

# 為使用NX-OS和Windows Server 2022的Nexus 9000配置並驗證VxLAN交換矩陣中的DHCP

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## 簡介

本文檔介紹如何在具有Nexus 9000交換機的VxLAN交換矩陣中配置DHCP並對其進行故障排除。

## 必要條件

### 需求

思科建議您瞭解以下主題：

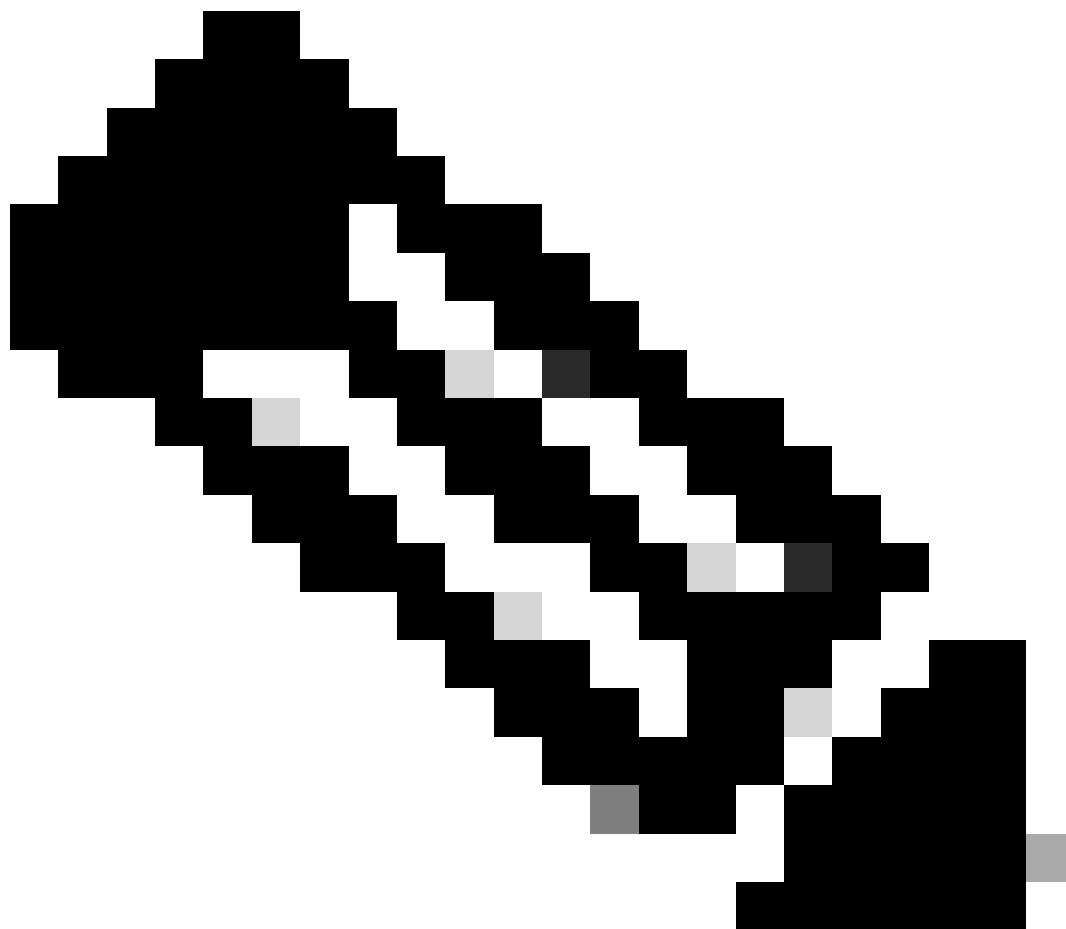
- Nexus NX-OS軟體。
- 虛擬連線埠通道(vPC)。
- VxLAN BGP L2VPN EVPN
- BGP address-family IPv4
- OSPF
- 多點傳送PIM ( 稀疏模式 )
- DHCP

### 採用元件

本文中的資訊係根據以下軟體和硬體版本：

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

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除 ( 預設 ) 的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

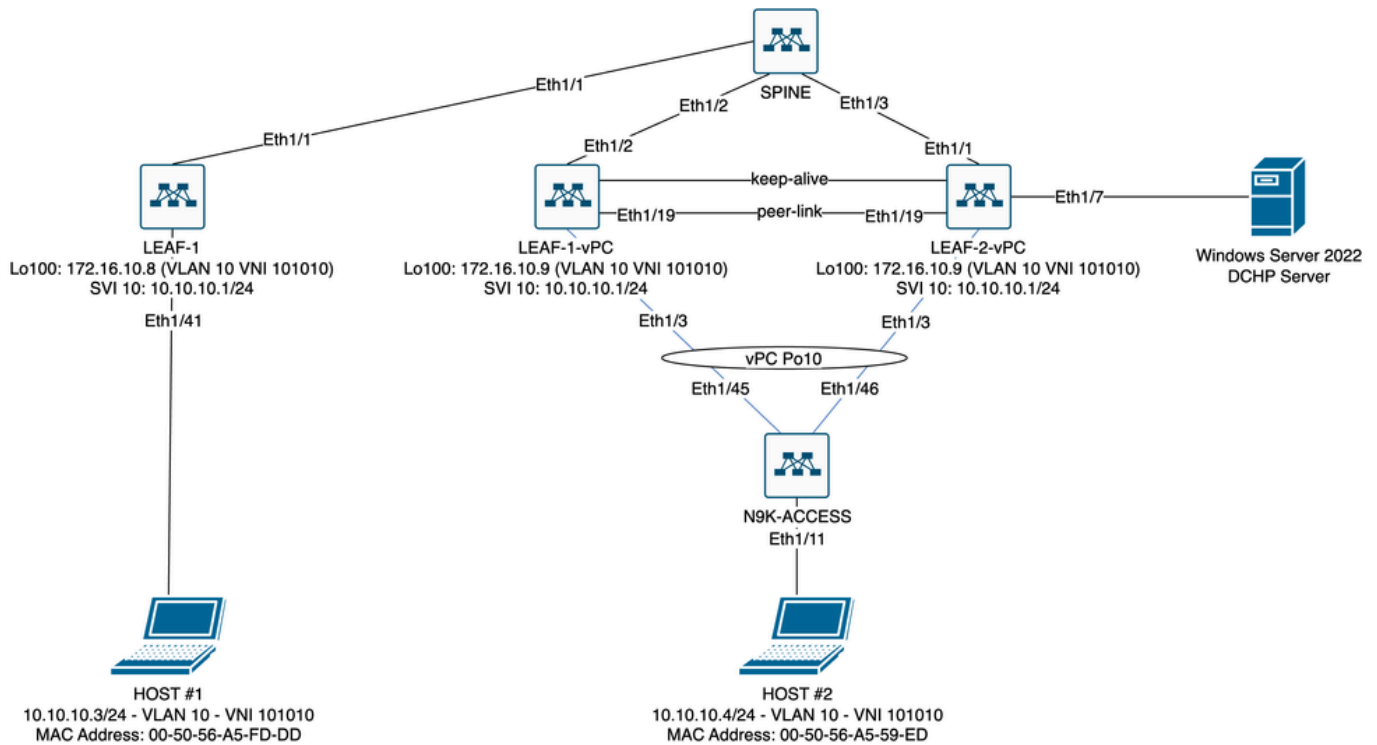


注意：有關第三方軟體或硬體的配置和整合的任何問題均不在思科支援範圍內。使用第三方工具是向客戶演示思科裝置的配置和運行的最佳方法。

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## 背景資訊

### 實驗室中VxLAN的底層與重疊配置



實驗室中的VxLAN交換矩陣圖

#### • 骨幹:

- 此Nexus交換機傳送DHCP ( 發現、提供、請求、確認 ) 資料包，在此場景中不會解除封裝。僅使用外部標頭。
- 充當網路交換矩陣中的中心路由點。
- 負責連線所有LEAF交換機並促進它們之間的資料流。
- 參與BGP以將EVPN路由分發到枝葉交換機。
- 執行IP路由，並可以透過檢視外部IP報頭來路由不同子網或VxLAN網段之間的流量。
- 將重疊網路(VxLAN)與底層物理網路分離。
- 使用傳統IP路由協定管理底層，而重疊則由使用BGP EVPN的VxLAN管理，從而提供可擴展且靈活的網路架構。

#### • 枝葉1 :

- 枝葉交換機為伺服器、儲存裝置和其他網路裝置等終端提供物理連線。
- 枝葉交換機充當VTEP，這意味著它們會封裝和解封VxLAN資料包。
- 在這種情況下，主機1發出IP地址請求。
- LEAF-1負責封裝VxLAN報頭中的DCHP資料包。
- HOST#1以傳統乙太網透明方式接收DCHP資料包。

#### • LEAF-1-vPC和LEAF-2-vPC :

- 枝葉交換機透過運行BGP和交換路由資訊參與EVPN控制平面。這允許分配MAC和IP地址資訊，確保流量可以透過VxLAN交換矩陣有效路由。
- 在此場景中，DHCP伺服器與VLAN 10相關聯，VNI 101010與HOST#1相同。這表示它只是VxLAN橋接。
- 如果DHCP伺服器與HOST#1以外的VNI關聯，則路由嚴格需要L3VNI。必須建立源和目標VNI。
- DHCP伺服器作為傳統乙太網透明接收DCHP資料包。
- vPC中的兩個Nexus交換機均接收BUM流量，但只有在vPC中運行的主要Nexus交換機



傳送流量。輔助Nexus交換機丟棄流量。在此場景中，LEAF-1-vPC在操作上為主要。

- 必須使用infra-vlan，因為如果LEAF-2-vPC到SPINE的介面斷開，則無法傳送DCHP資料包。要將VxLAN封裝流量傳送到LEAF-1-vPC，需要此備份VLAN。這樣，LEAF-1-vPC可以將DCHP資料包傳送到骨幹。

- N9K-ACCESS：

- 此Nexus交換機僅使用vPC埠通道為向HOST#2提供冗餘目的而提供到兩個枝葉的連線

## 骨幹

```
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 12vpn evpn
send-community
send-community extended
route-reflector-client
neighbor 192.168.4.4
remote-as 65000
update-source loopback0
address-family 12vpn evpn
send-community
send-community extended
route-reflector-client
neighbor 192.168.5.5
remote-as 65000
update-source loopback0
address-family 12vpn evpn
send-community
send-community extended
route-reflector-client
```

## 枝葉-1

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

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

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

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

spanning-tree vlan 10 priority 4096

ip prefix-list host_subnets seq 5 permit 10.10.10.0/24 le 32
ip prefix-list host_subnets seq 10 permit 192.168.20.0/24 le 32
ip prefix-list host_subnets seq 15 permit 172.16.10.8/32
```

```
route-map direct_routes_tenant-a permit 10
  match ip address prefix-list host_subnets
```

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

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

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

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

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

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

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

```
interface loopback100
  vrf member tenant-a
```

```

ip address 172.16.10.8/32

router ospf 1

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

```

## 枝葉-1-vPC

```

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

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

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

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

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

```

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

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

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

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

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

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

interface mgmt0
  vrf member management
  ip address 10.88.238.194/29

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

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

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

interface loopback100
```

```
vrf member tenant-a
ip address 172.16.10.9/32

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

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

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

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

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

router ospf 1

router bgp 65000
address-family ipv4 unicast
address-family l2vpn evpn
advertise-pip
neighbor 192.168.0.11
remote-as 65000
update-source loopback0
address-family l2vpn evpn
send-community
send-community extended
neighbor 192.168.88.2
remote-as 65000
description OVERLAY_BACKUP
```

```

update-source Vlan888
address-family l2vpn evpn
    send-community
    send-community extended
vrf tenant-a
    address-family ipv4 unicast
        redistribute direct route-map direct_routes_tenant-a
evpn
vni 101010 l2
    rd auto
    route-target import auto
    route-target export auto
vni 202020 l2
    rd auto
    route-target import auto
    route-target export auto

```

## 枝葉-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 12
  rd auto
  route-target import auto
  route-target export auto
vni 202020 12
  rd auto
  route-target import auto
  route-target export auto
```

## N9K-ACCESS

```
feature lACP
```

```
vlan 1,10
```

```
interface port-channel10
  switchport
  switchport mode trunk
```

```
interface Ethernet1/11
  switchport
  switchport access vlan 10
  no shutdown
```

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

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

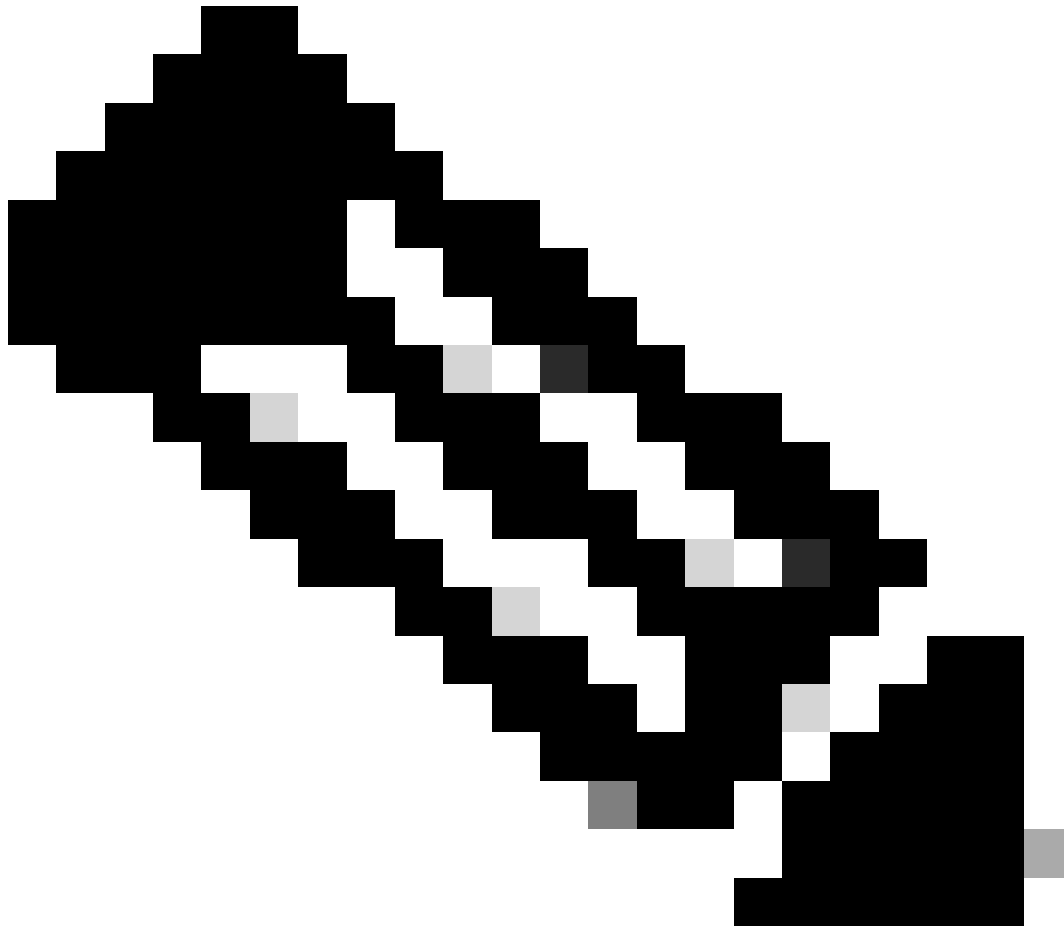
## Nexus交換機上的DHCP配置

### 枝葉-1

步驟 1. 啟用功能DHCP。

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

---



注意：自NX-OS 7.x以來，DHCP伺服器和中繼代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay預設處於啟用狀態。

---

步驟 2.應用命令ip dhcp relay information option。

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

---

注意：使用此命令，DHCP中繼代理可以插入和刪除選項82有關轉發資料包的資訊。

---

步驟 3. 應用命令 `ip dhcp relay information option vpn`。

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



注意：此命令用於啟用到達該DHCP伺服器所屬的不同VRF的DHCP中繼請求。

---

步驟 4. 應用命令「ip dhcp relay address [DHCP server的ip地址]」。

---

注意：在本示例中，DCHP伺服器的IP地址為10.10.10.150。

---

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

步驟 5.應用命令「ip dhcp relay source-interface [unique loopback]」。



注意：此命令配置DHCP中繼代理的源IP地址，以針對單播通訊處理Discover、Offer、Request和ACK，DHCP中繼代理將SVI的IP地址用作DHCP中繼代理的源IP地址。這是不需要的，因為此IP地址由多個VTEP共用，並且可能會發生DHCP資料包的黑洞。要避免這種情況，需要使用唯一的IP地址（使用環回介面）來區分每個VTEP。

---

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

步驟 6.在BGP內對應的VRF租戶中，使用字首清單和路由對映（包括環回介面的IP地址）直接進行路由重分配。

---

注意：此環回介面屬於SVI的租戶。

---

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

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

步驟 7. 使用命令 `show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]` 驗證是否已在 BGP L2VPN EVPN 中向主幹通告環回介面的 IP 地址。



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

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

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

步驟 8. 驗證環回介面的IP地址是否已注入DHCP伺服器所在的BGP L2VPN EVPN中。

---

注意：如果vPC中有Nexus交換機，請確認它們都獲取BGP L2VPN EVPN中環回介面的IP地址。

---

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

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

Path-id 1 not advertised to any peer

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

Advertised path-id 1

Path type: internal, path is valid, is best path, no labeled nexthop  
Imported from 192.168.5.5:4:[5]:[0]:[0]:[32]:[172.16.10.8]/224

Gateway IP: 0.0.0.0

AS-Path: NONE, path sourced internal to AS

192.168.5.5 (metric 45) from 192.168.0.11 (192.168.0.11)

Origin incomplete, MED 0, localpref 100, weight 0

Received label 303030

Extcommunity: RT:65000:303030 ENCAP:8 Router MAC:707d.b9b8.4daf

Originator: 192.168.5.5 Cluster list: 192.168.0.11

Path-id 1 not advertised to any peer

步驟 9. 使用命令 `show ip route [DHCP server IP] vrf [tenant vrf]` 驗證源租戶上是否存在 DHCP 伺服器的路由。

---

注意：要使用的路由條目必須從VxLAN到預設VRF。如果沒有可用的路由，請檢查VTEP在本機是否知道DCHP伺服器IP位址。

---

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

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

步驟 10.使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf]驗證是否可使用環回介面和相應的VRF作為VRF源訪問DCHP伺服器IP。

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

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

步驟 11.檢驗DHCP中繼代理的狀態。

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

步驟 12.驗證選項82 ( 例如vpn選項 ) 和中繼代理下的正確中繼IP地址。

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

Smart-relay is enabled on the following interfaces:

-----

Subnet-broadcast is enabled on the following interfaces:

-----

Relay Trusted Port is enabled on the following interfaces:

-----

Relay Source Address HSRP is enabled on the following interfaces:

-----

Helper addresses are configured on the following interfaces:

Interface	Relay Address	VRF Name
Vlan10	10.10.10.150	<<<<<<<<<

### 步驟 13. 檢驗已處理和轉發的資料包的統計資訊。

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

### 步驟 14. 檢驗中繼資料包的統計資訊。

