# Configurazione e verifica di DHCP in un fabric VxLAN per Nexus 9000 con NX-OS e Windows Server 2022

## Sommario

# Introduzione

In questo documento viene descritto come configurare e risolvere i problemi relativi a DHCP in un fabric VxLAN con switch Nexus 9000.

# Prerequisiti

## Requisiti

Cisco raccomanda la conoscenza dei seguenti argomenti:

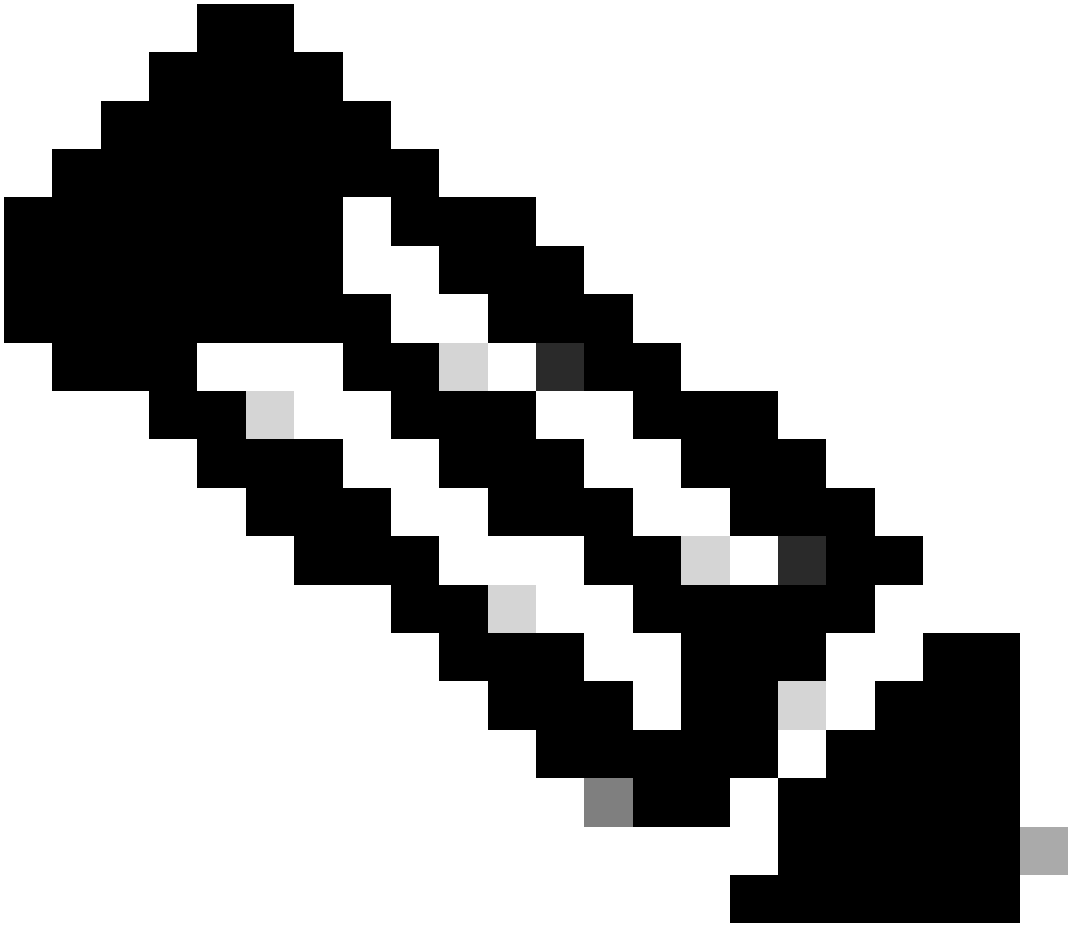
- Software Nexus NX-OS.
- Virtual Port Channel (vPC).
- VxLAN BGP L2VPN VPN
- IPv4 famiglia di indirizzi BGP
- OSPF
- PIM multicast (modalità sparse)
- DHCP

## Componenti usati

Le informazioni fornite in questo documento si basano sulle seguenti versioni software e hardware:

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

Le informazioni discusse in questo documento fanno riferimento a dispositivi usati in uno specifico ambiente di emulazione. Su tutti i dispositivi menzionati nel documento la configurazione è stata ripristinata ai valori predefiniti. Se la rete è operativa, valutare attentamente eventuali conseguenze derivanti dall'uso dei comandi.



Nota: per qualsiasi domanda sulla configurazione e sull'integrabilità di software o hardware di terze parti, non è previsto il supporto Cisco. L'uso di strumenti di terze parti è il modo migliore per dimostrare al cliente la configurazione e il funzionamento dell'apparecchiatura Cisco.

## Premesse

## Configurazione della sovrapposizione e della sovrapposizione per VxLAN in laboratorio

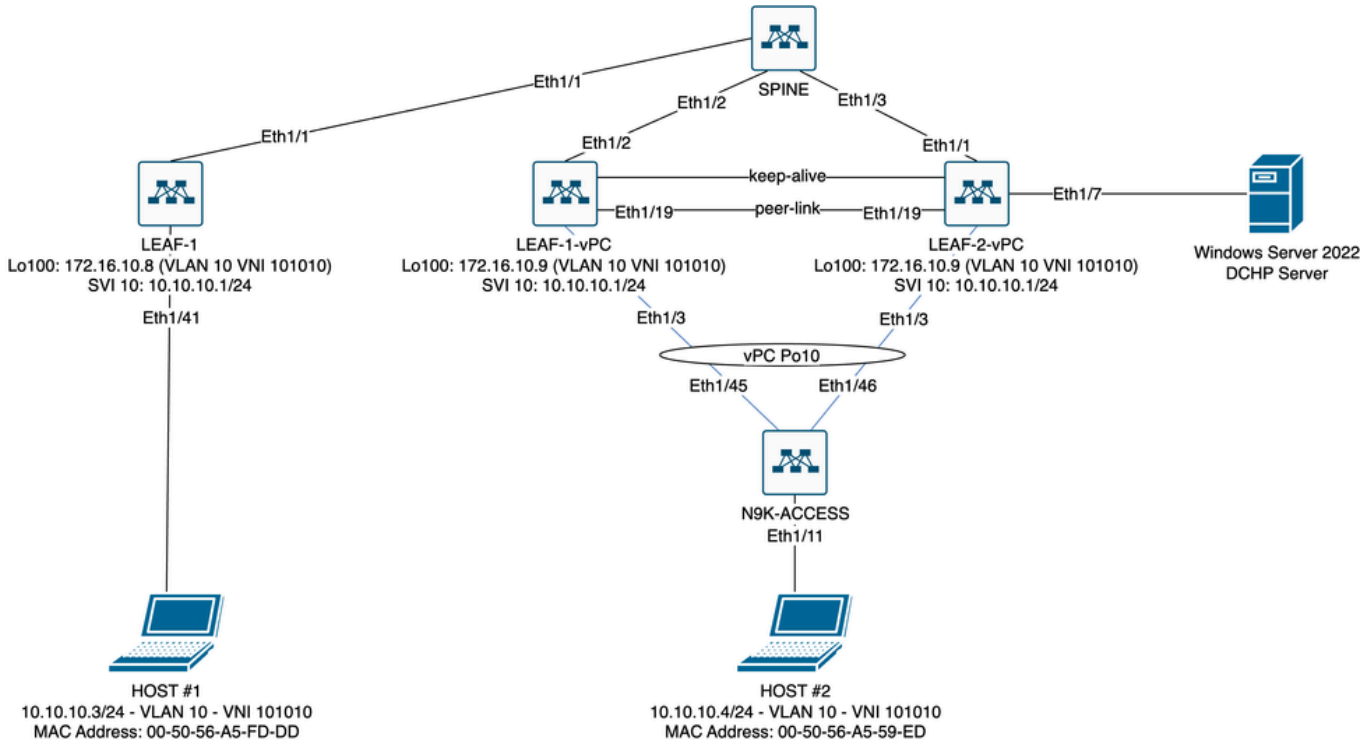



Diagramma fabric VxLAN in laboratorio

- DORSO:
  - Questo switch Nexus invia pacchetti DHCP (Discover, Offre, Request, Ack) senza essere decapsulato in questo scenario. Viene utilizzata solo l'intestazione esterna.
  - Funge da punto di routing centrale nel fabric di rete.
  - Responsabile dell'interconnessione di tutti gli interruttori LEAF e della semplificazione del flusso di dati tra di essi.
  - Partecipa a BGP per distribuire le route EVPN agli switch LEAF.
  - Esegue il routing IP e può instradare il traffico tra subnet diverse o segmenti VxLAN guardando le intestazioni IP esterne.
  - Separa la rete sovrapposta (VxLAN) dalla rete fisica sottostante.
  - Gestisce la sovrapposizione con i protocolli di routing IP tradizionali, mentre la sovrapposizione è gestita da VxLAN con BGP EVPN, fornendo un'architettura di rete scalabile e flessibile.

- FOGLIA-1:
  - Gli switch LEAF offrono connettività fisica per endpoint quali server, dispositivi di storage e altri accessori di rete.
  - Gli switch LEAF svolgono la funzione di VTEP, ossia incapsulano e decapsulano i pacchetti VxLAN.
  - In questo scenario, HOST#1 effettua la richiesta dell'indirizzo IP.
  - LEAF-1 è responsabile dell'incapsulamento dei pacchetti DCHP nell'intestazione VxLAN.
  - L'HOST 1 riceve i pacchetti DCHP in modo trasparente come Ethernet classico.

- LEAF-1-vPC e LEAF-2-vPC:
  - Gli switch LEAF partecipano al control plane EVPN eseguendo BGP e scambiando informazioni sulla route. Ciò consente la distribuzione delle informazioni sugli indirizzi

MAC e IP, garantendo che il traffico possa essere indirizzato in modo efficiente attraverso il fabric VxLAN.
    - In questo scenario, il server DHCP viene associato alla VLAN 10 con il VNI 10101 e all'HOST 1. Questo significa che è solo un bridging VxLAN.
    - Se il server DHCP è stato associato a un VNI diverso da HOST#1, un L3VNI sarebbe strettamente necessario per il routing. È necessario creare il VNI di origine e di destinazione.
    - Il server DHCP riceve i pacchetti DCHP in modo trasparente come Ethernet classico.
    - Il traffico BUM viene ricevuto da entrambi gli switch Nexus in vPC, ma solo lo switch Nexus primario operativo in vPC invia il traffico. Lo switch Nexus secondario scarta il traffico. In questo scenario, LEAF-1-vPC è operativo primario.
    - L'uso delle infra-vlan è obbligatorio perché se l'interfaccia su LEAF-2-vPC su SPINE si interrompe, i pacchetti DCHP non possono essere inviati. Per inviare il traffico incapsulato VxLAN a LEAF-1-vPC, è necessaria questa VLAN di backup. In questo modo LEAF-1-vPC potrebbe inviare pacchetti DCHP a SPINE.

- ACCESSO N9K:
    - Questo switch Nexus fornisce connettività solo a entrambi i sistemi Leafs utilizzando un canale della porta vPC a scopo di ridondanza verso HOST#2

## DORSO

```
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
```

## FOGLIA-1

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

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

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

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

spanning-tree vlan 10 priority 4096

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

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

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

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

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

interface nve1
  no shutdown
  host-reachability protocol bgp
  source-interface loopback0
  member vni 101010
    suppress-arp
    mcast-group 224.10.10.10
  member vni 202020
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf
```

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

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

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

router ospf 1

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

## LEAF-1-vPC

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

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

ip pim rp-address 192.168.11.11 group-list 224.10.10.0/24
```

```
ip pim ssm range 232.0.0.0/8

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

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

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

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

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

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

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

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

interface mgmt0
  vrf member management
  ip address 10.88.238.194/29

interface loopback0
  description UNDERLAY-VERIFICATION
```

```
  ip address 192.168.3.3/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode

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

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

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

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

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

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

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

interface nve1
  no shutdown
  host-reachability protocol bgp
  advertise virtual-rmac
  source-interface loopback1
  member vni 101010
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf
```

```
router ospf 1

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

## LEAF-2-vPC

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

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

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

vlan 1,10,20,300,777
vlan 10
  vn-segment 101010
vlan 20
  vn-segment 202020
vlan 300
```

```
  vn-segment 303030
vlan 777
  name BACKUP_VLAN_ROUTING_NVE_INFRA

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

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

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

system nve infra-vlans 777

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

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

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

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

interface mgmt0
  vrf member management
  ip address 10.88.238.195/29

interface loopback0
  description UNDERLAY-VERIFICATION
  ip address 192.168.4.4/32
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
```

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

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

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

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

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

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

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

interface nve1
  no shutdown
  host-reachability protocol bgp
  advertise virtual-rmac
  source-interface loopback1
  member vni 101010
    suppress-arp
    mcast-group 224.10.10.10
  member vni 202020
    suppress-arp
    mcast-group 224.10.10.10
  member vni 303030 associate-vrf
```

```
router ospf 1

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

## N9K-ACCESS

```
feature lacp

vlan 1,10

interface port-channel10
  switchport
  switchport mode trunk

interface Ethernet1/11
  switchport
  switchport access vlan 10
  no shutdown

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

interface Ethernet1/46
  switchport
  switchport mode trunk
```

```
channel-group 10 mode active
no shutdown
```

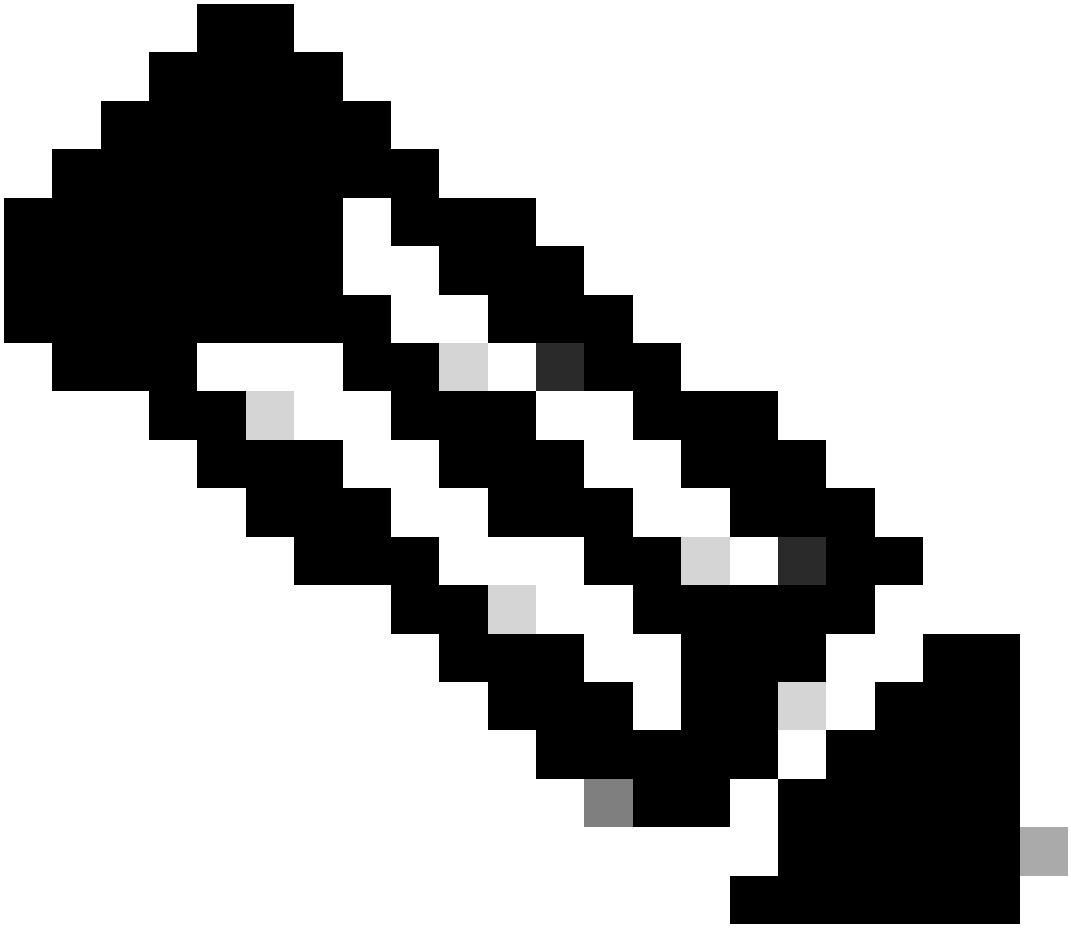
# Configurazione DHCP sugli switch Nexus

## FOGLIA-1

Passaggio 1. Attivare la funzionalità DCHP.

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

---



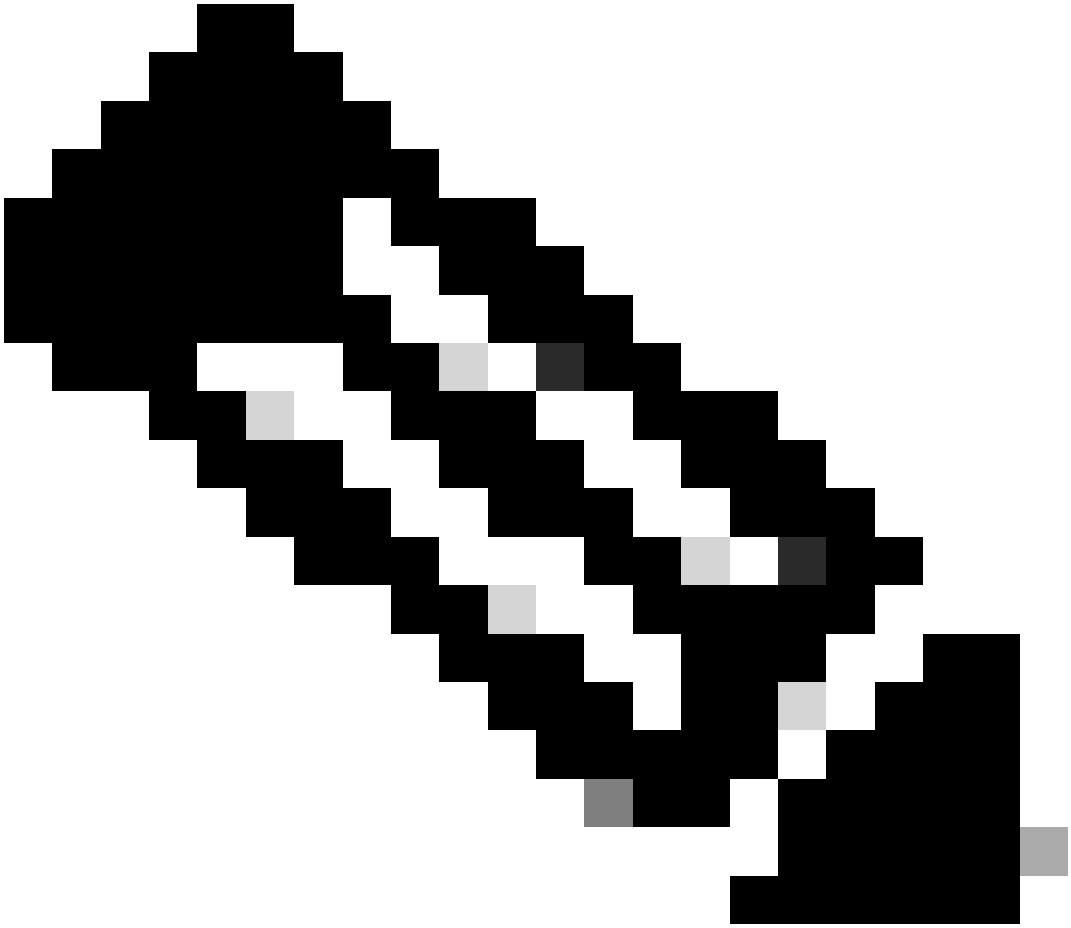
Nota: il server DHCP e il servizio di comando dell'agente di inoltro dhcp, ip dhcp relay e ipv6 dhcp relay sono abilitati per impostazione predefinita da NX-OS 7.x.

---

Passaggio 2. Applicare il comando ip dhcp relay information option.

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

---

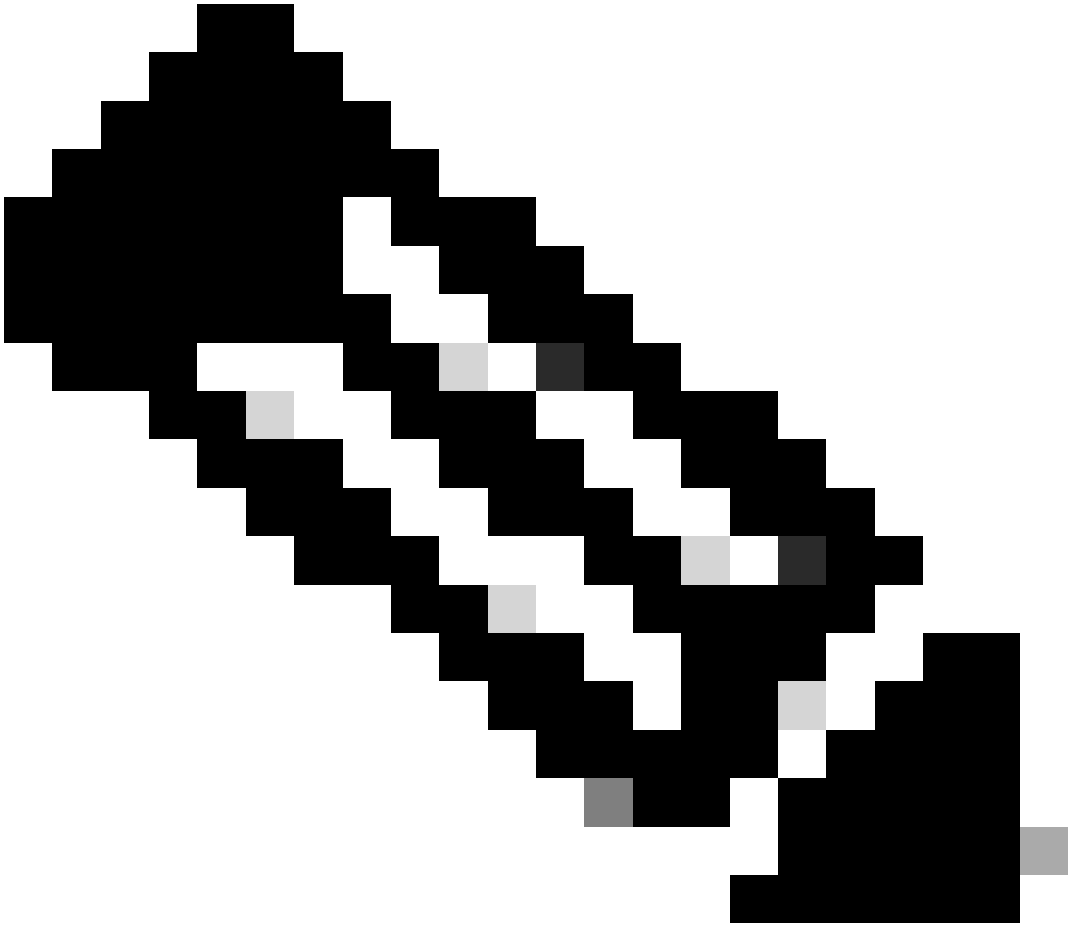


> Nota: questo comando consente all'agente di inoltro DHCP di inserire e rimuovere le informazioni dell'opzione 82 sui pacchetti inoltrati.

---

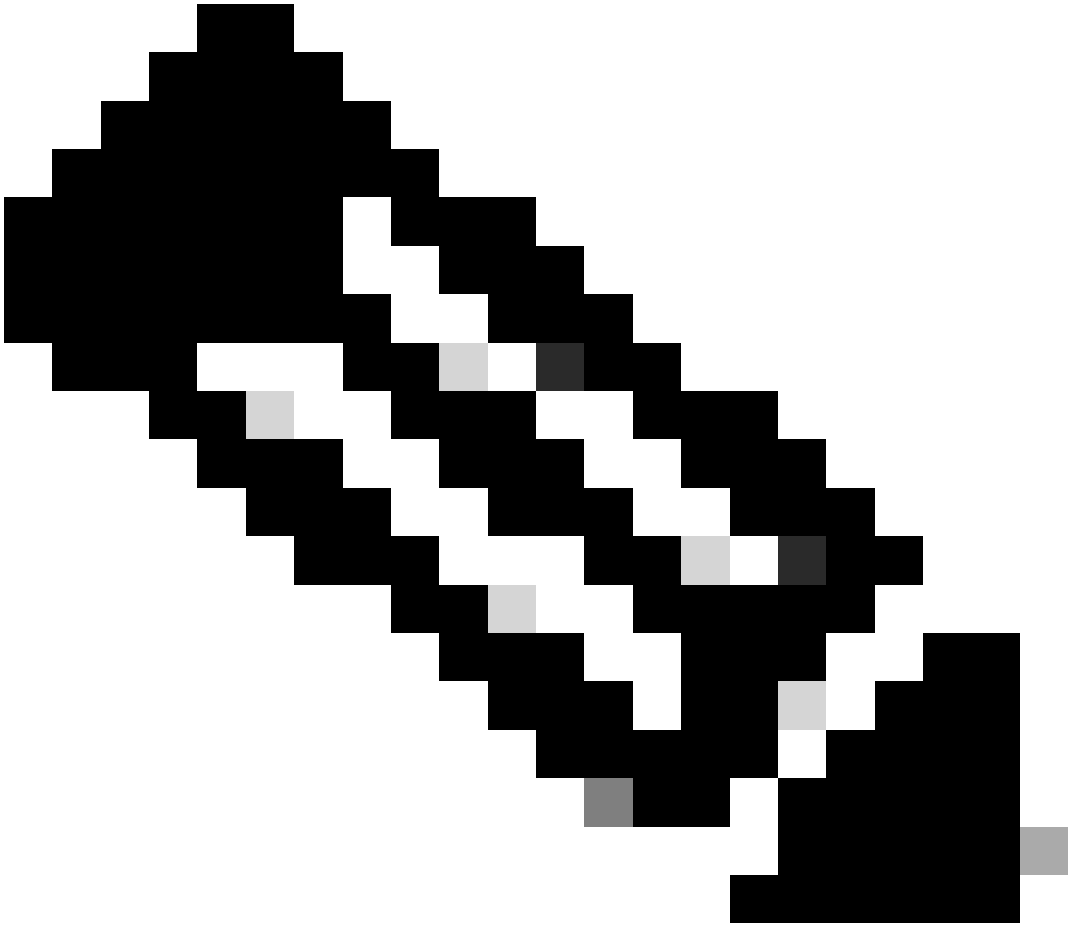
Passaggio 3. Applicare il comando ip dhcp relay information option vpn.

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



Nota: questo comando abilita le richieste di inoltro DHCP che arrivano su VRF diversi a cui appartiene il server DHCP.

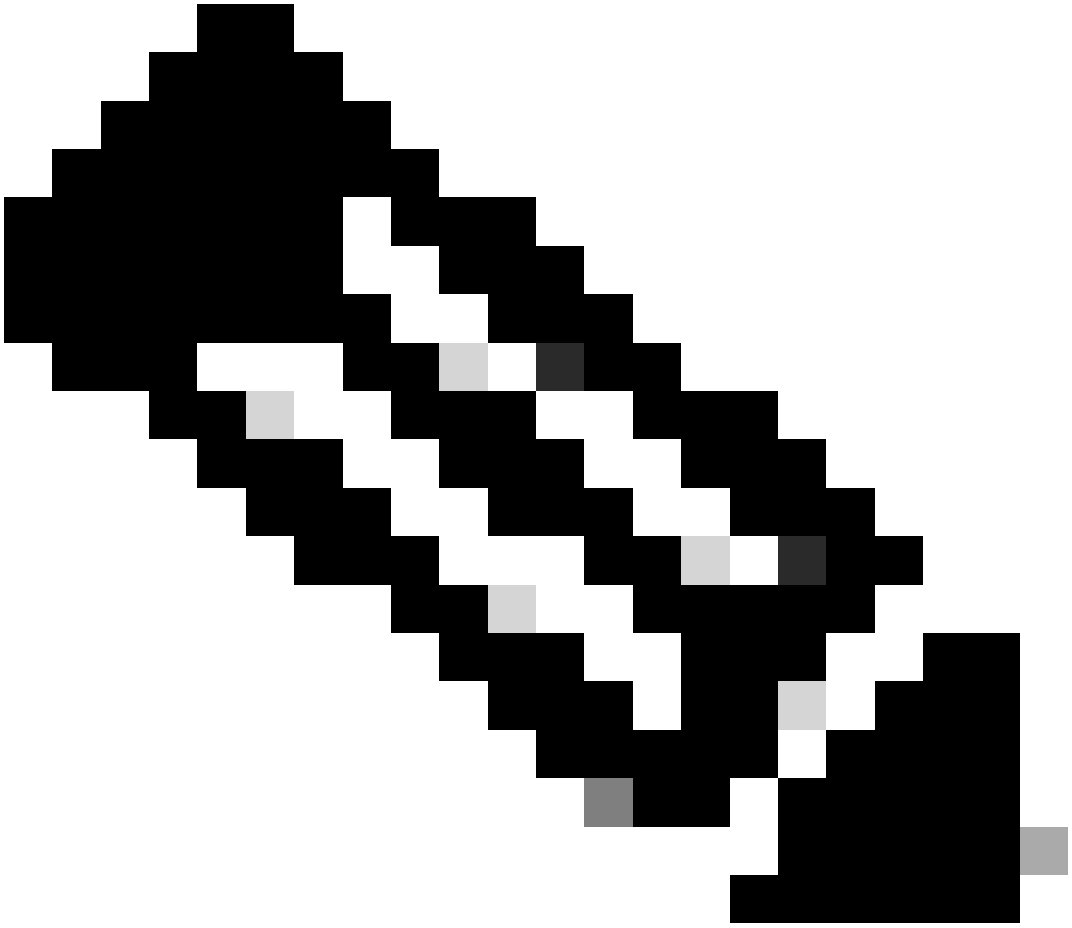
Passaggio 4. Applicare il comando "ip dhcp relay address [ip address of DCHP server]".



Nota: nell'esempio, l'indirizzo IP del server DHCP è 10.10.150.

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

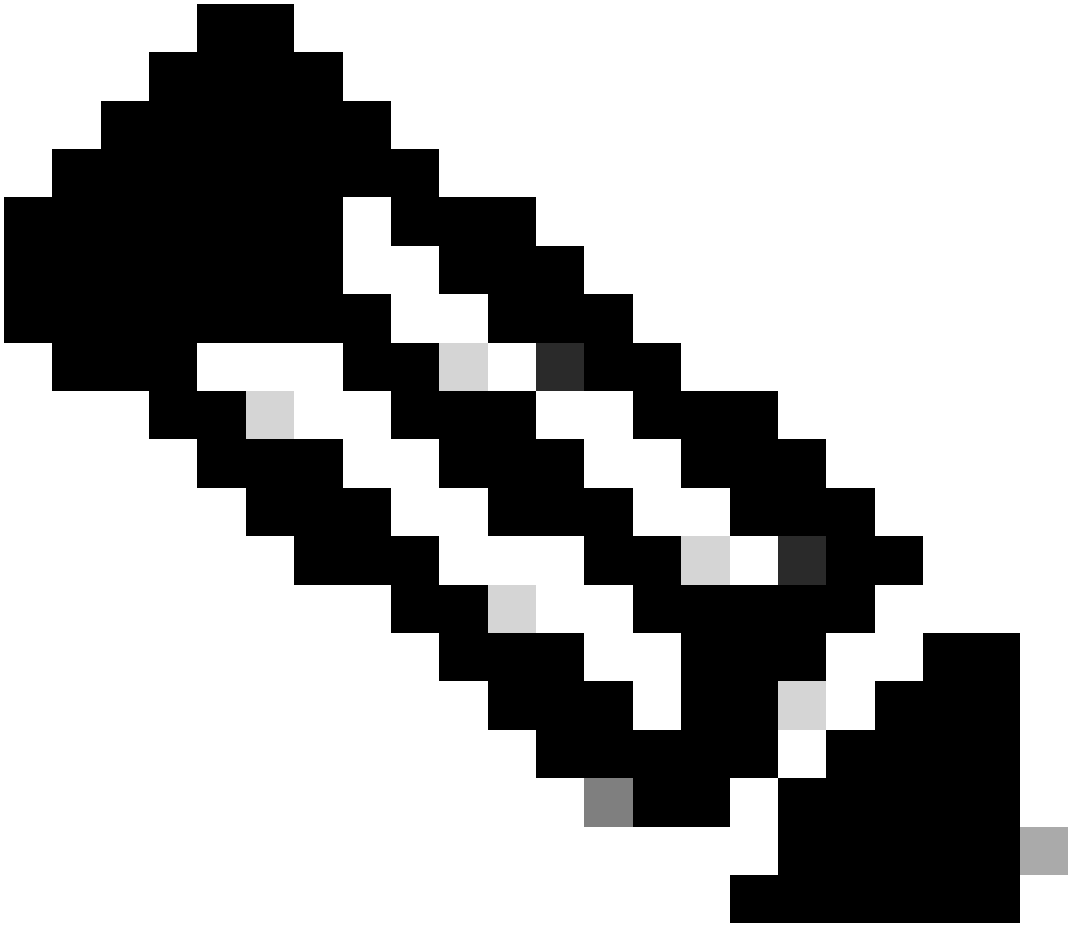
Passaggio 5. Applicare il comando "ip dhcp relay source-interface [unique loopback]".



Nota: questo comando configura l'indirizzo IP di origine per l'agente di inoltro DHCP per gestire Discover, Offre, Request e ACK, per la comunicazione unicast che l'agente di inoltro DHCP utilizza come indirizzo IP di origine dell'agente di inoltro DHCP. Questa operazione non è desiderata perché l'indirizzo IP è condiviso da più VTEP ed è possibile che i pacchetti DHCP rimangano bloccati. Per evitare ciò, è necessario un indirizzo IP univoco (che utilizzi un'interfaccia di loopback) per distinguere ciascun VTEP.

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

Passaggio 6. Nel tenant corrispondente VRF all'interno di BGP, ridistribuzione diretta della route con un prefisso-elenco e una route-map che include l'indirizzo IP dell'interfaccia di loopback.



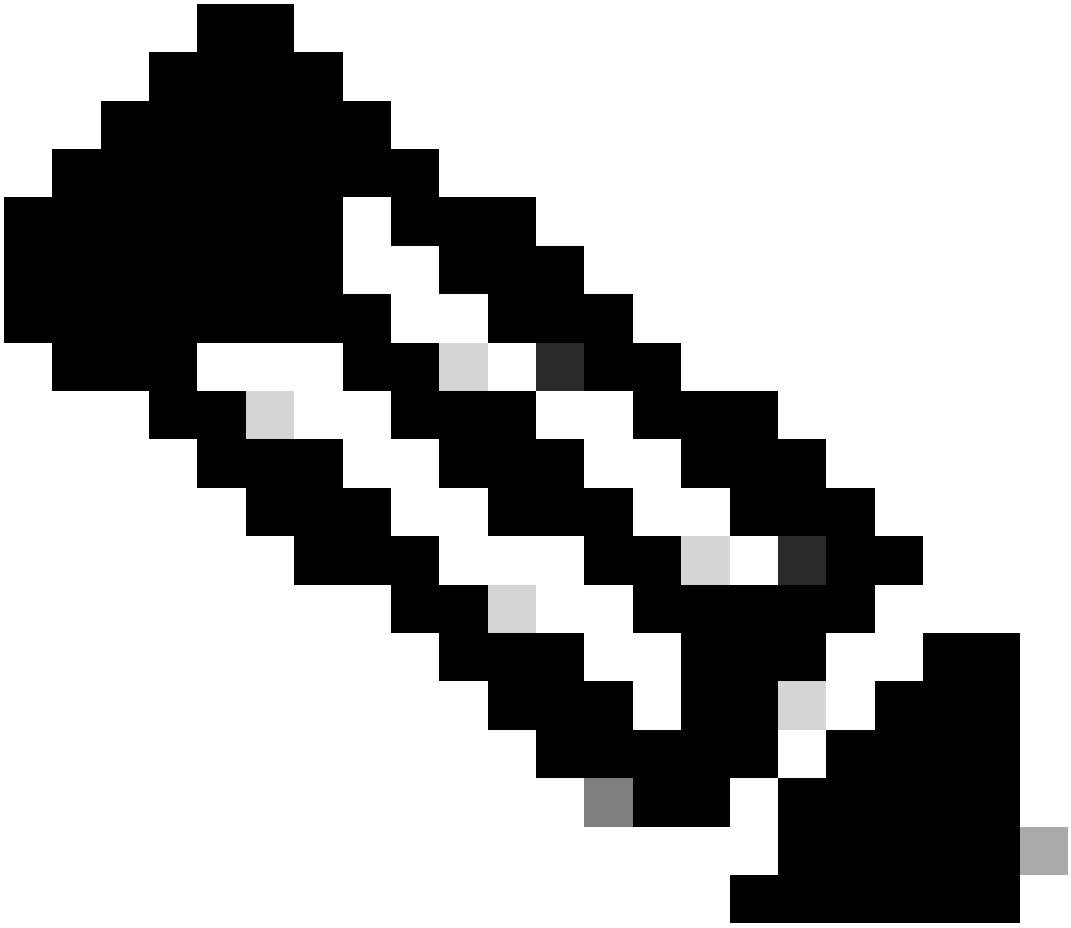
Nota: questa interfaccia di loopback appartiene al tenant di SVI.

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

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

Passaggio 7. Verificare che l'indirizzo IP dell'interfaccia di loopback venga annunciato in BGP L2VPN VPN agli Spine con il comando show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

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

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

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

Passaggio 8. Verificare che l'indirizzo IP dell'interfaccia di loopback venga inserito nell'EVPN BGP L2VPN in cui si trova il server DHCP.

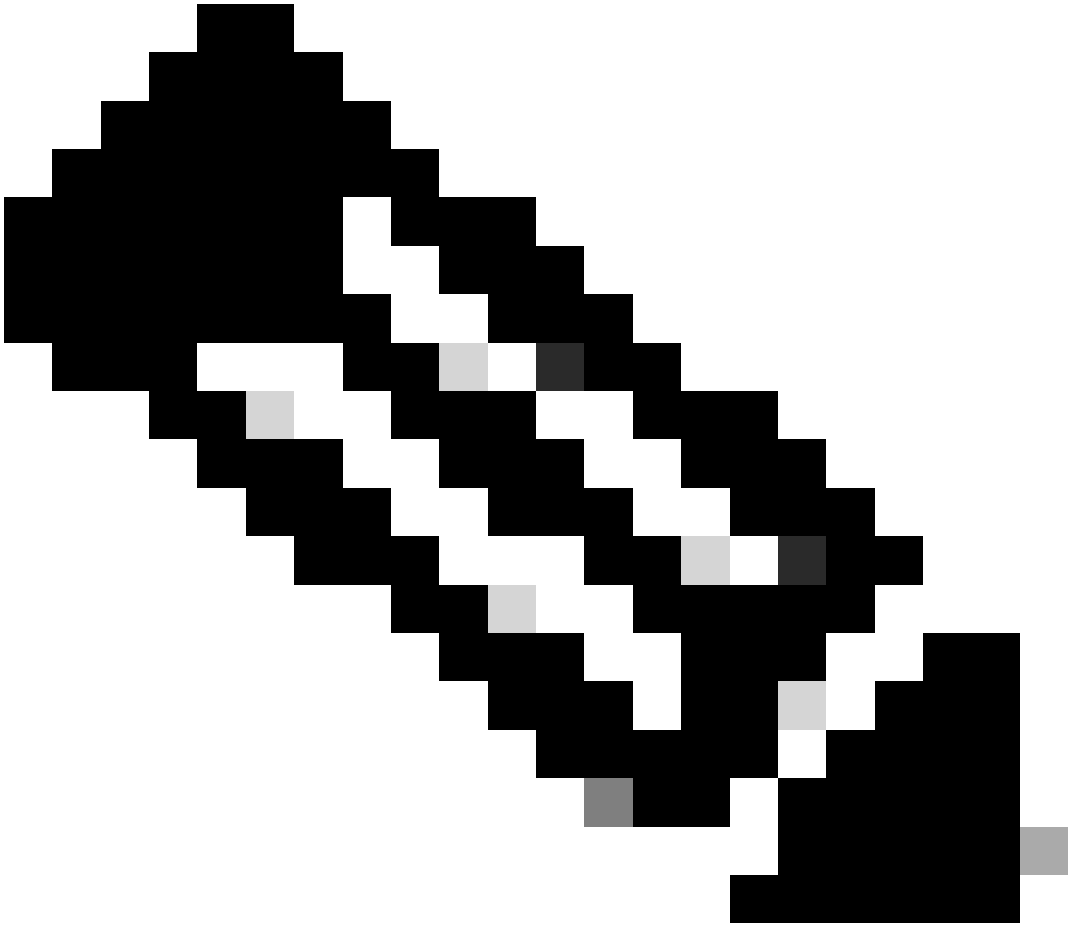


Nota: se vi sono switch Nexus in vPC, verificare che entrambi conoscano l'indirizzo IP dell'interfaccia di loopback in BGP L2VPN EVPN.

