


```
!  
!  
!  
!  
voice-card 0  
!  
!  
!  
!  
archive  
  log config  
  hidekeys  
!  
!  
!  
!  
!  
!  
!  
!  
!  
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  
!  
interface Serial0/1/0  
  no ip address  
  ip nat outside  
  ip virtual-reassembly  
  shutdown  
  clock rate 56000  
!  
interface Serial0/2/0  
  no ip address  
  encapsulation frame-relay  
!  
interface Serial0/2/0.12 point-to-point  
  ip address 10.1.1.2 255.255.255.252  
  ip pim sparse-dense-mode
```

```
snmp trap link-status
ipv6 address 2026::12:2/122
ipv6 enable
ipv6 ospf 6 area 12
frame-relay interface-dlci 201
!
interface Serial0/2/0.23 point-to-point
 ip address 10.1.1.5 255.255.255.252
 ip pim sparse-dense-mode
 snmp trap link-status
 ipv6 address 2026::1:1/122
 ipv6 enable
 ipv6 ospf 6 area 0
 frame-relay interface-dlci 203
!
interface Serial0/3/0
 no ip address
 ip virtual-reassembly
 shutdown
 clock rate 56000
!
router ospf 1
 router-id 2.2.2.2
 log-adjacency-changes
 network 10.1.1.1 0.0.0.0 area 0
 network 10.1.1.5 0.0.0.0 area 0
 network 10.2.2.1 0.0.0.0 area 0
 network 10.0.0.0 0.255.255.255 area 12
!
ip forward-protocol nd
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
 router-id 2.2.2.2
 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  
line vty 5  
  exec-timeout 0 0  
  login  
!  
scheduler allocate 20000 1000  
ntp peer 10.1.1.1  
ntp server 10.1.1.1  
end
```

R2#

```
R2#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 = 96/97/100 ms
```

```
R2#
```

```
R2#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 = 96/96/100 ms
```

```
R2#
```

```
R2#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 = 64/68/76 ms
```

R2#

R2#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 = 64/66/68 ms

R2#

```
R2#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 = 128/132/136  
ms
```

```
R2#
```



```
R2#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 = 132/132/136  
ms
```

```
R2#
```

```
R2#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 = 64/66/68 ms
```

```
R2#
```

```
R2#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 = 64/66/68 ms
R2#

R2#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 = 128/133/148
ms

R2#

```
R2#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 = 128/130/132  
ms
```

```
R2#
```

```
R2#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 = 128/132/136  
ms
```

```
R2#
```

```
R2#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 = 128/132/136  
ms
```

```
R2#
```

```
R2#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 = 128/130/132  
ms  
R2#
```

```
R2#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 = 128/132/140  
ms  
R2#
```

```
R2#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 = 128/131/136  
ms
```

```
R2#
```



```
R2#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 = 128/130/132  
ms
```

```
R2#
```

```
R2#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 = 128/129/132
```

```
ms
```

```
R2#
```

```
R2#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 = 128/129/132  
ms
```

```
R2#
```

```
R2#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 = 128/129/132  
ms
```

```
R2#
```

```
R2#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 = 128/130/132  
ms
```

```
R2#
```

```
R2#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 = 128/129/132  
ms
```

```
R2#
```

```
R2#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				
Serial0/2/0.12	10.1.1.2	YES	NVRAM	up
up				
Serial0/2/0.23	10.1.1.5	YES	NVRAM	up
up				
Serial0/3/0	unassigned	YES	NVRAM	administratively
down down				
NV10	unassigned	YES	unset	administratively
down down				

```
R2#
```

R2#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 10.1.1.1, 00:16:45, Serial0/2/0.12
O E2 209.65.200.224/30 [110/20] via 10.1.1.1, 00:16:45, Serial0/2/0.12
10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
O E2 10.2.4.12/30 [110/20] via 10.1.1.6, 00:16:39, Serial0/2/0.23
O IA 10.1.1.8/30 [110/128] via 10.1.1.6, 00:16:45, Serial0/2/0.23
O E2 10.1.4.8/30 [110/20] via 10.1.1.6, 00:16:39, Serial0/2/0.23
O E2 10.2.1.0/24 [110/20] via 10.1.1.6, 00:16:40, Serial0/2/0.23
O E2 10.2.2.0/24 [110/20] via 10.1.1.6, 00:16:40, Serial0/2/0.23
C 10.1.1.0/30 is directly connected, Serial0/2/0.12
O E2 10.1.4.4/30 [110/20] via 10.1.1.6, 00:16:40, Serial0/2/0.23
C 10.1.1.4/30 is directly connected, Serial0/2/0.23
R2#

