NUTANIX AND NVIDIA SN2010 DEPLOYMENT WITH ONYX/CLI

Quick Start Guide

Rev 1.0

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1. OVERVIEW

NVIDIA®. switches allow you to create a network fabric that offers predictable, low-latency switching while achieving maximum throughput and linear scalability. Combined with the features and intelligence of the NVIDIA Onyx® operating system (OS), multilink aggregation groups (MLAGs) create a highly available L2 fabric across NVIDIA networking appliances to ensure that you can meet even the most stringent SLAs.

MLAGs aggregate ports across multiple physical switches. Configuring link aggregation between physical switch ports and Nutanix appliances enables the Nutanix Controller Virtual Machine (CVM) to utilize all pNICs and actively load balances user VMs on TCP streams. This capability is a key advantage, particularly in all-flash clusters.

NVIDIA Onyx operating system provides a streamlined deployment model with a full documentation set to facilitate networking configurations, ranging from basic to advanced. NVIDIA Spectrum® ASIC (application-specific integrated circuit) delivers 100GbE port speed with the industry's lowest port-to-port latency (approximately 300 ns, or about 0.6 us leaf to spine).

In the examples that follow, we deploy the leaf-spine topology using MLAGs. Managing and updating each switch independently with MLAGs mitigates the single point of failure that typically results from employing stacking techniques within the switches.

MLAGs do not disable links to prevent network loops, as with STP. Although STP is still enabled to prevent loops during switch startup, once the switch is initialized and in a forwarding state, all MLAG ports' STP states are synced, and they send the same BPDU so they are considered as a single link from the connected devices' point of view. This ensures that all links are available to pass traffic and benefit from the aggregated bandwidth.

2. SETUP

2.1 NVIDIA MLAG-Based Leaf-Spine Topology

In this setup, we demonstrate how to achieve an NVIDIA MLAG-based leaf-spine topology utilizing NVIDIA SN2000 Series switches. This reference architecture consists of NVIDIA SN2010 switches (18 ports x 10/25GbE + 4 ports x 40/100GbE) as leaf switches and SN2700 (32 ports x 100GbE) as spine switches.

The routing between VLANs can be done by the spine switches (which also operate in MLAG for the downlinks) or at the layer above the spines.
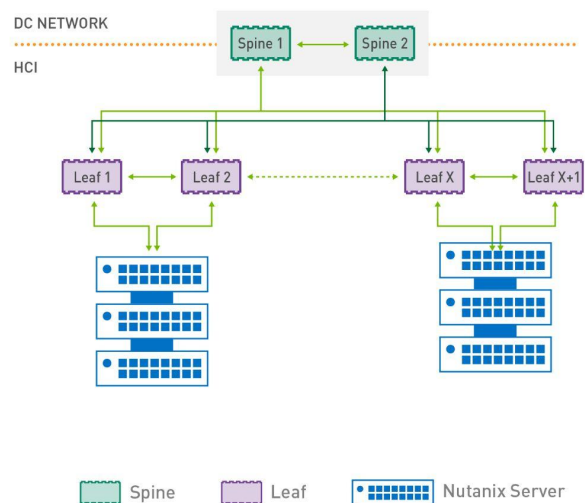
2.2 Nutanix and NVIDIA Spectrum SN2010 MLAG

| ▪ Nutanix host | ▪ SN2010 - MLAG | —— 10G/25G | ------- 1G |
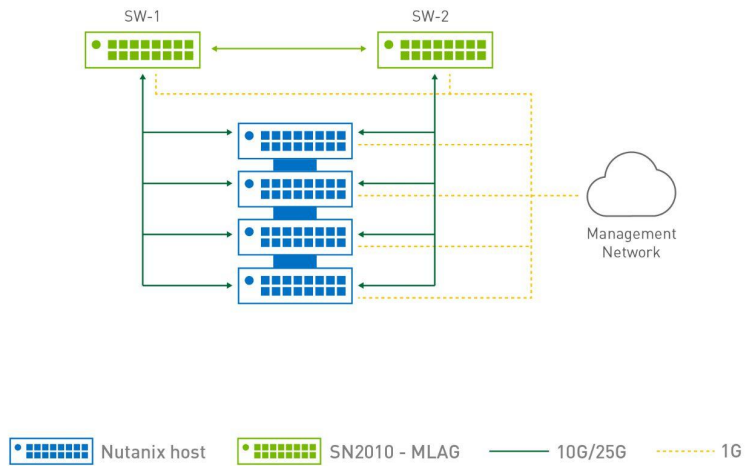
In the diagram that will be used for this guide, there are four Nutanix Nodes that are connected using an Active-Active LACP bond to a pair of NVIDIA SN2010 switches that are configured in MLAG.