```
LEAF-1# show ip dhcp relay statistics
```

Message Type	Rx	Tx	Drops
Discover	260521	260520	0
Offer	289330	289330	0
Request(*)	267162	267161	0
Ack	8322	8322	0
Release(*)	181121	181121	0
Decline	1	1	0
Inform(*)	0	0	0
Nack	289280	289280	0
Total	1295737	1295735	0

DHCP L3 FWD:

Total Packets Received	:	0
Total Packets Forwarded	:	0
Total Packets Dropped	:	0
Non DHCP:		
Total Packets Received	:	0
Total Packets Forwarded	:	0
Total Packets Dropped	:	0

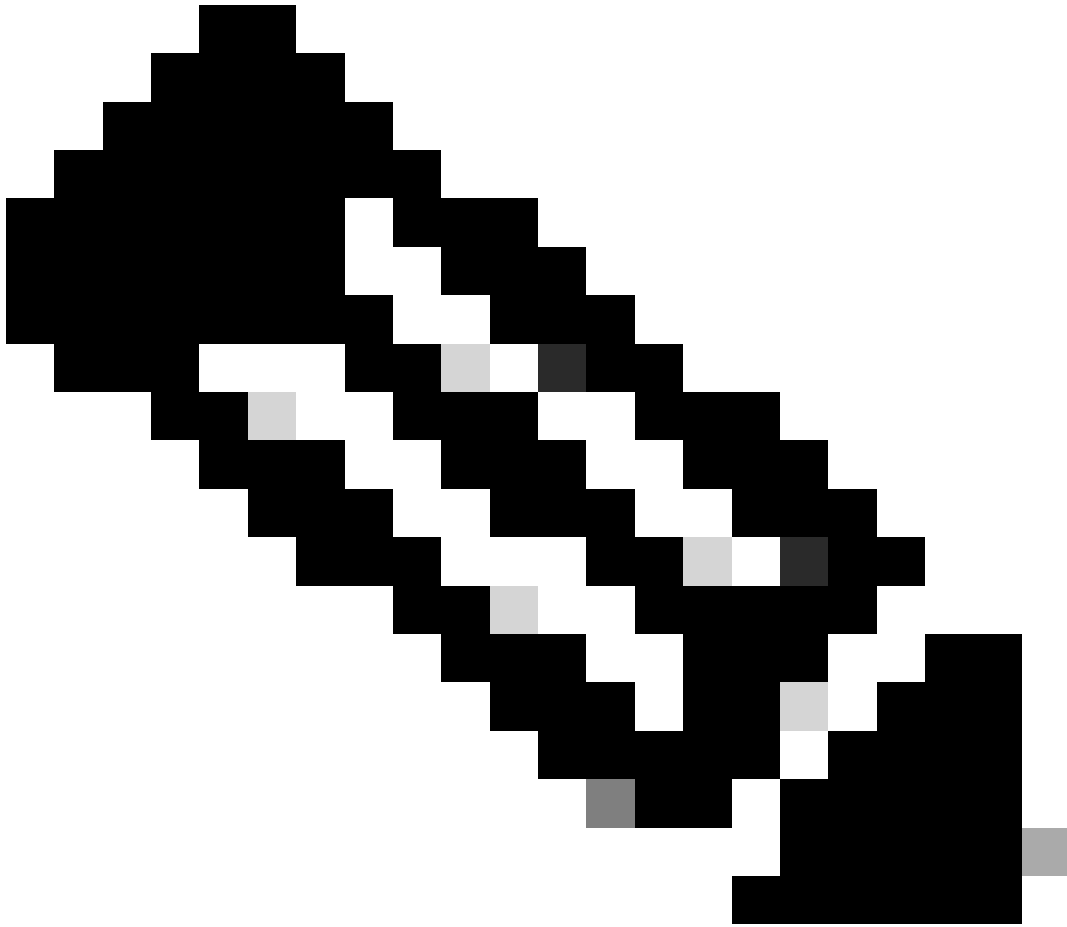
DROP:

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

## 枝葉1-vPC DHCP

步驟 1.啟用功能DCHP。

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



注意：自NX-OS 7.x以來，DHCP伺服器和中繼代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay預設處於啟用狀態。

---

步驟 2.應用命令ip dhcp relay information option。

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



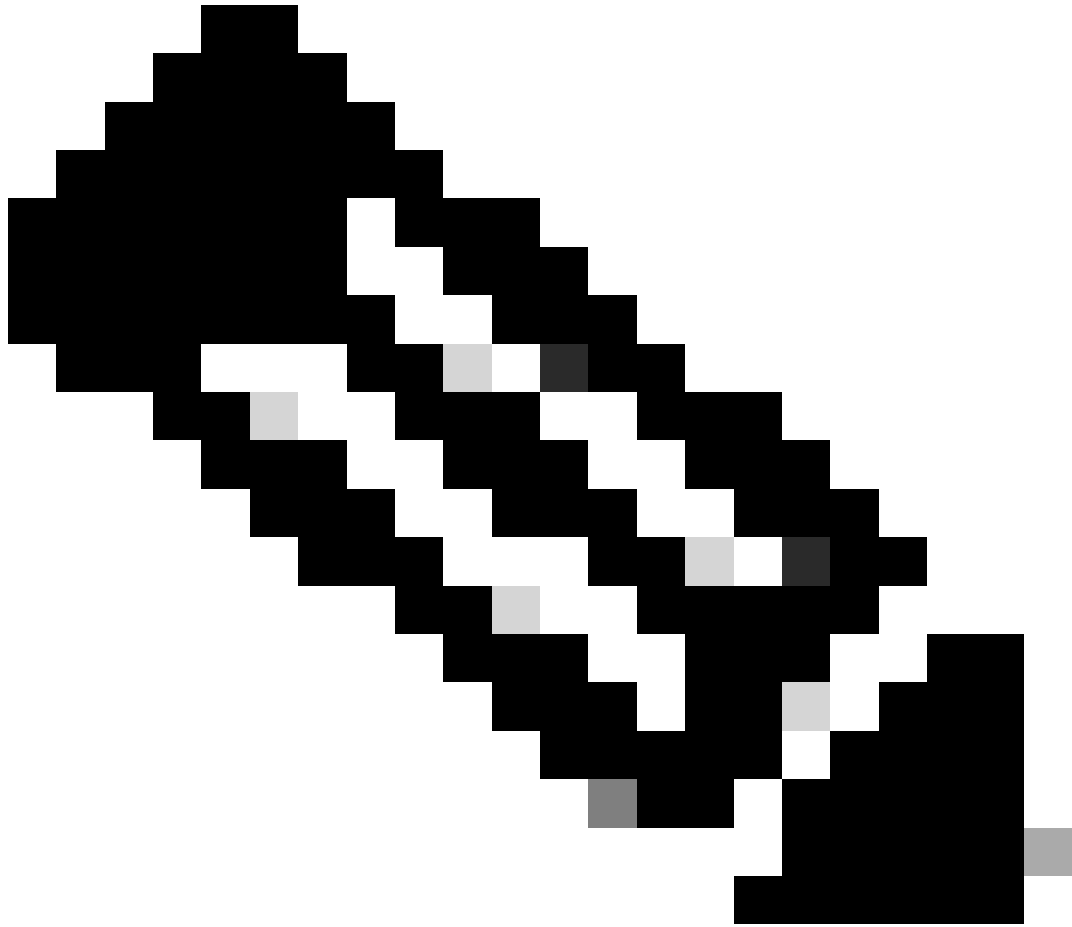
---

注意：使用此命令，DHCP中繼代理可以插入和刪除選項82有關轉發資料包的資訊。

---

步驟 3. 應用命令「ip dhcp relay information option vpn」。

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



注意：此命令用於啟用到達該DHCP伺服器所屬的不同VRF的DHCP中繼請求。

---

步驟 4. 應用命令 `ip dhcp relay address [DHCP 伺服器的 IP 地址]`。

---

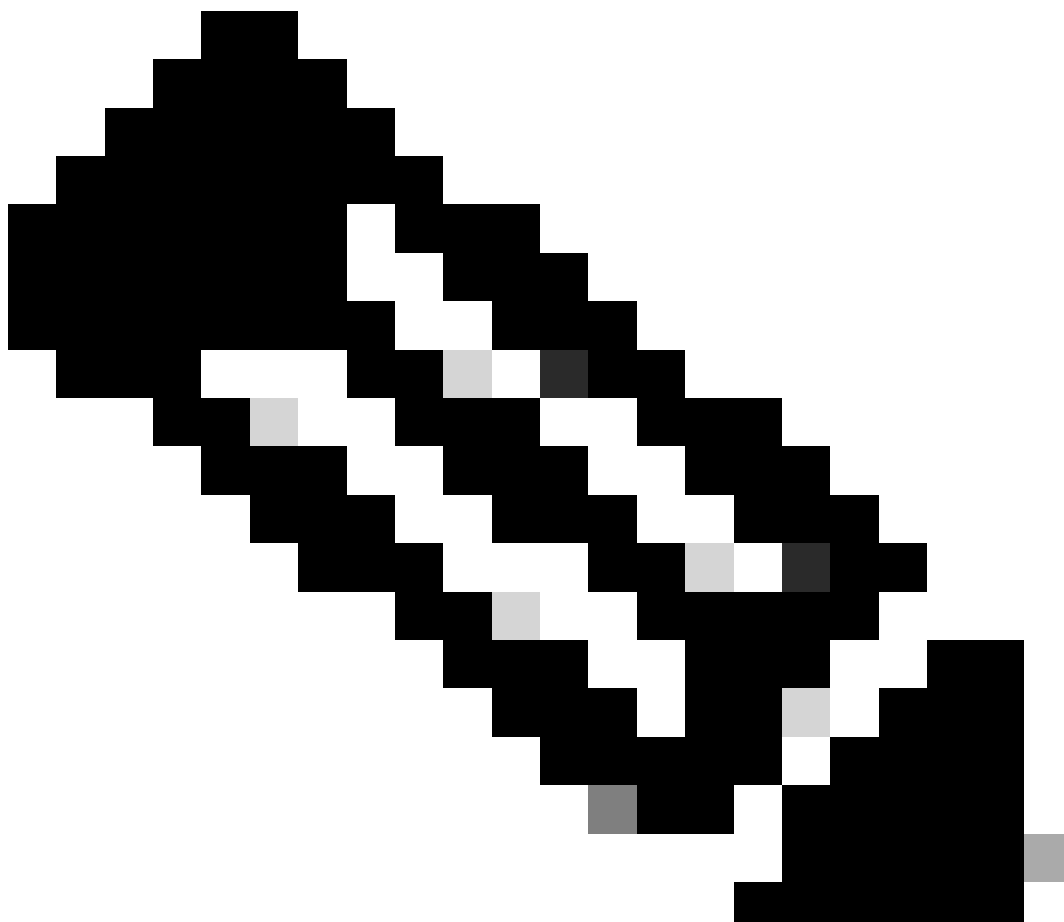
注意：在本示例中，DCHP伺服器的IP地址為10.10.10.150。

---

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

步驟 5.應用命令「ip dhcp relay source-interface [unique loopback]」。

---



注意：此命令配置DHCP中繼代理的源IP地址，以針對單播通訊處理Discover、Offer、Request和ACK，DHCP中繼代理將SVI的IP地址用作DHCP中繼代理的源IP地址。這是不需要的，因為此IP地址由多個VTEP共用，並且可能會發生DHCP資料包的黑洞。要避免這種情況，需要使用唯一的IP地址（使用環回介面）來區分每個VTEP。

---

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

步驟 6.在BGP內對應的VRF租戶中，使用字首清單和路由對映（包括環回介面的IP地址）直接進行路由重分配。

---

注意：此環回介面屬於SVI的租戶。

---

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

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

步驟 7. 使用命令 `show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]` 驗證是否已在 BGP L2VPN EVPN 中向主幹通告環回介面的 IP 地址。

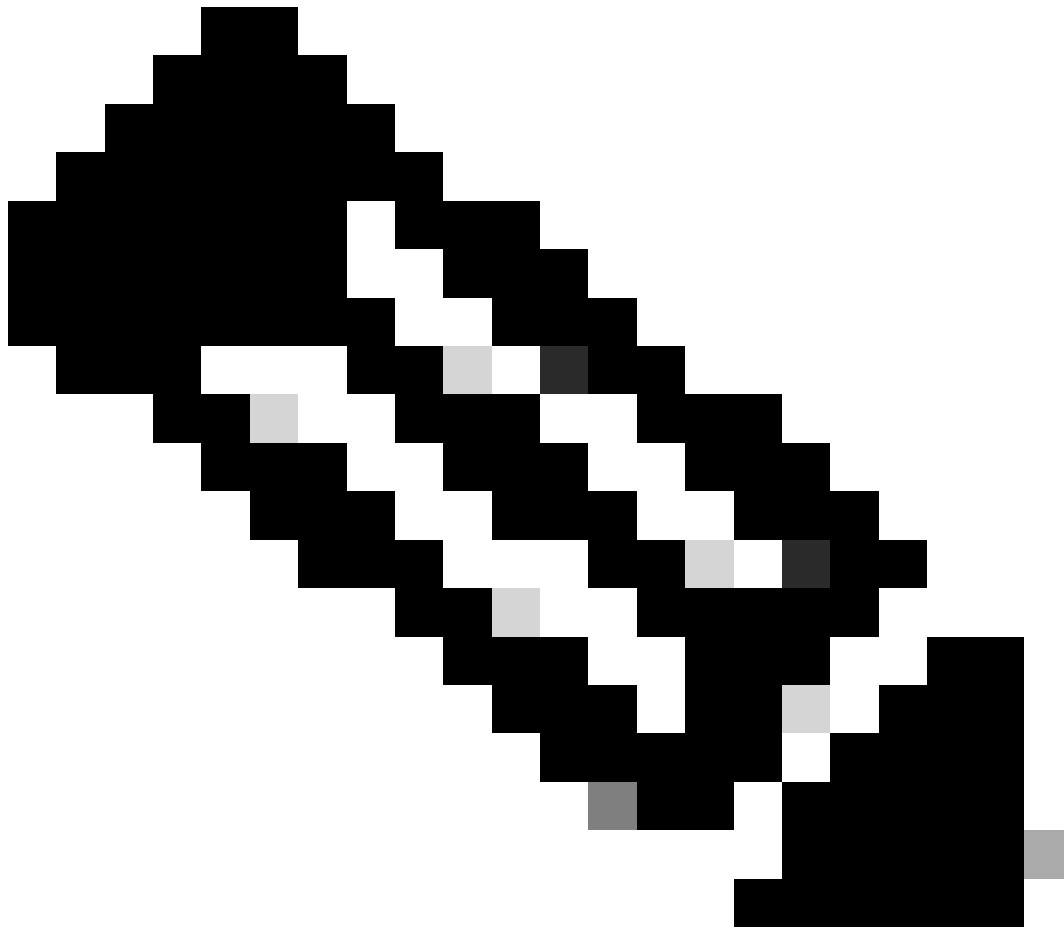
```
LEAF-1-VPC# show bgp l2vpn evpn 172.16.10.9 vrf tenant-a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.3.3:4 (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.9]/224, version 637
Paths: (1 available, best #1)
Flags: (0x000002)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

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

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

步驟 8. 驗證環回介面的IP地址是否已注入DHCP伺服器所在的BGP L2VPN EVPN中。

---



---

注意：如果vPC中有Nexus交換機，請確認它們都獲取BGP L2VPN EVPN中環回介面的IP地址。

---

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

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

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

步驟 9. 使用命令 `show ip route [DHCP server IP] vrf[tenant vrf]` 驗證源租戶上是否存在DHCP伺服器的路由。

---

注意：要使用的路由條目必須從VxLAN到預設VRF。如果沒有可用的路由，請檢查VTEP在本機是否知道DCHP伺服器IP位址。

---

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

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



步驟 10.使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenvrf]，驗證是否可使用環回介面和相應的VRF作為VRF源訪問DCHP伺服器IP。

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

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

步驟 11.檢驗DHCP中繼代理的狀態。

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

步驟 12.驗證選項82 ( 例如vpn選項 ) 和中繼代理下的正確中繼IP地址。

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

Smart-relay is enabled on the following interfaces:

-----

Subnet-broadcast is enabled on the following interfaces:

-----

Relay Trusted Port is enabled on the following interfaces:

-----

Relay Source Address HSRP is enabled on the following interfaces:

-----

Helper addresses are configured on the following interfaces:

Interface	Relay Address	VRF Name
Vlan10	10.10.10.150	<<<<<<<<<

### 步驟 13. 檢驗已處理和已轉發的資料包的統計資訊。

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

### 步驟 14. 檢驗中繼資料包的統計資訊。

```
LEAF-1-VPC# show ip dhcp relay statistics
```

Message Type	Rx	Tx	Drops
Discover	8	7	0
Offer	29304	29304	0
Request(*)	5029	5029	0
Ack	6535	6535	0
Release(*)	191482	191482	0
Decline	0	0	0
Inform(*)	3	3	0
Nack	29281	29281	0
Total	261642	261641	0

DHCP L3 FWD:

```
Total Packets Received : 0
Total Packets Forwarded : 0
Total Packets Dropped : 0
Non DHCP:
Total Packets Received : 0
Total Packets Forwarded : 0
Total Packets Dropped : 0
DROP:
DHCP Relay not enabled : 0
```

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

## 枝葉2-vPC DHCP

步驟 1.啟用功能DHCP。

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

---

注意：自NX-OS 7.x以來，DHCP伺服器和中繼代理命令service dhcp、ip dhcp relay和ipv6 dhcp relay預設處於啟用狀態。

