

```
R3#
R3#
R3#show running-config
Building configuration...
```

```
Current configuration : 2433 bytes
```

```
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R3
!
boot-start-marker
boot-end-marker
!
logging message-counter syslog
enable secret 5 $1$p7Bj$JJYJbGT9E4K7craiToCfl.
!
no aaa new-model
!
dot11 syslog
ip source-route
!
!
ip cef
!
!
ip multicast-routing
ipv6 unicast-routing
ipv6 cef
!
multilink bundle-name authenticated
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
```

```
!  
!  
!  
voice-card 0  
!  
!  
!  
!  
!  
archive  
  log config  
  hidekeys  
!  
!  
!  
!  
!  
!  
!  
!  
!  
interface Tunnel34  
  no ip address  
  ipv6 address 2026::34:1/122  
  ipv6 enable  
  ipv6 ospf 6 area 34  
  tunnel source 10.1.1.9  
  tunnel destination 10.1.1.10  
  tunnel mode ipv6ip  
!  
interface FastEthernet0/0  
  no ip address  
  shutdown  
  duplex auto  
  speed auto  
!  
interface FastEthernet0/1  
  no ip address  
  shutdown  
  duplex auto  
  speed auto  
!  
interface Serial0/0/0  
  no ip address  
!  
interface Serial0/0/1  
  no ip address  
  clock rate 2000000  
!  
interface Serial0/1/0  
  no ip address  
  shutdown  
!  
interface Serial0/2/0
```

```
no ip address
encapsulation frame-relay
!
interface Serial0/2/0.23 point-to-point
 ip address 10.1.1.6 255.255.255.252
 ip pim sparse-dense-mode
 snmp trap link-status
 ipv6 address 2026::1:2/122
 ipv6 enable
 ipv6 ospf 6 area 0
 frame-relay interface-dlci 302
!
interface Serial0/2/0.34 point-to-point
 ip address 10.1.1.9 255.255.255.252
 ip pim sparse-dense-mode
 snmp trap link-status
 frame-relay interface-dlci 304
!
interface Serial0/3/0
 no ip address
!
router ospf 1
 router-id 3.3.3.3
 log-adjacency-changes
 area 34 nssa no-summary
 passive-interface Serial0/2/0
 network 10.1.1.2 0.0.0.0 area 0
 network 10.1.1.8 0.0.0.3 area 34
 network 10.3.3.1 0.0.0.0 area 0
 network 10.3.3.3 0.0.0.0 area 0
 network 0.0.0.0 255.255.255.255 area 0
!
ip forward-protocol nd
no ip http server
no ip http secure-server
!
!
!
ip access-list standard DENY_10
 deny 10.0.0.0 0.255.255.255
 permit any
ip access-list standard DENY_ALL
 deny any
ip access-list standard PERMIT_10
 permit 10.0.0.0 0.255.255.255
ip access-list standard PERMIT_ALL
 permit any
!
ipv6 router ospf 6
 log-adjacency-changes
!
!
!
!
```

```
!  
!  
!  
!  
control-plane  
!  
!  
!  
ccm-manager fax protocol cisco  
!  
mgcp fax t38 ecm  
mgcp behavior g729-variants static-pt  
!  
!  
!  
!  
!  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
line aux 0  
line vty 0 4  
  exec-timeout 0 0  
  password cisco  
  login  
!  
scheduler allocate 20000 1000  
ntp server 10.1.1.1  
ntp peer 10.1.1.1  
end
```

R3#

```
R3#ping 209.65.200.241
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 209.65.200.241, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 160/162/164  
ms
```

```
R3#
```

```
R3#ping 209.65.200.226
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 209.65.200.226, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 160/164/172
```

```
ms
```

```
R3#
```

```
R3#ping 209.65.200.225
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 209.65.200.225, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 128/130/132
ms
R3#
```

```
R3#ping 10.1.1.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 128/130/132
```

```
ms
```

```
R3#
```

```
R3#ping 10.1.1.2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```



```
R3#ping 10.1.1.5
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.5, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```

```
R3#ping 10.1.1.6
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.6, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 128/132/136
```

```
ms
```

```
R3#
```

```
R3#ping 10.1.1.9
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.9, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 132/134/140  
ms  
R3#
```

```
R3#ping 10.1.1.10
```

```
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.1.1.10, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/64/68 ms  
R3#
```

```
R3#ping 10.1.4.10
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.4.10, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/66/68 ms
```

```
R3#
```

```
R3#ping 10.1.4.9
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.4.9, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```

