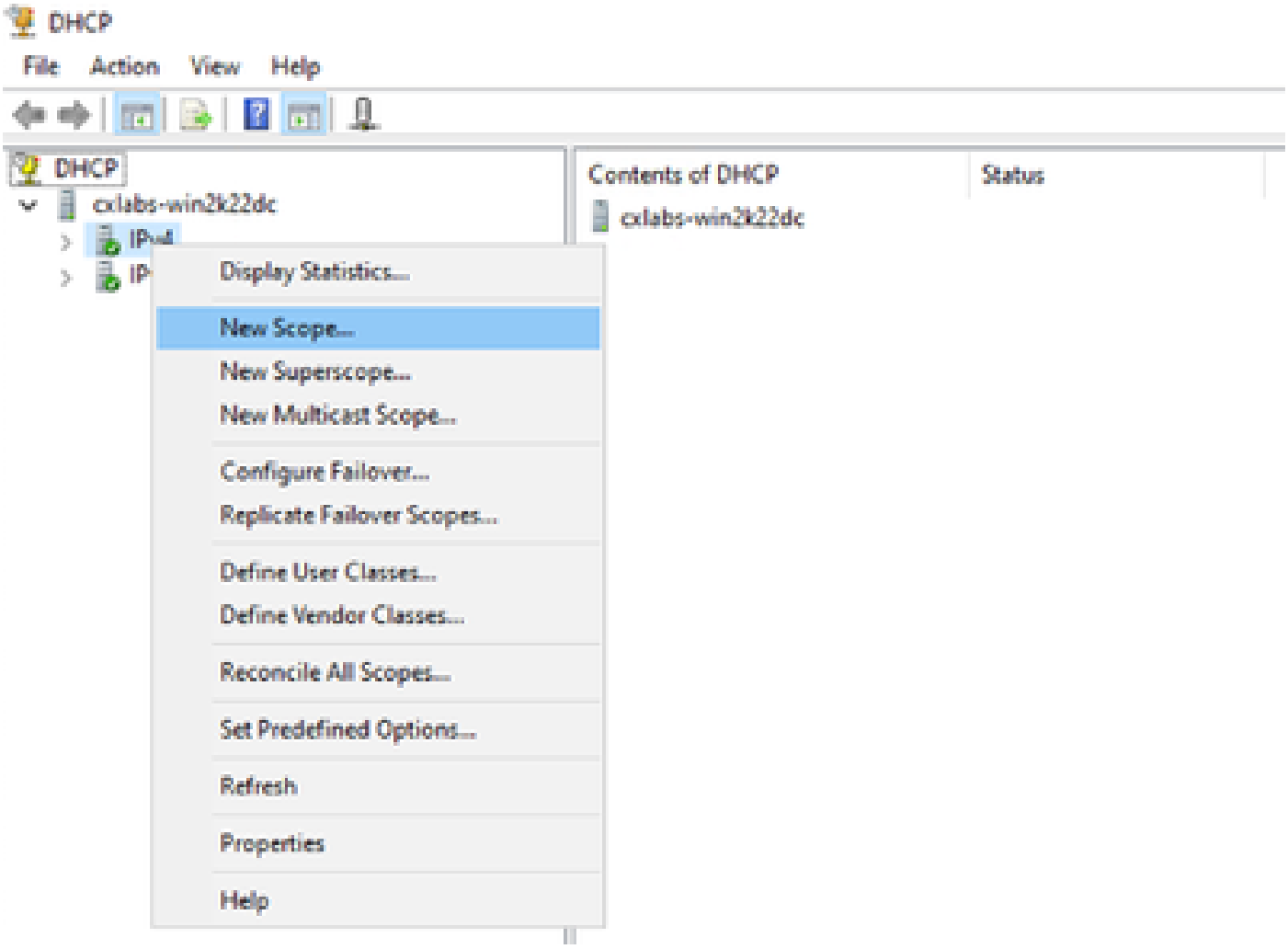


Etapa 12. Selecione Yes, I want to ativate this scope now.



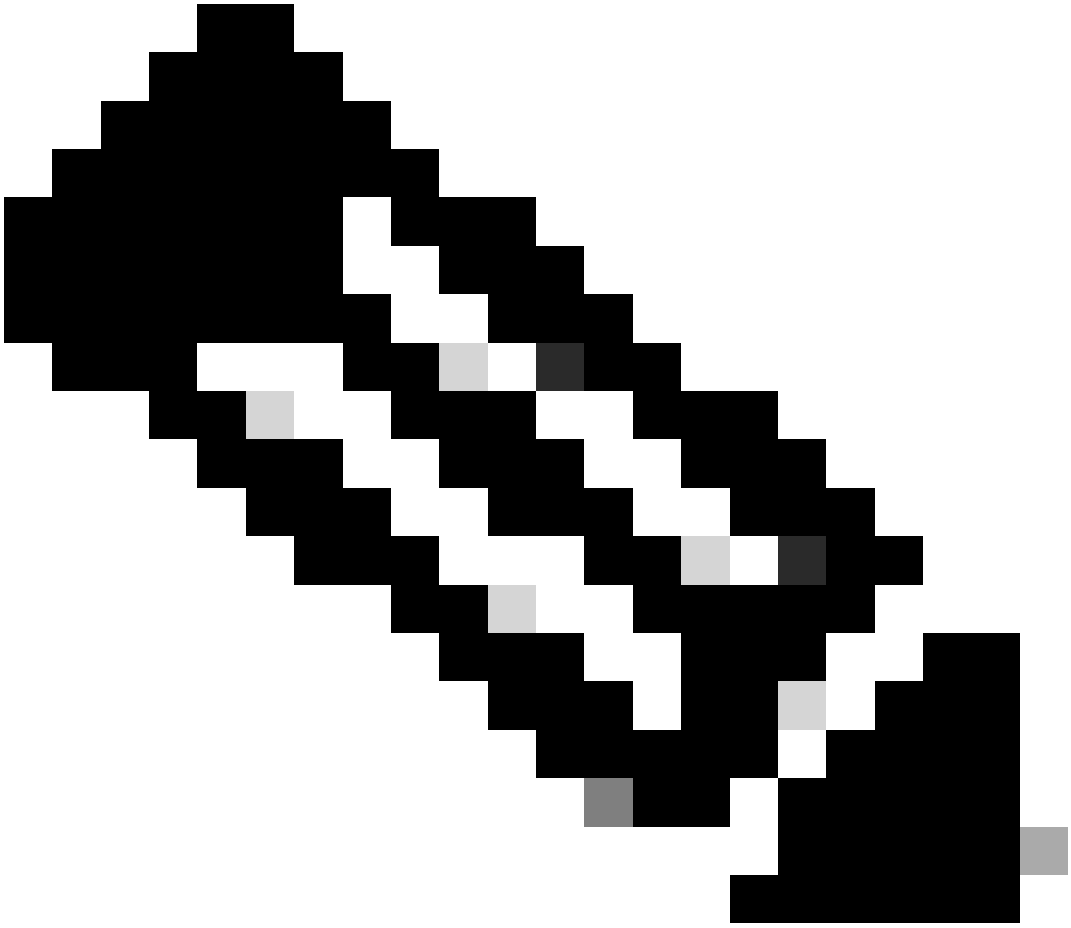
Configurando o escopo para endereços IP exclusivos de loopbacks no SVI como agente de retransmissão DHCP.

Etapa 1. Clique com o botão direito do mouse em IPv4 e selecione IPv4Scope.



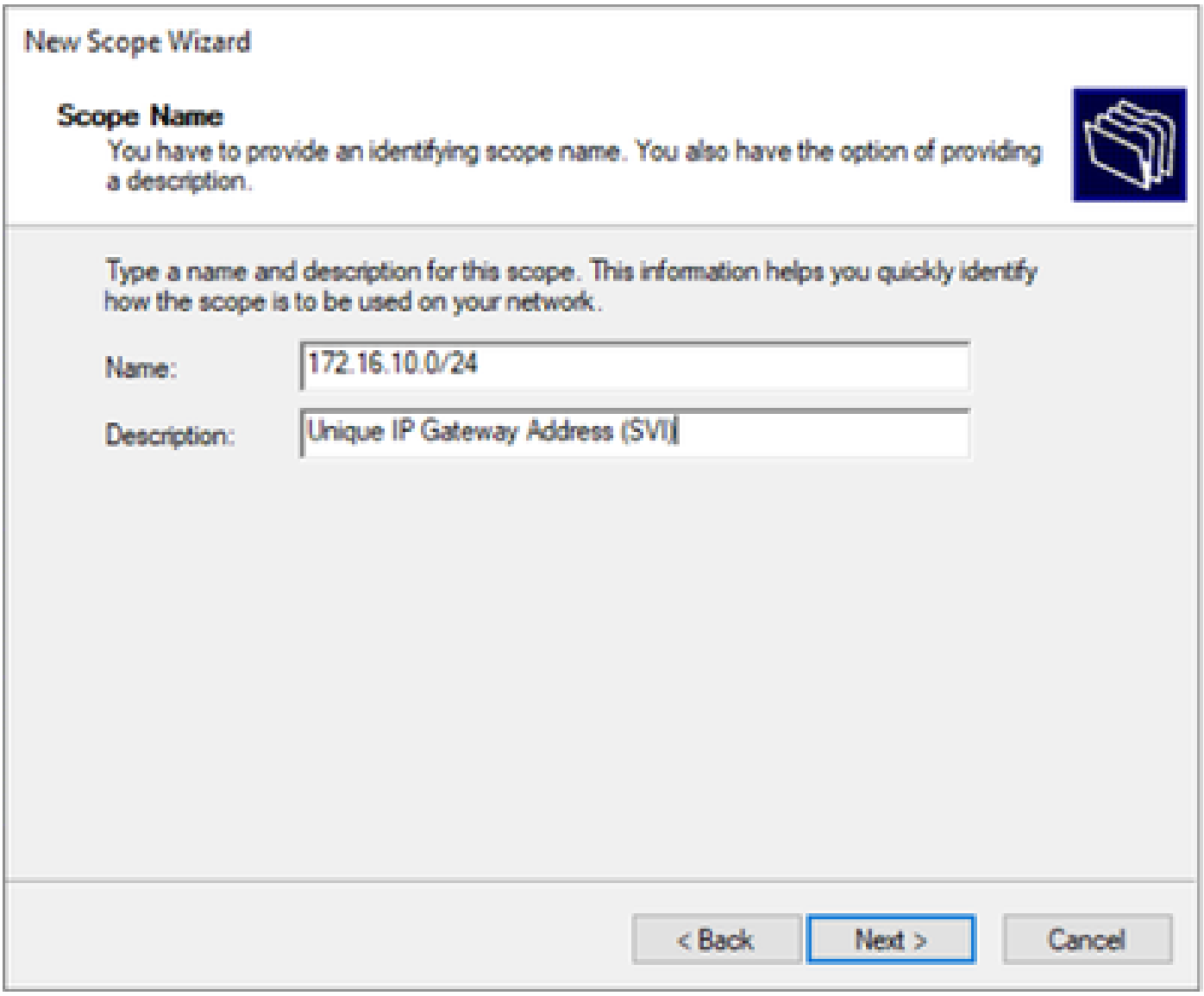
Novo escopo no DHCP

Etapa 2. Escreva um Nome e uma Descrição. Neste exemplo, o nome é a sub-rede usada para a sub-rede com endereço de loopback.

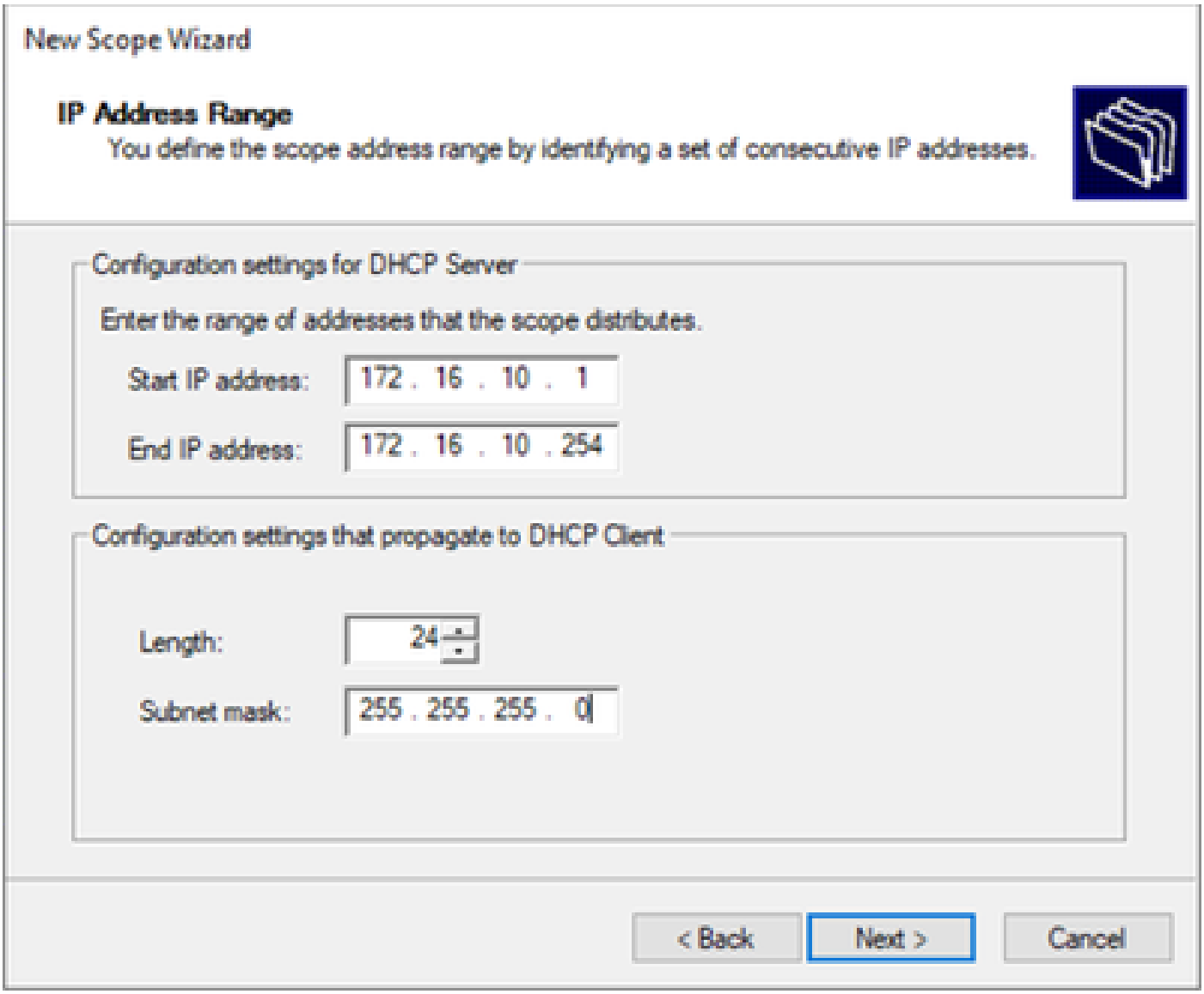


IPte: Um loopback é usado como endereço IP exclusivo de loopback em toda a estrutura VxLAN para o locatário VxLAN. Isso deve ser anunciado na redistribuição de rota BGP L2VPN EVPN no BGP dentro do VRF do locatário correspondente no endereço IPv4 address-famIPv4

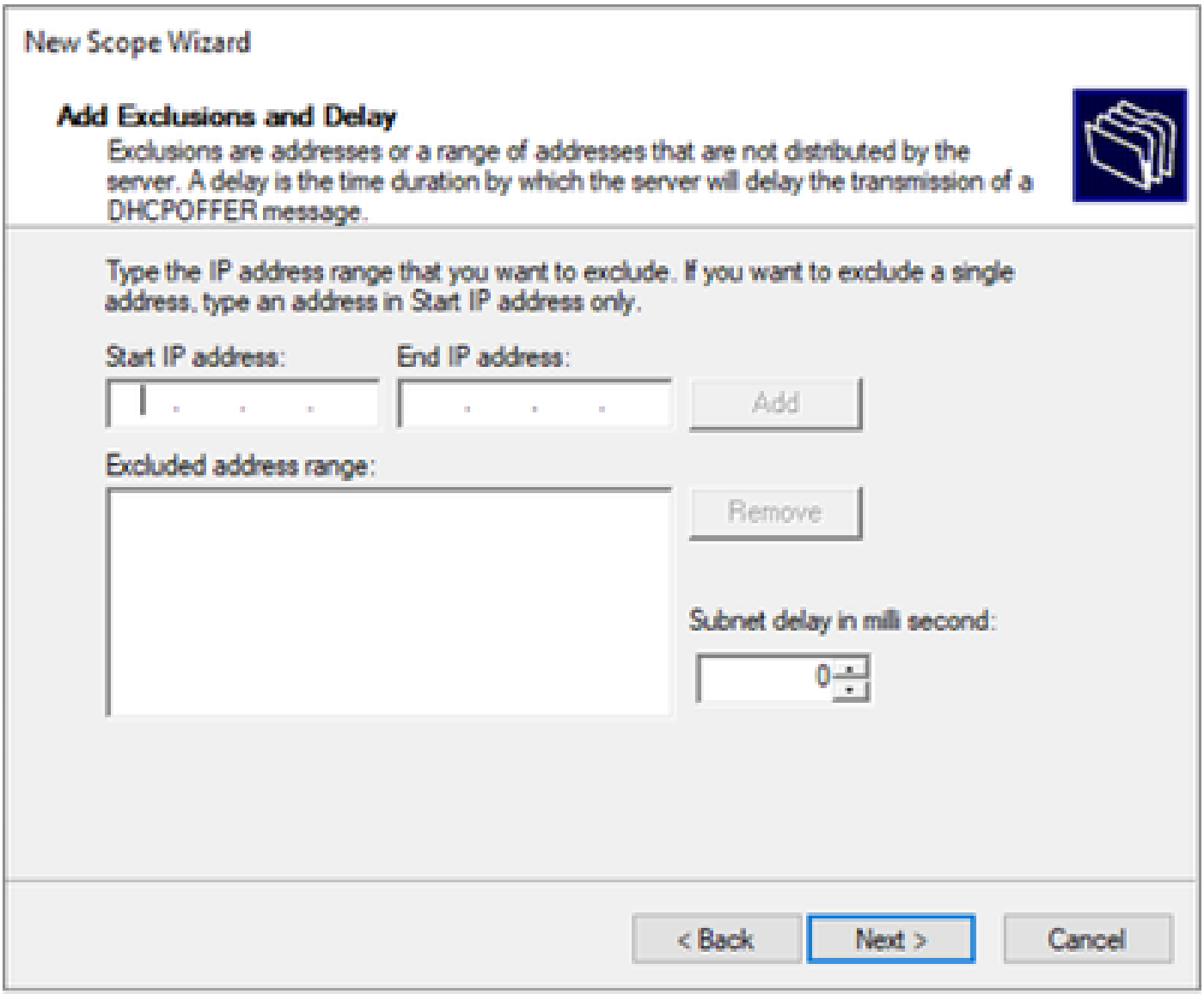
```
LEAF-1# show running-config interface loopback 100
<snip>
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.8/32
```



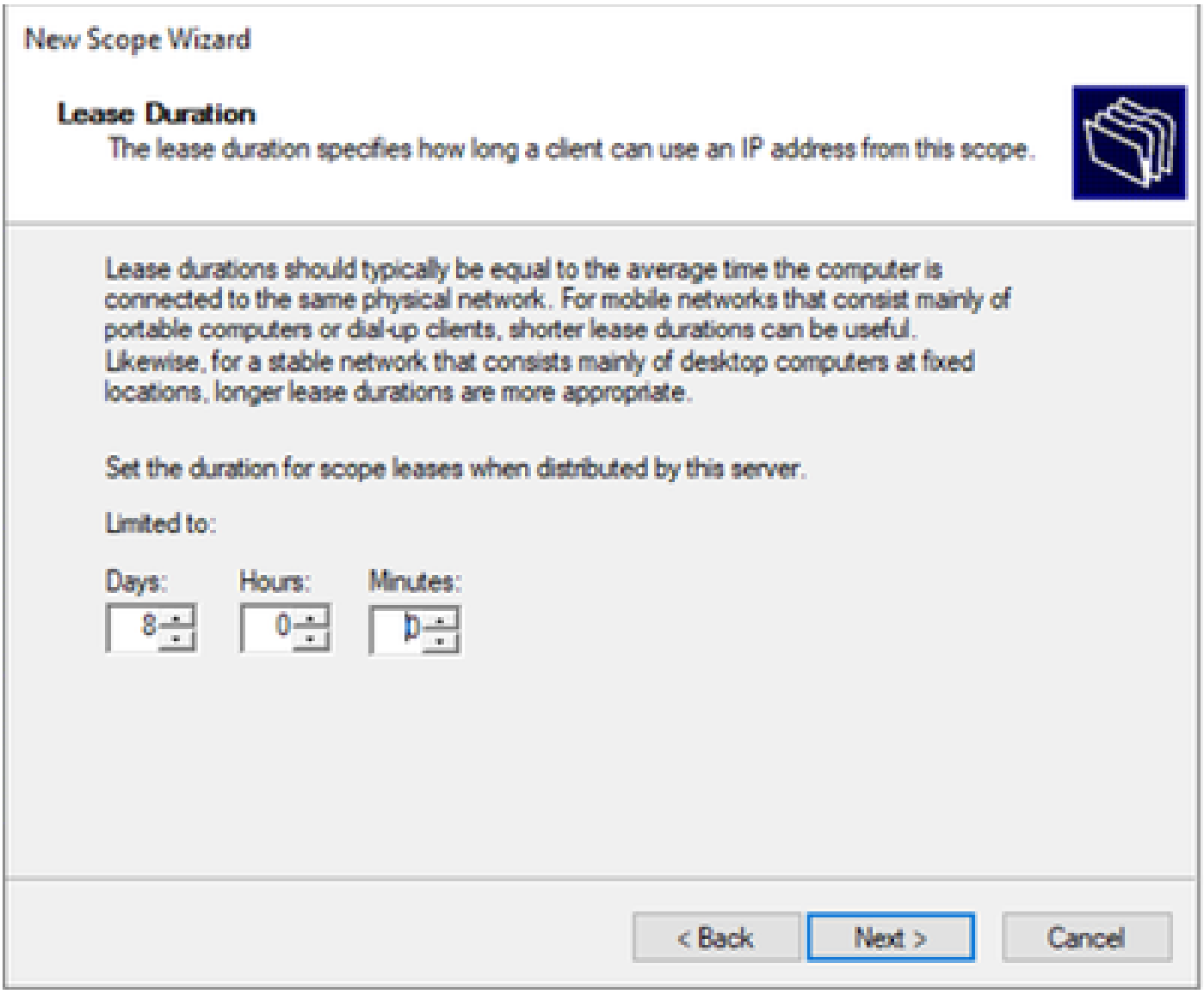
Etapa 3. Configure o intervalo de endereços IPip. Esse é o pool para loopbacks.



