Supported Underlay Configuration

This appendix provides information about supported underlay template configuration.

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Supported Underlay Configuration

The following table lists the supported underlay configuration:

Configuration Area	Sample Configuration	Device Type	Device Role

Note Prerequisite: You should enable the following configuration for the device configuration to work.	`feature telnet`
	`feature nxapi`
	`feature ospf`
	`feature bgp`
	`feature pim`
	`feature udld`
	`feature interface-vlan`
	`feature vn-segment-vlan-based`
	`feature hsrp`
	`feature lacp`
	`feature vpc`
	`feature lldp`
	`feature nv overlay`
	`feature pbr`
	`feature sla sender`
	`feature sla responder`
	`feature vrrpv3`
	`feature bfd`		

UNDERLAY IGP ROUTING OSPF routing process	`router ospf 10`	N9K	Leaf
	`router ospf 10`	ASR9K	DCI
OSPF Area	`interface ethernet 1/5` `  ip ospf router 10 area 0.0.0.0`	N9K	Leaf
	`interface ethernet 1/5` `  ip ospf router 10 area 0.0.0.0`	N9K	Leaf
	`router ospf 10` `  area 0`	ASR9K	DCI

OSPF router-id	`router ospf 10` `  router-id 10.218.20.15`	N9K	Leaf
	`router ospf 10` `  router-id 10.218.20.15`	ASR9K	DCI

OSPF auto-cost reference	`router ospf 10`
	`!`
	`  auto-cost reference-bandwidth 800000`
		ASR9K	DCI

OSPF Network type	`interface ethernet1/5` `  ip ospf network point-to-point`	N9K	Leaf
	`interface vlan10` `  ip ospf network point-to-point`	N9K	Leaf

	`router ospf 10`
	`  area 0`
	`  interface GigabitEthernet0/0/1/3`
	`  network point-to-point`
		ASR9K	DCI

OSPF Authentication	`interface Ethernet1/5` `  ip ospf authentication message-digest`	N9K	Leaf
	`interface Ethernet1/5` `  ip ospf message-digest-key 1 md5 0 xxx`	N9K	Leaf

	`router ospf 10`
	`  area 0`
	`  interface <Fabric Interface>`
	`  authentication message-digest`
	`  message-digest-key 1 md5 encrypted`
	`202cb962ac59075b964b07152d234b70`
		ASR9K	DCI

OSPF Passive-interface	`interface loopback3` `  ip router ospf 100 area 0.0.0.0`	N9K	Leaf

	`router ospf 10`
	`  area 0`
	`  interface Loopback10`
	`  passive enable`
		ASR9K	DCI

OSPF Convergence	`router ospf 10`
	`  timers lsa arrival 15`
	`  timers throttle lsa 0 20 5000`
	`  timers throttle spf 50 100 5000`
		N9K	Leaf

	`router ospf 10`
	`  timers throttle lsa all 0 20 5000`
	`  timers throttle spf 50 100 5000`
	`  timers lsa min-arrival 15`
		ASR9K	DCI

OSPF BFD (per-link)	`feature bfd`
	`router ospf 10`
	`  bfd`
		N9K	Leaf

	`interface Ethernet1/5` `  no ip redirects`	N9K	Leaf

	`router ospf 10`
	`  bfd minimum-interval 150`
	`  bfd multiplier 3`
	`  area 0`
	`  interface TenGigE0/0/2/1`
	`  bfd fast-detect`
		ASR9K	DCI

	`interface vlan 10` `  no bfd echo`	N9K	Leaf

Multicast Routing	`feature pim`	N9K	Leaf

	`interface loopback1`
	`  ip address 10.218.20.250/32`
	`  ip router ospf 10 area 0.0.0.0`
	`  ip pim sparse-mode`
		N9K	Spine

	`ip pim rp-address 10.218.20.250 group-list 239.255.0.0/16 override`	N9K	Spine
	`ip pim anycast-rp 10.218.20.250 10.218.20.249` `ip pim anycast-rp 10.218.20.250 10.218.20.248`	N9K	Spine
	`feature pim`	N9K	Leaf
	`ip pim rp-address 10.218.20.250 group-list 239.255.0.0/16 override`	N9K	Leaf
	`interface Vlan10` `  ip pim sparse-mode`	N9K	Leaf
	`interface loopback0` `  ip pim sparse-mode`	N9K	Leaf
	`interface Ethernet2/1` `  ip pim sparse-mode`	N9K	Leaf
	`interface Ethernet2/2` `  ip pim sparse-mode`	N9K	Leaf
L2 Technologies	`interface Ethernet 1/10` `  switchport mode trunk`	N9K	Leaf
	`interface Ethernet 1/10` `  switchport trunk allowed vlan none`	N9K	Leaf
	`interface Ethernet 1/10` `  spanning-tree port type edge trunk`	N9K	Leaf
	`interface Ethernet 1/10` `  spanning-tree bpduguard enable`	N9K	Leaf
	`interface Ethernet 1/10` `  spanning-tree bpdufilter enable`	N9K	Leaf
	`interface Ethernet 1/10` `  storm-control broadcast level 20.0`	N9K	Leaf
	`interface Ethernet 1/10` `  storm-control multicast level 30.0`	N9K	Leaf
	`interface Ethernet 1/10` `  storm-control unicast level 50.0`	N9K	Leaf
	`interface Ethernet 1/10` `  storm-control action shutdown`	N9K	Spine
vPC Role and Priority	`vpc domain 1` `  role priority 100`	N9K	Leaf
	`vpc domain 1` `  role priority 200`	N9K	Leaf
vPC Peer Keep-alive Link	`vrf context management`	N9K	Leaf
	`interface mgmt 0` `  vrf member management`	N9K	Leaf