```
R3#ping 10.1.4.6
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.4.6, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```

```
R3#ping 10.1.4.5
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.4.5, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms  
R3#
```

```
R3#ping 10.2.1.1
```

```
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.2.1.1, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/68/76 ms  
R3#
```

```
R3#ping 10.2.2.2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.2.2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/64/68 ms
```

```
R3#
```



```
R3#ping 10.2.1.254
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.1.254, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/68/76 ms
```

```
R3#
```

```
R3#ping 10.2.4.14
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.4.14, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/66/68 ms
```

```
R3#
```

```
R3#ping 10.2.4.13
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.4.13, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/66/68 ms  
R3#
```

```
R3#ping 10.2.1.2
```

```
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.2.1.2, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/64/64 ms  
R3#
```

```
R3#ping 10.2.2.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.2.1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/67/72 ms
```

```
R3#
```

```
R3#ping 10.2.1.4
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.2.1.4, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```

```
R3#show ip interface brief
```

| Interface | IP-Address | OK? | Method | Status |
|-----------------|------------|-----|--------|------------------|
| FastEthernet0/0 | unassigned | YES | NVRAM | administratively |
| down down | | | | |
| FastEthernet0/1 | unassigned | YES | NVRAM | administratively |
| down down | | | | |
| Serial0/0/0 | unassigned | YES | NVRAM | down |
| down | | | | |
| Serial0/0/1 | unassigned | YES | NVRAM | down |
| down | | | | |
| Serial0/1/0 | unassigned | YES | NVRAM | administratively |
| down down | | | | |
| Serial0/2/0 | unassigned | YES | NVRAM | up |
| up | | | | |
| Serial0/2/0.23 | 10.1.1.6 | YES | NVRAM | up |
| up | | | | |
| Serial0/2/0.34 | 10.1.1.9 | YES | NVRAM | up |
| up | | | | |
| Serial0/3/0 | unassigned | YES | NVRAM | down |
| down | | | | |
| Tunnel34 | unassigned | YES | NVRAM | up |
| up | | | | |

```
R3#
```

```
R3#show 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, su - IS-IS summary, 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
```

