

Probleemoplossing voor EVPN/VXLAN in multisite omgeving

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Inleiding

Dit document beschrijft hoe u Ethernet VPN/Virtual Extensible LAN (EVPN/VxLAN) in een omgeving met meerdere locaties kunt oplossen.

Voorwaarden

Vereisten

Cisco raadt kennis van de volgende onderwerpen aan:

- Multiprotocol Label Switching (MPLS) Layer 3 VPN
- Multiprotocol-Border Gateway Protocol (MP-BGP)
- EVPN

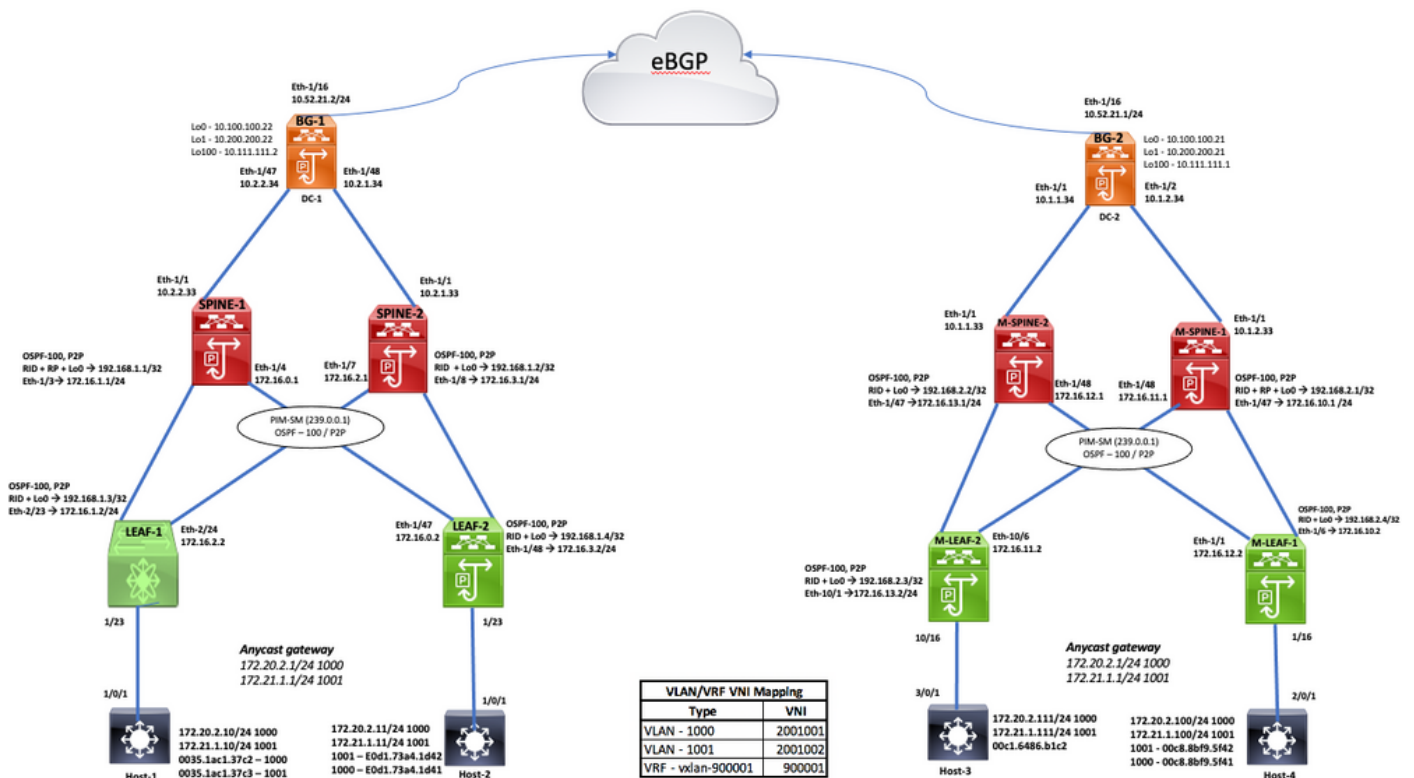
Gebruikte componenten

De informatie in dit document is gebaseerd op de volgende software- en hardware-versies:

blad1#	N5K-C562UP-16G-SUP	systeem: versie 7.3(0)N1(1)
blad2#	N9K-C92160YC-X switch	NXOS: versie 9.2(3)
ruggegraat1#	N9K-C9396PX switch	NXOS: versie 9.2(3)
ruggegraat2#	N9K-C9396PX switch	NXOS: versie 9.2(3)
MultisiteBG1#	N9K-C93108TC-EX	NXOS: versie 9.2(3)
MultisiteBG2#	N9K-C93108TC-FX	NXOS: versie 9.3(1)
multisitespine2#	N9K-C9372TX-E switch	NXOS: versie 9.2(3)
Multiservice-over-1#	N9K-C92160YC-X switch	NXOS: versie 9.2(3)
MultisteLeaf1#	N9K-C93108TC-EX	NXOS: versie 7.0(3)I7(5)

De informatie in dit document is gebaseerd op de apparaten in een specifieke laboratoriumomgeving. Alle apparaten die in dit document worden beschreven, hadden een opgeschoonde (standaard)configuratie. Als uw netwerk live is, moet u zorgen dat u de potentiële impact van elke opdracht begrijpt.

