

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

```
Current configuration : 2469 bytes
```

```
!
! No configuration change since last restart
!
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
  network 10.1.1.2 0.0.0.0 area 0
  network 10.1.1.9 0.0.0.0 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 peer 10.1.1.1  
ntp server 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 0 percent (0/5)
```

```
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 0 percent (0/5)
```

```
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 0 percent (0/5)
```

```
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 = 64/66/68 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 = 128/132/140
```

```
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 = 128/132/136
```

```
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 = 192/196/204
```

```
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 = 192/197/208  
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 = 192/194/196
```

```
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 = 192/194/196
```

```
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 = 192/196/200
```

```
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 = 192/194/196
```

```
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 = 192/195/196
```

```
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 = 192/194/196  
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 = 192/194/196
```

```
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 = 192/196/204  
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 = 192/194/196
```

```
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 = 192/194/196
```

```
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 = 192/194/196

ms

R3#

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

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, 00:35:07, 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, 00:35:07, Serial0/2/0.34

O N2 10.2.1.0/24 [110/20] via 10.1.1.10, 00:35:07, Serial0/2/0.34

O N2 10.2.2.0/24 [110/20] via 10.1.1.10, 00:35:07, Serial0/2/0.34

O IA 10.1.1.0/30 [110/128] via 10.1.1.5, 00:35:17, Serial0/2/0.23

O N2 10.1.4.4/30 [110/20] via 10.1.1.10, 00:35:08, Serial0/2/0.34

C 10.1.1.4/30 is directly connected, Serial0/2/0.23

R3#

R3#show processes cpu

CPU utilization for five seconds: 1%/0%; one minute: 2%; five minutes: 2%

PID	Runtime(ms)	Invoked	uSecs	5Sec	1Min	5Min	TTY	Process
1	12	69	173	0.00%	0.00%	0.00%	0	Chunk
Manager								
2	0	474	0	0.00%	0.04%	0.02%	0	Load Meter
3	0	5	0	0.00%	0.00%	0.00%	0	Collection
proce								
4	4	1	4000	0.00%	0.00%	0.00%	0	EDDRI_MAIN
5	2892	280	10328	0.00%	0.12%	0.11%	0	Check
heaps								
6	0	1	0	0.00%	0.00%	0.00%	0	Pool
Manager								
7	0	2	0	0.00%	0.00%	0.00%	0	Timers
8	0	1	0	0.00%	0.00%	0.00%	0	License
Client N								
9	68	988	68	0.00%	0.00%	0.00%	0	OSPF-1
Hello								
10	0	40	0	0.00%	0.00%	0.00%	0	IPC
Dynamic Cach								