Prerequisites:

- Bring-up your Nutanix cluster before starting the Switch configuration flow.
- Configure management IP addresses for both switches (Statically or DHCP).

| —— HCI | —— Uplink | —— IPL | —— mgmt |
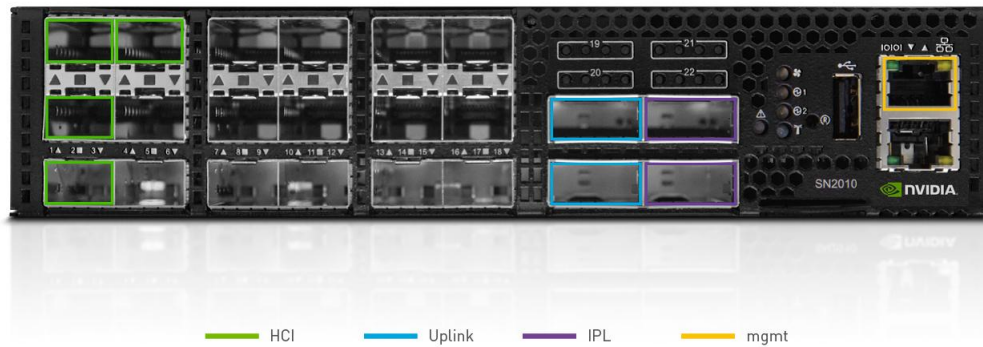
NOTE:

SN2700 spine switches aren't displayed in this diagram (can be seen in general diagrams), since the focus of the guide is on MLAG configuration on SN2010 leaf switches.

3. CONFIGURATION

The following section details NVIDIA MLAG configuration using CLI. You can find out more about MLAG configuration at NVIDIA community website.

NOTE:

Before you start, make sure that both switches have the same software version. Run the `show version` command to verify.

In addition, we recommend upgrading both switches to the latest NVIDIA Onyx software release.

3.1 General configuration

Run the following commands on both switches:

```
SW-1 (config) # lacp
SW-1 (config) # ip routing
SW-1 (config) # protocol mlag
```

```
SW-2 (config) # lacp
SW-2 (config) # ip routing
SW-2 (config) # protocol mlag
```

Port speed should be set if towards the Nutanix nodes in case they support 10G (switch default is 25G)

```
SW-1 (config) # interface ethernet 1/1-1/4 speed 10G force
```

```
SW-2 (config) # interface ethernet 1/1-1/4 speed 10G force
```

3.2 Configure IPL

Configure the Inter-Peer link (IPL), a LAG between switches that maintains state information, over an MLAG (port channel) with ID 1. For high availability, we recommend having more than one physical link within this LAG. In this example, we are configuring the IPL on ports 1/21 and 1/22 of two SN2010 switches. All VLANs are open on these ports. The example uses VLAN 4000 for configuring the IP address.

Run the following commands on both switches:

```
SW-1 (config) # interface port-channel 1
SW-1 (config interface port-channel 1) # exit
SW-1 (config) # interface ethernet 1/21-1/22 channel-group 1 mode active
SW-1 (config) # vlan 4000
SW-1 (config vlan 4000) # exit
SW-1 (config) # interface vlan 4000
SW-1 (config interface vlan 4000 ) # exit
SW-1 (config) # interface port-channel 1 ipl 1
```

```
SW-2 (config) # interface port-channel 1
SW-2 (config interface port-channel 1) # exit
SW-2 (config) # interface ethernet 1/21-1/22 channel-group 1 mode active
SW-2 (config) # vlan 4000
SW-2 (config vlan 4000) # exit
SW-2 (config) # interface vlan 4000
SW-2 (config interface vlan 4000 ) # exit
SW-2 (config) # interface port-channel 1 ipl 1
```

Configure the IP address for the IPL link on both switches on VLAN 4000. Enter the following commands on SW-1 and SW-2:

```
SW-1 (config) # interface vlan 4000
SW-1 (config interface vlan 4000) # ip address 10.10.10.1 255.255.255.0
SW-1 (config interface vlan 4000) # ipl 1 peer-address 10.10.10.2
```

```
SW-2 (config) # interface vlan 4000
SW-2 (config interface vlan 4000) # ip address 10.10.10.2 255.255.255.0
SW-2 (config interface vlan 4000) # ipl 1 peer-address 10.10.10.1
```

3.3 MLAG VIP and system MAC

The MLAG VIP (virtual IP) is important for retrieving peer information.

Configure the following on both switches:

```
SW-1 (config) # mlag-vip my-mlag-vip-domain ip 10.209.28.200 /24 force
SW-1 (config) # mlag system-mac 00:00:5E:00:01:5D
SW-1 (config) # no mlag shutdown
```

```
SW-2 (config) # mlag-vip my-mlag-vip-domain ip 10.209.28.200 /24 force
SW-2 (config) # mlag system-mac 00:00:5E:00:01:5D
SW-2 (config) # no mlag shutdown
```

NOTE:

The MLAG-VIP address should be within the same subnet as the management interface (mgmt0).

MLAG-VIP name should be unique per mlag switch pair.

MLAG system-mac should be unique per mlag switch pair.