```
        209.65.200.0/24 is variably subnetted, 2 subnets, 2 masks  
O E2    209.65.200.240/29 [110/1] via 10.1.1.5, 00:24:27, Serial0/2/0.23  
O E2    209.65.200.224/30 [110/20] via 10.1.1.5, 00:24:27, Serial0/2/0.23  
        10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks  
O N2    10.2.4.12/30 [110/20] via 10.1.1.10, 00:24:37, Serial0/2/0.34  
C       10.1.1.8/30 is directly connected, Serial0/2/0.34  
O N2    10.1.4.8/30 [110/20] via 10.1.1.10, 00:24:37, Serial0/2/0.34  
O N2    10.2.1.0/24 [110/20] via 10.1.1.10, 00:24:38, Serial0/2/0.34  
O N2    10.2.2.0/24 [110/20] via 10.1.1.10, 00:24:38, Serial0/2/0.34  
O IA    10.1.1.0/30 [110/128] via 10.1.1.5, 00:24:38, Serial0/2/0.23  
O N2    10.1.4.4/30 [110/20] via 10.1.1.10, 00:24:38, Serial0/2/0.34  
C       10.1.1.4/30 is directly connected, Serial0/2/0.23  
R3#
```


| | | | | | | | | |
|------------------|----|------|------|-------|-------|-------|---|------------|
| 17 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Crash |
| writer | | | | | | | | |
| 18 | 0 | 61 | 0 | 0.00% | 0.00% | 0.00% | 0 | |
| Environmental mo | | | | | | | | |
| 19 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | ARP Input |
| 20 | 0 | 1862 | 0 | 0.00% | 0.00% | 0.00% | 0 | ARP |
| Background | | | | | | | | |
| 21 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | ATM Idle |
| Timer | | | | | | | | |
| 22 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA high- |
| capacit | | | | | | | | |
| 23 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | |
| AAA_SERVER_DEADT | | | | | | | | |
| 24 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Policy |
| Manager | | | | | | | | |
| 25 | 4 | 8 | 500 | 0.00% | 0.00% | 0.00% | 0 | DDR Timers |
| 26 | 4 | 2 | 2000 | 0.00% | 0.00% | 0.00% | 0 | Entity MIB |
| API | | | | | | | | |
| 27 | 8 | 54 | 148 | 0.00% | 0.00% | 0.00% | 0 | EEM ED |
| Syslog | | | | | | | | |
| 28 | 0 | 536 | 0 | 0.00% | 0.00% | 0.00% | 0 | HC Counter |
| Timer | | | | | | | | |
| 29 | 0 | 63 | 0 | 0.00% | 0.00% | 0.00% | 0 | Serial |
| Background | | | | | | | | |
| 30 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | RO Notify |
| Timers | | | | | | | | |
| 31 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | RMI RM |
| Notify Wa | | | | | | | | |
| 32 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | SMART |
| 33 | 0 | 1780 | 0 | 0.00% | 0.00% | 0.00% | 0 | GraphIt |
| 34 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | Dialer |
| event | | | | | | | | |
| 35 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SERIAL |
| A'detect | | | | | | | | |
| 36 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | XML Proxy |
| Client | | | | | | | | |
| 37 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Critical |
| Bkgnd | | | | | | | | |
| 38 | 60 | 899 | 66 | 0.00% | 0.00% | 0.00% | 0 | Net |
| Background | | | | | | | | |
| 39 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | IDB Work |
| 40 | 4 | 63 | 63 | 0.00% | 0.00% | 0.00% | 0 | Logger |
| 41 | 0 | 1776 | 0 | 0.00% | 0.00% | 0.00% | 0 | TTY |
| Background | | | | | | | | |
| 42 | 4 | 1785 | 2 | 0.00% | 0.02% | 0.00% | 0 | Per-Second |
| Jobs | | | | | | | | |
| 43 | 0 | 120 | 0 | 0.00% | 0.00% | 0.00% | 0 | c2800 |
| Periodic | | | | | | | | |
| 44 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Inode |
| Table Dest | | | | | | | | |
| 45 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | IKE HA Mgr |
| 46 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | IPSEC HA |
| Mgr | | | | | | | | |
| 47 | 4 | 4 | 1000 | 0.00% | 0.00% | 0.00% | 0 | rf task |

| | | | | | | | | |
|------------------|------|-----|-------|-------|-------|-------|---|------------|
| 106 | 4 | 2 | 2000 | 0.00% | 0.00% | 0.00% | 0 | Ethernet |
| OAM Pro | | | | | | | | |
| 107 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | CEF |
| switching ba | | | | | | | | |
| 108 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | ADJ |
| resolve proc | | | | | | | | |
| 109 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | IP ARP |
| Adjacency | | | | | | | | |
| 110 | 4 | 1 | 4000 | 0.00% | 0.00% | 0.00% | 0 | IP ARP |
| Retry Age | | | | | | | | |
| 111 | 212 | 878 | 241 | 0.00% | 0.01% | 0.00% | 0 | IP Input |
| 112 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | ICMP event |
| handl | | | | | | | | |
| 113 | 0 | 4 | 0 | 0.00% | 0.00% | 0.00% | 0 | TurboACL |
| 114 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | TurboACL |
| chunk | | | | | | | | |
| 115 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | IPv6 Echo |
| event | | | | | | | | |
| 116 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | LSP Tunnel |
| FRR | | | | | | | | |
| 117 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | MPLS Auto- |
| Tunnel | | | | | | | | |
| 118 | 0 | 5 | 0 | 0.00% | 0.00% | 0.00% | 0 | MOP |
| Protocols | | | | | | | | |
| 119 | 0 | 3 | 0 | 0.00% | 0.00% | 0.00% | 0 | PPP Hooks |
| 120 | 3724 | 736 | 5059 | 0.07% | 0.24% | 0.23% | 0 | Exec |
| 121 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SSS |
| Manager | | | | | | | | |
| 122 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SSS |
| Feature Mana | | | | | | | | |
| 123 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SSS |
| Feature Time | | | | | | | | |
| 124 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | Spanning |
| Tree | | | | | | | | |
| 125 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | X.25 |
| Encaps Mana | | | | | | | | |
| 126 | 4 | 32 | 125 | 0.00% | 0.00% | 0.00% | 0 | SSM |
| connection m | | | | | | | | |
| 127 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | AC Switch |
| 128 | 0 | 7 | 0 | 0.00% | 0.00% | 0.00% | 0 | |
| Authentication P | | | | | | | | |
| 129 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Auth-proxy |
| AAA B | | | | | | | | |
| 130 | 100 | 2 | 50000 | 0.00% | 0.00% | 0.00% | 0 | EAPoUDP |
| Process | | | | | | | | |
| 131 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | IP Host |
| Track Pr | | | | | | | | |
| 132 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | KRB5 AAA |
| 133 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | Ethernet |
| LMI | | | | | | | | |
| 134 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | PPP IP |
| Route | | | | | | | | |
| 135 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | PPP IPCP |


