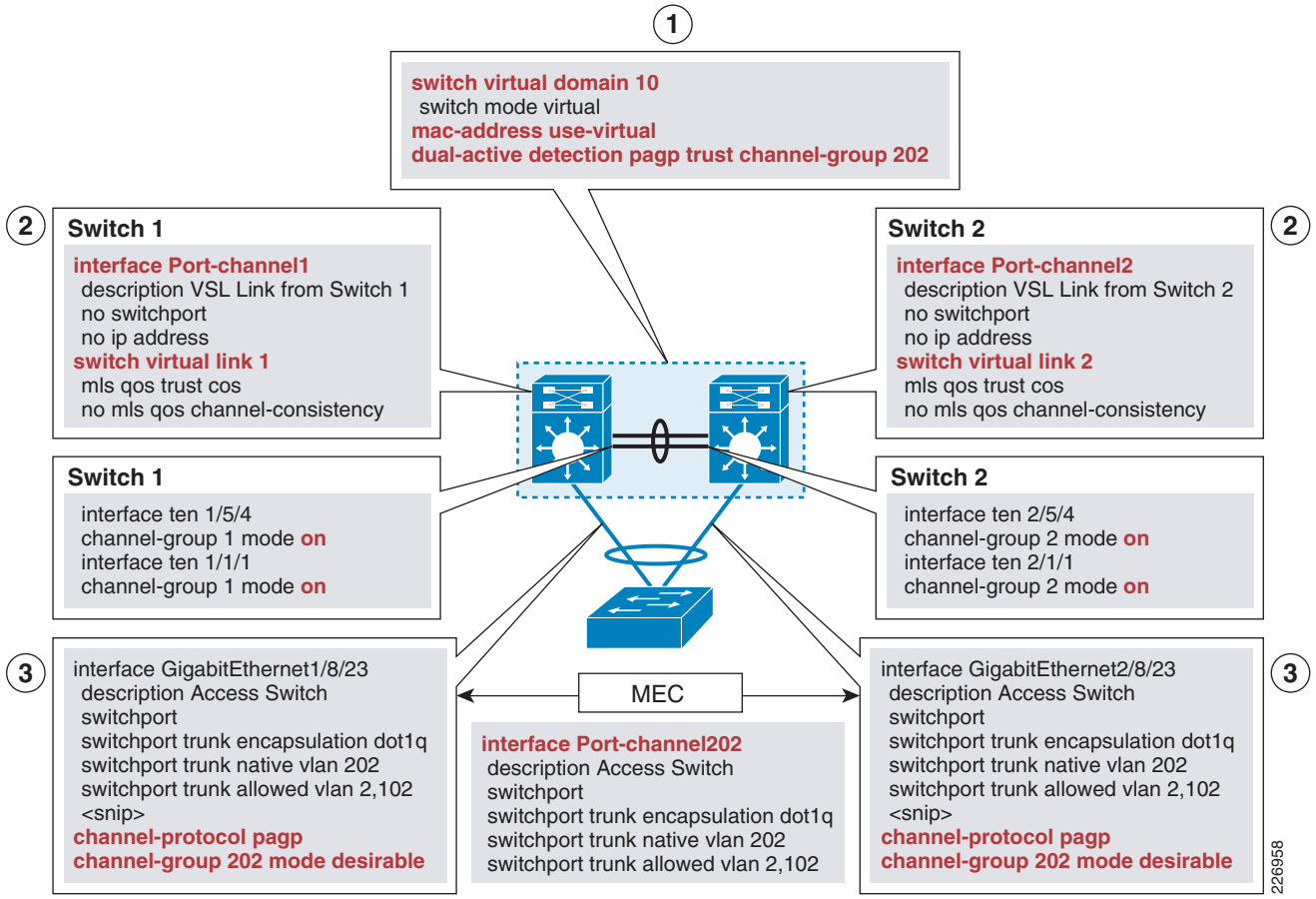
APPENDIX A

VSS-Enabled Campus Best Practice Configuration Example

Figure A-1 illustrates the baseline best practice configuration required to set up basic VSS enabled network. The circle indicates the essential steps required to create the VSS systems from standalone. The `red` text highlights the important CLI information with VSS configuration. Comments are provided in *`blue italic`* font.

