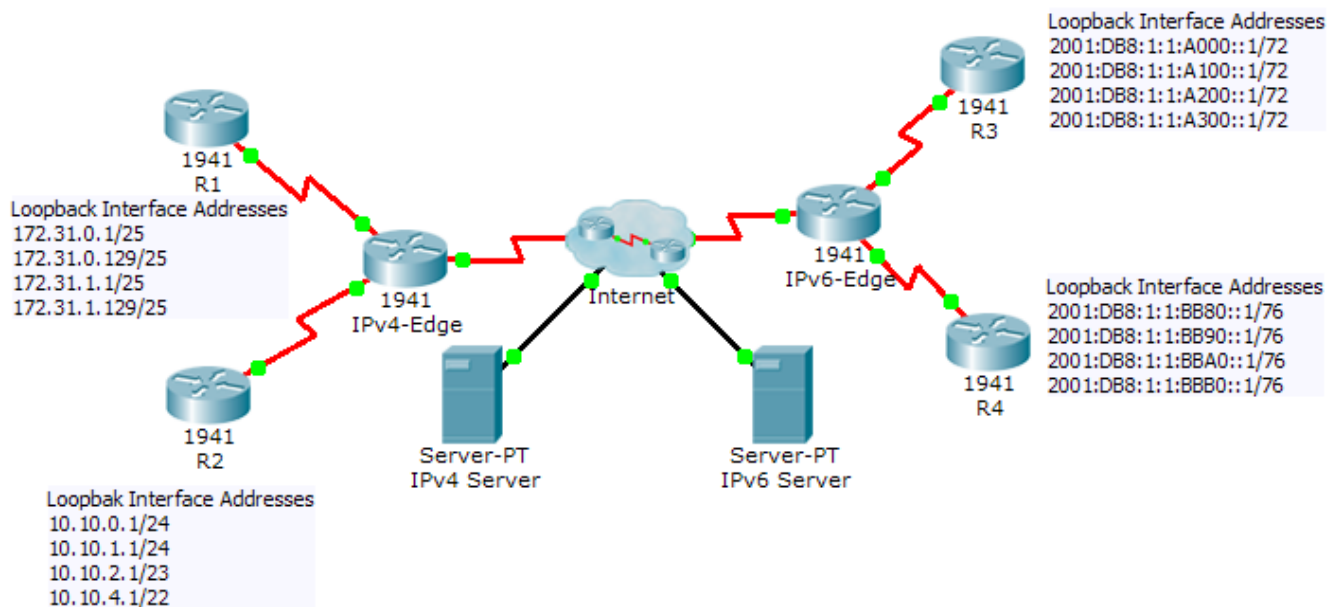


## Packet Tracer - Skills Integration Challenge (Instructor Version)

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

### Topology



## Addressing Table

Device	Interface	IPv4 Address	Subnet Mask
		IPv6 Address/Prefix	
IPv4-Edge	S0/0/0	172.31.6.1	255.255.255.252
	S0/0/1	10.10.8.1	255.255.255.252
	S0/1/0	209.165.200.226	255.255.255.224
R1	S0/0/0	172.31.6.2	255.255.255.252
R2	S0/0/1	10.10.8.2	255.255.255.252
IPv6-Edge	S0/0/0	2001:DB8:A001:6::1/64	
	S0/0/1	2001:DB8:A001:7::1/64	
	S0/1/0	2001:DB8:CAFE:1::2/64	
R3	S0/0/0	2001:DB8:A001:7::2/64	
R4	S0/0/1	2001:DB8:A001:6::2/64	

## Scenario

In this activity, you are tasked with implementing EIGRP for IPv4 and IPv6 on two separate networks. Your task includes enabling EIGRP, assigning router-IDs, changing the hello timers, configuring EIGRP summary routes and limiting EIGRP advertisements.

