ACI遠端枝葉發現和配置

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簡介

本文描述了使用應用策略基礎設施控制器(APIC)GUI在現有以應用為中心的基礎設施(ACI)交換矩陣 中發現和配置遠端枝葉(RLEAF)的步驟。

背景資訊

ACI遠端枝葉交換機部署可幫助客戶將ACI交換矩陣(ACI服務和APIC管理)擴展到沒有連線本地主 幹交換機或APIC的遠端資料中心。 遠端枝葉交換機通過廣域網(WAN)新增到交換矩陣中的現有 Pod。在主資料中心中部署的所有策略都部署在遠端交換機中,其行為類似於屬於交換矩陣的本地 枝葉交換機。在遠端枝葉拓撲中,所有單播流量都通過第3層通過VXLAN傳輸。第2層廣播、未知的 單點傳播和多點傳播(BUM)流量會透過前端複製(HER)通道傳送,不需要使用多點傳送。遠端站點 上的所有本地流量都直接在端點之間交換,無論是物理的還是虛擬的。任何需要使用脊柱代理的流 量都會轉發到主交換矩陣。與本地枝葉一樣,遠端枝葉可用於連線虛擬伺服器、物理伺服器和容器 。到連線到遠端枝葉的終端的流量通過遠端枝葉交換機進行本地轉發。

必要條件

需求

思科建議您瞭解以下主題:

- ACI光纖
- ACI GUI
- ACI枝葉和主幹交換機CLI
- NXoS交換機CLI

採用元件

本文中的資訊係根據以下軟體和硬體版本:

- APIC版本3.1(2q)
- 主幹LC N9K-X9732C-EX
- 枝葉N9K-X9732C-EX
- IP網路(IPN)- Nexus 7000、N7K-SUP2E、N7K-F348XP-25

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。

背景資訊

ACI 3.1(1)版本支援遠端枝葉解決方案。表中列出了截至編寫本文檔之日支援遠端枝葉解決方案的硬 體清單。

| 骨幹/枝葉 | 型號 |
|---------|-------------------------------------------|
| 固定骨幹 | N9364C |
| 模組化主幹LC | N9732C-EX N9736C-FX |
| 葉 | N93180YC-EX N93180YC-FX N93108TC-EX |

| N93108TC-FX |
|-------------|
| N93180LC-EX |
| N9348GC-FXP |
| N9336C-FX2 |

設定

網路圖表

此網路圖表說明此範例中使用的拓撲。



組態

本文檔主要介紹用於遠端枝葉部署的配置的ACI端,但不涉及IPN交換機WAN端配置的全部詳細資 訊。但是,此處列出了來自IPN的一些重要配置以供參考。

遠端WAN配置(ACI主交換矩陣端)

以下是在連線到主交換矩陣中的ACI主幹的IPN裝置中使用的配置:

vrf context RLEAF
 description VRF created for remote-leaf lab

router ospf 1

vrf RLEAF router-id 172.16.191.191 area 0.0.0.1 nssa

In this example same IPN router is used to connect to RLEAF and SPINE

interface loopback191 vrf member RLEAF ip address 172.16.191.191/32

連線到主幹的IPN上的介面特定配置。

| 朝向骨幹601 | 朝向骨幹501 |
|--------------------------------|--------------------------------|
| interface Ethernet3/38 | interface Ethernet3/39 |
| mtu 9150 | mtu 9150 |
| no shut | no shut |
| interface Ethernet3/38.4 | interface Ethernet3/39.4 |
| 指向spine601的描述連結 | 指向spine501的描述連結 |
| mtu 9150 | mtu 9150 |
| encapsulation dot1Q 4 | encapsulation dot1Q 4 |
| vrf成員RLEAF | vrf成員RLEAF |
| ip address 10.10.19.10/24 | ip address 10.10.20.10/24 |
| ip ospf network point-to-point | ip ospf network point-to-point |

| ip router osp | of 1區域0.0.0. | 1 |
|---------------|--------------|---|
|---------------|--------------|---|

no shut

遠端WAN配置(RLEAF端)

以下是在連線到遠端枝葉的IPN裝置中使用的配置:

| vrf情景RLEAF 說明為遠端枝葉實驗室建立的VRF |
|---------------------------------------------------------------------|
| router ospf 1 |
| vrf RLEAF router-id 172.16.191.191 區域0.0.0.1 nssa |
| #在本示例中,使用同一IPN路由器連線到RLEAF和SPINE |
| interface loopback191 vrf成員RLEAF ip address 172.16.191.191/32 |

連線到RLEAF的IPN上的介面特定配置:

| 向RLEAF-204前進 | 朝RLEAF-203 |
|--------------------------|--------------------------|
| interface Ethernet3/34 | interface Ethernet3/35 |
| mtu 9150 | mtu 9150 |
| no shut | no shut |
| interface Ethernet3/34.4 | interface Ethernet3/35.4 |
| 指向rleaf204的描述連結 | 指向rleaf203的描述連結 |
| mtu 915 | mtu 9150 |
| encapsulation dot1Q 4 | encapsulation dot1Q 4 |
| ip access-group 100 in | ip access-group 100 in |
| vrf成員RLEAF | vrf成員RLEAF |
| | |

| ip address 10.10.21.10/24 | ip address 10.10.22.10/24 |
|--------------------------------|--------------------------------|
| ip ospf network point-to-point | ip ospf network point-to-point |
| ip router ospf 1區域0.0.0.1 | ip router ospf 1區域0.0.0.1 |
| ip dhcp中繼地址10.0.0.1 | ip dhcp中繼地址10.0.0.1 |
| ip dhcp中繼地址10.0.0.2 | ip dhcp中繼地址10.0.0.2 |
| ip dhcp中繼地址10.0.0.3 | ip dhcp中繼地址10.0.0.3 |
| no shut | no shut |

註:確保dhcp中繼IP在連線到遠端枝葉的介面下配置了APIC交換矩陣IP地址。這是遠端枝葉 從APIC獲取載入程式檔案所必需的。在本示例中,10.0.0.1、10.0.0.2、10.0.0.3是APIC TEP IP地址。遠端枝葉向WAN傳送DHCP DISCOVER,以獲取連線到WAN路由器的子介面的IP地 址。WAN路由器將DHCP發現消息從遠端枝葉中繼到POD中的APIC。

