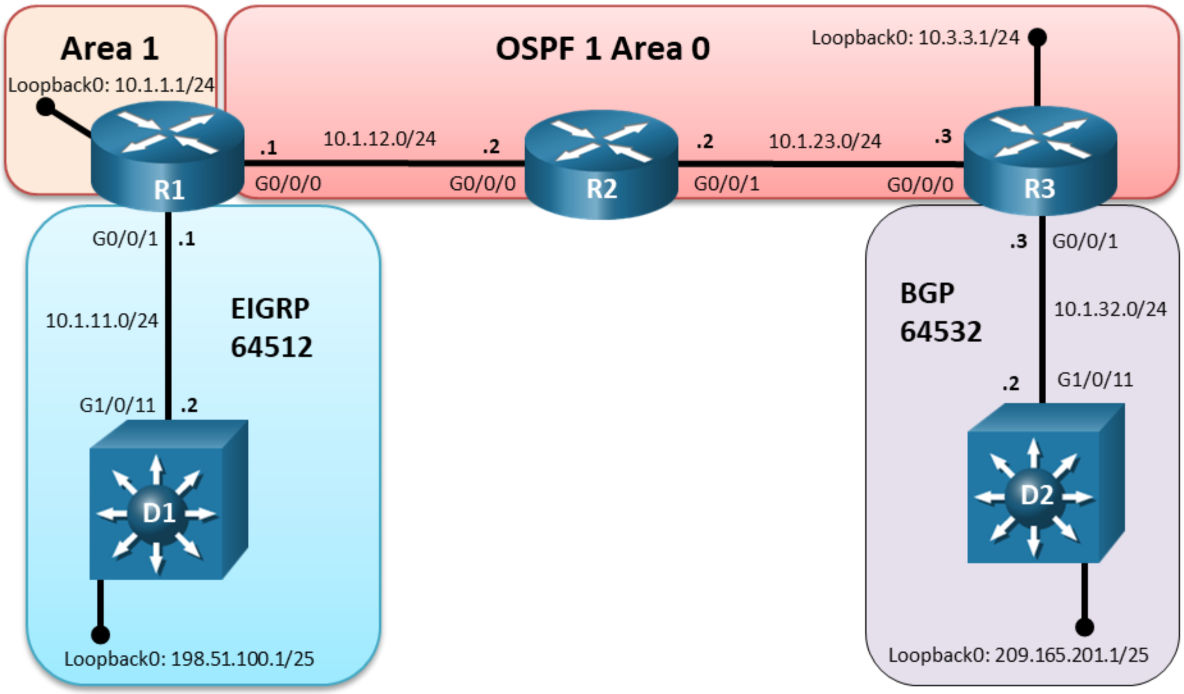
Lab - Implement Route Redistribution Between Multiple Protocols

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask
R1	G0/0/0	10.1.12.1	255.255.255.0
	G0/0/1	10.1.11.1	255.255.255.0
	Loopback 0	10.1.1.1	255.255.255.0
R2	G0/0/0	10.1.12.2	255.255.255.0
	G0/0/1	10.1.23.2	255.255.255.0
R3	G0/0/0	10.1.23.3	255.255.255.0
	G0/0/1	10.1.32.3	255.255.255.0
	Loopback 0	10.3.3.3	255.255.255.0
D1	G1/0/11	10.1.11.2	255.255.255.0
	Loopback 0	198.51.100.1	255.255.255.128
D2	G1/0/11	10.1.32.2	255.255.255.0
	Loopback 0	209.165.201.1	255.255.255.128

Objectives

Part 1: Build the Network and Configure Basic Device Settings

Part 2: Configure and Verify Two-Way Redistribution on R1

Part 3: Configure and Verify Two-Way Redistribution on R3

Part 4: Filter and Verify Redistribution using a Route Map

Background / Scenario

Every routing protocol has a unique redistribution behavior. The default redistribution behavior for EIGRP, OSPF, and BGP is as follows:

- External routes redistributed into EIGRP have a seed metric of infinity and EIGRP routes set with infinity are not installed into the EIGRP topology table.
- External routes redistributed into OSPF by default, are Type 2 (E2) external. Routes sourced from BGP will have a seed metric of 1, while other routing protocols will have a seed metric of 20. Only classful networks are redistributed, not subnets.
- External routes redistributed into BGP have the origin set to **incomplete (?)**, the multi-exit discriminator (MED) is set to the IGP metric and the weight is set to 32,768. By default, BGP does not redistribute internal BGP routes.