	`interface mgmt 0`
	`  ip address 172.20.118.119/25`
	`  no shutdown`
		N9K	Leaf

	`vpc domain 1` `  peer-keepalive destination 172.20.118.20`	N9K	Leaf

vPC Peer-Link	`interface Ethernet 1/1`
	`  spanning-tree port type network`
	`  channel-group 1 mode active no shutdown`
		N9K	Leaf

	`interface Ethernet 1/2`
	`  spanning-tree port type network`
	`  channel-group 1 mode active no shutdown`
		N9K	Leaf

	`interface port-channel1`
	`  switchport`
	`  switchport mode trunk`
	`  spanning-tree port type network`
	`  vpc peer-link`
		N9K	Leaf

vPC Port	`interface Ethernet 2/9` `  channel-group mode active id 51`	N9K	Leaf
	`interface port-channel 51` `  switchport`	N9K	Leaf

	`interface port-channel 51`
	`  switchport`
	`  vpc 51`
		N9K	Spine

vPC Peer-Switch Option	`vpc domain 1` `  peer-switch`	N9K	Leaf
vPC ARP Synchronization	`vpc domain 1` `  ip arp synchronize`	N9K	Leaf

vPC in VXLAN environment adjustment	`vpc domain 10`
	`   peer-switch`
	`   system-priority 100 ( could not find this option)`
	
	`   peer-keepalive destination 172.20.118.120`
	`   delay restore 200`
	`   peer-gateway`
	`   ip arp synchronize`
		N9K	Leaf

	`interface port-channel1` `description vPC peer-link`	N9K	Spine
	`interface port-channel1` `   description vPC switchport mode trunk`	N9K	Leaf
	`interface port-channel 1` `  description vPC switchport mode trunk`	N9K	
	`interface port-channel 1` `  description vPC spanning-tree port type network`	N9K	
	`interface port-channel 1` `  vpc peer-link`	N9K	
	`interface port-channel 10` `  switchport trunk allowed vlan`	N9K	
	`interface port-channel 10` `  spanning-tree port type edge trunk`	N9K	
	`interface port-channel 10` `  spanning-tree bpdufilter enable`	N9K	
	`interface port-channel 10` `  spanning-tree bpduguard enable`	N9K	
	`interface port-channel 10` `  vpc 10`	N9K	Spine
	`interface Ethernet 1/10` `  switchport trunk allowed vlan none`	N9K	Spine
	`interface Ethernet 1/10` `  spanning-tree port type edge trunk`	N9K	Leaf
	`interface Ethernet 1/10` `  spanning-tree bpduguard enable`	N9K	Leaf
	`interface Ethernet 1/10` `  spanning-tree bpdufilter enable`	N9K	Leaf
	`interface Ethernet 1/10` `  channel-group 10 mode active`	N9K	Leaf
	`interface loopback 0` `  ip address 10.218.20.1/32`	N9K	Leaf
	`interface loopback 0` `  ip address 10.218.20.1/32 secondary`	N9K	Leaf
	`interface loopback 0` `  ip router ospf 100 area 0.0.0.0`	N9K	Leaf
	`interface loopback 0` `  ip pim sparse-mode`	N9K	Leaf
	`interface Vlan 10` `  ip address 10.218.18.0/31`	N9K	Leaf

	interface Vlan 10
	  description Underlay vPC Backup link
	  no shutdown
	  no bfd echo
		N9K	Spine

	interface Vlan 10 ip ospf network point-to-point	N9K	Leaf
	interface Vlan 10 ip router ospf 100 area 0.0.0.0	N9K	Leaf
	interface Vlan10 ip pim sparse-mode	N9K	Leaf

STP	interface Ethernet 1/10 switchport mode trunk	N9K	Leaf
	interface Ethernet 1/10 switchport mode trunk allowed vlan 10	N9K	Leaf
	interface Ethernet 1/10 spanning-tree port type edge trunk	N9K	Leaf
	interface Ethernet 1/10 spanning-tree bpduguard enable	N9K	Leaf
	nx:interface Ethernet 1/10 spanning-tree bpdufilter enable	N9K	Leaf
	interface Ethernet 1/10 no shutdown	N9K	
	interface port-channel 10 switchport mode trunk	N9K	Leaf
	interface port-channel 10 switchport mode trunk trunk allowed vlan ids 1	N9K	Leaf
	interface port-channel 10 spanning-tree port type edge	N9K	Leaf
	interface port-channel 10 spanning-tree bpduguard enable	N9K	Leaf
	interface port-channel 10 spanning-tree bpdufilter enable	N9K	Leaf
	interface port-channel 10 no shutdown	N9K	Leaf
	interface port-channel 10 vpc port-channel-number 10	N9K	Leaf
	interface Ethernet 1/10 switchport mode trunk	N9K	Leaf
	interface Ethernet 1/10 switchport mode trunk allowed vlan 10	N9K	Leaf
	interface Ethernet 1/10 spanning-tree port type edge trunk	N9K	Leaf
	interface Ethernet 1/10 spanning-tre guard root	N9K	Leaf
	interface Ethernet 1/10 no shutdown	N9K	Leaf
	interface ethernet <xxxx> description <leaf/Spine Fabric> ip address	N9K	Leaf
	interface Ethernet 1/10 description leaf mtu 9216	N9K	Leaf
	interface Vlan 1 description <attachment/border facing intf>	N9K	Leaf
	interface Vlan 1 description ip address <addr>	N9K	Leaf
	interface Vlan 1 description ip address mtu 1500	N9K	Leaf
	interface <To Spine> mtu 9214	N9K	Leaf
	interface <To Border Leaf> mtu 1518	N9K	Leaf

