

在 SDA 中設定融合路由器

目錄

[簡介](#)

[必要條件](#)

[需求](#)

[採用元件](#)

[背景資訊](#)

[DNA SD-Access解決方案中融合裝置的功能](#)

[設定](#)

[網路圖表](#)

[組態](#)

[步驟1.配置DNAC的傳遞鏈路](#)

[步驟2.驗證邊界路由器上的DNAC推送的配置](#)

[步驟3.在邊界路由器上配置允許接入](#)

[步驟4.配置Fusion路由器](#)

[步驟5.在Fusion路由器上配置VRF洩漏](#)

[驗證](#)

[步驟1.驗證Fusion路由器與邊界路由器之間的eBGP對等](#)

[步驟2.驗證兩台Fusion路由器之間的iBGP對等](#)

[步驟3.驗證BGP表和路由表中的字首](#)

[手動配置邊界冗餘](#)

[SDA-Border-1](#)

[SDA-Border-2](#)

[使用模板簡化融合配置](#)

[變數定義](#)

[模板示例](#)

[融合1](#)

[融合2](#)

簡介

本文說明如何在Cisco軟體定義存取(SDA)解決方案中設定Fusion路由器。

必要條件

需求

本文件沒有特定需求。

注意：需要根據在[Link](#)上找到的受支援裝置進行設定，以[發佈註釋](#)

採用元件

本檔案中的資訊是根據以下硬體版本：

- DNAC — 版本1.2.1
- 邊緣和邊界 — Cat3k Cisco交換機
- Fusion — 支援VRF間洩漏的Cisco路由器

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

在Cisco SD-Access解決方案中，裝置由Cisco DNA Center進行管理和配置。一般來說，SD-Access交換矩陣的所有部分都可以而且通常都由Cisco DNA Center配置和管理。但是，Fusion裝置位於交換矩陣外部，因此是手動配置的。Border Automation（下文討論）是Cisco DNA Center中的一個功能，可以自動執行Border配置，以便將VRF切換到Fusion裝置。

有時，由於通常與當前配置的相容性相關的原因，Border Automation並不適用，因此也可以手動配置從Border到Fusion裝置的切換。瞭解所使用的配置有助於說明有關整個系統最佳配置和運行的重要詳細資訊。

DNA SD-Access解決方案中融合裝置的功能

Fusion裝置支援跨SD訪問交換矩陣域的虛擬路由和轉發(VRF)洩漏，並支援主機與共用服務(如DHCP、DNS、NTP、ISE、Cisco DNA Center、無線LAN控制器(WLC)等)的連線。雖然此角色可由路由器以外的其他裝置執行，但本文檔重點介紹作為Fusion裝置的路由器。

如前所述，共用服務必須可用於園區中的所有虛擬網路(VN)。這是藉由建立從邊界路由器到融合路由器的邊界閘道通訊協定(BGP)對等來實現的。在Fusion路由器上，需要訪問這些共用服務的交換矩陣VRF的子網會洩漏到GRT或共用服務VRF中，反之亦然。路由對映可用於幫助包含特定於SD-Access Fabric的子網的路由表。

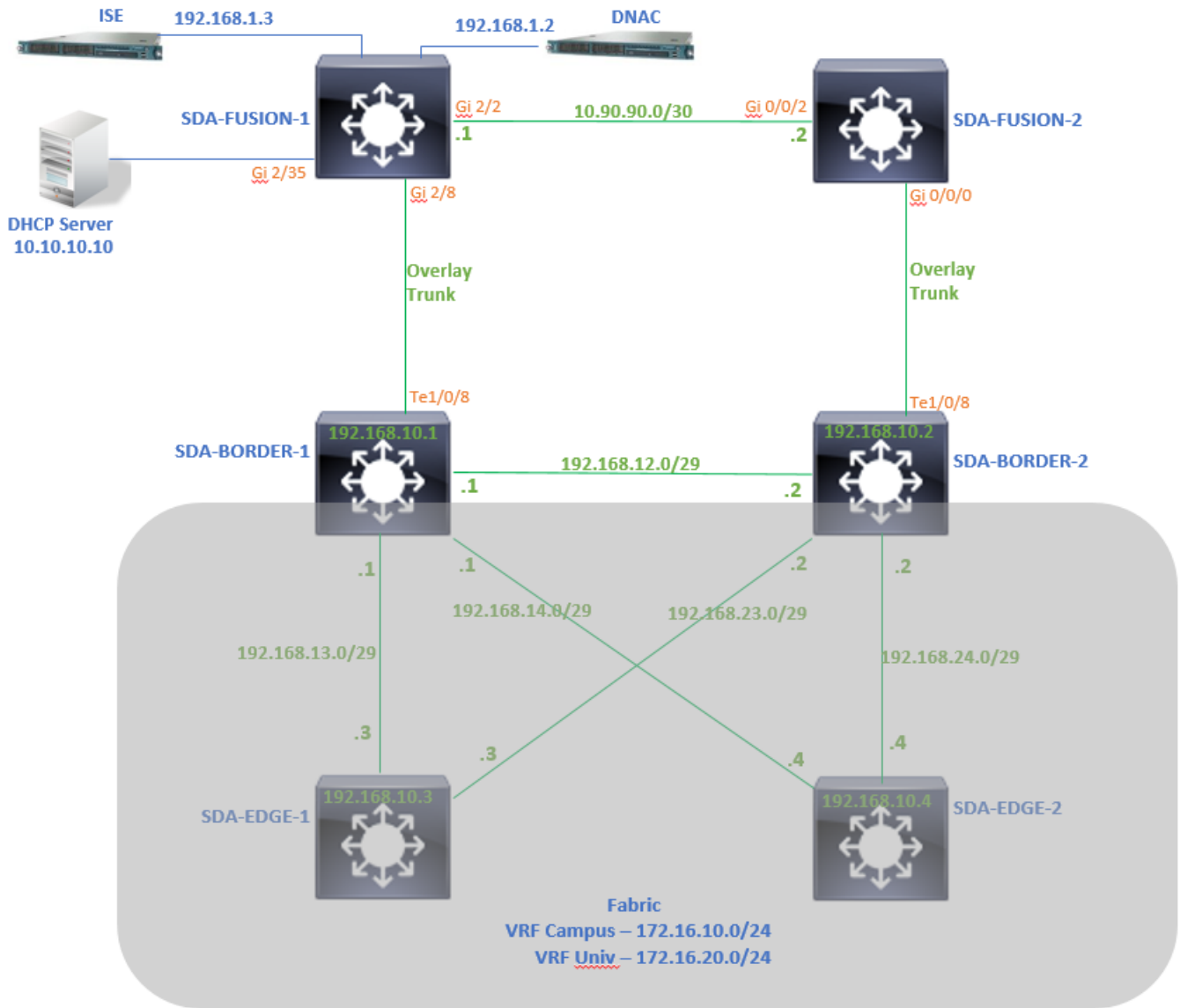
注意：SD訪問邊界節點不支援與SD訪問IP池重疊的總結路由。在從Fusion裝置到邊界節點的路由通告中必須過濾與IP池重疊的總結路由。