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

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

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

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

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

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

Passaggio 9. Verificare che esista una route per il server DHCP nel tenant di origine con il comando show ip route [DHCP server IP] vrf [tenant vrf].



Nota: la voce della route da utilizzare deve essere da VxLAN a VRF predefinita. Se non è disponibile alcuna route, verificare che il VTEP conosca localmente l'indirizzo IP del server DHCP.

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

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

Passaggio 10. Verificare che l'indirizzo IP del server DHCP sia raggiungibile utilizzando l'interfaccia di loopback e il VRF corrispondente come origine VRF con il comando ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf].

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

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

Passaggio 11. Verificare lo stato dell'agente di inoltro DHCP.

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

Passaggio 12. Verificare l'opzione 82, ad esempio vpn option e l'indirizzo IP corretto del relay nell'agente di inoltro.

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

Passaggio 13. Verificare le statistiche dei pacchetti elaborati e inoltrati.

```
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
```

Passaggio 14. Verificare le statistiche dei pacchetti relay.

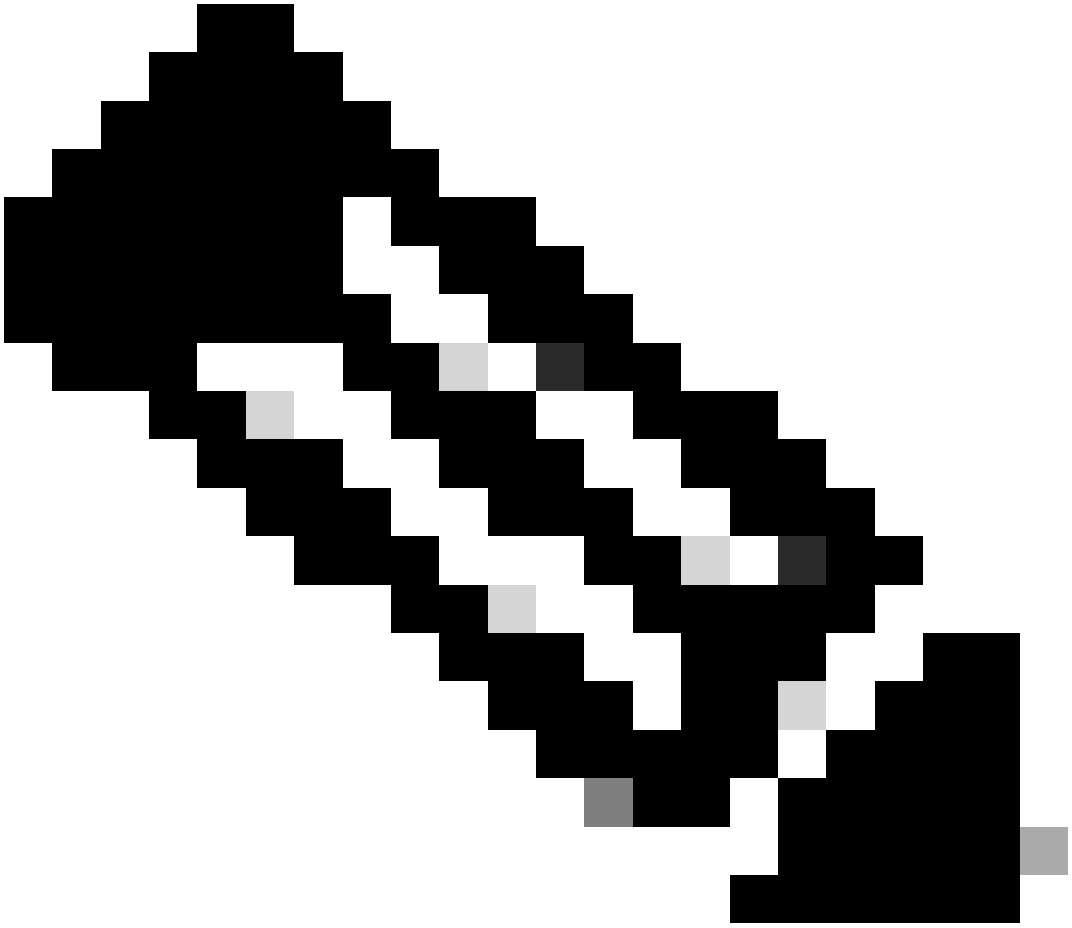
```
LEAF-1# show ip dhcp relay statistics
---------------------------------------------------------------------
Message Type              Rx              Tx           Drops
---------------------------------------------------------------------
Discover             260521          260520               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
```

## DHCP LEAF-1-vPC

### Passaggio 1. Attivare la funzionalità DCHP.

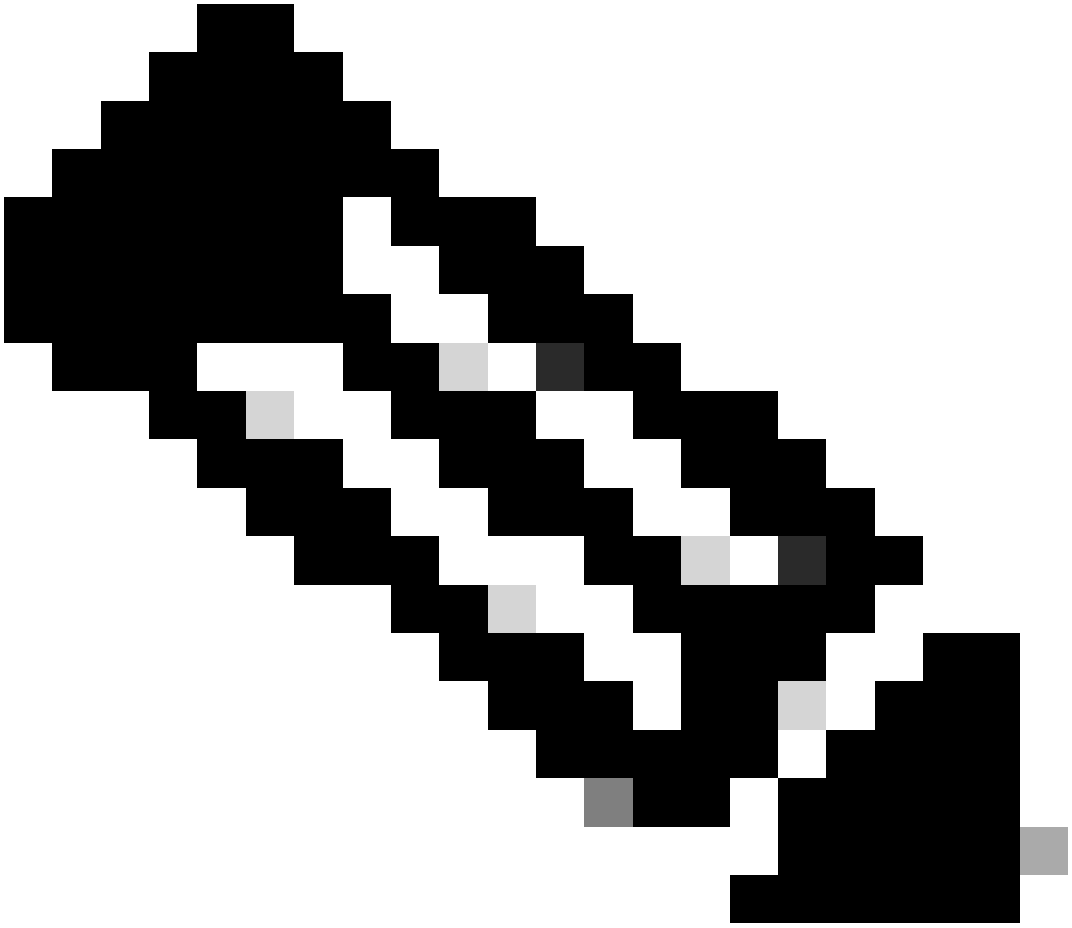
```
LEAF-1-VPC(config)#feature dhcp
```



Nota: il server DHCP e il servizio di comando dell'agente di inoltro dhcp, ip dhcp relay e ipv6 dhcp relay sono abilitati per impostazione predefinita da NX-OS 7.x.

Passaggio 2. Applicare il comando ip dhcp relay information option.

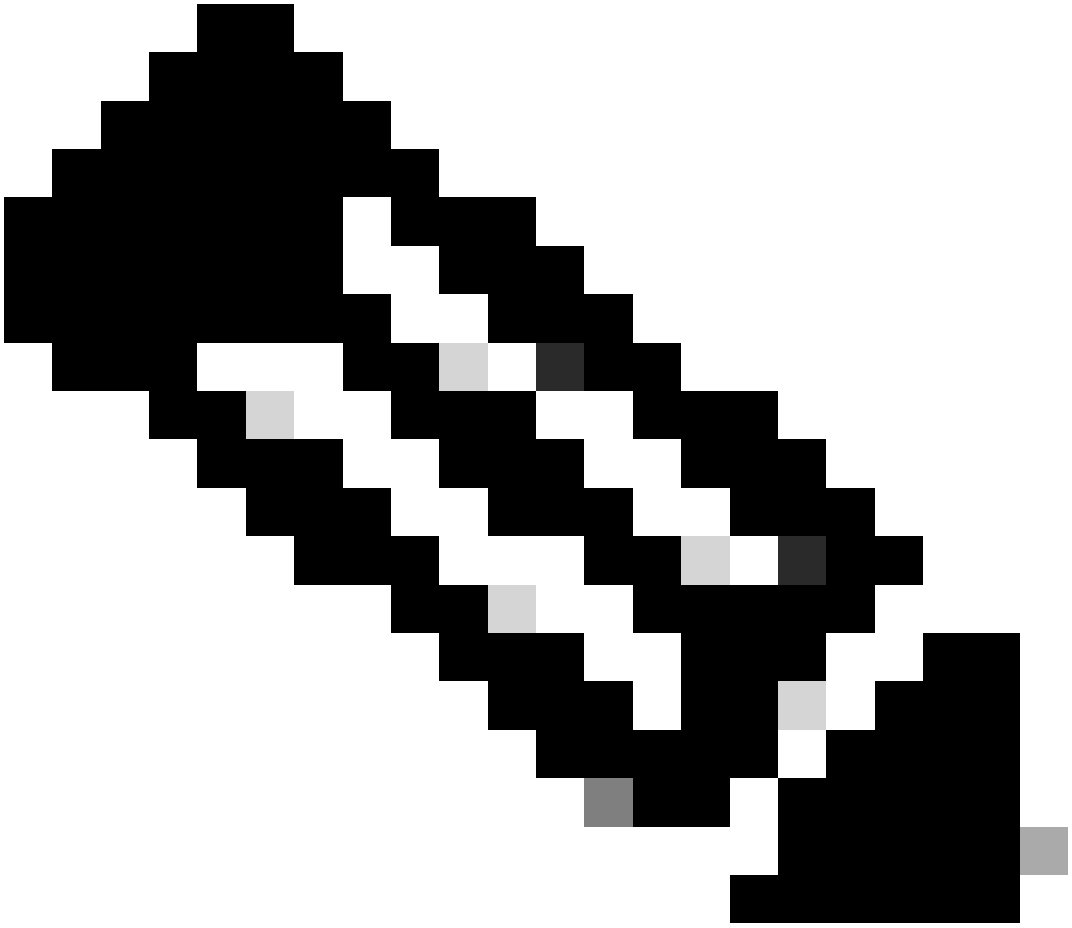
```
LEAF-1-VPC(config)#ip dhcp relay information option
```



Nota: questo comando consente all'agente di inoltro DHCP di inserire e rimuovere le informazioni dell'opzione 82 sui pacchetti inoltrati.

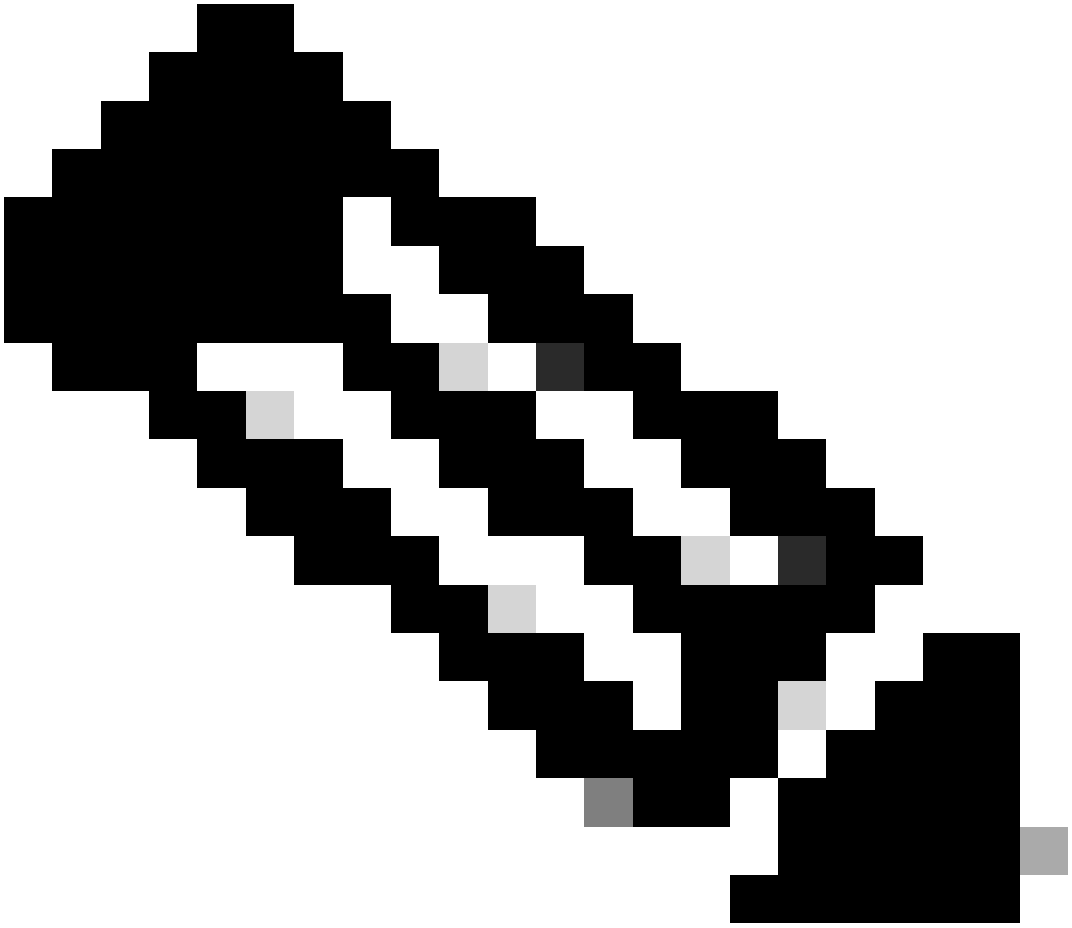
Passaggio 3. Applicare il comando "ip dhcp relay information option vpn".

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



Nota: questo comando abilita le richieste di inoltro DHCP che arrivano su VRF diversi a cui appartiene il server DHCP.

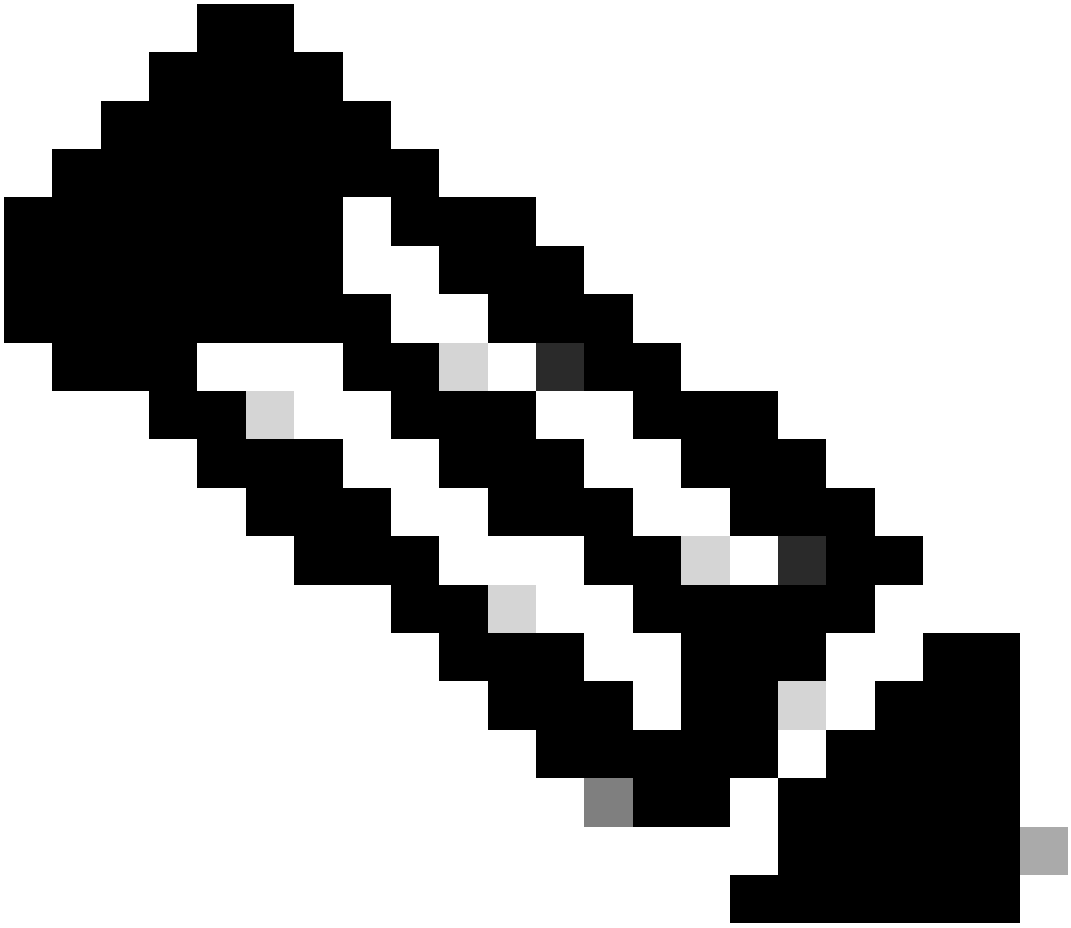
Passaggio 4. Applicare il comando ip dhcp relay address [ip address of DCHP server].



Nota: nell'esempio, l'indirizzo IP del server DHCP è 10.10.150.

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

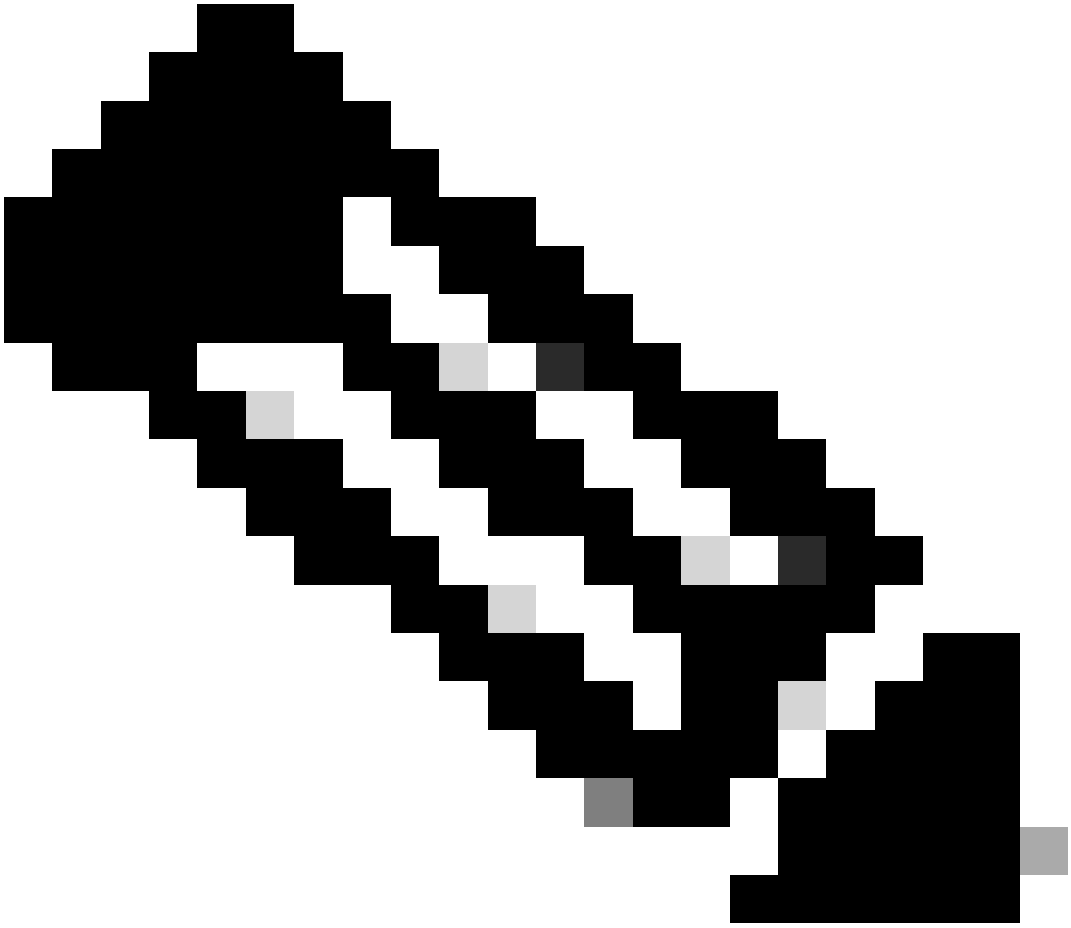
Passaggio 5. Applicare il comando "ip dhcp relay source-interface [unique loopback]".



Nota: questo comando configura l'indirizzo IP di origine per l'agente di inoltro DHCP per gestire Discover, Offre, Request e ACK, per la comunicazione unicast che l'agente di inoltro DHCP utilizza come indirizzo IP di origine dell'agente di inoltro DHCP. Questa operazione non è desiderata perché l'indirizzo IP è condiviso da più VTEP ed è possibile che i pacchetti DHCP rimangano bloccati. Per evitare ciò, è necessario un indirizzo IP univoco (che utilizzi un'interfaccia di loopback) per distinguere ciascun VTEP.

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

Passaggio 6. Nel tenant corrispondente VRF all'interno di BGP, ridistribuzione diretta della route con un prefisso-elenco e una route-map che include l'indirizzo IP dell'interfaccia di loopback.



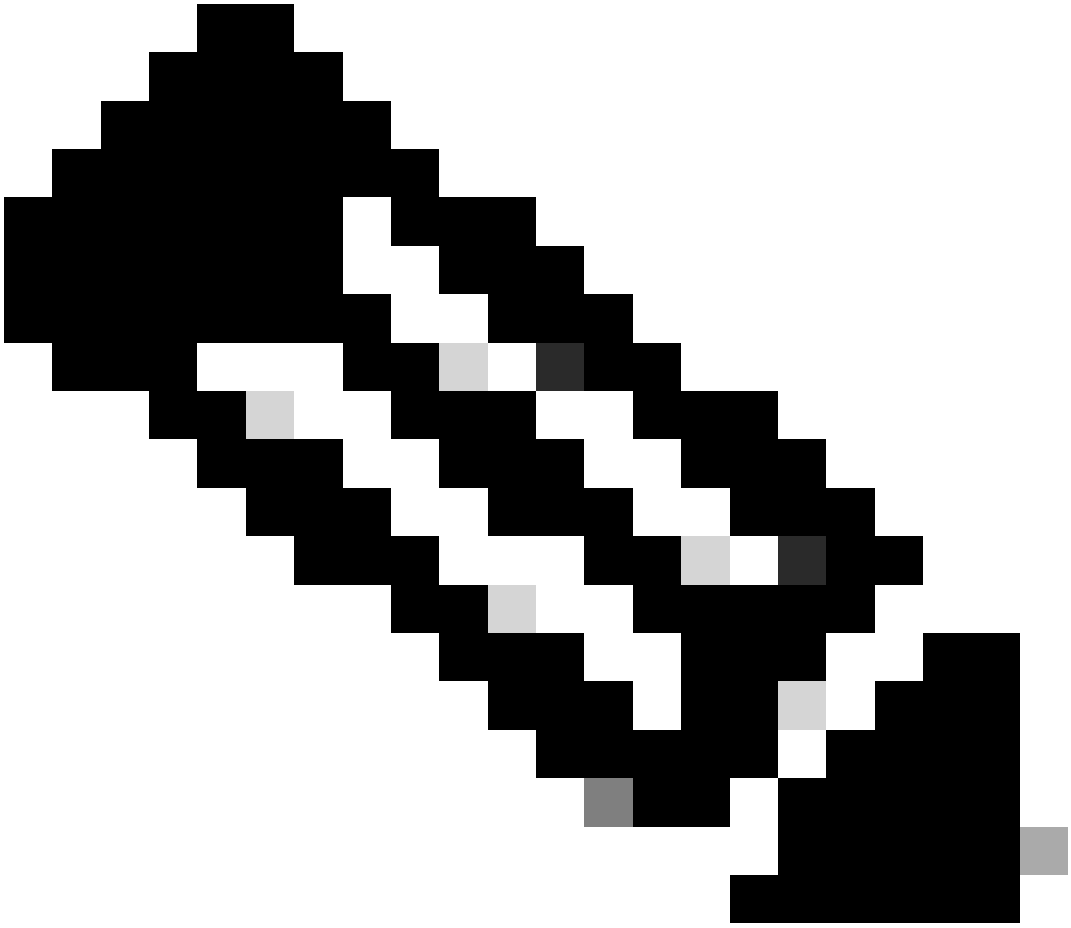
Nota: questa interfaccia di loopback appartiene al tenant di SVI.

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

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

Passaggio 7. Verificare che l'indirizzo IP dell'interfaccia di loopback venga annunciato in BGP L2VPN VPN agli Spine con il comando show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

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

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

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

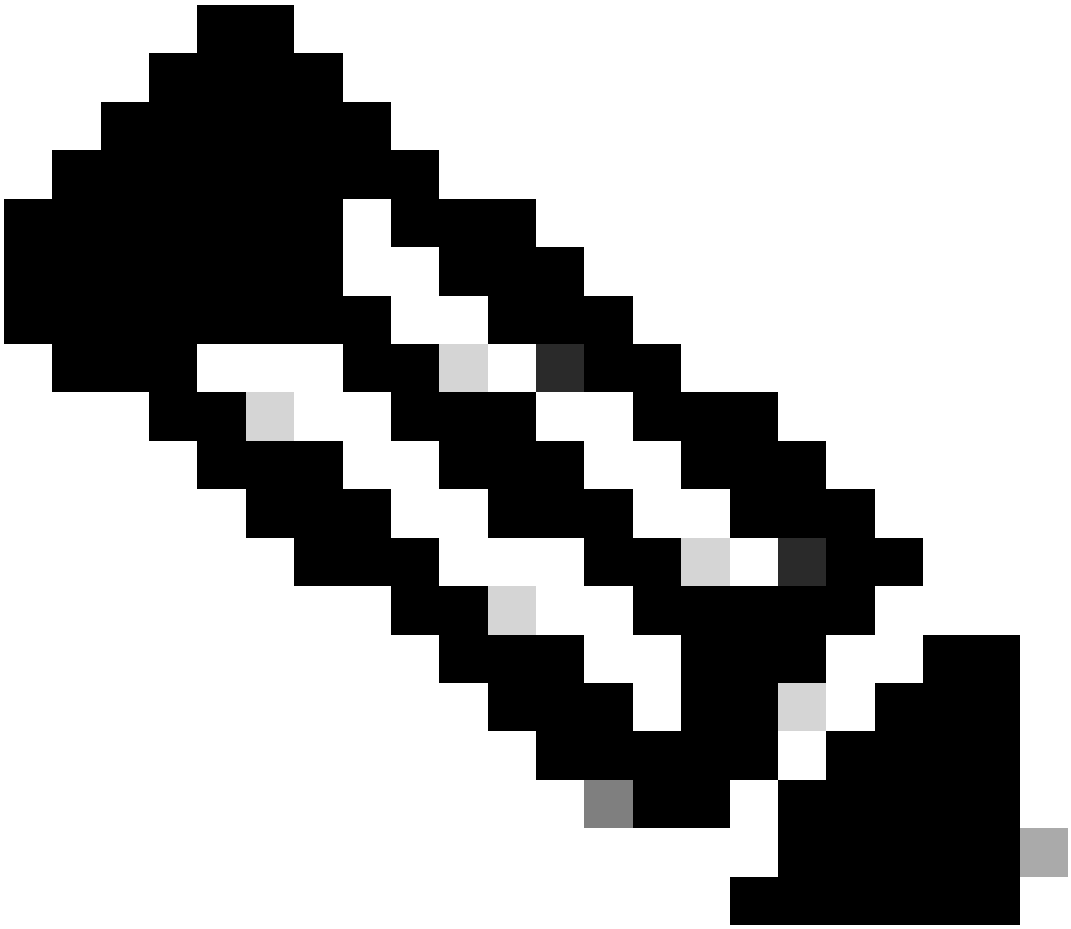
Passaggio 8. Verificare che l'indirizzo IP dell'interfaccia di loopback venga inserito nell'EVPN BGP L2VPN in cui si trova il server DHCP.



Nota: se vi sono switch Nexus in vPC, verificare che entrambi conoscano l'indirizzo IP dell'interfaccia di loopback in BGP L2VPN EVPN.

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

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

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

Passaggio 9. Verificare che nel tenant di origine sia presente una route per il server DHCP con il comando show ip route [DHCP server IP] vrf[tenant vrf].



Nota: la voce della route da utilizzare deve essere da VxLAN a VRF predefinita. Se non è disponibile alcuna route, verificare che il VTEP conosca localmente l'indirizzo IP del server DHCP.

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

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

Passaggio 10. Verificare che l'indirizzo IP del server DHCP sia raggiungibile utilizzando l'interfaccia di loopback e il VRF corrispondente come origine VRF con il comando ping [DHCP server IP] source-interface loopback [x] vrf [tenvrf].

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

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

Passaggio 11. Verificare lo stato dell'agente di inoltro DHCP.

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

Passaggio 12. Verificare l'opzione 82, ad esempio vpn option e l'indirizzo IP corretto del relay nell'agente di inoltro.

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

Passaggio 13. Verificare le statistiche dei pacchetti elaborati e inoltrati.

```
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
```

Passaggio 14. Verificare le statistiche dei pacchetti relay.