R2#show processes cpu

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

PID	Runtime(ms)	Invoked	uSecs	5Sec	1Min	5Min	TTY	Process
1	12	75	160	0.00%	0.00%	0.00%	0	Chunk
Manager								
2	4	260	15	0.00%	0.04%	0.02%	0	Load Meter
3	1252	628	1993	0.79%	0.25%	0.22%	0	Exec
4	4	1	4000	0.00%	0.00%	0.00%	0	EDDRI_MAIN
5	1700	150	11333	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	24	514	46	0.00%	0.01%	0.00%	0	OSPF-1
Hello								
10	0	23	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	1312	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	60	75	800	0.00%	0.00%	0.00%	0	IP
Background								
137	60	15	4000	0.00%	0.00%	0.00%	0	IP RIB
Update								
138	4	2	2000	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	23	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	24	0	0.00%	0.00%	0.00%	0	CEF
background p								
145	8	1572	5	0.00%	0.01%	0.00%	0	CEF: IPv4
proces								
146	12	19	631	0.00%	0.00%	0.00%	0	ADJ
background								
147	4	2	2000	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	0	1	0	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	6	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	0	2	0	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	0	1311	0	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	1325	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	8	327322	0	0.95%	0.90%	0.88%	0 HQF Shaper
Backg							
179	0	13087	0	0.00%	0.02%	0.01%	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	4	2	2000	0.00%	0.00%	0.00%	0 SDEE
Management							
186	0	2562	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	2562	0	0.00%	0.00%	0.00%	0 FW DP
Inspect pr							
189	0	2562	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							

283	4	3	1333	0.00%	0.00%	0.00%	0	EEM ED
None								
284	0	2	0	0.00%	0.00%	0.00%	0	EEM ED Nf
285	0	3	0	0.00%	0.00%	0.00%	0	EEM ED OIR
286	0	3	0	0.00%	0.00%	0.00%	0	EEM ED RF
287	0	3	0	0.00%	0.00%	0.00%	0	EEM ED
SNMP								
288	0	2	0	0.00%	0.00%	0.00%	0	EEM ED
SNMP Noti								
289	0	38	0	0.00%	0.00%	0.00%	0	EEM ED
Timer								
290	4	3	1333	0.00%	0.00%	0.00%	0	EEM ED
Test								
291	0	3	0	0.00%	0.00%	0.00%	0	EEM ED
Config								
292	0	3	0	0.00%	0.00%	0.00%	0	EEM ED Env
293	0	18	0	0.00%	0.00%	0.00%	0	Syslog
294	0	1	0	0.00%	0.00%	0.00%	0	VPDN Test
295	0	3	0	0.00%	0.00%	0.00%	0	EEM ED RPC
296	0	2	0	0.00%	0.00%	0.00%	0	Key Proc
297	0	1	0	0.00%	0.00%	0.00%	0	tHUB
299	12	49	244	0.00%	0.00%	0.00%	0	IPv6 RIB
Event H								
300	4	667	5	0.00%	0.00%	0.00%	0	CEF: IPv6
proces								
301	0	2584	0	0.00%	0.00%	0.00%	0	IP NAT
Ager								
302	0	1	0	0.00%	0.00%	0.00%	0	IP NAT
WLAN								
303	0	1	0	0.00%	0.00%	0.00%	0	IP VFR
proc								
304	148	233	635	0.00%	0.00%	0.00%	0	FR LMI
305	36	34	1058	0.00%	0.00%	0.00%	0	FR PVC
event man								
306	4	13211	0	0.07%	0.03%	0.02%	0	FR
Broadcast Out								
307	0	25	0	0.00%	0.00%	0.00%	0	FR ARP
308	0	23	0	0.00%	0.00%	0.00%	0	FR
FRAGMENTATION								
309	0	67	0	0.00%	0.00%	0.00%	0	FR TUNNEL
310	0	1	0	0.00%	0.00%	0.00%	0	FRF9
manager								
311	0	1	0	0.00%	0.00%	0.00%	0	FRF9 timed
event								
312	0	134	0	0.00%	0.00%	0.00%	0	compute
load per								
313	4	1331	3	0.00%	0.00%	0.00%	0	IGMP Input
314	0	13218	0	0.00%	0.03%	0.02%	0	Mwheel
Process								
315	28	26497	1	0.15%	0.15%	0.15%	0	PIM
Process								
316	40	83	481	0.00%	0.00%	0.00%	0	IPv6 IDB
317	52	327	159	0.00%	0.00%	0.00%	0	IPv6 Input
318	16	21	761	0.00%	0.00%	0.00%	0	IPv6 ND