設定

此處提供的配置詳細資訊與下面顯示的網路拓撲相關。此網路拓撲不是推薦的部署拓撲。此處僅用於簡化提供的配置示例的演示。有關推薦的部署設計，請參閱[思科數位網路架構設計區](#)。

網路圖表

本文使用的拓撲包括兩個均配置為外部邊界的邊界路由器以及兩個連線到每個邊界路由器的融合路由器。



組態

步驟1.配置DNAC的傳遞鏈路

在將Border Router新增到交換矩陣時為裝置分配角色這一步驟中，可以建立一條傳遞鏈路。在第2層，它是連線到Fusion路由器的中繼鏈路。接下來需要採取的步驟是：

- 1.配置BGP的本地AS編號。此自治系統(AS)編號用於配置邊界路由器上的BGP進程。
- 2.在Transit下新增介面。此介面是Border和Fusion路由器之間直接連線。(本例中為Border上的1/0/8)。

SDA-Border1

Border to

- Rest of Company (Internal)
- Outside World (External)
- Anywhere (Internal & External)

Local Autonomous Number

65005



Select Ip Pool

✖ BGP (10.50.50.0/24)



Connected to the Internet

Transit

Add

ABC

External Interface

[+ Add Interface](#)

Interface

Number of VN

TenGigabitEthernet1/0/8

2

3.配置遠端AS編號。此AS編號在邊界路由器上用於對Fusion路由器執行鄰居語句以配置外部BGP(eBGP)對等體。

4.選擇Fusion Router上需要VRF洩漏的所有虛擬網路(VRF)。

5.將配置從DNAC部署到裝置。

SDA-Border1

[< Back](#)

External Interface

✖ TenGigabitEthernet1/0/8

Remote AS Number

65004



This number is automatically derived from the selected Transit. The selected autonomous system number will be used to automate IP routing between Border Node and remote peer.

Virtual Network

DEFAULT_VN

INFRA_VN

Univ

Campus

對SDA-Border-2裝置使用相同的步驟。

步驟2.驗證邊界路由器上的DNAC推送的配置

本節介紹如何驗證與BGP協定相關的邊界路由器上的配置。

SDA-Border-1

```
SDA-Border1#show run interface loopback 0
!
interface Loopback0
ip address 192.168.10.1 255.255.255.255
ip router isis
end
```

```
SDA-Border1#show run interface tenGigabitEthernet 1/0/8
!
interface TenGigabitEthernet1/0/8
switchport mode trunk
end
```

```
SDA-Border1#show run interface loopback 1021

interface Loopback1021
description Loopback Border
vrf forwarding Campus
ip address 172.16.10.1 255.255.255.255
end
```

```
SDA-Border1#show run interface loopback 1022

interface Loopback1022
description Loopback Border
vrf forwarding Univ
ip address 172.16.20.1 255.255.255.255
end
```

```
SDA-Border1#show run | section vrf definition Campus
vrf definition Campus
rd 1:4099
!
address-family ipv4
route-target export 1:4099
route-target import 1:4099
exit-address-family
```

```
SDA-Border1#show run | section vrf definition Univ
vrf definition Univ
rd 1:4100
!
address-family ipv4
route-target export 1:4100
route-target import 1:4100
exit-address-family
SDA-Border1#
```

```
SDA-Border1#show run interface vlan 3007
!
interface Vlan3007 <<< SVI created for BGP Peering under VRF Campus
description vrf interface to External router
vrf forwarding Campus
ip address 10.50.50.25 255.255.255.252
no ip redirects
ip route-cache same-interface
end
```

```
SDA-Border1#show run interface vlan 3006
!
interface Vlan3006 <<< SVI created for BGP Peering under VRF Univ
description vrf interface to External router
vrf forwarding Univ
ip address 10.50.50.21 255.255.255.252
no ip redirects
ip route-cache same-interface
end
```

```
SDA-Border1#show run | section bgp
router bgp 65005 <<< Local AS Number from DNAC
bgp router-id interface Loopback0
bgp log-neighbor-changes
bgp graceful-restart
!
address-family ipv4
network 192.168.10.1 mask 255.255.255.255
redistribute lisp metric 10
exit-address-family
!
address-family ipv4 vrf Campus
bgp aggregate-timer 0
network 172.16.10.1 mask 255.255.255.255 <<< Anycast IP for Pool in VRF Campus
aggregate-address 172.16.10.0 255.255.255.0 summary-only <<< Only Summary is Advertised
redistribute lisp metric 10
neighbor 10.50.50.26 remote-as 65004 <<< Peer IP to be used on Fusion for VRF Campus and Remote
AS Number from DNAC
neighbor 10.50.50.26 update-source Vlan3007
neighbor 10.50.50.26 activate
neighbor 10.50.50.26 weight 65535 <<< Weight needed for Fusion peering to make sure locally
originated path from LISP is never preferred
exit-address-family
!
address-family ipv4 vrf Univ
bgp aggregate-timer 0
network 172.16.20.1 mask 255.255.255.255 <<< Anycast IP for Pool in VRF Univ
aggregate-address 172.16.20.0 255.255.255.0 summary-only
redistribute lisp metric 10
neighbor 10.50.50.22 remote-as 65004
neighbor 10.50.50.22 update-source Vlan3006
neighbor 10.50.50.22 activate
neighbor 10.50.50.22 weight 65535
exit-address-family
```

