

Name : Marilyn Almeida

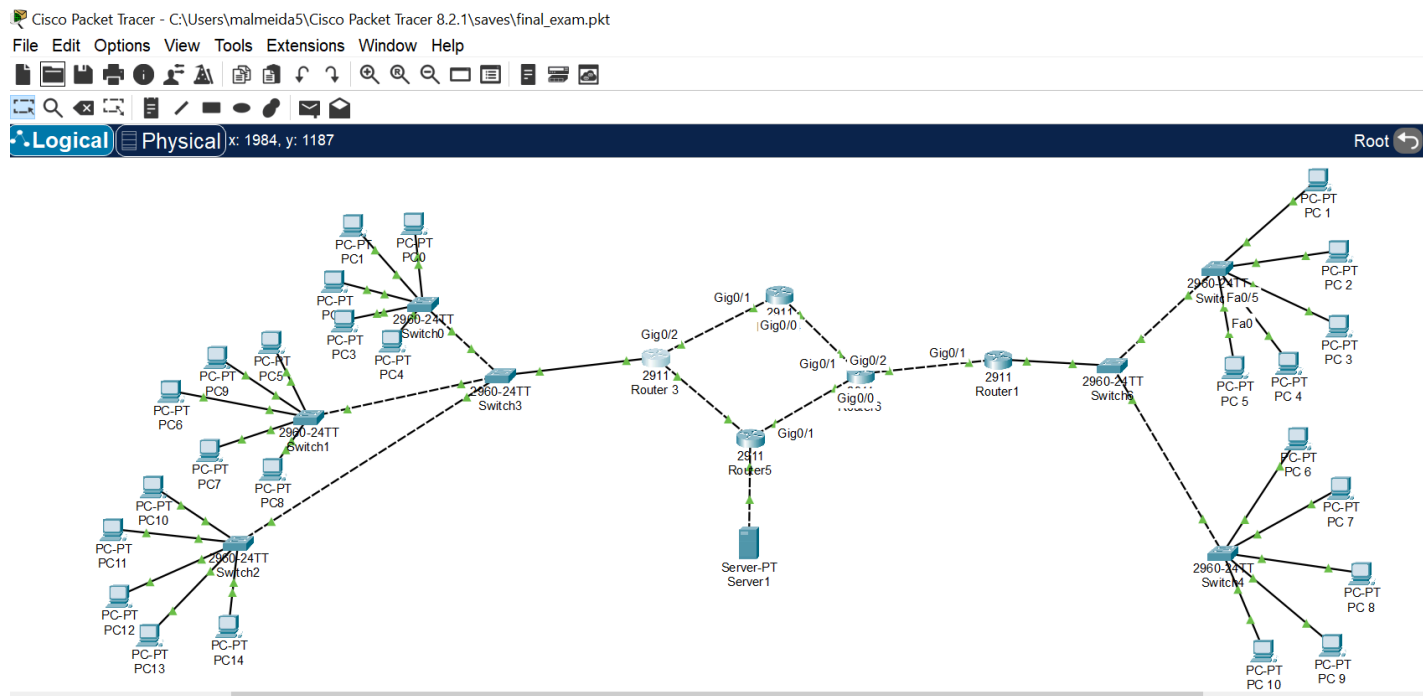
CYB 551 - Final Exam: Networking Lab Assignment

1. Overview

This document outlines the configuration, implementation, and testing of a multi-router network designed for a final networking lab assignment. The objective was to build a fully functional routed network connecting two geographical sites — Florida and California — using EIGRP as the dynamic routing protocol. The California site includes VLAN-based segmentation (Sales, Finance, and IT) implemented via router-on-a-stick, while the Florida site connects directly to a local LAN. The network also incorporates end-to-end connectivity for PCs across both regions and a server linked through an intermediary router, ensuring full route propagation, device communication, and structured topology.

2. Network Topology Description

- Router1 (Florida) connects to the Florida LAN and Router6.
- Router6 connects to Router1, Router4, and Router5 (intermediary router).
- Router4 and Router5 connect Router6 to Router3 (California).
- Router3 (California) connects to VLAN switches for PCs.
- A server is directly connected to Router5.



