# OSPF Router ID

- OSPF routers identify themselves using an OSPF 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.

# OSPF 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 "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 10.0.3.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.0.0.0 0.0.255.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.1.2             110      00:24:12
    10.1.0.2             110      00:17:30
    10.1.3.2             110      00:24:01
    203.0.113.1          110      00:23:22
  Distance: (default is 110)
```

# OSPF 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 protocols
*** IP Routing is NSF aware ***

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.0.0.0 0.0.255.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.1.1.2              110      00:31:38
    10.1.0.2              110      00:03:46
    10.1.3.2              110      00:31:27
Distance: (default is 110)
```

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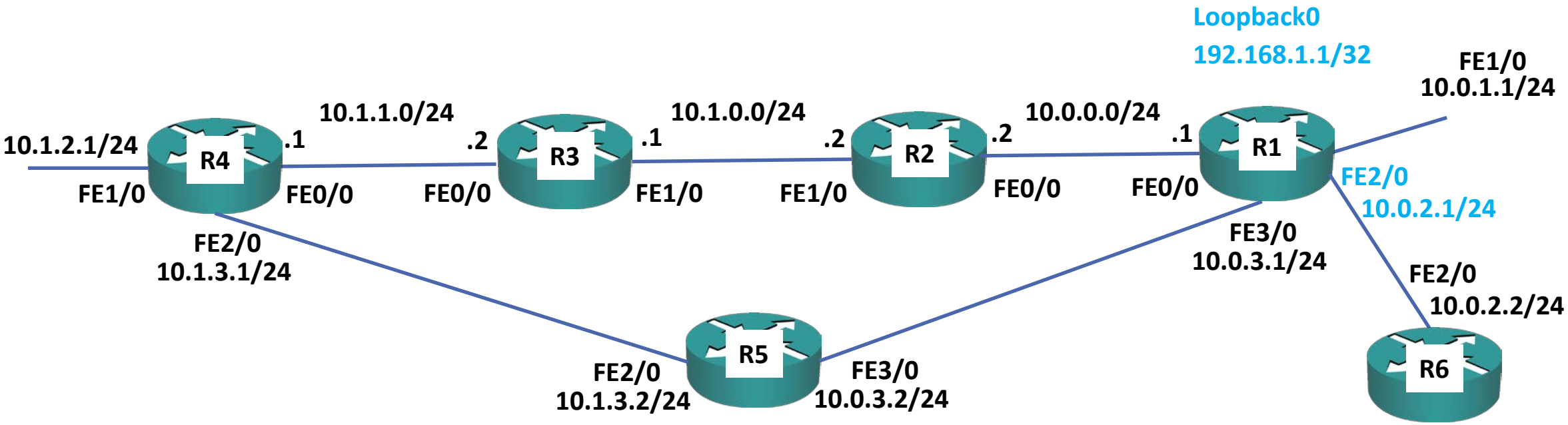
- If a loopback or higher IP address is configured, the Router ID will change on OSPF process restart.

# OSPF Router ID – Manually Configured


```
R1(config-router)#router ospf 1
R1(config-router)#router-id 2.2.2.2
% OSPF: Reload or use "clear ip ospf process" command, for this to take effect
R1#clear ip ospf process

R1#show ip protocols
*** IP Routing is NSF aware ***
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 2.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
! truncated
```

# Passive Interface Configuration




```
R1(config)#router ospf 1
R1(config-router)#passive-interface loopback 0
R1(config-router)#passive-interface f2/0
```