Topologie



Dit document beschrijft waar het verkeer afkomstig is van (DC-1, Host1/2 - 172.20.2.10/11) en vervolgens met onze pakketten te lopen tot de bestemming DC-2, Host4 (172.20.2.100).

Verificatie van besturingsplane



Traffic Flow:

Stap 1.

Controleer het juiste IP, VLAN op het bronknooppunt.

```
ToLeaf1#show ip interface brief | exclude down
```

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1000	172.20.2.10	YES	NVRAM	up	up
Vlan1001	172.21.1.10	YES	NVRAM	up	up
GigabitEthernet1/0/1	unassigned	YES	unset	up	up

```
ToLeaf1#
```

Nu hebt u de bereikbaarheid van het bronknooppunt tot zijn SVI-GW van VLAN-1000.

```
ToLeaf1#ping 172.20.2.1
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.20.2.1, timeout is 2 seconds:

```
!!!!!
```

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/205/1006 ms

```
ToLeaf1#
```

Stap 2. Ga verder naar de eerste hop die **leaf1** is en controleer dingen op Layer-2 en Layer-3 niveau.

Zie nu of **leaf1** de mac, arp van bronknooppunt leert of niet.

Ja, mac-adres (0035.1ac1.37c2), IP 172.20.2.10 van het bronknooppunt wordt aangeleerd op eth1/23 via Vlan1000.

```
leaf1#show mac address-table
```

Legend:

* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC

age - seconds since last seen,+ - primary entry using vPC Peer-Link

VLAN	MAC Address	Type	age	Secure	NTFY	Ports/SWID.SSID.LID
* 1001	0000.2222.3333	static	0	F	F	sup-eth2

```

* 1001    0035.1ac1.37c3    dynamic    500        F    F    Eth1/23
* 1001    005d.738e.a337    static     0          F    F    nve1/10.111.111.2
* 1001    00c8.8bf9.5f42    dynamic     0          F    F    nve1/10.111.111.2
* 1001    6cb2.ae91.38bf    static     0          F    F    nve1/10.200.200.22
* 1001    e0d1.73a4.1d42    dynamic     0          F    F    nve1/192.168.1.4
* 1000    0000.2222.3333    static     0          F    F    sup-eth2
* 1000    0035.1ac1.37c2    dynamic    70          F    F    Eth1/23
* 1000    005d.738e.a337    static     0          F    F    nve1/10.111.111.2
* 1000    00c8.8bf9.5f41    dynamic     0          F    F    nve1/10.111.111.2
* 1000    6cb2.ae91.38bf    static     0          F    F    nve1/10.200.200.22
* 1000    e0d1.73a4.1d41    dynamic     0          F    F    nve1/192.168.1.4

leaf1#

```

Controleer ARP-tabel in bronblad

```
leaf1#show ip arp vrf all
```

Flags: * - Adjacencies learnt on non-active FHRP router
+ - Adjacencies synced via CFSOE
- Adjacencies Throttled for Glean
D - Static Adjacencies attached to down interface

IP ARP Table for all contexts

Total number of entries: 5

Address	Age	MAC Address	Interface
172.21.1.10	00:08:14	0035.1ac1.37c3	Vlan1001
172.20.2.10	00:00:58	0035.1ac1.37c2	Vlan1000
10.31.121.1	00:08:14	2c31.24b0.bf46	mgmt0
172.16.1.1	00:07:51	0081.c41c.f007	Ethernet2/23
172.16.2.1	00:08:14	cc46.d68f.d74b	Ethernet2/24

```
leaf1#
```

Dit toont hoe leaf1 het bericht krijgt om een IP/mac-ingang van bronknooppunt te maken.

```

leaf1#show system internal l2rib event-history mac | i 0035.1ac1.37c2 | be create

[04/24/20 13:10:09.721 UTC 6 4173] (1000,0035.1ac1.37c2,3):MAC route created with seq num:0,
flags:L (), soo:0, peerid:0

[04/24/20 13:10:09.732 UTC c 4173] (1000,0035.1ac1.37c2,3):Encoding MAC best route (ADD, client
id 4)

[04/24/20 13:10:09.871 UTC e 4173] (1000,0035.1ac1.37c2):Bound MAC-IP(172.20.2.10) to MAC, Total
MAC-IP linked: 1

[04/24/20 13:10:42.651 UTC 1a 4173] Received MAC ROUTE msg: addr: (1000-0035.1ac1.37c2) vni: 0
admin_dist: 0 seq_num: 0 rt_flags: L soo: 0 dg_count: 0 res: 0 esi: (F) nh_count: 1

[04/24/20 13:10:42.651 UTC 1c 4173] (1000,0035.1ac1.37c2):Mobility check for new rte from prod:
3

[04/24/20 13:10:42.651 UTC 1d 4173] (1000,0035.1ac1.37c2):Current non-del-pending route
local:yes, remote:no, linked mac-ip count:1

[04/24/20 13:10:42.651 UTC 1e 4173] (1000,0035.1ac1.37c2):Mobility type: local-to-local; New
route SOO: 0, Seq num: 0; Existing route SOO: 0, Seq num: 0

[04/24/20 13:10:42.651 UTC 1f 4173] (1000,0035.1ac1.37c2):Local Update, Add to DB

[04/24/20 13:10:42.651 UTC 20 4173] (1000,0035.1ac1.37c2,3):Using seq number from Recv-based
route

<.....snipped for brevity.....>

```

leaf1#

Zodra u hebt geverifieerd hoe de mac/IP-vermelding in leaf1 is gemaakt, is dit een van de belangrijke observatiepunten waar de mac/mac-ip-informatie gekoppeld wordt aan BGP en geadverteerd als l2vpn/evpn-routes.

