为使用NX-OS和Windows Server 2022的Nexus 9000配置并验证VxLAN交换矩阵中的DHCP

目录

简介

本文档介绍如何在具有Nexus 9000交换机的VxLAN交换矩阵中配置DHCP并对其进行故障排除。

先决条件

要求

Cisco 建议您了解以下主题：

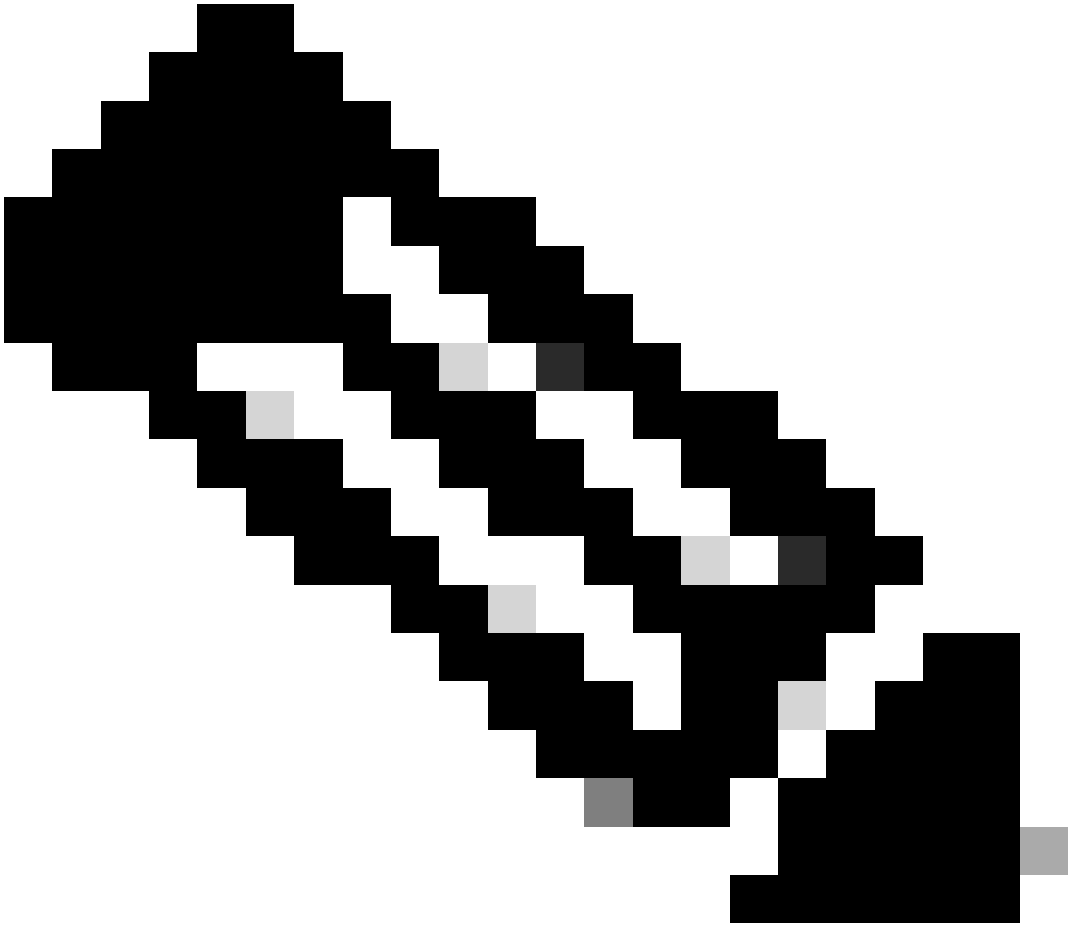
- Nexus NX-OS 软件。
- 虚拟端口通道(vPC)。
- VxLAN BGP L2VPN EVPN
- BGP address-family IPv4
- OSPF
- 组播PIM（稀疏模式）
- DHCP

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco Nexus 9000和Cisco NX-OS。
  - N9K-C93180YC-EX
  - N9K-C93180YC-FX
  - NX-OS 10.3(4a)
- Windows Server 2022数据中心

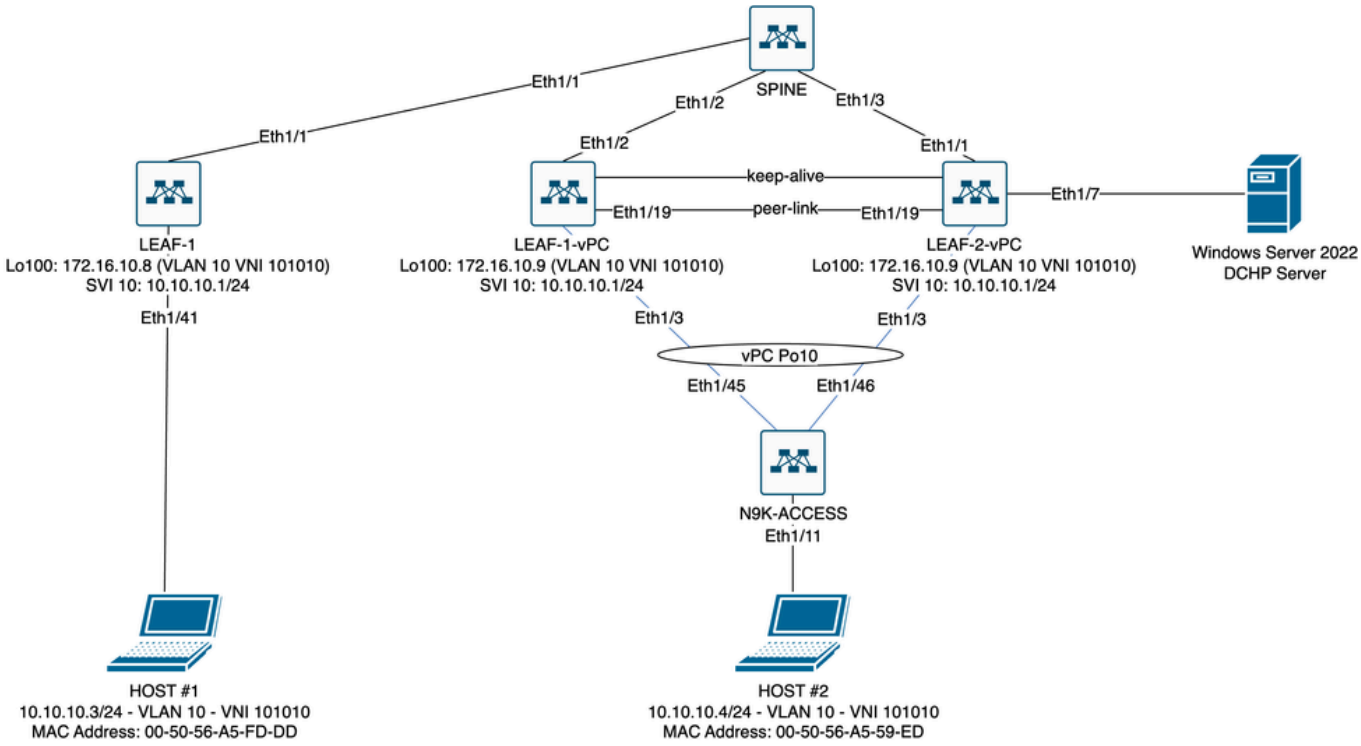
本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。



注意：有关第三方软件或硬件的配置和集成的任何问题均不在思科支持范围内。使用第三方工具是向客户演示您使用思科设备的配置和操作的最佳方式。

背景信息

实验室中VxLAN的底层和重叠配置



实验室中的VxLAN交换矩阵图

- 主干:
  - 此Nexus交换机发送DHCP（发现、提供、请求、确认）数据包，在此场景中未解封。仅使用外部报头。
  - 充当网络交换矩阵中的中心路由点。
  - 负责互连所有枝叶交换机并促进它们之间的数据流。
  - 参与BGP以将EVPN路由分发到枝叶交换机。
  - 执行IP路由，并可通过查看外部IP报头在不同子网或VxLAN网段之间路由流量。
  - 将重叠网络(VxLAN)与底层物理网络分离。
  - 使用传统IP路由协议管理底层，而重叠则由采用BGP EVPN的VxLAN管理，从而提供可扩展的灵活网络架构。

- 枝叶1：
  - 枝叶交换机为服务器、存储设备和其他网络设备等终端提供物理连接。
  - 枝叶交换机充当VTEP，这意味着它们会封装和解封VxLAN数据包。
  - 在这种情况下，主机1发出IP地址请求。
  - LEAF-1负责在VxLAN报头中封装DCHP数据包。
  - 主机1以经典以太网透明方式接收DCHP数据包。

- 枝叶-1-vPC和枝叶-2-vPC：
  - 枝叶交换机通过运行BGP和交换路由信息参与EVPN控制平面。这允许分配MAC和IP地址信息，确保流量可以通过VxLAN交换矩阵高效路由。
  - 在此场景中，DHCP服务器与VLAN 10和VNI 101010关联，就像主机1一样。这意味着它只是VxLAN桥接。
  - 如果DHCP服务器与HOST#1以外的VNI关联，则路由严格需要L3VNI。必须创建源和目标VNI。
  - DCHP服务器以经典以太网透明方式接收DCHP数据包。
  - vPC中的两台Nexus交换机均会接收BUM流量，但只有在vPC中运行的主要Nexus交换

机才会发送流量。辅助Nexus交换机丢弃流量。在此场景中，LEAF-1-vPC在操作上为主要。
    - 必须使用infra-vlan，因为如果LEAF-2-vPC到SPINE的接口断开，则无法发送DCHP数据包。要将VxLAN封装的流量发送到LEAF-1-vPC，需要此备份VLAN。这样，LEAF-1-vPC可以将DCHP数据包发送到SPINE。

- N9K-ACCESS：
    - 此Nexus交换机仅使用vPC端口通道提供到两个枝叶的连接，以实现到HOST#2的冗余

主干

```
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
```

枝叶-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
```

枝叶-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
```

枝叶-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

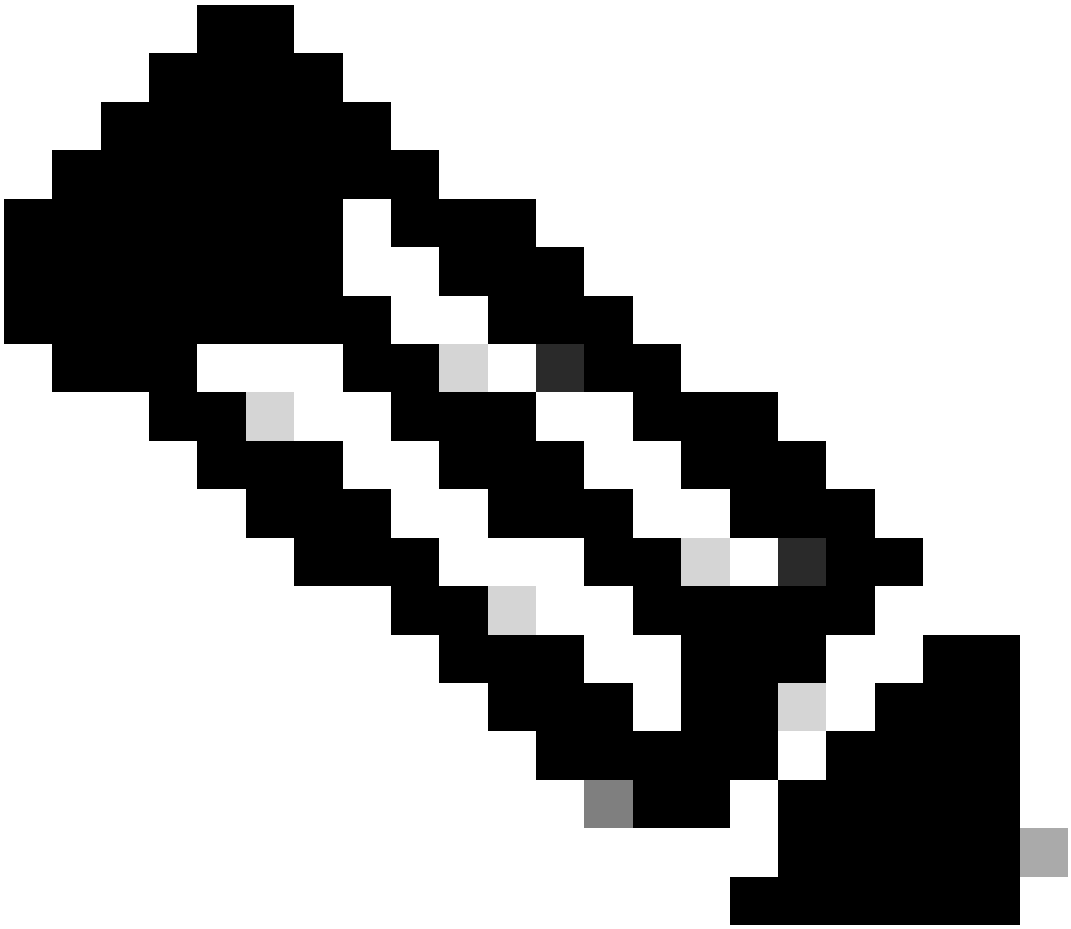
```
feature lacp

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
```

Nexus交换机上的DHCP配置

枝叶-1

步骤1:启用功能DCHP。

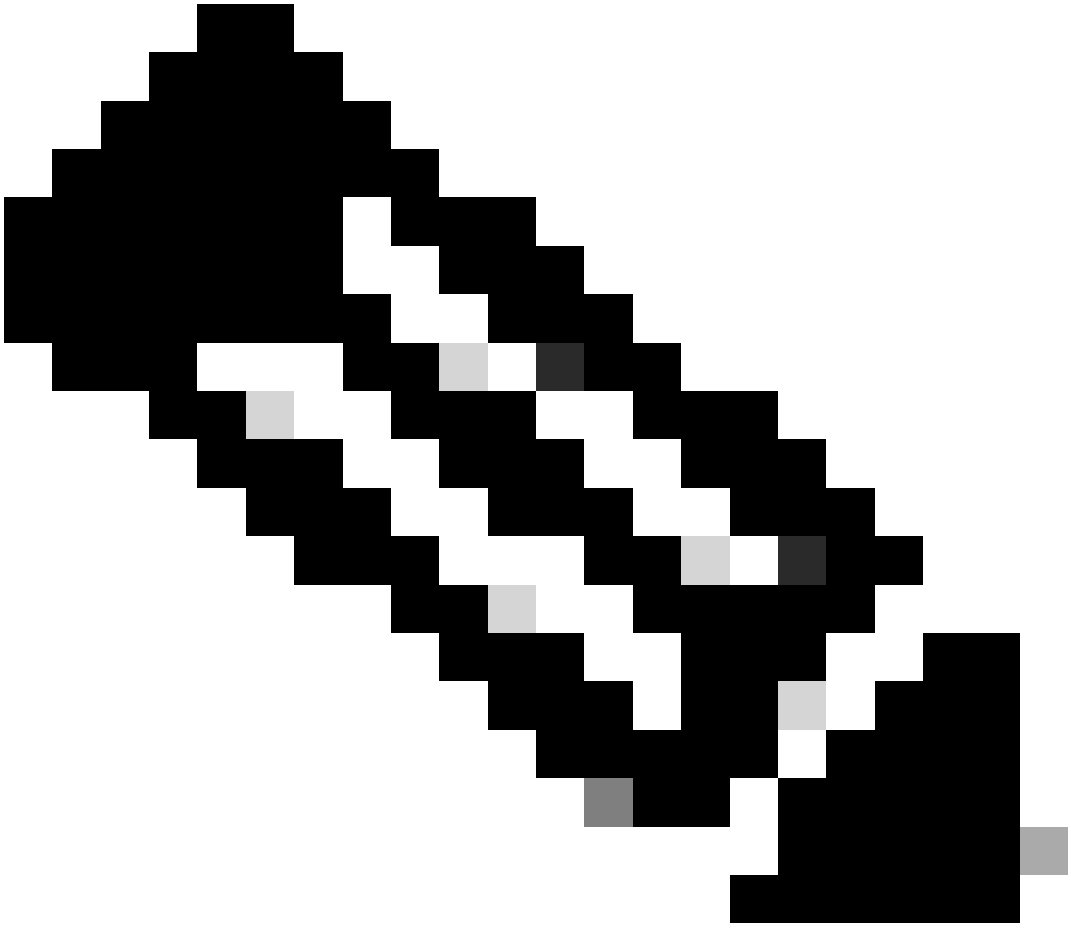
```
LEAF-1(config)# feature dhcp
```



注意：自NX-OS 7.x以来，默认情况下启用DHCP服务器和中继代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay。

第二步：应用命令ip dhcp relay information option。

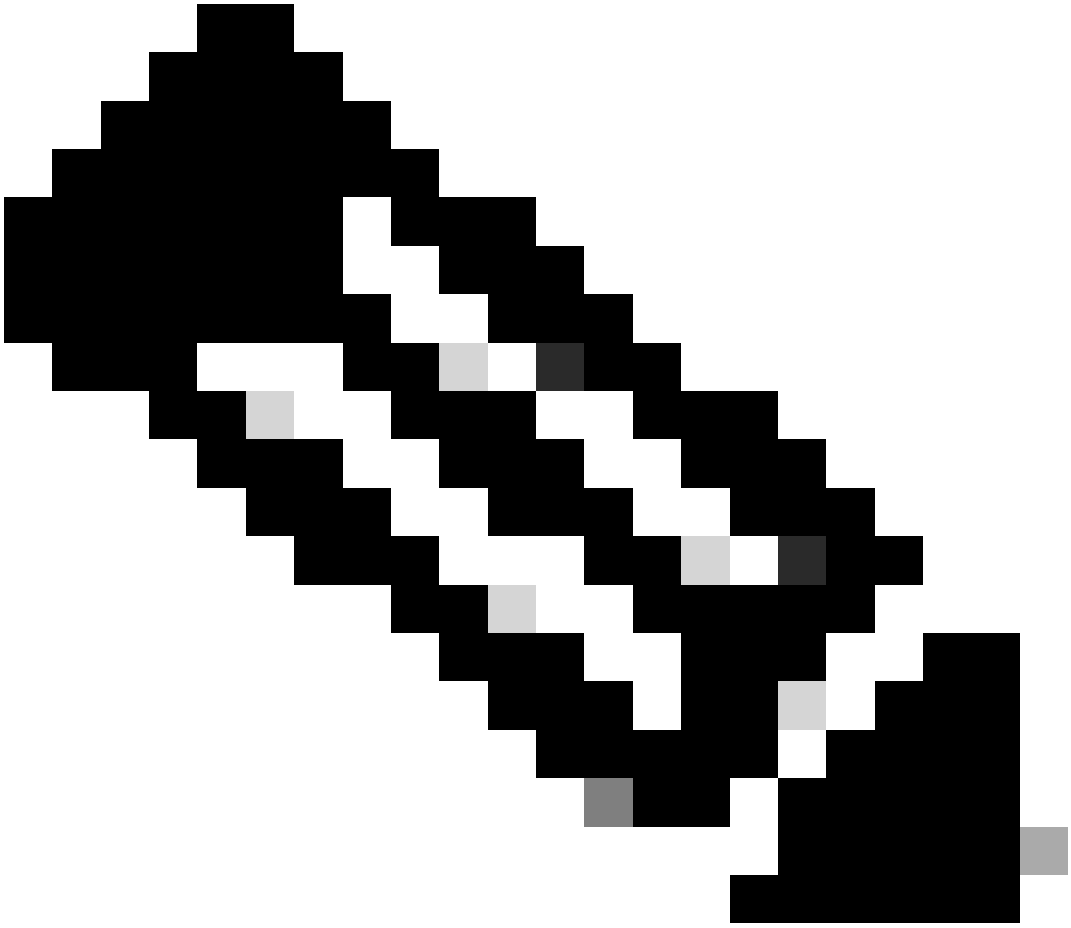
```
LEAF-1(config)# ip dhcp relay information option
```



注意：使用此命令，DHCP中继代理可以插入和删除选项82有关转发数据包的信息。

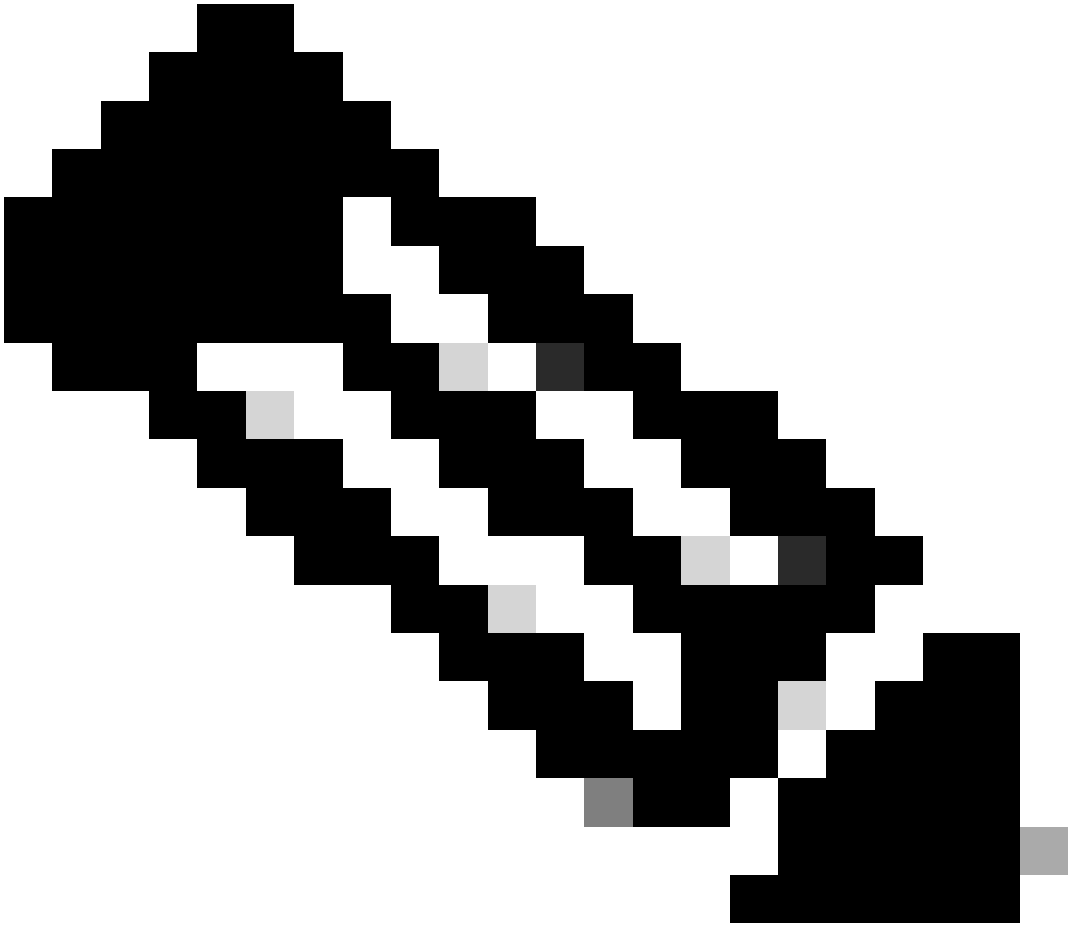
第三步：应用命令ip dhcp relay information option vpn。

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



注意：此命令启用到达DHCP服务器所属的不同VRF的DHCP中继请求。

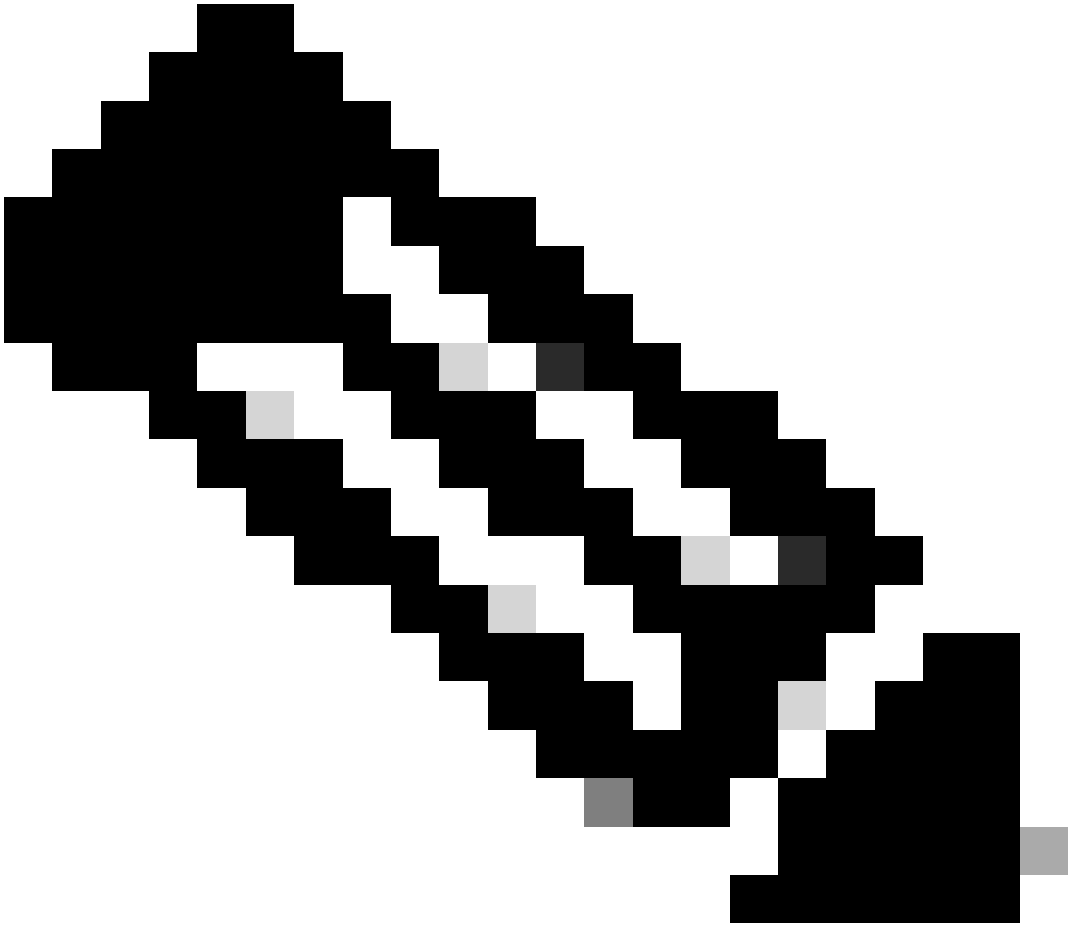
第四步：应用命令“ip dhcp relay address [DCHP服务器的IP地址]”。



注意：在本示例中，DCHP服务器的IP地址为10.10.10.150。

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

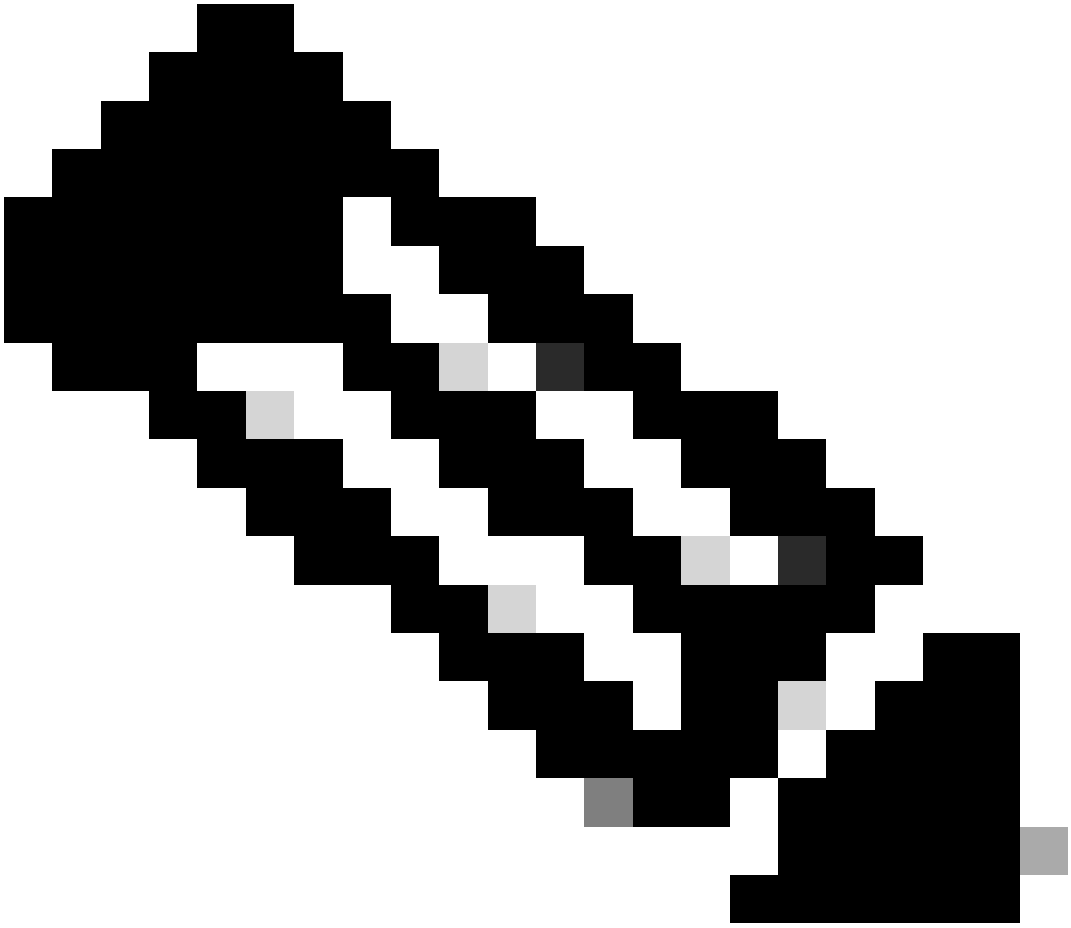
第五步：应用命令“ip dhcp relay source-interface [unique loopback]”。



注意：此命令配置DHCP中继代理的源IP地址，以便处理发现、提供、请求和ACK单播通信，而DHCP中继代理使用SVI的IP地址作为DHCP中继代理的源IP地址。这是不需要的，因为此IP地址由多个VTEP共享，并且可能发生对DHCP数据包的黑洞。要避免这种情况，需要唯一IP地址（使用环回接口）来区分每个VTEP。

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

第六步：在BGP内对应租户的VRF中，使用前缀列表和路由映射（包括环回接口的IP地址）直接路由重分配。



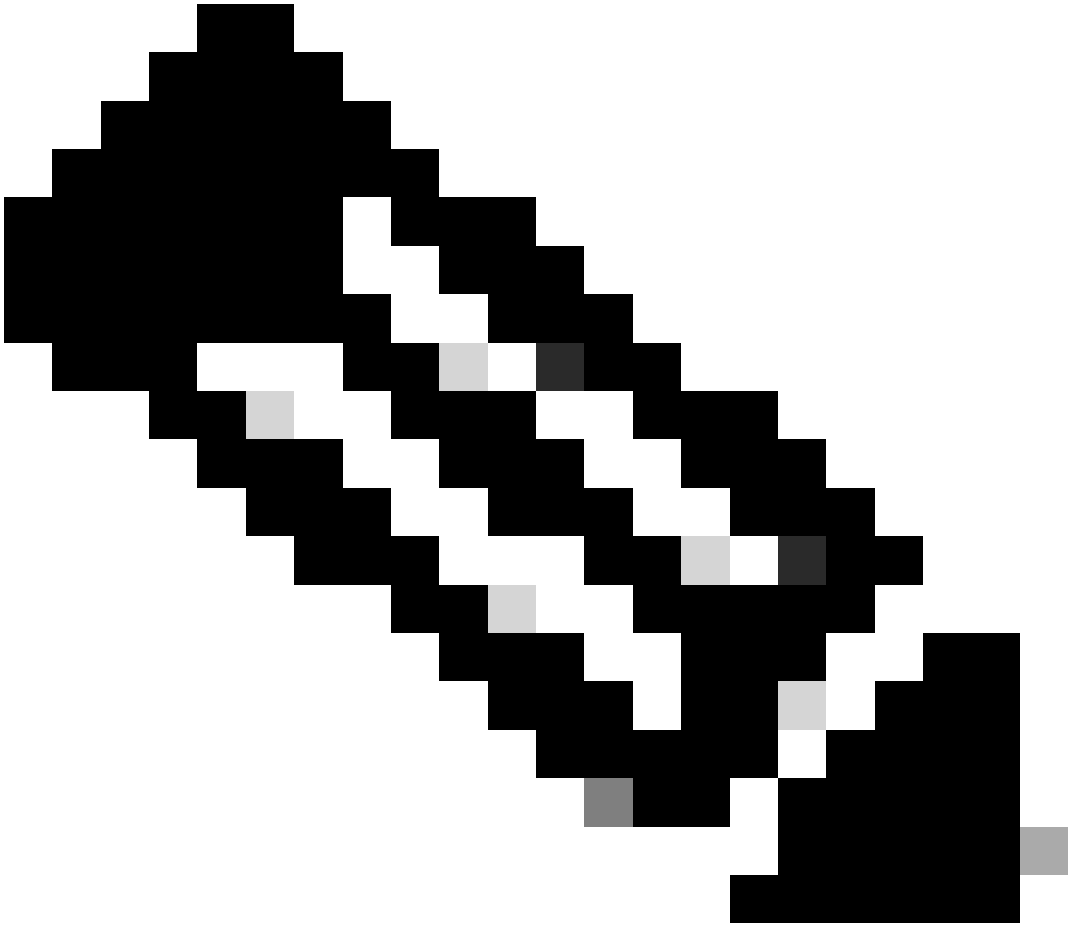
注意：此环回接口属于SVI的租户。

```
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
```

步骤 7.使用命令show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]验证环回接口的IP地址是否已在BGP L2VPN EVPN中通告给主干。

```
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
```

步骤 8验证环回接口的IP地址已注入到DHCP服务器所在的BGP L2VPN EVPN。

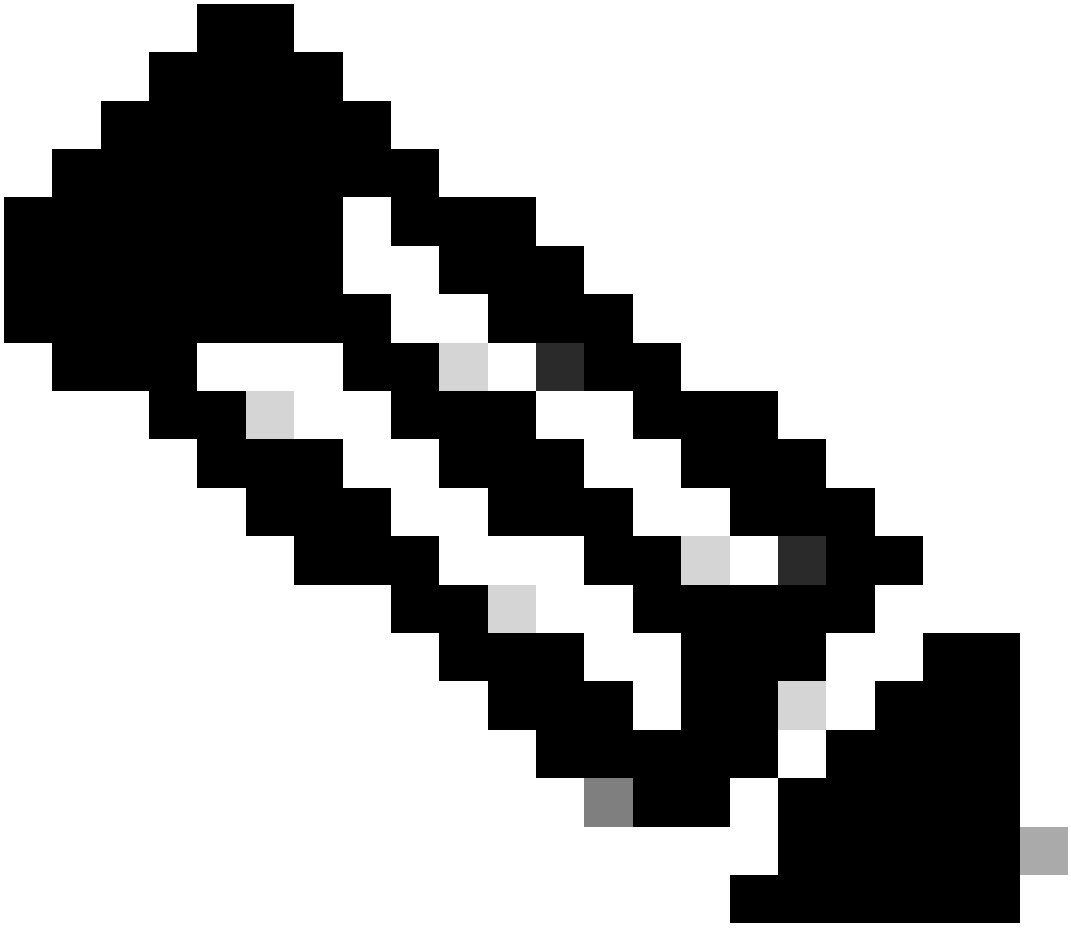


注意：如果vPC中有Nexus交换机，请确认它们都获取BGP L2VPN EVPN中环回接口的IP地址。

```
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
```

步骤 9 使用命令show ip route [DHCP server IP] vrf [tenant vrf]验证源租户上是否存在DHCP服务器的路由。



注意：要使用的路由条目必须从VxLAN到默认VRF。如果没有可用的路由，请检查VTEP是否本地知道DCHP服务器IP地址。

```
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:
```

步骤 10使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf]验证DCHP服务器IP是否可通过环回接口和相应的VRF作为VRF源来访问。

```
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
```

步骤 11检验DHCP中继代理的状态。

```
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
```

步骤 12检验option82，例如vpn选项和中继代理下的正确中继IP地址。

```
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   <<<<<<<<<
```

步骤 13检验已处理和转发的数据包的统计信息。

```
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
```

步骤 14检验中继数据包的统计信息。

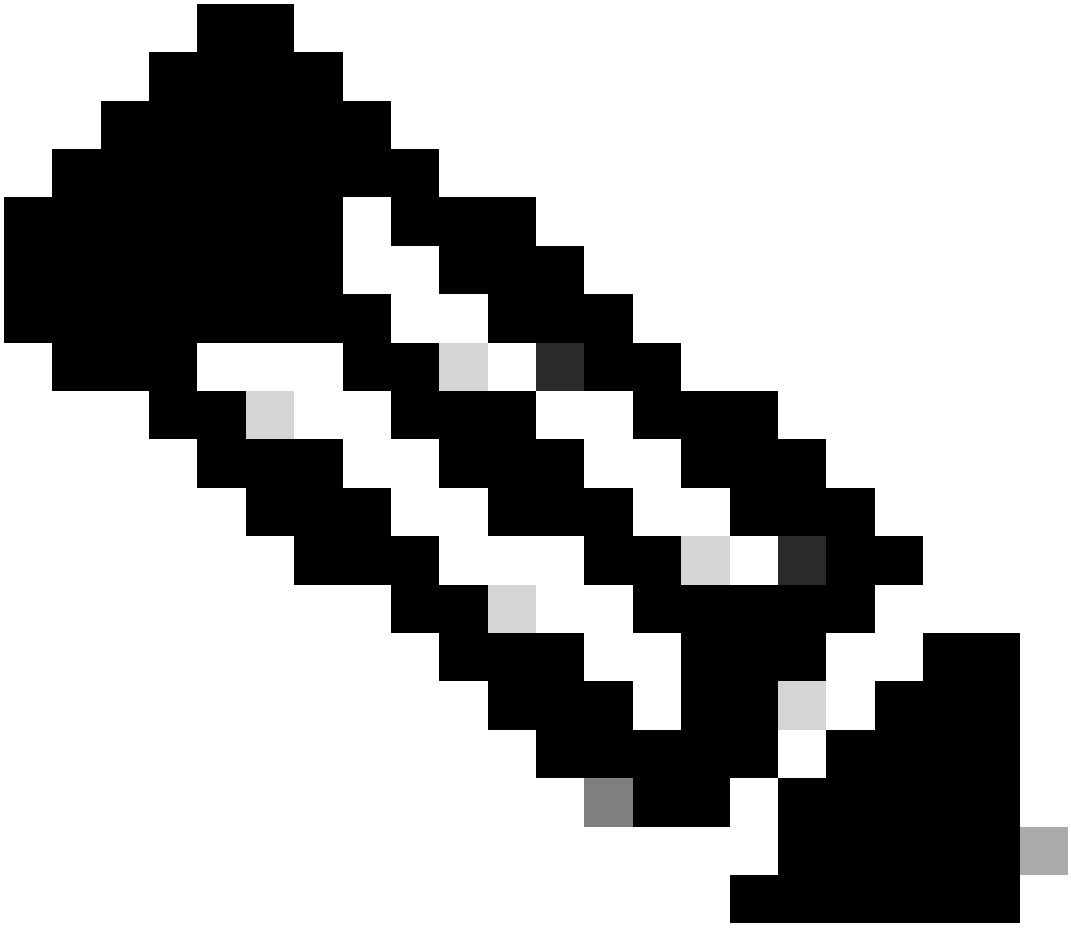
```
LEAF-1# show ip dhcp relay statistics
--------------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
--------------------------------------------------------------------------------
Discover              260521          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
```