SDA-Border-2

```
SDA-Border2#show run interface loopback 0
!
interface Loopback0
```

```
ip address 192.168.10.2 255.255.255.255
ip router isis
end
```

```
SDA-Border2#show run interface tenGigabitEthernet 1/0/8
!
interface TenGigabitEthernet1/0/8
  switchport mode trunk
end
```

```
SDA-Border2#show run interface loopback 1021
!
interface Loopback1021
description Loopback Border
vrf forwarding Campus
ip address 172.16.10.1 255.255.255.255
end
```

```
SDA-Border2#show run interface loopback 1022
!
interface Loopback1022
description Loopback Border
vrf forwarding Univ
ip address 172.16.20.1 255.255.255.255
end
```

```
SDA-Border2#show run | section vrf definition Campus vrf definition Campus rd 1:4099 ! address-
family ipv4 route-target export 1:4099 route-target import 1:4099 exit-address-family SDA-
Border2#show run | section vrf definition Univ vrf definition Univ rd 1:4100 ! address-family
ipv4 route-target export 1:4100 route-target import 1:4100 exit-address-family SDA-Border2#show
run interface vlan 3001 ! interface Vlan3001 description vrf interface to External router vrf
forwarding Campus ip address 10.50.50.1 255.255.255.252 no ip redirects ip route-cache same-
interface end SDA-Border2#show run interface vlan 3003 ! interface Vlan3003 description vrf
interface to External router vrf forwarding Univ ip address 10.50.50.9 255.255.255.252 no ip
redirects ip route-cache same-interface end SDA-Border2#show run | section bgp router bgp 65005
bgp router-id interface Loopback0 bgp log-neighbor-changes bgp graceful-restart ! address-family
ipv4 network 192.168.10.2 mask 255.255.255.255 redistribute lisp metric 10 exit-address-family !
address-family ipv4 vrf Campus bgp aggregate-timer 0 network 172.16.10.1 mask 255.255.255.255
aggregate-address 172.16.10.0 255.255.255.0 summary-only redistribute lisp metric 10 neighbor
10.50.50.2 remote-as 65004 neighbor 10.50.50.2 update-source Vlan3001 neighbor 10.50.50.2
activate neighbor 10.50.50.2 weight 65535 exit-address-family ! address-family ipv4 vrf Univ bgp
aggregate-timer 0 network 172.16.20.1 mask 255.255.255.255 aggregate-address 172.16.20.0
255.255.255.0 summary-only redistribute lisp metric 10 neighbor 10.50.50.10 remote-as 65004
neighbor 10.50.50.10 update-source Vlan3003 neighbor 10.50.50.10 activate neighbor 10.50.50.10
weight 65535 exit-address-family
```

步驟3.在邊界路由器上配置允許接入

由於VRF洩漏在Fusion路由器上，VRF園區地址系列ipv4獲知源自VRF Univ(172.16.20.0/24)的路由。始發路由器和學習路由器具有相同的BGP AS編號(65005)。要克服BGP環路預防機制，並在邊界路由器上接受/安裝路由，必須為與Fusion路由器的對等配置allois-in:

```
SDA-Border1
```

```
SDA-Border1(config)#router bgp 65005
SDA-Border1(config-router)#address-family ipv4 vrf Campus
SDA-Border1(config-router-af)#neighbor 10.50.50.26 allowas-in
SDA-Border1(config-router-af)#exit-address-family
SDA-Border1(config-router)#
SDA-Border1(config-router)#address-family ipv4 vrf Univ
SDA-Border1(config-router-af)#neighbor 10.50.50.22 allowas-in
```

```
SDA-Border1(config-router-af)#exit-address-family
SDA-Border1(config-router)#
```

SDA-Border2

```
SDA-Border2(config)#router bgp 65005
SDA-Border2(config-router)#address-family ipv4 vrf Campus
SDA-Border2(config-router-af)#neighbor 10.50.50.2 allowas-in
SDA-Border2(config-router-af)#exit-address-family
SDA-Border2(config-router)#
SDA-Border2(config-router)#address-family ipv4 vrf Univ
SDA-Border2(config-router-af)#neighbor 10.50.50.10 allowas-in
SDA-Border2(config-router-af)#exit-address-family
SDA-Border2(config-router)#
```

注意：必須謹慎使用**allowas-in**命令，因為它可能會導致環路。當您僅使用一台與兩個邊界對等的Fusion裝置時，需要過濾以確保本地生成的路由不被接受為來自同一VN內Fusion對等的AS。如果發生這種情況，由於eBGP路徑的最大權重，因此eBGP路徑優先於本地發起的路徑

。

步驟4.配置Fusion路由器

本節說明Fusion路由器的手動配置。

SDA-Fusion-1

將通向Border Router的鏈路配置為中繼，以匹配Border-1上的vlan配置：

```
interface GigabitEthernet2/8
  switchport
  switchport trunk encapsulation dot1q
  switchport trunk allowed vlan 3006, 3007
  switchport mode trunk
end
```

配置所需的VRF:

```
vrf definition Campus
  rd 1:4099
  !
  address-family ipv4
    route-target export 1:4099
    route-target import 1:4099
  exit-address-family
!
```

```
vrf definition Univ
  rd 1:4100
  !
  address-family ipv4
    route-target export 1:4100
    route-target import 1:4100
  exit-address-family
```


配置SVI介面：

```
interface Vlan3007
  vrf forwarding Campus
  ip address 10.50.50.26 255.255.255.252
end
```

```
interface Vlan3006
  vrf forwarding Univ
  ip address 10.50.50.22 255.255.255.252
end
```

