

For this lab section, refer to Figure 26-4 on page 918 of the book.

```
R1#sho run
Building configuration...

Current configuration : 1719 bytes
!
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname R1
!
enable secret 5 $1$1xxK$LWh42sY9aO17mvAuehLPM.
!
ip subnet-zero
no ip domain-lookup
!
!
!
!
interface Loopback0
 no ip address
!
interface Loopback1
 description OSPF Loopback
 ip address 1.1.1.1 255.255.255.255
!
interface Loopback10
 description BGP Loopback
 ip address 1.1.1.11 255.255.255.255
!
interface Serial0
 ip address 150.100.31.1 255.255.255.240
 encapsulation frame-relay
 ip ospf authentication message-digest
 ip ospf message-digest-key 5 md5 7 094F471A1A0A
 ip ospf network point-to-point
 ip ospf hello-interval 65
 traffic-shape rate 512000 12800 12800 1000
 traffic-shape adaptive 32000
 frame-relay map ip 150.100.31.3 101 broadcast
 frame-relay lmi-type ansi
!
interface Serial1
 no ip address
 shutdown
!
router ospf 123
 router-id 1.1.1.1
 log-adjacency-changes
 area 0 authentication message-digest
 network 1.1.1.1 0.0.0.0 area 0
 network 150.100.31.0 0.0.0.15 area 0
```

```
    distribute-list 2 in Serial0
!
router bgp 1
  no synchronization
  bgp router-id 1.1.1.1
  bgp log-neighbor-changes
  bgp confederation identifier 1234
  bgp confederation peers 2 3
  network 1.1.1.11 mask 255.255.255.255
  neighbor 150.100.31.3 remote-as 3
  no auto-summary
!
ip classless
access-list 2 deny    6.6.6.6
access-list 2 permit any
```

```
R7#sho run
Building configuration...

Current configuration : 2967 bytes
!
version 12.1
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
service password-encryption
!
hostname R7
!
!
!
!
!
!
ip subnet-zero
no ip domain-lookup
!
!
key chain ccie
  key 6727
    key-string 7 03520C5951
!
!
!
interface Loopback1
  ip address 7.1.1.7 255.255.255.0
!
interface Loopback2
  ip address 17.1.1.7 255.255.255.0
!
interface Loopback3
  ip address 27.1.1.7 255.255.255.0
!
interface Loopback4
  ip address 37.1.1.7 255.255.255.0
!
```

```
interface Loopback100
 ip address 209.112.65.1 255.255.255.0
!
interface Loopback101
 ip address 209.112.66.1 255.255.255.0
!
interface Loopback102
 ip address 209.112.67.1 255.255.255.0
!
interface Loopback103
 ip address 209.112.68.1 255.255.255.0
!
interface Loopback104
 ip address 209.112.69.1 255.255.255.0
!
interface Loopback105
 ip address 209.112.70.1 255.255.255.0
!
interface Loopback200
 ip address 156.46.1.1 255.255.255.0
!
interface Loopback201
 ip address 156.46.2.1 255.255.255.0
!
interface Loopback202
 ip address 156.46.3.1 255.255.255.0
!
interface Loopback203
 ip address 156.46.4.1 255.255.255.0
!
interface Loopback204
 ip address 156.46.100.1 255.255.252.0
!
interface Loopback444
 ip address 140.100.9.1 255.255.255.224
!
interface Loopback777
 ip address 7.7.7.7 255.255.255.255
!
interface Loopback6727
 description Test Loopback for RIPv2
 ip address 67.67.67.1 255.255.255.0
!
interface Ethernet0
 ip address 140.100.47.7 255.255.255.192
 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 140.100.48.1 255.255.255.0
 no keepalive
!
interface Serial1
 no ip address
 shutdown
!
```

```
router rip
version 2
network 67.0.0.0
network 140.100.0.0
no auto-summary
!
router bgp 1560
no synchronization
bgp router-id 7.7.7.7
bgp log-neighbor-changes
network 7.1.1.0 mask 255.255.255.0
network 7.7.7.7 mask 255.255.255.255
network 17.1.1.0 mask 255.255.255.0
network 27.1.1.0 mask 255.255.255.0
network 37.1.1.0 mask 255.255.255.0
network 140.100.47.0 mask 255.255.255.192
network 156.46.1.0 mask 255.255.255.0
network 156.46.2.0 mask 255.255.255.0
network 156.46.3.0 mask 255.255.255.0
network 156.46.4.0 mask 255.255.255.0
network 156.46.100.0 mask 255.255.252.0
network 209.112.65.0
network 209.112.66.0
network 209.112.67.0
network 209.112.68.0
network 209.112.69.0
network 209.112.70.0
neighbor 140.100.47.4 remote-as 456
neighbor 140.100.47.4 description R4