枝叶-1-vPC DHCP

步骤1:启用功能DCHP。

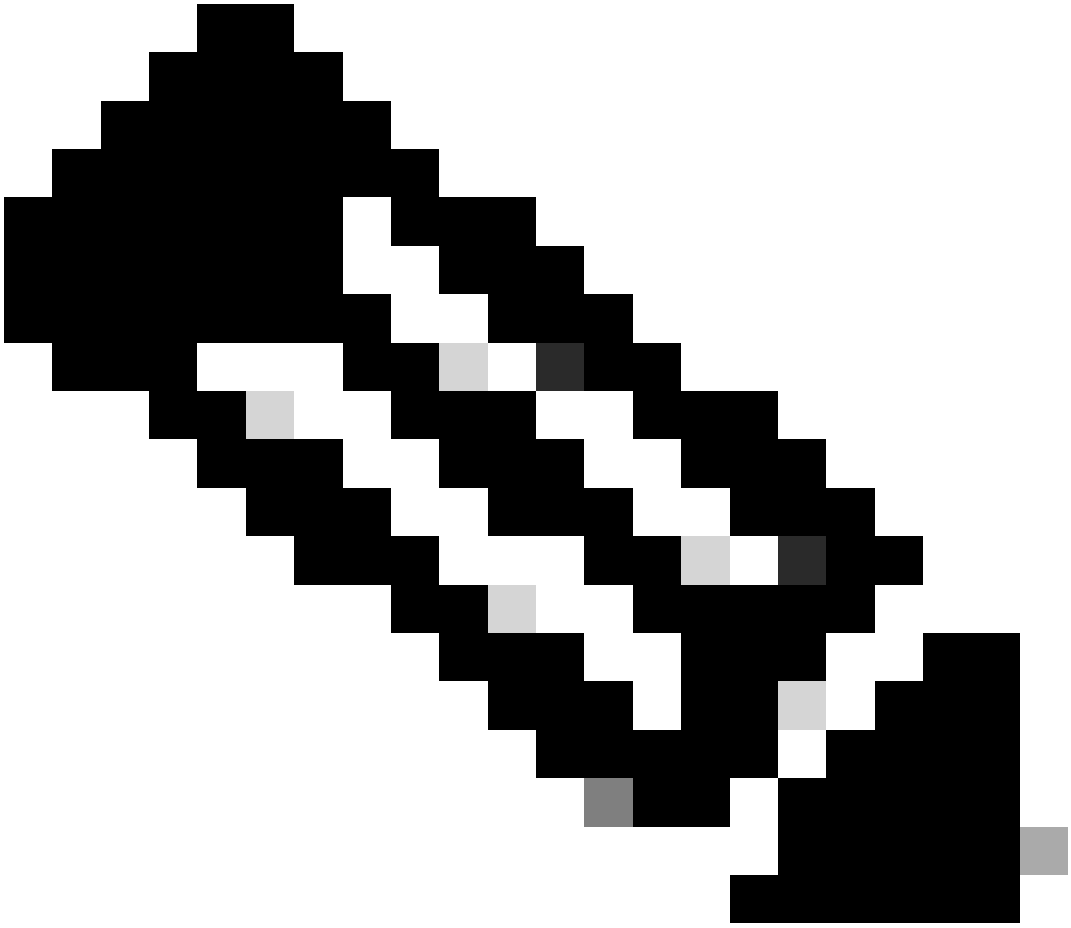
```
LEAF-1-VPC(config)#feature dhcp
```



注意：自NX-OS 7.x以来，默认情况下启用DHCP服务器和中继代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay。

第二步：应用命令ip dhcp relay information option。

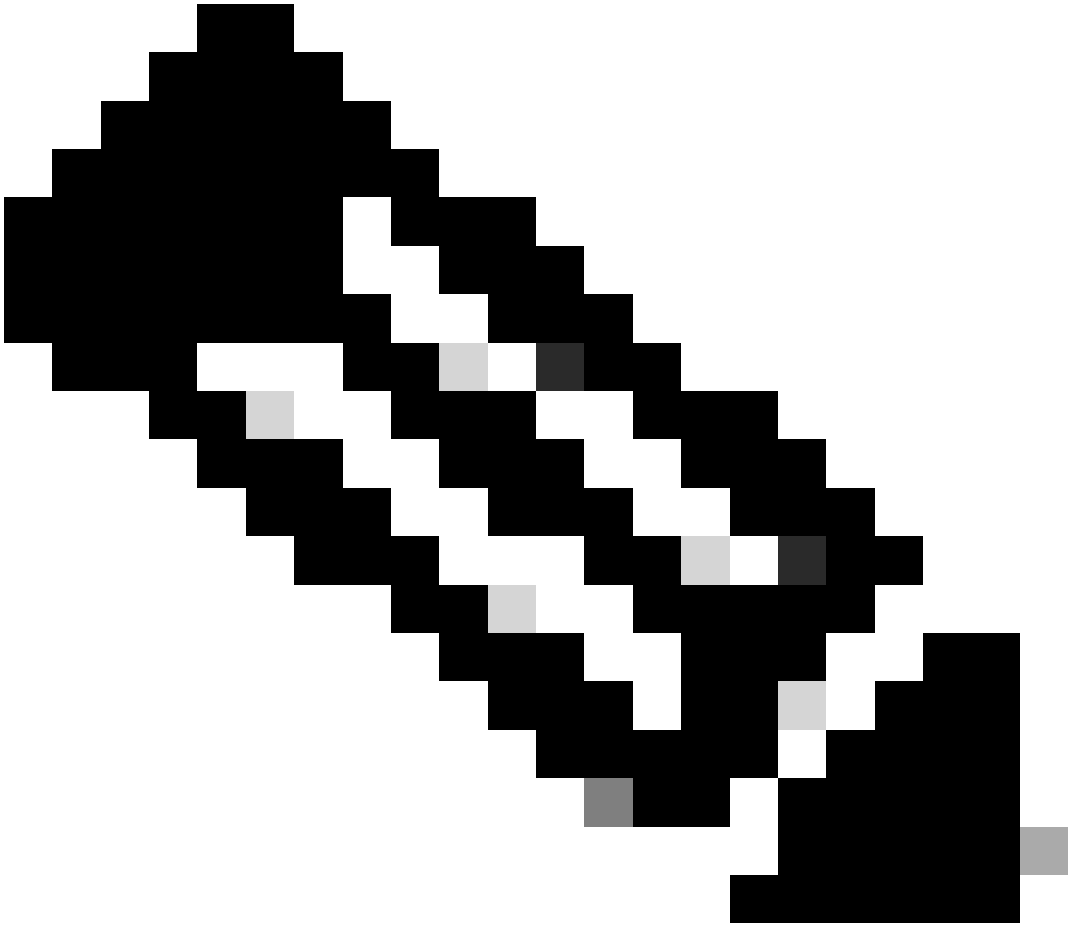
```
LEAF-1-VPC(config)#ip dhcp relay information option
```



注意：使用此命令，DHCP中继代理可以插入和删除选项82有关转发数据包的信息。

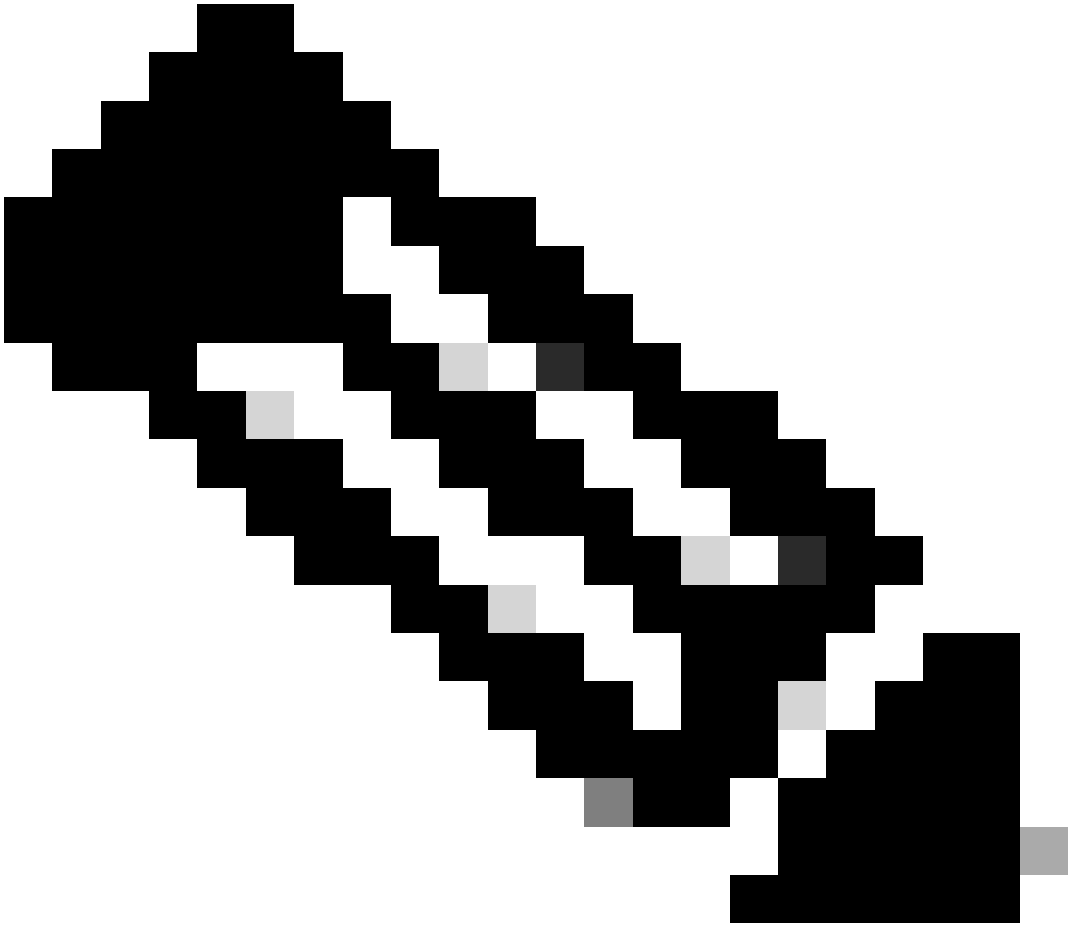
第三步：应用命令“ip dhcp relay information option vpn”。

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



注意：此命令启用到达DHCP服务器所属的不同VRF的DHCP中继请求。

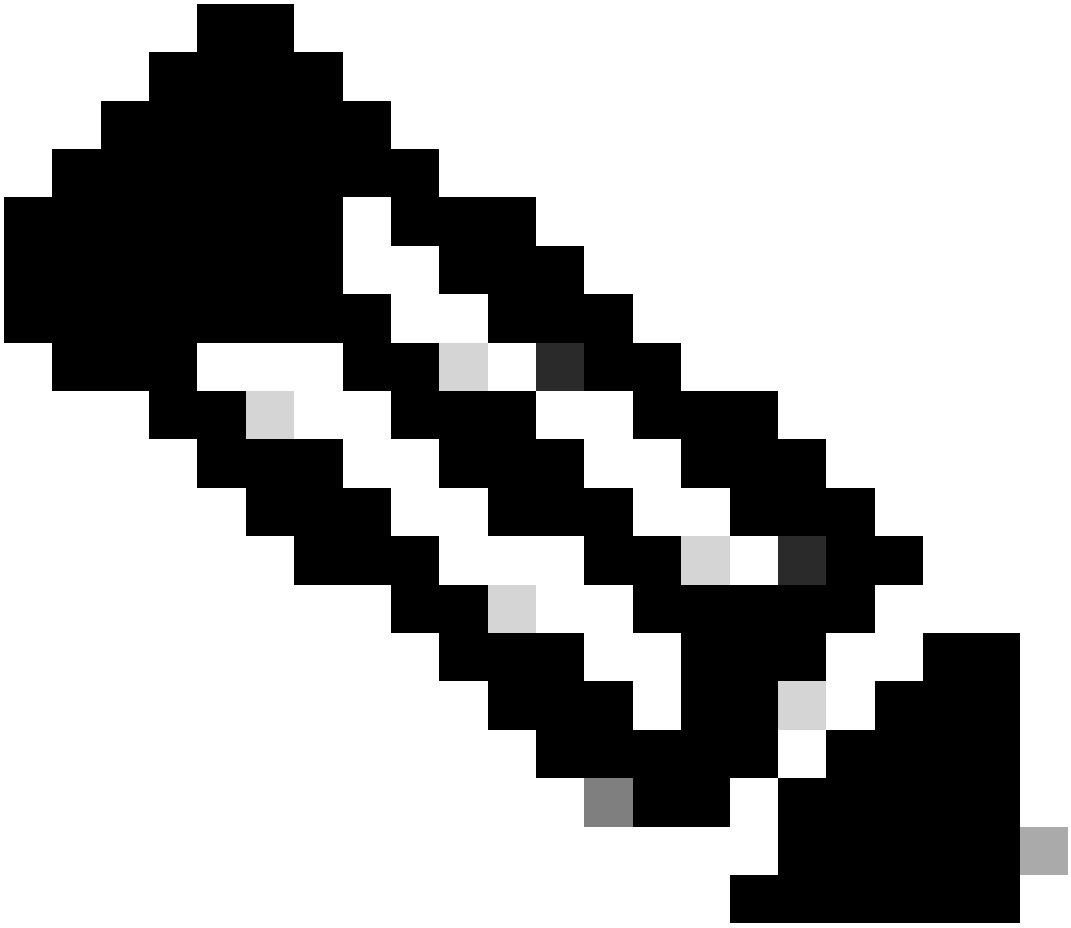
第四步：应用命令ip dhcp relay address [DCHP服务器的IP地址]。



注意：在本示例中，DCHP服务器的IP地址为10.10.10.150。

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

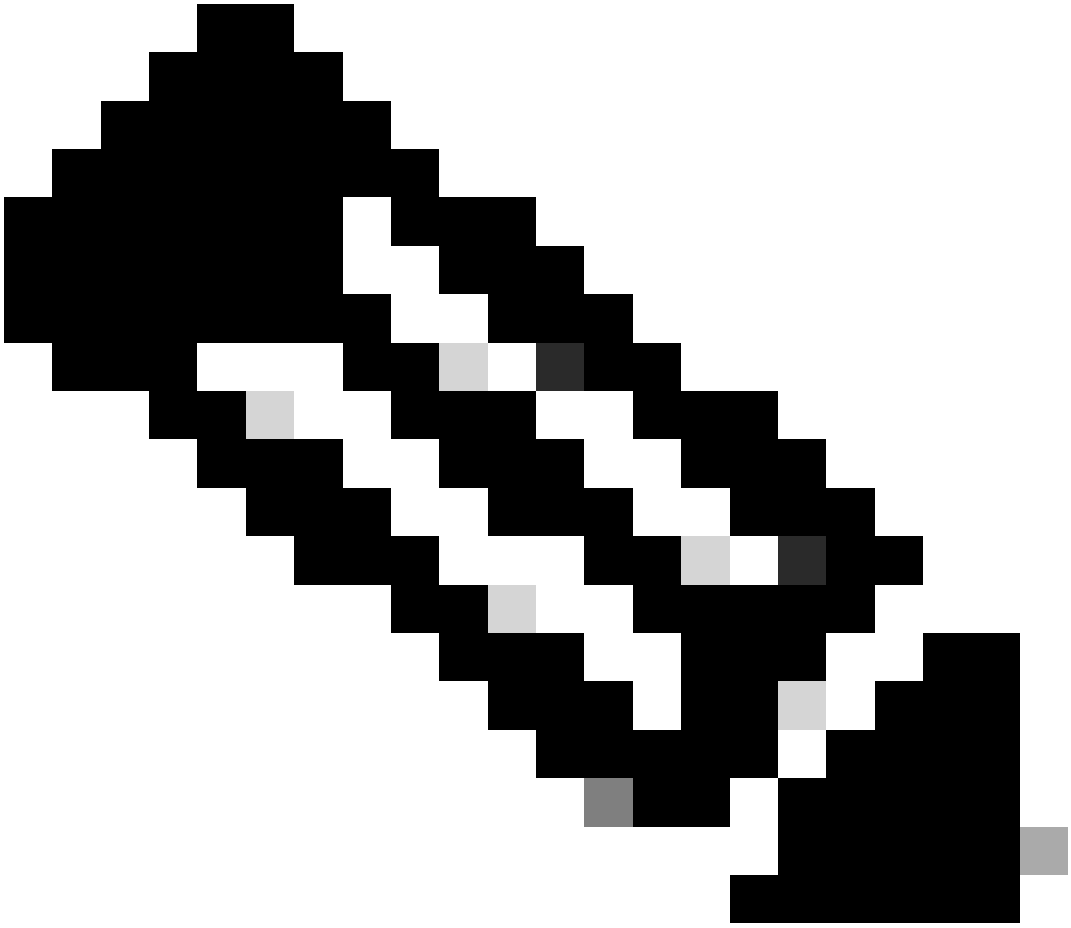
第五步：应用命令“ip dhcp relay source-interface [unique loopback]”。



注意：此命令配置DHCP中继代理的源IP地址，以便处理发现、提供、请求和ACK单播通信，而DHCP中继代理使用SVI的IP地址作为DHCP中继代理的源IP地址。这是不需要的，因为此IP地址由多个VTEP共享，并且可能发生对DHCP数据包的黑洞。要避免这种情况，需要唯一IP地址（使用环回接口）来区分每个VTEP。

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

第六步：在BGP内对应租户的VRF中，使用前缀列表和路由映射（包括环回接口的IP地址）直接路由重分配。



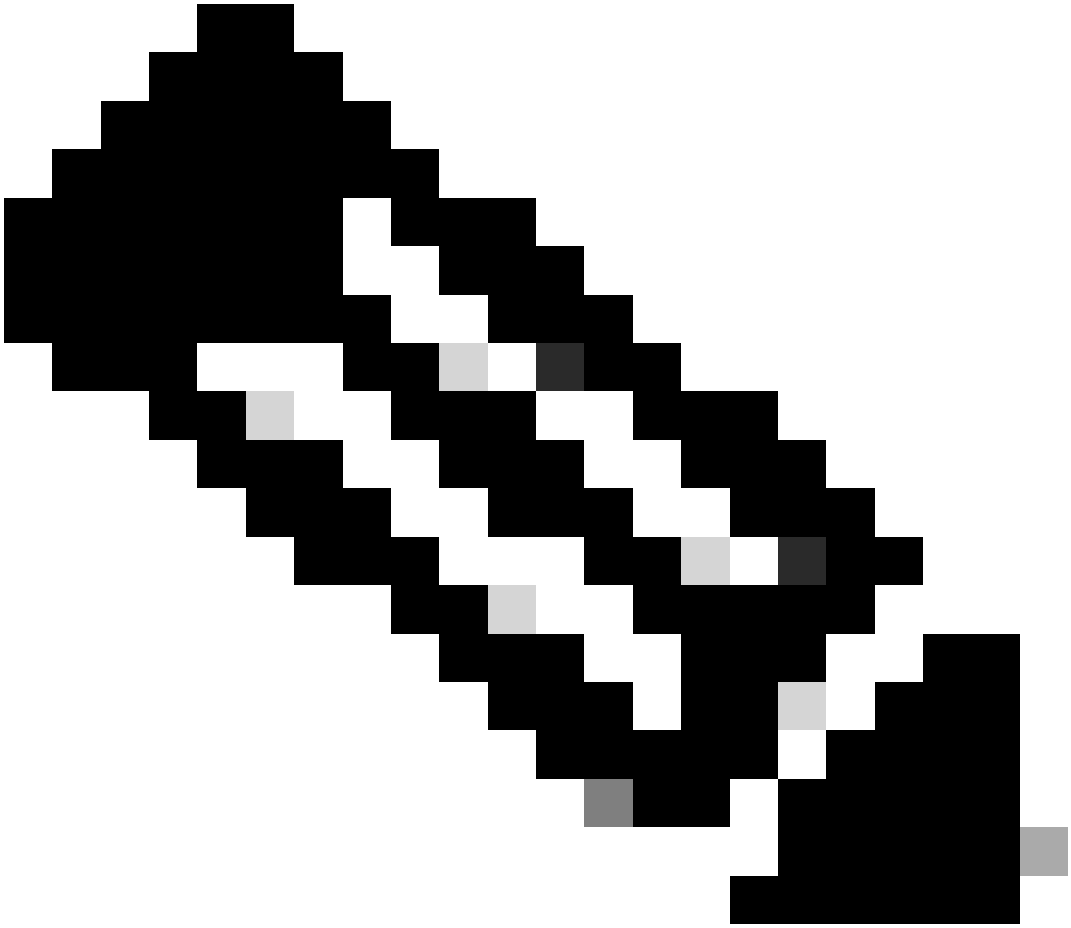
注意：此环回接口属于SVI的租户。

```
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
```

步骤 7.使用命令show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]验证环回接口的IP地址是否已在BGP L2VPN EVPN中通告给主干。

```
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
```

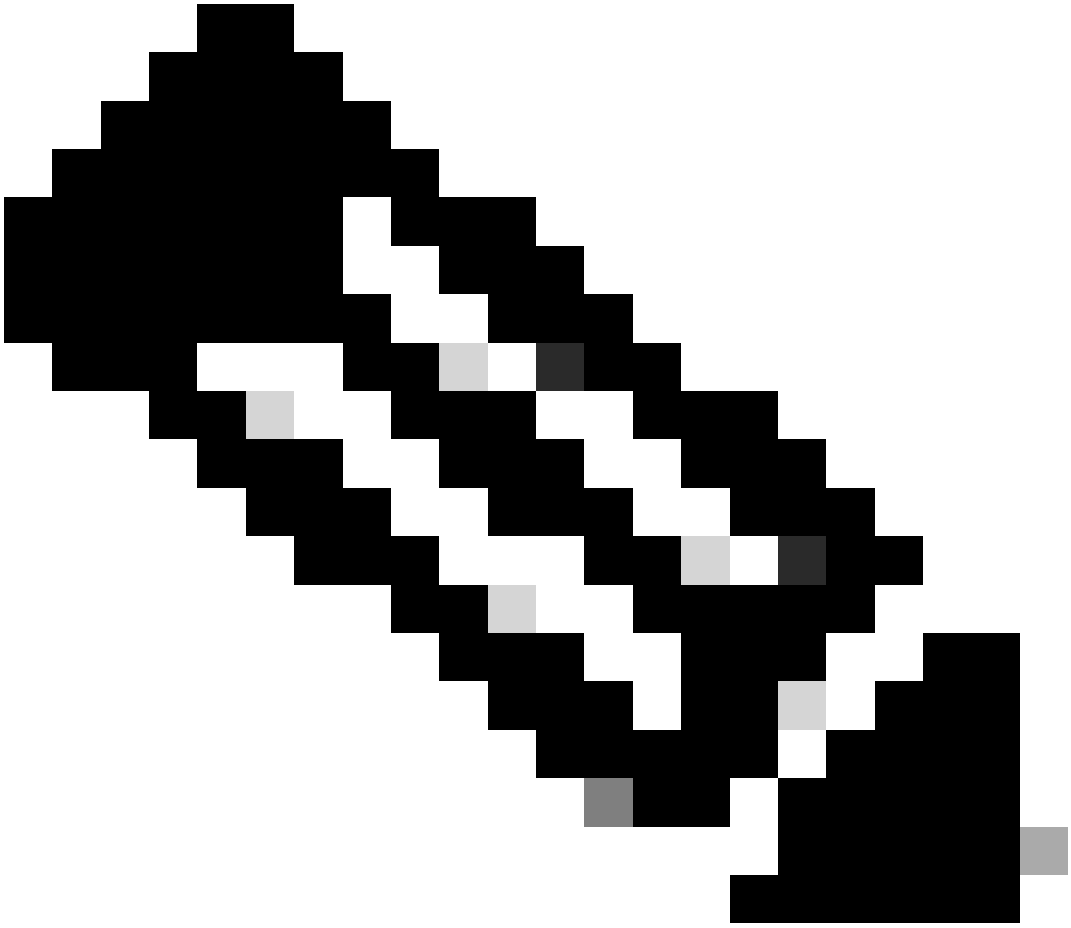
步骤 8验证环回接口的IP地址已注入到DHCP服务器所在的BGP L2VPN EVPN。



注意：如果vPC中有Nexus交换机，请确认它们都获取BGP L2VPN EVPN中环回接口的IP地址。

```
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
```

步骤 9 使用命令show ip route [DHCP server IP] vrf[tenant vrf]验证源租户上是否存在DHCP服务器的路由。



注意：要使用的路由条目必须从VxLAN到默认VRF。如果没有可用的路由，请检查VTEP是否本地知道DCHP服务器IP地址。

```
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
```

步骤 10使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenvrf]验证能否使用环回接口和相应的VRF作为VRF源访问DCHP服务器IP。

```
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 ---
```

步骤 11检验DHCP中继代理的状态。

```
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
```

步骤 12检验option82，例如vpn选项和中继代理下的正确中继IP地址。

```
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      <<<<<<<<<
```

步骤 13检验已处理和已转发的数据包的统计信息。

```
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
```

步骤 14检验中继数据包的统计信息。

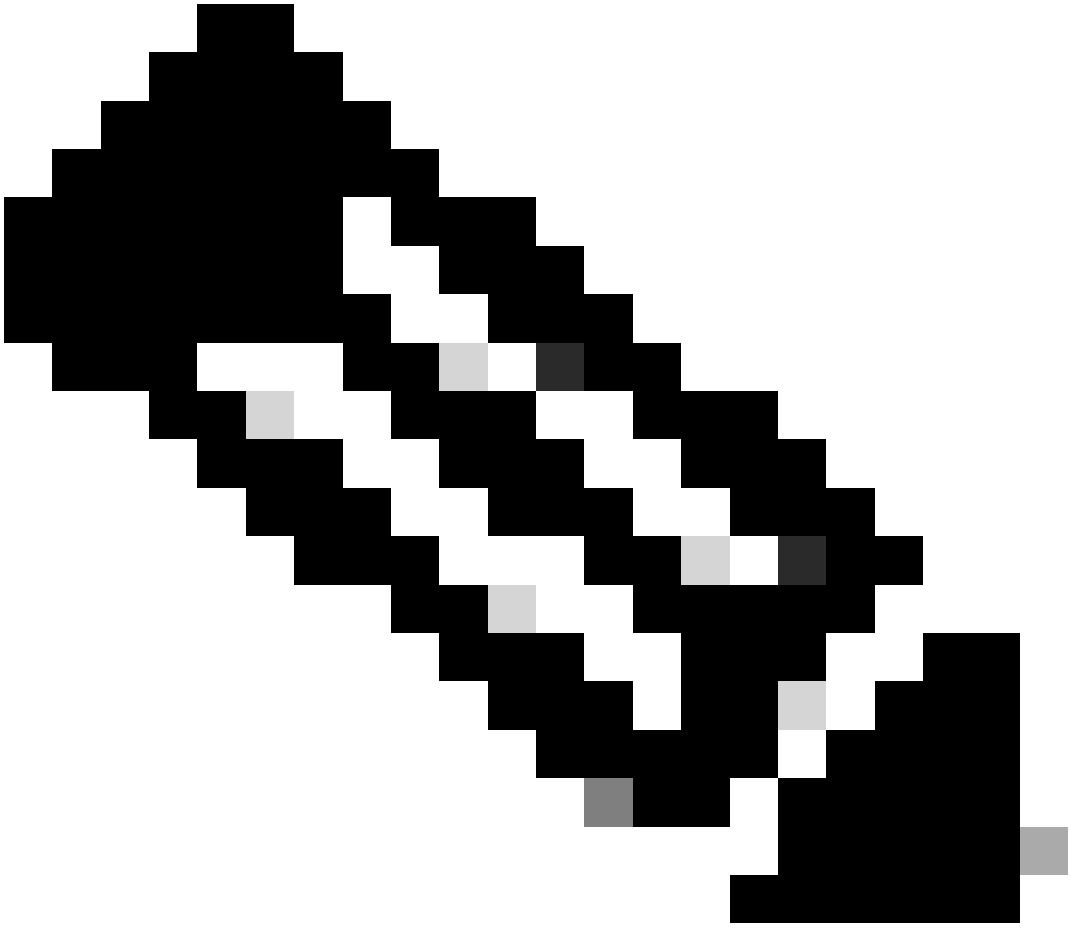
```
LEAF-1-VPC# show ip dhcp relay statistics
--------------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
--------------------------------------------------------------------------------
Discover                   8               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
```

枝叶-2-vPC DHCP

步骤1:启用功能DCHP。

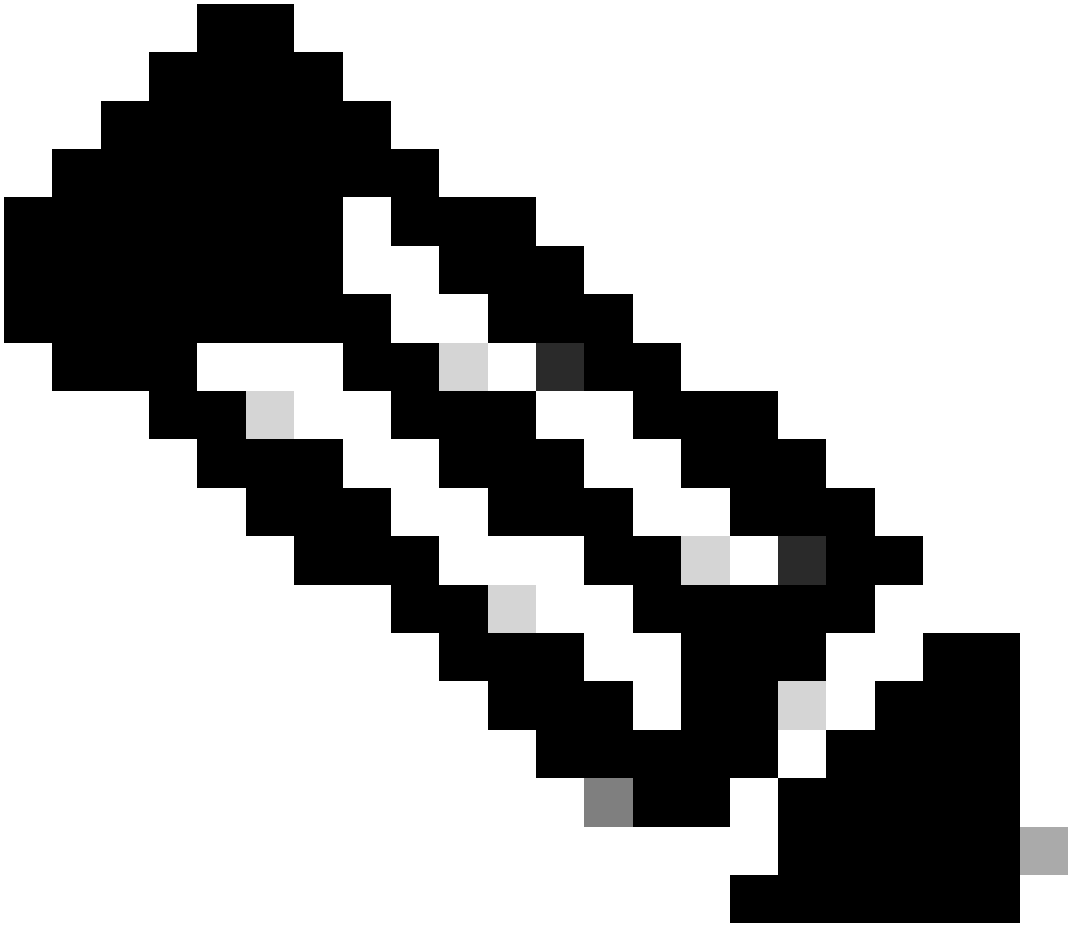
```
LEAF-2-VPC(config)# feature dhcp
```



注意：自NX-OS 7.x以来，默认情况下启用DHCP服务器和中继代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay。

第二步：应用命令“ip dhcp relay information option”。

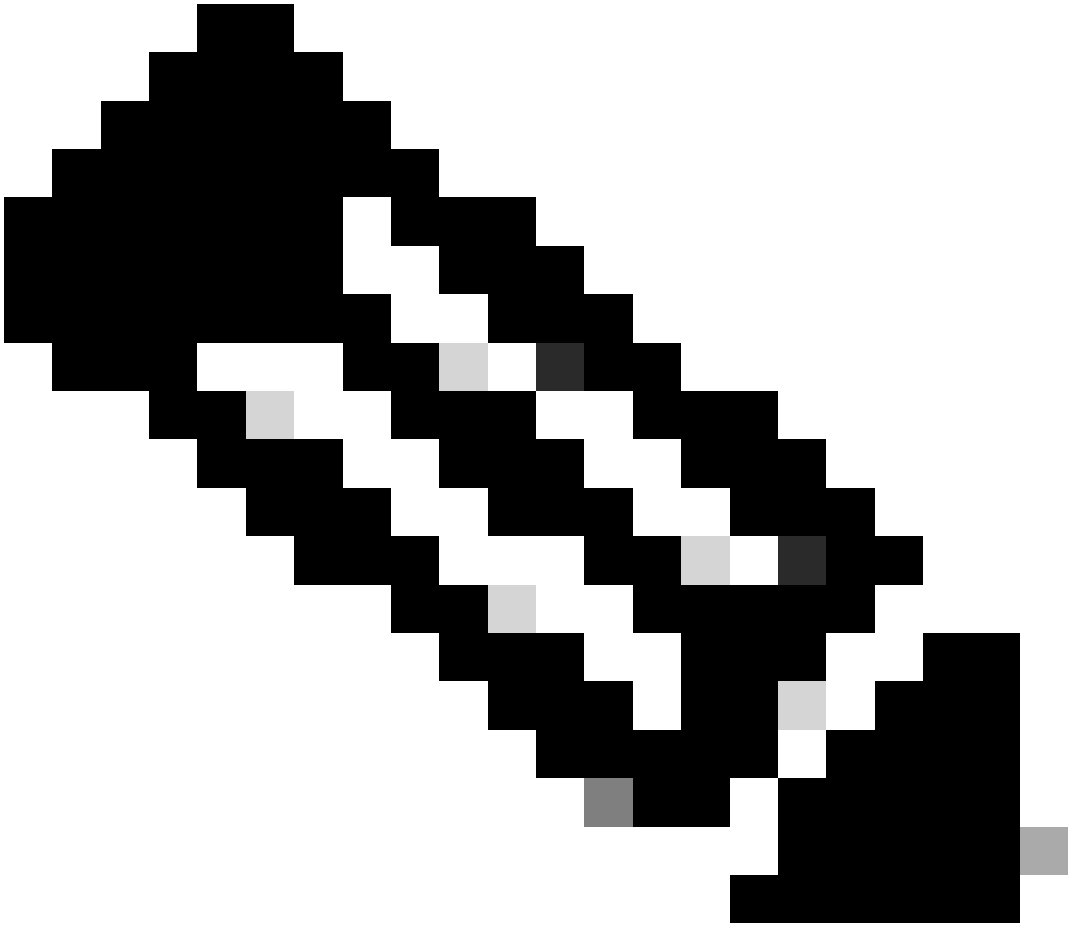
```
LEAF-2-VPC(config)# ip dhcp relay information option
```



注意：使用此命令，DHCP中继代理可以插入和删除选项82有关转发数据包的信息。

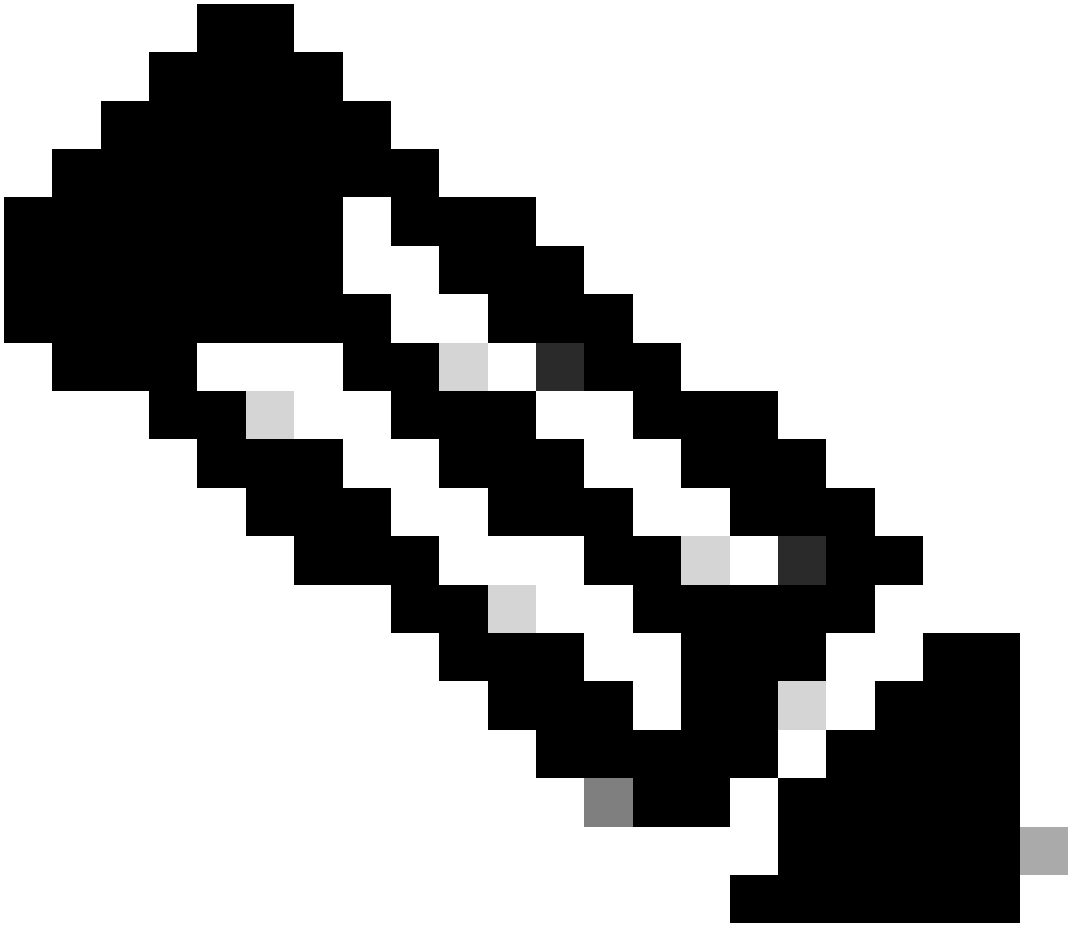
第三步：应用命令“ip dhcp relay information option vpn”。

