

Routing
Switching
Tigers
Forum



MPLS



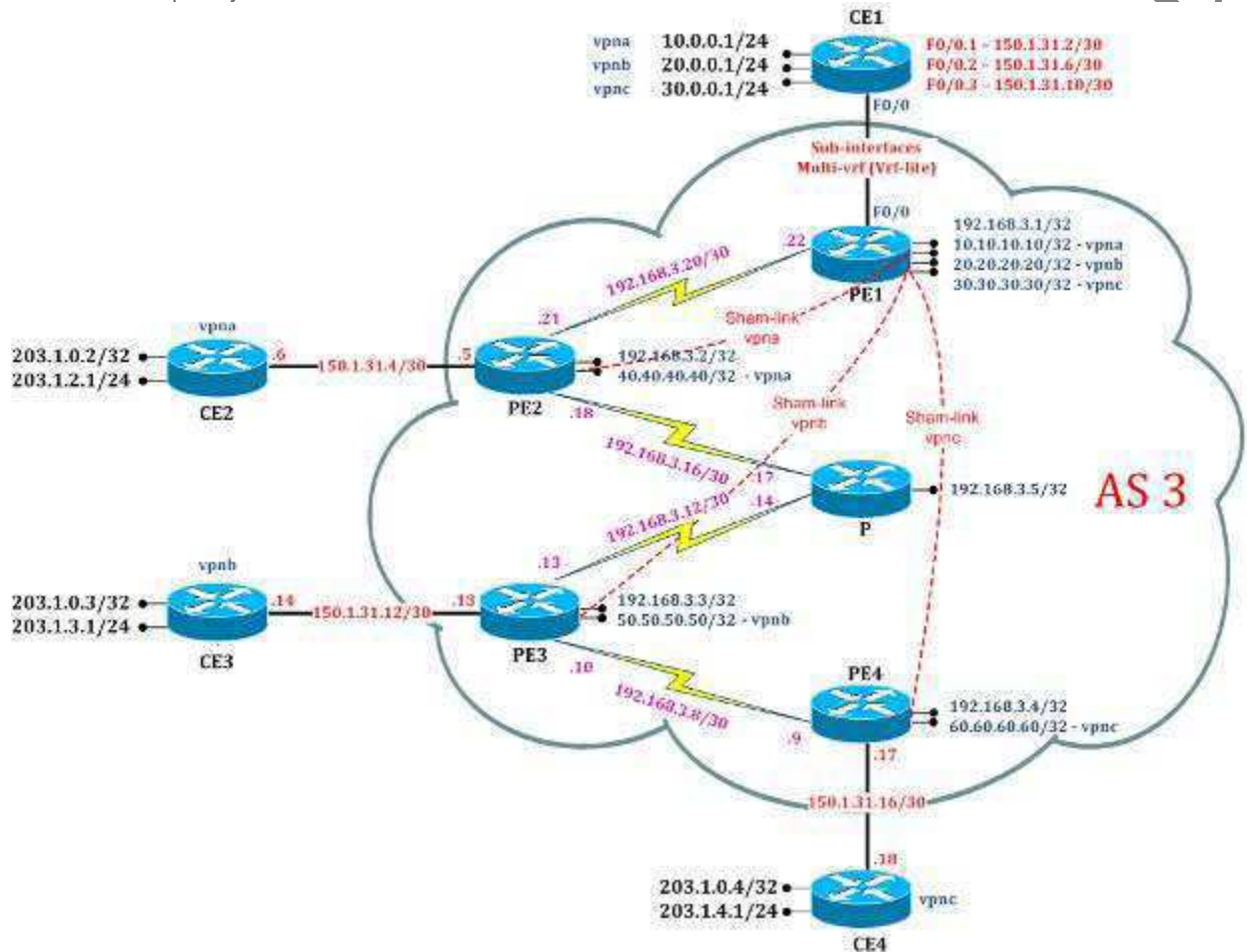
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Sham-Link support on Multi-VRF

