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Advanced Cisco CCNP Networking

EIGRP Configuration

Lab 3

OSPF Setup Lab 1

Purpose

The purpose of this lab was to demonstrate our ability to implement EIGRP into a network.

Background Information on Lab Concepts

EIGRP (Enhanced Interior Gateway Routing Protocol) is a vector routing protocol. It calculates the shortest loop-free path to a destination within a network by using Diffused Update Algorithm (DUAL). DUAL works by creating three tables to determine the best route: the neighbor table, topology table, and routing table. The neighbor table is extremely important since it is necessary for learning the different paths in the network. It is constructed through "hello" packets, which are sent during pre-configured periods of time. If no reply from a neighbor router is received during that time, then that router is considered dead. The topology table is constructed based on feasible distance. Feasible distance is calculated using 5 metrics. The best route is the route calculated with the least feasible distance value. The routing table is constructed by ordering the best routes in order of least to greatest feasible distance. It is best utilized in case the best calculated route fails, such as if one of the routers along that path goes offline. EIGRP is a particularly useful protocol because of its very low usage of a network. If configured efficiently, it should only transmit periodic hello packets on a network. By definition, it is also flexible to changes in network topology or down links.

Lab Summary

First my team designed a topology of the network in Packet tracer. We then subnetted the network by creating a networking scheme and assigning IPs to each link. We then created a document with the necessary commands for configuring the network for EIGRP. We tested this configuration in packet tracer until it functioned correctly on the simulated topology. Once if functioned correctly, we transferred this configuration onto the routers in the CCNP lab. Problems such as uneven load balancing arose, and these issues are described in the problems section of this report. Once these issues were remedied, we tested our network by pinging the interfaces on each router from every router.

Lab Commands

Router> **enable**
Turns on privileged exec mode which allows changes to be made to the router.

Router# **config t**
Enters the router config file and allows you to make changes to the router configuration file.

Router# **copy run start**
Saves the running-configuration (current config on the router, includes the edits you have made during the session, clears when the router powers off) to the startup-configuration (file that router pulls running-config from on bootup, default config)

Router# show **ip route**
Displays information about the various routes that are available to the router, including the protocol by which the route was acquired (OSPF, RIP, EGRIP, static, etc.)

Router(config)# **router eigrp** [instance]
Enables EIGRP of a particular instance on the router and enters router configuration mode.
There can be multiple instances of EIGRP running on a router, however, adjacent routers will only communicate if they are using the same instance.

Router# show **ip route**
Displays information about the various routes that are available to the router, including the protocol by which the route was acquired (OSPF, RIP, EGRIP, static, etc.)

Router# show **ip route**

Displays information about the various routes that are available to the router, including the protocol by which the route was acquired (OSPF, RIP, EGRIP, static, etc.)