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



注意：此命令启用到达DHCP服务器所属的不同VRF的DHCP中继请求。

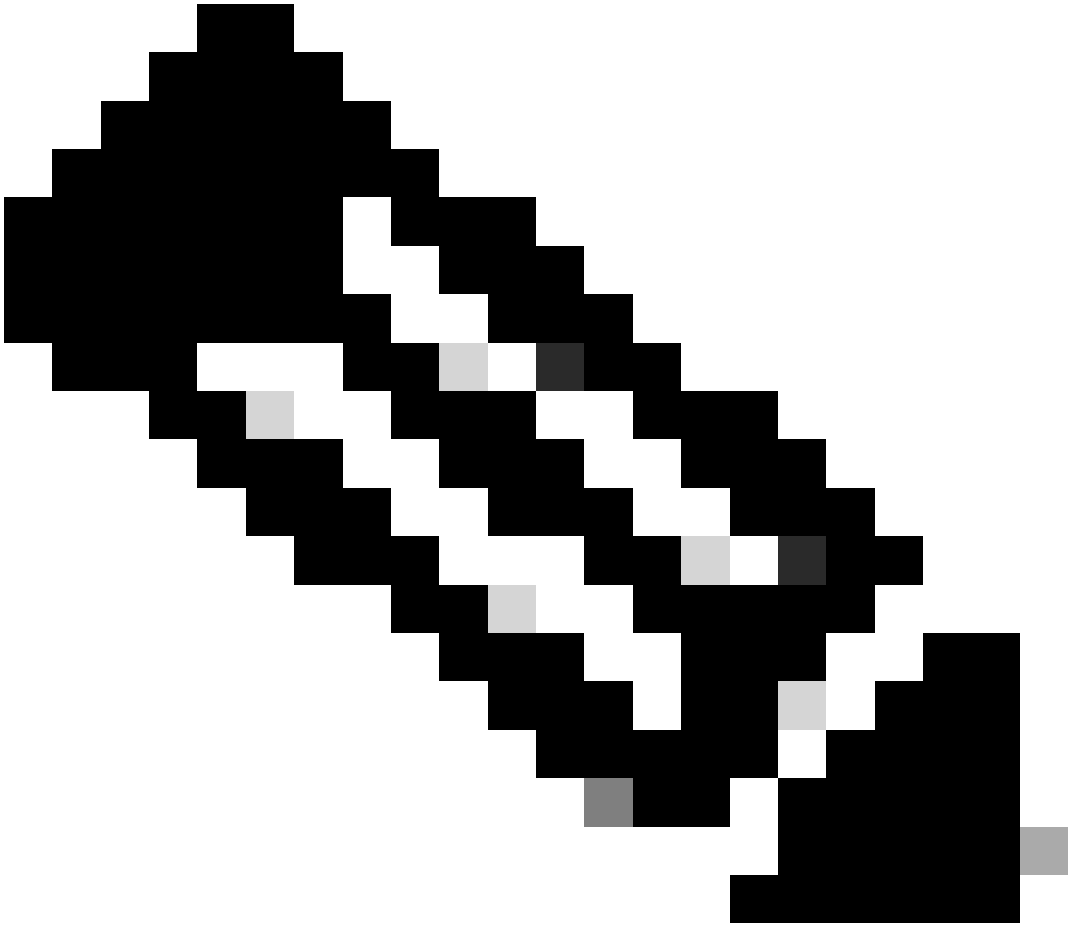
第四步：应用命令“ip dhcp relay address [DCHP服务器的IP地址]”。



注意：在本示例中，DCHP服务器的IP地址为10.10.10.150。

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

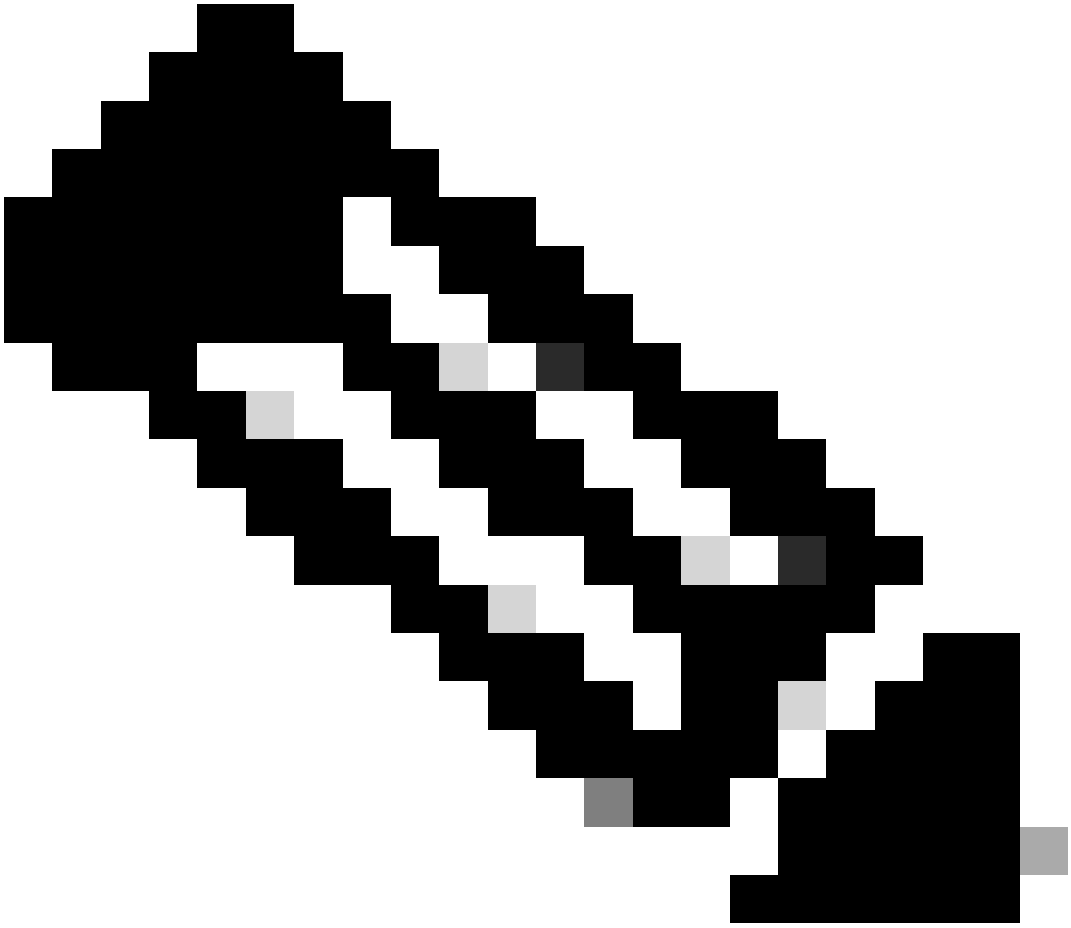
第五步：应用命令“ip dhcp relay source-interface [unique loopback]”。



注意：此命令配置DHCP中继代理的源IP地址，以便处理发现、提供、请求和ACK单播通信，而DHCP中继代理使用SVI的IP地址作为DHCP中继代理的源IP地址。这是不需要的，因为此IP地址由多个VTEP共享，并且可能发生对DHCP数据包的黑洞。要避免这种情况，需要唯一IP地址（使用环回接口）来区分每个VTEP。

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

第六步：在BGP内对应租户的VRF中，使用前缀列表和路由映射（包括环回接口的IP地址）直接路由重分配。



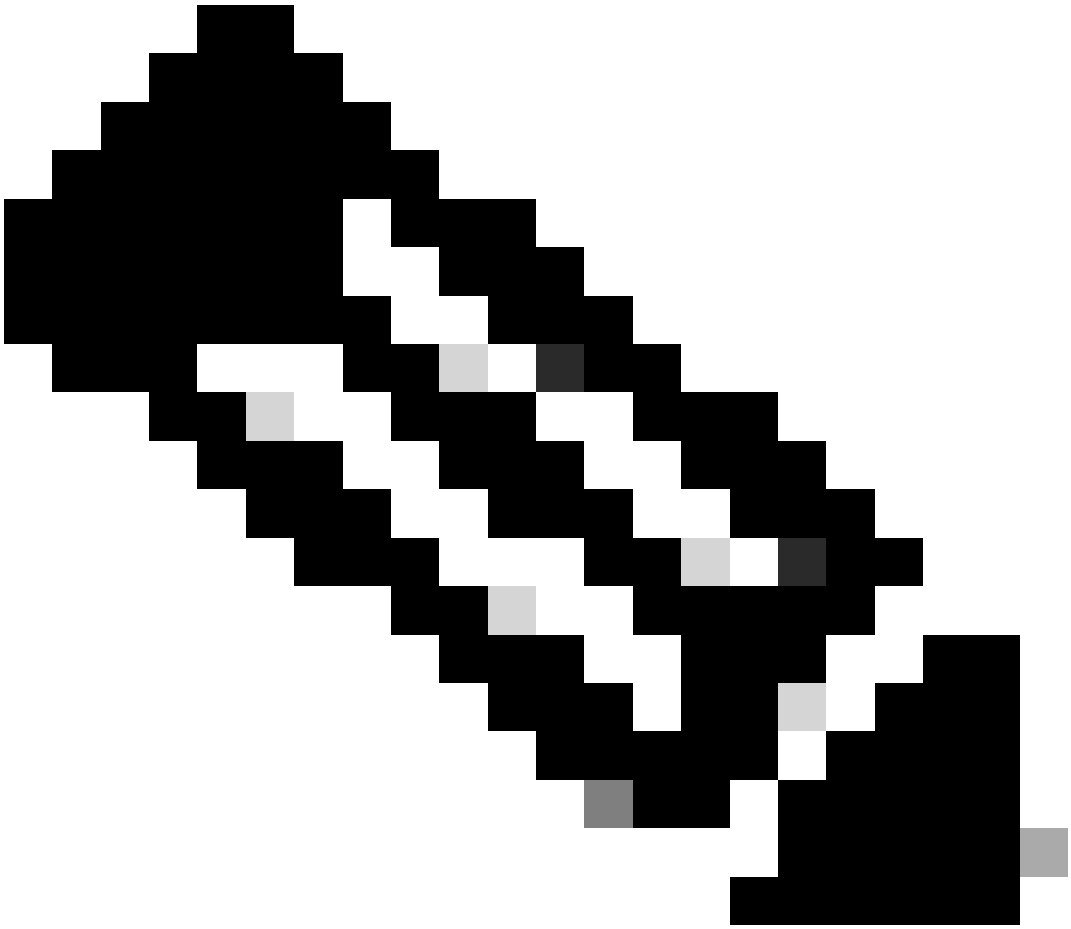
注意：此环回接口属于SVI的租户。

```
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
```

步骤 7.使用命令show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]验证环回接口的IP地址是否已在BGP L2VPN EVPN中通告给主干。

```
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
```

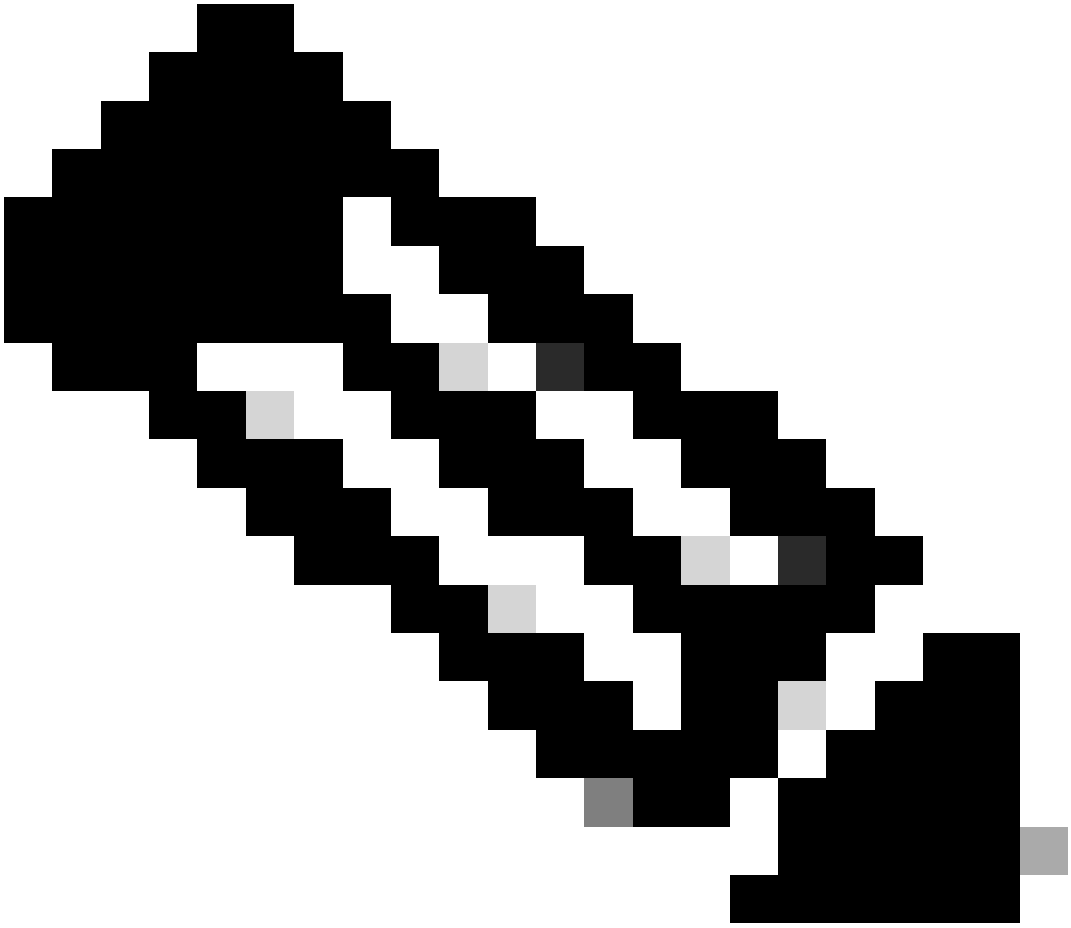
步骤 8验证环回接口的IP地址已注入到DHCP服务器所在的BGP L2VPN EVPN。



注意：如果vPC中有Nexus交换机，请确认它们都获取BGP L2VPN EVPN中环回接口的IP地址。

```
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
```

步骤 9使用命令show ip route [DHCP server IP] vrf[tenvrf]验证源租户上是否存在DHCP服务器的路由。



注意：要使用的路由条目必须从VxLAN到默认VRF。如果没有可用的路由，请检查VTEP是否本地知道DCHP服务器IP地址。

```
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
```

步骤 10使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf]验证DCHP服务器IP是否可通过环回接口和相应的VRF作为VRF源来访问。

```
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 ---
```

步骤 11检验DHCP中继代理的状态。

```
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
```

步骤 12检验option82，例如vpn选项和中继代理下的正确中继IP地址。

```
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 <<<<
```

步骤 13检验已处理和已转发的数据包的统计信息。

```
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
```

步骤 14检验中继数据包的统计信息。

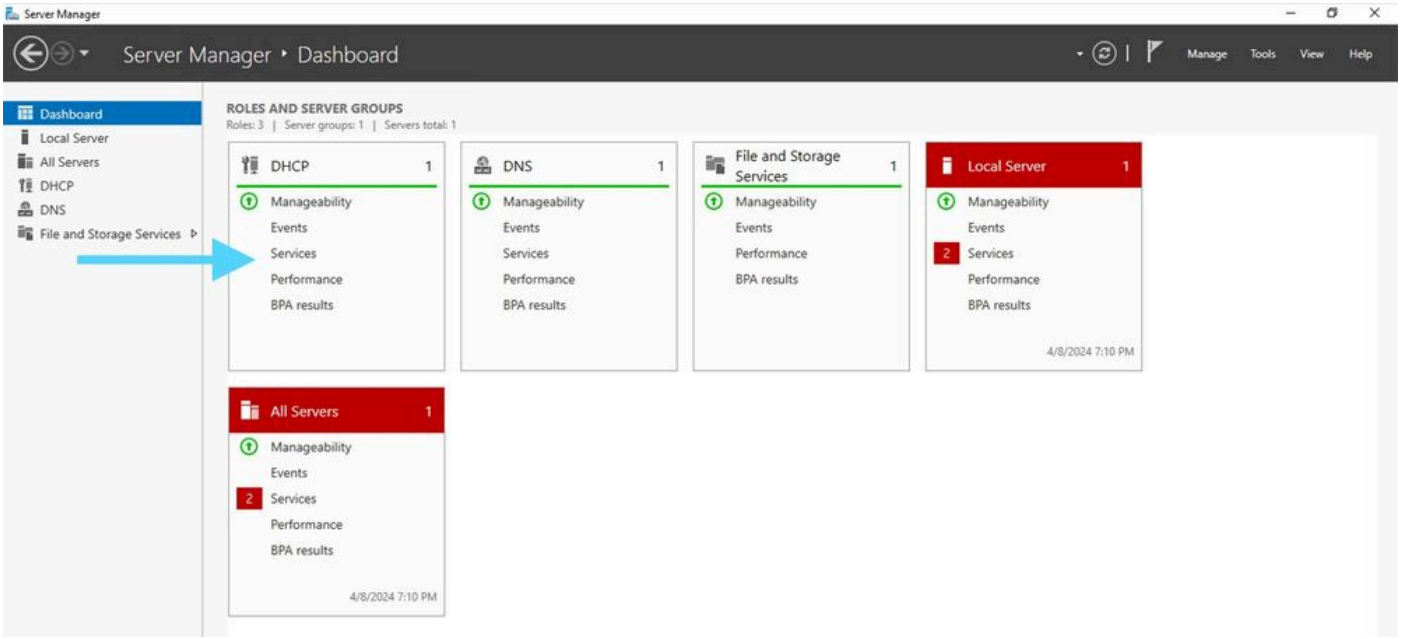
```
LEAF-2-VPC# show ip dhcp relay statistics
--------------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
--------------------------------------------------------------------------------
Discover               29312           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
```

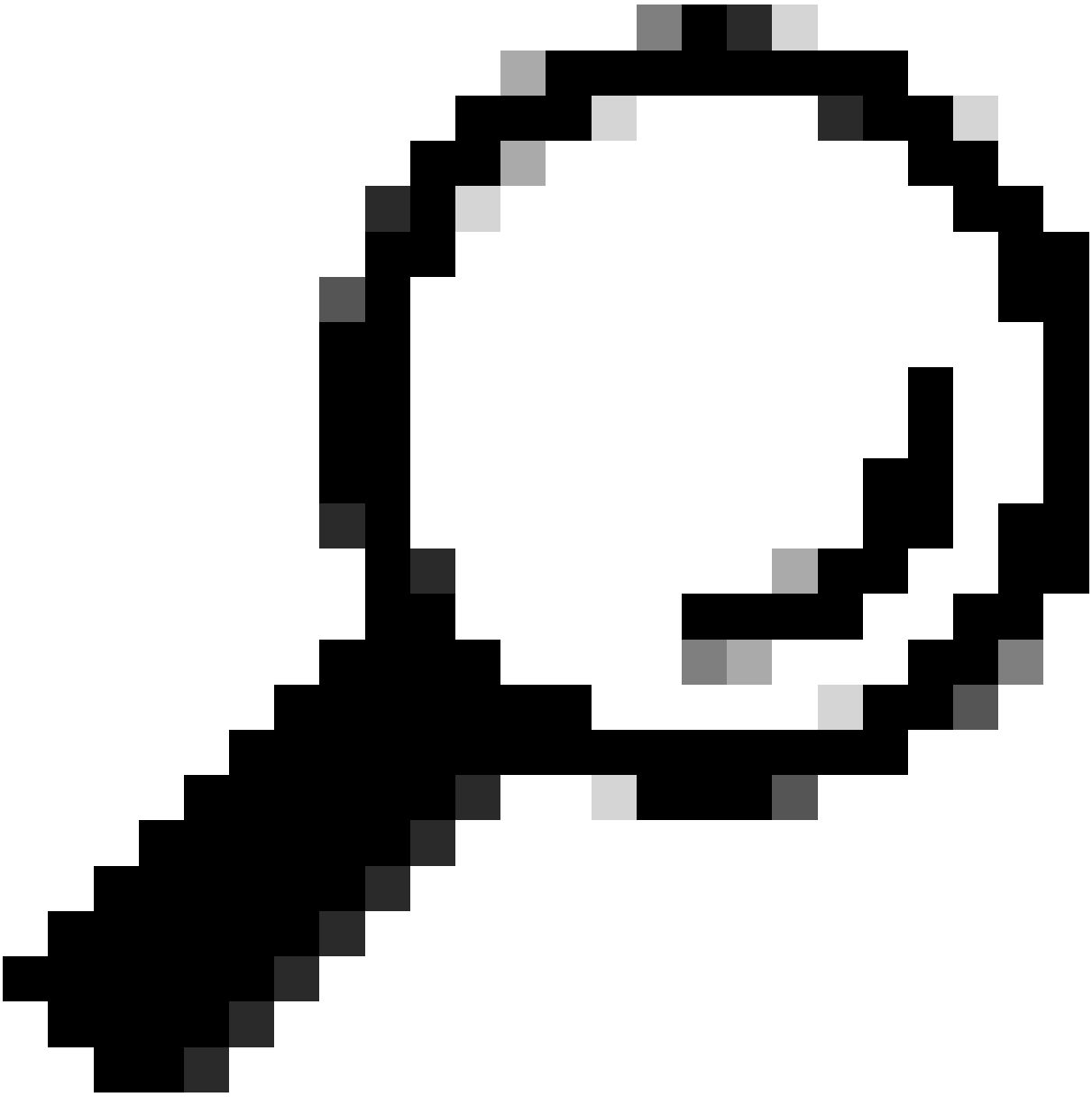
Windows Server 2022上的DHCP服务器配置

主机的IP寻址范围配置。

步骤1:打开服务器管理器，并验证控制面板中的DCHP服务器上没有警报。

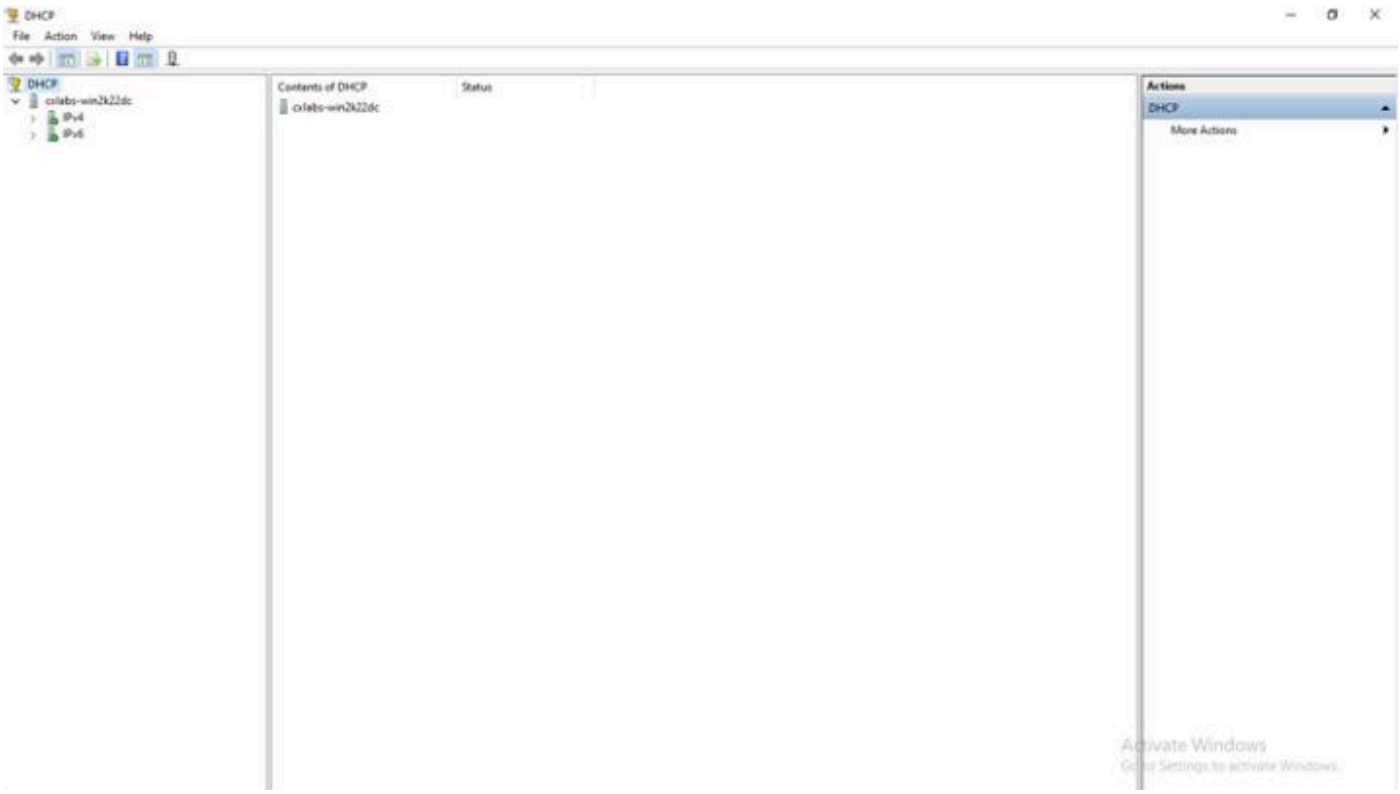


Windows Server 2022上服务器管理器的仪表板



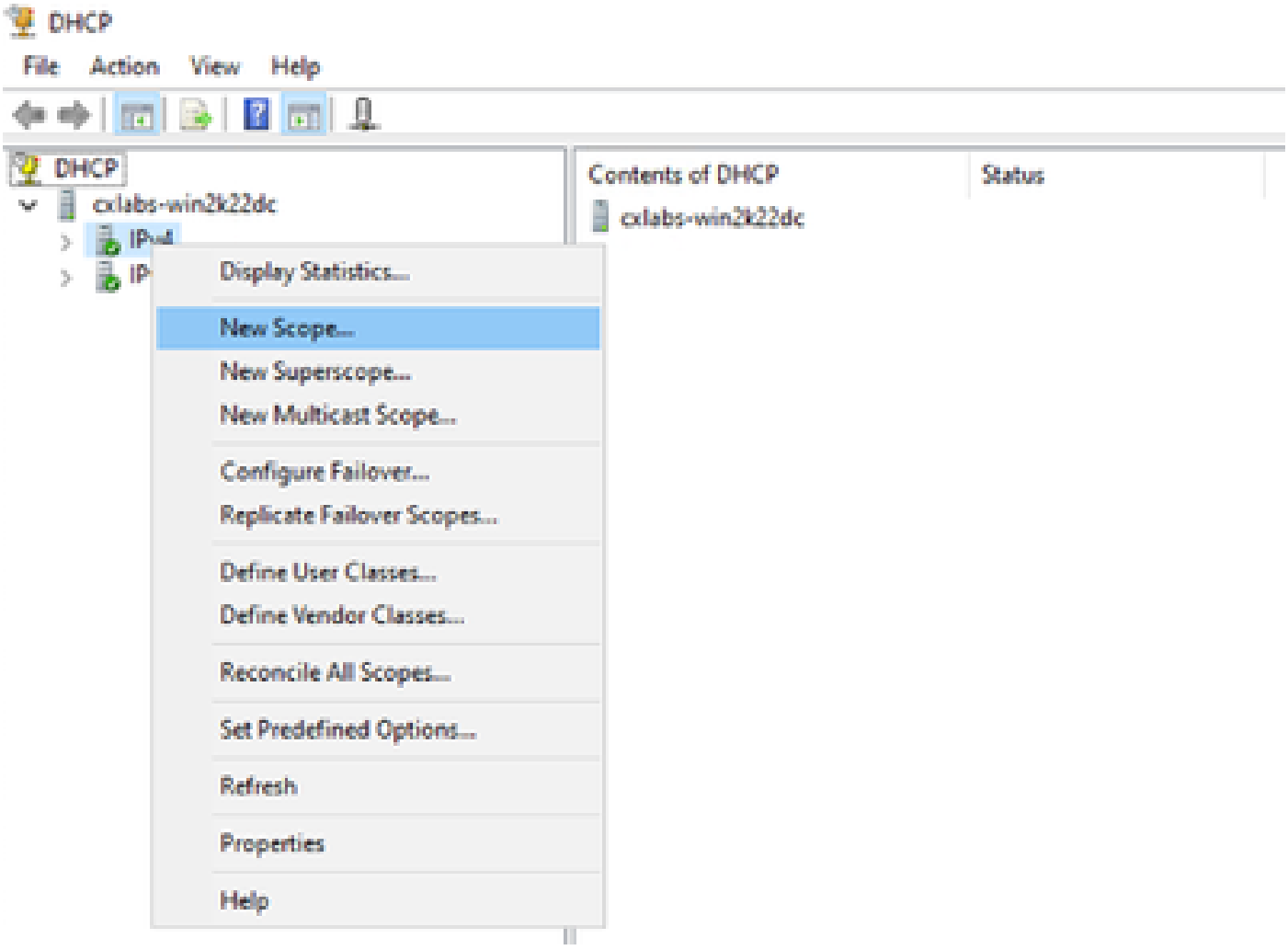
提示：双击时，图像会增大。

第二步：打开DHCP Server（DHCP服务器）应用程序。

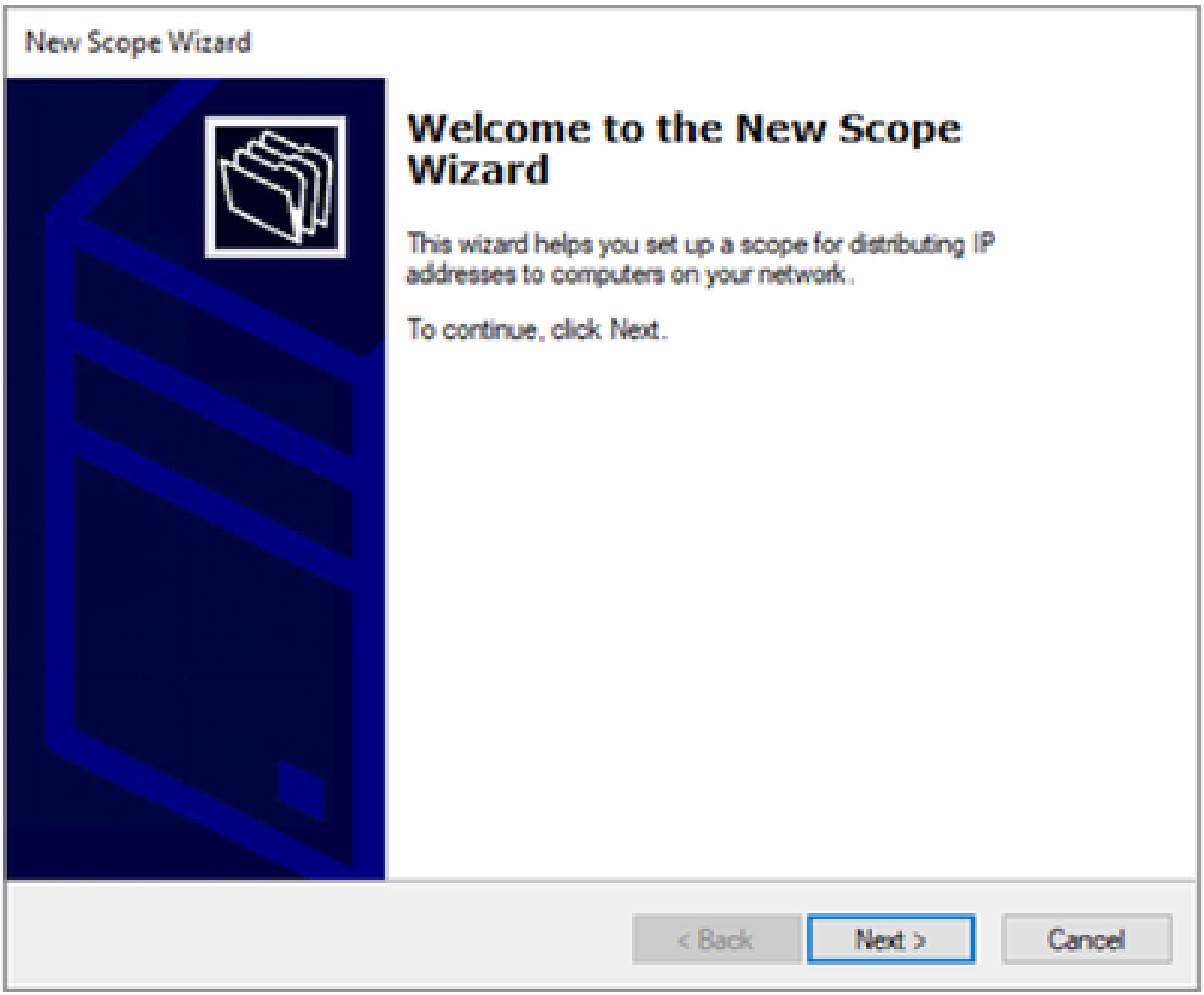


Windows Server 2022上的DHCP服务器

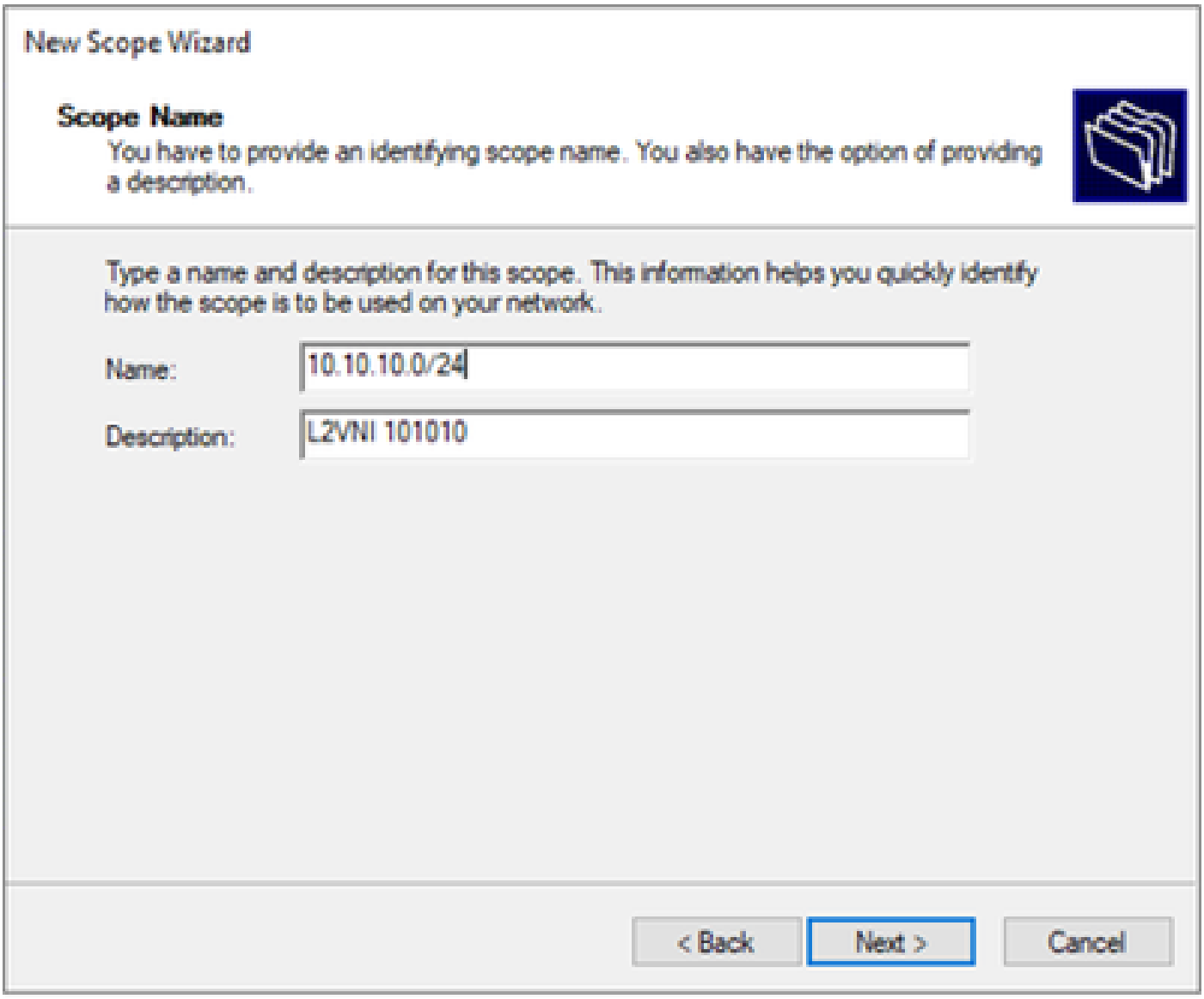
第三步： 右键单击IPv4并单击New Scope。



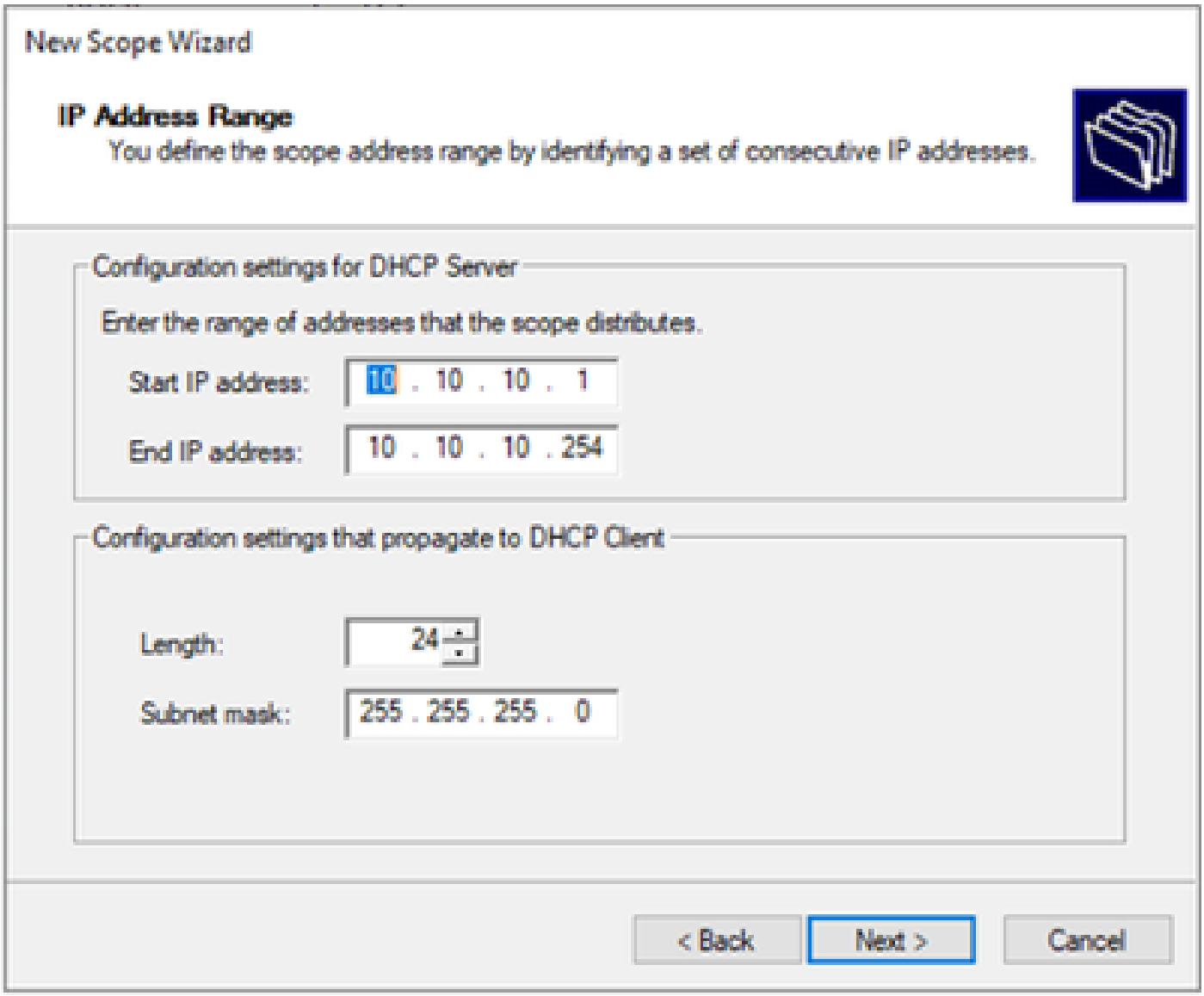
第四步：单击 Next。



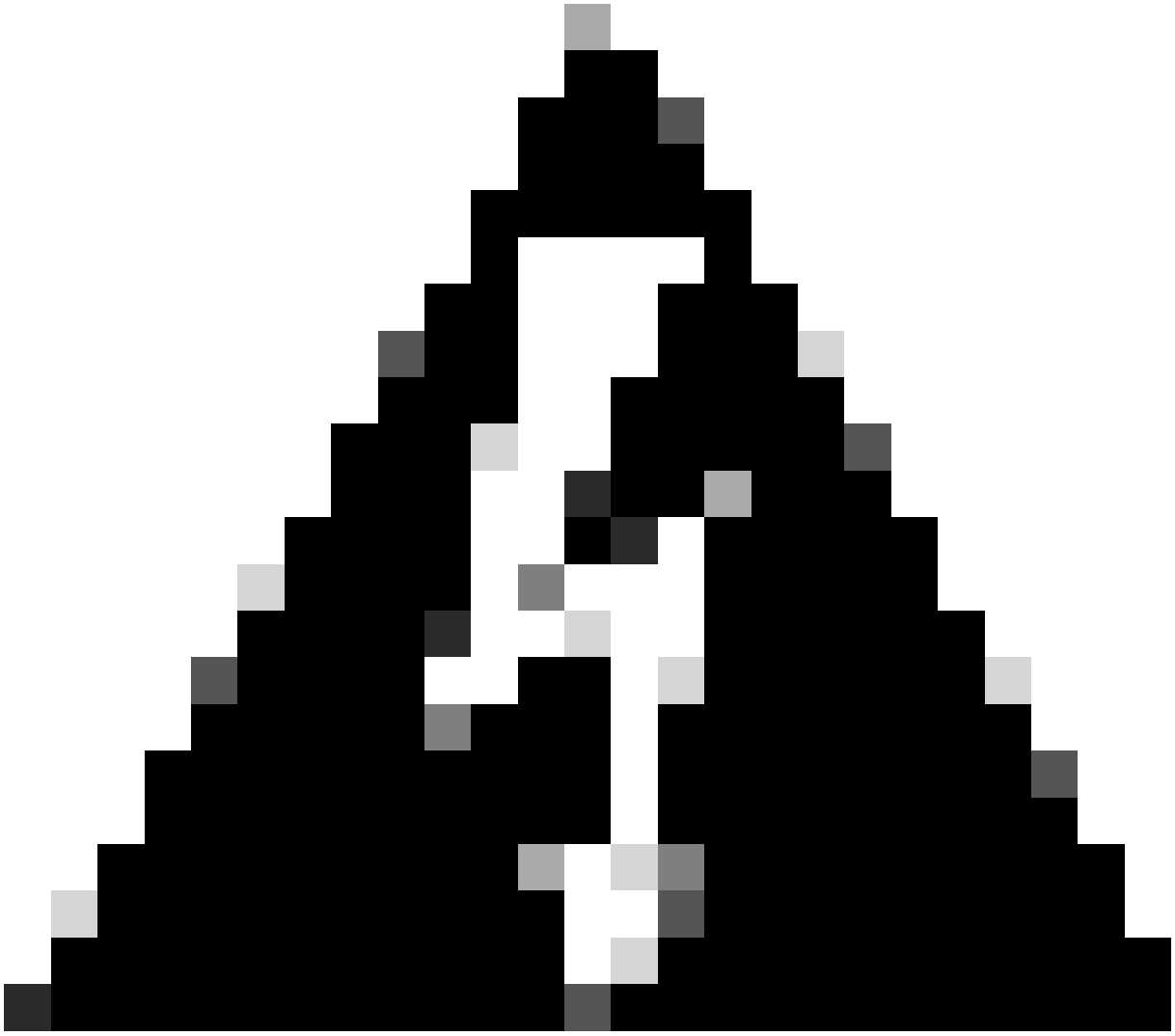
第五步：写下名称和说明。在本示例中，名称是属于VLAN 10的子网，说明是L2VNI，作为L2VNI列于VLAN 10。