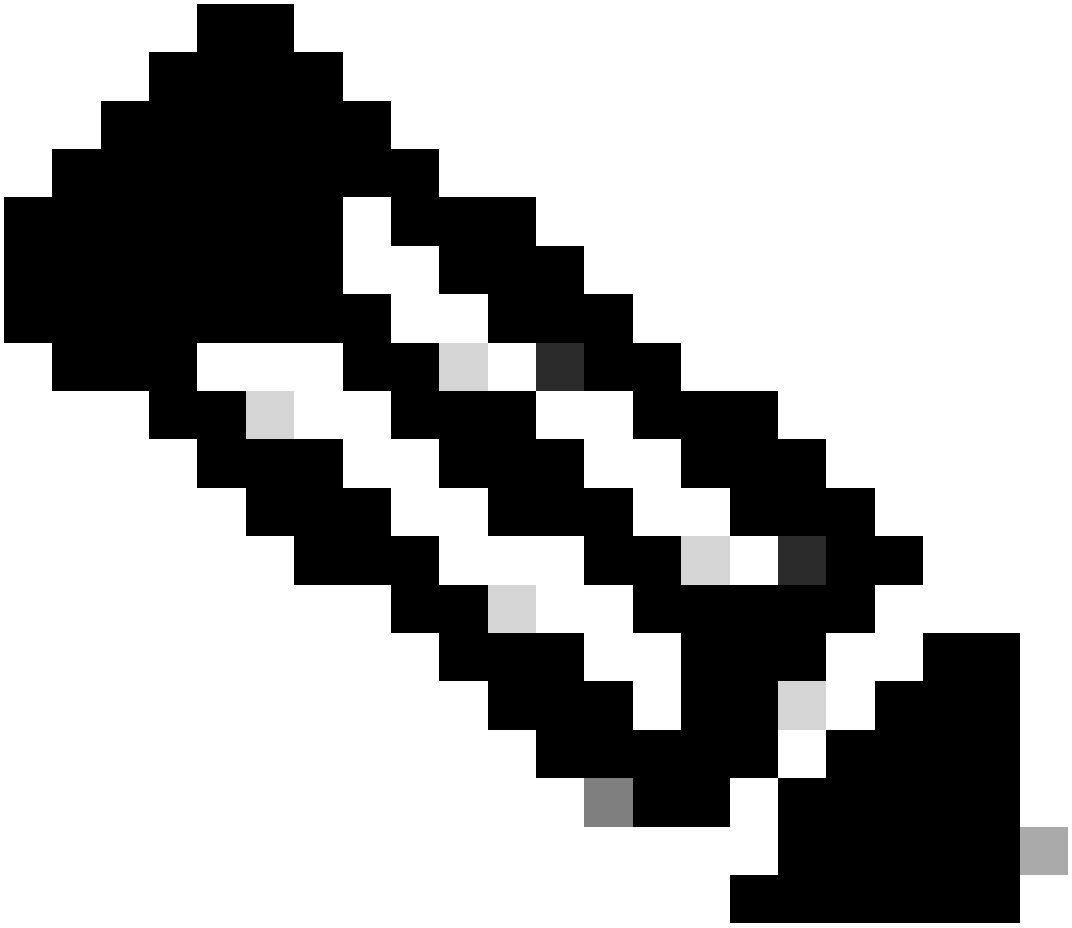
```
LEAF-1-VPC# show ip dhcp relay statistics
--------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
--------------------------------------------------------------------------
Discover                   8               7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

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

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

## DHCP LEAF-2-vPC

### Passaggio 1. Attivare la funzionalità DCHP.

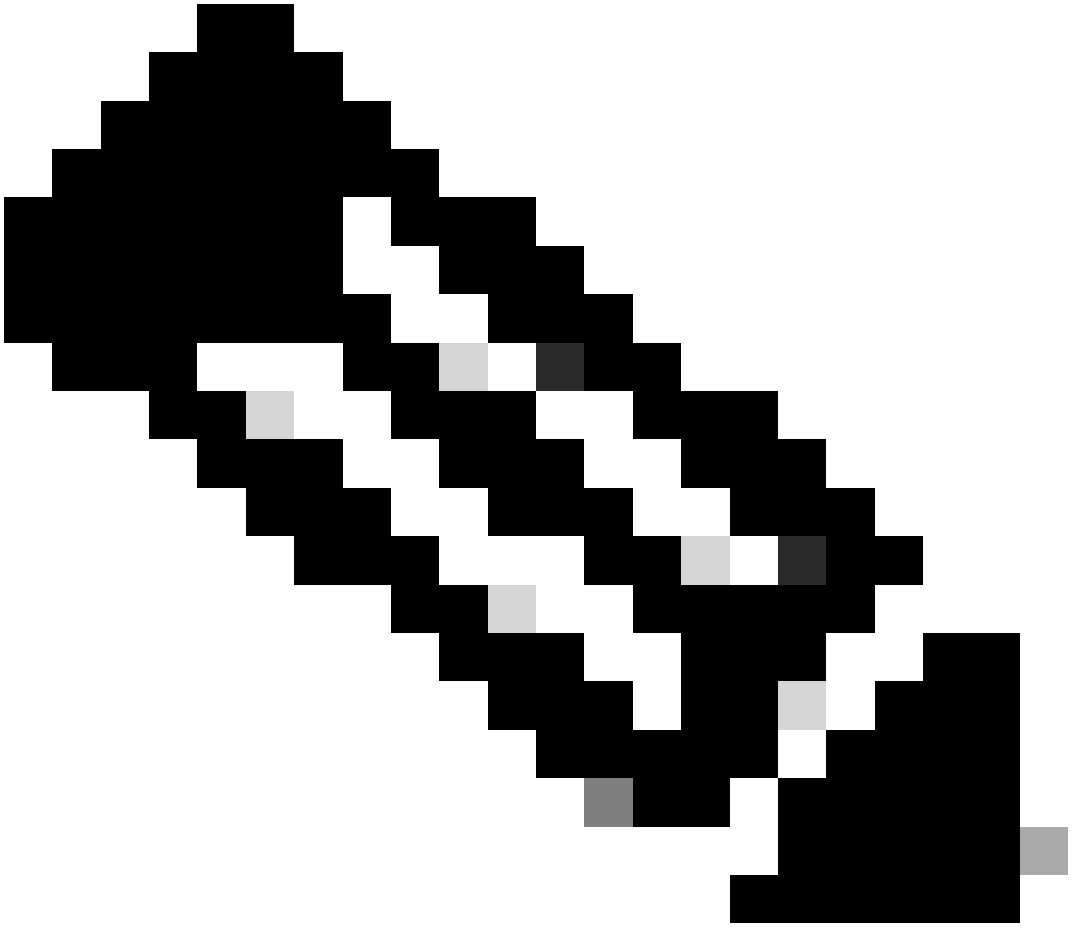
```
LEAF-2-VPC(config)# feature dhcp
```



Nota: il server DHCP e il servizio di comando dell'agente di inoltro dhcp, ip dhcp relay e ipv6 dhcp relay sono abilitati per impostazione predefinita a partire da NX-OS 7.x.

Passaggio 2. Applicare il comando "ip dhcp relay information option".

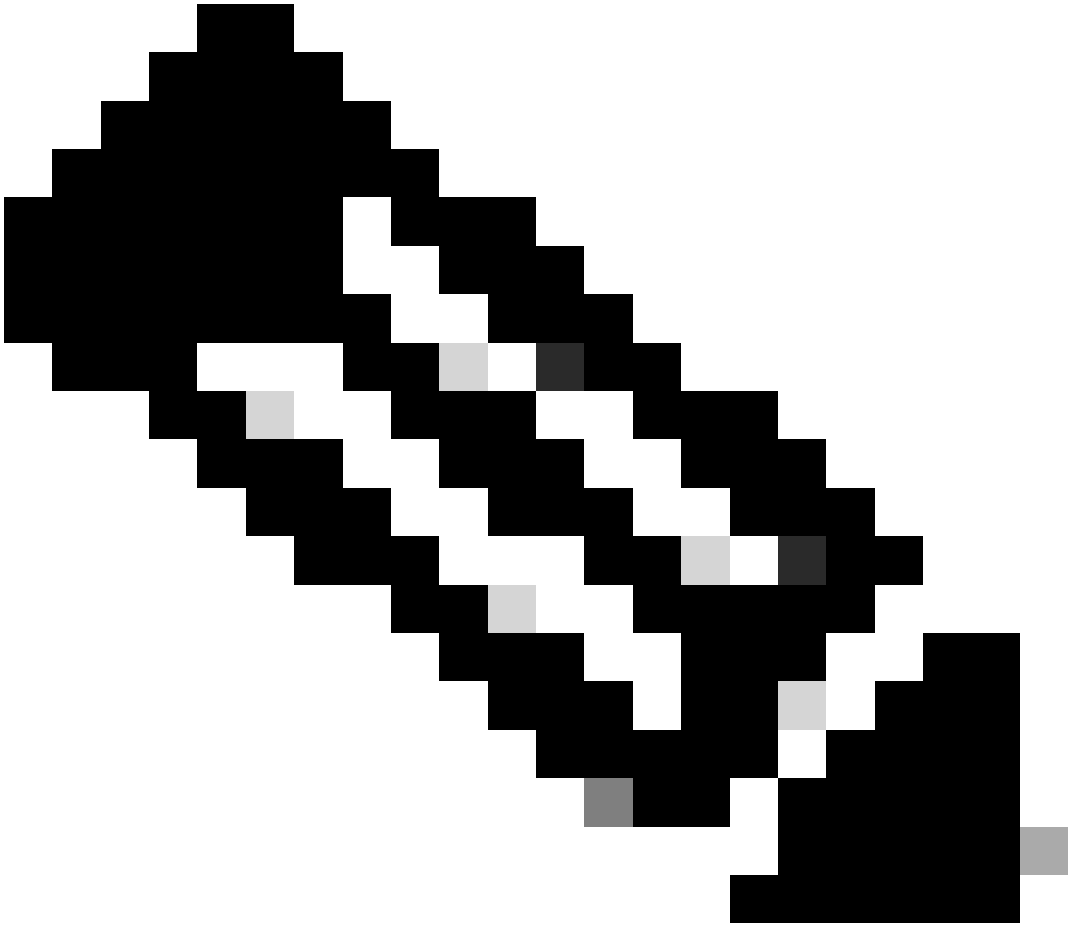
```
LEAF-2-VPC(config)# ip dhcp relay information option
```



Nota: questo comando consente all'agente di inoltro DHCP di inserire e rimuovere le informazioni dell'opzione 82 sui pacchetti inoltrati.

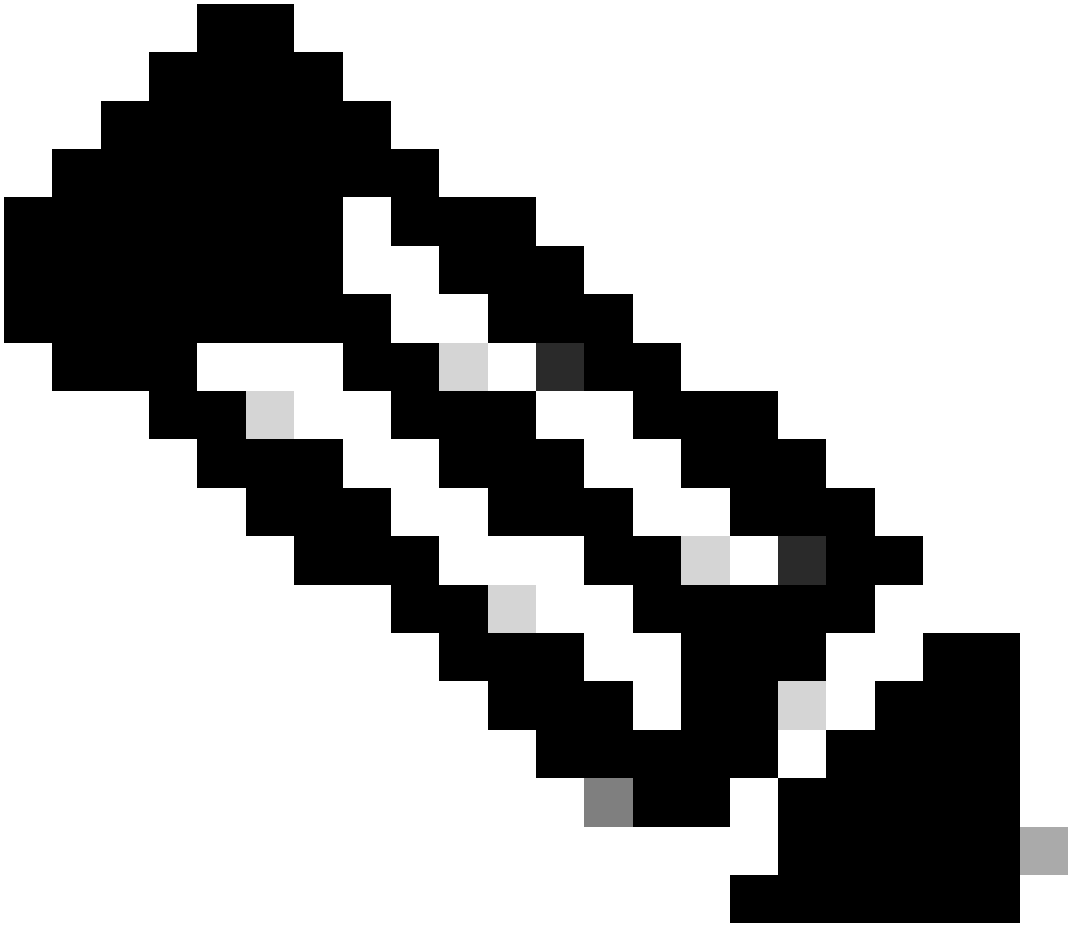
Passaggio 3. Applicare il comando "ip dhcp relay information option vpn".

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



Nota: questo comando abilita le richieste di inoltro DHCP che arrivano su VRF diversi a cui appartiene il server DHCP.

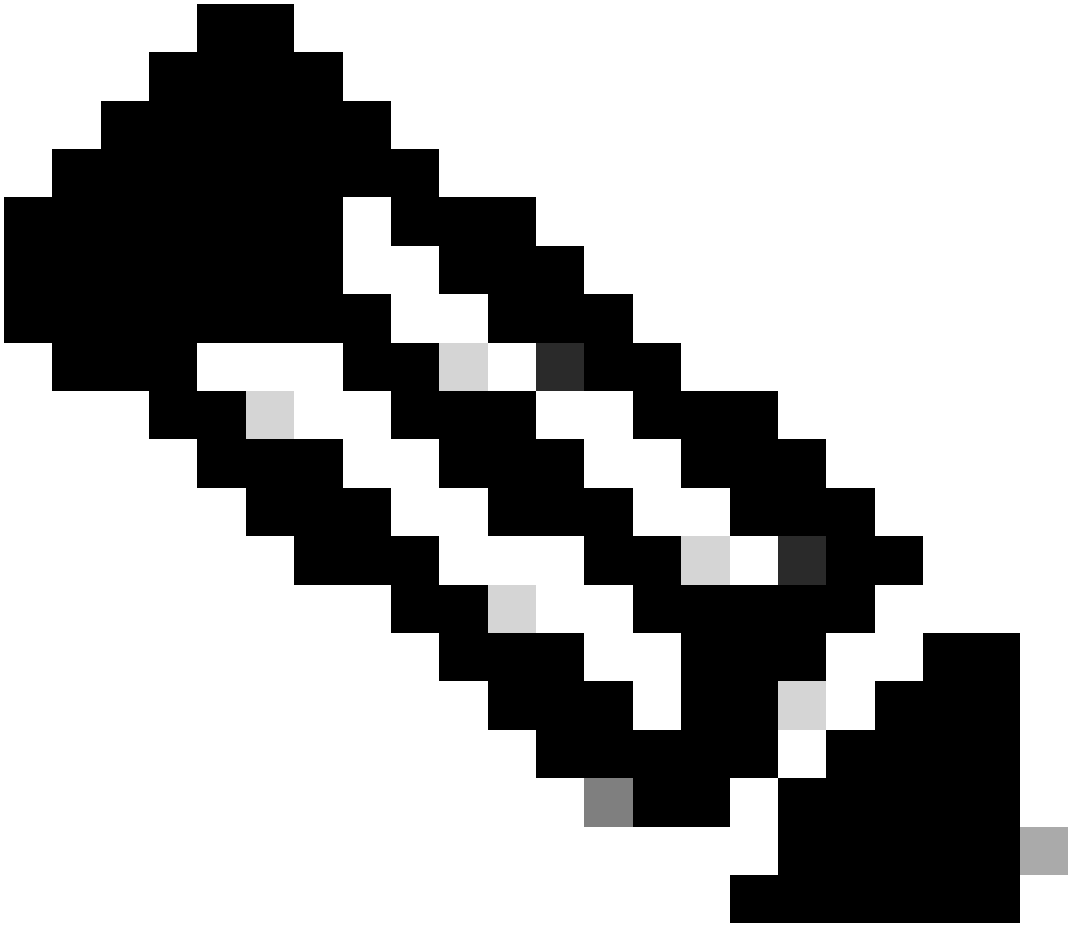
Passaggio 4. Applicare il comando "ip dhcp relay address [ip address of DCHP server]".



Nota: nell'esempio, l'indirizzo IP del server DHCP è 10.10.150.

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

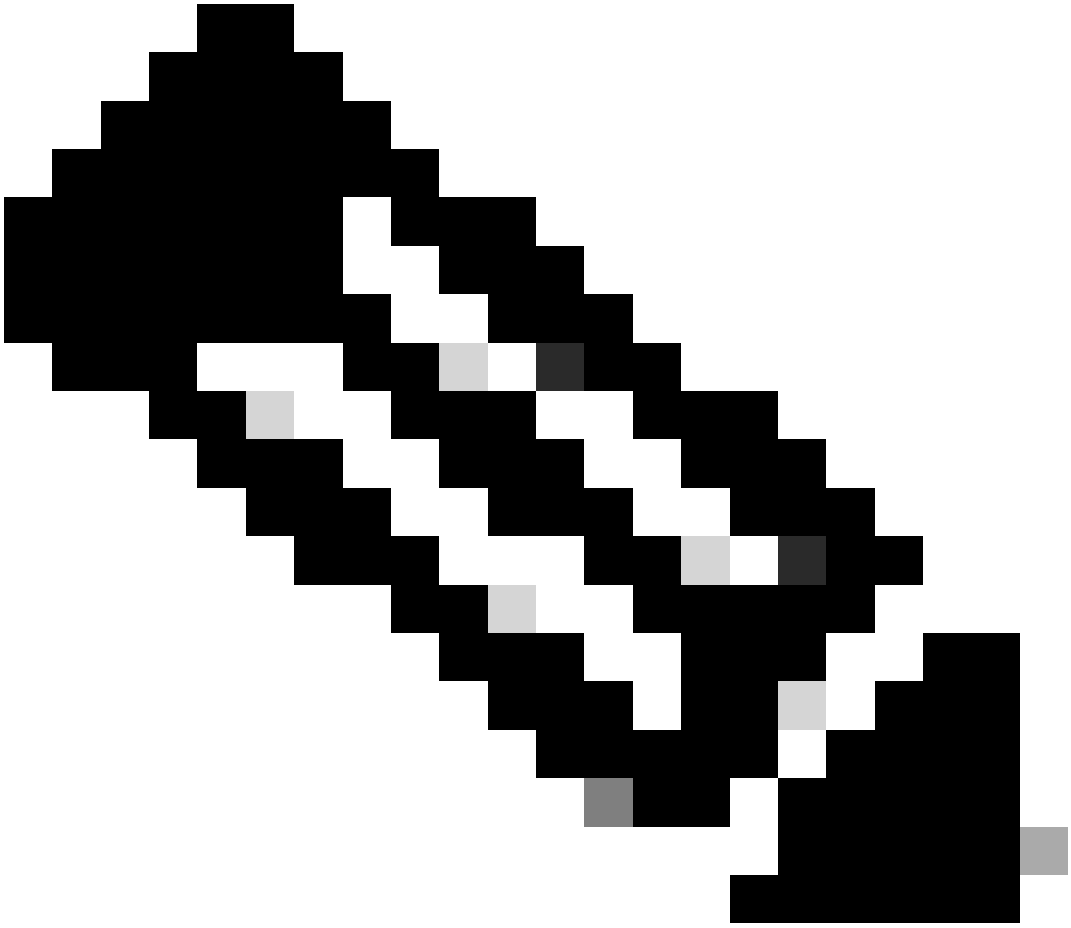
Passaggio 5. Applicare il comando "ip dhcp relay source-interface [unique loopback]".



Nota: questo comando configura l'indirizzo IP di origine per l'agente di inoltro DHCP per gestire Discover, Offre, Request e ACK, per la comunicazione unicast che l'agente di inoltro DHCP utilizza come indirizzo IP di origine dell'agente di inoltro DHCP. Questa operazione non è desiderata perché l'indirizzo IP è condiviso da più VTEP ed è possibile che i pacchetti DHCP rimangano bloccati. Per evitare ciò, è necessario un indirizzo IP univoco (che utilizzi un'interfaccia di loopback) per distinguere ciascun VTEP.

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

Passaggio 6. Nel tenant corrispondente VRF all'interno di BGP, ridistribuzione diretta della route con un prefisso-elenco e una route-map che include l'indirizzo IP dell'interfaccia di loopback.



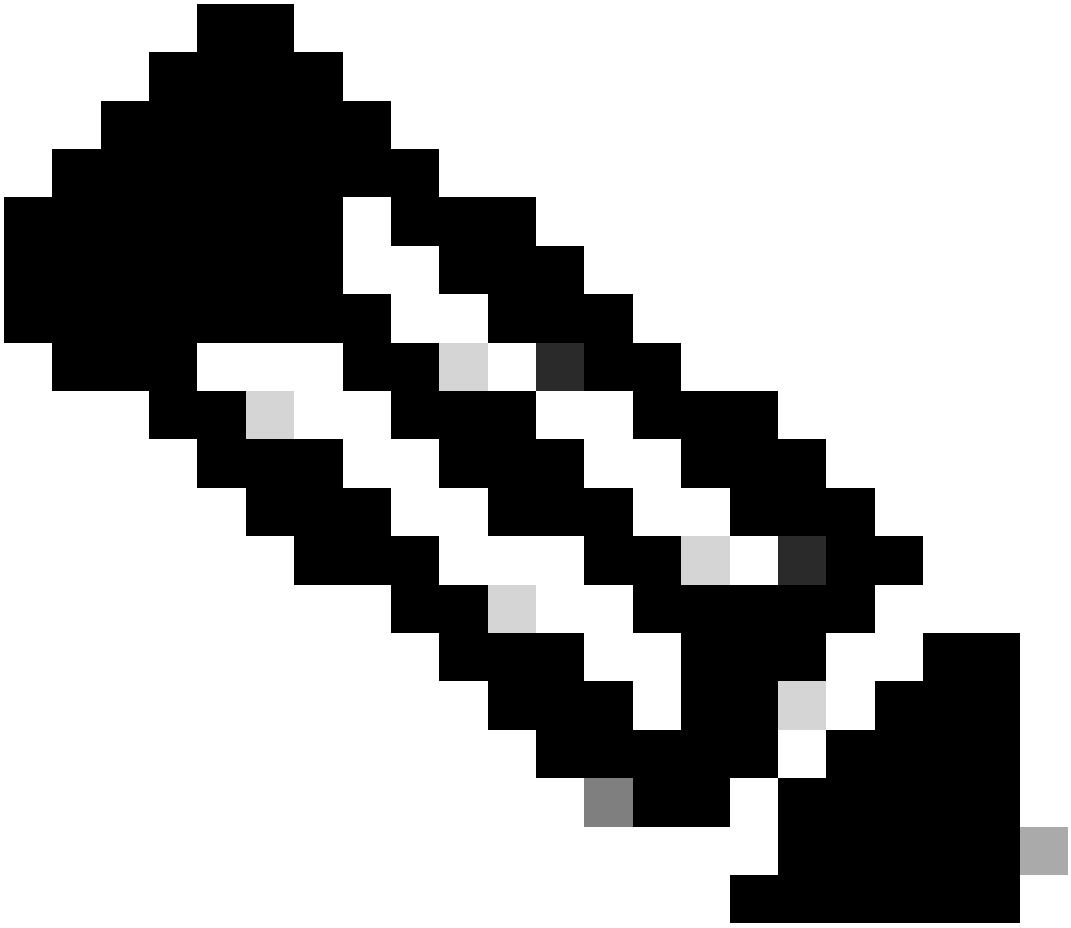
Nota: questa interfaccia di loopback appartiene al tenant di SVI.

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

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

Passaggio 7. Verificare che l'indirizzo IP dell'interfaccia di loopback venga annunciato in BGP L2VPN VPN agli Spine con il comando show bgp l2vpn evpn [loopback IP] vrf [tenant vrf].

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

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

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

Passaggio 8. Verificare che l'indirizzo IP dell'interfaccia di loopback venga inserito nell'EVPN BGP L2VPN in cui si trova il server DHCP.



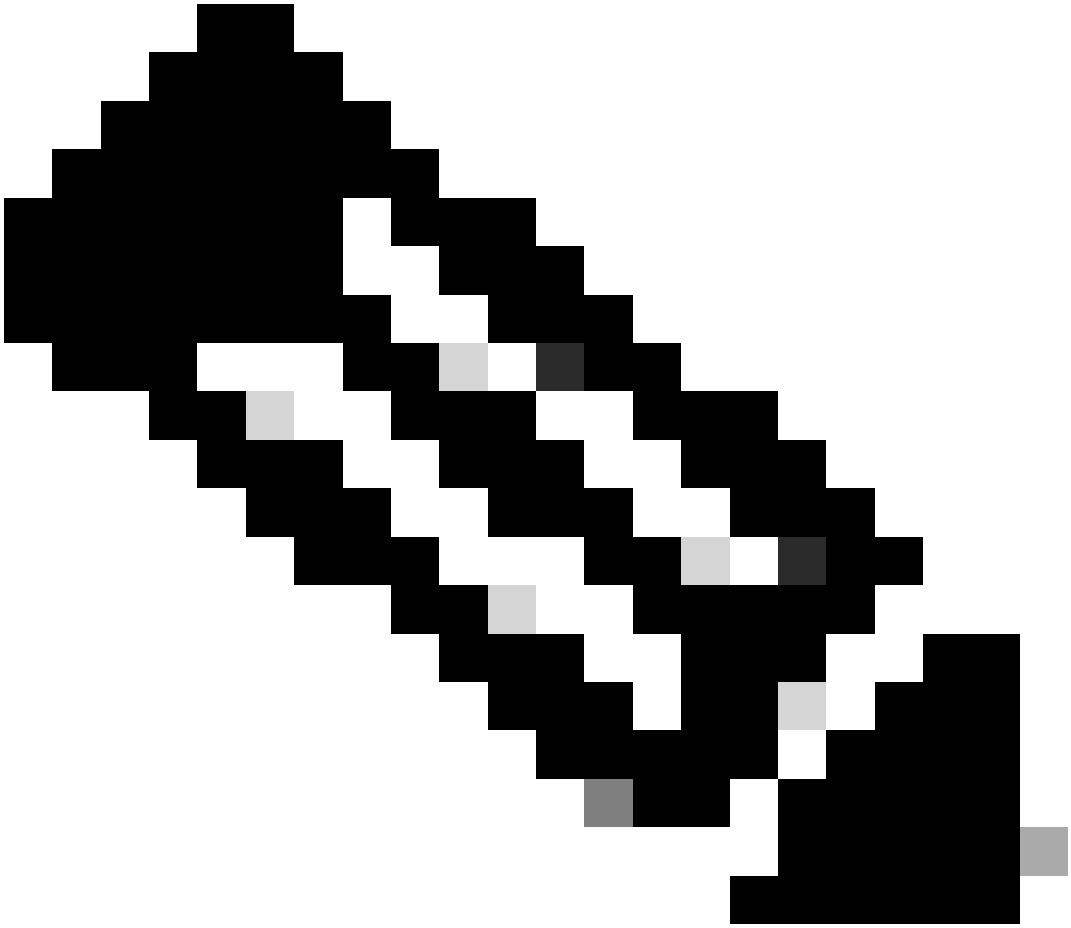
Nota: se vi sono switch Nexus in vPC, verificare che entrambi conoscano l'indirizzo IP dell'interfaccia di loopback in BGP L2VPN EVPN.

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

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

  Path-id 1 advertised to peers:
```

```
    192.168.0.11
```

Passaggio 9. Verificare che nel tenant di origine sia presente una route per il server DHCP con il comando show ip route [DHCP server IP] vrf[tenvrf].

---



> Nota: la voce della route da utilizzare deve essere da VxLAN a VRF predefinita. Se non è disponibile alcuna route, verificare che il VTEP conosca localmente l'indirizzo IP del server DHCP.

---

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

```
  ip dhcp relay source-interface loopback100

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

Passaggio 10. Verificare che l'indirizzo IP del server DHCP sia raggiungibile utilizzando l'interfaccia di loopback e il VRF corrispondente come origine VRF con il comando ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf].

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

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

Passaggio 11. Verificare lo stato dell'agente di inoltro DHCP.

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

Passaggio 12. Verificare l'opzione 82, ad esempio vpn option e l'indirizzo IP corretto del relay nell'agente di inoltro.

```
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 <<<<
```

Passaggio 13. Verificare le statistiche dei pacchetti elaborati e inoltrati.