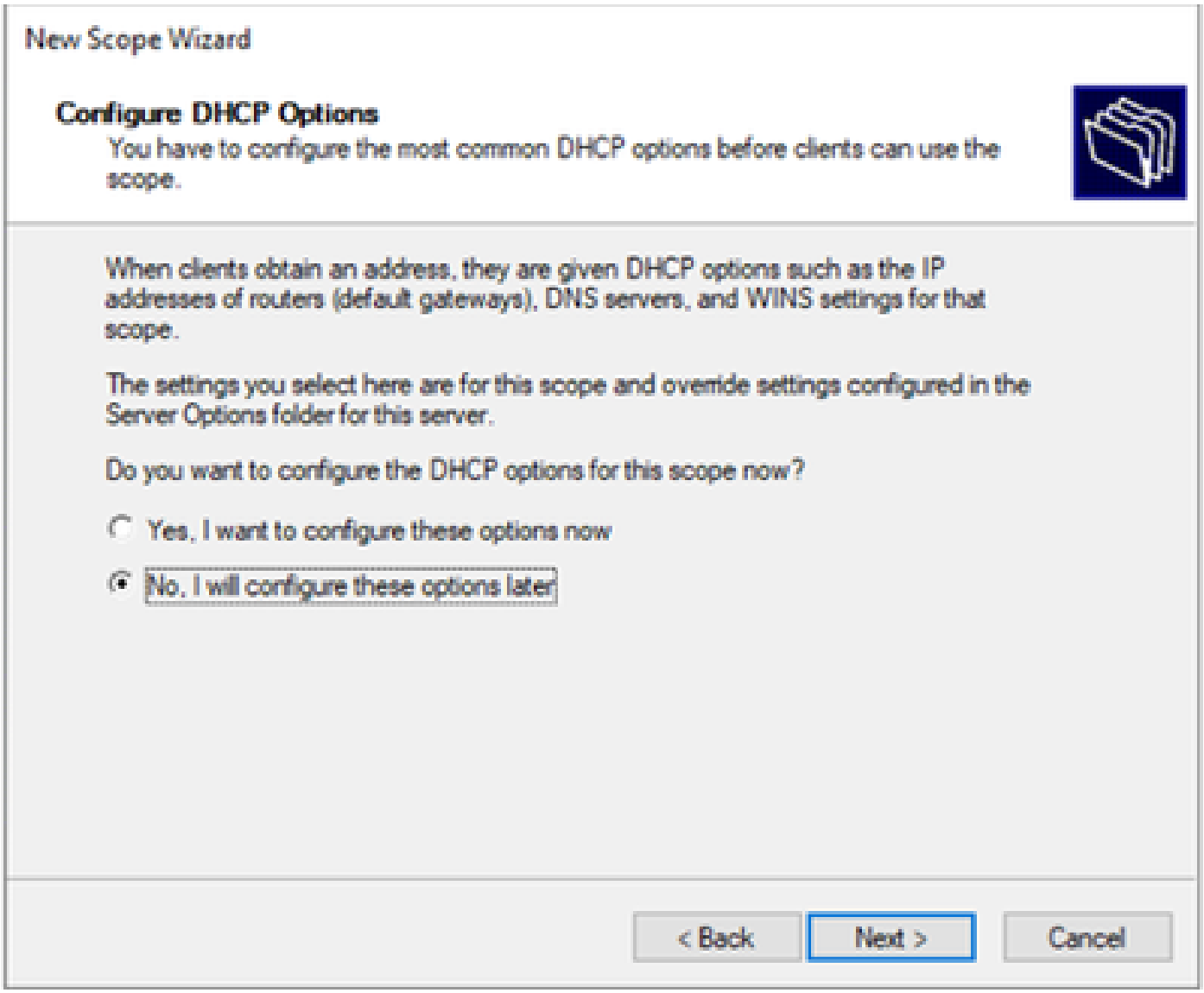
Etapa 4. Configure exclusões (opcional porque o servidor DHCP aluga endereços IP que pertencem a esta sub-rede).



Etapa 5. Ignore a duração do aluguel e clique em Avançar.

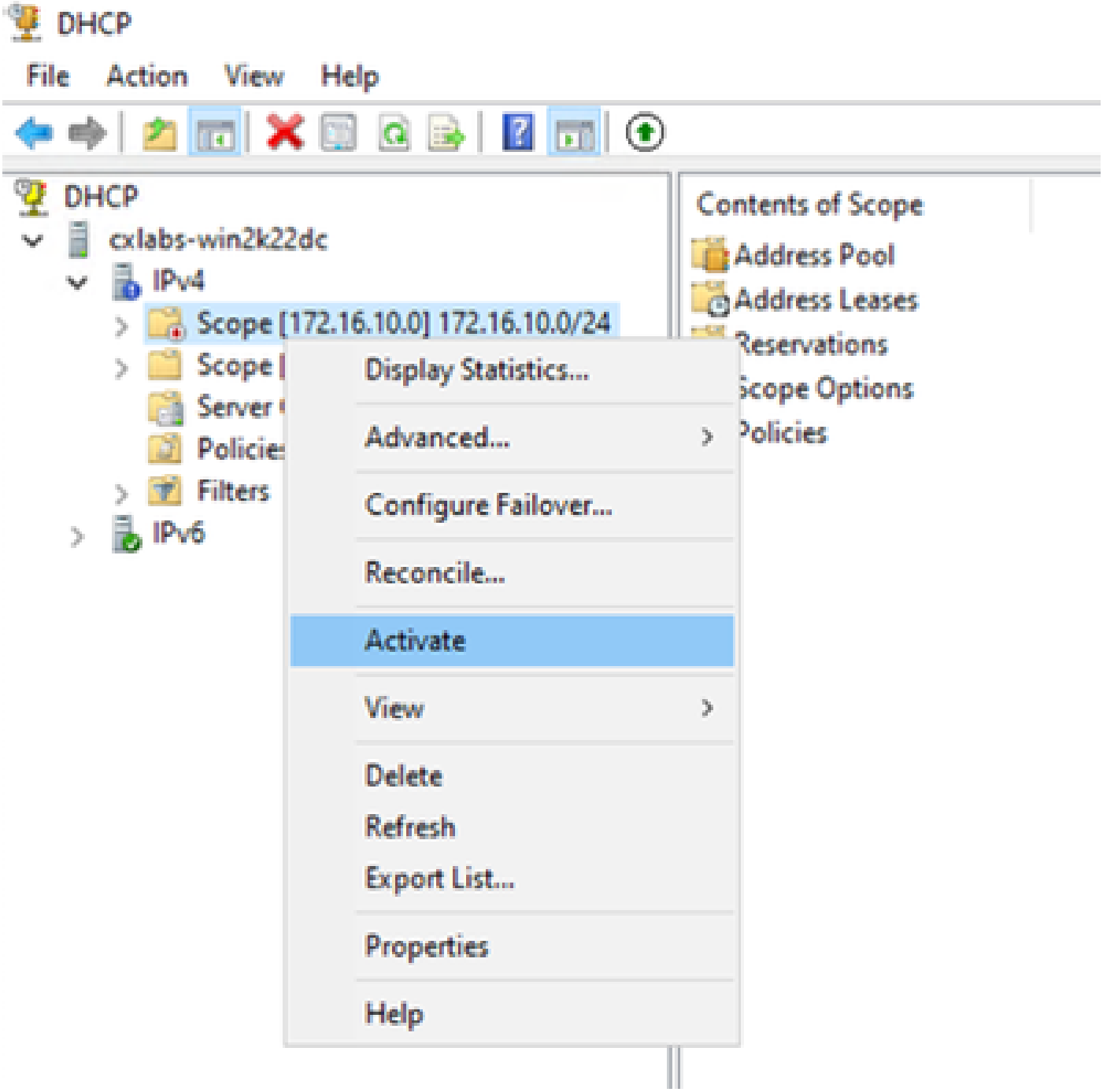


Etapa 6. Selecione Não, configurarei essas opções mais tarde.



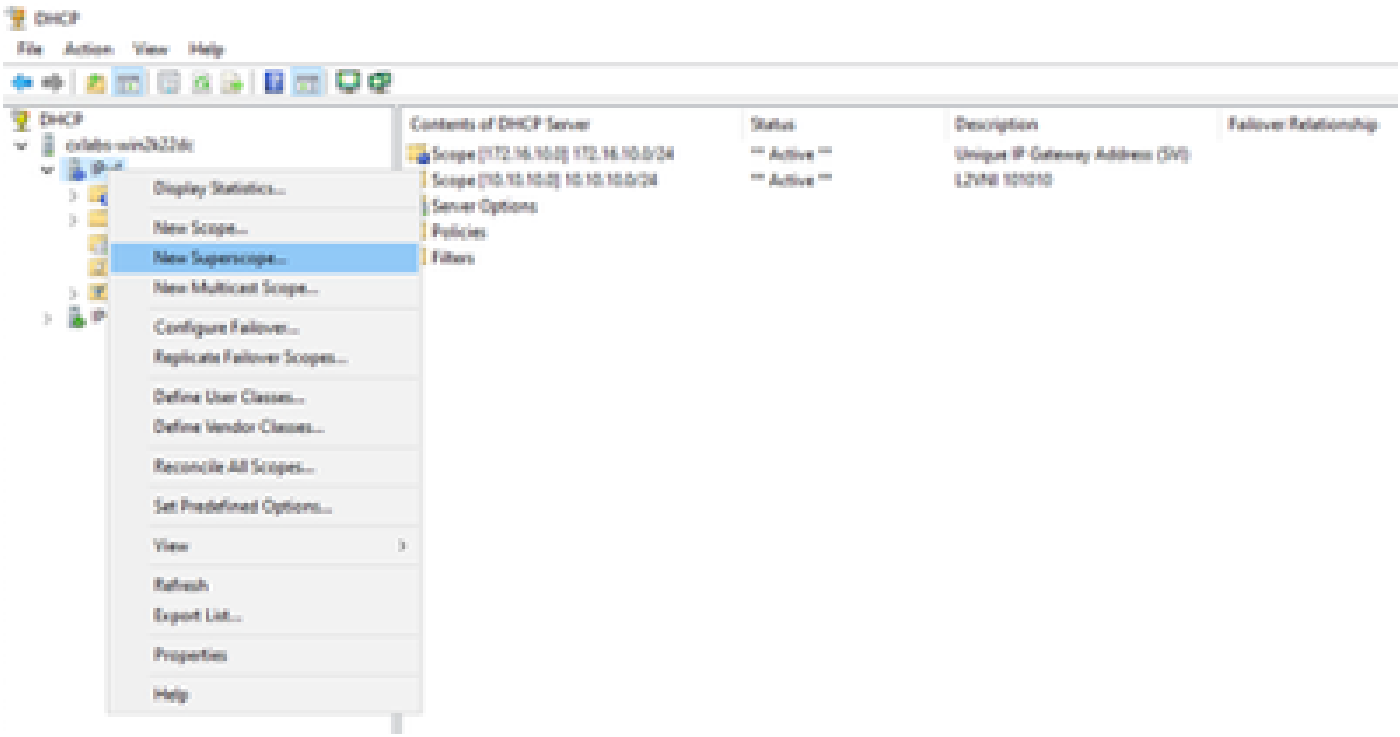
Passo 7. Clique em Finish.

Etapa 8. Clique com o botão direito do mouse no escopo criado e selecione ativar.

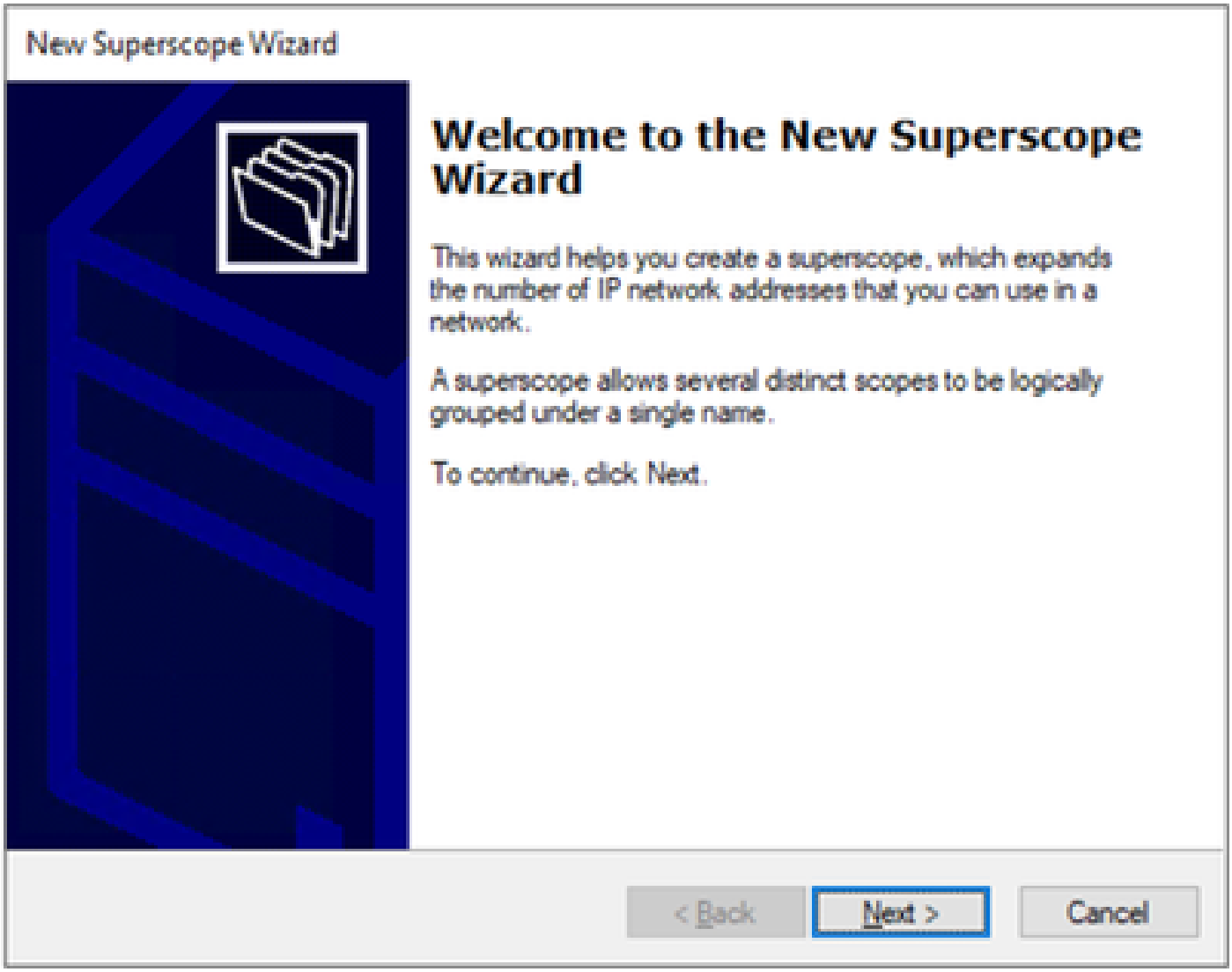


Configurando superescopo para estrutura VxLAN.

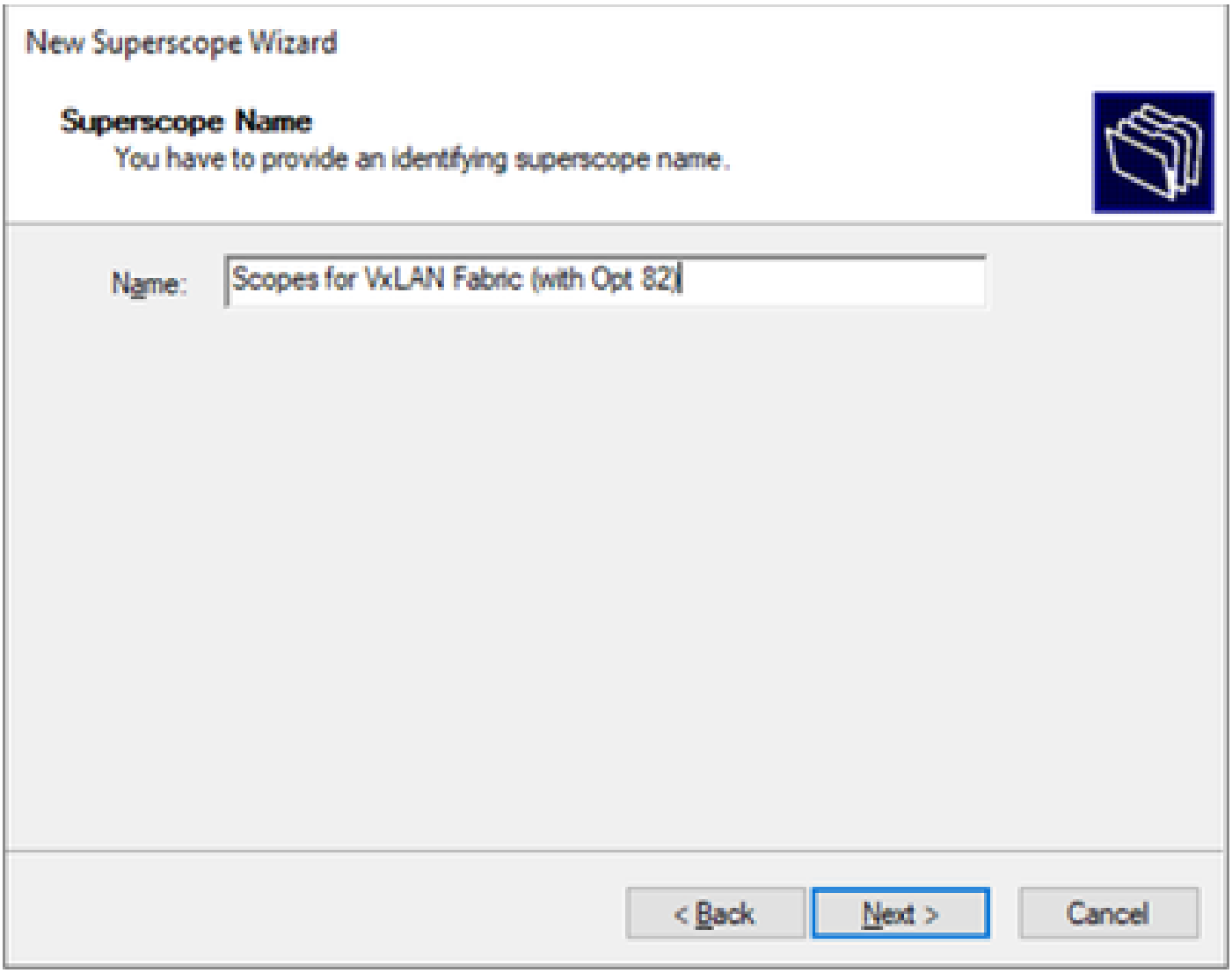
Etapa 1. Clique com o botão direito do mouse em IPv4 e selecione Novo superescopo.



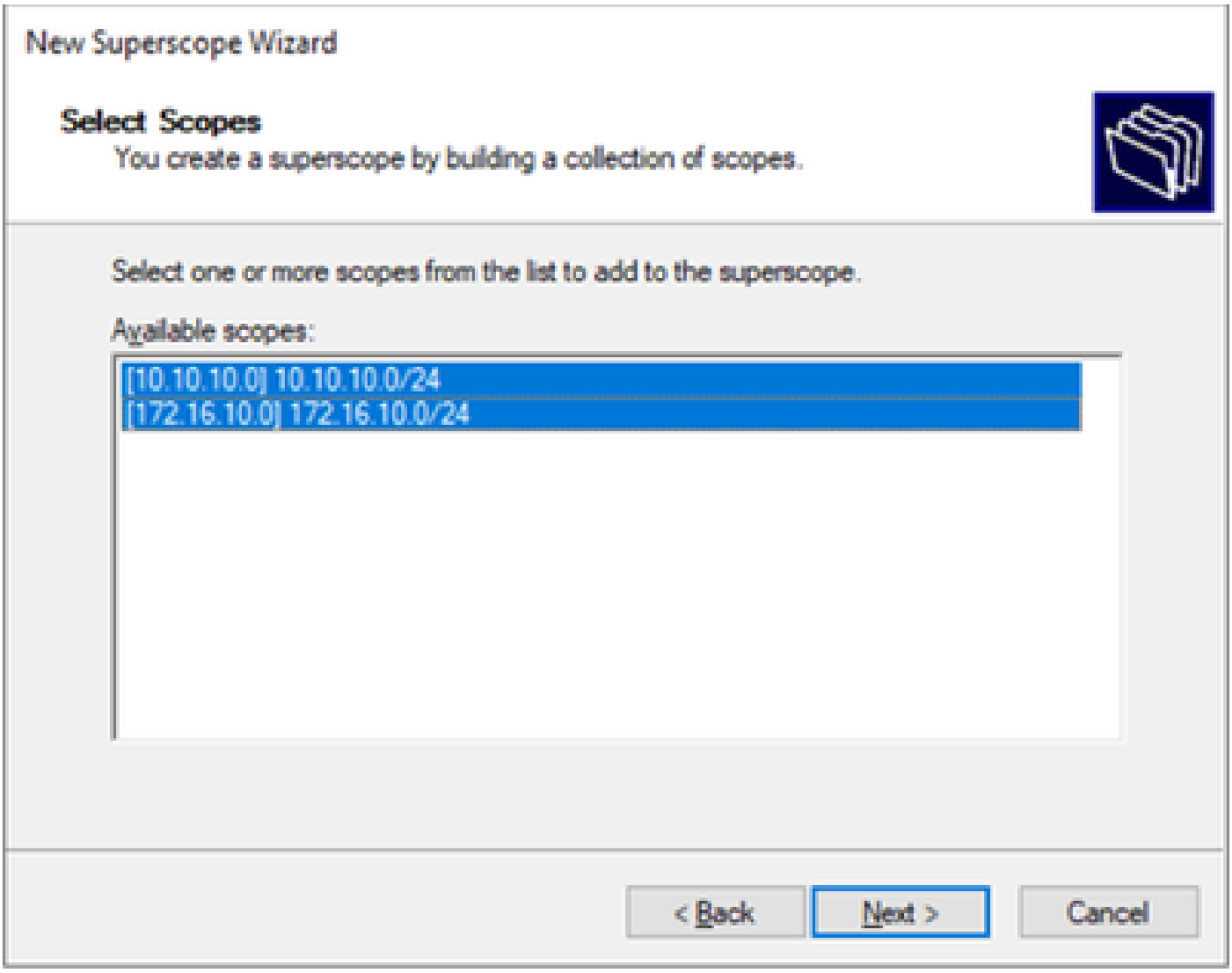
Etapa 2. Clique em Next.



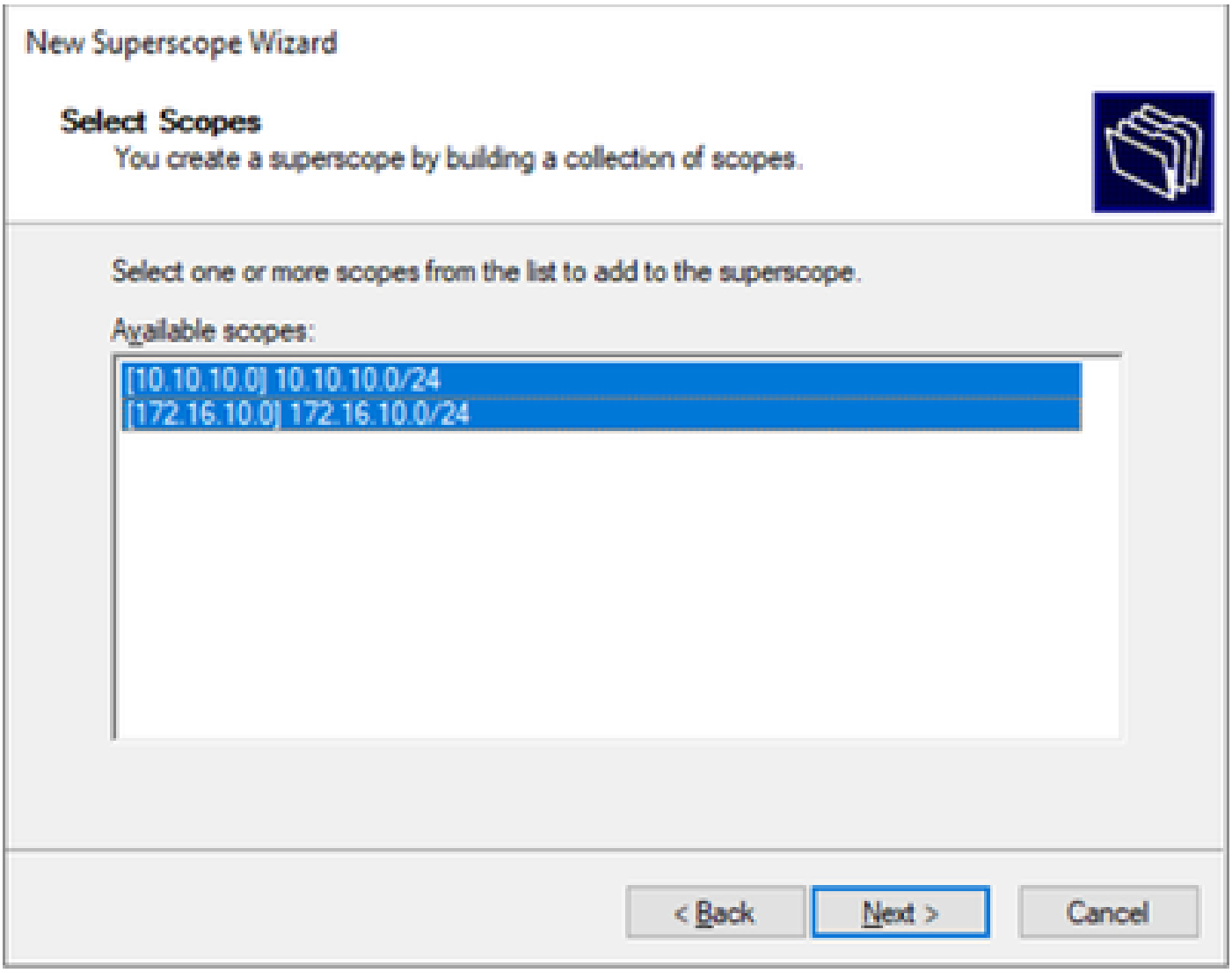
Etapa 3. Escreva o nome do superescopo.