第六步：配置IP地址范围这是主机池。

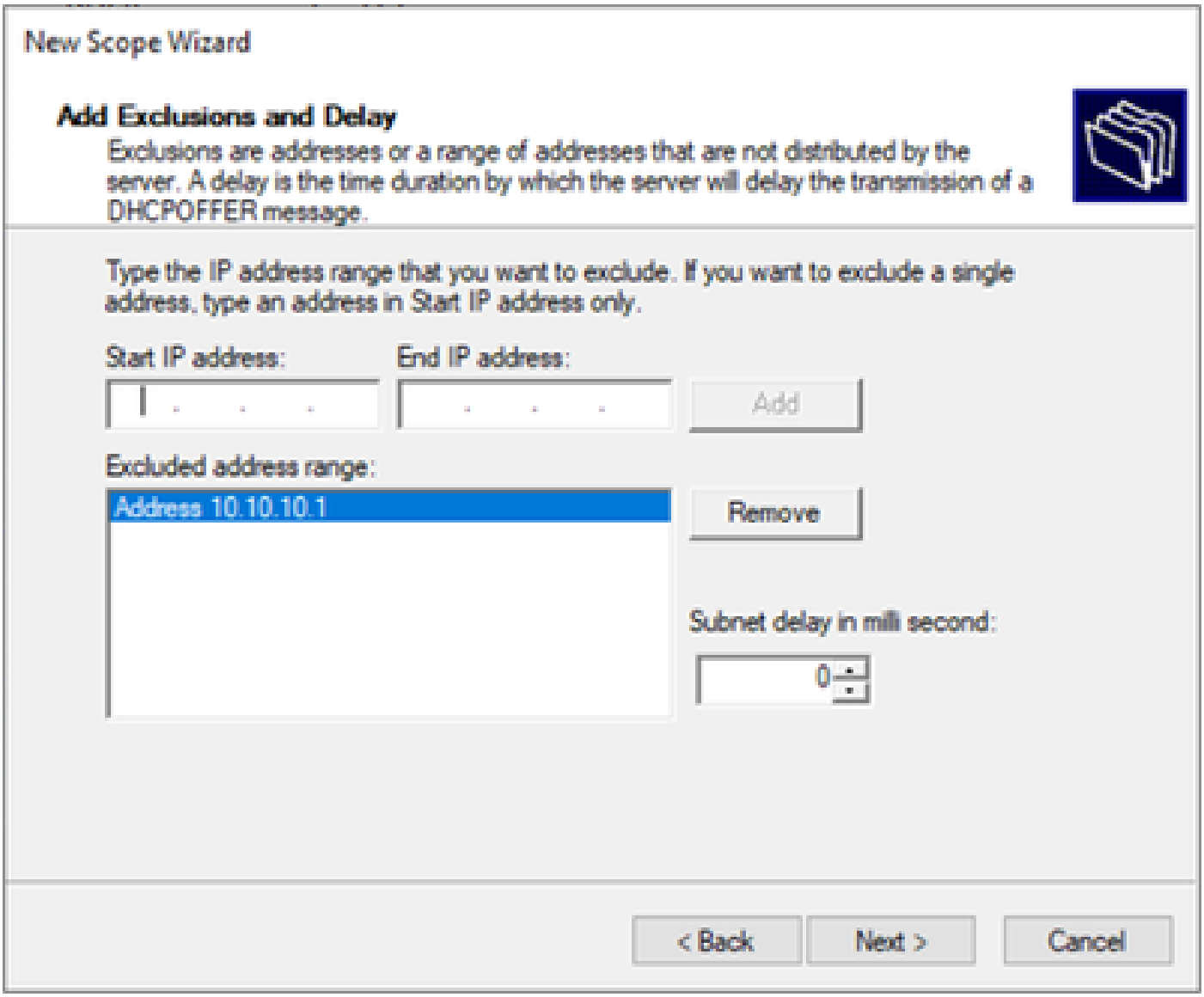


第六步：从VTEP中的SVI配置中排除共享IP地址。在本示例中，接口VLAN 10的地址为IP.10.10.1/24。

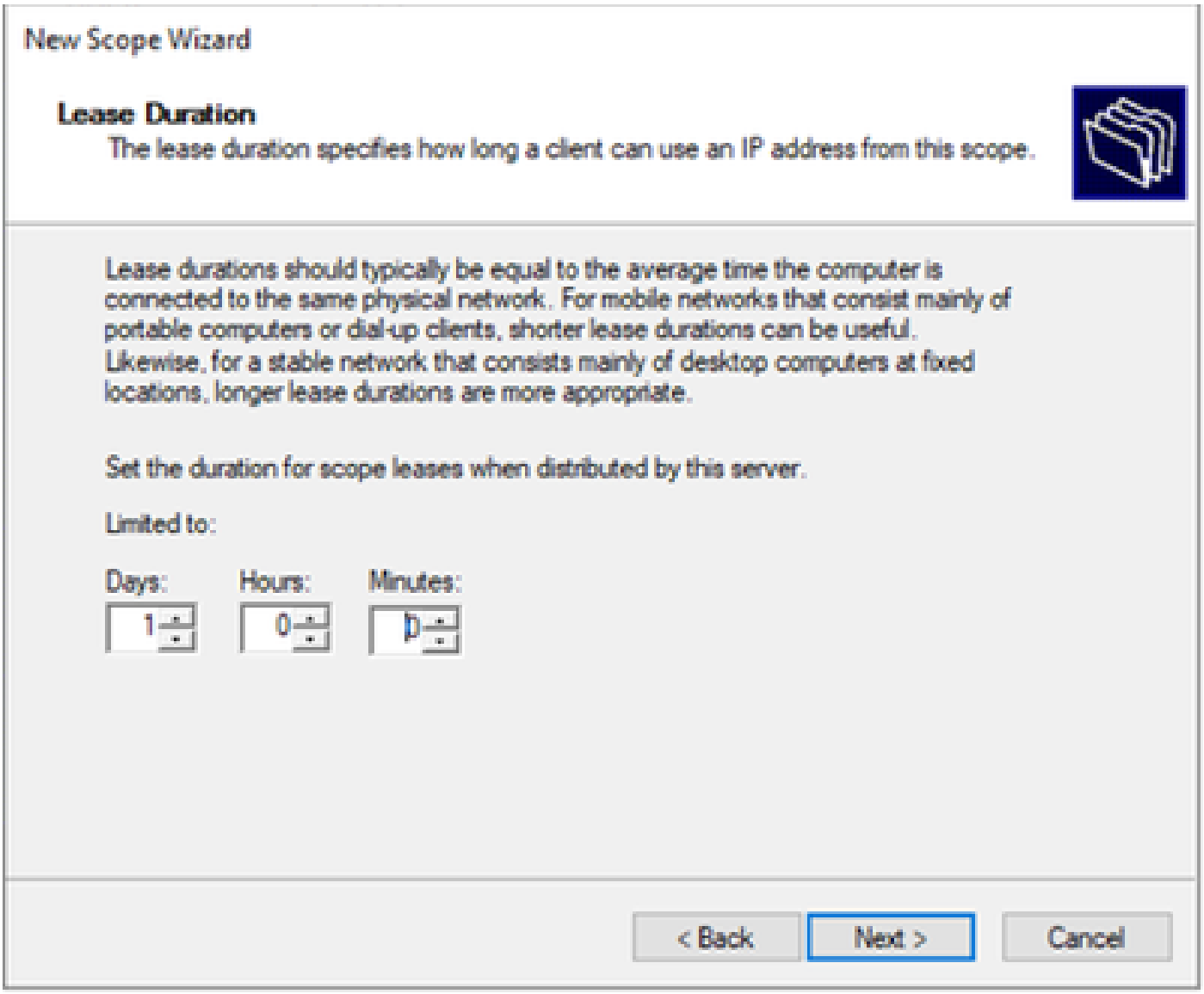


警告：未能从SVI（或默认网关）中排除IP地址可能会导致重复IP地址并影响流量传输。

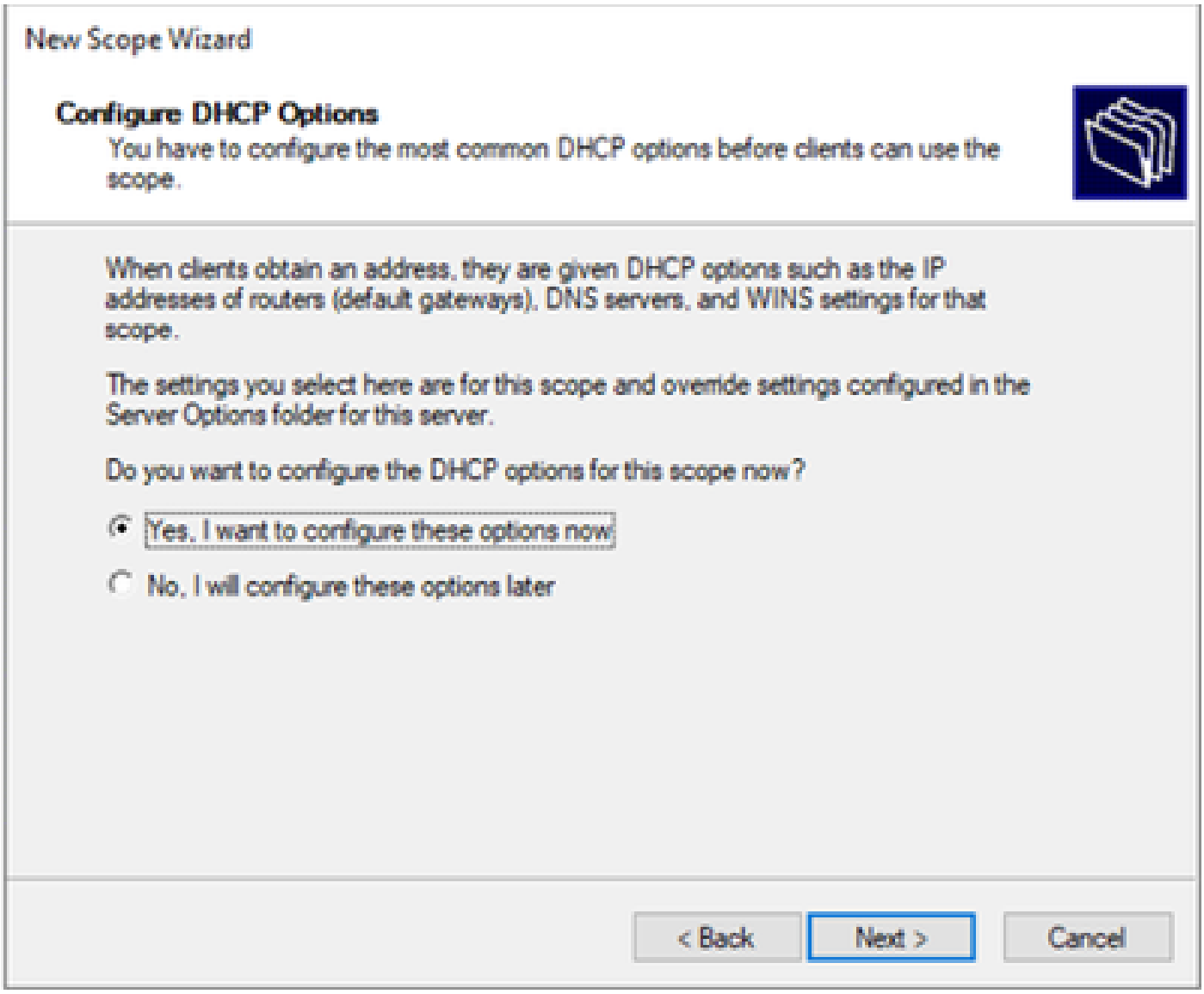
```
LEAF-1# show running-config interface vlan 10
<snip>
interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100
```



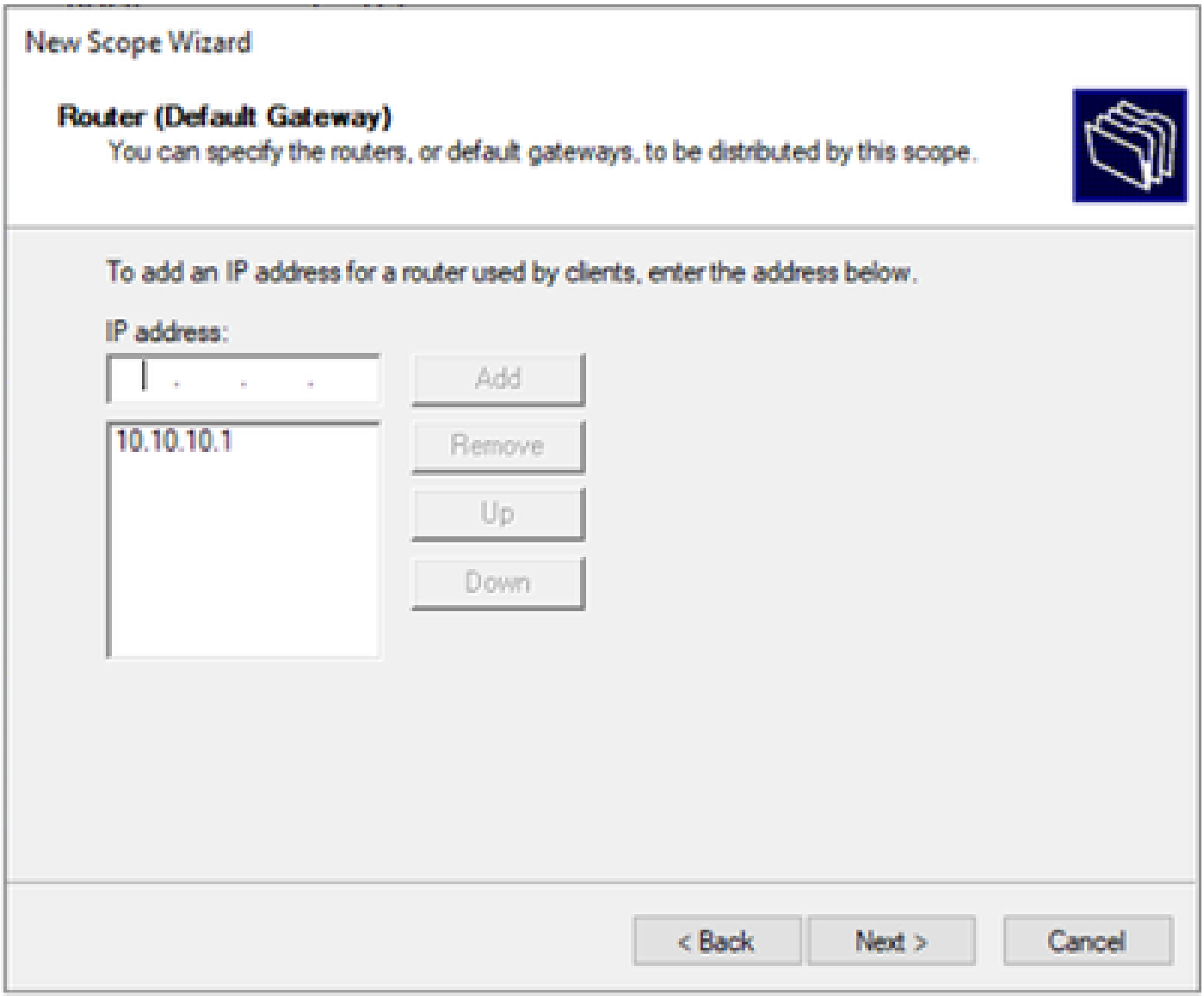
步骤 7.配置IP地址的租用期限。这是指主机在更新之前可以使用分配的IP地址的时间。



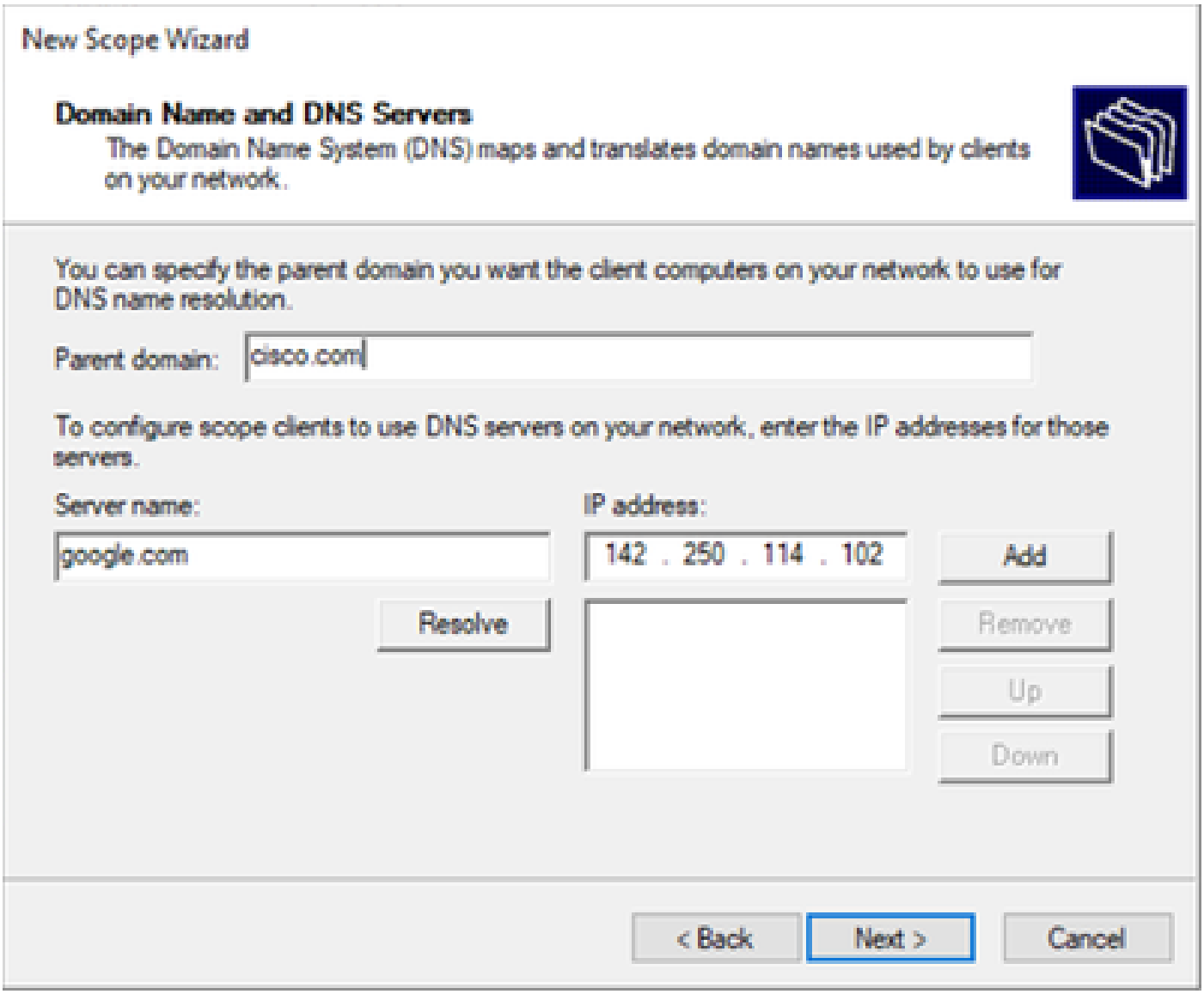
步骤 8选择Yes， I want to configure these options now。



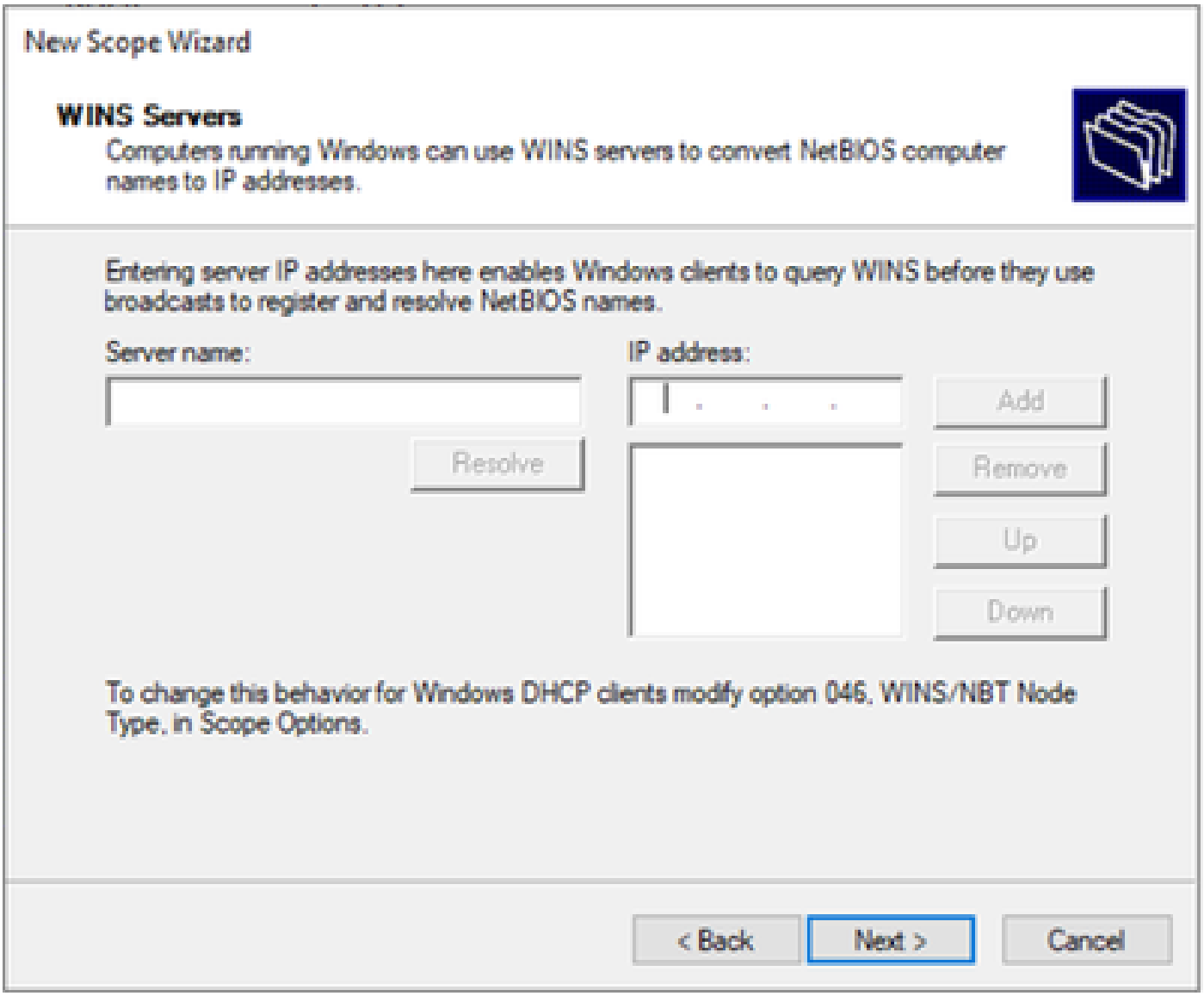
步骤 9配置默认网关IP地址。



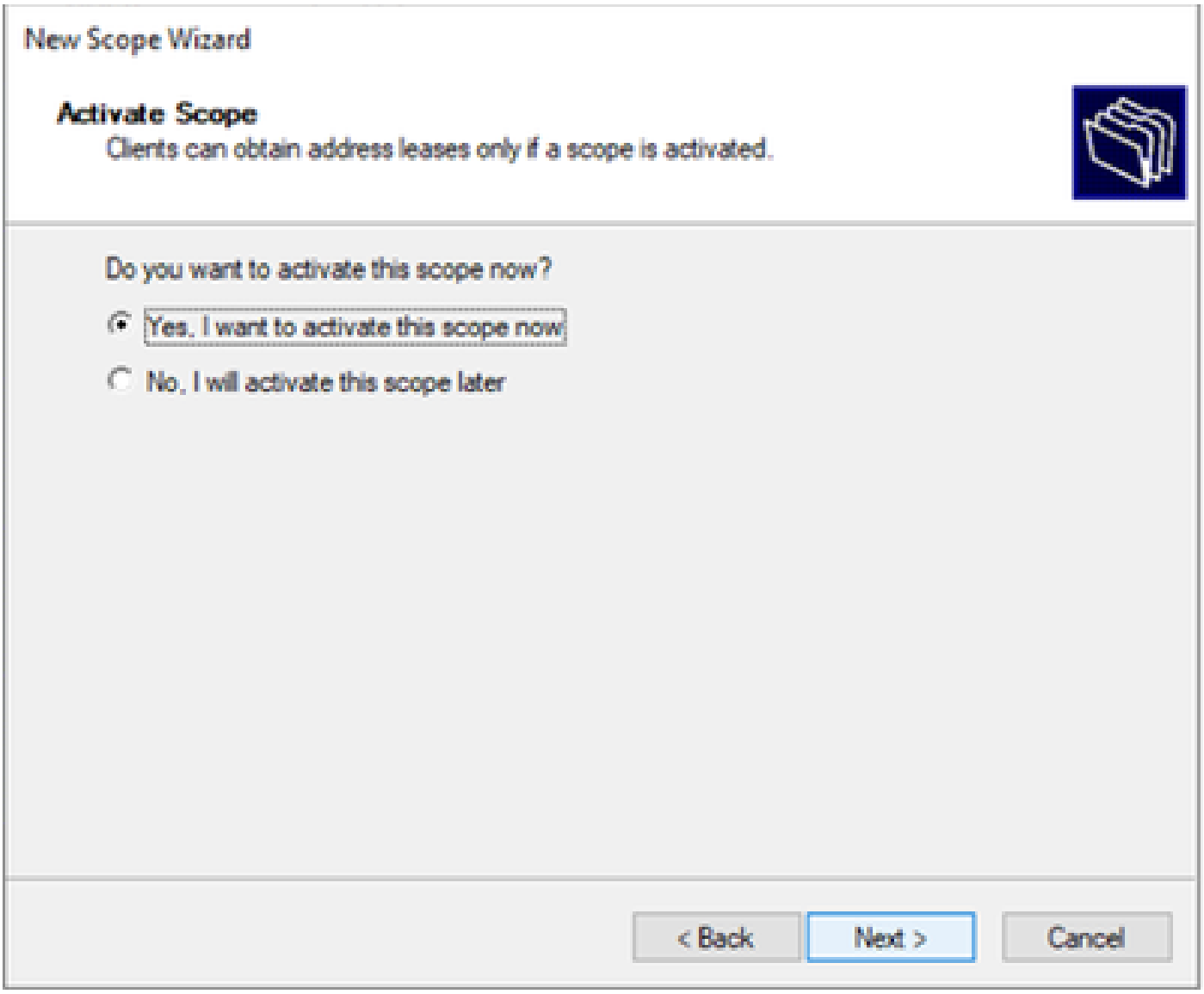
步骤 10配置域名和DNS服务器



步骤 11配置WINS服务器（如果适用）。如果信息未知，可以跳过此步骤。

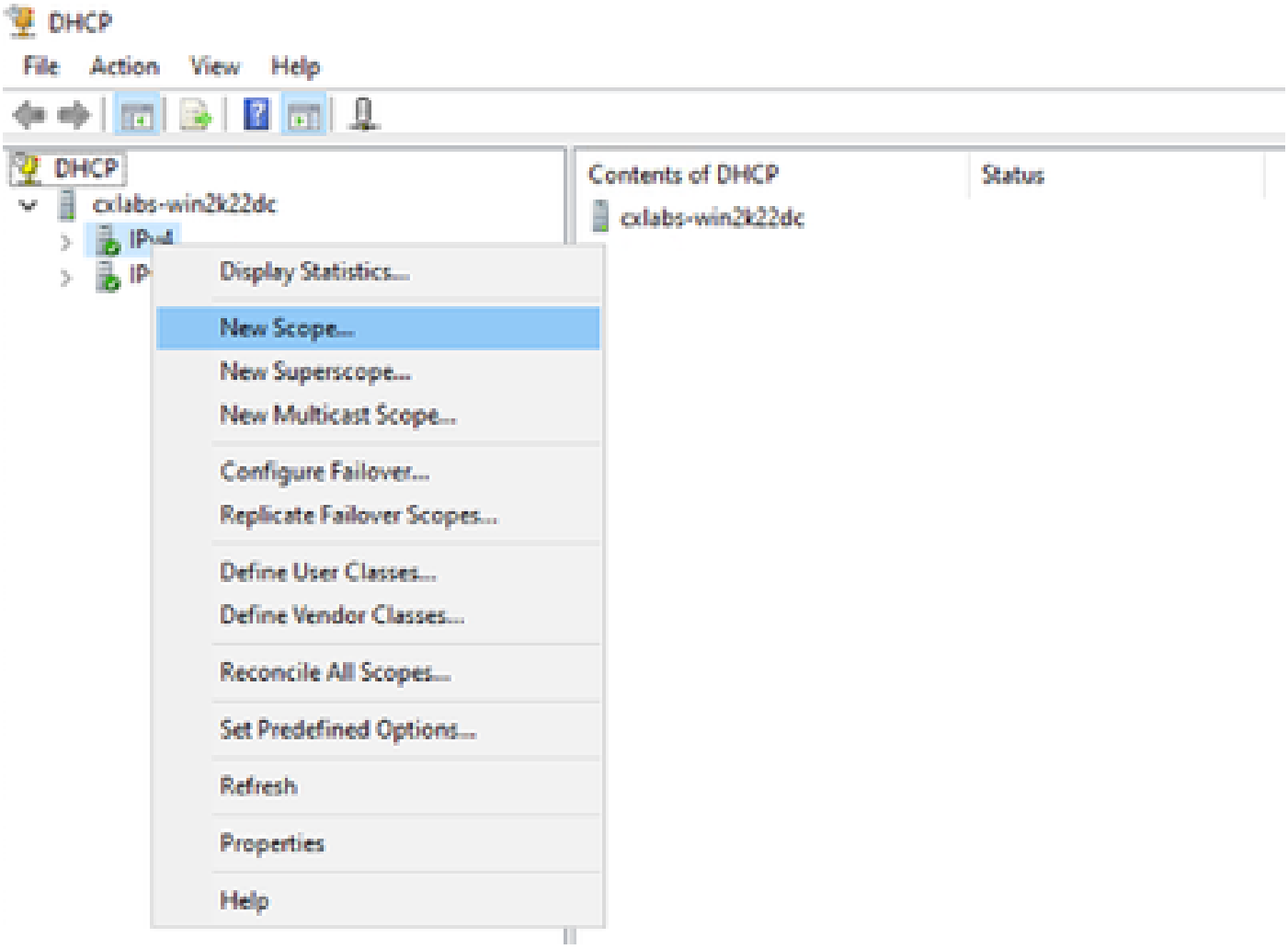


步骤 12选择Yes， I want to activate this scope now。



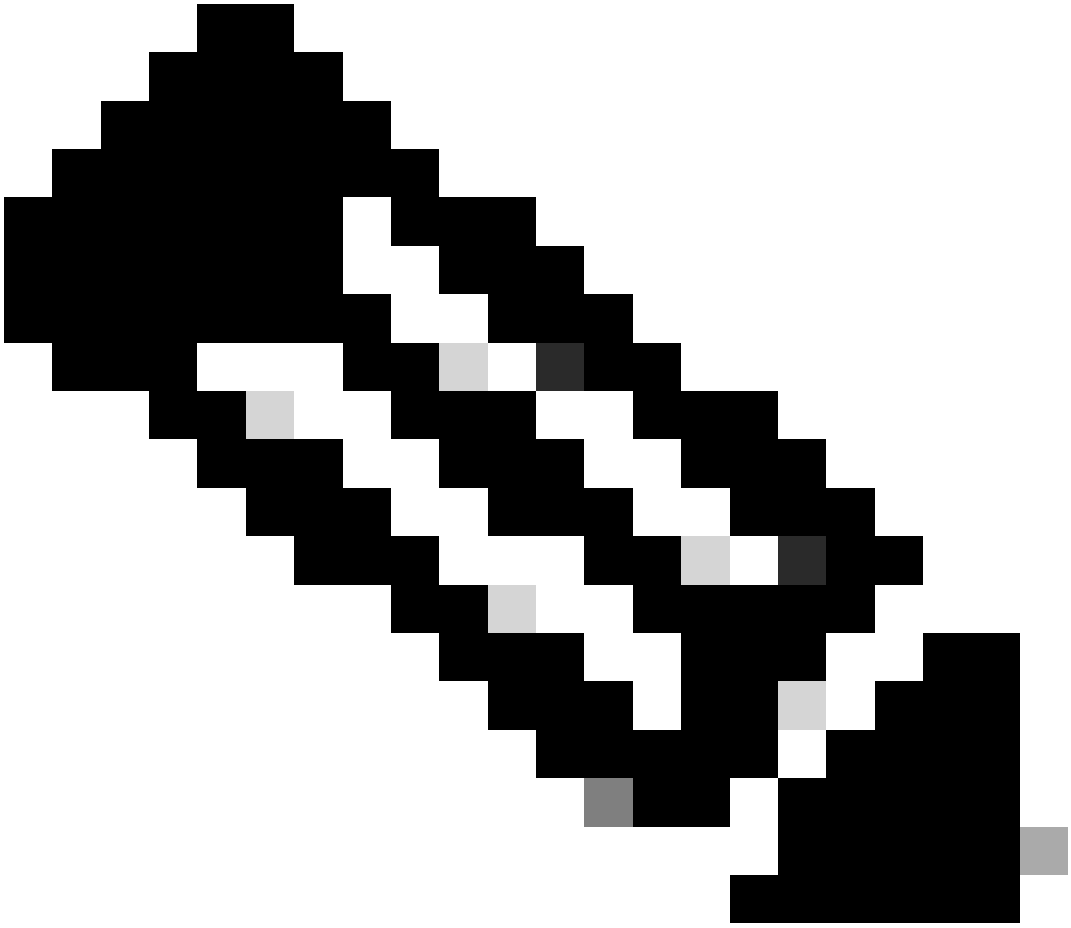
将SVI中环回的唯一IP地址的范围配置为DCHP中继代理。

步骤1:右键单击IPv4并选择IPv4Scope。



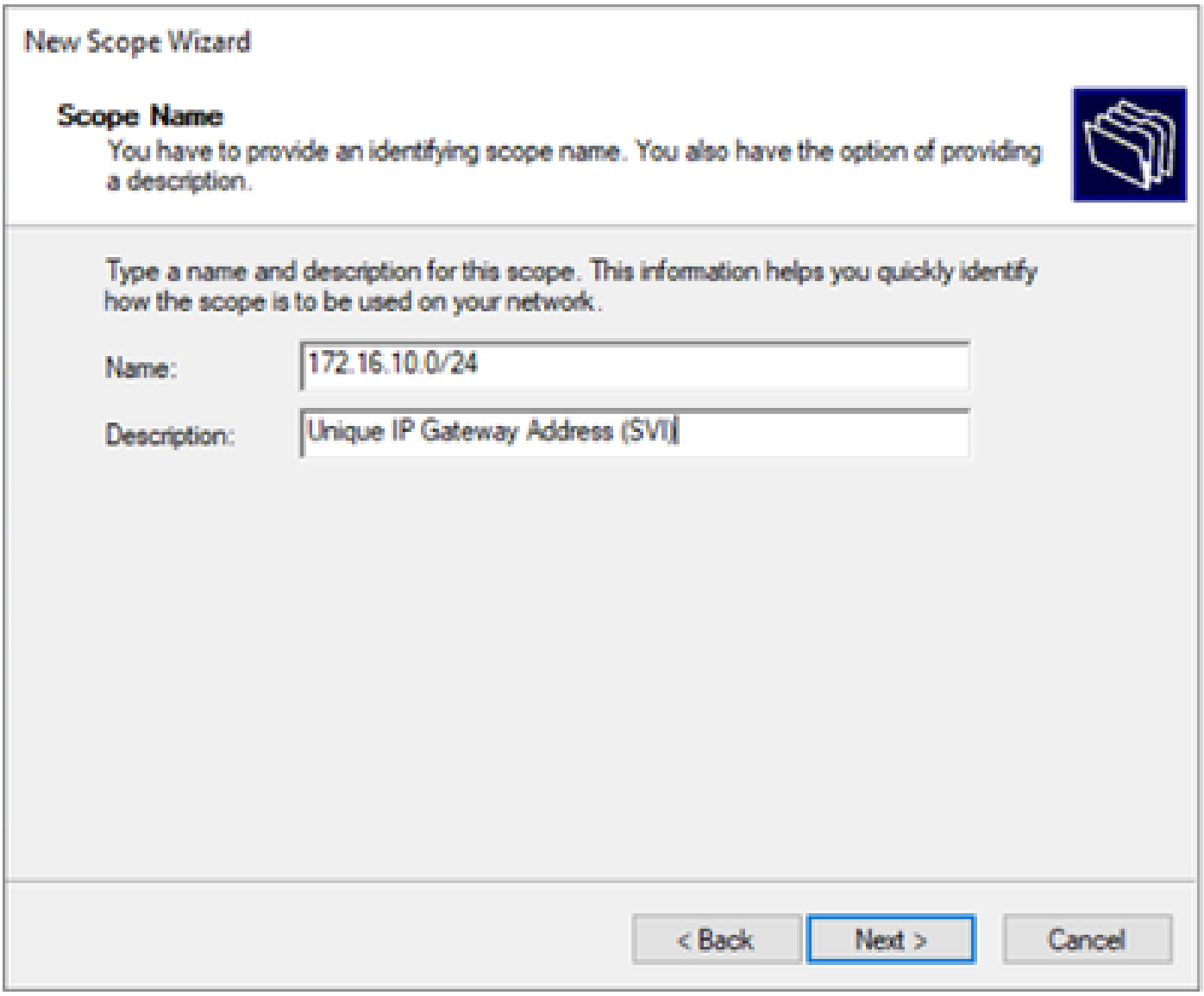
DCHP中的新作用域

第二步：写下名称和说明。在本示例中，name是环回地址子网使用的子网。

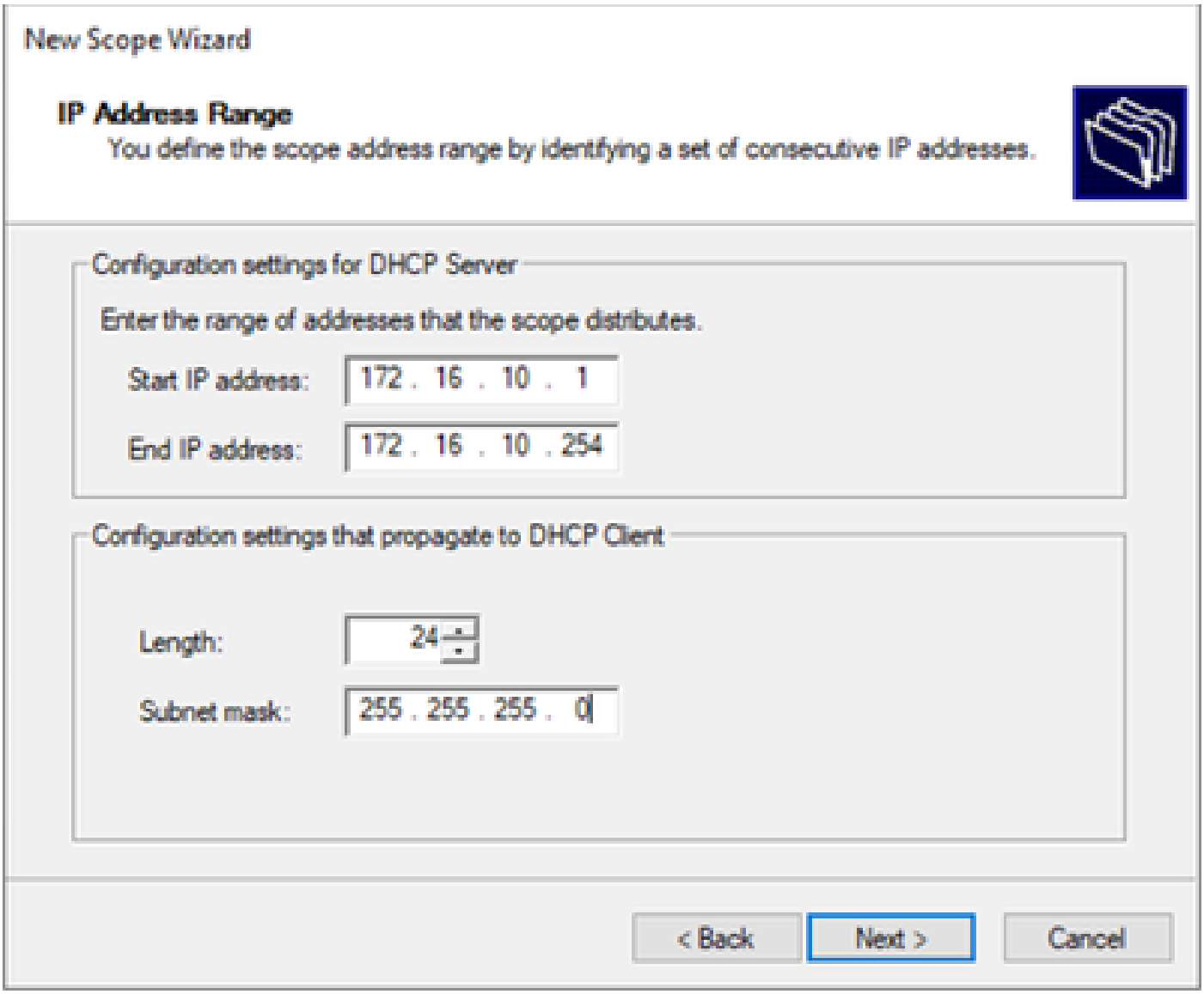


IPte：在整个VxLAN交换矩阵中，VxLAN租户使用环回唯一IP地址。必须在IPv4 address-famIPv4中相应租户的VRF内的BGP L2VPN EVPN路由重分配中通告此路由