```
leaf1#show bgp l2vpn evpn 0035.1ac1.37c2
```

```
Route Distinguisher: 192.168.1.3:33767 (L2VNI 2001002)
```

```
BGP routing table entry for [2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216, version 99
```

```
Paths: (1 available, best #1)
```

```
Flags: (0x00010a) on xmit-list, is not in l2rib/evpn
```

```
Advertised path-id 1
```

```
Path type: local, path is valid, is best path
```

```
AS-Path: NONE, path locally originated
```

```
192.168.1.3 (metric 0) from 0.0.0.0 (192.168.1.3)
```

```
Origin IGP, MED not set, localpref 100, weight 32768
```

```
Received label 2001002
```

```
Extcommunity:
```


Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected

Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup

Network	Next Hop	Metric	LocPrf	Weight	Path
---------	----------	--------	--------	--------	------

Route Distinguisher: 10.100.100.21:33767

Route Distinguisher: 10.100.100.21:33768

Route Distinguisher: 10.100.100.22:33767

Route Distinguisher: 10.100.100.22:33768

Route Distinguisher: 192.168.1.3:33767 (L2VNI 2001002)

***>1[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216**

192.168.1.3	100	32768	i
-------------	-----	-------	---

***>1[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272**

192.168.1.3	100	32768	i
-------------	-----	-------	---

Route Distinguisher: 192.168.1.3:33768 (L2VNI 2001001)

***>1[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[0]:[0.0.0.0]/216**

192.168.1.3	100	32768	i
-------------	-----	-------	---

***>1[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[32]:[172.21.1.10]/272**

192.168.1.3	100	32768	i
-------------	-----	-------	---

Route Distinguisher: 192.168.1.4:33767

Route Distinguisher: 192.168.1.4:33768

Route Distinguisher: 192.168.2.4:33767

Route Distinguisher: 192.168.2.4:33768

Route Distinguisher: 192.168.1.3:3 (L3VNI 900001)

leaf1#

DC-1 Leaf1 naar Spine2 routeverificatie

leaf1#show bgp l2vpn evpn neighbors 192.168.1.2 advertised-routes

Peer 192.168.1.2 routes for address family L2VPN EVPN:

BGP table version is 191, local router ID is 192.168.1.3

Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best

Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redirect, I-injected

Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.100.100.21:33767					
Route Distinguisher: 10.100.100.21:33768					
Route Distinguisher: 10.100.100.22:33767					
Route Distinguisher: 10.100.100.22:33768					
Route Distinguisher: 192.168.1.3:33767 (L2VNI 2001002)					
*>1[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216					
	192.168.1.3		100	32768	i
*>1[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272					
	192.168.1.3		100	32768	i
Route Distinguisher: 192.168.1.3:33768 (L2VNI 2001001)					
*>1[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[0]:[0.0.0.0]/216					
	192.168.1.3		100	32768	i


```
*>1[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[32]:[172.21.1.10]/272
```

```
192.168.1.3
```

```
100
```

```
32768 i
```

```
Route Distinguisher: 192.168.1.4:33767
```

```
Route Distinguisher: 192.168.1.4:33768
```

```
Route Distinguisher: 192.168.2.4:33767
```

```
Route Distinguisher: 192.168.2.4:33768
```

```
Route Distinguisher: 192.168.1.3:3 (L3VNI 900001)
```

```
leaf1#
```

Aangezien er meerdere stekels zijn, controleer verschillende opdrachten op verschillende stekels om te bevestigen (houd routeupdates intact).

In DC-1 hebben SPINE-1 en SPINE-2 een EVPN-wijk met Leaf1, Leaf2 en BGW-1

```
spine1#show bgp l2vpn evpn summary
```

```
BGP summary information for VRF default, address family L2VPN EVPN
```

```
BGP router identifier 192.168.1.1, local AS number 200
```

```
BGP table version is 31, L2VPN EVPN config peers 3, capable peers 3
```

```
19 network entries and 19 paths using 4256 bytes of memory
```

```
BGP attribute entries [17/2788], BGP AS path entries [1/6]
```

```
BGP community entries [0/0], BGP clusterlist entries [0/0]
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.100.100.22	4	200	44002	43993	31	0	0	4w2d	11
192.168.1.3	4	200	43991	43989	31	0	0	4w2d	4
192.168.1.4	4	200	43996	43992	31	0	0	4w2d	4

```
spine1#
```

```
spine2#show bgp l2vpn evpn summary
```

```
BGP summary information for VRF default, address family L2VPN EVPN
```

```
BGP router identifier 192.168.1.2, local AS number 200
```

```
BGP table version is 65, L2VPN EVPN config peers 3, capable peers 3
```

```
19 network entries and 19 paths using 4256 bytes of memory
```

```
BGP attribute entries [17/2788], BGP AS path entries [1/6]
```

```
BGP community entries [0/0], BGP clusterlist entries [0/0]
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.100.100.22	4	200	47140	47115	65	0	0	4w4d	11
192.168.1.3	4	200	47115	47112	65	0	0	4w4d	4
192.168.1.4	4	200	47121	47116	65	0	0	4w4d	4

```
spine2#
```

Tot nu toe hebt u tot de laag van de RUGGENGRAAT bereikt, nu zie of dit wordt doorgegeven aan grensgateway (DC-1, BGW-1) of niet.