3. IP Addressing Scheme

Segment / VLAN	Device / Host	Interface	IP Address	Subnet Mask	Default Gateway
Florida LAN	Router1	G0/0	192.168.2.1	255.255.255.240	—
	Florida PC1	—	192.168.2.2	255.255.255.240	192.168.2.1
	Florida PC2	—	192.168.2.3	255.255.255.240	192.168.2.1
	Florida PC3	—	192.168.2.4	255.255.255.240	192.168.2.1
	Florida PC4	—	192.168.2.5	255.255.255.240	192.168.2.1
	Florida PC5	—	192.168.2.6	255.255.255.240	192.168.2.1
	Florida PC6	—	192.168.2.7	255.255.255.240	192.168.2.1

	Florida PC7	—	192.168.2.8	255.255.255.240	192.168.2.1
	Florida PC8	—	192.168.2.9	255.255.255.240	192.168.2.1
	Florida PC9	—	192.168.2.10	255.255.255.240	192.168.2.1
	Florida PC10	—	192.168.2.11	255.255.255.240	192.168.2.1

Router Links	Device	Interface	IP Address	Subnet Mask	Notes
Router1 ↔ Router6	Router1	G0/1	192.168.1.105	255.255.255.252	Link to Router6
	Router6	G0/2	192.168.1.106	255.255.255.252	Link to Router1
Router6 ↔ Router4	Router6	G0/1	192.168.1.109	255.255.255.252	Link to Router4
	Router4	G0/0	192.168.1.110	255.255.255.252	Link to Router6
Router4 ↔ Router0	Router4	G0/1	192.168.1.98	255.255.255.252	Link to Router0
	Router0	G0/1	192.168.1.97	255.255.255.252	Link to Router4
Router6 ↔ Router5	Router6	G0/0	192.168.1.113	255.255.255.252	Link to Router5
	Router5	G0/0	192.168.1.112	255.255.255.252	Link to Router6
Router5 ↔ Router0	Router5	G0/1	192.168.1.102	255.255.255.252	Link to Router0
	Router0	G0/2	192.168.1.101	255.255.255.252	Link to Router5

VLAN	Device	Interface	IP Address	Subnet Mask	Default Gateway
VLAN 10	Router0	G0/0.10	192.168.1.1	255.255.255.224	—
VLAN 10	Sales PC1	—	192.168.1.2	255.255.255.224	192.168.1.1
VLAN 10	Sales PC2	—	192.168.1.3	255.255.255.224	192.168.1.1
VLAN 10	Sales PC3	—	192.168.1.4	255.255.255.224	192.168.1.1
VLAN 10	Sales PC4	—	192.168.1.5	255.255.255.224	192.168.1.1

VLAN 20	Router0	G0/0.20	192.168.1.33	255.255.255.224	—
VLAN 20	Finance PC1	—	192.168.1.34	255.255.255.224	192.168.1.33
VLAN 20	Finance PC2	—	192.168.1.35	255.255.255.224	192.168.1.33
VLAN 20	Finance PC3	—	192.168.1.36	255.255.255.224	192.168.1.33
VLAN 20	Finance PC4	—	192.168.1.37	255.255.255.224	192.168.1.33
VLAN 30	Router0	G0/0.30	192.168.1.65	255.255.255.224	—
VLAN 30	IT PC1	—	192.168.1.66	255.255.255.224	192.168.1.65
VLAN 30	IT PC2	—	192.168.1.67	255.255.255.224	192.168.1.65
VLAN 30	IT PC3	—	192.168.1.68	255.255.255.224	192.168.1.65

4. Device Configurations

✓ Router1

```
hostname Router1

interface GigabitEthernet0/0
 ip address 192.168.2.1 255.255.255.240
 no shutdown
exit

interface GigabitEthernet0/1
 ip address 192.168.1.105 255.255.255.252
 no shutdown
exit

router eigrp 100
 network 192.168.2.0 0.0.0.15
 network 192.168.1.104 0.0.0.3
 no auto-summary
exit
```