Figure A-1 Overall VSS-Enabled Campus Best Practice Configuration Summary



End-to-End Device Configurations

The end-to-end devices configuration is categorized into three major sections. Each section configuration contains specific CLI which is a required as part of best practice configuration and corresponding explanation.

- VSS and L2 Domain- Includes above base configuration as well as L2 domain configuration
- Access-layer- Sample L2 domain configuration
- L3 Domain - Includes global L3 configuration for VSS and core routers. Then separate section for specifics topologies (ECMP and MEC) for EIGRP and OSPF. In addition, the core devices configuration shown below are standalone router/devices.

VSS Specific

VSS Global Configuration

```
switch virtual domain 10 ! Must configure unique domain ID
 switch mode virtual
 switch 1 priority 110 ! Not needed, helps in operational mgmt
 switch 2 priority 100 ! Not needed, helps in operational mgmt
 dual-active exclude interface GigabitEthernet1/5/3 ! Connectivity to VSS during dual
active
mac-address use-virtual ! Required for consistent MAC address
dual-active detection pagp trust channel-group 202 ! Enhanced PAgP based dual active
detection

redundancy ! Default SSO Enabled
 main-cpu
  auto-sync running-config
 mode sso
```

Switch 1

```
interface Port-channel1 ! Unique port-channel number for SW 1
 description VSL Link from Switch 1
 no switchport
 no ip address
switch virtual link 1 ! Defines switch ID for SW 1
 mls qos trust cos
 no mls qos channel-consistency

interface ten 1/5/4
channel-group 1 mode on ! EC mode is ON – EtherChannel Managemeent Protocol off
interface ten 1/1/1
channel-group 1 mode on
```

Switch 2

```
interface Port-channel2 ! Unique port-channel number for SW 1
 description VSL Link from Switch 2
 no switchport
 no ip address
switch virtual link 2 ! Defines switch ID for SW 2
 mls qos trust cos
 no mls qos channel-consistency

interface ten 2/5/4
```

```
channel-group 2 mode on ! EC mode is ON - EtherChannel Managemeent Protocoloff
interface ten 2/1/1
channel-group 2 mode on
```

Layer-2 Domain

VSS

```
udld enable
vtp domain campus-test
vtp mode transparent

spanning-tree mode rapid-pvst
no spanning-tree optimize bpdu transmission
spanning-tree extend system-id
spanning-tree vlan 2-999 priority 24576 !  STP Root

port-channel load-balance src-dst-mixed-ip-port !  Enhanced hash algorithem


vlan 400 !  VLANs spanning multiple access-layer SWs
 name L2_ Spaned_VLAN _400

vlan 450
 name L2_ Spaned_VLAN _450

vlan 500
 name L2_ Spaned_VLAN _500

vlan 550
 name L2_ Spaned_VLAN _550

vlan 600
 name L2_ Spaned_VLAN _600

vlan 650
 name L2_Spaned_VLAN_650

vlan 900
 name NetMgmt_VLAN_900

vlan 999
 name Unused_Port_VLAN_999

vlan 2
 name cr7-3750-Stack-Data-VLAN
!
vlan 102
 name cr7-3750-Stack-Voice-VLAN

interface Vlan2 ! Sample VLAN interface configuration
 ip address 10.120.2.1 255.255.255.0
 no ip redirects
 no ip unreachables
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 hold-queue 150 in
 hold-queue 150 out
!
```

