EIGRP Router ID

- EIGRP routers identify themselves using an EIGRP Router ID which is in the form of an IP address.
- This will default to being the highest IP address of any loopback interfaces configured on the router, or the highest other IP address if a loopback does not exist.
- Loopback interfaces never go down so the Router ID will not change.
- You can also manually specify the Router ID.
- Best practice is to use a Loopback or manually set the Router ID.

EIGRP Router ID – No Loopback


```
R1#sh ip int brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        10.0.0.1        YES NVRAM  up                    up
FastEthernet1/0        10.0.1.1        YES NVRAM  up                    up
FastEthernet2/0        10.0.2.1        YES NVRAM  up                    up
FastEthernet3/0        10.0.3.1        YES NVRAM  up                    up

R1#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 100"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(100)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 10.0.3.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1
```

EIGRP Router ID - Loopback

```
R1#sh ip int brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        10.0.0.1        YES NVRAM  up                    up
FastEthernet1/0        10.0.1.1        YES NVRAM  up                    up
FastEthernet2/0        10.0.2.1        YES NVRAM  up                    up
FastEthernet3/0        10.0.3.1        YES NVRAM  up                    up
Loopback0              1.1.1.1         YES manual up                    up

R1#sh ip proto
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 100"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(100)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 1.1.1.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1
```

- If a loopback or higher IP address is configured after EIGRP has been set up, the Router ID will change on EIGRP process restart.

EIGRP Router ID – Manually Configured

```
R1(config-router)#router eigrp 100
R1(config-router)#eigrp router-id 2.2.2.2

R1#sh ip proto
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 100"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(100)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 2.2.2.2
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1
```

EIGRP Configuration – Auto-Summary

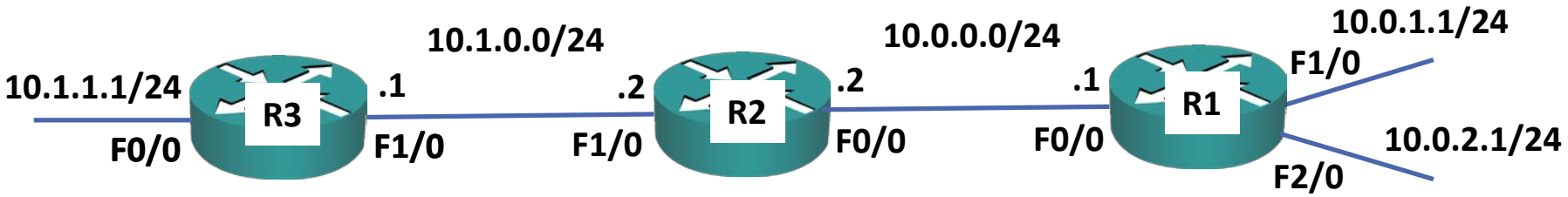
- EIGRP can automatically summarise routes to the classful boundary
- For example, 192.168.10.1/30 can be advertised as 192.168.10.0/24
- This is almost never desirable
- Auto-summary is disabled by default (it was enabled in some old IOS versions)
- No need to run this command:

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

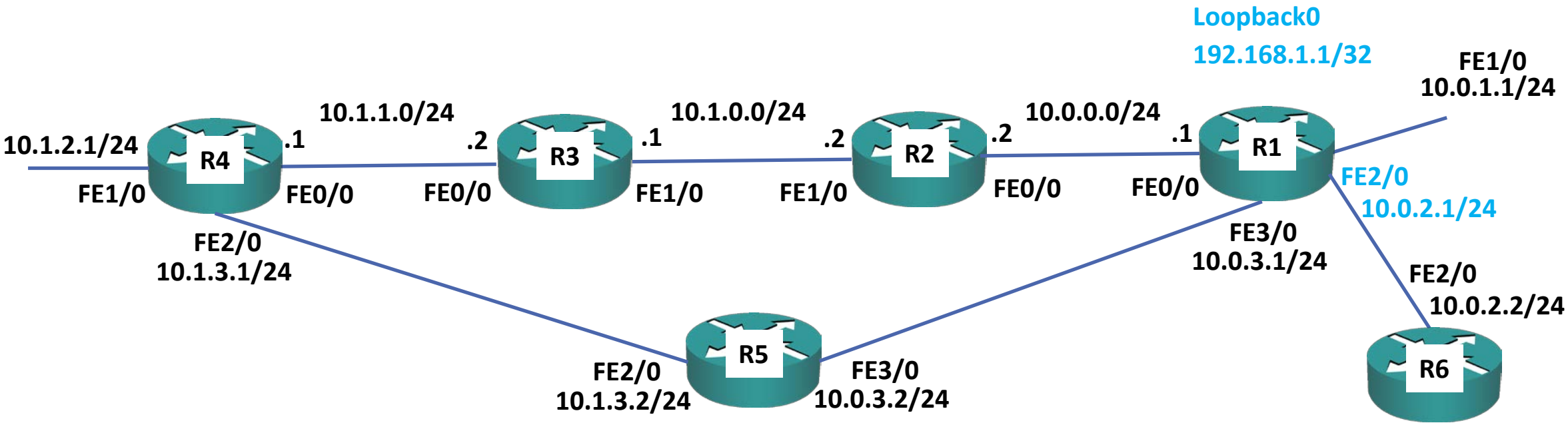
Manual Summarization

- The individual summarised routes are not advertised - only their summary route

```
R2(config-router)#interface f1/0
R2(config-if)#ip summary-address eigrp 100 10.0.0.0 255.255.0.0
```

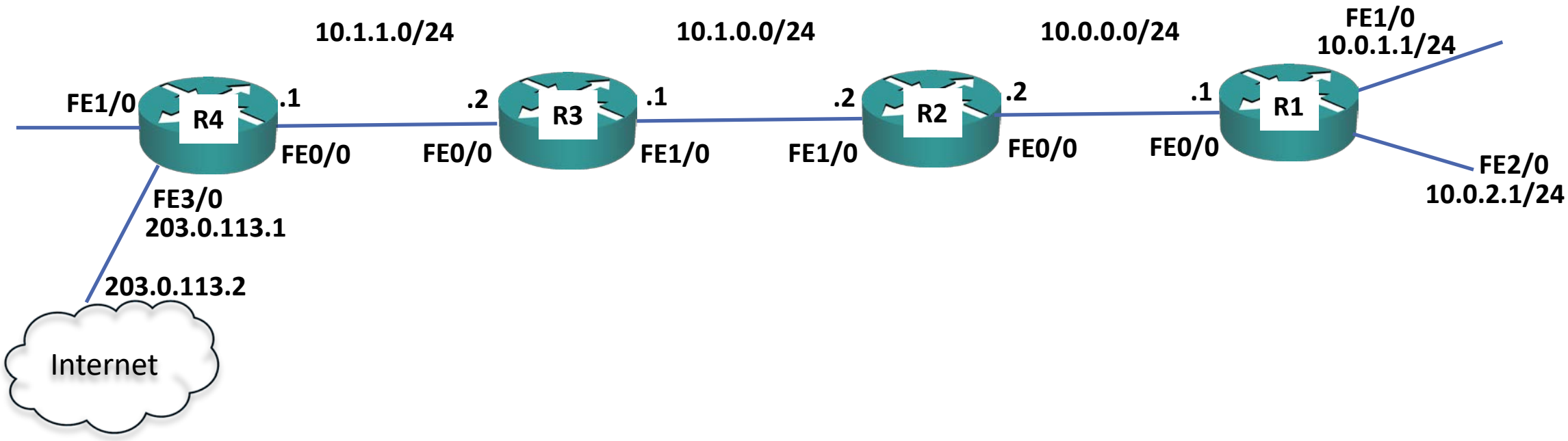


Passive Interface Configuration




```
R1(config)#router eigrp 100
R1(config-router)#passive-interface loopback 0
R1(config-router)#passive-interface f2/0
```

Default Route Injection




```
R4(config)#ip route 0.0.0.0 0.0.0.0 203.0.113.2
R4(config)#interface f0/0
R4(config-if)#ip summary-address eigrp 100 0.0.0.0 0.0.0.0
```