```
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
```

Passaggio 14. Verificare le statistiche dei pacchetti relay.

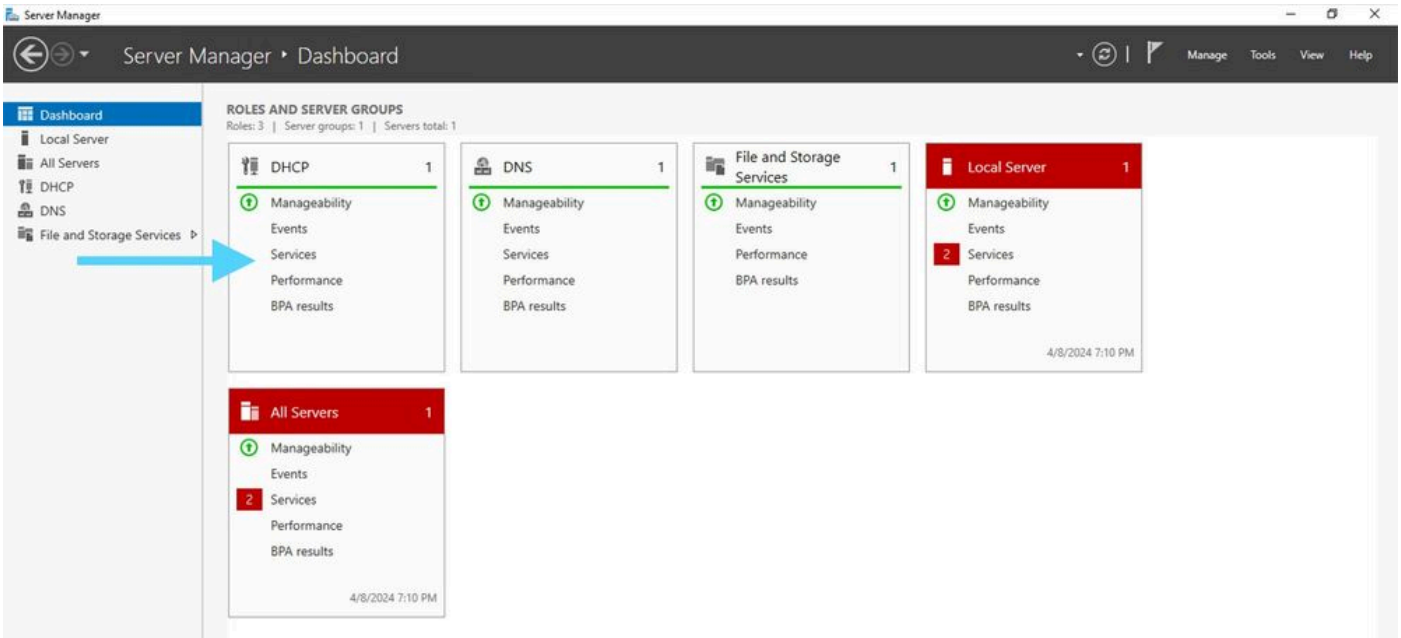
```
LEAF-2-VPC# show ip dhcp relay statistics
------------------------------------------------------------------------
Message Type              Rx              Tx           Drops
------------------------------------------------------------------------
Discover               29312           29311               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
```

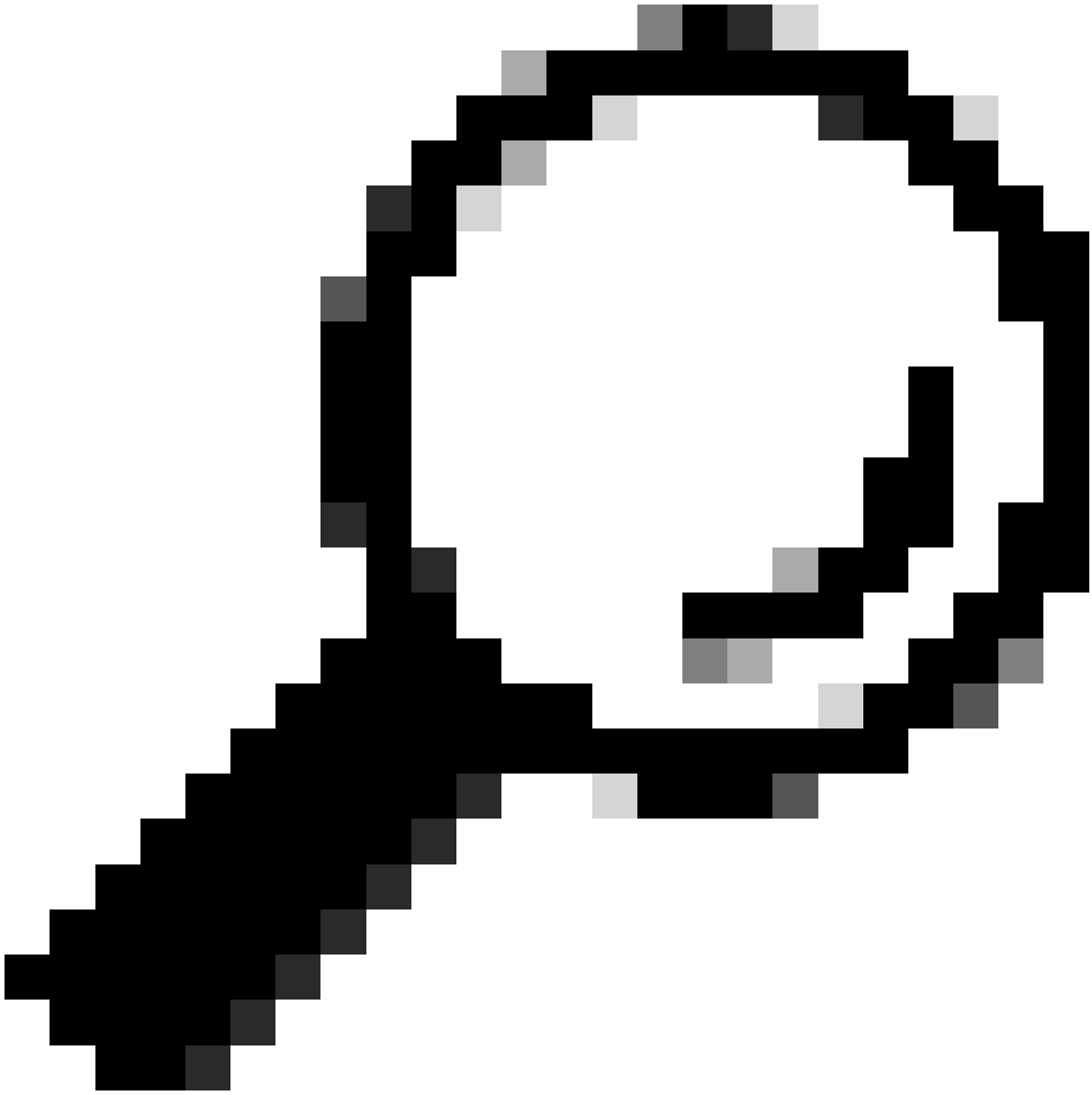
# Configurazione del server DHCP in Windows Server 2022

## Configurazione dell'ambito di indirizzamento IP per gli host.

Passaggio 1. Aprire Server Manager e verificare che non vi siano allarmi sul server DHCP nel dashboard.

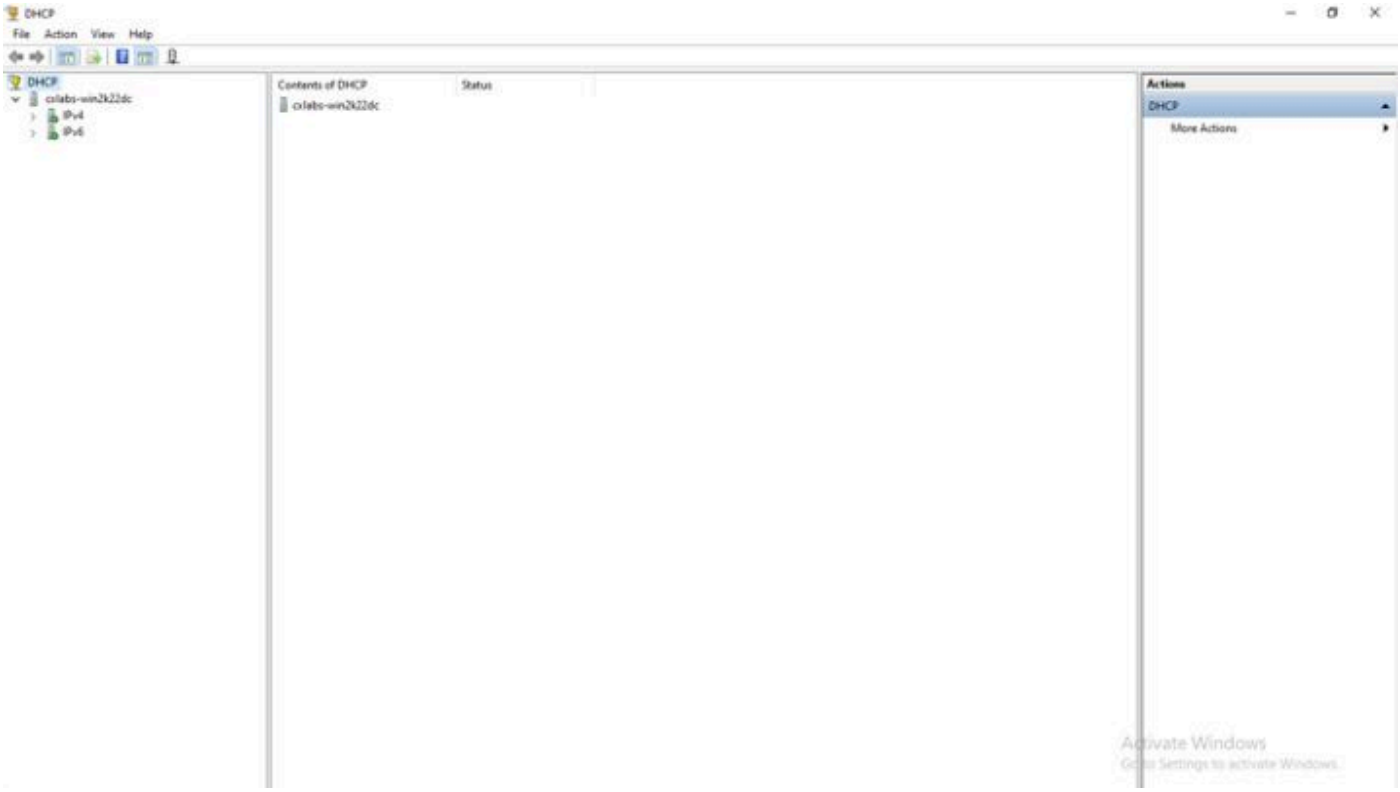



Dashboard da Server Manager in Windows Server 2022



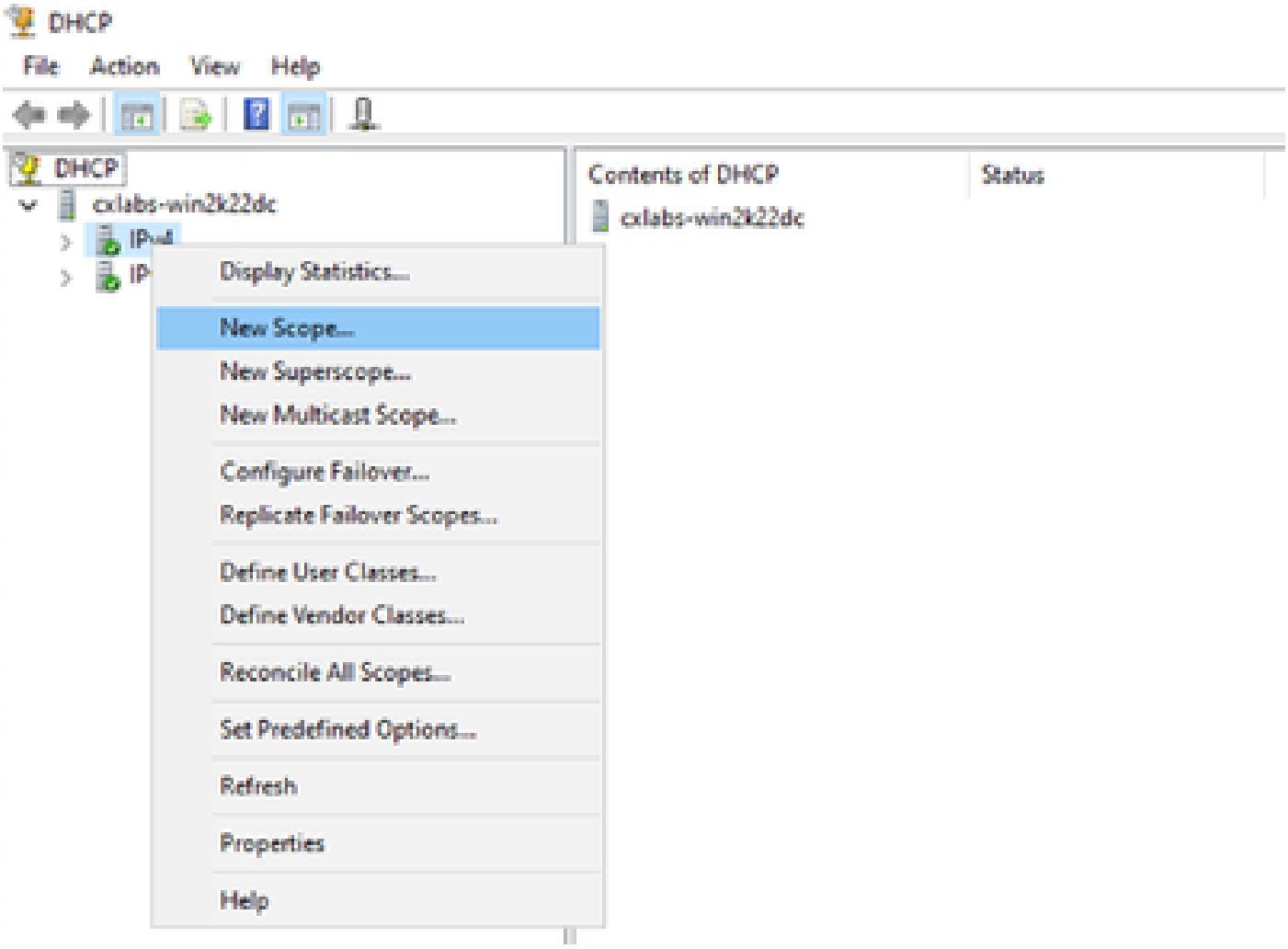
Suggerimento: quando si fa doppio clic, l'immagine si ingrandisce.

Passaggio 2. Aprire l'applicazione server DHCP.



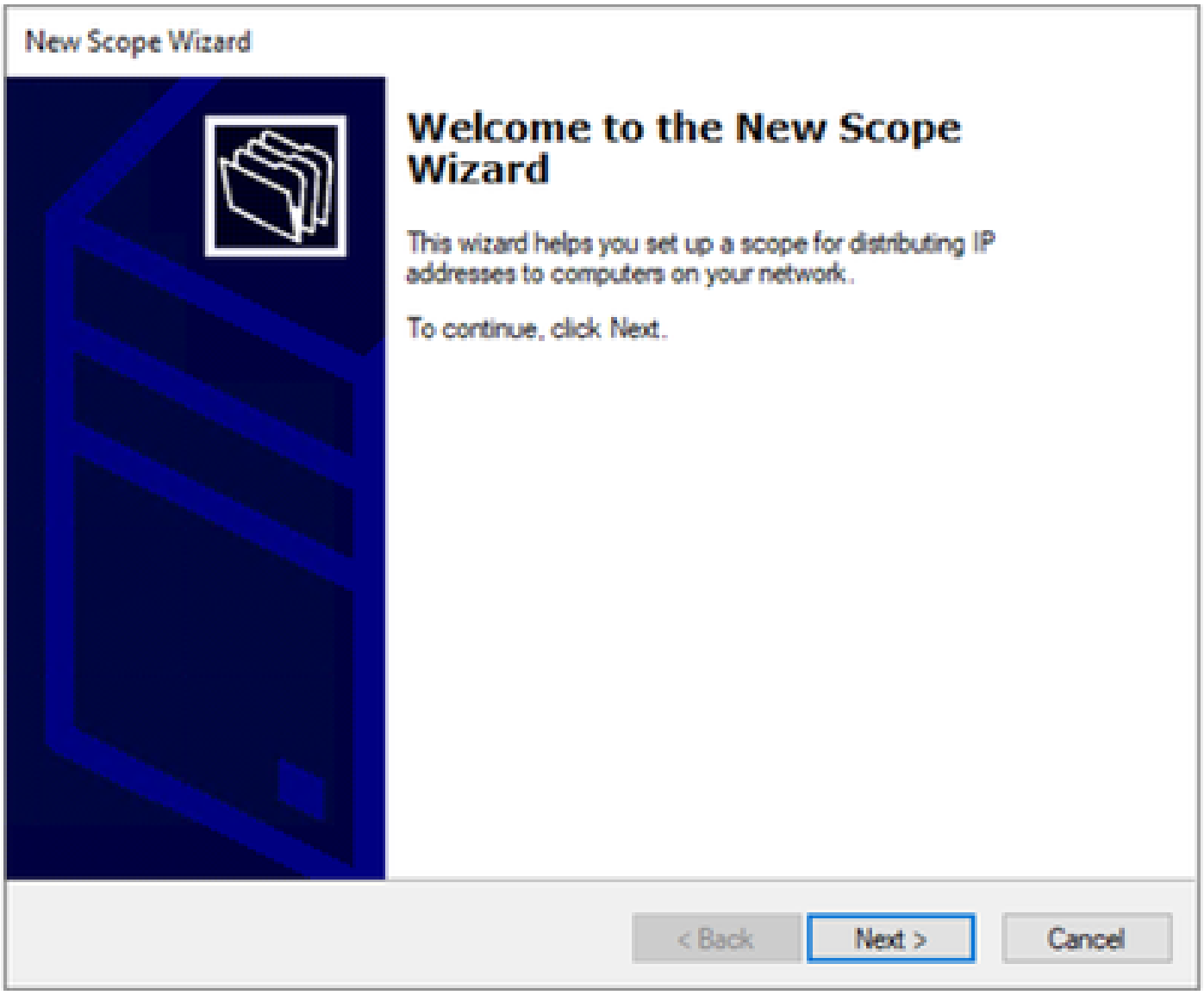

Server DHCP su Windows Server 2022

Passaggio 3. Fare clic con il pulsante destro del mouse su IPv4 e selezionare New Scope (Nuovo ambito).

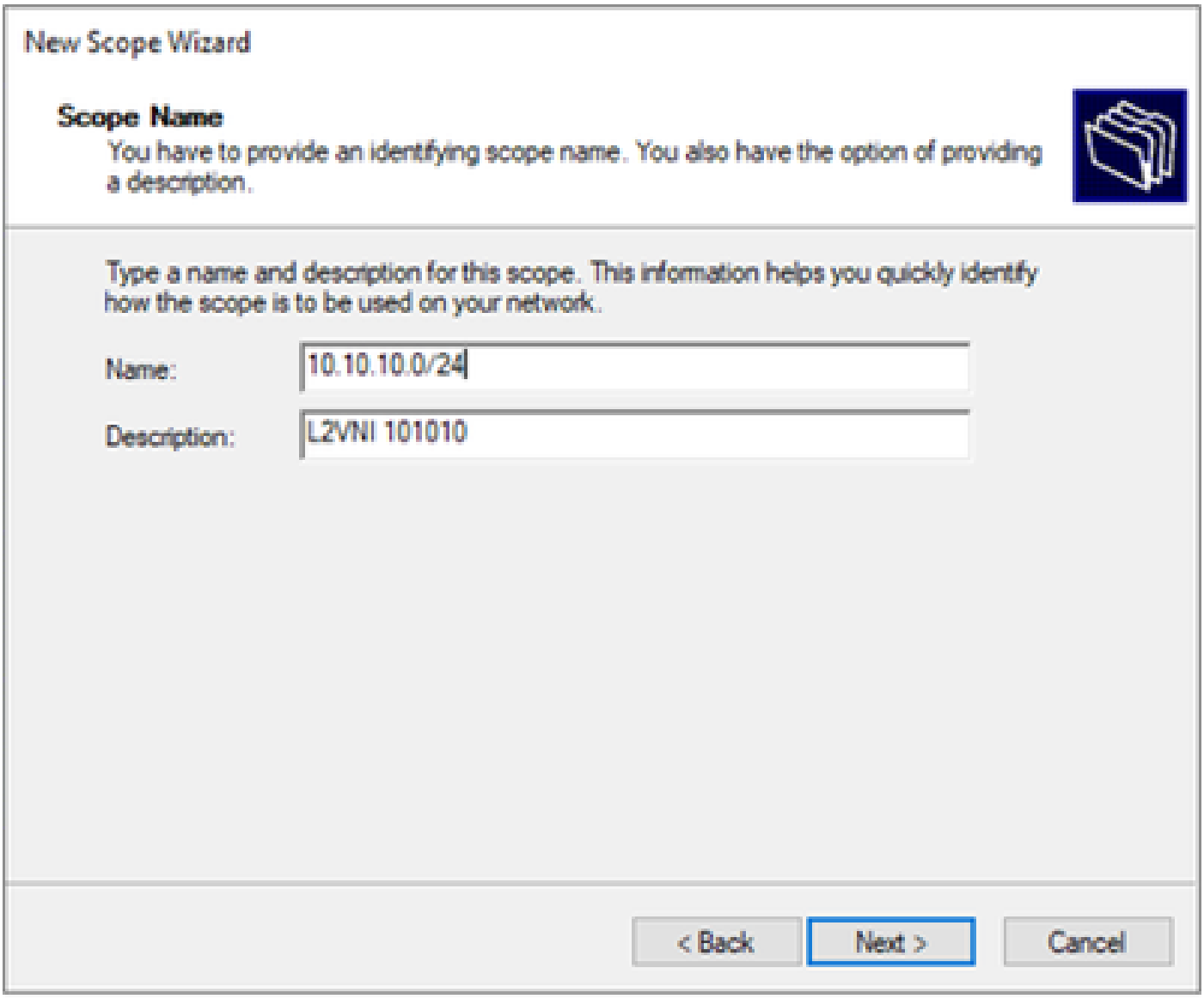



Nuovo ambito in DCHP

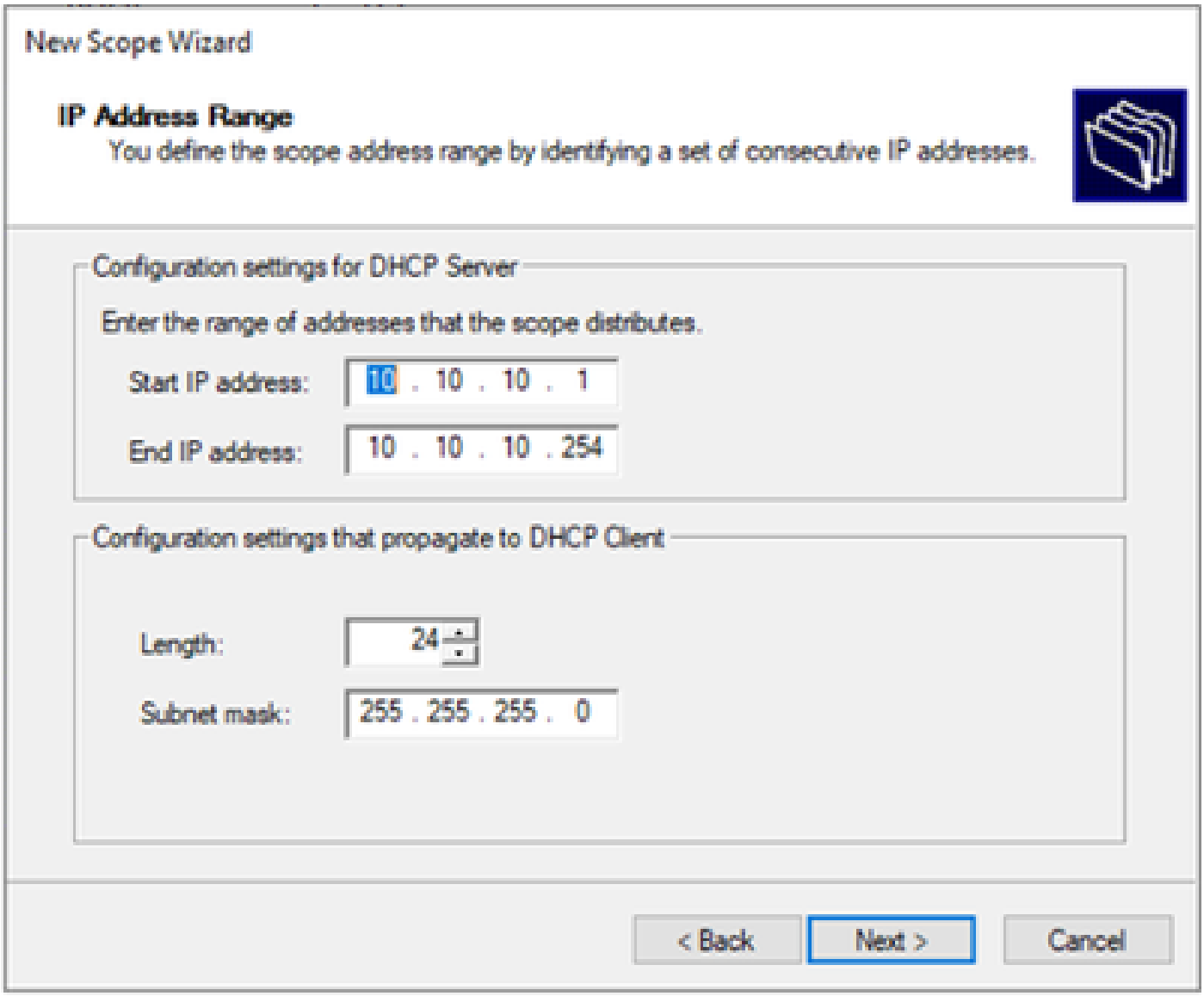
Passaggio 4. Fare clic su Next (Avanti).



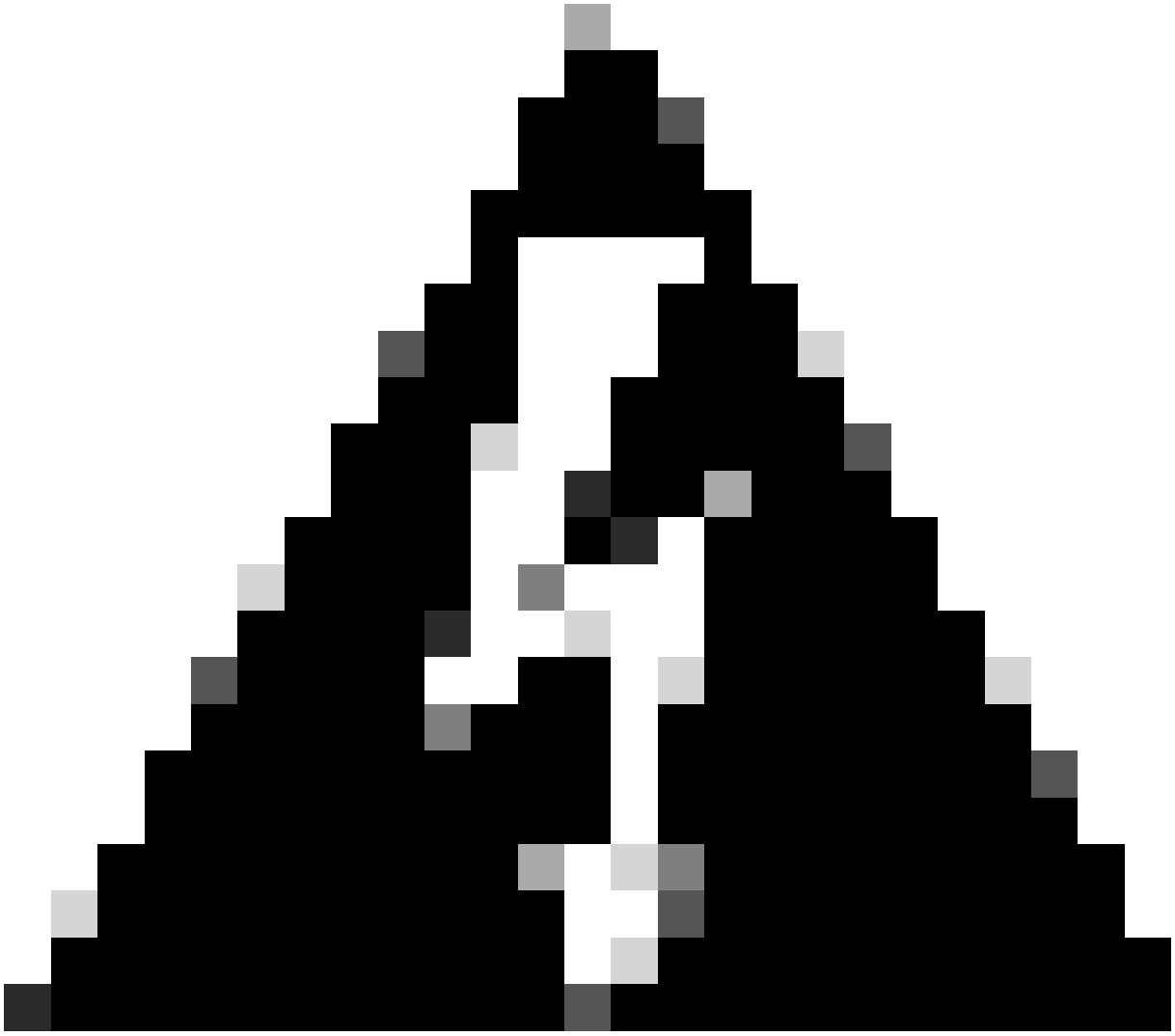

Passaggio 5. Scrivere un nome e una descrizione. Nell'esempio, il nome è la subnet che appartiene alla VLAN 10 e la descrizione è l'L2VNI come L2VNI elencato nella VLAN 10.




Passaggio 6. Configurare l'intervallo di indirizzi IP. Pool per gli host.

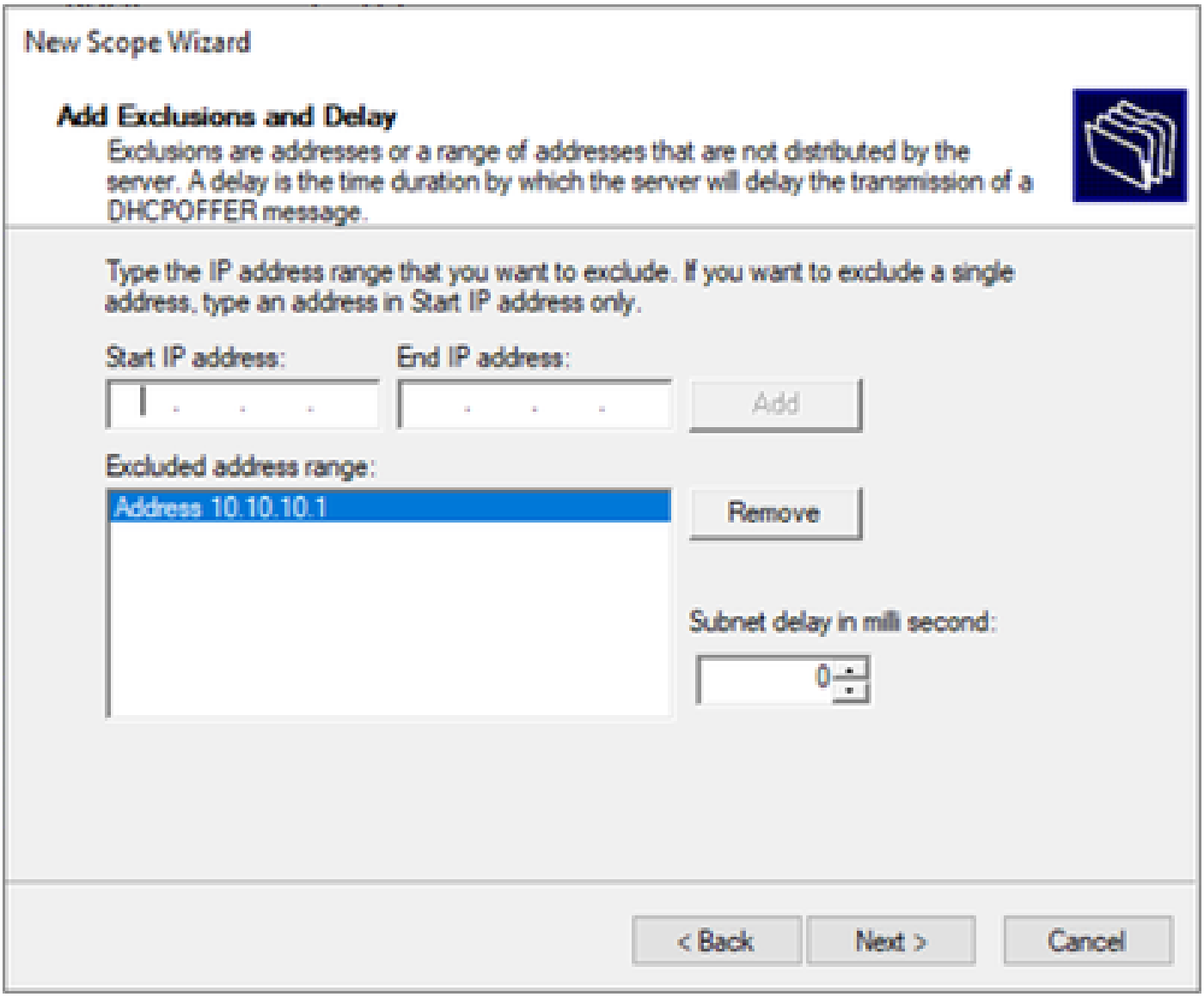



Passaggio 6. Escludere l'indirizzo IP condiviso dalla configurazione SVI nei VTEP. In questo esempio, l'interfaccia VLAN 10 ha l'indirizzo IP.10.10.1/24.

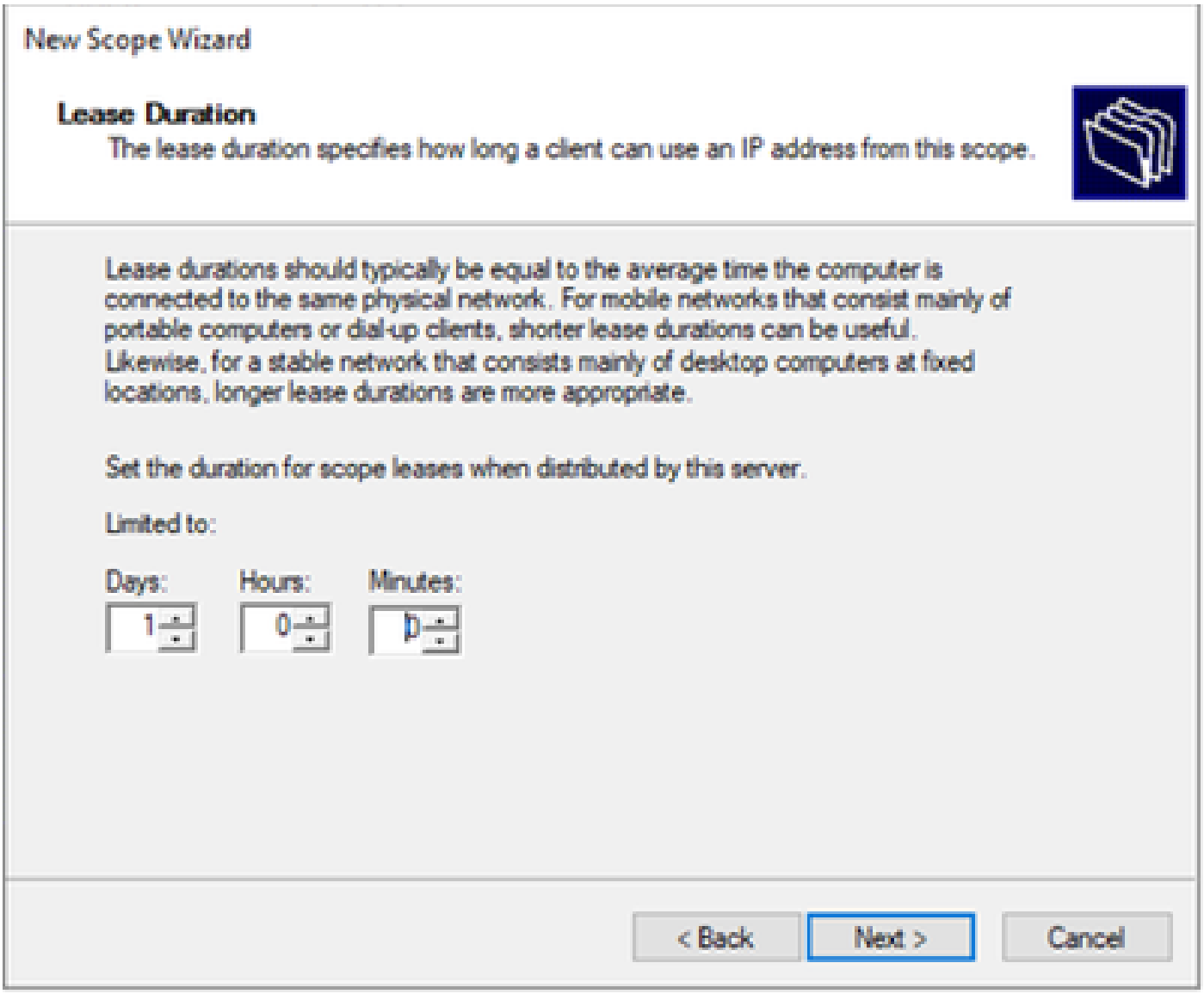


Avviso: se non si esclude l'indirizzo IP dall'SVI (o gateway predefinito), è possibile che gli indirizzi IP vengano duplicati e il traffico recapitato venga compromesso.

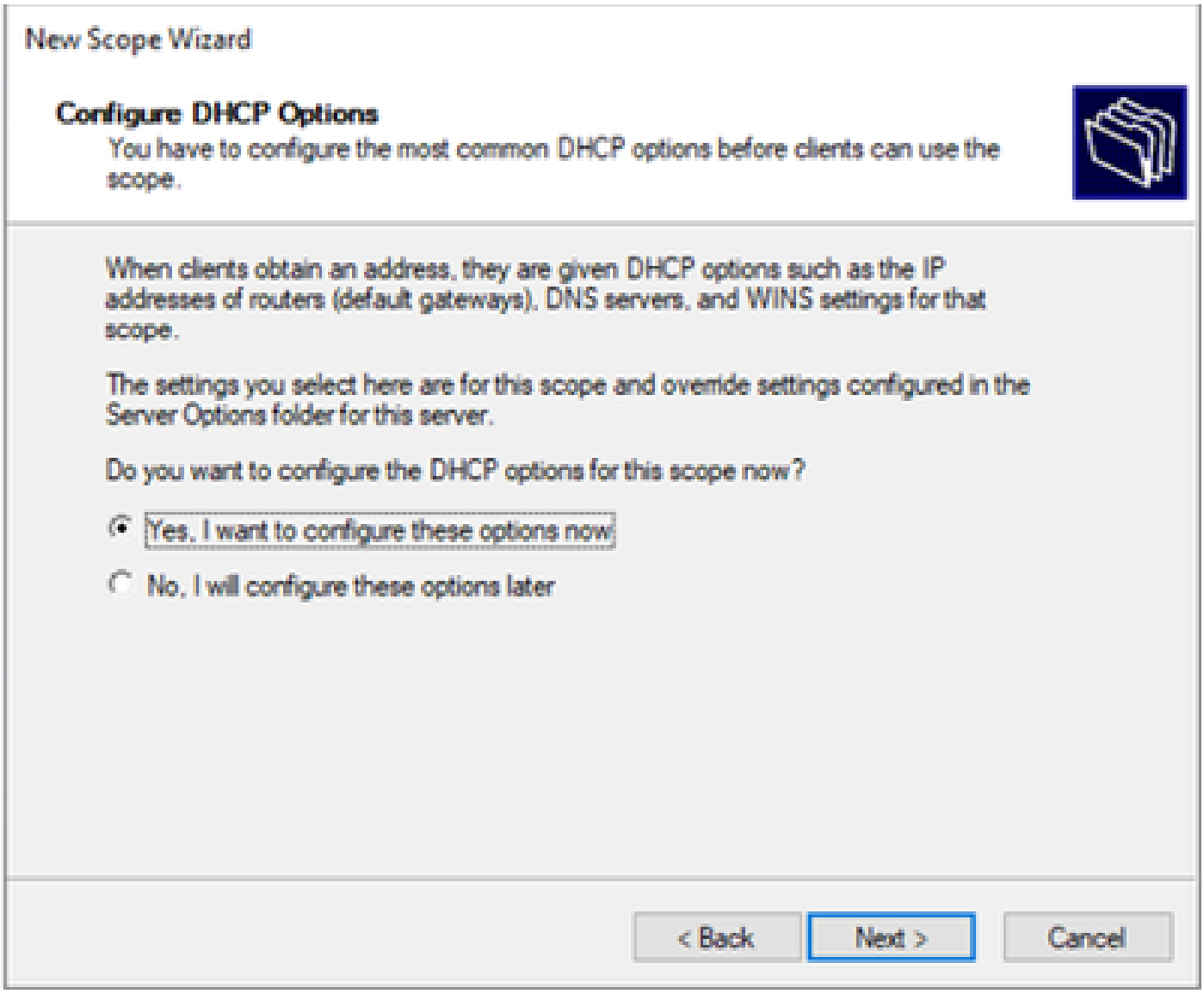
```
LEAF-1# show running-config interface vlan 10
<snip>
interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100
```



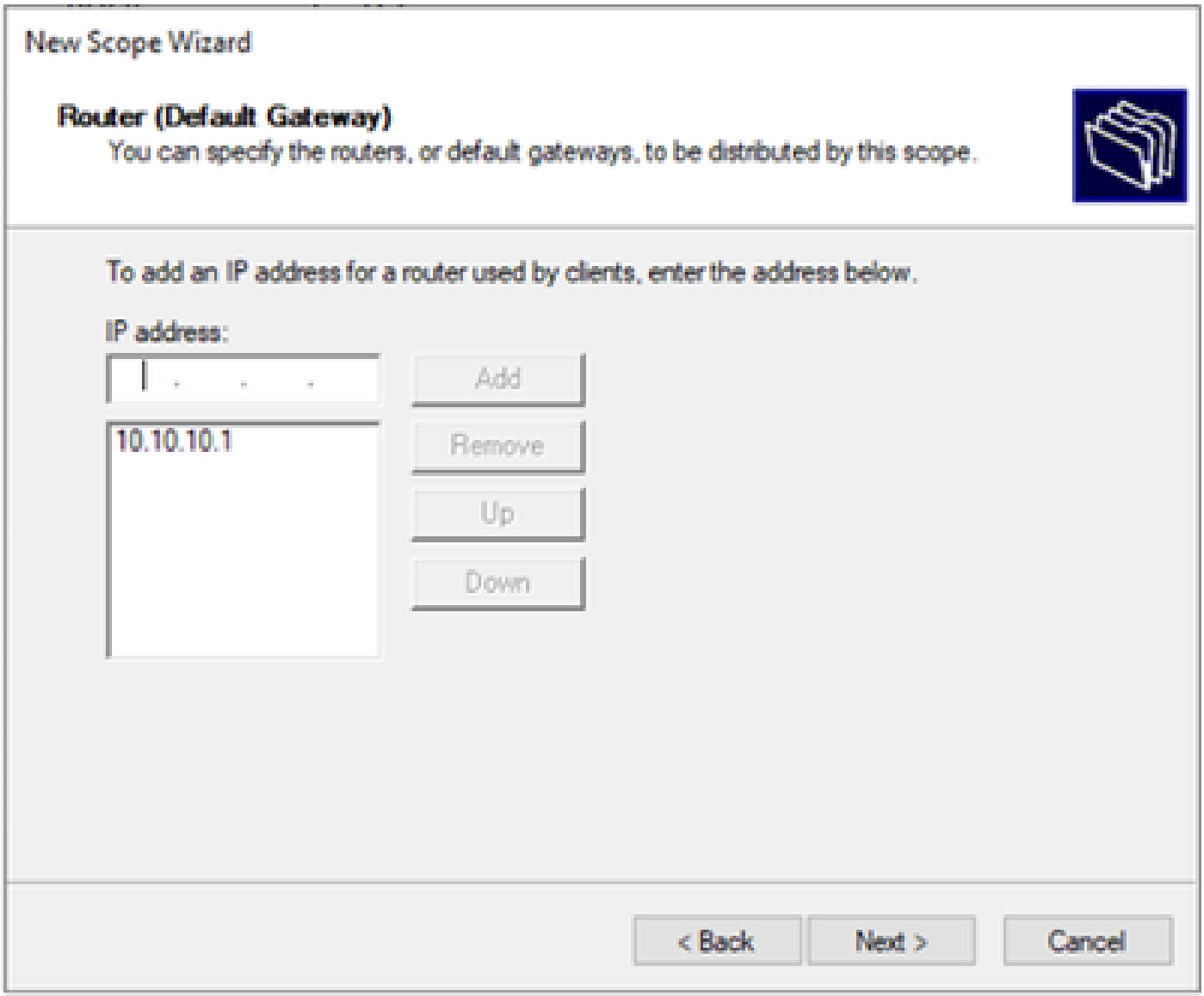

Passaggio 7. Configurare la durata del lease dell'indirizzo IP. Questo valore si riferisce alla quantità di tempo durante la quale un host può utilizzare l'indirizzo IP assegnato prima di rinnovarlo.



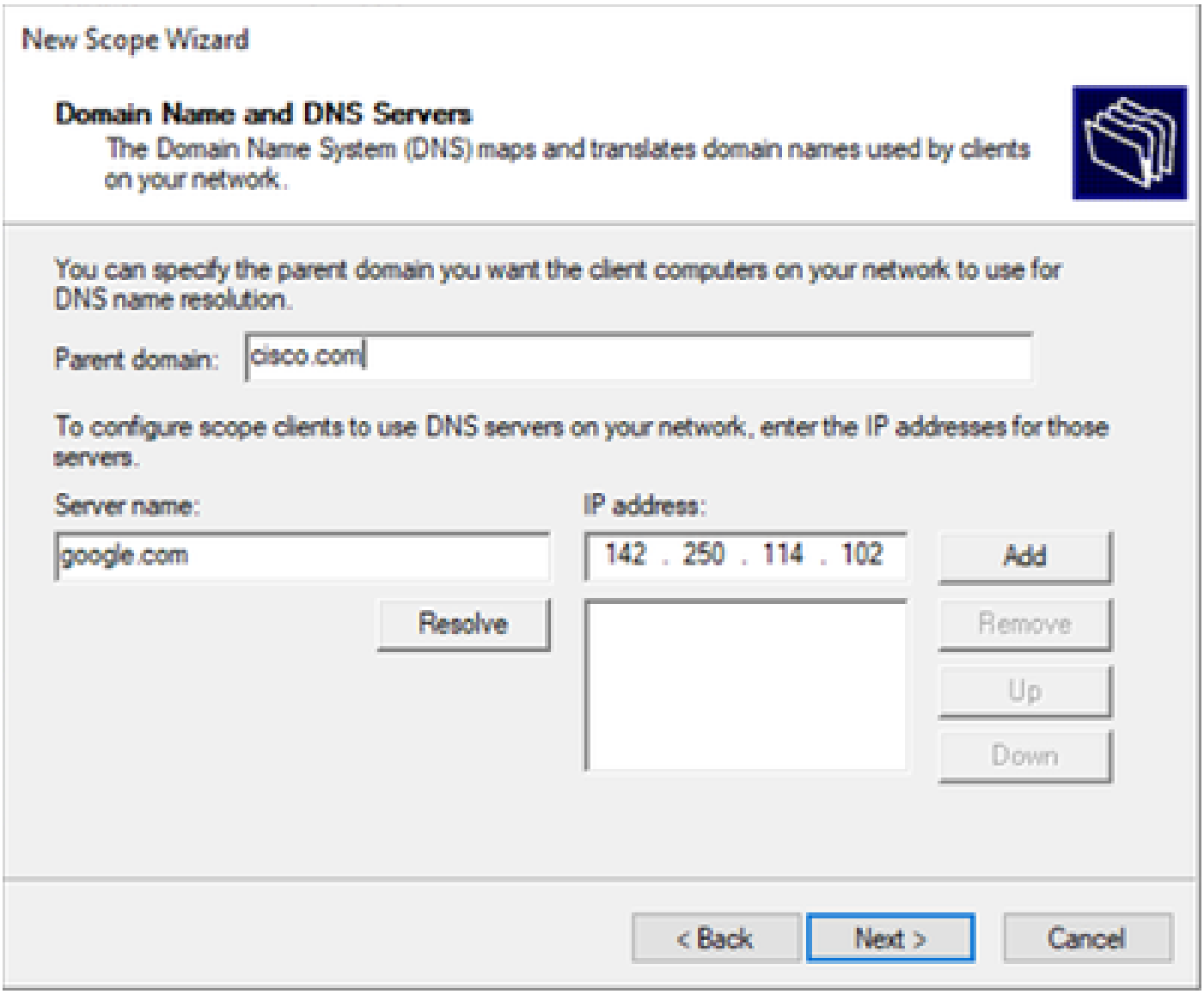

Passaggio 8. Selezionare Sì, configurare le opzioni ora.



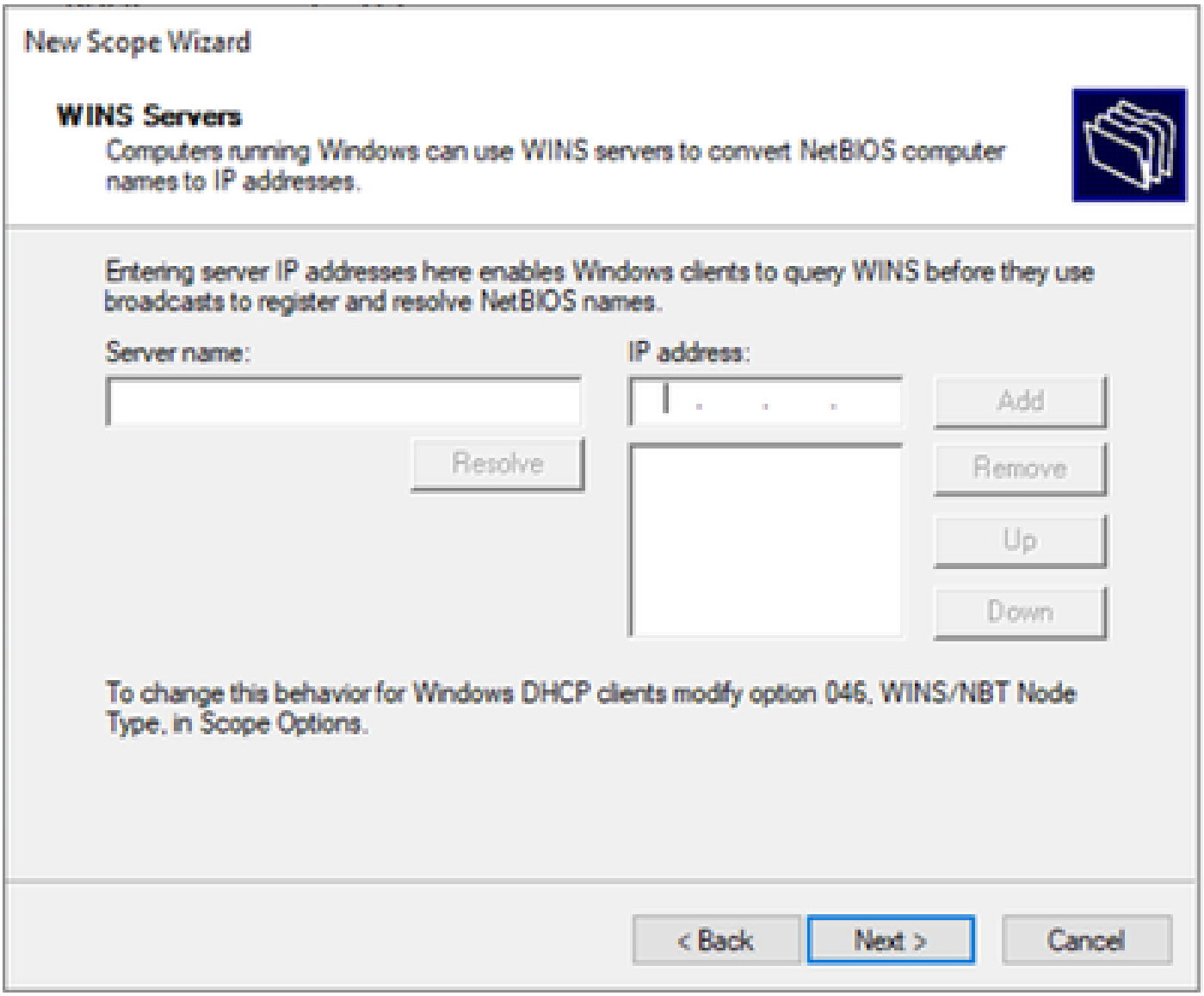

Passaggio 9. Configurare l'indirizzo IP del gateway predefinito.



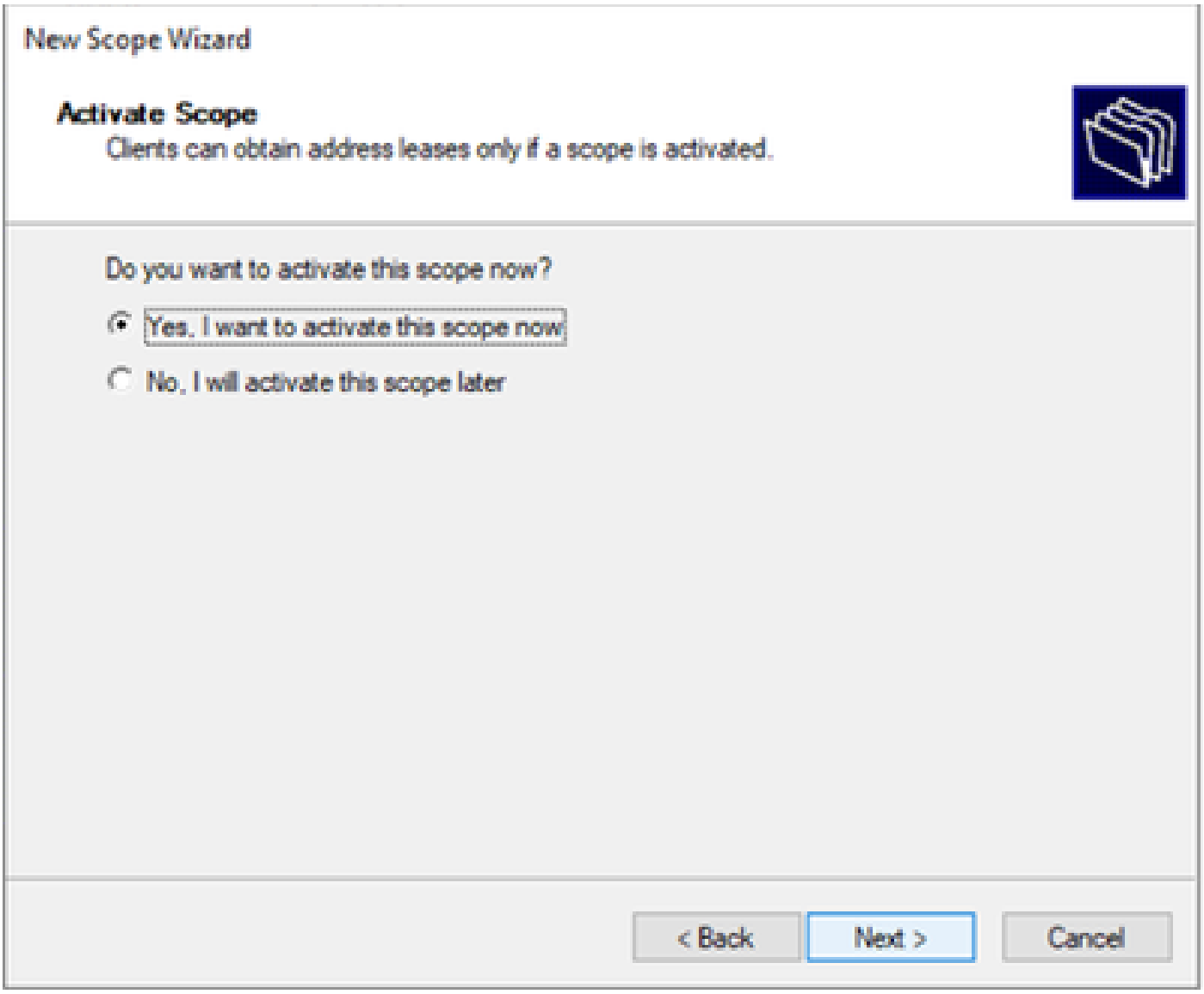

Passaggio 10. Configurare il nome di dominio e il server DNS.




Passaggio 11. Configurare il server WINS, se applicabile. Questa operazione può essere ignorata se le informazioni non sono note.

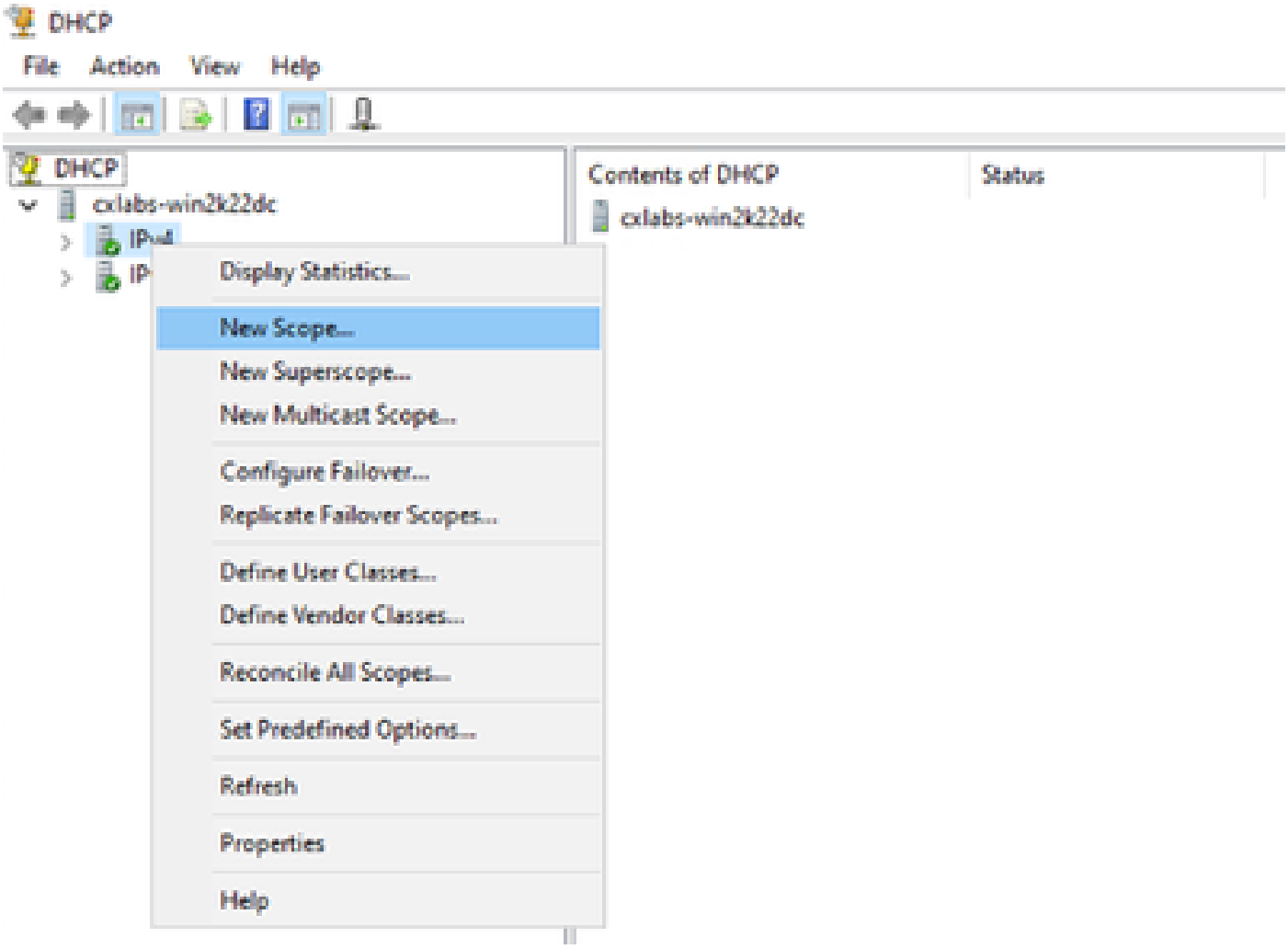



Passaggio 12. Selezionare Sì, attiva l'ambito ora.



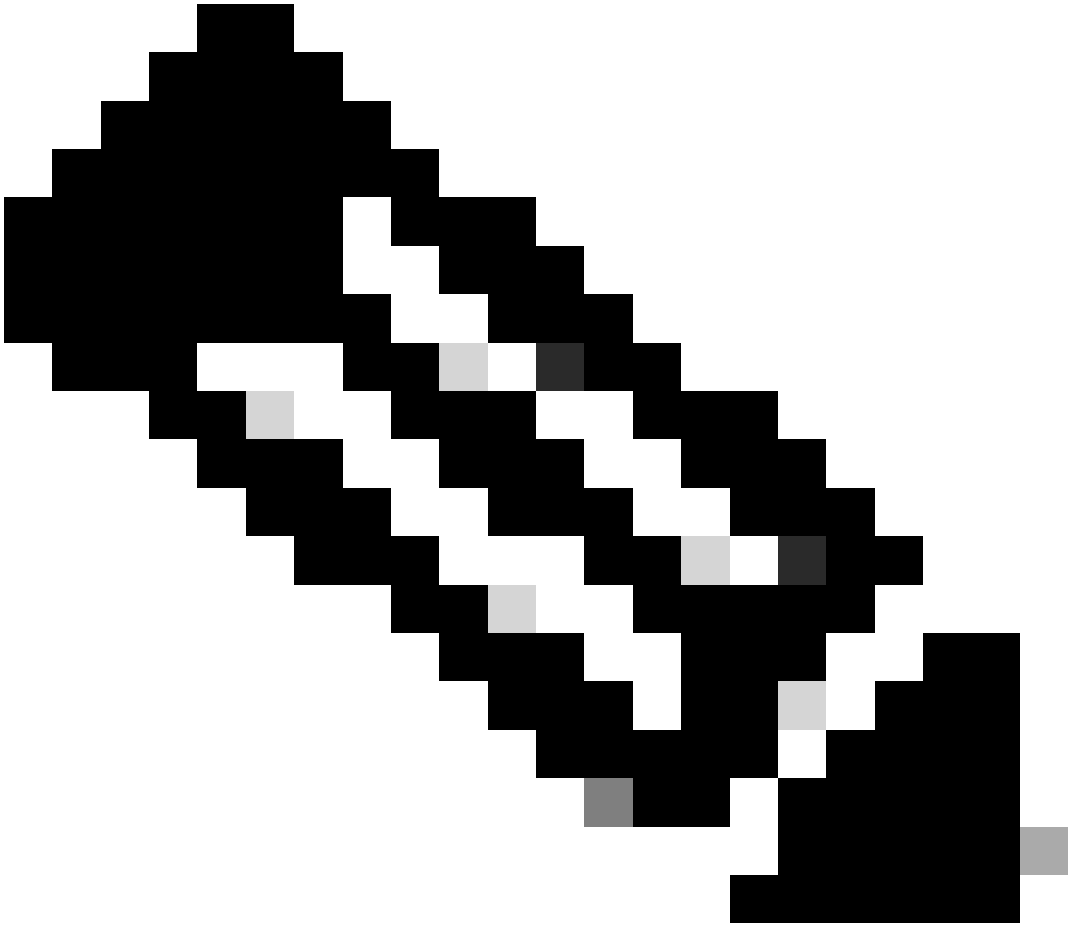

Configurazione dell'ambito per gli indirizzi IP univoci dai loopback in SVI come agente di inoltro DCHP.

Passaggio 1. Fare clic con il pulsante destro del mouse su IPv4 e selezionare IPv4Scope.



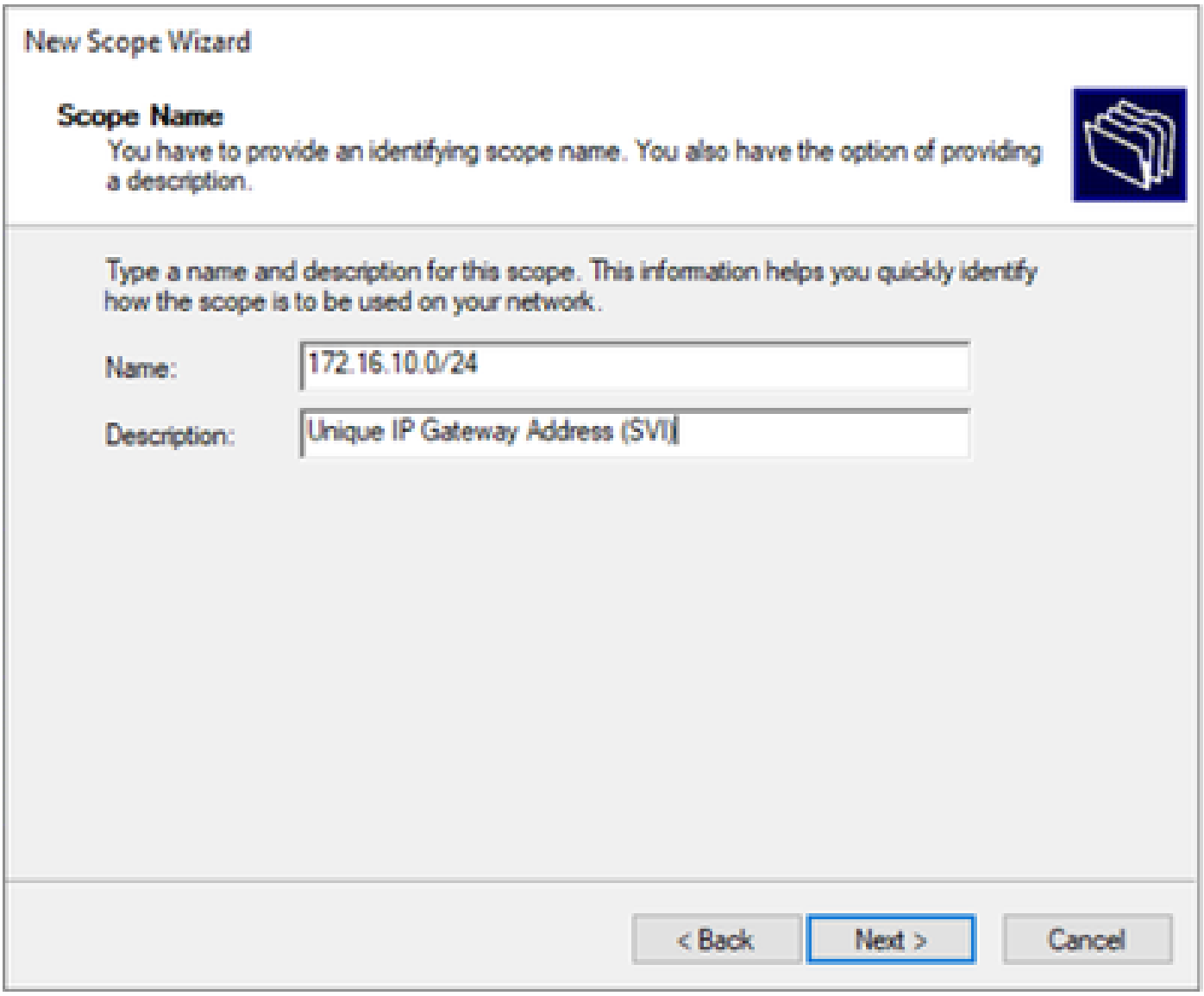

Nuovo ambito in DCHP

Passaggio 2. Scrivere un nome e una descrizione. In questo esempio, name è la subnet utilizzata per la subnet con indirizzo di loopback.

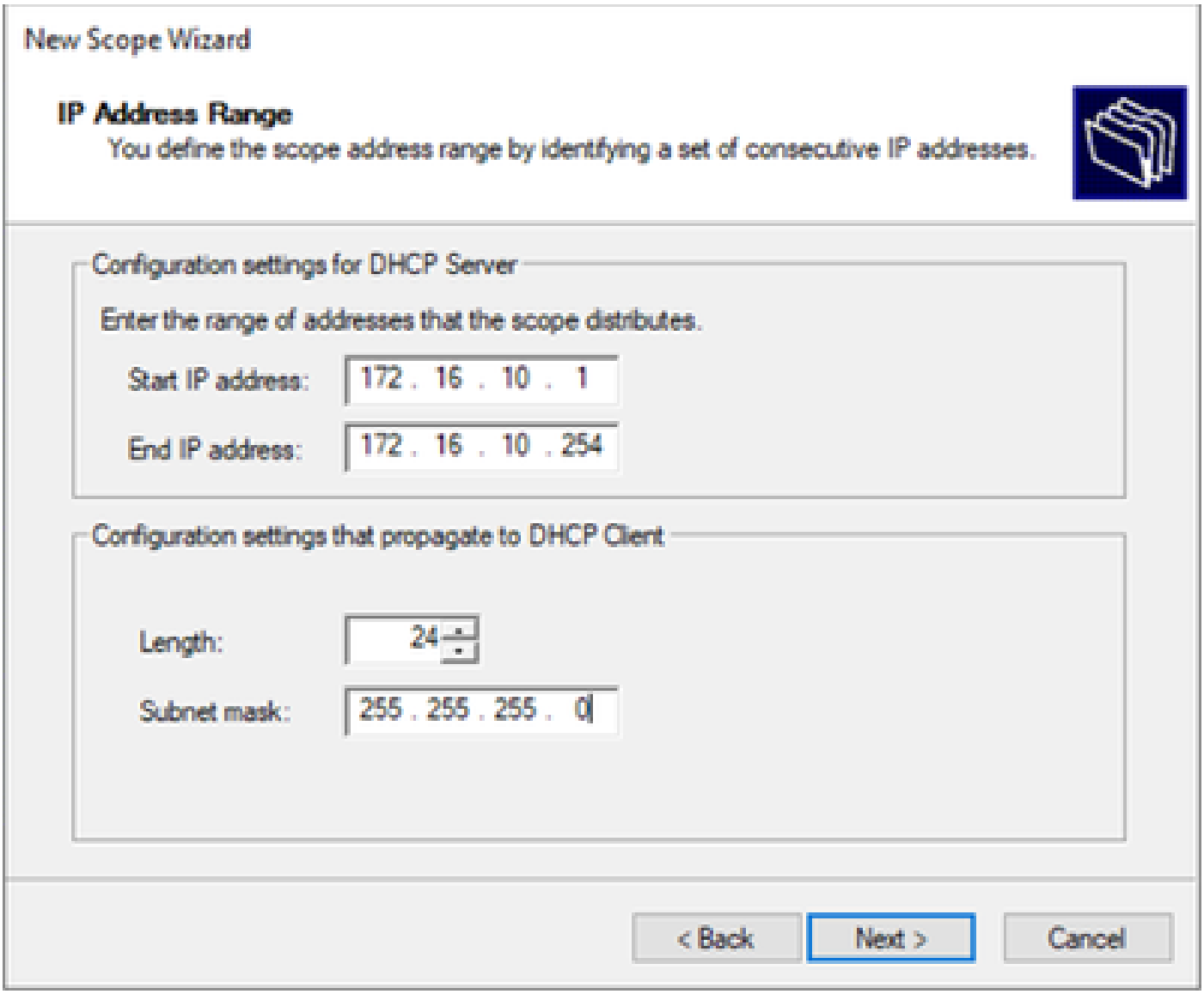


IPte: viene utilizzato un loopback per un indirizzo IP univoco loopback in tutta la struttura VxLAN per il tenant VxLAN. Questo deve essere annunciato nella ridistribuzione della route VPN BGP L2VPN in BGP all'interno del VRF del tenant corrispondente nell'indirizzo IPv4-famIPv4

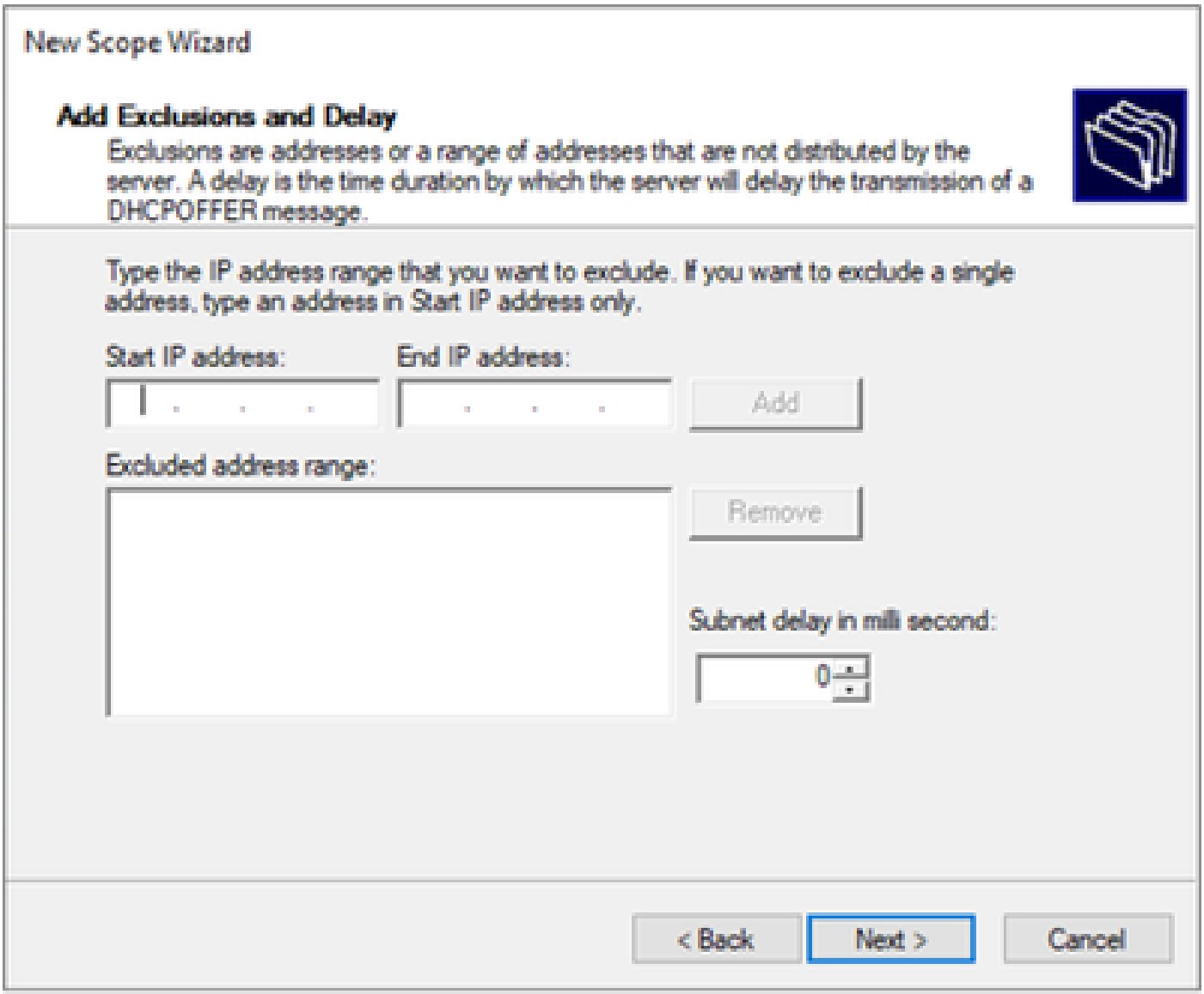
```
LEAF-1# show running-config interface loopback 100
<snip>
interface loopback100
  vrf member tenant-a
  ip address 172.16.10.8/32
```



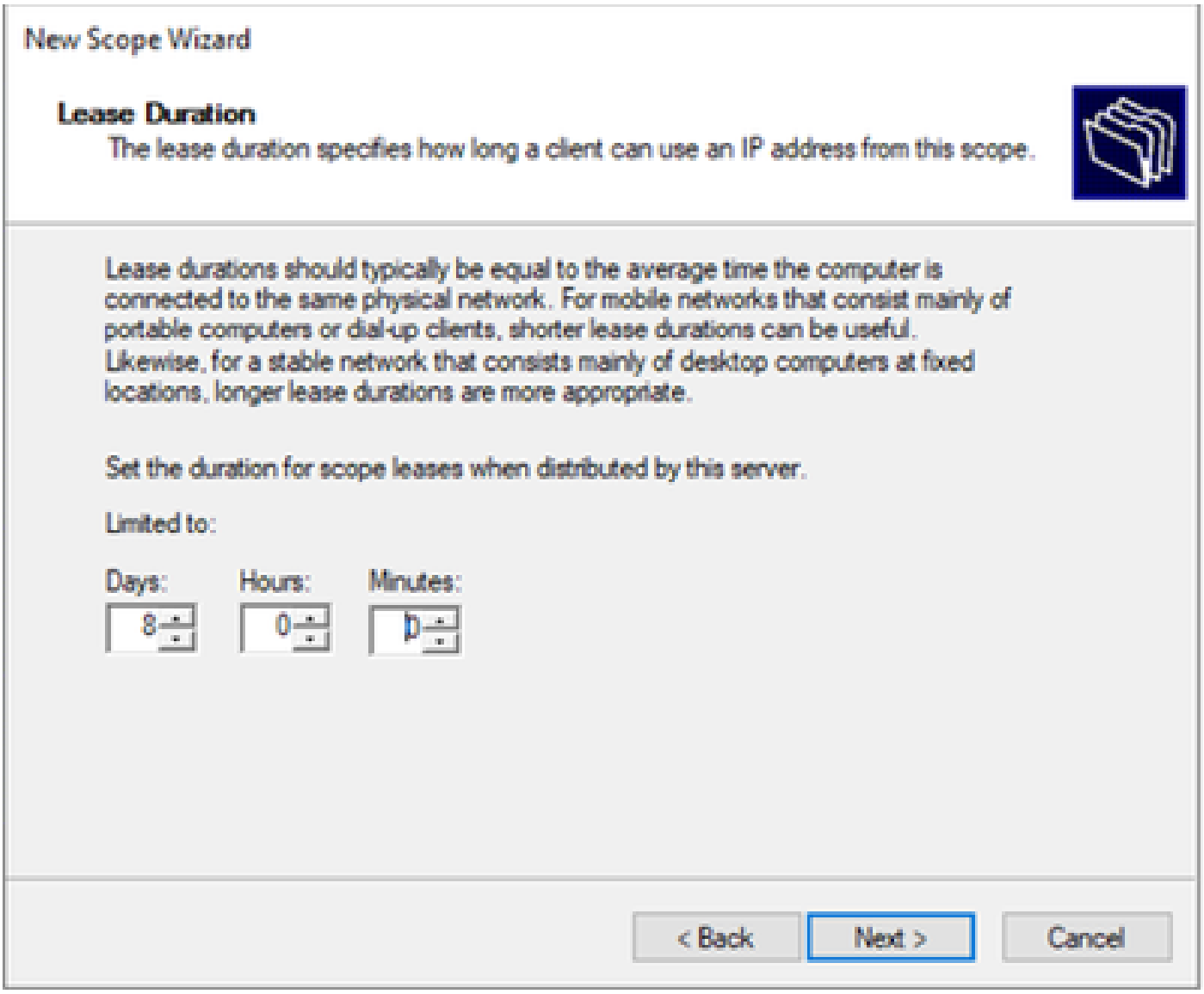

Passaggio 3. Configurare l'intervallo di indirizzi IPip. Pool di loopback.



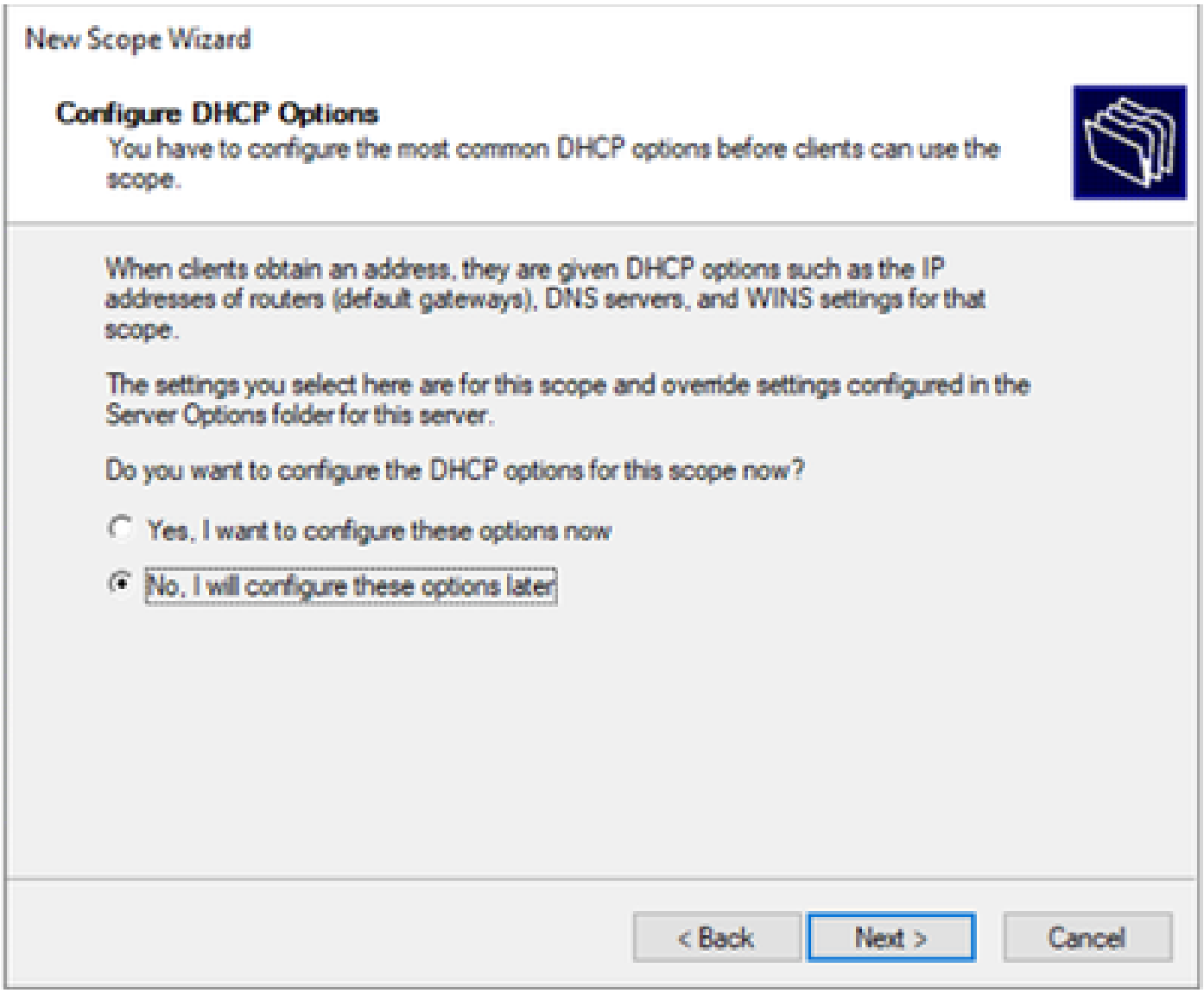

Passaggio 4. Configurare le esclusioni (facoltativo perché il server DHCP non assegna in lease indirizzi IP appartenenti a questa subnet).




Passaggio 5. Ignorare la durata del lease e fare clic su Avanti.

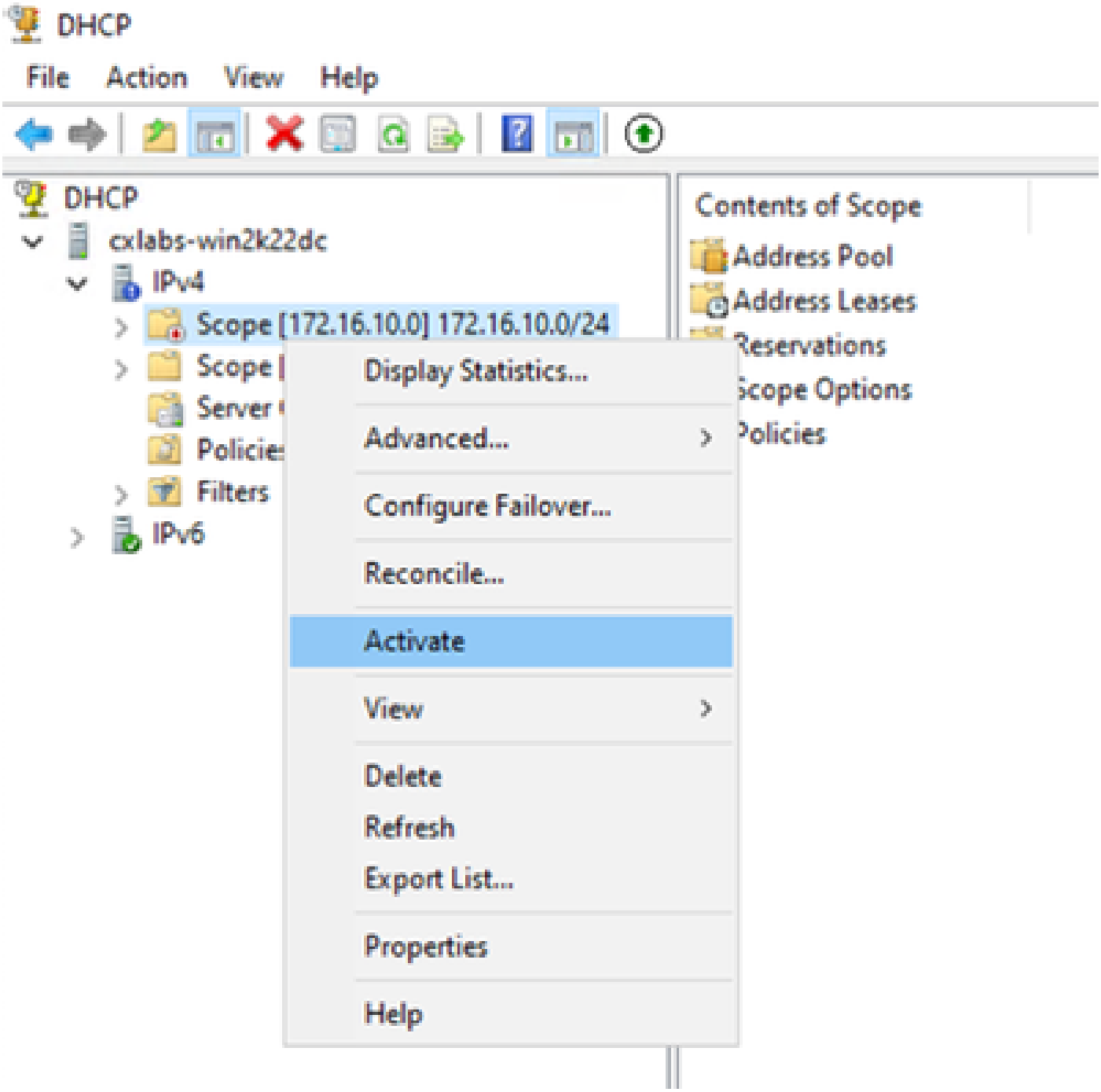



Passaggio 6. Selezionare No. Queste opzioni verranno configurate in seguito.