VSS—Multi-Chassis EtherChannel

PAgP

```
interface GigabitEthernet1/8/23  !  Interface on SW 1
 description Access Switch Facing Interface
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
switchport mode dynamic desirable ! Trunk mod dynamic and desirable
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900 !  Only allow need VLANs
for a given trunk
logging event link-status !  Logging for link status
logging event trunk-status !  Logging for trunk status
logging event bundle-status !  Logging for port-channel status
 load-interval 30
 mls qos trust dscp
channel-protocol pagp
channel-group 202 mode desirable !  Define Port-channel, PAgP mode desirable


interface GigabitEthernet2/8/23  !  Interface on SW 2
 description Access Switch Facing Interface
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
switchport mode dynamic desirable
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 load-interval 30
 mls qos trust dscp
 load-interval 30
channel-protocol pagp
channel-group 202 mode desirable

interface Port-channel202  !  Automatically created by defining at interfaces
 description Access Switch MEC
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900
logging event link-status
logging event spanning-tree status ! STP logging enabled on port-channel
 load-interval 30
 mls qos trust dscp
 spanning-tree portfast ! Optional - helps during initialization
 hold-queue 2000 out
```

LACP

LACP Sample Configuration

```
interface GigabitEthernet1/8/23
 description Access Switch Facing Interface
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
switchport mode dynamic desirable
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900
logging event link-status
```

```
logging event trunk-status
logging event bundle-status
 load-interval 30
 mls qos trust dscp
 channel-protocol lacp
 channel-group 202 mode active
 hold-queue 2000 out

interface GigabitEthernet2/8/23
 description Access Switch Facing Interface
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
switchport mode dynamic desirable
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900
logging event link-status
logging event trunk-status
logging event bundle-status
 load-interval 30
 mls qos trust dscp
 channel-protocol lacp
 channel-group 202 mode active
 hold-queue 2000 out

interface Port-channel202 !  Automatically created by defining at interfaces
 description Access Switch MEC
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 202
 switchport trunk allowed vlan 2,102,400,450,500,550,600,650,900
logging event link-status
logging event spanning-tree status
 load-interval 30
 mls qos trust dscp
 spanning-tree portfast ! Optional - helps during initialization
 hold-queue 2000 out
```

Access-Layer Switch

Sample Configuration (Platform Specific Configuration Varies)

```
interface GigabitEthernet0/27
 description Uplink to VSS Switch Gig 1/8/24
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 203
switchport mode dynamic desirable
 switchport trunk allowed vlan 3,103,400,450,500,550,600,650,900
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 70 25 5
 srr-queue bandwidth shape  3  0  0  0
 priority-queue out
 mls qos trust dscp
channel-protocol pagp
channel-group 1 mode desirable

interface GigabitEthernet0/28
 description Uplink to VSS Switch Gig 2/8/24
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 203
```

```
 switchport trunk allowed vlan 3,103,400,450,500,550,600,650,900
 switchport mode dynamic desirable
 logging event link-status
 logging event trunk-status
 logging event bundle-status
 carrier-delay msec 0
 srr-queue bandwidth share 1 70 25 5
 srr-queue bandwidth shape  3  0  0  0
 priority-queue out
 mls qos trust dscp
channel-protocol pagp
channel-group 1 mode desirable


interface Port-channel1 !  Automatically created by defining at interfaces
 description EC Uplink to VSS
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 203
 switchport trunk allowed vlan 3,103,400,450,500,550,600,650,900
 switchport mode dynamic desirable
logging event link-status
logging event spanning-tree status
 carrier-delay msec 0
 spanning-tree portfast ! Optional - helps during initialization
```

Layer-3 Domain

The Layer 3 domain represents VSS interconnection to the core-layer. The core-layer devices configuration shown below are standalone router/switch.

Global Configuration

```
mls ip cef load-sharing <option> !  Apply Campus Best Practices
```

Multicast

VSS

```
ip multicast-routing
ip pim rp-address 10.122.100.1 GOOD-IPMC override !  RP mapping with filter

ip access-list standard GOOD-IPMC
 permit 224.0.1.39
 permit 224.0.1.40
 permit 239.192.240.0 0.0.3.255
 permit 239.192.248.0 0.0.3.255
```

Core 1 Standalone Router (No VSS)