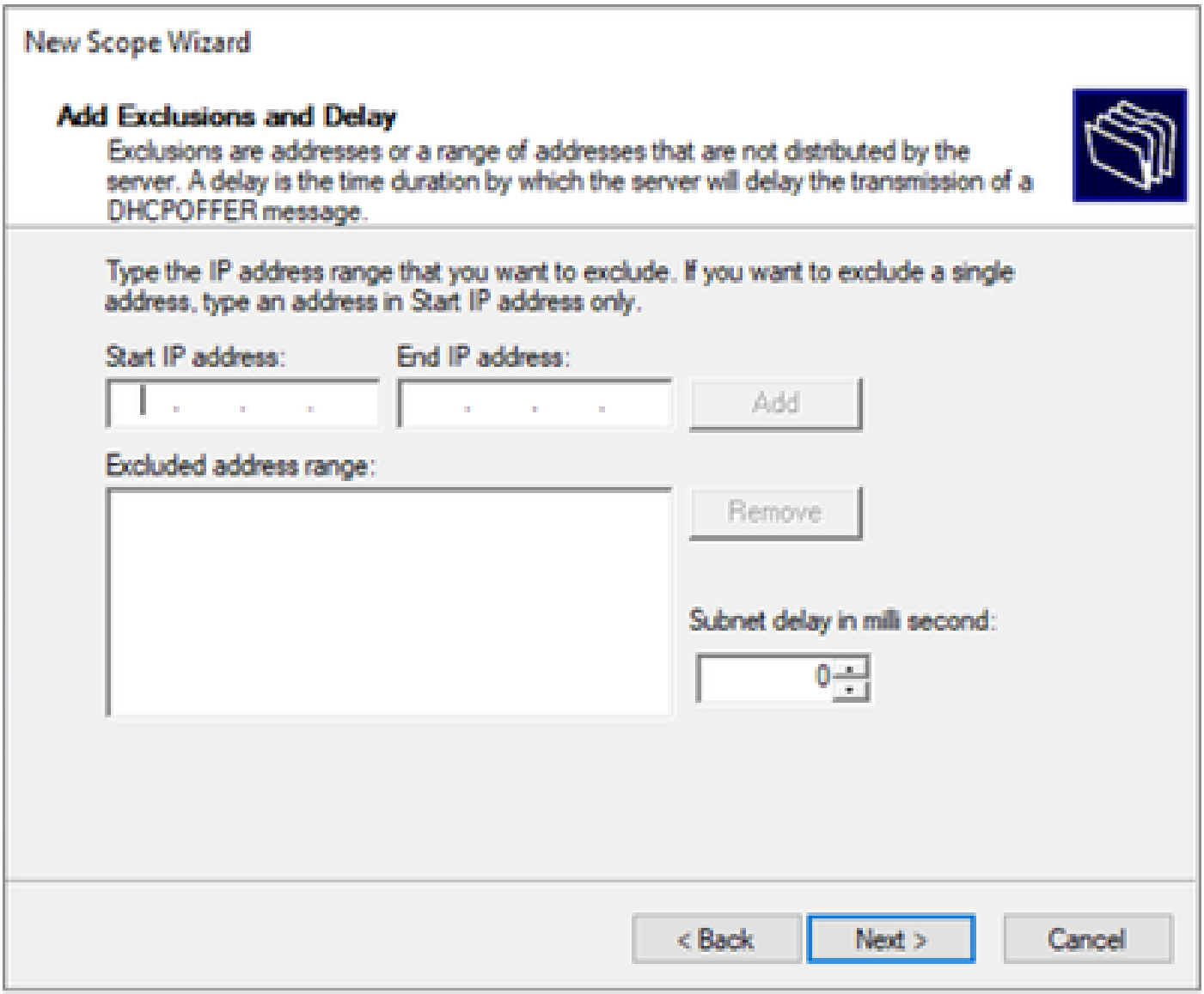
```
LEAF-1# show running-config interface loopback 100
<snip>
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.8/32
```



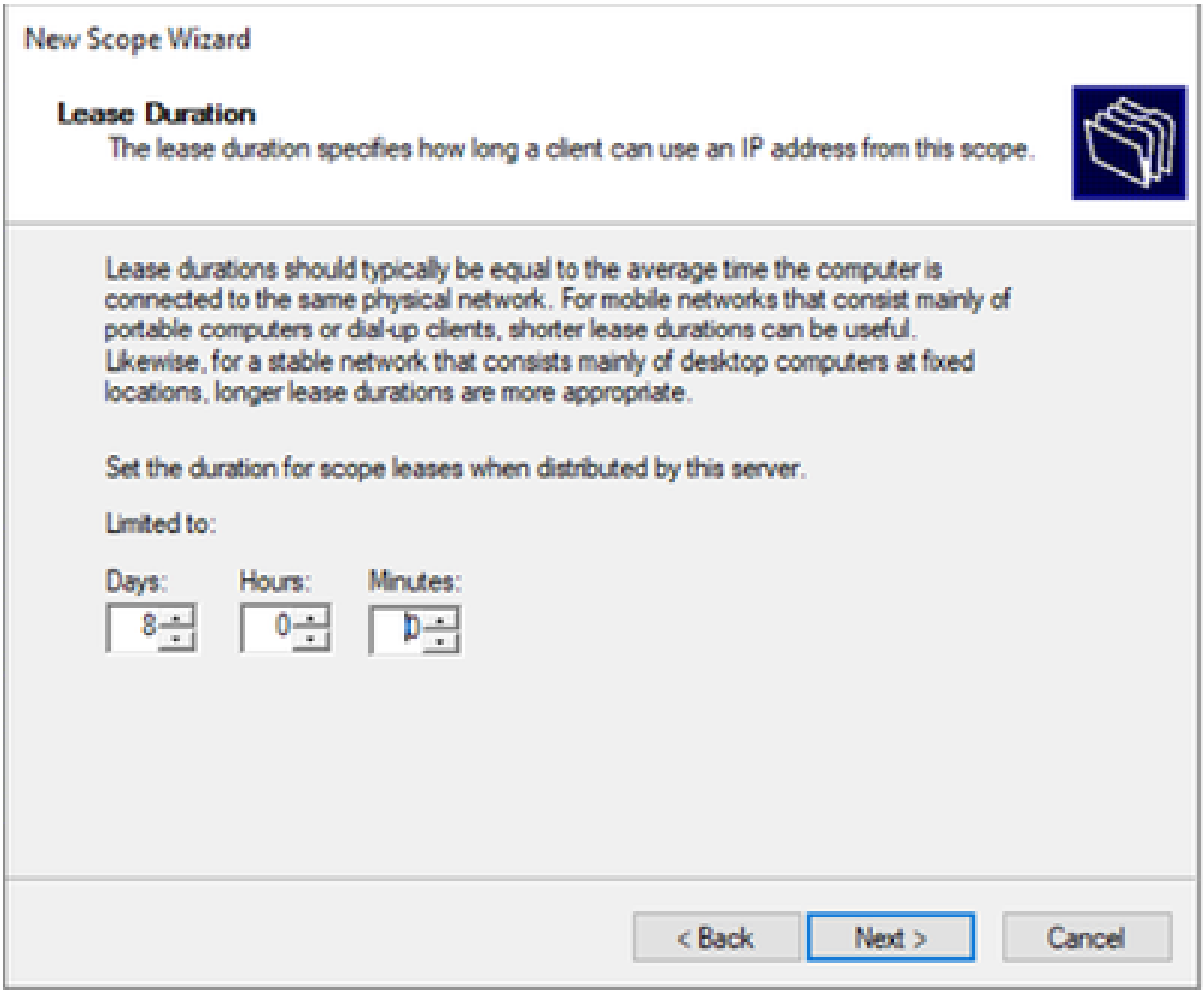
第三步： 配置IP地址范围IP。这是环回地址池。



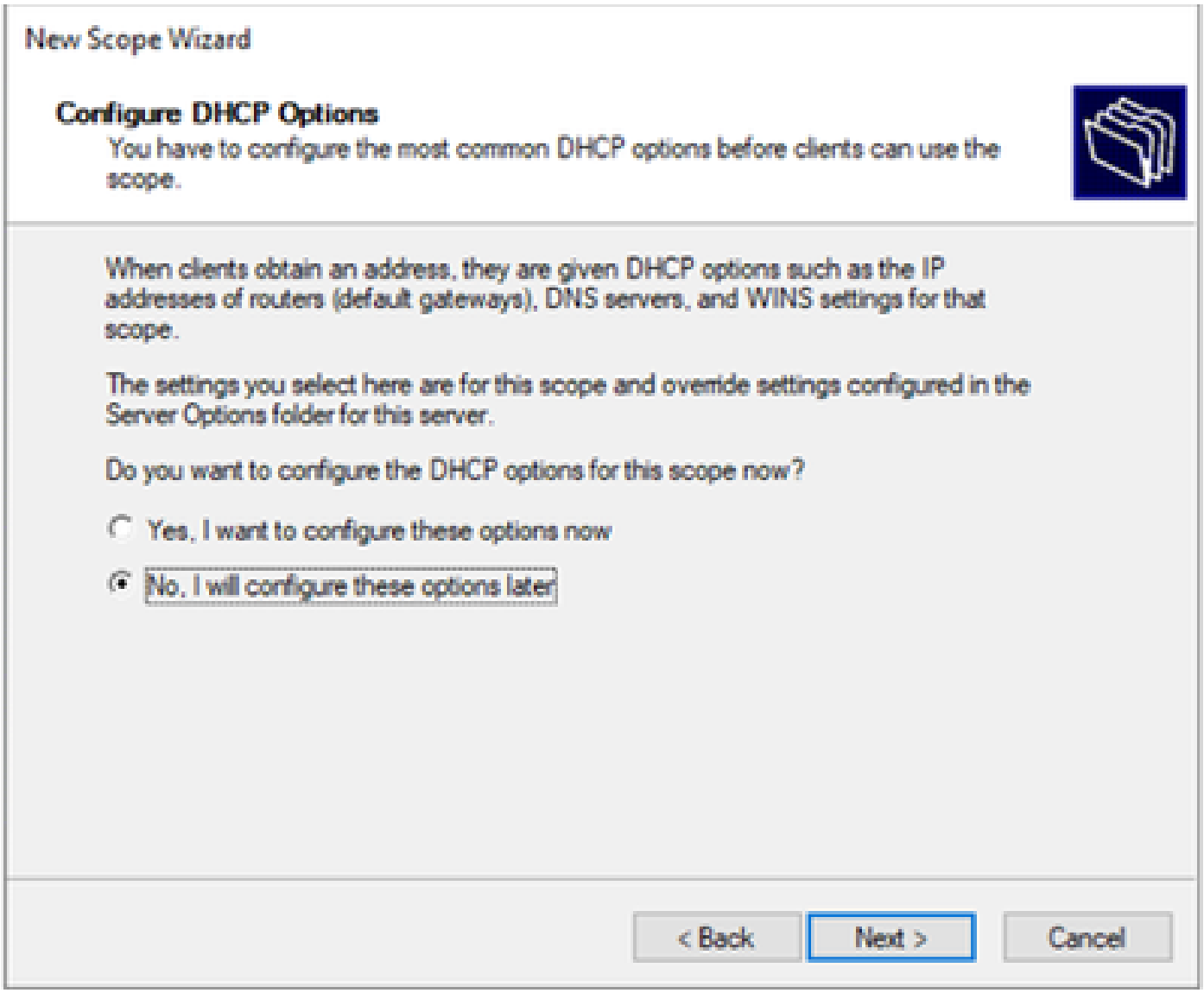
第四步：配置例外项（可选，因为DHCP服务器确实租用属于此子网的IP地址）。



第五步：跳过租期，然后单击下一步。

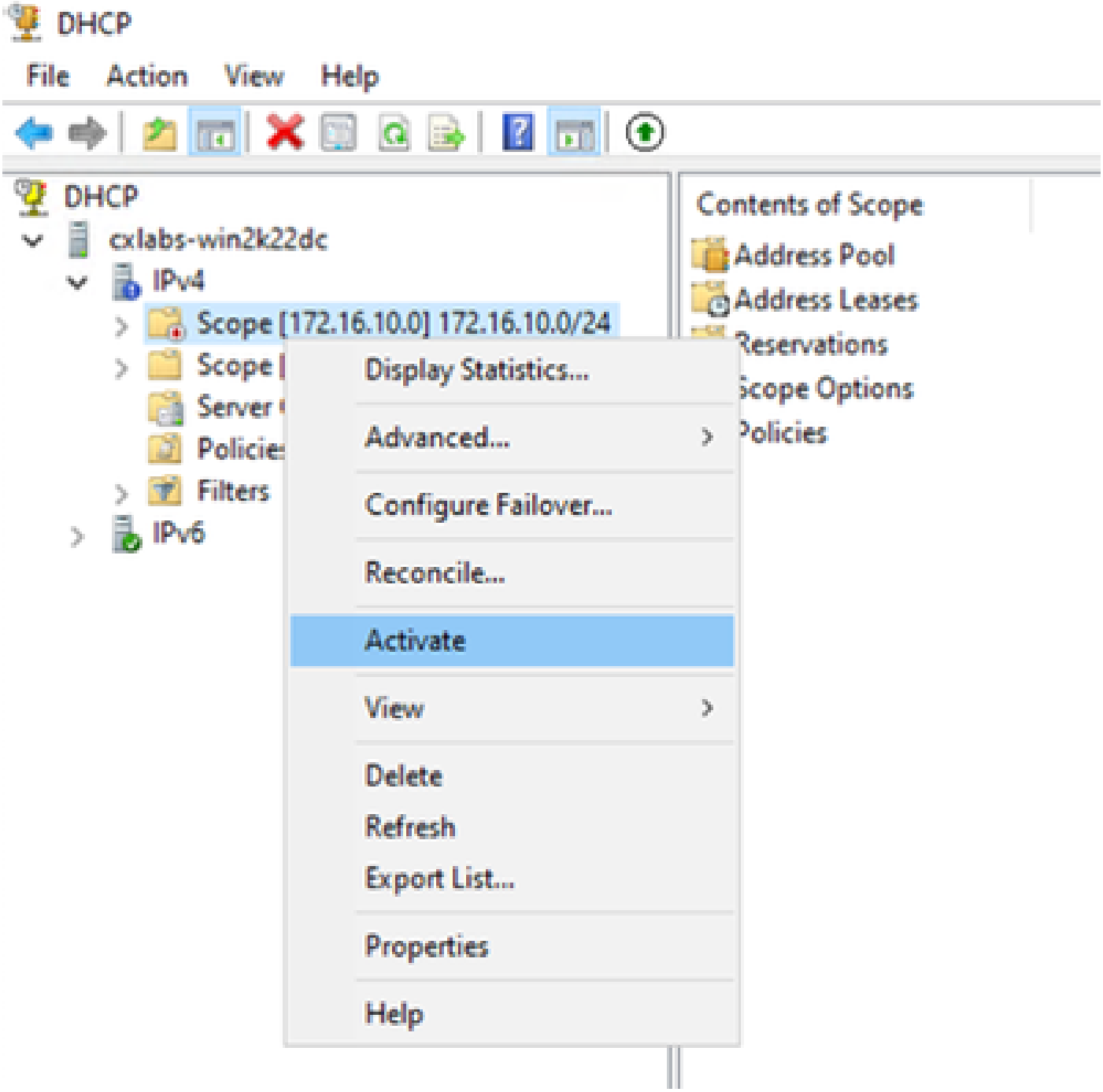


第六步：选择No， I will configure these options later。


New Scope Wizard
Configure DHCP Options
You have to configure the most common DHCP options before clients can use the scope.
When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.
The settings you select here are for this scope and override settings configured in the Server Options folder for this server.
Do you want to configure the DHCP options for this scope now?
Yes, I want to configure these options now
No, I will configure these options later
< Back
Next >
Cancel

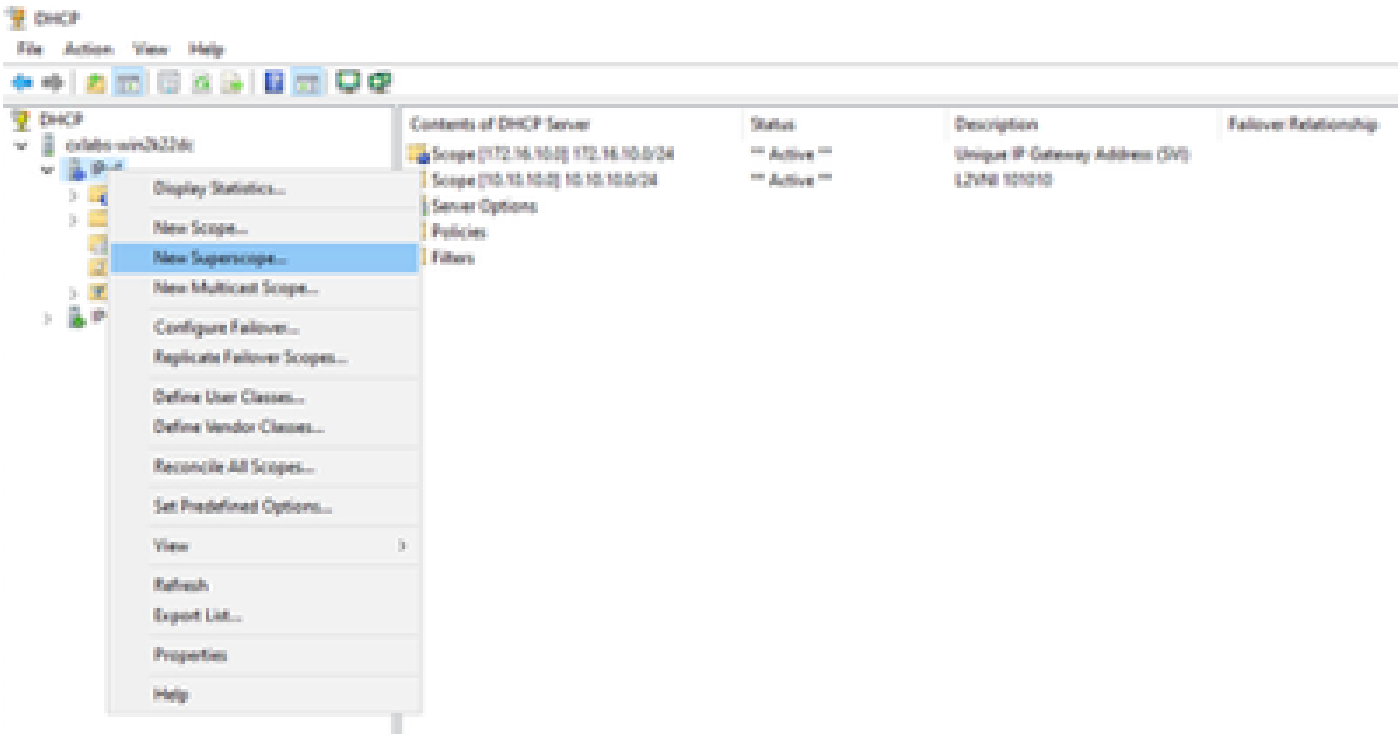
步骤 7.单击 完成。

步骤 8右键单击已创建的范围，然后选择“激活”。

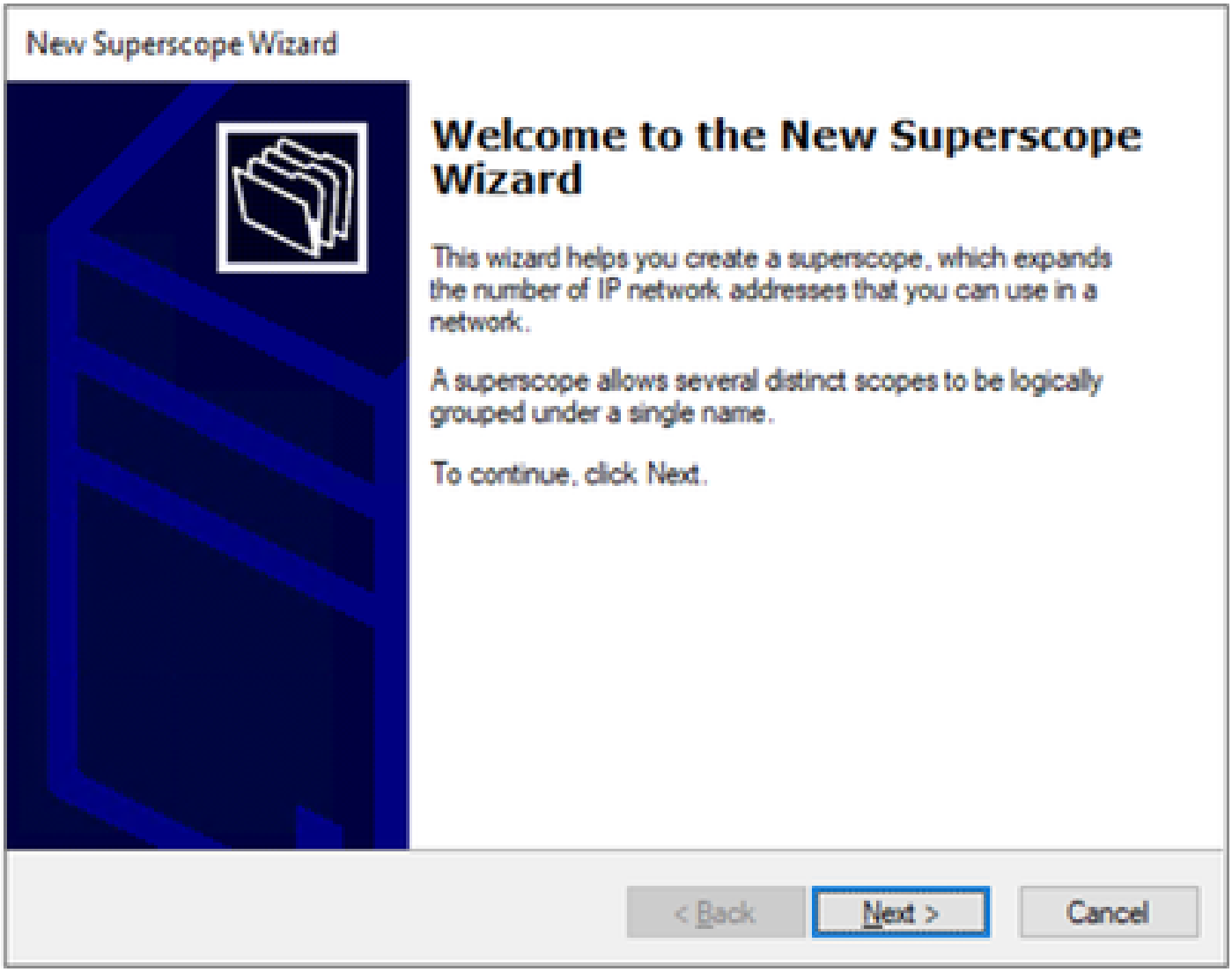


为VxLAN交换矩阵配置超级作用域。

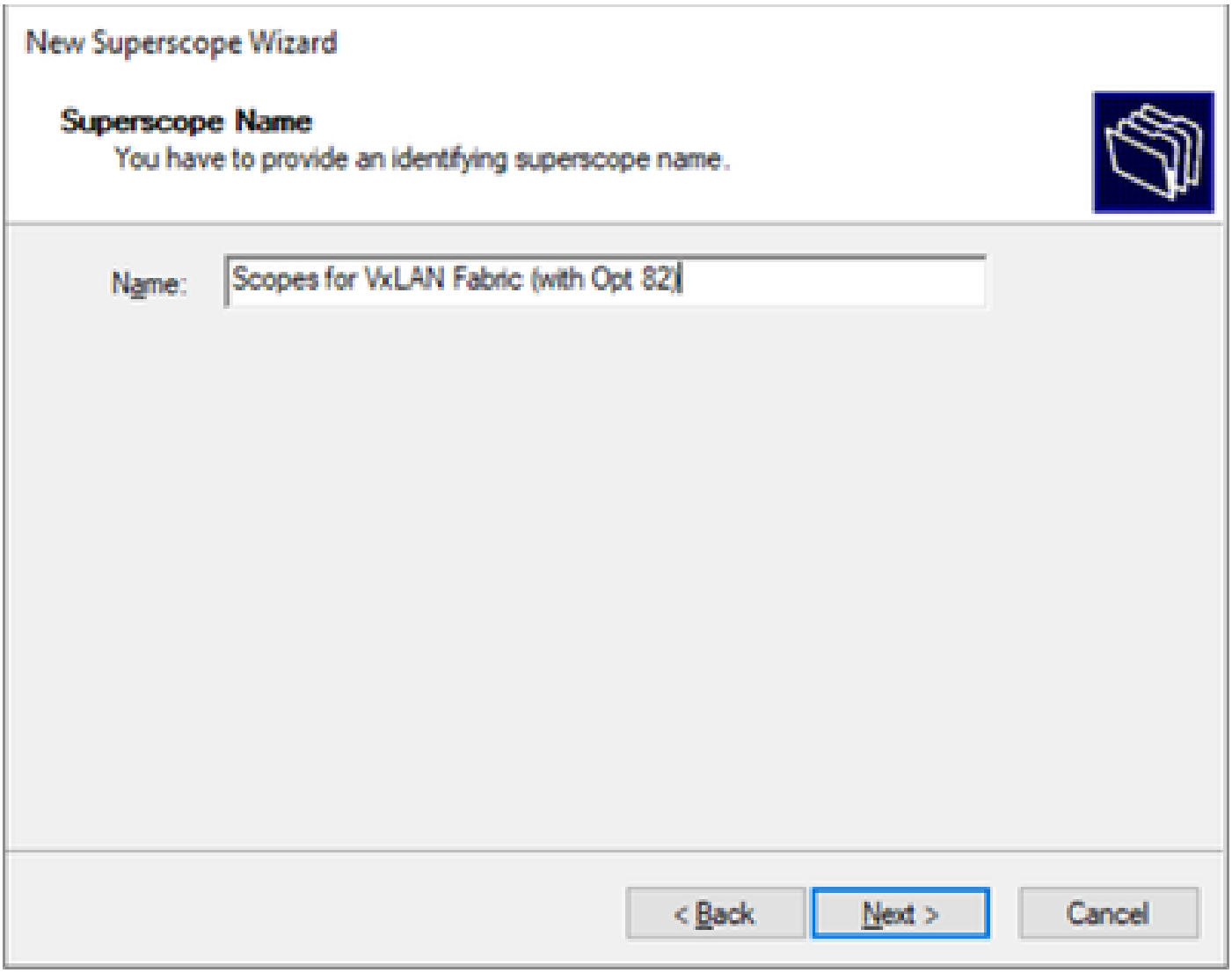
步骤1:在IPv4中单击鼠标右键，然后选择New Superscope。


DHCP
File Action View Help
DHCP
Contents of DHCP Server
Status
Description
Failover Relationship
Scope [172.16.10.0] 172.16.10.0/24
** Active **
Unique IP Gateway Address (SVI)
Scope [10.10.10.0] 10.10.10.0/24
** Active **
L2VNI 101010
Server Options
Policies
Filters
Display Statistics...
New Scope...
New Superscope...
New Multicast Scope...
Configure Failover...
Replicate Failover Scopes...
Define User Classes...
Define Vendor Classes...
Reconcile All Scopes...
Set Predefined Options...
View
Refresh
Export List...
Properties
Help

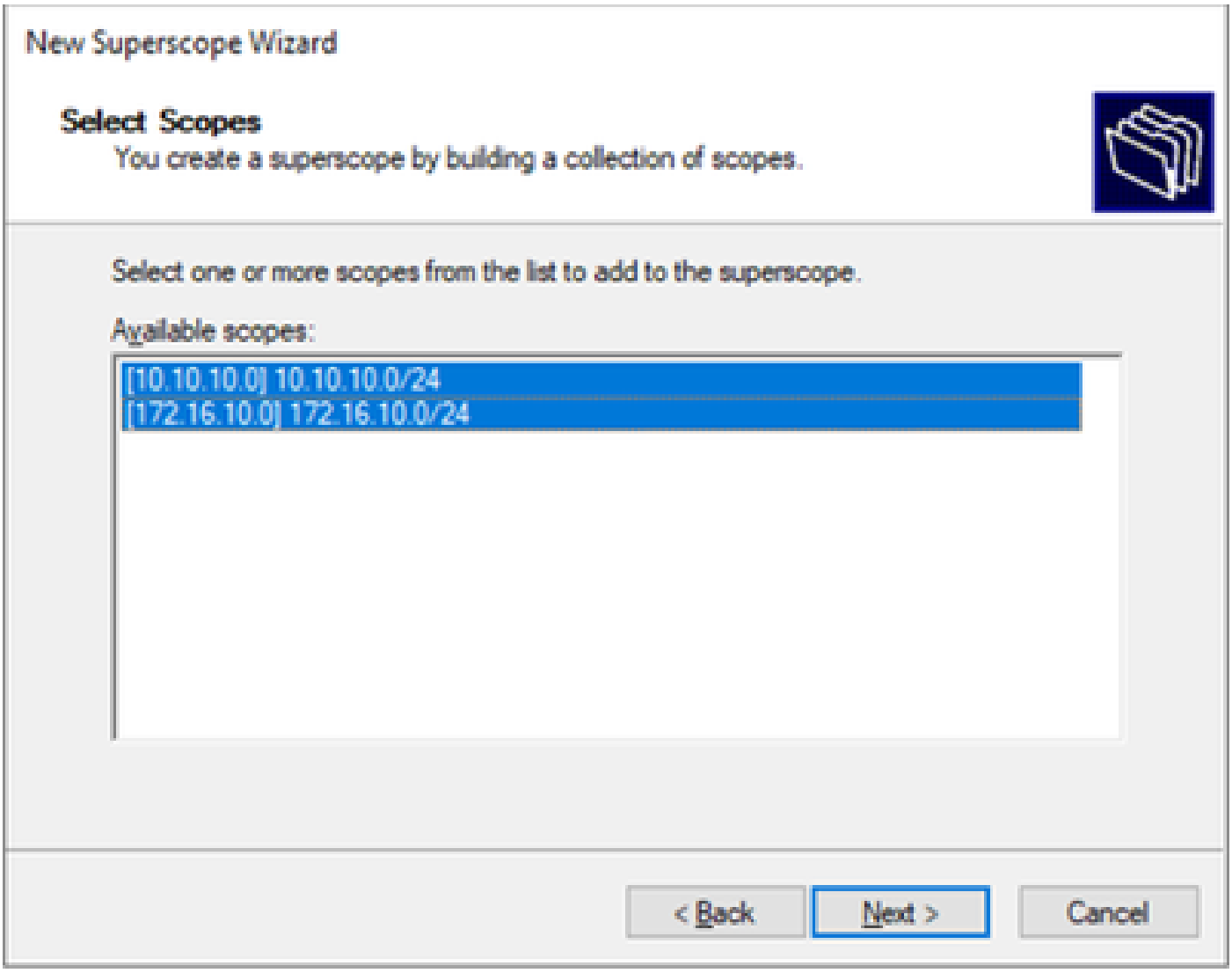
第二步：单击 Next。


New Superscope Wizard
Welcome to the New Superscope Wizard
This wizard helps you create a superscope, which expands the number of IP network addresses that you can use in a network.
A superscope allows several distinct scopes to be logically grouped under a single name.
To continue, click Next.
< Back
Next >
Cancel