ACI配置步驟1。配置Pod交換矩陣設定策略

1.定位至「結構」>「庫存」>「Pod結構設定策略」。

2.按兩下以開啟現有Pod的交換矩陣設定策略。

3.新增(+)遠端池,提供遠端ID(在本例中為11)和遠端池(在本例中為172.17.0.0/20),然後按一下 Submit。影象片段可以顯示不同的IP編址方案。

| | Inventory Fab | | | |
|---------------------------|-----------------|-------------------------------|-------------|-----------------------|
| | | | | |
| Inventory | 0 = 1 | Pod Fabric Setup Policy | | |
| > 🕩 Quick Start | | | | |
| 😚 Topology | | Pod ID | TEP Pool | Remote ID |
| > 😑 Pod 1 | | 1 | 10.0.0/16 | 11 |
| Pod Fabric Setup Policy | | | | |
| > 🔚 Fabric Membership | Fabric Setup P | olicy For A POD - Pod 1 | | 08 |
| > 📰 Unmanaged Fabric Node | | | | |
| Unreachable Nodes | | | | Policy Faults History |
| Disabled Interfaces and [| 8 👽 🛆 🕚 | | | 0 <u>+</u> **+ |
| | Properties | | | |
| | ID | :1 | | |
| | TEP Pool | : 10.0.0/16 | | |
| | Remote Pools | | | + |
| | | Remote ID | Remote Pool | |
| | | 11 | 11.0.0.0/20 | |
| | | | | |

[✤] 注意:遠端枝葉TEP池子網不能與主交換矩陣TEP池子網重疊。使用的子網必須是/24或更低。

1.導航到租戶>基礎設施>外部路由網路。 2.按一下右鍵並建立Routed Outside。

3.配置脊柱到IPN的OSPF外部路由。

4.使用OSPF作為路由協定。

5.使用overlay-1作為VRF。

在此示例中,遠端枝葉連線到單個Pod交換矩陣。因此,未選擇「Enable remote leaf with Multipod」。如果將遠端枝葉與多容器交換矩陣一起使用,則必須選中此選項。

| Tenant infra | () () () () () () () () () () () () () (| L3 Outside - spine2rleaf | | e |) () |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------|
| Ouick Start | | Poli | cy Stats Fault | s H | istory |
| Tenant infra Email: Application Profiles | | | ain Node Profiles | Netv | works |
| Networking Bridge Domains VRFs External Bridged Networks External Routed Networks Route Maps/Profiles Set Rules for Route Maps | | Image: Second State Control Enforcement: Import Image: Second State Control Enforcement: Import VRF: overlay-1 VRF: overlay-1 Resolved VRF: infra/overlay-1 External Routed Domain: spine-13 External Routed Domain: spine-13 | Ŏ | <u>+</u> | Υ,. |
| Match Rules for Route Maps Match Rules for Route Maps | | Route Profile for Interleas: Belect a value Route Control For Dampening: | | Ĩ. | + |
| Spine2rleaf Second Action Content of the second action of the s | | No items have been found. Select Actions to create a new item. | | | |
| > Dot1Q Tunnels > Contracts > Policies > Services | | Enable BGP/EIGRP/OSPF: BGP OSPF Area ID: 0.0.0.1 OSPF Area Control: Solution III Control IIII Control IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | | | |
| | | OSPF Area Type: NSSA area Regular area Stub area OSPF Area Cost: 1 | | | woue & |

為連線到IPN的每個主幹(在本示例中為node-501和node-601)配置節點配置檔案。此處顯示了 node-501的示例。對節點601執行相同的步驟。影象片段可以顯示不同的IP編址方案。

| Tenant infra | 0 = | 0 | Node Association | | | | | C |) () |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|------------------------------------|----------------------------------------------------|--------------------------------------|--------|--------|----------|--------|
| Bridge Domains | | | | | | Policy | Faults | Hi | istory |
| > External Bridged Networks | | | 8 👽 🛆 🕚 | | | | Ó | + | *** |
| External Routed Networks | | | Properties | | | | | | |
| > Route Maps/Profiles | | | Node ID: | topology/pod-1/node-501 | | | | | |
| > 🔚 Set Rules for Route Maps | | | Router ID: | 50.50.50 | | | | | |
| > Atch Rules for Route Maps | | | Use Router ID as Loopback Address: | This setting will be ignored if loopback addresses | are defined in the table below. | | | | |
| > 📤 rleaf-wan | | | Loopback Addresses: | | | | | | + |
| ✓ | | | | ▲ IP | | | | | |
| Logical Node Profiles | | | | | No items have been found. | | | | |
| V 🗧 spine501 | | | | | Select Actions to create a new item. | | | | |
| Logical Interface Profiles | | | | | | | | | |
| > 🗐 spine501 | | | | | | | | | |
| Configured Nodes | | | Static Routes: | | | | | | $^+$ |
| topology/pod-1/node-501 | | | | IP Address | Next Hop IP | | | | |
| v 🗧 spine601 | | | | | No items have been found. | | | | |
| ✓ Image: Value >> | | | | | Select Actions to create a new item. | | | | |
| > 🧧 spine601 | | | | | | | | | |
| Configured Nodes | | | | | | | | | |
| topology/pod-1/node-601 | | | | | | | | | |
| V Networks | | | | | | | | | |
| > \Xi rleaf | | | | < < Page 0 Of 0 > > | Objects Per Page: 15 🗸 | | No Ob | jects Fo | ound |
| > Route Maps/Profiles | | | External Control Peering: | | | | | | |

為IPN連線配置介面配置檔案。

Subscription State Sta

例如path-501/pathep-[eth1/9]。

| Tenant infra O Quick Start | Cogical Interface Profile - spine501 | P | Policy | Faults | History |
|--------------------------------------------------------------|--------------------------------------------------|--------|--------|--------------|----------|
| Tenant infra Definition Profiles Definition Profiles | Routed Sub-Interface | Policy | Faults | History | SVI |
| > Bridge Domains | | | 0 | <u>+</u> ≪*+ | |
| > WRFs | Properties | | | | + |
| > 📰 External Bridged Networks | Target: topology/pod-1/paths-501/pathep-[eth1/9] | | | | |
| External Routed Networks | Description: optional | | | - 1 | _ |
| > Route Maps/Profiles | Encap: VLAN V 4 | | | - 1 | |
| > 📰 Set Rules for Route Maps | Integer Value | | | - 1 | |
| > 🔛 Match Rules for Route Map | adress/mask | | | - 1 | |
| > 🛆 rleaf-wan | IPv6 DAD: disabled enabled | | | - 1 | |
| ✓ ▲ spine2rleaf | IPv4 Secondary / IPv6 Additional Addresses: + | | | - 1 | |
| Logical Node Profiles | Address IPv6 DAD | | | - 1 | |
| ✓ | No items have been found | | | - 1 | |
| V 🖿 Logical Interface | Select Actions to create a new item. | | | - 1 | |
| > 🥫 spine501 | | | | - 1 | |
| > Configured Node: | | | | - 1 | |
| ✓ 🗧 spine601 | Link-Local Address: :: | | | - 1 | |
| > 🔚 Logical Interface | ND RA Prefix: | | | - 1 | |
| > Configured Node: | MAC Address: 00:22:BD:F8:19:FF | | | - 1 | |
| > Networks | MTU (bytes): inherit | | | | |
| > Route Maps/Profiles | Target DSCP: Unspecified | | | | |
| > Dot1Q Tunnels | Show Usage | Close | s | ubmit | ••• ₽ |
| > Contracts | | | | | - 8 |