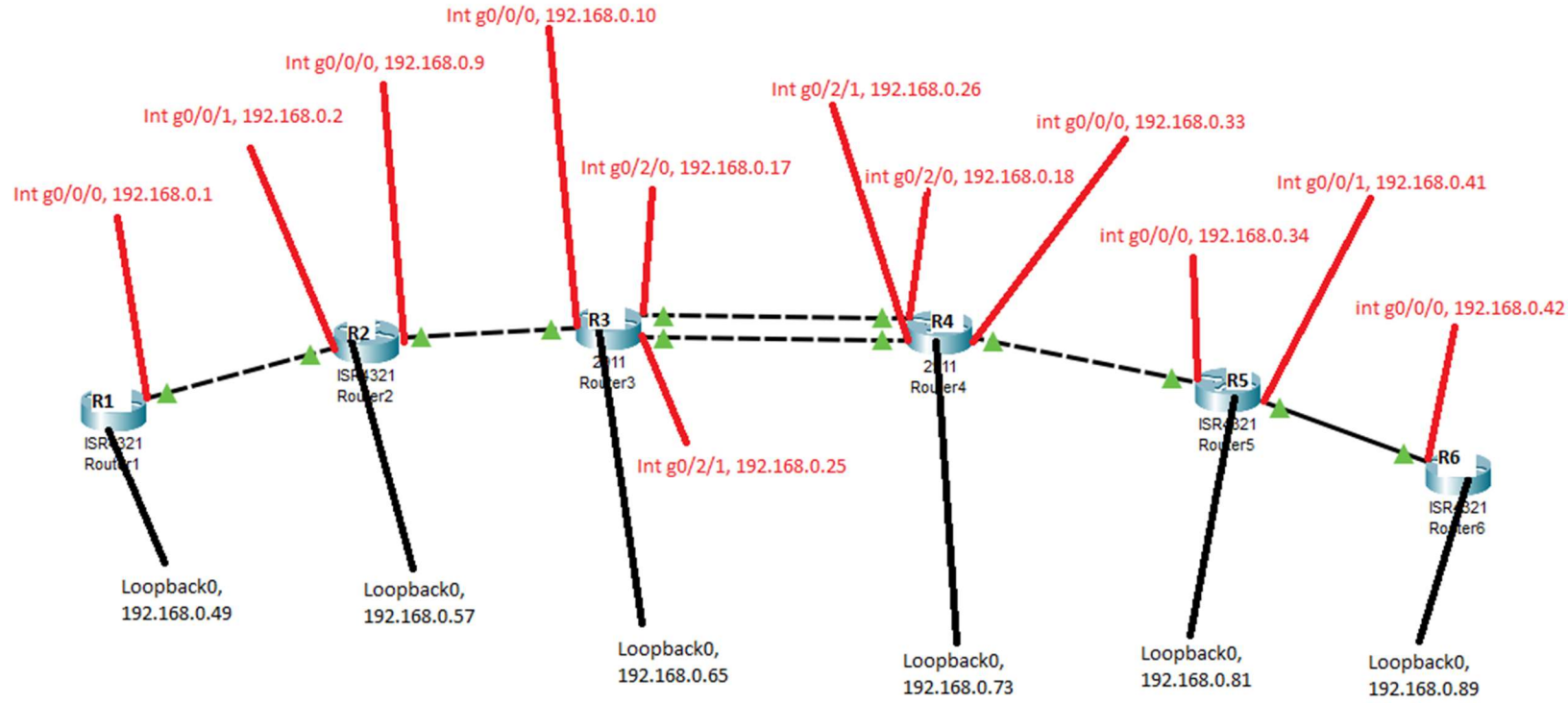
Router(config)# **interface [*interface*] [*id*]**
Enables configuration on a specific interface.

Router(config-router)# **network [*network address*] [*wildcard mask*] area [*area number*]**
Activates OSPFv2 for a specific subnet.
This command is typed after you enter router OSPF configuration mode. Routers in a particular area share a complete topological database and have route summaries of external areas.

Router(config-router)# **metric weights [*TOS Number*] [*K1*] [*K2*] [*K3*] [*K4*] [*K5*]**
Used to determine which values are weighted to determine the metric value for routes.
K1 (Bandwidth), K2 (Load), K3 (Delay), K4 (Reliability), K5 (MTU)

Router(config-router)# **variance [*value: 1-128*]**
Allows for uneven load balancing by multiplying the highest metric link by the given value and load-balancing with all links that are equal to or less than that value