Core RP ANYCAST - Primary

```
ip multicast-routing

interface Loopback0
 description MSDP PEER INT !  MSDP Loopback
 ip address 10.122.10.1 255.255.255.255
```

```
interface Loopback1
 description ANYCAST RP ADDRESS (PRIMARY) !  Anycast RP Primary
 ip address 10.122.100.1 255.255.255.255

interface Loopback2
 description Garbage-CAN RP
 ip address 2.2.2.2 255.255.255.255

interface Port-channel1 !  Core 1- Core2 L3 for MSDP
 description Channel to Peer Core Node
 dampening
 ip address 10.122.0.18 255.255.255.254
 ip pim sparse-mode
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp

ip access-list standard GOOD-IPMC
 permit 224.0.1.39
 permit 224.0.1.40
 permit 239.192.240.0 0.0.3.255
 permit 239.192.248.0 0.0.3.255

ip msdp peer 10.122.10.2 connect -source Loopback0 ! MSDP Configuration
ip msdp description 10.122.10.2 ANYCAST-PEER-6k-core-2
ip msdp cache -sa-state
ip msdp originator-id Loopback0
```

Core 2 Standalone Router (No VSS)

```
ip multicast-routing

interface Loopback0
 description MSDP PEER INT
 ip address 10.122.10.2 255.255.255.255

interface Loopback1
 description ANYCAST RP ADDRESS
 ip address 10.122.100.1 255.255.255.255 ! Secondary ANYCAST RP
 delay 600

interface Loopback2
 description Garbage-CAN RP
 ip address 2.2.2.2 255.255.255.255

interface Port-channel1
 description Channel to Peer Core node
 dampening
 ip address 10.122.0.19 255.255.255.254
 ip pim sparse-mode
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp

ip pim rp-address 10.122.100.1 GOOD-IPMC override
ip access-list standard GOOD-IPMC
 permit 224.0.1.39
 permit 224.0.1.40
 permit 239.192.240.0 0.0.3.255
 permit 239.192.248.0 0.0.3.255
```

```
ip msdp peer 10.122.10.1 connect-source Loopback0
ip msdp description 10.122.10.1 ANYCAST-PEER-6k-core-1
ip msdp cache-sa-state
ip msdp originator-id Loopback0
```

EIGRP MEC

VSS

```
router eigrp 100
 passive-interface default
 no passive-interface Port-channel200
 no passive-interface Port-channel201
 network 10.0.0.0
eigrp log-neighbor-warnings
eigrp log-neighbor-changes
 no auto-summary
 eigrp router-id 10.122.102.1
 eigrp event-log-size 3000
 nsf !  Enable NSF Capability

interface Port-channel200 !  Create L3 MEC Interface first
 description 20 Gig MEC to CORE-1 (cr2-6500-1 4/1-4/3)
 no switchport
 dampening
 ip address 10.122.0.26 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.125.0.0 255.255.0.0 5 !  Summarization for Access-subnets
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface Port-channel201
 description 20 Gig to CORE-2 (cr2-6500-1 4/1-4/3)
 no switchport
 dampening
 ip address 10.122.0.21 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.125.0.0 255.255.0.0 5
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet1/2/1
 description 10 GigE to Core 1
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 load-interval 30
 carrier-delay msec 0
```

```
 mls qos trust dscp
 channel-protocol pagp
 channel-group 200 mode desirable
 hold-queue 2000 in
 hold-queue 2000 out
!
interface TenGigabitEthernet1/2/2
 description 10 GigE to Core 2
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 channel-protocol pagp
 channel-group 201 mode desirable
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet2/2/1
 description to core 1
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 logging event spanning-tree status
 load-interval 30
 mls qos trust dscp
 channel-protocol pagp
 channel-group 200 mode desirable
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet2/2/2
 description 10 GigE to Core 2
 no switchport
 no ip address
 logging event link-status
 logging event bundle-status
 load-interval 30
 mls qos trust dscp
 channel-protocol pagp
 channel-group 201 mode desirable
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 1 Standalone Router (No VSS)