✓ Router6

```
hostname Router6

interface GigabitEthernet0/0
 ip address 192.168.1.113 255.255.255.252
 no shutdown
exit

interface GigabitEthernet0/1
 ip address 192.168.1.109 255.255.255.252
 no shutdown
exit

interface GigabitEthernet0/2
 ip address 192.168.1.106 255.255.255.252
 no shutdown
exit

router eigrp 100
 network 192.168.1.104 0.0.0.3
 network 192.168.1.108 0.0.0.3
 network 192.168.1.112 0.0.0.3
 no auto-summary
exit
```

✓ Router4

```
hostname Router4

interface GigabitEthernet0/0
 ip address 192.168.1.110 255.255.255.252
 no shutdown
exit

interface GigabitEthernet0/1
 ip address 192.168.1.98 255.255.255.252
 no shutdown
exit

router eigrp 100
 network 192.168.1.108 0.0.0.3
 network 192.168.1.96 0.0.0.3
 no auto-summary
exit
```

✓ Router5

```
hostname Router5

interface GigabitEthernet0/0
 ip address 192.168.1.112 255.255.255.252
 no shutdown
exit

interface GigabitEthernet0/1
 ip address 192.168.1.102 255.255.255.252
 no shutdown
exit

interface GigabitEthernet0/2
 ip address 192.168.1.121 255.255.255.248
 no shutdown
exit

router eigrp 100
 network 192.168.1.112 0.0.0.3
 network 192.168.1.100 0.0.0.3
 network 192.168.1.120 0.0.0.7
 no auto-summary
exit
```

✓ Router3 (California Gateway)

```
interface GigabitEthernet0/1
  ip address 192.168.1.97 255.255.255.252
  no shutdown
exit

interface GigabitEthernet0/2
  ip address 192.168.1.101 255.255.255.252
  no shutdown
exit

interface GigabitEthernet0/0.10
  encapsulation dot1Q 10
  ip address 192.168.1.1 255.255.255.224
  no shutdown
exit

interface GigabitEthernet0/0.20
  encapsulation dot1Q 20
  ip address 192.168.1.33 255.255.255.224
  no shutdown
exit

interface GigabitEthernet0/0.30
  encapsulation dot1Q 30
  ip address 192.168.1.65 255.255.255.224
  no shutdown
exit

router eigrp 100
  network 192.168.1.0 0.0.0.31
  network 192.168.1.32 0.0.0.31
  network 192.168.1.64 0.0.0.31
  network 192.168.1.96 0.0.0.3
  network 192.168.1.100 0.0.0.3
  no auto-summary
exit
```

5. VLAN Configuration (California Side)

- Switch0 (Sales)

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```

Name: Fa0/4
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access

Switch#show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/6     on        802.1q         trunking    1

Port      Vlans allowed on trunk
Fa0/6     1-1005

Port      Vlans allowed and active in management domain
Fa0/6     1,10,20,30

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/6     1,10,20,30

Switch#show vlan brief
VLAN Name      Status      Ports
-----
1    default     active      Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                           Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                           Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                           Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                           Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   Sales       active      Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5
20   Finance     active
30   IT          active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active

```

- Switch1 (Finance)

Switch1

Physical Config CLI Attributes

IOS Command Line Interface

```

Switch>enable
Switch#show vlan brief
VLAN Name      Status      Ports
-----
1    default     active      Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                           Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                           Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                           Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                           Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   Sales       active
20   Finance     active      Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5
30   IT          active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active

Switch#show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/6     auto      n-802.1q       trunking    1

Port      Vlans allowed on trunk
Fa0/6     1-1005

Port      Vlans allowed and active in management domain
Fa0/6     1,10,20,30

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/6     1,10,20,30

Switch#

```

Copy Paste

- Switch2 (IT)

IOS Command Line Interface

```
Switch>enable
Switch#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/11, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
10	Sales	active	
20	Finance	active	
30	IT	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

```
Switch#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/6	on	802.1q	trunking	1