```
spine2#show bgp l2vpn evpn neighbors 10.100.100.22 advertised-routes
```

```
Peer 10.100.100.22 routes for address family L2VPN EVPN:
```

```
BGP table version is 65, Local Router ID is 192.168.1.2
```

```
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
```

```
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redirect, I-injected
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.100.100.21:33767					

```
Route Distinguisher: 10.100.100.21:33768
```

```
Route Distinguisher: 10.100.100.22:27001
```

Route Distinguisher: 10.100.100.22:33767

Route Distinguisher: 10.100.100.22:33768

Route Distinguisher: 192.168.1.3:33767

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216

192.168.1.3 100 0 i

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272

192.168.1.3 100 0 i

Route Distinguisher: 192.168.1.3:33768

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[0]:[0.0.0.0]/216

192.168.1.3 100 0 i

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[32]:[172.21.1.10]/272

192.168.1.3 100 0 i

Route Distinguisher: 192.168.1.4:33767

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d41]:[0]:[0.0.0.0]/216

192.168.1.4 100 0 i

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d41]:[32]:[172.20.2.11]/272

192.168.1.4 100 0 i

Route Distinguisher: 192.168.1.4:33768

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d42]:[0]:[0.0.0.0]/216

192.168.1.4 100 0 i

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d42]:[32]:[172.21.1.11]/272

192.168.1.4 100 0 i

Route Distinguisher: 192.168.2.4:33767

Route Distinguisher: 192.168.2.4:33768

spine2#

<<<<<<<<<

```
spine2#show bgp l2vpn evpn neighbors 10.100.100.22 advertised-routes | i 0035.1ac1.37c2  
p 1 n 1
```

Route Distinguisher: 192.168.1.3:33767

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216
```

```
192.168.1.3 100 0 i
```

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272
```

```
192.168.1.3 100 0 i
```

spine2#

Verifieer bij de laag van de GRENS van DC-1, van waar de routes aan een verschillende plaats worden verspreid.

U kunt dan zien met wie, welk type routes en hoeveel routes in BGW-1 worden uitgewisseld

DC-1 BGW-1 router

```
MultisiteBG1#show bgp l2vpn evpn summary
```

BGP summary information for VRF default, address family L2VPN EVPN

BGP router identifier 10.100.100.22, local AS number 200

BGP table version is 233, L2VPN EVPN config peers 3, capable peers 3

37 network entries and 45 paths using 7296 bytes of memory

BGP attribute entries [37/6068], BGP AS path entries [1/6]

BGP community entries [0/0], BGP clusterlist entries [4/16]

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.100.100.21	4	100	47145	47121	233	0	0	4w4d	8
192.168.1.1	4	200	47153	47125	233	0	0	18:52:35	8
192.168.1.2	4	200	47139	47119	233	0	0	4w4d	8

Neighbor	T	AS	PfxRcd	Type-2	Type-3	Type-4	Type-5
----------	---	----	--------	--------	--------	--------	--------

```

10.100.100.21  E   100 8           6           2           0           0
192.168.1.1   I   200 8           8           0           0           0
192.168.1.2   I   200 8           8           0           0           0

```

MultisiteBG1#

MultisiteBG1#**show bgp l2vpn evpn neighbors 10.100.100.21 advertised-routes**

Peer 10.100.100.21 routes for address family L2VPN EVPN:

BGP table version is 233, Local Router ID is 10.100.100.22

Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best

Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected

Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

Network	Next Hop	Metric	LocPrf	Weight	Path
---------	----------	--------	--------	--------	------

Route Distinguisher: 10.100.100.21:33767

Route Distinguisher: 10.100.100.21:33768

Route Distinguisher: 10.100.100.22:27001 (ES [0300.0000.0000.c800.0309 0])

*>l[4]:[0300.0000.0000.c800.0309]:[32]:[10.200.200.22]/136

10.200.200.22	100	32768	i
---------------	-----	-------	---

Route Distinguisher: 10.100.100.22:33767 (L2VNI 2001002)

*>l[2]:[0]:[0]:[48]:[6cb2.ae91.38bf]:[0]:[0.0.0.0]/216

10.200.200.22	100	32768	i
---------------	-----	-------	---

*>l[3]:[0]:[32]:[10.200.200.22]/88

10.200.200.22	100	32768	i
---------------	-----	-------	---

Route Distinguisher: 10.100.100.22:33768 (L2VNI 2001001)

