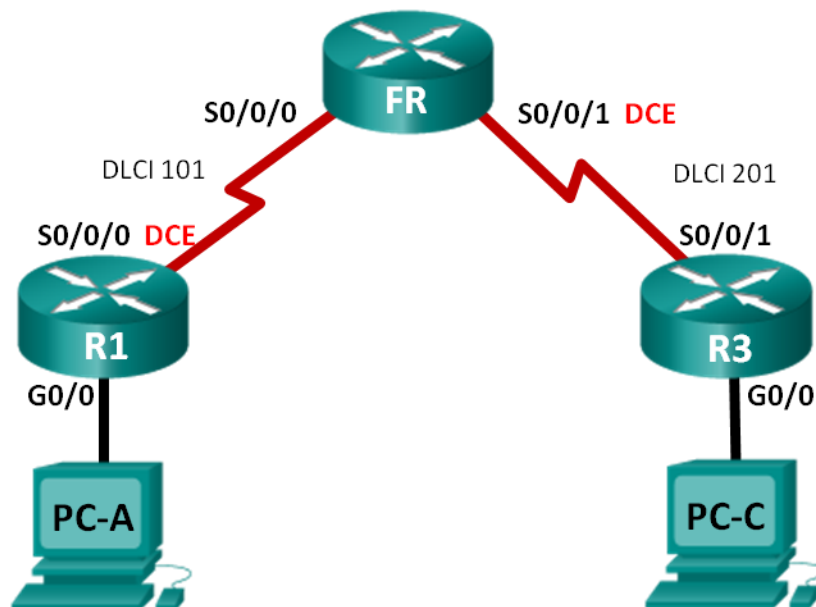


Lab – Troubleshooting Basic Frame Relay (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.1.1	255.255.255.0	N/A
	S0/0/0 (DCE)	10.1.1.1	255.255.255.252	N/A
FR	S0/0/0	N/A	N/A	N/A
	S0/0/1 (DCE)	N/A	N/A	N/A
R3	G0/0	192.168.3.1	255.255.255.0	N/A
	S0/0/1	10.1.1.2	255.255.255.252	N/A
PC-A	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC-C	NIC	192.168.3.3	255.255.255.0	192.168.3.1

Objectives

Part 1: Build the Network and Load Device Configurations

Part 2: Troubleshoot Layer 3 Connectivity

Part 3: Troubleshoot Frame Relay

Background / Scenario

Frame Relay is a WAN protocol that operates at the physical and data link layers of the OSI reference model. Unlike leased lines, Frame Relay requires only a single-access circuit to the Frame Relay provider to communicate with multiple sites that are connected to the same provider. Configuring Frame Relay at the customer site is generally simple; however, configuration problems can occur.

In this lab, R1 and R3 are experiencing problems communicating with each other. EIGRP is not working and there may also be problems with the Frame Relay configuration. You have been assigned the job of finding and correcting all problems on R1 and R3.

Note: The routers used with CCNA hands-on labs are Cisco 1941 Integrated Services Routers (ISRs) with Cisco IOS Release 15.2(4)M3 (universalk9 image). Other routers and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of this lab for the correct interface identifiers.

Note: Make sure that the routers have been erased and have no startup configurations. If you are unsure, contact your instructor.

Note: The FR router is acting as the Frame Relay switch, It does NOT have any configuration issues for you to troubleshoot.

Instructor Note: Refer to the Instructor Lab Manual for the procedures to initialize and reload devices.

Required Resources

- 3 Routers (Cisco 1941 with Cisco IOS Release 15.2(4)M3 universal image or comparable)
- 2 PCs (Windows 7, Vista, or XP with terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet and serial cables as shown in the topology

Part 1: Build the Network and Load Device Configurations

Step 1: Cable the network as shown in the topology.

Step 2: Configure addressing on the PCs.

Step 3: Load router configuration files.

Load the following configurations into the appropriate router. R1 and R3 have the same passwords. The encrypted privileged EXEC mode password is **class**, and the password for console and vty access is **cisco**.

