LAB GUIDE

VXLAN EVPN Troubleshooting

IMPORTANT! THIS GUIDE ASSUMES THAT THE AOS-CX OVA HAS BEEN INSTALLED AND WORKS IN GNS3 OR EVE-NG. PLEASE REFER TO GNS3/EVE-NG INITIAL SETUP LABS IF REQUIRED.

https://www.eve-ng.net/index.php/documentation/howtos/howto-add-aruba-cx-switch/

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Lab Objective

This lab will enable the reader to gain hands on experience with L2 Virtual Extensible LAN (VXLAN) Ethernet VPN (EVPN) troubleshooting. This lab as shown in Figure 1 is preconfigured with 3 problems, you will use the troubleshooting flowchart to perform verification steps to identify and fix the problems.

It is recommended you complete the VXLAN/EVPN lab before working on this troubleshooting lab.

Lab Overview

Spine1/Spine2 function as IBGP EVPN RRs, while Leaf1/Leaf2 function as IBGP EVPN RR clients.

VLAN 110 is mapped to VXLAN Network Identifier (VNI) 110 to provide L2 overlay connectivity across the leaf switches.

Lab Network Layout
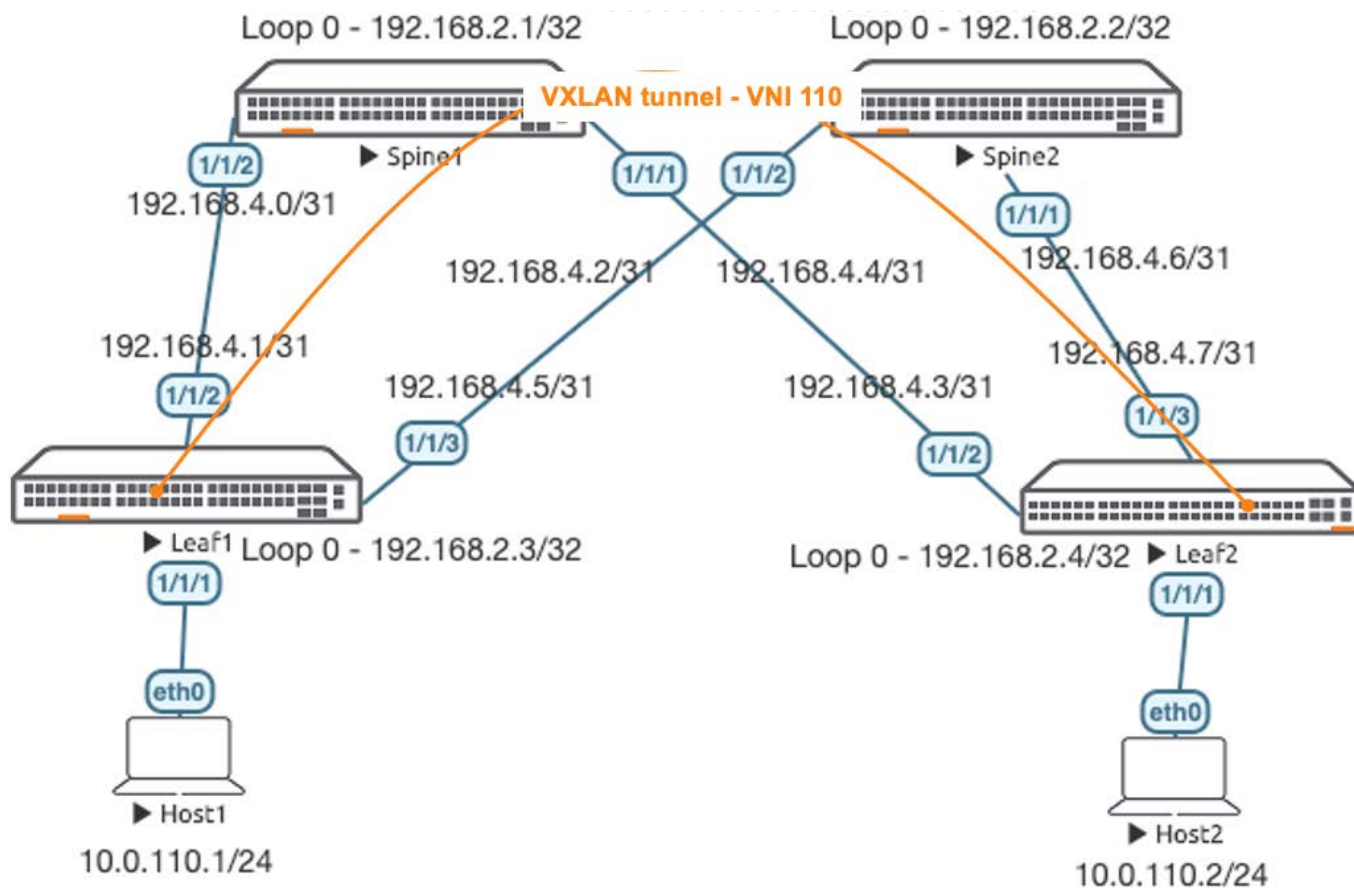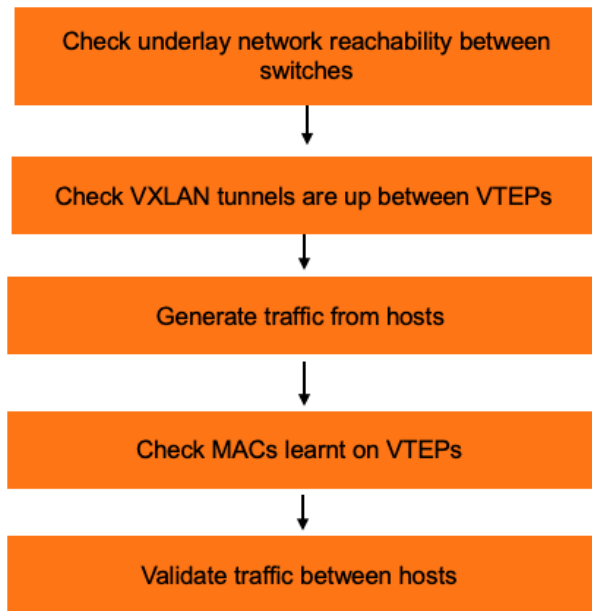