```
Port Fa0/6 Vlan allowed on trunk 1-1005
Port Fa0/6 Vlan allowed and active in management domain 1,10,20,30
Port Fa0/6 Vlan in spanning tree forwarding state and not pruned 1,10,20,30
```

Switch 3 trunk to Router3

IOS Command Line Interface

```
Switch#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	Sales	active	
20	Finance	active	
30	IT	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

```
Switch#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1
Fa0/2	on	802.1q	trunking	1
Fa0/3	on	802.1q	trunking	1
Fa0/4	on	802.1q	trunking	1

```
Port Fa0/1 Vlan allowed on trunk 1-1005
Port Fa0/2 Vlan allowed on trunk 1-1005
Port Fa0/3 Vlan allowed on trunk 1-1005
Port Fa0/4 Vlan allowed on trunk 1-1005
Port Fa0/1 Vlan allowed and active in management domain 1,10,20,30
Port Fa0/2 Vlan allowed and active in management domain 1,10,20,30
Port Fa0/3 Vlan allowed and active in management domain 1,10,20,30
Port Fa0/4 Vlan allowed and active in management domain 1,10,20,30
Port Fa0/1 Vlan in spanning tree forwarding state and not pruned 1,10,20,30
Port Fa0/2 Vlan in spanning tree forwarding state and not pruned 1,10,20,30
Port Fa0/3 Vlan in spanning tree forwarding state and not pruned 1,10,20,30
```

6. Server Configuration

Field	Value
IP Address	192.168.1.122
Subnet Mask	255.255.255.248
Default Gateway	192.168.1.121

7. Testing and Validation

- Ping Tests:
 - PC to PC across Florida and California: 

A screenshot of a Windows desktop environment. In the foreground, there's a window titled "Command Prompt". The title bar shows standard Windows icons on the left and the word "PC4" on the right. Below the title bar, the command prompt has a blue header area with white text saying "Command Prompt". The main black area contains several commands entered by the user and their outputs:

```
C:\>ping 192.168.2.8  
  
Pinging 192.168.2.8 with 32 bytes of data:  
  
Reply from 192.168.2.8: bytes=32 time<1ms TTL=124  
Reply from 192.168.2.8: bytes=32 time<1ms TTL=124  
Reply from 192.168.2.8: bytes=32 time<1ms TTL=124  
Reply from 192.168.2.8: bytes=32 time<1ms TTL=124  
  
Ping statistics for 192.168.2.8:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
C:\>ipconfig  
  
FastEthernet0 Connection:(default port)  
  
Connection-specific DNS Suffix...:  
Link-local IPv6 Address..... : FE80::20C:85FF:FE50:E421  
IPv6 Address..... : ::  
IPv4 Address..... : 192.168.1.6  
Subnet Mask..... : 255.255.255.224  
Default Gateway..... : ::  
                                192.168.1.1
```


At the bottom, another section labeled "Bluetooth Connection:" is partially visible.

PC 5

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.168.1.66

Pinging 192.168.1.66 with 32 bytes of data:

Reply from 192.168.1.66: bytes=32 time<1ms TTL=124
Reply from 192.168.1.66: bytes=32 time<1ms TTL=124
Reply from 192.168.1.66: bytes=32 time<1ms TTL=124
Reply from 192.168.1.66: bytes=32 time<1ms TTL=124

Ping statistics for 192.168.1.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::2E0:F9FF:FE96:6623
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 192.168.2.6
    Subnet Mask . . . . .: 255.255.255.240
    Default Gateway . . . . .: ::
                                   192.168.2.1
```

- Router to Server: ☒

Router5

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router5(config)#router eigrp 100
Router5(config-router)#network 192.168.1.120 0.0.0.7
Router5(config-router)#exit
Router5(config)#exit
Router5#
%SYS-5-CONFIG_I: Configured from console by console

Router5#ping 192.168.1.122

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.122, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/1/6 ms