```
R3#show interfaces
FastEthernet0/0 is administratively down, line protocol is down
  Hardware is MV96340 Ethernet, address is 0016.479a.f6e8 (bia
0016.479a.f6e8)
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto Speed, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog
    0 input packets with dribble condition detected
```

```
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 unknown protocol drops
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
FastEthernet0/1 is administratively down, line protocol is down
  Hardware is MV96340 Ethernet, address is 0016.479a.f6e9 (bia
0016.479a.f6e9)
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto Speed, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog
    0 input packets with dribble condition detected
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 unknown protocol drops
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
Serial0/0/0 is down, line protocol is down
  Hardware is GT96K Serial
  MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set
  Keepalive set (10 sec)
  CRC checking enabled
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/0/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
    Available Bandwidth 1158 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
```

0 output errors, 0 collisions, 4 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=down DSR=down DTR=up RTS=up CTS=down

Serial0/0/1 is down, line protocol is down

Hardware is GT96K Serial
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set
Keepalive set (10 sec)
CRC checking enabled
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 5 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=up DSR=up DTR=down RTS=down CTS=up

Serial0/1/0 is administratively down, line protocol is down

Hardware is GT96K Serial
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set
Keepalive set (10 sec)
CRC checking enabled
Last input 00:30:19, output 00:30:18, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/1/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1 packets input, 24 bytes, 0 no buffer
Received 1 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1 packets output, 24 bytes, 0 underruns

0 output errors, 0 collisions, 3 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=down DSR=down DTR=down RTS=down CTS=down

Serial0/2/0 is up, line protocol is up

Hardware is GT96K Serial
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation FRAME-RELAY, loopback not set
Keepalive set (10 sec)
CRC checking enabled
LMI enq sent 165, LMI stat recvd 163, LMI upd recvd 0, DTE LMI up
LMI enq recvd 0, LMI stat sent 0, LMI upd sent 0
LMI DLCI 1023 LMI type is CISCO frame relay DTE
FR SVC disabled, LAPF state down
Broadcast queue 0/64, broadcasts sent/dropped 859/0, interface
broadcasts 822
Last input 00:00:00, output 00:00:00, output hang never
Last clearing of "show interface" counters 00:30:17
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/4/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 1000 bits/sec, 3 packets/sec
5 minute output rate 1000 bits/sec, 3 packets/sec
5069 packets input, 378160 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
5247 packets output, 395339 bytes, 0 underruns
0 output errors, 0 collisions, 7 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
68 carrier transitions
DCD=up DSR=up DTR=up RTS=up CTS=up

Serial0/2/0.23 is up, line protocol is up

Hardware is GT96K Serial
Internet address is 10.1.1.6/30
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation FRAME-RELAY
CRC checking enabled
Last clearing of "show interface" counters never

Serial0/2/0.34 is up, line protocol is up

Hardware is GT96K Serial
Internet address is 10.1.1.9/30
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation FRAME-RELAY
CRC checking enabled

Last clearing of "show interface" counters never
Serial0/3/0 is down, line protocol is down
Hardware is GT96K Serial
MTU 1500 bytes, BW 1544 Kbit/sec, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set
Keepalive set (10 sec)
CRC checking enabled
Last input 00:29:46, output 00:29:52, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/1/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1 packets input, 24 bytes, 0 no buffer
Received 1 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
5 packets output, 1026 bytes, 0 underruns
0 output errors, 0 collisions, 63 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
8 carrier transitions
DCD=down DSR=down DTR=up RTS=up CTS=down

Tunnel34 is up, line protocol is up
Hardware is Tunnel
MTU 17916 bytes, BW 100 Kbit/sec, DLY 50000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation TUNNEL, loopback not set
Keepalive not set
Tunnel source 10.1.1.9, destination 10.1.1.10
Tunnel protocol/transport GRE/IP
Key disabled, sequencing disabled
Checksumming of packets disabled
Tunnel TTL 255
Fast tunneling enabled
Tunnel transport MTU 1476 bytes
Tunnel transmit bandwidth 8000 (kbps)
Tunnel receive bandwidth 8000 (kbps)
Last input 00:23:56, output 00:00:09, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 21
Queueing strategy: fifo
Output queue: 0/0 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
62 packets input, 9112 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
304 packets output, 30836 bytes, 0 underruns