Figure 1. Lab topology and addresses

Lab Tasks

Task 1 – Lab setup

For this lab refer to Figure 1 for topology and IP address details.

- Start all devices
- Open each switch console and log in with user "admin" and hit enter, so that no password is applied
- Configs are not transferred in the .unl/.zip files, copy and paste in configs for all devices from the appendix section

Here is a troubleshooting flowchart to help

```
┌─────────────────────────────────────┐
│  Check underlay network reachability │
│           between switches           │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│  Check VXLAN tunnels are up between  │
│                VTEPs                 │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│        Generate traffic from hosts   │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│        Check MACs learnt on VTEPs    │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│      Validate traffic between hosts  │
└─────────────────────────────────────┘
```

Task 2 – Check underlay network reachability between switches

- Use these commands on each switch to check

    - sh ip os nei

    - sh bgp l2vpn evpn sum

    - sh ip route

    - ping *X* source *Y*

- If you don't see expected OSPF neighbors or BGP peers, check configs of impacted switches

- Pings using both destination and source IPs are great for validating network connectivity

Note: If you need to change an IP in the AOS-CX VM and OSPF/BGP neighbors don't form as expected, you can try to "wr mem", stop and start the switch to reload it

Task 3 – Check VXLAN tunnels are up between VTEPs

- Use these commands on leaf VTEPs to check

    - sh int vxlan

- If you don't see VXLAN interface is up or expected VTEP peers, check configs of impacted switches

Task 4 – Generate traffic between hosts

- On VPCS Host1, configure IP and generate traffic to Host2

```
VPCS> ip 10.0.110.1/24 10.0.110.254


VPCS> ping 10.0.110.2

host (10.0.110.2) not reachable
```

- On VPCS Host2, configure IP and generate traffic to Host1

```
VPCS> ip 10.0.110.2/24 10.0.110.254


VPCS> ping 10.0.110.1

host (10.0.110.1) not reachable
```

Task 5 – Check MACs learnt on VTEPs

- After traffic is generated from the hosts, use these commands on leaf VTEPs to check
    - sh mac-address-table
- If you don't see both local and remote MACs, that is the direction you can troubleshoot next
    - e.g. Leaf1 does not see remote MAC from Leaf2, but Leaf2 sees remote MAC from Leaf1
- Use these commands on leaf VTEPs to check
    - sh bgp l2vpn evpn
    - sh bgp l2vpn evpn extcommunity