Router R1 Configuration:

```
hostname R1
enable secret class
no ip domain lookup
interface GigabitEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 ! no shutdown
interface Serial0/0/0
 ip address 10.1.1.5 255.255.255.252
 !ip address 10.1.1.1 255.255.255.252
 encapsulation frame-relay
```

```
clock rate 128000
frame-relay map ip 10.1.1.2 101
!frame-relay map ip 10.1.1.2 101 broadcast
!frame-relay map ip 10.1.1.1 101
no frame-relay inverse-arp
no shutdown
router eigrp 1
network 10.1.0.0 0.0.0.3
!network 10.1.1.0 0.0.0.3
network 192.168.1.0
eigrp router-id 1.1.1.1
no auto-summary
line con 0
password cisco
logging synchronous
login
line vty 0 4
password cisco
login
end
```

Router R3 Configuration:

```
hostname R3
enable secret class
no ip domain lookup
interface GigabitEthernet0/0
ip address 192.168.30.1 255.255.255.0
!ip address 192.168.3.1 255.255.255.0
no shutdown
interface Serial0/0/1
ip address 10.1.1.2 255.255.255.252
encapsulation frame-relay
frame-relay map ip 10.1.1.2 201
frame-relay map ip 10.1.1.1 202 broadcast
!frame-relay map ip 10.1.1.1 201 broadcast
no frame-relay inverse-arp
no shutdown
router eigrp 1
network 10.1.1.0 0.0.0.3
!network 192.168.3.0
eigrp router-id 3.3.3.3
line con 0
password cisco
logging synchronous
login
line vty 0 4
```

```
password cisco
login
end
```

Frame Relay Switch (router FR) Configuration:

```
hostname FR
frame-relay switching
interface Serial0/0/0
  no ip address
  encapsulation frame-relay
  frame-relay intf-type dce
  frame-relay route 101 interface Serial0/0/1 201
  no shutdown
interface Serial0/0/1
  no ip address
  encapsulation frame-relay
  clock rate 2000000
  frame-relay intf-type dce
  frame-relay route 201 interface Serial0/0/0 101
  no shutdown
end
```

Step 4: Save your configuration.

Part 2: Troubleshoot Layer 3 Connectivity

In Part 2, you will verify that Layer 3 connectivity is established on all interfaces. You will need to test IPv4 connectivity for all device interfaces.

Step 1: Verify that the interfaces listed in the Addressing Table are active and configured with the correct IP address information.

- Issue the **show ip interface brief** command on R1 and R3 to verify that the interfaces are in an up/up state.

R1# **show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	192.168.1.1	YES	manual	administratively down	down
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0/0	10.1.1.5	YES	manual	up	up
Serial0/0/1	unassigned	YES	unset	administratively down	down

R3# **show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	192.168.30.1	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0/0	unassigned	YES	unset	administratively down	down

Serial0/0/1	10.1.1.2	YES manual up	up
-------------	----------	---------------	----

- b. Issue the **show run | section interface** command to view all the commands related to interfaces.

R1:

```
R1# show run | section interface
interface Embedded-Service-Engine0/0
  no ip address
  shutdown
interface GigabitEthernet0/0
  ip address 192.168.1.1 255.255.255.0
  shutdown
  duplex auto
  speed auto
interface GigabitEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
interface Serial0/0/0
  ip address 10.1.1.5 255.255.255.252
  encapsulation frame-relay
  clock rate 128000
  frame-relay map ip 10.1.1.2 101
  no frame-relay inverse-arp
interface Serial0/0/1
  no ip address
  shutdown
```

R3:

```
R3# show run | section interface
interface Embedded-Service-Engine0/0
  no ip address
  shutdown
interface GigabitEthernet0/0
  ip address 192.168.30.1 255.255.255.0
  duplex auto
  speed auto
interface GigabitEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
interface Serial0/0/0
  no ip address
  shutdown
  clock rate 2000000
```

```
interface Serial0/0/1
 ip address 10.1.1.2 255.255.255.252
 encapsulation frame-relay
 frame-relay map ip 10.1.1.1 202 broadcast
 frame-relay map ip 10.1.1.2 201
 no frame-relay inverse-arp
```

- c. Resolve all problems found. Record the commands used to correct the configuration.

```
R1(config)# interface g0/0
R1(config-if)# no shutdown
R1(config-if)# interface s0/0/0
R1(config-if)# ip address 10.1.1.1 255.255.255.252
```

```
R3(config)# interface g0/0
R3(config-if)# ip address 192.168.3.1 255.255.255.0
```

- d. Using **show** commands, verify that R1 and R3 router interfaces match the IP addresses in the Addressing Table.