Network Diagram with IP's



Configuration

Router 1:

```
R1#Show run
Building configuration...
Current configuration : 1417 bytes
Last configuration change at 17:54:35
UTC Mon Oct 18 2021
version 15.5
```

```
service timestamps debug datetime
msec
service timestamps log datetime msec
no platform punt-keepalive disable-
kernel-core
hostname R1
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21441
WDF
spanning-tree extend system-id
redundancy
mode none
vlan internal allocation policy
ascending
interface Loopback0
ip address 192.168.0.49
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.1
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
no ip address
shutdown
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdown
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
interface Vlan1
no ip address
shutdown
router eigrp 10
metric weights 0 1 1 1 1 0
network 192.168.0.0 0.0.0.7
ip forward-protocol nd
no ip http server
no ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
Gateway of last resort is not set
      192.168.0.0/24 is variably subnetted, 9 subnets, 2 masks
C        192.168.0.0/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.1/32 is directly connected, GigabitEthernet0/0/0
D        192.168.0.8/29
           [90/3082] via 192.168.0.2, 00:06:18, GigabitEthernet0/0/0
D        192.168.0.16/29
           [90/65018] via 192.168.0.2, 00:06:18, GigabitEthernet0/0/0
D        192.168.0.24/29
           [90/32893] via 192.168.0.2, 00:06:18, GigabitEthernet0/0/0
D        192.168.0.32/29
```

```
           [90/65274] via 192.168.0.2, 00:06:18, GigabitEthernet0/0/0
D        192.168.0.40/29
           [90/33405] via 192.168.0.2, 00:06:18, GigabitEthernet0/0/0
C        192.168.0.48/29 is directly connected, Loopback0
L        192.168.0.49/32 is directly connected, Loopback0
```

R1#Show eigrp protocols

```
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.49
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1
```

R1#Show ip eigrp interfaces

```
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
Gi0/0/0                  1        0/0       0/0           2       0/0           5
0           0
```

R1#Show ip eigrp neighbors

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)          (ms)       Cnt N
um
0   192.168.0.2             Gi0/0/0                  13
00:06:40    2   100  0  4
```

R1#Show ip eigrp topology

```
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.49)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 192.168.0.8/29, 1 successors, FD is 3082
        via 192.168.0.2 (3082/2826), GigabitEthernet0/0/0
P 192.168.0.16/29, 1 successors, FD is 65018
        via 192.168.0.2 (65018/64762), GigabitEthernet0/0/0
P 192.168.0.40/29, 1 successors, FD is 33405
        via 192.168.0.2 (33405/33149), GigabitEthernet0/0/0
P 192.168.0.0/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.32/29, 1 successors, FD is 65274
        via 192.168.0.2 (65274/65018), GigabitEthernet0/0/0
```

```
P 192.168.0.24/29, 1 successors, FD is 32893
        via 192.168.0.2 (32893/32637), GigabitEthernet0/0/0
```

Router 2:

```
R2#Show run
Building configuration...
Current configuration : 1461 bytes
Last configuration change at 17:48:10
UTC Mon Oct 18 2021
version 15.5
service timestamps debug datetime
msec
service timestamps log datetime msec
no platform punt-keepalive disable-
kernel-core
hostname R2
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21500
9QY
spanning-tree extend system-id
redundancy
mode none
vlan internal allocation policy
ascending
interface Loopback0
ip address 192.168.0.57
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.9
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
ip address 192.168.0.2
255.255.255.248
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdown
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
interface Vlan1
no ip address
shutdown
router eigrp 10
metric weights 0 1 1 1 1 0
network 192.168.0.0 0.0.0.7
network 192.168.0.8 0.0.0.7
ip forward-protocol nd
no ip http server
no ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

```
R2#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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
Gateway of last resort is not set
      192.168.0.0/24 is variably subnetted, 10 subnets, 2 masks
```

```
C        192.168.0.0/29 is directly connected, GigabitEthernet0/0/1
L        192.168.0.2/32 is directly connected, GigabitEthernet0/0/1
C        192.168.0.8/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.9/32 is directly connected, GigabitEthernet0/0/0
D        192.168.0.16/29
           [90/64762] via 192.168.0.10, 00:11:40, GigabitEthernet0/0/0
D        192.168.0.24/29
           [90/32637] via 192.168.0.10, 00:11:40, GigabitEthernet0/0/0
D        192.168.0.32/29
           [90/65018] via 192.168.0.10, 00:11:40, GigabitEthernet0/0/0
D        192.168.0.40/29
           [90/33149] via 192.168.0.10, 00:11:40, GigabitEthernet0/0/0
C        192.168.0.56/29 is directly connected, Loopback0
L        192.168.0.57/32 is directly connected, Loopback0
```