path-601/pathep-[eth2/9]示例。

| Tenant infra | () () () () () () () () () () () () () (| ogical Interface Profil | e - spine601 | | | | | Policy | Faults | History |
|---------------------------------------|---------------------------------------------|------------------------------------|--------------|------------|--------|--------|---------|--------------|----------------|------------|
| Tenant infra Application Profiles | Routed Sub-Interface | | | | | | 28 | erfaces Rout | ted Interfaces | s SVI |
| Networking | | | | | Policy | Faults | History | | | o + |
| > Bridge Domains | | | | | | o + | *** | | | 0 - |
| > WRFs | Proportion | | | | | 0 - | | | | w + |
| > 🔚 External Bridged Networks | Target: | topology/pod-1/paths-601/pathep-[r | eth2/9] | | | | | MTU (bytes) | Encap | |
| V 🔚 External Routed Networks | Description: | optional | | | | | | | | |
| > Route Maps/Profiles | Encap: | VLAN 🗸 4 | | | | | | inherit | vlan-4 | |
| > 📰 Set Rules for Route Maps | IPv4 Primary / IPv6 Preferred Address: | Integer Value | | | | | | | | |
| > 🔚 Match Rules for Route Map | in ter timely / in ter terene a radie out | address/mask | | | | | | | | |
| > 🗂 rleaf-wan | IPv6 DAD: | disabled enabled | | | | | | | | |
| ✓ 	 spine2rleaf | IPv4 Secondary / IPv6 Additional Addresses: | | + | | | | | | | |
| Logical Node Profiles | | Address | IPv6 DAD | | | | | | | |
| ✓ ■ spine501 | | No items have been four | nd. | | | | | | | |
| Cogical Interface | | Select Actions to create a ne | w item. | | | | | | | |
| > spine501 | | | | | | | | | | |
| Configured Node | | | | | | | | | | |
| Spineou i | Link-Local Address: | <u> </u> | | | | | | | | |
| Spine601 | ND RA Prefix: | | | | | | | | | |
| > Configured Node | | | | Show Usage | Close | Sub | omit | | | |
| > Networks | | | | | | | | | | _ |
| > Route Maps/Profiles | | | | | | | | | | ••• • |
| > Dot10 Tunnels | | | | | | | | | | how |

為IPN配置L3Out網路(外部EPG)。

| Tenant infra | 0 | Ξ | 0 | External Network | Instance Profi | e - rleaf | Policy | Operational Stats | Health Faults | History |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------|----------------------------------------------------------|-----------------------|----------------------------|--------------|
| External Bridged Networks | | | | | | | | General Contracts | Subject Labels | EPG Labels |
| External Robited VetWorks Route Maps/Profiles Set Rules for Route Maps Match Rules for Route Maps freaf-wan spine2rleaf Logical Node Profiles | | | | Oroperties QoS Class: Target DSCP: Configuration Status: Configuration Issues: Preferred Group Member: | Unspecified v Unspecified v applied | | | | ¢ | <u>+</u> **+ |
| spine501 Logical Interface Profiles spine501 Configured Nodes topology/pod-1/node-501 spine601 Logical Interface Profiles spine601 | | | | L3Out Contract Masters: | L3Out Contract Master | | No items have been four Select Actions to create a ne | nd. w item. | | + |
| Configured Nodes Configured Nodes Dopology/pod-1/node-601 Configured Teaf Duria Mane/Drofilae | | | | Subnets: | IP Address 0.0.0.0/0 | Scope External Subnets | Aggregate | Route Control Profile | Route Summarizat Policy | + ion |

現在您已將OSPF L3Out從骨幹(節點501和節點601)配置到IPN裝置。如果IPN上的OSPF配置正確,則OSPF鄰接關係應處於開啟狀態並交換路由。因此,請檢查從脊柱到IPN裝置的OSPF相鄰關係。

從骨幹:

spine501# show ip ospf neighbors vrf overlay-1
OSPF Process ID default VRF overlay-1
Total number of neighbors: 1
Neighbor ID Pri State Up Time Address Interface
172.16.191.191 1 FULL/ - 00:00:36 10.10.20.10 Eth1/9.9
spine501#

spine601# show ip ospf neighbors vrf overlay-1
OSPF Process ID default VRF overlay-1
Total number of neighbors: 1
Neighbor ID Pri State Up Time Address Interface
172.16.191.191 1 FULL/ - 00:00:39 10.10.19.10 Eth2/9.9
spine601#

在IPN上:

SPINE-IPN# show ip ospf neighbors vrf RLEAF OSPF Process ID 1 VRF RLEAF Total number of neighbors: 2 Neighbor ID Pri State Up Time Address Interface 172.16.60.60 1 FULL/ - 00:00:06 10.10.19.11 Eth3/38.4 172.16.50.50 1 FULL/ - 00:00:17 10.10.20.11 Eth3/39.4 SPINE-IPN#

現在,您在脊柱和IPN之間具有OSPF鄰居關係,您可以看到通往ACI交換矩陣Pod基礎設施網路的 路由是通過OSPF在IPN中學習的。

SPINE-IPN# show ip route vrf RLEAF IP Route Table for VRF "RLEAF" '*' denotes best ucast next-hop '**' denotes best mcast next-hop '[x/y]' denotes [preference/metric] '%' in via output denotes VRF 10.0.0.0/16, ubest/mbest: 2/0 *via 10.10.19.11, Eth3/38.4, [110/20], 00:01:21, ospf-1, nssa type-2 *via 10.10.20.11, Eth3/39.4, [110/20], 00:01:21, ospf-1, nssa type-2 < snip > SPINE-IPN#

ACI配置步驟3.發現遠端枝葉

在此階段,交換矩陣已準備好通過WAN發現連線到IPN的遠端枝葉。確保連線到RLEAF的IPN具有 通過WAN網路到達ACI Pod Infra網路的路由。

<#root>

RLEAF-IPN#

show lldp neighbors

Capability codes:

(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other Hold-time Capability Port ID Device ID Local Intf Eth3/34 120 BR Eth1/54 switch Eth3/35 120 BR Eth1/54 switch Total entries displayed: 2 RLEAF-IPN# RLEAF-IPN# show ip route vrf RLEAF IP Route Table for VRF "RLEAF" '*' denotes best ucast next-hop '**' denotes best mcast next-hop '[x/y]' denotes [preference/metric] '%<string>' in via output denotes VRF <string> 10.0.0/16, ubest/mbest: 2/0 *via 10.10.19.11, Eth3/38.4, [110/20], 00:01:21, ospf-1, nssa type-2 *via 10.10.20.11, Eth3/39.4, [110/20], 00:01:21, ospf-1, nssa type-2