In this lab, you will configure mutual or two-way redistribution between multiple EIGRP and OSPF on R1. Then you will configure two-way redistribution between OSPF and BGP on R3. Finally, a route map will be used to selectively redistribute routes.

Note: This lab is an exercise in configuring and verifying two-way route redistribution on router’s R1 and R3. Route redistribution in this lab does not reflect networking best practices.

Note: The routers used with CCNP hands-on labs are Cisco 4221 with Cisco IOS XE Release 16.9.4 (universalk9 image). The switches used in the labs are Cisco Catalyst 3650 with Cisco IOS XE Release 16.9.4 (universalk9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs.

Note: Make sure that all the devices have been erased and have no startup configurations. If you are unsure, contact your instructor.

Required Resources

- 3 Routers (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 2 Switches (Cisco 3650 with Cisco IOS XE release 16.9.4 universal image or comparable)
- 1 PC (Windows with terminal emulation program)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

Instructions

Part 1: Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Configure basic settings for each device.

a. Console into each device, enter global configuration mode, and apply the basic settings for the lab. Initial configurations for each device are listed below.

Router R1

```
hostname R1
no ip domain lookup
banner motd # R1, Configure BGP Route Redistribution #
line con 0
 exec-timeout 0 0
 logging synchronous
 exit
interface g0/0/0
 ip address 10.1.12.1 255.255.255.0
 no shutdown
 exit
interface g0/0/1
 ip address 10.1.11.1 255.255.255.0
 no shutdown
 exit
interface loopback 0
 ip address 10.1.1.1 255.255.255.0
 ip ospf network point-to-point
 ip ospf cost 15
 no shutdown
 exit
router eigrp 64512
  eigrp router-id 1.1.1.1
  network 10.1.11.0 0.0.0.255
  exit
router ospf 1
  router-id 1.1.1.1
  network 10.1.1.0 0.0.0.255 area 1
  network 10.1.12.0 0.0.0.255 area 0
  exit
end
```

Router R2

```
hostname R2
no ip domain lookup
banner motd # R2, Configure BGP Route Redistribution #
line con 0
 exec-timeout 0 0
 logging synchronous
 exit
interface g0/0/0
```



```
 ip address 10.1.12.2 255.255.255.0
 no shutdown
 exit
interface g0/0/1
 ip address 10.1.23.2 255.255.255.0
 no shutdown
 exit
router ospf 1
  router-id 2.2.2.2
  network 10.1.12.0 0.0.0.255 area 0
  network 10.1.23.0 0.0.0.255 area 0
 end
```

Router R3

```
hostname R3
no ip domain lookup
banner motd # R3, Configure BGP Route Redistribution #
line con 0
 exec-timeout 0 0
 logging synchronous
 exit
interface g0/0/0
 ip address 10.1.23.3 255.255.255.0
 no shutdown
 exit
interface g0/0/1
 ip address 10.1.32.3 255.255.255.0
 no shutdown
 exit
interface loopback 0
 ip address 10.3.3.1 255.255.255.0
 ip ospf network point-to-point
 no shutdown
 exit
router ospf 1
  router-id 3.3.3.3
  network 10.3.3.0 0.0.0.255 area 0
  network 10.1.23.0 0.0.0.255 area 0
router bgp 64532
 bgp router-id 3.3.3.3
 no bgp default ipv4-unicast
 neighbor 10.1.32.2 remote-as 64532
 address-family ipv4
  neighbor 10.1.32.2 activate
  neighbor 10.1.32.2 next-hop-self
exit-address-family
```

```
end
```

