

**PASS4SURE**

Building Scalable Cisco Internetworks  
**Cisco CCNP – BSCI**  
CCNP study Package

**642-901 LAB FASTRACK**

Preparation Labs provide lab instructions, scenarios and tutorials, all technical support will be provided by Cisco.

**LAB  
25**

**NOTE:** This lab manual is a joint fruit of Pass4sure and ciscosim. If you have any questions or suggestions, or want to exchange experience, please go to <http://www.ciscosim.net>.

**Copyright © 2001-2008 FREETECH SERVICES Ltd. All Rights Reserved.**



## CCNP-Building Scalable Cisco Internetworks

# 642-901-Preparation-Labs

Lab 1.	Configuring Basic EIGRP.....	3
Lab 2.	Configuring Default-network for EIGRP.....	7
Lab 3.	Manually Summarizing EIGRP Routes.....	15
Lab 4.	Configuring EIGRP Unequal-Cost Paths.....	22
Lab 5.	Configuring EIGRP Authentication.....	26
Lab 6.	Configuring OSPF in NBMA.....	31
Lab 7.	Configuring OSPF Authentication.....	39
Lab 8.	Configuring OSPF External Summary.....	47
Lab 9.	Configuring OSPF Stub Area.....	51
Lab 10.	Configuring OSPF Totally Stub Area.....	56
Lab 11.	Configuring OSPF NSSA Area and NSSA Totally Stub.....	61
Lab 12.	Configuring OSPF Virtual-Link.....	70
Lab 13.	Configuring Basic IS-IS.....	74
Lab 14.	Configuring IS-IS Multi Area and Summary Route.....	79
Lab 15.	Redistributing into RIP and OSPF.....	85
Lab 16.	Redistributing into EIGRP and IS-IS.....	88
Lab 17.	Configuring Basic BGP.....	92
Lab 18.	Configuring BGP Using Loopback Addresses.....	96
Lab 19.	Configuring BGP Summarization.....	99
Lab 20.	BGP Neighbor Authentication.....	103
Lab 21.	Configuring BGP Local Preference.....	107
Lab 22.	Configuring BGP Multi-Exit Discriminator.....	112
Lab 23.	Configuring BGP Weight.....	117
Lab 24.	Example Analysis(A).....	123
Lab 25.	Example Analysis(B).....	125

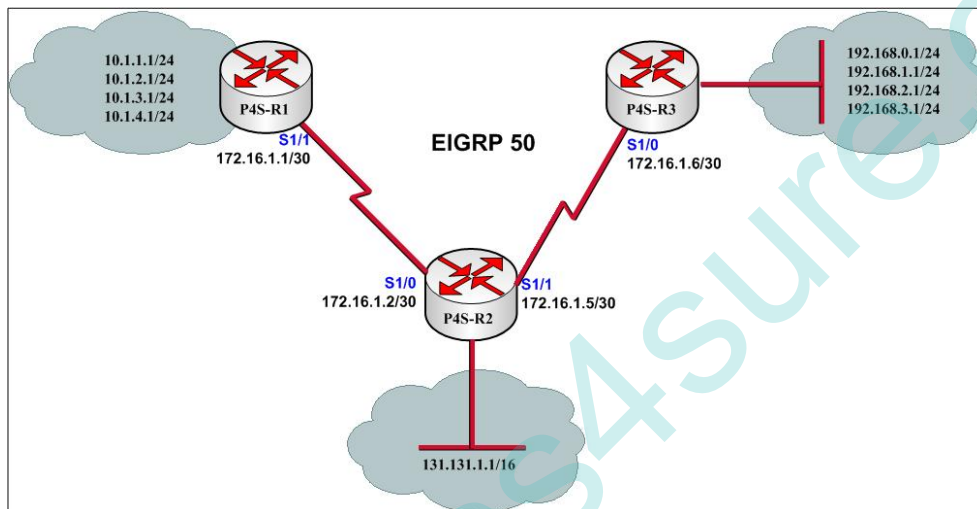
## CCNP-BSCI Lab1

### Configuring Basic EIGRP

#### 【Lab objectives】

1. Learn basic configurations of EIGRP
2. Learn the configuration method of EIGRP wildcard mask
3. Learn auto summary and auto summary turnoff features of EIGRP
4. Learn manual summary of EIGRP

#### 【Lab Topology】



#### 【Lab steps and requirements】

1. Configure IP addresses of every router, and use ping command to confirm the direct interface connectivity of every router.
2. Configure EIGRP auto system number as 50 on the three routers
3. Login P4S-R2, configure as follows (use this as reference for other router configuration)

```
P4S-R2#configure terminal
P4S-R2(config-if)#router eigrp 50
P4S-R2(config-router)#network 172.16.0.0
P4S-R2(config-router)#network 131.131.0.0
P4S-R2(config-router)#exit
```

4. Check EIGRP neighbor on a router

```
P4S-R2#show ip eigrp 50 neighbors
```

**Comment [k1]:** By default, EIGRP can network main classful of network directly when configuring routers. This configuration will also add the two serial interfaces of P4S-R2 to EIGRP routing process

**Comment [k2]:** Check auto system neighbor of EIGRP 50

IP-EIGRP neighbors for process 50							
H	Address	Interface	Hold	Uptime	SRTT	RT0	Q Seq
			(sec)	(ms)			Cnt Num
1	172.16.1.6	Se1/1	13	00:00:37	436	2616	0 2
0	172.16.1.1	Se1/0	13	00:02:34	736	4416	0 4

Row H indicates neighbor learning orders, Address indicates neighbor addresses, and Interface indicates the local interface of neighbors