< snip >

檢查連線到遠端枝葉的IPN,確保APIC交換矩陣IP地址配置為DHCP中繼。

<#root>

RLEAF-IPN#

show ip dhcp relay

< snip >

| Helper addresses Interface | are configured or Relay Address | n the following VRF Name | interfaces: |
|-------------------------------|------------------------------------|-----------------------------|-------------|
| | | | |
| Ethernet3/34.4 | 10.0.0.1 | | |
| Ethernet3/34.4 | 10.0.0.2 | | |
| Ethernet3/34.4 | 10.0.0.3 | | |
| Ethernet3/35.4 | 10.0.0.1 | | |
| Ethernet3/35.4 | 10.0.0.2 | | |
| Ethernet3/35.4 | 10.0.0.3 | | |
| RLEAF-IPN# | | | |

在ACI GUI中導航到Inventory > Fabric Membership,然後檢查是否發現了新交換機。

| Inventory | Fabric Memb | ership |) | | | | | | | | | (| 0 0 |
|-----------------------------------------------|---------------|-----------|---------|-------------|--------------|--------------|-----------------|-------|----------------|-----------------|----------------|--------|------|
| > O Quick Start | | | | | | | | | | | Ċ | 5 ± | **.∗ |
| Topology | Serial Number | Pod ID | Node ID | RL TEP Pool | Node Name | Rack Name | Model | Role | IP | Suppor Model | SSL Certifi | Status | |
| > eaf101 (Node-101) | FDO20331BFQ | 1 | 202 | 0 | leaf202 | | N9K-C93180YC-EX | leaf | 10.0.232.68/32 | True | yes | Active | |
| > leaf102 (Node-102) | FDO21031WXP | 1 | 201 | 0 | leaf201 | | N9K-C93108TC-FX | leaf | 10.0.232.72/32 | True | yes | Active | |
| > 📖 leaf103 (Node-103) | FDO220810B0 | 1 | 0 | 0 | | | N9K-C93180YC-EX | leaf | 0.0.0.0 | True | n/a | | |
| > ==== leaf104 (Node-104) | FOX1948G9EA | 1 | 601 | 0 | spine601 | | N9K-C9504 | spine | 10.0.232.65/32 | True | yes | Active | |
| > leaf201 (Node-201) | FOX1949GHHM | 1 | 501 | 0 | spine501 | | N9K-C9504 | spine | 10.0.232.66/32 | True | yes | Active | |
| > 1111 leaf202 (Node-202) | SAL1946SWJM | 1 | 101 | 0 | leaf101 | | N9K-C9372PX-E | leaf | 10.0.232.64/32 | True | yes | Active | |
| > spine501 (Node-501) | SAL1946SWNS | 1 | 102 | 0 | leaf102 | | N9K-C9372PX-E | leaf | 10.0.232.73/32 | True | yes | Active | |
| > spine601 (Node-601) | SAL1946SWNT | 1 | 104 | 0 | leaf104 | | N9K-C9372PX-E | leaf | 10.0.8.64/32 | True | yes | Active | |
| Pod Fabric Setup Policy | SAL1946SWNU | 1 | 103 | 0 | leaf103 | | N9K-C9372PX-E | leaf | 10.0.232.69/32 | True | yes | Active | |
| Fabric Membership Dinmanaged Fabric Nodes | FDO22080JDA | 1 | 0 | 0 | | | N9K-C93180YC-EX | leaf | 0.0.0.0 | True | n/a | | |
| Unreachable Nodes | | | | | | | | | | | | | |

將新發現的枝葉註冊到現有交換矩陣:

1.根據序列號識別新的枝葉。
 2.按一下右鍵新發現的枝葉,然後按一下Register。
 3.提供正確的Pod ID和節點ID。

4.選擇RL TEP POOL。

5.提供節點名稱。

6.檢查並確認已將Role選為遠端枝葉。

7.按一下更新。

| | | | | | | | | | | Ŏ <u>+</u> | *** |
|---------------|-------------|---------|-------------|--------------|--------------|-----------------|-------|----------------|-----------------|-----------------------|-----|
| Serial Number | ▲ Pod ID | Node ID | RL TEP Pool | Node Name | Rack Name | Model | Role | IP | Suppor Model | SSL Status Certifi | 0 |
| FDO22080JDA | 1 | 203 | 11 | rleaf203 | select 🗸 | N9K-C93180YC-EX | leaf | ✓ 0.0.0.0 | True | n/a | |
| FDO220810B0 | 1 | 204 | H 11 | rleaf204 | select 🗸 | N9K-C93180YC-EX | leaf | ✓ 0.0.0.0 | True | n/a | |
| FOX1948G9EA | 1 | 601 | 0 | spine601 | Update | Cancel | spine | 10.0.232.65/32 | True | yes Active | |

✤ 注意:請確保選擇在步驟1中配置的正確RL TEP池。此外,從下拉選單中選擇RL TEP POOL時,請選中並確認已自動將Role選為遠端枝葉。

現在,您可以看到節點型別標識為「遠端枝葉」,狀態標識為「發現」。該節點尚未獲得結構IP地 址。

| Inventory | 0 = 0 | Fabric Mem | pership |) | | | | | | | | | |
|------------------------------------|----------------|---------------|---------|---------|-------------|----------|------|-----------------|-------------|----------------|--------|--------|-------------|
| > 🔿 Quick Start | | | | | | | | | | | | (| 0 ± %∗ |
| 😚 Topology | | Serial Number | A Pod | Node ID | RL TEP Pool | Node | Rack | Model | Role | IP | Suppor | SSL | Status |
| ✓ | | | ID | | | Name | Name | | | | Model | Certin | 1 |
| > leaf101 (Node-101) | | FDO20331BFQ | 1 | 202 | 0 | leaf202 | | N9K-C93180YC-EX | leaf | 10.0.232.68/32 | True | yes | Active |
| > leaf102 (Node-102) | | FDO21031WXP | 1 | 201 | 0 | leaf201 | | N9K-C93108TC-FX | leaf | 10.0.232.72/32 | True | yes | Active |
| > leaf103 (Node-103) | | FDO22080JDA | 1 | 203 | 11 | rleaf203 | | N9K-C93180YC-EX | remote leaf | 0.0.0.0 | True | yes | Discovering |
| > leaf104 (Node-104) | | FDO220810B0 | 1 | 204 | 11 | rleaf204 | | N9K-C93180YC-EX | remote leaf | 0.0.0.0 | True | yes | Discovering |
| > leaf201 (Node-201) | | FOX1948G9EA | 1 | 601 | 0 | spine601 | | N9K-C9504 | spine | 10.0.232.65/32 | True | yes | Active |
| > leaf202 (Node-202) | | FOX1949GHHM | 1 | 501 | 0 | spine501 | | N9K-C9504 | spine | 10.0.232.66/32 | True | yes | Active |
| > spine501 (Node-501) | | SAL1946SWJM | 1 | 101 | 0 | leaf101 | | N9K-C9372PX-E | leaf | 10.0.232.64/32 | True | yes | Active |
| > 🧧 spine601 (Node-601) | | SAL1946SWNS | 1 | 102 | 0 | leaf102 | | N9K-C9372PX-E | leaf | 10.0.232.73/32 | True | ves | Active |
| Pod Fabric Setup Policy | | | | | | | | | | | | | |
| > 🧮 Fabric Membership | | SAL1946SWNT | 1 | 104 | 0 | leaf104 | | N9K-C9372PX-E | leaf | 10.0.8.64/32 | True | yes | Active |
| > 📰 Unmanaged Fabric Nodes | | SAL1946SWNU | 1 | 103 | 0 | leaf103 | | N9K-C9372PX-E | leaf | 10.0.232.69/32 | True | yes | Active |
| Unreachable Nodes | | | | | | | | | | | | | |
| Disabled Interfaces and Decommissi | ioned Switches | | | | | | | | | | | | |