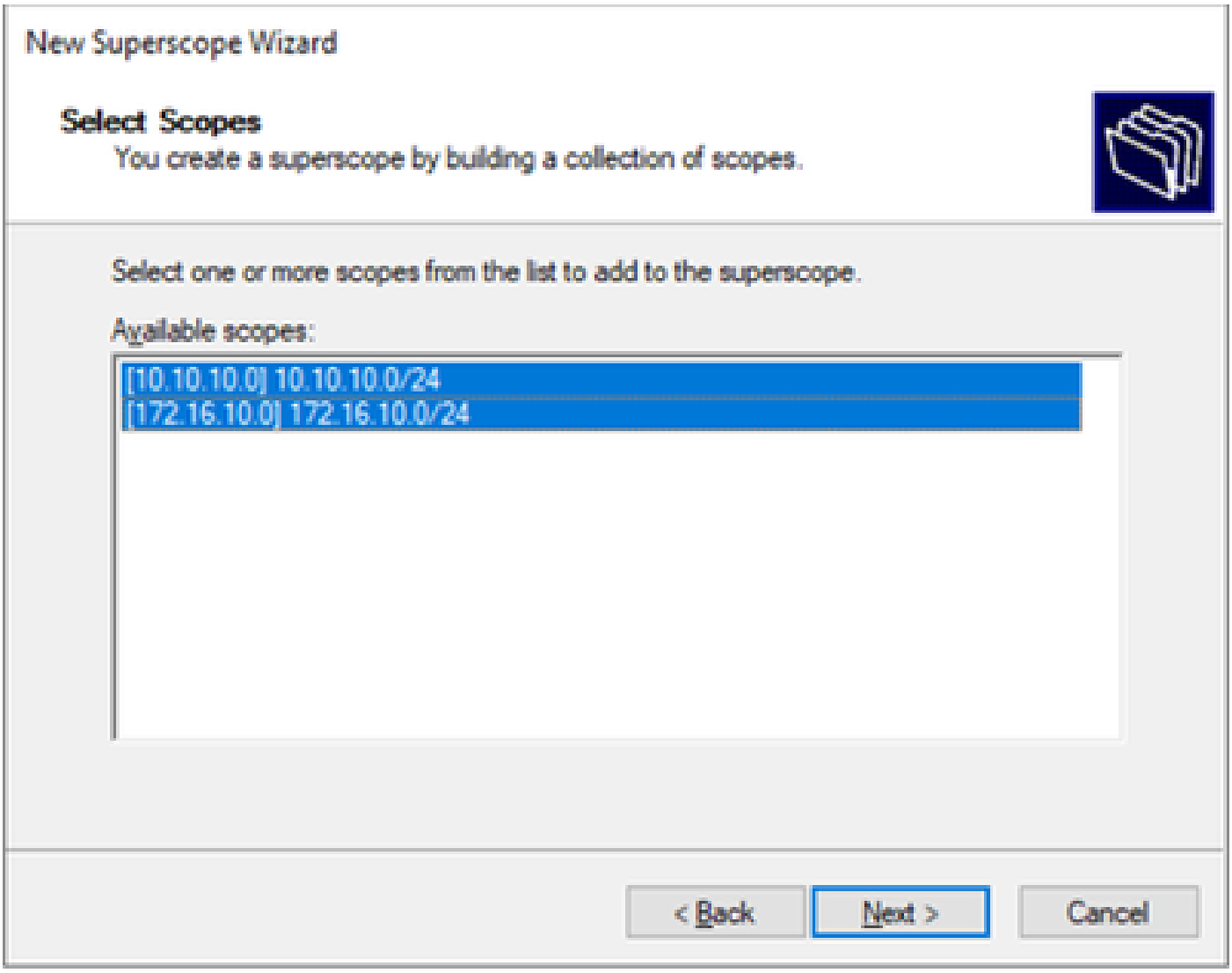
第三步：写超级作用域名称。



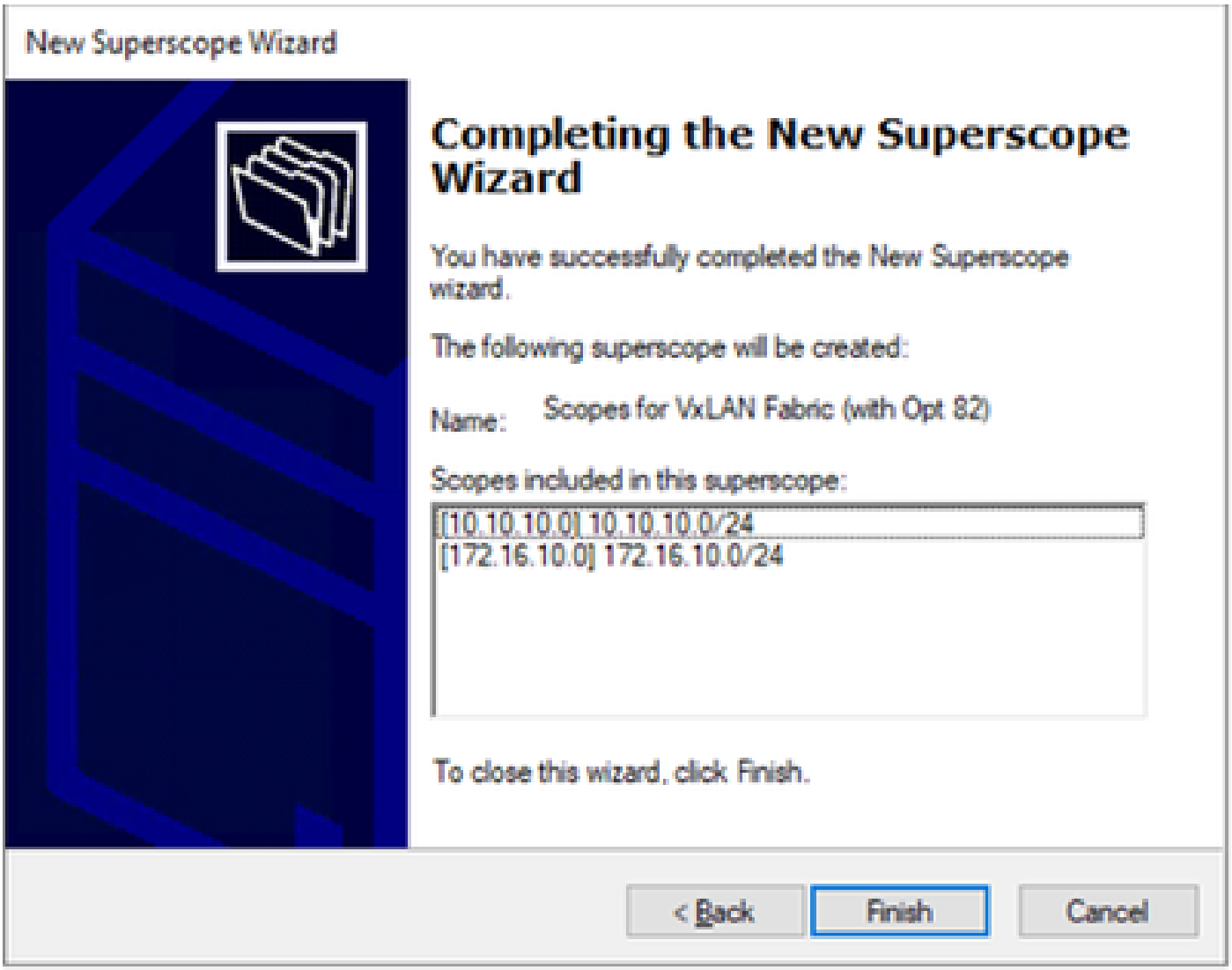
第四步：选择属于VxLAN交换矩阵的所有范围。



第五步：选择属于VxLAN交换矩阵的所有范围。

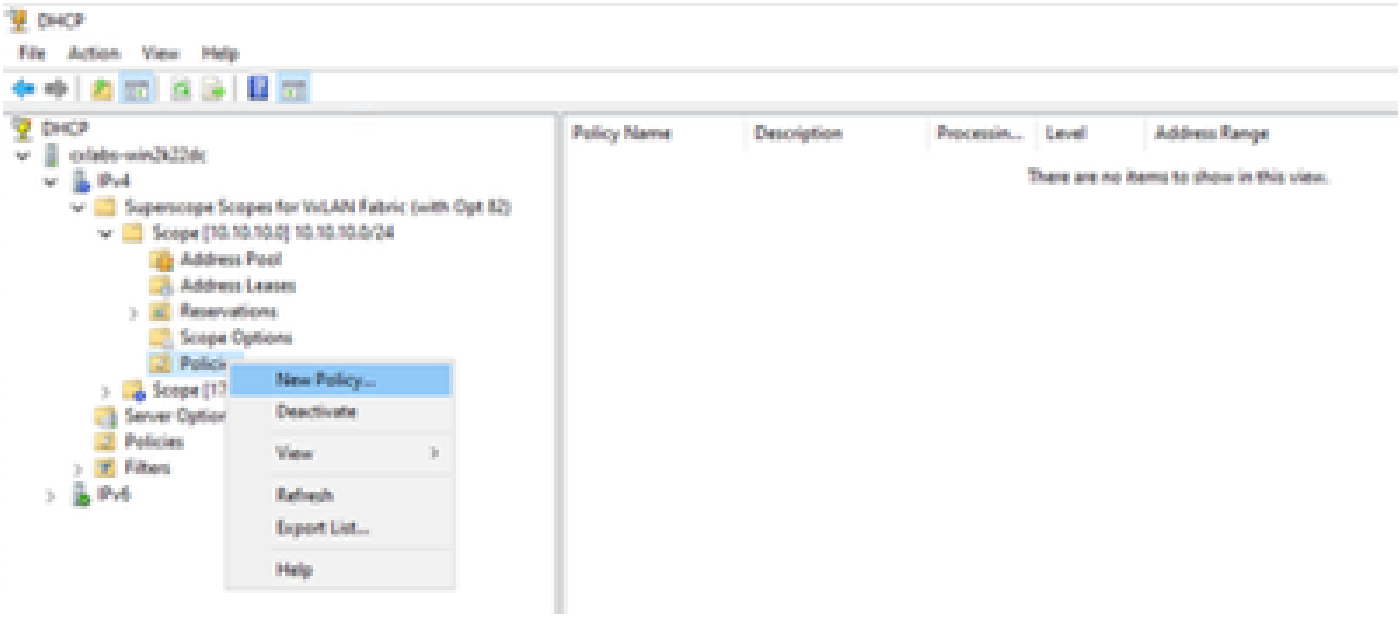


第六步：验证所有VxLAN交换矩阵超级作用域都已就位，然后单击完成。

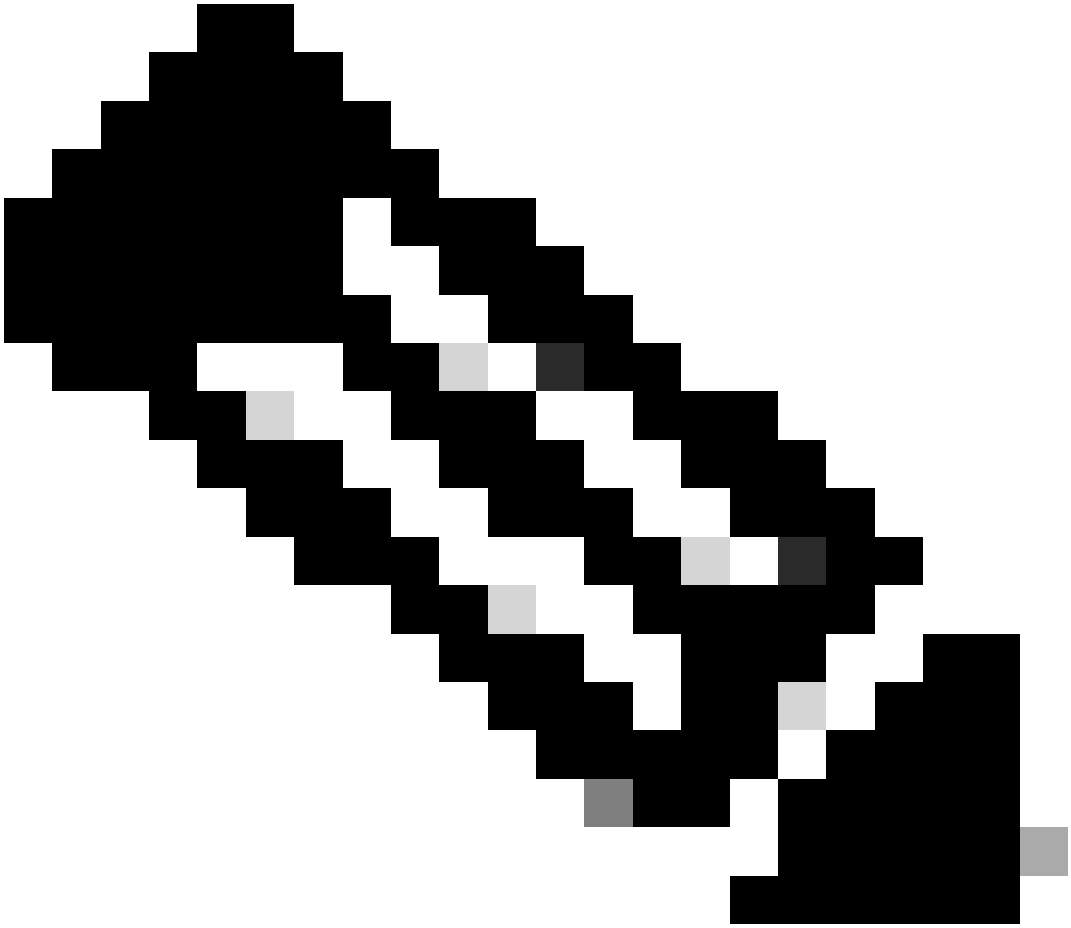


配置主机范围中的选项82。

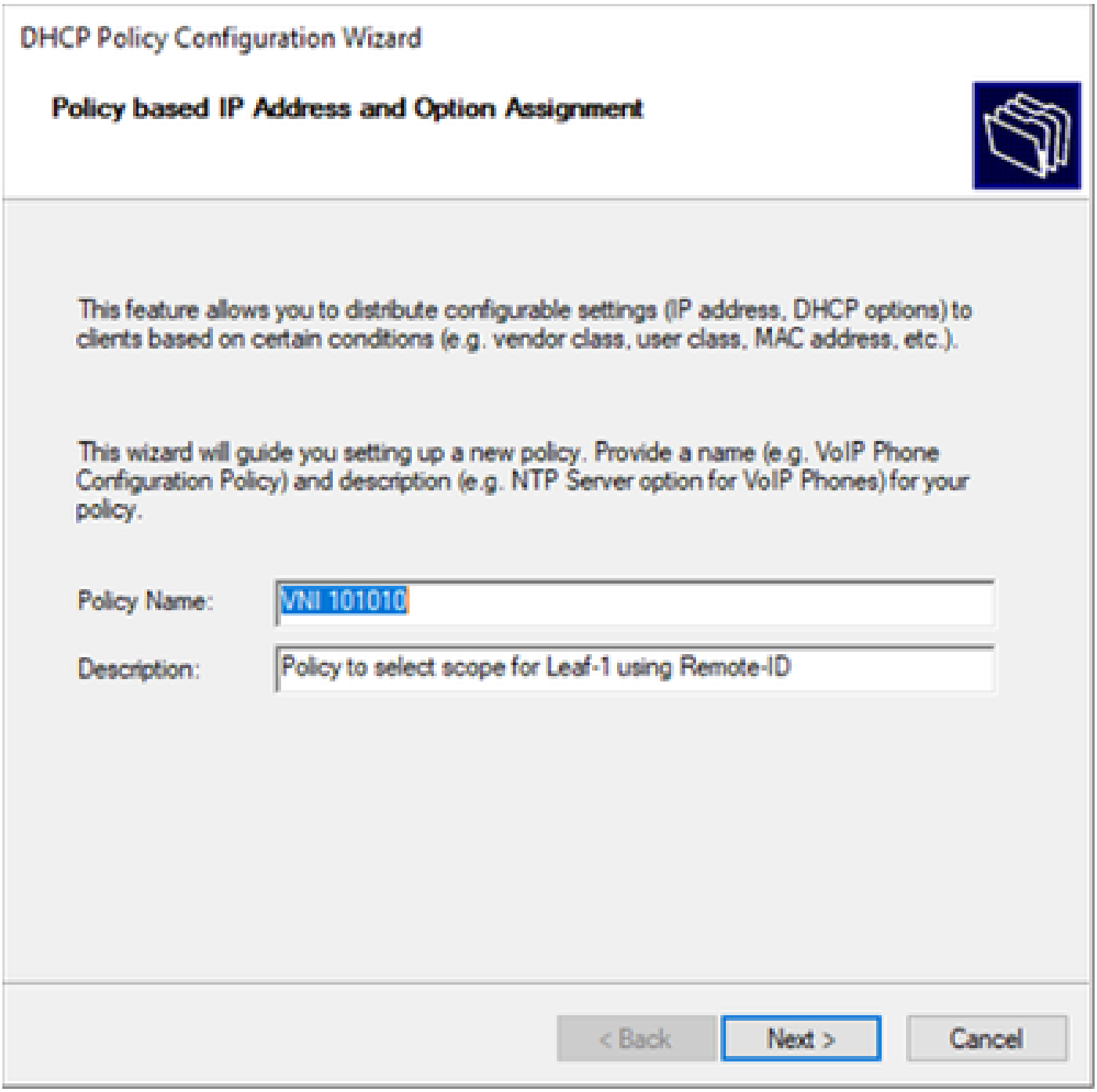
步骤1:右键单击主机范围内的策略（最后一个选项），然后单击New Policy。



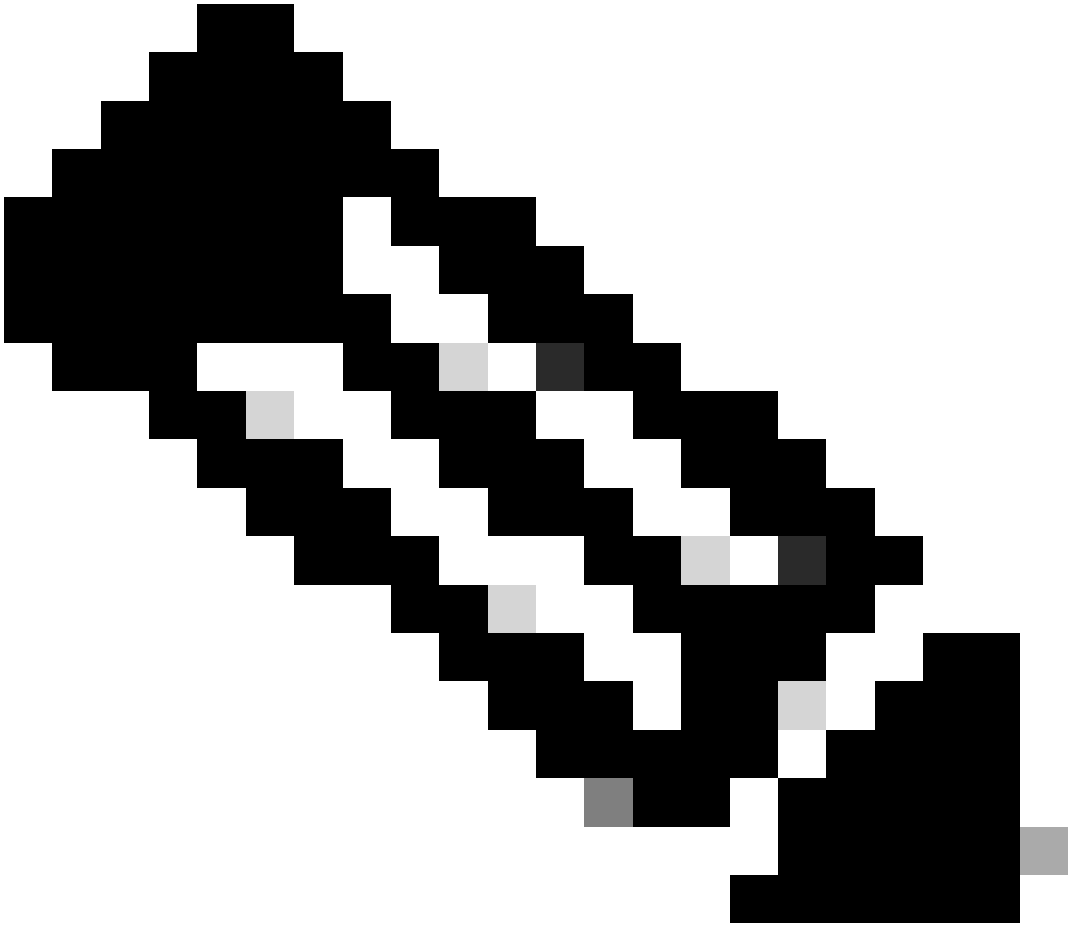
第二步：写下名称和说明，并单击Next。



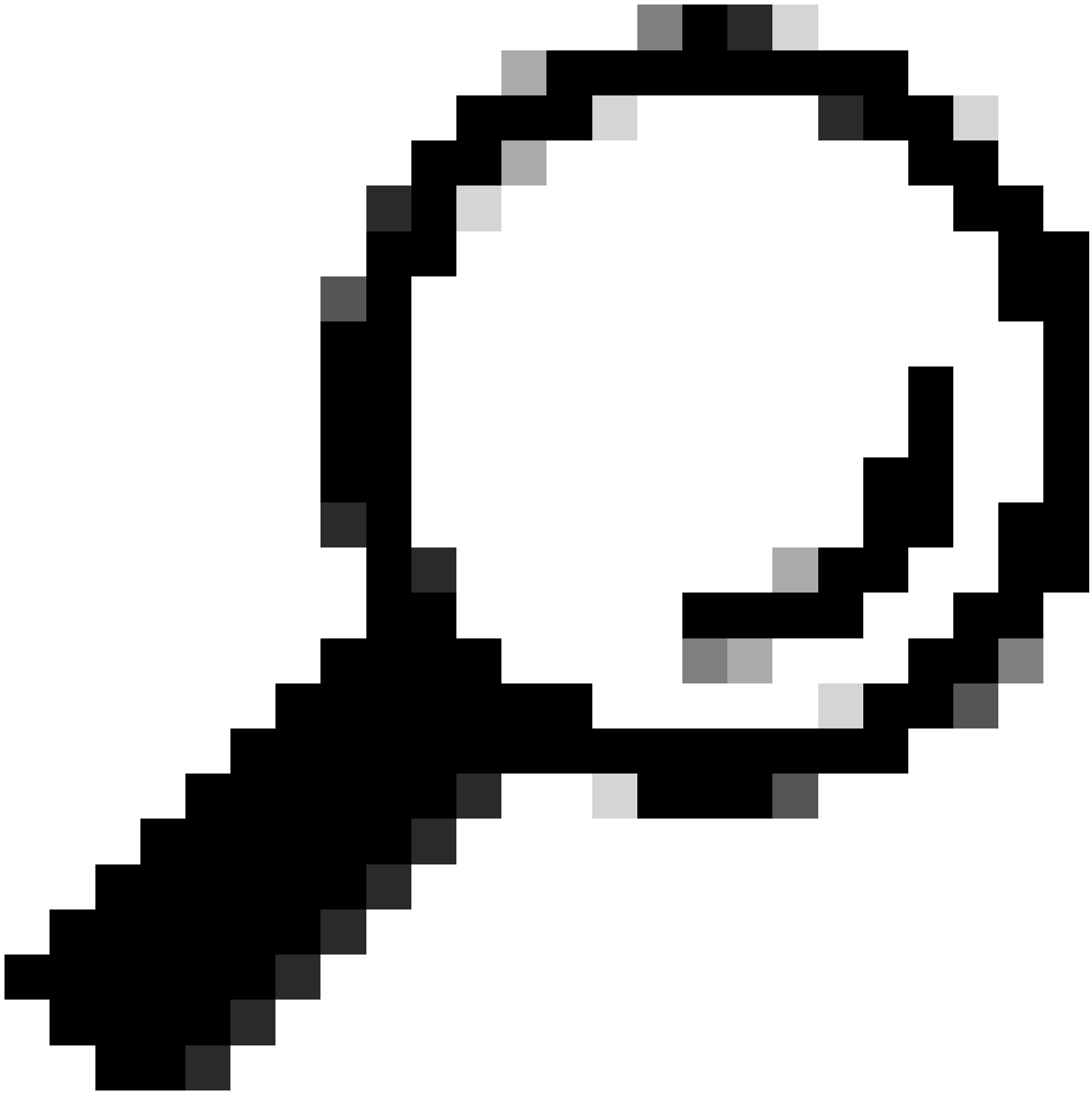
注意：在本示例中，创建策略是为了为Leaf-1中的主机选择IP编址paIPicorly，以便使用VNI 101010 basedVNI Remote-ID（选项82的参数）。



第三步：单击 Add。在Criteria中，选择Relay Agent Information。在Operator中，选择Equals。然后选择Agent Remote ID并键入值。单击OK，然后单击Next。

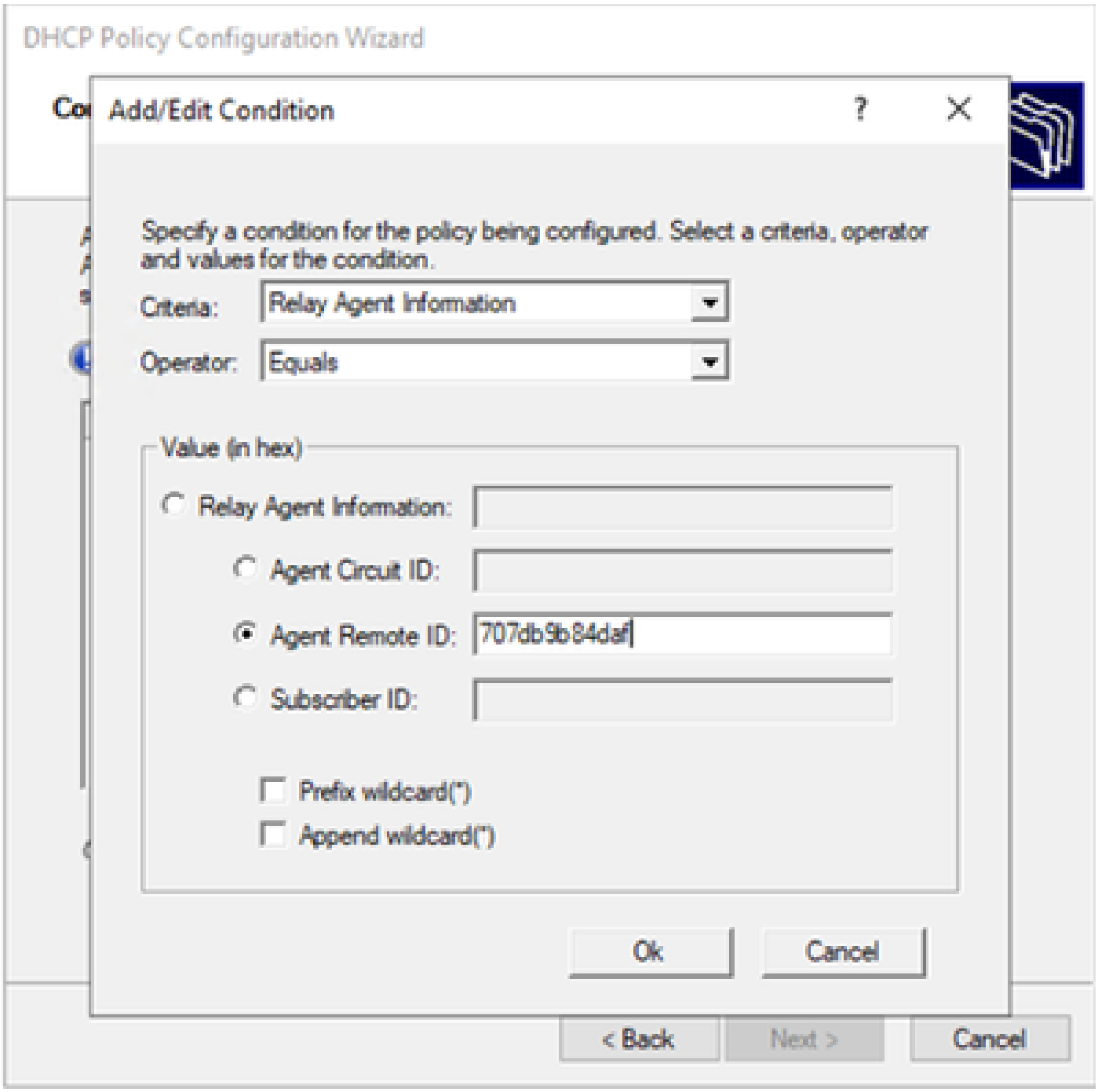


注意：远程ID从SVI的MAC地址获取，而SVI与SVII相关联。

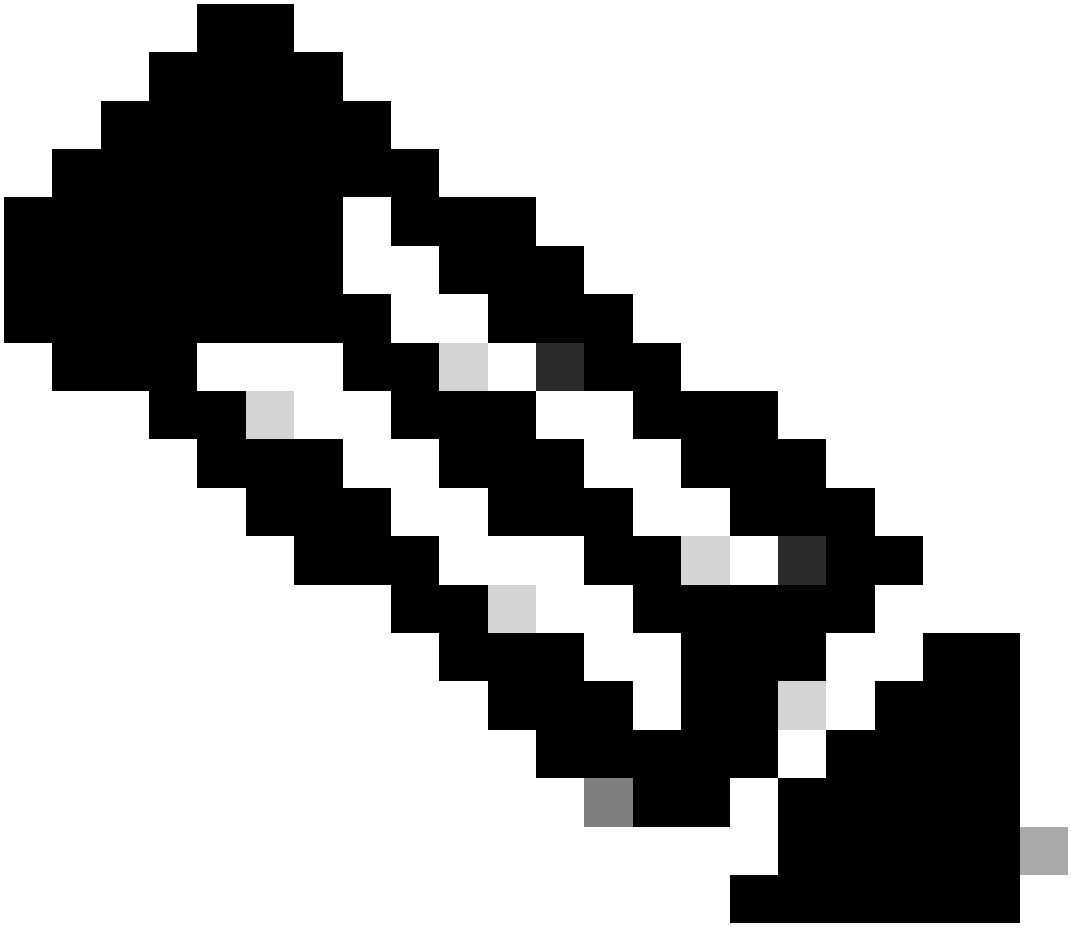


提示：通过添加更多条件并选择OR而不是AND，可以将策略应用于多个远程ID（或VTEP）。

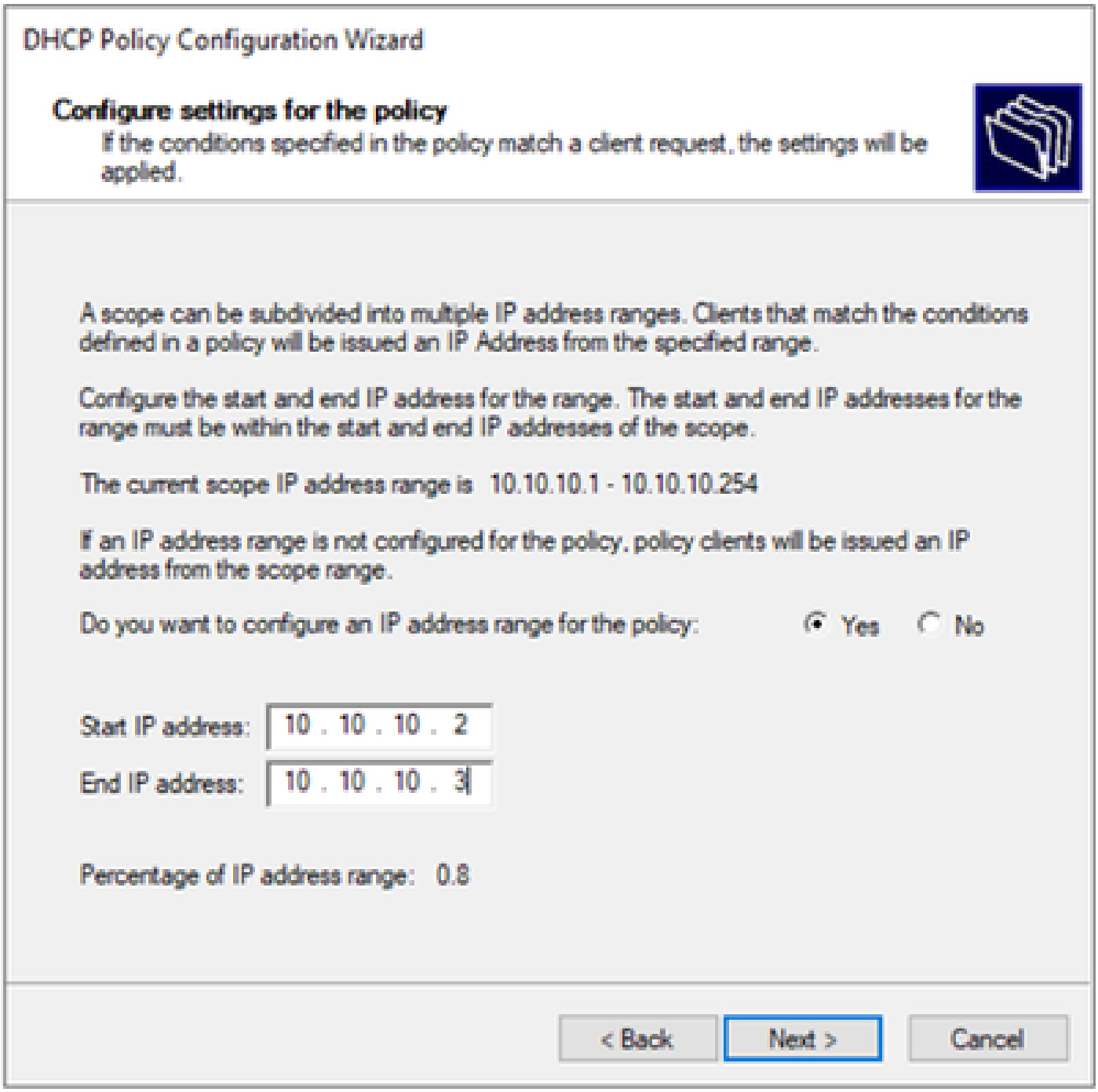
```
LEAF-1# show interface vlan 10
Vlan10 is up, line protocol is up, autostate enabled
  Hardware is EtherSVI, address is  707d.b9b8.4daf <<<<
  Internet Address is 10.10.10.1/24
 <snip>
```



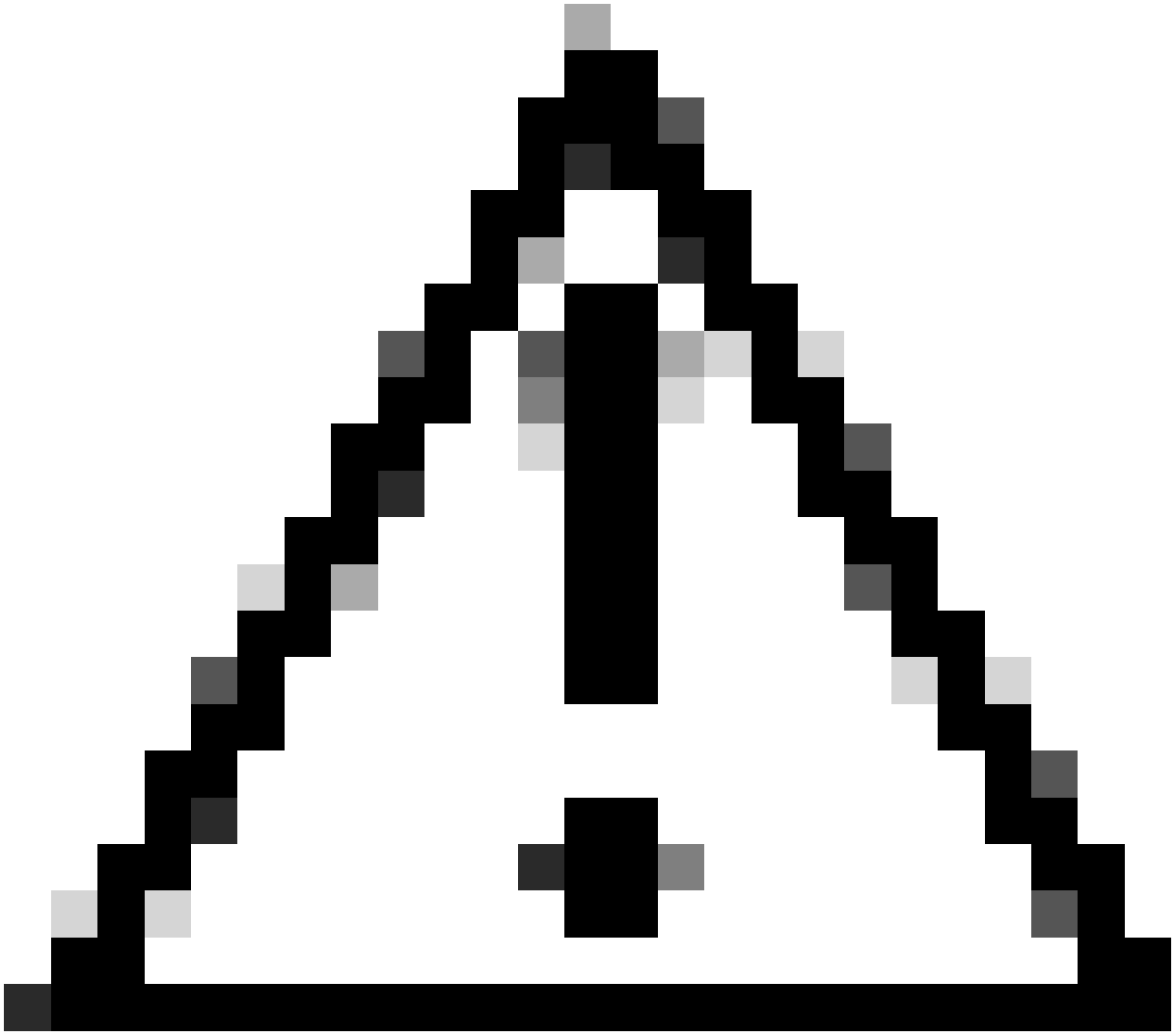
第四步：在通过ID选择的VTEP上配置现有IP可以使用的IP编址，然后单击Next。



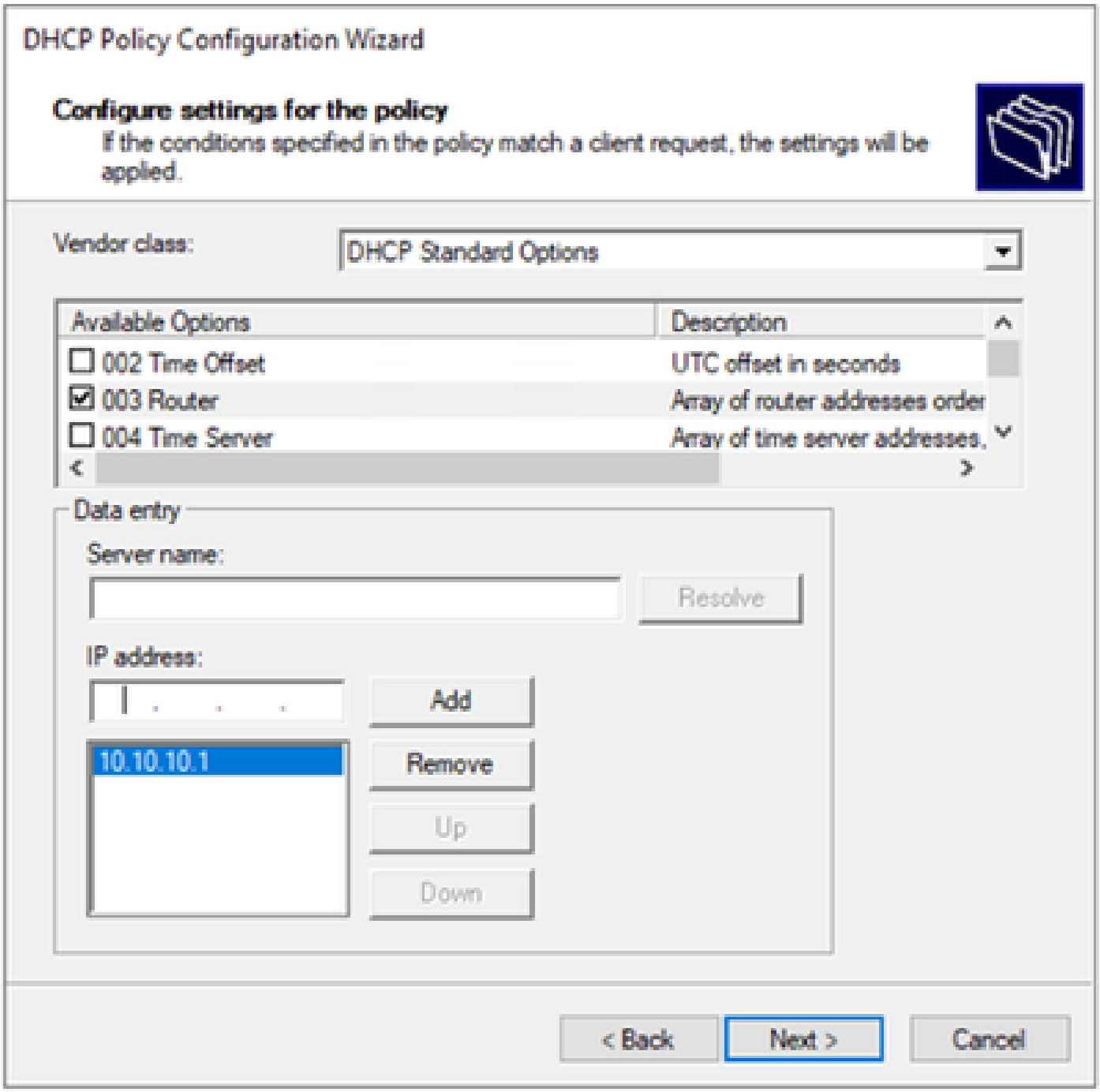
注意：在本示例中，只有一个虚拟机连接到枝叶1，因此只有一个IP地址需要IPd。这里添加了第二个IP地址，以备其它主机连接。