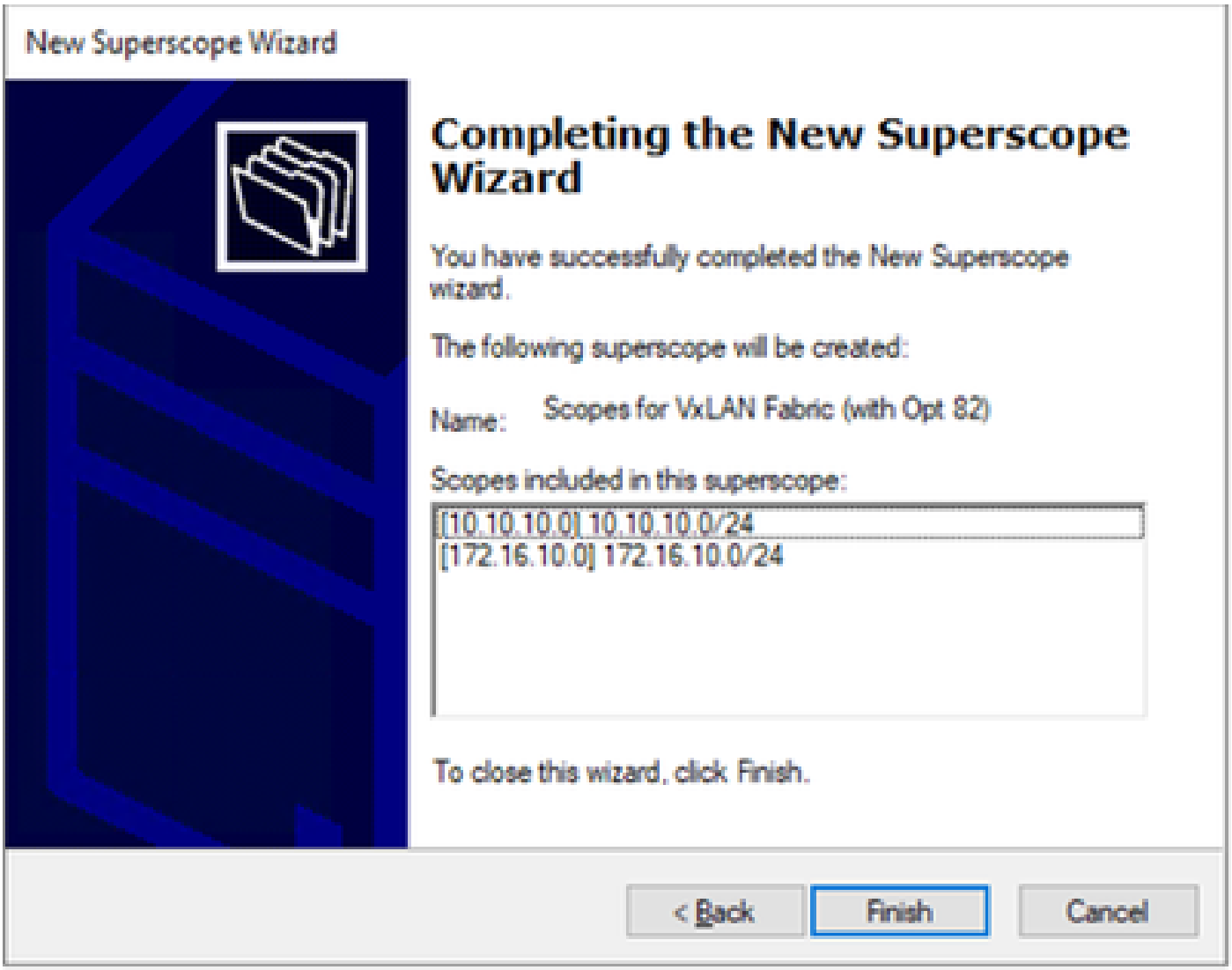
Etapa 4. Selecione todos os escopos que pertencem ao VxLAN Fabric.



Etapa 5. Selecione todos os escopos que pertencem ao VxLAN Fabric.

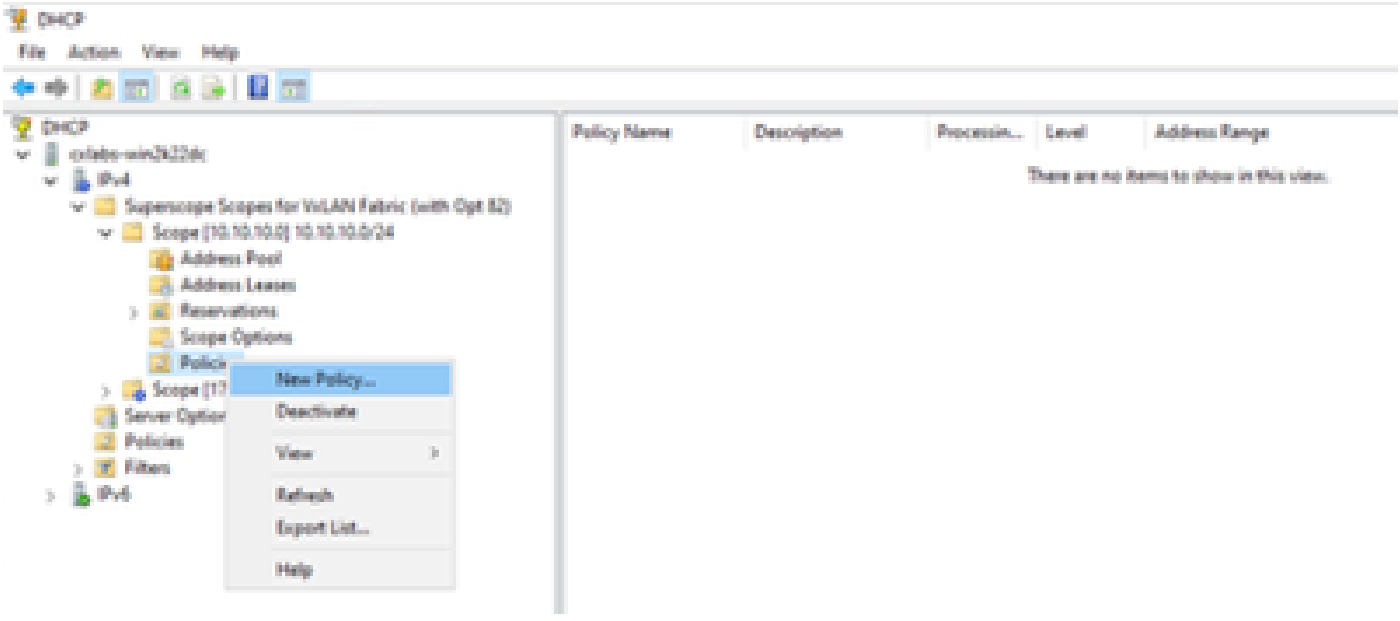


Etapa 6. Verifique se todos os superescopos de estrutura VxLAN estão no lugar e clique em Finish.

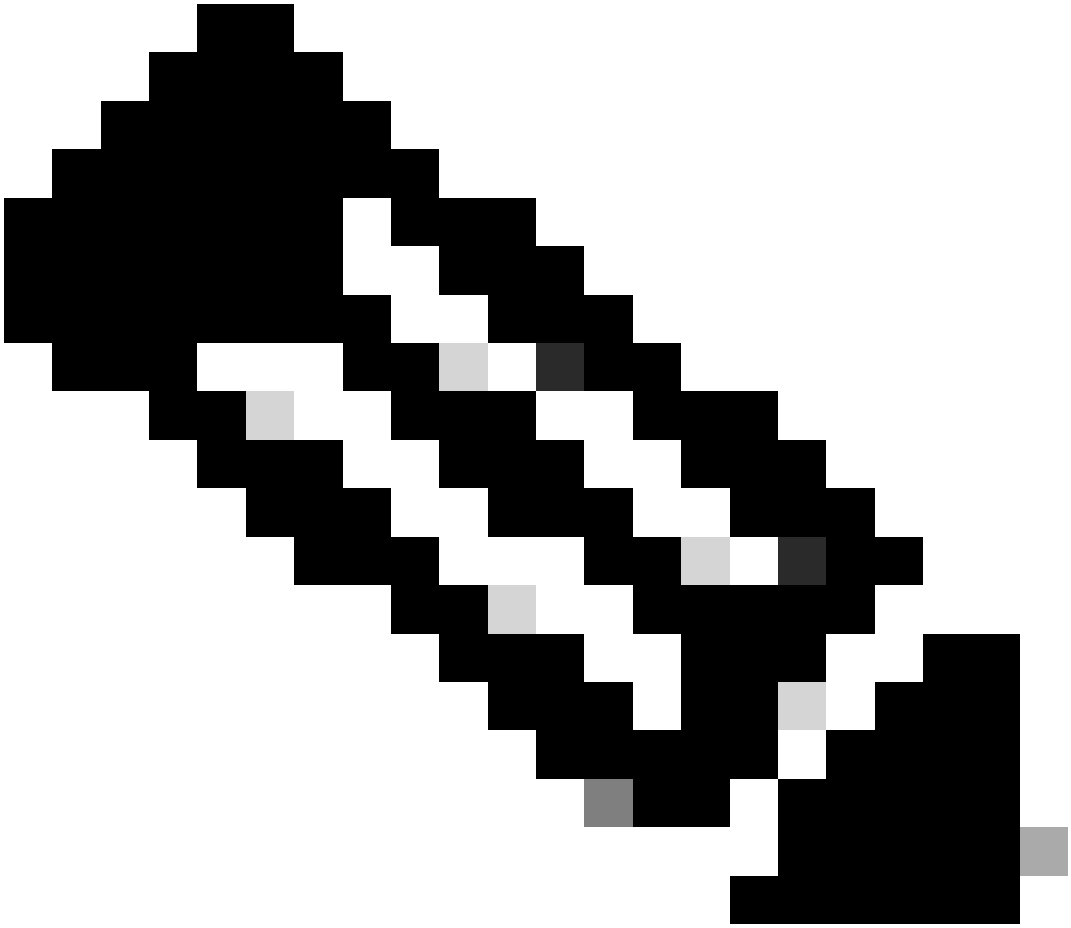


Configure a Opção 82 em escopos de host.

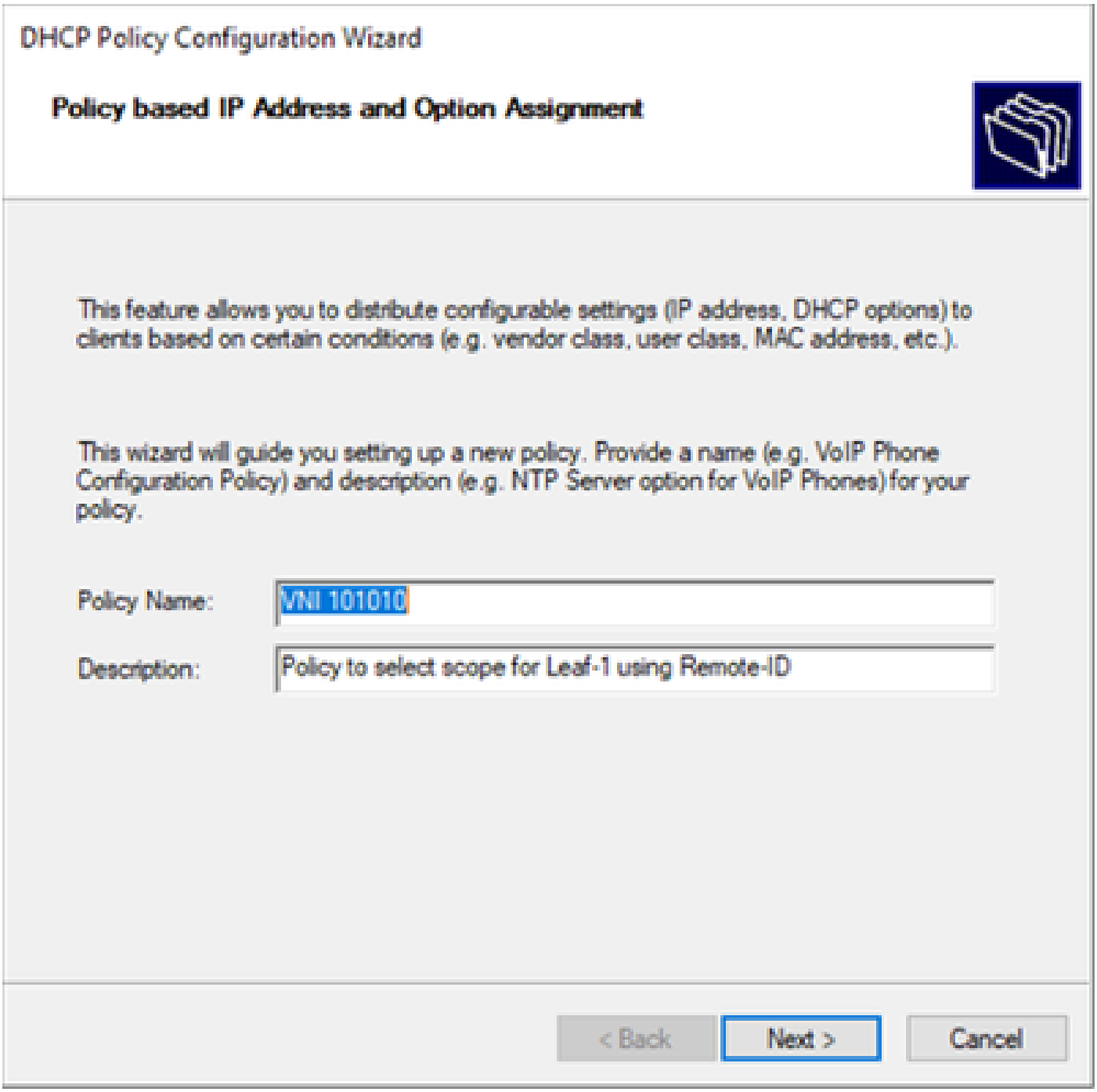
Etapa 1. Clique com o botão direito do mouse em Policies (last option) dentro do escopo para o host e clique em New Policy.



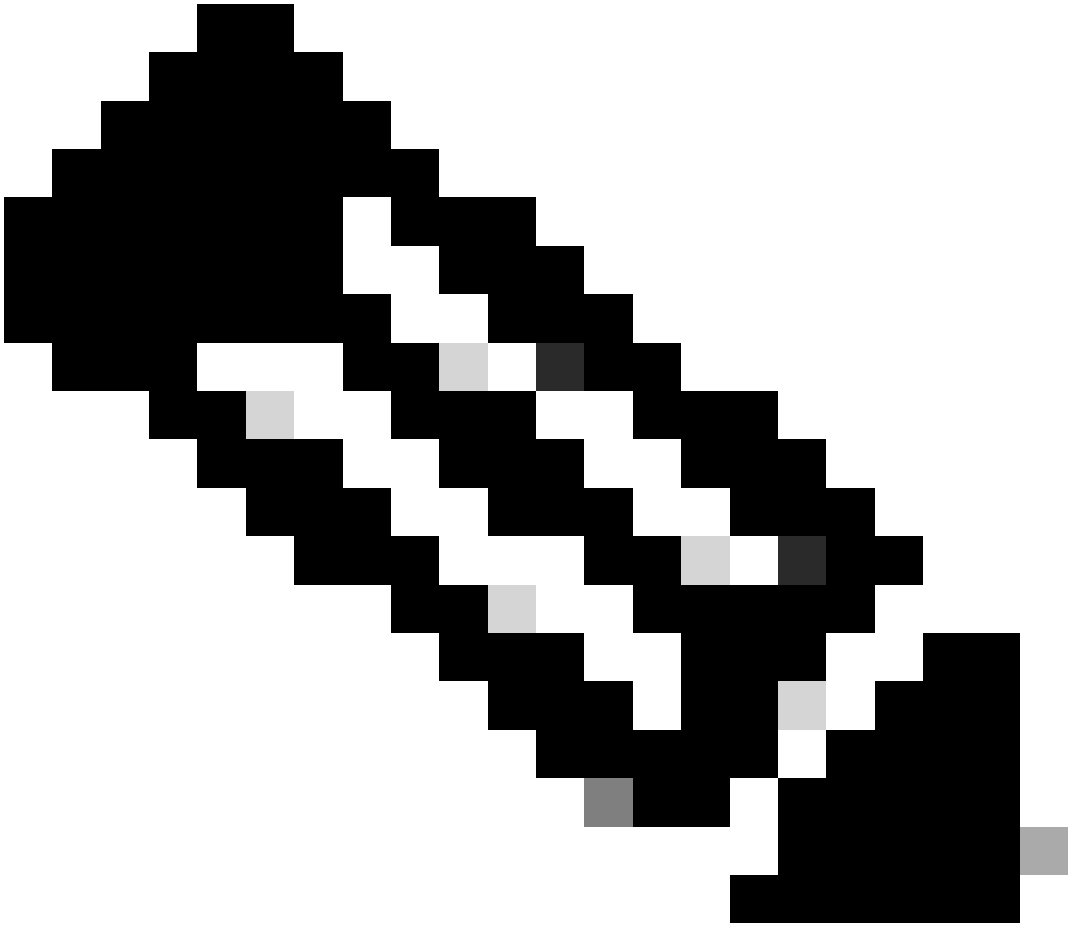
Etapa 2. Escreva um nome e uma descrição e clique em Avançar.



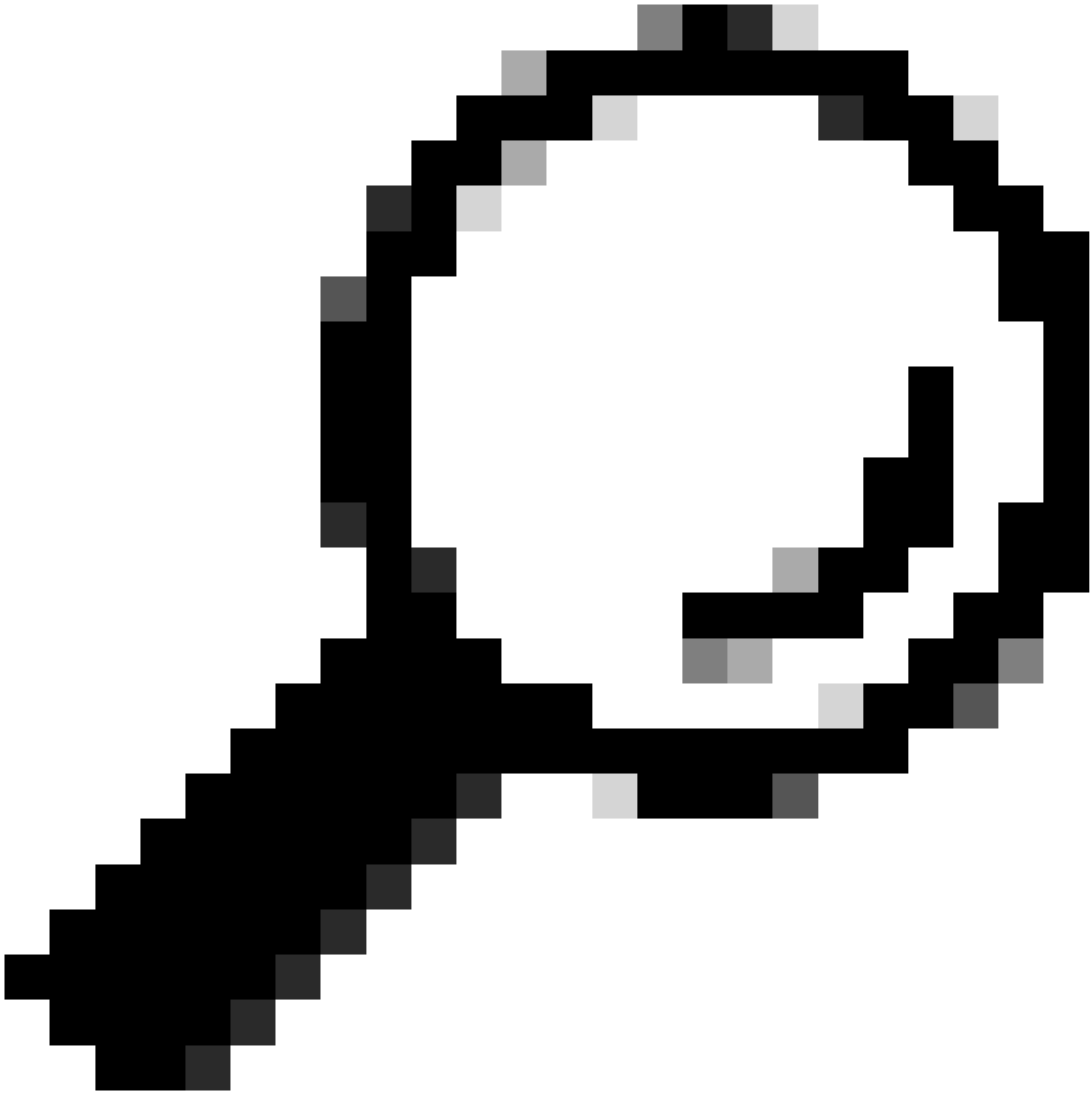
Observação: neste exemplo, a política é criada para selecionar o endereço IP paIP, especialmente para hosts em Leaf-1 para VNI 101010 basedVNI Remote-ID (parâmetro da Opção 82).



Etapa 3. Clique em Add. Em Critérios, selecione Informações do Agente de Retransmissão. Em Operador, selecione Iguais. Em seguida, selecione ID remota do agente e digite o valor. Clique em OK e em Avançar.

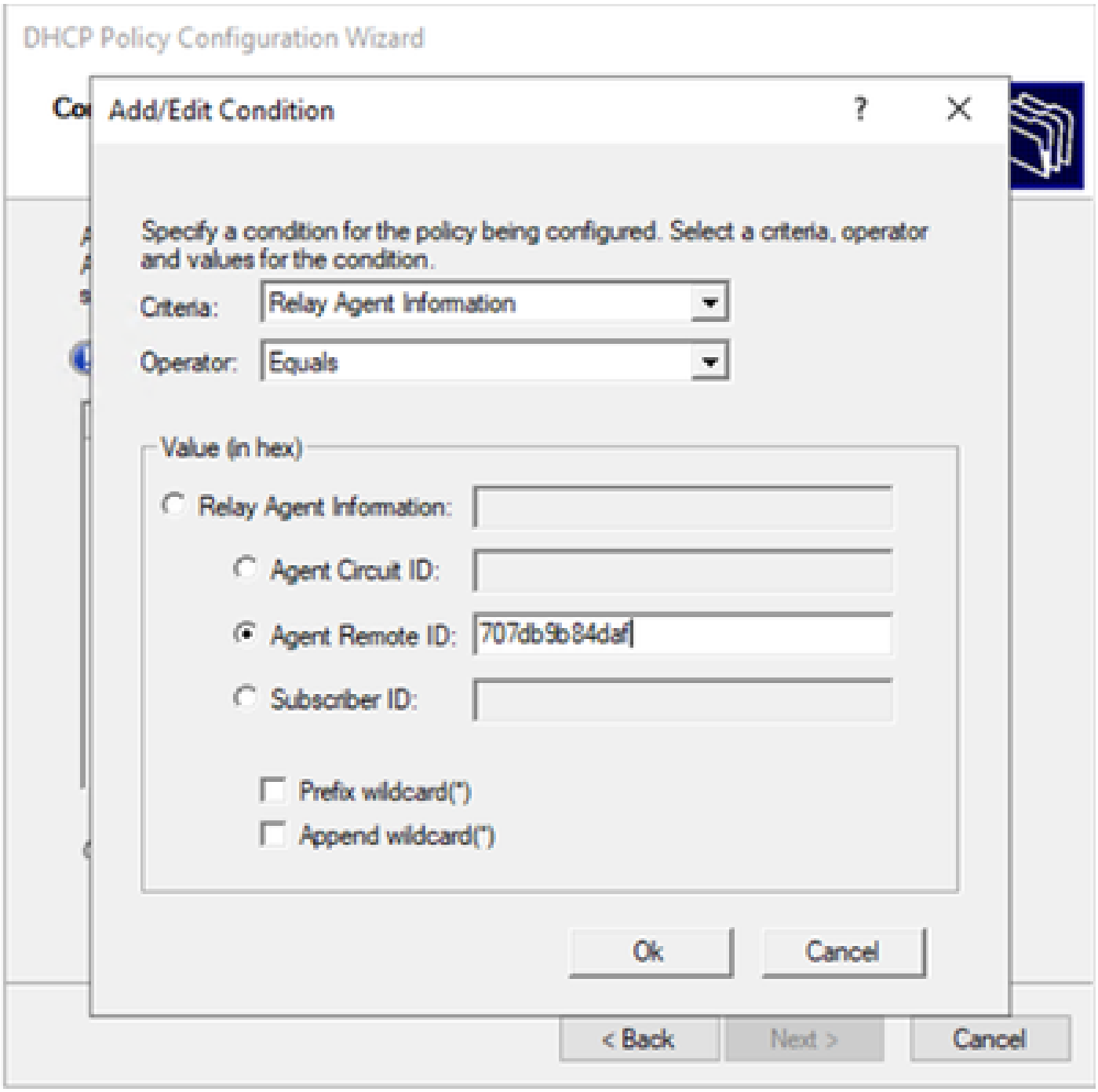


Observação: o ID remoto é obtido do endereço MAC do SVI ao qual o SVII está associado.