```
0 output errors, 0 collisions, 0 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
R3#
```

```
R3#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID          Local Intrfce    Holdtme    Capability  Platform  Port
ID
R2                  Ser 0/2/0.23     134        R S I       2811      Ser
0/2/0.23
R4                  Ser 0/2/0.34     133        R S I       1841      Ser
0/1/0.34
R3#
```



```
R3#show cdp neighbors detail
```

```
-----
```

```
Device ID: R2
```

```
Entry address(es):
```

```
  IP address: 10.1.1.5
```

```
  IPv6 address: 2026::1:1 (global unicast)
```

```
  IPv6 address: FE80::216:9DFF:FEFA:CAB0 (link-local)
```

```
Platform: Cisco 2811, Capabilities: Router Switch IGMP
```

```
Interface: Serial0/2/0.23, Port ID (outgoing port): Serial0/2/0.23
```

```
Holdtime : 126 sec
```

```
Version :
```

```
Cisco IOS Software, 2800 Software (C2800NM-ADVIPSERVICESK9-M), Version  
12.4(22)T2, RELEASE SOFTWARE (fc4)
```

```
Technical Support: http://www.cisco.com/techsupport
```

```
Copyright (c) 1986-2009 by Cisco Systems, Inc.
```

```
Compiled Fri 19-Jun-09 15:34 by prod_rel_team
```

```
advertisement version: 2
```

```
VTP Management Domain: ''
```

Device ID: R4

Entry address(es):

 IP address: 10.1.1.10

Platform: Cisco 1841, Capabilities: Router Switch IGMP

Interface: Serial0/2/0.34, Port ID (outgoing port): Serial0/1/0.34

Holdtime : 125 sec

Version :

Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version
12.4(25b), RELEASE SOFTWARE (fc1)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2009 by Cisco Systems, Inc.

Compiled Wed 12-Aug-09 10:49 by prod_rel_team

advertisement version: 2

VTP Management Domain: ''

R3#

```
R3#show frame-relay map
Serial0/2/0.23 (up): point-to-point dlci, dlci 302(0x12E,0x48E0),
broadcast
        status defined, active
Serial0/2/0.34 (up): point-to-point dlci, dlci 304(0x130,0x4C00),
broadcast
        status defined, active
R3#
```

```
R3#show ip interface
FastEthernet0/0 is administratively down, line protocol is down
    Internet protocol processing disabled
FastEthernet0/1 is administratively down, line protocol is down
    Internet protocol processing disabled
Serial0/0/0 is down, line protocol is down
    Internet protocol processing disabled
Serial0/0/1 is down, line protocol is down
    Internet protocol processing disabled
```

```
Serial0/1/0 is administratively down, line protocol is down
  Internet protocol processing disabled
Serial0/2/0 is up, line protocol is up
  Internet protocol processing disabled
Serial0/2/0.23 is up, line protocol is up
  Internet address is 10.1.1.6/30
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22
224.0.0.13
  224.0.0.5
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is enabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Policy routing is disabled
  Network address translation is disabled
  BGP Policy Mapping is disabled
  Input features: MCI Check
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
Serial0/2/0.34 is up, line protocol is up
  Internet address is 10.1.1.9/30
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22
224.0.0.13
  224.0.0.5
  Outgoing access list is not set
```

```
Inbound access list is not set
Proxy ARP is enabled
Local Proxy ARP is disabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachable are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP fast switching on the same interface is enabled
IP Flow switching is disabled
IP CEF switching is enabled
IP CEF switching turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled
Serial0/3/0 is down, line protocol is down
Internet protocol processing disabled
Tunnel34 is up, line protocol is up
Internet protocol processing disabled
R3#
```

```

R3#show ip cef
Prefix                Next Hop                Interface
0.0.0.0/0             no route
0.0.0.0/8             drop
0.0.0.0/32            receive
10.1.1.0/30           10.1.1.5                Serial0/2/0.23
10.1.1.4/30           attached                 Serial0/2/0.23
10.1.1.4/32           receive                  Serial0/2/0.23
10.1.1.6/32           receive                  Serial0/2/0.23
10.1.1.7/32           receive                  Serial0/2/0.23
10.1.1.8/30           attached                 Serial0/2/0.34
10.1.1.8/32           receive                  Serial0/2/0.34
10.1.1.9/32           receive                  Serial0/2/0.34
10.1.1.11/32          receive                  Serial0/2/0.34
10.1.4.4/30           10.1.1.10               Serial0/2/0.34
10.1.4.8/30           10.1.1.10               Serial0/2/0.34
10.2.1.0/24           10.1.1.10               Serial0/2/0.34
10.2.2.0/24           10.1.1.10               Serial0/2/0.34
10.2.4.12/30          10.1.1.10               Serial0/2/0.34
127.0.0.0/8          drop
209.65.200.224/30    10.1.1.5                Serial0/2/0.23
209.65.200.240/29    10.1.1.5                Serial0/2/0.23
224.0.0.0/4          multicast
224.0.0.0/24         receive
240.0.0.0/4          drop
255.255.255.255/32   receive
R3#

```