3.4 MLAG Ports (Downlinks)

In this example, there are 4 MLAG ports—one for each host. Host A is connected to mlag-port-channel 1 (MPo1), host B is connected to MPo2, host C is connected to MPo3 and host D to MPo4.

NOTE:

In case an LACP bond is not used, there is no need to configure any MLAG Ports (MPo) on the switches, as the bond will use Active-Backup mode.

Configure the following on both switches:

```
SW-1 (config) # interface mlag-port-channel 1-4
SW-1 (config interface port-channel 1-4) # mtu 9216
SW-1 (config) # interface ethernet 1/1 mlag-channel-group 1 mode active
SW-1 (config) # interface ethernet 1/2 mlag-channel-group 2 mode active
SW-1 (config) # interface ethernet 1/3 mlag-channel-group 3 mode active
SW-1 (config) # interface ethernet 1/4 mlag-channel-group 4 mode active
SW-1 (config) # vlan 1-4
```

```
SW-1 (config) # interface mlag-port-channel 1 switchport mode hybrid
SW-1 (config) # interface mlag-port-channel 2 switchport mode hybrid
SW-1 (config) # interface mlag-port-channel 3 switchport mode hybrid
SW-1 (config) # interface mlag-port-channel 4 switchport mode hybrid
SW-1 (config) # interface mlag-port-channel 1 switchport hybrid allowed-vlan [x,y..]
SW-1 (config) # interface mlag-port-channel two switchport hybrid allowed-vlan [x,y..]
SW-1 (config) # interface mlag-port-channel 3 switchport hybrid allowed-vlan [x,y..]
SW-1 (config) # interface mlag-port-channel 4 switchport hybrid allowed-vlan [x,y..]
SW-1 (config) # interface mlag-port-channel 1-4 no shutdown
```

```
SW-2 (config) # interface mlag-port-channel 1-4
SW-2 (config interface port-channel 1-4) # mtu 9216
SW-2 (config) # interface ethernet 1/1 mlag-channel-group 1 mode active
SW-2 (config) # interface ethernet 1/2 mlag-channel-group 2 mode active
SW-2 (config) # interface ethernet 1/3 mlag-channel-group 3 mode active
SW-2 (config) # interface ethernet 1/4 mlag-channel-group 4 mode active
SW-2 (config) # vlan 1-4
SW-2 (config) # interface mlag-port-channel 1 switchport mode hybrid
SW-2 (config) # interface mlag-port-channel 2 switchport mode hybrid
SW-2 (config) # interface mlag-port-channel 3 switchport mode hybrid
SW-2 (config) # interface mlag-port-channel 4 switchport mode hybrid
SW-2 (config) # interface mlag-port-channel 1 switchport hybrid allowed-vlan [x,y..]
SW-2 (config) # interface mlag-port-channel 2 switchport hybrid allowed-vlan [x,y..]
SW-2 (config) # interface mlag-port-channel 3 switchport hybrid allowed-vlan [x,y..]
SW-2 (config) # interface mlag-port-channel 4 switchport hybrid allowed-vlan [x,y..]
SW-2 (config) # interface mlag-port-channel 1-4 no shutdown
```

3.5 Switch Uplinks

L2 ports are used as MLAG switch uplinks towards the spine switches. These ports need to be aggregated into a single MLAG port (Mpo), and MLAG needs to be configured on the spine switches.

Each MLAG switch has two uplinks towards the spine switches, port numbers 1/19 and 1/20.

MAGP will be used as the host's (VM's) gateways to communicate with outer networks. Each VLAN must have its own MAGP instance to be able to communicate with other VLANs or external networks.
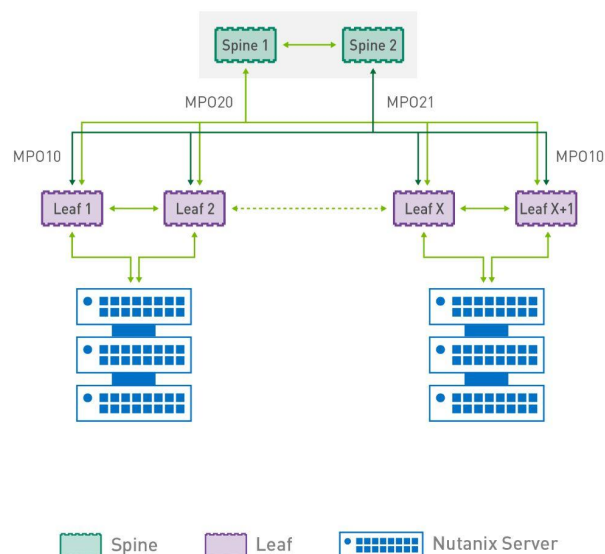
3.6 L2 Uplinks - MPo