---

步驟 2.應用命令「ip dhcp relay information option」。

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



注意：使用此命令，DHCP中繼代理可以插入和刪除選項82有關轉發資料包的資訊。

---

步驟 3. 應用命令「ip dhcp relay information option vpn」。

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



注意：此命令用於啟用到達該DHCP伺服器所屬的不同VRF的DHCP中繼請求。

---

步驟 4. 應用命令「ip dhcp relay address [DHCP server的ip地址]」。



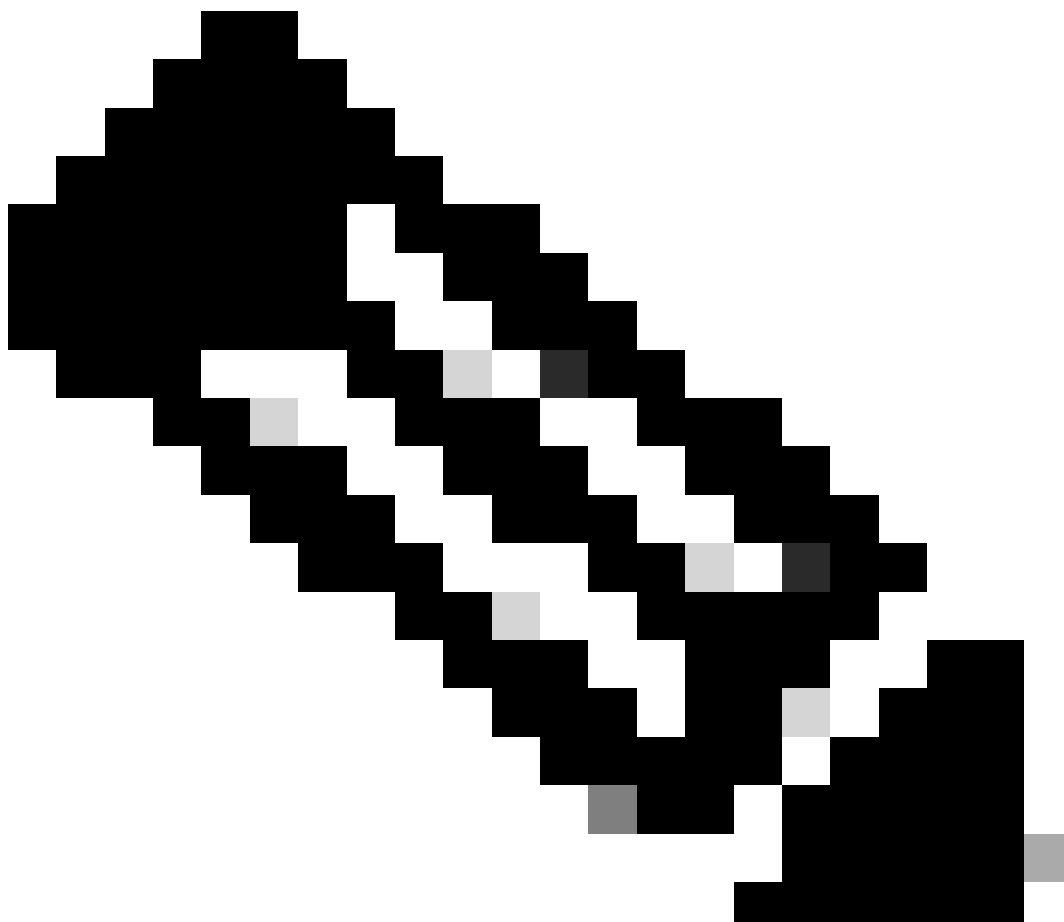
注意：在本示例中，DCHP伺服器的IP地址為10.10.10.150。

---

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

步驟 5.應用命令「ip dhcp relay source-interface [unique loopback]」。

---



注意：此命令配置DHCP中繼代理的源IP地址，以針對單播通訊處理Discover、Offer、Request和ACK，DHCP中繼代理將SVI的IP地址用作DHCP中繼代理的源IP地址。這是不需要的，因為此IP地址由多個VTEP共用，並且可能會發生DHCP資料包的黑洞。要避免這種情況，需要使用唯一的IP地址（使用環回介面）來區分每個VTEP。

---

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

步驟 6.在BGP內對應的VRF租戶中，使用字首清單和路由對映（包括環回介面的IP地址）直接進行路由重分配。



---

注意：此環回介面屬於SVI的租戶。

---

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

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

步驟 7. 使用命令 `show bgp l2vpn evpn [loopback IP] vrf [tenant vrf]` 驗證是否已在 BGP L2VPN EVPN 中向主幹通告環回介面的 IP 地址。

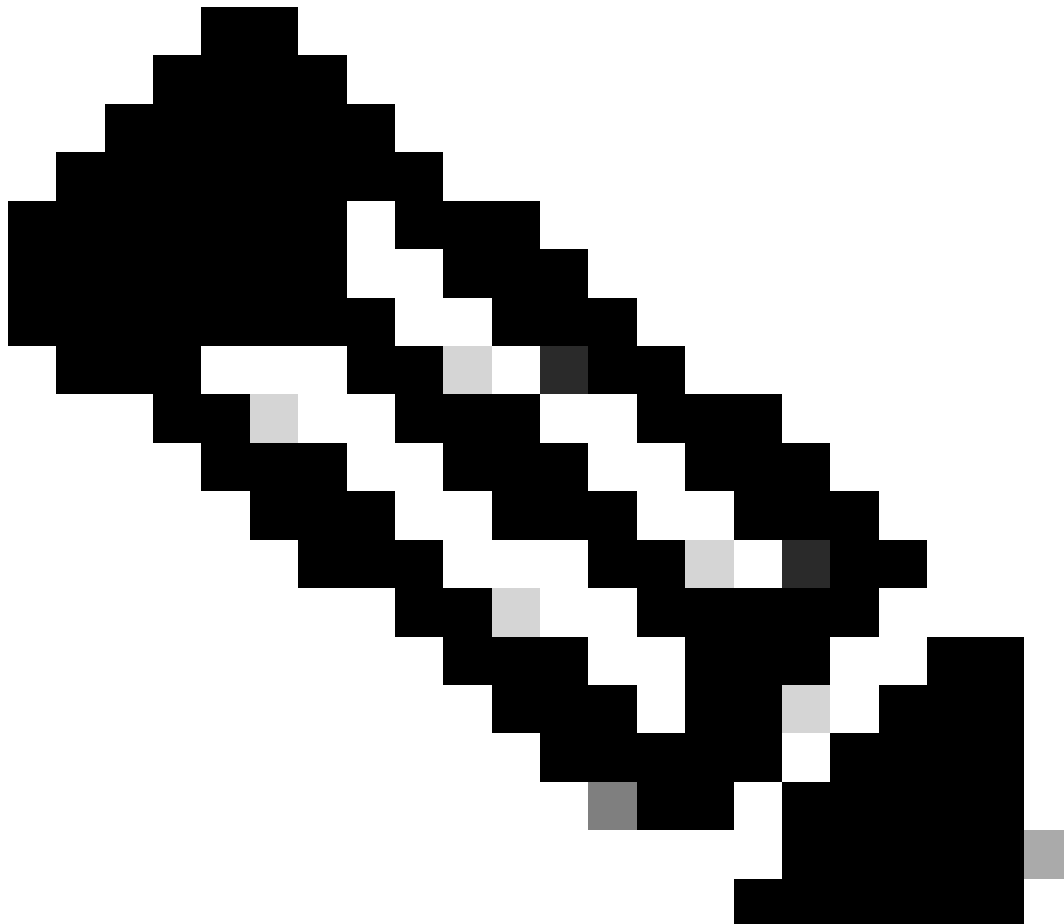
```
LEAF-2-VPC(config-if)# show bgp l2vpn evpn 172.16.10.10 vrf tenant-a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.4.4:4 (L3VNI 303030)
BGP routing table entry for [5]:[0]:[0]:[32]:[172.16.10.10]/224, version 49
5
Paths: (1 available, best #1)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

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

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

步驟 8. 驗證環回介面的IP地址是否已注入DHCP伺服器所在的BGP L2VPN EVPN中。

---



---

注意：如果vPC中有Nexus交換機，請確認它們都獲取BGP L2VPN EVPN中環回介面的IP地址。

---

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

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

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

步驟 9.使用命令show ip route [DHCP server IP] vrf[tenvrf]驗證源租戶上是否存在DHCP伺服器的路由。

---

注意：要使用的路由條目必須從VxLAN到預設VRF。如果沒有可用的路由，請檢查VTEP在本機是否知道DHCP伺服器IP位址。

---

```
LEAF-2-VPC(config-if)# show running-config interface vlan 10
interface Vlan10
  no shutdown
  vrf member tenant-a
  no ip redirects
  ip address 10.10.10.1/24
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
  ip dhcp relay address 10.10.10.150
  ip dhcp relay source-interface loopback100
```

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

步驟 10.使用命令ping [DHCP server IP] source-interface loopback [x] vrf [tenant vrf]驗證是否可使用環回介面和相應的VRF作為VRF源訪問DCHP伺服器IP。

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

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

步驟 11.檢驗DHCP中繼代理的狀態。

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

步驟 12.驗證選項82 ( 例如vpn選項 ) 和中繼代理下的正確中繼IP地址。

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

Smart-relay is enabled on the following interfaces:

-----

Subnet-broadcast is enabled on the following interfaces:

-----

Relay Trusted Port is enabled on the following interfaces:

-----

Relay Source Address HSRP is enabled on the following interfaces:

-----

Helper addresses are configured on the following interfaces:

Interface	Relay Address	VRF Name
Vlan10	10.10.10.150	<<<<

### 步驟 13. 檢驗已處理和已轉發的資料包的統計資訊。

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

### 步驟 14. 檢驗中繼資料包的統計資訊。

```
LEAF-2-VPC# show ip dhcp relay statistics
```

Message Type	Rx	Tx	Drops
Discover	29312	29311	0
Offer	300001	300001	0
Request(*)	29324	29324	0
Ack	1574	1574	0
Release(*)	191493	191493	0
Decline	0	0	0
Inform(*)	1540	1540	0
Nack	472890	472890	0
Total	1026134	1026133	0

DHCP L3 FWD:

Total Packets Received	:	0
Total Packets Forwarded	:	0
Total Packets Dropped	:	0
Non DHCP:		
Total Packets Received	:	0
Total Packets Forwarded	:	0
Total Packets Dropped	:	0
DROP:		
DHCP Relay not enabled	:	0

```

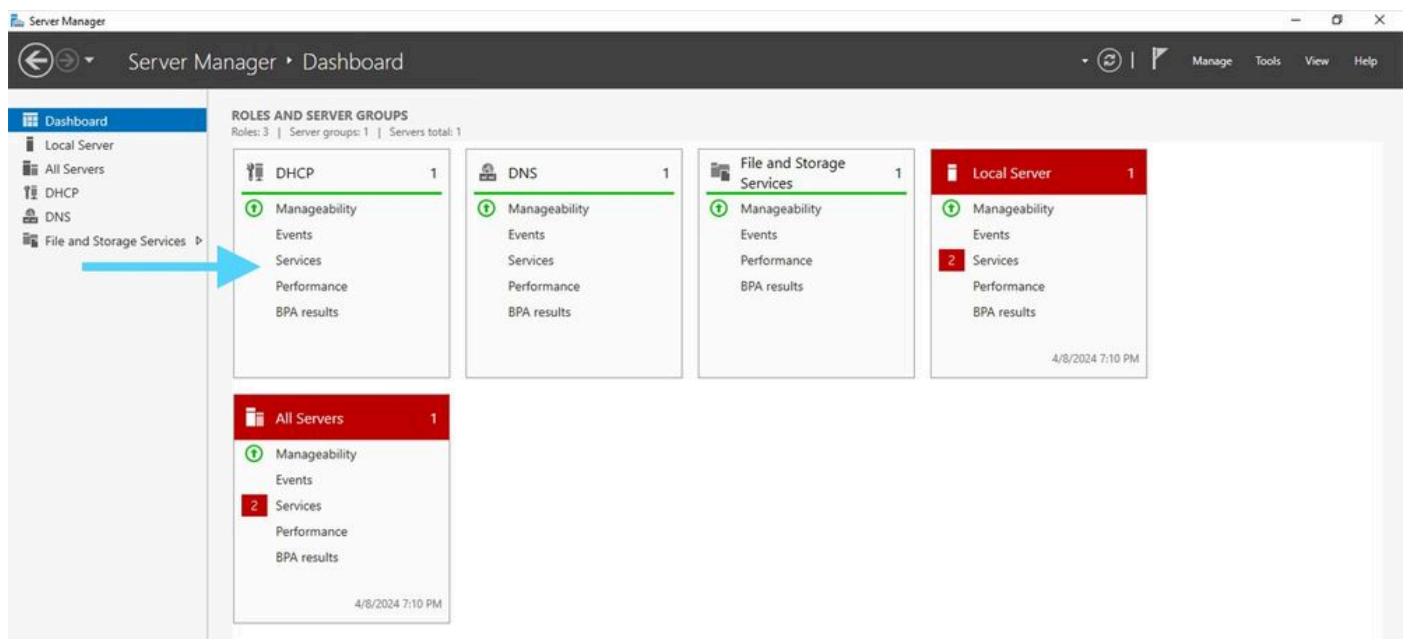
Invalid DHCP message type           :           0
Interface error                     :           0
Tx failure towards server           :           0
Tx failure towards client           :           0
Unknown output interface            :           0
Unknown vrf or interface for server :           0
Max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

```

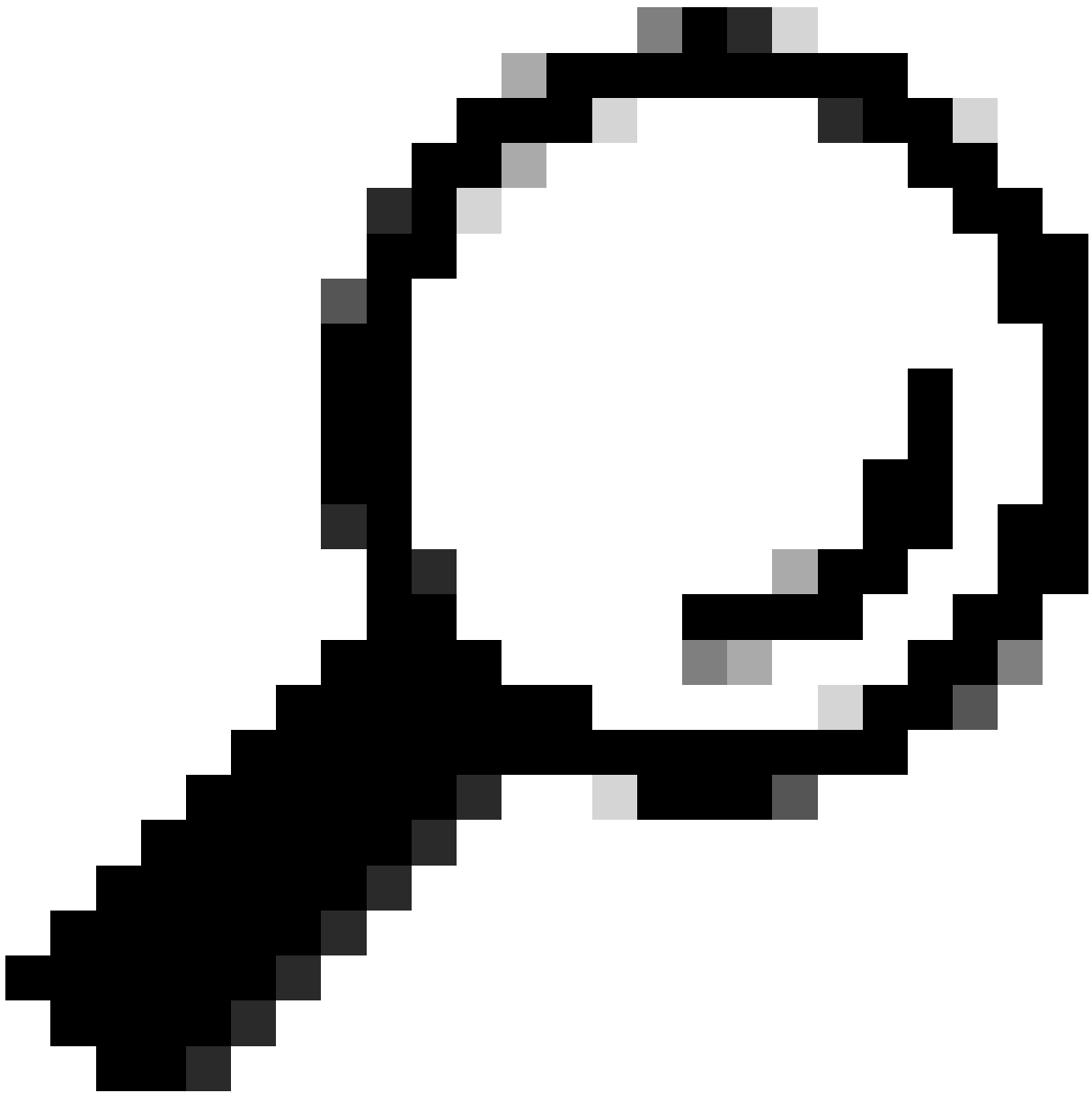
## Windows Server 2022上的DHCP伺服器配置

主機的IP定址範圍配置。

步驟 1.開啟「伺服器管理員」，並確認儀表板的DCHP伺服器上沒有警報。



來自Windows Server 2022上的伺服器管理器的儀表板



提示：連按兩下時，影像會放大。

---

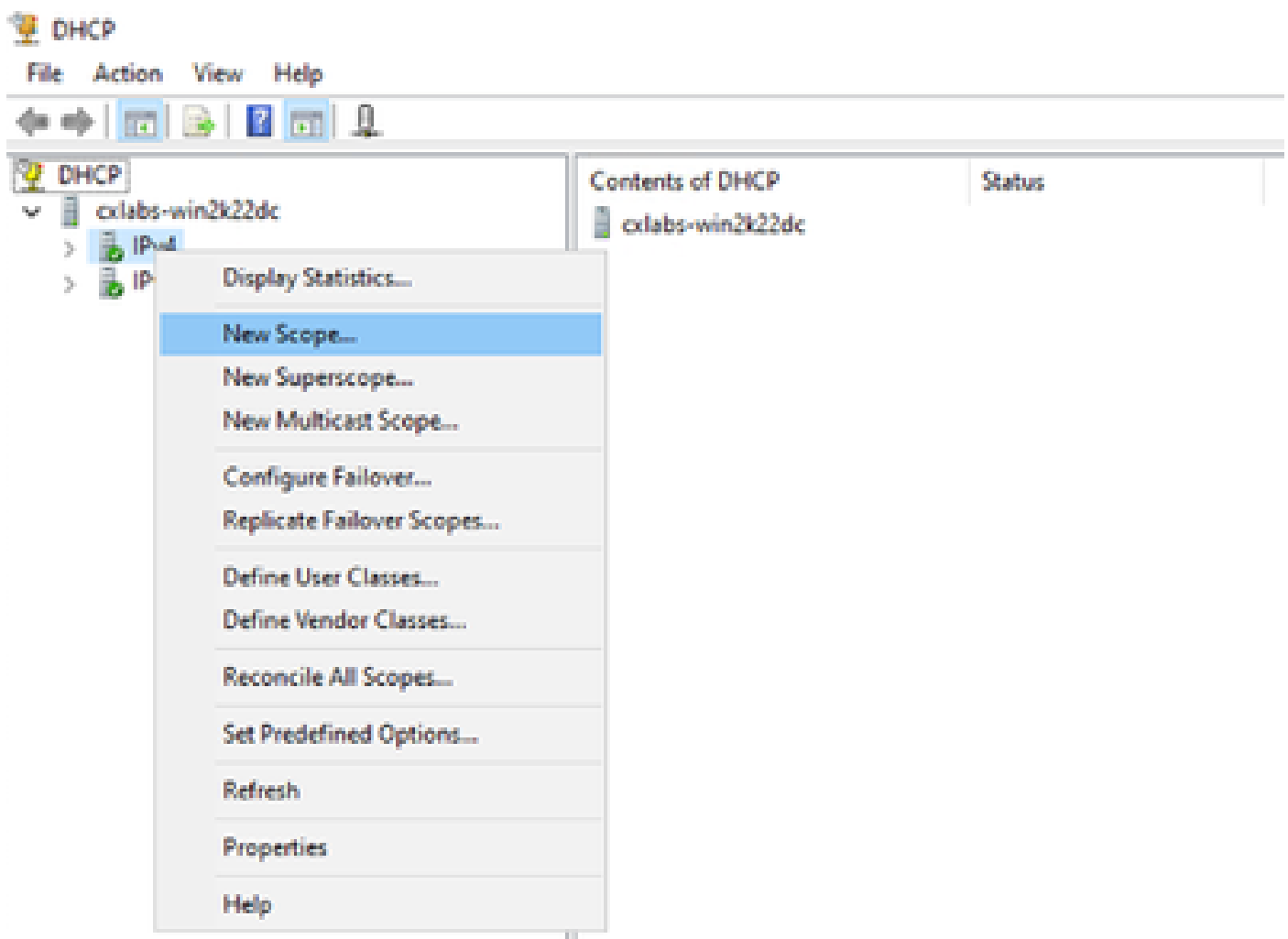
步驟 2. 打開 DHCP Server 應用程式。



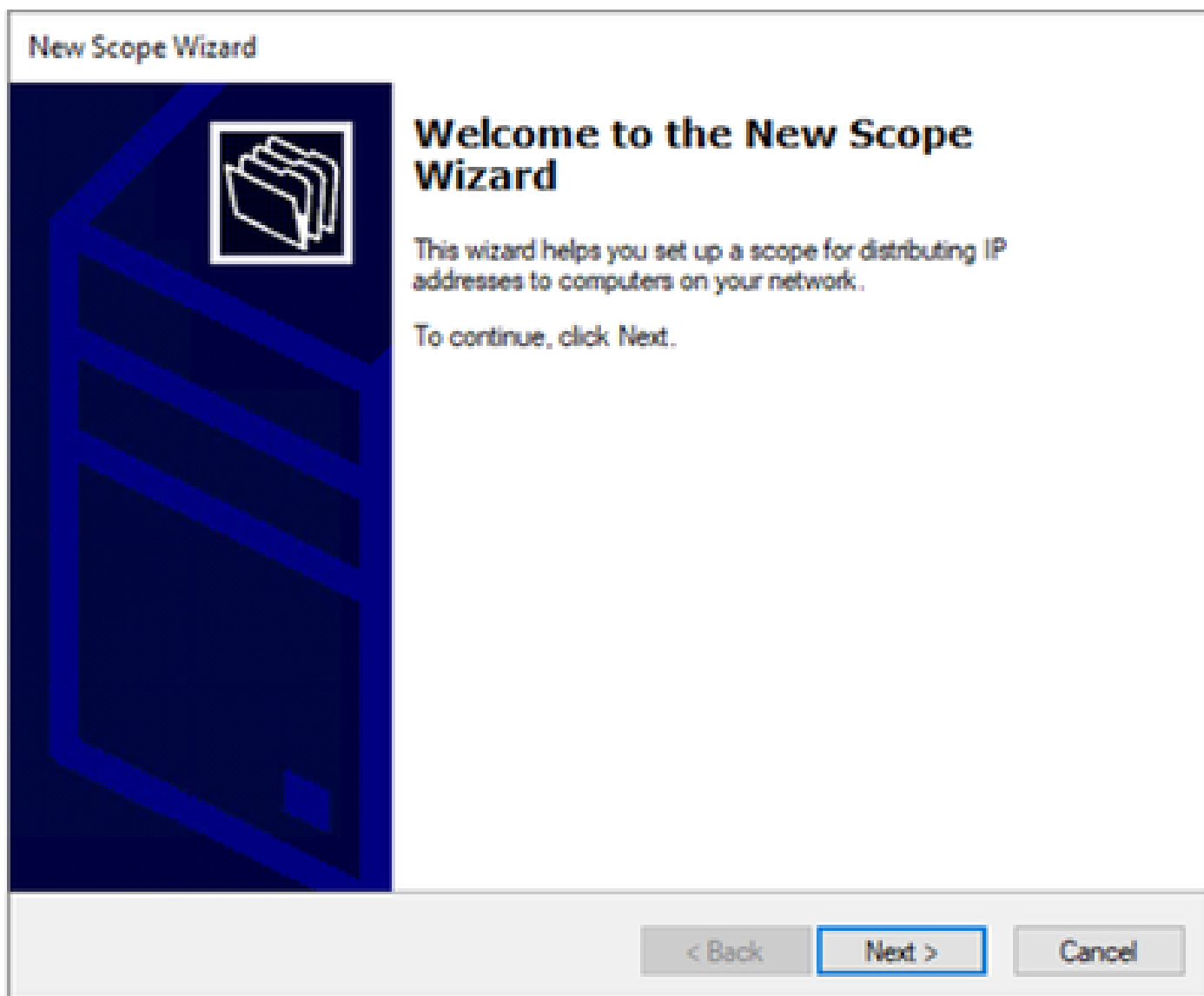


Windows Server 2022上的DHCP伺服器

步驟 3. 按一下右鍵IPv4並按一下New Scope。



步驟 4. 按「Next」（下一步）。



步驟 5. 寫下名稱和說明。在本例中，名稱是屬於VLAN 10的子網，說明是L2VNI，作為L2VNI列在VLAN 10中。

## New Scope Wizard

### Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

< Back

Next >

Cancel

步驟 6. 配置IP地址範圍。這是主機的池。

## New Scope Wizard

### IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



#### Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

#### Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

步驟 6. 從VTEP中的SVI配置中排除共用IP地址。在本例中，介面VLAN 10的地址為IP.10.10.1/24。



警告：未能從SVI（或預設網關）中排除IP地址會導致重複IP地址並影響流量傳輸。

---