	interface GigabitEthernet0/0/1/5 mtu 9214	ASR9K	DCI
Nexus 9500 QOS	system qos service-policy type queuing output default-out-policy	N9K	Leaf
	policy-map type network-qos Jumbo-nq-policy class type network-qos c-nq3	N9K	Leaf
	policy-map type network-qos Jumbo-nq-policy class type network-qos c-nq3 match qos-group 3	N9K	Leaf
	policy-map type network-qos Jumbo-nq-policy class type network-qos c-nq3 mtu 9216	N9K	Leaf

	class type network-qos c-nq3
	  match qos-group 3
	  mtu 9216
	class type network-qos c-nq2
	  match qos-group 2
	  mtu 9216
	class type network-qos c-nq1
	  match qos-group 1
	  mtu 9216
	class type network-qos c-nq-default
	  match qos-group 0
	  mtu 9216
		N9K	Leaf

	system qos service-policy type network-qos Jumbo-nq-policy	N9K	Leaf
QoS Hardware resources configuration	"hardware access-list tcam region racl 0 hardware access-list tcam region e-racl 0 hardware access-list tcam region span 0 hardware access-list tcam region vqos 256 hardware access-list tcam region e-qos 256 hardware access-list tcam region arp-ether 256"	N9K	Leaf
N 9500 QoS	system qos service-policy type queuing output default-out-policy	N9K	Leaf
	system qos service-policy type network-qos Jumbo-nq-policy	N9K	Leaf

N 9500 QoS Queuing policy	policy-map type queuing default-out-policy
	class type queuing c-out-q3
	  priority level 1
	class type queuing c-out-q2
	  bandwidth remaining percent 0
	class type queuing c-out-q1
	  bandwidth remaining percent 0
	class type queuing c-out-q-default
	bandwidth remaining percent 100
		N9K	Leaf

	System qos Service-policy type queuing out default-out-policy	N9K	Leaf

N 9500 QoS Queuing Policy	policy-map type queuing default-out-policy class type queuing c-out-q3 priority level 1 class type queuing c-out-q2 bandwidth remaining percent 0 class type queuing c-out-q1 bandwidth remaining percent 0 class type queuing c-out-q-default bandwidth remaining percent 100	N9K	Leaf
	System qos Service-policy type queuing out default-out-policy	N9K	Leaf
Network Management Ethernet (Mgmt0)	interface mgmt0 ip address 10.218.22.10/24	N9K	Leaf
	vrf context management ip route 0.0.0.0/0 10.218.23.254	N9K	Leaf
Configuring Hostname on Nexus 9000	hostname nw_lf_cnx9_001.41gebz_o01_s01	N9K	Leaf
Time Zone and day-light saving	clock timezone EET 2 0 clock summer-time EEST 4 Sunday March 02:00 4 Sunday October 03:00 60	N9K	Leaf
DNS	ip domain-name <cust_name> no ip domain-lookup	N9K	Leaf
SNMP	snmp-server contact <contact_name> snmp-server location <location_name>	N9K	Leaf
	snmp-server host 85.29.26.36 traps version 2c <SNMP_Community_1> snmp-server host 85.29.56.136 traps version 2c <SNMP_Community_1> snmp-server host 85.29.60.191 traps version 2c <SNMP_Community_1> snmp-server host 85.29.60.235 traps version 2c <SNMP_Community_1> snmp-server host 213.74.189.232 traps version 2c <SNMP_Community_1> snmp-server host 213.74.189.233 traps version 2c <SNMP_Community_1>	N9K	Leaf
	snmp-server host 85.29.26.36 use-vrf management snmp-server host 85.29.56.136 use-vrf management snmp-server host 85.29.60.191 use-vrf management snmp-server host 85.29.60.235 use-vrf management snmp-server host 213.74.189.232 use-vrf management snmp-server host 213.74.189.233 use-vrf management	N9K	Leaf
	snmp-server source-interface trap mgmt0	N9K	Leaf
	snmp-server community <community> group network-admin	N9K	Leaf
	15 permit ip host 213.74.197.43 any ... 390 permit ip host 176.43.250.25 any	N9K	Leaf

LLDP on Nexus 9000	`feature lldp`	N9K	Leaf

Network Security Disable IP Redirects	`interface Ethernet slot#/port#`
	`  no ip redirects`
	`  no ipv6 redirects`
		N9K	Leaf

Device Access Security	`NX-OS(config)#no ssh server enable`
	`NX-OS(config)#ssh key {dsa [force] | rsa [bits [force]]}`
	`NX-OS(config)#ssh server enable`
	`NX-OS#show ssh key`
	`**********`
	`rsa Keys generated:Fri Apr 10 20:13:21 2010`
	`<clipped> !`
		N9K	Leaf