11	0	1	0	0.00%	0.00%	0.00%	0	IPC Zone
Manager								
12	0	2368	0	0.00%	0.00%	0.00%	0	IPC
Periodic Tim								











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
136	40	163	245	0.00%	0.00%	0.00%	0	IP
Background								
137	48	13	3692	0.00%	0.00%	0.00%	0	IP RIB
Update								
138	0	2	0	0.00%	0.00%	0.00%	0	Dot1x
Supplicant								
139	0	2	0	0.00%	0.00%	0.00%	0	Dot1x
Supplicant								
140	0	2	0	0.00%	0.00%	0.00%	0	Dot1x
Supplicant								
141	0	1	0	0.00%	0.00%	0.00%	0	Asy FS
Helper								
142	0	40	0	0.00%	0.00%	0.00%	0	Licensing
Auto U								
143	0	1	0	0.00%	0.00%	0.00%	0	Socket
Timers								
144	0	86	0	0.00%	0.00%	0.00%	0	CEF
background p								
145	12	3697	3	0.00%	0.00%	0.00%	0	CEF: IPv4
proces								
146	4	20	200	0.00%	0.00%	0.00%	0	ADJ
background								
147	0	2	0	0.00%	0.00%	0.00%	0	L2MM
148	0	1	0	0.00%	0.00%	0.00%	0	MRD
149	0	1	0	0.00%	0.00%	0.00%	0	IGMPSN
150	4	1	4000	0.00%	0.00%	0.00%	0	L2X Data
Daemon								
151	0	1	0	0.00%	0.00%	0.00%	0	TCP Timer
152	0	1	0	0.00%	0.00%	0.00%	0	TCP
Protocols								
153	0	8	0	0.00%	0.00%	0.00%	0	HTTP CORE
154	0	1	0	0.00%	0.00%	0.00%	0	IP
Traceroute								
155	0	2	0	0.00%	0.00%	0.00%	0	RLM groups
Proce								
156	0	2	0	0.00%	0.00%	0.00%	0	PPPoE Flow
Contr								
157	0	1	0	0.00%	0.00%	0.00%	0	SNMP
Timers								
158	4	2	2000	0.00%	0.00%	0.00%	0	SCTP Main
Proces								
159	0	1	0	0.00%	0.00%	0.00%	0	IUA Main
Process								
160	4	2378	1	0.00%	0.00%	0.00%	0	RUDPV1
Main Proc								
161	0	1	0	0.00%	0.00%	0.00%	0	bsm_timers

162	0	2382	0	0.00%	0.00%	0.00%	0
bsm_xmt_proc							
163	0	1	0	0.00%	0.00%	0.00%	0 CES Client
SVC R							
164	0	1	0	0.00%	0.00%	0.00%	0 COPS
165	0	2	0	0.00%	0.00%	0.00%	0 Dialer
Forwarder							
166	0	3	0	0.00%	0.00%	0.00%	0 Flow
Exporter Ti							
167	0	2	0	0.00%	0.00%	0.00%	0 ATM OAM
Input							
168	0	2	0	0.00%	0.00%	0.00%	0 ATM OAM
TIMER							
169	0	1	0	0.00%	0.00%	0.00%	0 RARP Input
170	0	1	0	0.00%	0.00%	0.00%	0 LAPB
Process							
171	0	1	0	0.00%	0.00%	0.00%	0 IPv6
Inspect Tim							
172	0	2	0	0.00%	0.00%	0.00%	0 LFDp Input
Proc							
173	0	1	0	0.00%	0.00%	0.00%	0 PAD InCall
174	0	2	0	0.00%	0.00%	0.00%	0 X.25
Background							
175	0	2	0	0.00%	0.00%	0.00%	0 PPP Bind
176	0	2	0	0.00%	0.00%	0.00%	0 PPP SSS
177	0	1	0	0.00%	0.00%	0.00%	0 MQC Flow
Event B							
178	0	593078	0	0.79%	0.77%	0.79%	0 HQF Shaper
Backg							
179	0	23762	0	0.07%	0.03%	0.02%	0 RBSCP
Background							
180	0	1	0	0.00%	0.00%	0.00%	0 VPDN call
manage							
181	0	1	0	0.00%	0.00%	0.00%	0 CHKPT
EXAMPLE							
182	0	1	0	0.00%	0.00%	0.00%	0 CHKPT
DevTest							
183	0	1	0	0.00%	0.00%	0.00%	0 IPS
Process							
184	0	2	0	0.00%	0.00%	0.00%	0 IPS Auto
Update							
185	0	2	0	0.00%	0.00%	0.00%	0 SDEE
Management							
186	0	4647	0	0.07%	0.00%	0.00%	0 Inspect
process							
187	0	2	0	0.00%	0.00%	0.00%	0
cpf_process_msg_							
188	0	4647	0	0.00%	0.00%	0.00%	0 FW DP
Inspect pr							
189	0	4647	0	0.00%	0.00%	0.00%	0 CCE DP
URLF cach							
190	0	2	0	0.00%	0.00%	0.00%	0 URL filter
proc							