```
R3#show tcp statistics
Rcvd: 0 Total, 0 no port
      0 checksum error, 0 bad offset, 0 too short
      0 packets (0 bytes) in sequence
      0 dup packets (0 bytes)
      0 partially dup packets (0 bytes)
      0 out-of-order packets (0 bytes)
      0 packets (0 bytes) with data after window
      0 packets after close
      0 window probe packets, 0 window update packets
      0 dup ack packets, 0 ack packets with unsend data
      0 ack packets (0 bytes)
Sent: 0 Total, 0 urgent packets
      0 control packets (including 0 retransmitted)
      0 data packets (0 bytes)
      0 data packets (0 bytes) retransmitted
      0 data packets (0 bytes) fastretransmitted
      0 ack only packets (0 delayed)
      0 window probe packets, 0 window update packets
0 Connections initiated, 0 connections accepted, 0 connections
established
0 Connections closed (including 0 dropped, 0 embryonic dropped)
0 Total rxmt timeout, 0 connections dropped in rxmt timeout
0 Keepalive timeout, 0 keepalive probe, 0 Connections dropped in
keepalive
R3#
```

```
R3#show ip protocols
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 3.3.3.3
  It is an area border and autonomous system boundary router
  Redistributing External Routes from,
  Number of areas in this router is 2. 1 normal 0 stub 1 nssa
  Maximum path: 4
  Routing for Networks:
    10.1.1.2 0.0.0.0 area 0
    10.1.1.8 0.0.0.3 area 34
    10.3.3.1 0.0.0.0 area 0
    10.3.3.3 0.0.0.0 area 0
    0.0.0.0 255.255.255.255 area 0
  Reference bandwidth unit is 100 mbps
  Passive Interface(s):
    Serial0/2/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    4.4.4.4          110          00:26:22
    2.2.2.2          110          00:26:22
```



```
10.1.1.1          110      00:26:12
Distance: (default is 110)
```

R3#

```
R3#show access-lists
Standard IP access list DENY_10
 10 deny 10.0.0.0, wildcard bits 0.255.255.255
 20 permit any
Standard IP access list DENY_ALL
 10 deny any
Standard IP access list PERMIT_10
 10 permit 10.0.0.0, wildcard bits 0.255.255.255
Standard IP access list PERMIT_ALL
 10 permit any
R3#
```

```
R3#show ip ospf neighbor
```

| Neighbor ID | Pri | State | Dead Time | Address |
|----------------|-----|---------|-----------|-----------|
| Interface | | | | |
| 2.2.2.2 | 0 | FULL/ - | 00:00:38 | 10.1.1.5 |
| Serial0/2/0.23 | | | | |
| 4.4.4.4 | 0 | FULL/ - | 00:00:37 | 10.1.1.10 |
| Serial0/2/0.34 | | | | |

```
R3#
```

```
R3#show ip ospf interface
Serial0/2/0.23 is up, line protocol is up
  Internet Address 10.1.1.6/30, Area 0
  Process ID 1, Router ID 3.3.3.3, Network Type POINT_TO_POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT_TO_POINT
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:05
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Index 1/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 4, maximum is 4
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 2.2.2.2
  Suppress hello for 0 neighbor(s)
Serial0/2/0.34 is up, line protocol is up
  Internet Address 10.1.1.9/30, Area 34
  Process ID 1, Router ID 3.3.3.3, Network Type POINT_TO_POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT_TO_POINT
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:02
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
```

```
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 4.4.4.4
Suppress hello for 0 neighbor(s)
R3#
```

```
R3#show ip ospf database
```

```
OSPF Router with ID (3.3.3.3) (Process ID 1)
```

```
Router Link States (Area 0)
```

| Link ID count | ADV Router | Age | Seq# | Checksum | Link |
|------------------|------------|------|------------|----------|------|
| 2.2.2.2 | 2.2.2.2 | 1622 | 0x8000000C | 0x00C09D | 2 |
| 3.3.3.3 | 3.3.3.3 | 1621 | 0x8000000C | 0x0066F0 | 2 |

