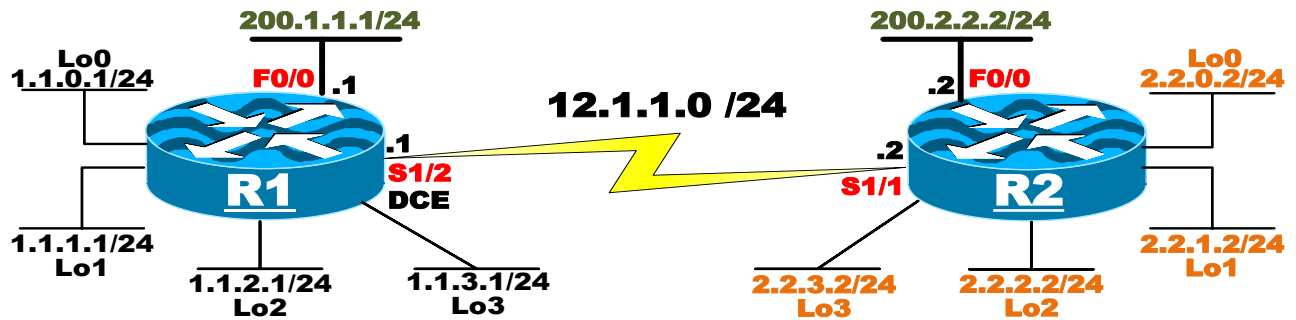


## Lab 2 - EIGRP Stub



### Task 1

Configure EIGRP AS 100 on the serial and all loopback interfaces of these two routers. R1 should configure EIGRP using the classic method and R2 should use the new EIGRP named configuration to accomplish this task. **DO NOT run EIGRP on the F0/0 interfaces of these two routers.**

#### On R1:

```
R1 (config) #router eigrp 100
R1 (config-router) #netw 1.1.0.1 0.0.0.0
R1 (config-router) #netw 1.1.1.1 0.0.0.0
R1 (config-router) #netw 1.1.2.1 0.0.0.0
R1 (config-router) #netw 1.1.3.1 0.0.0.0
R1 (config-router) #netw 12.1.1.1 0.0.0.0
```

#### On R2:

```
R2 (config) #router eigrp tst
R2 (config-router) #address-family ipv4 unicast autonomous-system 100
R2 (config-router-af) #netw 2.2.0.2 0.0.0.0
R2 (config-router-af) #netw 2.2.1.2 0.0.0.0
R2 (config-router-af) #netw 2.2.2.2 0.0.0.0
R2 (config-router-af) #netw 2.2.3.2 0.0.0.0
R2 (config-router-af) #netw 12.1.1.2 0.0.0.0
```

**You should see the following console message:**

```
%DUAL-5-NBRCHANGE: EIGRP-IPv4 100: neighbor 12.1.1.1 (Serial1/1) is up:
new adjacency
```

### **To verify the configuration:**

#### **On R1:**

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set

    2.0.0.0/24 is subnetted, 4 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:03:18, Serial1/2
D       2.2.1.0 [90/20640000] via 12.1.1.2, 00:03:18, Serial1/2
D       2.2.2.0 [90/20640000] via 12.1.1.2, 00:03:18, Serial1/2
D       2.2.3.0 [90/20640000] via 12.1.1.2, 00:03:18, Serial1/2
```

#### **On R2:**

```
R2#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/24 is subnetted, 4 subnets
D       1.1.0.0 [90/20640000] via 12.1.1.1, 00:03:42, Serial1/1
D       1.1.1.0 [90/20640000] via 12.1.1.1, 00:03:42, Serial1/1
D       1.1.2.0 [90/20640000] via 12.1.1.1, 00:03:42, Serial1/1
D       1.1.3.0 [90/20640000] via 12.1.1.1, 00:03:42, Serial1/1
```

## **Task 2**

Configure R1 and R2 to summarize their Loopback interfaces in EIGRP.

#### **On R1:**

```
R1(config)#int s1/2
R1(config-if)#ip summary-address eigrp 100 1.1.0.0 255.255.252.0
```

#### **On R2:**

```
R2(config)#router eigrp tst
R2(config-router)#address-family ipv4 unicast autonomous-system 100
R2(config-router-af)#af-interface s1/1
```