```
router eigrp 100
 passive-interface default
 no passive-interface Port-channel1
 no passive-interface Port-channel20
 no passive-interface Port-channel1221
 network 10.0.0.0
 no auto-summary
eigrp log-neighbor-warnings
eigrp log-neighbor-changes
eigrp event-log-size 3000

interface Port-channel20
 description 20 Gig MEC to VSS 1/2/1 2/2/1
```

```
 dampening
 ip address 10.122.0.27 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 2 Standalone Router (No VSS)

```
router eigrp 100
 passive-interface default
 no passive-interface Port-channel1
 no passive-interface Port-channel20
 no passive-interface Port-channel221
 network 10.0.0.0
 no auto-summary
eigrp log-neighbor-warnings
eigrp log-neighbor-changes
eigrp event-log-size 3000

interface Port-channel21
 description 20 Gig to VSS 1/2/2-2/2/2
 dampening
 ip address 10.122.0.20 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

EIGRP ECMP

VSS

```
router eigrp 100
 passive-interface default
 no passive-interface TenGigabitEthernet1/2/1
 no passive-interface TenGigabitEthernet1/2/2
 no passive-interface TenGigabitEthernet2/2/1
 no passive-interface TenGigabitEthernet2/2/2
 network 10.0.0.0
 no auto-summary
 eigrp router-id 10.122.102.1
 eigrp log-neighbor-warnings
 eigrp log-neighbor-changes
 eigrp event-log-size 3000
 nsf !  Enable NSF Capability

interface TenGigabitEthernet1/2/1
 description 10 GigE to Core 1
 no switchport
 dampening
```

```
 ip address 10.122.0.26 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface TenGigabitEthernet1/2/2
 description 10 GigE to Core 2
 no switchport
 dampening
 ip address 10.122.0.23 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet2/2/1
 description to Core 1
 no switchport
 dampening
 ip address 10.122.0.32 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface TenGigabitEthernet2/2/2
 description 10 GigE to Core 2
 no switchport
 dampening
 ip address 10.122.0.20 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip summary-address eigrp 100 10.120.0.0 255.255.0.0 5
 logging event link-status
 load-interval 30
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 1 Standalone Router (No VSS)

```
router eigrp 100
 passive-interface default
 no passive-interface TenGigabitEthernet4/1
 no passive-interface TenGigabitEthernet4/3
 network 10.0.0.0
 no auto-summary
```

```
eigrp log-neighbor-warnings
eigrp log-neighbor-changes
eigrp event-log-size 3000

interface TenGigabitEthernet4/1
 description To VSS Ten1/2/1
 dampening
 ip address 10.122.0.27 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet4/3
 description To VSS Ten2/2/1
 dampening
 ip address 10.122.0.33 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 logging event bundle-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 2 Standalone Router (No VSS)

```
router eigrp 100
 passive-interface default
 no passive-interface TenGigabitEthernet4/1
 no passive-interface TenGigabitEthernet4/3
 network 10.0.0.0
 no auto-summary
eigrp log-neighbor-warnings
eigrp log-neighbor-changes
eigrp event-log-size 3000

interface TenGigabitEthernet4/1
 description To VSS Ten 1/2/2
 dampening
 ip address 10.122.0.22 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out

interface TenGigabitEthernet4/3
 description To VSS Ten 2/2/2
 dampening
 ip address 10.122.0.21 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
```

```
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

OSPF MEC

VSS

```
router ospf 100
 router-id 10.122.0.235
 log-adjacency-changes detail
 auto-cost reference-bandwidth 20000 !  Optional
 nsf !  Enable NSF Capability
 area 120 stub no-summary
 area 120 range 10.120.0.0 255.255.0.0 cost 10
 area 120 range 10.125.0.0 255.255.0.0 cost 10
 passive-interface default
 no passive-interface Port-channel200
 no passive-interface Port-channel201
 network 10.120.0.0 0.0.255.255 area 120
 network 10.122.0.0 0.0.255.255 area 0
 network 10.125.0.0 0.0.255.255 area 120


interface Port-channel200
 description 20 Gig MEC to VSS (cr2-6500-1 4/1-4/3)
 no switchport
 dampening
 ip address 10.122.0.26 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface Port-channel201
 description 20 Gig to VSS (cr2-6500-1 4/1-4/3)
 no switchport
 dampening
 ip address 10.122.0.21 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 1 Standalone Router No VSS)