Configure the following commands on both leaf switches:

```
SW-1 (config) # interface mlag-port-channel 10
SW-1 (config interface port-channel 10) # mtu 9216
SW-1 (config) # interface ethernet 1/19-1/20 mlag-channel-group 10 mode active
SW-1 (config) # interface mlag-port-channel 10 switchport mode hybrid
SW-1 (config) # interface mlag-port-channel 10 switchport hybrid allowed-vlan [x,y..]
SW-1 (config) # interface mlag-port-channel 10 no shutdown
```

```
SW-2 (config) # interface mlag-port-channel 10
SW-2 (config interface port-channel 10) # mtu 9216
SW-2 (config) # interface ethernet 1/19-1/20 mlag-channel-group 10 mode active
SW-2 (config) # interface mlag-port-channel 10 switchport mode hybrid
SW-2 (config) # interface mlag-port-channel 10 switchport hybrid allowed-vlan [x,y..]
SW-2 (config) # interface mlag-port-channel 10 no shutdown
```

Example of a Core/Spine switch connection:

3.7 Spine Switch Routing Configuration

Spine   Leaf   Nutanix Server
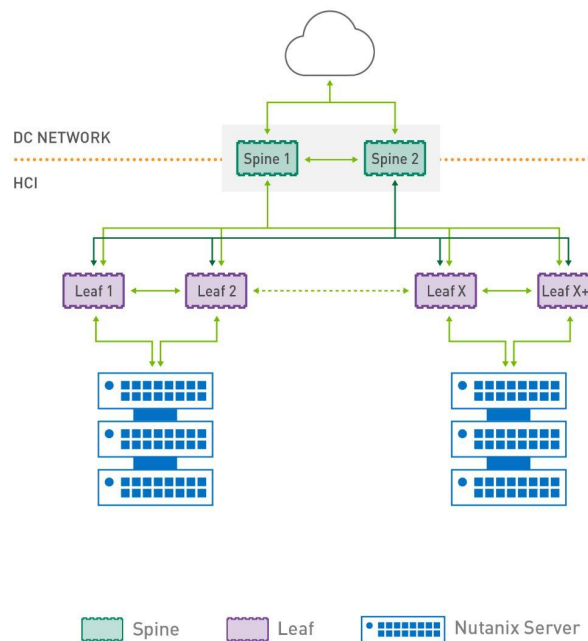
In this example, we use L3 router ports uplinks towards the DC network. The Routing protocol assumed is BGP.

Multi-Active Gateway Protocol (MAGP) will be used as the host's (VM's) gateways to communicate with outer networks. Each VLAN must have its own MAGP instance to be able to communicate with other VLANs or external networks. The configuration is done on the leaf switches' level.
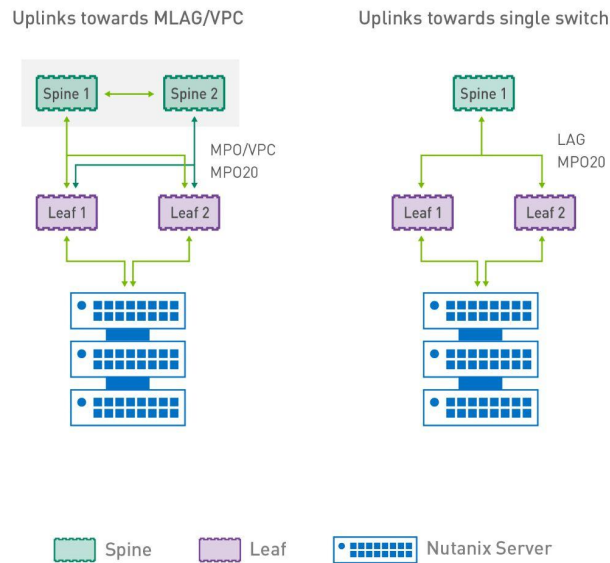
NOTE:

The spines of the MLAG configuration should be done in the same way as on the leaf switches.

NOTE:

The example below can be configured on the leafs switches as well, if your leafs are connected directly to the DC network, and routing is desired on the leafs.

