

# **CCIE S/P LAB Demo**

**V50**

**Update March, 2009**



- Frame-Relay Switching:

Frame Relay Configuration:

R3-R5: 305-503; R4-R6: 406-604; R6-R1: 611-116;

All routers are PVCs fully meshed. Do not use the extra PVCs;

R1/R3/R4/R5/R6:

```
interface Serial3/0
```

```
ip address x.x.x.x 255.255.255.252
```

```
encapsulation frame-relay
```

```
frame-relay map ip x.x.x.x xxx broadcast
```

```
no frame-relay inverse-arp
```

```
!
```

## 2. IGP Routing and MPLS Switching

- ISIS for R2/R3/R4: Uses 49.00YY as NSAP prefix;

In order to conserve resource, **use level-1**. Do not achieve it by configuring on interface;

**Security:** authenticate your ISIS network by minimum configuration;

Use minimum configuration to tune the core network to achieve the following goals:

.In order to get fast convergence, eliminate the election of Designated Intermediate System (DIS);

.In order to improve the link efficiency, do not send CSNP flooding;

R2:

```
interface Ethernet0/0
```

```
ip address 142.2.23.2 255.255.255.0
```

```
ip router isis
```

```
isis network point-to-point
```

```
!
```

```
interface Ethernet1/0
```

```
ip address 142.2.24.2 255.255.255.0
```

```
ip router isis
```

```
isis network point-to-point
```

```
!
```

```
router isis
```

```
net 49.0002.0000.0000.0002.00
```

```
is-type level-1
```

```
area-password cisco
spf-interval 1 1 1000
prc-interval 1 1 1000
lsp-gen-interval 1 1 1000
log-adjacency-changes
passive-interface Loopback0
```

R3:

```
interface Ethernet0/0
ip address 142.2.23.3 255.255.255.0
ip router isis
isis network point-to-point
!
interface Ethernet1/0
ip address 142.2.34.3 255.255.255.0
ip router isis
isis network point-to-point
!
router isis
net 49.0002.0000.0000.0003.00
is-type level-1
area-password cisco
spf-interval 1 1 1000
prc-interval 1 1 1000
lsp-gen-interval 1 1 1000
log-adjacency-changes
passive-interface Loopback0
!
```

R4:

```
interface Ethernet0/0
ip address 142.2.24.4 255.255.255.0
ip router isis
isis network point-to-point
!
interface Ethernet1/0
ip address 142.2.34.4 255.255.255.0
ip router isis
```

```
isis network point-to-point
!  
router isis  
net 49.0002.0000.0000.0004.00  
is-type level-1  
area-password cisco  
spf-interval 1 1 1000  
prc-interval 1 1 1000  
lsp-gen-interval 1 1 1000  
log-adjacency-changes  
passive-interface Loopback0
```

#### RIP

##### •RIP V2 for R6/R1:

Run RIP V2 between R6 and R1;

Do not send and receive RIP update on un-necessary interfaces;

R6 and R1 should be able to ping each other;

##### R1:

```
router rip  
version 2  
passive-interface default  
no passive-interface s4/0  
no passive-interface Ethernet0/0  
network 142.2.0.0  
no auto-summary
```

!

##### R6:

!

```
router rip  
version 2  
passive-interface default  
no passive-interface S5/0  
network 142.2.0.0  
distribute-list 10 out Serial5/0  
no auto-summary
```

!

```
access-list 10 permit 142.2.6.6
access-list 10 permit 142.2.16.0
!
```

•MPLS on Core:

Run MPLS switching on R2/R3/R4 and R6/R1;

Do not configure MPLS switching on Inter-AS links and VPN links;

R2/R3/R4 and R6/R1:

```
mpls label protocol ldp
tag-switching tdp router-id Loopback0 force
!
Int Sx/x and Ex/x
mpls label protocol ldp
tag-switching ip
!
```

### 3. BGP

Setup AS234 of r2,r3 and r4

•iBGP ipv4:

Do not use BGP route reflector;

Do not inject any access interface or VPN interface into BGP;

Configure peers among R2/R3/R4, R1/R6;

Configure the AS: AS#234, AS#55, AS#66;

R2:

```
router bgp 234
no synchronization
bgp router-id 142.2.2.2
no bgp default ipv4-unicast
neighbor 142.2.3.3 remote-as 234
neighbor 142.2.3.3 update-source Loopback0
neighbor 142.2.4.4 remote-as 234
neighbor 142.2.4.4 update-source Loopback0
no auto-summary
!
address-family ipv4
neighbor 142.2.3.3 activate
neighbor 142.2.4.4 activate
```

```
no auto-summary
no synchronization
exit-address-family
```