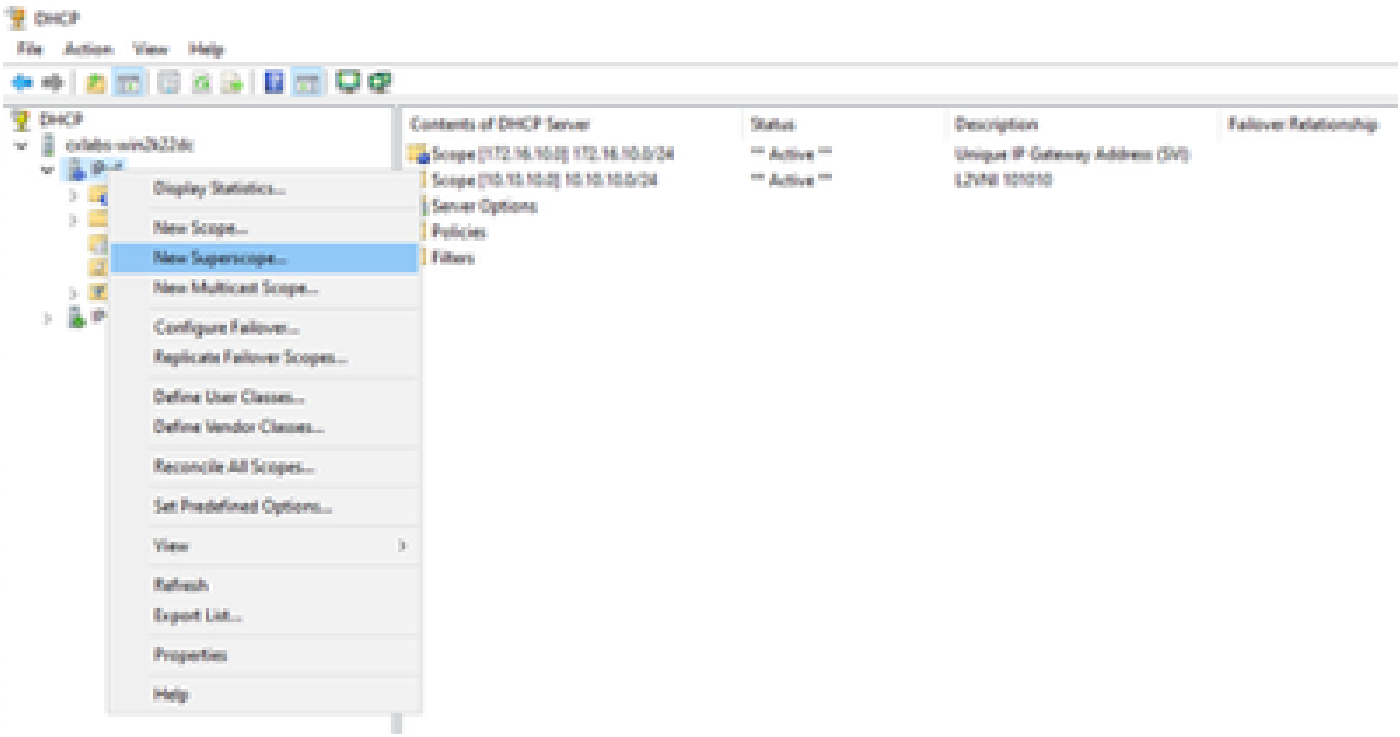

Passaggio 7. Fare clic su Finish (Fine).


Passaggio 8. Fare clic con il pulsante destro del mouse sull'ambito creato e selezionare attiva.

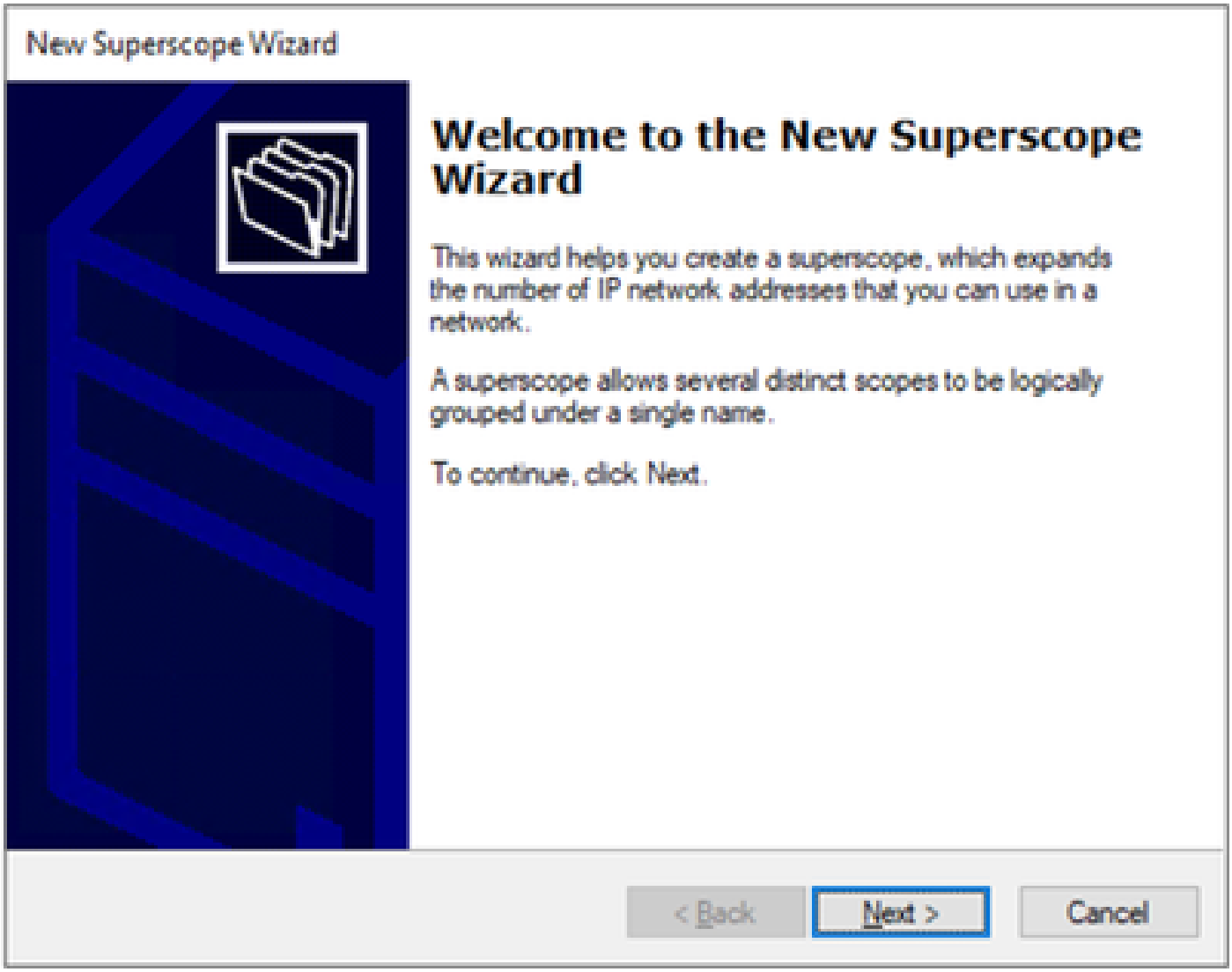



Configurazione dell'ambito esteso per l'infrastruttura VxLAN.

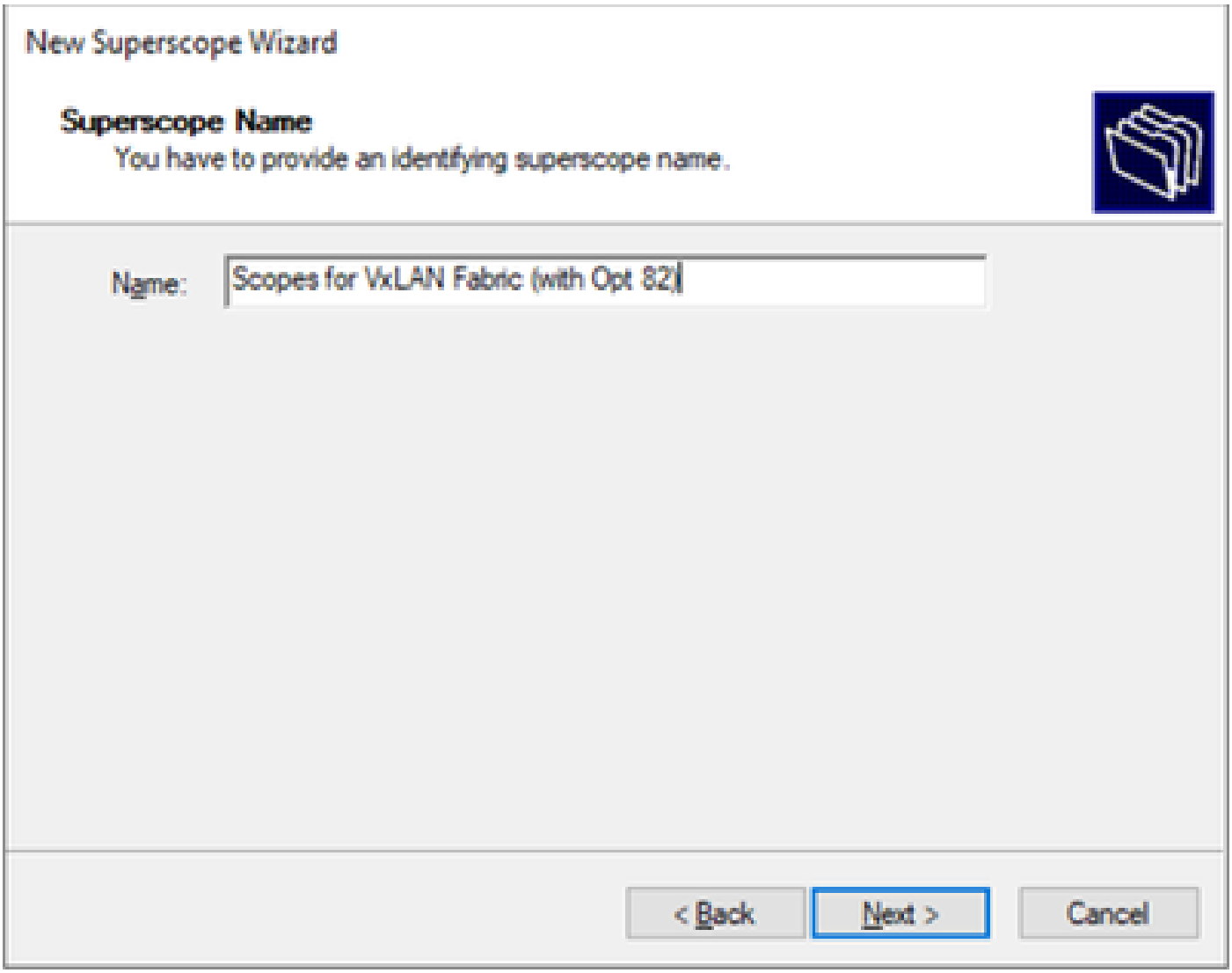
Passaggio 1. Fare clic con il pulsante destro del mouse su IPv4 e selezionare Nuovo ambito esteso.



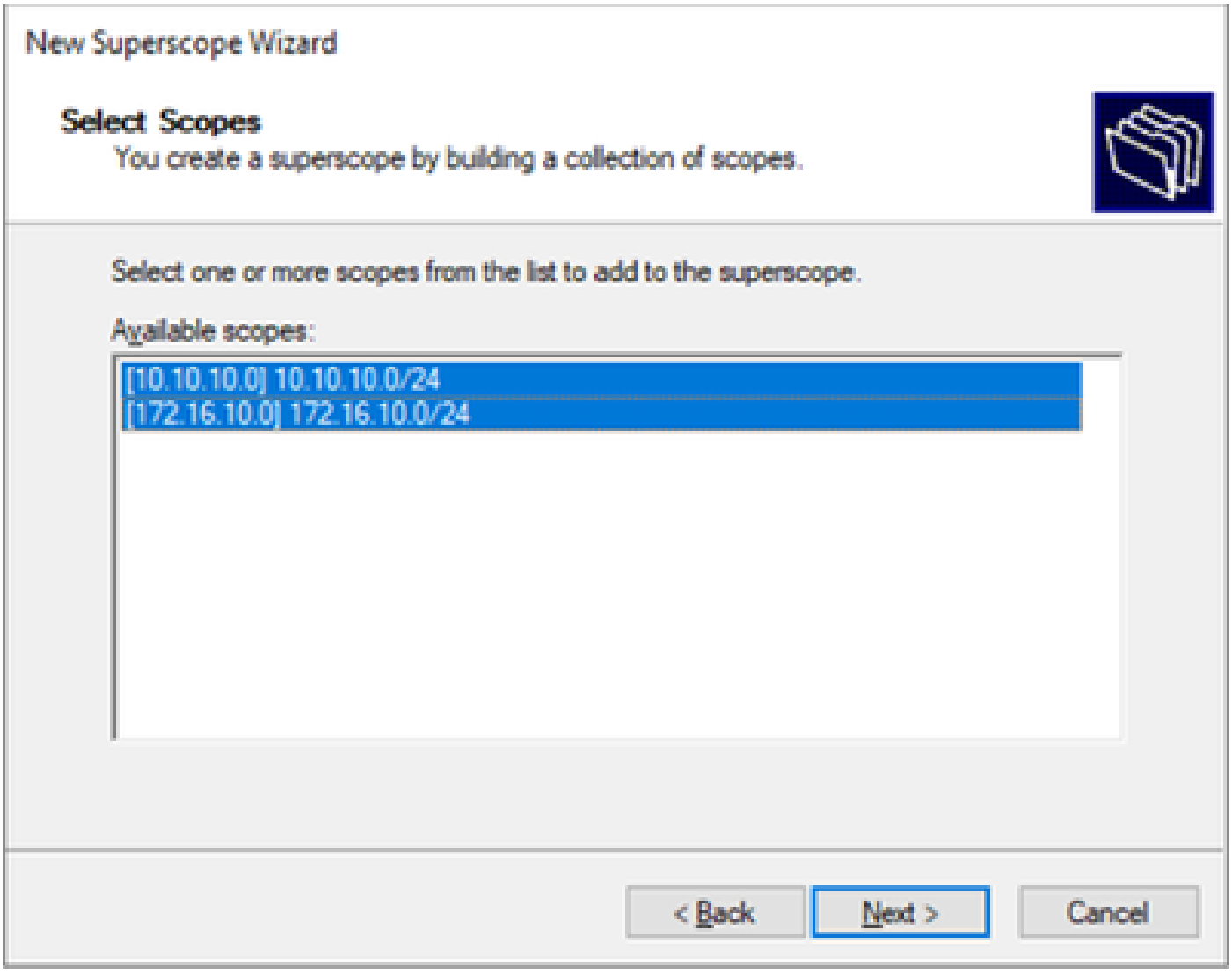

Passaggio 2. Fare clic su Next (Avanti).



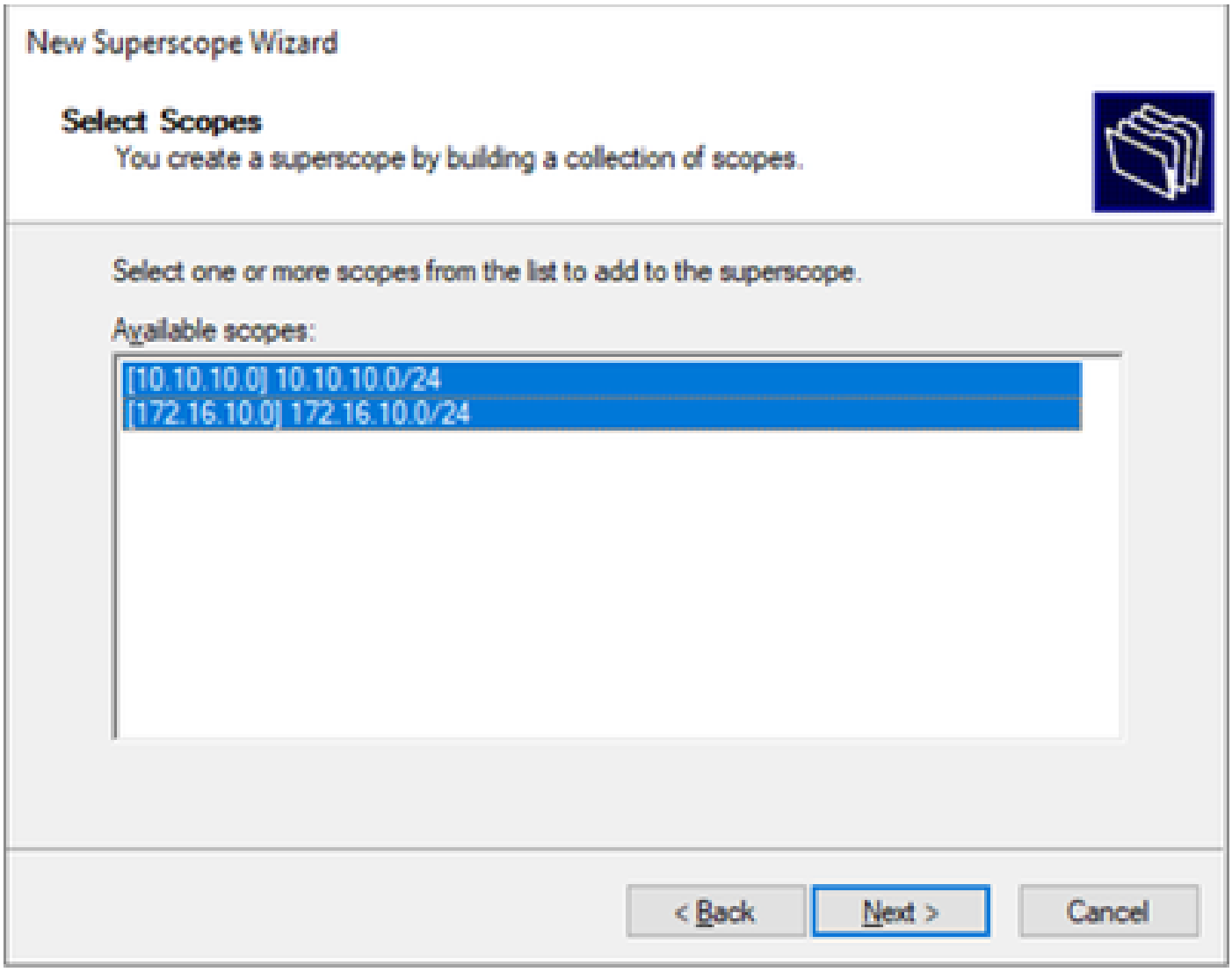
Passaggio 3. Scrivere il nome dell'ambito esteso.



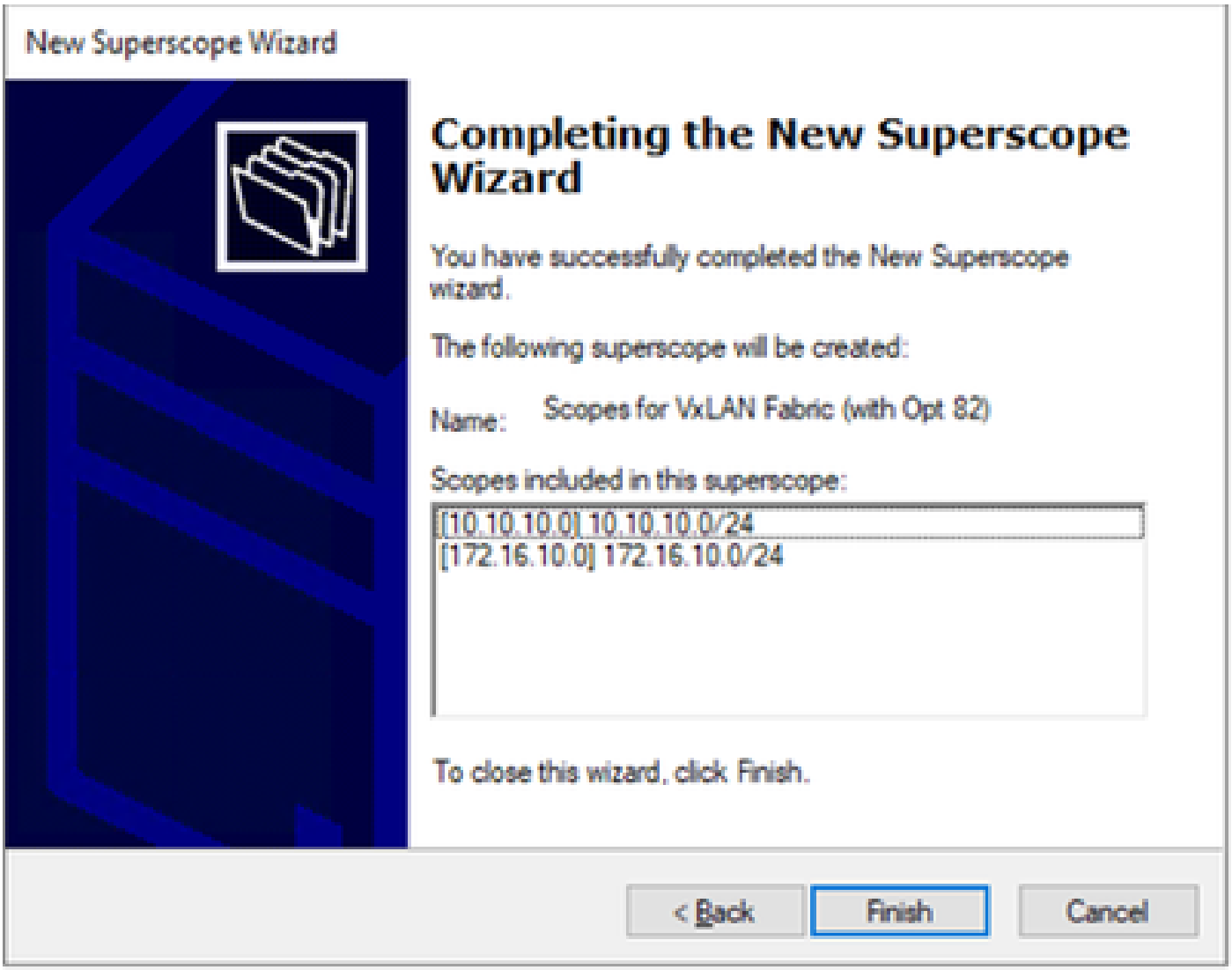

Passaggio 4. Selezionare tutti gli ambiti che appartengono a VxLAN Fabric.




Passaggio 5. Selezionare tutti gli ambiti che appartengono a VxLAN Fabric.

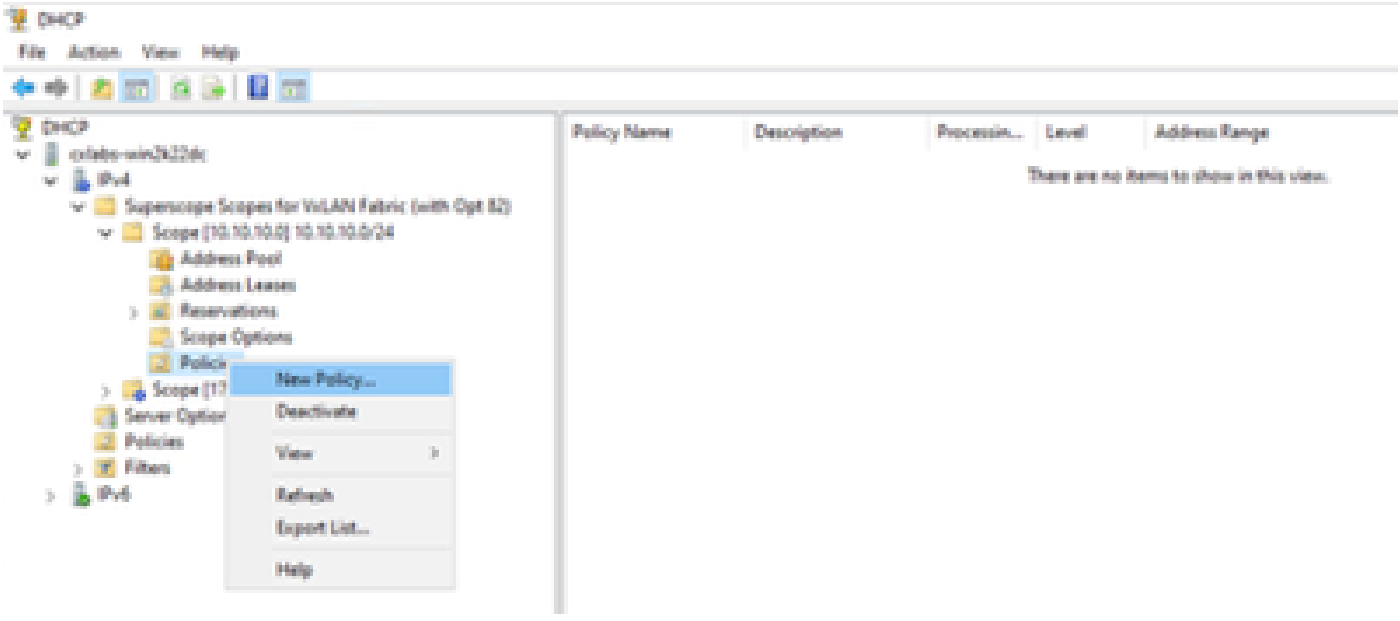



Passaggio 6. Verificare che tutto l'ambito esteso dell'infrastruttura VxLAN sia presente e fare clic su Fine.

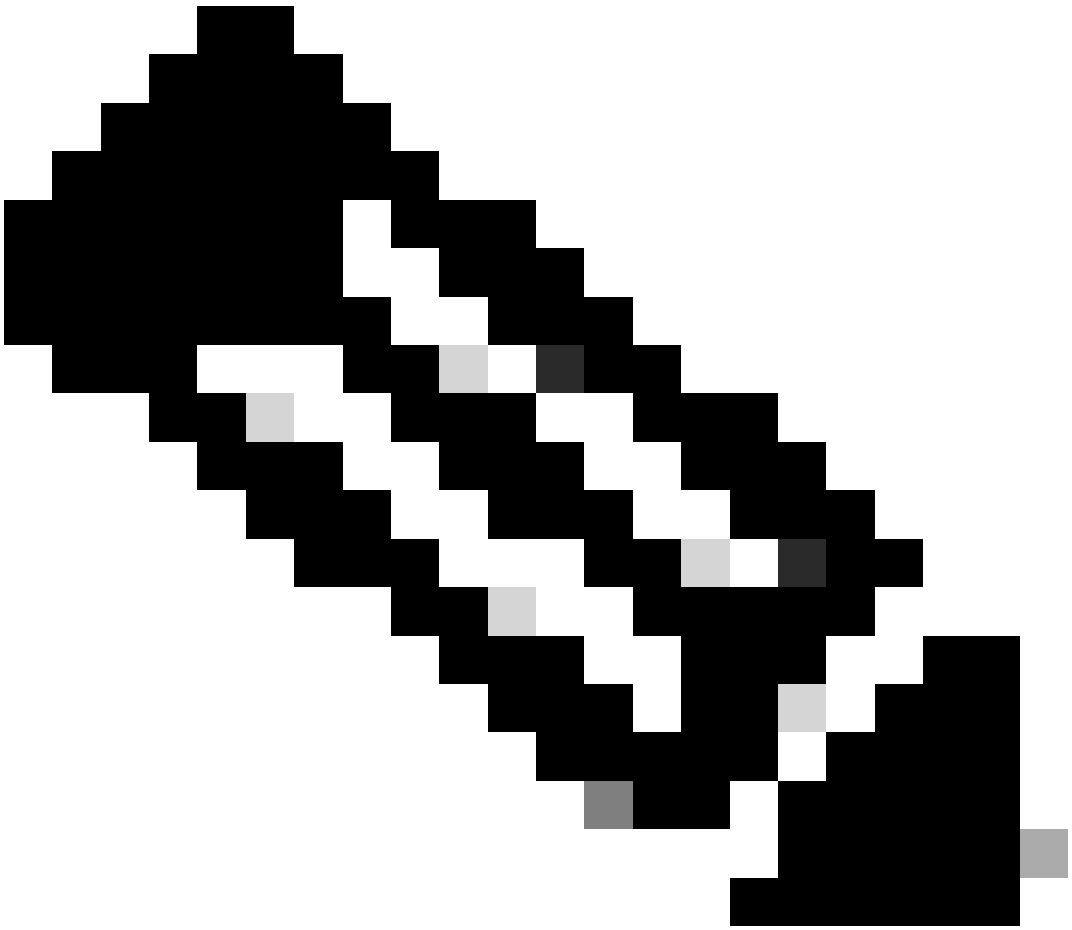



Configurare l'opzione 82 negli ambiti host.

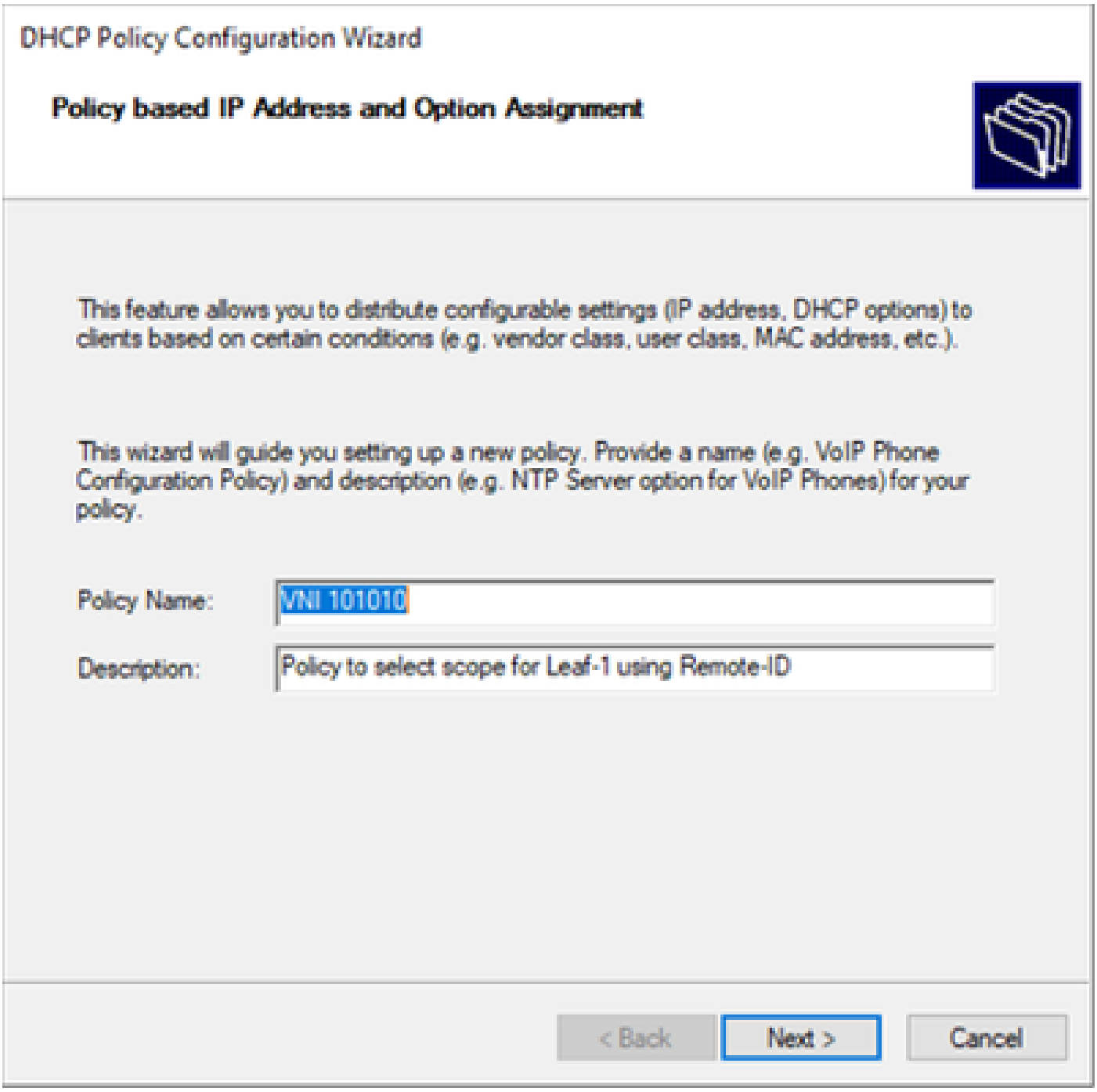
Passaggio 1. Fare clic con il pulsante destro del mouse su Policy (ultima opzione) all'interno dell'ambito per l'host e fare clic su New Policy.



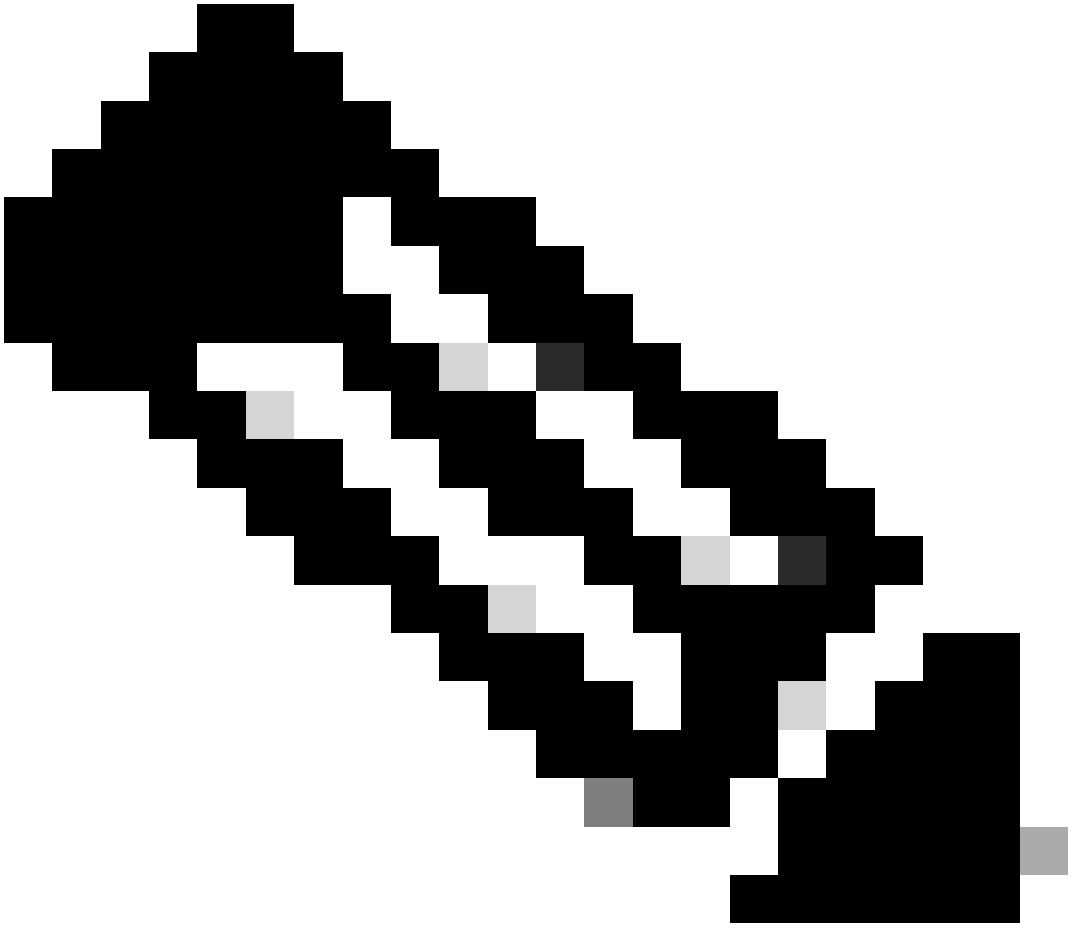
Passaggio 2. Scrivere un nome e una descrizione e fare clic su Avanti.



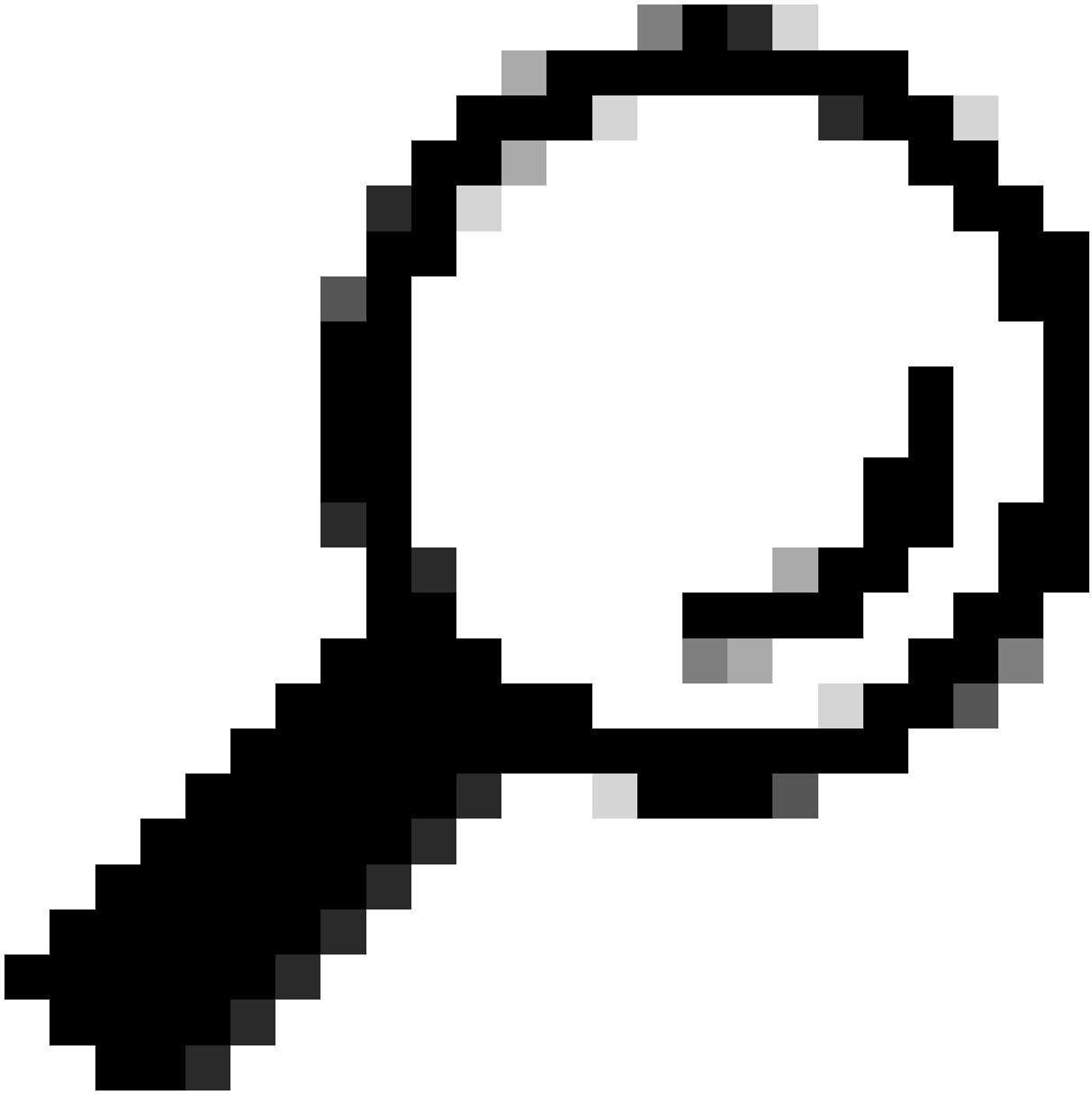
Nota: in questo esempio, il criterio viene creato per selezionare paIP di indirizzamento IP, in particolare per gli host in Leaf-1 per VNI 101010 basedVNI Remote-ID (parametro dell'opzione 82).




Passaggio 3. Fare clic su Add. In Criteri, selezionare Inoltra informazioni sull'agente. In Operatore, selezionare Uguale a. Quindi selezionare Agent Remote ID e digitare il valore. Fare clic su OK, quindi su Avanti.

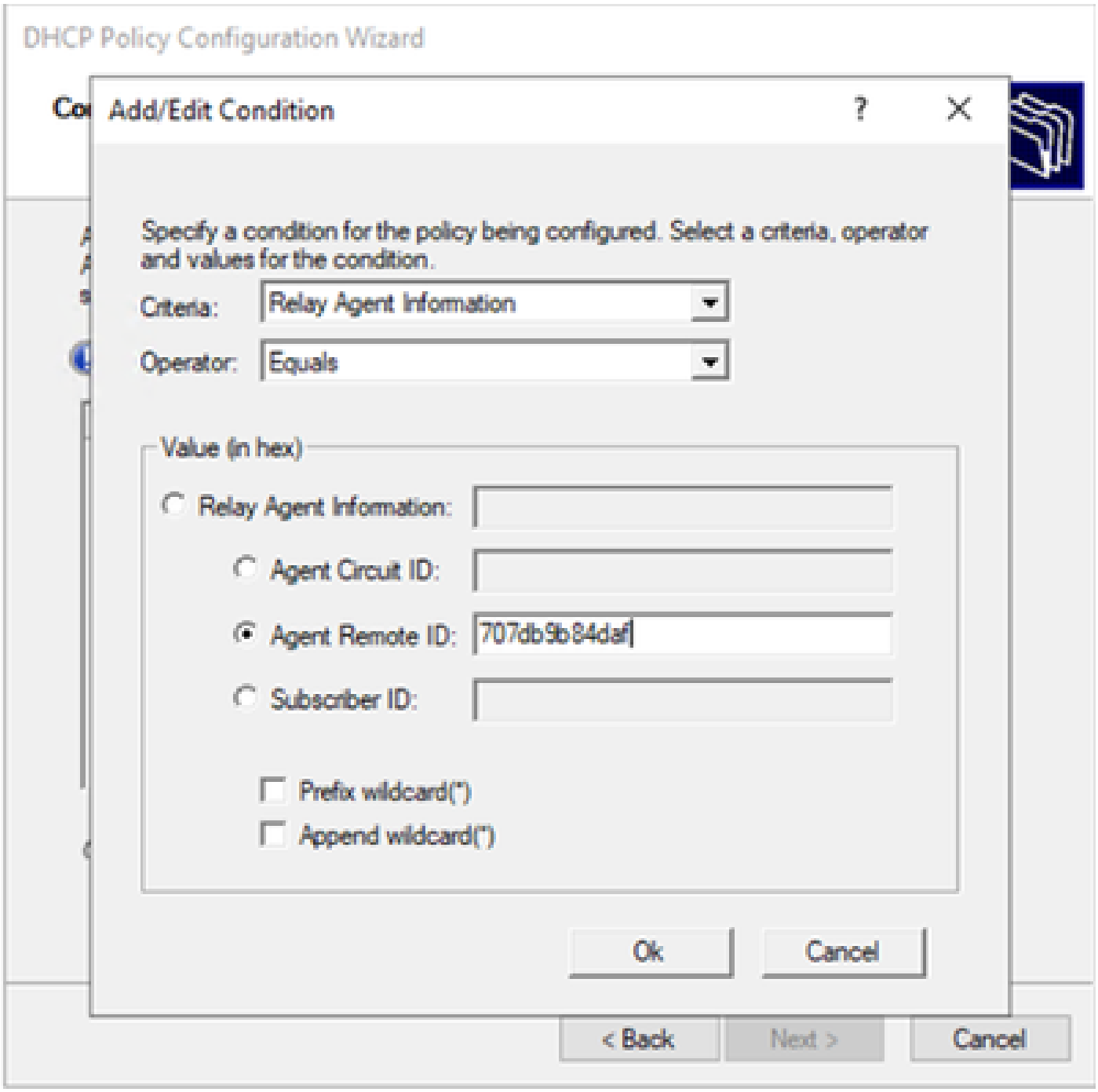


Nota: l'ID remoto viene ottenuto dall'indirizzo MAC dell'SVI a cui è associata la SVI.

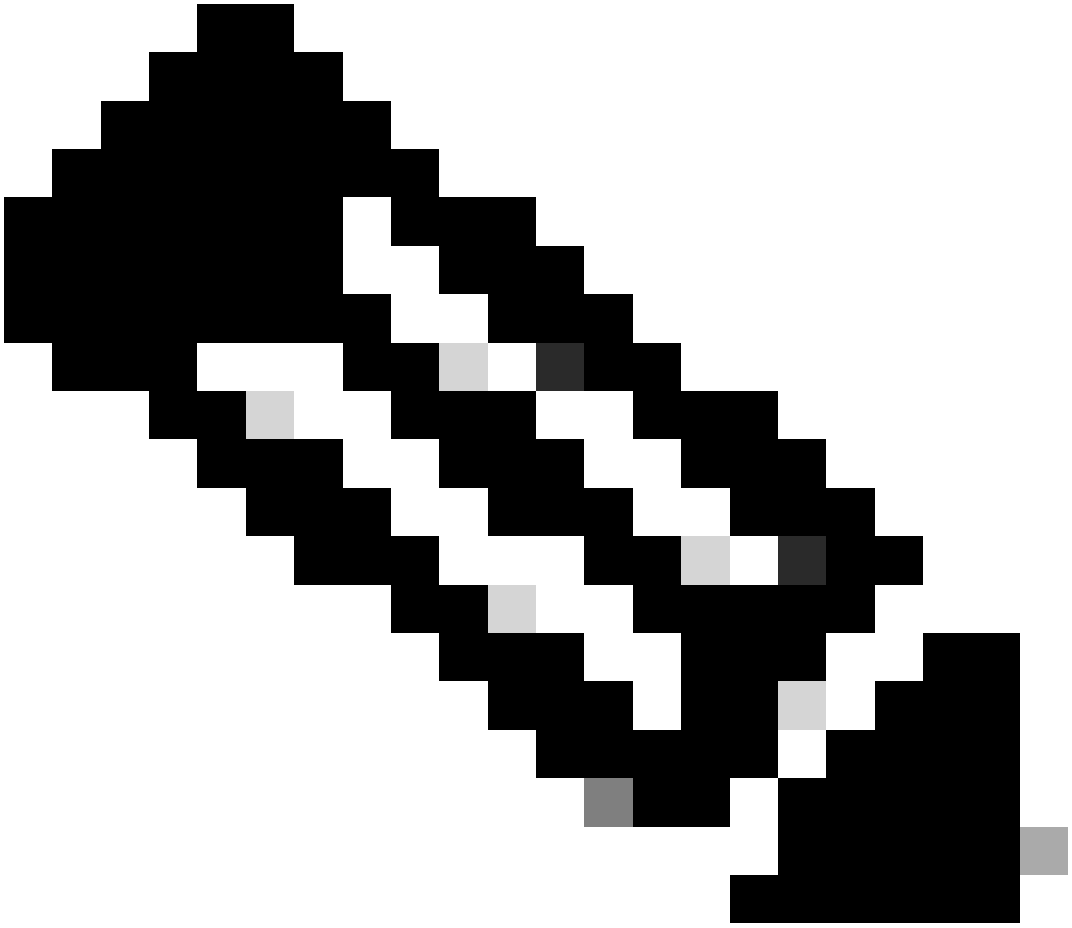


Suggerimento: è possibile applicare un criterio a più ID remoti (o VTEP) aggiungendo ulteriori condizioni e selezionando OR anziché AND.

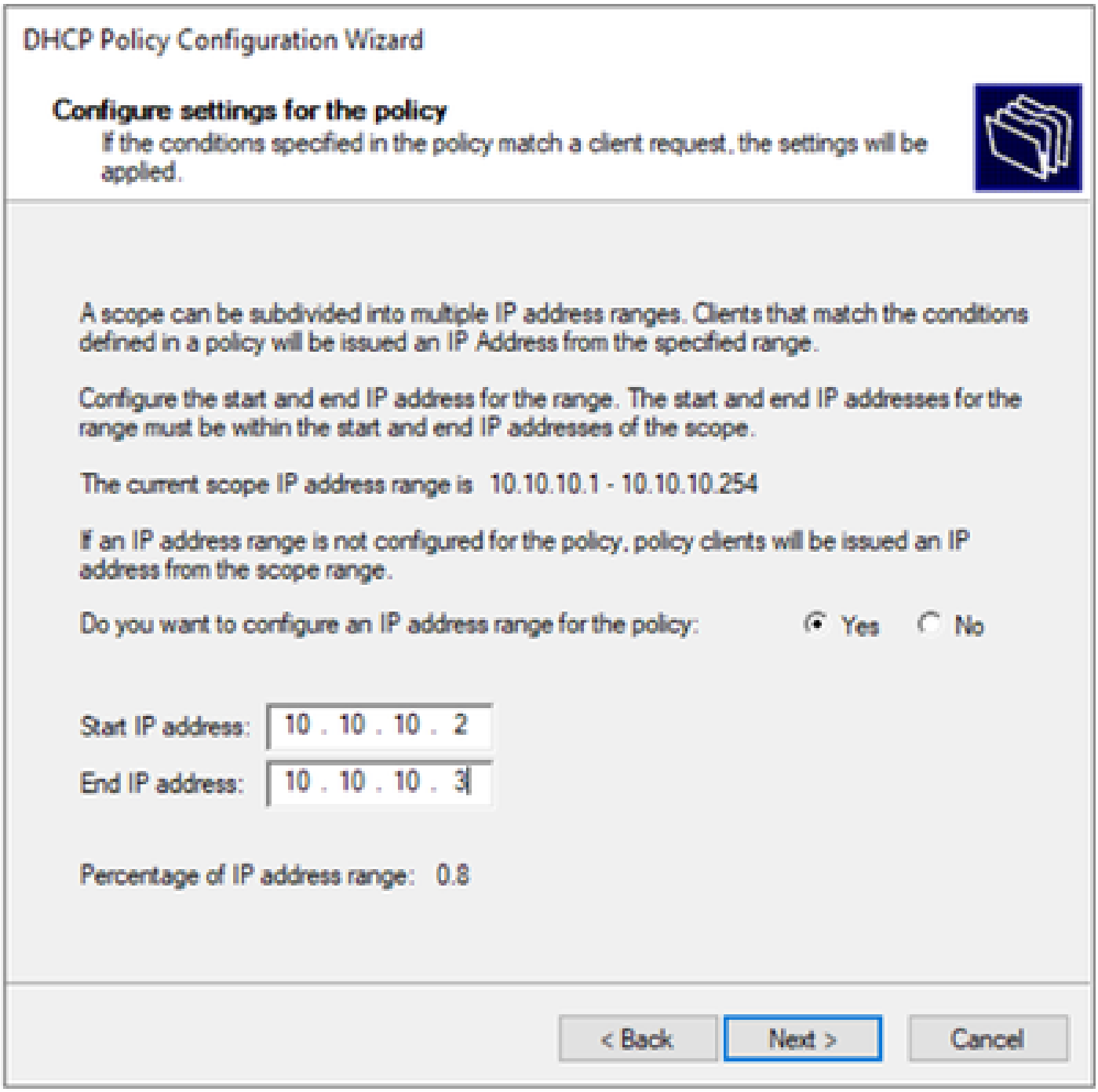
```
LEAF-1# show interface vlan 10
Vlan10 is up, line protocol is up, autostate enabled
  Hardware is EtherSVI, address is  707d.b9b8.4daf <<<<
  Internet Address is 10.10.10.1/24
 <snip>
```



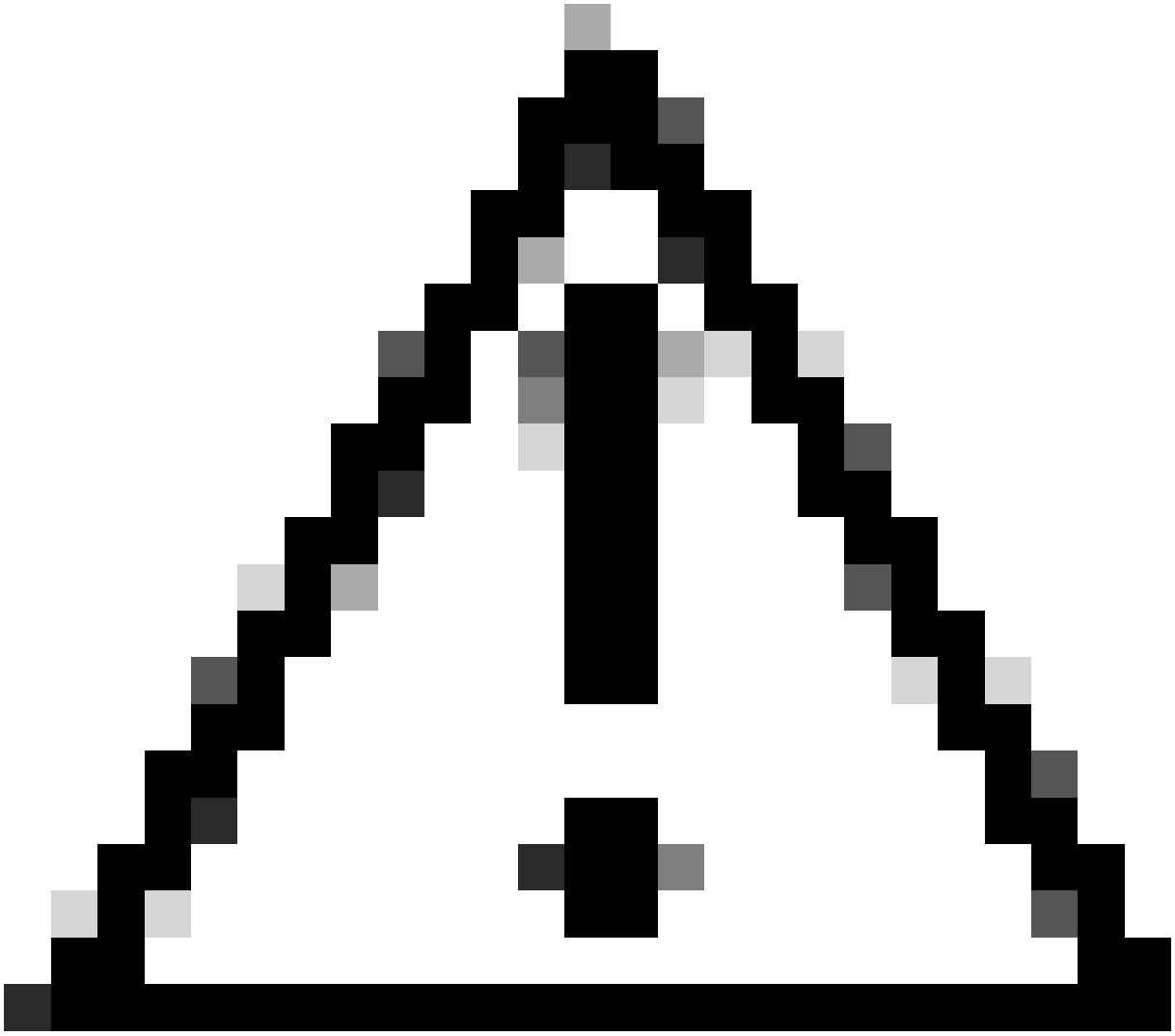

Passaggio 4. Configurare l'indirizzo IP che gli indirizzi IP esistenti possono utilizzare sui VTEP selezionati dall'ID, quindi fare clic su Avanti.



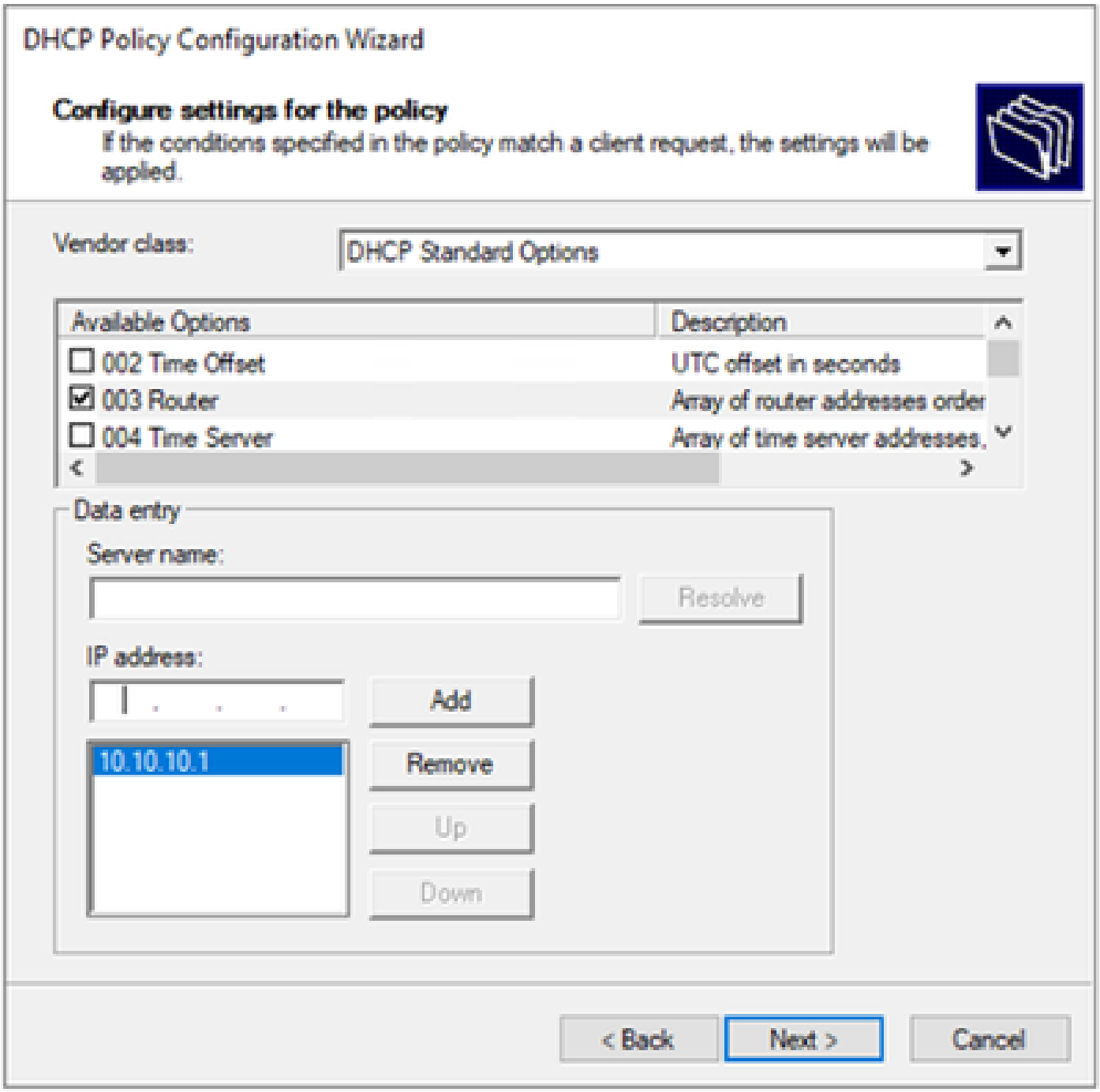
Nota: in questo esempio esiste solo una macchina virtuale connessa a Foglia-1, quindi è richiesto un solo indirizzo IP. Qui viene aggiunto un secondo indirizzo IPn caso un altro host si connetta.



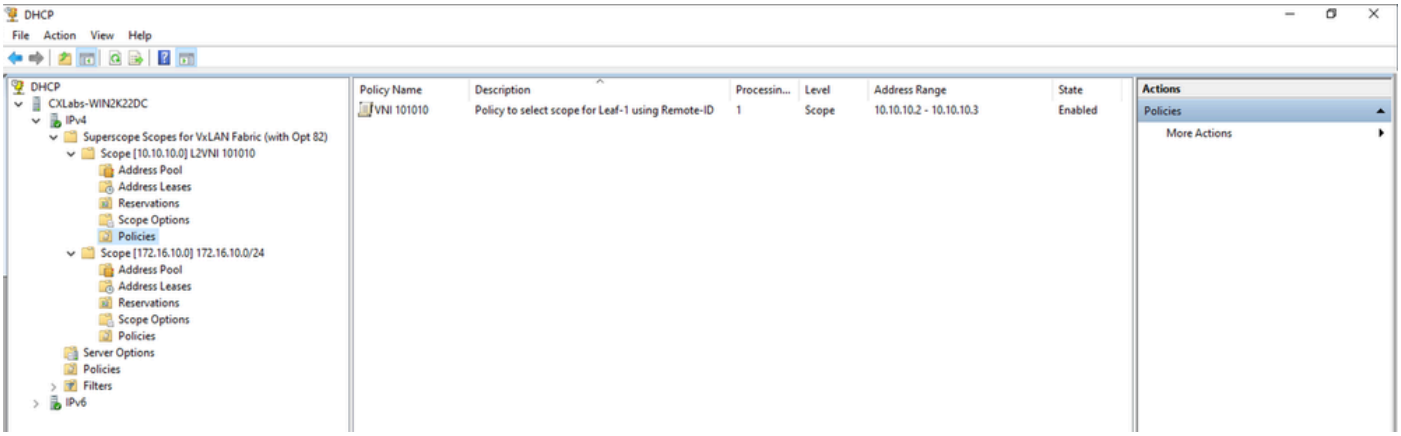

Passaggio 5. Selezionare la casella a sinistra di 003 Router in DCHP Standard Option. Scrivere quindi l'indirizzo IP del gateway predefinito per gli host che appartengono a questo criterio e premere Aggiungi. Fare clic su Next (Avanti).



Attenzione: è possibile selezionare più di un'opzione, ma in caso di dubbi sul valore da immettere, non selezionarla. Una configurazione incoerente o errata può causare un comportamento imprevisto.




Passaggio 6. Verificare le condizioni dei criteri e fare clic su Fine.

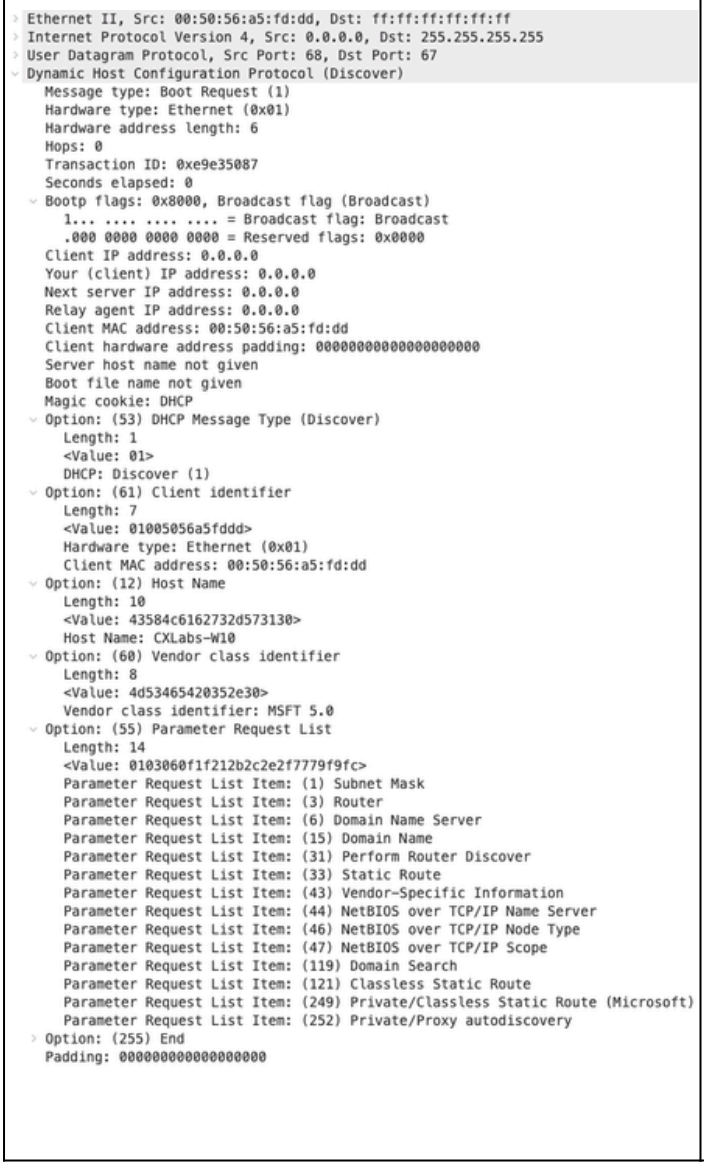
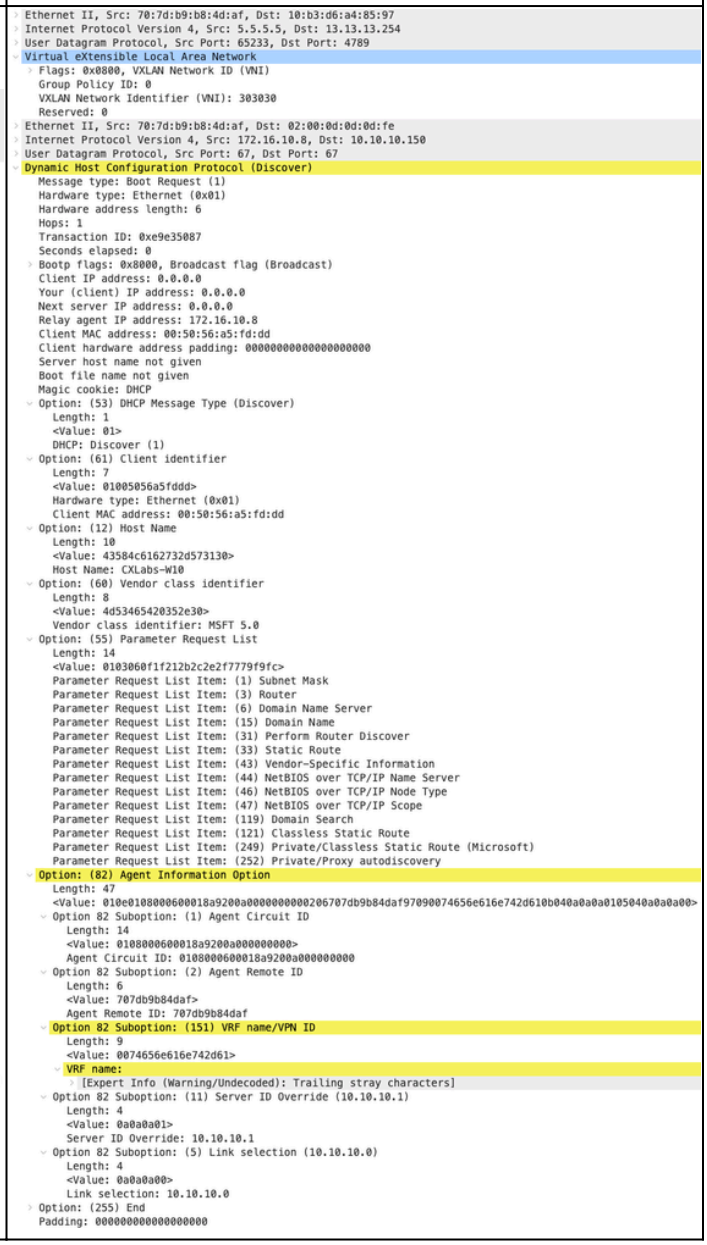


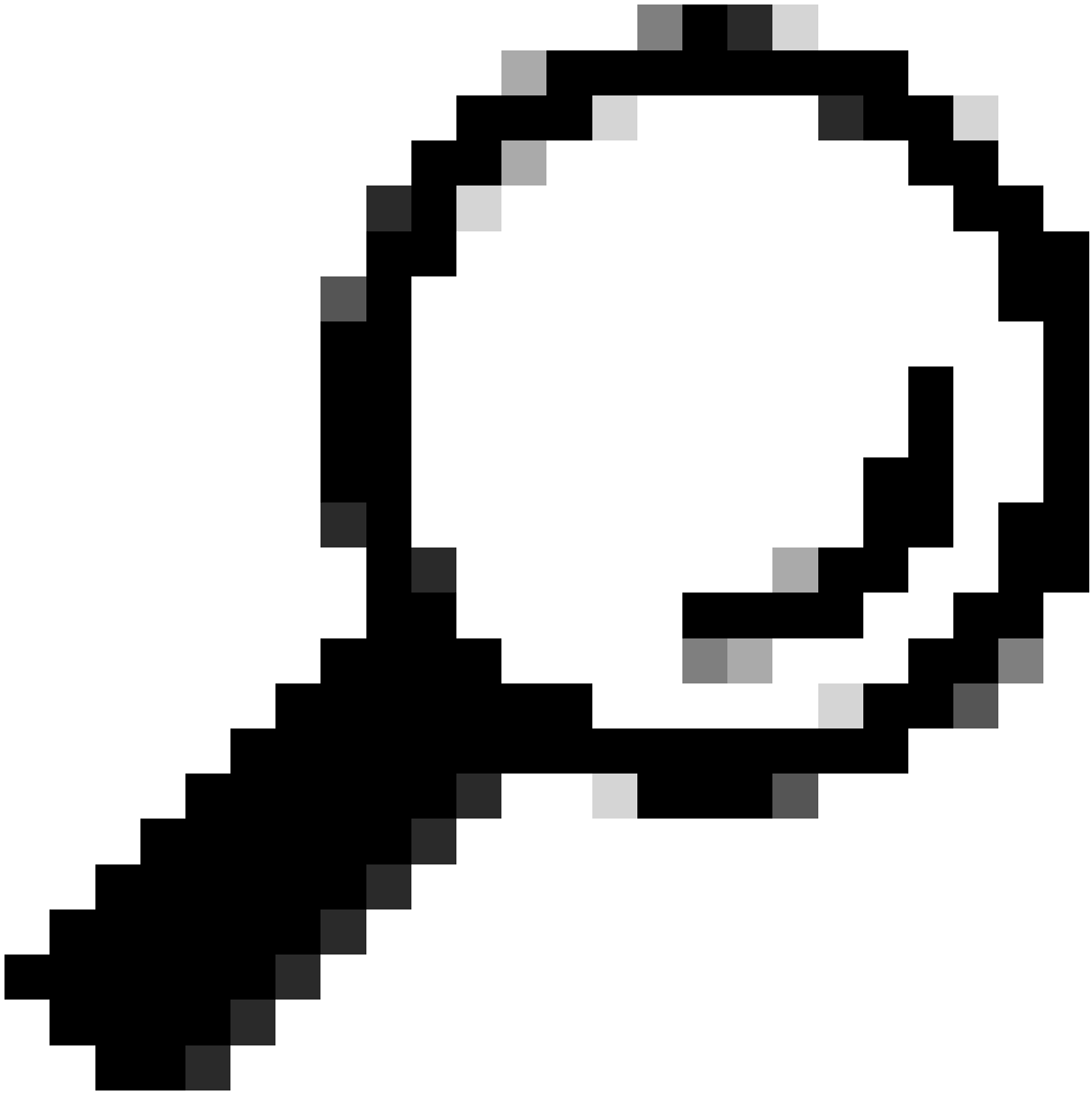
# Packet-walk DCHP dall'inizio alla fine in VxLAN Fabric.

Discovery inviato dall'HOST-1

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

# Rilevamento su FOGLIA-1

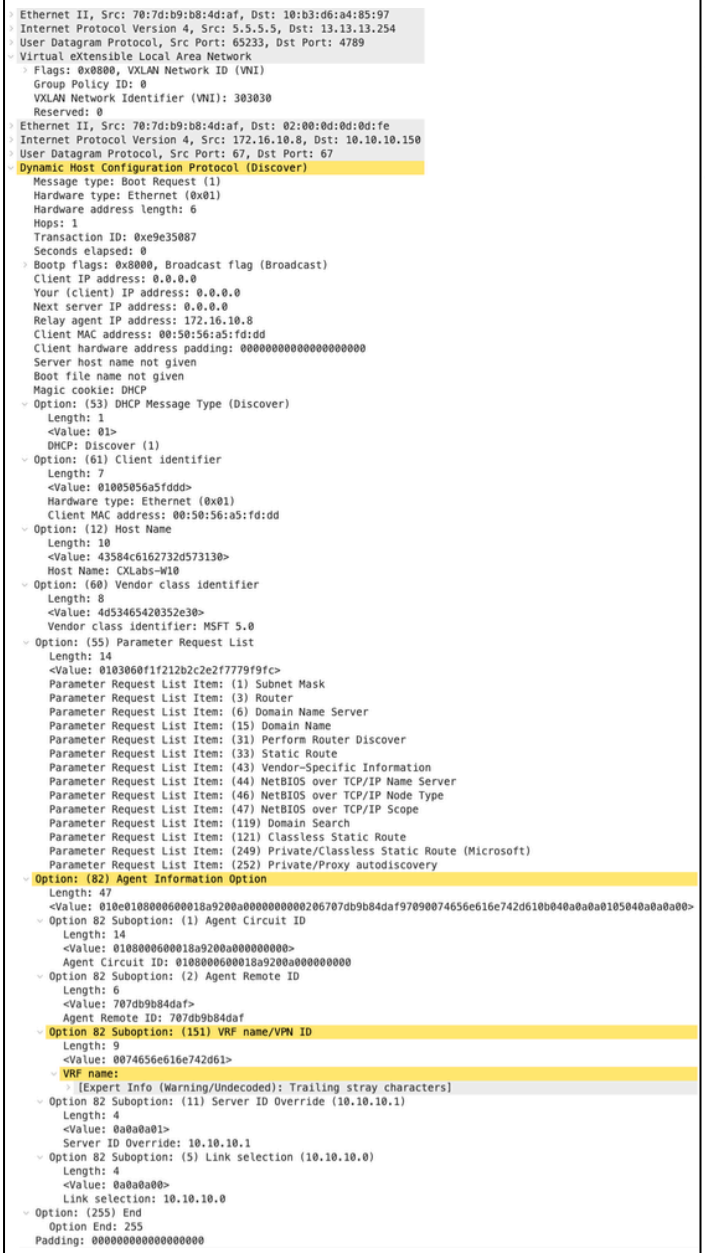
| Rilevamento ricevuto su LEAF-1 | Individuazione invio da FOGLIA-1 |
| --- | --- |
|  |  |

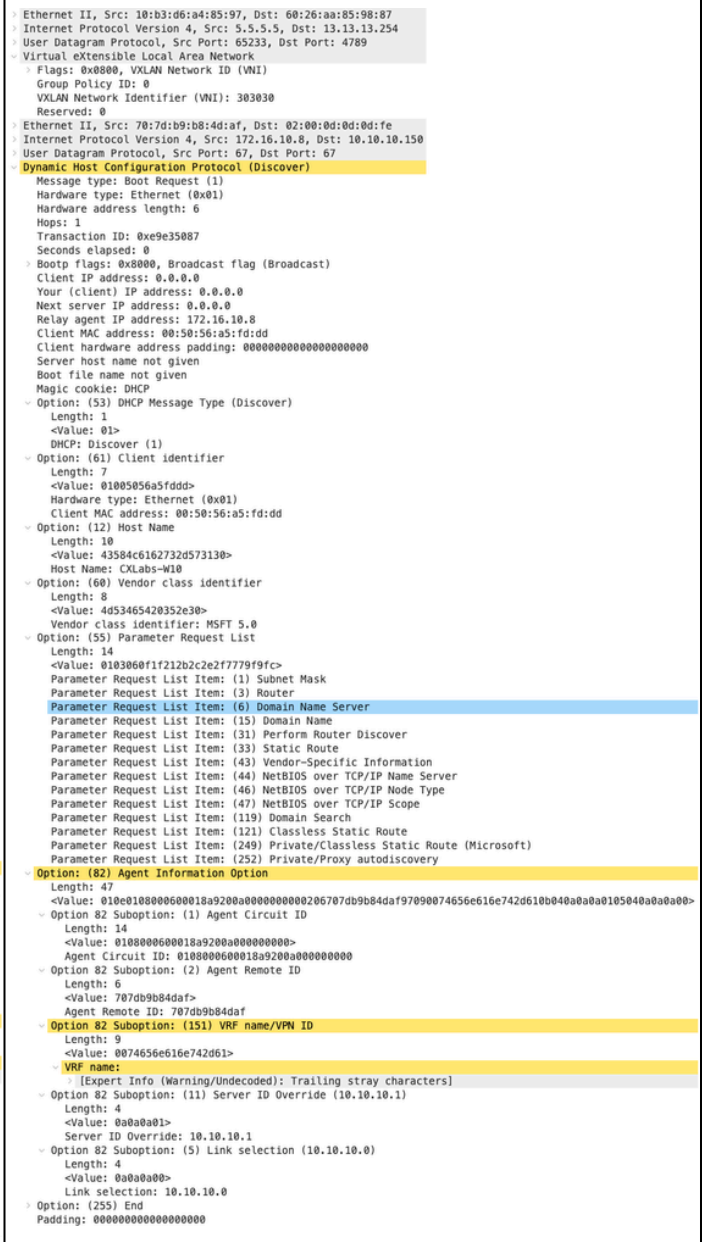


Suggerimento: quando si fa doppio clic, l'immagine si ingrandisce.

## Rilevamento sul dorso

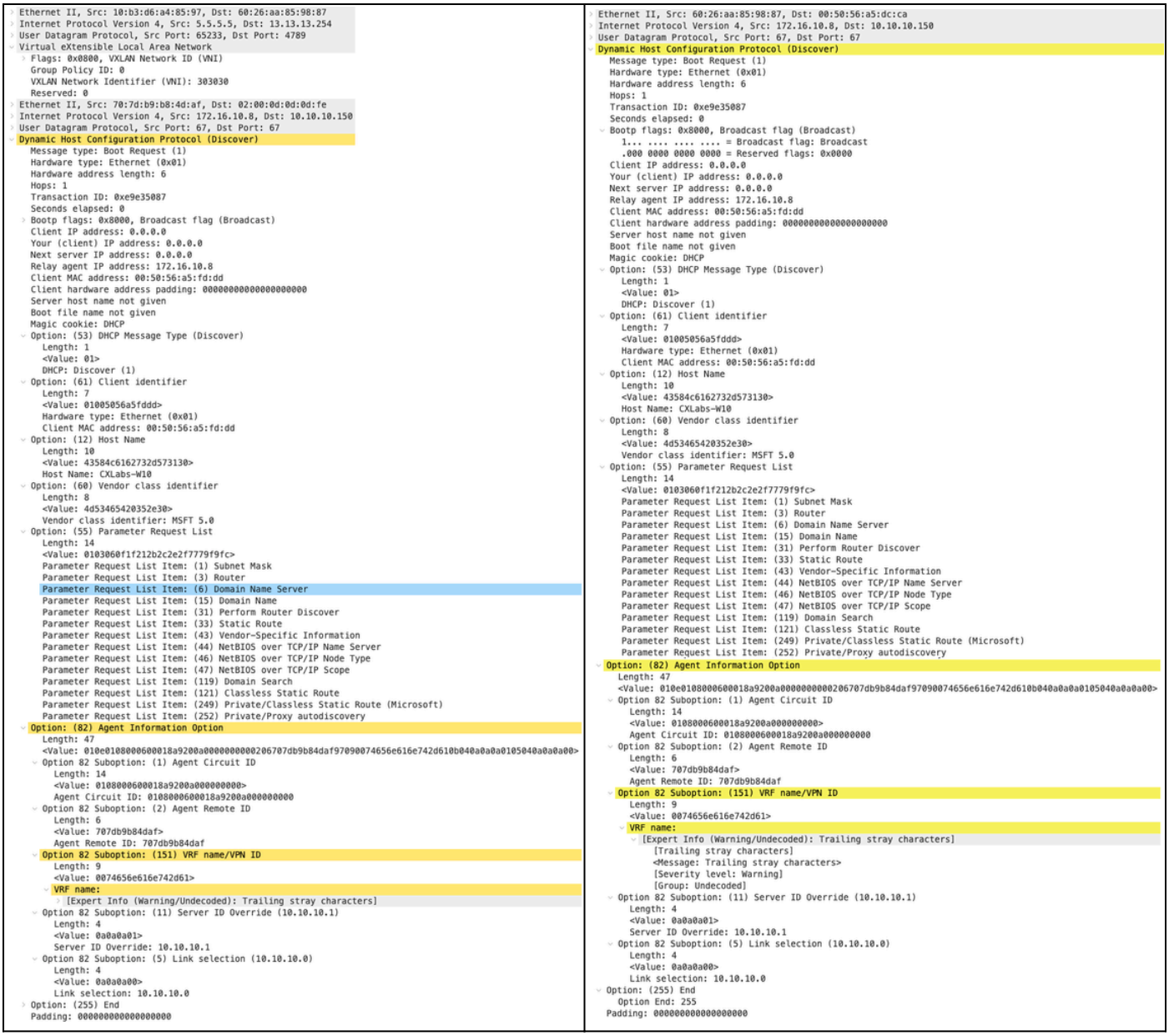
| Rilevamento ricevuto su SPINE | Individuazione invio per SPINE |
| --- | --- |

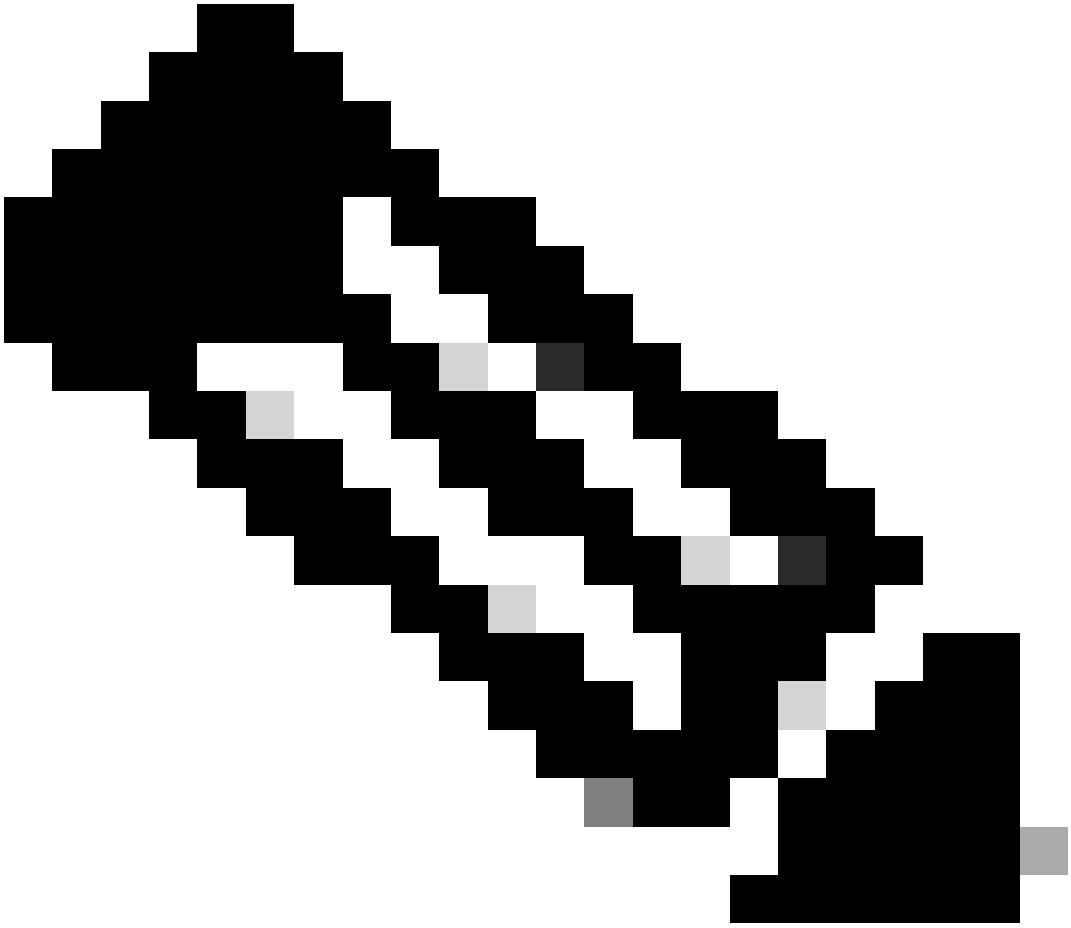



## Discovery su LEAF-1-vPC

| Rilevamento ricevuto su LEAF-1-vPC | Discovery inviato da LEAF-1-vPC |
|---|---|


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

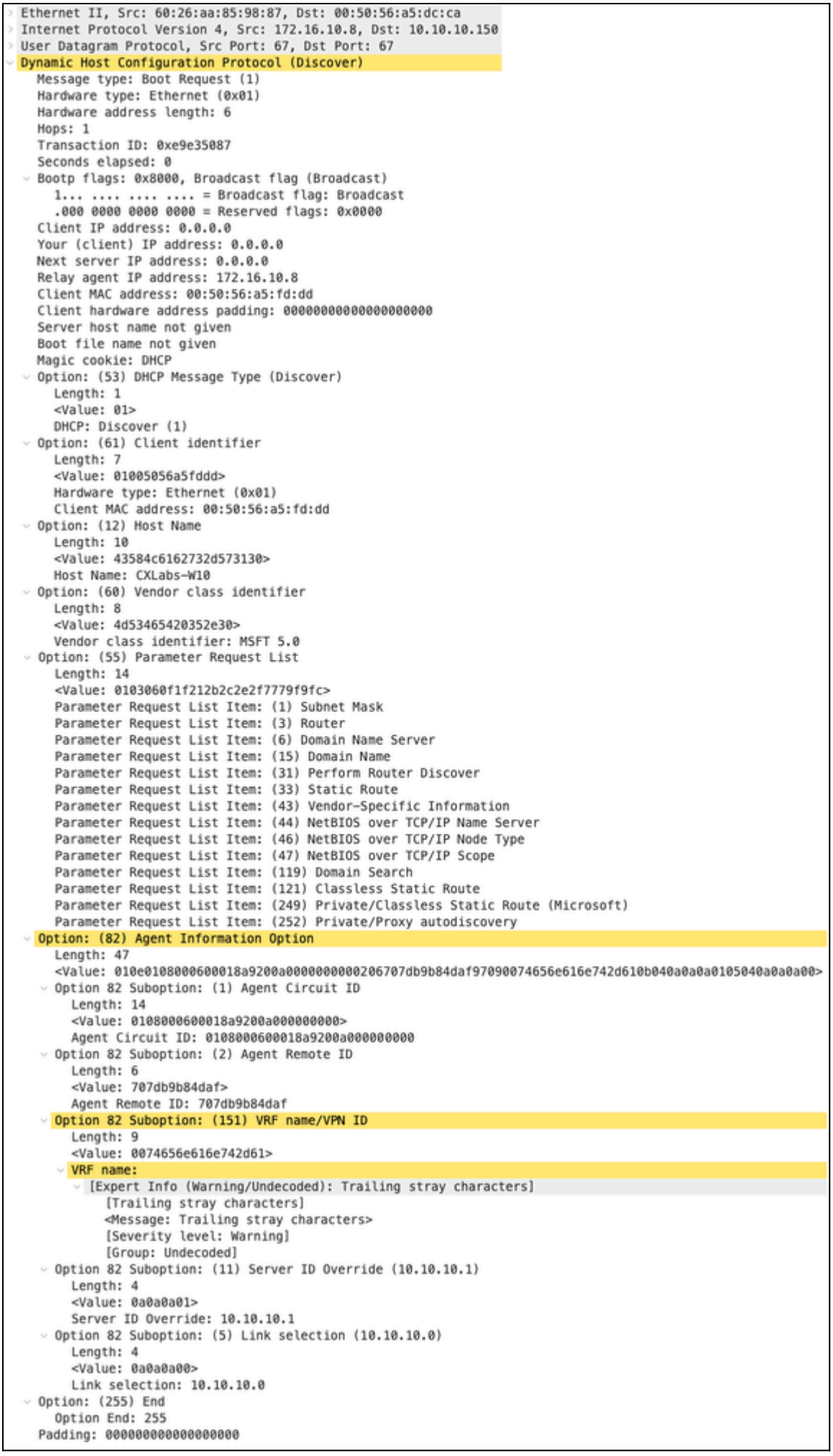


Nota: LEAF-2-vPC riceve il pacchetto Discovert, ma è solo commutato. L'indirizzo MAC di destinazione appartiene al server DHCP.

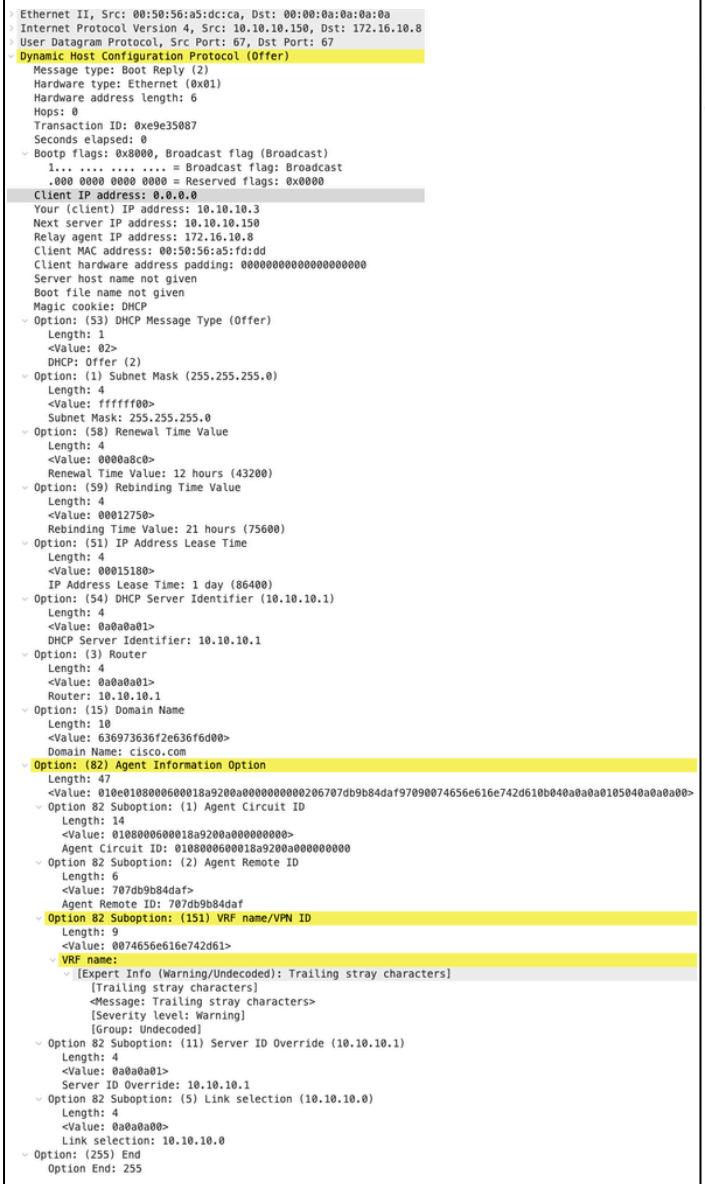
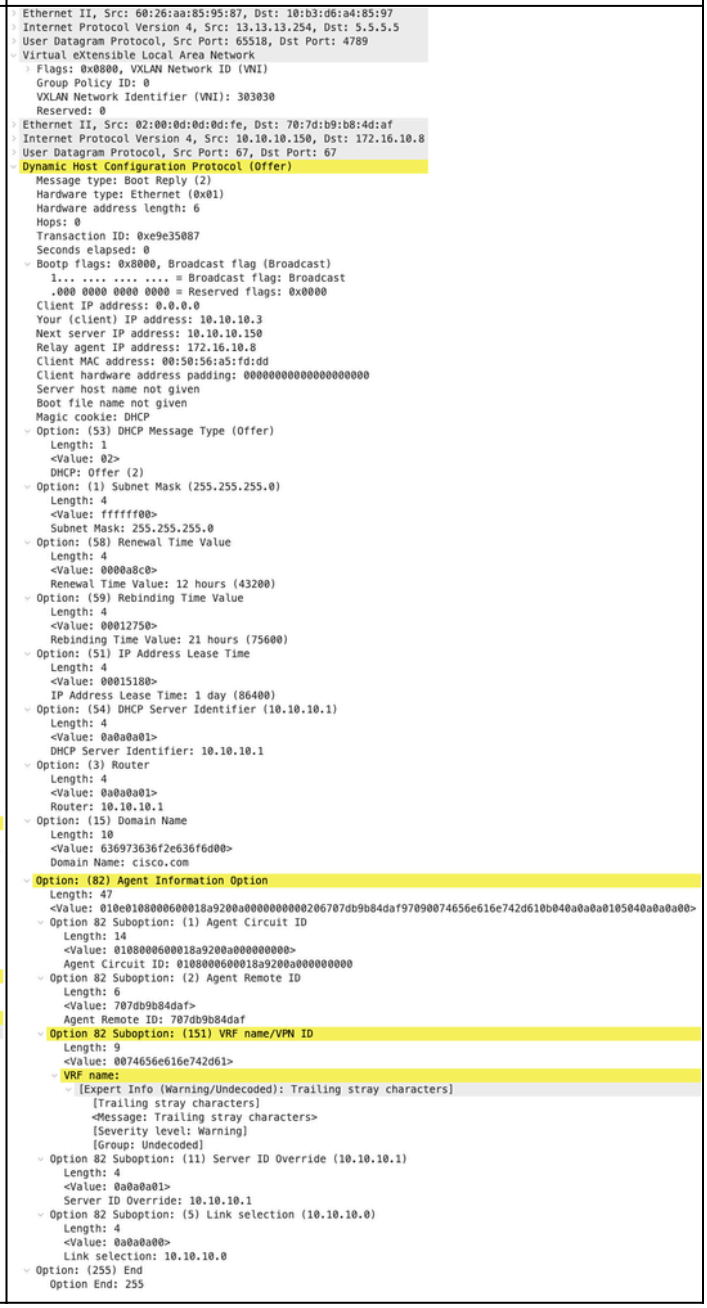
Rilevamento ricevuto sul server DHCP