319	0	1	0	0.00%	0.00%	0.00%	0	IPv6
Address								
320	4	5311	0	0.00%	0.02%	0.01%	0	MLD
321	64	1431	44	0.00%	0.00%	0.00%	0	OSPFv3-6
Router								
323	8	1360	5	0.00%	0.01%	0.09%	0	NTP
325	0	1	0	0.00%	0.00%	0.00%	0	LICENSE
AGENT								
326	76	1398	54	0.00%	0.00%	0.00%	0	OSPF-1
Router								
R2#								

```

R2#show interfaces
FastEthernet0/0 is administratively down, line protocol is down
  Hardware is MV96340 Ethernet, address is 0016.9dfa.cab0 (bia
0016.9dfa.cab0)
  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 0016.9dfa.cab1 (bia
0016.9dfa.cab1)
  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, 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

Serial0/1/0 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 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, 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 117, LMI stat recvd 115, 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 863/1, interface
broadcasts 838
 Last input 00:00:00, output 00:00:00, output hang never
 Last clearing of "show interface" counters 00:22:16
 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 0/3/256 (active/max active/max total)
 Reserved Conversations 0/0 (allocated/max allocated)
 Available Bandwidth 1158 kilobits/sec
5 minute input rate 2000 bits/sec, 3 packets/sec
5 minute output rate 1000 bits/sec, 2 packets/sec
 3624 packets input, 269640 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
 3848 packets output, 289693 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

```
Serial0/2/0.12 is up, line protocol is up
  Hardware is GT96K Serial
  Internet address is 10.1.1.2/30
  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
Serial0/2/0.23 is up, line protocol is up
  Hardware is GT96K Serial
  Internet address is 10.1.1.5/30
  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 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 00:22:32, output 00:22:32, 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
    4 carrier transitions
    DCD=down DSR=down DTR=down RTS=down CTS=down

NV10 is administratively down, line protocol is down
  Hardware is NVI
  MTU 1514 bytes, BW 56 Kbit/sec, DLY 5000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation UNKNOWN, loopback not set
  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
  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, 0 interface resets
0 unknown protocol drops
0 output buffer failures, 0 output buffers swapped out
```

R2#

R2#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
R3 0/2/0.23	Ser 0/2/0.23	123	R S I	2811	Ser
R1 0/2/0.12	Ser 0/2/0.12	123	R S I	2811	Ser

R2#


```
R2#show cdp neighbors detail
```

```
-----
```

```
Device ID: R3
```

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

```
  IP address: 10.1.1.6
```

```
  IPv6 address: 2026::1:2 (global unicast)
```

```
  IPv6 address: FE80::216:47FF:FE9A:F6E8 (link-local)
```

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

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

```
Holdtime : 175 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: R1
Entry address(es):
 IP address: 10.1.1.1
 IPv6 address: 2026::12:1 (global unicast)
 IPv6 address: FE80::21D:70FF:FEA0:C690 (link-local)
Platform: Cisco 2811, Capabilities: Router Switch IGMP
Interface: Serial0/2/0.12, Port ID (outgoing port): Serial0/2/0.12
Holdtime : 176 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: ''

R2#

```
R2#show frame-relay map
Serial0/2/0.12 (up): point-to-point dlci, dlci 201(0xC9,0x3090),
broadcast
        status defined, active
Serial0/2/0.23 (up): point-to-point dlci, dlci 203(0xCB,0x30B0),
broadcast
        status defined, active
R2#
```

```
R2#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
Serial0/2/0.12 is up, line protocol is up
  Internet address is 10.1.1.2/30
  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
Serial0/2/0.23 is up, line protocol is up
  Internet address is 10.1.1.5/30
  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 administratively down, line protocol is down
    Internet protocol processing disabled
NV10 is administratively down, line protocol is down
    Internet protocol processing disabled
R2#
```

```
R2#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	attached	Serial0/2/0.12
10.1.1.0/32	receive	Serial0/2/0.12
10.1.1.2/32	receive	Serial0/2/0.12
10.1.1.3/32	receive	Serial0/2/0.12
10.1.1.4/30	attached	Serial0/2/0.23
10.1.1.4/32	receive	Serial0/2/0.23
10.1.1.5/32	receive	Serial0/2/0.23
10.1.1.7/32	receive	Serial0/2/0.23
10.1.1.8/30	10.1.1.6	Serial0/2/0.23
10.1.4.4/30	10.1.1.6	Serial0/2/0.23
10.1.4.8/30	10.1.1.6	Serial0/2/0.23
10.2.1.0/24	10.1.1.6	Serial0/2/0.23
10.2.2.0/24	10.1.1.6	Serial0/2/0.23
10.2.4.12/30	10.1.1.6	Serial0/2/0.23
127.0.0.0/8	drop	
209.65.200.224/30	10.1.1.1	Serial0/2/0.12
209.65.200.240/29	10.1.1.1	Serial0/2/0.12
224.0.0.0/4	multicast	
224.0.0.0/24	receive	
240.0.0.0/4	drop	
255.255.255.255/32	receive	