*>l[2]:[0]:[0]:[48]:[6cb2.ae91.38bf]:[0]:[0.0.0.0]/216

10.200.200.22	100	32768	i
---------------	-----	-------	---

*>l[3]:[0]:[32]:[10.200.200.22]/88

10.200.200.22 100 32768 i

Route Distinguisher: 192.168.1.3:33767

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216

192.168.1.3 100 0 i

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272

192.168.1.3 100 0 i

Route Distinguisher: 192.168.1.3:33768

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[0]:[0.0.0.0]/216

192.168.1.3 100 0 i

*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c3]:[32]:[172.21.1.10]/272

192.168.1.3 100 0 i

Route Distinguisher: 192.168.1.4:33767

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d41]:[0]:[0.0.0.0]/216

192.168.1.4 100 0 i

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d41]:[32]:[172.20.2.11]/272

192.168.1.4 100 0 i

Route Distinguisher: 192.168.1.4:33768

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d42]:[0]:[0.0.0.0]/216

192.168.1.4 100 0 i

*>i[2]:[0]:[0]:[48]:[e0d1.73a4.1d42]:[32]:[172.21.1.11]/272

192.168.1.4 100 0 i

Route Distinguisher: 192.168.2.4:33767

Route Distinguisher: 192.168.2.4:33768

MultisiteBG1#

```
MultisiteBG1#show bgp l2vpn evpn neighbors 10.100.100.21 advertised-routes | i 0035.1ac1.37c2  
p 1 n 1
```

```
Route Distinguisher: 192.168.1.3:33767
```

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216
```

```
192.168.1.3 100 0 i
```

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272
```

```
192.168.1.3 100 0 i
```

```
MultisiteBG1#
```

Zodra de routes bij DC-2/BGW-2 zijn ontvangen, ziet u de routereclame aan zijn verbonden SPINE-1 (192.168.2.1)

DC-2 BGW-2 router

```
MultisiteBG2#show bgp l2vpn evpn summary
```

```
BGP summary information for VRF default, address family L2VPN EVPN
```

```
BGP router identifier 10.100.100.21, local AS number 100
```

```
BGP table version is 142, L2VPN EVPN config peers 3, capable peers 2
```

```
43 network entries and 43 paths using 7680 bytes of memory
```

```
BGP attribute entries [33/5412], BGP AS path entries [1/6]
```

```
BGP community entries [0/0], BGP clusterlist entries [1/4]
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.100.100.22	4	200	47169	47124	142	0	0	4w4d	12
192.168.2.1	4	100	47136	47124	142	0	0	4w4d	4
192.168.2.2	4	100	45969	45963	0	0	0	19:21:40	Idle

Neighbor	T	AS	PfxRcd	Type-2	Type-3	Type-4	Type-5
10.100.100.22	E	200	12	10	2	0	0
192.168.2.1	I	100	4	4	0	0	0
192.168.2.2	I	100	Idle	0	0	0	0

```
MultisiteBG2#
```

```
MultisiteBG2#show bgp l2vpn evpn neighbors 192.168.2.1 advertised-routes | i 0035.1ac1.37c2 p 1 n 1
```

```
Route Distinguisher: 192.168.1.3:33767
```

```
*>e[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216
```

```
10.111.111.2 2000 0 200 i
```

```
*>e[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272
```

```
10.111.111.2 2000 0 200 i
```

```
MultisiteBG2#
```

Routes worden verder geadverteerd naar DC-2, Leaf-1 waar de bestemming is verbonden met.

DC-2 advertentie van route van wervelkolom naar blad

```
Multistespinel#show bgp l2vpn evpn summary
```

```
BGP summary information for VRF default, address family L2VPN EVPN
```

```
BGP router identifier 192.168.2.1, local AS number 100
```

```
BGP table version is 50, L2VPN EVPN config peers 3, capable peers 2
```

```
19 network entries and 19 paths using 4256 bytes of memory
```

```
BGP attribute entries [15/2460], BGP AS path entries [1/6]
```

```
BGP community entries [0/0], BGP clusterlist entries [0/0]
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.100.100.21	4	100	47152	47131	50	0	0	4w4d	15
192.168.2.3	4	100	0	0	0	0	0	4w4d	Idle
192.168.2.4	4	100	47135	47131	50	0	0	4w4d	4

```
Multistespinel#
```

```
Multistespinel#show bgp l2vpn evpn neighbors 192.168.2.4 advertised-routes | i 0035.1ac1.37c2 p 1 n 1
```

```
Route Distinguisher: 192.168.1.3:33767
```

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[0]:[0.0.0.0]/216
```

```
10.111.111.1 2000 100 0 200 i
```

```
*>i[2]:[0]:[0]:[48]:[0035.1ac1.37c2]:[32]:[172.20.2.10]/272
```



```

* 1001    00c8.8bf9.5f42    dynamic  0          F        F        Eth1/16
C 1001    e0d1.73a4.1d42    dynamic  0          F        F        nve1(10.111.111.1)
G  -      0000.2222.3333    static   -          F        F        sup-eth1(R)
G  -      00be.75f4.544d    static   -          F        F        sup-eth1(R)
G 101     00be.75f4.544d    static   -          F        F        sup-eth1(R)
G 1000    00be.75f4.544d    static   -          F        F        sup-eth1(R)
G 1001    00be.75f4.544d    static   -          F        F        sup-eth1(R)

```

MultisteLeaf1#

DC-2, Leaf-1 leerde Host-4 Mac via Vlan1000.

MultisteLeaf1#**show ip arp vrf vxlan-900001**