3.8 MAGP Configuration

Configure the following commands on both switches:

```
Spine-1 (config) # protocol magp
Spine-1 (config) # vlan 1-4
Spine-1 (config) # interface vlan 1 ip address 192.168.1.252/24
Spine-1 (config) # interface vlan 1 mtu 9216
Spine-1 (config) # interface vlan 2 ip address 192.168.2.252/24
Spine-1 (config) # interface vlan 2 mtu 9216
Spine-1 (config) # interface vlan 3 ip address 192.168.3.252/24
Spine-1 (config) # interface vlan 3 mtu 9216
Spine-1 (config) # interface vlan 4 ip address 192.168.4.252/24
Spine-1 (config) # interface vlan 4 mtu 9216
```

```
Spine-1 (config) # interface vlan 1 magp 1 ip virtual-router address 192.168.1.254
Spine-1 (config) # interface vlan 1 magp 1 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-1 (config) # interface vlan 2 magp 2 ip virtual-router address 192.168.2.254
Spine-1 (config) # interface vlan 2 magp 2 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-1 (config) # interface vlan 3 magp 3 ip virtual-router address 192.168.3.254
Spine-1 (config) # interface vlan 3 magp 3 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-1 (config) # interface vlan 4 magp 4 ip virtual-router address 192.168.4.254
Spine-1 (config) # interface vlan 4 magp 4 ip virtual-router mac-address
00:00:5E:00:01:01
```

```
Spine-2 (config) # protocol magp
Spine-2 (config) # vlan 1-4
Spine-2 (config) # interface vlan 1 ip address 192.168.1.253/24
Spine-2 (config) # interface vlan 1 mtu 9216
Spine-2 (config) # interface vlan 2 ip address 192.168.2.253/24
Spine-2 (config) # interface vlan 2 mtu 9216
Spine-2 (config) # interface vlan 3 ip address 192.168.3.253/24
Spine-2 (config) # interface vlan 3 mtu 9216
Spine-2 (config) # interface vlan 4 ip address 192.168.4.253/24
Spine-2 (config) # interface vlan 4 mtu 9216
Spine-2 (config) # interface vlan 1 magp 1 ip virtual-router address 192.168.1.254
Spine-2 (config) # interface vlan 1 magp 1 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-2 (config) # interface vlan 2 magp 2 ip virtual-router address 192.168.2.254
Spine-2 (config) # interface vlan 2 magp 2 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-2 (config) # interface vlan 3 magp 3 ip virtual-router address 192.168.3.254
Spine-2 (config) # interface vlan 3 magp 3 ip virtual-router mac-address
00:00:5E:00:01:01
Spine-2 (config) # interface vlan 4 magp 4 ip virtual-router address 192.168.4.254
Spine-2 (config) # interface vlan 4 magp 4 ip virtual-router mac-address
00:00:5E:00:01:01
```

3.9 Uplinks and BGP Routing

Configure the following commands on both switches:

```
Spine-1 (config) # interface ethernet 1/19 no switchport force
Spine-1 (config) # interface ethernet 1/20 no switchport force
Spine-1 (config) # interface ethernet 1/19 ip address 19.1.0.1/24
Spine-1 (config) # interface ethernet 1/19 ip address 20.1.0.1/24
Spine-1 (config) # router bgp 65001
Spine-1 (config) # router bgp 65001 router-id 1.1.1.1
Spine-1 (config) # router bgp 65001 neighbor 19.1.0.2 remote-as 65005
Spine-1 (config) # router bgp 65001 neighbor 20.1.0.2 remote-as 65005
Spine-1 (config) # router bgp 65001 neighbor 10.10.10.2 remote-as 65001
Spine-1 (config) # router bgp 65001 maximum-paths 2
Spine-1 (config) # router bgp 65001 bestpath as-path multipath-relax force
Spine-1 (config) # router bgp 65001 network 192.168.1.0/24
Spine-1 (config) # router bgp 65001 network 192.168.2.0/24
Spine-1 (config) # router bgp 65001 network 192.168.3.0/24
Spine-1 (config) # router bgp 65001 network 192.168.4.0/24
```

```
Spine-2 (config) # interface ethernet 1/19 no switchport force
Spine-2 (config) # interface ethernet 1/20 no switchport force
Spine-2 (config) # interface ethernet 1/19 ip address 19.2.0.1/24
Spine-2 (config) # interface ethernet 1/20 ip address 20.2.0.1/24
Spine-2 (config) # router bgp 65001
Spine-2 (config) # router bgp 65001 router-id 2.2.2.2
Spine-2 (config) # router bgp 65001 neighbor 19.2.0.2 remote-as 65005
```

```
Spine-2 (config) # router bgp 65001 neighbor 20.2.0.2 remote-as 65005
Spine-2 (config) # router bgp 65001 neighbor 10.10.10.1 remote-as 65001
Spine-2 (config) # router bgp 65001 maximum-paths 2
Spine-2 (config) # router bgp 65001 bestpath as-path multipath-relax force
Spine-2 (config) # router bgp 65001 network 192.168.1.0/24
Spine-2 (config) # router bgp 65001 network 192.168.2.0/24
Spine-2 (config) # router bgp 65001 network 192.168.3.0/24
Spine-2 (config) # router bgp 65001 network 192.168.4.0/2
```

3.10 Nutanix AHV LAG (bond) Configuration to LACP

LACP with balance-tcp
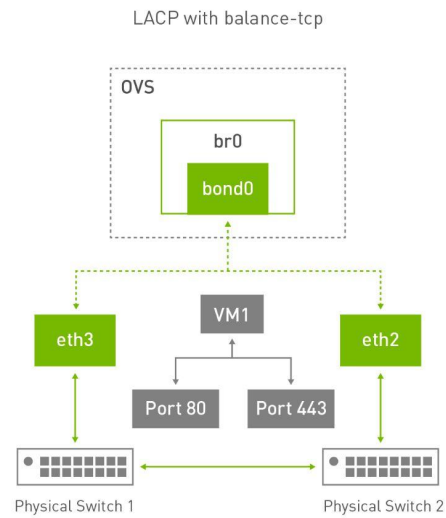

```
nutanix@CVM$ ssh root@192.168.5.1 "ovs-vsctl set port bond0 lacp=active"
nutanix@CVM$ ssh root@192.168.5.1 "ovs-vsctl set port bond0 bond_mode=balance-tcp"
nutanix@CVM$ ssh root@192.168.5.1 "ovs-vsctl set port bond0
other_config:lacp-fallback-ab=true"
```

NOTE:

If an LACP bond is not used, there is no need to configure any MLAG Ports (MPo) on the switches. The bond will use Active-Backup mode.