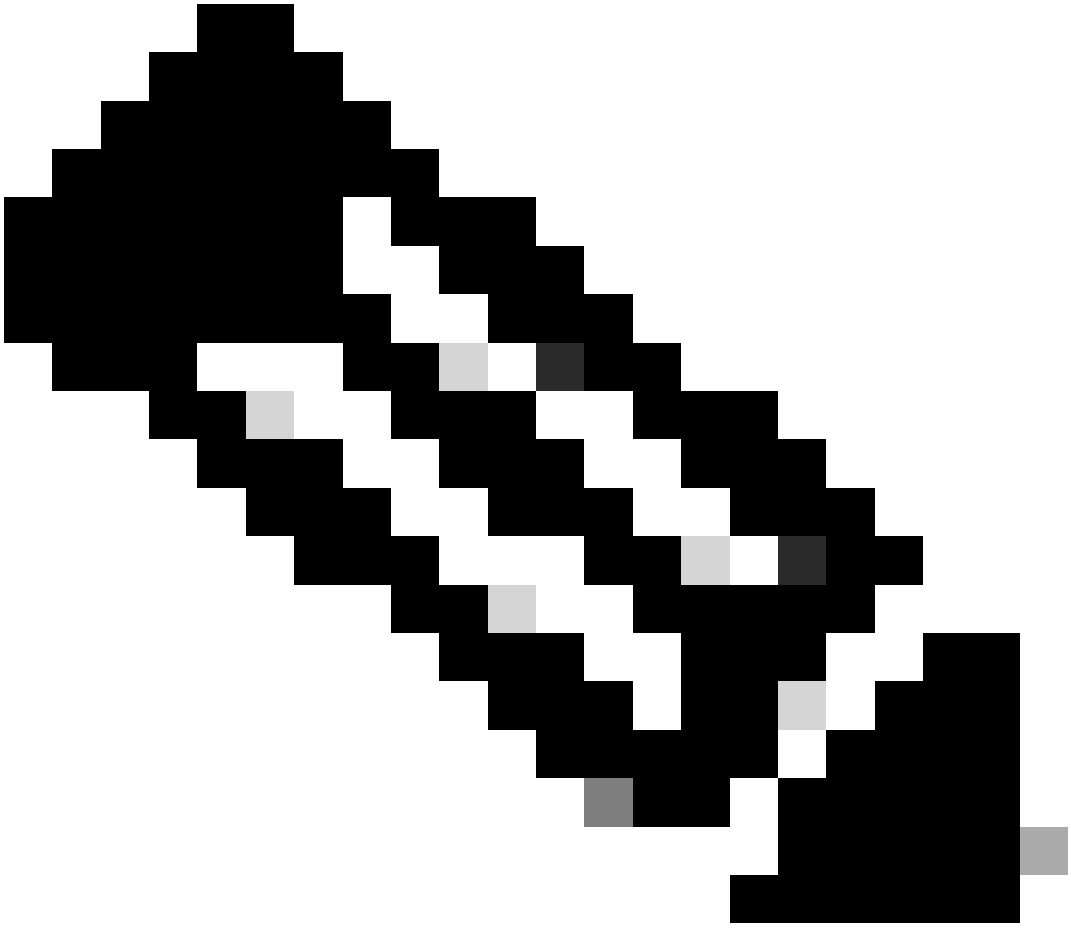


Dica: uma política pode ser aplicada a várias IDs remotas (ou VTEPs) adicionando mais condições e selecionando OU em vez de E.

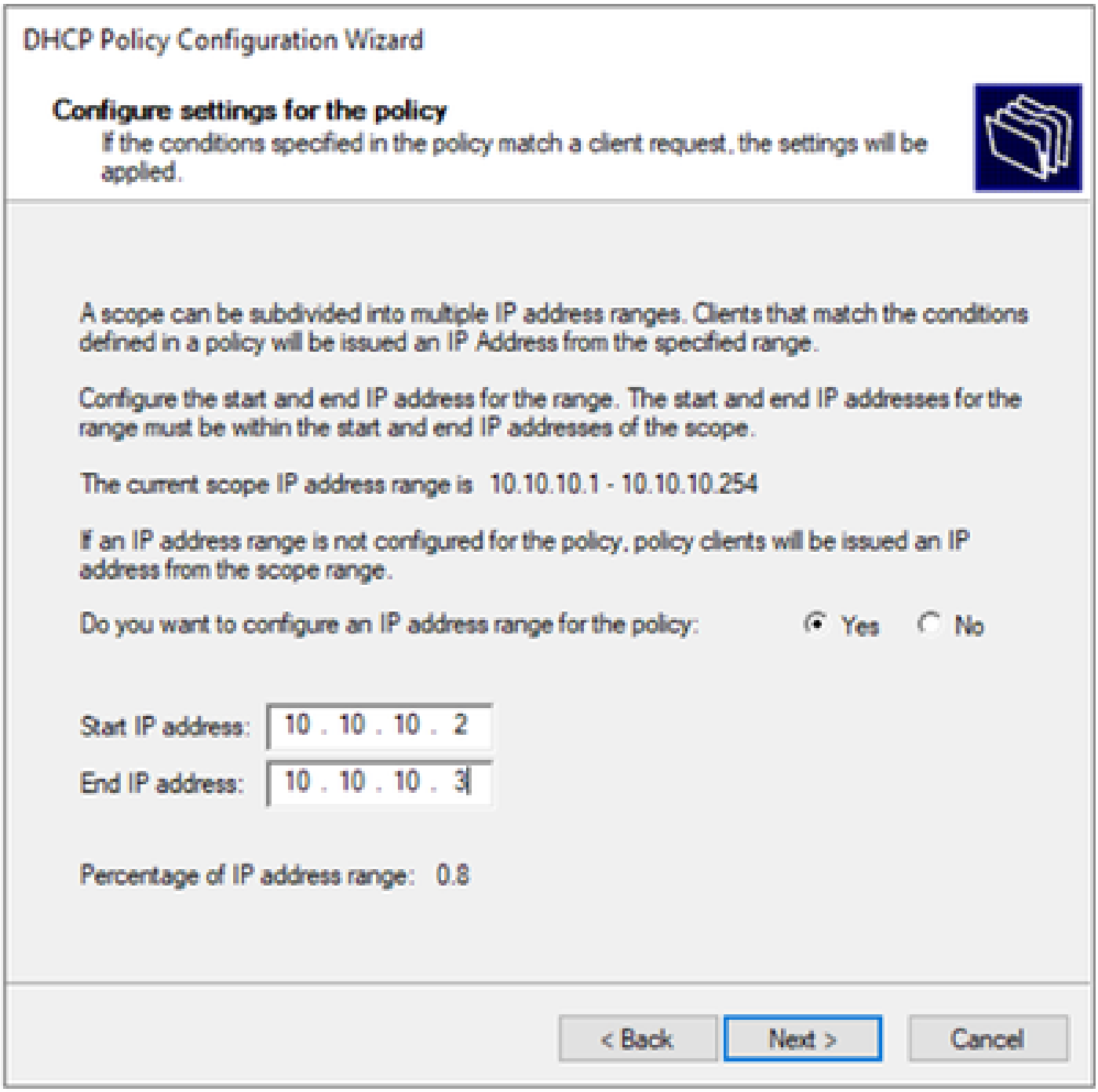
```
LEAF-1# show interface vlan 10
Vlan10 is up, line protocol is up, autostate enabled
  Hardware is EtherSVI, address is  707d.b9b8.4daf <<<<
  Internet Address is 10.10.10.1/24
 <snip>
```



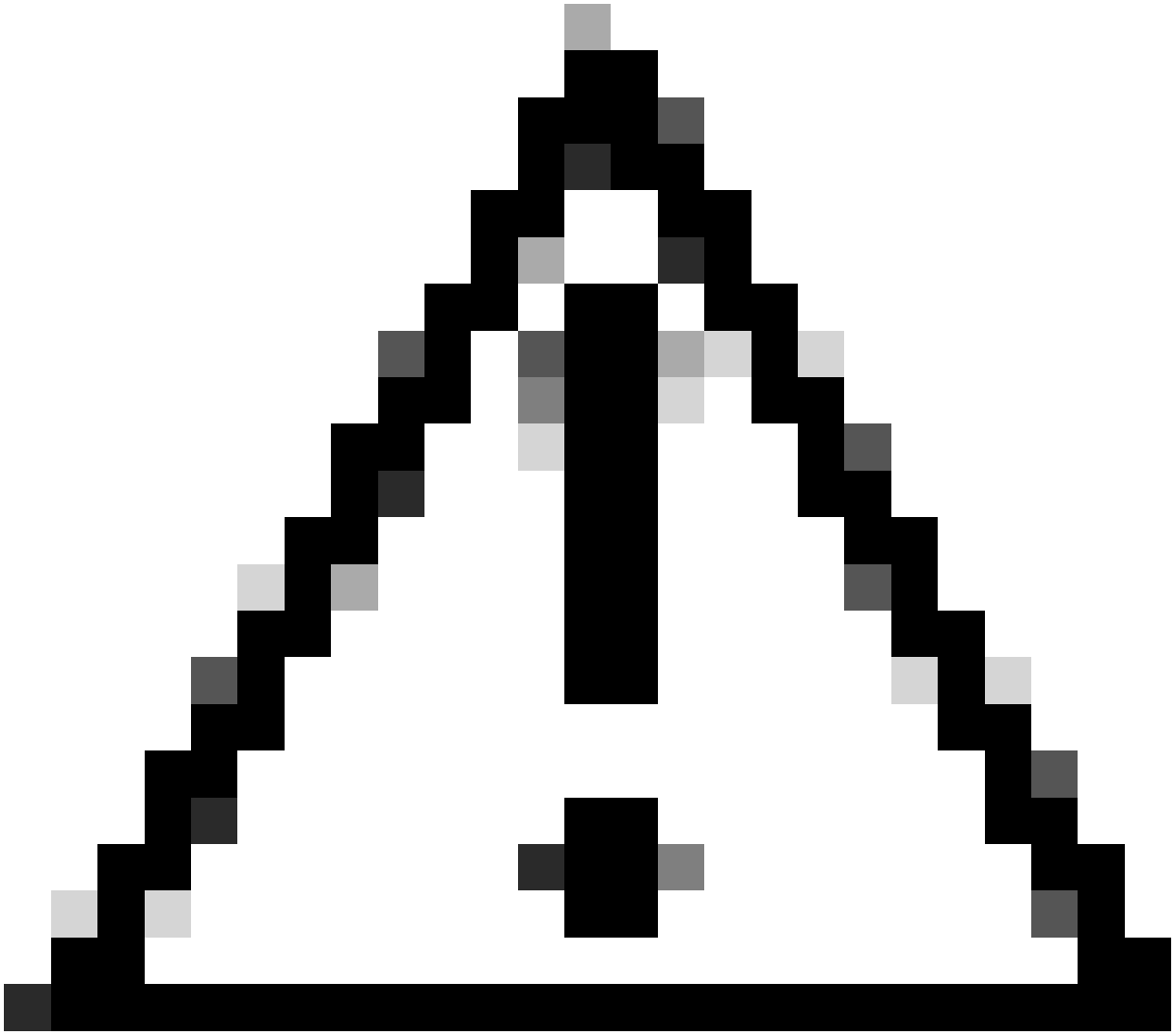
Etapa 4. Configure o endereçamento IP que o IP existente pode usar no(s) VTEP(s) selecionado(s) pelo ID e clique em Avançar.



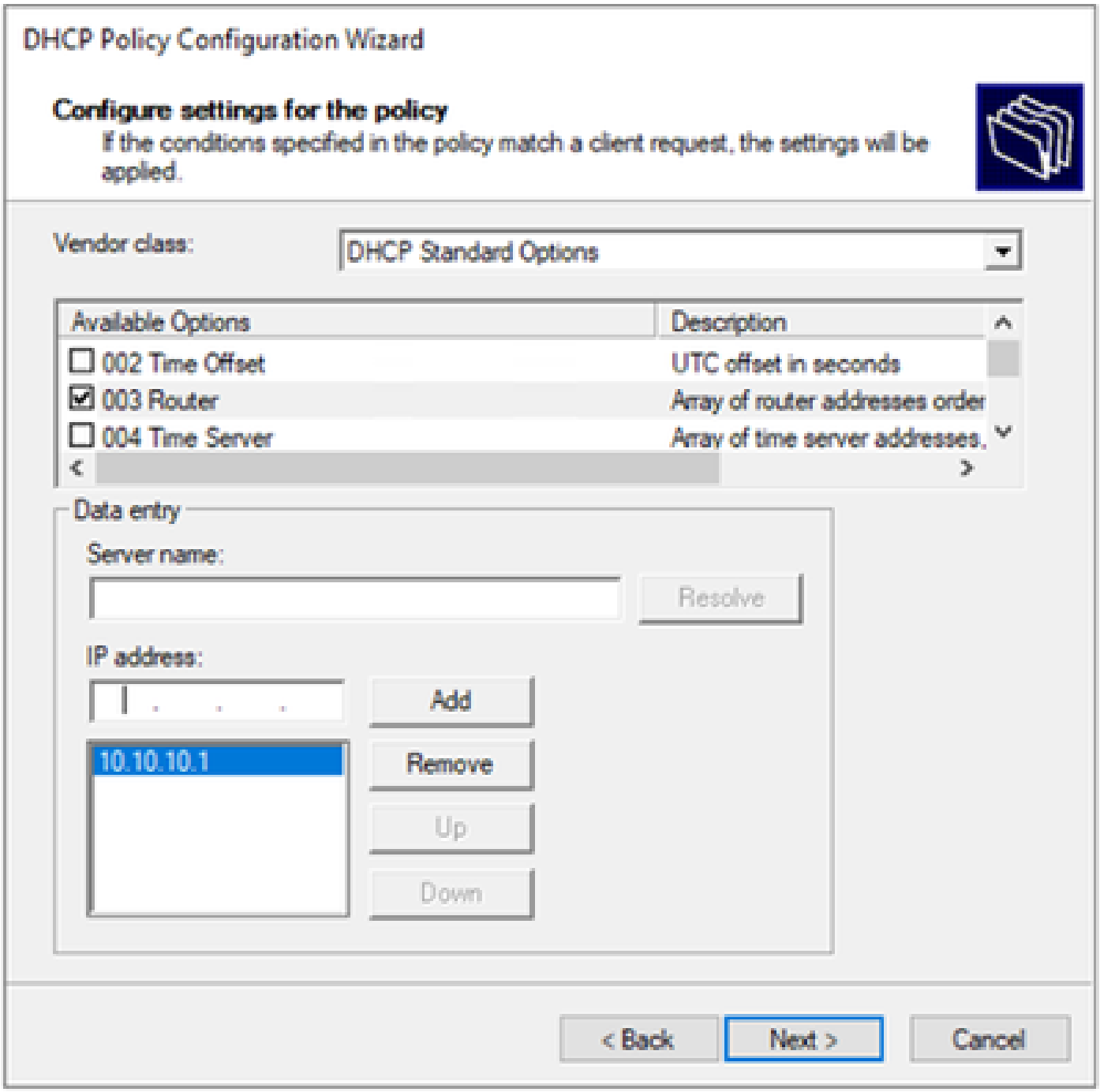
Observação: neste exemplo, há apenas uma máquina virtual conectada à Leaf-1, portanto, apenas um endereço IP requer IPd. Aqui um segundo endereço IP é adicionadoIP caso outro host se conecte.



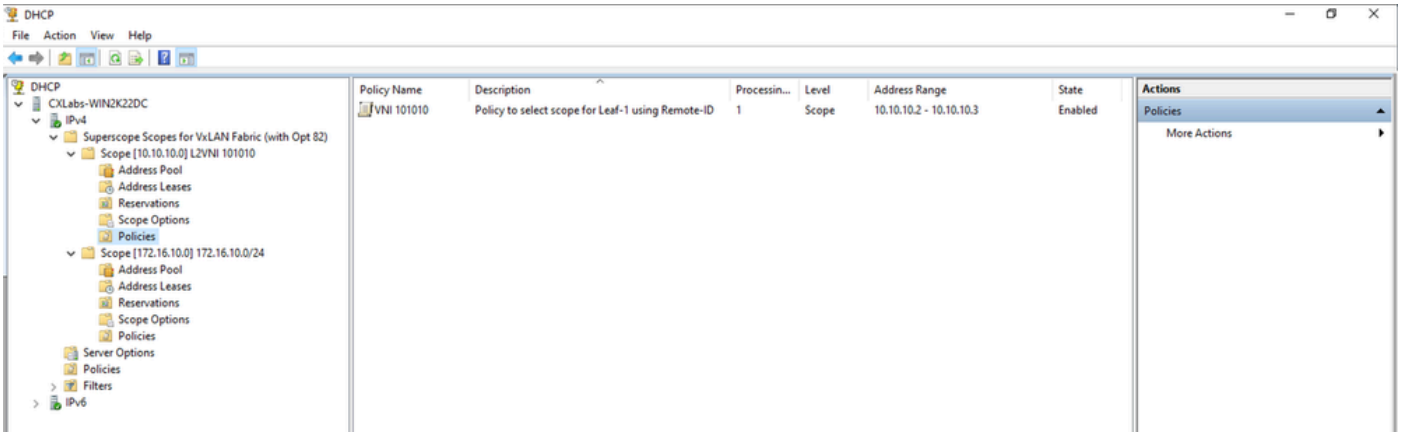
Etapa 5. Selecione a caixa à esquerda de 003 Router (Roteador 003) em DCHP Standard Option. Em seguida, escreva o endereço IP do gateway padrão para os hosts que pertencem a essa política e pressione Adicionar. Clique em Next.



Cuidado: Você pode selecionar mais de uma opção, mas se não tiver certeza de qual valor informar, não o faça. Configuração inconsistente ou incorreta pode causar comportamento inesperado.



Etapa 6. Verifique as condições da política e clique em Finish.

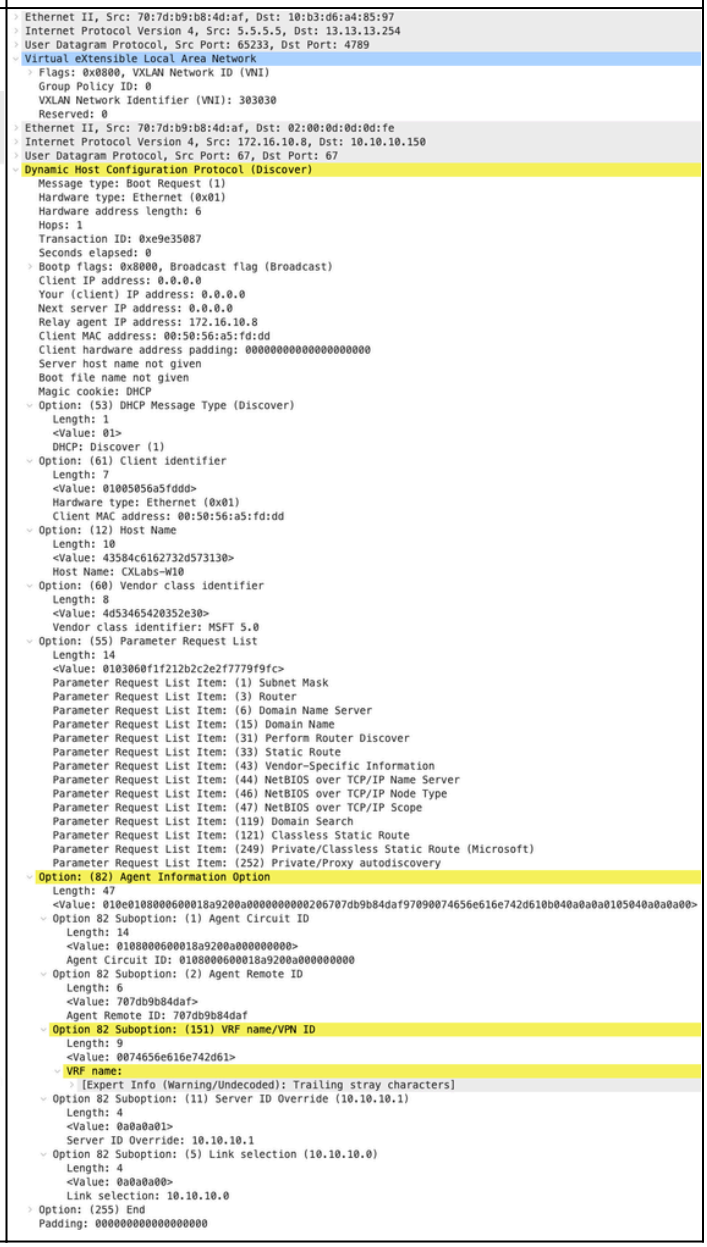


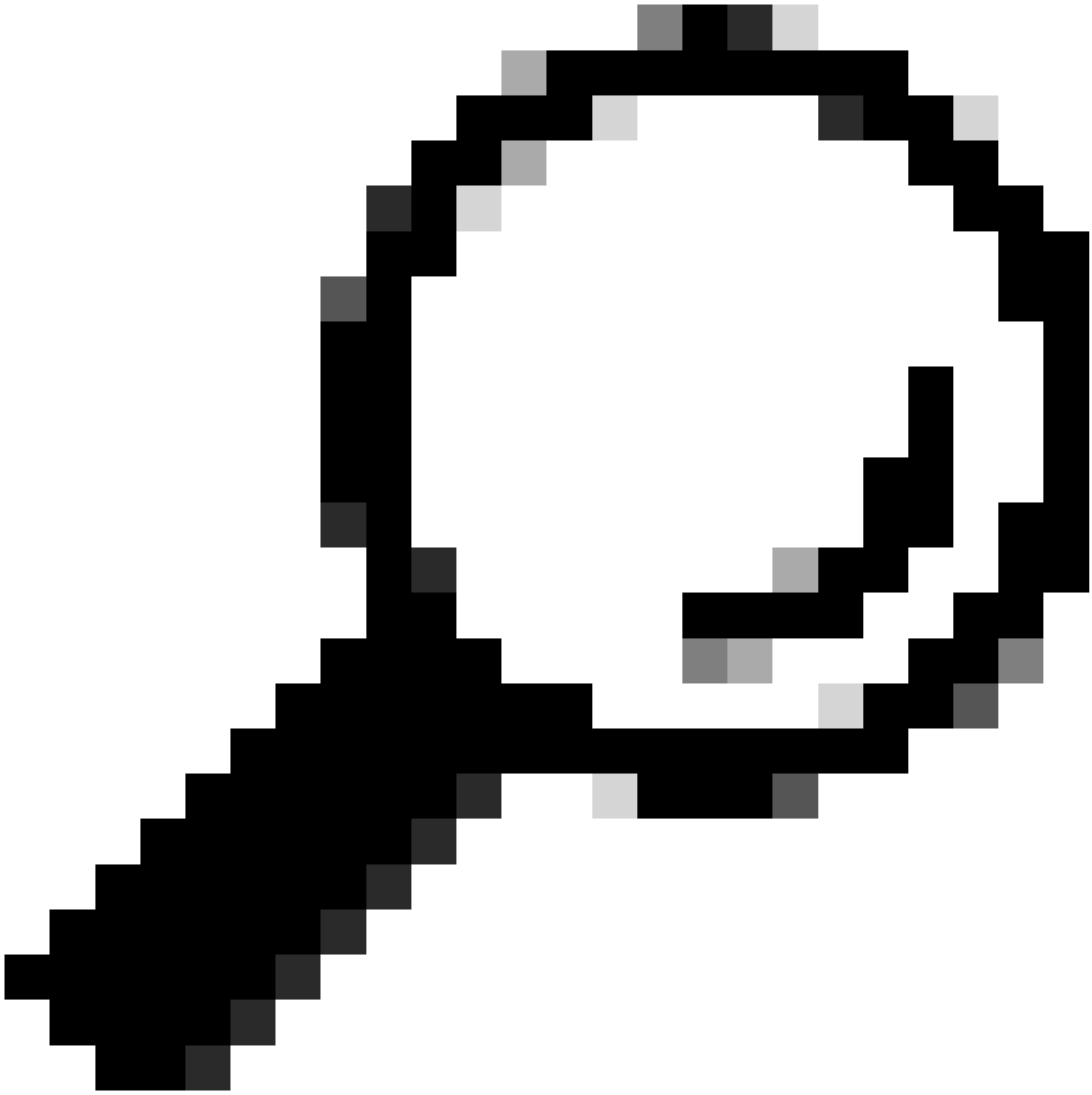
Pacote de caminho do DCHP do início ao fim em VxLAN Fabric.