--
```

 Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router1>enable
Router1#ping 192.168.1.122

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.122, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router1#
```

- Traceroute tests confirmed correct hop sequences

 PC4

```
C:\>tracert 192.168.2.8

Tracing route to 192.168.2.8 over a maximum of 30 hops:

  0  5 ms    0 ms    0 ms    192.168.1.1
  1  0 ms    0 ms    0 ms    192.168.1.98
  2  0 ms    0 ms    0 ms    192.168.1.109
  3  0 ms    8 ms    0 ms    192.168.1.105
  4  0 ms    0 ms    0 ms    192.168.2.8

Trace complete.

C:\>
```

☐ Top

```
PC 5

Subnet Mask.....: 255.255.255.240
Default Gateway.....: ::
                  192.168.2.1

Bluetooth Connection:

Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
                  0.0.0.0

C:\>tracert 192.168.1.66

Tracing route to 192.168.1.66 over a maximum of 30 hops:

  1  10 ms    0 ms    0 ms    192.168.2.1
  2   0 ms    0 ms    0 ms    192.168.1.106
  3   0 ms    0 ms    0 ms    192.168.1.114
  4   0 ms    0 ms    0 ms    192.168.1.97
  5  12 ms    0 ms    0 ms    192.168.1.66

Trace complete.

C:\>|
```

- Routing Tables: `show ip route` confirmed learned EIGRP routes

```
Router1

Physical Config CLI Attributes

IOS Command Line Interface

Router1#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, E - EGP
       i - IS-IS, 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

  192.168.1.0/24 is variably subnetted, 10 subnets, 4 masks
D   192.168.1.0/27 [90/28928] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.32/27 [90/28928] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.64/27 [90/28928] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.96/30 [90/3328] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.100/30 [90/3328] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
C   192.168.1.104/30 is directly connected, GigabitEthernet0/1
L   192.168.1.105/32 is directly connected, GigabitEthernet0/1
D   192.168.1.108/30 [90/3072] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.112/30 [90/3072] via 192.168.1.106, 01:15:27, GigabitEthernet0/1
D   192.168.1.120/29 [90/5632] via 192.168.1.106, 01:04:32, GigabitEthernet0/1
  192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.2.0/28 is directly connected, GigabitEthernet0/0
L   192.168.2.1/32 is directly connected, GigabitEthernet0/0
```

IOS Command Line Interface

```
Router6#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, E - EGP
       i - IS-IS, 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

    192.168.1.0/24 is variably subnetted, 12 subnets, 4 masks
D       192.168.1.0/27 [90/28672] via 192.168.1.110, 01:44:47, GigabitEthernet0/1
        [90/28672] via 192.168.1.114, 01:44:47, GigabitEthernet0/0
D       192.168.1.32/27 [90/28672] via 192.168.1.110, 01:44:47, GigabitEthernet0/1
        [90/28672] via 192.168.1.114, 01:44:47, GigabitEthernet0/0
D       192.168.1.64/27 [90/28672] via 192.168.1.114, 01:44:47, GigabitEthernet0/0
        [90/28672] via 192.168.1.110, 01:44:47, GigabitEthernet0/1
D       192.168.1.96/30 [90/3072] via 192.168.1.110, 01:44:47, GigabitEthernet0/1
D       192.168.1.100/30 [90/3072] via 192.168.1.114, 01:44:47, GigabitEthernet0/0
C       192.168.1.104/30 is directly connected, GigabitEthernet0/2
L       192.168.1.106/32 is directly connected, GigabitEthernet0/2
C       192.168.1.108/30 is directly connected, GigabitEthernet0/1
L       192.168.1.109/32 is directly connected, GigabitEthernet0/1
C       192.168.1.112/30 is directly connected, GigabitEthernet0/0
L       192.168.1.113/32 is directly connected, GigabitEthernet0/0
D       192.168.1.120/29 [90/5376] via 192.168.1.114, 01:05:48, GigabitEthernet0/0
    192.168.2.0/28 is subnetted, 1 subnets
D       192.168.2.0/28 [90/5376] via 192.168.1.105, 01:16:43, GigabitEthernet0/2
```