4. CONFIGURATION VERIFICATION

As MLAG is configured on both SN2010 switches, they will act as a single switch from the Nutanix hosts' (VMs') point of view.

Each MLAG switch will have four MLAG port channels connected in Active-Active LACP bonds to the MLAG pair.

4.1 MLAG Status

To verify that MLAG is configured correctly and fully functional, use the `show mlag` command on both switches:

```
SW-1 [my-mlag-vip-domain: master] (config) # show mlag
Admin status: Enabled
Operational status: Up
Reload-delay: 30 sec
Keepalive-interval: 1 sec
Upgrade-timeout: 60 min
System-mac: 00:00:5E:00:01:5D

MLAG Ports Configuration Summary:
 Configured: 4
 Disabled:   0
 Enabled:    4

MLAG Ports Status Summary:
 Inactive:       0
 Active-partial: 0
 Active-full:    4

MLAG IPLs Summary:
---------------------------------------------------------------------------------
ID Group         Vlan      Operational Local      Peer       Up            Toggle
   Port-Channel Interface State       IP address IP address Time          Counter
---------------------------------------------------------------------------------
1  Po1          4000      Up          10.10.10.1 10.10.10.2 0 days,00:01:01 0

MLAG Members Summary:
---------------------------------------------------------------------
System-id            State                    Hostname
---------------------------------------------------------------------
7C:FE:90:FB:81:08    Up                       <SW-1>
7C:FE:90:ED:4B:88    Up                        SW-2
```

```
SW-2 [my-mlag-vip-domain: standby] (config) # show mlag
Admin status: Enabled
Operational status: Up
Reload-delay: 30 sec
Keepalive-interval: 1 sec
Upgrade-timeout: 60 min
System-mac: 00:00:5E:00:01:5D

MLAG Ports Configuration Summary:
 Configured: 4
 Disabled:   0
 Enabled:    4

MLAG Ports Status Summary:
 Inactive:       0
 Active-partial: 0
 Active-full:    4

MLAG IPLs Summary:
------------------------------------------------------------------------------
ID Group        Vlan       Operational Local      Peer       Up           Toggle
   Port-Channel Interface  State       IP address IP address Time         Counter
------------------------------------------------------------------------------
1  Po1          4000       Up          10.10.10.2 10.10.10.1 0 days,00:01:16 0

MLAG Members Summary:
------------------------------------------------------------------
System-id          State                        Hostname
------------------------------------------------------------------
7C:FE:90:ED:4B:88  Up                           <SW-2>
7C:FE:90:FB:81:08  Up                            SW-1
```

4.2 MLAG Port-channels (MPo) Status

To verify that MLAG Ports (MPo) are configured correctly and fully functional, use the `show interfaces mlag-port-channel summary` command on both switches:

```
SW-1 [my-mlag-vip-domain: master] (config) # show interfaces mlag-port-channel summary

MLAG Port-Channel Flags: D-Down, U-Up, P-Partial UP, S-suspended by MLAG

Port Flags:
  D: Down
  P: Up in port-channel (members)
  S: Suspend in port-channel (members)
  I: Individual

MLAG Port-Channel Summary:
  --------------------------------------------------------------------------
  Group            Type     Local                    Peer
  Port-Channel              Ports                    Ports
  (D/U/P/S)                (D/P/S/I)                (D/P/S/I)
  --------------------------------------------------------------------------
  1 Mpo1(U)        LACP     Eth1/1(P)                Eth1/1(P)
  2 Mpo2(U)        LACP     Eth1/2(P)                Eth1/2(P)
  3 Mpo3(U)        LACP     Eth1/3(P)                Eth1/3(P)
  4 Mpo4(U)        LACP     Eth1/4(P)                Eth1/4(P)
```

```
SW-2 [my-mlag-vip-domain: standby] (config) # show interfaces mlag-port-channel
summary

MLAG Port-Channel Flags: D-Down, U-Up, P-Partial UP, S-suspended by MLAG

Port Flags:
  D: Down
  P: Up in port-channel (members)
  S: Suspend in port-channel (members)
  I: Individual

MLAG Port-Channel Summary:
  --------------------------------------------------------------------------
  Group              Type      Local                    Peer
  Port-Channel                 Ports                    Ports
  (D/U/P/S)                    (D/P/S/I)                (D/P/S/I)
  --------------------------------------------------------------------------
  1 Mpo1(U)          LACP      Eth1/1(P)                Eth1/1(P)
  2 Mpo2(U)          LACP      Eth1/2(P)                Eth1/2(P)
  3 Mpo3(U)          LACP      Eth1/3(P)                Eth1/3(P)
  4 Mpo4(U)          LACP      Eth1/4(P)                Eth1/4(P)
```