Step 2: Verify EIGRP configurations on R1 and R3.

- a. Issue the **show ip protocols** command on R1 and R3.

R1:

```
R1# show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(1)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 1.1.1.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1

  Automatic Summarization: disabled
  Maximum path: 4
```

Routing for Networks:

10.1.0.0/30

192.168.1.0

Routing Information Sources:

Gateway Distance Last Update

Distance: internal 90 external 170

R3:

R3# **show ip protocols**

*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Default networks flagged in outgoing updates

Default networks accepted from incoming updates

EIGRP-IPv4 Protocol for AS(1)

Metric weight K1=1, K2=0, K3=1, K4=0, K5=0

NSF-aware route hold timer is 240

Router-ID: 3.3.3.3

Topology : 0 (base)

Active Timer: 3 min

Distance: internal 90 external 170

Maximum path: 4

Maximum hopcount 100

Maximum metric variance 1

Automatic Summarization: disabled

Maximum path: 4

Routing for Networks:

10.1.1.0/30

Routing Information Sources:

Gateway Distance Last Update

Distance: internal 90 external 170

- b. Resolve all problems found. Record your answers below.

R1(config)# **router eigrp 1**

R1(config-router)# **no network 10.1.0.0 0.0.0.3**

R1(config-router)# **network 10.1.1.0 0.0.0.3**

R3(config)# **router eigrp 1**

R3(config-router)# **network 192.168.3.0**

- c. Issue a **show ip route** command on both R1 and R3. Do any EIGRP routes display in the routing table of R1 or R3? _____ **No**

R1# **show ip route**

Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Serial0/0/0
L       10.1.1.1/32 is directly connected, Serial0/0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, GigabitEthernet0/0
L       192.168.1.1/32 is directly connected, GigabitEthernet0/0
```

R3# **show ip route**

Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Serial0/0/1
L       10.1.1.2/32 is directly connected, Serial0/0/1
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.3.0/24 is directly connected, GigabitEthernet0/0
L       192.168.3.1/32 is directly connected, GigabitEthernet0/0
```

Part 3: Troubleshoot Frame Relay

Step 1: Test IPv4 end-to-end connectivity.

Note: FR (the Frame Relay switch), will NOT have any interfaces for you to ping.

Ping all the active interfaces on R1 and R3. Were the pings successful? Record your ping results in the table below.

Router	Active Router Interfaces			
	R1 G0/0	R1 S0/0/0	R3 G0/0	R3 S0/0/1
R1	Yes	No	No	No
R3	No	No	Yes	Yes

Because IPv4 addressing and EIGRP configuration issues have been checked and corrected, the problems must exist with the Frame Relay configuration.

Step 2: Verify Frame Relay configurations on R1 and R3.

- Issue the **show frame-relay pvc** command on R1 and R3.

R1# **show frame-relay pvc**

PVC Statistics for interface Serial0/0/0 (Frame Relay DTE)

	Active	Inactive	Deleted	Static
Local	1	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

DLCI = 101, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0/0/0

```

input pkts 10          output pkts 15          in bytes 1040
out bytes 1560         dropped pkts 0         in pkts dropped 0
out pkts dropped 0     out bytes dropped 0
in FECN pkts 0        in BECN pkts 0        out FECN pkts 0
out BECN pkts 0       in DE pkts 0          out DE pkts 0
out bcast pkts 0      out bcast bytes 0
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
pvc create time 04:20:07, last time pvc status changed 00:59:58

```

R3# **show frame-relay pvc**

PVC Statistics for interface Serial0/0/1 (Frame Relay DTE)

	Active	Inactive	Deleted	Static
Local	1	0	1	0
Switched	0	0	0	0
Unused	0	0	0	0

DLCI = 201, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0/0/1

```

input pkts 20          output pkts 10          in bytes 2080
out bytes 1040         dropped pkts 0         in pkts dropped 0
out pkts dropped 0     out bytes dropped 0
in FECN pkts 0        in BECN pkts 0        out FECN pkts 0
out BECN pkts 0       in DE pkts 0          out DE pkts 0

