

Routing
Switching
Tigers
Forum



MPLS

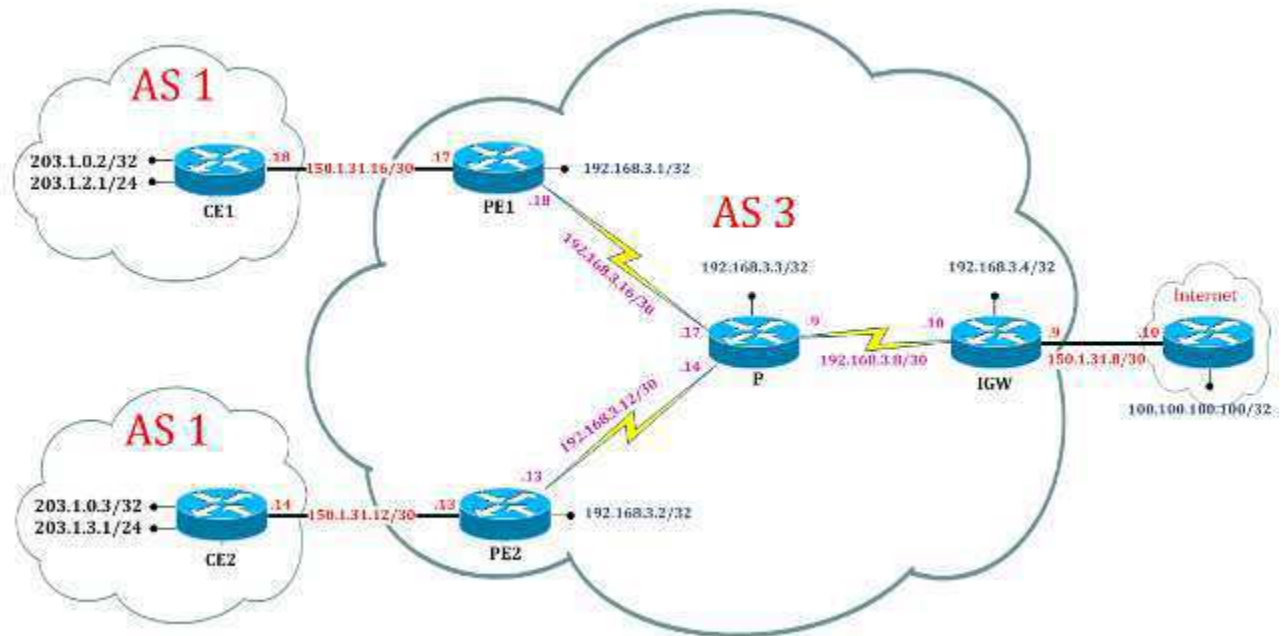
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Internet connectivity through Route Leaking

Disclaimer

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CE1 Router:

```
ip cef
!
interface Loopback0
ip address 203.1.0.1 255.255.255.255
!
interface Loopback1
ip address 203.1.1.1 255.255.255.0
!
interface FastEthernet0/0
ip address 150.1.31.18 255.255.255.252
!
```

CE2 Router:

```
ip cef
!
interface Loopback0
ip address 203.1.0.2 255.255.255.255
!
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
!
```

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```
router bgp 1
no synchronization
network 203.1.0.1 mask 255.255.255.255
network 203.1.1.0
redistribute connected
neighbor 150.1.31.17 remote-as 3
neighbor 150.1.31.17 allowas-in
no auto-summary
!
ip route 0.0.0.0 0.0.0.0 150.1.31.17
!
end
```

```
router bgp 1
no synchronization
network 203.1.0.2 mask 255.255.255.255
network 203.1.2.0
redistribute connected
neighbor 150.1.31.13 remote-as 3
neighbor 150.1.31.13 allowas-in
no auto-summary
!
ip route 0.0.0.0 0.0.0.0 150.1.31.13
!
end
```

PE1 Router:

```
ip cef!
ip vrf vpna
rd 3:10
route-target export 3:10
route-target import 3:10
!
mpls label protocol ldp
!
interface Loopback1
ip address 192.168.3.1 255.255.255.255
!
interface FastEthernet0/0
ip vrf forwarding vpna
ip address 150.1.31.17 255.255.255.252
!
interface Serial2/0
ip address 192.168.3.18 255.255.255.252
mpls ip
!
router ospf 1
redistribute static subnets
network 192.168.3.0 0.0.0.255 area 0
!
router bgp 3
```

PE2 Router:

```
ip cef!
!
ip vrf vpna
rd 3:10
route-target export 3:10
route-target import 3:10
!
mpls label protocol ldp
!
interface Loopback1
ip address 192.168.3.2 255.255.255.255
!
interface FastEthernet0/0
ip vrf forwarding vpna
ip address 150.1.31.13 255.255.255.252
!
interface Serial2/1
ip address 192.168.3.13 255.255.255.252
mpls ip
!
router ospf 1
redistribute static subnets
network 192.168.3.0 0.0.0.255 area 0
!
```

```
neighbor 192.168.3.2 remote-as 3
neighbor 192.168.3.2 update-source Loopback1
neighbor 192.168.3.4 remote-as 3
neighbor 192.168.3.4 update-source Loopback1
!
address-family ipv4
neighbor 192.168.3.2 activate
neighbor 192.168.3.2 next-hop-self
neighbor 192.168.3.2 soft-reconfiguration inbound
neighbor 192.168.3.4 activate
neighbor 192.168.3.4 next-hop-self
neighbor 192.168.3.4 soft-reconfiguration inbound
no auto-summary
no synchronization
network 192.168.3.1 mask 255.255.255.255
exit-address-family
!
address-family vpnv4
neighbor 192.168.3.2 activate
neighbor 192.168.3.2 send-community extended
exit-address-family
!
address-family ipv4 vrf vpna
neighbor 150.1.31.18 remote-as 1
neighbor 150.1.31.18 activate
neighbor 150.1.31.18 as-override
no synchronization
exit-address-family
!
ip route 203.1.0.1 255.255.255.255 FastEthernet0/0
150.1.31.18
ip route 203.1.1.0 255.255.255.0 FastEthernet0/0
150.1.31.18
ip route vrf vpna 0.0.0.0 0.0.0.0 150.1.31.9 global
!
mpls ldp router-id Loopback1
!
end
```

```
router bgp 3
neighbor 192.168.3.1 remote-as 3
neighbor 192.168.3.1 update-source Loopback1
neighbor 192.168.3.4 remote-as 3
neighbor 192.168.3.4 update-source Loopback1
!
address-family ipv4
neighbor 192.168.3.1 activate
neighbor 192.168.3.1 next-hop-self
neighbor 192.168.3.1 soft-reconfiguration inbound
neighbor 192.168.3.4 activate
neighbor 192.168.3.4 next-hop-self
neighbor 192.168.3.4 soft-reconfiguration inbound
no auto-summary
no synchronization
network 192.168.3.2 mask 255.255.255.255
exit-address-family
!
address-family vpnv4
neighbor 192.168.3.1 activate
neighbor 192.168.3.1 send-community extended
exit-address-family
!
address-family ipv4 vrf vpna
neighbor 150.1.31.14 remote-as 1
neighbor 150.1.31.14 activate
neighbor 150.1.31.14 as-override
no synchronization
exit-address-family
!
ip route 203.1.0.2 255.255.255.255 FastEthernet0/0
150.1.31.14
ip route 203.1.2.0 255.255.255.0 FastEthernet0/0
150.1.31.14
ip route vrf vpna 0.0.0.0 0.0.0.0 150.1.31.9 global
!
mpls ldp router-id Loopback1
!
end
```

P Router:

```
ip cef
!
mpls label protocol ldp
!
interface Loopback1
ip address 192.168.3.3 255.255.255.255
!
interface Serial2/0
ip address 192.168.3.17 255.255.255.252
mpls ip
!
interface Serial2/1
ip address 192.168.3.14 255.255.255.252
mpls ip
!
interface Serial2/2
ip address 192.168.3.9 255.255.255.252
mpls ip
!
router ospf 1
network 192.168.3.0 0.0.0.255 area 0
!
mpls ldp router-id Loopback1
!
end
```

Internet Router:

```
ip cef
!
interface Loopback1
ip address 100.100.100.100 255.255.255.255
!
interface FastEthernet0/0
ip address 150.1.31.10 255.255.255.252
!
router bgp 200
no synchronization
network 100.100.100.100 mask 255.255.255.255
neighbor 150.1.31.9 remote-as 3
neighbor 150.1.31.9 soft-reconfiguration inbound
```

IGW Router:

```
ip cef
!
mpls label protocol ldp
!
interface Loopback1
ip address 192.168.3.4 255.255.255.255
!
interface FastEthernet0/0
ip address 150.1.31.9 255.255.255.252
!
interface Serial2/2
ip address 192.168.3.10 255.255.255.252
mpls ip
!
router ospf 1
network 0.0.0.0 255.255.255.255 area 0
!
router bgp 3
no synchronization
network 192.168.3.4 mask 255.255.255.255
network 203.1.0.1 mask 255.255.255.255
network 203.1.0.2 mask 255.255.255.255
network 203.1.1.0
network 203.1.2.0
neighbor 150.1.31.10 remote-as 200
neighbor 150.1.31.10 soft-reconfiguration inbound
neighbor 192.168.3.1 remote-as 3
neighbor 192.168.3.1 update-source Loopback1
neighbor 192.168.3.1 next-hop-self
neighbor 192.168.3.1 soft-reconfiguration inbound
neighbor 192.168.3.2 remote-as 3
neighbor 192.168.3.2 update-source Loopback1
neighbor 192.168.3.2 next-hop-self
neighbor 192.168.3.2 soft-reconfiguration inbound
no auto-summary
!
mpls ldp router-id Loopback1
!
end
```

```
no auto-summary
!  
end
```

Verification:

CE1#ping 100.100.100.100 source 203.1.1.1

Sending 5, 100-byte ICMP Echos to 100.100.100.100, timeout is 2 seconds:Packet sent with a source address of 203.1.1.1

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 732/473/672 ms

CE2#ping 100.100.100.100 source 203.1.2.1

Sending 5, 100-byte ICMP Echos to 100.100.100.100, timeout is 2 seconds:

Packet sent with a source address of 203.1.2.1

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 388/595/1044 ms

PE1#show ip route vrf vpna

Routing Table: vpna

Gateway of last resort is 150.1.31.9 to network 0.0.0.0

B 203.1.2.0/24 [200/0] via 192.168.3.2, 00:13:54

B 203.1.1.0/24 [20/0] via 150.1.31.18, 00:14:00

203.1.0.0/32 is subnetted, 2 subnets

B 203.1.0.2 [200/0] via 192.168.3.2, 00:13:54

B 203.1.0.1 [20/0] via 150.1.31.18, 00:14:00

150.1.0.0/30 is subnetted, 2 subnets

B 150.1.31.12 [200/0] via 192.168.3.2, 00:13:54

C 150.1.31.16 is directly connected, FastEthernet0/0

S* 0.0.0.0/0 [1/0] via 150.1.31.9

INTERNET#show ip route

Gateway of last resort is not set

100.0.0.0/32 is subnetted, 1 subnets

C 100.100.100.100 is directly connected, Loopback1

B 203.1.2.0/24 [20/20] via 150.1.31.9, 00:16:47

B 203.1.1.0/24 [20/20] via 150.1.31.9, 00:16:47

203.1.0.0/32 is subnetted, 2 subnets

B 203.1.0.2 [20/20] via 150.1.31.9, 00:16:47

B 203.1.0.1 [20/20] via 150.1.31.9, 00:16:47

150.1.0.0/30 is subnetted, 1 subnets

C 150.1.31.8 is directly connected, FastEthernet0/0

192.168.3.0/32 is subnetted, 3 subnets

B 192.168.3.2 [20/0] via 150.1.31.9, 00:16:47

B 192.168.3.1 [20/0] via 150.1.31.9, 00:16:47

B 192.168.3.4 [20/0] via 150.1.31.9, 00:16:47

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