使用SDA-Border-1設定外部BGP(eBGP)對等：

```
router bgp 65004                                     <<< Remote AS from DNAC
  bgp log-neighbor-changes
  !
  address-family ipv4
  exit-address-family
  !
  address-family ipv4 vrf Campus
    neighbor 10.50.50.25 remote-as 65005
    neighbor 10.50.50.25 update-source Vlan3007
    neighbor 10.50.50.25 activate
  exit-address-family
  !
  address-family ipv4 vrf Univ
    neighbor 10.50.50.21 remote-as 65005
    neighbor 10.50.50.21 update-source Vlan3006
    neighbor 10.50.50.21 activate
  exit-address-family
```

使用SDA-Fusion-2設定內部BGP(iBGP)對等：

```
interface GigabitEthernet2/2
  description SDA-Fusion1--->SDA-Fusion2
  ip address 10.90.90.1 255.255.255.252
end
```

```
router bgp 65004
  neighbor 10.90.90.2 remote-as 65004
  !
  address-family ipv4
    neighbor 10.90.90.2 activate
  exit-address-family
  !
```

在全域性地址系列下通告DHCP伺服器子網，其中DHCP伺服器IP為10.10.10:

```
interface GigabitEthernet2/35
  description connection to DHCP server
  ip address 10.10.10.9 255.255.255.252
end
```

```
router bgp 65004
!
address-family ipv4
network 10.10.10.8 mask 255.255.255.252
exit-address-family
!
```

SDA-Fusion-2

配置通向Border Router的鏈路。如果Fusion上的介面是L3而不是TRUNK — 配置子介面：

```
interface GigabitEthernet0/0/0.3001
encapsulation dot1Q 3001
vrf forwarding Campus
ip address 10.50.50.2 255.255.255.252
end
```

```
interface GigabitEthernet0/0/0.3003
encapsulation dot1Q 3003
vrf forwarding Univ
ip address 10.50.50.10 255.255.255.252
end
```

配置相應的VRF:

```
vrf definition Campus
rd 1:4099
!
address-family ipv4
route-target export 1:4099
route-target import 1:4099
exit-address-family
!
!
vrf definition Univ
rd 1:4100
!
address-family ipv4
route-target export 1:4100
route-target import 1:4100
exit-address-family
!
```

使用SDA-Border-2配置eBGP對等：

```
router bgp 65004
bgp log-neighbor-changes
!
address-family ipv4
exit-address-family
!
address-family ipv4 vrf Campus
neighbor 10.50.50.1 remote-as 65005
neighbor 10.50.50.1 update-source GigabitEthernet0/0/0.3001
neighbor 10.50.50.1 activate
exit-address-family
```

```

!
address-family ipv4 vrf Univ
  neighbor 10.50.50.9 remote-as 65005
  neighbor 10.50.50.9 update-source GigabitEthernet0/0/0.3003
  neighbor 10.50.50.9 activate
exit-address-family

```

使用SDA-Fusion-1配置iBGP對等：

```

interface GigabitEthernet0/0/2
ip address 10.90.90.2 255.255.255.252
negotiation auto
end

router bgp 65004 neighbor 10.90.90.1 remote-as 65004 ! address-family ipv4 neighbor 10.90.90.1
activate exit-address-family

```

步驟5.在Fusion路由器上配置VRF洩漏

Fusion路由器SDA-Fusion-1和SDA-Fusion-2的VRF洩漏配置相同。

首先，配置兩個VRF (Campus和Univ) 之間的VRF洩漏，使用**route-target import**:

```

vrf definition Campus
!
  address-family ipv4
route-target export 1:4099 route-target import 1:4099
route-target import 1:4100 <<< Import VRF Univ prefixes in VRF Campus
exit-address-family
!
vrf definition Univ
!
  address-family ipv4
route-target export 1:4100 route-target import 1:4100
route-target import 1:4099 <<< Import VRF Campus prefixes in VRF Univ
exit-address-family
!

```

然後，配置全域性路由表(GRT)到VRF之間的路由洩漏，並從VRF到GRT，使用**import ...map**和**export ...map**:

```

ip prefix-list Campus_Prefix seq 5 permit 172.16.10.0/24 <<< Include Prefixes belonging to
VRF Campus
ip prefix-list Global_Prefix seq 5 permit 10.10.10.8/30 <<< Include Prefixes belonging to
Global (eq DHCP Server Subnet)
ip prefix-list Univ_Prefix seq 5 permit 172.16.20.0/24 <<< Include Prefixes belonging to
VRF Univ

route-map Univ_Map permit 10
  match ip address prefix-list Univ_Prefix
route-map Global_Map permit 10
  match ip address prefix-list Global_Prefix
route-map Campus_Map permit 10
  match ip address prefix-list Campus_Prefix

vrf definition Campus
!
  address-family ipv4

```

```

import ipv4 unicast map Global_Map <<< Injecting Global into VRF Campus matching route-map
Global_Map
export ipv4 unicast map Campus_Map <<< Injecting VRF Campus into Global matching route-map
Campus_Map
exit-address-family
!
vrf definition Univ
!
address-family ipv4
import ipv4 unicast map Global_Map <<< Injecting Global into VRF Univ matching route-map
Global_Map
export ipv4 unicast map Univ_Map <<< Injecting VRF Univ into Global matching route-map Univ_Map
exit-address-family
!

```

驗證

本節包含確保先前配置已正確生效的驗證步驟。

步驟1.驗證Fusion路由器與邊界路由器之間的eBGP對等

SDA-Border-1 -----對-----SDA-Fusion-1

```
SDA-Border1#show ip bgp vpnv4 vrf Campus summary
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.50.50.26	4	65004	1294	1295	32	0	0	19:32:22	2

```
SDA-Border1#show ip bgp vpnv4 vrf Univ summary
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.50.50.22	4	65004	1294	1292	32	0	0	19:32:57	2

```
-----
```

```
SDA-Fusion1#show ip bgp vpnv4 vrf Campus summary
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.50.50.25	4	65005	1305	1305	31	0	0	19:41:58	1

```
SDA-Fusion1#show ip bgp vpnv4 vrf Univ summary
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.50.50.21	4	65005	1303	1305	31	0	0	19:42:14	1

SDA-Border-2(-----等-----SDA-Fusion-2

```
SDA-Border2#show ip bgp vpnv4 vrf Campus summary
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.50.50.2	4	65004	6	6	61	0	0	00:01:37	2

