VSX keepalive: . OOBM . IPv6

aruba

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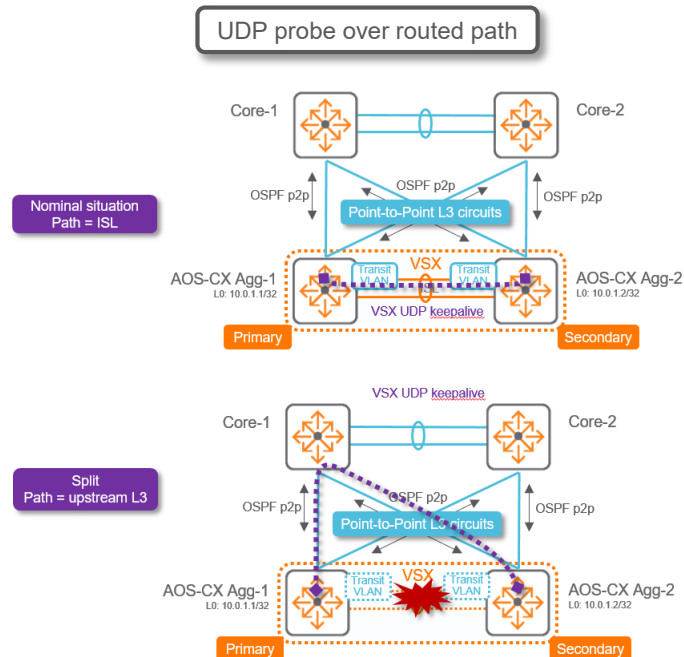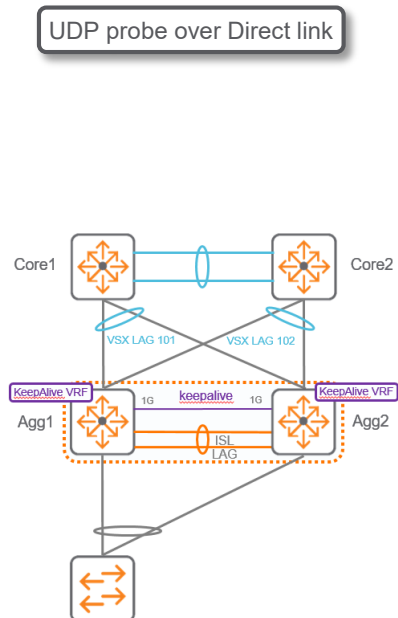
Agenda

Overview

- VSX keepalive over OOBM
- IPv6 VSX keepalive

VSX keepalive over OOBM port

Overview

AOS-CX 10.01-10.09

- VSX keepalive is supported:
  - On dedicated link between Primary and Secondary
  - Over a routed IPv4 path over ISL and upstream L3 alternate path if ISL fails
- VSX keepalive is not supported over OOBM port.

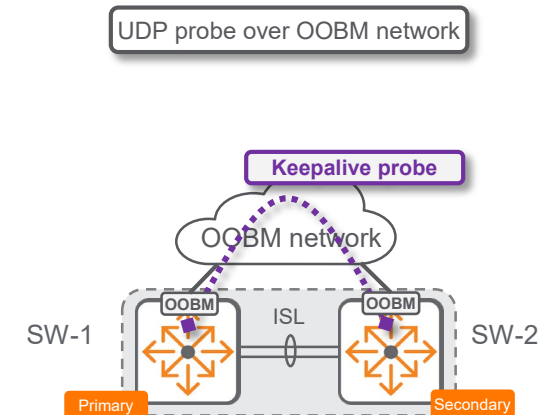### AOS-CX 10.10

- VSX keepalive is supported:
  - On dedicated link between Primary and Secondary
  - Over a routed IPv4 path over ISL and upstream L3 alternate path if ISL fails
  - **Over Out-Of-Band-Management port in mgmt VRF**

VSX keepalive over OOBM port

Overview

Keepalive probe
OOBM network
SW-1 OOBM ISL OOBM SW-2
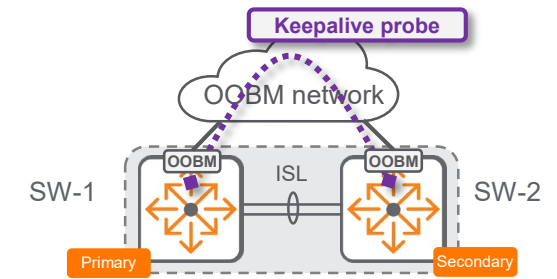Primary Secondary