R2#Show eigrp protocols

```
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.57
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1
```

R2#Show ip eigrp interfaces

```
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
Gi0/0/1                  1        0/0       0/0           1       0/0           5
0           0
Gi0/0/0                  1        0/0       0/0           1       0/0           5
0           0
```

R2#Show ip eigrp neighbors

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)         (ms)       Cnt N
um
1   192.168.0.1             Gi0/0/1                  10
00:11:54    1   100  0  3
0   192.168.0.10            Gi0/0/0                  13
00:11:57    1   100  0  31
```

R2#Show ip eigrp topology

```
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.57)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 192.168.0.8/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.16/29, 1 successors, FD is 64762
        via 192.168.0.10 (64762/64506), GigabitEthernet0/0/0
P 192.168.0.40/29, 1 successors, FD is 33149
        via 192.168.0.10 (33149/32893), GigabitEthernet0/0/0
P 192.168.0.0/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/1
P 192.168.0.32/29, 1 successors, FD is 65018
        via 192.168.0.10 (65018/64762), GigabitEthernet0/0/0
P 192.168.0.24/29, 1 successors, FD is 32637
        via 192.168.0.10 (32637/32381), GigabitEthernet0/0/0
```

Router 3:

```
R3#Show run
Building configuration...
Current configuration : 3981 bytes
Last configuration change at 17:55:19
UTC Mon Oct 18 2021
version 16.9
service timestamps debug datetime
msec
service timestamps log datetime msec
platform qfp utilization monitor load
80
platform punt-keepalive disable-
kernel-core
hostname R3
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
login on-success log
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21482
DXE
no license smart enable
diagnostic bootup level minimal
spanning-tree extend system-id
redundancy
mode none
interface Loopback0
ip address 192.168.0.65
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.10
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
no ip address
shutdown
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdown
interface GigabitEthernet0/2/0
bandwidth 40000
ip address 192.168.0.17
255.255.255.248
negotiation auto
interface GigabitEthernet0/2/1
bandwidth 80000
ip address 192.168.0.25
255.255.255.248
negotiation auto
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
router eigrp 10
metric weights 0 1 1 1 1 0
variance 128
network 192.168.0.8 0.0.0.7
network 192.168.0.16 0.0.0.7
network 192.168.0.24 0.0.0.7
ip forward-protocol nd
ip http server
```

```
ip http authentication local
ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
transport input none
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
Gateway of last resort is not set
      192.168.0.0/24 is variably subnetted, 11 subnets, 2 masks
D        192.168.0.0/29
           [90/3082] via 192.168.0.9, 00:14:46, GigabitEthernet0/0/0
C        192.168.0.8/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.10/32 is directly connected, GigabitEthernet0/0/0
C        192.168.0.16/29 is directly connected, GigabitEthernet0/2/0
L        192.168.0.17/32 is directly connected, GigabitEthernet0/2/0
C        192.168.0.24/29 is directly connected, GigabitEthernet0/2/1
L        192.168.0.25/32 is directly connected, GigabitEthernet0/2/1
D        192.168.0.32/29
           [90/32637] via 192.168.0.26, 00:19:48, GigabitEthernet0/2/1
           [90/64762] via 192.168.0.18, 00:19:48, GigabitEthernet0/2/0
D        192.168.0.40/29
           [90/32893] via 192.168.0.26, 00:19:41, GigabitEthernet0/2/1
           [90/65018] via 192.168.0.18, 00:19:41, GigabitEthernet0/2/0
C        192.168.0.64/29 is directly connected, Loopback0
L        192.168.0.65/32 is directly connected, Loopback0
```

R3#Show eigrp protocols

```
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.65
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 128
```

R3#Show ip eigrp interfaces

```
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
Gi0/0/0                  1        0/0       0/0           1       0/0           5
0           0
Gi0/2/0                  1        0/0       0/0           1       0/0           5
0           0
Gi0/2/1                  1        0/0       0/0           1       0/0           5
0           0
```

R3#Show ip eigrp neighbors

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)         (ms)       Cnt N
um
2   192.168.0.9             Gi0/0/0                  11
00:15:04    1   100  0  5
1   192.168.0.26            Gi0/2/1                  12
00:29:32    1   100  0  35
0   192.168.0.18            Gi0/2/0                  11
00:29:32    1   100  0  36
```