```
SDA-Border2#show ip bgp vpnv4 vrf Univ summary
```

```
Neighbor      V          AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
10.50.50.10   4          65004      6      6       61    0  0 00:01:39      2
```

```
-----
SDA-Fusion2#show ip bgp vpnv4 vrf Campus summary
```

```
Neighbor      V          AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
10.50.50.1    4          65005     17     17       9    0  0 00:11:16      1
```

```
SDA-Fusion2#show ip bgp vpnv4 vrf Univ summary
```

```
Neighbor      V          AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
10.50.50.9    4          65005     17     17       9    0  0 00:11:33      1
```

步驟2.驗證兩台Fusion路由器之間的iBGP對等

SDA-Fusion-1 -----對-----SDA-Fusion-2

```
SDA-Fusion1#show ip bgp summary
```

```
Neighbor      V          AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
10.90.90.2    4          65004     10     12       12   0  0 00:04:57      2
```

```
-----
SDA-Fusion2#show ip bgp summary
```

```
Neighbor      V          AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down  State/PfxRcd
10.90.90.1    4          65004     19     17       4    0  0 00:11:35      3
```

步驟3.驗證BGP表和路由表中的字首

SDA-Border-1

```
SDA-Border1#show ip bgp vpnv4 vrf Campus
```

```
Network      Next Hop      Metric LocPrf Weight Path
Route Distinguisher: 1:4099 (default for vrf Campus)
*> 10.10.10.8/30 10.50.50.26      65535 65004 i      <<< Prefix
leaked from Global Routing Table on Fusion
*> 172.16.10.0/24 0.0.0.0          32768 i      <<< VRF Campus
originated prefix
*> 172.16.20.0/24 10.50.50.26      65535 65004 65005 i      <<< Prefix
originated in VRF Univ, leaked on Fusion to VRF Campus
```

```
SDA-Border1#show ip route vrf Campus bgp Routing Table: Campus B 10.10.10.8/30 [20/0] via
10.50.50.26, 20:30:30 <<< RIB entry for DHCP Server pool prefix B 172.16.10.0/24 [200/0],
20:32:45, Null0 <<< Null entry created by "aggregate-address" BGP configuration B 172.16.20.0/24
[20/0] via 10.50.50.26, 20:32:45 <<< RIB entry for VRF Univ prefix -----
----- SDA-Border1#show ip bgp vpnv4 vrf Univ Network
Next Hop Metric LocPrf Weight Path Route Distinguisher: 1:4100 (default for vrf Univ) *>
10.10.10.8/30 10.50.50.22 65535 65004 i <<< Prefix leaked from Global Routing Table on Fusion *>
172.16.10.0/24 10.50.50.22 65535 65004 65005 i <<< Prefix originated in VRF Campus, leaked on
Fusion to VRF Univ *> 172.16.20.0/24 0.0.0.0 32768 i <<< VRF Univ originated prefix SDA-
```

```
Border1#show ip route vrf Univ bgp Routing Table: Univ B 10.10.10.8/30 [20/0] via 10.50.50.22,
20:31:06 <<< RIB entry for DHCP Server pool prefix B 172.16.10.0/24 [20/0] via 10.50.50.22,
20:33:21 <<< RIB entry for VRF Campus prefix B 172.16.20.0/24 [200/0], 20:33:21, Null0 <<< Null
entry created by "aggregate-address" BGP configuration
```

SDA-Border-2

```
SDA-Border2#show ip bgp vpnv4 vrf Campus
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 1:4099 (default for vrf Campus)					
*> 10.10.10.8/30	10.50.50.2	65535	65004	i	<<< Prefix leaked from Global Routing Table on Fusion
*> 172.16.10.0/24	0.0.0.0	32768	i		<<< VRF Campus originated prefix
*> 172.16.20.0/24	10.50.50.2	65535	65004	65005	i <<< Prefix originated in VRF Univ, leaked on Fusion to VRF Campus

```
SDA-Border2#show ip route vrf Campus bgp
```

```
B      10.10.10.8/30 [20/0] via 10.50.50.2, 01:02:19 <<< RIB entry for DHCP Server
pool prefix
B      172.16.10.0/24 [200/0], 1w6d, Null0 <<< Null entry created by
"aggregate-address" BGP configuration
B      172.16.20.0/24 [20/0] via 10.50.50.2, 01:02:27 <<< RIB entry for VRF Univ
Prefix
```

```
SDA-Border2#show ip bgp vpnv4 vrf Univ
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 1:4100 (default for vrf Univ)					
*> 10.10.10.8/30	10.50.50.10	65535	65004	i	<<< Prefix leaked from Global Routing Table on Fusion
*> 172.16.10.0/24	10.50.50.10	65535	65004	65005	i <<< Prefix originated in VRF Campus, leaked on Fusion to VRF Univ
*> 172.16.20.0/24	0.0.0.0	32768	i		<<< VRF Univ originated prefix

```
SDA-Border2#show ip route vrf Univ bgp
```

```
B      10.10.10.8/30 [20/0] via 10.50.50.10, 01:02:29 <<< RIB entry for DHCP Server
pool prefix
B      172.16.10.0/24 [20/0] via 10.50.50.10, 01:02:34 <<< RIB entry for VRF Campus
prefix
B      172.16.20.0/24 [200/0], 1w6d, Null0 <<< Null entry created by
"aggregate-address" BGP configuration
```

SDA-Fusion-1

```
SDA-Fusion1#show ip bgp
```

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 10.10.10.8/30	0.0.0.0	0		32768	i <<< Locally originated Global prefix
* i 172.16.10.0/24	10.50.50.1	0	100	0	65005 i <<< Prefix imported

```

from VRF Campus
*> 10.50.50.25 0 0 65005 i
* i 172.16.20.0/24 10.50.50.9 0 100 0 65005 i <<< Prefix imported
from VRF Univ
*> 10.50.50.21 0 0 65005 i

```

SDA-Fusion1#show ip route

