



Supported Underlay Configuration Examples

This appendix provides examples of supported underlay template configuration.

- [Supported Underlay Configuration Examples, on page 1](#)

Supported Underlay Configuration Examples

Configuration Area	Sample Configuration	Device Type	Device Role
Note Prerequisite: You should enable the following configuration for the device configuration to work.	<pre>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</pre>		
UNDERLAY IGP ROUTING OSPF routing process	<pre>router ospf 10</pre>	N9K	Leaf
	<pre>router ospf 10</pre>	ASR9K	DCI
OSPF Area	<pre>interface ethernet 1/5 ip ospf router 10 area 0.0.0.0</pre>	N9K	Leaf
	<pre>interface ethernet 1/5 ip ospf router 10 area 0.0.0.0</pre>	N9K	Leaf
	<pre>router ospf 10 area 0</pre>	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	ASPK	DCI
OSPF auto-cost reference	router ospf 10 ! auto-cost reference-bandwidth 800000	ASPK	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	ASPK	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	ASPK	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	ASPK	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	ASPK	DCI
OSPF BFD (per-link)	feature bfd router ospf 10 bfd	N9K	Leaf
	interface Ethernet1/5 no ip redirects	N9K	Leaf

	<pre>router ospf 10 bfd minimum-interval 150 bfd multiplier 3 area 0 interface TenGigE0/0/2/1 bfd fast-detect</pre>	AS9K	DCI
	<pre>interface vlan 10 no bfd echo</pre>	N9K	Leaf
Multicast Routing	<pre>feature pim</pre>	N9K	Leaf
	<pre>interface loopback1 ip address 10.10.10.10/24 ip router ospf 10 area 0.0.0.0 ip pim sparse-mode</pre>	N9K	Spine
	<pre>ip pim rp-address 10.218.20.250 group-list 239.255.0.0/16 override</pre>	N9K	Spine
	<pre>ip pim anycast-rp 10.218.20.250 10.218.20.249 ip pim anycast-rp 10.218.20.250 10.218.20.248</pre>	N9K	Spine
	<pre>feature pim</pre>	N9K	Leaf
	<pre>ip pim rp-address 10.218.20.250 group-list 239.255.0.0/16 override</pre>	N9K	Leaf
	<pre>interface Vlan10 ip pim sparse-mode</pre>	N9K	Leaf
	<pre>interface loopback0 ip pim sparse-mode</pre>	N9K	Leaf
	<pre>interface Ethernet2/1 ip pim sparse-mode</pre>	N9K	Leaf
	<pre>interface Ethernet2/2 ip pim sparse-mode</pre>	N9K	Leaf
L2 Technologies	<pre>interface Ethernet 1/10 switchport mode trunk</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 switchport trunk allowed vlan none</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 spanning-tree port type edge trunk</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 spanning-tree bpduguard enable</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 spanning-tree bpdufilter enable</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 storm-control broadcast level 20.0</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 storm-control multicast level 30.0</pre>	N9K	Leaf
	<pre>interface Ethernet 1/10 storm-control unicast level 50.0</pre>	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 10.10.10.10/24 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-channell 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-channell 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 bpdfilter enable	N9K	
	interface port-channel 10 spanning-tree bpdguard 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 bpdguard enable	N9K	Leaf
	interface Ethernet 1/10 spanning-tree bpdfilter enable	N9K	Leaf
	interface Ethernet 1/10 channel-group 10 mode active	N9K	Leaf
	interface loopback 0 ip address 10.10.10.10/24	N9K	Leaf
	interface loopback 0 ip address 10.10.10.10/24 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 10.10.10.10/24	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	ASXK	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 10.10.10.10/24	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_001.4lgebz_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