R3#Show ip eigrp topology

```
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.65)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.0.8/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.16/29, 1 successors, FD is 64506
        via Connected, GigabitEthernet0/2/0
P 192.168.0.40/29, 1 successors, FD is 32893
        via 192.168.0.26 (32893/3082), GigabitEthernet0/2/1
        via 192.168.0.18 (65018/3082), GigabitEthernet0/2/0
P 192.168.0.0/29, 1 successors, FD is 3082
        via 192.168.0.9 (3082/2826), GigabitEthernet0/0/0
P 192.168.0.32/29, 2 successors, FD is 32637
        via 192.168.0.18 (64762/2826), GigabitEthernet0/2/0
        via 192.168.0.26 (32637/2826), GigabitEthernet0/2/1
P 192.168.0.24/29, 1 successors, FD is 32381
        via Connected, GigabitEthernet0/2/1
```

R3#show ip route 192.168.0.42

```
Routing entry for 192.168.0.40/29
  Known via "eigrp 10", distance 90, metric 32893, type internal
  Redistributing via eigrp 10
  Last update from 192.168.0.26 on GigabitEthernet0/2/1, 00:21:45 ago
  Routing Descriptor Blocks:
    192.168.0.26, from 192.168.0.26, 00:21:45 ago, via GigabitEthernet0/2/1
      Route metric is 32893, traffic share count is 240
      Total delay is 30 microseconds, minimum bandwidth is 80000 Kbit
```

```
      Reliability 255/255, minimum MTU 1500 bytes
      Loading 1/255, Hops 2
  * 192.168.0.18, from 192.168.0.18, 00:21:45 ago, via GigabitEthernet0/2/0
      Route metric is 65018, traffic share count is 121
      Total delay is 30 microseconds, minimum bandwidth is 40000 Kbit
      Reliability 255/255, minimum MTU 1500 bytes
      Loading 1/255, Hops 2
```

Router 4:

```
R4#Show run
Building configuration...
Current configuration : 3982 bytes
Last configuration change at 17:53:56
UTC Mon Oct 18 2021
version 16.9
service timestamps debug datetime
msec
service timestamps log datetime msec
platform qfp utilization monitor load
80
platform punt-keepalive disable-
kernel-core
hostname R4
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
login on-success log
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21500
G1N
no license smart enable
diagnostic bootup level minimal
spanning-tree extend system-id
redundancy
mode none
interface Loopback0
ip address 192.168.0.73
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.33
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
no ip address
shutdown
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdow
interface GigabitEthernet0/2/0
bandwidth 40000
ip address 192.168.0.18
255.255.255.248
negotiation auto
interface GigabitEthernet0/2/1
bandwidth 80000
ip address 192.168.0.26
255.255.255.248
negotiation auto
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
router eigrp 10
metric weights 0 1 1 1 1 0
variance 128
network 192.168.0.16 0.0.0.7
network 192.168.0.24 0.0.0.7
network 192.168.0.32 0.0.0.7
ip forward-protocol nd
ip http server
ip http authentication local
ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
transport input none
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

```
R4#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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 11 subnets, 2 masks
D        192.168.0.0/29
           [90/32893] via 192.168.0.25, 00:19:09, GigabitEthernet0/2/1
           [90/65018] via 192.168.0.17, 00:19:09, GigabitEthernet0/2/0
D        192.168.0.8/29
           [90/32637] via 192.168.0.25, 00:19:15, GigabitEthernet0/2/1
           [90/64762] via 192.168.0.17, 00:19:15, GigabitEthernet0/2/0
C        192.168.0.16/29 is directly connected, GigabitEthernet0/2/0
L        192.168.0.18/32 is directly connected, GigabitEthernet0/2/0
C        192.168.0.24/29 is directly connected, GigabitEthernet0/2/1
L        192.168.0.26/32 is directly connected, GigabitEthernet0/2/1
C        192.168.0.32/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.33/32 is directly connected, GigabitEthernet0/0/0
D        192.168.0.40/29
           [90/3082] via 192.168.0.34, 00:24:04, GigabitEthernet0/0/0
C        192.168.0.72/29 is directly connected, Loopback0
L        192.168.0.73/32 is directly connected, Loopback0