Disclaimer

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```
CE1 Router:ip cef
!
ip vrf vpna
rd 3:10
route-target export 3:10
route-target import 3:10
```

```
CE2 Router:
interface Loopback0
ip address 203.1.0.2 255.255.255.255
!
interface Loopback1
ip address 203.1.2.1 255.255.255.0
```

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```

!
ip vrf vpbna
rd 3:20
route-target export 3:20
route-target import 3:20
!
ip vrf vpbnc
rd 3:30
route-target export 3:30
route-target import 3:30
!
interface Loopback10
ip vrf forwarding vpbna
ip address 10.0.0.1 255.255.255.0
!
interface Loopback11
ip vrf forwarding vpbna
ip address 20.0.0.1 255.255.255.0
!
interface Loopback12
ip vrf forwarding vpbnc
ip address 30.0.0.1 255.255.255.0
!
interface FastEthernet0/0.1
encapsulation dot1Q 10
ip vrf forwarding vpbna
ip address 150.1.40.2 255.255.255.252
!
interface FastEthernet0/0.2
encapsulation dot1Q 20
ip vrf forwarding vpbna
ip address 150.1.40.6 255.255.255.252
!
interface FastEthernet0/0.3
encapsulation dot1Q 30
ip vrf forwarding vpbnc
ip address 150.1.40.10 255.255.255.252
!
router ospf 10 vrf vpbna
capability vrf-lite
network 10.0.0.0 0.0.0.255 area 0
network 150.1.40.0 0.0.0.3 area 0
!

```

```

!
interface FastEthernet0/0
ip address 150.1.31.6 255.255.255.252
!
router ospf 10
network 0.0.0.0 255.255.255.255 area 0
!
end

```

CE3 Router:

```

interface Loopback0
ip address 203.1.0.3 255.255.255.255
!
interface Loopback1
ip address 203.1.2.1 255.255.255.0
!
interface FastEthernet0/0
ip address 150.1.31.14 255.255.255.252
!
router ospf 20
network 0.0.0.0 255.255.255.255 area 0
!
end

```

CE4 Router:

```

interface Loopback0
ip address 203.1.0.4 255.255.255.255
!
interface Loopback1
ip address 203.1.4.1 255.255.255.0
!
interface FastEthernet0/0
ip address 150.1.31.18 255.255.255.252
!
router ospf 30
network 0.0.0.0 255.255.255.255 area 0
!
end

```

```

router ospf 20 vrf vpb
capability vrf-lite
network 20.0.0.0 0.0.0.255 area 0
network 150.1.40.4 0.0.0.3 area 0
!
router ospf 30 vrf vpnc
capability vrf-lite
network 30.0.0.0 0.0.0.255 area 0
network 150.1.40.8 0.0.0.3 area 0
!
end

```

PE1 Router:

```

ip cef
!
ip vrf vpna
rd 3:10
route-target export 3:10
route-target import 3:10
!
ip vrf vpb
rd 3:20
route-target export 3:20
route-target import 3:20
!
ip vrf vpnc
rd 3:30
route-target export 3:30
route-target import 3:30
!
mpls label protocol ldp
!
interface Loopback0
ip address 192.168.3.1 255.255.255.255
!
interface Loopback10
ip vrf forwarding vpna
ip address 10.10.10.10 255.255.255.255
!
interface Loopback20
ip vrf forwarding vpb
ip address 20.20.20.20 255.255.255.255

```

PE2 Router:

```

ip vrf vpna
rd 3:10
route-target export 3:10
route-target import 3:10
!
mpls label protocol ldp
!
interface Loopback0
ip address 192.168.3.2 255.255.255.255
!
interface Loopback10
ip vrf forwarding vpna
ip address 40.40.40.40 255.255.255.255
!
interface FastEthernet0/0
description *** Link to A2 ***
ip vrf forwarding vpna
ip address 150.1.31.5 255.255.255.252
!
interface Serial2/0
description *** Link to PE1 ***
ip address 192.168.3.21 255.255.255.252
tag-switching ip
!
interface Serial2/1
description *** Link to P ***
ip address 192.168.3.18 255.255.255.252
tag-switching ip
!