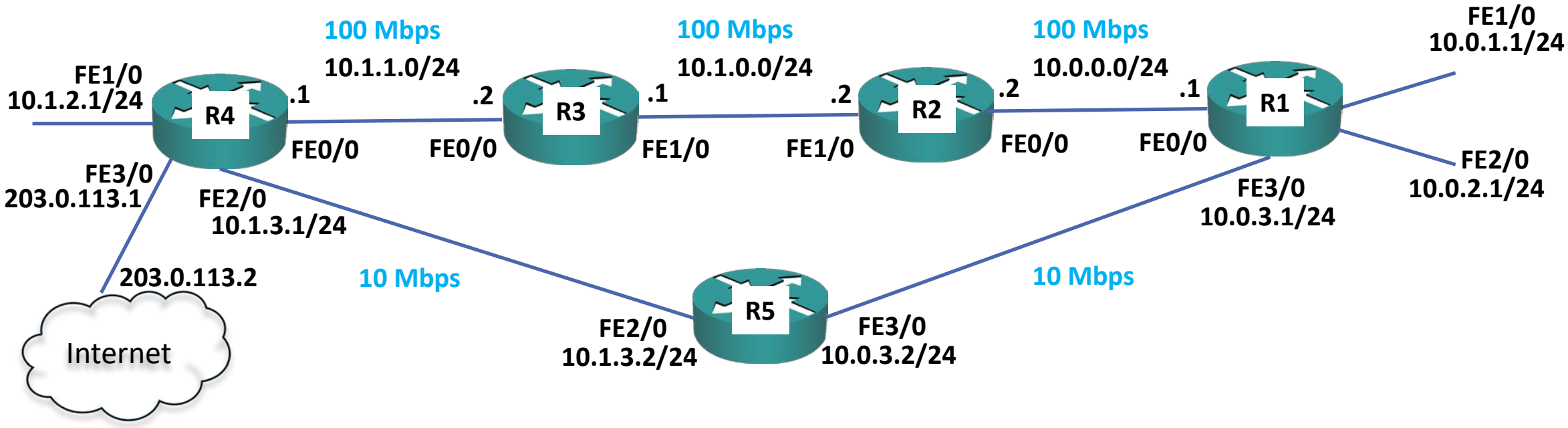
Default Route Injection Verification


```
R1#sh 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
       + - replicated route, % - next hop override

Gateway of last resort is 10.0.0.2 to network 0.0.0.0

D*    0.0.0.0/0 [90/35840] via 10.0.0.2, 00:00:35, FastEthernet0/0
      10.0.0.0/8 is variably subnetted, 11 subnets, 2 masks
C        10.0.0.0/24 is directly connected, FastEthernet0/0
L        10.0.0.1/32 is directly connected, FastEthernet0/0
C        10.0.1.0/24 is directly connected, FastEthernet1/0
L        10.0.1.1/32 is directly connected, FastEthernet1/0
C        10.0.2.0/24 is directly connected, FastEthernet2/0
L        10.0.2.1/32 is directly connected, FastEthernet2/0
C        10.0.3.0/24 is directly connected, FastEthernet3/0
L        10.0.3.1/32 is directly connected, FastEthernet3/0
D        10.1.0.0/24 [90/30720] via 10.0.0.2, 00:21:07, FastEthernet0/0
D        10.1.1.0/24 [90/33280] via 10.0.0.2, 00:21:04, FastEthernet0/0
D        10.1.3.0/24 [90/35840] via 10.0.3.2, 00:21:04, FastEthernet3/0
      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.0.0/24 is directly connected, Loopback0
L        192.168.0.1/32 is directly connected, Loopback0
```

Lab


100 Mbps
10.1.1.0/24
100 Mbps
10.1.0.0/24
100 Mbps
10.0.0.0/24
FE1/0
10.1.2.1/24
R4
.1
FE0/0
.2
FE0/0
R3
.1
FE1/0
.2
FE1/0
R2
.2
FE0/0
.1
FE0/0
R1
FE1/0
10.0.1.1/24
FE2/0
10.0.2.1/24
FE3/0
203.0.113.1
FE2/0
10.1.3.1/24
FE3/0
10.0.3.1/24
203.0.113.2
10 Mbps
10 Mbps
Internet
R5
FE2/0
10.1.3.2/24
FE3/0
10.0.3.2/24