R4#Show eigrp protocols
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.73
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 128

R4#Show ip eigrp interfaces
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
```

```
Gi0/2/0                  1        0/0       0/0           1       0/1           5
0           0
Gi0/2/1                  1        0/0       0/0           1       0/0           5
0           0
Gi0/0/0                  1        0/0       0/0           1       0/0           5
0           0
```

R4#Show ip eigrp neighbors

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)          (ms)       Cnt N
um
2   192.168.0.34            Gi0/0/0                  11
00:24:22    1   100  0  12
1   192.168.0.25            Gi0/2/1                  14
00:33:54    1   100  0  32
0   192.168.0.17            Gi0/2/0                  12
00:33:54    1   100  0  33
```

R4#Show ip eigrp topology

```
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.73)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.0.8/29, 1 successors, FD is 32637
        via 192.168.0.25 (32637/2826), GigabitEthernet0/2/1
        via 192.168.0.17 (64762/2826), GigabitEthernet0/2/0
P 192.168.0.16/29, 1 successors, FD is 64506
        via Connected, GigabitEthernet0/2/0
P 192.168.0.40/29, 1 successors, FD is 3082
        via 192.168.0.34 (3082/2826), GigabitEthernet0/0/0
P 192.168.0.0/29, 2 successors, FD is 32893
        via 192.168.0.17 (65018/3082), GigabitEthernet0/2/0
        via 192.168.0.25 (32893/3082), GigabitEthernet0/2/1
P 192.168.0.32/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.24/29, 1 successors, FD is 32381
        via Connected, GigabitEthernet0/2/1
```

R4#show ip route 192.168.0.1

```
Routing entry for 192.168.0.0/29
  Known via "eigrp 10", distance 90, metric 32893, type internal
  Redistributing via eigrp 10
  Last update from 192.168.0.17 on GigabitEthernet0/2/0, 00:19:31 ago
  Routing Descriptor Blocks:
  * 192.168.0.25, from 192.168.0.25, 00:19:31 ago, via GigabitEthernet0/2/1
      Route metric is 32893, traffic share count is 240
      Total delay is 30 microseconds, minimum bandwidth is 80000 Kbit
      Reliability 255/255, minimum MTU 1500 bytes
      Loading 1/255, Hops 2
    192.168.0.17, from 192.168.0.17, 00:19:31 ago, via GigabitEthernet0/2/0
      Route metric is 65018, traffic share count is 121
      Total delay is 30 microseconds, minimum bandwidth is 40000 Kbit
```

```
      Reliability 255/255, minimum MTU 1500 bytes
      Loading 1/255, Hops 2
```

Router 5:

```
R5#Show run
Building configuration...
Current configuration : 1465 bytes
! Last configuration change at
17:56:21 UTC Mon Oct 18 2021
version 15.5
service timestamps debug datetime
msec
service timestamps log datetime msec
no platform punt-keepalive disable-
kernel-core
hostname R5
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21442
0HM
spanning-tree extend system-id
redundancy
mode none
vlan internal allocation policy
ascending
interface Loopback0
ip address 192.168.0.81
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.34
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
ip address 192.168.0.41
255.255.255.248
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdown
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
interface Vlan1
no ip address
shutdown
router eigrp 10
metric weights 0 1 1 1 1 0
network 192.168.0.32 0.0.0.7
network 192.168.0.40 0.0.0.7
ip forward-protocol nd
no ip http server
no ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

```
R5#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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
Gateway of last resort is not set
      192.168.0.0/24 is variably subnetted, 10 subnets, 2 masks
```