```

```

!
interface Loopback30
ip vrf forwarding vpn1
ip address 30.30.30.30 255.255.255.255
!
interface FastEthernet0/0.1
encapsulation dot1Q 10
ip vrf forwarding vpn1
ip address 150.1.40.1 255.255.255.252
!
interface FastEthernet0/0.2
encapsulation dot1Q 20
ip vrf forwarding vpn2
ip address 150.1.40.5 255.255.255.252
!
interface FastEthernet0/0.3
encapsulation dot1Q 30
ip vrf forwarding vpn3
ip address 150.1.40.9 255.255.255.252
!
interface Serial2/0
description *** Link to PE2 ***
ip address 192.168.3.22 255.255.255.252
tag-switching ip
!
router ospf 10 vrf vpn1
router-id 10.10.10.10
area 0 sham-link 10.10.10.10 40.40.40.40
cost 10
redistribute bgp 3 subnets
network 150.1.40.0 0.0.0.3 area 0
!
router ospf 20 vrf vpn2
router-id 20.20.20.20
area 0 sham-link 20.20.20.20 50.50.50.50
cost 10
redistribute bgp 3 subnets
network 150.1.40.4 0.0.0.3 area 0
!
router ospf 30 vrf vpn3
router-id 30.30.30.30
area 0 sham-link 30.30.30.30 60.60.60.60
cost 10
redistribute bgp 3 subnets

```

```

router ospf 10 vrf vpn1
router-id 40.40.40.40
area 0 sham-link 40.40.40.40 10.10.10.10
cost 10
redistribute bgp 3 subnets
network 150.1.0.0 0.0.255.255 area 0
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
router bgp 3
no synchronization
network 192.168.3.2 mask 255.255.255.255
neighbor 192.168.3.1 remote-as 3
neighbor 192.168.3.1 update-source
Loopback0
neighbor 192.168.3.1 route-reflector-client
neighbor 192.168.3.3 remote-as 3
neighbor 192.168.3.3 update-source
Loopback0
neighbor 192.168.3.3 route-reflector-client
no auto-summary
!
address-family vpnv4
neighbor 192.168.3.1 activate
neighbor 192.168.3.1 send-community
extended
neighbor 192.168.3.1 route-reflector-client
neighbor 192.168.3.3 activate
neighbor 192.168.3.3 send-community
extended
exit-address-family
!
address-family ipv4 vrf vpn1
redistribute ospf 10 vrf vpn1
no synchronization
network 40.40.40.40 mask 255.255.255.255
exit-address-family
!
tag-switching tdp router-id Loopback0
!
end

```

P Router:

```

network 150.1.40.8 0.0.0.3 area 0
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
router bgp 3
no synchronization
network 192.168.3.1 mask 255.255.255.255
neighbor 192.168.3.2 remote-as 3
neighbor 192.168.3.2 update-source
Loopback0
no auto-summary
!
address-family vpnv4
neighbor 192.168.3.2 activate
neighbor 192.168.3.2 send-community
extended
exit-address-family
!
address-family ipv4 vrf vpnc
redistribute ospf 30 vrf vpnc
no synchronization
network 30.30.30.30 mask 255.255.255.255
exit-address-family
!
address-family ipv4 vrf vpb
redistribute ospf 20 vrf vpb
no synchronization
network 20.20.20.20 mask 255.255.255.255
exit-address-family
!
address-family ipv4 vrf vpna
redistribute ospf 10 vrf vpna
no synchronization
network 10.10.10.10 mask 255.255.255.255
exit-address-family
!
tag-switching tdp router-id Loopback0
!
end