AAA-N	`NX-OS(config)#feature tacacs+`
	`NX-OS(config)#tacacs-server host {ipv4-address | ipv6-address | host-name}`
	`NX-OS(config)#tacacs-server key [0 | 7] key-value`
	`NX-OS(config)#aaa group server tacacs+ group-name`
	
	`  server {ipv4-address | ipv6-address | host-name}`
	`deadtime minutes`
	`  use-vrf vrf-name`
	`NX-OS(config)#tacacs-server timeout seconds`
	`NX-OS(config)#tacacs-server host {ipv4-address | ipv6-address | host-name} port tcp-port`
	`NX-OS(config)#tacacs-server deadtime minutes`
		N9K	Leaf

	`feature tacacs+`
	`aaa group server tacacs+ TacacsGroup`
	`  use-vrf management`
	`  server 10.35.175.1`
	`aaa authentication login console group TacacsGroup`
	`aaa authentication login default group TacacsGroup`
	`aaa authentication login error-enable`
	`!`
	`tacacs-server host 10.35.175.1 key <shared-key> port 49`
	`tacacs-server directed-request`
	`ip tacacs source-interface mgmt 0`
	`!`
	`! Device Login Authorisation with AAA`
	`!`
		N9K	Leaf

	`aaa authorization config-commands default group TacacsGroup local`
	`aaa authorization commands default group TacacsGroup local`
	`!`
	`! Device Login Accounting with AAA`
	`!`
	`aaa accounting default group TacacsGroup`
	`!`
	`! Local User Configuration`
	`!`
	`username admin Pword <Pword> role network-admin`
		N9K	Leaf

Device Hardening 3.9.9.4 COPP policy and class maps	policy-map type control-plane
	copp-system-p-policy-strict
	  class copp-system-p-class-l3uc-data
	  set cos 1
	  police cir 250 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-critical
	  set cos 7
	  police cir 19000 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-important
	  set cos 6
	  police cir 3000 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-multicast-router
	  set cos 6
	  police cir 3000 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-management
	  set cos 2
	  police cir 3000 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-multicast-host
	  set cos 1
	  police cir 2000 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-l3mc-data
	  set cos 1
	  police cir 3000 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-normal
	  set cos 1
	  police cir 1500 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-ndp
	  set cos 6
	  police cir 1500 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-normal-dhcp
	  set cos 1
	  police cir 300 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class
	copp-system-p-class-normal-dhcp-relay-response
	  set cos 1
	  police cir 400 pps bc 64 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-normal-igmp
	  set cos 3
	  police cir 6000 pps bc 64 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-redirect
	  set cos 1
	  police cir 1500 pps bc 32 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-exception
	  set cos 1
	  police cir 50 pps bc 32 packets conform transmit
	violate drop
		N9K	Leaf

	class copp-system-p-class-exception-diag
	  set cos 1
	  police cir 50 pps bc 32 packets conform transmit
	 violate drop
		N9K	Leaf

	class copp-system-p-class-monitoring
	  set cos 1
	  police cir 300 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-l2-unpoliced
	  set cos 7
	  police cir 20000 pps bc 8192 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-undesirable
	  set cos 0
	  police cir 15 pps bc 32 packets conform transmit
	 violate drop
		N9K	Leaf

	class copp-system-p-class-fcoe
	  set cos 6
	  police cir 1500 pps bc 128 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-nat-flow
	  set cos 7
	  police cir 100 pps bc 64 packets conform
	transmit violate drop
		N9K	Leaf

	class copp-system-p-class-l2-default
	  set cos 0
	  police cir 50 pps bc 32 packets conform transmit
	 violate drop
		N9K	Leaf

	class class-default
	  set cos 0
	  police cir 50 pps bc 32 packets conform transmit
	 violate drop
		N9K	Leaf

	N9k-ST-Leaf-01# sh copp status Last Config Operation: None Last Config Operation Timestamp: None Last Config Operation Status: None Policy-map attached to the control-plane: copp-system-p-policy-strict	N9K	Leaf
	N9k-ST-Leaf-01# sh copp profile ? dense Display dense profile lenient Display lenient profile moderate Display moderate profile strict Display strict profile	N9K	Leaf
BFD	feature bfd bfd interval 50 min_rx 50 multiplier 3	N9K	Leaf
	router ospf UNDERLAY bfd	N9K	Leaf
	router bgp 100 vrf vrf1 address-family ipv4 unicast	N9K	Leaf

	router bgp 100
	  vrf vrf1
	  local-as 65004
		N9K	Leaf

	router bgp 100
	vrf vrf1
	  neighbor 10.23.65.0 remote-as 22394
	  bfd
		N9K	Leaf

OSPF Routing Process	`feature ospf`
	`!`
	`router ospf UNDERLAY`
	`  log-adjacency-changes detail`
	`  bfd`
		N9K	Leaf

OSPF Router ID	`router ospf UNDERLAY`
	`  log-adjacency-changes detail`
	`  bfd`
	`  router-id <loopback17-ip-address>`
		N9K	Leaf

Enabling OSPF on interfaces	`router ospf UNDERLAY` `  passive-interface default`	N9K	Leaf