```
D        192.168.0.0/29
           [90/65274] via 192.168.0.33, 00:21:19, GigabitEthernet0/0/0
D        192.168.0.8/29
           [90/32893] via 192.168.0.33, 00:21:25, GigabitEthernet0/0/0
D        192.168.0.16/29
           [90/64762] via 192.168.0.33, 00:26:18, GigabitEthernet0/0/0
D        192.168.0.24/29
           [90/32637] via 192.168.0.33, 00:26:18, GigabitEthernet0/0/0
C        192.168.0.32/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.34/32 is directly connected, GigabitEthernet0/0/0
C        192.168.0.40/29 is directly connected, GigabitEthernet0/0/1
L        192.168.0.41/32 is directly connected, GigabitEthernet0/0/1
C        192.168.0.80/29 is directly connected, Loopback0
L        192.168.0.81/32 is directly connected, Loopback0
```

R5#Show eigrp protocols

```
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.81
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1
```

R5#Show ip eigrp interfaces

```
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
Gi0/0/0                  1        0/0       0/0           1       0/0           5
0           0
Gi0/0/1                  1        0/0       0/0           1       0/0           5
0           0
```

R5#Show ip eigrp neighbors

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)         (ms)       Cnt N
um
1   192.168.0.42            Gi0/0/1                  13
00:26:27    1   100  0  6
0   192.168.0.33            Gi0/0/0                  12
00:26:31    1   100  0  34
```

R5#Show ip eigrp topology

```
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.81)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.0.8/29, 1 successors, FD is 32893
        via 192.168.0.33 (32893/32637), GigabitEthernet0/0/0
P 192.168.0.16/29, 1 successors, FD is 64762
        via 192.168.0.33 (64762/64506), GigabitEthernet0/0/0
P 192.168.0.40/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/1
P 192.168.0.0/29, 1 successors, FD is 65274
        via 192.168.0.33 (65274/65018), GigabitEthernet0/0/0
P 192.168.0.32/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.24/29, 1 successors, FD is 32637
        via 192.168.0.33 (32637/32381), GigabitEthernet0/0/0
```