```

```

ip cef
!
mpls label protocol ldp
!
interface Loopback0
ip address 192.168.3.5 255.255.255.255
!
interface Serial2/0
description *** Link to PE3 ***
ip address 192.168.3.14 255.255.255.252
tag-switching ip
!
interface Serial2/1
description *** Link to PE2 ***
ip address 192.168.3.17 255.255.255.252
tag-switching ip
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
tag-switching tdp router-id Loopback0
!
end

```

PE3 Router:

```
ip cef
!
ip vrf vpnb
rd 3:20
route-target export 3:20
route-target import 3:20
!
mpls label protocol ldp
!
interface Loopback0
ip address 192.168.3.3 255.255.255.255
!
interface Loopback20
ip vrf forwarding vpnb
ip address 50.50.50.50 255.255.255.255
!
interface FastEthernet0/0
description *** Link to A3 ***
ip vrf forwarding vpnb
ip address 150.1.31.13 255.255.255.252
!
interface Serial2/0
description *** Link to P ***
ip address 192.168.3.13 255.255.255.252
tag-switching ip
!
interface Serial2/1
description *** Link to PE4 ***
ip address 192.168.3.10 255.255.255.252
tag-switching ip
!
router ospf 20 vrf vpnb
router-id 50.50.50.50
area 0 sham-link 50.50.50.50 20.20.20.20
cost 10
redistribute bgp 3 subnets
network 150.1.0.0 0.0.255.255 area 0
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
router bgp 3
```

PE4 Router:

```
ip cef
!
ip vrf vpnc
rd 3:30
route-target export 3:30
route-target import 3:30
!
mpls label protocol ldp
!
interface Loopback0
ip address 192.168.3.4 255.255.255.255
!
interface Loopback30
ip vrf forwarding vpnc
ip address 60.60.60.60 255.255.255.255
!
interface FastEthernet0/0
description *** Link to A4 ***
ip vrf forwarding vpnc
ip address 150.1.31.17 255.255.255.252
!
interface Serial2/1
description *** Link to PE3 ***
ip address 192.168.3.9 255.255.255.252
no ip directed-broadcast
tag-switching ip
!
router ospf 30 vrf vpnc
router-id 60.60.60.60
area 0 sham-link 60.60.60.60 30.30.30.30
cost 10
redistribute bgp 3 subnets
network 150.1.0.0 0.0.255.255 area 0
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
router bgp 3
no synchronization
bgp log-neighbor-changes
network 192.168.3.4 mask 255.255.255.255
neighbor 192.168.3.3 remote-as 3
```

```
no synchronization
network 192.168.3.3 mask 255.255.255.255
neighbor 192.168.3.2 remote-as 3
neighbor 192.168.3.2 update-source
Loopback0
neighbor 192.168.3.2 route-reflector-client
neighbor 192.168.3.4 remote-as 3
neighbor 192.168.3.4 update-source
Loopback0
neighbor 192.168.3.4 route-reflector-client
no auto-summary
!
address-family vpnv4
neighbor 192.168.3.2 activate
neighbor 192.168.3.2 send-community
extended
neighbor 192.168.3.4 activate
neighbor 192.168.3.4 send-community
extended
neighbor 192.168.3.4 route-reflector-client
exit-address-family
!
address-family ipv4 vrf vpnb
redistribute ospf 20 vrf vpnb
no synchronization
network 50.50.50.50 mask 255.255.255.255
exit-address-family
!
tag-switching tdp router-id Loopback0
!
end
```

```
neighbor 192.168.3.3 update-source
Loopback0
no auto-summary
!
address-family vpnv4
neighbor 192.168.3.3 activate
neighbor 192.168.3.3 send-community
extended
exit-address-family
!
address-family ipv4 vrf vpnc
redistribute ospf 30 vrf vpnc
no synchronization
network 60.60.60.60 mask 255.255.255.255
exit-address-family
!
tag-switching tdp router-id Loopback0
!
end
```