neighbor 140.100.47.4 password 7 045802150C2E
neighbor 140.100.47.4 update-source Loopback777
neighbor 140.100.47.4 version 4
neighbor 140.100.47.4 distribute-list 1 out
!
ip classless
!
access-list 1 deny 209.112.0.0 0.0.254.255
access-list 1 permit any
access-list 10 permit 150.100.0.0 0.0.255.255 log
!
line con 0
exec-timeout 0 0
privilege level 15
line aux 0
line vty 0 4
```

```
R3#sho run
Building configuration...

Current configuration : 3410 bytes
!
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname R3
!
```

```
ip subnet-zero
!
interface Loopback3
  description OSPF Loopback
  ip address 3.3.3.3 255.255.255.255
!
interface Loopback10
  ip address 3.3.3.13 255.255.255.255
!
interface Loopback11
  ip address 3.3.3.23 255.255.255.255
!
interface Loopback13
  ip address 130.100.100.1 255.255.255.255
!
interface Loopback33
  description BGP Loopback
  ip address 3.3.3.33 255.255.255.255
!
interface Ethernet0
  ip address 130.100.1.3 255.255.255.0
!
interface Serial0
  no ip address
  encapsulation frame-relay
  no fair-queue
  clockrate 64000
  frame-relay lmi-type ansi
!
interface Serial0.1 point-to-point
  ip address 150.100.31.3 255.255.255.240
  ip access-group 100 in
  ip ospf authentication message-digest
  ip ospf message-digest-key 5 md5 cisco
  ip ospf hello-interval 65
  traffic-shape rate 64000 8000 8000 1000
  traffic-shape adaptive 32000
  frame-relay interface-dlci 301
!
interface Serial0.2 point-to-point
  ip address 150.100.32.3 255.255.255.224
  ip access-group 100 in
  ip ospf authentication message-digest
  ip ospf message-digest-key 5 md5 cisco
  ip ospf hello-interval 65
  frame-relay interface-dlci 302
!
interface Serial0.3 point-to-point
  ip address 150.100.33.3 255.255.255.248
  ip access-group 100 in
  ip ospf authentication message-digest
  ip ospf message-digest-key 5 md5 cisco
  ip ospf hello-interval 65
  frame-relay interface-dlci 304
!
router ospf 123
  router-id 3.3.3.3
  log-adjacency-changes
```

```
area 0 authentication message-digest
redistribute connected subnets route-map redist
network 3.3.3.3 0.0.0.0 area 0
network 150.100.31.0 0.0.0.15 area 0
network 150.100.32.0 0.0.0.31 area 0
network 150.100.33.0 0.0.0.7 area 0
!
router rip
version 1
redistribute ospf 123 metric 1
network 130.100.0.0
!
router bgp 3
no synchronization
bgp router-id 3.3.3.3
bgp log-neighbor-changes
bgp confederation identifier 1234
bgp confederation peers 1 2
network 3.3.3.33 mask 255.255.255.255
neighbor 10.1.1.9 remote-as 9
neighbor 10.1.1.9 ebgp-multihop 2
neighbor 10.1.1.9 next-hop-self
neighbor 10.1.1.9 description to R9
neighbor 150.100.31.1 remote-as 1
neighbor 150.100.31.1 next-hop-self
neighbor 150.100.31.1 description to R1
neighbor 150.100.32.2 remote-as 2
neighbor 150.100.32.2 next-hop-self
neighbor 150.100.32.2 description to R2
neighbor 150.100.33.4 remote-as 456
neighbor 150.100.33.4 next-hop-self
neighbor 150.100.33.4 description to R4
no auto-summary
!
ip classless
ip route 10.1.1.0 255.255.255.0 130.100.1.1
!
access-list 1 permit 3.3.3.13
access-list 1 permit 3.3.3.23
access-list 100 permit tcp any eq bgp any
access-list 100 permit ospf any any
access-list 100 permit tcp any host 130.100.1.13 eq www
access-list 100 permit tcp 192.168.1.0 0.0.0.255 host
130.100.1.13 eq 443
access-list 100 permit tcp 192.168.1.0 0.0.0.255 host
130.100.1.13 eq ftp
access-list 100 permit tcp 192.168.1.0 0.0.0.255 host
130.100.1.13 eq ftp-data
access-list 100 permit icmp any any echo-reply log
access-list 100 permit icmp any any echo log
access-list 100 deny any any log
route-map redist permit 10
match ip address 1
!
!
line con 0
exec-timeout 0 0
privilege level 15
```

```
logging synchronous
line aux 0
line vty 0 4
logging synchronous
```

```
R2#sho run
Building configuration...

Current configuration : 1742 bytes
!
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
service password-encryption
!
hostname R2
!