	<pre>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</pre>	N9K	Leaf
	<pre>snmp-server source-interface trap mgmt0</pre>	N9K	Leaf
	<pre>snmp-server community <community> group network-admin</pre>	N9K	Leaf
	<pre>15 permit ip host 213.74.197.43 any ... 390 permit ip host 176.43.250.25 any</pre>	N9K	Leaf
LLDP on Nexus 9000	<pre>feature lldp</pre>	N9K	Leaf
Network Security Disable IP Redirects	<pre>interface Ethernet slot#/port# no ip redirects no ipv6 redirects</pre>	N9K	Leaf
Device Access Security	<pre>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> !</pre>	N9K	Leaf
AAA-N	<pre>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 <demo_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</pre>	N9K	Leaf
	<pre>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 !</pre>	N9K	Leaf

	<pre> 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 </pre>	N9K	Leaf
Device Hardening 3.9.9.4 COPP policy and class maps	<pre> 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 </pre>	N9K	Leaf
	<pre> class copp-system-p-class-critical set cos 7 police cir 19000 pps bc 128 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-important set cos 6 police cir 3000 pps bc 128 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-multicast-router set cos 6 police cir 3000 pps bc 128 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-management set cos 2 police cir 3000 pps bc 32 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-multicast-host set cos 1 police cir 2000 pps bc 128 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-l3mc-data set cos 1 police cir 3000 pps bc 32 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-normal set cos 1 police cir 1500 pps bc 32 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-ndp set cos 6 police cir 1500 pps bc 32 packets conform transmit violate drop </pre>	N9K	Leaf
	<pre> class copp-system-p-class-normal-dhcp set cos 1 police cir 300 pps bc 32 packets conform transmit violate drop </pre>	N9K	Leaf

	<pre>class copp-system-p-class-normal-dhcp-relay-response set cos 1 police cir 400 pps bc 64 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-normal-igmp set cos 3 police cir 6000 pps bc 64 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-redirect set cos 1 police cir 1500 pps bc 32 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-exception set cos 1 police cir 50 pps bc 32 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-exception-diag set cos 1 police cir 50 pps bc 32 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-monitoring set cos 1 police cir 300 pps bc 128 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-12-unpoliced set cos 7 police cir 20000 pps bc 8192 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-undesirable set cos 0 police cir 15 pps bc 32 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-fcoe set cos 6 police cir 1500 pps bc 128 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-nat-flow set cos 7 police cir 100 pps bc 64 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class copp-system-p-class-12-default set cos 0 police cir 50 pps bc 32 packets conform transmit violate drop</pre>	N9K	Leaf
	<pre>class class-default set cos 0 police cir 50 pps bc 32 packets conform transmit violate drop</pre>	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 65539 vrf <demo_name> address-family ipv4 unicast	N9K	Leaf
	router bgp 65539 vrf <demo_name> local-as 65539	N9K	Leaf
	router bgp 65539 vrf <demo_name> neighbor 10.23.65.0 remote-as 65541 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

	<code>ip pim rp-address <anycast-loopback> group-list 239.239.0.0/16</code>	N9K	Leaf
Multicast configuration for Spine	<code>feature pim ip pim log-neighbor-changes</code>	N9K	Spine
	<code>interface ethernet 1/10 ip pim sparse-mode</code>	N9K	Spine
	<code>interface ethernet 1/10 ip pim bfd-instance</code>	N9K	Spine
	<code>interface loopback17 ip pim sparse-mode</code>	N9K	Spine
	<code>interface loopback18 ip pim sparse-mode</code>	N9K	Spine
	<code>ip pim rp-address <loopback18> group-list 239.239.0.0/16</code>	N9K	Spine
	<code>ip pim anycast-rp <loopback18> <loopback17></code>	N9K	Spine
Service Extensions for OSPF routing	<code>vlan 17 vn-segment 10019</code>	N9K	
	<code>interface Vlan17 mtu 9216 vrf member <demo_name> ip ospf cost 10 ip ospf passive-interface ip router ospf 1 area 0.0.0.0</code>	N9K	
Service Extensions for Static routing	<code>vrf context <demo_name> ip route 0.0.0.0/0 Vlan1605 11.0.23.30</code>	N9K	
Service Extension for default route injection on N9K BL/redistribute mode.	<code>router bgp 65542 vrf <demo_name> address-family ipv4 unicast network 0.0.0.0/0</code>	N9K	
route-map	<code>route-map RM-IN-S2 permit 10 match tag 1000 route-map RM-IN-S3 permit 10 match tag 1000</code>	N9K	
	<code>route-map RM-S-to-O permit 10 match tag 131 132 133 139 134 135 set metric-type type-1</code>	N9K	
vrf context <demo_name>	<code>vrf context <demo_name> ip route 9.59.207.0/24 Vlan1603 11.0.34.30 name <test_name> tag 1000 50</code>	N9K	
	<code>vrf context <demo_name> ip route 9.59.207.0/24 Ethernet1/46.2 11.0.40.142 name <test_name> tag 1000 10</code>	N9K	
	<code>vrf context <demo_name> ip route 10.0.0.0/12 Vlan1603 11.0.34.30 tag 1000 50</code>	N9K	

