

Interoperability with 3rd Party Switches

Netvisor® / Open Netvisor® Linux as TOR or Spine

Sample Test Plan with Cisco

Testing Goals: This test is being executed to verify full interoperability between Dell + Pluribus ONVL with existing <CUSTOMER> Cisco infrastructure. The Cisco infrastructure in all tests in this test plan are represented by Cisco Nexus 9332 switches which are to simulate the Catalyst 6800 in <Datacenter 1> and Catalyst 4500s in <Datacenter 2>

Data to Record:

Record all relevant output commands to show full interoperability. Examples may include interface show commands and counters as well as VLAN and running configurations

Procedures

1. Issue a fabric-node-show command to show the devices present in this test scenario. Make note of where these devices are located in the physical topology noting that they are all connected to the same logical fabric
2. Issue a fabric-show command to show that the fabric is configured in-band through the upstream Nexus 9332 devices as opposed to out-of-band through the management interface which is also an option
3. Issue a cluster-show command to show that the four switches used in this test plan are configured as two pairs of active-active leaf nodes
4. Issue a vlag-show command to display the multi-chassis link aggregation configuration that will present a dual-link, single logical instance to hosts and servers
5. Issue a show port-channel summary on sw-test-n9332-1 and sw-test-n9332-2 to show the port-channel being presented to both of the Dell 4048-ON switches
6. Issue a show lacp neighbors on sw-test-n9332-1 and sw-test-n9332-2 to show that the Cisco Nexus 9000 switches are able to see LACP information from the Dell 4048-ON switches
7. Demonstrate that existing network constructs of VLANs are being used to pass traffic between the Dell S40408-ON switches and the Cisco Nexus 9332 switches by showing port and VLAN configurations from both Pluribus and Cisco devices.

Results

CLI (network-admin@sw-test-s4048-1) > fabric-node-show

name	fab-name	mgmt-ip	in-band-ip	fab-tid	cluster-tid	out-port	version	state	firmware-upgrade	device-state
sw-test-s4048-1	TME-PoCTest	10.9.32.7/16	10.7.45.7/24	107	10	0	2.4.204019611,#47~14.04.1-Ubuntu	online	not-required	ok
sw-test-s4048-4	TME-PoCTest	10.9.32.10/16	10.7.45.10/24	107	10	128	2.4.204019611,#47~14.04.1-Ubuntu	online	not-required	ok
sw-test-s4048-2	TME-PoCTest	10.9.32.8/16	10.7.45.8/24	107	10	53	2.4.204019611,#47~14.04.1-Ubuntu	online	not-required	ok
sw-test-s4048-3	TME-PoCTest	10.9.32.9/16	10.7.45.9/24	107	10	128	2.4.204019611,#47~14.04.1-Ubuntu	online	not-required	ok

CLI (network-admin@sw-test-s4048-1) > fabric-show

name	id	vlan	fabric-network	control-network	tid
TME-PoCTest	600021a:578d6754	500	in-band	in-band	107
vxlan-fabric	600007b:570c895f	0	mgmt	in-band	450
italy-fabric	f000004:5717b874	0	mgmt	in-band	661
TME-Maestro	a00028d:569fefcd	0	mgmt	in-band	150
pst-fab	c0001f8:56f472a0	0	mgmt	in-band	4755
ursa-lyon	6000210:566621ee	0	mgmt	in-band	17853
tele1	e000010:5776c1c6	0	mgmt	in-band	539
fab-sys1-vxlan	6000092:5785dd47	0	mgmt	in-band	12
L3_Alta	a0000d3:57291906	0	mgmt	mgmt	1678
IP-ECMP	b0000de:56df797e	0	mgmt	mgmt	10096
linux_up	9000194:5709e8c2	0	mgmt	in-band	93
ONVL-L2-L3	90001b0:572d15ff	0	mgmt	mgmt	3754
carina-fab	900014f:56b275c9	0	mgmt	in-band	13
puppet-ansible-fab	9000143:578e698a	0	mgmt	in-band	1274
yyy	600001d:5769955d	0	mgmt	in-band	11
pluribustollytest	f00000b:571d636e	0	mgmt	in-band	2392
Dell-DCI	600021a:5730e8de	0	mgmt	mgmt	99
aug-fl	600001d:5779793c	0	mgmt	in-band	139
andromeda02	44413042:5793bf35	0	mgmt	mgmt	7
vanquish2345	6000003:579493df	0	mgmt	in-band	19

CLI (network-admin@sw-test-s4048-1) > cluster-show

name	state	cluster-node-1	cluster-node-2	tid	mode	ports	remote-ports
DC1-DCI	online	sw-test-s4048-1	sw-test-s4048-3	0	master	65,69,128	65,69,128
DC2-DCI	online	sw-test-s4048-2	sw-test-s4048-4	0	slave	65,69,128	65,69,128

CLI (network-admin@sw-test-s4048-1) > vlag-show

name	cluster	mode	switch	port	peer-switch	peer-port	status	local-state	lACP-mode	lACP-fallback	lACP-fallback-timeout	lACP-individual
DC1-TO-ESXi	DC1-DCI	active-active	sw-test-s4048-1	11	sw-test-s4048-3	11	normal	enabled,up	active	bundle	50	none
DC1-TO-CORE-UNDERLAY	DC1-DCI	active-active	sw-test-s4048-1	57	sw-test-s4048-3	57	normal	enabled,up	active	bundle	50	none
DC1-TO-CORE-OVERLAY	DC1-DCI	active-active	sw-test-s4048-1	58	sw-test-s4048-3	58	normal	enabled,up	active	bundle	50	none
DC2-TO-ESXi	DC2-DCI	active-active	sw-test-s4048-4	11	sw-test-s4048-2	11	normal	enabled,up	active	bundle	50	none
DC2-TO-CORE-UNDERLAY	DC2-DCI	active-active	sw-test-s4048-4	57	sw-test-s4048-2	57	normal	enabled,up	active	bundle	50	none
DC2-TO-CORE-OVERLAY	DC2-DCI	active-active	sw-test-s4048-4	58	sw-test-s4048-2	58	normal	enabled,up	active	bundle	50	none