```

Flags: * - Adjacencies learnt on non-active FHRP router
      + - Adjacencies synced via CFSOE
      # - Adjacencies Throttled for Glean
      CP - Added via L2RIB, Control plane Adjacencies
      PS - Added via L2RIB, Peer Sync
      RO - Re-Originated Peer Sync Entry
      D - Static Adjacencies attached to down interface

```

IP ARP Table for context vxlan-900001

Total number of entries: 2

Address	Age	MAC Address	Interface	Flags
172.21.1.100	00:04:09	00c8.8bf9.5f42	Vlan1001	
172.20.2.100	00:04:09	00c8.8bf9.5f41	Vlan1000	

MultisteLeaf1#

Probleemoplossing voor dataplane

De verificatie van het gegevensplan wordt getest op meerdere apparaten om verschillende pakketopnamemethoden en -varianten te begrijpen.



N9K.

U kunt starten vanaf Host-4 en een eenvoudige ping naar Host-2 uitvoeren. Hoewel het een transitoverkeer voor LEAF-switches is, controleer je nog steeds of je deze pakketten goed kunt verwerken of niet. Bevestig bij DC-1/Leaf-2.

Om te bevestigen, controleer de interface eth-1/23, en geef die pakketten aan CPU en voer ethanalyzer/spiegel voor het zelfde uit.

Monitorsessie configureren

```
leaf2#configure terminal
leaf2(config)#monitor session 1
leaf2(config-monitor)#source interface ethernet 1/23
leaf2(config-monitor)#destination interface sup-eth 0
leaf2(config-monitor)#no shut
leaf2(config-monitor)#exit
```

```
toMultisiteLeaf1#ping 172.20.2.11 repeat 2
Type escape sequence to abort.
Sending 2, 100-byte ICMP Echos to 172.20.2.11, timeout is 2 seconds:
!!
Success rate is 100 percent (2/2), round-trip min/avg/max = 1/1/1 ms
toMultisiteLeaf1#
```

```
leaf2#ethanalyzer local interface inband mirror
```

```
Capturing on inband
2020-05-27 12:20:57.081654 172.20.2.100 -> 172.20.2.11 ICMP Echo (ping) request
2020-05-27 12:20:57.082193 172.20.2.11 -> 172.20.2.100 ICMP Echo (ping) reply
2020-05-27 12:20:57.084902 172.20.2.100 -> 172.20.2.11 ICMP Echo (ping) request
2020-05-27 12:20:57.087406 172.20.2.11 -> 172.20.2.100 ICMP Echo (ping) reply

4 packets captured
leaf2#
```

```
leaf2#ethanalyzer local interface inband display-filter "ip.addr==172.20.2.100 && ip.addr==172.20.2.11 && icmp" limit-captured-frames 0
```

```
Capturing on inband
2020-05-27 12:20:57.081654 172.20.2.100 -> 172.20.2.11 ICMP Echo (ping) request
2020-05-27 12:20:57.082193 172.20.2.11 -> 172.20.2.100 ICMP Echo (ping) reply
2020-05-27 12:20:57.084902 172.20.2.100 -> 172.20.2.11 ICMP Echo (ping) request
2020-05-27 12:20:57.087406 172.20.2.11 -> 172.20.2.100 ICMP Echo (ping) reply

4 packets captured
leaf2#
```

In het geval als u wat gegevens uit de bron wilt verzenden en op het bestemmingsblad wilt opnemen, is dit de procedure:

1. Start een ping van host-4 naar host-2.
2. BRON: 172.20.2.100 // Src MAC-adres: 00:C8:8B:F9:5F:41

3. BESTEMMING: 172.20.2.11 // DST MAC-adres: E0:D1:73:A4:1D:41
4. Packet Size: 777
5. Do-Not-Fragment: JA
6. Data Pattern String: rundvlees

U hebt genoeg pakketellingen in dit voorbeeld zodat u pakketten op de bron en bestemmingsbladeren kunt vangen.

```
toMultisiteLeaf1#ping 172.20.2.11 repeat 200000 data beef df-bit validate size 777
Type escape sequence to abort.
Sending 200000, 777-byte ICMP Echos to 172.20.2.11, timeout is 2 seconds:
Packet sent with the DF bit set
Packet has data pattern 0xBEEF
Reply data will be validated
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

<.....>
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (7376/7376), round-trip min/avg/max = 1/5/151 ms
toMultisiteLeaf1#
```

Basiscontroles op eerste hopDC-2, blad-1



```
MultisteLeaf1#show module
Mod Ports Module-Type Model Status
-----
1 54 48x10GT + 6x40G/100G Ethernet Module N9K-C93108TC-EX active *

Mod Sw Hw Slot
-----
1 7.0(3)I7(5) 1.3 NA

Mod MAC-Address(es) Serial-Num
-----
1 00-be-75-f4-54-46 to 00-be-75-f4-54-95 FDO220225UX

Mod Online Diag Status
-----
1 Pass

* this terminal session
MultisteLeaf1#
```


Src MAC address: 00:C8:8B:F9:5F:41

.1q Tag0 **VLAN: 1000**, cos = 0x0

Dst IPv4 address: 172.20.2.11

Src IPv4 address: 172.20.2.100

Ver = 4, DSCP = 0, **Don't Fragment = 1**

Proto = 1, TTL = 255, More Fragments = 0

Hdr len = 20, **Pkt len = 777**, Checksum = 0xcffe

L4 Protocol : 1

ICMP type : 8

ICMP code : 0

Drop Info:

LUA:

LUB:

LUC:

LUD:

Final Drops:

```
module-1(TAH-elam-insel6)# exit
```

```
module-1(TAH-elam)# exit
```

```
module-1# exit
```

```
MultisteLeaf1#
```

Als u als pcap wilt zien, laat het continu pingen, de monitorsessie is geconfigureerd op het bron- en doelblad.

Monitorsessie op bronblad

```
MultisteLeaf1#show run | section monitor
```

```
monitor session 1
```

```
source interface Ethernet1/16 both
```

```
destination interface sup-eth0
```

```
no shut
```

```
MultisteLeaf1#
```

Monitorsessie op doelblad

```
leaf2(config)#show run | section monitor
```

```
monitor session 1
```

```
source interface Ethernet1/23 both
```

```
destination interface sup-eth0
```

```
no shut
```

```
leaf2(config)#
```

Opnemen op bronblad

```
MultisteLeaf1#ethalyzer local interface inband display-filter "ip.addr==172.20.2.100 && ip.addr==172.20.2.11 && icmp" limit-captured-frames 0 detail
```

```
Capturing on inband
```

```
Frame 1 (791 bytes on wire, 791 bytes captured)
```

```
Arrival Time: May 31, 2020 15:44:46.767411000
```

```
[Time delta from previous captured frame: 0.000000000 seconds]
```


Frame 4 (795 bytes on wire, 795 bytes captured)

Arrival Time: May 31, 2020 15:44:46.888728000
[Time delta from previous captured frame: 0.047867000 seconds]
[Time delta from previous displayed frame: 0.047867000 seconds]
[Time since reference or first frame: 0.121317000 seconds]
Frame Number: 4
Frame Length: 795 bytes
Capture Length: 795 bytes
[Frame is marked: False]
[Protocols in frame: eth:vlan:ip:icmp:data]
Ethernet II, Src: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41), Dst: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
Destination: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
Address: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
.... 0 = IG bit: Individual address (unicast)
...0. = LG bit: Globally unique address (factory default)
Source: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41)
Address: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41)
.... 0 = IG bit: Individual address (unicast)
...0. = LG bit: Globally unique address (factory default)
Type: 802.1Q Virtual LAN (0x8100)
802.1Q Virtual LAN, PRI: 0, CFI: 0, ID: 1000
000. = Priority: 0
...0 = CFI: 0
... 0011 1110 1000 = ID: 1000
Type: IP (0x0800)
Internet Protocol, Src: 172.20.2.100 (172.20.2.100), Dst: 172.20.2.11 (172.20.2.11)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
... ..0. = ECN-Capable Transport (ECT): 0
... ..0 = ECN-CE: 0
Total Length: 777
Identification: 0xaf65 (44901)
Flags: 0x02 (Don't Fragment)
0.. = Reserved bit: Not Set
.1. = Don't fragment: Set
..0 = More fragments: Not Set
Fragment offset: 0
Time to live: 255
Protocol: ICMP (0x01)
Header checksum: 0xbd1b [correct]
[Good: True]
[Bad : False]
Source: 172.20.2.100 (172.20.2.100)
Destination: 172.20.2.11 (172.20.2.11)
Internet Control Message Protocol
Type: 8 (Echo (ping) request)
Code: 0 ()
Checksum: 0x704a [correct]
Identifier: 0x001c
Sequence number: 7430 (0x1d06)
Data (749 bytes)

0000 00 00 00 00 14 67 5f aa be ef be ef be ef be efg_.....
0010 be ef be ef be ef be ef be ef be ef be ef be ef
0020 be ef be ef be ef be ef be ef be ef be ef be ef
0030 be ef be ef be ef be ef be ef be ef be ef be ef
0040 be ef be ef be ef be ef be ef be ef be ef be ef
0050 be ef be ef be ef be ef be ef be ef be ef be ef
0060 be ef be ef be ef be ef be ef be ef be ef be ef
0070 be ef be ef be ef be ef be ef be ef be ef be ef
0080 be ef be ef be ef be ef be ef be ef be ef be ef

```

0090 be ef be ef be ef be ef be ef be ef be ef be ef .....
00a0 be ef be ef be ef be ef be ef be ef be ef be ef .....
00b0 be ef be ef be ef be ef be ef be ef be ef be ef .....
00c0 be ef be ef be ef be ef be ef be ef be ef be ef .....
00d0 be ef be ef be ef be ef be ef be ef be ef be ef .....
00e0 be ef be ef be ef be ef be ef be ef be ef be ef .....
00f0 be ef be ef be ef be ef be ef be ef be ef be ef .....
0100 be ef be ef be ef be ef be ef be ef be ef be ef .....
0110 be ef be ef be ef be ef be ef be ef be ef be ef .....
0120 be ef be ef be ef be ef be ef be ef be ef be ef .....
0130 be ef be ef be ef be ef be ef be ef be ef be ef .....
0140 be ef be ef be ef be ef be ef be ef be ef be ef .....
0150 be ef be ef be ef be ef be ef be ef be ef be ef .....
0160 be ef be ef be ef be ef be ef be ef be ef be ef .....
0170 be ef be ef be ef be ef be ef be ef be ef be ef .....
0180 be ef be ef be ef be ef be ef be ef be ef be ef .....
0190 be ef be ef be ef be ef be ef be ef be ef be ef .....
01a0 be ef be ef be ef be ef be ef be ef be ef be ef .....
01b0 be ef be ef be ef be ef be ef be ef be ef be ef .....
01c0 be ef be ef be ef be ef be ef be ef be ef be ef .....
01d0 be ef be ef be ef be ef be ef be ef be ef be ef .....

```

MultisteLeaf1#

Basiscontroles op de laatste hop DC-1, blad-2