	`continue from the above...`
	`interface Ethernet1/5`
	`  ip router ospf UNDERLAY area 0.0.0.1`
	`  ip ospf bfd`
	`  ip ospf network point-to-point`
	`  no ip ospf passive-interface`
		N9K	Leaf

	`interface loopback<id>` `  ip router ospf UNDERLAY area 0.0.0.1`	N9K	Leaf

OSPF Authentication	`interface eth <slot>/<port>`
	`  ip ospf authentication message-digest`
	`  ip ospf message-digest-key <key-id> md5 0`
	`<clear-text-key>`
		N9K	Leaf

OSPF Reference-Bandwidth	`router ospf UNDERLAY` `  auto-cost reference bandwidth 100Gbps`	N9K	Leaf
Underlay OSPF Configuration on Leaf Underlay OSPF Configuration on Spine	`interface loopback17` `  ip router ospf UNDERLAY area 0.0.0.1`	N9K	Leaf

	`interface eth<slot>/<port>`
	`  ip router ospf UNDERLAY area 0.0.0.1`
	`  ip ospf network point-to-point`
	`  no ip ospf passive-interface`
	`  ip ospf bfd`
	`  ip ospf authentication message-digest`
	`  ip ospf message-digest-key <key-id> md5 0`
	`<clear-text-key>`
		N9K	Leaf / Spine

Enabling Multicast Routing - PIM	`feature pim`	N9K	Leaf
	`ip pim long-neighbor-changes`	N9K	Spine
	`interface ethernet 1/10` `  ip pim sparse-mode`	N9K	Spine
	`interface ethernet 1/10` `  ip pim bfd-instance`	N9K	Spine
	`interface loopback<id>` `  ip pim sparse-mode`	N9K	Leaf

Mapping Layer 2 VNI VXLAN segment to ASM group	interface nve<id>
	  member vni <L2-VNID>
	  mcast-group 239.239.0.1
	  member vni <L2-VNID>
	  mcast-group 239.239.0.2
		N9K	Leaf

PIM Anycast RP (RFC 4610)	interface loopback18 ip pim sparse-mode	N9K	Leaf
	interface loopback17 ip pim sparse-mode	N9K	Leaf
	ip pim rp-address <loopback18> group-list 239.239.0.0/16	N9K	Leaf
Multicast configuration for Leaf	ip pim rp-address <anycast-loopback> group-list 239.239.0.0/16	N9K	Leaf
	feature pim ip pim log-neighbor-changes	N9K	Leaf
	interface loopback17 ip pim sparse-mode	N9K	Leaf

	interface ethernet<slot>/<port>
	  ip pim sparse-mode
	  ip pim bfd-instance
		N9K	Leaf

	interface nve1
	member vni <L2-VNID>
	  mcast-group 239.64.64.1
	member vni <L2-VNID>
	  mcast-group 239.64.64.2
		N9K	Leaf

	ip pim rp-address <anycast-loopback> group-list 239.239.0.0/16	N9K	Leaf
Multicast configuration for Spine	feature pim ip pim log-neighbor-changes	N9K	Spine
	interface ethernet 1/10 ip pim sparse-mode	N9K	Spine
	interface ethernet 1/10 ip pim bfd-instance	N9K	Spine
	interface loopback17 ip pim sparse-mode	N9K	Spine
	interface loopback18 ip pim sparse-mode	N9K	Spine
	ip pim rp-address <loopback18> group-list 239.239.0.0/16	N9K	Spine
	ip pim anycast-rp <loopback18> <loopback17>	N9K	Spine
Service Extensions for OSPF routing	vlan 17 vn-segment 10019	N9K	
	interface Vlan17 mtu 9216 vrf member VRF-MEMBER-1 ip ospf cost 10 ip ospf passive-interface ip router ospf 1 area 0.0.0.0	N9K	

Service Extensions for Static routing	`vrf context VRF-MEMBER-1`
	
	`ip route 0.0.0.0/0 Vlan1605 11.0.23.30`
		N9K	

Service Extension for default route injection on N9K BL/redistribute mode.	`router bgp 65002`
	`vrf VRF-MEMBER-1`
	`address-family ipv4 unicast`
	`network 0.0.0.0/0`
		N9K	

route-map	`route-map RM-IN-S2 permit 10`
	`match tag 1000`
	`route-map RM-IN-S3 permit 10`
	`match tag 1000`
		N9K	

	`route-map RM-S-to-O permit 10`
	`match tag 131 132 133 139 134 135`
	`set metric-type type-1`
		N9K	

vrf context RM-IN-S2	`vrf context RM-IN-S2` `ip route 9.59.207.0/24 Vlan1603 11.0.34.30 name qianyi-henfang tag 1000 50`	N9K	
	`vrf context RM-IN-S2` `ip route 9.59.207.0/24 Ethernet1/46.2 11.0.40.142 name qianyi-henfang tag 1000 10`	N9K	
	`vrf context RM-IN-S2` `ip route 10.0.0.0/12 Vlan1603 11.0.34.30 tag 1000 50`	N9K	
	`vrf context RM-IN-S2` `ip route 10.0.0.0/12 Ethernet1/46.2 11.0.40.142 tag 1000 10`	N9K	
	`vrf context RM-IN-S2` `ip route 10.2.52.0/24 Vlan6 10.2.42.3 tag 1000`	N9K	

