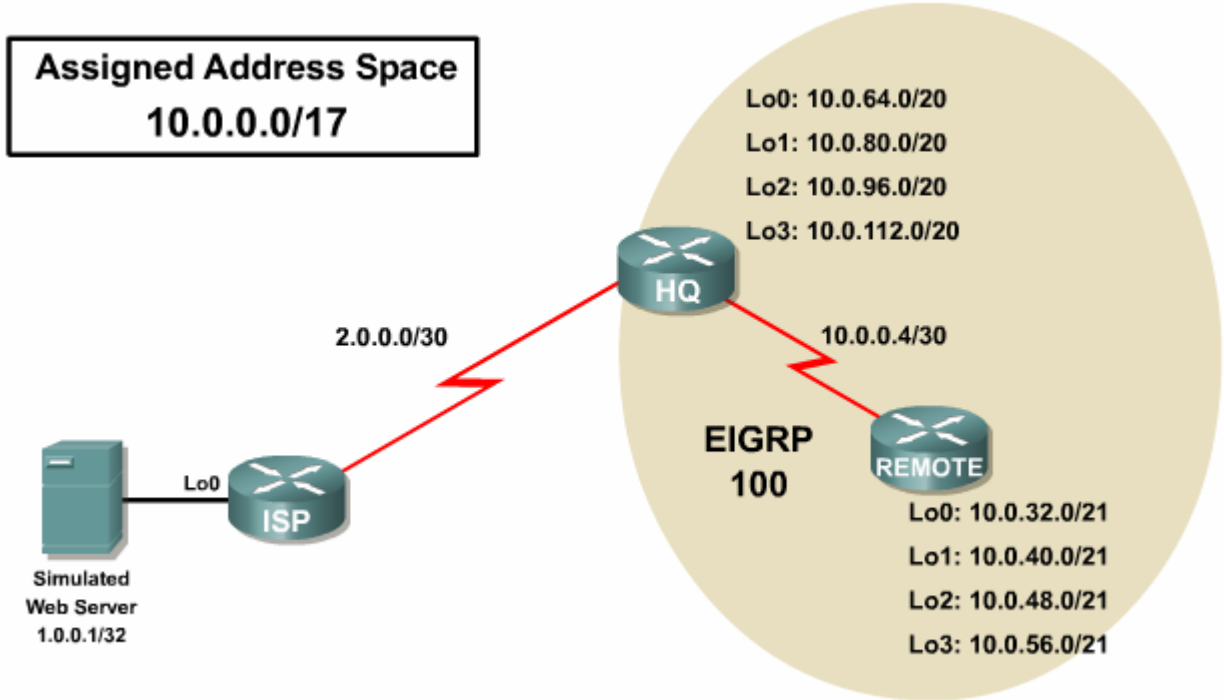


CCNA3 Module 3 Challenge Lab (NetLab Friendly)



Device	Interface	IP Address	Subnet Mask
ISP	Lo0	1.0.0.1	255.255.255.255
		2.0.0.1	255.255.255.252
HQ		2.0.0.2	255.255.255.252
	Lo0		
	Lo1		
	Lo2		
	Lo3		
REMOTE	Lo0		
	Lo1		
	Lo2		
	Lo3		

Objective

Configure and Verify EIGRP, Default Routing and EIGRP Summary Routes

Step 1: Complete Topology and IP Addressing Table

- Label the topology with the interface names of your particular routers (e.g. S0, S1, S0/0, etc.)
- Fill in the table with the IP addresses you have chosen to use on the interfaces.

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Step 2: Cable the Topology and Basic Configuration

- Choose three routers and cable them according to the topology. You will not need any LAN interfaces or switches for this lab. (If using NetLab, choose a three router pod)
- Configure the routers according to your Instructor's required basic configuration including interface IP addresses. For this lab, you do not need to use the `description` command on the loopback interfaces. However, you must describe the WAN links. Copy configuration to NVRAM.

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Step 3: Configure EIGRP Routing

- Configure both HQ and REMOTE to use EIGRP as the routing protocol. Advertise the simulated LAN subnets and the WAN link between HQ and REMOTE. **DO NOT** advertise the 2.0.0.0/30 network. Turn off automatic summarization.
- Verify that routing tables on HQ and REMOTE look like the ones below. If not, troubleshoot.

```
HQ#sh ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is not set

      2.0.0.0/30 is subnetted, 1 subnets
C       2.0.0.0 is directly connected, Serial0
      10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
C       10.0.0.4/30 is directly connected, Serial1
D       10.0.40.0/21 [90/2297856] via 10.0.0.6, 00:02:07, Serial1
D       10.0.32.0/21 [90/2297856] via 10.0.0.6, 00:02:07, Serial1
D       10.0.56.0/21 [90/2297856] via 10.0.0.6, 00:02:07, Serial1
D       10.0.48.0/21 [90/2297856] via 10.0.0.6, 00:02:07, Serial1
C       10.0.64.0/20 is directly connected, Loopback0
C       10.0.80.0/20 is directly connected, Loopback1
C       10.0.96.0/20 is directly connected, Loopback2
C       10.0.112.0/20 is directly connected, Loopback3

REMOTE#show ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
C       10.0.0.4/30 is directly connected, Serial0
C       10.0.40.0/21 is directly connected, Loopback1
C       10.0.32.0/21 is directly connected, Loopback0
C       10.0.56.0/21 is directly connected, Loopback3
C       10.0.48.0/21 is directly connected, Loopback2
D       10.0.64.0/20 [90/2297856] via 10.0.0.5, 00:00:03, Serial0
D       10.0.80.0/20 [90/2297856] via 10.0.0.5, 00:00:03, Serial0
D       10.0.96.0/20 [90/2297856] via 10.0.0.5, 00:00:04, Serial0
D       10.0.112.0/20 [90/2297856] via 10.0.0.5, 00:00:04, Serial0
```