```
> Ethernet II, Src: 60:26:aa:85:98:87, Dst: 00:50:56:a5:dc:ca
> Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
> User Datagram Protocol, Src Port: 67, Dst Port: 67
v 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
  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: 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 (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: (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:
        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
    Padding: 000000000000000000
```

Offerta DHCP inviata dal server DHCP


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

## Offerta DHCP su LEAF-2-vPC

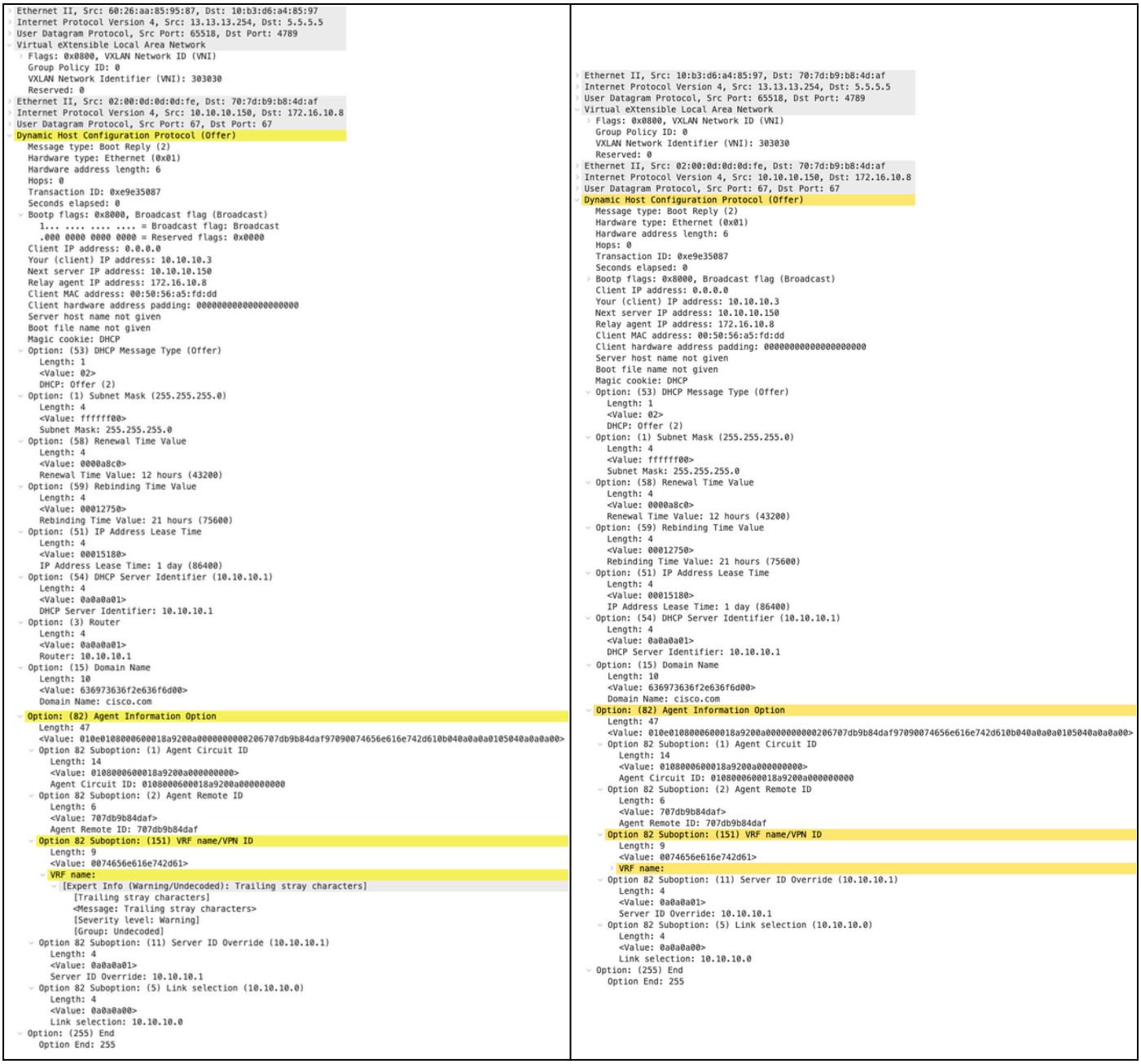
| Offerta ricevuta su LEAF-2-vPC | Offerta inviata da LEAF-2-vPC |
| --- | --- |
|  |  |

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

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

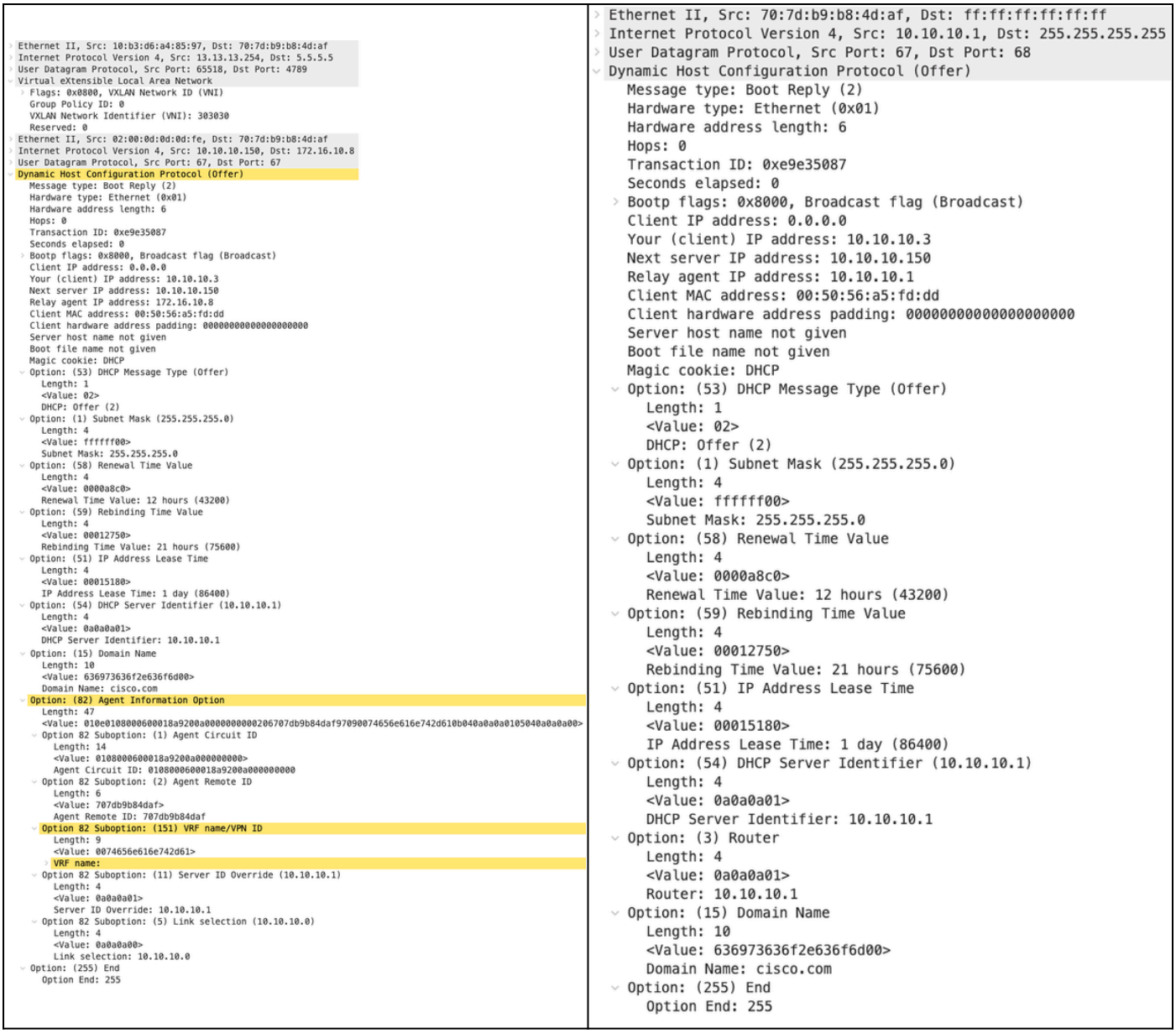
## Offerta DHCP vPC SPINE

| Offerta ricevuta su SPINE | Invia offerta per SPINE |
| --- | --- |




## Offerta DHCP su LEAF-1

| Offerta ricevuta su LEAF-1 | Invio offerta su FOGLIA-1 |
| --- | --- |



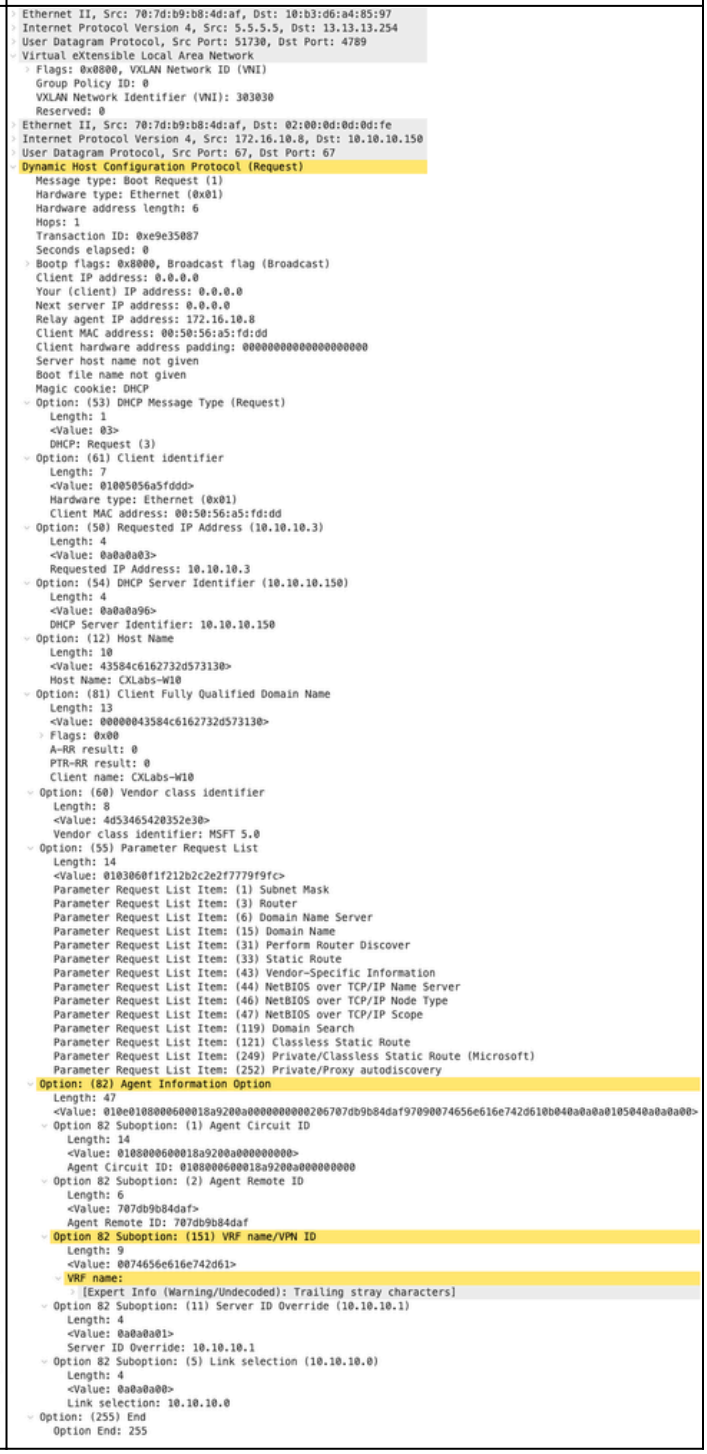

Offerta DHCP ricevuta su HOST-1

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

Richiesta inviata da HOST-1