```
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
```

## New Scope Wizard

### Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

Address 10.10.10.1

Remove

Subnet delay in milli second:

< Back

Next >

Cancel

步驟 7. 配置 IP 地址的租用期限。這是指主機在續約之前可以使用分配的 IP 地址的時間。

## New Scope Wizard

### Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.



Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days:

Hours:

Minutes:

< Back

Next >

Cancel

步驟 8.選擇Yes , I want to configure these options now。

## New Scope Wizard

### Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

步驟 9. 配置預設網關IP地址。



## New Scope Wizard

### Router (Default Gateway)

You can specify the routers, or default gateways, to be distributed by this scope.



To add an IP address for a router used by clients, enter the address below.

IP address:

Add

Remove

Up

Down

< Back

Next >

Cancel

步驟 10. 配置域名和DNS伺服器。

## New Scope Wizard

### Domain Name and DNS Servers

The Domain Name System (DNS) maps and translates domain names used by clients on your network.



You can specify the parent domain you want the client computers on your network to use for DNS name resolution.

Parent domain:

To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.

Server name:

IP address:

步驟 11. 配置WINS伺服器 ( 如果適用 ) 。 如果資訊未知 , 則可以跳過此步驟。

## New Scope Wizard

### WINS Servers

Computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses.



Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.

Server name:

Resolve

IP address:

Add

Remove

Up

Down

To change this behavior for Windows DHCP clients modify option 046, WINS/NBT Node Type, in Scope Options.

< Back


Next >

Cancel

步驟 12.選擇Yes , I want to activate this scope now。

New Scope Wizard

**Activate Scope**  
Clients can obtain address leases only if a scope is activated.



Do you want to activate this scope now?

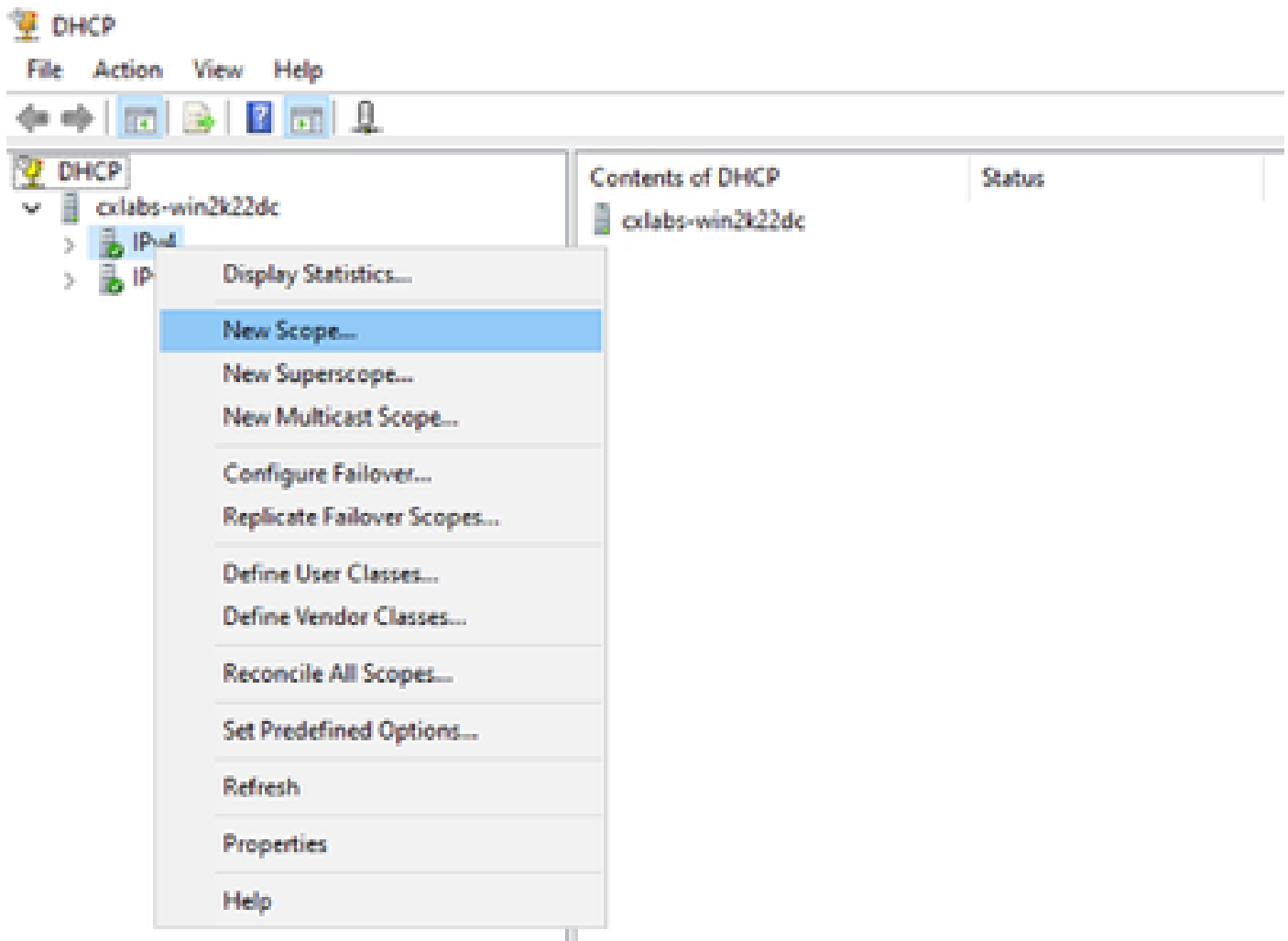
Yes, I want to activate this scope now

No, I will activate this scope later

< Back   Next >   Cancel

將SVI中環回的唯一IP地址的範圍配置為DCHP中繼代理。

步驟 1.按一下右鍵IPv4並選擇IPv4Scope。



DCHP中的新作用域

步驟 2. 寫下名稱和說明。在本示例中，name 是用於具有環回地址的子網的子網。



IPte : 在VxLAN租戶的整個VxLAN交換矩陣中，環回使用環回唯一IP地址。這必須在BGP中的BGP L2VPN EVPN路由重分配中通告，BGP位於IPv4 address-family IPv4中相應租戶的VRF內

---

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

## New Scope Wizard

### Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

< Back

Next >

Cancel

步驟 3. 配置IP地址範圍IP。這是環回的池。

## New Scope Wizard

### IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



#### Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

#### Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

步驟 4. 配置排除 ( 可選 , 因為 DHCP 伺服器租用的是屬於此子網的 IP 地址 ) 。



## New Scope Wizard

### Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

Remove

Subnet delay in milli second:

< Back

Next >

Cancel

步驟 5.跳過租用期限，然後按一下下一步。

## New Scope Wizard

### Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.



Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days:

Hours:

Minutes:

< Back

Next >

Cancel

步驟 6.選擇No , I will configure these options later。

## New Scope Wizard

### Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

步驟 7. 按一下「Finish」（結束）。

## New Scope Wizard



### Completing the New Scope Wizard

You have successfully completed the *New Scope* wizard.

Before clients can receive addresses you need to do the following:

1. Add any scope specific options (optional).
2. Activate the scope.

To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on *configure failover*.

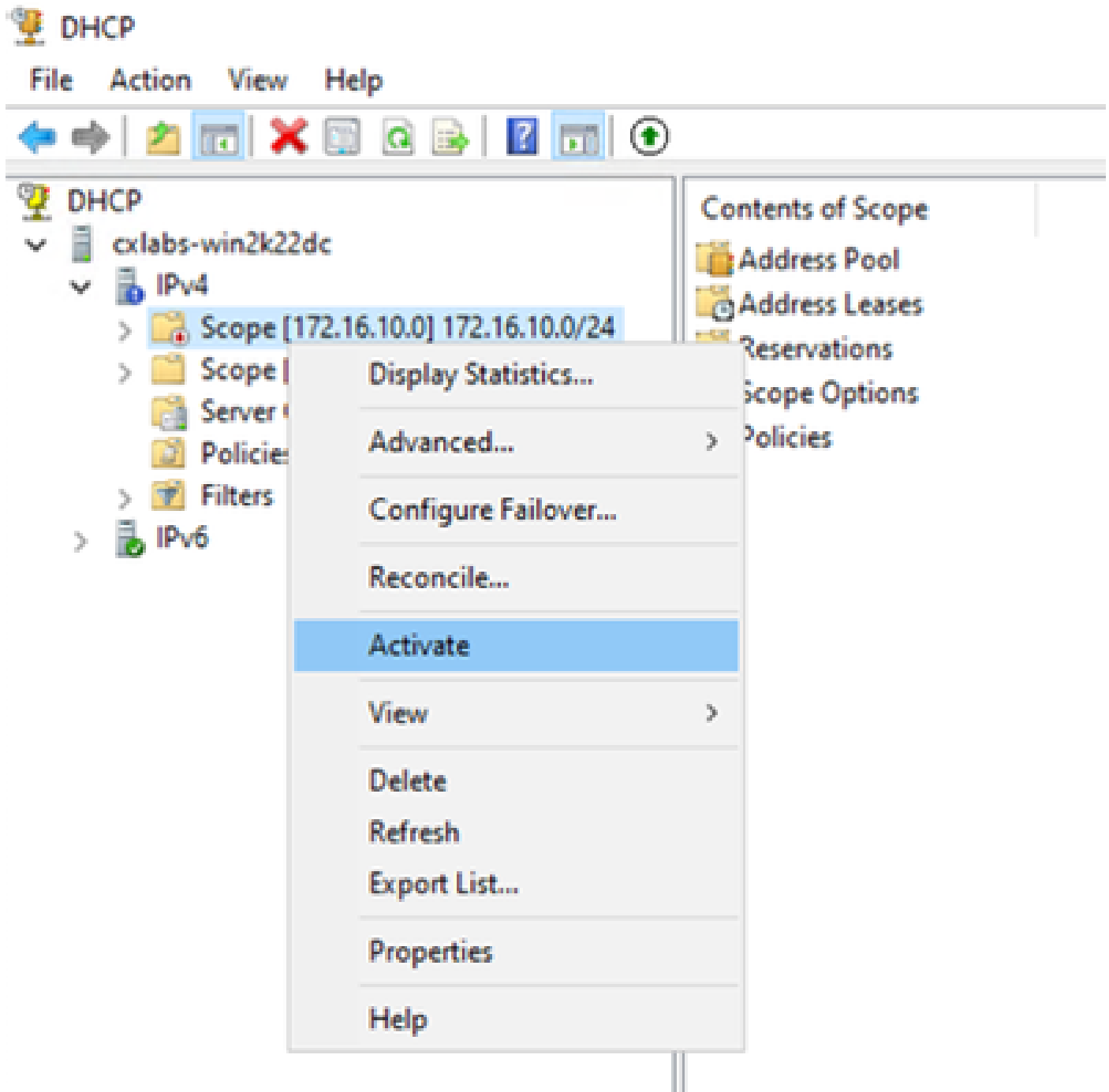
To close this wizard, click *Finish*.

< Back

Finish

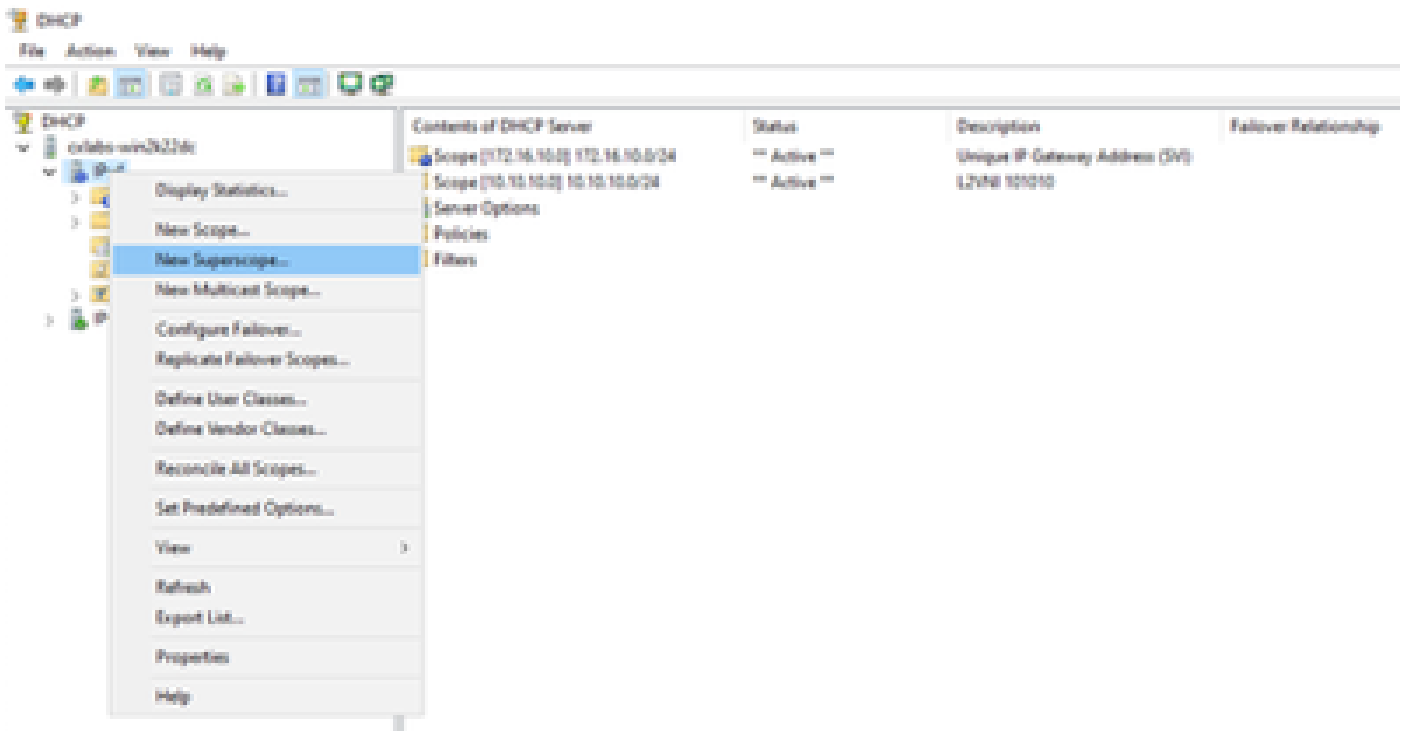
Cancel

步驟 8. 在建立的範圍上按一下滑鼠右鍵，然後選取啟動。

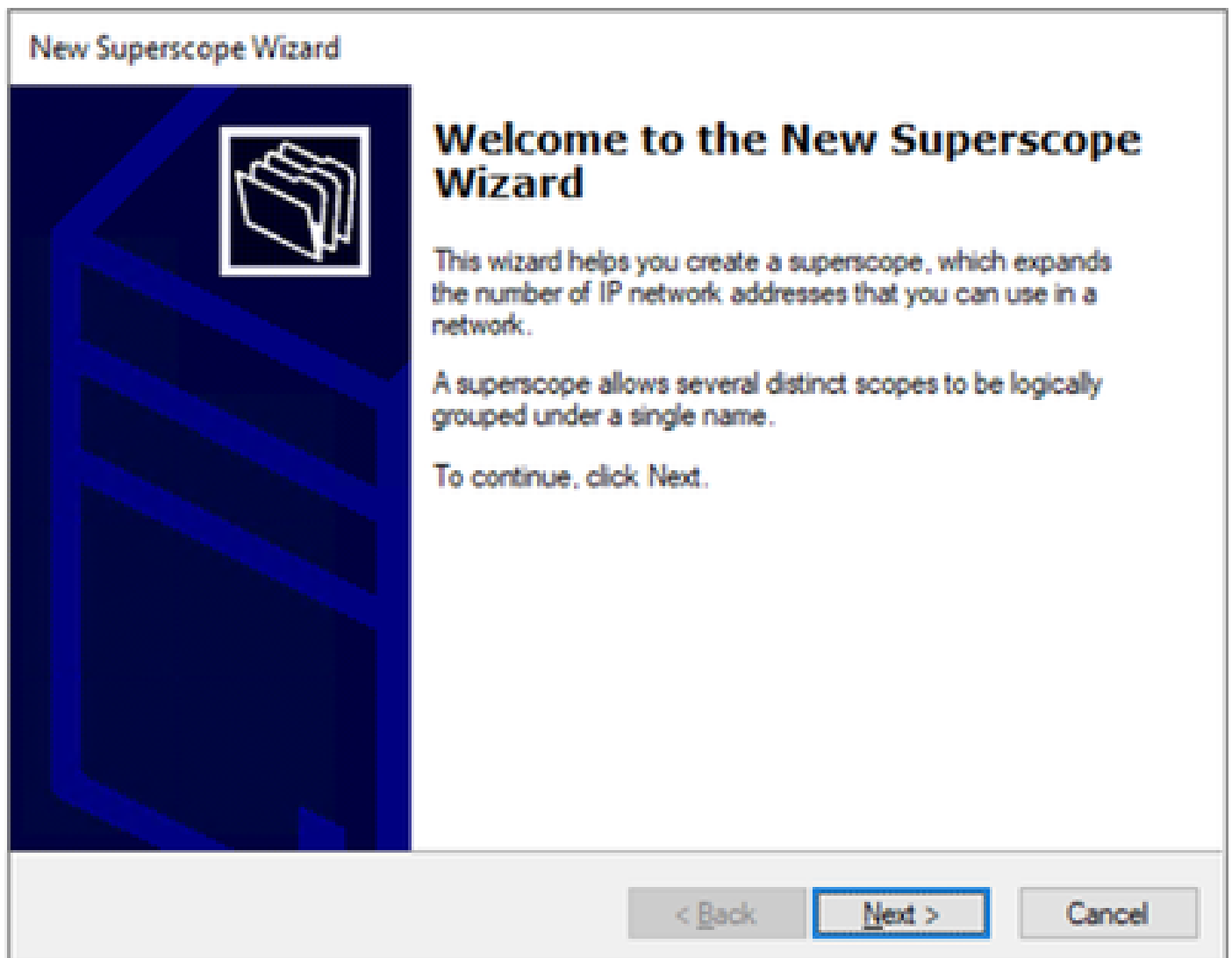


為VxLAN交換矩陣配置超級作用域。

步驟 1. 按一下右鍵IPv4並選擇New Superscope。



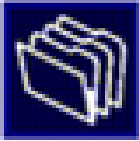
步驟 2. 按「Next」（下一步）。



步驟 3. 寫入超級領域名稱。

New Superscope Wizard