Tip: Remember evpn routes need ext-community values set to be advertised and learnt correctly

Task 6 – Validate traffic between hosts

After MAC addresses are learnt correctly, validate ping traffic between hosts work as expected

Pre-configured problems

In case you are not able to find them, these are the 3 problems injected into this lab

1. Leaf1 Lo0 misconfigured = bgp evpn peers won't form between Leaf1 and Spines

2. Leaf1 tunnel source misconfigured = VXLAN tunnel won't come up between VTEP leafs

3. Leaf2 bgp send-community not configured = VTEP peers not shown correctly on Leaf1 "show int vxlan" and MACs are not learnt correctly in "show mac-add"

Appendix – Configurations

- These configs contain 3 issues to be fixed

Leaf1
```
Leaf1# sh run
Current configuration:
!
!Version ArubaOS-CX Virtual.10.05.0001
!export-password: default
hostname Leaf1
user admin group administrators password ciphertext
AQBapcKrWs0lH419WalY0Dm+Za4htjnLmO+Ls1dXghTgnIryYgAAAOwnaXufao2AYCrM65gtEn57a6KQvBI6FOH/6R+x9Zg
To5unjeT6AF0WeAZPUDmuqS3I92YAm1sl3thtANRbE/9AuxpS
hNxVfGTIPl4R75y8H6O5RrAsmzkYkKNFjAS/ymms
led locator on
!
!
!
!
ssh server vrf mgmt
vlan 1,110
evpn
    vlan 110
        rd auto
        route-target export auto
        route-target import auto
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/1
    no shutdown
    no routing
    vlan access 110
interface 1/1/2
    no shutdown
    ip address 192.168.4.1/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/3
    no shutdown
    ip address 192.168.4.5/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/4
    no shutdown
interface 1/1/5
    no shutdown
interface 1/1/6
    no shutdown
interface loopback 0
    ip address 192.168.2.30/32
    ip ospf 1 area 0.0.0.0
interface vxlan 1
    source ip 192.168.2.7
    no shutdown
    vni 110
        vlan 110
    !
!
!
!
!
```

```
!
router ospf 1
    router-id 192.168.2.3
    area 0.0.0.0
router bgp 65001
    bgp router-id 192.168.2.3
    neighbor 192.168.2.1 remote-as 65001
    neighbor 192.168.2.1 update-source loopback 0
    neighbor 192.168.2.2 remote-as 65001
    neighbor 192.168.2.2 update-source loopback 0
    address-family l2vpn evpn
        neighbor 192.168.2.1 activate
        neighbor 192.168.2.1 send-community extended
        neighbor 192.168.2.2 activate
        neighbor 192.168.2.2 send-community extended
    exit-address-family
!
https-server vrf mgmt
```

Leaf2
```
Leaf2# sh run
Current configuration:
!
!Version ArubaOS-CX Virtual.10.05.0001
!export-password: default
hostname Leaf2
user admin group administrators password ciphertext
AQBapeiNCNPd8ot4dOP1dYW+2jPOaOw1dX1o+2tMfTcdi3Y0YgAAAKG6Cu+giZQkk8/EBYfeF7ZTTsKXXQNNOmGKZWaSY0O
aQjSsD8oKOmB5j3MRZGnvibur0tYsQX06BhTOh76Km+uwp6BI
gbw+KPzAp6DEBvsFUu1MEnHoyHRHbATsAmxijw3Q
led locator on
!
!
!
!
ssh server vrf mgmt
vlan 1,110
evpn
    vlan 110
        rd auto
        route-target export auto
        route-target import auto
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/1
    no shutdown
    no routing
    vlan access 110
interface 1/1/2
    no shutdown
    ip address 192.168.4.3/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/3
    no shutdown
    ip address 192.168.4.7/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/4
    no shutdown
interface 1/1/5
```

```
        no shutdown
interface 1/1/6
    no shutdown
interface loopback 0
    ip address 192.168.2.4/32
    ip ospf 1 area 0.0.0.0
interface vxlan 1
    source ip 192.168.2.4
    no shutdown
    vni 110
        vlan 110
    !
!
!
!
!
!
router ospf 1
    router-id 192.168.2.4
    area 0.0.0.0
router bgp 65001
    bgp router-id 192.168.2.4
    neighbor 192.168.2.1 remote-as 65001
    neighbor 192.168.2.1 update-source loopback 0
    neighbor 192.168.2.2 remote-as 65001
    neighbor 192.168.2.2 update-source loopback 0
    address-family l2vpn evpn
        neighbor 192.168.2.1 activate
        neighbor 192.168.2.2 activate
    exit-address-family
!
https-server vrf mgmt
```

