

For this lab section, refer to Figure 26-3 on page 216 of the book.

```
R4#sho run
Building configuration...

Current configuration : 2625 bytes
!
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname R4
!
!
ip subnet-zero
no ip domain-lookup
!
!
key chain ccie
  key 6727
    key-string 7 03520C5951
!
!
interface Loopback4
  description OSPF Loopback
  ip address 4.4.4.4 255.255.255.255
!
interface Loopback44
  description BGP Loopback
  ip address 4.4.4.44 255.255.255.255
!
interface Ethernet0
  ip address 140.100.47.4 255.255.255.192
  ip rip send version 2
  ip rip receive version 2
  ip rip authentication mode md5
  ip rip authentication key-chain ccie
!
interface Serial0
  ip address 150.100.33.4 255.255.255.248
  encapsulation frame-relay
  ip ospf authentication message-digest
  ip ospf message-digest-key 5 md5 7 104D000A0618
  ip ospf network point-to-point
  frame-relay map ip 150.100.33.3 404 broadcast
  frame-relay lmi-type ansi
!
interface Serial1
  ip address 140.100.45.4 255.255.255.192
  ip ospf authentication message-digest
```

```
ip ospf message-digest-key 5 md5 7 1511021F0725
ip ospf network point-to-point
clockrate 64000
!
router ospf 123
  router-id 4.4.4.4
  log-adjacency-changes detail
  area 0 authentication message-digest
  area 45 authentication message-digest
  area 45 virtual-link 5.5.5.5 authentication message-digest
  area 45 virtual-link 5.5.5.5 message-digest-key 5 md5 7
  0822455D0A16
  redistribute rip subnets route-map red_rip_ospf
  network 4.4.4.4 0.0.0.0 area 0
  network 140.100.45.0 0.0.0.63 area 45
  network 150.100.33.0 0.0.0.7 area 0
!
router rip
  version 2
  network 4.0.0.0
  network 140.100.0.0
  default-information originate
  no auto-summary
!
router bgp 456
  no synchronization
  bgp router-id 4.4.4.4
  bgp log-neighbor-changes
  network 4.4.4.44 mask 255.255.255.255
  network 140.100.47.0 mask 255.255.255.192
  aggregate-address 209.112.0.0 255.255.0.0 summary-only
  neighbor 140.100.45.5 remote-as 456
  neighbor 140.100.45.5 next-hop-self
  neighbor 140.100.47.7 remote-as 1560
  neighbor 140.100.47.7 description R7_BB2
  neighbor 140.100.47.7 password 7 1511021F0725
  neighbor 140.100.47.7 remove-private-AS
  neighbor 150.100.33.3 remote-as 1234
  no auto-summary
!
ip classless
ip http server
ip pim bidir-enable
!
access-list 44 permit 67.67.67.0 log
access-list 44 permit 140.100.9.0 log
route-map red_rip_ospf permit 10
  match ip address 44
!
!
line con 0
  exec-timeout 0 0
  logging synchronous
line aux 0
```

```
line vty 0 4
 privilege level 15
 logging synchronous
 no login
!
end
```

```
R4#sho ip rip da
0.0.0.0/0    auto-summary
0.0.0.0/0    redistributed
      [0] via 0.0.0.0,
1.0.0.0/8    auto-summary
1.1.1.1/32   redistributed
      [1] via 1.1.1.1,
2.0.0.0/8    auto-summary
2.2.2.2/32   redistributed
      [1] via 2.2.2.2,
3.0.0.0/8    auto-summary
3.3.3.3/32   redistributed
      [1] via 3.3.3.3,
3.3.3.13/32  redistributed
      [1] via 3.3.3.3,
3.3.3.23/32  redistributed
      [1] via 3.3.3.3,
4.0.0.0/8    auto-summary
4.4.4.4/32   directly connected, Loopback4
4.4.4.44/32  directly connected, Loopback44
5.0.0.0/8    auto-summary
5.5.5.5/32   redistributed
      [1] via 5.5.5.5,
5.5.5.55/32  redistributed
      [1] via 5.5.5.5,
6.0.0.0/8    auto-summary
6.6.6.6/32   redistributed
      [1] via 5.5.5.5,
8.0.0.0/8    auto-summary
8.8.8.8/32   redistributed
      [1] via 6.6.6.6,
67.0.0.0/8   auto-summary
67.67.67.0/24
      [1] via 140.100.47.7, 00:00:19, Ethernet0
130.100.0.0/16 auto-summary
140.100.0.0/16 auto-summary
140.100.9.0/27
      [1] via 140.100.47.7, 00:00:20, Ethernet0
140.100.45.0/26 directly connected, Serial1
140.100.47.0/26 directly connected, Ethernet0
140.100.56.0/26 redistributed
      [1] via 5.5.5.5,
150.100.0.0/16 auto-summary
150.100.31.0/28 redistributed
      [1] via 3.3.3.3,
150.100.32.0/27 redistributed
```

```
    [1] via 3.3.3.3,  
150.100.33.0/29    redistributed  