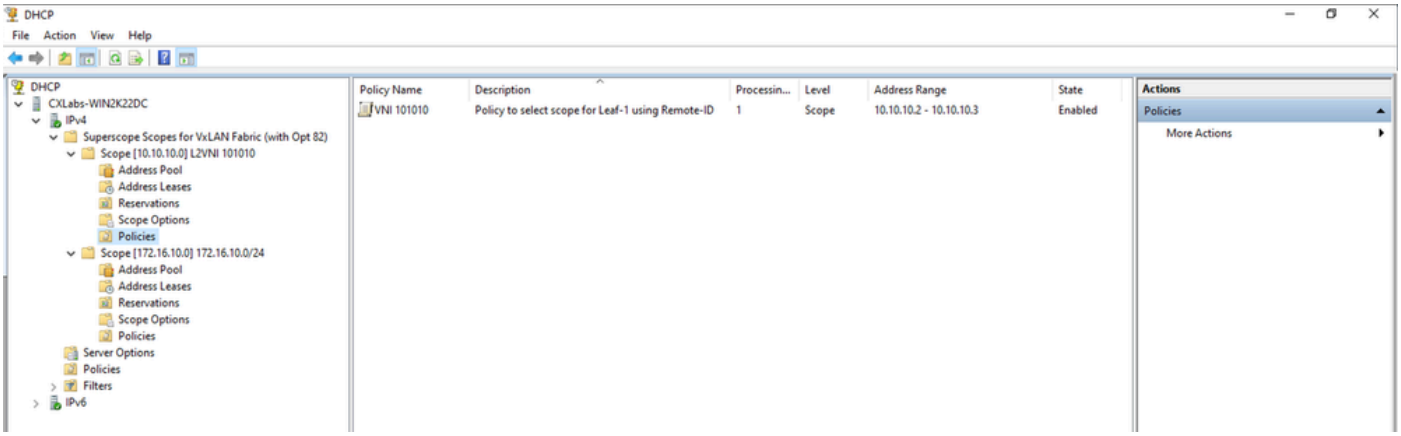
第五步：选中DCHP Standard Option下003路由器左侧的框。然后写下属于此策略的主机的默认网关的IP地址，并按Add。单击 Next。



注意：您可以选择多个选项，但如果不确定要输入哪个值，请不要选择。配置不一致或错误会导致意外行为。



第六步：检查策略条件并单击Finish。

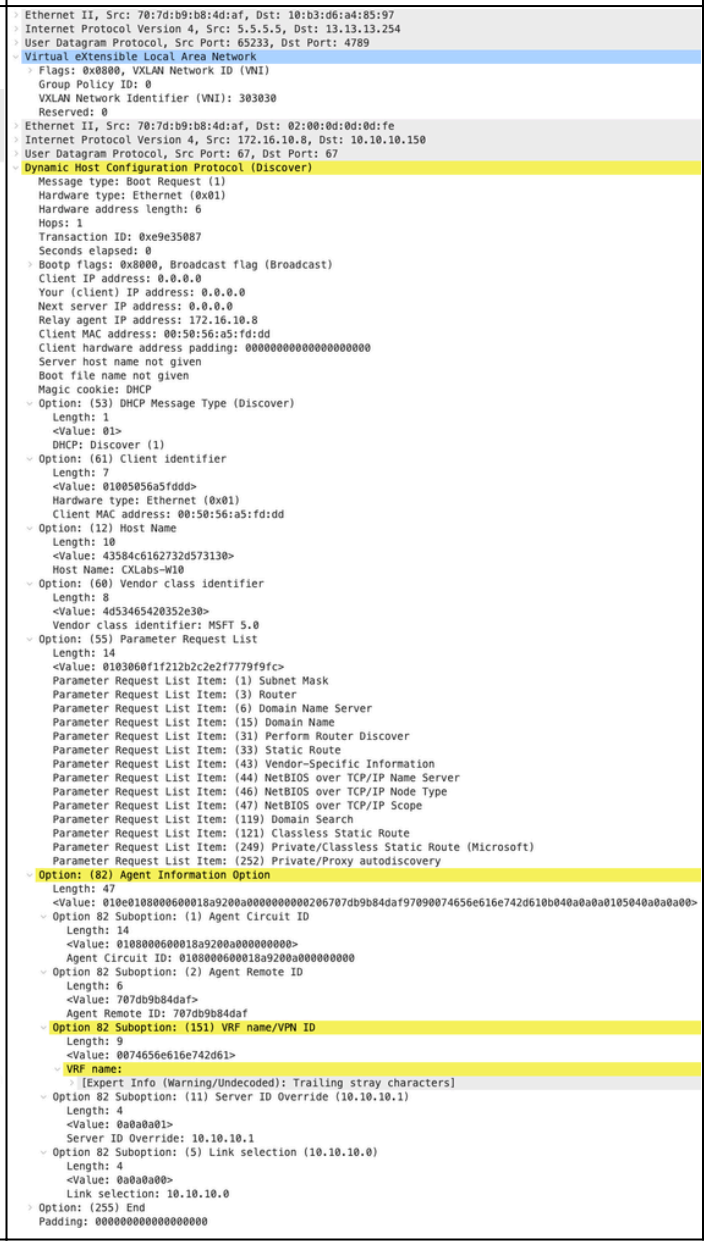


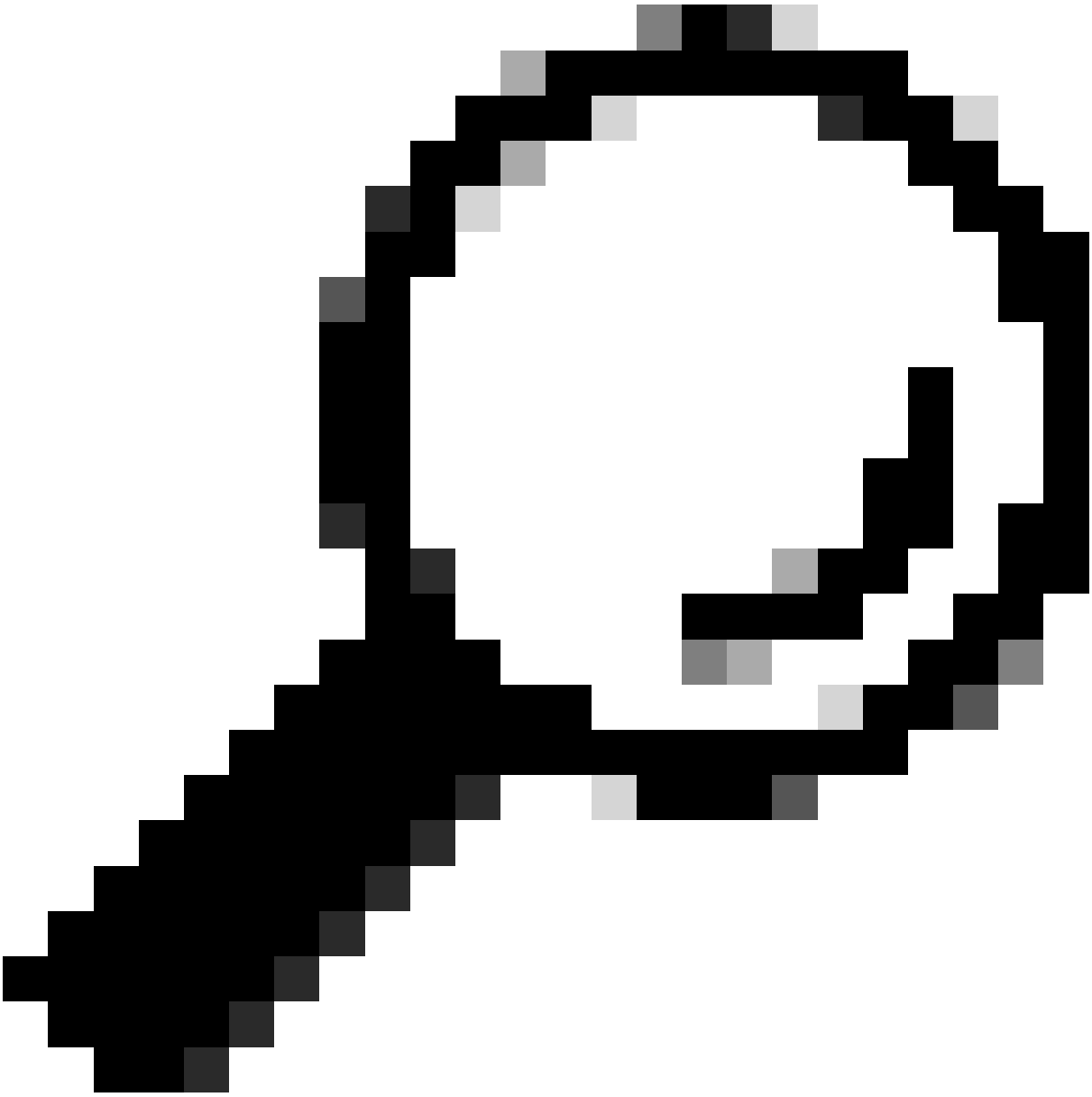
在VxLAN交换矩阵中，DCHP数据包从头到尾遍历。

发现由HOST-1发送

```
> 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
```

在LEAF-1上发现

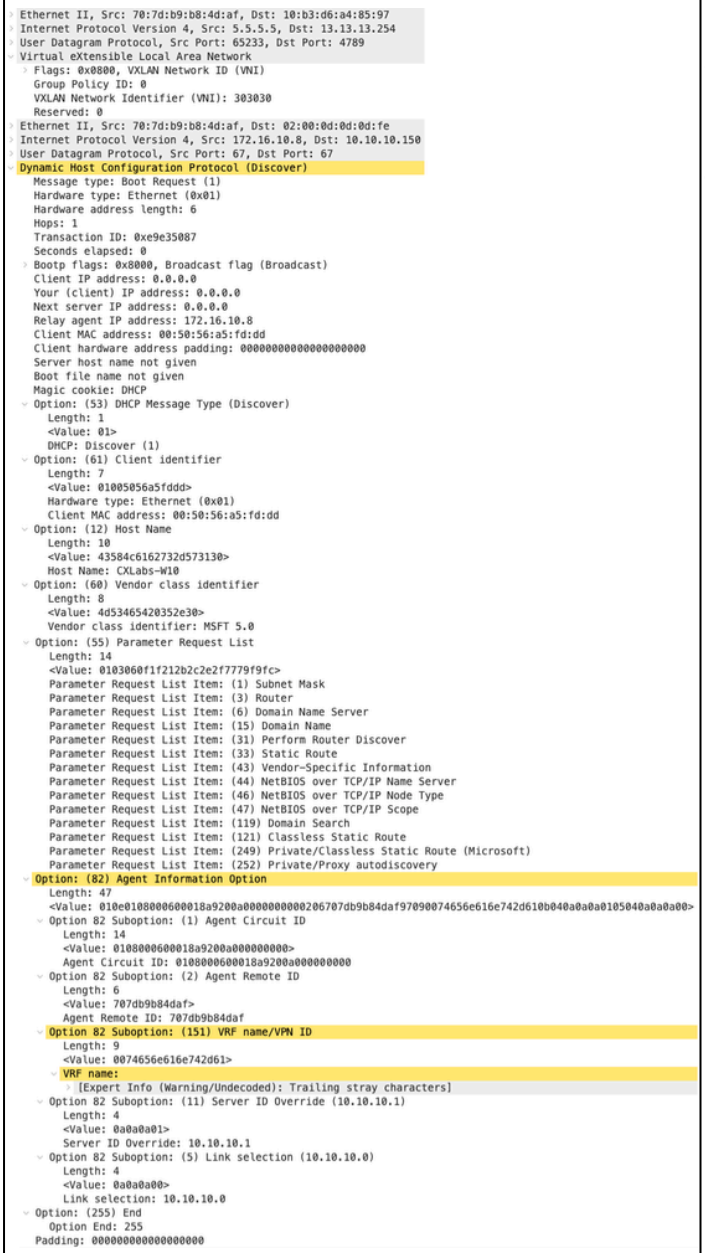
在LEAF-1上收到的发现	发现由LEAF-1发送
	

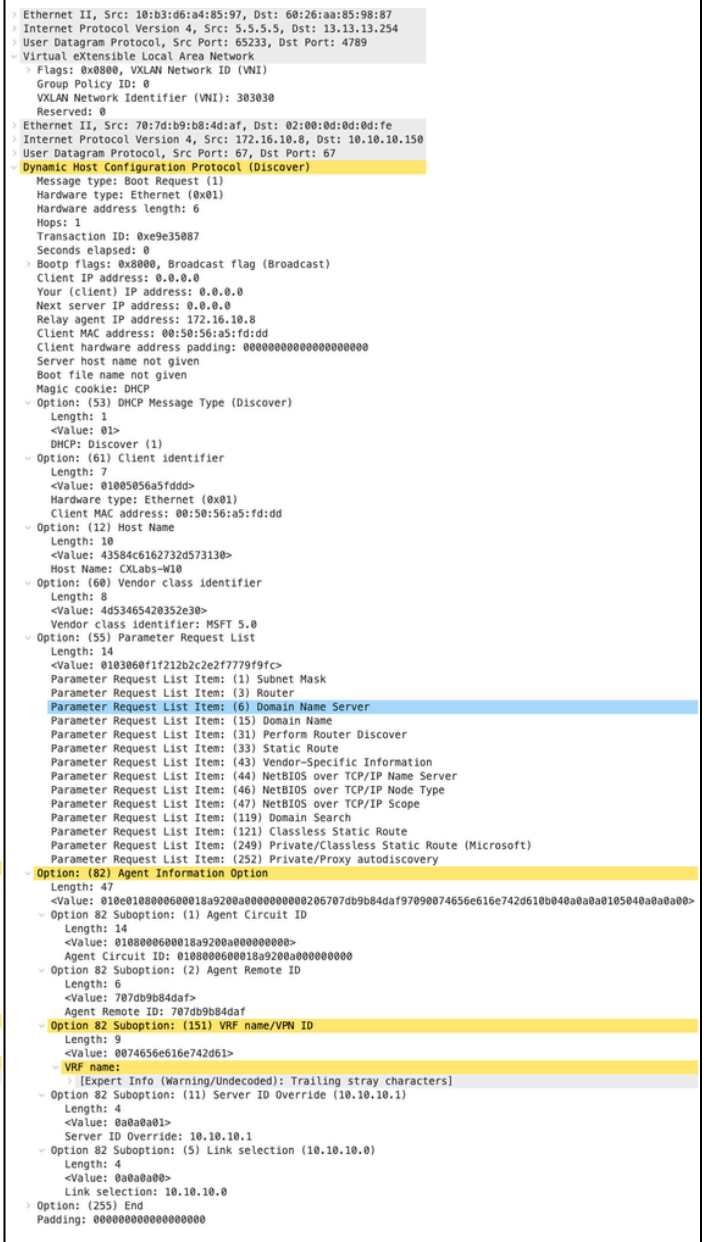


提示：双击时，图像会增大。

主干上的发现

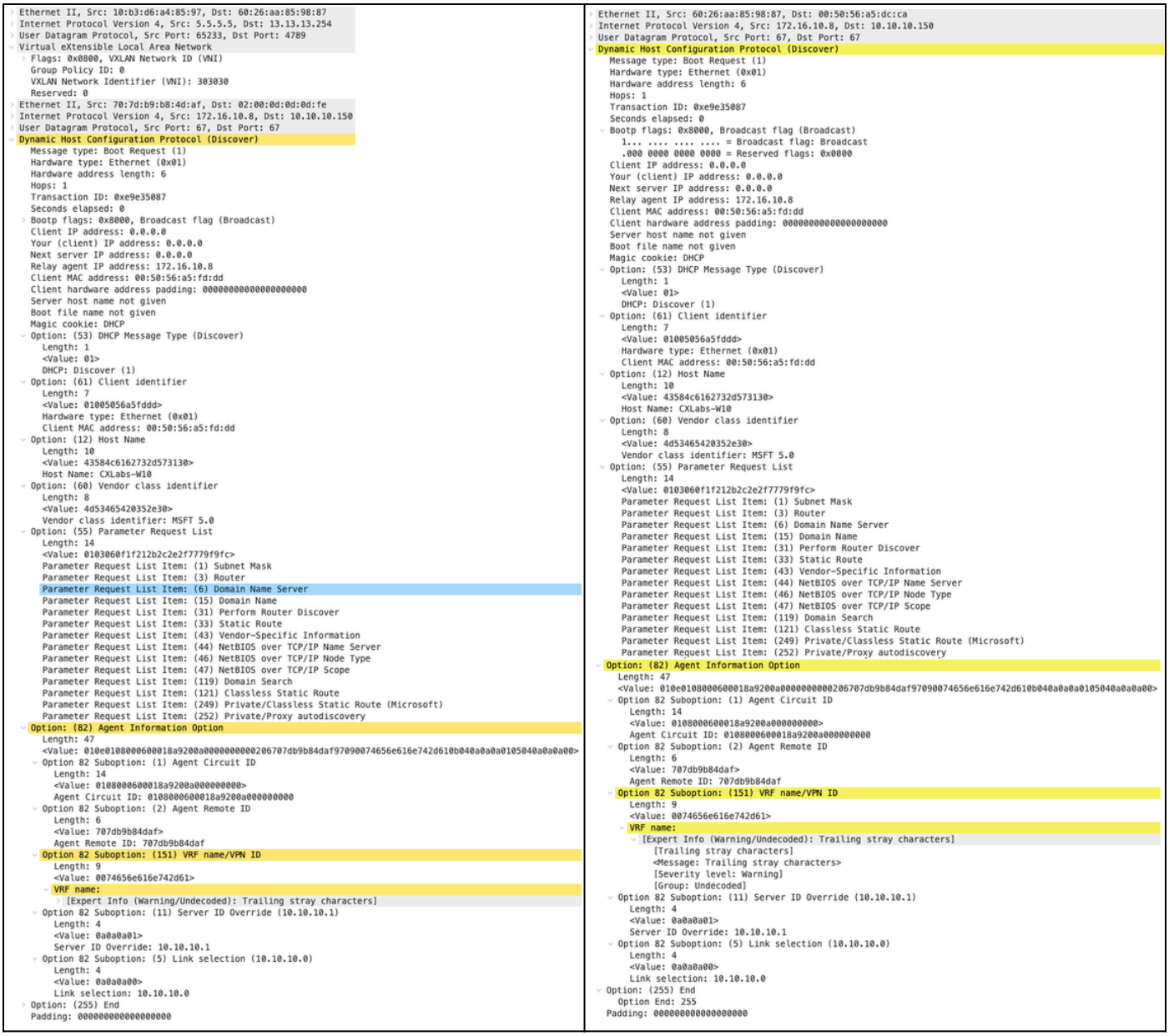
主干上收到的发现	通过SPINE发送的发现

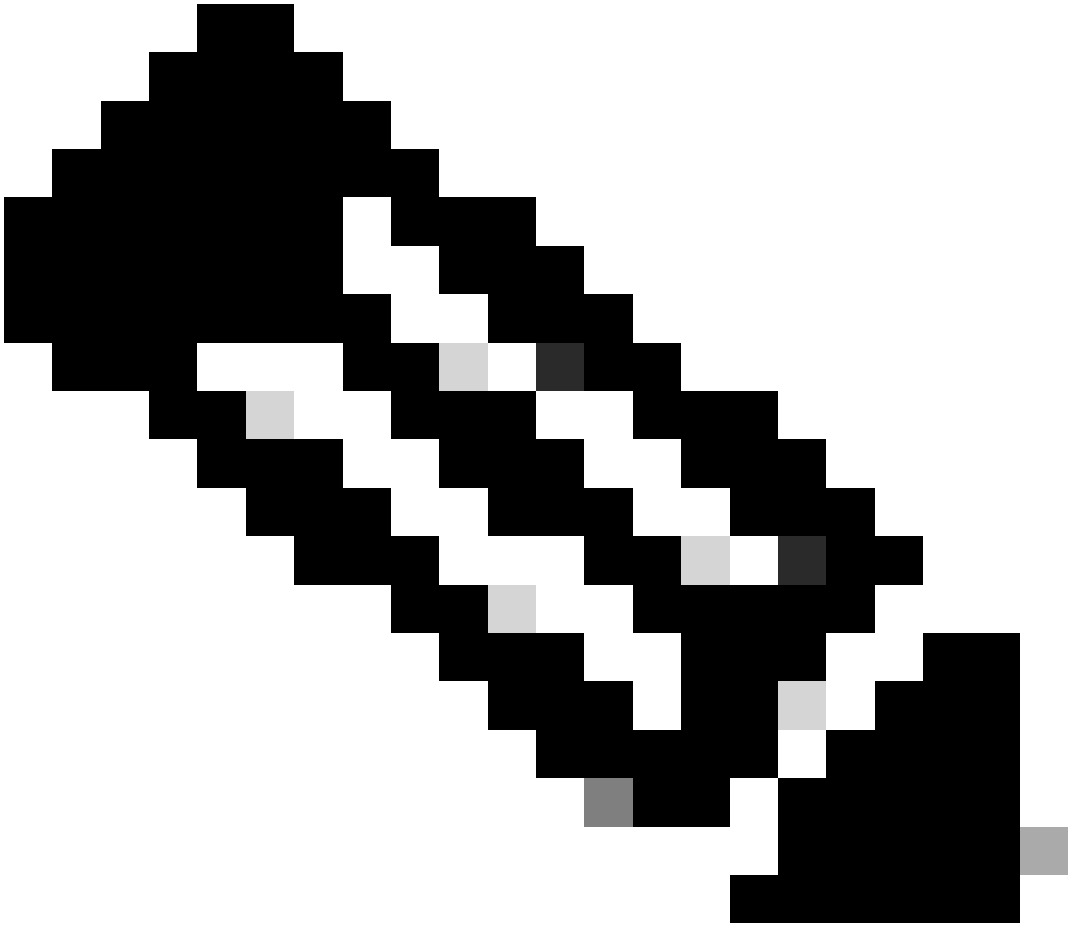




在LEAF-1-vPC上的发现

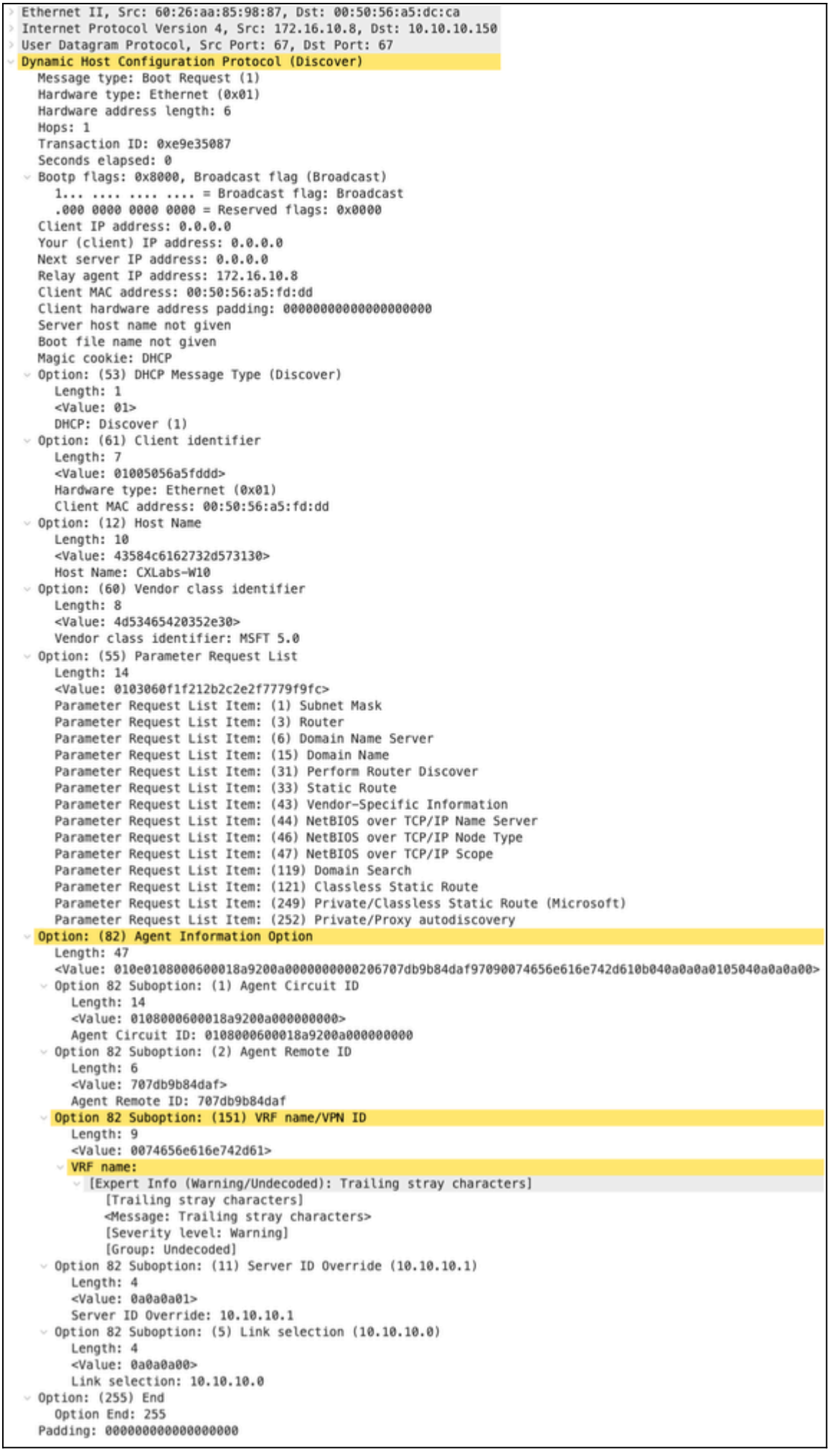
在LEAF-1-vPC上收到的发现	发现由LEAF-1-vPC发送


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

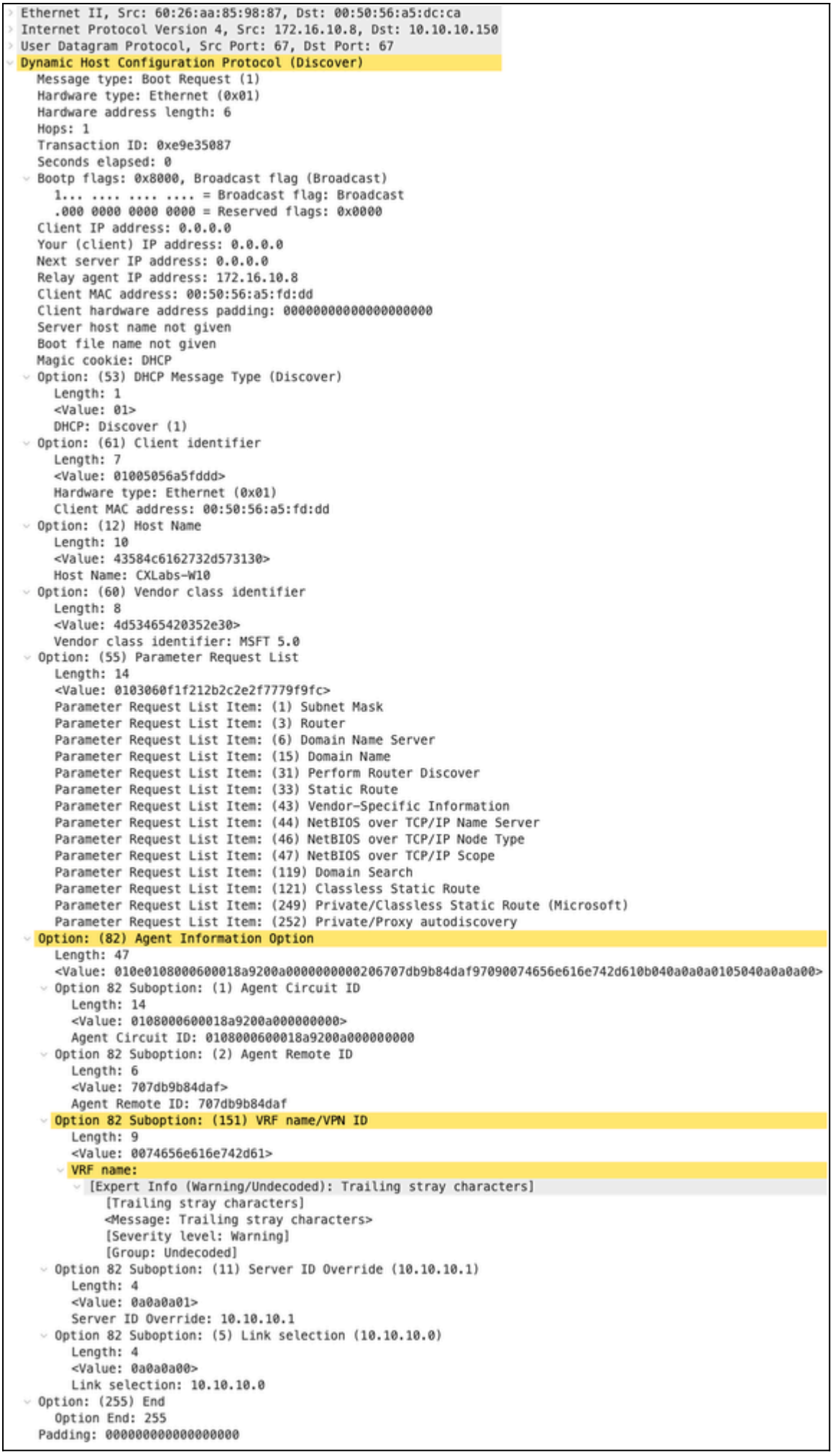


注意：LEAF-2-vPC接收Discovert数据包，但此数据包仅进行交换。目的MAC地址属于DHCP服务器。

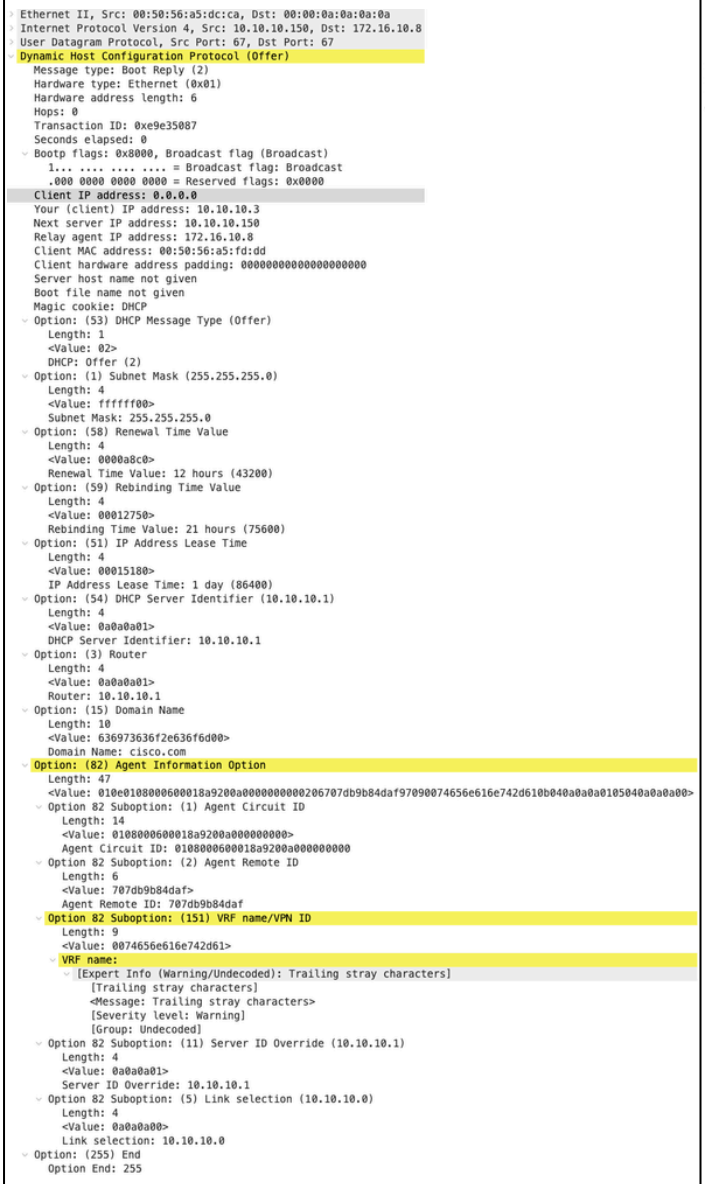
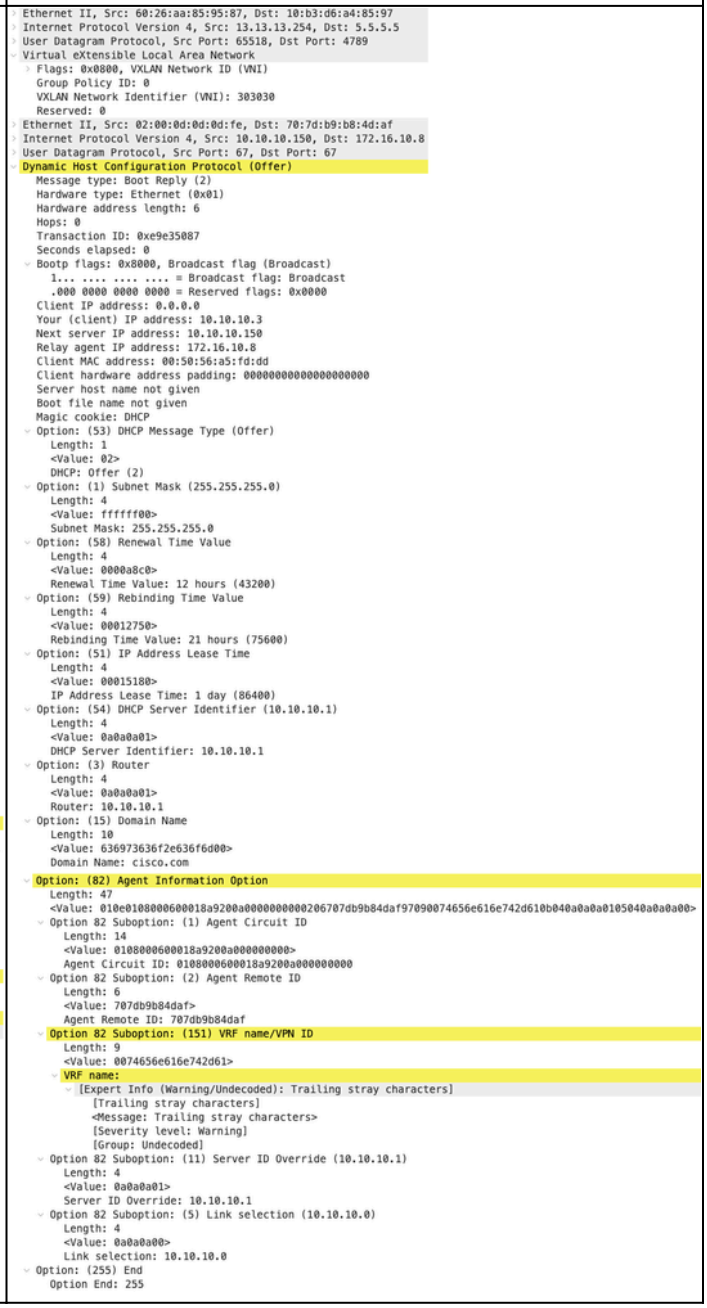
在DCHP服务器上接收的发现


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

由DCHP服务器发送的DCHP提供


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

LEAF-2-vPC上的DCHP优惠

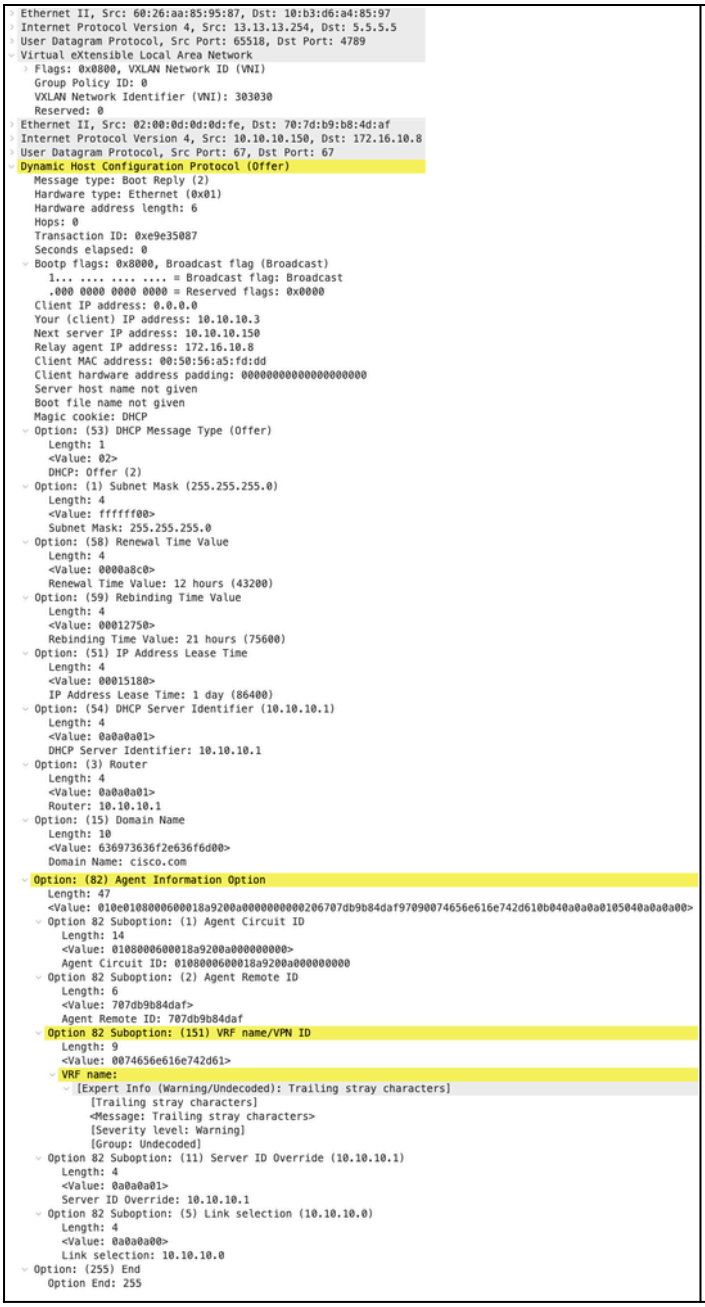
在LEAF-2-vPC上接收的产品	提供通过LEAF-2-vPC发送
	

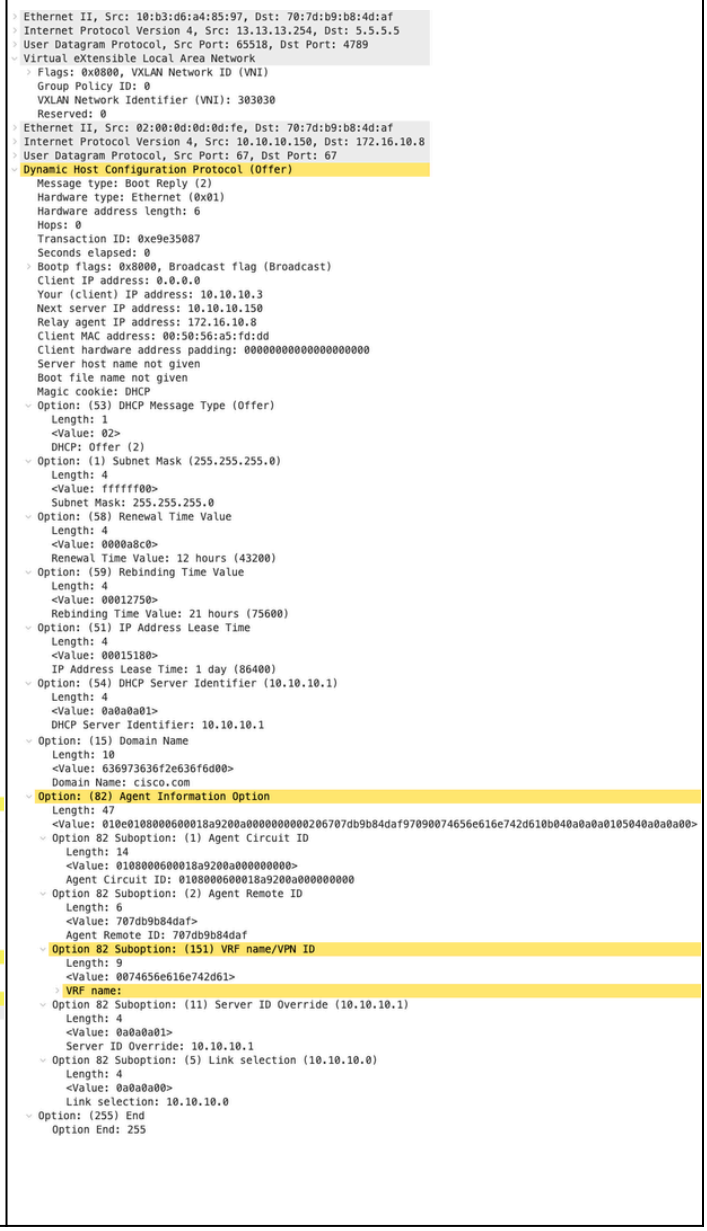
```
> Ethernet II, Src: 00:50:56:a5:dc:ca, Dst: 00:00:0a:0a:0a:0a
> Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
> User Datagram Protocol, Src Port: 67, Dst Port: 67
v Dynamic Host Configuration Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xe9e35087
    Seconds elapsed: 0
  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: 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
  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: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    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:
        v [Expert Info (Warning/Undecoded): Trailing stray characters]
            [Trailing stray characters]
            <Message: Trailing stray characters>
            [Severity level: Warning]
            [Group: Undecoded]
    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: 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
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: 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
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
  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: 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
  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: (82) Agent Information Option
      Length: 47
      <Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
    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:
        v [Expert Info (Warning/Undecoded): Trailing stray characters]
            [Trailing stray characters]
            <Message: Trailing stray characters>
            [Severity level: Warning]
            [Group: Undecoded]
    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
```