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Step 4: Configure Static and Default Routing

- Configure ISP with a static route pointing to the Assigned Address Space.
- Configure HQ with a default route pointing to ISP.
- Configure HQ to advertise the default route to REMOTE by entering the following commands:
HQ(config)#ip default-network 2.0.0.0
HQ(config)#router eigrp 100
HQ(config-router)#network 2.0.0.0
- Verify that routing tables on ISP, HQ and REMOTE look like the ones below. If not, troubleshoot.

```
ISP#show ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

    1.0.0.0/32 is subnetted, 1 subnets
C       1.0.0.1 is directly connected, Loopback0
    2.0.0.0/30 is subnetted, 1 subnets
C       2.0.0.0 is directly connected, Serial0
    10.0.0.0/17 is subnetted, 1 subnets
S       10.0.0.0 [1/0] via 2.0.0.2

HQ#show ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is 2.0.0.1 to network 0.0.0.0

*    2.0.0.0/30 is subnetted, 1 subnets
C*   2.0.0.0 is directly connected, Serial0
    10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
C    10.0.0.4/30 is directly connected, Serial1
D    10.0.40.0/21 [90/2297856] via 10.0.0.6, 00:25:05, Serial1
D    10.0.32.0/21 [90/2297856] via 10.0.0.6, 00:25:05, Serial1
D    10.0.56.0/21 [90/2297856] via 10.0.0.6, 00:25:05, Serial1
D    10.0.48.0/21 [90/2297856] via 10.0.0.6, 00:25:05, Serial1
C    10.0.64.0/20 is directly connected, Loopback0
C    10.0.80.0/20 is directly connected, Loopback1
C    10.0.96.0/20 is directly connected, Loopback2
C    10.0.112.0/20 is directly connected, Loopback3
S*   0.0.0.0/0 [1/0] via 2.0.0.1

REMOTE#show ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is 10.0.0.5 to network 2.0.0.0

    2.0.0.0/30 is subnetted, 1 subnets
D*   2.0.0.0 [90/2681856] via 10.0.0.5, 00:20:30, Serial0
    10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
C    10.0.0.4/30 is directly connected, Serial0
C    10.0.40.0/21 is directly connected, Loopback1
C    10.0.32.0/21 is directly connected, Loopback0
C    10.0.56.0/21 is directly connected, Loopback3
C    10.0.48.0/21 is directly connected, Loopback2
D    10.0.64.0/20 [90/2297856] via 10.0.0.5, 00:25:51, Serial0
D    10.0.80.0/20 [90/2297856] via 10.0.0.5, 00:25:52, Serial0
D    10.0.96.0/20 [90/2297856] via 10.0.0.5, 00:25:52, Serial0
D    10.0.112.0/20 [90/2297856] via 10.0.0.5, 00:25:52, Serial0
```

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Step 5: Configure EIGRP Summary Routes

- To reduce the size of the routing tables on both HQ and REMOTE, configure each router to summarize the simulated LANs (the loopback subnets) into one advertisement.
- Summary route on HQ:

- Summary route on REMOTE:

- Verify that routing tables on HQ and REMOTE look like the ones below. If not, troubleshoot.

```
HQ#sh ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is 2.0.0.1 to network 0.0.0.0

*    2.0.0.0/30 is subnetted, 1 subnets
C*   2.0.0.0 is directly connected, Serial0
     10.0.0.0/8 is variably subnetted, 7 subnets, 4 masks
C    10.0.0.4/30 is directly connected, Serial1
D    10.0.32.0/19 [90/2297856] via 10.0.0.6, 00:00:05, Serial1
D    10.0.64.0/18 is a summary, 00:00:11, Null0
C    10.0.64.0/20 is directly connected, Loopback0
C    10.0.80.0/20 is directly connected, Loopback1
C    10.0.96.0/20 is directly connected, Loopback2
C    10.0.112.0/20 is directly connected, Loopback3
S*   0.0.0.0/0 [1/0] via 2.0.0.1

REMOTE#show ip route
Codes: <some codes omitted>
       D - EIGRP, EX - EIGRP external, * - candidate default

Gateway of last resort is 10.0.0.5 to network 2.0.0.0

     2.0.0.0/30 is subnetted, 1 subnets
D*   2.0.0.0 [90/2681856] via 10.0.0.5, 00:01:43, Serial0
     10.0.0.0/8 is variably subnetted, 7 subnets, 4 masks
C    10.0.0.4/30 is directly connected, Serial0
C    10.0.40.0/21 is directly connected, Loopback1
D    10.0.32.0/19 is a summary, 00:02:41, Null0
C    10.0.32.0/21 is directly connected, Loopback0
C    10.0.56.0/21 is directly connected, Loopback3
C    10.0.48.0/21 is directly connected, Loopback2
D    10.0.64.0/18 [90/2297856] via 10.0.0.5, 00:01:44, Serial0
```

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Step 6: Verification and Documentation

- Capture the following verifications to a “verify.txt” file.
 - Ping output from REMOTE pinging the Simulated Web Server
 - Capture **show ip route** on all three routers: ISP, HQ and REMOTE
 - Capture **show ip eigrp neighbors, show ip eigrp topology** and **show ip eigrp traffic** on HQ and REMOTE
- Capture the running configurations on all three routers to separate text files. Use the hostname of the router to name each text file.
- Clean up the “verify.txt”, “HQ.txt”, “REMOTE.txt” and “ISP.txt” files. Add appropriate notes to assist in your studies.

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