**Superscope Name**  
You have to provide an identifying superscope name.



Name:

< Back   **Next >**   Cancel

步驟 4. 選擇屬於VxLAN交換矩陣的所有作用域。

## New Superscope Wizard

### Select Scopes

You create a superscope by building a collection of scopes.



Select one or more scopes from the list to add to the superscope.

Available scopes:

[10.10.10.0] 10.10.10.0/24  
[172.16.10.0] 172.16.10.0/24

< Back

Next >

Cancel

步驟 5.選擇屬於VxLAN交換矩陣的所有作用域。



## New Superscope Wizard

### Select Scopes

You create a superscope by building a collection of scopes.



Select one or more scopes from the list to add to the superscope.

Available scopes:

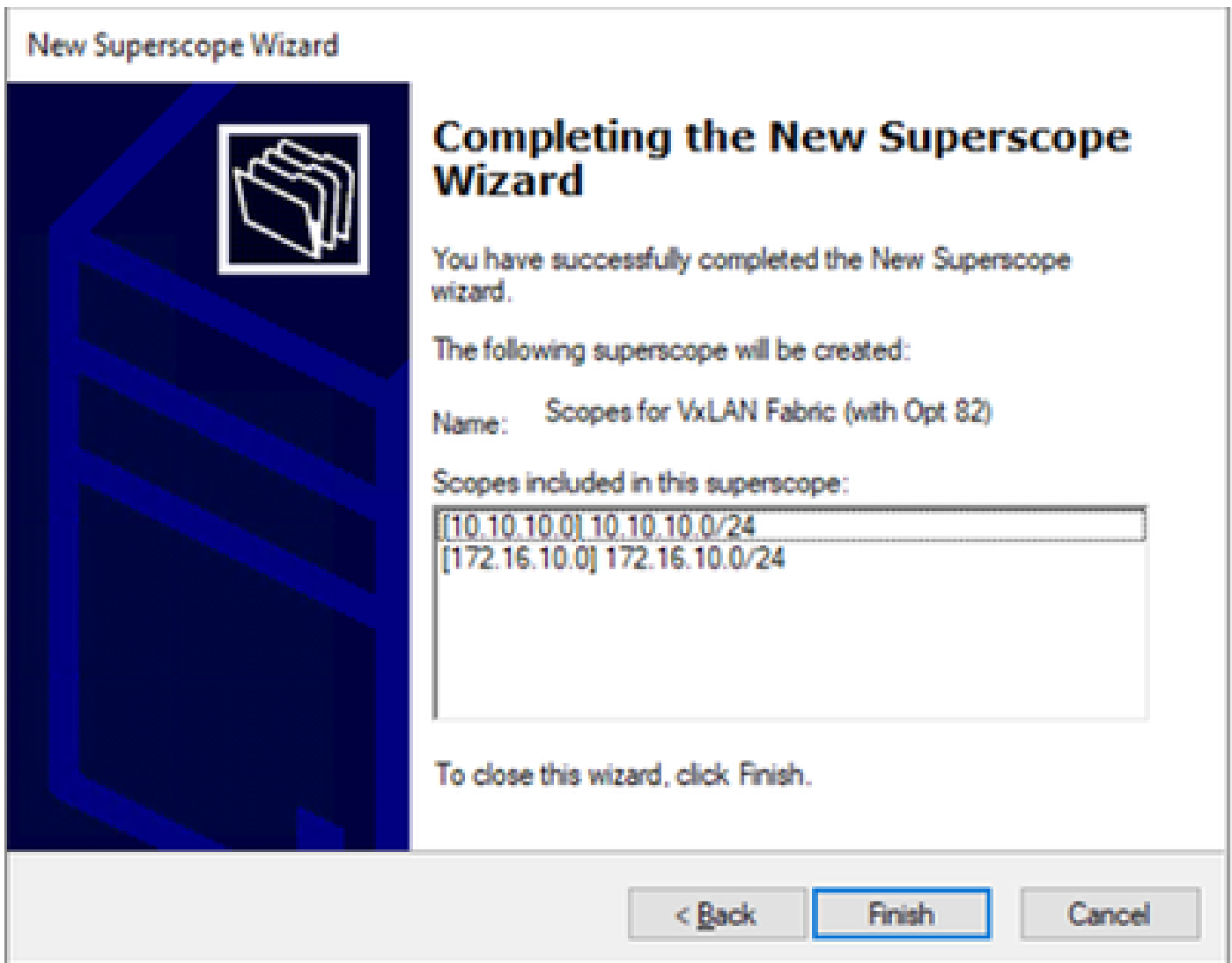
[10.10.10.0] 10.10.10.0/24  
[172.16.10.0] 172.16.10.0/24

< Back

Next >

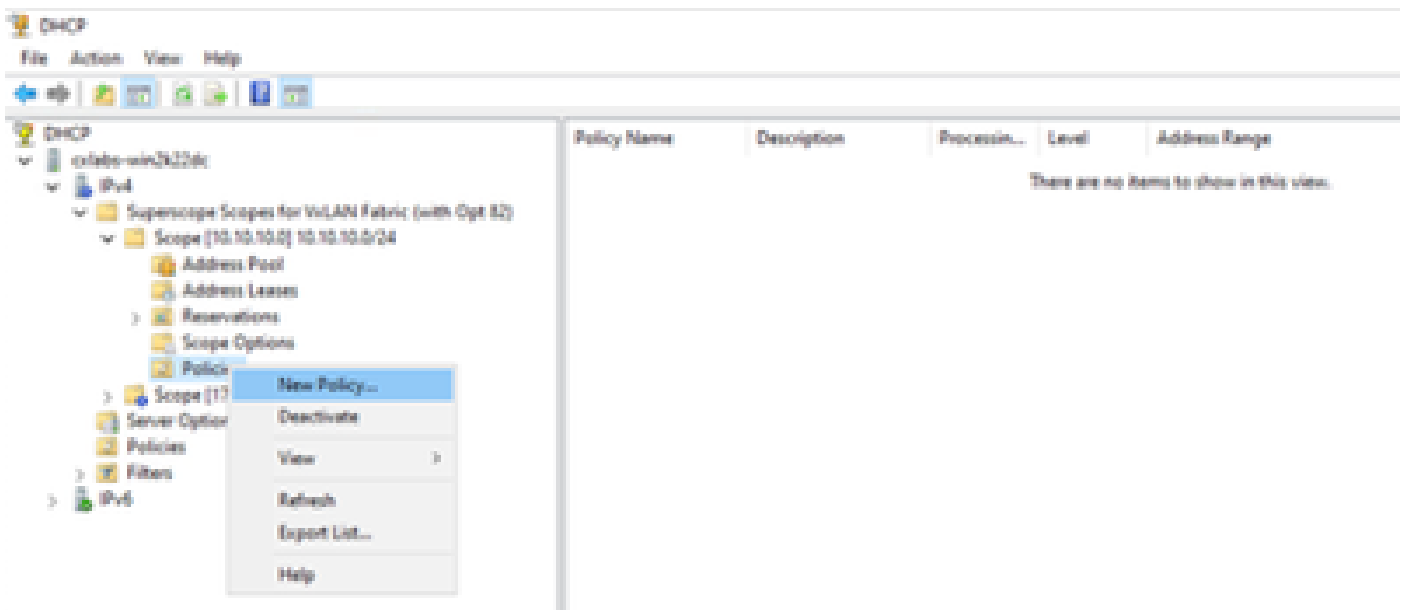
Cancel

步驟 6. 驗證是否所有VxLAN交換矩陣超級作用域都已就位，然後按一下完成。



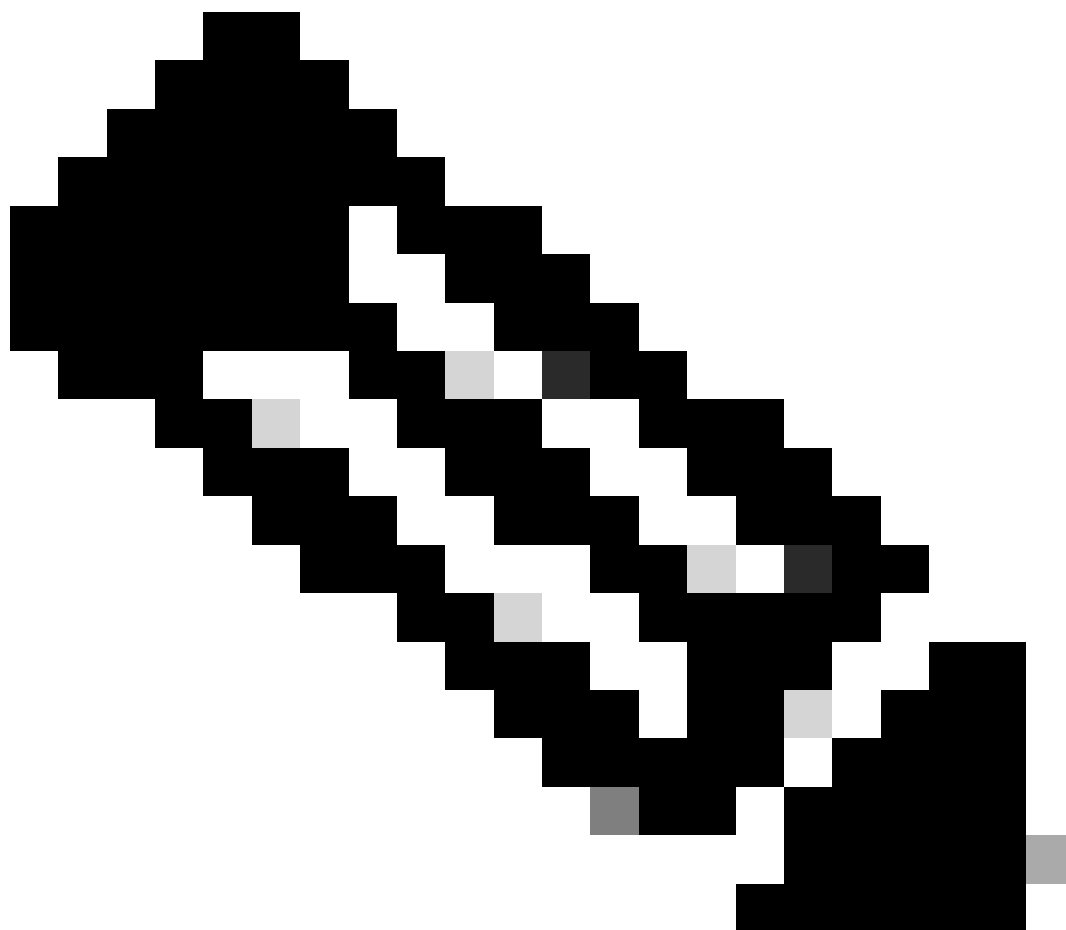
在主機範圍內配置選項82。

步驟 1. 按一下右鍵主機範圍內的策略（最後一個選項），然後按一下New Policy。



步驟 2. 寫下名稱和說明，然後按一下Next。

---



注意：在本示例中，建立策略是為了為VNI 101010 basedVNI Remote-ID ( 選項82的引數 ) 的枝葉1中的主機選擇IP編址palPicorly。

---

## DHCP Policy Configuration Wizard

### Policy based IP Address and Option Assignment



This feature allows you to distribute configurable settings (IP address, DHCP options) to clients based on certain conditions (e.g. vendor class, user class, MAC address, etc.).

This wizard will guide you setting up a new policy. Provide a name (e.g. VoIP Phone Configuration Policy) and description (e.g. NTP Server option for VoIP Phones) for your policy.

Policy Name:

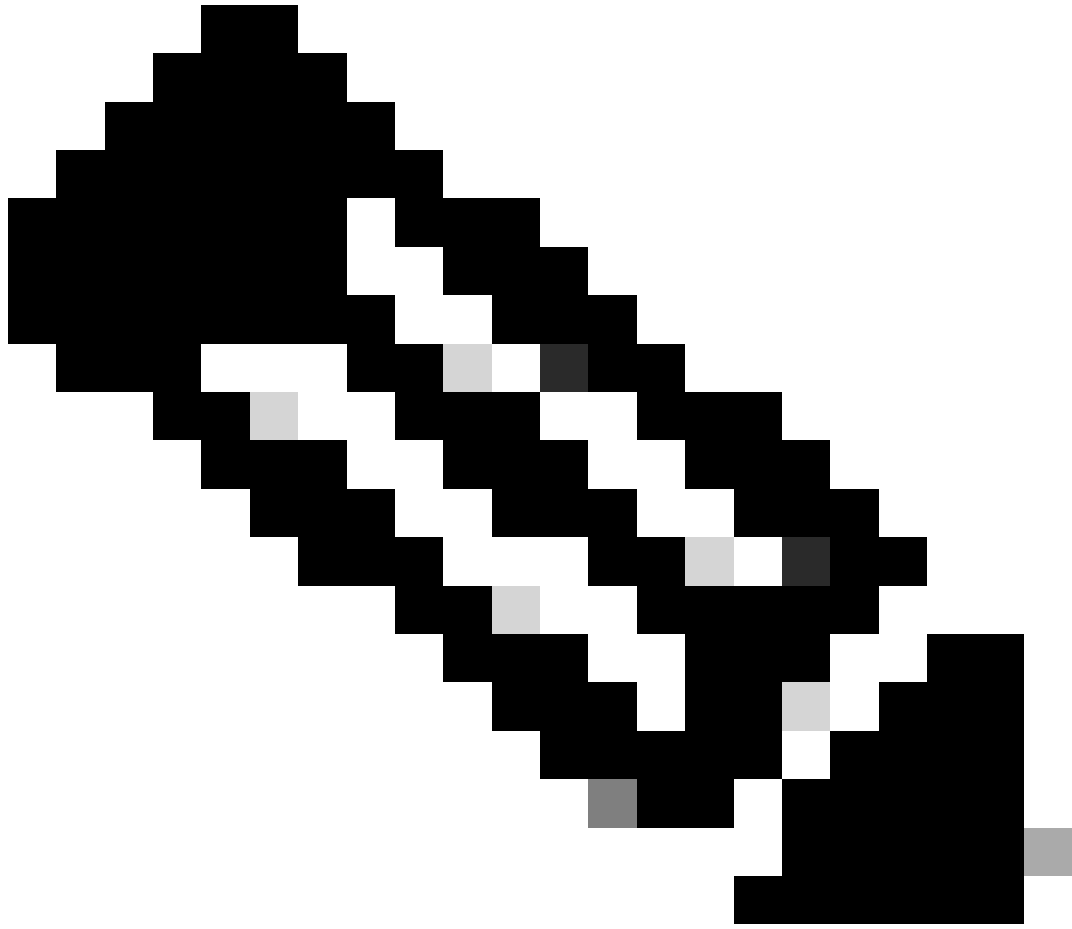
Description:

< Back

Next >

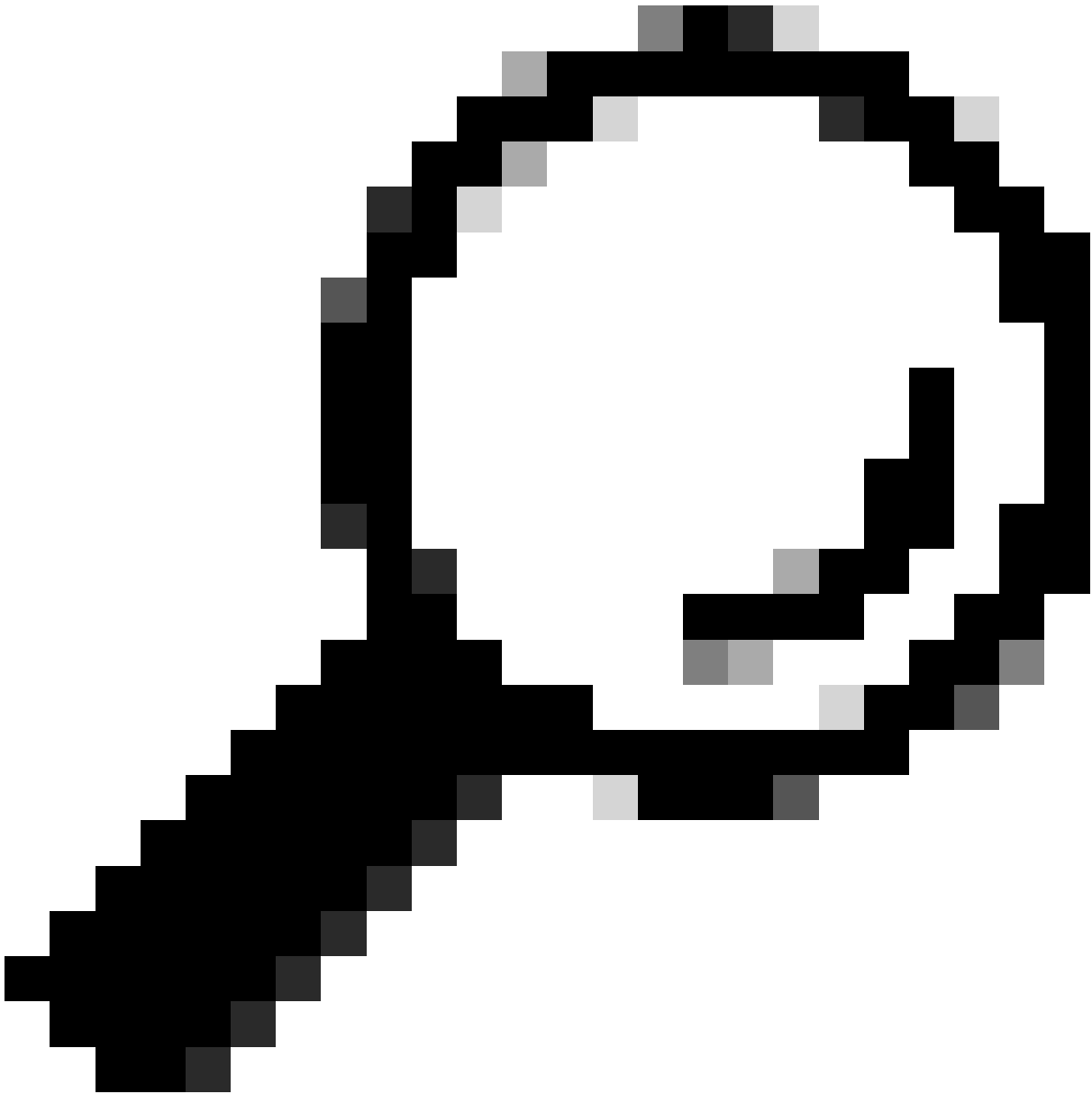
Cancel

步驟 3. 按一下Add。在Criteria中選擇Relay Agent Information。在運算子中，選擇等於。然後選擇Agent Remote ID並鍵入值。按一下OK，然後按一下Next。



註：遠端ID是從SVII關聯的SVI的MAC地址獲取的。

---



提示：透過增加更多條件並選擇OR而不是AND，可以將策略應用於多個遠端ID（或VTEP）。

---

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

## DHCP Policy Configuration Wizard

### Add/Edit Condition

Specify a condition for the policy being configured. Select a criteria, operator and values for the condition.

Criteria: Relay Agent Information

Operator: Equals

Value (in hex)

Relay Agent Information:

Agent Circuit ID:

Agent Remote ID: 707db9b84daf

Subscriber ID:

Prefix wildcard(\*)

Append wildcard(\*)

Ok

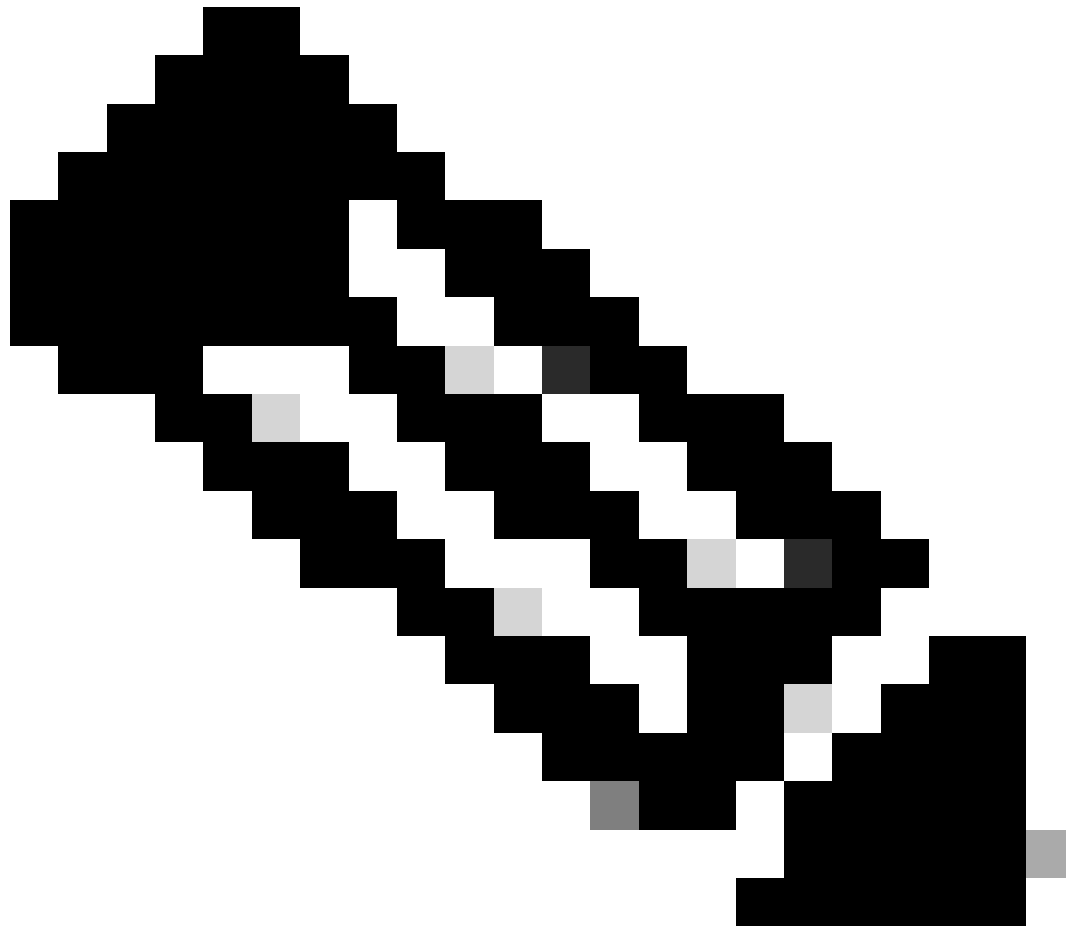
Cancel

< Back

Next >

Cancel

步驟 4. 對透過ID選擇的VTEP配置現有IP可以使用的IP地址，然後按一下Next。



注意：在本示例中，只有一個虛擬機器連線到Leaf-1，因此只有一個IP地址需要IPd。此處增加第二個IP地址，以防另一台主機連線。

---



## DHCP Policy Configuration Wizard

### Configure settings for the policy

If the conditions specified in the policy match a client request, the settings will be applied.



A scope can be subdivided into multiple IP address ranges. Clients that match the conditions defined in a policy will be issued an IP Address from the specified range.

Configure the start and end IP address for the range. The start and end IP addresses for the range must be within the start and end IP addresses of the scope.

The current scope IP address range is 10.10.10.1 - 10.10.10.254

If an IP address range is not configured for the policy, policy clients will be issued an IP address from the scope range.

Do you want to configure an IP address range for the policy:  Yes  No

Start IP address:

End IP address:

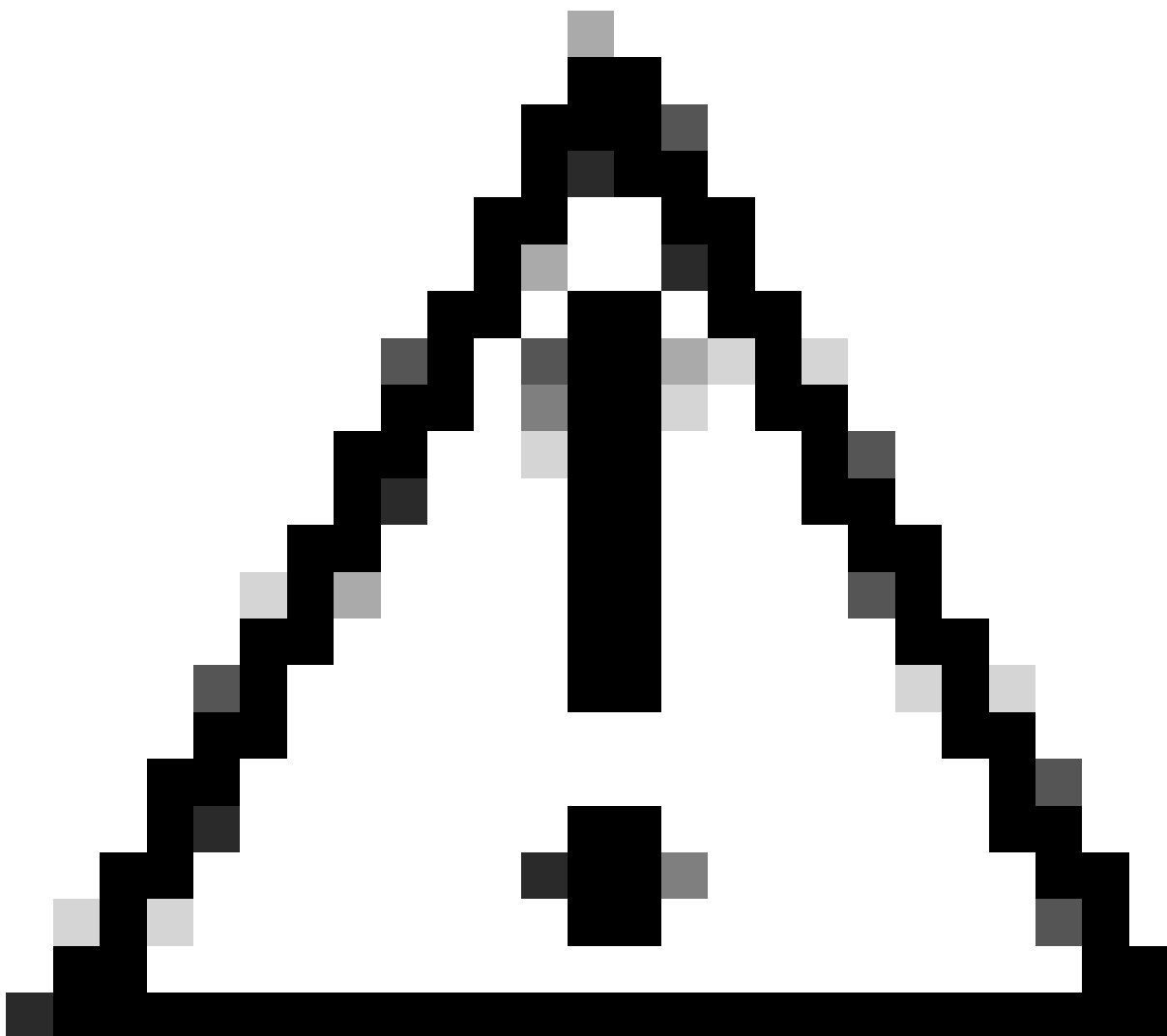
Percentage of IP address range: 0.8

< Back

Next >

Cancel

步驟 5.選擇DHCP Standard Option下003路由器左側的框。然後寫下屬於此策略的主機的預設網關的IP地址，然後按Add。按「Next」（下一步）。



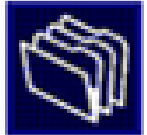
注意：您可以選取多個選項，但是如果您不確定要輸入哪個值，請不要這樣做。配置不一致或錯誤可能導致意外行為。

---

## DHCP Policy Configuration Wizard

### Configure settings for the policy

If the conditions specified in the policy match a client request, the settings will be applied.



Vendor class:

DHCP Standard Options

Available Options	Description
<input type="checkbox"/> 002 Time Offset	UTC offset in seconds