```
router ospf 100
 router-id 10.254.254.7
 log-adjacency-changes detail ! Helps in NSF Restart Activities
 auto-cost reference-bandwidth 20000 !  Optional
 passive-interface default
 no passive-interface Port-channel1
 no passive-interface Port-channel20
 network 10.122.0.0 0.0.255.255 area 0

interface Port-channel20
 description 20 Gig MEC to VSS 1/2/1 2/2/1
 dampening
 ip address 10.122.0.27 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 2 Standalone Router (No VSS)

```
router ospf 100
 router-id 10.254.254.7
 log-adjacency-changes detail
 auto-cost reference-bandwidth 20000 !  Optional
 passive-interface default
 no passive-interface Port-channel1
 no passive-interface Port-channel20
 network 10.122.0.0 0.0.255.255 area 0

interface Port-channel21
 description 20 Gig to VSS 1/2/2-2/2/2
 dampening
 ip address 10.122.0.20 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

OSPF ECMP

VSS

```
router ospf 100
 router-id 10.122.0.235
 log-adjacency-changes detail
 auto-cost reference-bandwidth 20000 !  Optional
 nsf !  Enable NSF Capability
 area 120 stub no-summary
```

```
 area 120 range 10.120.0.0 255.255.0.0 cost 10
 area 120 range 10.125.0.0 255.255.0.0 cost 10
 passive-interface default
 no passive-interface TenGigabitEthernet1/2/1
 no passive-interface TenGigabitEthernet1/2/2
 no passive-interface TenGigabitEthernet2/2/1
 no passive-interface TenGigabitEthernet2/2/2
 network 10.120.0.0 0.0.255.255 area 120
 network 10.122.0.0 0.0.255.255 area 0
 network 10.125.0.0 0.0.255.255 area 120


interface TenGigabitEthernet1/2/1
 description 10 GigE to Core 1
 no switchport
 dampening
 ip address 10.122.0.26 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface TenGigabitEthernet1/2/2
 description 10 GigE to Core 2
 no switchport
 dampening
 ip address 10.122.0.23 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!


interface TenGigabitEthernet2/2/1
 description to Core 1
 no switchport
 dampening
 ip address 10.122.0.32 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
interface TenGigabitEthernet2/2/2
 description 10 GigE to Core 2
 no switchport
 dampening
 ip address 10.122.0.20 255.255.255.254
 ip flow ingress
```

```
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 1 Standalone Router (No VSS)

```
router ospf 100
 router-id 10.254.254.7
 log-adjacency-changes detail
 auto-cost reference-bandwidth 20000 !  Optional
 passive-interface default
 no passive-interface GigabitEthernet2/5
 no passive-interface TenGigabitEthernet4/1
 no passive-interface TenGigabitEthernet4/3
 no passive-interface Port-channel1
 network 10.122.0.0 0.0.255.255 area 0


interface TenGigabitEthernet4/1
 description To VSS Ten1/2/1
 dampening
 ip address 10.122.0.27 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
!
interface TenGigabitEthernet4/3
 description To VSS Ten2/2/1
 dampening
 ip address 10.122.0.33 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```

Core 2 Standalone Router (No VSS)

```
router ospf 100
 router-id 10.254.254.7
 log-adjacency-changes detail
 auto-cost reference-bandwidth 20000 !  Optional
 passive-interface default
 no passive-interface GigabitEthernet2/5
 no passive-interface TenGigabitEthernet4/1
 no passive-interface TenGigabitEthernet4/3
 no passive-interface Port-channel1
 network 10.122.0.0 0.0.255.255 area 0
```

```
interface TenGigabitEthernet4/1
 description To VSS Ten 1/2/2
 dampening
 ip address 10.122.0.22 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
!
!
interface TenGigabitEthernet4/3
 description To VSS Ten 2/2/2
 dampening
 ip address 10.122.0.21 255.255.255.254
 ip flow ingress
 ip pim sparse-mode
 ip ospf network point-to-point
 logging event link-status
 load-interval 30
 carrier-delay msec 0
 mls qos trust dscp
 hold-queue 2000 in
 hold-queue 2000 out
```