

SDA - Steps to configure Fusion Router

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Introduction

In Digital Network Architecture Controller (DNAC) Software defined Access (SD-Access) solution, devices are managed and configured by a DNAC. But there is a part of the topology which has to be manually configured, as components with the role of Fusion Routers are not managed by DNAC. This article provides detailed steps for configuring the Fusion Routers, which helps achieve Virtual routing and forwarding (VRF) leaking across SD-Access Fabric domains, and host connectivity to different external servers (Dynamic Host configuration Protocol or DHCP and others).

Why the DNA-SDA solution requires Fusion router?

Today the Digital Network Architecture Software Defined Access (DNA-SDA) solution requires a fusion router to perform VRF route leaking between user VRFs and Shared-Services, which may be in the Global routing table (GRT) or another VRF. Shared Services may consist of DHCP, Domain Name System (DNS), Network Time Protocol (NTP), Wireless LAN Controller (WLC), Identity Services Engine (ISE), DNAC components which must be made available to other virtual networks (VN's) in the Campus. Thus by creating Border Gateway Protocol (BGP) peerings from the Border Routers to the Fusion Routers, on the Fusion Router the fabric VRF's subnets which need access to these shared services will be leaked into GRT, and vice-versa. Route maps can be used to help contain routing tables to subnets specific to SDA Fabric.

Note:

This article is based on DNAC version 1.2.1. In the future, with the introduction of the "LISP Extranet"(Location Identifier Separation Protocol) feature, dependency on Fusion Router will be reduced.

Prerequisites

Requirements

Setup is required as per "Supported devices for SDA" which can be found at: [Link to release notes](#)

Components Used

Devices used for this Article

DNAC - Version 1.2.1

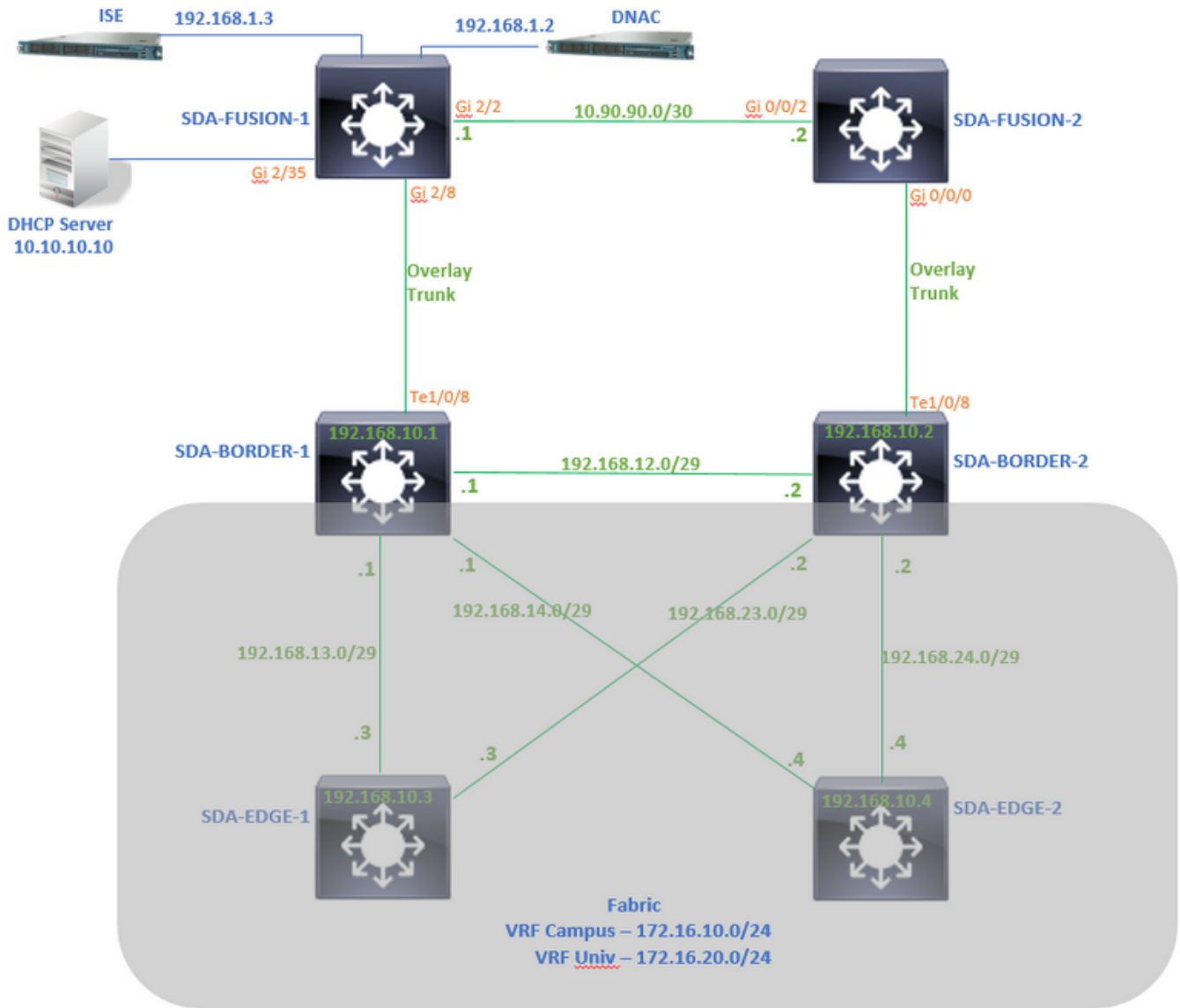
Edge and Border - Cat3k Cisco Switch

Fusion - Cisco Router with Support for Inter-VRF leaking

Configuration

Network Diagram

Topology used for this article consists of two Border Routers both configured as External Borders, and two Fusion Routers with a connection to each respective Border Router.