Router 6:

```
R6#Show run
Building configuration...
Current configuration : 1419 bytes
Last configuration change at 17:53:14
UTC Mon Oct 18 2021
version 15.5
service timestamps debug datetime
msec
service timestamps log datetime msec
no platform punt-keepalive disable-
kernel-core
hostname R6
boot-start-marker
boot-end-marker
vrf definition Mgmt-intf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
no aaa new-model
subscriber templating
multilink bundle-name authenticated
license udi pid ISR4321/K9 sn FDO21441
4DZ
spanning-tree extend system-id
redundancy
mode none
vlan internal allocation policy
ascending
interface Loopback0
ip address 192.168.0.89
255.255.255.248
interface GigabitEthernet0/0/0
ip address 192.168.0.42
255.255.255.248
negotiation auto
interface GigabitEthernet0/0/1
no ip address
shutdown
negotiation auto
interface Serial0/1/0
no ip address
shutdown
interface Serial0/1/1
no ip address
shutdown
interface GigabitEthernet0
vrf forwarding Mgmt-intf
no ip address
shutdown
negotiation auto
interface Vlan1
no ip address
shutdown
router eigrp 10
metric weights 0 1 1 1 1 0
network 192.168.0.40 0.0.0.7
ip forward-protocol nd
no ip http server
no ip http secure-server
ip tftp source-interface
GigabitEthernet0
control-plane
line con 0
stopbits 1
line aux 0
stopbits 1
line vty 0 4
login
end
```

```
R6#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
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 9 subnets, 2 masks
D        192.168.0.0/29
           [90/65530] via 192.168.0.41, 00:23:44, GigabitEthernet0/0/0
D        192.168.0.8/29
           [90/33149] via 192.168.0.41, 00:23:50, GigabitEthernet0/0/0
D        192.168.0.16/29
           [90/65018] via 192.168.0.41, 00:28:38, GigabitEthernet0/0/0
D        192.168.0.24/29
           [90/32893] via 192.168.0.41, 00:28:38, GigabitEthernet0/0/0
D        192.168.0.32/29
           [90/3082] via 192.168.0.41, 00:28:38, GigabitEthernet0/0/0
C        192.168.0.40/29 is directly connected, GigabitEthernet0/0/0
L        192.168.0.42/32 is directly connected, GigabitEthernet0/0/0
C        192.168.0.88/29 is directly connected, Loopback0
L        192.168.0.89/32 is directly connected, Loopback0

R6#Show eigrp protocols
EIGRP-IPv4 Protocol for AS(10)
  Metric weight K1=1, K2=1, K3=1, K4=1, K5=0
  Soft SIA disabled
  NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
  Router-ID: 192.168.0.89
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1

R6#Show ip eigrp interfaces
EIGRP-IPv4 Interfaces for AS(10)
                              Xmit Queue   PeerQ        Mean   Pacing
Time   Multicast    Pending
Interface              Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow
Timer   Routes
Gi0/0/0                  1        0/0       0/0           1       0/0           5
0           0

R6#Show ip eigrp neighbors
```

```
EIGRP-IPv4 Neighbors for AS(10)
H   Address                 Interface              Hold
Uptime   SRTT   RTO  Q  Seq
                                                   (sec)         (ms)       Cnt N
um
0   192.168.0.41            Gi0/0/0                  11
00:28:54    1   100  0  11

R6#Show ip eigrp topology
EIGRP-IPv4 Topology Table for AS(10)/ID(192.168.0.89)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.0.8/29, 1 successors, FD is 33149
        via 192.168.0.41 (33149/32893), GigabitEthernet0/0/0
P 192.168.0.16/29, 1 successors, FD is 65018
        via 192.168.0.41 (65018/64762), GigabitEthernet0/0/0
P 192.168.0.40/29, 1 successors, FD is 2826
        via Connected, GigabitEthernet0/0/0
P 192.168.0.0/29, 1 successors, FD is 65530
        via 192.168.0.41 (65530/65274), GigabitEthernet0/0/0
P 192.168.0.32/29, 1 successors, FD is 3082
        via 192.168.0.41 (3082/2826), GigabitEthernet0/0/0
P 192.168.0.24/29, 1 successors, FD is 32893
        via 192.168.0.41 (32893/32637), GigabitEthernet0/0/0
```

Pings:

Router 1:

```
R1#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

```
R1#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Router 2:

```
R2#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.10
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R2#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Router 3:

```
R3#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
```

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R3#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
```

Router 4:

```
R4#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
```

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R4#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Router 5:

```
R5#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/5 ms
R5#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R5#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Router 6:

```
R6#Ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.9
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.9, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.17
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.17, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.25
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.25, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.33
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.33, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

```
R6#Ping 192.168.0.18
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.18, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.26
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.26, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.34
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.34, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.41
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.41, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R6#Ping 192.168.0.42
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.42, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Problems

The first problem we encountered was unfamiliarity with the commands necessary to configure EIGRP. This was especially significant with some features we wanted to implement, like uneven load-balancing. We remedied these issues by studying the Cisco documentation and discussing how to setup these features with other students in the CCNP lab room.

A second problem we encountered was understanding how to calculate and implement K-values and variance. These concepts were the most difficult part of the lab for our group. We eventually understood how these systems worked by studying the Cisco documentation and testing different configurations in packet tracer. Throughout these steps, we also discussed solutions with other groups.

Conclusions

In this lab, we learned how to properly setup EIGRP on the equipment in the CCNP lab room. We accomplished this by first reading the Cisco documentation to learn the required commands to setup EIGRP, building a networking scheme, creating a configuration file, testing the file in packet tracer, transferring the configuration file onto the CCNP routers, and testing it on the routers in the lab room. Some errors we encountered were learning how to implement uneven load-balancing, variance, and K-values. These issues were solved by speaking with other students and reading the Cisco documentation.

Instructor Signoff