```
R2 (config-router-af-interface) #summary-address 2.2.0.0 255.255.252.0
```

### To verify the configuration:

#### On R1:

```
R1#sh ip route eigrp | b Gate
```

```
Gateway of last resort is not set
```

```
      1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       1.1.0.0/22 is a summary, 00:01:33, Null0
      2.0.0.0/22 is subnetted, 1 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:00:34, Serial1/2
```

#### On R2:

```
R2#sh ip route eigrp | b Gate
```

```
Gateway of last resort is not set
```

```
      1.0.0.0/22 is subnetted, 1 subnets
D       1.1.0.0 [90/20640000] via 12.1.1.1, 00:02:21, Serial1/1
      2.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       2.2.0.0/22 is a summary, 00:01:22, Null0
```

## Task 3

Configure the following static routes on R1 and R2 and redistribute them into EIGRP.

<b>Router</b>	<b>Static route</b>
R1	Create a static route to netw 11.0.0.0 /8 via F0/0
R2	Create a static route to netw 22.0.0.0 /8 via F0/0

#### On R1:

```
R1 (config) #ip route 11.0.0.0 255.0.0.0 F0/0
```

```
R1 (config) #router eigrp 100
```

```
R1 (config-router) #redistribute static
```

#### On R2:

```
R2 (config) #ip route 22.0.0.0 255.0.0.0 f0/0
```

```
R2 (config) #router eigrp tst
R2 (config-router) #address-family ipv4 unicast auto 100
R2 (config-router-af) #topology Base
R2 (config-router-af-topology) #redistribute static
```

### To verify the configuration:

#### On R1:

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       1.1.0.0/22 is a summary, 00:16:40, Null0
    2.0.0.0/22 is subnetted, 1 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:15:41, Serial1/2
D EX 22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:01:37, Serial1/2
```

#### On R2:

```
R2#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/22 is subnetted, 1 subnets
D       1.1.0.0 [90/20640000] via 12.1.1.1, 00:17:13, Serial1/1
    2.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       2.2.0.0/22 is a summary, 00:16:14, Null0
D EX 11.0.0.0/8 [170/20514560] via 12.1.1.1, 00:05:18, Serial1/1
```

## Task 4

Advertise the FastEthernet interfaces of these two routers in RIPv2 and disable auto-summarization. You should redistribute RIP into EIGRP, use any metric for redistributed routes.

#### On R1:

```
R1 (config) #router rip
R1 (config-router) #no au
R1 (config-router) #ver 2
R1 (config-router) #netw 200.1.1.0
```

```
R1 (config) #router eigrp 100
R1 (config-router) #redistribute rip metric 1 1 1 1 1
```

### On R2:

```
R2 (config) #router rip
R2 (config-router) #no au
R2 (config-router) #ver 2
R2 (config-router) #netw 200.2.2.0
```

```
R2 (config) #router eigrp tst
R2 (config-router) #address-family ipv4 unicast auto 100
R2 (config-router-af) #topology Base
R2 (config-router-af-topology) #redistribute rip metric 1 1 1 1 1
```

### To verify the configuration:

#### On R1:

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       1.1.0.0/22 is a summary, 00:31:50, Null0
       2.0.0.0/22 is subnetted, 1 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:30:51, Serial1/2
D EX   22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:16:47, Serial1/2
D EX  200.2.2.0/24 [170/2560512256] via 12.1.1.2, 00:00:47, Serial1/2
```

#### On R2:

```
R2#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/22 is subnetted, 1 subnets
D       1.1.0.0 [90/20640000] via 12.1.1.1, 00:32:20, Serial1/1
       2.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       2.2.0.0/22 is a summary, 00:31:21, Null0
D EX   11.0.0.0/8 [170/20514560] via 12.1.1.1, 00:20:25, Serial1/1
D EX  200.1.1.0/24 [170/2560512256] via 12.1.1.1, 00:02:03, Serial1/1
```

## Task 5

Configure Eigrp Stub routing on R1 using the “**Eigrp stub connected**”; test this option and verify the routes in the routing tables of both routers.

### On R1:

```
R1 (config) #router eigrp 100
R1 (config-router) #eigrp stub connected
```

You should see the following console message stating that the neighbor adjacency was reset:

```
%DUAL-5-NBRCHANGE: EIGRP-IPv4 100: neighbor 12.1.1.2 (Serial1/2) is down:
peer info changed
```

```
%DUAL-5-NBRCHANGE: EIGRP-IPv4 100: neighbor 12.1.1.2 (Serial1/2) is up:
new adjacency
```

The “EIGRP Stub” routing can also be configured in EIGRP named configuration in the “Address-family” configuration mode, but in this case it is ONLY configured on R1. The following shows how EIGRP Stub routing can be configured in EIGRP named configuration:

```
R2 (config) #router eigrp tst
R2 (config-router) #address-family ipv4 unicast auto 100
R2 (config-router-af) #eigrp stub ?
    connected      Do advertise connected routes
    leak-map       Allow dynamic prefixes based on the leak-map
    receive-only   Set receive only neighbor
    redistributed  Do advertise redistributed routes
    static         Do advertise static routes

    summary       Do advertise summary routes
```

### To verify the configuration:

### On R2:

```
R2#sh ip route eigrp | inc 12.1.1.1

D          1.1.0.0 [90/20640000] via 12.1.1.1, 00:08:13, Serial1/1
D          1.1.1.0 [90/20640000] via 12.1.1.1, 00:08:13, Serial1/1
D          1.1.2.0 [90/20640000] via 12.1.1.1, 00:08:13, Serial1/1
D          1.1.3.0 [90/20640000] via 12.1.1.1, 00:08:13, Serial1/1
```

**NOTE: Only the directly connected networks that R1 used a netw command to advertise were advertised to R2.**

### **On R1:**

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       1.1.0.0/22 is a summary, 01:09:13, Null0
    2.0.0.0/22 is subnetted, 1 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:09:11, Serial1/2
D EX   22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:09:11, Serial1/2
D EX   200.2.2.0/24 [170/2560512256] via 12.1.1.2, 00:09:11, Serial1/2
```

**NOTE: The routing table of R1 was NOT affected at all.**

## **Task 6**

Remove the “Eigrp stub connected” option configured in the previous task and re-configure Eigrp Stub routing on R1 using the “**Eigrp stub summary**”; test this option and verify the routes in the routing tables of both routers.

### **On R1:**

```
R1 (config)#router eigrp 100
R1 (config-router)#no eigrp stub connected

R1 (config-router)#eigrp stub summary
```

### **To verify the configuration:**

### **On R2:**

```
R2#sh ip route eigrp | inc 12.1.1.1

D       1.1.0.0 [90/20640000] via 12.1.1.1, 00:00:30, Serial1/1
```

### **On R1:**

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set
```

```
1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D      1.1.0.0/22 is a summary, 01:12:59, Null0
      2.0.0.0/22 is subnetted, 1 subnets
D      2.2.0.0 [90/20640000] via 12.1.1.2, 00:00:57, Serial1/2
D EX   22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:00:57, Serial1/2
D EX   200.2.2.0/24 [170/2560512256] via 12.1.1.2, 00:00:57, Serial1/2
```

**By looking at the routing table of these two routers, we can clearly see that ONLY the summarized route/s were advertised to R2, but once again the routing table of R1 was NOT affected at all.**

## Task 7

Remove the “Eigrp stub summary” option configured in the previous task and re-configure Eigrp Stub routing on R1 using the “**Eigrp stub Static**”; test this option and verify the routes in the routing tables of both routers.

### On R1:

```
R1(config)#router eigrp 100
R1(config-router)#no eigrp stub summary
R1(config-router)#eigrp stub Static
```

### To verify the configuration:

### On R2:

```
R2#sh ip route eigrp | inc 12.1.1.1
```

```
D EX 11.0.0.0/8 [170/20514560] via 12.1.1.1, 00:00:57, Serial1/1
```

### On R1:

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set
```

```
1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D      1.1.0.0/22 is a summary, 01:16:33, Null0
      2.0.0.0/22 is subnetted, 1 subnets
D      2.2.0.0 [90/20640000] via 12.1.1.2, 00:01:41, Serial1/2
D EX   22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:01:41, Serial1/2
D EX   200.2.2.0/24 [170/2560512256] via 12.1.1.2, 00:01:41, Serial1/2
```



The output of the above sh command reveals that R1's routing table was NOT affected at all but R2 received the static routes that R1 redistributed into its routing table. NOTE: The routing protocol/s that are redistributed into EIGRP are NOT advertised and ONLY the static routes are advertised.