	`vrf context RM-IN-S2`
	`ip route 192.168.0.0/16 Vlan1603 11.0.34.30`
	`name beimaluceshiwang tag 1000`
	`rd auto`
	`address-family ipv4 unicast`
	`route-target both auto`
	`route-target both auto evpn`
		N9K	

vrf context RM-OUT	`vrf context RM-OUT` `ip route 10.2.0.0/19 Vlan1607 11.0.34.14 tag 131 50`	N9K	
	`vrf context RM-OUT` `ip route 10.2.0.0/19 Ethernet1/45.1 11.0.40.145 tag 131 10`	N9K	
	`vrf context RM-OUT` `ip route 10.2.96.0/19 Vlan3203 11.0.39.14 tag 134`	N9K	

interface Vlan1601	interface Vlan1601
	no shutdown
	vrf member RM-IN-S3
	no ip redirects
	  ip address 11.0.34.34/28
	no ipv6 redirects
	hsrp version 2
	hsrp 1601
	    preempt
	   priority 110
	   ip 11.0.34.33
		N9K	

interface Vlanxx	interface Vlan1602 no shutdown vrf member VRF-MEMBER-IN-S2 no ip redirects no ipv6 redirects ip ospf cost 10 ip ospf passive-interface ip router ospf 100 area 0.0.0.0	N9K	

interface Ethernet
(IPv4 and IPv6)
	interface ex/y
	  mac aaaa.bbbb.cccc
	  vrf member WSN_LOOP
	  ip address x.x.x.x/31
	  ipv6 address x:x:x::x
	  ip policy route-map TO_VPER_OR_FW
	  ipv6 policy route-map TO_VPER_OR_FW_v6
	  no shut
		N7K	

interface Ethernet1/46.1	interface Ethernet1/36.1 mtu 1500	N9K	
	interface Ethernet1/36.1 encapsulation dot1q 1602 mac-address 0000.0000.2222 vrf member RM-IN-S3 no ip redirects ip address 11.0.40.145/30	N9K	
interface Ethernet1/47.1	interface Ethernet1/37.1 mtu 1500 encapsulation dot1q 1608 vrf member RM-OUT no ip redirects ip address 11.0.72.42/30 ip ospf dead-interval 20 ip ospf hello-interval 5 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0	N9K	

router ospf 1	router ospf 1
	vrf RM-IN-S2
	   router-id 55.2.32.5
	vrf RM-IN-S3
	   router-id 55.2.32.5
	vrf RM-OUT
	   router-id 55.2.32.5
	   redistribute static route-map RM-S-to-O
		N9K	

router bgp 65003	router bgp 65003
	vrf RM-IN-S2
	   address-family ipv4 unicast
	     advertise l2vpn evpn
	     redistribute direct route-map
	vts-subnet-policy
	     redistribute static route-map RM-IN-S2
		N9K	

	nv overlay evpn	N9K	
	clock protocol ntp vdc 1	N9K	

role name nsdcheck	role name nsdcheck rule 4 permit command show * rule 3 permit command terminal length * rule 2 permit command ping * rule 1 permit read	N9K	
	role name devcheck rule 8 permit command tac-pac * rule 7 permit command dir * rule 6 permit command ssh * rule 5 permit command traceroute * rule 4 permit command ping *	N9K	
	role name devopera rule 1 permit read-write	N9K	
ip name-server 55.6.8.73 55.22.8.3	ip name-server 55.6.8.73 55.22.8.3	N9K	
username	username user password 5 1lDuqR.60$eNzZ5I22WxJT58gdEm88N0 role network-operator	N9K	
	username vtsadmin password 5 5MmpswImI$vbZhP/52dNjHY5KWj4yBvmiDvuOZZ9gd2vo2oZc61b4 role network-admin	N9K	
	username nsdcheck password 5 5dpIXMjZs$jDIZVf6grMu1yq79vTts2mcgPlt0QWp5z3tDnw3N5W8 role nsdcheck	N9K	
snmp-server	snmp-server source-interface trap loopback1	N9K	
	snmp-server user user network-operator auth md5 0x3eaa4221f6bbf8722cbdea7ea6bf2f11 priv 0x3eaa4221f6bbf8722cbdea7ea6bf2f11 localizedkey	N9K	
	snmp-server host 55.6.8.1 traps version 2c COMMUNITY1 snmp-server host 55.6.8.1 use-vrf default	N9K	
	snmp-server enable traps bgp snmp-server enable traps ospf snmp-server enable traps callhome event-notify snmp-server enable traps callhome smtp-send-fail snmp-server enable traps cfs state-change-notif snmp-server enable traps lldp lldpRemTablesChange snmp-server enable traps aaa server-state-change snmp-server enable traps hsrp state-change snmp-server enable traps feature-control FeatureOpStatusChange snmp-server enable traps sysmgr cseFailSwCoreNotifyExtended snmp-server enable traps config ccmCLIRunningConfigChanged snmp-server enable traps snmp authentication snmp-server enable traps link cisco-xcvr-mon-status-chg snmp-server enable traps vtp notifs snmp-server enable traps vtp vlancreate snmp-server enable traps vtp vlandelete snmp-server enable traps bridge newroot snmp-server enable traps bridge topologychange snmp-server enable traps stpx inconsistency snmp-server enable traps stpx root-inconsistency snmp-server enable traps system Clock-change-notification snmp-server enable traps feature-control ciscoFeatOpStatusChange	N9K	
	snmp-server community COMMUNITY1 group network-operator	N9K	