```

```
out bcast pkts 0          out bcast bytes 0
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
pvc create time 04:16:10, last time pvc status changed 01:03:33
```

```
DLCI = 202, DLCI USAGE = LOCAL, PVC STATUS = DELETED, INTERFACE = Serial0/0/1
```

```
input pkts 0          output pkts 0          in bytes 0
out bytes 0          dropped pkts 0          in pkts dropped 0
out pkts dropped 0          out bytes dropped 0
in FECN pkts 0          in BECN pkts 0          out FECN pkts 0
out BECN pkts 0          in DE pkts 0          out DE pkts 0
out bcast pkts 0          out bcast bytes 0
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
pvc create time 04:16:10, last time pvc status changed 01:06:12
```

- b. Issue the **show frame-relay map** command on R1 and R3.

R1:

```
R1# show frame-relay map
Serial0/0/0 (up): ip 10.1.1.2 dlci 101(0x65,0x1850), static,
                  CISCO, status defined, active
```

R3:

```
R3# show frame-relay map
Serial0/0/1 (up): ip 10.1.1.2 dlci 201(0xC9,0x3090), static,
                  CISCO, status defined, active
Serial0/0/1 (up): ip 10.1.1.1 dlci 202(0xCA,0x30A0), static,
                  broadcast,
                  CISCO, status deleted
```

- c. Issue the **show frame-relay lmi** command on R1 and R3.

R1:

```
R1# show frame-relay lmi
LMI Statistics for interface Serial0/0/0 (Frame Relay DTE) LMI TYPE = CISCO
Invalid Unnumbered info 0          Invalid Prot Disc 0
Invalid dummy Call Ref 0          Invalid Msg Type 0
Invalid Status Message 0          Invalid Lock Shift 0
Invalid Information ID 0          Invalid Report IE Len 0
Invalid Report Request 0          Invalid Keep IE Len 0
Num Status Enq. Sent 6220          Num Status msgs Rcvd 6221
Num Update Status Rcvd 0          Num Status Timeouts 0
Last Full Status Req 00:00:40      Last Full Status Rcvd 00:00:40
```

R3:

```
R3# show frame-relay lmi
LMI Statistics for interface Serial0/0/1 (Frame Relay DTE) LMI TYPE = CISCO
Invalid Unnumbered info 0          Invalid Prot Disc 0
Invalid dummy Call Ref 0          Invalid Msg Type 0
```

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```
Invalid Status Message 0          Invalid Lock Shift 0
Invalid Information ID 0          Invalid Report IE Len 0
Invalid Report Request 0         Invalid Keep IE Len 0
Num Status Enq. Sent 6227        Num Status msgs Rcvd 6228
Num Update Status Rcvd 0         Num Status Timeouts 0
Last Full Status Req 00:00:56    Last Full Status Rcvd 00:00:56
```

- d. Resolve all problems found. Record your answers below.

```
R1(config)# interface s0/0/0
R1(config-if)# frame-relay map ip 10.1.1.2 101 broadcast
R1(config-if)# frame-relay map ip 10.1.1.1 101
```

```
R3(config)# interface s0/0/1
R3(config-if)# no frame-relay map ip 10.1.1.1 202 broadcast
R3(config-if)# frame-relay map ip 10.1.1.1 201 broadcast
R3(config-if)# frame-relay map ip 10.1.1.2 201
```

Note: After entering the commands above to fix the Frame Relay problems, communication between the R1, R3, and the Frame Relay switch can take a few minutes before all DLCI communication is resolved.

Step 3: Verify Frame Relay and EIGRP configurations.

- a. Issue a **show ip route eigrp** command on both R1 and R3. Are the LAN networks listed in the output?
_____ **Yes**

R1# **show ip route eigrp**

```
Codes: L - local, 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, H - NHRP, l - LISP
       + - replicated route, % - next hop override
```

Gateway of last resort is not set

```
D      192.168.3.0/24 [90/2172416] via 10.1.1.2, 00:26:36, Serial0/0/0
```

R3# **show ip route eigrp**