## Task 8

Remove the "Eigrp stub Static" option configured in the previous task and re-configure Eigrp Stub routing on R1 using the "**Eigrp stub redistributed**"; test this option and verify the routes in the routing tables of both routers.

### On R1:

```
R1 (config) #router eigrp 100
R1 (config-router) #no eigrp stub static
R1 (config-router) #eigrp stub redistributed
```

### To verify the configuration:

### On R2:

```
R2#sh ip route eigrp | inc 12.1.1.1
```

```
D EX 11.0.0.0/8 [170/20514560] via 12.1.1.1, 00:00:26, Serial1/1
D EX 200.1.1.0/24 [170/2560512256] via 12.1.1.1, 00:00:26, Serial1/1
```

**NOTE: All the redistributed routes are advertised to R2, this means that the static route/s and the routing protocol/s that were redistributed into Eigrp were advertised with this option.**

## Task 9

Remove the "Eigrp stub redistributed" option configured in the previous task and re-configure Eigrp Stub routing on R1 using the "**Eigrp stub receive-only**"; test this option and verify the routes in the routing tables of both routers.

### On R1:

```
R1 (config) #router eigrp 100
R1 (config-router) #no eigrp stub redistributed
R1 (config-router) #eigrp stub receive-only
```

### To verify the configuration:

#### On R2:

```
R2#sh ip route eigrp | inc 12.1.1.1
R2#
```

We can clearly see that nothing was advertised to R2, with this option configured on R1, R1 receives all the routes from R2, but does NOT advertise any routes to R2.

#### On R1:

```
R1#sh ip route eigrp | b Gate
Gateway of last resort is not set

    1.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D       1.1.0.0/22 is a summary, 01:31:37, Null0
    2.0.0.0/22 is subnetted, 1 subnets
D       2.2.0.0 [90/20640000] via 12.1.1.2, 00:01:27, Serial1/2
D EX   22.0.0.0/8 [170/20514560] via 12.1.1.2, 00:01:27, Serial1/2
D EX   200.2.2.0/24 [170/2560512256] via 12.1.1.2, 00:01:27, Serial1/2
```

## Task 10

Remove the “Eigrp stub receive-only” option configured in the previous task and re-configure Eigrp Stub routing on R1 using the “**Eigrp stub**”; test this option and verify the routes in the routing tables of both routers.

#### On R1:

```
R1 (config) #router eigrp 100
R1 (config-router) #no eigrp stub receive-only
R1 (config-router) #eigrp stub
```

### To verify the configuration:

#### On R2:

```
R2#sh ip route eigrp | inc 12.1.1.1
```

```
D          1.1.0.0 [90/20640000] via 12.1.1.1, 00:01:54, Serial1/1
```

**NOTE: All the directly connected and the summary route/s are advertised to R2, the reason we only see a single summary route is because when summarization is performed the specific routes that are included in the summary are suppressed, to prove this fact let's configure Loopback100 interface on R1 and assign an IP address of 100.1.1.1/24 and advertise this route in Eigrp AS 100. If this is performed successfully, R2 should see the summary plus the 100.1.1.0/24 routes:**

### **On R1:**

```
R1(config)#int lo100
```

```
R1(config-if)#ip addr 100.1.1.1 255.255.255.0
```

```
R1(config)#router eigrp 100
```

```
R1(config-router)#netw 100.1.1.1 0.0.0.0
```

### **To verify the configuration:**

### **On R2:**

```
R2#sh ip route eigrp | inc 12.1.1.1
```

```
D          1.1.0.0 [90/20640000] via 12.1.1.1, 00:04:45, Serial1/1
```

```
D          100.1.1.0 [90/20640000] via 12.1.1.1, 00:00:07, Serial1/1
```

## **Task 11**

Erase the startup config and reload the routers before proceeding to the next lab.