ntp	ntp source-interface loopback0 ntp logging	N9K	
ip pim	ip pim ssm range 232.0.0.0/8	N9K	
spanning-tree	spanning-tree pathcost method long spanning-tree mst 1 priority 4096 spanning-tree mst configuration name CFG01 revision 1 instance 1 vlan 1-4094	N9K	
hardware	hardware access-list tcam region qos 0	N9K	
vpc domain	vpc domain 151 peer-keepalive destination 55.2.34.2 source 55.2.34.1 vrf default	N9K	
	vpc domain 151 auto-recovery	N9K	
interface vlan	interface Vlan1602 no shutdown vrf member VRF-MEMBER-IN-S2 no ip redirects fabric forwarding mode anycast-gateway	N9K	
interface port-channel	interface port-channel101 no switchport mtu 9216 no ip redirects ip address 55.2.36.2/30 ip ospf cost 10 ip ospf dead-interval 20 ip ospf hello-interval 5 ip ospf network point-to-point ip router ospf 1 area 0.0.0.0 ip pim sparse-mode	N9K	
interface Ethernet	interface Ethernet1/45 no switchport mtu 9216 mac-address 0000.0000.1111	N9K	
	interface Ethernet1/47 no switchport mtu 9216 udld enable	N9K	
	interface Ethernet2/5 switchport mode trunk switchport trunk allowed vlan 2-4094 channel-group 21 mode active	N9K	

interface mgmt0	`interface mgmt0`
	`no lldp transmit`
	`no lldp receive`
		N9K	

clock timezone	`clock timezone PRC 8 0`	N9K	
ip route	`ip route 0.0.0.0/0 Ethernet1/46.452 55.6.34.198 tag 1000 10` `ip route 0.0.0.0/0 Vlan3903 55.6.40.14 tag 1000 50`	N9K	
router ospf	`router ospf 1` `redistribute static route-map RM-S-to-O`	N9K	

router bgp	`router bgp 65003`
	`router-id 55.2.32.5`
	`address-family ipv4 unicast`
	`address-family l2vpn evpn`
	`neighbor 55.2.32.1`
	`remote-as 65003`
	`update-source loopback1`
	`address-family ipv4 unicast`
	`address-family l2vpn evpn`
	`send-community extended`
		N9K	

router bgp
(IPv4 only)
	`router bgp 65004`
	`router-id 192.168.0.25`
	`log-neighbor-changes`
	`address-family ipv4 unicast`
	`maximum-paths 32`
	`maximum-paths ibgp 32`
	`address-family ipv6 unicast`
	`maximum-paths 32`
	`maximum-paths ibgp 32`
	`address-family l2vpn evpn`
	`neighbor 192.168.0.3`
	`remote-as 65004`
	`password 3 2b7cf4643b66b222`
	`update-source loopback17`
	`address-family l2vpn evpn`
	`send-community`
	`send-community extended`
		N9K and N7K	

Event manager config
(IPv4 and IPv6)
	`event manager applet TRACK-PING-FOR-BGP-DOWN`
	`event track 1 state down`
	`action 1.0 syslog msg CANNOT PING FW. GOING TO SHUTDOWN BGP PEER`
	`action 2.0 cli config term`
	`action 3.0 cli router bgp 65004`
	`action 4.0 cli vrf WSN`
	`action 5.0 cli neighbor 175.175.175.175`
	`action 6.0 cli shutdown`
	`event manager applet TRACK-PING-FOR-BGP-UP`
	`event track 1 state up`
	`action 1.0 syslog msg CAN PING FW. GOING TO NO SHUTDOWN BGP PEER`
	`action 2.0 cli config term`
	`action 3.0 cli router bgp 65004`
	`action 4.0 cli vrf WSN`
	`action 5.0 cli neighbor 175.175.175.175`
	`action 6.0 cli no shutdown`
		N9K	

IP sla config (IPv4 only for N9K) (IPv4 and IPv6 for N7K)		N9K and N7K	

	!On BL-1 Track the local VPER-1
	ip sla 1
	  icmp-echo 69.83.32.36 source-interface vlan 2400
	
	  vrf WSN_LOOP ☐ forward reference to VRF
	  threshold 500
	  timeout 500
	  frequency 1
	! Start the SLAs
	ip sla schedule 1 life forever start-time now
	
	! Setup a track object for sla 1
	track 1 ip sla 1 reachability
	 delay up 180 down 3
	
	! Set up a track open that returns a DOWN only if
	 both objects 1 and 2 are down.
	track 111 list boolean or
	  object 1		

Track config (IPv4 and IPv6)	track 10 ip route 0.0.0.0/0 reachability vrf member WSN	N9K and N7K	