## Requirements

### EIGRP for IPv4

- Implement EIGRP on IPv4 enabled routers using Autonomous System 1.
  - Use the classful network address for the loopback interfaces.
  - Use the wildcard mask to advertise the /30 networks between **R1**, **R2** and **IPv4-Edge**.
  - Use the **default** method to only allow EIGRP updates out the active EIGRP serial interfaces.
  - Advertisements should not be summarized.

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

```
R1(config-router)# passive-interface default
```

```
R1(config-router)# no passive-interface Serial0/0/0
```

```
R1(config-router)# network 172.31.0.0
```

```
R1(config-router)# no auto-summary
```

```
R2(config)# router eigrp 1
```

```
R2(config-router)# passive-interface default
```

```
R2(config-router)# no passive-interface Serial0/0/1
```

```
R2(config-router)# network 10.0.0.0
```

```
R2(config-router)# no auto-summary
```

```
IPv4-Edge(config)# router eigrp 1
```

```
IPv4-Edge(config-router)# passive-interface default
```

```
IPv4-Edge(config-router)# no passive-interface Serial0/0/0
```

```
IPv4-Edge(config-router)# no passive-interface Serial0/0/1
```

```
IPv4-Edge(config-router)# network 172.31.6.0 0.0.0.3
```

```
IPv4-Edge(config-router)# network 10.10.8.0 0.0.0.3
```

```
IPv4-Edge(config-router)# no auto-summary
```

- Configure a directly attached default route on **IPv4-Edge** and propagate it in EIGRP updates.

```
IPv4-Edge(config)# ip route 0.0.0.0 0.0.0.0 Serial0/1/0
```

```
IPv4-Edge(config)# router eigrp 1
```

```
IPv4-Edge(config-router)# redistribute static
```

- Configure the serial interfaces between **R1**, **R2** and **IPv4-Edge** to send hellos every 10 seconds.

```
R1(config)# interface s0/0/0
```

```
R1(config-if)# ip hello-interval eigrp 1 10
```

```
R2(config)# interface s0/0/1
```

```
R2(config-if)# ip hello-interval eigrp 1 10
```

```
IPv4-Edge(config)# interface s0/0/0
```

```
IPv4-Edge(config-if)# ip hello-interval eigrp 1 10
```

```
IPv4-Edge(config-if)# interface s0/0/1
```

```
IPv4-Edge(config-if)# ip hello-interval eigrp 1 10
```

- On **R1** and **R2**, configure an EIGRP summary route for the loopback networks.

R1 Loopback Networks	R2 Loopback Networks
172.31.0.0/25	10.10.0.0/24
172.31.0.128/25	10.10.1.0/24
172.31.1.0/25	10.10.2.0/23
172.31.1.128/25	10.10.4.0/22
Summary: 172.31.0.0/23	Summary: 10.10.0.0/21

```
R1(config)# interface Serial0/0/0
```

```
R1(config-if)# ip summary-address eigrp 1 172.31.0.0 255.255.254.0
```

```
R2(config)# interface Serial0/0/1
```

```
R2(config-if)# ip summary-address eigrp 1 10.10.0.0 255.255.248.0
```

- **R1** and **R2** should only have four EIGRP routes in the routing table, one of which is the default route (D\*EX). **IPv4-Edge** should only have two EIGRP routes in the routing table.
- Verify **R1** and **R2** can ping the **IPv4 Server**. **IPv4 Server** should also be able to ping every loopback address on **R1** and **R2**.