AOS-CX 10.01-10.09

- "vrf mgmt" in the keepalive command is accepted by CLI but **keepalive stays in init state**

```
vsx
    system-mac 02:00:00:00:01:00
    inter-switch-link lag 256
    role primary
    keepalive peer 16.1.38.238 source 16.1.38.237 vrf mgmt
```

```
8325-1# show vsx brief
ISL State                           : In-Sync
Device State                        : Peer-Established
Keepalive State                     : Keepalive-Init
Device Role                         : Primary
Number of Multi-chassis LAG interfaces : 2

8325-1# show vsx status keepalive
Keepalive State         : Keepalive-Init
Last Established         : Tue Mar 15 15:57:44 2022
Last Failed             :
Peer System Id          : 02:00:00:00:01:00
Peer Device Role        : secondary

Keepalive Counters
Keepalive Packets Tx    : 0
Keepalive Packets Rx    : 0
Keepalive Timeouts      : 0
Keepalive Packets Dropped : 0
```

AOS-CX 10.10

- "vrf mgmt" in the keepalive command is accepted by CLI and **keepalive is in established state**

new option

```
vsx
    system-mac 02:00:00:00:01:00
    inter-switch-link lag 256
    role primary
    keepalive peer 16.1.38.238 source 16.1.38.237 vrf mgmt
```

```
8325-1# show vsx brief
ISL State                           : In-Sync
Device State                        : Peer-Established
Keepalive State                     : Keepalive-Established
Device Role                         : Primary
Number of Multi-chassis LAG interfaces : 2

8325-1# show vsx status keepalive
Keepalive State         : Keepalive-Established
Last Established         : Wed Mar 16 12:01:33 2022
Last Failed             :
Peer System Id          : 02:00:00:00:01:00
Peer Device Role        : secondary

Keepalive Counters
Keepalive Packets Tx    : 24260
Keepalive Packets Rx    : 24261
Keepalive Timeouts      : 0
Keepalive Packets Dropped : 0
```

VSX keepalive with IPv6 address

Overview

AOS-CX 10.01-10.09

- VSX keepalive is an **IPv4 only** UDP probe

```
8325-3(config-vsx)# keepalive peer
  A.B.C.D  IPv4 address of the peer
```

```
vsx
    system-mac 00:00:00:01:02:01
    inter-switch-link lag 1
    role primary
    keepalive peer 192.168.0.5 source 192.168.0.4 vrf keepalive
```

AOS-CX 10.10

- VSX keepalive UDP probe can be IPv4 **or** IPv6.

```
8320-3(config-vsx)# keepalive peer
  A.B.C.D   IPv4 address of the peer
  X:X::X:X  IPv6 address of the peer
```

```
vsx
    system-mac 00:00:00:01:02:01
    inter-switch-link lag 1
    role primary
    keepalive peer fd00:192:168:0::2 source fd00:192:168:0::1 vrf keepalive
```
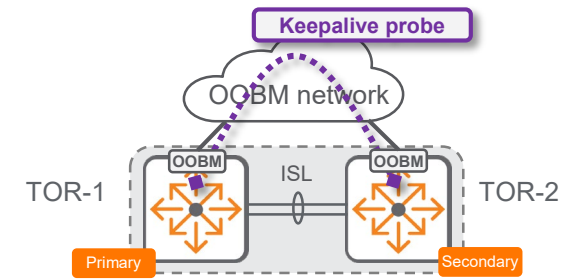
- IPv6 address can be used for keepalive address for all keepalive cases:
  - dedicated link
  - OOBM port
  - between routed loopbacks.

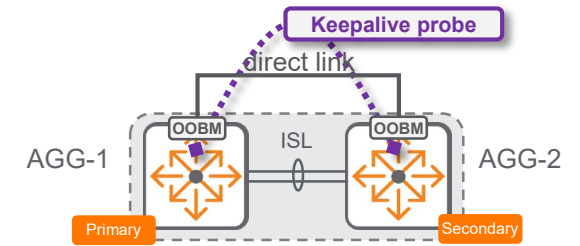# Use Cases

OOBM Use-Case #1
DataCenter

- Reserving a dedicated 25G/40G/100G port for keepalive is sub-optimum and not preferred.

- Using routed loopback addresses for UDP source and destination addresses on transit VLAN over ISL and backup routed path over upstream L3 network is a working solution; but induces additional configuration and caution.

- Managed OOBM network is available and immediately suitable to transport keepalive traffic.

OOBM Use-Case #2
Campus

- All data ports might be used.

- Using routed loopback addresses for UDP source and destination addresses on transit VLAN over ISL and backup routed path over upstream L3 network might lead to additional configuration on upstream L3 nodes or firewalls.

- OOBM network is generally not available but direct copper connectivity between OOBM port of VSX Primary and VSX Secondary is possible (below 100 meters).

IPv6 Use-Case

IPv6 deployment

- IPv6 ready deployment, without relying on IPv4 for either loopbacks or management IP.