DHCP提供vPC主干

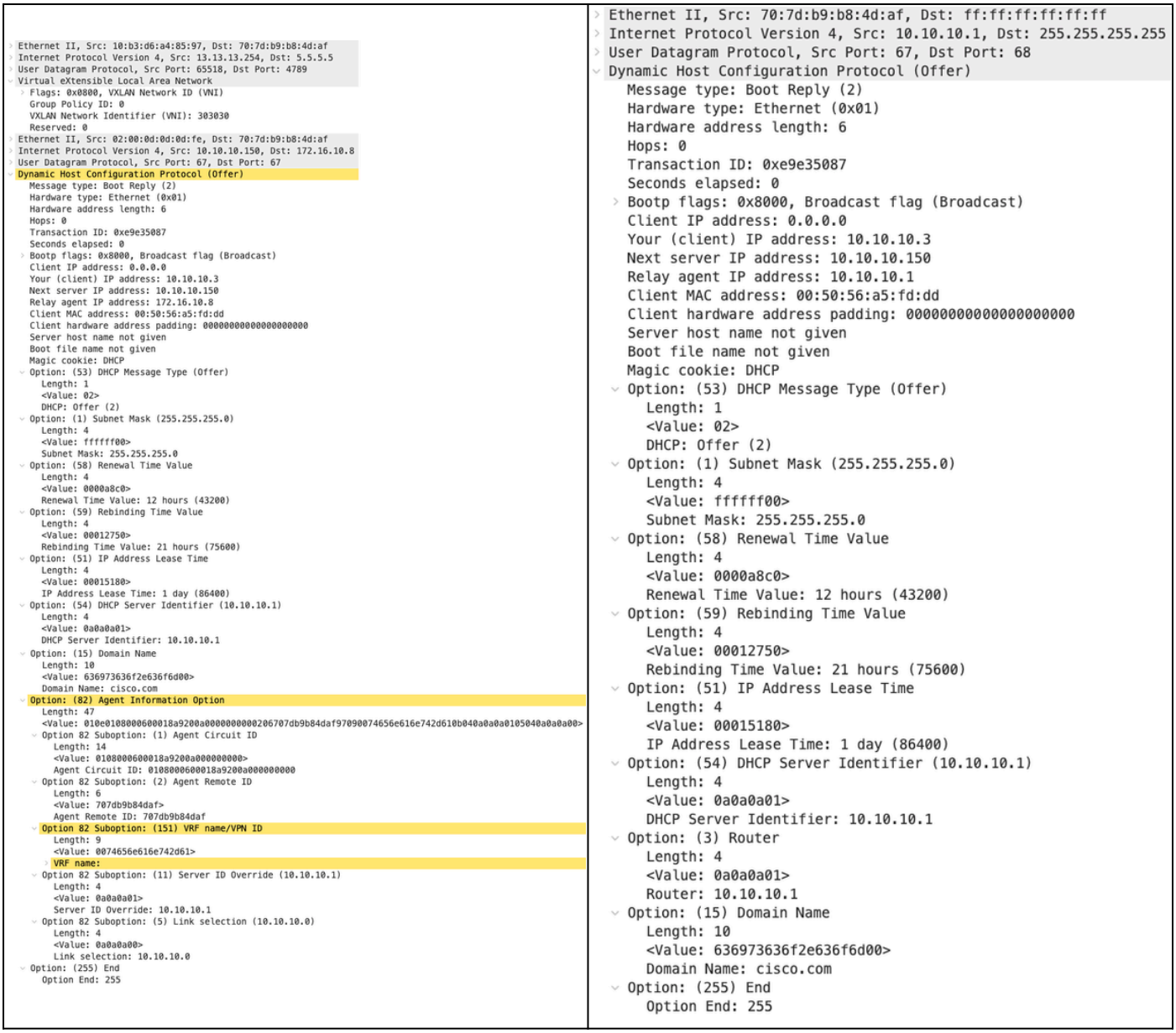
主干上接收的产品	提供通过SPINE发送





LEAF-1上的DHCP提供

在LEAF-1上收到优惠	在LEAF-1上发送优惠



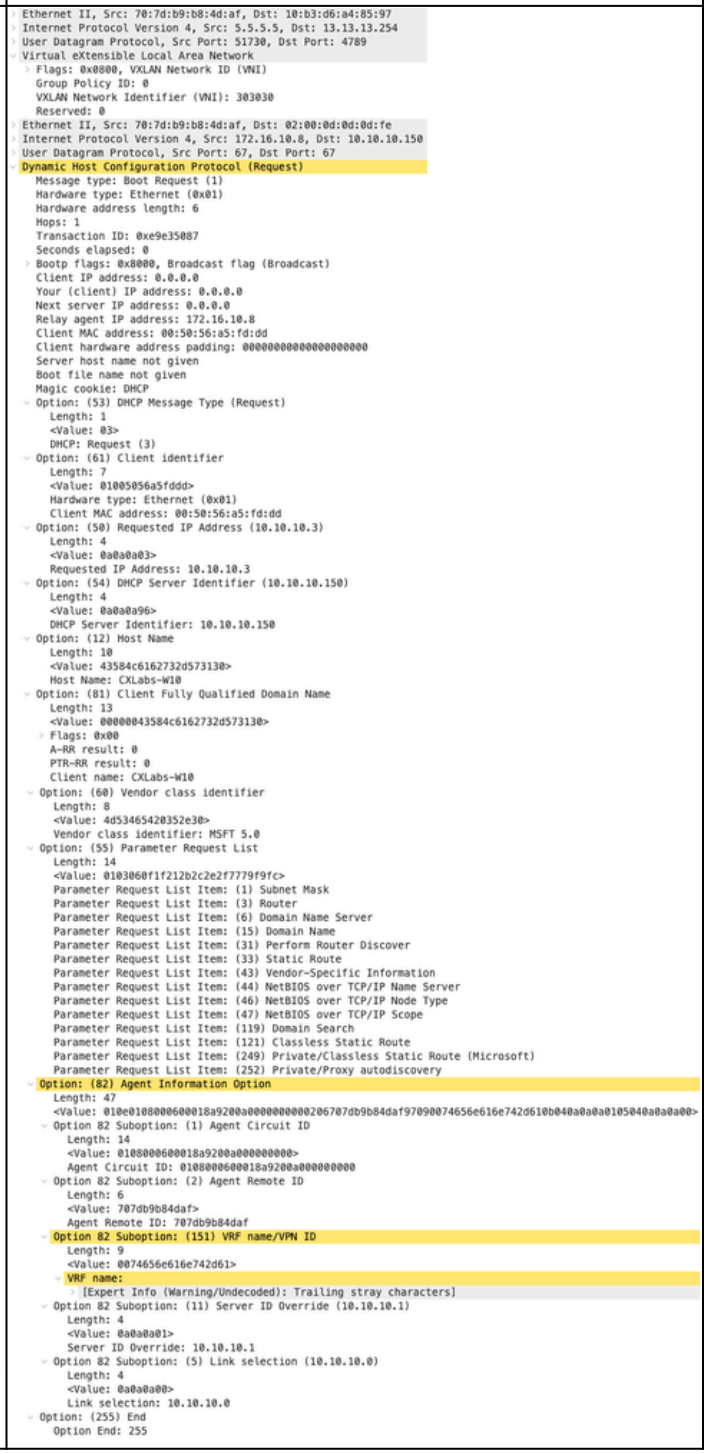
HOST-1上接收的DHCP提供

```
> 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
```

请求由HOST-1发送


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

对LEAF-1的请求

在LEAF-1上收到的请求	请求由LEAF-1发送
	

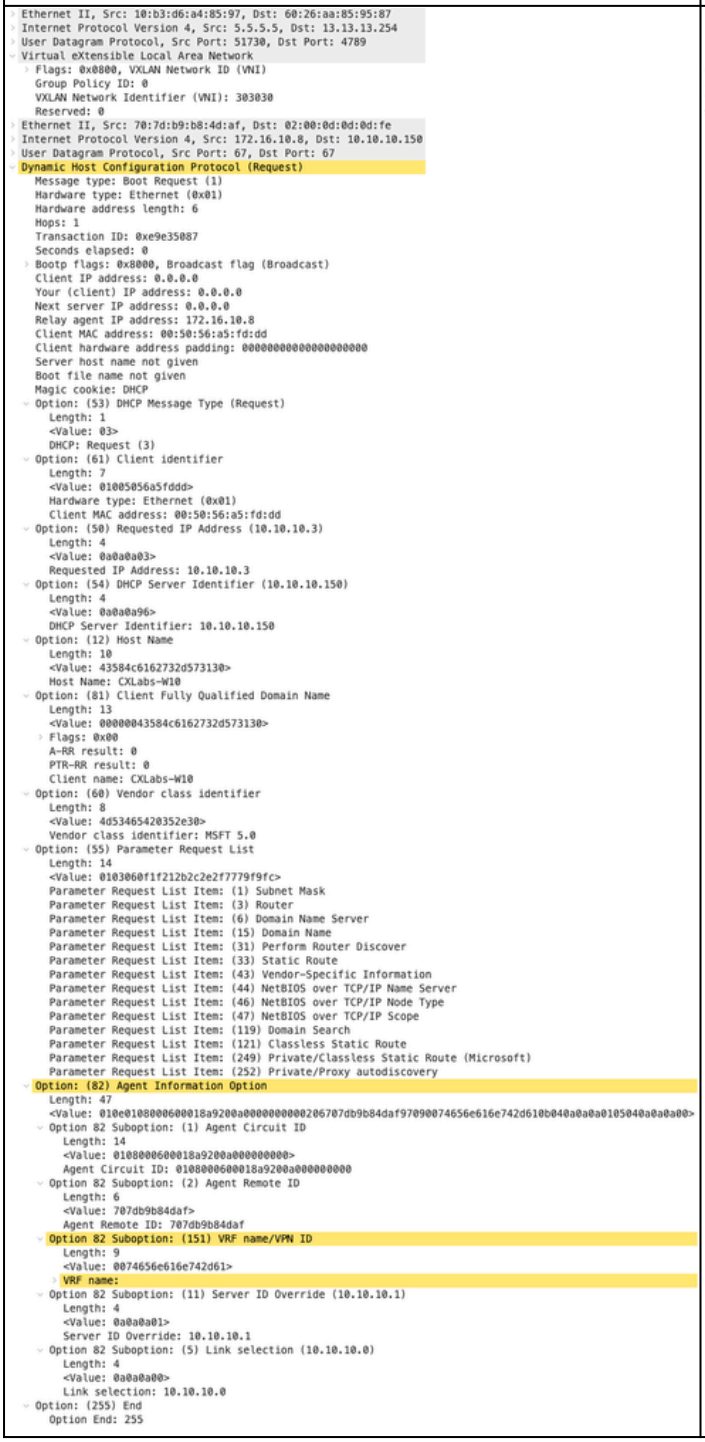
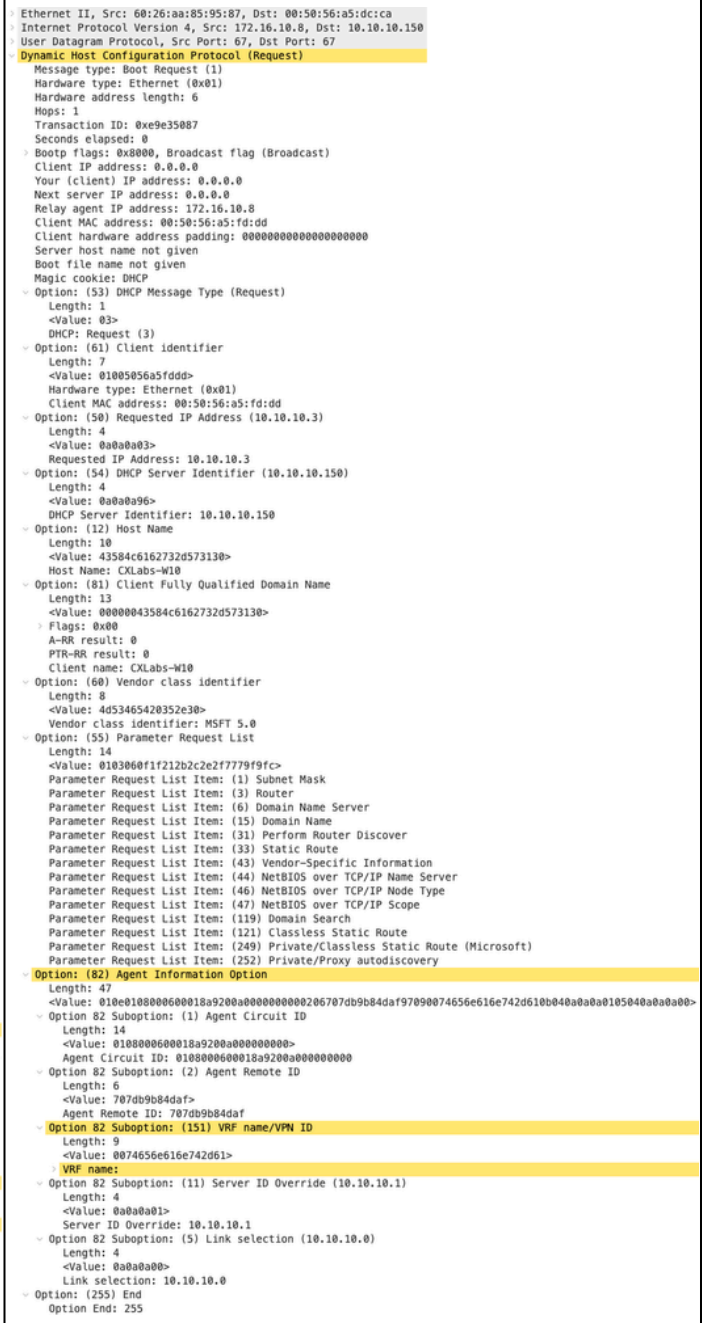
主干上的请求

主干上收到的请求	请求由SPINE发送

```
> 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
```

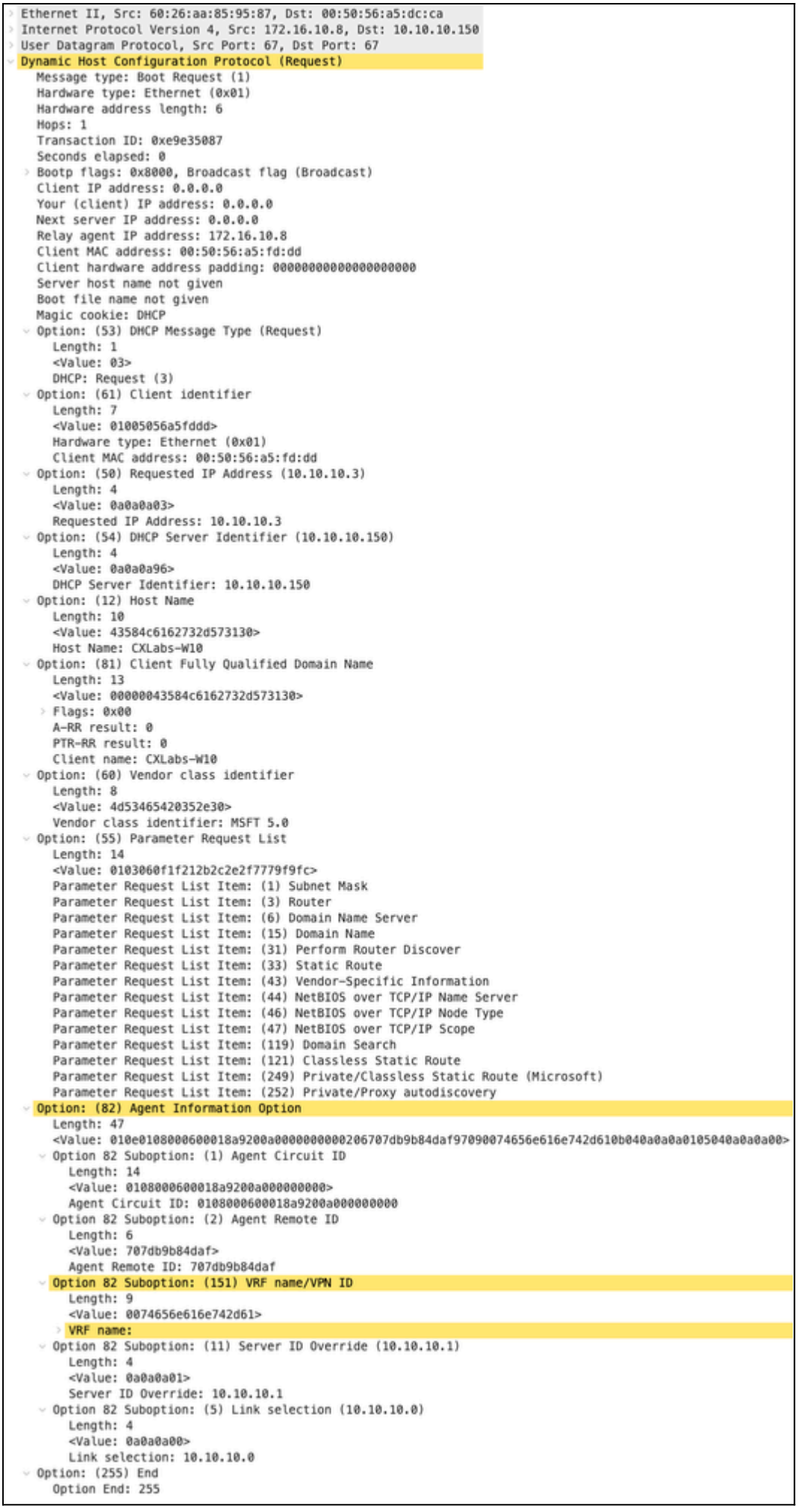
枝叶-2-vPC上的请求

在LEAF-2-vPC上请求接收PCd	请求通过vPCAF-2-vPC发送
	

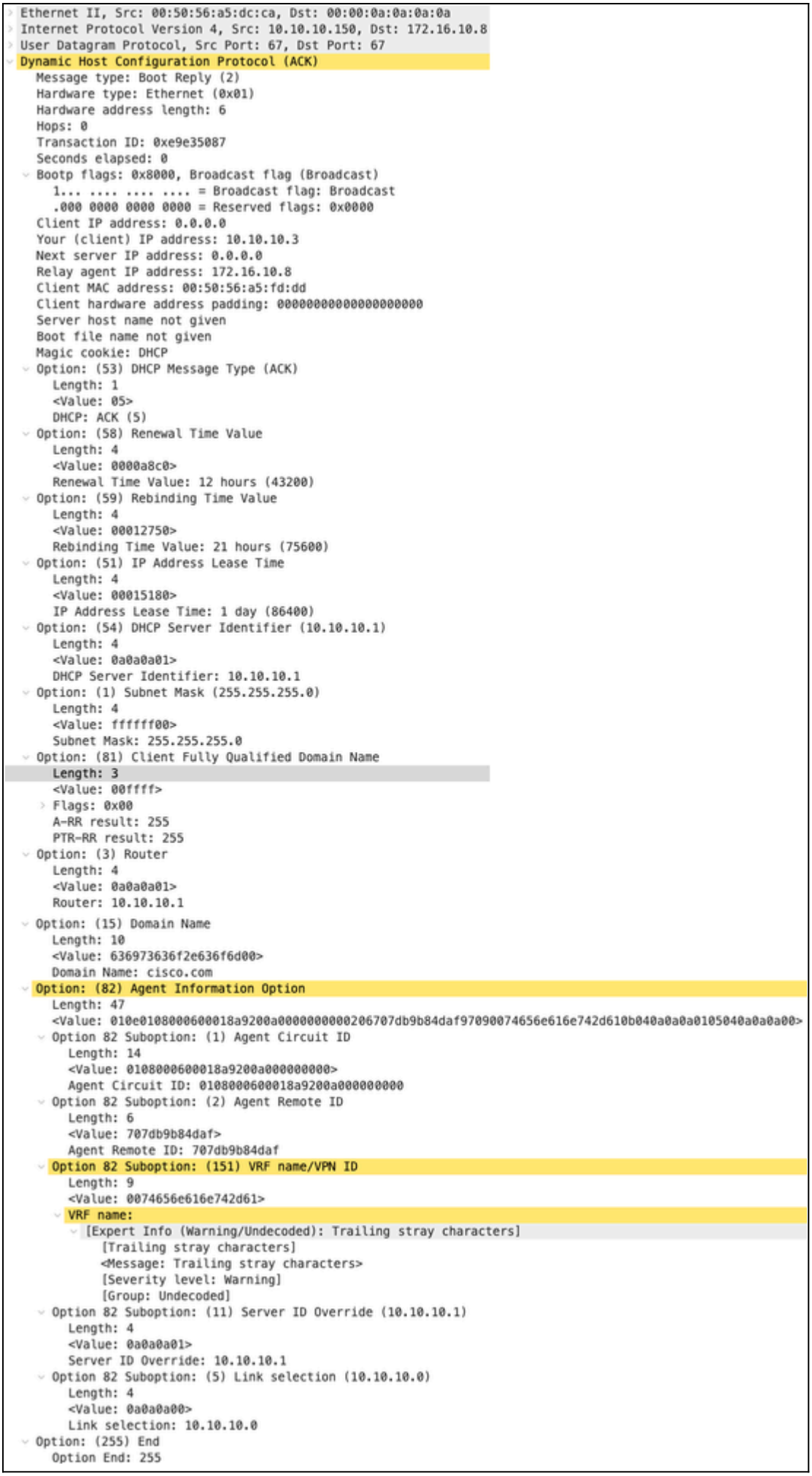
```
Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 60:26:aa:85:95:87
Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
User Datagram Protocol, Src Port: 51730, Dst Port: 4789
Virtual eXtensible Local Area Network
    Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN Network 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 (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: 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:
        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: 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: 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:
        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
```

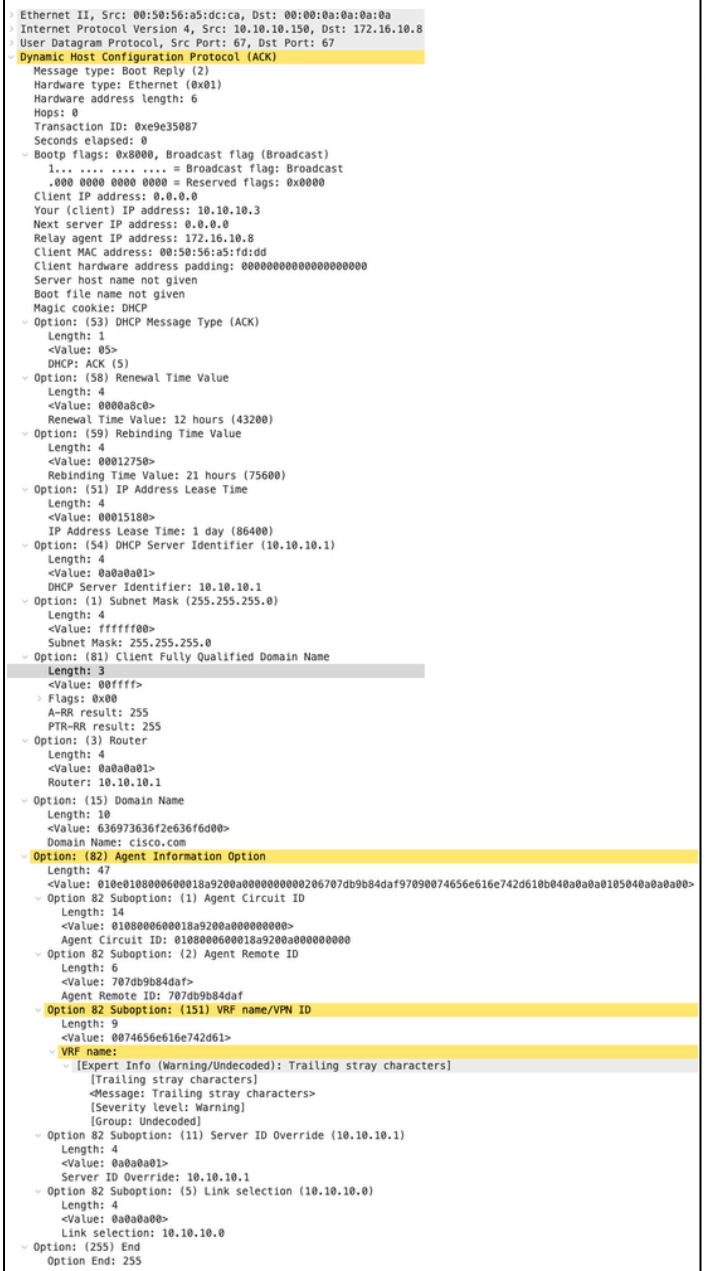
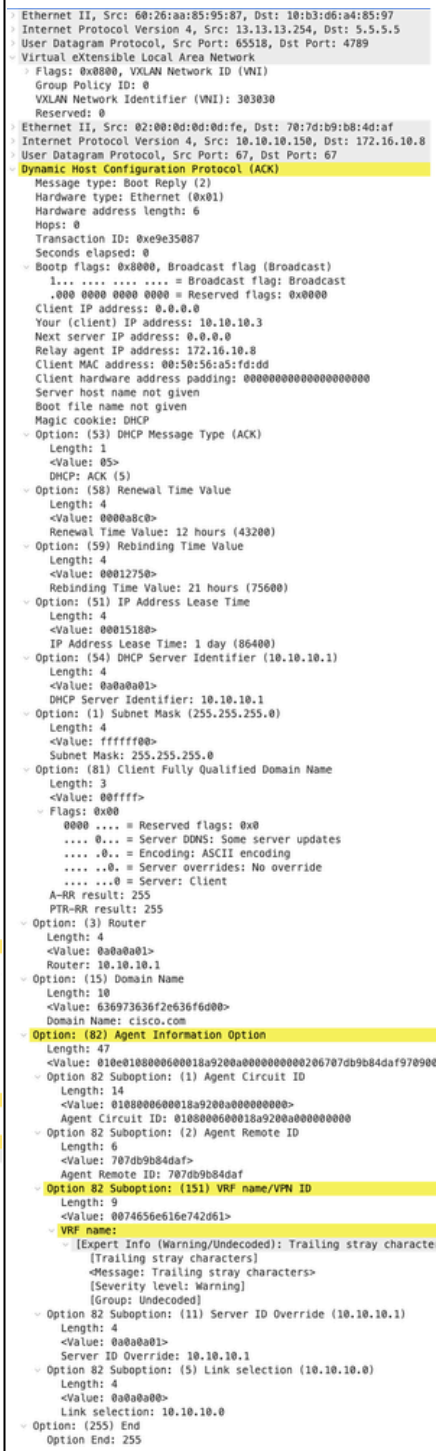
DCHP服务器上收到的请求


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

ACK由DCHP服务器发送


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

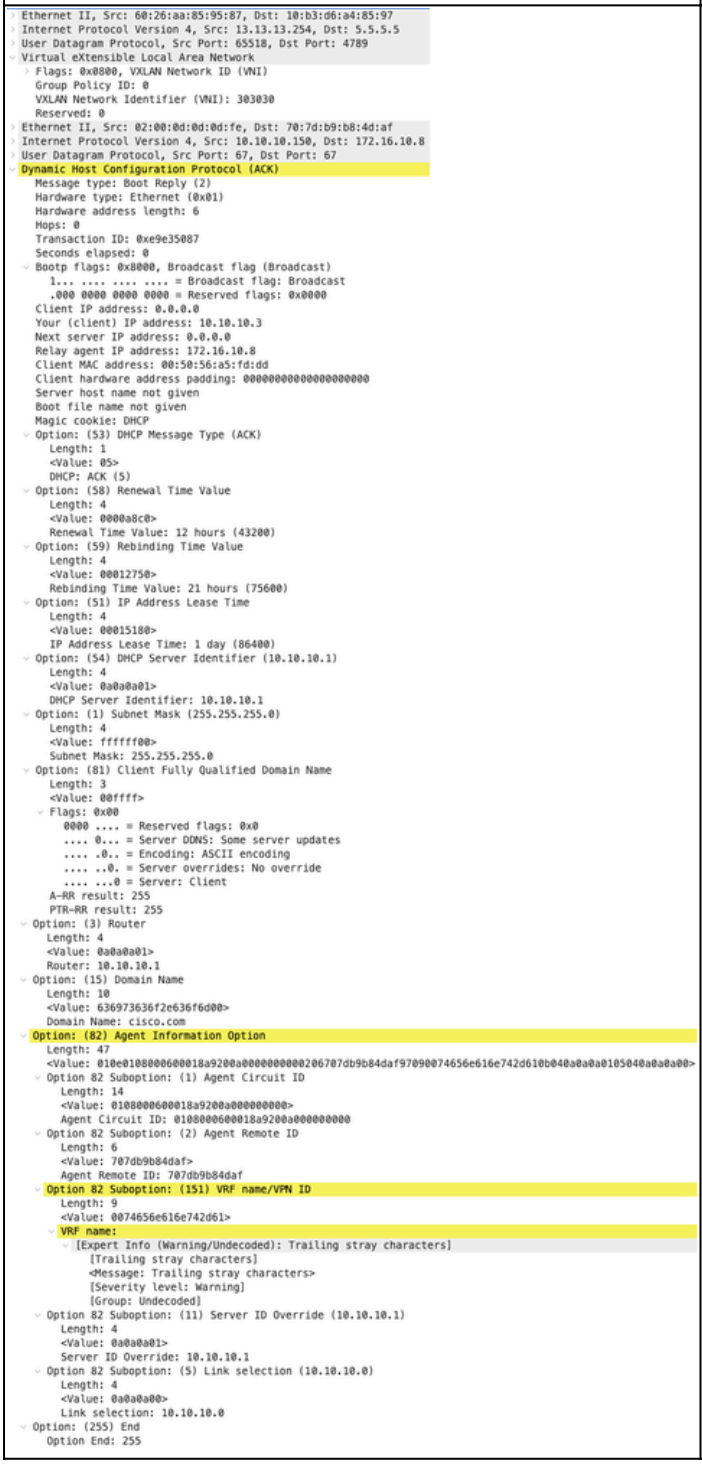
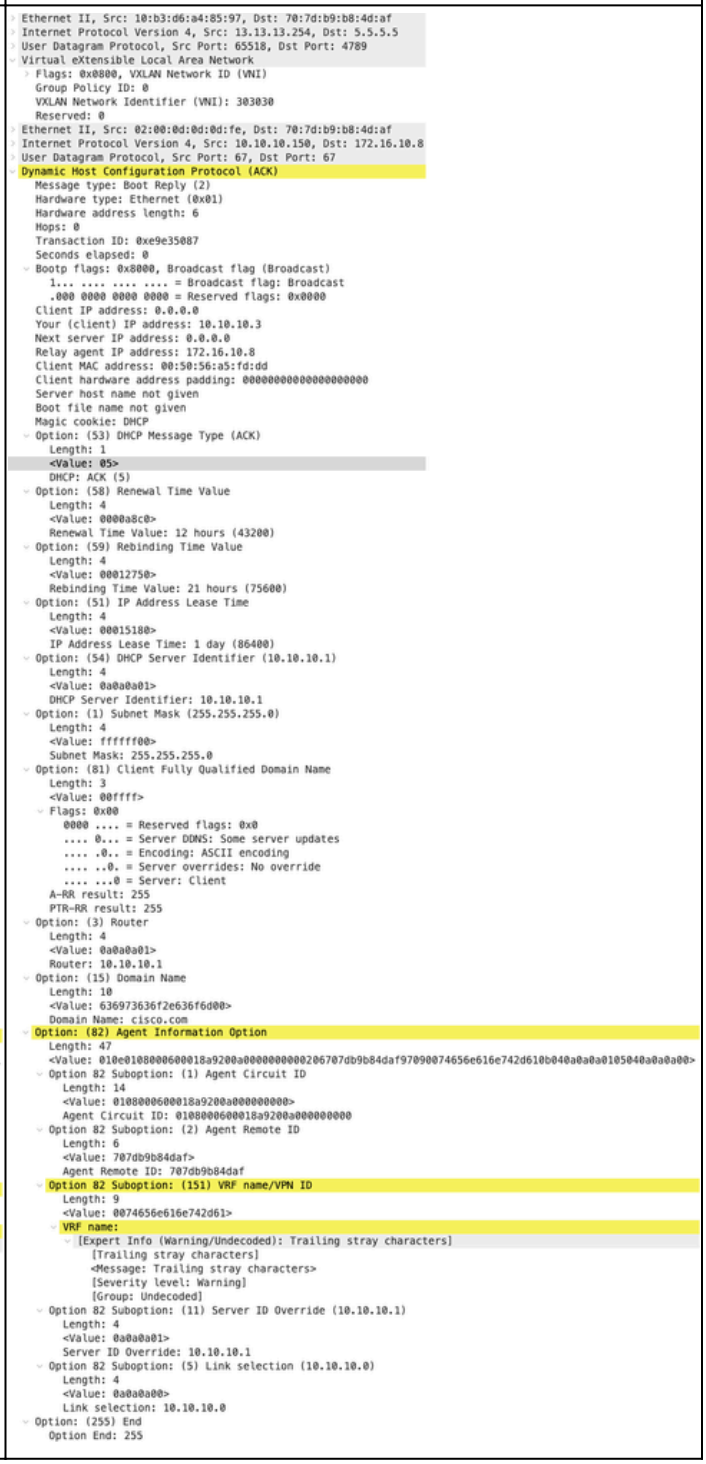
LEAF-2-vPC上的ACK

在LEAF-2-vPC上收到ACK	ACK通过LEAF-2-vPC发送
	

```
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
```

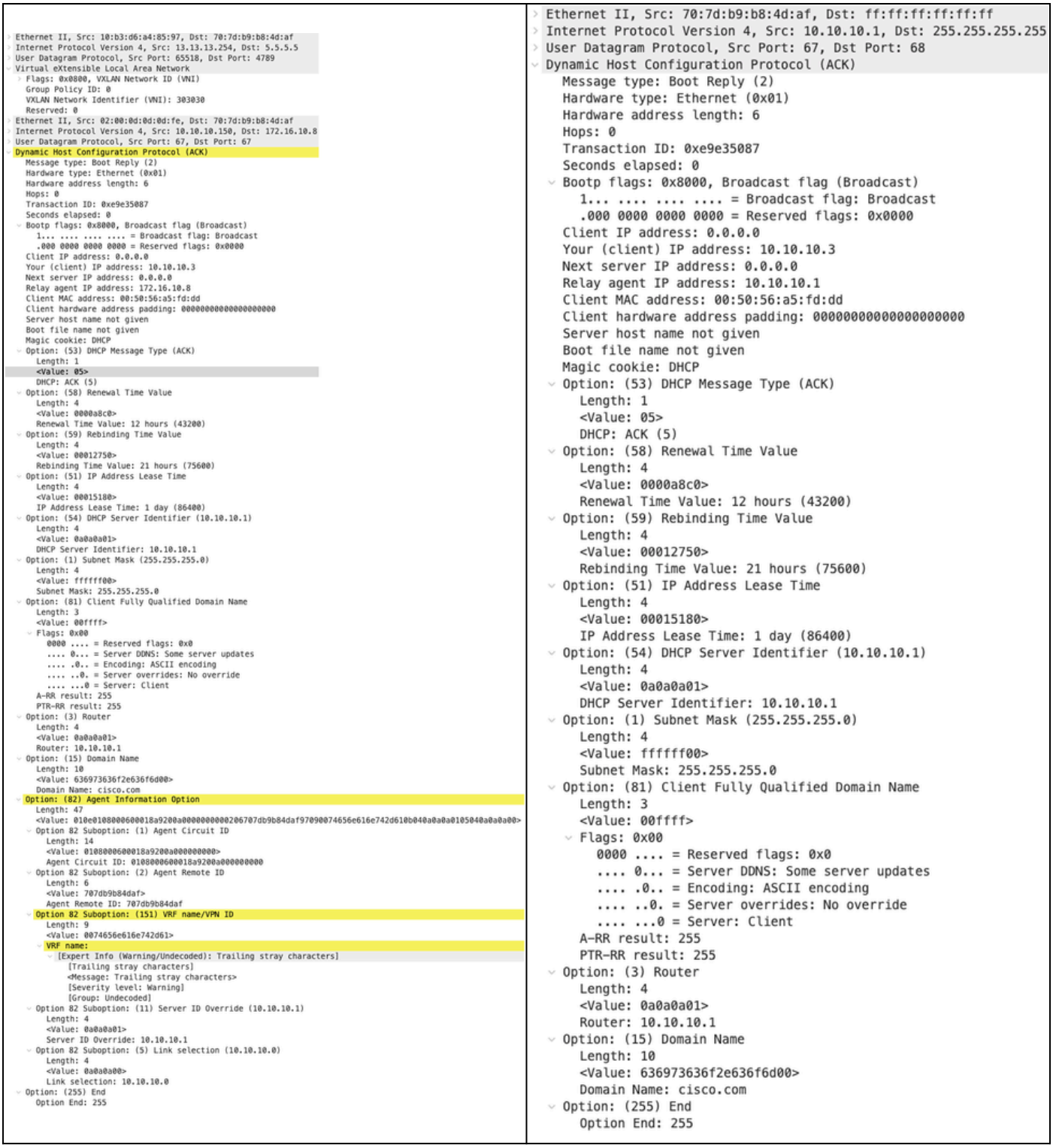
```
Ethernet II, Src: 60:26:aa:85:95:87, Dst: 10:b3:d6:a4:85:97
Internet Protocol Version 4, Src: 13.13.13.254, Dst: 5.5.5.5
User Datagram Protocol, Src Port: 65518, Dst Port: 4789
Virtual eXtensible Local Area Network
  > Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN Network 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 (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: 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
```


脊柱上的ACK

主干上收到ACK	通过主干发送ACK
	

LEAF-1上的ACK

LEAF-1上收到ACK	ACK由LEAF-1发送


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

HOST-1上的ACK

```
> 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
```

相关信息

配置VXLAN BGP EVPN

配置VXLAN

排除Nexus 9000的DHCP相关问题

Cisco Nexus 9000系列NX-OS VXLAN配置指南，版本10.4(x)

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