4.3 MLAG Ports VLAN membership verification

To verify VLAN membership of the MLAG Ports (MPo), use the `show vlan` command on both switches:

```
SW-1 [my-mlag-vip-domain: master] (config) # show vlan
-------------------------------------------------------------------------------
VLAN    Name                     Ports
-------------------------------------------------------------------------------
1       default                  Eth1/5, Eth1/6, Eth1/7, Eth1/8, Eth1/9, Eth1/10
                                 Eth1/11, Eth1/12, Eth1/13, Eth1/14, Eth1/15,
                                 Eth1/16, Eth1/17, Eth1/18, Mpo1
2                                Mpo2
3                                Mpo3
4                                Mpo4
4000
```

```
SW-2 [my-mlag-vip-domain: standby] (config) # show vlan
-------------------------------------------------------------------------------
VLAN    Name                     Ports
-------------------------------------------------------------------------------
1       default                  Eth1/5, Eth1/6, Eth1/7, Eth1/8, Eth1/9, Eth1/10
                                 Eth1/11, Eth1/12, Eth1/13, Eth1/14, Eth1/15,
                                 Eth1/16, Eth1/17, Eth1/18, Mpo1
2                                Mpo2
3                                Mpo3
4                                Mpo4
4000
```

For a pure L2 fabric, additional MPo (trunk/hybrid) needs to be configured on the leaf switches:

```
SW-1 [my-mlag-vip-domain: master] (config) # show vlan
-------------------------------------------------------------------------------
VLAN    Name                     Ports
-------------------------------------------------------------------------------
1       default                  Eth1/5, Eth1/6, Eth1/7, Eth1/8, Eth1/9, Eth1/10
                                 Eth1/11, Eth1/12, Eth1/13, Eth1/14, Eth1/15,
                                 Eth1/16, Eth1/17, Eth1/18, Mpo1, Mpo10
2                                Mpo2, Mpo10
3                                Mpo3, Mpo10
```

```
4                                    Mpo4, Mpo10
4000
```

```
SW-2 [my-mlag-vip-domain: standby] (config) # show vlan
--------------------------------------------------------------------------------
VLAN    Name                      Ports
--------------------------------------------------------------------------------
1       default                   Eth1/5, Eth1/6, Eth1/7, Eth1/8, Eth1/9, Eth1/10
                                  Eth1/11, Eth1/12, Eth1/13, Eth1/14, Eth1/15,
                                  Eth1/16, Eth1/17, Eth1/18, Mpo1, Mpo10
2                                 Mpo2, Mpo10
3                                 Mpo3, Mpo10
4                                 Mpo4, Mpo10
4000
```

4.4 MLAG-VIP status

To verify that MLAG-VIP is configured correctly, use the `show mlag-vip` command on both switches

```
SW-1 [my-mlag-vip-domain: master] # show mlag-vip
MLAG-VIP:
 MLAG group name: my-mlag-vip-domain
 MLAG VIP address: 10.209.28.200/24
 Active nodes: 2


------------------------------------------------------------
Hostname             VIP-State            IP Address
------------------------------------------------------------
SW-1                 master               10.209.28.102
SW-2                 standby              10.209.28.113
```

```
SW-2 [my-mlag-vip-domain: standby] # show mlag-vip
MLAG-VIP:
 MLAG group name: my-mlag-vip-domain
 MLAG VIP address: 10.209.28.200/24
 Active nodes: 2


------------------------------------------------------------
Hostname             VIP-State            IP Address
------------------------------------------------------------
SW-1                 master               10.209.28.102
SW-2                 standby              10.209.28.113
```

4.5 MAGP status

To verify that MAGP is configured correctly and functional, use the `show magp` command on both switches. Each MAGP instance on each switch should be in Master state.

NOTE:

In case of pure L2 fabric, MAGP should be configured and checked on the spine switches. No MAGP configuration should exist on the leaf switches.

```
Spine-1 [my-mlag-vip-domain: master] (config) # show magp
```

```
MAGP 1:
  Interface vlan: 1
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.1.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 2:
  Interface vlan: 2
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.2.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 3:
  Interface vlan: 3
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.3.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 4:
  Interface vlan: 4
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.4.254
  Virtual MAC   : 00:00:5E:00:01:01
```

```
Spine -2 [my-mlag-vip-domain: standby] (config) # show magp

MAGP 1:
  Interface vlan: 1
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.1.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 2:
  Interface vlan: 2
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.2.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 3:
  Interface vlan: 3
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.3.254
  Virtual MAC   : 00:00:5E:00:01:01

MAGP 4:
  Interface vlan: 4
  Admin state   : Enabled
  State         : Master
  Virtual IP    : 192.168.4.254
  Virtual MAC   : 00:00:5E:00:01:01
```

4.6 BGP Routing status

To verify that BGP routing protocol is enabled and connected to neighbors, use the `show ip bgp summary` and `show ip route` commands on both switches.