CLI (network-admin@sw-test-s4048-1) >

top9k# show port-channel summary

Flags: D - Down P - Up in port-channel (members)

I - Individual H - Hot-standby (LACP only)

s - Suspended r - Module-removed

S - Switched R - Routed

U - Up (port-channel)

p - Up in delay-lACP mode (member)

M - Not in use. Min-links not met

Group	Port-Channel	Type	Protocol	Member	Ports
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55	Po55(RU)	Eth	LACP	Eth1/29(P)	Eth1/30(D)
121	Po121(SU)	Eth	LACP	Eth1/1/1(P)	Eth1/2/1(P)
122	Po122(SU)	Eth	LACP	Eth1/1/2(P)	Eth1/2/2(P)



top9k#

bottom9k# sh port-channel sum

Flags: D - Down P - Up in port-channel (members)
 I - Individual H - Hot-standby (LACP only)
 s - Suspended r - Module-removed
 S - Switched R - Routed
 U - Up (port-channel)
 p - Up in delay-lACP mode (member)
 M - Not in use. Min-links not met

Group Port-Channel	Type	Protocol	Member Ports
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55	Po55(RU)	Eth	LACP	Eth1/29(P)	Eth1/30(D)
121	Po121(SU)	Eth	LACP	Eth1/1/1(P)	Eth1/2/1(P)
122	Po122(SU)	Eth	LACP	Eth1/1/2(P)	Eth1/2/2(P)

bottom9k#

bottom9k# sh lacp neighbor

Flags: S - Device is sending Slow LACPDUs F - Device is sending Fast LACPDUs
 A - Device is in Active mode P - Device is in Passive mode

port-channel55 neighbors

Partner's information

Port	Partner System ID	Partner Port Number	Partner Age	Partner Flags
Eth1/29	32768,0-c8-8b-e2-c6-b7	0x171	682667	SA

LACP Port	Partner Oper Key	Partner Port State
32768	0x36	0x3d

Po121 neighbors

Partner's information

Port	Partner System ID	Partner Port Number	Partner Age	Partner Flags
Eth1/1/1	32768,66-e-94-1b-f5-b0	0x39	240395	SA

LACP Port	Partner Oper Key	Partner Port State
32768	0xec4f	0x3d

Partner's information

Port	Partner System ID	Partner Port Number	Partner Age	Partner Flags
Eth1/2/1	32768,66-e-94-1b-f5-b0	0x39	242922	SA

LACP Port	Partner Oper Key	Partner Port State
32768	0xec4f	0x3d

Po122 neighbors

Partner's information

Port	Partner System ID	Partner Port Number	Partner Age	Partner Flags
Eth1/1/2	32768,66-e-94-1b-f5-b0	0x3a	240395	SA

LACP Port	Partner Oper Key	Partner Port State
32768	0xea2	0x3d

Partner's information

Partner	Partner	Partner

```

Port    System ID    Port Number    Age    Flags
Eth1/2/2  32768,66-e-94-1b-f5-b0 0x3a    242922  SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0xea2      Port State
    0x3d
  
```

bottom9k#

top9k# sh lacp neighbor

Flags: S - Device is sending Slow LACPDUs F - Device is sending Fast LACPDUs

A - Device is in Active mode P - Device is in Passive mode

port-channel55 neighbors

Partner's information

```

    Partner    Partner    Partner
Port    System ID    Port Number    Age    Flags
Eth1/29  32768,0-78-88-a1-90-b9 0x171    682763  SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0x36      Port State
    0xbd
  
```

Po121 neighbors

Partner's information

```

    Partner    Partner    Partner
Port    System ID    Port Number    Age    Flags
Eth1/1/1  32768,66-e-94-1a-be-66 0x39    183277  SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0x5220   Port State
    0x3d
  
```

Partner's information

```

    Partner    Partner    Partner
Port    System ID    Port Number    Age    Flags
Eth1/2/1  32768,66-e-94-1a-be-66 0x39    52707   SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0x5220   Port State
    0x3d
  
```

Po122 neighbors

Partner's information

```

    Partner    Partner    Partner
Port    System ID    Port Number    Age    Flags
Eth1/1/2  32768,66-e-94-1a-be-66 0x3a    199098  SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0x1c36   Port State
    0x3d
  
```

Partner's information

```

    Partner    Partner    Partner
Port    System ID    Port Number    Age    Flags
Eth1/2/2  32768,66-e-94-1a-be-66 0x3a    52710   SA

    LACP Partner    Partner
    Port Priority    Oper Key    Partner
    32768            0x1c36   Port State
    0x3d
  
```



top9k#

Results show that a proper L3 underlay simulating <CUSTOMER> WAN routers was provided by Cisco Nexus 9332 switches. Pluribus was able to demonstrate full visibility into the configurations and network topologies as shared in this test procedure. Full interoperability was demonstrated by passing packets between Dell + Pluribus switches and Cisco with L2 VLANs and with L3 routes. Although not used in this test scenario, Pluribus ONVL can also peer with Cisco NX-OS via OSPF or BGP. All cluster, node, tunnel, and underlay setup details were demonstrated successfully.