```
318          56      47930          1  0.07%  0.14%  0.15%  0 PIM
Process
320          20      2462           8  0.00%  0.01%  0.00%  0 NTP
322          84      2515          33  0.00%  0.00%  0.00%  0 OSPF-1
Router
R3#
```

```
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 00:40:05, output 00:40:05, 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 228, LMI stat recvd 227, 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 1107/0, interface  
broadcasts 1042  
Last input 00:00:01, output 00:00:01, output hang never  
Last clearing of "show interface" counters 00:40:04  
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 0 bits/sec, 0 packets/sec  
5 minute output rate 0 bits/sec, 0 packets/sec  
2249 packets input, 195259 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  
2376 packets output, 206852 bytes, 0 underruns  
0 output errors, 0 collisions, 6 interface resets

0 unknown protocol drops  
0 output buffer failures, 0 output buffers swapped out  
52 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 00:39:33, output 00:39:38, 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, 83 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 17920 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 IPv6/IP
Tunnel TTL 255
Tunnel transport MTU 1480 bytes
Tunnel transmit bandwidth 8000 (kbps)
Tunnel receive bandwidth 8000 (kbps)
Last input 00:00:02, output 00:00:01, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 13
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
  248 packets input, 36288 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
  295 packets output, 29768 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 interfaces counters errors
```

```
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
R2	Ser 0/2/0.23	144	R S I	2811	Ser
R4	Ser 0/2/0.34	149	R S I	1841	Ser

```
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 : 135 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 : 140 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 arp
```

```
R3#
```

```
R3#show ip arp
```

```
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
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
    10.1.1.9 0.0.0.0 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
```



Routing Information Sources:

Gateway	Distance	Last Update
4.4.4.4	110	00:37:16
2.2.2.2	110	00:37:26

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/ -	00:00:35	10.1.1.5
Serial0/2/0.23				
4.4.4.4	0	FULL/ -	00:00:32	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 6, maximum is 6
  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 00:00:05
  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	240	0x8000000B	0x00C29C	2
3.3.3.3	3.3.3.3	250	0x8000000B	0x0068EF	2

Summary Net Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
10.1.1.0	2.2.2.2	239	0x80000002	0x0022C8
10.1.1.8	3.3.3.3	250	0x80000002	0x00B32B

Summary ASB Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
10.1.1.1	2.2.2.2	239	0x80000002	0x001CC9

Router Link States (Area 34)

Link ID count	ADV Router	Age	Seq#	Checksum	Link
3.3.3.3	3.3.3.3	250	0x8000000D	0x00D070	2

4.4.4.4            4.4.4.4            337            0x8000000E 0x006BD0 2

Summary Net Link States (Area 34)

Link ID	ADV Router	Age	Seq#	Checksum
0.0.0.0	3.3.3.3	250	0x80000002	0x00DC4C

Type-7 AS External Link States (Area 34)

Link ID	ADV Router	Age	Seq#	Checksum	Tag
10.1.4.4	4.4.4.4	338	0x80000005	0x00F16A	0
10.1.4.8	4.4.4.4	338	0x80000005	0x00C98E	0
10.2.1.0	4.4.4.4	338	0x80000005	0x00411E	0
10.2.2.0	4.4.4.4	338	0x80000003	0x003A26	0
10.2.4.12	4.4.4.4	338	0x80000003	0x0099BB	0

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
10.1.4.4	3.3.3.3	251	0x80000002	0x00AAC2	0
10.1.4.8	3.3.3.3	251	0x80000002	0x0082E6	0
10.2.1.0	3.3.3.3	251	0x80000002	0x00F976	0
10.2.2.0	3.3.3.3	251	0x80000002	0x00EE80	0
10.2.4.12	3.3.3.3	251	0x80000002	0x004E16	0

R3#

```
R3#show ip route ospf
    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, 00:37:58, Serial0/2/0.34
O N2   10.1.4.8/30 [110/20] via 10.1.1.10, 00:37:58, Serial0/2/0.34
O N2   10.2.1.0/24 [110/20] via 10.1.1.10, 00:37:58, Serial0/2/0.34
O N2   10.2.2.0/24 [110/20] via 10.1.1.10, 00:37:58, Serial0/2/0.34
O IA   10.1.1.0/30 [110/128] via 10.1.1.5, 00:38:08, Serial0/2/0.23
O N2   10.1.4.4/30 [110/20] via 10.1.1.10, 00:37:58, Serial0/2/0.34
R3#
```