<input checked="" type="checkbox"/> 003 Router	Array of router addresses order
<input type="checkbox"/> 004 Time Server	Array of time server addresses.

#### Data entry

Server name:

Resolve

IP address:

Add

10.10.10.1

Remove

Up

Down

< Back

Next >

Cancel

步驟 6. 檢查策略條件並按一下Finish。

The screenshot shows the DHCP console interface. On the left is a tree view showing the hierarchy: DHCP > CXLabs-WIN2K22DC > IPv4 > Superscope Scopes for VxLAN Fabric (with Opt 82) > Scope [10.10.10.0] L2VNI 101010 > Policies. The main area displays a table of policy configurations:

Policy Name	Description	Processin...	Level	Address Range	State	Actions
VNI 101010	Policy to select scope for Leaf-1 using Remote-ID	1	Scope	10.10.10.2 - 10.10.10.3	Enabled	More Actions

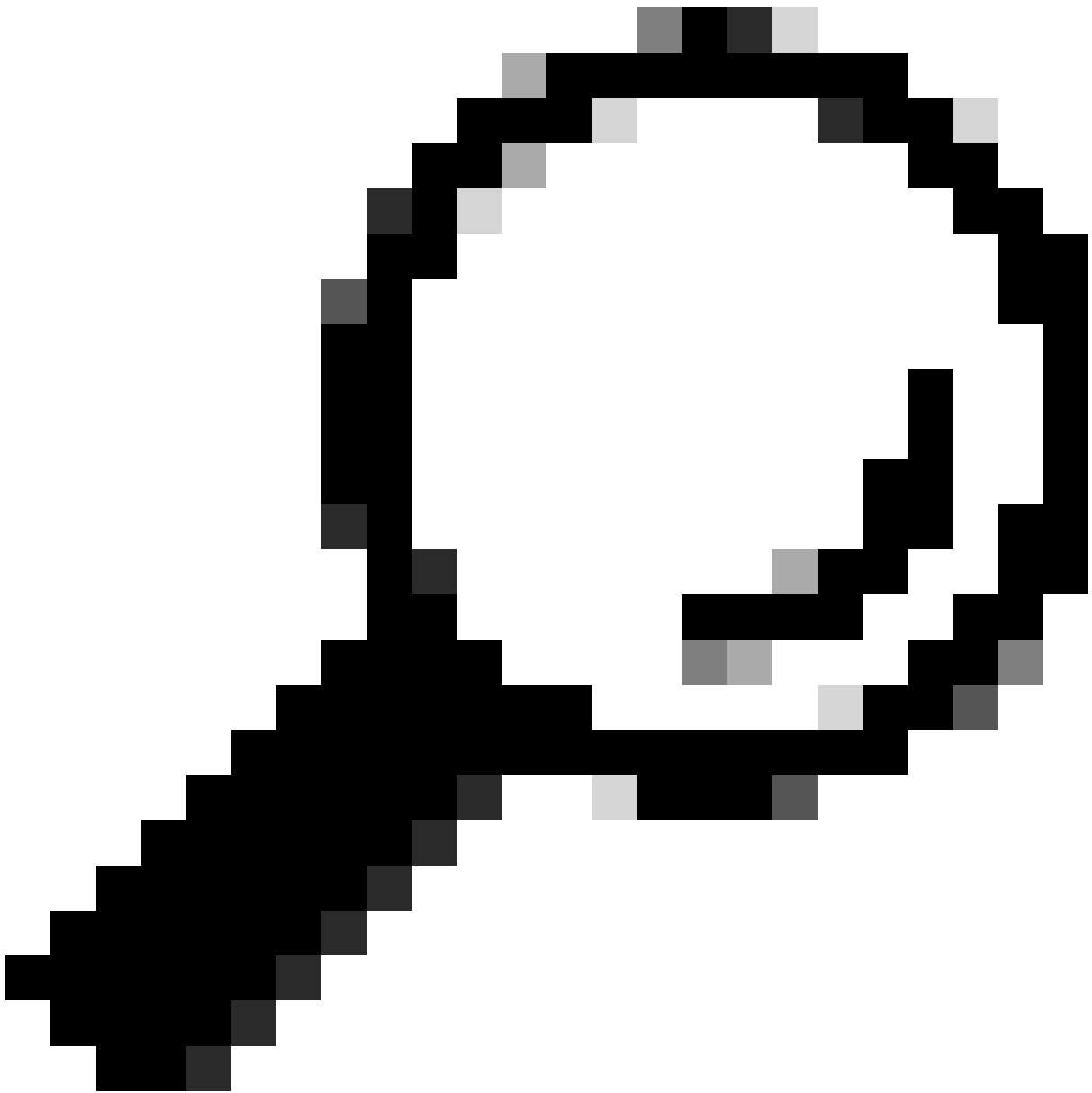
DCHP資料包在VxLAN交換矩陣中從頭到尾進行遍歷。

發現由HOST-1傳送

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

# 在LEAF-1上發現

在LEAF-1上收到的發現	發現由LEAF-1傳送
<pre> &gt; Ethernet II, Src: 00:50:56:a5:fd:dd, Dst: ff:ff:ff:ff:ff:ff &gt; Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255 &gt; User Datagram Protocol, Src Port: 68, Dst Port: 67 &gt; 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   &gt; 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   &gt; Option: (53) DHCP Message Type (Discover)     Length: 1     &lt;Value: 01&gt;     DHCP: Discover (1)   &gt; Option: (61) Client identifier     Length: 7     &lt;Value: 01005056a5fddd&gt;     Hardware type: Ethernet (0x01)     Client MAC address: 00:50:56:a5:fd:dd   &gt; Option: (12) Host Name     Length: 10     &lt;Value: 43584c6162732d573130&gt;     Host Name: CXLabs-W10   &gt; Option: (60) Vendor class identifier     Length: 8     &lt;Value: 4d53465420352e30&gt;     Vendor class identifier: MSFT 5.0   &gt; Option: (55) Parameter Request List     Length: 14     &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;     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   &gt; Option: (255) End   Padding: 0000000000000000 </pre>	<pre> &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 10:b3:d6:a4:85:97 &gt; Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150 &gt; User Datagram Protocol, Src Port: 65233, Dst Port: 4789 &gt; Virtual eXtensible Local Area Network   Flags: 0x8000, VXLAN Network ID (VNI)   Group Policy ID: 0   VXLAN Network Identifier (VNI): 303030   Reserved: 0 &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe &gt; Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150 &gt; User Datagram Protocol, Src Port: 67, Dst Port: 67 &gt; 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   &gt; 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   &gt; Option: (53) DHCP Message Type (Discover)     Length: 1     &lt;Value: 01&gt;     DHCP: Discover (1)   &gt; Option: (61) Client identifier     Length: 7     &lt;Value: 01005056a5fddd&gt;     Hardware type: Ethernet (0x01)     Client MAC address: 00:50:56:a5:fd:dd   &gt; Option: (12) Host Name     Length: 10     &lt;Value: 43584c6162732d573130&gt;     Host Name: CXLabs-W10   &gt; Option: (60) Vendor class identifier     Length: 8     &lt;Value: 4d53465420352e30&gt;     Vendor class identifier: MSFT 5.0   &gt; Option: (55) Parameter Request List     Length: 14     &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;     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   &gt; Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d10b040a0a0105040a0a0a0&gt;   &gt; Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0180000600018a9200a000000000&gt;     Agent Circuit ID: 0180000600018a9200a000000000   &gt; Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   &gt; Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]   &gt; Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   &gt; Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   &gt; Option: (255) End   Padding: 0000000000000000 </pre>



提示：連按兩下時，影像會放大。

---

## 脊柱上的發現

在主幹上收到發現	探索由SPINE傳送
----------	------------