```
Summary Net Link States (Area 0)
```

| Link ID | ADV Router | Age | Seq# | Checksum |
|----------|------------|------|------------|----------|
| 10.1.1.0 | 2.2.2.2 | 1623 | 0x80000001 | 0x0024C7 |
| 10.1.1.8 | 3.3.3.3 | 1622 | 0x80000001 | 0x00B52A |

Summary ASB Link States (Area 0)

| Link ID | ADV Router | Age | Seq# | Checksum |
|----------|------------|------|------------|----------|
| 10.1.1.1 | 2.2.2.2 | 1613 | 0x80000001 | 0x001EC8 |

Router Link States (Area 34)

| Link ID | ADV Router | Age | Seq# | Checksum | Link |
|---------|------------|------|------------|----------|------|
| count | | | | | |
| 3.3.3.3 | 3.3.3.3 | 1621 | 0x8000000D | 0x00D070 | 2 |
| 4.4.4.4 | 4.4.4.4 | 1623 | 0x8000000F | 0x0069D1 | 2 |

Summary Net Link States (Area 34)

| Link ID | ADV Router | Age | Seq# | Checksum |
|---------|------------|------|------------|----------|
| 0.0.0.0 | 3.3.3.3 | 1627 | 0x80000001 | 0x00DE4B |

Type-7 AS External Link States (Area 34)

| Link ID | ADV Router | Age | Seq# | Checksum | Tag |
|-----------|------------|------|------------|----------|-----|
| 10.1.4.4 | 4.4.4.4 | 1625 | 0x80000004 | 0x00F369 | 0 |
| 10.1.4.8 | 4.4.4.4 | 1622 | 0x80000004 | 0x00CB8D | 0 |
| 10.2.1.0 | 4.4.4.4 | 1625 | 0x80000002 | 0x00471B | 0 |
| 10.2.2.0 | 4.4.4.4 | 1625 | 0x80000002 | 0x003C25 | 0 |
| 10.2.4.12 | 4.4.4.4 | 1625 | 0x80000002 | 0x009BBA | 0 |

Type-5 AS External Link States

| Link ID | ADV Router | Age | Seq# | Checksum | Tag |
|----------------|------------|------|------------|----------|-------|
| 10.1.4.4 | 3.3.3.3 | 1607 | 0x80000001 | 0x00ACC1 | 0 |
| 10.1.4.8 | 3.3.3.3 | 1607 | 0x80000001 | 0x0084E5 | 0 |
| 10.2.1.0 | 3.3.3.3 | 1607 | 0x80000001 | 0x00FB75 | 0 |
| 10.2.2.0 | 3.3.3.3 | 1607 | 0x80000001 | 0x00F07F | 0 |
| 10.2.4.12 | 3.3.3.3 | 1607 | 0x80000001 | 0x005015 | 0 |
| 209.65.200.224 | 10.1.1.1 | 1858 | 0x80000001 | 0x004693 | 0 |
| 209.65.200.240 | 10.1.1.1 | 1800 | 0x80000001 | 0x0031C6 | 65002 |

R3#

```
R3#show ip route ospf
    209.65.200.0/24 is variably subnetted, 2 subnets, 2 masks
O E2    209.65.200.240/29 [110/1] via 10.1.1.5, 00:26:51, Serial0/2/0.23
O E2    209.65.200.224/30 [110/20] via 10.1.1.5, 00:26:51, Serial0/2/0.23
    10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
O N2    10.2.4.12/30 [110/20] via 10.1.1.10, 00:27:01, Serial0/2/0.34
O N2    10.1.4.8/30 [110/20] via 10.1.1.10, 00:27:01, Serial0/2/0.34
O N2    10.2.1.0/24 [110/20] via 10.1.1.10, 00:27:01, Serial0/2/0.34
O N2    10.2.2.0/24 [110/20] via 10.1.1.10, 00:27:01, Serial0/2/0.34
O IA    10.1.1.0/30 [110/128] via 10.1.1.5, 00:27:01, Serial0/2/0.23
O N2    10.1.4.4/30 [110/20] via 10.1.1.10, 00:27:01, Serial0/2/0.34
R3#
```