Interface port channel
(IPv4 and IPv6)
	interface port-channel 110.2511
	  encapsulation dot1q 2511
	  vrf member WSN_LOOP
	  ip address 69.83.28.32/31
	  no shut
	interface port-channel 110.2575
	  encapsulation dot1q 2575
	  vrf member WSN_LOOP
	  ipv6 address 2001:4888:16:2078:1e1:2a1::/64
		N9K and N7K	

	interface port-channel 110.2577
	  ip policy route-map FROM_VPER
	
	interface port-channel 110.2577
	  ipv6 policy route-map FROM_VPERv6
	! EEM to track both VPERs, when one is up restore
	 traffic
	event manager applet VPER_TRACK_UP
	  event track 111 state up
	  action 1.0 syslog msg "BOTH VPERS ARE UP.
	REMOVING BYPASS!"
	  action 2.0 cli command "config t"
	  action 3.0 cli command "route-map TO_VPER_OR_FW
	 permit 20"
	  action 4.0 cli command "no continue 30"
	  action 5.0 cli command "exit"
	  action 6.0 cli command "route-map TO_VPER_OR_FWv6
	 permit 20"
	  action 7.0 cli command "no continue 30"
	  action 8.0 cli command "exit"
	  action 9.0 cli command "route-map
	FROM_FW_TO_VPER_OR_MOBILE permit 10"
	  action 10.0 cli command "no continue 20"
	  action 11.0 cli command "end"
	  action 12.0 cli command "route-map
	FROM_FW_TO_VPER_OR_MOBILEv6 permit 10"
	  action 13.0 cli command "no continue 20"
	  action 14.0 cli command "end"
	  action 15.0 syslog msg "TRAFFIC HAS BEEN RESTORED
	 TO VPER"
		N7K	

		N9K	

	! EEM to track both VPERs, when one is up restore traffic
	event manager applet VPER_TRACK_UP
	  event track 111 state up
	  action 1.0 syslog msg BOTH VPERS ARE UP. REMOVING BYPASS
	  action 2.0 cli command "config t"
	  action 3.0 cli command "route-map TO_VPER_OR_FW permit 20"
	  action 4.0 cli command "no continue 30"
	  action 5.0 cli command "exit"
	  action 6.0 cli command "route-map TO_VPER_OR_FWv6 permit 20"
	  action 7.0 cli command "no continue 30"
	  action 8.0 cli command "exit"
	  action 9.0 cli command "route-map FROM_FW_TO_VPER_OR_MOBILE permit 10"
	  action 10.0 cli command "no continue 20"
	  action 11.0 cli command "end"
	  action 12.0 cli command "route-map FROM_FW_TO_VPER_OR_MOBILEv6 permit 10"
	  action 13.0 cli command "no continue 20"
	  action 14.0 cli command "end"
	  action 15.0 syslog msg TRAFFIC HAS BEEN RESTORED TO VPER		

IP access list
(IPv4 and IPv6)
	ip access-list ALL_POOLS
	  10 permit ip 1.0.0.0/8 any
	  20 permit ip any 1.0.0.0/8
	  30 permit ip 2.0.0.0/8 any
	  40 permit ip any 2.0.0.0/8
	
	! Need to configure a ACL for all All POOLS
	ipv6 access-list ALL_POOLSv6
	  10 permit ipv6 2001:1::/32 any
	  20 permit ipv6 any 2001:1::/32
	  30 permit ipv6 2001:2::/32 any
	  40 permit ipv6 any 2001:2::/32
		N9K and N7K	

Route-map
(IPv4 and IPv6)
	set ip next-hop verify-availability 69.83.32.35 track 2
	route-map TO_VPER_OR_FW permit 30
	  match ip address ALL_POOLS
	  ! Set the ip next-hop to the FW VIP
	  set ip next-hop 69.83.136.129
	
	route-map TO_VPER_OR_FW_v6 permit 10
	! Leave room here for the pilot packets
	route-map TO_VPER_OR_FW_v6 permit 20
	  match ipv6 address VPER_POOLSv6
	  set ipv6 next-hop verify-availability 2001:4888:16:2078:1e1:210:: track 1
	  set ipv6 next-hop verify-availability 2001:4888:16:207a:1e1:210:: track 2
	route-map TO_VPER_OR_FW_v6 permit 30
	  match ipv6 address ALL_POOLSv6
	  ! Set the ipv6 next-hop to the FW VIP
	  set ipv6 next-hop 2001:4888:39:3080:308:25::
		N9K and N7K	

	route-map FROM_FW_TO_VPER_OR_MOBILE permit 10
	  match ip address VPER_POOLS
	  set vrf WSN_VPER
		N7K	

Monitor erspan	monitor session 1 type erspan-source
	  erspan-id 5
	  vrf TEST
	  ip ttl 25
	  ip dscp 42
	
	monitor erspan origin ip-address 10.0.0.1 global
		N9K and N7K	

QOS- class-map	class-map type qos match-any TEST1 match packet length 5	N9K and N7K	

QOS class-map policy-map	class-map type control-plane match-any vzw-copp-system-p-class-exception
	  match exception ip option
	  match exception ip icmp unreachable
	  match exception ipv6 option
	  match exception ipv6 icmp unreachable
	class-map type control-plane match-any vzw-copp-system-p-class-fcoe
	  match access-group name vzw-copp-system-p-acl-mac-fcoe
	
	policy-map type control-plane vzw-copp-system-p-policy-strict
	  class vzw-copp-system-p-class-exception
	  set cos 1
	  police cir 360 kbps bc 250 ms conform transmit violate drop
	  class vzw-copp-system-p-class-fcoe
	  set cos 6
	  police cir 1060 kbps bc 1000 ms conform transmit violate drop		