R3:

```
router bgp 234
no synchronization
bgp router-id 142.2.3.3
no bgp default ipv4-unicast
neighbor 142.2.2.2 remote-as 234
neighbor 142.2.2.2 update-source Loopback0
neighbor 142.2.4.4 remote-as 234
neighbor 142.2.4.4 update-source Loopback0
no auto-summary
!
address-family ipv4
neighbor 142.2.2.2 activate
neighbor 142.2.2.2 next-hop-self
neighbor 142.2.4.4 activate
neighbor 142.2.4.4 next-hop-self
no auto-summary
no synchronization
exit-address-family
!
```

R4:

```
router bgp 234
no synchronization
bgp router-id 142.2.4.4
no bgp default ipv4-unicast
no bgp default route-target filter
neighbor 142.2.2.2 remote-as 234
neighbor 142.2.2.2 update-source Loopback0
neighbor 142.2.3.3 remote-as 234
neighbor 142.2.3.3 update-source Loopback0
no auto-summary
!
address-family ipv4
```

```
neighbor 142.2.2.2 activate
neighbor 142.2.2.2 next-hop-self
neighbor 142.2.3.3 activate
neighbor 142.2.3.3 next-hop-self
no auto-summary
no synchronization
exit-address-family
!
```

R1:

```
router bgp 66
no synchronization
bgp router-id 142.2.1.1
no bgp default ipv4-unicast
bgp log-neighbor-changes
neighbor 142.2.6.6 remote-as 66
neighbor 142.2.6.6 update-source Loopback0
no auto-summary
!
address-family ipv4
neighbor 142.2.6.6 activate
no auto-summary
no synchronization
exit-address-family
!
```

R6:

```
router bgp 66
no synchronization
bgp router-id 142.2.6.6
no bgp default ipv4-unicast
no bgp default route-target filter
neighbor 142.2.1.1 remote-as 66
neighbor 142.2.1.1 update-source Loopback0
no auto-summary
!
address-family ipv4
neighbor 142.2.1.1 activate
```

```
neighbor 142.2.1.1 next-hop-self
no auto-summary
no synchronization
exit-address-family
!
```

#### •Ebgp

Configure the AS: AS#234, AS#55, AS#66;

R5 peer with BB1 AS254, receive the 197.68.1.0/24, 197.68.2.0/24, 197.68.3.0/24,  
197.68.4.0/24, 197.68.5.0/24, 197.68.21.0/24, 197.68.22.0/24.

EBGP Feature Points:

Configure peer between R5 and BB1: AS#254 treats R5's neighbor as AS#YY;  
AS#YY is a pseudo AS number. This pseudo AS number should not be spread to R3,  
and R3 should see the BGP routes which are learned from AS#254 by R5 without the  
pseudo AS#YY;

Do not use BGP confederation;

R5:

```
router bgp 55
no synchronization
bgp router-id 142.2.5.5
no bgp default ipv4-unicast
neighbor 150.100.1.254 remote-as 254
neighbor 150.100.1.254 local-as 2 no-prepend
no auto-summary
!
address-family ipv4
neighbor 150.100.1.254 activate
no auto-summary
no synchronization
exit-address-family
!
```

R5 ebgp with R3, R5 ebgp with R6, R6 EBGP with R4

#### •Route Control: IPV4

Configure on R4, about the routes learned from AS#254 by R5: 197.68.21.0/24  
and 197.68.22.0/24;

Within AS#234, all routers should use R4 via AS#66 as exit path;

Within AS#234, other routes beside "197.68.21.0/24" and "197.68.22.0/24" should use the regular path as exit path;

In case of the link failure between R4 and R6 or R4 is not available, all the routers within AS#234 should use R3 via AS#55 as exit path;

R3:

```
router bgp 234
no synchronization
bgp router-id 142.2.3.3
no bgp default ipv4-unicast
neighbor 142.2.35.5 remote-as 55
no auto-summary
!
address-family ipv4
neighbor 142.2.35.5 activate
no auto-summary
no synchronization
exit-address-family
!
```

R5:

```
router bgp 55
no synchronization
bgp router-id 142.2.5.5
no bgp default ipv4-unicast
neighbor 142.2.35.3 remote-as 234
neighbor 142.2.56.6 remote-as 66
no auto-summary
!
address-family ipv4
neighbor 142.2.35.3 activate
neighbor 142.2.56.6 activate
no auto-summary
no synchronization
exit-address-family
!
```