```

> Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 10:b3:d6:a4:85:97
> Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254
> User Datagram Protocol, Src Port: 65233, Dst Port: 4789
> Virtual eXtensible Local Area Network
  > Flags: 0x0000, 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: 0x0000, 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: 01005056a5fd>
    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: 0103060f1f212b2c2e2f779f9fc>
    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: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
  > 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
    Option End: 255
    Padding: 00000000000000000000

```

```

> Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 00:26: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: 0x0000, 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: 0x0000, 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: 01005056a5fd>
    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: 0103060f1f212b2c2e2f779f9fc>
    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: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
  > 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
    Option End: 255
    Padding: 00000000000000000000

```

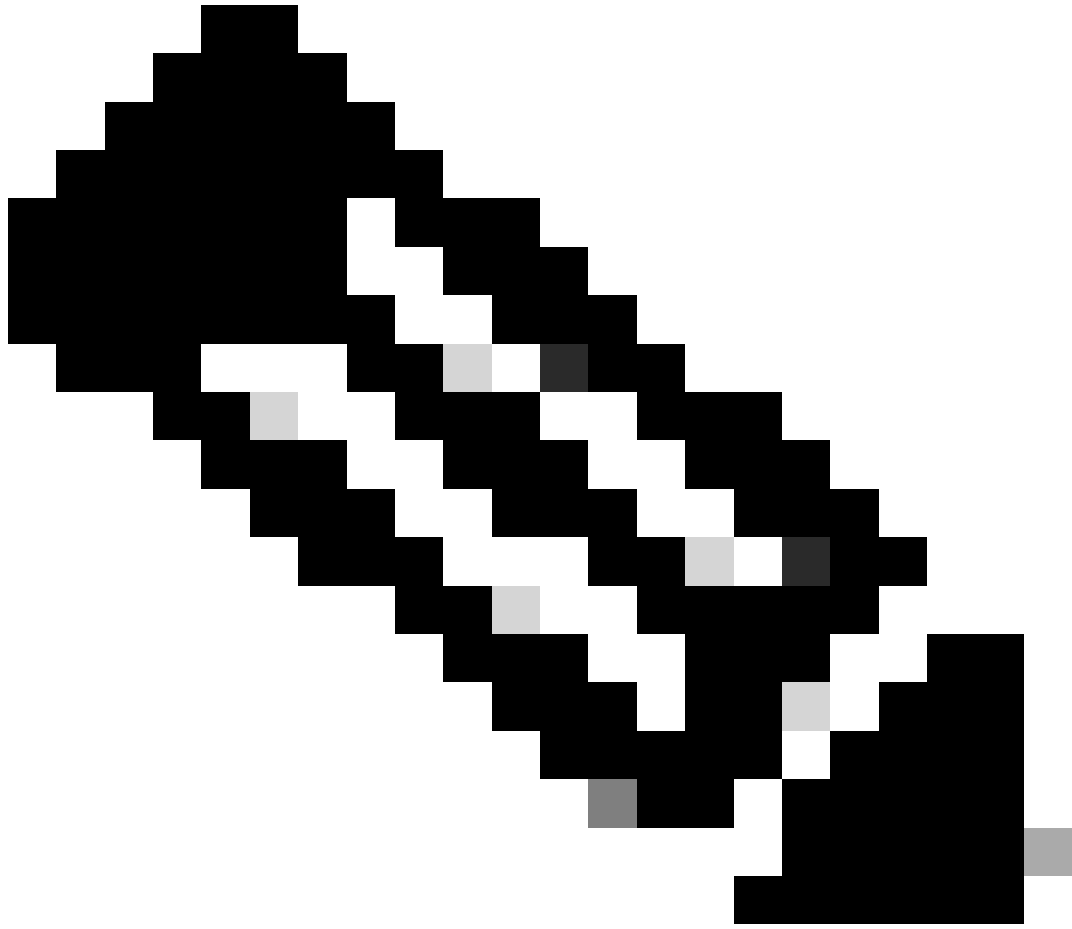
## 在LEAF-1-vPC上發現

在LEAF-1-vPC上收到的發現	由LEAF-1-vPC傳送的發現
-------------------	------------------



```
Ethernet II, Src: 10:b3:06: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: 0x0000, 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: 0x0000, 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: 01005056a5fd>
    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: 0103060f1f212b2c2e2f779f9f>
    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: 010e0108000600018a9200a000000000206707db9b84daf97090074656e16e742d610b040a0a0a0105040a0a00>
  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: 0074656e16e742d61>
    VRF name:
    [Expert Info (Warning/Undecoded): Trailing stray characters]
    [Trailing stray characters]
    <Message: Trailing stray characters>
    [Severity level: Warning]
    [Group: Undecoded]
  Option 82 Suboption: (111) 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: 00000000000000000000

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: 0x0000, 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: 01005056a5fd>
    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: 0103060f1f212b2c2e2f779f9f>
    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: 010e0108000600018a9200a000000000206707db9b84daf97090074656e16e742d610b040a0a0a0105040a0a00>
  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: 0074656e16e742d61>
    VRF name:
    [Expert Info (Warning/Undecoded): Trailing stray characters]
    [Trailing stray characters]
    <Message: Trailing stray characters>
    [Severity level: Warning]
    [Group: Undecoded]
  Option 82 Suboption: (111) 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: 00000000000000000000
```



注意：LEAF-2-vPC接收Discover資料包，但僅交換此資料包。目的MAC地址屬於DHCP伺服器。

---

在DCHP伺服器上接收的發現

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

由DCHP伺服器傳送的DCHP優惠

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

# LEAF-2-vPC上的DCHP優惠

在LEAF-2-vPC上收到優惠	透過LEAF-2-vPC傳送優惠
<pre> Ethernet II, Src: 00:50:56:a5:d5:c4, 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: 0x0000, 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     &lt;Value: 02&gt;     DHCP: Offer (2)   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff&gt;     Subnet Mask: 255.255.255.0   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0105040a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]     [Trailing stray characters]     &lt;Message: Trailing stray characters&gt;     [Severity level: Warning]     [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255           </pre>	<pre> Ethernet II, Src: 00:26: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: 0x0000, 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: 0x0000, 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     &lt;Value: 02&gt;     DHCP: Offer (2)   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff&gt;     Subnet Mask: 255.255.255.0   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0105040a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]     [Trailing stray characters]     &lt;Message: Trailing stray characters&gt;     [Severity level: Warning]     [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255           </pre>

# DHCP提供vPC主幹

主幹上收到優惠	提供由SPINE傳送
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<pre> 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: 0x0000, 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: 0x0000, 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     &lt;Value: 02&gt;     DHCP: Offer (2)   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff&gt;     Subnet Mask: 255.255.255.0   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]     [Trailing stray characters]     &lt;Message: Trailing stray characters&gt;     [Severity level: Warning]     [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255 </pre>	<pre> 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: 0x0000, 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: 0x0000, 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: 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     &lt;Value: 02&gt;     DHCP: Offer (2)   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff&gt;     Subnet Mask: 255.255.255.0   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255 </pre>
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## LEAF-1上的DHCP提供

<p>在LEAF-1上收到優惠</p>	<p>在LEAF-1上傳送優惠</p>
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<pre> &gt; Ethernet II, Src: 18:b3:d6:a4:85:97, Dst: 70:7d:b9:b8:4d:af &gt; Internet Protocol Version 4, Src: 13.13.13.254, Dst: 5.5.5.5 &gt; User Datagram Protocol, Src Port: 65518, Dst Port: 4789 &gt; Virtual eXtensible Local Area Network   &gt; Flags: 0x8000, VXLAN Network ID (VNI)     Group Policy ID: 0     VXLAN Network Identifier (VNI): 383038     Reserved: 0 &gt; Ethernet II, Src: 02:00:0d:0d:0d:fe, Dst: 70:7d:b9:b8:4d:af &gt; Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8 &gt; User Datagram Protocol, Src Port: 67, Dst Port: 67 &gt; 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   &gt; 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: 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   &gt; Option: (53) DHCP Message Type (Offer)     Length: 1     &lt;Value: 02&gt;     DHCP: Offer (2)   &gt; Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffff00&gt;     Subnet Mask: 255.255.255.0   &gt; Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   &gt; Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   &gt; Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   &gt; Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   &gt; Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   &gt; Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00&gt;   &gt; Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   &gt; Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   &gt; Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:   &gt; Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   &gt; Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   &gt; Option: (255) End   Option End: 255 </pre>	<pre> &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: ff:ff:ff:ff:ff:ff &gt; Internet Protocol Version 4, Src: 10.10.10.1, Dst: 255.255.255.255 &gt; User Datagram Protocol, Src Port: 67, Dst Port: 68 &gt; 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   &gt; 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   &gt; Option: (53) DHCP Message Type (Offer)     Length: 1     &lt;Value: 02&gt;     DHCP: Offer (2)   &gt; Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffff00&gt;     Subnet Mask: 255.255.255.0   &gt; Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   &gt; Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   &gt; Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   &gt; Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   &gt; Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   &gt; Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   &gt; Option: (255) End   Option End: 255 </pre>
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在HOST-1上接收的DHCP Offer



```
> 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 (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: 0000000000000000000000
  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: ffffffff00>
    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: (255) End
    Option End: 255
```

請求由HOST-1傳送

```

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

```

## 對LEAF-1的請求

在LEAF-1上收到的請求	請求由LEAF-1傳送
<pre> &gt; Ethernet II, Src: 00:50:56:a5:fd:dd, Dst: ff:ff:ff:ff:ff:ff &gt; Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255 &gt; User Datagram Protocol, Src Port: 68, Dst Port: 67 &gt; 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   &gt; 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   &gt; Option: (53) DHCP Message Type (Request)     Length: 1     &lt;Value: 03&gt;     DHCP: Request (3)   &gt; Option: (61) Client identifier     Length: 7     &lt;Value: 01005056a5fddd&gt;     Hardware type: Ethernet (0x01)     Client MAC address: 00:50:56:a5:fd:dd   &gt; Option: (50) Requested IP Address (10.10.10.3)     Length: 4     &lt;Value: 0a0a0a03&gt;     Requested IP Address: 10.10.10.3   &gt; Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   &gt; Option: (12) Host Name     Length: 10     &lt;Value: 43584c6162732d573130&gt;     Host Name: CXLabs-W10   &gt; Option: (81) Client Fully Qualified Domain Name     Length: 13     &lt;Value: 00000043584c6162732d573130&gt;     &gt; 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   &gt; Option: (60) Vendor class identifier     Length: 8     &lt;Value: 4d53465420352e30&gt;     Vendor class identifier: MSFT 5.0   &gt; Option: (55) Parameter Request List     Length: 14     &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;     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   &gt; Option: (255) End     Option End: 255 </pre>	<pre> &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 10:b3:d6:a4:85:97 &gt; Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254 &gt; User Datagram Protocol, Src Port: 51730, Dst Port: 4789 &gt; Virtual Extensible Local Area Network   &gt; Flags: 0x8000, VXLAN Network ID (VNI)     Group Policy ID: 0     VXLAN Network Identifier (VNI): 303030     Reserved: 0   &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe   &gt; Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150   &gt; User Datagram Protocol, Src Port: 67, Dst Port: 67   &gt; 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     &gt; 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     &gt; Option: (53) DHCP Message Type (Request)       Length: 1       &lt;Value: 03&gt;       DHCP: Request (3)     &gt; Option: (61) Client identifier       Length: 7       &lt;Value: 01005056a5fddd&gt;       Hardware type: Ethernet (0x01)       Client MAC address: 00:50:56:a5:fd:dd     &gt; Option: (50) Requested IP Address (10.10.10.3)       Length: 4       &lt;Value: 0a0a0a03&gt;       Requested IP Address: 10.10.10.3     &gt; Option: (54) DHCP Server Identifier (10.10.10.150)       Length: 4       &lt;Value: 0a0a0a96&gt;       DHCP Server Identifier: 10.10.10.150     &gt; Option: (12) Host Name       Length: 10       &lt;Value: 43584c6162732d573130&gt;       Host Name: CXLabs-W10     &gt; Option: (81) Client Fully Qualified Domain Name       Length: 13       &lt;Value: 00000043584c6162732d573130&gt;       &gt; Flags: 0x00       A-RR result: 0       PTR-RR result: 0       Client name: CXLabs-W10     &gt; Option: (60) Vendor class identifier       Length: 8       &lt;Value: 4d53465420352e30&gt;       Vendor class identifier: MSFT 5.0     &gt; Option: (55) Parameter Request List       Length: 14       &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;       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     &gt; Option: (82) Agent Information Option       Length: 47       &lt;Value: 010e010800060018a9200a000000000206707db9b84daf97090074656e16e742d610b40a0a0105040a0a00&gt;     &gt; Option 82 Suboption: (1) Agent Circuit ID       Length: 14       &lt;Value: 0108000600018a9200a000000000&gt;       Agent Circuit ID: 0108000600018a9200a000000000     &gt; Option 82 Suboption: (2) Agent Remote ID       Length: 6       &lt;Value: 707db9b84daf&gt;       Agent Remote ID: 707db9b84daf     &gt; Option 82 Suboption: (151) VRF name/VPN ID       Length: 9       &lt;Value: 0074656e16e742d61&gt;       &gt; VRF name:         [Expert Info (Warning/Undecoded): Trailing stray characters]     &gt; Option 82 Suboption: (11) Server ID Override (10.10.10.1)       Length: 4       &lt;Value: 0a0a0a01&gt;       Server ID Override: 10.10.10.1     &gt; Option 82 Suboption: (5) Link selection (10.10.10.0)       Length: 4       &lt;Value: 0a0a0a00&gt;       Link selection: 10.10.10.0     &gt; Option: (255) End       Option End: 255 </pre>

## 主幹上的請求

在主幹上收到請求	請求由SPINE傳送
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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  
Virtual Extensible Local Area Network  
Flags: 0x8000, VLAN Network ID (VNI)  
Group Policy ID: 0  
VLAN Network Identifier (VNI): 303030  
Reserved: 0

Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe  
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150  
User Datagram Protocol, Src Port: 67, Dst Port: 67

Dynamic Host Configuration Protocol (Request)

Message type: Boot Request (1)  
Hardware type: Ethernet (0x01)  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0xe9e35087  
Seconds elapsed: 0  
Bootp flags: 0x8000, Broadcast flag (Broadcast)  
Client IP address: 0.0.0.0  
Your (client) IP address: 0.0.0.0  
Next server IP address: 0.0.0.0  
Relay agent IP address: 172.16.10.8  
Client MAC address: 00:50:56:a5:fd:dd  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: DHCP  
Option: (53) DHCP Message Type (Request)  
Length: 1  
<Value: 03>  
DHCP: Request (3)  
Option: (61) Client Identifier  
Length: 7  
<Value: 01005056a5fddd>  
Hardware type: Ethernet (0x01)  
Client MAC address: 00:50:56:a5:fd:dd  
Option: (50) Requested IP Address (10.10.10.3)  
Length: 4  
<Value: 0a0a0a03>  
Requested IP Address: 10.10.10.3  
Option: (54) DHCP Server Identifier (10.10.10.150)  
Length: 4  
<Value: 0a0a0a96>  
DHCP Server Identifier: 10.10.10.150  
Option: (12) Host Name  
Length: 10  
<Value: 43584c6162732d573130>  
Host Name: CXLabs-W10  
Option: (81) Client Fully Qualified Domain Name  
Length: 13  
<Value: 00000043584c6162732d573130>  
Flags: 0x00  
A-RR result: 0  
PTR-RR result: 0  
Client name: CXLabs-W10  
Option: (60) Vendor class identifier  
Length: 8  
<Value: 4d53465420352e30>  
Vendor class identifier: MSFT 5.0  
Option: (55) Parameter Request List  
Length: 14  
<Value: 0103060f1f212b2c2e2f7779f9fc>  
Parameter Request List Item: (1) Subnet Mask  
Parameter Request List Item: (3) Router  
Parameter Request List Item: (6) Domain Name Server  
Parameter Request List Item: (15) Domain Name  
Parameter Request List Item: (31) Perform Router Discover  
Parameter Request List Item: (33) Static Route  
Parameter Request List Item: (43) Vendor-Specific Information  
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server  
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type  
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope  
Parameter Request List Item: (119) Domain Search  
Parameter Request List Item: (121) Classless Static Route  
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)  
Parameter Request List Item: (252) Private/Proxy autodiscovery  
Option: (82) Agent Information Option  
Length: 47  
<Value: 010e018000600018a9200a00000000206707db9b84daf9790074656e616e742d610b040a0a0105040a0a0a00>  
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  
Option End: 255

Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 00:26:aa:85:95:87  
Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254  
User Datagram Protocol, Src Port: 51730, Dst Port: 4789

Virtual Extensible Local Area Network  
Flags: 0x8000, VLAN Network ID (VNI)  
Group Policy ID: 0  
VLAN Network Identifier (VNI): 303030  
Reserved: 0

Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe  
Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150  
User Datagram Protocol, Src Port: 67, Dst Port: 67

Dynamic Host Configuration Protocol (Request)

Message type: Boot Request (1)  
Hardware type: Ethernet (0x01)  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0xe9e35087  
Seconds elapsed: 0  
Bootp flags: 0x8000, Broadcast flag (Broadcast)  
Client IP address: 0.0.0.0  
Your (client) IP address: 0.0.0.0  
Next server IP address: 0.0.0.0  
Relay agent IP address: 172.16.10.8  
Client MAC address: 00:50:56:a5:fd:dd  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: DHCP  
Option: (53) DHCP Message Type (Request)  
Length: 1  
<Value: 03>  
DHCP: Request (3)  
Option: (61) Client identifier  
Length: 7  
<Value: 01005056a5fddd>  
Hardware type: Ethernet (0x01)  
Client MAC address: 00:50:56:a5:fd:dd  
Option: (50) Requested IP Address (10.10.10.3)  
Length: 4  
<Value: 0a0a0a03>  
Requested IP Address: 10.10.10.3  
Option: (54) DHCP Server Identifier (10.10.10.150)  
Length: 4  
<Value: 0a0a0a96>  
DHCP Server Identifier: 10.10.10.150  
Option: (12) Host Name  
Length: 10  
<Value: 43584c6162732d573130>  
Host Name: CXLabs-W10  
Option: (81) Client Fully Qualified Domain Name  
Length: 13  
<Value: 00000043584c6162732d573130>  
Flags: 0x00  
A-RR result: 0  
PTR-RR result: 0  
Client name: CXLabs-W10  
Option: (60) Vendor class identifier  
Length: 8  
<Value: 4d53465420352e30>  
Vendor class identifier: MSFT 5.0  
Option: (55) Parameter Request List  
Length: 14  
<Value: 0103060f1f212b2c2e2f7779f9fc>  
Parameter Request List Item: (1) Subnet Mask  
Parameter Request List Item: (3) Router  
Parameter Request List Item: (6) Domain Name Server  
Parameter Request List Item: (15) Domain Name  
Parameter Request List Item: (31) Perform Router Discover  
Parameter Request List Item: (33) Static Route  
Parameter Request List Item: (43) Vendor-Specific Information  
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server  
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type  
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope  
Parameter Request List Item: (119) Domain Search  
Parameter Request List Item: (121) Classless Static Route  
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)  
Parameter Request List Item: (252) Private/Proxy autodiscovery  
Option: (82) Agent Information Option  
Length: 47  
<Value: 010e018000600018a9200a00000000206707db9b84daf9790074656e616e742d610b040a0a0105040a0a0a00>  
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



# 在LEAF-2-vPC上請求

在LEAF-2-vPC上請求接收PCd	請求透過vPCAF-2-vPC傳送
<pre> Ethernet II, Src: 10:b3:d6:a4:85:97, Dst: 00:26:aa:85:95:87 Internet Protocol Version 4, Src: 5.5.5.5, Dst: 13.13.13.254 User Datagram Protocol, Src Port: 51730, Dst Port: 4789 Virtual extensible Local Area Network   Flags: 0x0000, VXLAN Network ID (VNI)     Group Policy ID: 0     VXLAN Network Identifier (VNI): 303030     Reserved: 0 Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: 02:00:0d:0d:0d:fe Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150 User Datagram Protocol, Src Port: 67, Dst Port: 67 Dynamic Host Configuration Protocol (Request)   Message type: Boot Request (1)   Hardware type: Ethernet (0x01)   Hardware address length: 6   Hops: 1   Transaction ID: 0xe9e35087   Seconds elapsed: 0   Bootp flags: 0x0000, 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   &lt;Value: 03&gt;   DHCP: Request (3) Option (61) Client identifier   Length: 7   &lt;Value: 01005056a5fddd&gt;   Hardware type: Ethernet (0x01)   Client MAC address: 00:50:56:a5:fd:dd Option (50) Requested IP Address (10.10.10.3)   Length: 4   &lt;Value: 0a0a0a03&gt;   Requested IP Address: 10.10.10.3 Option (54) DHCP Server Identifier (10.10.10.150)   Length: 4   &lt;Value: 0a0a0a96&gt;   DHCP Server Identifier: 10.10.10.150 Option (12) Host Name   Length: 10   &lt;Value: 43584c6162732d573130&gt;   Host Name: CXLabs-W10 Option (81) Client Fully Qualified Domain Name   Length: 13   &lt;Value: 00000043584c6162732d573130&gt;   Flags: 0x00   A-RR result: 0   PTR-RR result: 0   Client name: CXLabs-W10 Option (60) Vendor class identifier   Length: 8   &lt;Value: 4d53465428352e30&gt;   Vendor class identifier: MSFT 5.0 Option (55) Parameter Request List   Length: 14   &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;   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: (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   &lt;Value: 010e0108000600018a920a000000000206707db9b84daf97090074656e16e742d610b040a0a0a0105040a0a0a00&gt; Option 82 Suboption: (1) Agent Circuit ID   Length: 14   &lt;Value: 0108000600018a920a0000000000&gt;   Agent Circuit ID: 0108000600018a920a0000000000 Option 82 Suboption: (2) Agent Remote ID   Length: 6   &lt;Value: 707db9b84daf&gt;   Agent Remote ID: 707db9b84daf Option 82 Suboption: (151) VRF name/VPN ID   Length: 9   &lt;Value: 0074656e16e742d61&gt;   VRF name: Option 82 Suboption: (11) Server ID Override (10.10.10.1)   Length: 4   &lt;Value: 0a0a0a01&gt;   Server ID Override: 10.10.10.1 Option 82 Suboption: (5) Link selection (10.10.10.0)   Length: 4   &lt;Value: 0a0a0a00&gt;   Link selection: 10.10.10.0 Option (255) End   Option End: 255 </pre>	<pre> Ethernet II, Src: 00:26: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: 0x0000, 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   &lt;Value: 03&gt;   DHCP: Request (3) Option (61) Client identifier   Length: 7   &lt;Value: 01005056a5fddd&gt;   Hardware type: Ethernet (0x01)   Client MAC address: 00:50:56:a5:fd:dd Option (50) Requested IP Address (10.10.10.3)   Length: 4   &lt;Value: 0a0a0a03&gt;   Requested IP Address: 10.10.10.3 Option (54) DHCP Server Identifier (10.10.10.150)   Length: 4   &lt;Value: 0a0a0a96&gt;   DHCP Server Identifier: 10.10.10.150 Option (12) Host Name   Length: 10   &lt;Value: 43584c6162732d573130&gt;   Host Name: CXLabs-W10 Option (81) Client Fully Qualified Domain Name   Length: 13   &lt;Value: 00000043584c6162732d573130&gt;   Flags: 0x00   A-RR result: 0   PTR-RR result: 0   Client name: CXLabs-W10 Option (60) Vendor class identifier   Length: 8   &lt;Value: 4d53465428352e30&gt;   Vendor class identifier: MSFT 5.0 Option (55) Parameter Request List   Length: 14   &lt;Value: 0103060f1f212b2c2e2f779f9fc&gt;   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   &lt;Value: 010e0108000600018a920a000000000206707db9b84daf97090074656e16e742d610b040a0a0a0105040a0a0a00&gt; Option 82 Suboption: (1) Agent Circuit ID   Length: 14   &lt;Value: 0108000600018a920a0000000000&gt;   Agent Circuit ID: 0108000600018a920a0000000000 Option 82 Suboption: (2) Agent Remote ID   Length: 6   &lt;Value: 707db9b84daf&gt;   Agent Remote ID: 707db9b84daf Option 82 Suboption: (151) VRF name/VPN ID   Length: 9   &lt;Value: 0074656e16e742d61&gt;   VRF name: Option 82 Suboption: (11) Server ID Override (10.10.10.1)   Length: 4   &lt;Value: 0a0a0a01&gt;   Server ID Override: 10.10.10.1 Option 82 Suboption: (5) Link selection (10.10.10.0)   Length: 4   &lt;Value: 0a0a0a00&gt;   Link selection: 10.10.10.0 Option (255) End   Option End: 255 </pre>

# 在DCHP伺服器上收到請求