Configurations

Step1: Configuring Hand-off link from DNAC

During the step of assigning devices a role of Border Router while adding to the Fabric, hand-off link can be added.

At layer 2 this will be a trunk link connected to the Fusion Router. Following steps are needed:

- Configure Local AS Number for BGP. This Autonomous System (AS) number will be used to configure the BGP process on the Border Routers.
- Add interface under Transit. This interface is the direct connection between Border and Fusion Router. (Te 1/0/8 on Border in this example)

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

- Configure Remote AS Number. This AS Number will be used on Border Routers for neighbor statements towards Fusion Router to configure External BGP (eBGP) peering.

- Select all the Virtual Networks (VRFs) for which VRF leaking is required on Fusion Router.

- Deploy configuration from DNAC to Devices.

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

Follow same steps for SDA-Border-2 Device.

Step2: Verify Configurations pushed by DNAC on Border Routers

This Section covers verification of configuration on Border Routers related to BGP protocol

SDA-Border-1

```
SDA-Border1#sh run int lo 0
!
interface Loopback0
ip address 192.168.10.1 255.255.255.255
ip router isis
end
```

```
SDA-Border1#sh run int te 1/0/8
!
interface TenGigabitEthernet1/0/8
switchport mode trunk
end
```

```
SDA-Border1#sh run int lo 1021

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

```
SDA-Border1#sh run int lo 1022

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

```
SDA-Border1#sh run | s 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#sh run | s 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#sh run int vl 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#sh run int vl 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#sh run | s 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
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#sh run int lo 0
!
interface Loopback0
ip address 192.168.10.2 255.255.255.255
```

```
ip router isis
end
```

```
SDA-Border2#sh run int te 1/0/8
!
interface TenGigabitEthernet1/0/8
  switchport mode trunk
end
```

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

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

```
SDA-Border2#sh run | s 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#sh
run | s 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#sh run int vl 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#sh run
int vl 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#sh run | s 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
```

Step3: Configure "allowas-in" on Border Routers

As per VRF leaking on Fusion Router, address-family ipv4 for VRF Campus will learn routes originated by VRF Univ (172.16.20.0/24). But both originating and learning router have the same BGP AS number (65005). To Overcome BGP loop prevention mechanism and accept/install the routes on Border Routers, "allowas-in" must be configured for the peerings with the Fusion Router:

```
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)#
```

Step4: Configure Fusion Routers

This Section will show all the configuration needed on Fusion routers which are configured manually.

```
SDA-Fusion-1
```

Configure link towards Border Router as trunk

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

Configure corresponding VRF-s

```
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
```

Configure SVI interfaces


```
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
```

Configure eBGP Peering with SDA-Border-1

```
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
```

Configure Internal BGP (iBGP) Peering with SDA-Fusion-2

```
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
 !
```

Advertise DHCP Server Pool Under Global Address-Family

DHCP Server IP - 10.10.10.10

```
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

Configure link towards Border Router. If an interface on Fusion is L3 instead of trunk - configure subinterfaces.

```
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
```

Configure corresponding VRFs

```
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
!
```

Configure eBGP Peering with SDA-Border-2

```
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
```

Configure iBGP Peering with SDA-Fusion-1

```
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
```

Step5: Configure VRF Leaking on Fusion Router

Configuration for VRF leaking is identical for both Fusion Routers SDA-Fusion-1 and SDA-Fusion-2

At first configure VRF leaking between two VRFs - Campus and Univ - using "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
!
```

Then configure route leaking between Global Routing Table to VRFs and VRFs to Global Routing Table using Import-map and 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
!

```

Verify

This Section contains Verification steps to ensure configuration done as part of previous section has taken effect correctly.

Step1: Verify eBGP Peering Between Fusion and Border Routers

SDA-Border-1 -----Peering-----SDA-Fusion-1

```
SDA-Border1#sh 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#sh 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#sh 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#sh 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 -----Peering-----SDA-Fusion-2

```
SDA-Border2#sh 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#sh 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#sh 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#sh 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
```

Step2: Verify iBGP Peering Between both Fusion Routers

SDA-Fusion-1 -----Peering-----SDA-Fusion-2

```
SDA-Fusion1#sh 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#sh 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
```

Step3: Verify Prefixes in BGP table and Routing Table

Device: SDA-Border-1

```
SDA-Border1#sh 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#sh 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#sh 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#sh 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
```

Device: SDA-Border-2

```
SDA-Border2#sh 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#sh 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#sh 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#sh 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
```

Device: SDA-Fusion-1

```
SDA-Fusion1#sh 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#sh 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#sh 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#sh 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#sh 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#sh 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#sh 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#sh 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

```

Device: SDA-Fusion-2

```
SDA-Fusion2#sh 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#sh 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#sh 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#sh 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#sh 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#sh 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