Envio de descoberta por HOST-1

```
> Ethernet II, Src: 00:50:56:a5:fd:dd, Dst: ff:ff:ff:ff:ff:ff
> Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
> User Datagram Protocol, Src Port: 68, Dst Port: 67
v Dynamic Host Configuration Protocol (Discover)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  v Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
      .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0
    Your (client) IP address: 0.0.0.0
    Next server IP address: 0.0.0.0
    Relay agent IP address: 0.0.0.0
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  v Option: (53) DHCP Message Type (Discover)
      Length: 1
      <Value: 01>
      DHCP: Discover (1)
  v Option: (61) Client identifier
      Length: 7
      <Value: 01005056a5fddd>
      Hardware type: Ethernet (0x01)
      Client MAC address: 00:50:56:a5:fd:dd
  v Option: (12) Host Name
      Length: 10
      <Value: 43584c6162732d573130>
      Host Name: CXLabs-W10
  v Option: (60) Vendor class identifier
      Length: 8
      <Value: 4d53465420352e30>
      Vendor class identifier: MSFT 5.0
  v Option: (55) Parameter Request List
      Length: 14
      <Value: 0103060f1f212b2c2e2f7779f9fc>
      Parameter Request List Item: (1) Subnet Mask
      Parameter Request List Item: (3) Router
      Parameter Request List Item: (6) Domain Name Server
      Parameter Request List Item: (15) Domain Name
      Parameter Request List Item: (31) Perform Router Discover
      Parameter Request List Item: (33) Static Route
      Parameter Request List Item: (43) Vendor-Specific Information
      Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
      Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
      Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
      Parameter Request List Item: (119) Domain Search
      Parameter Request List Item: (121) Classless Static Route
      Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
      Parameter Request List Item: (252) Private/Proxy autodiscovery
  v Option: (255) End
      Option End: 255
    Padding: 000000000000000000
```

Descoberta no LEAF-1

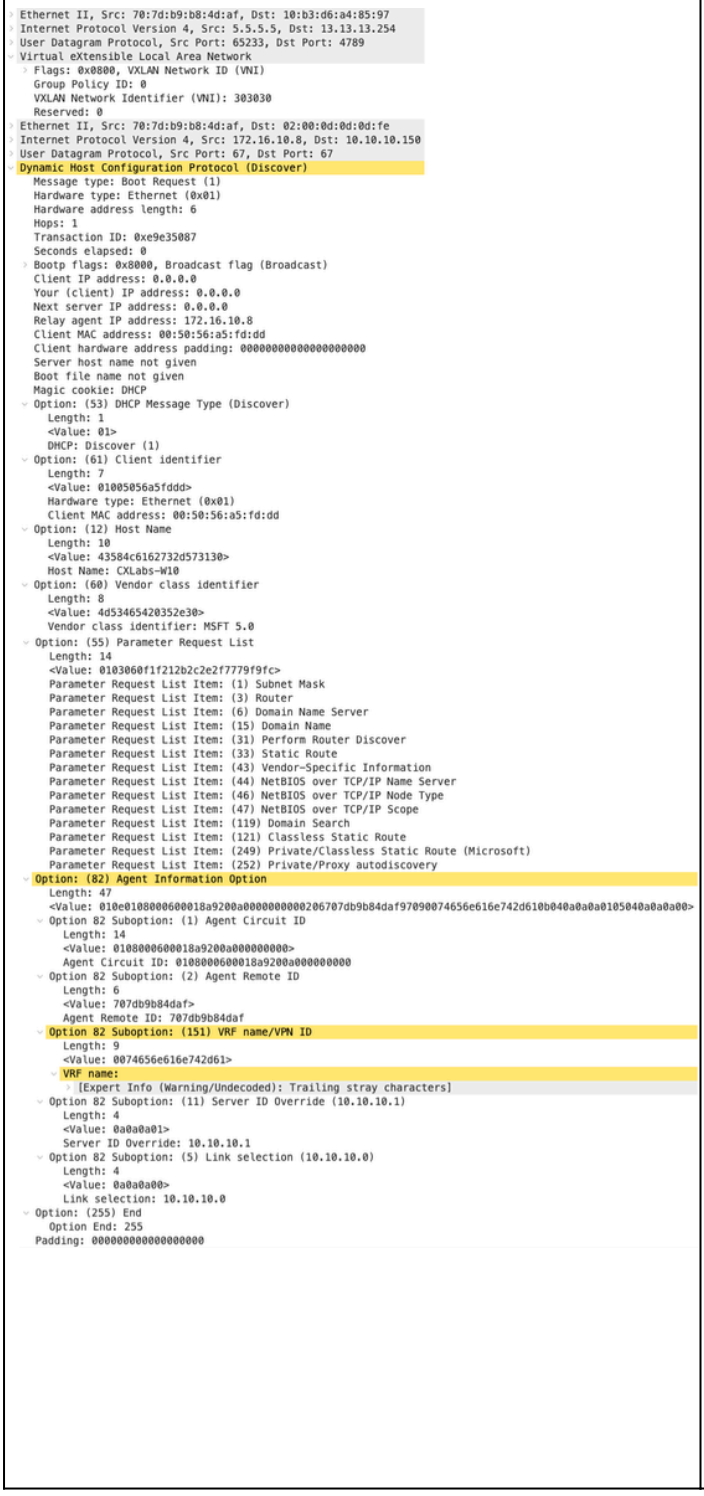
Descoberta recebida no LEAF-1	Envio de descoberta por LEAF-1
	

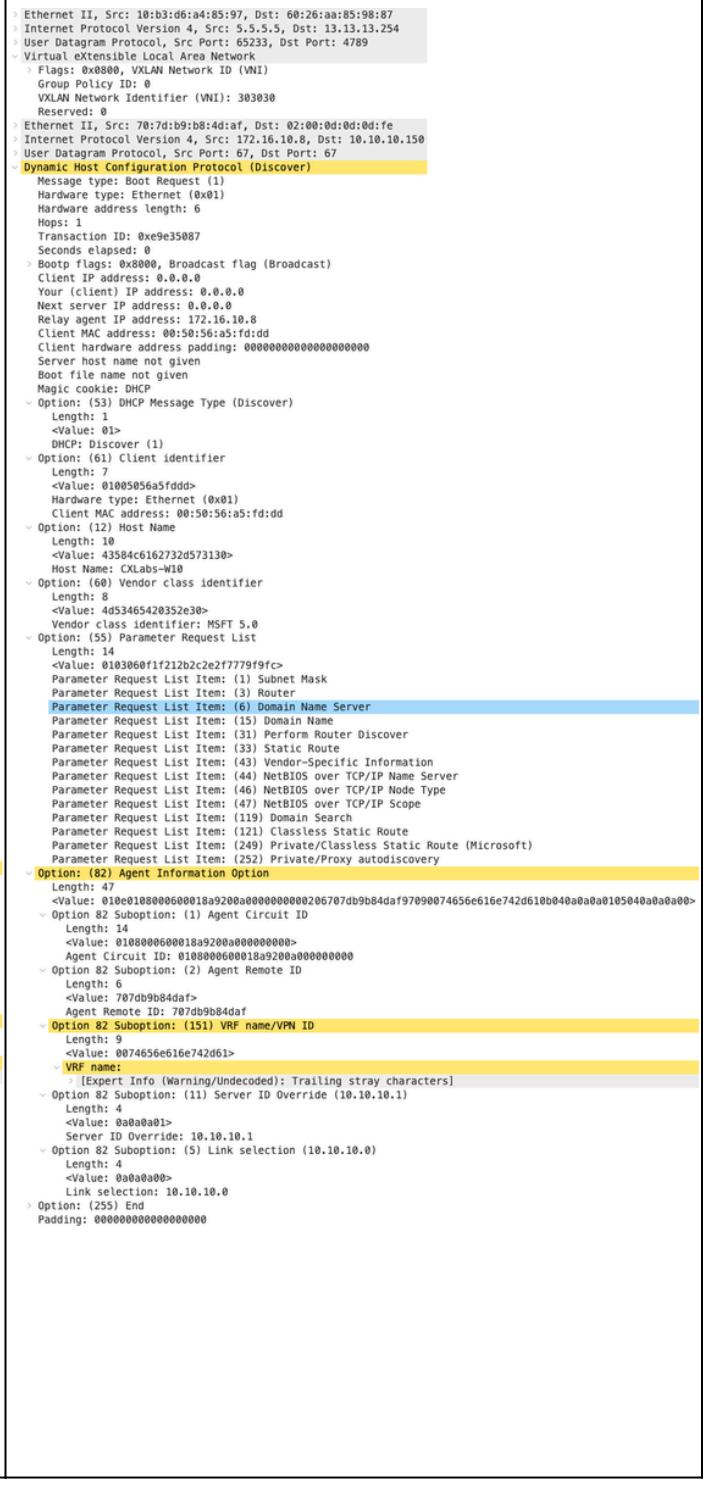


Dica: a imagem é ampliada quando você clica duas vezes.

Descoberta na SPINE

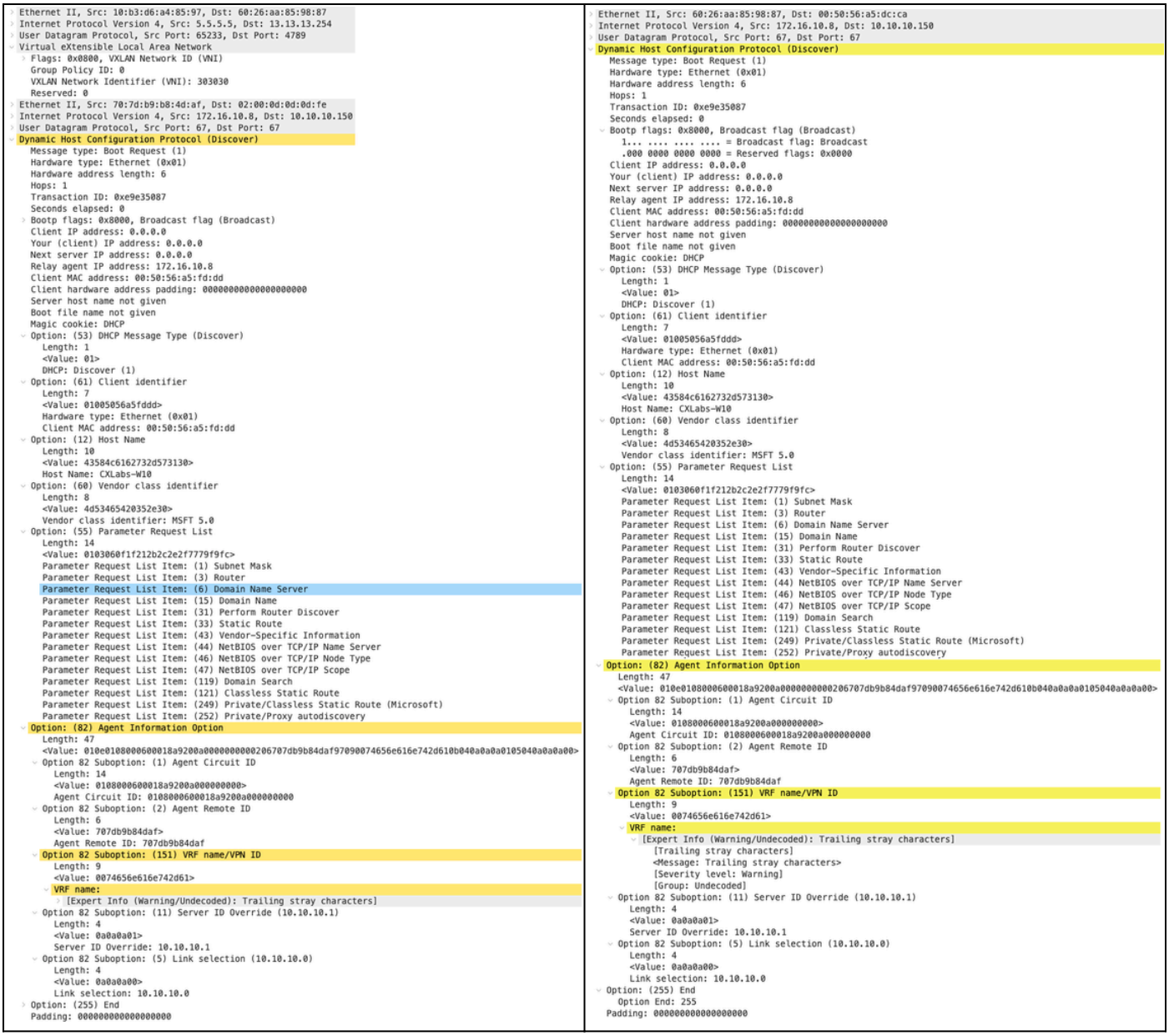
Descoberta recebida em SPINE	Envio de descoberta por SPINE

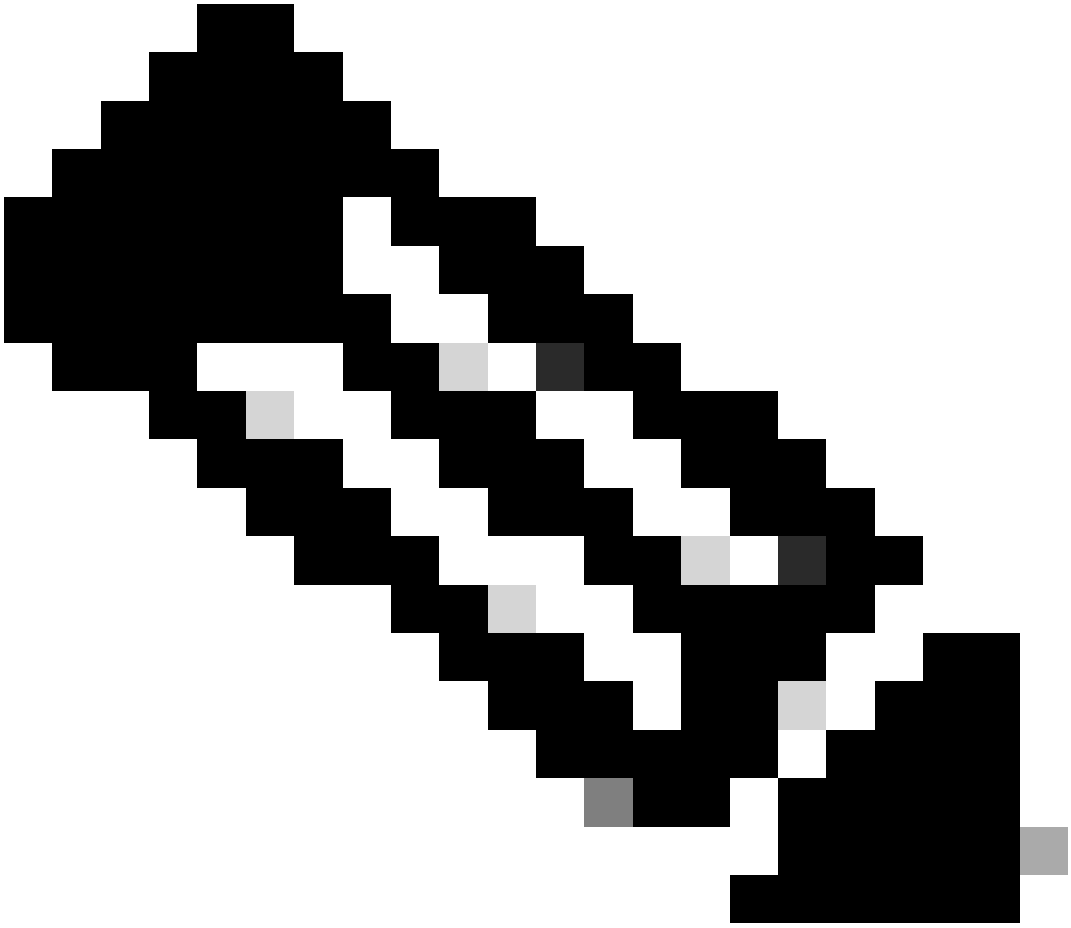




Descoberta no LEAF-1-vPC

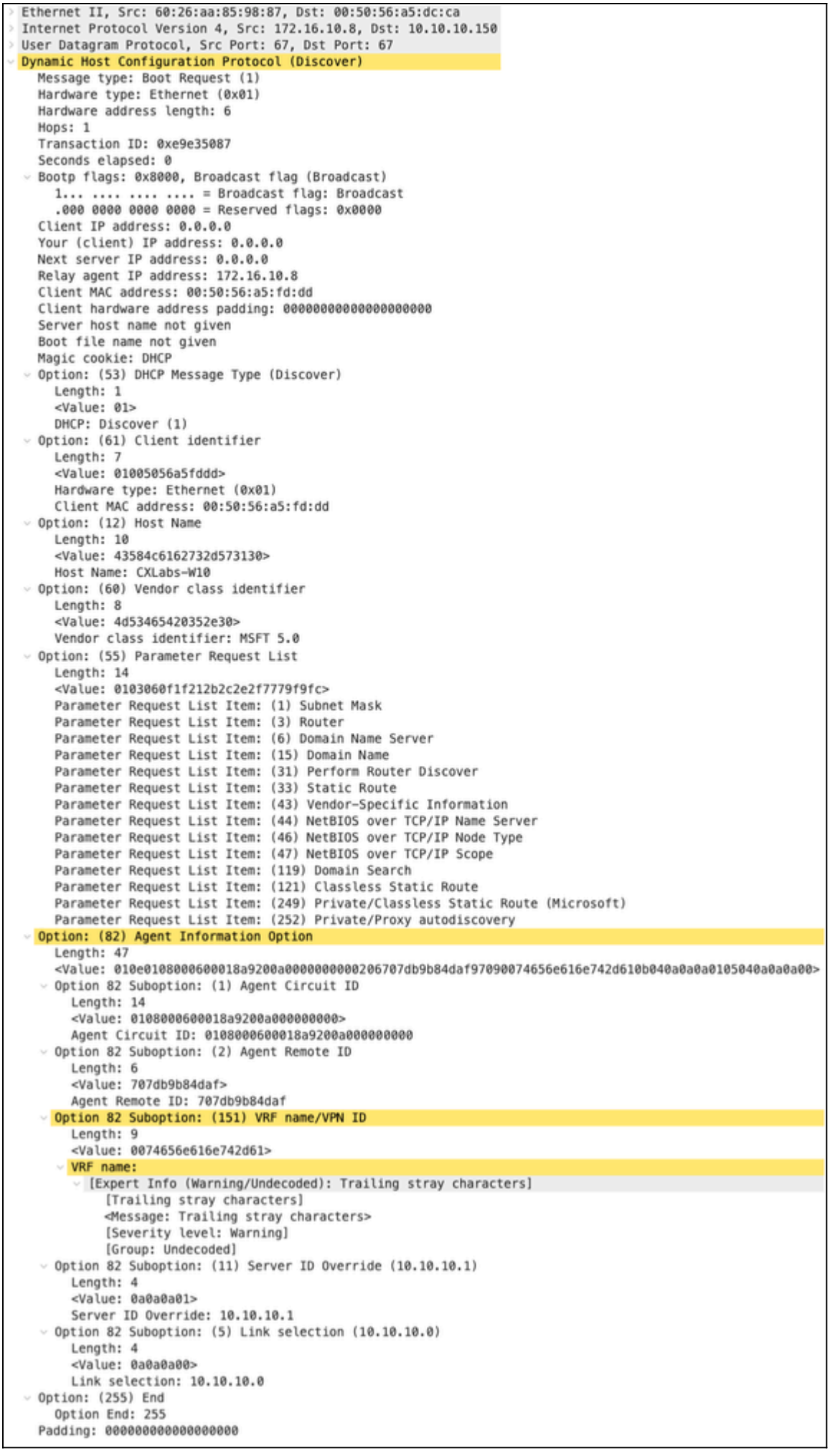
Descoberta recebida no LEAF-1-vPC	Envio de descoberta por LEAF-1-vPC


Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 60:26:aa:85:98:87
Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
User Datagram Protocol, Src Port: 65233, Dst Port: 4789
Virtual eXtensible Local Area Network
Flags: 0x0800, VXLAN Network ID (VNI)
Group Policy ID: 0
VXLAN Network Identifier (VNI): 303030
Reserved: 0
Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 1
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Discover)
Length: 1
<Value: 01>
DHCP: Discover (1)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Padding: 000000000000000000
Ethernet II, Src: 60:26:aa:85:98:87, Dst: 00:50:56:a5:dc:ca
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 1
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Discover)
Length: 1
<Value: 01>
DHCP: Discover (1)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
[Trailing stray characters]
<Message: Trailing stray characters>
[Severity level: Warning]
[Group: Undecoded]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255
Padding: 000000000000000000

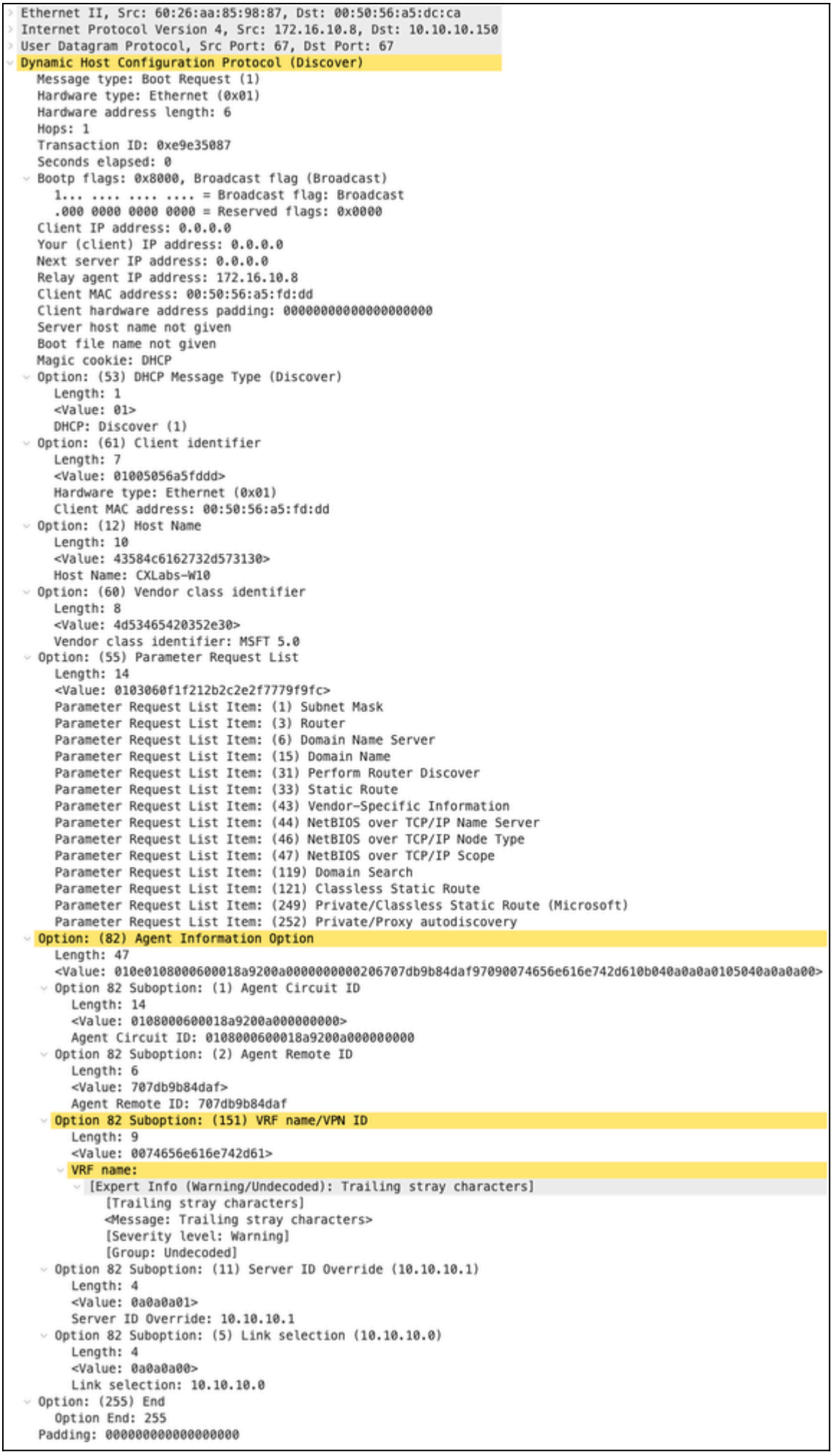


Observação: LEAF-2-vPC recebe o pacote Discovert, mas isso só é comutado. O endereço MAC de destino pertence ao servidor DHCP.