ACI配置步驟4.配置從RLEAF到IPN的路由外端

1.定位至「租戶」>「基礎設施」>「外部路由網路」,然後創建「外部路由」。

| Create Routed Out | tside | | | | ? | \otimes |
|------------------------------|------------------------------|-------------------------------------------------------|-------------------|---------------------|-------|-----------|
| STEP 1 > Identity | | | 1. Identity | 2. External EPG Net | works | |
| Define the Routed Outside | | | | | | |
| Description: | optional | Consumer Label: enter names separated BGP EIGRP | by comma | | | |
| Tags: | ~ | OSPF Area ID: 1 | | | | |
| e | nter tags separated by comma | OSPF Area 🕑 🔲 | | | | |
| PIM: | | Control: Send redistributed LSAs into N | NSSA area | | | |
| Route Control Enforcement: | Import Export | Originate summary LSA Suppress forwarding address | in translated LSA | | | |
| Target DSCP: U | Unspecified v overlay-1 v | OSPF Area Type: NSSA area Regular area | Stub area | | | |
| External Routed Domain: r | rleaf-I3 V | OSPF Area Cost: 1 | | | | |
| Route Profile for Interleak: | select a value | Enable Remote | | | | |
| Route Control For Dampenin | ng: | | | | | + |
| | Address Family Type | ✓ Route Dampening Policy | | | | |
| | | Address Family Type | | | | |
| Nodes and Interfaces Proto | ocol Profiles | | | | | |
| | | | | | | + |
| Name | Description | DSCP | Nodes | | | |
| rleaf-node-profile | | Unspecified | 203, 204 | | | - |
| | | | | | | • |
| | | | Previous | Cancel | Next | |

2.為節點203和204建立RLEAF節點配置檔案。

現在,您可以從Node ID下拉選單中選擇rleaf-203(Node-203)和rleaf-204(Node-204),因為它們現 在已在交換矩陣中發現。

RLEAF 203節點配置檔案:

| Create Routed Outsid | le | | |
|-----------------------------------|------------------------|-----|-----------|
| Select Node | | ? | \otimes |
| Select Node and Configure St | tatic Routes | | |
| Node ID | : rleaf203 (Node-203) | | |
| Router ID | : 203.203.203.203 | | |
| Use Router ID as Loopback Address | | | |
| External Control Peering | : 🗹 | | _ |
| Loopback Addresses: | | | + |
| | IP | | |
| | | | |
| | | | |
| | | | |
| Static Routes: | | | |
| | ID Address Next Hop ID | | T |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | 015 | |
| | Cancel | OK | |

RLEAF 204節點配置檔案:

| Create Routed Outsid | le | | |
|-----------------------------------|------------------------|----|-----------|
| Select Node | | ? | \otimes |
| Select Node and Configure St | atic Routes | | |
| Node ID Bouter ID | r: rleaf204 (Node-204) | | |
| Use Router ID as Loopback Address | | | |
| External Control Peering | | | |
| Loopback Addresses: | | | + |
| | ▲ IP | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Static Routes: | | | + |
| | IP Address Next Hop IP | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | Cancel | ÖK | |

為node-203和node-204建立RLEAF介面配置檔案:

◆ 註:由於RLEAF203或RLEAF204未註冊,因此您無法在Node下拉選單中看到Noderleaf-203(Node-203)或rleaf-204(Node-204)。因此,請在節點與路徑欄位中手動輸入路徑,如下圖 所示。

為node-203建立介面配置檔案。手動輸入節點和路徑欄位,如下所示。

Node: topology/pod-1/node-203

Path: topology/pod-1/paths-203/pathep-[eth1/54]

| Select Routed Sub-Inter | face | | ? ⊗ |
|----------------------------------------|-------------------------------------------------------------------------------------------|----------|------------|
| Specify the Interface | | | |
| Node: | topology/pod-1/node-203 V Ex: topology/pod-1/node-1 | | |
| Path: | topology/pod-1/paths-203/pathep-[eth ~ Ex: topology/pod-1/paths-101/pathep-[eth1/23] | | |
| Description: | optional | • | |
| Encap: | VLAN V 4 Integer Value | | |
| IPv4 Primary / IPv6 Preferred Address: | 10.10.22.11/24 address/mask | | |
| IPv6 DAD: | disabled enabled | | |
| IPv4 Secondary / IPv6 Additional | | + | |
| Addresses: | Address | IPv6 DAD | |
| | | | |
| MAC Address: | 00:22:BD:F8:19:FF | | |
| MTU (bytes): | inherit | | |
| Link-local Address: | | | |
| | | Cano | cel OK |
| | | | |

為node-204建立介面配置檔案。手動輸入節點和路徑欄位,如下所示。

Node: topology/pod-1/node-204

Path: topology/pod-1/paths-204/pathep-[eth1/54]

| Select Rout | ted Sub-Inte | rface | | | | ? ⊗ |
|---------------------------------------------------------|-----------------------------------------------------|----------------------------------------|-------------------------|---------------|-------------|--------------------------|
| Specify the Inter | rface | | | | | |
| | Node: | topology/pod-1/ Ex: topology/pod-1/ | node-203 ∨ | | | |
| | Path: | topology/pod-1/ Ex: topology/pod-1/ | paths-203/pathep-[eth1/ | eth 🗸 [23] | | |
| | Description: | optional | | | | |
| | Encap: | VLAN V 4 | ger Value | | | |
| IPv4 Primary / IP | v6 Preferred Address: | 10.10.22.11/24 address/mask | | | | |
| | IPv6 DAD: | disabled er | nabled | | | _ |
| IPv4 Secor | ndary / IPv6 Additional | | | | + | |
| | Addresses. | Address | | | IPv6 DAD | |
| | MAC Address: MTU (bytes): Link-local Address: | 00:22:BD:F8:19: inherit | FF | | Car | ncel |
| 建立L3Out外部約 | 網路(外部EPG) | : | | | | |
| Create Routed Out | tside | | | | 1. Identity | 2. External EPG Networks |
| STEP 2 > External EPG Net Configure External EPG Net | tworks etworks | | | | . Ronaty | |
| Create Route Profiles: | | | | | | |
| External EPG Networks | | | | | | ¥ + |
| Name | QoS Class | Description | Target DSCP | Sub | bnet | |
| rlear-I3out | Unspecified | | Unspecified | 0.0 | 0.0.0/0 | |