    [1] via 0.0.0.0,  
192.168.2.0/24    auto-summary  
192.168.2.0/24    redistributed  
    [1] via 6.6.6.6,
```

```
R4# sho ip route rip  
    140.100.0.0/16 is variably subnetted, 4 subnets, 2  
masks  
R    140.100.9.0/27 [120/1] via 140.100.47.7, 00:00:23,  
Ethernet0  
    67.0.0.0/24 is subnetted, 1 subnets  
R    67.67.67.0 [120/1] via 140.100.47.7, 00:00:23,  
Ethernet0
```

```
R6#sho ip route  
Codes: C - connected, S - static, R - RIP, M - mobile, B -  
BGP  
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF  
inter area  
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA  
external type 2  
       E1 - OSPF external type 1, E2 - OSPF external type 2  
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia  
- IS-IS inter area  
       * - candidate default, U - per-user static route, o -  
ODR  
       P - periodic downloaded static route  
  
Gateway of last resort is not set  
  
    17.0.0.0/24 is subnetted, 1 subnets  
B    17.1.1.0 [200/0] via 140.100.45.4, 04:52:31  
    1.0.0.0/32 is subnetted, 2 subnets  
O    1.1.1.1 [110/257] via 140.100.56.5, 04:52:38,  
Serial0/0  
B    1.1.1.11 [200/0] via 140.100.45.4, 04:52:31  
    2.0.0.0/32 is subnetted, 2 subnets  
O    2.2.2.2 [110/257] via 140.100.56.5, 04:52:38,  
Serial0/0  
B    2.2.2.22 [200/0] via 140.100.45.4, 04:52:31  
    3.0.0.0/32 is subnetted, 4 subnets  
O    3.3.3.3 [110/193] via 140.100.56.5, 04:52:38,  
Serial0/0  
O E2   3.3.3.13 [110/20] via 140.100.56.5, 04:52:19,  
Serial0/0  
O E2   3.3.3.23 [110/20] via 140.100.56.5, 04:52:19,  
Serial0/0  
B    3.3.3.33 [200/0] via 140.100.45.4, 04:52:32  
    4.0.0.0/32 is subnetted, 2 subnets
```

```

O      4.4.4.4 [110/129] via 140.100.56.5, 04:52:39,
Serial0/0
B      4.4.4.44 [200/0] via 140.100.45.4, 04:52:32
      140.100.0.0/16 is variably subnetted, 5 subnets, 2
masks
C      140.100.86.0/27 is directly connected, Loopback66
O IA   140.100.45.0/26 [110/128] via 140.100.56.5,
04:52:19, Serial0/0
B      140.100.47.0/26 [200/0] via 140.100.45.4, 04:52:32
C      140.100.56.0/26 is directly connected, Serial0/0
O E2   140.100.9.0/27 [110/20] via 140.100.56.5, 04:52:19,
Serial0/0
      5.0.0.0/32 is subnetted, 2 subnets
O IA   5.5.5.5 [110/65] via 140.100.56.5, 04:52:19,
Serial0/0
O IA   5.5.5.55 [110/65] via 140.100.56.5, 04:52:19,
Serial0/0
      156.46.0.0/16 is variably subnetted, 5 subnets, 2 masks
B      156.46.2.0/24 [200/0] via 140.100.45.4, 04:52:32
B      156.46.3.0/24 [200/0] via 140.100.45.4, 04:52:32
B      156.46.1.0/24 [200/0] via 140.100.45.4, 04:52:32
B      156.46.4.0/24 [200/0] via 140.100.45.4, 04:52:33
B      156.46.100.0/22 [200/0] via 140.100.45.4, 04:52:33
      6.0.0.0/32 is subnetted, 2 subnets
C      6.6.6.6 is directly connected, Loopback6
C      6.6.6.66 is directly connected, Loopback666
      67.0.0.0/24 is subnetted, 1 subnets
O E2   67.67.67.0 [110/20] via 140.100.56.5, 04:52:21,
Serial0/0
      37.0.0.0/24 is subnetted, 1 subnets
B      37.1.1.0 [200/0] via 140.100.45.4, 04:52:34
      7.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
B      7.7.7.7/32 [200/0] via 140.100.45.4, 04:52:34
B      7.1.1.0/24 [200/0] via 140.100.45.4, 04:52:34
      8.0.0.0/32 is subnetted, 2 subnets
O      8.8.8.8 [110/11112] via 192.168.2.1, 04:52:21,
Tunnel0
B      8.8.8.88 [20/0] via 192.168.2.1, 04:52:07
      9.0.0.0/32 is subnetted, 1 subnets
B      9.9.9.9 [200/0] via 140.100.45.4, 04:52:34
      130.100.0.0/16 is variably subnetted, 2 subnets, 2
masks
O E2   130.100.55.0/24 [110/20] via 140.100.56.5, 04:52:21,
Serial0/0
C      130.100.26.0/27 is directly connected,
FastEthernet0/0
      10.0.0.0/24 is subnetted, 1 subnets
B      10.1.1.0 [200/0] via 140.100.45.4, 04:52:34
      27.0.0.0/24 is subnetted, 1 subnets
B      27.1.1.0 [200/0] via 140.100.45.4, 04:52:34
S      192.168.1.0/24 [1/0] via 130.100.26.2
C      192.168.2.0/24 is directly connected, Tunnel0
      150.100.0.0/16 is variably subnetted, 3 subnets, 3
masks