### EIGRP for IPv6

- Implement EIGRP on IPv6 enabled routers using Autonomous System 1.
  - Assign **IPv6-Edge** with the router-ID of 1.1.1.1
  - Assign **R3** with the router-ID of 3.3.3.3
  - Assign **R4** with the router-ID of 4.4.4.4

```
IPv6-Edge(config)# ipv6 unicast-routing
IPv6-Edge(config)# ipv6 router eigrp 1
IPv6-Edge(config-rtr)# eigrp router-id 1.1.1.1
IPv6-Edge(config-rtr)# no shutdown
IPv6-Edge(config-rtr)# interface Serial0/0/0
IPv6-Edge(config-if)# ipv6 eigrp 1
IPv6-Edge(config-if)# interface Serial0/0/1
IPv6-Edge(config-if)# ipv6 eigrp 1
```

```
R3(config)# ipv6 unicast-routing
R3(config)# ipv6 router eigrp 1
R3(config-rtr)# eigrp router-id 3.3.3.3
R3(config-rtr)# no shutdown
R3(config-rtr)# interface Loopback0
R3(config-if)# ipv6 eigrp 1
R3(config-if)# interface Loopback1
R3(config-if)# ipv6 eigrp 1
R3(config-if)# interface Loopback2
R3(config-if)# ipv6 eigrp 1
R3(config-if)# interface Loopback3
R3(config-if)# ipv6 eigrp 1
R3(config-if)# interface Serial0/0/0
R3(config-if)# ipv6 eigrp 1
```

```
R4(config)# ipv6 unicast-routing
R4(config)# ipv6 router eigrp 1
R4(config-rtr)# eigrp router-id 4.4.4.4
R4(config-rtr)# no shutdown
R4(config-rtr)# interface Loopback8
```

```
R4(config-if)# ipv6 eigrp 1
R4(config-if)# interface Loopback9
R4(config-if)# ipv6 eigrp 1
R4(config-if)# interface Loopback10
R4(config-if)# ipv6 eigrp 1
R4(config-if)# interface Loopback11
R4(config-if)# ipv6 eigrp 1
R4(config-if)# interface Serial0/0/1
R4(config-if)# ipv6 eigrp 1
```

- Configure a directly attached default route on **IPv6-Edge** and propagate it in EIGRP updates.

```
IPv6-Edge(config)# ipv6 route ::/0 Serial0/1/0
IPv6-Edge(config)# ipv6 router eigrp 1
IPv6-Edge(config-rtr)# redistribute static
```

- On **R3** and **R4**, configure an EIGRP summary route for the loopback networks.

R3 Loopback Networks	R4 Loopback Networks
2001:DB8:1:1:A000::1/72	2001:DB8:1:1:BB80::1/76
2001:DB8:1:1:A100::1/72	2001:DB8:1:1:BB90::1/76
2001:DB8:1:1:A200::1/72	2001:DB8:1:1:BBA0::1/76
2001:DB8:1:1:A300::1/72	2001:DB8:1:1:BBB0::1/76
Summary: 2001:DB8:1:1:A000::/70	Summary: 2001:DB8:1:1:BB80::/74

```
R3(config)# interface Serial0/0/0
R3(config-if)# ipv6 summary-address eigrp 1 2001:DB8:1:1:A000::/70
```

```
R4(config)# interface Serial0/0/1
R4(config-if)# ipv6 summary-address eigrp 1 2001:DB8:1:1:BB80::/74
```

- **R3** and **R4** should only have four EIGRP routes in the routing table, counting the default external route. **IPv6-Edge** should only have two EIGRP routes in the routing table.
- Verify **R3** and **R4** can ping the **IPv6 Server**. **IPv6 Server** should also be able to ping every loopback address on **R3** and **R4**.

### Suggested Scoring Rubric

**Note:** Packet Tracer does not currently grade EIGRP for IPv6 summary routes. Therefore, part of your grade depends on routing table verification by your instructor.

Scored Work	Possible Points	Earned Points
IPv6-Edge Routing Table	10	
Packet Tracer Score	90	
Total Score	100	

The **IPv6-Edge** router should show the following summary routes and no other **D** routes:

```
IPv6-Edge# show ipv6 route
```

```
<output omitted>
```

```
D    2001:DB8:1:1:A000::/70 [90/2297856]
```

```
    via FE80::2E0:F7FF:FE41:B901, Serial0/0/1
```

```
D    2001:DB8:1:1:BB80::/74 [90/2297856]
```

```
    via FE80::20A:41FF:FE80:4002, Serial0/0/0
```