```
> Ethernet II, Src: 00:50:56:a5:fd:dd, Dst: ff:ff:ff:ff:ff:ff
> Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
> User Datagram Protocol, Src Port: 68, Dst Port: 67
v Dynamic Host Configuration Protocol (Request)
    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 (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 (10.10.10.1)
      Length: 4
      <Value: 0a0a0a01>
      DHCP Server Identifier: 10.10.10.1
  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>
    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: 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: (255) End
      Option End: 255
```

## Richiesta su FOGLIA-1

| Richiesta ricevuta su LEAF-1 | Richiesta inviata da LEAF-1 |
|---|---|
|  |  |

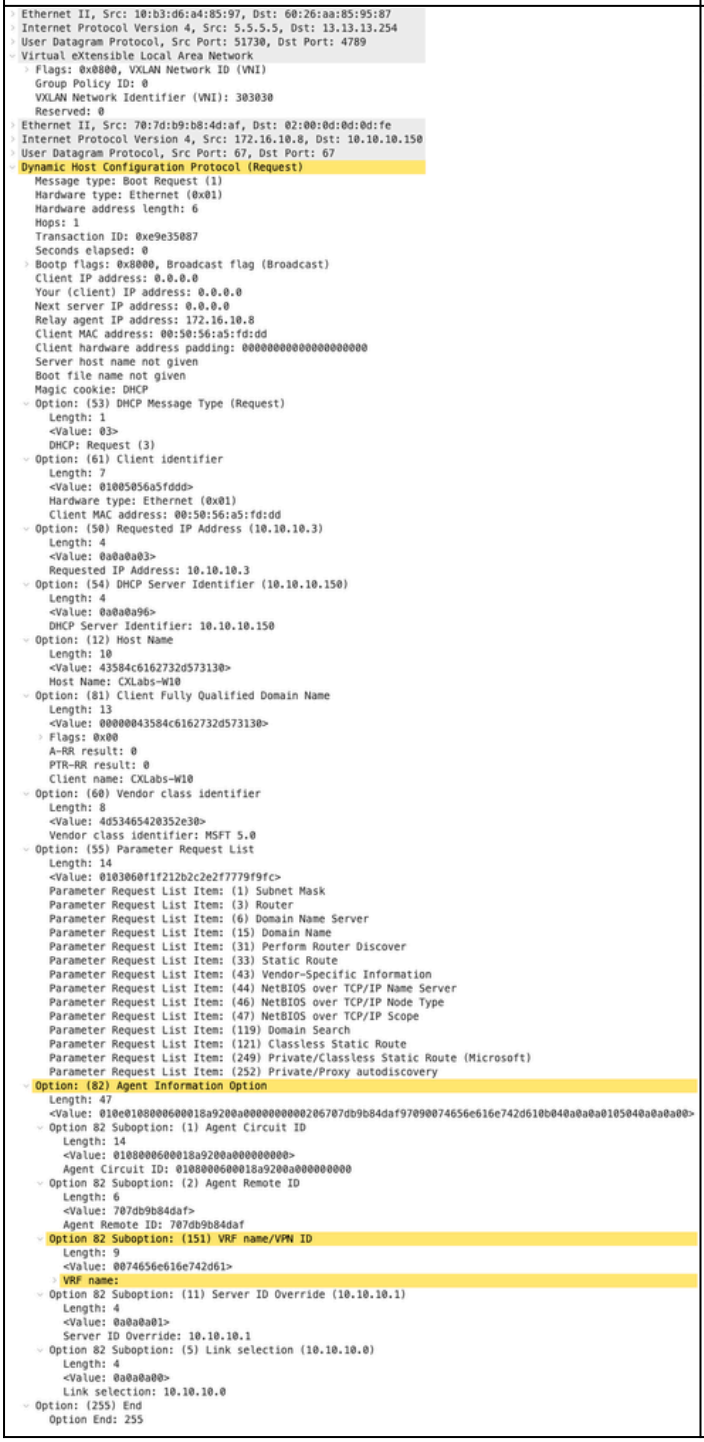
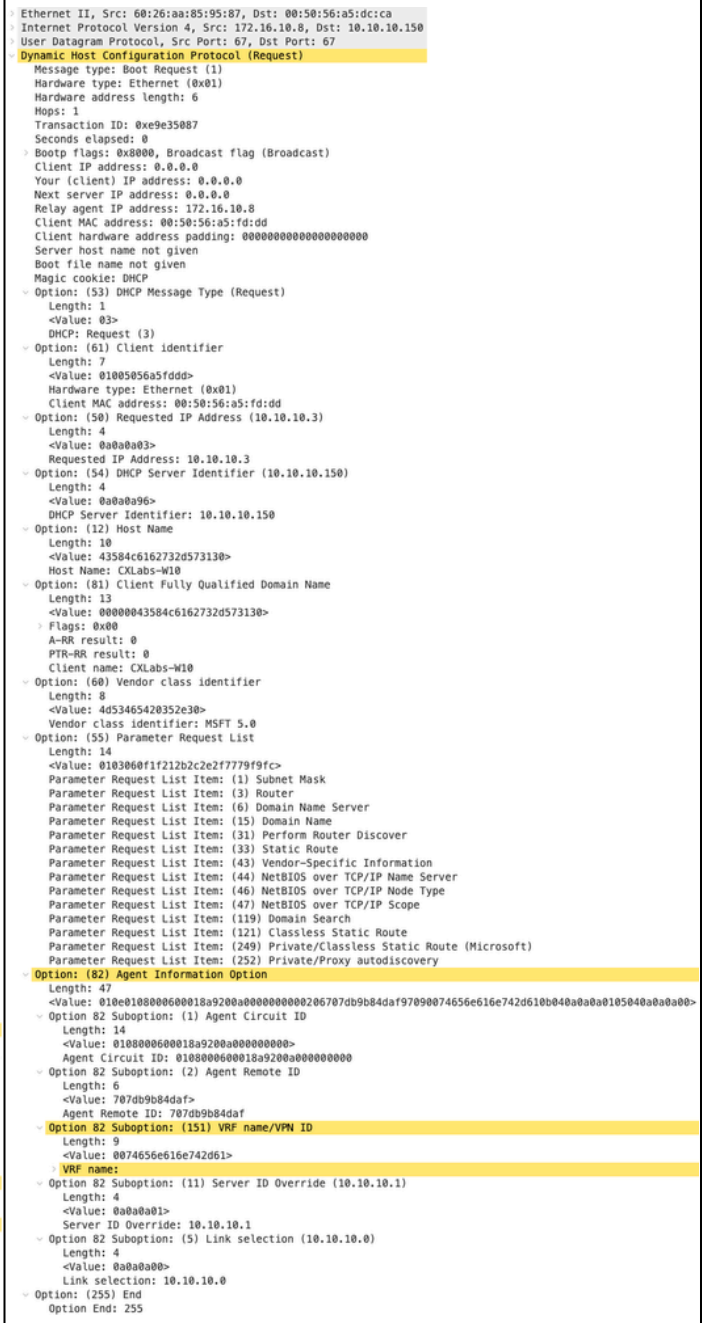
## Richiesta sul dorso

| Richiesta ricevuta su SPINE | Richiesta inviata da SPINE |
|---|---|

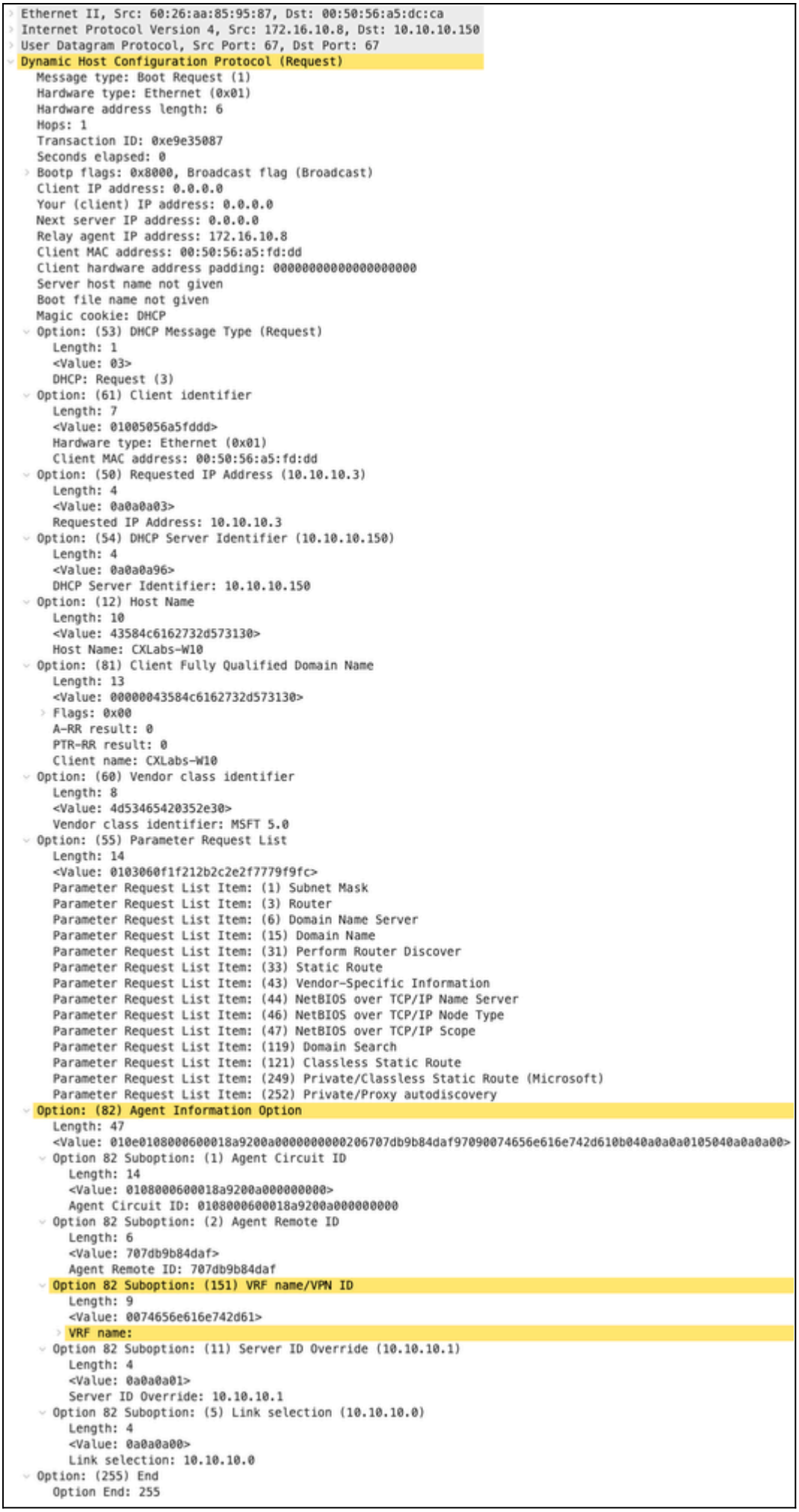
```
> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 10:b3:d6:a4:85:97
> Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
> User Datagram Protocol, Src Port: 51730, Dst Port: 4789
v Virtual eXtensible Local Area Network
  > Flags: 0x0800, VXLAN Network ID (VNI)
    Group Policy ID: 0
    VXLAN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