ACI配置步驟5.建立交換矩陣外部連線策略

1.導航到Tenant > Infra > Policies > Protocol > Fabric Ext Connection Policy > Fabric External Connection Policy並建立Intransite/Intersite Profile。

2.使用連接到WAN路由器(IPN)的RLEAF203和RLEAF204的外部網路,新增交換矩陣外部路由配置 檔案。

3.在本例中,這些地址分別為10.10.22.0/24和10.10.21.0/24。

| Tenant infra | 0 1 | ntrasite/Intersite Pro | ofile - Fabric Ext Co | nnection Policy rlea | f | | | • | ? |
|------------------------------------|-----|----------------------------|-----------------------------------------|------------------------------------|-------------------------|--------|--------|-------|----------------|
| Ouick Start | | | | | | Policy | Faults | Histo | ory |
| Tenant infra | 115 | | | | - | | | | |
| > Application Profiles | | | | | | | 0 - | ± % | (- |
| > Networking | | Properties | | | | | | | |
| > Contracts | | Fabric ID: 1 | | | | | | | |
| V Policies | | Name: riear | | | | | | | |
| V Protocol | | Community: exter | nded:as2-nn4:5:16 ended:as2-nn4:5:16 | | | | | | |
| > 📰 Route Maps | | Pod Peering Profile | 2 | | | | | | |
| > 🖬 BFD | | Peoring Type: | Mach Pouto Poflactor | | | | | | |
| > 🛅 BGP | | Peering Type. | Roule Reflector | | | | | | |
| > CSPF | | Password: | | | | | | | |
| > EIGRP | | Confirm Password: | | | | | | | |
| > 🔚 IGMP Snoop | 14 | Pod Connection Profile | | | | | | | . 1 |
| > IGMP Interface | | | | | | | | + | |
| > Custom QOS | | Pod ID | MultiPod Da | taplane TEP | Intersite Dataplane TEP | | | | . 1 |
| > End Point Retention | | | 50 | No items have been found. | | | | | |
| > DHCP | | | 50 | lect Actions to create a new item. | | | | | |
| > III ND Interface | | | | | | | | | |
| > 📰 ND RA Prefix | | | | | | | | | |
| > 📰 Route Tag | | Fabric External Routing I | Profile | | | | | | 1 |
| > L4-L7 Policy Based Redirect | | | | | | | | + | 1 |
| > a L4-L7 Redirect Health Groups | | Name | | Subnet | | | | | |
| > 🛅 Data Plane Policing | | rleaf203 | | 10.10.22.0/24 | | | | | |
| V Fabric Ext Connection Policies | | rleaf204 | | 10 10 21 0/24 | | | | | 2 |
| Fabric Ext Connection Policy rleaf | | | | . 5.16.2.10/2.4 | | | | | OW III |

ACI配置步驟6.將遠端枝葉註冊到ACI交換矩陣Pod

然後,遠端枝葉從APIC TEP池獲取交換矩陣IP地址。

| | Inventory Fab | ric Policies Access Po | olicies | | | | | | | | | | | |
|----------------------------|-----------------|--------------------------|------------------|---------|-------------|----------|------|-----------------|-------------|----------------|-------|--------|------------|------|
| Inventory | () = 0 | Fabric Mem | ıbric Membership | | | | | | | | | ¢ |) () | |
| > C Quick Start | | | | | | | | | | | | | 0 <u>+</u> | ** ≁ |
| Topology | | Serial Number | A Pod | Node ID | RL TEP Pool | Node | Rack | Model | Role | IP | Suppo | SSL | Status | |
| > (=) Pod 1 | | | ID | | | Name | Name | | | | Model | Certif | (| |
| Pod Fabric Setup Policy | | FDO20331BFQ | 1 | 202 | 0 | leaf202 | | N9K-C93180YC-EX | leaf | 10.0.232.68/32 | True | yes | Active | |
| > 🔚 Fabric Membership | | FDO21031WXP | 1 | 201 | 0 | leaf201 | | N9K-C93108TC-FX | leaf | 10.0.232.72/32 | True | yes | Active | |
| > 📰 Unmanaged Fabric Nodes | | FDO22080JDA | 1 | 203 | 11 | rleaf203 | | N9K-C93180YC-EX | remote leaf | 11.0.3.128/32 | True | yes | Inactive | |
| Unreachable Nodes | | FDO220810B0 | 1 | 204 | 11 | rleaf204 | | N9K-C93180YC-EX | remote leaf | 11.0.7.128/32 | True | yes | Inactive | |

請等待一段時間,以使遠端枝葉進入活動狀態。現在,您可以看到遠端枝葉rleaf-203和rleaf-204已 註冊到ACI交換矩陣。

| Inventory | G | <u>ا</u> | Fabric Mem | pership |) | | | | | | | | | C | |
|--------------|---------------------------------|----------|---------------|---------|---------|-------------|--------------|--------------|-----------------|-------------|----------------|-----------------|----------------|--------|-----|
| > 🕩 Quick St | art | | | | | | | | | | | | ¢ | 5 ± | *** |
| Topology | 1 | | Serial Number | Pod ID | Node ID | RL TEP Pool | Node Name | Rack Name | Model | Role | IP | Suppor Model | SSL Certifi | Status | |
| > 🕒 Pod 1 | ic Setup Policy | | FDO20331BFQ | 1 | 202 | 0 | leaf202 | | N9K-C93180YC-EX | leaf | 10.0.232.68/32 | True | yes | Active | |
| > 🔚 Fabric M | embership | | FDO21031WXP | 1 | 201 | 0 | leaf201 | | N9K-C93108TC-FX | leaf | 10.0.232.72/32 | True | yes | Active | |
| > 📰 Unmanag | ged Fabric Nodes | | FDO22080JDA | 1 | 203 | 11 | rleaf203 | | N9K-C93180YC-EX | remote leaf | 11.0.3.128/32 | True | yes | Active | |
| Unreach: | able Nodes | | FDO220810B0 | 1 | 204 | 11 | rleaf204 | | N9K-C93180YC-EX | remote leaf | 11.0.7.128/32 | True | yes | Active | |
| Disabled | Interfaces and Decommissioned S | Switches | FOX1948G9EA | 1 | 601 | 0 | spine601 | | N9K-C9504 | spine | 10.0.232.65/32 | True | yes | Active | |