```
R3#
R3#show ipv6 interface brief
FastEthernet0/0      [administratively down/down]
    unassigned
FastEthernet0/1      [administratively down/down]
    unassigned
Serial0/0/0          [down/down]
    unassigned
Serial0/0/1          [down/down]
    unassigned
Serial0/1/0          [administratively down/down]
    unassigned
Serial0/2/0          [up/up]
    unassigned
Serial0/2/0.23       [up/up]
    FE80::216:47FF:FE9A:F6E8
    2026::1:2
Serial0/2/0.34       [up/up]
    unassigned
Serial0/3/0          [down/down]
    unassigned
Tunnel34             [up/up]
    FE80::A01:109
    2026::34:1
R3#
```

```
R3#ping ipv6 2026::12:1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::12:1, timeout is 2 seconds:
```

```
.....
```

```
Success rate is 0 percent (0/5)
```

```
R3#
```



```
R3#ping ipv6 2026::12:2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::12:2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/65/68 ms
```

```
R3#
```

```
R3#ping ipv6 2026::1:1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::1:1, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 64/64/68 ms
```

```
R3#
```

```
R3#ping ipv6 2026::1:2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::1:2, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/4 ms
```

```
R3#
```

```
R3#ping ipv6 2026::34:1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::34:1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/4 ms
```

```
R3#
```

```
R3#ping ipv6 2026::34:2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::34:2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 76/76/80 ms
```

```
R3#
```

```
R3#ping ipv6 2026::2:1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::2:1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 76/76/80 ms
```

```
R3#
```

```
R3#ping ipv6 2026::2:2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::2:2, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 80/83/96 ms
```

```
R3#
```

```
R3#ping ipv6 2026::3:1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::3:1, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 76/78/80 ms
```

```
R3#
```

```
R3#ping ipv6 2026::3:2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2026::3:2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 80/80/84 ms
```

```
R3#
```

```
R3#show ipv6 route
IPv6 Routing Table - Default - 8 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, M - MIPv6, R - RIP, I1 - ISIS L1
       I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary, D - EIGRP
       EX - EIGRP external
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext
2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
C    2026::1:0/122 [0/0]
     via Serial0/2/0.23, directly connected
L    2026::1:2/128 [0/0]
     via Serial0/2/0.23, receive
OE2  2026::2:0/122 [110/20]
     via FE80::A01:10A, Tunnel34
OE2  2026::3:0/122 [110/20]
     via FE80::A01:10A, Tunnel34
OI   2026::12:0/122 [110/128]
     via FE80::216:9DFF:FEFA:CAB0, Serial0/2/0.23
C    2026::34:0/122 [0/0]
     via Tunnel34, directly connected
L    2026::34:1/128 [0/0]
     via Tunnel34, receive
L    FF00::/8 [0/0]
     via Null0, receive
R3#
```



```
R3#show ipv6 ospf
Routing Process "ospfv3 6" with ID 10.1.1.6
It is an area border router
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
Number of external LSA 2. Checksum Sum 0x010531
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
Reference bandwidth unit is 100 mbps
  Area BACKBONE(0)
    Number of interfaces in this area is 1
    SPF algorithm executed 2 times
    Number of LSA 9. Checksum Sum 0x040D0C
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
  Area 34
    Number of interfaces in this area is 1
    SPF algorithm executed 6 times
    Number of LSA 8. Checksum Sum 0x03EAD5
```

Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

R3#

```
R3#show ipv6 ospf interface
Serial0/2/0.23 is up, line protocol is up
  Link Local Address FE80::216:47FF:FE9A:F6E8, Interface ID 19
  Area 0, Process ID 6, Instance ID 0, Router ID 10.1.1.6
  Network Type POINT_TO_POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:07
  Index 1/1/2, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 4
  Last flood scan time is 0 msec, maximum is 0 msec
```

```
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 2.2.2.2
  Suppress hello for 0 neighbor(s)
Tunnel34 is up, line protocol is up
  Link Local Address FE80::A01:109, Interface ID 18
  Area 34, Process ID 6, Instance ID 0, Router ID 10.1.1.6
  Network Type POINT_TO_POINT, Cost: 1000
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:01
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 4
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 4.4.4.4
    Suppress hello for 0 neighbor(s)
R3#
```

```
R3#show ipv6 ospf neighbor
```

| Neighbor ID | Pri | State | Dead Time | Interface ID |
|---------------------------|-----|---------|-----------|--------------|
| Interface 2.2.2.2 | 1 | FULL/ - | 00:00:38 | 20 |
| Serial0/2/0.23 4.4.4.4 | 1 | FULL/ - | 00:00:33 | 13 |
| Tunnel34 | | | | |

```
R3#
```

```
R3#
```