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

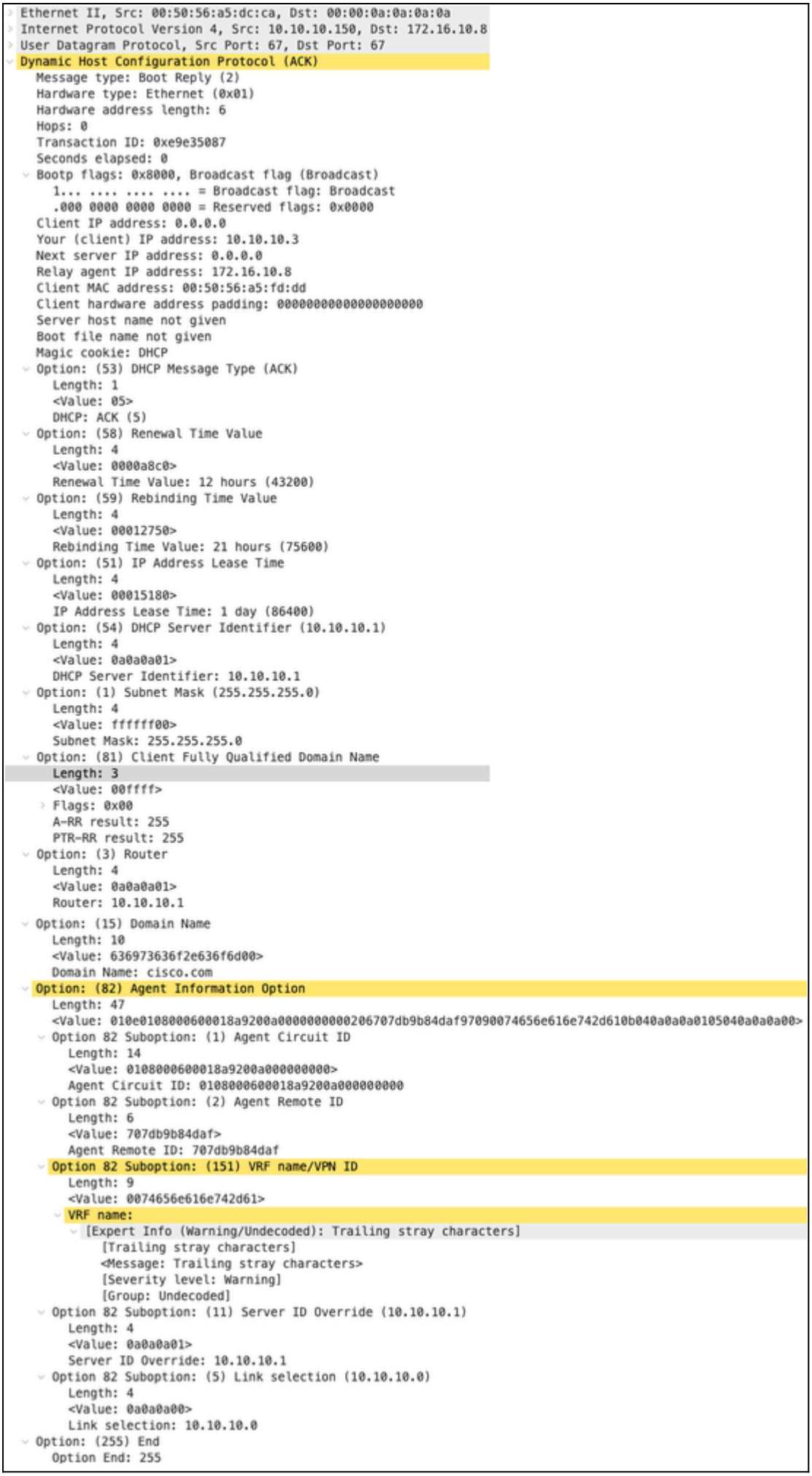
## Richiesta su LEAF-2-vPC

| Richiesta receivePCd su LEAF-2-vPC | Richiesta di invio tramite vPCAF-2-vPC |
| --- | --- |
|  |  |

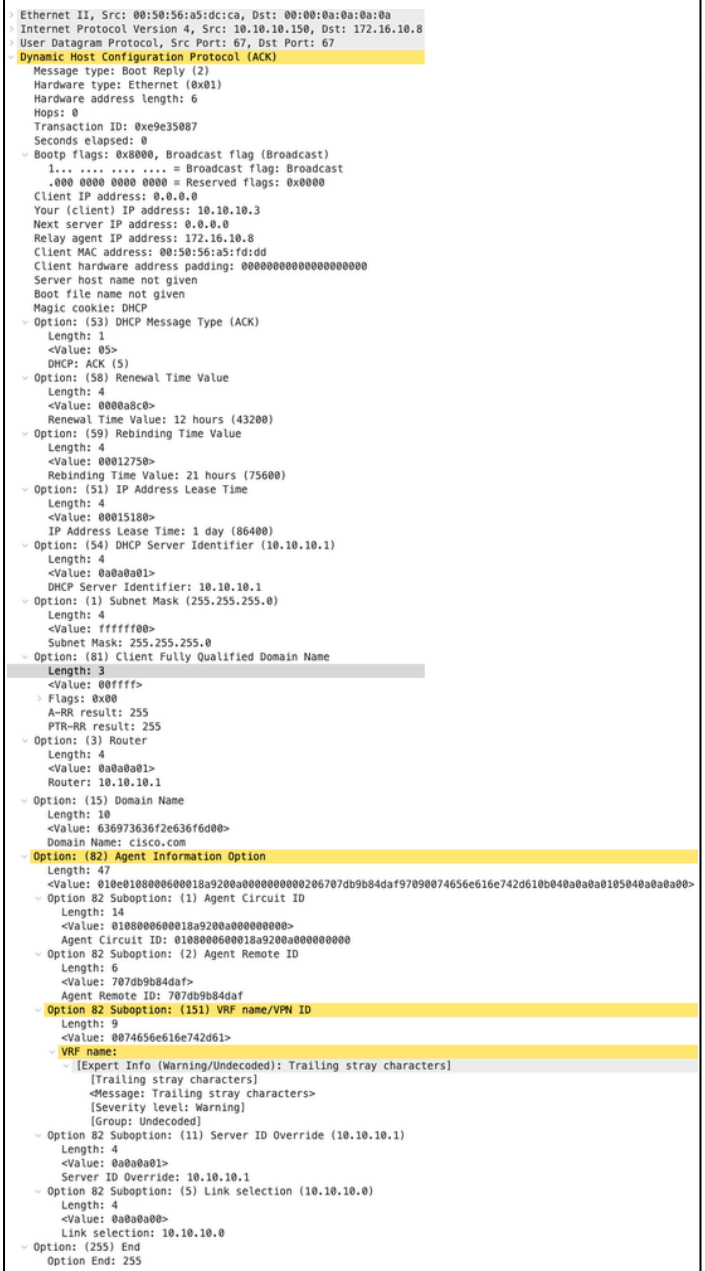
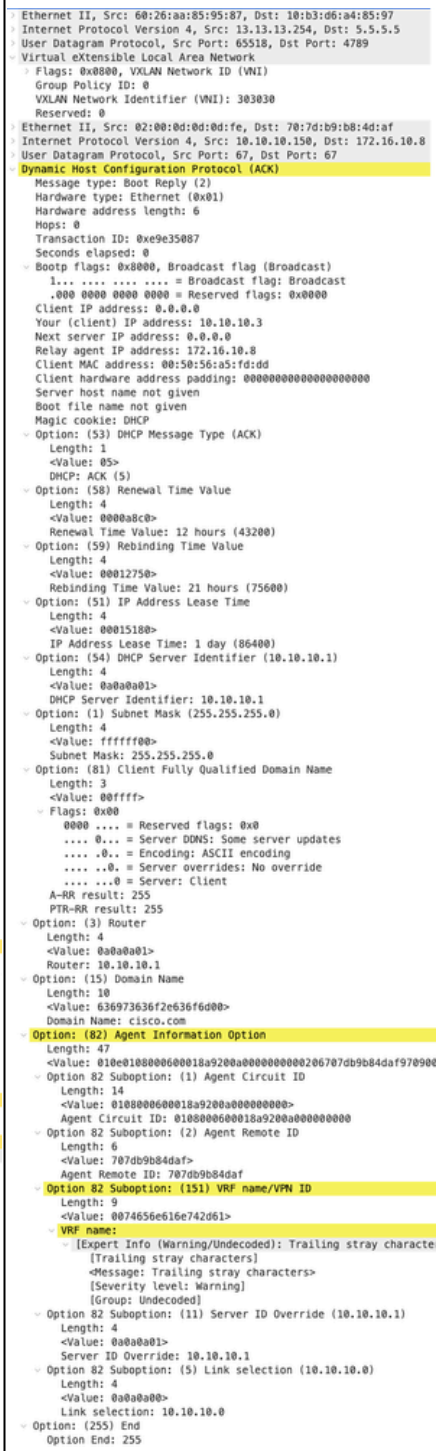
## Richiesta ricevuta sul server DHCP


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

Invio ACK dal server DHCP


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

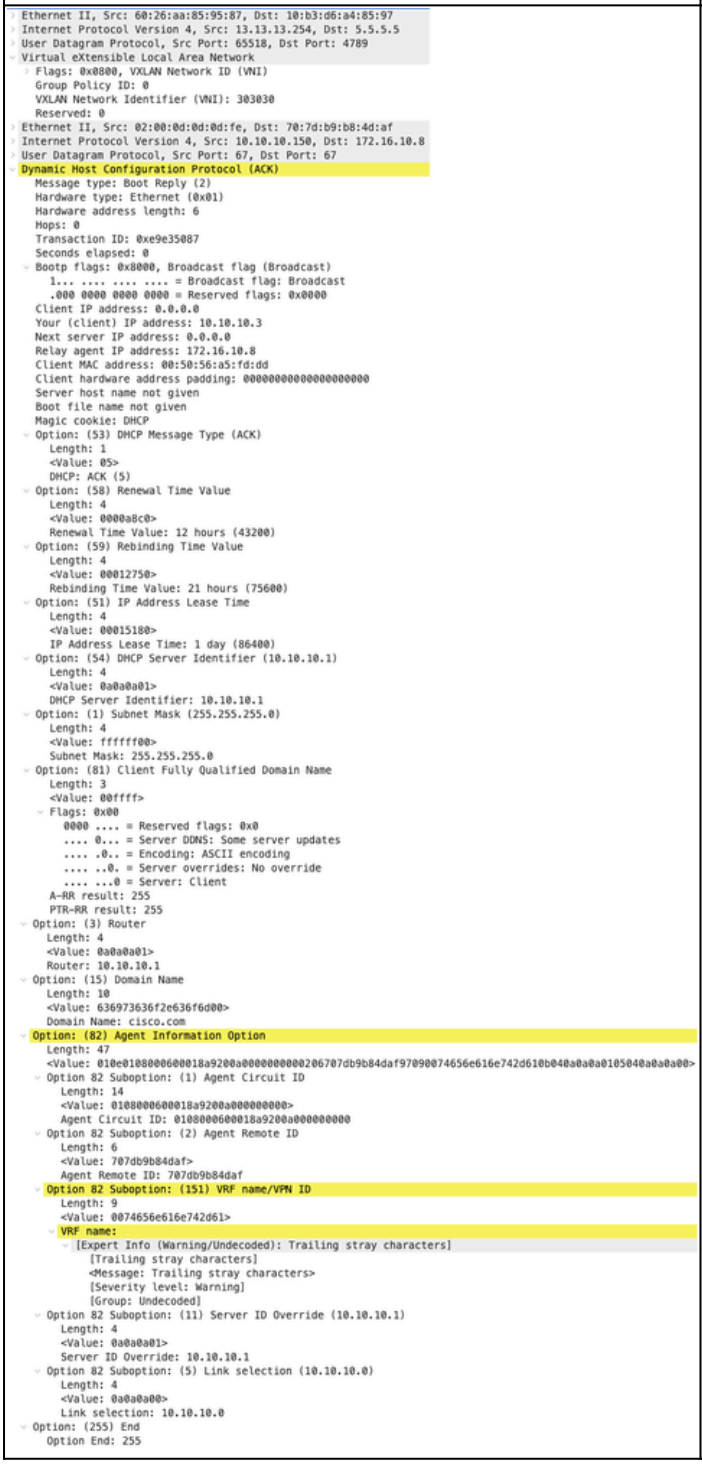
# ACK su LEAF-2-vPC

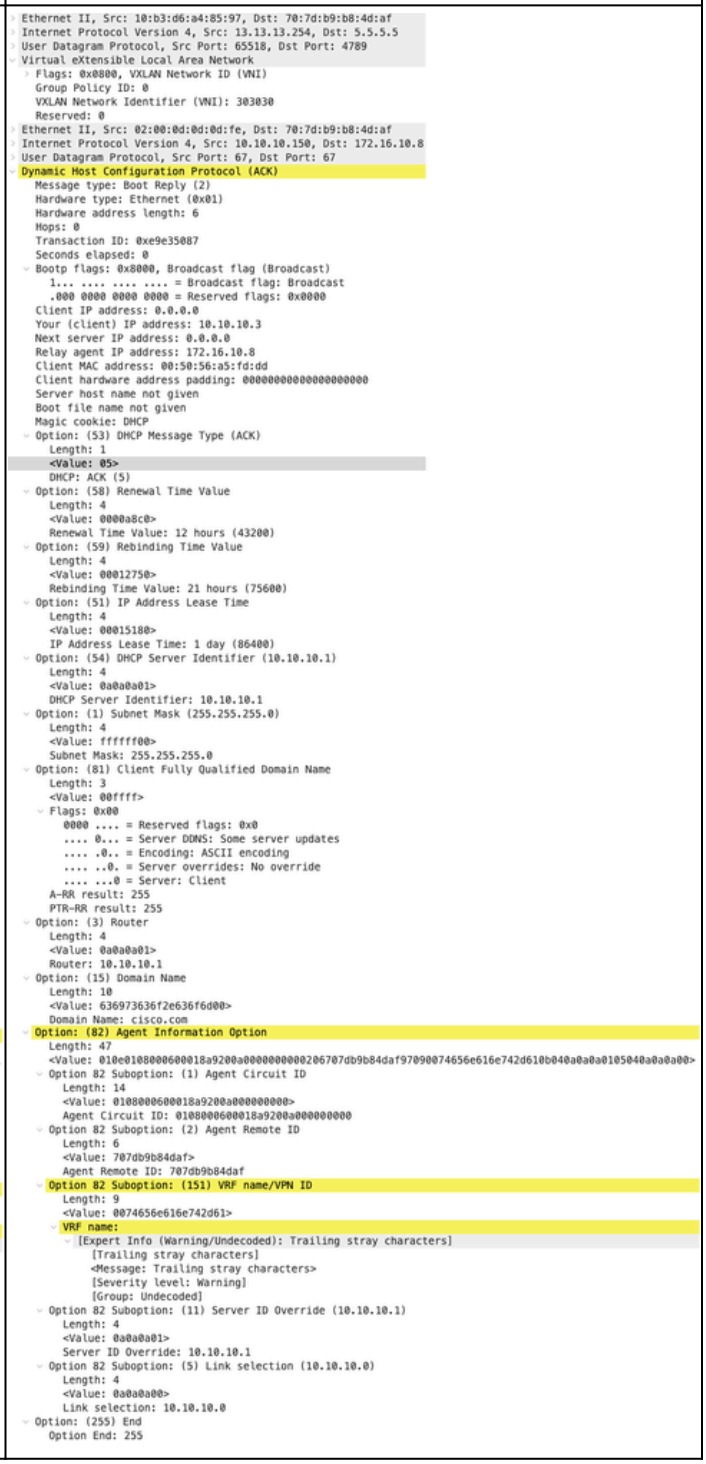
| ACK ricevuti su LEAF-2-vPC | ACK inviati da LEAF-2-vPC |
| --- | --- |
|  |  |

| | |
|---|---|
| | |

## ACK sul DORSO

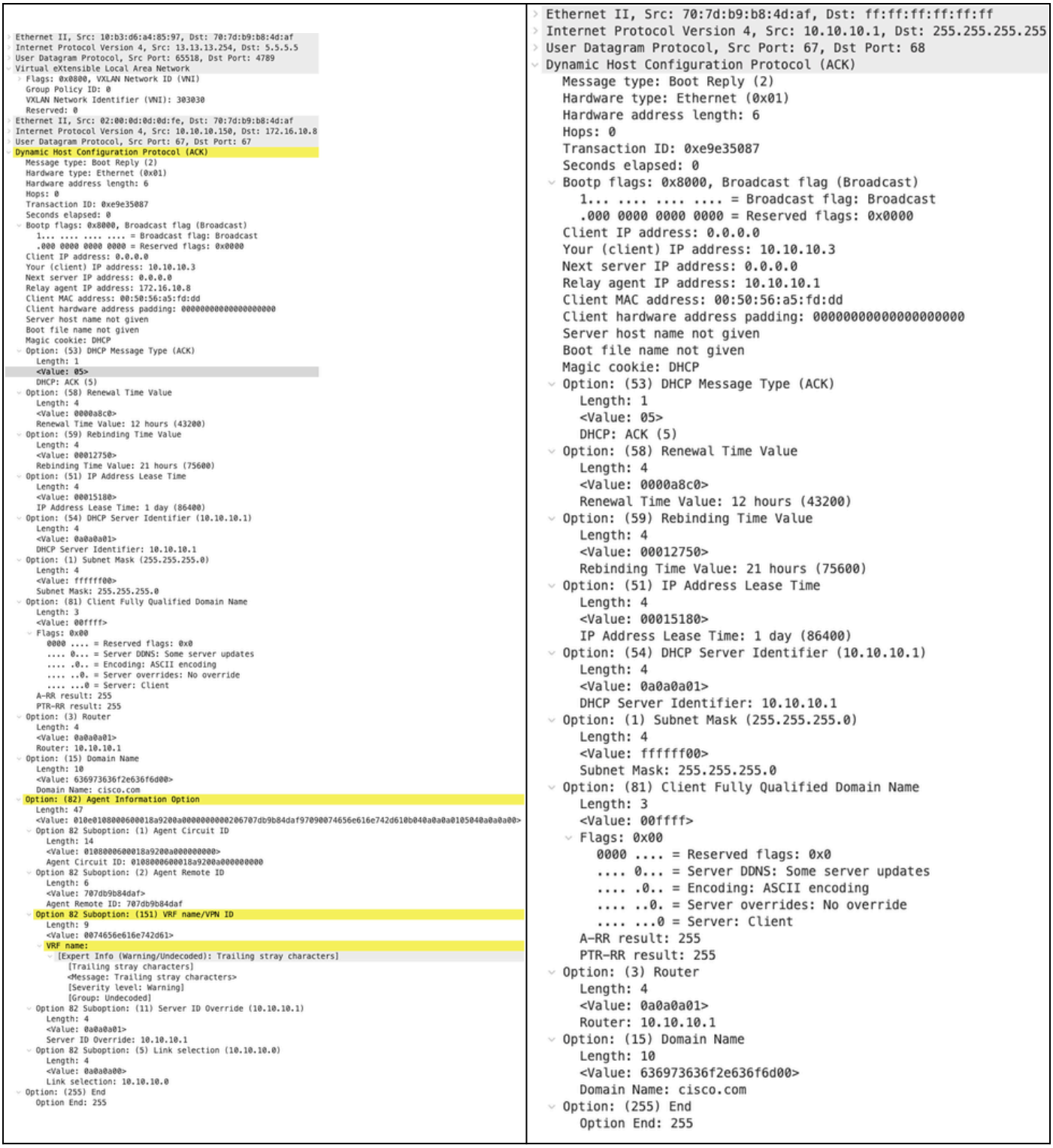
| ACK ricevuti su SPINE | ACK inviati da SPINE |
|---|---|




## ACK su FOGLIA-1

| ACK ricevuti su FOGLIA-1 | ACK inviati da FOGLIA-1 |
|---|---|


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

ACK su HOST-1

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

## Informazioni correlate

Configurazione di VXLAN BGP VPN

Configurazione di VXLAN

Risoluzione dei problemi relativi a DHCP su Nexus 9000

Guida alla configurazione di Cisco Nexus serie 9000 NX-OS VXLAN, versione 10.4(x)

Informazioni su questa traduzione

Cisco ha tradotto questo documento utilizzando una combinazione di tecnologie automatiche e umane per offrire ai nostri utenti in tutto il mondo contenuti di supporto nella propria lingua. Si noti che anche la migliore traduzione automatica non sarà mai accurata come quella fornita da un traduttore professionista. Cisco Systems, Inc. non si assume alcuna responsabilità per l’accuratezza di queste traduzioni e consiglia di consultare sempre il documento originale in inglese (disponibile al link fornito).