<#root>

apic3#

acidiag fnvread

| ID | Pod ID | Name | Serial Number | IP Address | Role | State | LastU |
|------------|--------|----------------------|----------------------------|----------------------------------|----------------|------------------|--------|
| 101 | 1 | leaf101 | SAL1946SWJM | 10.0.232.64/32 | leaf | active | 0 |
| 102 | 1 | leaf102 | SAL1946SWNS | 10.0.232.73/32 | leaf | active | 0 |
| 103 | 1 | leaf103 | SAL1946SWNU | 10.0.232.69/32 | leaf | active | 0 |
| 104 | 1 | leaf104 | SAL1946SWNT | 10.0.8.64/32 | leaf | active | 0 |
| 201 | 1 | leaf201 | FD021031WXP | 10.0.232.72/32 | leaf | active | 0 |
| 202 | 1 | leaf202 | FD020331BFQ | 10.0.232.68/32 | leaf | active | 0 |
| 203 | 1 | rleaf203 | FDO22080JDA | 172.17.3.128/32 | leaf | activo | e 0 |
| 204 | 1 | rleaf204 | FD0220810B0 | 172.17.7.128/32 | leaf | activ | e 0 |
| 501 601 | 1 1 | spine501 spine601 | FOX1949GHHM FOX1948G9EA | 10.0.232.66/32 10.0.232.65/32 | spine spine | active active | 0 0 |

```
Total 10 nodes
```

apic3#

現在,您可以看到遠端枝葉和IPN之間的OSPF相鄰關係。

從2003年RLEAF開始:

<#root>

```
rleaf203#
```

show ip ospf neighbors vrf overlay-1

OSPF Process ID default VRF overlay-1 Total number of neighbors: 1 Neighbor ID Pri State Up Time Address Interface 172.16.191.191 1 FULL/ - 00:24:57 10.10.22.10 Eth1/54.6 rleaf203#

rleaf203#

show ip route vrf overlay-1

IP Route Table for VRF "overlay-1"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

```
10.0.0.0/16, ubest/mbest: 1/0
    *via 10.10.22.10, eth1/54.6, [110/20], 00:30:24, ospf-default, nssa type-2
10.0.0.1/32, ubest/mbest: 1/0
    *via 10.10.22.10, eth1/54.6, [110/20], 00:30:24, ospf-default, nssa type-2
```

< snip >

從2004年RLEAF開始:

<#root>

rleaf204#

show ip ospf neighbors vrf overlay-1

OSPF Process ID default VRF overlay-1 Total number of neighbors: 1 Neighbor ID Pri State Up Time Address Interface 172.16.191.191 1 FULL/ - 00:25:36 10.10.21.10 Eth1/54.6 rleaf204#

rleaf204#

show ip route vrf overlay-1

IP Route Table for VRF "overlay-1"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

10.0.0/16, ubest/mbest: 1/0
 *via 10.10.21.10, eth1/54.6, [110/20], 00:31:37, ospf-default, nssa type-2
10.0.0.1/32, ubest/mbest: 1/0
 *via 10.10.21.10, eth1/54.6, [110/20], 00:31:37, ospf-default, nssa type-2

< snip >

在IPN上:

<#root>

RLEAF-IPN#

show ip ospf neighbors vrf RLEAF

OSPF Process ID 1 VRF RLEAF

| Total number of | neighbors: 4 | | |
|-----------------|--------------|----------------------|-----------|
| Neighbor ID | Pri State | Up Time Address | Interface |
| 172.16.204.204 | 1 FULL/ - | 00:26:03 10.10.21.11 | Eth3/34.4 |
| 172.16.203.203 | 1 FULL/ - | 00:26:03 10.10.22.11 | Eth3/35.4 |
| RLEAF-IPN# | | | |

ACI配置步驟7.遠端枝葉的QoS配置

需要將ACI交換矩陣類(QoS級別)分類為IPN內的DSCP值。要達到此要求,應使用L3流量的 DSCP class-cos轉換策略啟用ACI交換矩陣。使用此配置可以將ACI QOS級別和預設類對映到 IPN中的DSCP值。

導覽至Tenant > Infra > Policies > DSCP class-cos translation policy for L3 traffic,如下圖所示。

DSCP class-cos translation policy for L3 traffic

| roperties | | |
|---------------------------|----------|---------|
| Translation Policy State: | Disabled | Enabled |
| User Level 1: | CS0 | ~ |
| User Level 2: | CS1 | \sim |
| User Level 3: | CS2 | \sim |
| Control Plane Traffic: | CS3 | \sim |
| Policy Plane Traffic: | CS4 | ~ |
| Span Traffic: | CS5 | \sim |
| Traceroute Traffic: | CS6 | ~ |

Doliov

History

 $? \times$

ACI配置步驟8(可選)。使用遠端枝葉建立虛擬埠通道(vPC)顯式保護組

VPC Explicit Protection Group - VPC Protection Group Rleaf-Vpc

由於遠端枝葉交換機已註冊到ACI交換矩陣,因此您可以使用遠端枝葉建立vPC顯式保護組。導航到 Fabric > Access Policies > Switch Policies > Policies > Virtual Port Channel Default並創建顯式 VPC保護組(+)。 影象片段顯示了不同的IP編址方案。

| | | | Policy | Faults | Histor | | |
|--------------------|-----------------------------|---------------|--------|------------|--------|--|--|
| 8 👽 🛆 🕚 | | | | 0 <u>+</u> | - %- | | |
| Properties | | | | | | | |
| Name: | rleaf-vpc | | | | | | |
| Logical Pair ID: | 234 | | | | | | |
| VPC Domain Policy: | default 🗸 🗸 | | | | | | |
| Virtual IP: | 11.0.3.130/32 | | | | - 1 | | |
| Switch Pairs: | Node ID | Peer IP | | | - 1 | | |
| | 203 | 11.0.3.129/32 | | | | | |
| | 204 | 11.0.7.129/32 | | | | | |
| | | | | | | | |

<#root>

rleaf203#

show system internal epm vpc

| Local TEP IP | : 172.17.3.128 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Peer TEP IP | : 172.17.7.129 |
| vPC configured | : Yes |
| VPC VIP | : 172.17.3.130 |
| MCT link status Local vPC version bitmap Peer vPC version bitmap Negotiated vPC version Peer advertisement received Tunnel to vPC peer | : Up : 0x7 : 0x7 : 3 : Yes : Up |
| <pre>vPC# 343 if : port-channel1, if index local vPC state : MCEC_STATE_ current link state : LOCAL_UF vPC fast conv : Off rleaf203#</pre> | : 0x16000000 _UP, peer vPC state : MCEC_STATE_UP ^_PEER_UP |



RLeaf TEP審閱

遠端枝葉資料平面隧道端點(RL-DP-PTEP) — 此IP地址從分配給遠端位置的TEP池分配給每台遠端 枝葉交換機。當遠端枝葉節點不是vPC域的一部分時,來自遠端枝葉節點的VXLAN資料包將用此 TEP作為源IP地址發起。