BGP neighbors should be ESTABLISHED and all local/remote prefixes exist in the routing table.

NOTE:

In case of pure L2 fabric, BGP should be configured and checked on the spine switches. No BGP configuration should exist on the leaf switches.

```
Spine -1 [my-mlag-vip-domain: master] # show ip route

Flags:
  F: Failed to install in H/W
  B: BFD protected (static route)
  i: BFD session initializing (static route)
  x: protecting BFD session failed (static route)
  c: consistent hashing
  p: partial programming in H/W

VRF Name default:
  -------------------------------------------------------------------------------
  Destination     Mask            Flag  Gateway       Interface     Source     AD/M
  -------------------------------------------------------------------------------
  default         0.0.0.0               10.209.28.21  mgmt0         DHCP       1/1
  10.209.28.0     255.255.255.0         0.0.0.0       mgmt0         direct     0/0
  19.1.0.0        255.255.255.0         0.0.0.0       eth1/19       direct     0/0
  20.1.0.0        255.255.255.0         0.0.0.0       eth1/20       direct     0/0
  192.168.1.0     255.255.255.0         0.0.0.0       vlan1         direct     0/0
  192.168.2.0     255.255.255.0         0.0.0.0       vlan2         direct     0/0
  192.168.3.0     255.255.255.0         0.0.0.0       vlan3         direct     0/0
  192.168.4.0     255.255.255.0         0.0.0.0       vlan4         direct     0/0
```

```
Spine -2 [my-mlag-vip-domain: standby] # show ip route

Flags:
  F: Failed to install in H/W
  B: BFD protected (static route)
  i: BFD session initializing (static route)
  x: protecting BFD session failed (static route)
  c: consistent hashing
  p: partial programming in H/W

VRF Name default:
  -------------------------------------------------------------------------------
  Destination     Mask            Flag  Gateway       Interface     Source     AD/M
  -------------------------------------------------------------------------------
  default         0.0.0.0               10.209.28.21  mgmt0         DHCP       1/1
  10.209.28.0     255.255.255.0         0.0.0.0       mgmt0         direct     0/0
  19.2.0.0        255.255.255.0         0.0.0.0       eth1/19       direct     0/0
  20.2.0.0        255.255.255.0         0.0.0.0       eth1/20       direct     0/0
  192.168.1.0     255.255.255.0         0.0.0.0       vlan1         direct     0/0
  192.168.2.0     255.255.255.0         0.0.0.0       vlan2         direct     0/0
  192.168.3.0     255.255.255.0         0.0.0.0       vlan3         direct     0/0
  192.168.4.0     255.255.255.0         0.0.0.0       vlan4         direct     0/0
```

```
Spine -1 [my-mlag-vip-domain: master] # show ip bgp summary

VRF name                  : vrf-default
BGP router identifier     : 1.1.1.1
local AS number           : 65001
BGP table version         : 1
Main routing table version: 1
IPV4 Prefixes             : 6
IPV6 Prefixes             : 0
L2VPN EVPN Prefixes       : 0


-----------------------------------------------------------------------------
Neighbor     V   AS       MsgRcvd  MsgSent   TblVer InQ OutQ Up/Down    State/PfxRcd
-----------------------------------------------------------------------------
19.1.0.2     4   65005    420      414       1      0   0    0:00:23:48 ESTABLISHED/0
20.1.0.2     4   65005    413      409       1      0   0    0:00:23:47 ESTABLISHED/0
10.10.10.2   4   65001    413      409       1      0   0    0:00:23:47 ESTABLISHED/4
```

```
Spine -2 [my-mlag-vip-domain: standby] # show ip bgp summary

VRF name                  : vrf-default
BGP router identifier     : 2.2.2.2
local AS number           : 65001
BGP table version         : 1
Main routing table version: 1
IPV4 Prefixes             : 6
IPV6 Prefixes             : 0
L2VPN EVPN Prefixes       : 0


-----------------------------------------------------------------------------
Neighbor     V   AS       MsgRcvd  MsgSent   TblVer InQ OutQ Up/Down    State/PfxRcd
-----------------------------------------------------------------------------
19.2.0.2     4   65005    401      409       1      0   0    0:00:21:18 ESTABLISHED/0
20.2.0.2     4   65005    411      422       1      0   0    0:00:21:22 ESTABLISHED/0
10.10.10.2   4   65001    409      413       1      0   0    0:00:23:50 ESTABLISHED/4
```

NOTE:

There are no BGP prefixes in the routing tables. BGP routes will appear with prefix advertisements from other racks.