```

C 10.10.10.8/30 is directly connected, GigabitEthernet2/35 <<< Prefix for DHCP
Server
B 172.16.10.0 [20/0] via 10.50.50.25 (Campus), 20:50:21 <<< Prefix imported
from VRF Campus
B 172.16.20.0 [20/0] via 10.50.50.21 (Univ), 20:50:21 <<< Prefix imported from
VRF Univ

```

SDA-Fusion1#show ip bgp vpnv4 vrf Campus

```

Network Next Hop Metric LocPrf Weight Path
Route Distinguisher: 1:4099 (default for vrf Campus)
Import Map: Global_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000
Export Map: Campus_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000
*> 10.10.10.8/30 0.0.0.0 0 32768 i <<< Prefix imported
from Global Routing
*> 172.16.10.0/24 10.50.50.25 0 0 65005 i <<< Prefix learnt from
Border1 in VRF Campus
*> 172.16.20.0/24 10.50.50.21 0 0 65005 i <<< Prefix imported from
VRF Univ

```

SDA-Fusion1#show ip bgp vpnv4 vrf Campus 172.16.20.0/24

```

BGP routing table entry for 1:4099:172.16.20.0/24, version 27
Paths: (1 available, best #1, table Campus)
Advertised to update-groups:
5
Refresh Epoch 1
65005, (aggregated by 65005 192.168.10.1), imported path from 1:4100:172.16.20.0/24 (Univ)
10.50.50.21 (via vrf Univ) (via Univ) from 10.50.50.21 (192.168.10.1)
Origin IGP, metric 0, localpref 100, valid, external, atomic-aggregate, best
Extended Community: RT:1:4100
rx pathid: 0, tx pathid: 0x0

```

SDA-Fusion1#show ip route vrf Campus bgp B 10.10.10.8/30 is directly connected, 20:46:51, GigabitEthernet2/35 B 172.16.10.0 [20/0] via 10.50.50.25, 20:50:07 B 172.16.20.0 [20/0] via 10.50.50.21 (Univ), 20:50:07

```

----- SDA-Fusion1#show ip bgp vpnv4 vrf Univ Network Next Hop Metric LocPrf Weight Path
Route Distinguisher: 1:4100 (default for vrf Univ) Import Map: Global_Map, Address-Family: IPv4
Unicast, Pfx Count/Limit: 1/1000 Export Map: Univ_Map, Address-Family: IPv4 Unicast, Pfx
Count/Limit: 1/1000 *> 10.10.10.8/30 0.0.0.0 0 32768 i <<< Prefix imported from Global Routing
*> 172.16.10.0/24 10.50.50.25 0 0 65005 i <<< Prefix imported from VRF Campus *> 172.16.20.0/24
10.50.50.21 0 0 65005 i <<< Prefix learnt from Border1 in VRF Univ

```

SDA-Fusion1#show ip bgp vpnv4 vrf Univ 172.16.10.0/24

```

BGP routing table entry for 1:4100:172.16.10.0/24, version 25
Paths: (1 available, best #1, table Univ)
Advertised to update-groups:
4
Refresh Epoch 1
65005, (aggregated by 65005 192.168.10.1), imported path from 1:4099:172.16.10.0/24 (Campus)
10.50.50.25 (via vrf Campus) (via Campus) from 10.50.50.25 (192.168.10.1)

```

Origin IGP, metric 0, localpref 100, valid, external, atomic-aggregate, best
Extended Community: RT:1:4099
rx pathid: 0, tx pathid: 0x0

SDA-Fusion1#show ip route vrf Univ bgp B 10.10.10.8/30 is directly connected, 20:47:01,
GigabitEthernet2/35 B 172.16.10.0 [20/0] via 10.50.50.25 (Campus), 20:50:17 B 172.16.20.0 [20/0]
via 10.50.50.21, 20:50:17

SDA-Fusion-2

SDA-Fusion2#show ip bgp

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>i	10.10.10.8/30	10.90.90.1	0	100	0	i
*>	172.16.10.0/24	10.50.50.1	0		0	65005 i
* i		10.50.50.25	0	100	0	65005 i
*>	172.16.20.0/24	10.50.50.9	0		0	65005 i
* i		10.50.50.21	0	100	0	65005 i

SDA-Fusion2#show ip route

B 10.10.10.8/30 [200/0] via 10.90.90.1, 01:25:56
B 172.16.10.0 [20/0] via 10.50.50.1 (Campus), 01:25:56
B 172.16.20.0 [20/0] via 10.50.50.9 (Univ), 01:25:56

SDA-Fusion2#show ip bgp vpnv4 vrf Campus

	Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 1:4099 (default for vrf Campus)						
Import Map: Global_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000						
Export Map: Campus_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000						
*>i	10.10.10.8/30	10.90.90.1	0	100	0	i
*>	172.16.10.0/24	10.50.50.1	0		0	65005 i
*>	172.16.20.0/24	10.50.50.9	0		0	65005 i

SDA-Fusion2#show ip route vrf Campus bgp

B 10.10.10.8/30 [200/0] via 10.90.90.1, 01:26:09
B 172.16.10.0 [20/0] via 10.50.50.1, 01:26:13
B 172.16.20.0 [20/0] via 10.50.50.9 (Univ), 01:26:13

SDA-Fusion2#show ip bgp vpnv4 vrf Univ

	Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 1:4100 (default for vrf Univ)						
Import Map: Global_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000						
Export Map: Univ_Map, Address-Family: IPv4 Unicast, Pfx Count/Limit: 1/1000						
*>i	10.10.10.8/30	10.90.90.1	0	100	0	i
*>	172.16.10.0/24	10.50.50.1	0		0	65005 i
*>	172.16.20.0/24	10.50.50.9	0		0	65005 i

SDA-Fusion2#show ip route vrf Univ bgp


```
B      10.10.10.8/30 [200/0] via 10.90.90.1, 01:26:19
B      172.16.10.0 [20/0] via 10.50.50.1 (Campus), 01:26:23
B      172.16.20.0 [20/0] via 10.50.50.9, 01:26:23
```

手動配置邊界冗餘

為了在邊界外部鏈路發生故障時在PETR之間實現冗餘，對於外部邊界和外部邊界+內部邊界，您必須在兩個VN邊界之間手動建立iBGP會話。此外，在將BGP匯入LISP並將LISP重新分發回BGP的外部+內部邊界情況下，需要標籤來防止iBGP到LISP路由匯入，從而避免潛在的環路。

SDA-Border-1