遠端枝葉vPC通道端點(RL-vPC) — 這是從分配給遠端位置的TEP池中分配給遠端枝葉節點的vPC對的任播IP地址。如果遠端枝葉交換機是vPC域的一部分,則源自兩個遠端枝葉交換機的所有 VXLAN資料包均源自此TEP地址。

<#root>

```
show ip int vrf overlay-1
```

```
IP Interface Status for VRF "overlay-1"
eth1/54.6, Interface status: protocol-up/link-up/admin-up, iod: 64, mode: external
 IP address: 10.10.22.11, IP subnet: 10.10.22.0/24
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo0, Interface status: protocol-up/link-up/admin-up, iod: 4, mode: ptep
 IP address: 172.17.3.128, IP subnet: 172.17.3.128/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo1, Interface status: protocol-up/link-up/admin-up, iod: 65, mode: unspecified
 IP address: 172.16.203.203, IP subnet: 172.16.203.203/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo2, Interface status: protocol-up/link-up/admin-up, iod: 72, mode: vpc
 IP address: 172.17.3.130, IP subnet: 172.17.3.130/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo3, Interface status: protocol-up/link-up/admin-up, iod: 75, mode: dp-ptep
 IP address: 172.17.3.129, IP subnet: 172.17.3.129/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo1023, Interface status: protocol-up/link-up/admin-up, iod: 66, mode: ftep
 IP address: 172.17.0.32, IP subnet: 172.17.0.32/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
rleaf203#
```

<#root>

show ip int vrf overlay-1

```
IP Interface Status for VRF "overlay-1"
eth1/54.6, Interface status: protocol-up/link-up/admin-up, iod: 64, mode: external
    IP address: 10.10.21.11, IP subnet: 10.10.21.0/24
```

```
IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo0, Interface status: protocol-up/link-up/admin-up, iod: 4, mode: ptep
 IP address: 172.17.7.128, IP subnet: 172.17.7.128/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo1, Interface status: protocol-up/link-up/admin-up, iod: 65, mode: unspecified
 IP address: 172.16.204.204, IP subnet: 172.16.204.204/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo2, Interface status: protocol-up/link-up/admin-up, iod: 71, mode: dp-ptep
 IP address: 172.17.7.129, IP subnet: 172.17.7.129/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo9, Interface status: protocol-up/link-up/admin-up, iod: 81, mode: vpc
 IP address: 172.17.3.130, IP subnet: 172.17.3.130/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo1023, Interface status: protocol-up/link-up/admin-up, iod: 66, mode: ftep
 IP address: 172.17.0.32, IP subnet: 172.17.0.32/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
```

rleaf204#

主幹TEP稽核

遠端枝葉單播隧道端點(RL-UCAST) — 這是本地TEP池的任播IP地址部分,自動分配給與遠端枝葉 交換機關聯的所有主幹。當單點傳播封包從連線到RLEAF節點的終端傳送到ACI主Pod時

,VXLAN封裝封包會傳送目的地RL-Ucast-TEP位址,來源為RL-DP-TEP或RL-vPC。因此,ACI主 DC Pod中的任何主幹都可以接收流量,將其解除封裝,執行所需的第2層或第3層查詢,最後重新 封裝它並將其轉發到最終目的地。

遠端枝葉 單點傳播-多點傳送通道端點(RL-MCAST-HREP) — 這是本地TEP池中的另一個任播IP位 址部分,自動分配給與遠端枝葉交換器相關聯的所有主幹。當連線到遠端枝葉節點的終端產生 BUM(第2層廣播、未知單點傳播或多點傳送)流量時,封包會被RLEAF節點封裝,並以目的地為 RL-Mcast-TEP位址以及來源為RL-DP-TEP或RL-vPC來傳送。 ACI Pod中的任何主幹都可以接收 BUM流量並將其轉送到交換矩陣內。

```
<#root>
spine501#
show ip int vrf overlay-1
< snip >
lo12, Interface status: protocol-up/link-up/admin-up, iod: 88, mode: rl-mcast-hrep
 IP address: 10.0.0.37, IP subnet: 10.0.0.37/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
lo13, Interface status: protocol-up/link-up/admin-up, iod: 91, mode: rl-ucast
 IP address: 10.0.0.36, IP subnet: 10.0.0.36/32
 IP broadcast address: 255.255.255.255
 IP primary address route-preference: 1, tag: 0
spine501#
<#root>
spine601#
show ip int vrf overlay-1
< snip >
loll, Interface status: protocol-up/link-up/admin-up, iod: 76, mode: rl-mcast-hrep
```

IP address: 10.0.0.37, IP subnet: 10.0.0.37/32

IP broadcast address: 255.255.255.255

IP primary address route-preference: 1, tag: 0

lo12, Interface status: protocol-up/link-up/admin-up, iod: 79, mode: rl-ucast

IP address: 10.0.0.36, IP subnet: 10.0.0.36/32

IP broadcast address: 255.255.255.255

IP primary address route-preference: 1, tag: 0

spine601#

遠端枝葉可路由子網

如果可以通過IPN/ISN/WAN訪問APIC,則無需遠端子網即可發現遠端枝葉節點。此子網用於為主幹 交換機上的APIC建立NAT條目並支援vPOD。此功能也可以與RL Direct結合使用。

F0467配置失敗

如果您使用嚮導將遠端枝葉新增到Pod,則該嚮導不會配置此處列出的所需訪問策略,並且您會看 到常見的<u>F0467故</u>障消息。您需要手動建立它們。

- 遠端枝葉節點和枝葉選擇器的枝葉交換機配置檔案
- 遠端枝葉節點的枝葉介面配置檔案和上行鏈路的介面選擇器
- 訪問介面策略組

F0467 Fault delegate: Configuration failed for uni/tn-infra/out-rl-infra.l3out/instP-ipnInstP node 203 topology/pod-1/node-203/local/svc-policyelem-id-0/uni/epp/rtd-[uni/tn-infra/out-rl-infra.l3out/instP-ip

啟動驗證

由於啟用Bootscript驗證,遠端枝葉可能無法被發現。

基本上,啟用Bootscript Validation後,枝葉會啟動並瞭解其應通過DHCP運行的版本,然後它應從 APICS下載映像。但問題是,對於啟用了RL direct的遠端站點,必須在枝葉上安裝特定的攝影機規 則,以允許已捕獲的APIC流量。因為bootscript驗證失敗了這些規則,並且對象沒有安裝在RL上。 但是,由於未安裝這些對象/規則,因此無法從APIC成功下載映像。 如果您遇到這種情況,請嘗試在BSV關閉的情況下發現RL。

相關資訊

- <u>https://www.cisco.com/c/en/us/solutions/collateral/data-center-virtualization/application-centric-infrastructure/white-paper-c11-740861.html</u>
- <u>技術支援與文件 Cisco Systems</u>

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)。