```

```
O      150.100.32.0/27 [110/256] via 140.100.56.5,  
04:52:42, Serial0/0  
O      150.100.33.0/29 [110/192] via 140.100.56.5,  
04:52:42, Serial0/0  
O      150.100.31.0/28 [110/256] via 140.100.56.5,  
04:52:42, Serial0/0  
B      209.112.0.0/16 [200/0] via 140.100.45.4, 04:52:35
```

R6#**ping 67.67.67.1**

```
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 67.67.67.1, timeout is 2  
seconds:  
!!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max =  
60/62/72 ms
```

R6#**sho run**

Building configuration...

```
Current configuration : 3111 bytes  
!  
! Last configuration change at 05:55:42 UTC Sat Mar 15 2003  
!  
version 12.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname R6  
!  
!  
ip subnet-zero  
!  
no ip domain lookup  
!  
ip audit notify log  
ip audit po max-events 100  
!  
isdn switch-type basic-ni  
!  
!  
key chain ccie  
  key 1  
    key-string ccie  
!  
!  
!  
!  
interface Loopback6  
  description OSPF Loopback  
  ip address 6.6.6.6 255.255.255.255  
!
```

```
interface Loopback66
 ip address 140.100.86.1 255.255.255.224
!
interface Loopback666
 description BGP Loopback
 ip address 6.6.6.66 255.255.255.255
!
interface Tunnel0
 ip address 192.168.2.2 255.255.255.0
 no ip proxy-arp
 ip ospf authentication message-digest
 ip ospf message-digest-key 5 md5 cisco
 ip ospf mtu-ignore
 tunnel source 130.100.26.6
 tunnel destination 192.168.1.1
!
interface FastEthernet0/0
 ip address 130.100.26.6 255.255.255.224
 no ip proxy-arp
 ip rip authentication mode md5
 ip rip authentication key-chain ccie
 speed 10
 half-duplex
!
interface Serial0/0
 ip address 140.100.56.6 255.255.255.192
 no ip proxy-arp
 ip ospf authentication message-digest
 ip ospf message-digest-key 5 md5 cisco
 ip ospf network point-to-point
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
router ospf 123
 router-id 6.6.6.6
 log-adjacency-changes detail
 area 56 authentication message-digest
 area 56 virtual-link 5.5.5.5 authentication message-digest
 area 56 virtual-link 5.5.5.5 message-digest-key 5 md5 cisco
 area 86 authentication message-digest
 network 6.6.6.6 0.0.0.0 area 56
 network 140.100.56.0 0.0.0.63 area 56
 network 192.168.2.0 0.0.0.255 area 86
!
router rip
 version 2
 redistribute ospf 123 metric 1
 redistribute bgp 456 metric 1
 network 130.100.0.0
 no auto-summary
!
```

```
router bgp 456
  no synchronization
  bgp router-id 6.6.6.6
  bgp log-neighbor-changes
  network 6.6.6.66 mask 255.255.255.255
  network 130.100.86.0 mask 255.255.255.224
  neighbor 140.100.56.5 remote-as 456
  neighbor 140.100.56.5 next-hop-self
  neighbor 192.168.2.1 remote-as 65000
  no auto-summary
!
ip classless
ip route 192.168.1.0 255.255.255.0 130.100.26.2
no ip http server
!
!
no cdp run
!
!
line con 0
  exec-timeout 0 0
line aux 0
line vty 0 4
  privilege level 15
  no login
```