IOS Command Line Interface

```
Router4#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, E - EGP
       i - IS-IS, 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

    192.168.1.0/24 is variably subnetted, 11 subnets, 4 masks
D       192.168.1.0/27 [90/28416] via 192.168.1.97, 4294967274:4294967282:4294967271,
GigabitEthernet0/1
D       192.168.1.32/27 [90/28416] via 192.168.1.97, 4294967274:4294967282:4294967271,
GigabitEthernet0/1
D       192.168.1.64/27 [90/28416] via 192.168.1.97, 4294967274:4294967282:4294967271,
GigabitEthernet0/1
C       192.168.1.96/30 is directly connected, GigabitEthernet0/1
L       192.168.1.98/32 is directly connected, GigabitEthernet0/1
D       192.168.1.100/30 [90/3072] via 192.168.1.97, 4294967274:4294967282:4294967271,
GigabitEthernet0/1
D       192.168.1.104/30 [90/3072] via 192.168.1.109, 4294967274:4294967259:4294967268,
GigabitEthernet0/0
C       192.168.1.108/30 is directly connected, GigabitEthernet0/0
L       192.168.1.110/32 is directly connected, GigabitEthernet0/0
D       192.168.1.112/30 [90/3072] via 192.168.1.109, 4294967274:4294967282:4294967271,
GigabitEthernet0/0
D       192.168.1.120/29 [90/5632] via 192.168.1.97, 4294967274:4294967243:4294967272,
GigabitEthernet0/1
        [90/5632] via 192.168.1.109, 4294967274:4294967243:4294967272,
GigabitEthernet0/0
    192.168.2.0/28 is subnetted, 1 subnets
D       192.168.2.0/28 [90/5632] via 192.168.1.109, 4294967274:4294967254:4294967267,
GigabitEthernet0/0
```

IOS Command Line Interface

```
Router5#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, E - EGP
       i - IS-IS, 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

    192.168.1.0/24 is variably subnetted, 12 subnets, 4 masks
D       192.168.1.0/27 [90/28416] via 192.168.1.101, 4294967274:4294967283:4294967259,
GigabitEthernet0/0
D       192.168.1.32/27 [90/28416] via 192.168.1.101, 4294967274:4294967283:4294967259,
GigabitEthernet0/0
D       192.168.1.64/27 [90/28416] via 192.168.1.101, 4294967274:4294967283:4294967259,
GigabitEthernet0/0
D       192.168.1.96/30 [90/3072] via 192.168.1.101, 4294967274:4294967283:4294967259,
GigabitEthernet0/0
C       192.168.1.100/30 is directly connected, GigabitEthernet0/0
L       192.168.1.102/32 is directly connected, GigabitEthernet0/0
D       192.168.1.104/30 [90/3072] via 192.168.1.113, 4294967274:4294967260:4294967256,
GigabitEthernet0/1
D       192.168.1.108/30 [90/3072] via 192.168.1.113, 4294967274:4294967283:4294967259,
GigabitEthernet0/1
C       192.168.1.112/30 is directly connected, GigabitEthernet0/1
L       192.168.1.114/32 is directly connected, GigabitEthernet0/1
C       192.168.1.120/29 is directly connected, GigabitEthernet0/2
L       192.168.1.121/32 is directly connected, GigabitEthernet0/2
    192.168.2.0/28 is subnetted, 1 subnets
D       192.168.2.0/28 [90/5632] via 192.168.1.113, 4294967274:4294967255:4294967254,
GigabitEthernet0/1
```