	<pre>vrf context <demo_name> ip route 10.0.0.0/12 Ethernet1/46.2 11.0.40.142 tag 1000 10</pre>	N9K	
	<pre>vrf context <demo_name> ip route 10.2.52.0/24 Vlan6 10.2.42.3 tag 1000</pre>	N9K	
	<pre>vrf context <demo_name> ip route 192.168.0.0/16 Vlan1603 11.0.34.30 name <test_name> tag 1000 rd auto address-family ipv4 unicast route-target both auto route-target both auto evpn</pre>	N9K	
vrf context <demo_name>	<pre>vrf context <demo_name> ip route 10.2.0.0/19 Vlan1607 11.0.34.14 tag 131 50</pre>	N9K	
	<pre>vrf context <demo_name> ip route 10.2.0.0/19 Ethernet1/45.1 11.0.40.145 tag 131 10</pre>	N9K	
	<pre>vrf context <demo_name> ip route 10.2.96.0/19 Vlan3203 11.0.39.14 tag 134</pre>	N9K	
interface Vlan1601	<pre>interface Vlan1601 no shutdown vrf member <demo_name> no ip redirects ip address 10.10.10.10/24 no ipv6 redirects hsrp version 2 hsrp 1601 preempt priority 110 ip 11.0.34.33</pre>	N9K	
interface Vlanxx	<pre>interface Vlan1602 no shutdown vrf member <demo_name> no ip redirects no ipv6 redirects ip ospf cost 10 ip ospf passive-interface ip router ospf 100 area 0.0.0.0</pre>	N9K	
interface Ethernet (IPv4 and IPv6)	<pre>interface ex/y mac aaa.bbbb.cccc vrf member <demo_name> 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</pre>	N7K	
interface Ethernet1/46.1	<pre>interface Ethernet1/36.1 mtu 1500</pre>	N9K	

	<pre>interface Ethernet1/36.1 encapsulation dot1q 1602 mac-address 0000.0000.2222 vrf member <demo_name> no ip redirects ip address 10.10.10.10/24</pre>	N9K	
interface Ethernet1/47.1	<pre>interface Ethernet1/37.1 mtu 1500 encapsulation dot1q 1608 vrf member <demo_name> no ip redirects ip address 10.10.10.10/24 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</pre>	N9K	
router ospf 1	<pre>router ospf 1 vrf <demo_name> router-id 55.2.32.5 vrf <demo_name> router-id 55.2.32.5 vrf <demo_name> router-id 55.2.32.5 redistribute static route-map RM-S-to-O</pre>	N9K	
router bgp 65543	<pre>router bgp 65543 vrf <demo_name> address-family ipv4 unicast advertise l2vpn evpn redistribute direct route-map vts-subnet-policy redistribute static route-map RM-IN-S2</pre>	N9K	
	nv overlay evpn	N9K	
	clock protocol ntp vdc 1	N9K	
role name nsdcheck	<pre>role name nsdcheck rule 4 permit command show * rule 3 permit command terminal length * rule 2 permit command ping * rule 1 permit read</pre>	N9K	
	<pre>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 *</pre>	N9K	
	<pre>role name devopera rule 1 permit read-write</pre>	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	<pre>username user password 5 \$1\$lDuqR.60\$eNzZ5I22WxJT58gdEm88N0 role network-operator</pre>	N9K	