Spine1
```
Spine1# sh run
Current configuration:
!
!Version ArubaOS-CX Virtual.10.05.0001
!export-password: default
hostname Spine1
user admin group administrators password ciphertext
AQBapdN+X2MkQup/rK9tcIS2OOV50jjqKIBOlKBfl0ZvbX5wYgAAAA+/S76N3uxMu3SD54OGdqhEBAaV9o/VbZHsywKFDl5
mtPVLor/JOpQLosm6oz9tnYyNrIi3NqEzbs6cEHAoPuby/wdd
SkiX98cQMRR2omGOzFeCNv+n+ffhhZh9cRdi1jpq
led locator on
!
!
!
!
ssh server vrf mgmt
vlan 1
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/1
    no shutdown
    ip address 192.168.4.2/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/2
    no shutdown
    ip address 192.168.4.0/31
    ip ospf 1 area 0.0.0.0
```

```
    ip ospf network point-to-point
interface 1/1/3
    no shutdown
interface 1/1/4
    no shutdown
interface 1/1/5
    no shutdown
interface 1/1/6
    no shutdown
interface loopback 0
    ip address 192.168.2.1/32
    ip ospf 1 area 0.0.0.0
!
!
!
!
!
router ospf 1
    router-id 192.168.2.1
    area 0.0.0.0
router bgp 65001
    bgp router-id 192.168.2.1
    neighbor 192.168.2.3 remote-as 65001
    neighbor 192.168.2.3 update-source loopback 0
    neighbor 192.168.2.4 remote-as 65001
    neighbor 192.168.2.4 update-source loopback 0
    address-family l2vpn evpn
        neighbor 192.168.2.3 activate
        neighbor 192.168.2.3 route-reflector-client
        neighbor 192.168.2.3 send-community extended
        neighbor 192.168.2.4 activate
        neighbor 192.168.2.4 route-reflector-client
        neighbor 192.168.2.4 send-community extended
    exit-address-family
!
https-server vrf mgmt
```

Spine2
```
Spine2# sh run
Current configuration:
!
!Version ArubaOS-CX Virtual.10.05.0001
!export-password: default
hostname Spine2
user admin group administrators password ciphertext
AQBapeqNFZNIfg2VS3nXw14m1BHRuVRepPKC38/1TOq5eXpTYgAAALVlRjMRrxY70PG3GmRQoBTq0fhvUFBCqLclWosqK4u
blSFkZvw3kvaBOxDkedMDOColRUiehdiVgjaMnWNK9glnCwIG
HleRVpcMCnlMvQnPhj3ZTcsNaPfBOaoxloh+bH7M
led locator on
!
!
!
!
ssh server vrf mgmt
vlan 1
interface mgmt
    no shutdown
    ip dhcp
interface 1/1/1
    no shutdown
    ip address 192.168.4.6/31
```

```
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/2
    no shutdown
    ip address 192.168.4.4/31
    ip ospf 1 area 0.0.0.0
    ip ospf network point-to-point
interface 1/1/3
    no shutdown
interface 1/1/4
    no shutdown
interface 1/1/5
    no shutdown
interface 1/1/6
    no shutdown
interface loopback 0
    ip address 192.168.2.2/32
    ip ospf 1 area 0.0.0.0
!
!
!
!
!
router ospf 1
    router-id 192.168.2.2
    area 0.0.0.0
router bgp 65001
    bgp router-id 192.168.2.2
    neighbor 192.168.2.3 remote-as 65001
    neighbor 192.168.2.3 send-community extended
    neighbor 192.168.2.4 activate
    neighbor 192.168.2.4 route-reflector-client
    neighbor 192.168.2.4 send-community extended
    exit-address-family
!
https-server vrf mgmt
```