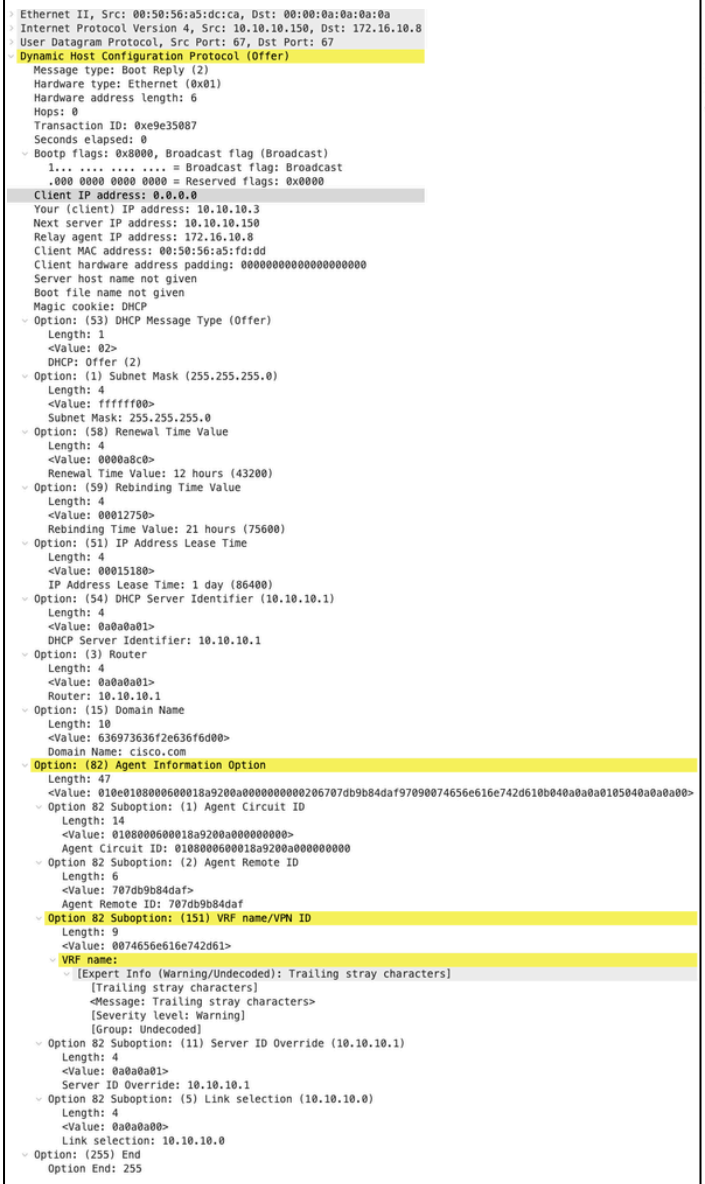
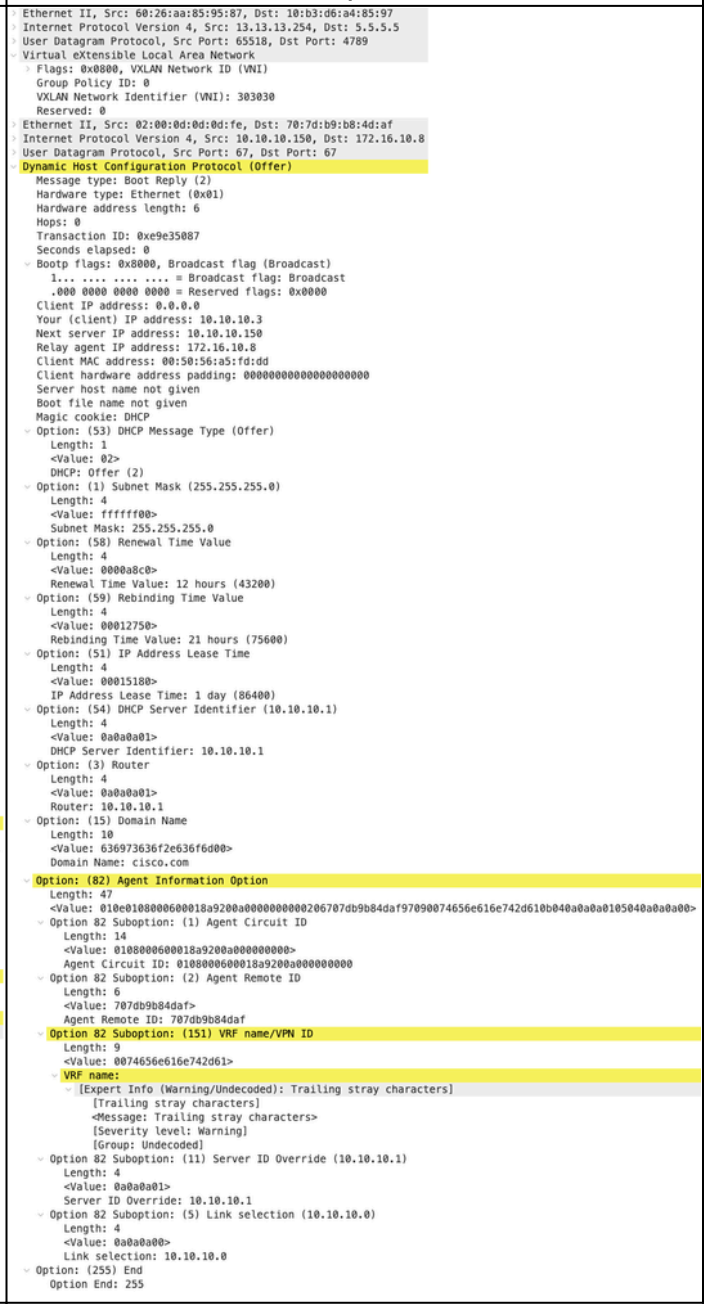
Descoberta recebida no Servidor DHCP


Ethernet II, Src: 60:26:aa:85:98:87, Dst: 00:50:56:a5:dc:ca
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 1
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Discover)
Length: 1
<Value: 01>
DHCP: Discover (1)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
[Trailing stray characters]
<Message: Trailing stray characters>
[Severity level: Warning]
[Group: Undecoded]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255
Padding: 000000000000000000

Oferta DCHP enviada pelo servidor DCHP


Ethernet II, Src: 60:26:aa:85:98:87, Dst: 00:50:56:a5:dc:ca
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 1
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Discover)
Length: 1
<Value: 01>
DHCP: Discover (1)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
[Trailing stray characters]
<Message: Trailing stray characters>
[Severity level: Warning]
[Group: Undecoded]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255
Padding: 000000000000000000

Oferta DCHP em LEAF-2-vPC

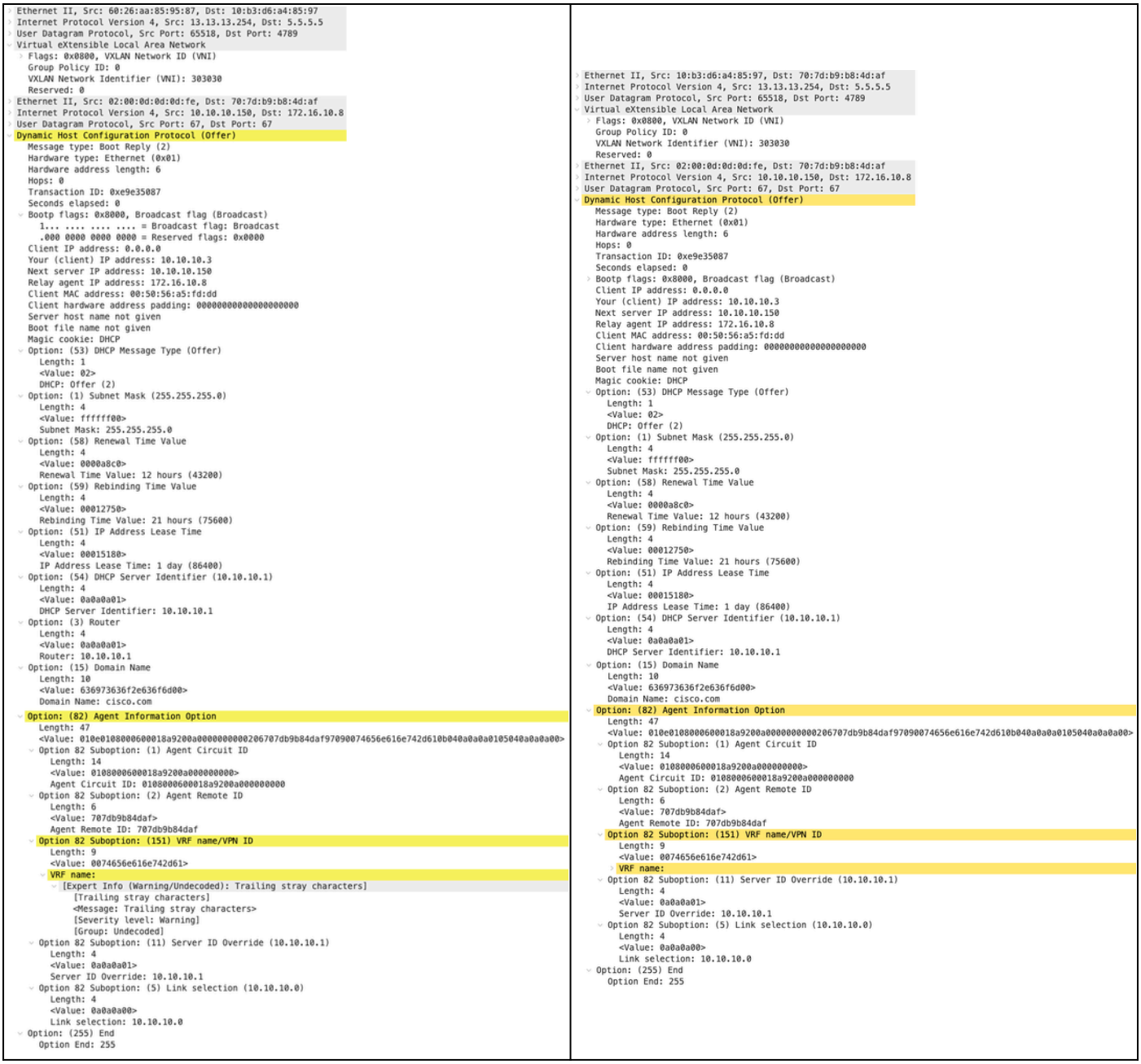
Oferta recebida em LEAF-2-vPC	Oferta enviada por LEAF-2-vPC
	

```
Ethernet II, Src: 00:50:56:a5:dc:ca, Dst: 00:00:0a:0a:0a:0a
Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
      .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0
    Your (client) IP address: 10.10.10.3
    Next server IP address: 10.10.10.150
    Relay agent IP address: 172.16.10.8
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  Option: (53) DHCP Message Type (Offer)
      Length: 1
      <Value: 02>
      DHCP: Offer (2)
  Option: (1) Subnet Mask (255.255.255.0)
      Length: 4
      <Value: ffffff00>
      Subnet Mask: 255.255.255.0
  Option: (58) Renewal Time Value
      Length: 4
      <Value: 0000a8c0>
      Renewal Time Value: 12 hours (43200)
  Option: (59) Rebinding Time Value
      Length: 4
      <Value: 00012750>
      Rebinding Time Value: 21 hours (75600)
  Option: (51) IP Address Lease Time
      Length: 4
      <Value: 00015180>
      IP Address Lease Time: 1 day (86400)
  Option: (54) DHCP Server Identifier (10.10.10.1)
      Length: 4
      <Value: 0a0a0a01>
      DHCP Server Identifier: 10.10.10.1
  Option: (3) Router
      Length: 4
      <Value: 0a0a0a01>
      Router: 10.10.10.1
  Option: (15) Domain Name
      Length: 10
      <Value: 636973636f2e636f6d00>
      Domain Name: cisco.com
  Option: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    Option 82 Suboption: (1) Agent Circuit ID
        Length: 14
        <Value: 0108000600018a9200a000000000>
        Agent Circuit ID: 0108000600018a9200a000000000
    Option 82 Suboption: (2) Agent Remote ID
        Length: 6
        <Value: 707db9b84daf>
        Agent Remote ID: 707db9b84daf
    Option 82 Suboption: (151) VRF name/VPN ID
        Length: 9
        <Value: 0074656e616e742d61>
      VRF name:
        [Expert Info (Warning/Undecoded): Trailing stray characters]
            [Trailing stray characters]
            <Message: Trailing stray characters>
            [Severity level: Warning]
            [Group: Undecoded]
    Option 82 Suboption: (11) Server ID Override (10.10.10.1)
        Length: 4
        <Value: 0a0a0a01>
        Server ID Override: 10.10.10.1
    Option 82 Suboption: (5) Link selection (10.10.10.0)
        Length: 4
        <Value: 0a0a0a00>
        Link selection: 10.10.10.0
  Option: (255) End
      Option End: 255
```

```
Ethernet II, Src: 60:26:aa:85:95:87, Dst: 10:b3:d6:a4:85:97
Internet Protocol Version 4, Src: 13.13.13.254, Dst: 5.5.5.5
User Datagram Protocol, Src Port: 65518, Dst Port: 4789
Virtual eXtensible Local Area Network
  Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN Network Identifier (VNI): 303030
    Reserved: 0
Ethernet II, Src: 02:00:0d:0d:0d:fe, Dst: 70:7d:b9:b8:4d:af
Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
      .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0
    Your (client) IP address: 10.10.10.3
    Next server IP address: 10.10.10.150
    Relay agent IP address: 172.16.10.8
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  Option: (53) DHCP Message Type (Offer)
      Length: 1
      <Value: 02>
      DHCP: Offer (2)
  Option: (1) Subnet Mask (255.255.255.0)
      Length: 4
      <Value: ffffff00>
      Subnet Mask: 255.255.255.0
  Option: (58) Renewal Time Value
      Length: 4
      <Value: 0000a8c0>
      Renewal Time Value: 12 hours (43200)
  Option: (59) Rebinding Time Value
      Length: 4
      <Value: 00012750>
      Rebinding Time Value: 21 hours (75600)
  Option: (51) IP Address Lease Time
      Length: 4
      <Value: 00015180>
      IP Address Lease Time: 1 day (86400)
  Option: (54) DHCP Server Identifier (10.10.10.1)
      Length: 4
      <Value: 0a0a0a01>
      DHCP Server Identifier: 10.10.10.1
  Option: (3) Router
      Length: 4
      <Value: 0a0a0a01>
      Router: 10.10.10.1
  Option: (15) Domain Name
      Length: 10
      <Value: 636973636f2e636f6d00>
      Domain Name: cisco.com
  Option: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    Option 82 Suboption: (1) Agent Circuit ID
        Length: 14
        <Value: 0108000600018a9200a000000000>
        Agent Circuit ID: 0108000600018a9200a000000000
    Option 82 Suboption: (2) Agent Remote ID
        Length: 6
        <Value: 707db9b84daf>
        Agent Remote ID: 707db9b84daf
    Option 82 Suboption: (151) VRF name/VPN ID
        Length: 9
        <Value: 0074656e616e742d61>
      VRF name:
        [Expert Info (Warning/Undecoded): Trailing stray characters]
            [Trailing stray characters]
            <Message: Trailing stray characters>
            [Severity level: Warning]
            [Group: Undecoded]
    Option 82 Suboption: (11) Server ID Override (10.10.10.1)
        Length: 4
        <Value: 0a0a0a01>
        Server ID Override: 10.10.10.1
    Option 82 Suboption: (5) Link selection (10.10.10.0)
        Length: 4
        <Value: 0a0a0a00>
        Link selection: 10.10.10.0
  Option: (255) End
      Option End: 255
```

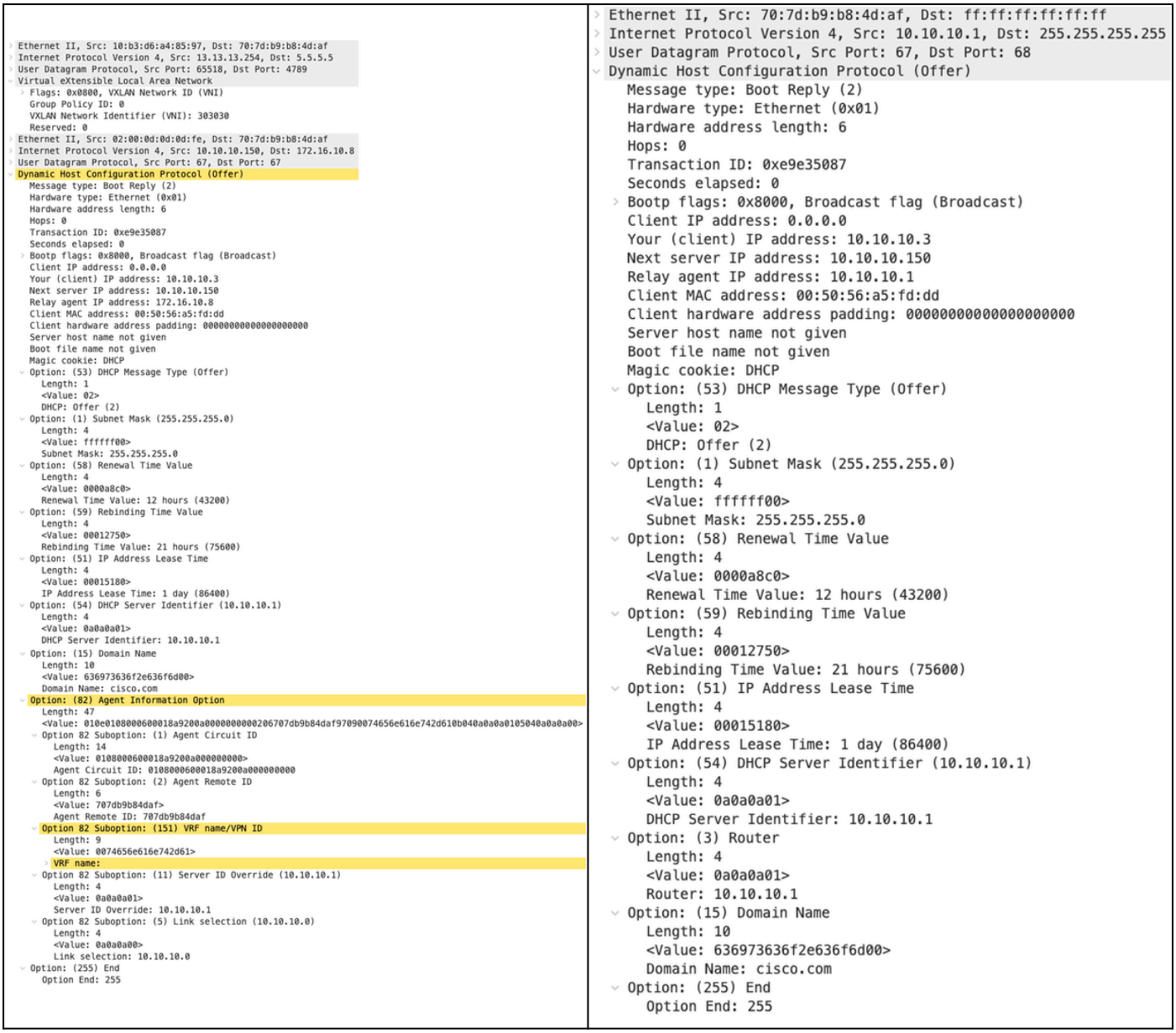
Oferta DHCP vPC SPINE

Oferta recebida em SPINE	Oferta enviada por SPINE



Oferta DHCP no LEAF-1

Oferta recebida no LEAF-1	Oferta enviada no LEAF-1



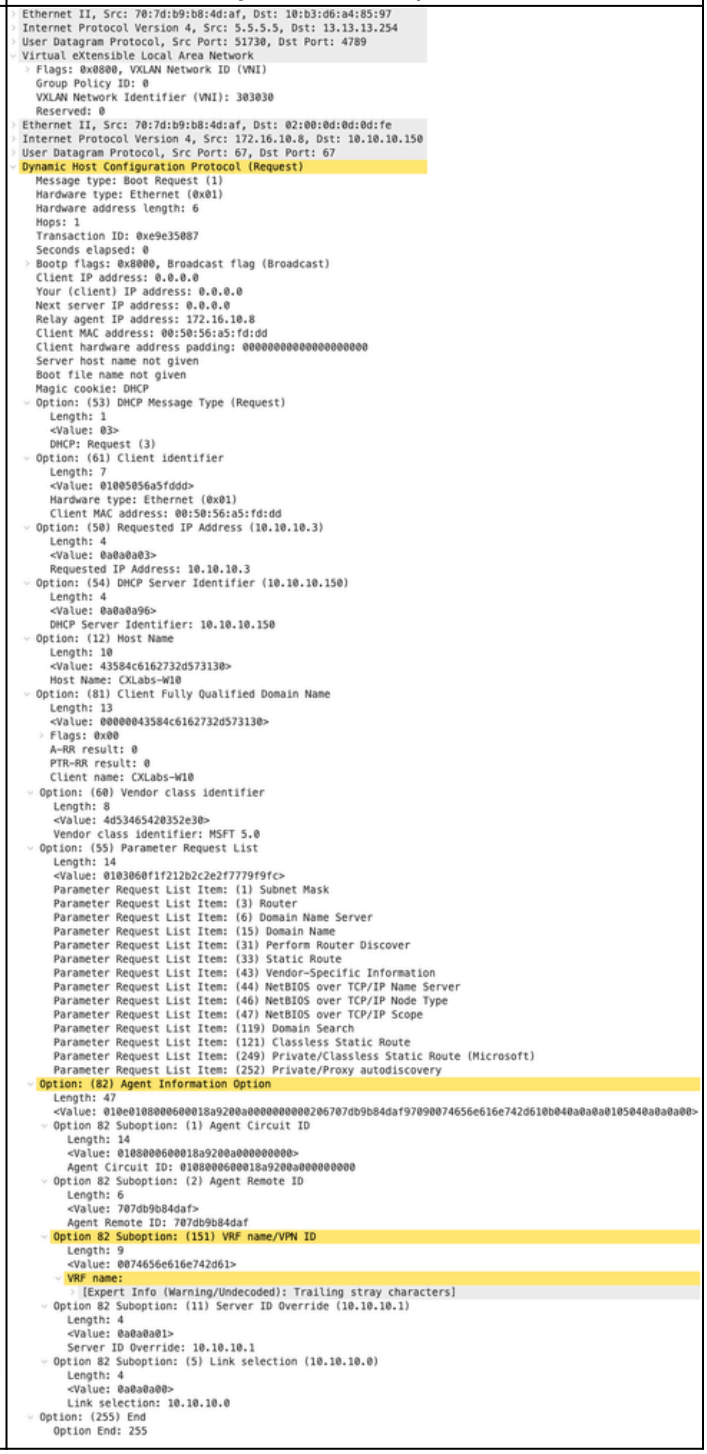
Oferta DHCP recebida no HOST-1

```
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: ff:ff:ff:ff:ff:ff
> Internet Protocol Version 4, Src: 10.10.10.1, Dst: 255.255.255.255
> User Datagram Protocol, Src Port: 67, Dst Port: 68
v Dynamic Host Configuration Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  > Bootp flags: 0x8000, Broadcast flag (Broadcast)
    Client IP address: 0.0.0.0
    Your (client) IP address: 10.10.10.3
    Next server IP address: 10.10.10.150
    Relay agent IP address: 10.10.10.1
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  v Option: (53) DHCP Message Type (Offer)
      Length: 1
      <Value: 02>
      DHCP: Offer (2)
  v Option: (1) Subnet Mask (255.255.255.0)
      Length: 4
      <Value: ffffff00>
      Subnet Mask: 255.255.255.0
  v Option: (58) Renewal Time Value
      Length: 4
      <Value: 0000a8c0>
      Renewal Time Value: 12 hours (43200)
  v Option: (59) Rebinding Time Value
      Length: 4
      <Value: 00012750>
      Rebinding Time Value: 21 hours (75600)
  v Option: (51) IP Address Lease Time
      Length: 4
      <Value: 00015180>
      IP Address Lease Time: 1 day (86400)
  v Option: (54) DHCP Server Identifier (10.10.10.1)
      Length: 4
      <Value: 0a0a0a01>
      DHCP Server Identifier: 10.10.10.1
  v Option: (3) Router
      Length: 4
      <Value: 0a0a0a01>
      Router: 10.10.10.1
  v Option: (15) Domain Name
      Length: 10
      <Value: 636973636f2e636f6d00>
      Domain Name: cisco.com
  v Option: (255) End
      Option End: 255
```