```
Ethernet II, Src: 60:26:aa:85:95:87, Dst: 00:50:56:a5:dc:ca
> Internet Protocol Version 4, Src: 172.16.10.8, Dst: 10.10.10.150
> User Datagram Protocol, Src Port: 67, Dst Port: 67
- Dynamic Host Configuration Protocol (Request)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0xe9e35087
  Seconds elapsed: 0
  > Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 172.16.10.8
  Client MAC address: 00:50:56:a5:fd:dd
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  - Option: (53) DHCP Message Type (Request)
    Length: 1
    <Value: 03>
    DHCP: Request (3)
  - Option: (61) Client identifier
    Length: 7
    <Value: 01005056a5fd00>
    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: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00>
  - Option 82 Suboption: (1) Agent Circuit ID
    Length: 14
    <Value: 0108000600018a9200a000000000>
    Agent Circuit ID: 0108000600018a9200a000000000
  - Option 82 Suboption: (2) Agent Remote ID
    Length: 6
    <Value: 707db9b84daf>
    Agent Remote ID: 707db9b84daf
  - Option 82 Suboption: (151) VRF name/VPN ID
    Length: 9
    <Value: 0074656e616e742d61>
    > VRF name:
  - Option 82 Suboption: (11) Server ID Override (10.10.10.1)
    Length: 4
    <Value: 0a0a0a01>
    Server ID Override: 10.10.10.1
  - Option 82 Suboption: (5) Link selection (10.10.10.0)
    Length: 4
    <Value: 0a0a0a00>
    Link selection: 10.10.10.0
  - Option: (255) End
    Option End: 255
```

ACK由DCHP伺服器傳送



```

> Ethernet II, Src: 00:50:56:a5:dc:ca, Dst: 00:00:0a:0a:0a:0a
> Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8
> User Datagram Protocol, Src Port: 67, Dst Port: 67
> Dynamic Host Configuration Protocol (ACK)
  Message type: Boot Reply (2)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 0
  Transaction ID: 0xe9e35087
  Seconds elapsed: 0
  Bootp flags: 0x8000, Broadcast flag (Broadcast)
    1... .... .... .... = Broadcast flag: Broadcast
    .000 0000 0000 0000 = Reserved flags: 0x0000
  Client IP address: 0.0.0.0
  Your (client) IP address: 10.10.10.3
  Next server IP address: 0.0.0.0
  Relay agent IP address: 172.16.10.8
  Client MAC address: 00:50:56:a5:fd:dd
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  Option: (53) DHCP Message Type (ACK)
    Length: 1
    <Value: 05>
    DHCP: ACK (5)
  Option: (58) Renewal Time Value
    Length: 4
    <Value: 0000a8c0>
    Renewal Time Value: 12 hours (43200)
  Option: (59) Rebinding Time Value
    Length: 4
    <Value: 00012750>
    Rebinding Time Value: 21 hours (75600)
  Option: (51) IP Address Lease Time
    Length: 4
    <Value: 00015180>
    IP Address Lease Time: 1 day (86400)
  Option: (54) DHCP Server Identifier (10.10.10.1)
    Length: 4
    <Value: 0a0a0a01>
    DHCP Server Identifier: 10.10.10.1
  Option: (1) Subnet Mask (255.255.255.0)
    Length: 4
    <Value: ffffffff00>
    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: 010e0108000600018a9200a000000000206707db9b84daf97090074656e616e742d610b040a0a0105040a0a0a00>
  Option 82 Suboption: (1) Agent Circuit ID
    Length: 14
    <Value: 0108000600018a9200a000000000>
    Agent Circuit ID: 0108000600018a9200a000000000
  Option 82 Suboption: (2) Agent Remote ID
    Length: 6
    <Value: 707db9b84daf>
    Agent Remote ID: 707db9b84daf
  Option 82 Suboption: (151) VRF name/VPN ID
    Length: 9
    <Value: 0074656e616e742d61>
  VRF name:
    > [Expert Info (Warning/Undecoded): Trailing stray characters]
      [Trailing stray characters]
      <Message: Trailing stray characters>
      [Severity level: Warning]
      [Group: Undecoded]
  Option 82 Suboption: (11) Server ID Override (10.10.10.1)
    Length: 4
    <Value: 0a0a0a01>
    Server ID Override: 10.10.10.1
  Option 82 Suboption: (5) Link selection (10.10.10.0)
    Length: 4
    <Value: 0a0a0a00>
    Link selection: 10.10.10.0
  Option: (255) End
  Option End: 255

```

# LEAF-2-vPC上的ACK

在LEAF-2-vPC上收到的ACK	LEAF-2-vPC傳送的ACK
<pre> 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: 0x0000, 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     &lt;Value: 05&gt;     DHCP: ACK (5)   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;     Flags: 0x00     A-RR result: 255     PTR-RR result: 255   Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d061&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]     [Trailing stray characters]     &lt;Message: Trailing stray characters&gt;     [Severity level: Warning]     [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End   Option End: 255 </pre>	<pre> Ethernet II, Src: 00:26:aa:85:95:07, Dst: 10:b3:d6:04:85:97 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: 0x0000, 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: 0x0000, 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     &lt;Value: 05&gt;     DHCP: ACK (5)   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;     Flags: 0x00     .000 .... = Reserved flags: 0x0     ... 0... = Server DNS: 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     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d061&gt;     VRF name:     [Expert Info (Warning/Undecoded): Trailing stray characters]     [Trailing stray characters]     &lt;Message: Trailing stray characters&gt;     [Severity level: Warning]     [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End   Option End: 255 </pre>

## 脊柱上的ACK

脊柱上收到ACK	透過主幹傳送ACK
<pre> Ethernet II, Src: 00:126: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: 0x0000, 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: 0x0000, 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     &lt;Value: 05&gt;     DHCP: ACK (5)   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;   Flags: 0x00     0000 .... = Reserved flags: 0x0     ... 0... = Server DNS: 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     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6400&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:       [Expert Info (Warning/Undecoded): Trailing stray characters]       [Trailing stray characters]       &lt;Message: Trailing stray characters&gt;       [Severity level: Warning]       [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255           </pre>	<pre> Ethernet II, Src: 10:b3:d6:a4:85:97, 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: 65518, Dst Port: 4789 Virtual eXtensible Local Area Network   Flags: 0x0000, 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: 0x0000, 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     &lt;Value: 05&gt;     DHCP: ACK (5)   Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;   Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;   Flags: 0x00     0000 .... = Reserved flags: 0x0     ... 0... = Server DNS: 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     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6400&gt;     Domain Name: cisco.com   Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d610b040a0a0105040a0a0a00&gt;   Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0108000600018a9200a000000000&gt;     Agent Circuit ID: 0108000600018a9200a000000000   Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;     VRF name:       [Expert Info (Warning/Undecoded): Trailing stray characters]       [Trailing stray characters]       &lt;Message: Trailing stray characters&gt;       [Severity level: Warning]       [Group: Undecoded]   Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   Option: (255) End     Option End: 255           </pre>

## LEAF-1上的ACK

在LEAF-1上收到的ACK	ACK由LEAF-1傳送
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<pre> &gt; Ethernet II, Src: 10:b3:06:a4:85:97, Dst: 70:7d:b9:b8:4d:af &gt; Internet Protocol Version 4, Src: 13.13.13.254, Dst: 5.5.5.5 &gt; User Datagram Protocol, Src Port: 65518, Dst Port: 4789 &gt; Virtual eXtensible Local Area Network   &gt; Flags: 0x0000, VLAN Network ID (VNI)     Group Policy ID: 0     VLAN Network Identifier (VNI): 303030     Reserved: 0 &gt; Ethernet II, Src: 02:00:0d:0d:0d:fe, Dst: 70:7d:b9:b8:4d:af &gt; Internet Protocol Version 4, Src: 10.10.10.150, Dst: 172.16.10.8 &gt; User Datagram Protocol, Src Port: 67, Dst Port: 67 &gt; 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   &gt; Bootp flags: 0x0000, 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   &gt; Option: (53) DHCP Message Type (ACK)     Length: 1     &lt;Value: 05&gt;     DHCP: ACK (5)   &gt; Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   &gt; Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   &gt; Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   &gt; Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   &gt; Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   &gt; Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;     &gt; Flags: 0x00       0000 ... = Reserved flags: 0x0       ... 0... = Server DNS: Some server updates       ... .0.. = Encoding: ASCII encoding       ... ..0. = Server overrides: No override       ... ...0 = Server: Client     A-RR result: 255     PTR-RR result: 255   &gt; Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   &gt; Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   &gt; Option: (82) Agent Information Option     Length: 47     &lt;Value: 010e0108000600018a9200a00000000206707db9b84daf97090074656e616e742d6100040a0a0105040a0a000&gt;   &gt; Option 82 Suboption: (1) Agent Circuit ID     Length: 14     &lt;Value: 0180000600018a9200a00000000000&gt;     Agent Circuit ID: 0180000600018a9200a0000000000000   &gt; Option 82 Suboption: (2) Agent Remote ID     Length: 6     &lt;Value: 707db9b84daf&gt;     Agent Remote ID: 707db9b84daf   &gt; Option 82 Suboption: (151) VRF name/VPN ID     Length: 9     &lt;Value: 0074656e616e742d61&gt;   &gt; VRF name:     &gt; [Expert Info (Warning/Undecoded): Trailing stray characters]       [Trailing stray characters]       &lt;Message: Trailing stray characters&gt;       [Severity level: Warning]       [Group: Undecoded]   &gt; Option 82 Suboption: (11) Server ID Override (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     Server ID Override: 10.10.10.1   &gt; Option 82 Suboption: (5) Link selection (10.10.10.0)     Length: 4     &lt;Value: 0a0a0a00&gt;     Link selection: 10.10.10.0   &gt; Option: (255) End     Option End: 255 </pre>	<pre> &gt; Ethernet II, Src: 70:7d:b9:b8:4d:af, Dst: ff:ff:ff:ff:ff:ff &gt; Internet Protocol Version 4, Src: 10.10.10.1, Dst: 255.255.255.255 &gt; User Datagram Protocol, Src Port: 67, Dst Port: 68 &gt; 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   &gt; Bootp flags: 0x0000, 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   &gt; Option: (53) DHCP Message Type (ACK)     Length: 1     &lt;Value: 05&gt;     DHCP: ACK (5)   &gt; Option: (58) Renewal Time Value     Length: 4     &lt;Value: 0000a8c0&gt;     Renewal Time Value: 12 hours (43200)   &gt; Option: (59) Rebinding Time Value     Length: 4     &lt;Value: 00012750&gt;     Rebinding Time Value: 21 hours (75600)   &gt; Option: (51) IP Address Lease Time     Length: 4     &lt;Value: 00015180&gt;     IP Address Lease Time: 1 day (86400)   &gt; Option: (54) DHCP Server Identifier (10.10.10.1)     Length: 4     &lt;Value: 0a0a0a01&gt;     DHCP Server Identifier: 10.10.10.1   &gt; Option: (1) Subnet Mask (255.255.255.0)     Length: 4     &lt;Value: ffffffff00&gt;     Subnet Mask: 255.255.255.0   &gt; Option: (81) Client Fully Qualified Domain Name     Length: 3     &lt;Value: 00ffff&gt;     &gt; Flags: 0x00       0000 ... = Reserved flags: 0x0       ... 0... = Server DNS: Some server updates       ... .0.. = Encoding: ASCII encoding       ... ..0. = Server overrides: No override       ... ...0 = Server: Client     A-RR result: 255     PTR-RR result: 255   &gt; Option: (3) Router     Length: 4     &lt;Value: 0a0a0a01&gt;     Router: 10.10.10.1   &gt; Option: (15) Domain Name     Length: 10     &lt;Value: 636973636f2e636f6d00&gt;     Domain Name: cisco.com   &gt; Option: (255) End     Option End: 255 </pre>
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## 主機1上的ACK



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> 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

```

## 相關資訊

[設定VXLAN BGP EVPN](#)

[配置VXLAN](#)

[排除Nexus 9000上的DHCP相關問題](#)

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

## 關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。