```
R2#
```

```
R2#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
```

R2#

```
R2#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 2.2.2.2
  It is an area border router
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.1.1.1 0.0.0.0 area 0
    10.1.1.5 0.0.0.0 area 0
    10.2.2.1 0.0.0.0 area 0
    10.0.0.0 0.255.255.255 area 12
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance        Last Update
    3.3.3.3          110             00:18:24
```



```
10.1.1.1          110      00:18:30
Distance: (default is 110)
```

R2#

```
R2#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
R2#
```

```
R2#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address
Interface				
3.3.3.3	0	FULL/ -	00:00:39	10.1.1.6
Serial0/2/0.23				
10.1.1.1	0	FULL/ -	00:00:38	10.1.1.1
Serial0/2/0.12				

```
R2#
```

```
R2#show ip ospf interface
Serial0/2/0.23 is up, line protocol is up
  Internet Address 10.1.1.5/30, Area 0
  Process ID 1, Router ID 2.2.2.2, 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 00:00:07
  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 3.3.3.3
  Suppress hello for 0 neighbor(s)
Serial0/2/0.12 is up, line protocol is up
  Internet Address 10.1.1.2/30, Area 12
  Process ID 1, Router ID 2.2.2.2, 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 3, maximum is 3
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.1.1.1
Suppress hello for 0 neighbor(s)
R2#
```

```
R2#show ip ospf database
```

```
OSPF Router with ID (2.2.2.2) (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	1150	0x8000000C	0x00C09D	2
3.3.3.3	3.3.3.3	1151	0x8000000C	0x0066F0	2

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

Link ID	ADV Router	Age	Seq#	Checksum
10.1.1.0	2.2.2.2	1151	0x80000001	0x0024C7
10.1.1.8	3.3.3.3	1152	0x80000001	0x00B52A

Summary ASB Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
10.1.1.1	2.2.2.2	1141	0x80000001	0x001EC8

Router Link States (Area 12)

Link ID	ADV Router	Age	Seq#	Checksum	Link
count					
2.2.2.2	2.2.2.2	1150	0x8000000C	0x00392B	2
10.1.1.1	10.1.1.1	1151	0x80000003	0x00A8BF	2

Summary Net Link States (Area 12)

Link ID	ADV Router	Age	Seq#	Checksum
10.1.1.4	2.2.2.2	1151	0x80000001	0x00FBEB
10.1.1.8	2.2.2.2	1142	0x80000001	0x00564D

Summary ASB Link States (Area 12)

Link ID	ADV Router	Age	Seq#	Checksum
3.3.3.3	2.2.2.2	1142	0x80000001	0x0037B0

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
10.1.4.4	3.3.3.3	1137	0x80000001	0x00ACC1	0
10.1.4.8	3.3.3.3	1137	0x80000001	0x0084E5	0
10.2.1.0	3.3.3.3	1137	0x80000001	0x00FB75	0
10.2.2.0	3.3.3.3	1137	0x80000001	0x00F07F	0
10.2.4.12	3.3.3.3	1137	0x80000001	0x005015	0
209.65.200.224	10.1.1.1	1386	0x80000001	0x004693	0
209.65.200.240	10.1.1.1	1328	0x80000001	0x0031C6	65002

R2#

```
R2#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 10.1.1.1, 00:19:10, Serial0/2/0.12
O E2    209.65.200.224/30 [110/20] via 10.1.1.1, 00:19:10, Serial0/2/0.12
    10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
O E2    10.2.4.12/30 [110/20] via 10.1.1.6, 00:19:04, Serial0/2/0.23
O IA    10.1.1.8/30 [110/128] via 10.1.1.6, 00:19:10, Serial0/2/0.23
O E2    10.1.4.8/30 [110/20] via 10.1.1.6, 00:19:04, Serial0/2/0.23
O E2    10.2.1.0/24 [110/20] via 10.1.1.6, 00:19:04, Serial0/2/0.23
O E2    10.2.2.0/24 [110/20] via 10.1.1.6, 00:19:04, Serial0/2/0.23
O E2    10.1.4.4/30 [110/20] via 10.1.1.6, 00:19:04, Serial0/2/0.23
R2#
```

R2 #