	username vtsadmin password 5 \$5\$MmpswImI\$vbZhP/52dNjHY5KWj4yBvmiDvuOZZ9gd2vo2oZc61b4 role network-admin	N9K	
	username nsdcheck password 5 \$5\$dpIXMjZs\$jDIZVf6grMulyq79vTts2mcgPlt0QWp5z3tDnw3N5W8 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 <demo_name> no ip redirects fabric forwarding mode anycast-gateway	N9K	
interface port-channel	interface port-channel101 no switchport mtu 9216 no ip redirects ip address 10.10.10.10/24 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 65543 router-id 55.2.32.5 address-family ipv4 unicast address-family l2vpn evpn neighbor 55.2.32.1 remote-as 65543 update-source loopback1 address-family ipv4 unicast address-family l2vpn evpn send-community extended	N9K	

<p>router bgp (IPv4 only)</p>	<pre>router bgp 65539 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 65539 password 3 2b7cf4643b66b222 update-source loopback17 address-family l2vpn evpn send-community send-community extended</pre>	<p>N9K and N7K</p>	
<p>Event manager config (IPv4 and IPv6)</p>	<pre>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 65539 action 4.0 cli vrf <demo_name> 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 65539 action 4.0 cli vrf <demo_name> action 5.0 cli neighbor 175.175.175.175 action 6.0 cli no shutdown</pre>	<p>N9K</p>	
<p>IP sla config (IPv4 only for N9K) (IPv4 and IPv6 for N7K)</p>	<pre>!On BL-1 Track the local VPER-1 ip sla 1 icmp-echo 69.83.32.36 source-interface vlan 2400 vrf <demo_name> □ 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</pre>	<p>N9K and N7K</p>	
<p>Track config (IPv4 and IPv6)</p>	<pre>track 10 ip route 0.0.0.0/0 reachability vrf member <demo_name></pre>	<p>N9K and N7K</p>	

Interface port channel (IPv4 and IPv6)	<pre>interface port-channel 110.2511 encapsulation dot1q 2511 vrf member <demo_name> ip address 10.10.10.10/24 no shut interface port-channel 110.2575 encapsulation dot1q 2575 vrf member <demo_name> ipv6 address 10:10:10:10:10:10:10:10/64</pre>	N9K and N7K	
	<pre>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 l1l 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"</pre>	N7K	

	<pre>! 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</pre>	N9K	
IP access list (IPv4 and IPv6)	<pre>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</pre>	N9K and N7K	
Route-map (IPv4 and IPv6)	<pre>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::</pre>	N9K and N7K	
	<pre>route-map FROM_FW_TO_VPER_OR_MOBILE permit 10 match ip address VPER_POOLS set vrf <demo_name>_VPER</pre>	N7K	

Monitor erspan	<pre>monitor session 1 type erspan-source erspan-id 5 vrf <demo_name> ip ttl 25 ip dscp 42 monitor erspan origin ip-address 10.0.0.1 global</pre>	N9K and N7K	
QOS- class-map	<pre>class-map type qos match-any TEST1 match packet length 5</pre>	N9K and N7K	
QOS class-map policy-map	<pre>class-map type control-plane match-any cust1-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 cust1-copp-system-p-class-fcoe match access-group name cust1-copp-system-p-acl-mac-fcoe policy-map type control-plane cust1-copp-system-p-policy-strict class cust1-copp-system-p-class-exception set cos 1 police cir 360 kbps bc 250 ms conform transmit violate drop class cust1-copp-system-p-class-fcoe set cos 6 police cir 1060 kbps bc 1000 ms conform transmit violate drop</pre>		
Tunnel Interface	<pre>interface Tunnel1 vrf member <demo_name> ip address 10.10.10.10/24 tunnel source 1.1.1.201 tunnel destination 1.1.1.200 no shutdown</pre>	N9K and N7K	