Details / Caveats

VSX Keepalive

Caveats

1. IPv6 address can not be link-local address.

2. Dual stack is not supported: it is either IPv4 keepalive or IPv6 keepalive, not both.

3. OOBM port is copper only, so the direct link between Campus VSX nodes (without OOBM managed network) in same cluster must be shorter than 100m.

4. Direct link between OOBM port is valid for 8320, 8325, 8360, 10000.
   It is also possible on 6400 and 8400 with single management module.
   It is not possible on 6400 and 8400 with dual management modules. (can't cross connect MMs).

5. For dual Management Module chassis, keepalive dead timer should be increased to 20 seconds.

10.10 Platform Support

VSX keepalive over OOBM

Platform	4100 6000 6100	6200	6300	6400	8320	8325	8360	8400	10000	Simulator
VSX KA OOBM	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No
IPv6 KA	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Configuration

Configuration

VSX keepalive using OOBM (mgmt) port

- "mgmt" VRF must be used

```
vsx
    system-mac 02:00:00:00:01:00
    inter-switch-link lag 256
    role primary
    keepalive peer 16.1.38.238 source 16.1.38.237 vrf mgmt
```

- Mgmt / OOBM IP addresses do not have to be in same subnet, as long as they can reach each other.

- For Campus use-case, with direct link between OOBM ports, they must be in same subnet as there is no intermediate gateway.

- Peer and source addresses are either both IPv4 or both IPv6 address.

Configuration

VSX keepalive with IPv6 address

- VSX keepalive uses unicast address: **G**lobal **U**nicast **A**ddress or **U**nique **L**ocal **A**ddress

```
vsx
   system-mac 00:00:00:01:02:01
   inter-switch-link lag 1
   role primary
   keepalive peer fd00:192:168:0::2 source fd00:192:168:0::1 vrf keepalive
```

- IPv6 addresses do not have to be in same subnet, as long as they can reach each other.

- For Campus use-case, with direct link between OOBM ports, they must be in same subnet as there is no intermediate gateway.

Best Practices

VSX keepalive over OOBM

Now part of default best practices

- Keepalive connectivity over OOBM becomes as of AOS-CX 10.10 a best practice by default.

- The VSX Configuration Best Practices will reflect this new best practice, as this new option provides benefits in almost all scenarios.

- Scenarios with 6400 and 8400 with dual-MM, and no OOBM managed network, are treated separately.

Troubleshooting

1 – Check VSX keepalive in running configuration

show run vsx

```
vsx
    system-mac 02:00:00:00:01:00
    inter-switch-link lag 256
    role primary
    keepalive peer 16.1.38.238 source 16.1.38.237 vrf mgmt
    vsx-sync aaa copp-policy dhcp-relay dns evpn l2-vlan-mac-cfg-mode mclag-interfaces qos-global route-map sflow-
global snmp ssh stp-global time vsx-global
...
```

```
vsx
    system-mac 00:00:00:01:02:01
    inter-switch-link lag 1
    role primary
    keepalive peer fd00:16:1:38::240 source fd00:16:1:38::239 vrf mgmt
    linkup-delay-timer 120
    vsx-sync aaa dhcp-server dns mclag-interfaces ospf sflow-global snmp ssh time vsx-global
...
```

2 – Check VSX keepalive configuration

show vsx configuration keepalive

```
8325-1# show vsx configuration keepalive
Keepalive Interface :
Keepalive VRF        : mgmt
Source IP Address    : 16.1.38.237
Peer IP Address      : 16.1.38.238
UDP Port             : 7678
Hello Interval       : 1 Seconds
Dead Interval        : 3 Seconds
```

```
8320-3# show vsx configuration keepalive
Keepalive Interface :
Keepalive VRF        : mgmt
Source IP Address    : fd00:16:1:38::239
Peer IP Address      : fd00:16:1:38::240
UDP Port             : 7678
Hello Interval       : 1 Seconds
Dead Interval        : 3 Seconds
```

3 – Check VSX KA state

show vsx brief

```
8325-1# show vsx brief
ISL State                                : In-Sync
Device State                             : Peer-Established
Keepalive State                          : Keepalive-Established
Device Role                              : Primary
Number of Multi-chassis LAG interfaces : 2
```

4 – Check VSX KA packets

show vsx status keepalive

```
8325-1# show vsx status keepalive
Keepalive State              : Keepalive-Established
Last Established             : Wed Mar 16 12:01:33 2022
Last Failed                  :
Peer System Id               : 02:00:00:00:01:00
Peer Device Role             : secondary

Keepalive Counters
Keepalive Packets Tx         : 123508
Keepalive Packets Rx         : 123508
Keepalive Timeouts           : 0
Keepalive Packets Dropped    : 0
```

Demonstration

Resources

Feature/Solution References

- User Guides update:
  - VSX for AOS-CX 10.10 on Aruba Support Portal: https://asp.arubanetworks.com/

Thank you

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