5. Check router on a router, confirm that route:

```
P4S-R2#show ip route
      172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
C       172.16.1.4/30 is directly connected, Serial1/1
D       172.16.0.0/16 is a summary, 00:06:33, Null0
C       172.16.1.0/30 is directly connected, Serial1/0
D       192.168.4.0/24 [90/2297856] via 172.16.1.6, 00:04:39, Serial1/1
D       10.0.0.0/8 [90/2297856] via 172.16.1.1, 00:06:34, Serial1/0
C       131.131.0.0/16 is directly connected, Loopback0
D       192.168.0.0/24 [90/2297856] via 172.16.1.6, 00:04:39, Serial1/1
D       192.168.1.0/24 [90/2297856] via 172.16.1.6, 00:04:39, Serial1/1
D       192.168.2.0/24 [90/2297856] via 172.16.1.6, 00:04:39, Serial1/1
D       192.168.3.0/24 [90/2297856] via 172.16.1.6, 00:04:39, Serial1/1
P4S-R2#
```

**Comment [k3]:** EIGRP will automatically generate a route pointing to null0 for subnets that can summary

**Comment [k4]:** 90 is the internal manage distance of EIGRP. 2297856 is the metric for EIGRP calculation (FD)

6. Use simple commands on P4S-R1 to check route

```
P4S-R2#show ip route eigrp
      172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
D       172.16.0.0/16 is a summary, 00:10:09, Null0
D       192.168.4.0/24 [90/2297856] via 172.16.1.6, 00:08:14, Serial1/1
D       10.0.0.0/8 [90/2297856] via 172.16.1.1, 00:10:10, Serial1/0
D       192.168.0.0/24 [90/2297856] via 172.16.1.6, 00:08:14, Serial1/1
D       192.168.1.0/24 [90/2297856] via 172.16.1.6, 00:08:14, Serial1/1
D       192.168.2.0/24 [90/2297856] via 172.16.1.6, 00:08:14, Serial1/1
D       192.168.3.0/24 [90/2297856] via 172.16.1.6, 00:08:14, Serial1/1
P4S-R2#
```

**Comment [k5]:** Auto summary route of P4S-R1

7. We can see that on P4S-R2 there is a 10.0.0.0/8 summary route pointing to s1/0. This is the result of EIGRP route protocol auto summary. Command no auto-summary can be used to close this. Just as follows:

```
P4S-R1(config)
P4S-R1(config)#router eigrp 50
P4S-R1(config-router)#no auto-summary
P4S-R1(config-router)#exit
```

**Comment [k6]:** To close EIGRP auto summary

```
P4S-R1(config)#
```

Then observe the changes of routing table on P4S-R2 as follows:

```
P4S-R2#show ip route eigrp
 172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
D    172.16.0.0/16 is a summary, 00:07:26, Null0
D    192.168.4.0/24 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
 10.0.0.0/24 is subnetted, 4 subnets
D    10.1.3.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    10.1.2.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    10.1.1.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    10.1.4.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    192.168.0.0/24 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
D    192.168.1.0/24 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
D    192.168.2.0/24 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
D    192.168.3.0/24 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
P4S-R2#
```

**Comment [k7]:** P4S-R2 will show detailed routes when closing auto summary.

7. EIGRP can also conduct manual address summary. Manual address summary may reduce the size of routing table effectively. For example, in routes on P4S-R2 there are four routes displayed concerning network 192.168.\*.\* of P4S-R3. You may configure as follows on P4S-R3 to reduce route announcement entries.

```
P4S-R3(config)#interface serial 1/0
P4S-R3(config-if)#ip summary eigrp 50 192.168.0.0 255.255.252.0
P4S-R3(config-if)#exit
```

8. Observe the routing table of P4S-R2:

```
P4S-R2#show ip route eigrp
.....
D    10.1.1.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    10.1.4.0 [90/2297856] via 172.16.1.1, 00:02:31, Serial1/0
D    192.168.0.0/22 [90/2297856] via 172.16.1.6, 00:05:09, Serial1/1
.....
```

**Comment [k8]:** Displayed as a summary route, effectively reduce the size of routing table

9. Use wildcard mask on P4S-R2 to configure EIGRP:

```
P4S-R2(config)#no router eigrp 50
P4S-R2(config)#router eigrp 50
P4S-R2(config-router)#network 172.16.1.0 0.0.0.3
P4S-R2(config-router)#network 131.131.0.0
P4S-R2(config-router)#exit
```

**Comment [k9]:** Wildcard mask may effectively control which interfaces are to be added to EIGRP processes. Or passive-interface command should be used for the configuration. Here you only add s1/0 to eigrp, thus s1/1 of P4S-R2 and route of P4S-R3 will not be forwarded to P4S-R1.

10. Find neighbor on P4S-R2. Only P4S-R1 is found to establish neighbors.

```
P4S-R2#show ip eigrp neighbors
IP-EIGRP neighbors for process 50
H  Address                Interface      Hold Uptime   SRTT  RTO   Q   Seq
```

			(sec)	(ms)	Cnt	Num
0	172.16.1.1	Se1/0	12	00:04:57	1510	5000 0 5

11. Check the routing table of P4S-R1, and confirm routes that have been learnt.

```
P4S-R1#show ip route eigrp
 172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
D    172.16.0.0/16 is a summary, 00:02:55, Null0
 10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
D    10.0.0.0/8 is a summary, 00:02:55, Null0
D    131.131.0.0/16 [90/2297856] via 172.16.1.2, 00:00:06, Serial1/1
P4S-R1#
```

12. Lab finished.

**Comment [k10]:** Because wildcard mask is used to conduct selective configuration, P4S-R1 learnt only route entry of 131.131.0.0/16, and cannot learn the direct route of P4S-R3.