```
interface Vlan31
  description vrf interface to SDA-Border-2
  vrf forwarding Campus
  ip address 10.31.1.1 255.255.255.252
!
interface Vlan33
  description vrf interface to SDA-Border-2
  vrf forwarding Univ
  ip address 10.33.1.1 255.255.255.252
!

router bgp 65005
!
address-family ipv4 vrf Campus
  redistribute lisp metric 10 <<< open redistribution pushed by DNAC
  neighbor 10.31.1.2 remote-as 65005 <<< iBGP peering with SDA-Border-2
  neighbor 10.31.1.2 activate
  neighbor 10.31.1.2 send-community <<< we need to send community/tag to the neighbor
  neighbor 10.31.1.2 route-map tag_local_eids out <<< route-map used to tag prefixes sent out
!
address-family ipv4 vrf Univ
  redistribute lisp metric 10
  neighbor 10.33.1.2 remote-as 65005
  neighbor 10.33.1.2 activate
  neighbor 10.33.1.2 send-community
  neighbor 10.33.1.2 route-map tag_local_eids out
!

router lisp
!
instance-id 4099
service ipv4
eid-table vrf Campus
  route-import database bgp 65005 route-map DENY-Campus locator-set rloc_a0602921-91eb-4e27-a294-
f88949a1ca37 <<< pushed by DNAC if Border is (also) Internal
!
instance-id 4103
service ipv4
eid-table vrf Univ
  route-import database bgp 65005 route-map DENY-Univ locator-set rloc_a0602921-91eb-4e27-a294-
f88949a1ca37
!

ip community-list 1 permit 655370 <<< community-list matching tag 655370 - pushed by DNAC
!

route-map DENY-Campus deny 5 <<< route-map pushed by DNAC and used in route-import
```

```

match ip address prefix-list Campus
!
route-map DENY-Campus deny 10
match ip address prefix-list l3handoff-prefixes
!
route-map DENY-Campus deny 15
match community 1 <<< match on community-list 1 to deny iBGP prefixes to be imported into LISP
!
route-map DENY-Campus deny 25
match ip address prefix-list deny_0.0.0.0
!
route-map DENY-Campus permit 30
!

route-map DENY-Univ deny 5 <<< similar route-map is pushed for Univ VN
match ip address prefix-list Univ
!
route-map DENY-Univ deny 10
match ip address prefix-list l3handoff-prefixes
!
route-map DENY-Univ deny 15
match community 1
!
route-map DENY-Univ deny 25
match ip address prefix-list deny_0.0.0.0
!
route-map DENY-Univ permit 30
!

route-map tag_local_eids permit 5 <<< route-map we need to create in order to tag the routes
advertised to the iBGP peer
set community 655370 <<< setting community/tag to 655370
!

```

SDA-Border-2

```

interface Vlan31
description vrf interface to SDA-Border-1
vrf forwarding Campus
ip address 10.31.1.2 255.255.255.252
!
interface Vlan33
description vrf interface to SDA-Border-1
vrf forwarding Univ
ip address 10.33.1.2 255.255.255.252
!

router bgp 65005
!
address-family ipv4 vrf Campus
neighbor 10.31.1.1 remote-as 65005
neighbor 10.31.1.1 activate
neighbor 10.31.1.1 send-community
neighbor 10.31.1.1 route-map tag_local_eids out
!
address-family ipv4 vrf Univ
neighbor 10.33.1.1 remote-as 65005
neighbor 10.33.1.1 activate
neighbor 10.33.1.1 send-community
neighbor 10.33.1.1 route-map tag_local_eids out
!

router lisp

```

```

!
instance-id 4099
service ipv4
eid-table vrf Campus
route-import database bgp 65005 route-map DENY-Campus locator-set rloc_677c0a8a-0802-49f9-99cc-
f9c6ebda80f3 <<< pushed by DNAC
!

instance-id 4103
service ipv4
eid-table vrf Univ
route-import database bgp 65005 route-map DENY-Univ locator-set rloc_677c0a8a-0802-49f9-99cc-
f9c6ebda80f3
!

ip community-list 1 permit 655370
!

route-map DENY-Campus deny 5
match ip address prefix-list Campus
!
route-map DENY-Campus deny 10
match ip address prefix-list l3handoff-prefixes
!
route-map DENY-Campus deny 15
match community 1
!
route-map DENY-Campus deny 25
match ip address prefix-list deny_0.0.0.0
!
route-map DENY-Campus permit 30
!

route-map DENY-Univ deny 5
match ip address prefix-list Univ
!
route-map DENY-Univ deny 10
match ip address prefix-list l3handoff-prefixes
!
route-map DENY-Univ deny 15
match community 1
!
route-map DENY-Univ deny 25
match ip address prefix-list deny_0.0.0.0
!
route-map DENY-Univ permit 30
!

route-map tag_local_eids permit 5
set community 655370
!

```

使用模板簡化融合配置

本節包含用於幫助簡化配置的Fusion Template配置示例示例。

接下來是需要根據部署設計定義的變數。在本示例中，配置和VN基於具有兩個VN (Campus和Univ) 的先前拓撲。

變數定義

```
interface_Fusion1: GigabitEthernet2/8
interface_Fusion2: GigabitEthernet0/0/0
```

```
Global_prefixes = 10.10.10.8/30
```

```
FUSION_BGP_AS = 65004
```

```
BORDER_BGP_AS = 65005
```

對於VN1:

```
VN1 = Campus
```

```
Fusion1_VN1_VLAN = 3007
```

```
Fusion2_VN1_VLAN = 3001
```

```
VN1_prefixes = 172.16.10.0/24
```

```
Fusion1_VN1_IP = 10.50.50.26
```

```
Fusion1_VN1_MASK = 255.255.255.252
```

```
Fusion2_VN1_IP = 10.50.50.2
```

```
Fusion2_VN1_MASK = 255.255.255.252
```

```
VN1_RD = 4099
```

```
VN1_border1_neighbor_IP = 10.50.50.25
```

```
VN1_border2_neighbor_IP = 10.50.50.1
```

對於VN2:

```
VN2 = Univ
```

```
Fusion1_VN2_VLAN = 3006
```

```
Fusion2_VN2_VLAN = 3003
```

```
VN2_prefixes = 172.16.20.0/24
```

```
Fusion1_VN2_IP = 10.50.50.22
```

```
Fusion1_VN2_MASK = 255.255.255.252
```

```
Fusion2_VN2_IP2 = 10.50.50.10
```

```
Fusion2_VN2_MASK = 255.255.255.252
```

```
VN2_RD = 4100
```

```
VN2_border1_neighbor_IP = 10.50.50.21
```

```
VN2_border2_neighbor_IP = 10.50.50.9
```

模板示例

融合1

```
interface $interface_Fusion1
switchport
switchport mode trunk
switchport trunk allowed vlan add $Fusion1_VN1_VLAN, $Fusion1_VN2_VLAN
!
vlan $Fusion1_VN1_VLAN
no shut
!
vlan $Fusion1_VN2_VLAN
no shut
!
vrf definition $VN1
```

```

rd 1:$VN1_RD
!
address-family ipv4
route-target export 1:$VN1_RD
route-target import 1:$VN1_RD
route-target import 1:$VN2_RD
exit-address-family
!
vrf definition $VN2
rd 1:$VN2_RD
!
address-family ipv4
route-target export 1:$VN2_RD
route-target import 1:$VN2_RD
route-target import 1:$VN1_RD
exit-address-family
!
interface Vlan $Fusion1_VN1_VLAN
vrf forwarding $VN1
ip address $Fusion1_VN1_IP $Fusion1_VN1_MASK
!
interface Vlan $Fusion1_VN2_VLAN
vrf forwarding $VN2
ip address $Fusion1_VN2_IP $Fusion1_VN2_MASK
!
router bgp $FUSION_BGP_AS
bgp log-neighbor-changes
!
address-family ipv4
exit-address-family
!
address-family ipv4 vrf $VN1
neighbor $VN1_border1_neighbor_IP remote-as $BORDER_BGP_AS
neighbor $VN1_border1_neighbor_IP update-source Vlan $Fusion1_VN1_VLAN
neighbor $VN1_border1_neighbor_IP activate
exit-address-family
!
address-family ipv4 vrf $VN2
neighbor $VN2_border1_neighbor_IP remote-as $BORDER_BGP_AS
neighbor $VN2_border1_neighbor_IP update-source $Fusion1_VN2_VLAN
neighbor $VN2_border1_neighbor_IP activate
exit-address-family

ip prefix-list ${VN1}_Prefix seq 5 permit $VN1_prefixes
ip prefix-list Global_Prefix seq 5 permit $Global_prefixes
ip prefix-list ${VN2}_Prefix seq 5 permit $VN2_prefixes

route-map ${VN2}_Map permit 10
match ip address prefix-list ${VN2}_Prefix
route-map Global_Map permit 10
match ip address prefix-list Global_Prefix
route-map ${VN1}_Map permit 10
match ip address prefix-list ${VN1}_Prefix

vrf definition $VN1
!
address-family ipv4
import ipv4 unicast map Global_Map
export ipv4 unicast map ${VN1}_Map
exit-address-family
!
vrf definition $VN2
!
address-family ipv4

```

```
import ipv4 unicast map Global_Map
export ipv4 unicast map ${VN2}_Map
exit-address-family
!
```

融合2

```
interface $interface_Fusion2.$Fusion2_VN1_VLAN
encapsulation dot1Q $Fusion2_VN1_VLAN
vrf forwarding $VN1
ip address $Fusion2_VN1_IP2 $Fusion2_VN1_MASK
!
interface $interface_Fusion2.$Fusion2_VN2_VLAN
encapsulation dot1Q $Fusion2_VN2_VLAN
vrf forwarding $VN2
ip address $Fusion2_VN2_IP2 $Fusion2_VN2_MASK
!
vlan $Fusion2_VN1_VLAN
no shut
!
vlan $Fusion2_VN2_VLAN
no shut
!
vrf definition $VN1
rd 1:$VN1_RD
!
address-family ipv4
route-target export 1:$VN1_RD
route-target import 1:$VN1_RD
route-target import 1:$VN2_RD
exit-address-family
!
vrf definition $VN2
rd 1:$VN2_RD
!
address-family ipv4
route-target export 1:$VN2_RD
route-target import 1:$VN2_RD
route-target import 1:$VN1_RD
exit-address-family
!
router bgp $FUSION_BGP_AS
bgp log-neighbor-changes
!
address-family ipv4
exit-address-family
!
address-family ipv4 vrf $VN1
neighbor $VN1_border2_neighbor_IP remote-as $BORDER_BGP_AS
neighbor $VN1_border2_neighbor_IP update-source $interface_Fusion2.$Fusion2_VN1_VLAN
neighbor $VN1_bordre2_neighbor_IP activate
exit-address-family
!
address-family ipv4 vrf $VN2
neighbor $VN2_border2_neighbor_IP remote-as $BORDER_BGP_AS
neighbor $VN2_border2_neighbor_IP update-source $interface_Fusion2.$Fusion2_VN2_VLAN
neighbor $VN2_border2_neighbor_IP activate
exit-address-family

ip prefix-list ${VN1}_Prefix seq 5 permit $VN1_prefixes
ip prefix-list Global_Prefix seq 5 permit $Global_prefixes
ip prefix-list ${VN2}_Prefix seq 5 permit $VN2_prefixes
```

```
route-map ${VN2}_Map permit 10
match ip address prefix-list ${VN2}_Prefix
route-map Global_Map permit 10
match ip address prefix-list Global_Prefix
route-map ${VN}_Map permit 10
match ip address prefix-list ${VN1}_Prefix

vrf definition $VN1
!
address-family ipv4
import ipv4 unicast map Global_Map
export ipv4 unicast map ${VN1}_Map
exit-address-family
!
vrf definition $VN2
!
address-family ipv4
import ipv4 unicast map Global_Map
export ipv4 unicast map ${VN2}_Map
exit-address-family
!
End
```

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）。