Solicitação enviada por HOST-1


Ethernet II, Src: 00:50:56:a5:fd:dd, Dst: ff:ff:ff:ff:ff:ff
Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
User Datagram Protocol, Src Port: 68, Dst Port: 67
Dynamic Host Configuration Protocol (Request)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 0
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 0.0.0.0
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Request)
Length: 1
<Value: 03>
DHCP: Request (3)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (50) Requested IP Address (10.10.10.3)
Length: 4
<Value: 0a0a0a03>
Requested IP Address: 10.10.10.3
Option: (54) DHCP Server Identifier (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
DHCP Server Identifier: 10.10.10.1
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (81) Client Fully Qualified Domain Name
Length: 13
<Value: 00000043584c6162732d573130>
Flags: 0x00
0000 .... = Reserved flags: 0x0
.... 0... = Server DDNS: Some server updates
.... .0.. = Encoding: ASCII encoding
.... ..0. = Server overrides: No override
....0 = Server: Client
A-RR result: 0
PTR-RR result: 0
Client name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (255) End
Option End: 255

Solicitação em LEAF-1

Solicitação recebida no LEAF-1	Solicitação enviada por LEAF-1
	

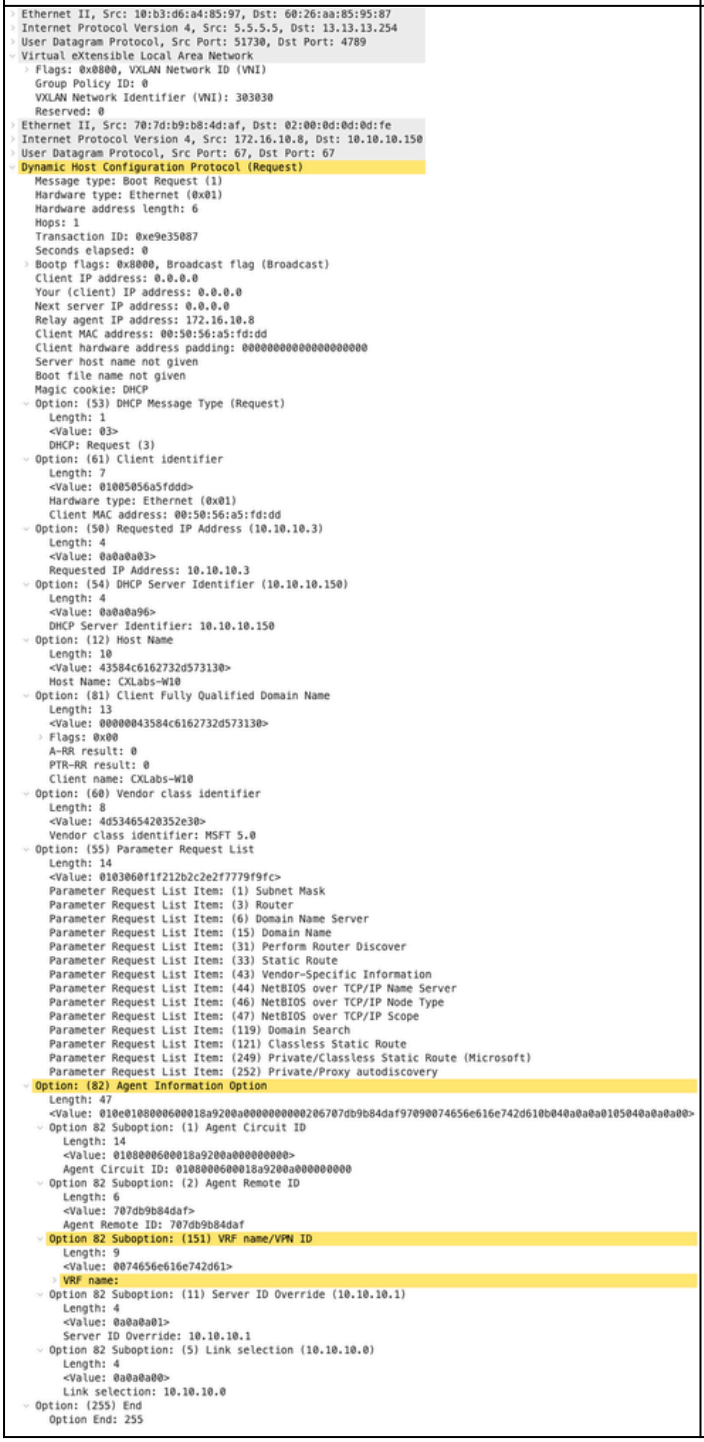
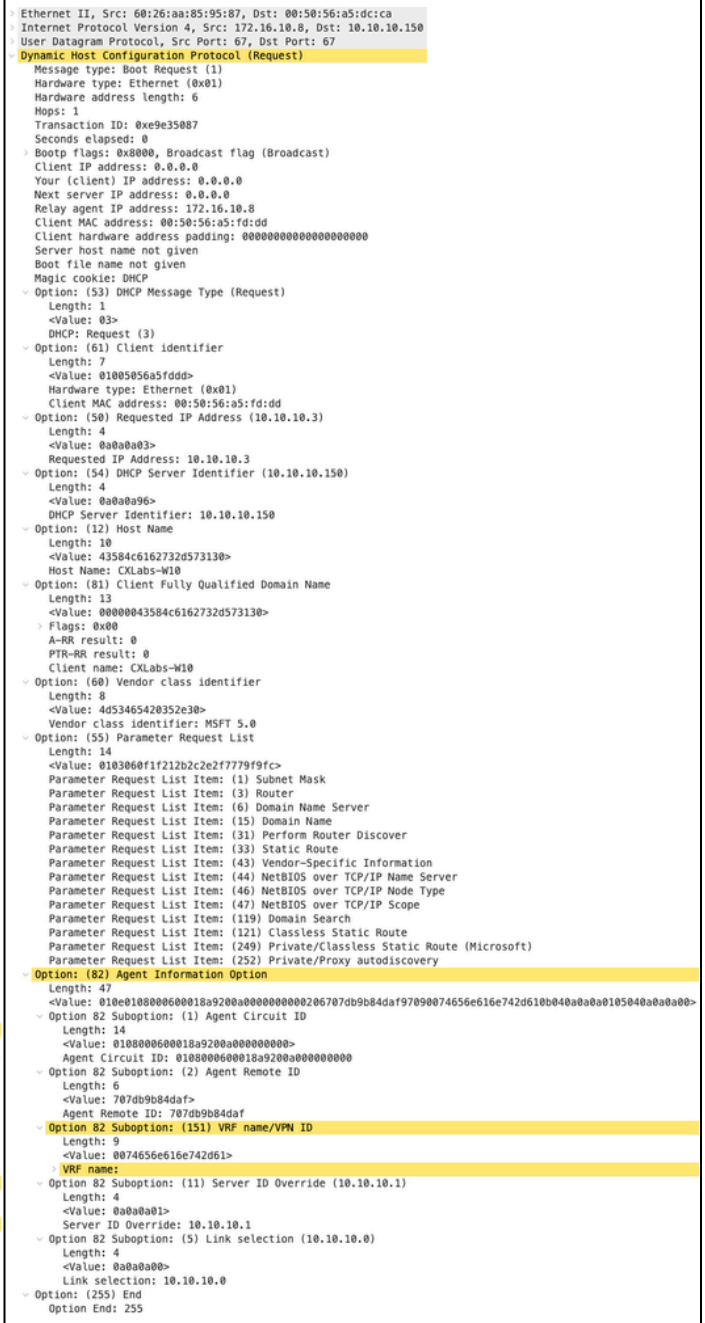
Solicitação em SPINE

Solicitação recebida em SPINE	Solicitação enviada por SPINE

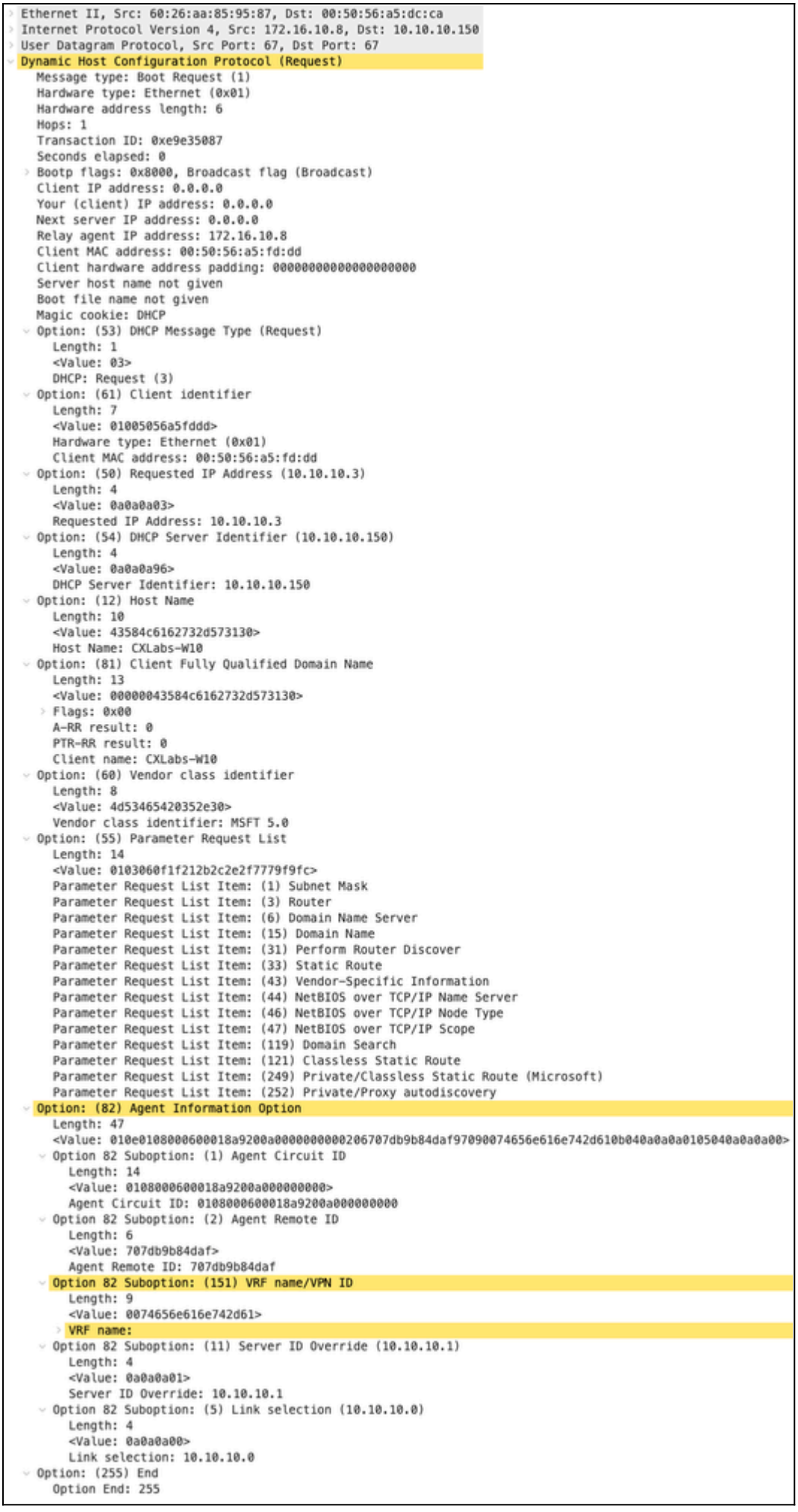
```
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 10:b3:d6:a4:85:97
> Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
> User Datagram Protocol, Src Port: 51730, Dst Port: 4789
v Virtual eXtensible Local Area Network
  > Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN Network Identifier (VNI): 303030
    Reserved: 0
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe
> Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
> User Datagram Protocol, Src Port: 67, Dst Port: 67
v Dynamic Host Configuration Protocol (Request)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 1
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  > Bootp flags: 0x8000, Broadcast flag (Broadcast)
    Client IP address: 0.0.0.0
    Your (client) IP address: 0.0.0.0
    Next server IP address: 0.0.0.0
    Relay agent IP address: 172.16.10.8
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  v Option: (53) DHCP Message Type (Request)
      Length: 1
      <Value: 03>
      DHCP: Request (3)
  v Option: (61) Client identifier
      Length: 7
      <Value: 01005056a5fddd>
      Hardware type: Ethernet (0x01)
      Client MAC address: 00:50:56:a5:fd:dd
  v Option: (50) Requested IP Address (10.10.10.3)
      Length: 4
      <Value: 0a0a0a03>
      Requested IP Address: 10.10.10.3
  v Option: (54) DHCP Server Identifier (10.10.10.150)
      Length: 4
      <Value: 0a0a0a96>
      DHCP Server Identifier: 10.10.10.150
  v Option: (12) Host Name
      Length: 10
      <Value: 43584c6162732d573130>
      Host Name: CXLabs-W10
  v Option: (81) Client Fully Qualified Domain Name
      Length: 13
      <Value: 00000043584c6162732d573130>
    > Flags: 0x00
      A-RR result: 0
      PTR-RR result: 0
      Client name: CXLabs-W10
  v Option: (60) Vendor class identifier
      Length: 8
      <Value: 4d53465420352e30>
      Vendor class identifier: MSFT 5.0
  v Option: (55) Parameter Request List
      Length: 14
      <Value: 0103060f1f212b2c2e2f7779f9fc>
      Parameter Request List Item: (1) Subnet Mask
      Parameter Request List Item: (3) Router
      Parameter Request List Item: (6) Domain Name Server
      Parameter Request List Item: (15) Domain Name
      Parameter Request List Item: (31) Perform Router Discover
      Parameter Request List Item: (33) Static Route
      Parameter Request List Item: (43) Vendor-Specific Information
      Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
      Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
      Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
      Parameter Request List Item: (119) Domain Search
      Parameter Request List Item: (121) Classless Static Route
      Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
      Parameter Request List Item: (252) Private/Proxy autodiscovery
  v Option: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    v Option 82 Suboption: (1) Agent Circuit ID
        Length: 14
        <Value: 0108000600018a9200a000000000>
        Agent Circuit ID: 0108000600018a9200a000000000
    v Option 82 Suboption: (2) Agent Remote ID
        Length: 6
        <Value: 707db9b84daf>
        Agent Remote ID: 707db9b84daf
    v Option 82 Suboption: (151) VRF name/VPN ID
        Length: 9
        <Value: 0074656e616e742d61>
      v VRF name:
          [Expert Info (Warning/Undecoded): Trailing stray characters]
    v Option 82 Suboption: (11) Server ID Override (10.10.10.1)
        Length: 4
        <Value: 0a0a0a01>
        Server ID Override: 10.10.10.1
    v Option 82 Suboption: (5) Link selection (10.10.10.0)
        Length: 4
        <Value: 0a0a0a00>
        Link selection: 10.10.10.0
  v Option: (255) End
      Option End: 255
```

```
> Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 60:26:aa:85:95:87
> Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
> User Datagram Protocol, Src Port: 51730, Dst Port: 4789
v Virtual eXtensible Local Area Network
  > Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN Network Identifier (VNI): 303030
    Reserved: 0
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe
> Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
> User Datagram Protocol, Src Port: 67, Dst Port: 67
v Dynamic Host Configuration Protocol (Request)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 1
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  > Bootp flags: 0x8000, Broadcast flag (Broadcast)
    Client IP address: 0.0.0.0
    Your (client) IP address: 0.0.0.0
    Next server IP address: 0.0.0.0
    Relay agent IP address: 172.16.10.8
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  v Option: (53) DHCP Message Type (Request)
      Length: 1
      <Value: 03>
      DHCP: Request (3)
  v Option: (61) Client identifier
      Length: 7
      <Value: 01005056a5fddd>
      Hardware type: Ethernet (0x01)
      Client MAC address: 00:50:56:a5:fd:dd
  v Option: (50) Requested IP Address (10.10.10.3)
      Length: 4
      <Value: 0a0a0a03>
      Requested IP Address: 10.10.10.3
  v Option: (54) DHCP Server Identifier (10.10.10.150)
      Length: 4
      <Value: 0a0a0a96>
      DHCP Server Identifier: 10.10.10.150
  v Option: (12) Host Name
      Length: 10
      <Value: 43584c6162732d573130>
      Host Name: CXLabs-W10
  v Option: (81) Client Fully Qualified Domain Name
      Length: 13
      <Value: 00000043584c6162732d573130>
    > Flags: 0x00
      A-RR result: 0
      PTR-RR result: 0
      Client name: CXLabs-W10
  v Option: (60) Vendor class identifier
      Length: 8
      <Value: 4d53465420352e30>
      Vendor class identifier: MSFT 5.0
  v Option: (55) Parameter Request List
      Length: 14
      <Value: 0103060f1f212b2c2e2f7779f9fc>
      Parameter Request List Item: (1) Subnet Mask
      Parameter Request List Item: (3) Router
      Parameter Request List Item: (6) Domain Name Server
      Parameter Request List Item: (15) Domain Name
      Parameter Request List Item: (31) Perform Router Discover
      Parameter Request List Item: (33) Static Route
      Parameter Request List Item: (43) Vendor-Specific Information
      Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
      Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
      Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
      Parameter Request List Item: (119) Domain Search
      Parameter Request List Item: (121) Classless Static Route
      Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
      Parameter Request List Item: (252) Private/Proxy autodiscovery
  v Option: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    v Option 82 Suboption: (1) Agent Circuit ID
        Length: 14
        <Value: 0108000600018a9200a000000000>
        Agent Circuit ID: 0108000600018a9200a000000000
    v Option 82 Suboption: (2) Agent Remote ID
        Length: 6
        <Value: 707db9b84daf>
        Agent Remote ID: 707db9b84daf
    v Option 82 Suboption: (151) VRF name/VPN ID
        Length: 9
        <Value: 0074656e616e742d61>
      > VRF name:
    v Option 82 Suboption: (11) Server ID Override (10.10.10.1)
        Length: 4
        <Value: 0a0a0a01>
        Server ID Override: 10.10.10.1
    v Option 82 Suboption: (5) Link selection (10.10.10.0)
        Length: 4
        <Value: 0a0a0a00>
        Link selection: 10.10.10.0
  v Option: (255) End
      Option End: 255
```

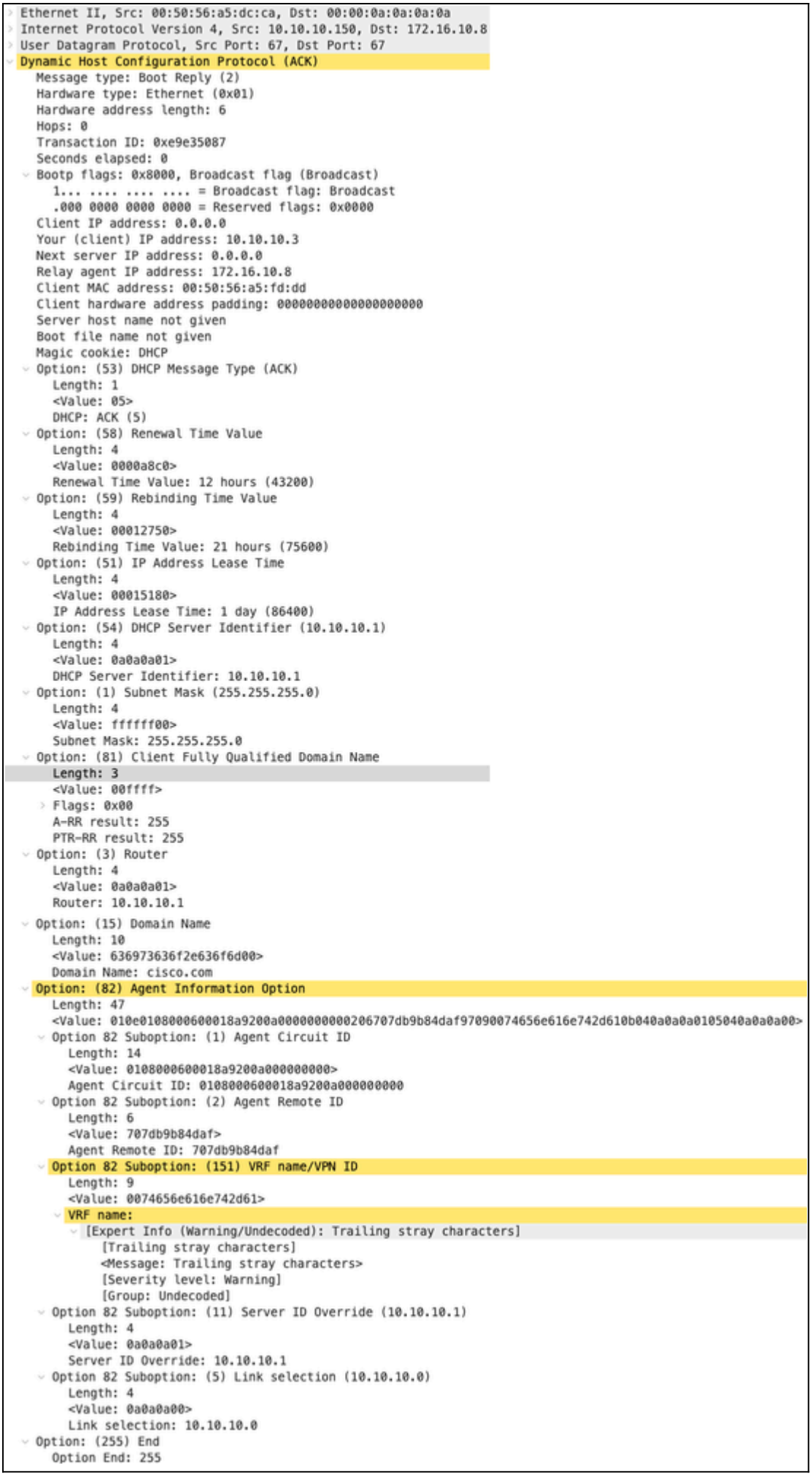
Solicitação em LEAF-2-vPC

Solicitar ReceivPCd em LEAF-2-vPC	Solicitação enviada por vPCAF-2-vPC
	

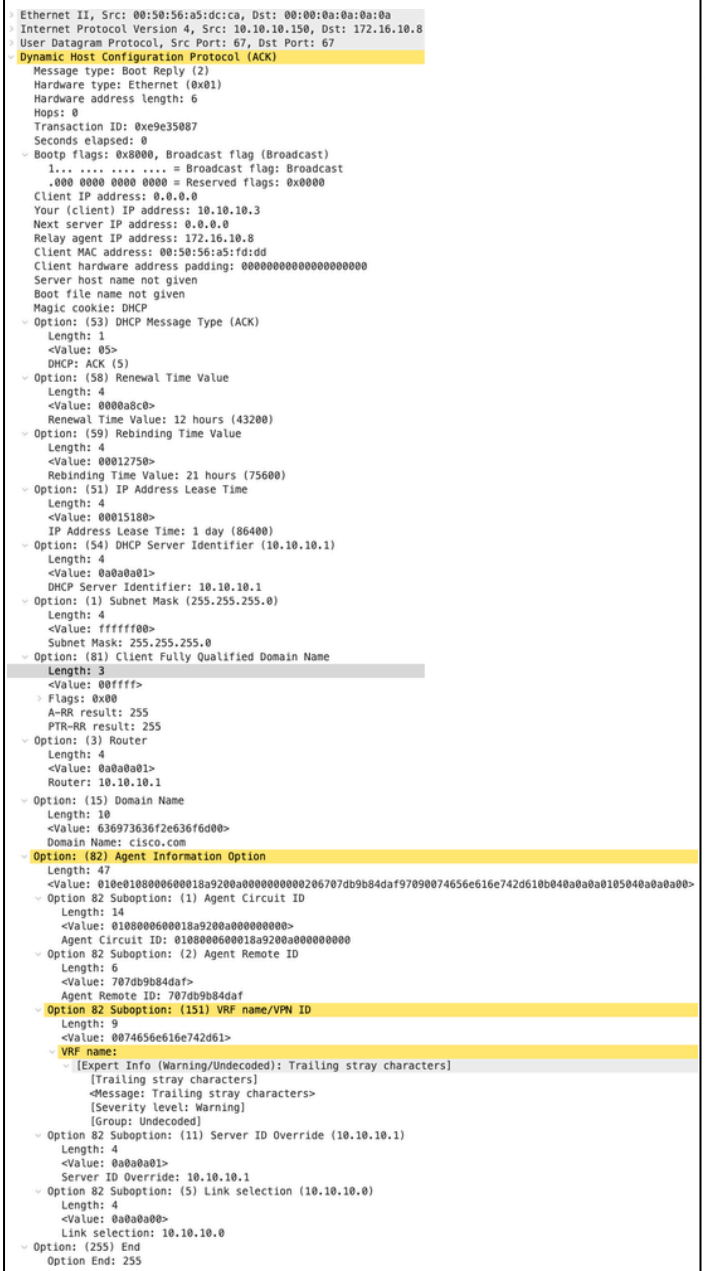
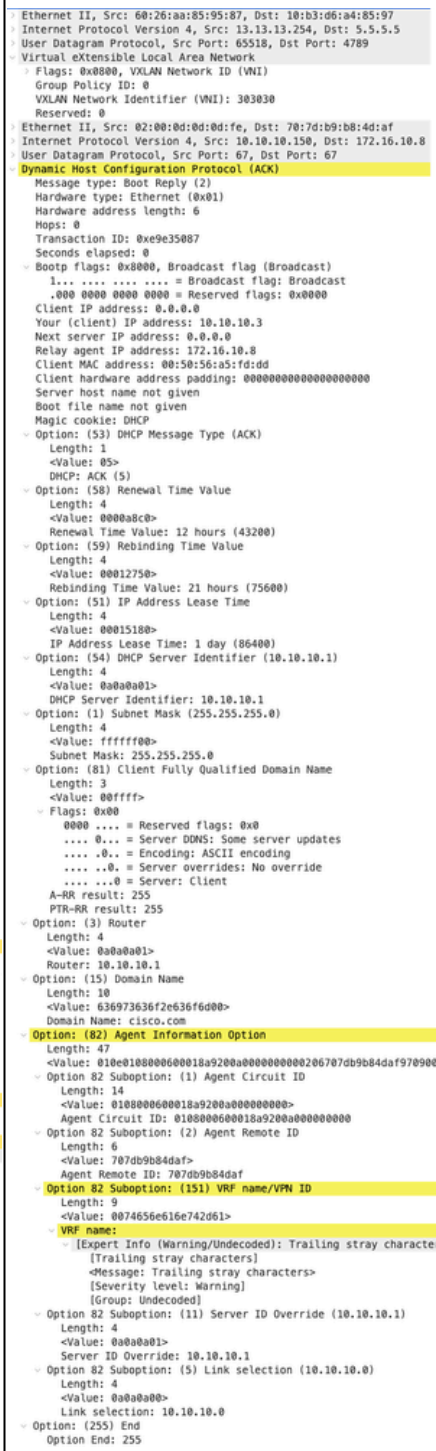
Solicitação recebida no Servidor DHCP