```
Codes: L - local, 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
```

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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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

D 192.168.1.0/24 [90/2172416] via 10.1.1.1, 00:27:32, Serial0/0/1

- b. Issue a **show frame-relay map** command on both R1 and R3. Are the DLCIs active? _____ **Yes**

R1# **show frame-relay map**

Serial0/0/0 (up): ip 10.1.1.1 dlci 101(0x65,0x1850), static,
CISCO, status defined, active
Serial0/0/0 (up): ip 10.1.1.2 dlci 101(0x65,0x1850), static,
broadcast,
CISCO, status defined, active

R3# **show frame-relay map**

Serial0/0/1 (up): ip 10.1.1.1 dlci 201(0xC9,0x3090), static,
broadcast,
CISCO, status defined, active
Serial0/0/1 (up): ip 10.1.1.2 dlci 201(0xC9,0x3090), static,
CISCO, status defined, active

Reflection

Describe the troubleshooting methodology you used to solve the issues in this lab. Outline the steps that were necessary to successfully meet the assignment.

Answers will vary. Hopefully, students will answer that breaking a problem down into smaller steps helps with troubleshooting. Solving IP addressing, then EIGRP and then Frame Relay issues separately instead of all at once can make troubleshooting easier.

Router Interface Summary Table

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)

Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.

Device Configs

Router R1

```
R1#sh run
Building configuration...

Current configuration : 1482 bytes
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R1
!
enable secret 4 06YFDUHH61wAE/kLkDq9BGho1QM5EnRtoyr8cHAUg.2
!
no ip domain lookup
!
interface Embedded-Service-Engine0/0
no ip address
shutdown
!
interface GigabitEthernet0/0
ip address 192.168.1.1 255.255.255.0
duplex auto
```

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```
speed auto
!
interface GigabitEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/0/0
ip address 10.1.1.1 255.255.255.252
encapsulation frame-relay
clock rate 128000
frame-relay map ip 10.1.1.1 101
frame-relay map ip 10.1.1.2 101 broadcast
no frame-relay inverse-arp
!
interface Serial0/0/1
no ip address
shutdown
!
!
router eigrp 1
network 10.1.1.0 0.0.0.3
network 192.168.1.0
eigrp router-id 1.1.1.1
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
!
control-plane
!
line con 0
password cisco
logging synchronous
login
line aux 0
line 2
no activation-character
no exec
transport preferred none
transport input all
transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
stopbits 1
line vty 0 4
password cisco
login
```

```
transport input all
!  
scheduler allocate 20000 1000
!  
end
```

Router R3

```
R3#sh run
Building configuration...

Current configuration : 1448 bytes
!  
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!  
hostname R3
!  
enable secret 4 06YFDUHH61wAE/kLkDq9BGho1QM5EnRtoyr8cHAUg.2
!  
no ip domain lookup
!  
interface Embedded-Service-Engine0/0
  no ip address
  shutdown
!  
interface GigabitEthernet0/0
  ip address 192.168.3.1 255.255.255.0
  duplex auto
  speed auto
!  
interface GigabitEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
!  
interface Serial0/0/0
  no ip address
  shutdown
  clock rate 2000000
!  
interface Serial0/0/1
  ip address 10.1.1.2 255.255.255.252
  encapsulation frame-relay
  frame-relay map ip 10.1.1.1 201 broadcast
  frame-relay map ip 10.1.1.2 201
  no frame-relay inverse-arp
```

```
!  
router eigrp 1  
  network 10.1.1.0 0.0.0.3  
  network 192.168.3.0  
  eigrp router-id 3.3.3.3  
!  
ip forward-protocol nd  
!  
no ip http server  
no ip http secure-server  
!  
control-plane  
!  
line con 0  
  password cisco  
  logging synchronous  
  login  
line aux 0  
line 2  
  no activation-character  
  no exec  
  transport preferred none  
  transport input all  
  transport output pad telnet rlogin lapb-ta mop udptn v120 ssh  
  stopbits 1  
line vty 0 4  
  password cisco  
  login  
  transport input all  
!  
scheduler allocate 20000 1000  
!  
end
```