```
leaf2#show module
```

```
Mod Ports Module-Type Model Status
```

```
-----
1 54 48x10G + 4x40G + 2x100G Ethernet Modu N9K-C92160YC-X active *
```

```
Mod Sw Hw Slot
```

```
-----
1 9.2(3) 1.3 NA
```

```
Mod MAC-Address(es) Serial-Num
```

```
-----
1 70-79-b3-3e-81-1c to 70-79-b3-3e-81-69 FDO22111H2V
```

```
Mod Online Diag Status
```

```
-----
1 Pass
```

```
* this terminal session
```

```
leaf2#show cdp neighbors
```

```
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
S - Switch, H - Host, I - IGMP, r - Repeater,
V - VoIP-Phone, D - Remotely-Managed-Device,
s - Supports-STP-Dispute
```

```
Device-ID Local Intrfce Hldtme Capability Platform Port ID
```

```
Toleaf2 Eth1/23 142 S I WS-C3750X-24S Gig1/0/1 <<<<<<<<<<<<<<< Towards Host-2
```

```
switch(SAL2024RRYF)
```

```
Eth1/47 175 R S I s N9K-C9372PX-E Eth1/4
```

```
spine2(SAL1949UELD)
```


0290 be ef be ef be ef be ef be ef be ef be ef be ef be ef
02a0 be ef be ef be ef be ef be ef be ef be ef be ef be ef
02b0 be ef be ef be ef be ef be ef be ef be ef be ef be ef
02c0 be ef be ef be ef be ef be ef be ef be ef be ef be ef
02d0 be ef be ef be ef be ef be ef be ef be ef be ef be ef
02e0 be ef be ef be ef be ef be ef be ef be ef 00
Data: 00000000147F4ADBEEFBEEFBEEFBEEFBEEFBEEFBEEFBEEFBEEFBEEF...
[Length: 749]

Frame 2 (791 bytes on wire, 791 bytes captured)
Arrival Time: May 31, 2020 15:45:55.694904000
[Time delta from previous captured frame: 0.020346000 seconds]
[Time delta from previous displayed frame: 0.020346000 seconds]
[Time since reference or first frame: 0.020346000 seconds]
Frame Number: 2
Frame Length: 791 bytes
Capture Length: 791 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:icmp:data]
Ethernet II, Src: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41), Dst: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
Destination: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
Address: e0:d1:73:a4:1d:41 (e0:d1:73:a4:1d:41)
.... 0 = IG bit: Individual address (unicast)
.... 0. = LG bit: Globally unique address (factory default)
Source: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41)
Address: 00:c8:8b:f9:5f:41 (00:c8:8b:f9:5f:41)
.... 0 = IG bit: Individual address (unicast)
.... 0. = LG bit: Globally unique address (factory default)
Type: IP (0x0800)
Internet Protocol, Src: 172.20.2.100 (172.20.2.100), Dst: 172.20.2.11 (172.20.2.11)
Version: 4
Header length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... 0. = ECN-Capable Transport (ECT): 0
.... 0 = ECN-CE: 0
Total Length: 777
Identification: 0x8237 (33335)
Flags: 0x02 (Don't Fragment)
0.. = Reserved bit: Not Set
.1. = Don't fragment: Set
..0 = More fragments: Not Set
Fragment offset: 0
Time to live: 255
Protocol: ICMP (0x01)
Header checksum: 0xea49 [correct]
[Good: True]
[Bad : False]
Source: 172.20.2.100 (172.20.2.100)
Destination: 172.20.2.11 (172.20.2.11)
Internet Control Message Protocol
Type: 8 (Echo (ping) request)
Code: 0 ()
Checksum: 0x980f [correct]
Identifier: 0x001f
Sequence number: 2515 (0x09d3)
Data (749 bytes)

0000 00 00 00 00 14 7f 4a fd be ef be ef be ef be efJ.....
0010 be ef be ef be ef be ef be ef be ef be ef be ef
0020 be ef be ef be ef be ef be ef be ef be ef be ef
0030 be ef be ef be ef be ef be ef be ef be ef be ef
0040 be ef be ef be ef be ef be ef be ef be ef be ef

Over deze vertaling

Cisco heeft dit document vertaald via een combinatie van machine- en menselijke technologie om onze gebruikers wereldwijd ondersteuningscontent te bieden in hun eigen taal. Houd er rekening mee dat zelfs de beste machinevertaling niet net zo nauwkeurig is als die van een professionele vertaler. Cisco Systems, Inc. is niet aansprakelijk voor de nauwkeurigheid van deze vertalingen en raadt aan altijd het oorspronkelijke Engelstalige document ([link](#)) te raadplegen.