Ethernet II, Src: 60:26:aa:85:95:87, Dst: 00:50:56:a5:dc:ca
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (Request)
Message type: Boot Request (1)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 1
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
Client IP address: 0.0.0.0
Your (client) IP address: 0.0.0.0
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (Request)
Length: 1
<Value: 03>
DHCP: Request (3)
Option: (61) Client identifier
Length: 7
<Value: 01005056a5fddd>
Hardware type: Ethernet (0x01)
Client MAC address: 00:50:56:a5:fd:dd
Option: (50) Requested IP Address (10.10.10.3)
Length: 4
<Value: 0a0a0a03>
Requested IP Address: 10.10.10.3
Option: (54) DHCP Server Identifier (10.10.10.150)
Length: 4
<Value: 0a0a0a96>
DHCP Server Identifier: 10.10.10.150
Option: (12) Host Name
Length: 10
<Value: 43584c6162732d573130>
Host Name: CXLabs-W10
Option: (81) Client Fully Qualified Domain Name
Length: 13
<Value: 00000043584c6162732d573130>
Flags: 0x00
A-RR result: 0
PTR-RR result: 0
Client name: CXLabs-W10
Option: (60) Vendor class identifier
Length: 8
<Value: 4d53465420352e30>
Vendor class identifier: MSFT 5.0
Option: (55) Parameter Request List
Length: 14
<Value: 0103060f1f212b2c2e2f7779f9fc>
Parameter Request List Item: (1) Subnet Mask
Parameter Request List Item: (3) Router
Parameter Request List Item: (6) Domain Name Server
Parameter Request List Item: (15) Domain Name
Parameter Request List Item: (31) Perform Router Discover
Parameter Request List Item: (33) Static Route
Parameter Request List Item: (43) Vendor-Specific Information
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
Parameter Request List Item: (119) Domain Search
Parameter Request List Item: (121) Classless Static Route
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)
Parameter Request List Item: (252) Private/Proxy autodiscovery
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a00000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255

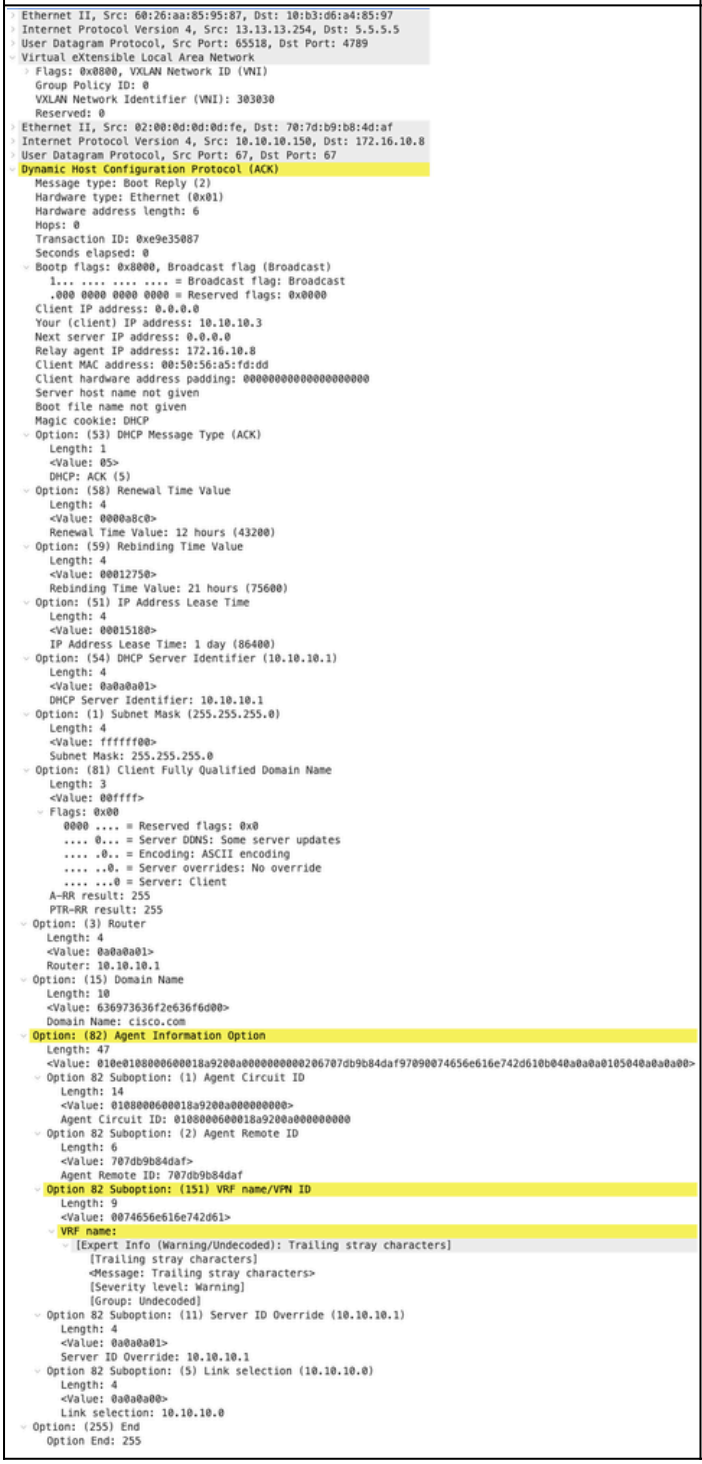
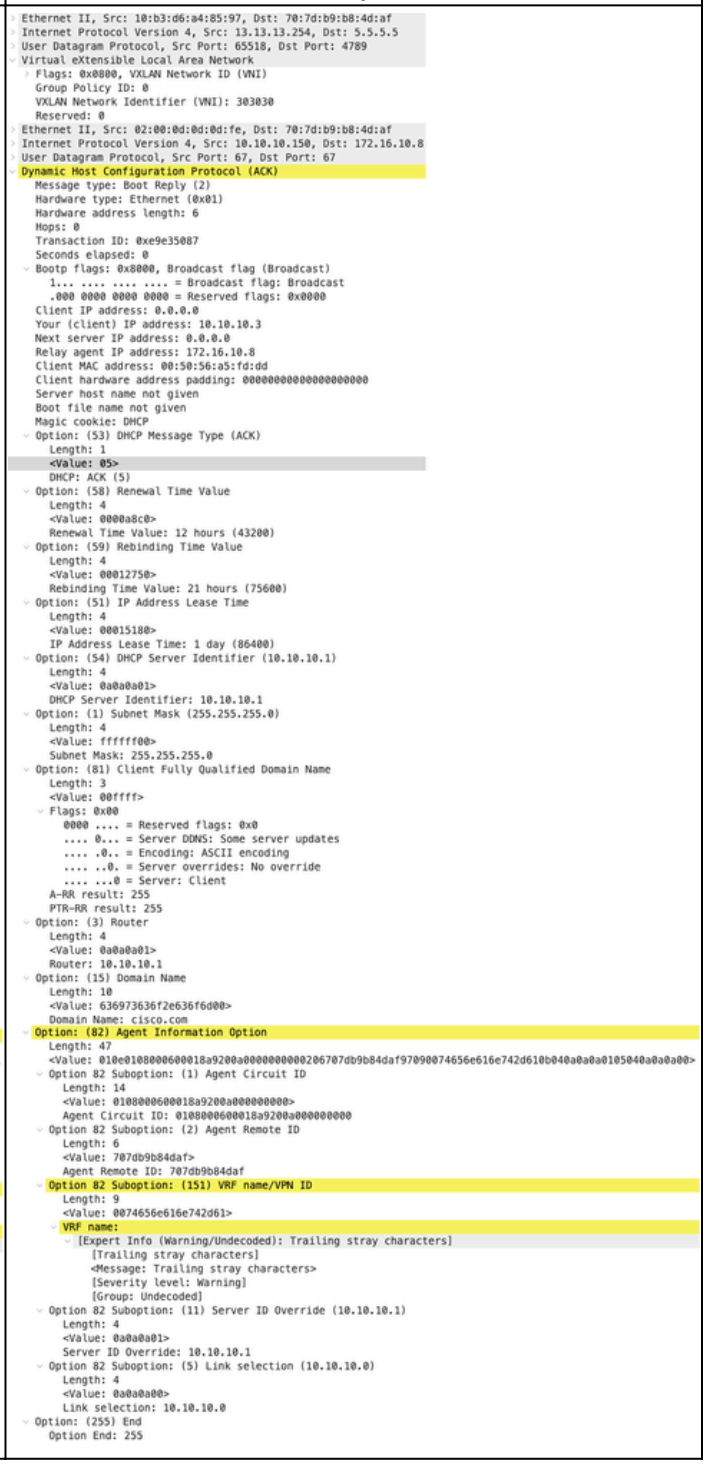
Envio ACK pelo servidor DHCP


Ethernet II, Src: 00:50:56:a5:dc:ca, Dst: 00:00:0a:0a:0a:0a
Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (ACK)
Message type: Boot Reply (2)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 0
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 10.10.10.3
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (ACK)
Length: 1
<Value: 05>
DHCP: ACK (5)
Option: (58) Renewal Time Value
Length: 4
<Value: 0000a8c0>
Renewal Time Value: 12 hours (43200)
Option: (59) Rebinding Time Value
Length: 4
<Value: 00012750>
Rebinding Time Value: 21 hours (75600)
Option: (51) IP Address Lease Time
Length: 4
<Value: 00015180>
IP Address Lease Time: 1 day (86400)
Option: (54) DHCP Server Identifier (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
DHCP Server Identifier: 10.10.10.1
Option: (1) Subnet Mask (255.255.255.0)
Length: 4
<Value: ffffff00>
Subnet Mask: 255.255.255.0
Option: (81) Client Fully Qualified Domain Name
Length: 3
<Value: 00ffff>
Flags: 0x00
A-RR result: 255
PTR-RR result: 255
Option: (3) Router
Length: 4
<Value: 0a0a0a01>
Router: 10.10.10.1
Option: (15) Domain Name
Length: 10
<Value: 636973636f2e636f6d00>
Domain Name: cisco.com
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a0000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
[Trailing stray characters]
<Message: Trailing stray characters>
[Severity level: Warning]
[Group: Undecoded]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255

ACK em LEAF-2-vPC

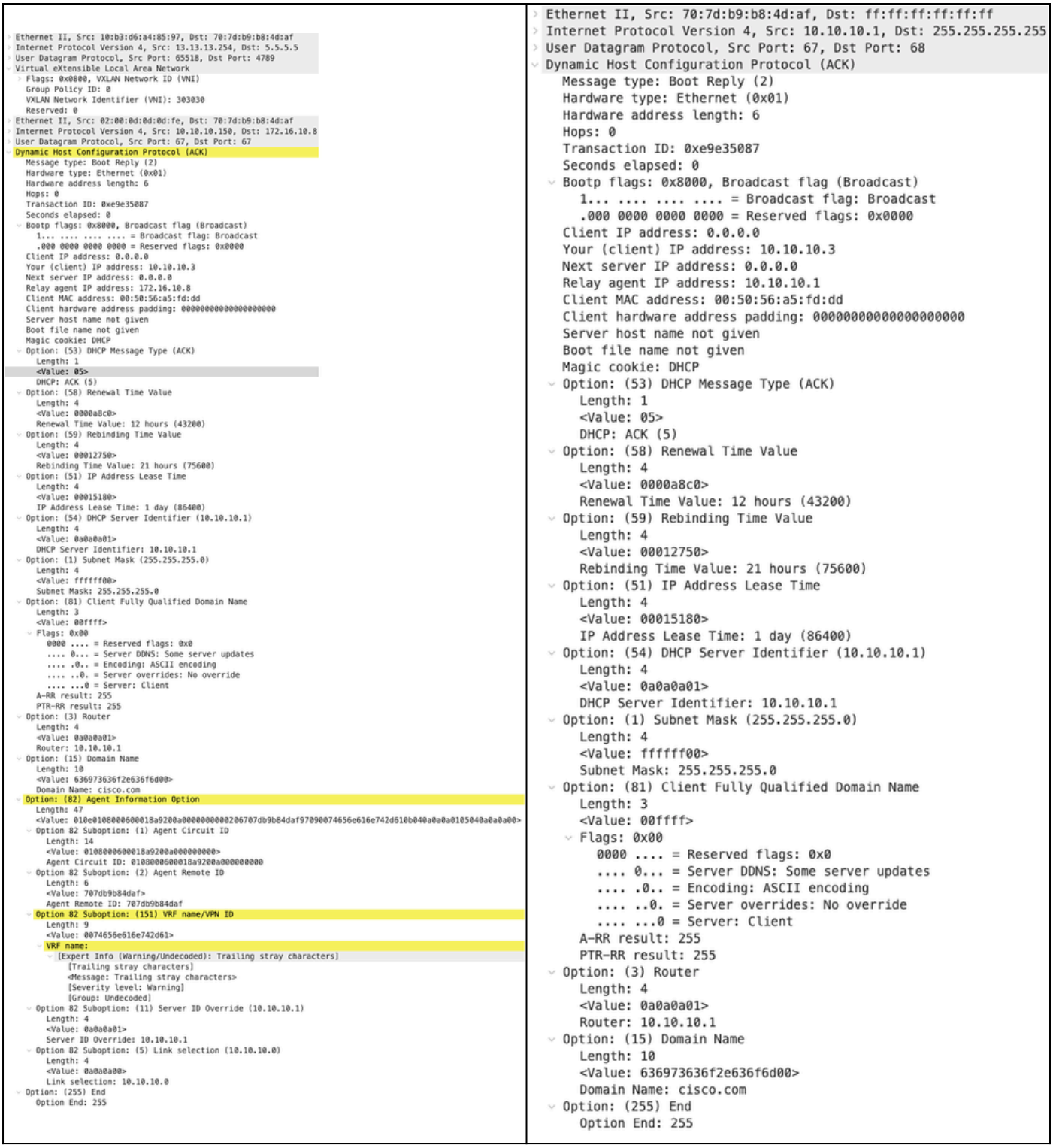
ACK recebido em LEAF-2-vPC	ACK enviado por LEAF-2-vPC
	

ACK na COLUNA

ACK recebido em SPINE	Envio ACK por SPINE
	

ACK na LEAF-1

ACK recebido no LEAF-1	Envio ACK por LEAF-1


Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 70:7d:b9:b8:4d:af
Internet Protocol Version 4, Src: 13.13.13.254, Dst: 5.5.5.5
User Datagram Protocol, Src Port: 65518, Dst Port: 4789
Virtual eXtensible Local Area Network
Flags: 0x0800, VXLAN Network ID (VNI)
Group Policy ID: 0
VXLAN Network Identifier (VNI): 303030
Reserved: 0
Ethernet II, Src: 02:00:0d:0d:0d:fe, Dst: 70:7d:b9:b8:4d:af
Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
User Datagram Protocol, Src Port: 67, Dst Port: 67
Dynamic Host Configuration Protocol (ACK)
Message type: Boot Reply (2)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 0
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 10.10.10.3
Next server IP address: 0.0.0.0
Relay agent IP address: 172.16.10.8
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (ACK)
Length: 1
<Value: 05>
DHCP: ACK (5)
Option: (58) Renewal Time Value
Length: 4
<Value: 0000a8c0>
Renewal Time Value: 12 hours (43200)
Option: (59) Rebinding Time Value
Length: 4
<Value: 00012750>
Rebinding Time Value: 21 hours (75600)
Option: (51) IP Address Lease Time
Length: 4
<Value: 00015180>
IP Address Lease Time: 1 day (86400)
Option: (54) DHCP Server Identifier (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
DHCP Server Identifier: 10.10.10.1
Option: (1) Subnet Mask (255.255.255.0)
Length: 4
<Value: ffffff00>
Subnet Mask: 255.255.255.0
Option: (81) Client Fully Qualified Domain Name
Length: 3
<Value: 00ffff>
Flags: 0x00
0000 .... = Reserved flags: 0x0
.... 0... = Server DDNS: Some server updates
.... .0.. = Encoding: ASCII encoding
.... ..0. = Server overrides: No override
....0 = Server: Client
A-RR result: 255
PTR-RR result: 255
Option: (3) Router
Length: 4
<Value: 0a0a0a01>
Router: 10.10.10.1
Option: (15) Domain Name
Length: 10
<Value: 636973636f2e636f6d00>
Domain Name: cisco.com
Option: (82) Agent Information Option
Length: 47
<Value: 010e0108000600018a9200a000000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
Option 82 Suboption: (1) Agent Circuit ID
Length: 14
<Value: 0108000600018a9200a000000000>
Agent Circuit ID: 0108000600018a9200a000000000
Option 82 Suboption: (2) Agent Remote ID
Length: 6
<Value: 707db9b84daf>
Agent Remote ID: 707db9b84daf
Option 82 Suboption: (151) VRF name/VPN ID
Length: 9
<Value: 0074656e616e742d61>
VRF name:
[Expert Info (Warning/Undecoded): Trailing stray characters]
[Trailing stray characters]
<Message: Trailing stray characters>
[Severity level: Warning]
[Group: Undecoded]
Option 82 Suboption: (11) Server ID Override (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
Server ID Override: 10.10.10.1
Option 82 Suboption: (5) Link selection (10.10.10.0)
Length: 4
<Value: 0a0a0a00>
Link selection: 10.10.10.0
Option: (255) End
Option End: 255
Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: ff:ff:ff:ff:ff:ff
Internet Protocol Version 4, Src: 10.10.10.1, Dst: 255.255.255.255
User Datagram Protocol, Src Port: 67, Dst Port: 68
Dynamic Host Configuration Protocol (ACK)
Message type: Boot Reply (2)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 0
Transaction ID: 0xe9e35087
Seconds elapsed: 0
Bootp flags: 0x8000, Broadcast flag (Broadcast)
1... .... = Broadcast flag: Broadcast
.000 0000 0000 0000 = Reserved flags: 0x0000
Client IP address: 0.0.0.0
Your (client) IP address: 10.10.10.3
Next server IP address: 0.0.0.0
Relay agent IP address: 10.10.10.1
Client MAC address: 00:50:56:a5:fd:dd
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
Option: (53) DHCP Message Type (ACK)
Length: 1
<Value: 05>
DHCP: ACK (5)
Option: (58) Renewal Time Value
Length: 4
<Value: 0000a8c0>
Renewal Time Value: 12 hours (43200)
Option: (59) Rebinding Time Value
Length: 4
<Value: 00012750>
Rebinding Time Value: 21 hours (75600)
Option: (51) IP Address Lease Time
Length: 4
<Value: 00015180>
IP Address Lease Time: 1 day (86400)
Option: (54) DHCP Server Identifier (10.10.10.1)
Length: 4
<Value: 0a0a0a01>
DHCP Server Identifier: 10.10.10.1
Option: (1) Subnet Mask (255.255.255.0)
Length: 4
<Value: ffffff00>
Subnet Mask: 255.255.255.0
Option: (81) Client Fully Qualified Domain Name
Length: 3
<Value: 00ffff>
Flags: 0x00
0000 .... = Reserved flags: 0x0
.... 0... = Server DDNS: Some server updates
.... .0.. = Encoding: ASCII encoding
.... ..0. = Server overrides: No override
....0 = Server: Client
A-RR result: 255
PTR-RR result: 255
Option: (3) Router
Length: 4
<Value: 0a0a0a01>
Router: 10.10.10.1
Option: (15) Domain Name
Length: 10
<Value: 636973636f2e636f6d00>
Domain Name: cisco.com
Option: (255) End
Option End: 255

ACK no HOST-1

```
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: ff:ff:ff:ff:ff:ff
> Internet Protocol Version 4, Src: 10.10.10.1, Dst: 255.255.255.255
> User Datagram Protocol, Src Port: 67, Dst Port: 68
v Dynamic Host Configuration Protocol (ACK)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  v Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
      .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0
    Your (client) IP address: 10.10.10.3
    Next server IP address: 0.0.0.0
    Relay agent IP address: 10.10.10.1
    Client MAC address: 00:50:56:a5:fd:dd
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
  v Option: (53) DHCP Message Type (ACK)
      Length: 1
      <Value: 05>
      DHCP: ACK (5)
  v Option: (58) Renewal Time Value
      Length: 4
      <Value: 0000a8c0>
      Renewal Time Value: 12 hours (43200)
  v Option: (59) Rebinding Time Value
      Length: 4
      <Value: 00012750>
      Rebinding Time Value: 21 hours (75600)
  v Option: (51) IP Address Lease Time
      Length: 4
      <Value: 00015180>
      IP Address Lease Time: 1 day (86400)
  v Option: (54) DHCP Server Identifier (10.10.10.1)
      Length: 4
      <Value: 0a0a0a01>
      DHCP Server Identifier: 10.10.10.1
  v Option: (1) Subnet Mask (255.255.255.0)
      Length: 4
      <Value: ffffff00>
      Subnet Mask: 255.255.255.0
  v Option: (81) Client Fully Qualified Domain Name
      Length: 3
      <Value: 00ffff>
    v Flags: 0x00
        0000 .... = Reserved flags: 0x0
        .... 0... = Server DDNS: Some server updates
        .... .0.. = Encoding: ASCII encoding
        .... ..0. = Server overrides: No override
        .... ...0 = Server: Client
      A-RR result: 255
      PTR-RR result: 255
  v Option: (3) Router
      Length: 4
      <Value: 0a0a0a01>
      Router: 10.10.10.1
  v Option: (15) Domain Name
      Length: 10
      <Value: 636973636f2e636f6d00>
      Domain Name: cisco.com
  v Option: (255) End
      Option End: 255
```

Informações Relacionadas

Configurando o VXLAN BGP EVPN

Configurando VXLAN

Solucione problemas relacionados ao DHCP no Nexus 9000

Guia de configuração do Cisco Nexus 9000 Series NX-OS VXLAN, versão 10.4(x)

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