enable secret 5 $1$OiDj$4.39veJ97UQ7La4nOLLiC0
!
ip subnet-zero
no ip domain-lookup
!
!
!
!
!
interface Loopback2
description OSPF Loopback
ip address 2.2.2.2 255.255.255.255
!
interface Loopback22
description BGP Loopback
ip address 2.2.2.22 255.255.255.255
!
interface Serial0
ip address 150.100.32.2 255.255.255.224
ip access-group 100 out
encapsulation frame-relay
ip ospf authentication message-digest
ip ospf message-digest-key 5 md5 7 045802150C2E
ip ospf network point-to-point
ip ospf hello-interval 65

frame-relay map ip 150.100.32.3 202 broadcast
!
router ospf 123
router-id 2.2.2.2
log-adjacency-changes
area 0 authentication message-digest
area 2 nssa
network 2.2.2.2 0.0.0.0 area 0
network 150.100.32.0 0.0.0.31 area 0
!
router bgp 2
bgp router-id 2.2.2.2

bgp log-neighbor-changes
bgp confederation identifier 1234
```

```
bgp confederation peers 1 3
network 2.2.2.22 mask 255.255.255.255
neighbor 150.100.32.3 remote-as 3
neighbor 150.100.32.3 description R3
no auto-summary
!
ip classless
!
access-list 100 permit tcp any any eq bgp
access-list 100 permit icmp any any echo
access-list 100 permit icmp any any echo-reply
access-list 100 permit tcp any any eq www
access-list 100 deny any any log
!
line con 0
  exec-timeout 0 0
  logging synchronous
line aux 0
line vty 0 4
  logging synchronous
  login
!
end

R2#
```

```
R5#sho run
Building configuration...

Current configuration : 2337 bytes
!
! No configuration change since last restart
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R5
!
!
ip subnet-zero
!
!
!
!
!
interface Loopback5
  description OSPF Loopback
  ip address 5.5.5.5 255.255.255.255
!
interface Loopback55
  description BGP Loopback
  ip address 5.5.5.55 255.255.255.255
!
interface Ethernet0
  ip address 130.100.26.5 255.255.255.224
!
```



```
interface Serial0
ip address 140.100.45.5 255.255.255.192
ip ospf authentication message-digest
ip ospf message-digest-key 5 md5 cisco
ip ospf network point-to-point
fair-queue
!
interface Serial1
ip address 140.100.56.5 255.255.255.192
ip access-group 100 in
ip ospf authentication message-digest
ip ospf message-digest-key 5 md5 cisco
ip ospf network point-to-point
clockrate 64000
!
router eigrp 5
network 130.100.55.0 0.0.0.255
no auto-summary
eigrp log-neighbor-changes
!
router ospf 123
router-id 5.5.5.5
log-adjacency-changes detail
area 0 authentication message-digest
area 45 authentication message-digest
area 45 virtual-link 4.4.4.4 authentication message-digest
area 45 virtual-link 4.4.4.4 message-digest-key 5 md5 cisco
area 56 authentication message-digest
area 56 virtual-link 6.6.6.6 authentication message-digest
area 56 virtual-link 6.6.6.6 message-digest-key 5 md5 cisco
redistribute eigrp 5 subnets
network 5.5.5.5 0.0.0.0 area 45
network 5.5.5.55 0.0.0.0 area 45
network 140.100.45.0 0.0.0.63 area 45
network 140.100.56.0 0.0.0.63 area 56
!
router bgp 456
no synchronization
bgp router-id 5.5.5.5
bgp log-neighbor-changes
network 5.5.5.55 mask 255.255.255.255
neighbor 140.100.45.4 remote-as 456
neighbor 140.100.45.4 route-reflector-client
neighbor 140.100.45.4 next-hop-self
neighbor 140.100.56.6 remote-as 456
neighbor 140.100.56.6 route-reflector-client
neighbor 140.100.56.6 next-hop-self
no auto-summary
!
ip classless
ip http server
ip pim bidir-enable
!
access-list 100 deny udp host 140.100.56.6 any range 33434
33523
access-list 100 permit ip any any
!
line con 0
```

```
exec-timeout 0 0
line aux 0
line vty 0 4
  privilege level 15
no login
```

From R6

R6#**ping 1.1.1.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 160/164/176 ms

r6#**ping 2.2.2.2**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 172/176/184 ms

R6#**traceroute 1.1.1.1**

Type escape sequence to abort.

Tracing the route to 1.1.1.1

1 140.100.56.5 !A 16 msec 16 msec

R6#**traceroute 2.2.2.2**

Type escape sequence to abort.

Tracing the route to 2.2.2.2

1 140.100.56.5 !A 16 msec 16 msec

R6#