# Passive Interface Configuration

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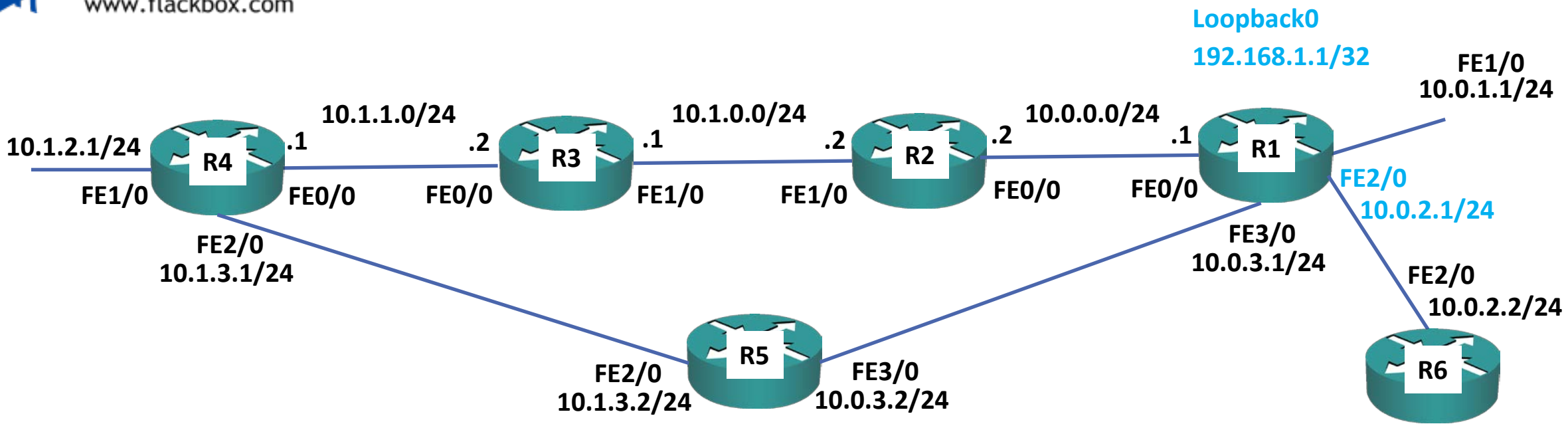
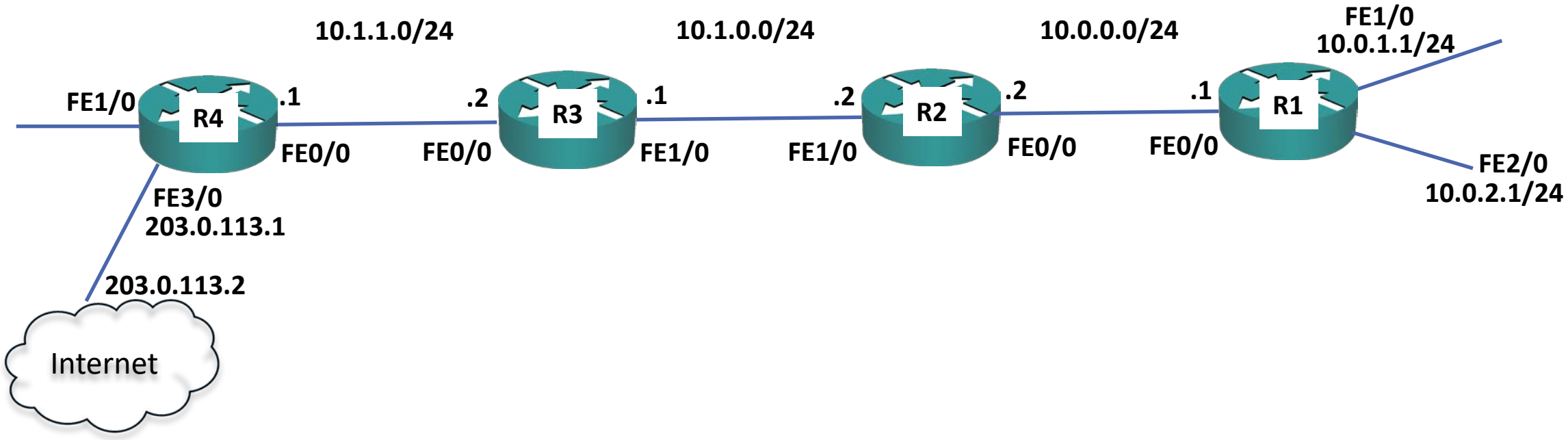



```
R1(config)#router ospf 1
R1(config-router)#passive-interface default
R1(config-router)#no passive-interface f0/0
R1(config-router)#no passive-interface f1/0
R1(config-router)#no passive-interface f3/0
```

# Default Route Injection




```
R4(config)#ip route 0.0.0.0 0.0.0.0 203.0.113.2
R4(config)#router ospf 1
R4(config-router)#default-information originate
```

# 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

O*E2  0.0.0.0/0 [110/1] via 10.0.0.2, 00:00:01, FastEthernet0/0
      1.0.0.0/32 is subnetted, 1 subnets
C        1.1.1.1 is directly connected, Loopback0
      10.0.0.0/8 is variably subnetted, 12 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
O        10.1.0.0/24 [110/51] via 10.0.0.2, 01:40:53, FastEthernet0/0
O        10.1.1.0/24 [110/52] via 10.0.0.2, 00:00:11, FastEthernet0/0
O        10.1.2.0/24 [110/53] via 10.0.0.2, 00:00:01, FastEthernet0/0
O        10.1.3.0/24 [110/2] via 10.0.3.2, 00:00:40, FastEthernet3/0
```

# Lab