IOS Command Line Interface

```
Router3#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, E - EGP
       i - IS-IS, 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

    192.168.1.0/24 is variably subnetted, 14 subnets, 4 masks
C       192.168.1.0/27 is directly connected, GigabitEthernet0/0.10
L       192.168.1.1/32 is directly connected, GigabitEthernet0/0.10
C       192.168.1.32/27 is directly connected, GigabitEthernet0/0.20
L       192.168.1.33/32 is directly connected, GigabitEthernet0/0.20
C       192.168.1.64/27 is directly connected, GigabitEthernet0/0.30
L       192.168.1.65/32 is directly connected, GigabitEthernet0/0.30
C       192.168.1.96/30 is directly connected, GigabitEthernet0/2
L       192.168.1.97/32 is directly connected, GigabitEthernet0/2
C       192.168.1.100/30 is directly connected, GigabitEthernet0/1
L       192.168.1.101/32 is directly connected, GigabitEthernet0/1
D       192.168.1.104/30 [90/3328] via 192.168.1.98, 4294967274:4294967262:4294967268,
GigabitEthernet0/2
                               [90/3328] via 192.168.1.102, 4294967274:4294967262:4294967268,
GigabitEthernet0/1
D       192.168.1.108/30 [90/3072] via 192.168.1.98, 4294967274:4294967285:4294967271,
GigabitEthernet0/2
D       192.168.1.112/30 [90/3072] via 192.168.1.102, 4294967274:4294967285:4294967271,
GigabitEthernet0/1
D       192.168.1.120/29 [90/5376] via 192.168.1.102, 4294967274:4294967246:4294967271,
GigabitEthernet0/1
    192.168.2.0/28 is subnetted, 1 subnets
D       192.168.2.0/28 [90/5888] via 192.168.1.102, 4294967274:4294967257:4294967266,
GigabitEthernet0/1
                               [90/5888] via 192.168.1.98, 4294967274:4294967257:4294967266,
GigabitEthernet0/2
```

- Neighbor Status: `show ip eigrp neighbors` confirmed stable adjacencies

Router1

```

192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/28 is directly connected, GigabitEthernet0/0
L    192.168.2.1/32 is directly connected, GigabitEthernet0/0

Router1#
Router1#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H   Address           Interface      Hold Uptime      SRTT      RTO      Q      Seq
   (sec)              (ms)          Cnt  Num
0   192.168.1.106      Gig0/1         11   01:23:34   40     1000    0     46

Router1#

```

Copy Paste

Top

Router6

```

% Invalid input detected at ... marker.

Router6#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H   Address           Interface      Hold Uptime      SRTT      RTO      Q      Seq
   (sec)              (ms)          Cnt  Num
0   192.168.1.114      Gig0/0         14   01:52:49   40     1000    0     175
1   192.168.1.110      Gig0/1         14   01:52:49   40     1000    0     185
2   192.168.1.105      Gig0/2         12   01:24:44   40     1000    0     17

Router6#

```

Copy Paste

Top

Router4

```

Router4#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H   Address           Interface      Hold Uptime      SRTT      RTO      Q      Seq
   (sec)              (ms)          Cnt  Num
0   192.168.1.109      Gig0/0         13   01:53:22   40     1000    0     46
1   192.168.1.97       Gig0/1         12   01:53:22   40     1000    0     132

Router4#

```

Copy Paste

Top

Router5

```
Router5#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H   Address          Interface    Hold Uptime    SRTT    RTO    Q    Seq
   (sec)              (ms)                Cnt    Num
0   192.168.1.101     Gig0/0       10  01:53:57    40     1000    0   133
1   192.168.1.113     Gig0/1       11  01:53:57    40     1000    0    47

Router5#
```

Copy

Router 3

```
Router3#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H   Address          Interface    Hold Uptime    SRTT    RTO    Q    Seq
   (sec)              (ms)                Cnt    Num
0   192.168.1.102     Gig0/1       14  01:54:26    40     1000    0   175
1   192.168.1.98      Gig0/2       12  01:54:26    40     1000    0   186

Router3#
```

Copy

8. Conclusion

The network was successfully configured with full routing and switching functionality. EIGRP was used to dynamically propagate routes across five routers. Subnetting, VLAN segmentation, and server configuration were implemented accurately. All testing confirmed complete end-to-end connectivity between hosts in Florida and California, including external services via the server on Router5.