Switch D1

```
hostname D1
no ip domain lookup
ip routing
banner motd # D1, Configure BGP Route Redistribution #
line con 0
 exec-timeout 0 0
 logging synchronous
 exit
interface range g1/0/1-24
 shutdown
 exit
interface g1/0/11
 no switchport
 ip address 10.1.11.2 255.255.255.0
 no shutdown
 exit
interface loopback 0
 ip address 198.51.100.1 255.255.255.128
 no shutdown
 exit
router eigrp 64512
 eigrp router-id 11.11.11.11
 network 10.1.11.0 0.0.0.255
 network 198.51.100.0 0.0.0.127
end
```

Switch D2

```
hostname D2
no ip domain lookup
ip routing
banner motd # D2, Configure BGP Route Redistribution #
line con 0
 exec-timeout 0 0
 logging synchronous
 exit
interface range g1/0/1-24
 shutdown
 exit
interface g1/0/11
 no switchport
 ip address 10.1.32.2 255.255.255.0
 no shutdown
 exit
```

```
interface loopback 0
 ip address 209.165.201.1 255.255.255.128
 no shutdown
 exit
router bgp 64532
 bgp router-id 22.22.22.22
 no bgp default ipv4-unicast
 neighbor 10.1.32.3 remote-as 64532
 address-family ipv4
  network 209.165.201.0 mask 255.255.255.128
  neighbor 10.1.32.3 activate
 exit-address-family
end
```

b. Set the clock on all devices to UTC time.

c. Save the running configuration to startup-config on all devices.

Step 3: Verify EIGRP on R1.

a. Verify that R1 has one EIGRP neighbor with D1.

```
R1# show ip eigrp neighbors
EIGRP-IPv4 Neighbors for AS(64512)
H   Address                 Interface              Hold Uptime   SRTT   RTO  QSeq
                                                  (sec)         (ms)       CntNum
0   10.1.11.2               Gi0/0/1                  10 00:04:08    3   100  032
```

b. Next, issue the **show ip route eigrp** command, as shown, and notice the internal EIGRP route is from D1, Loopback 0.

```
R1# show ip route eigrp | begin Gateway
Gateway of last resort is not set
      198.51.100.0/25 is subnetted, 1 subnets
D        198.51.100.0
           [90/130816] via 10.1.11.2, 00:07:43, GigabitEthernet0/0/1
```

Step 4: Verify OSPF on R1.

a. Verify that R1 has one OSPF neighbor with R2.

```
R1# show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
2.2.2.2           1   FULL/BDR        00:00:39    10.1.12.2       GigabitEthernet0/0/0
```

b. Next, on R1 issue the **show ip route ospf** command, as shown. Notice the two OSPF intra–area routes.

```
R1# show ip route ospf | begin Gateway
Gateway of last resort is not set
      10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
O        10.1.23.0/24 [110/2] via 10.1.12.2, 00:35:32, GigabitEthernet0/0/0
O        10.3.3.0/24 [110/3] via 10.1.12.2, 00:35:32, GigabitEthernet0/0/0
```


Step 5: Verify OSPF on R3.

a. Verify that R3 has one OSPF neighbor with R2 using the **show ip ospf neighbor** command.

```
R3# show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
2.2.2.2           1   FULL/DR         00:00:36    10.1.23.2       GigabitEthernet0/0/0
```

b. Next, issue the **show ip route ospf** command, as shown. Notice the first route is an OSPF inter–area route from Area 1 on R1 with an OSPF cost of 17. Notice the other route is an OSPF intra–area prefix with an OSPF cost of 2.

```
R3# show ip route ospf | begin Gateway
Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
O IA     10.1.1.0/24 [110/17] via 10.1.23.2, 06:07:43, GigabitEthernet0/0/0
O        10.1.12.0/24 [110/2] via 10.1.23.2, 06:16:33, GigabitEthernet0/0/0
```

Step 6: Verify BGP on R3.

a. Issue the **show bgp ipv4 unicast neighbors** command, as shown. Notice the "established" BGP peer at 10.1.32.2, D2.

```
R3# show bgp ipv4 unicast neighbors | include BGP
BGP neighbor is 10.1.32.2,  remote AS 64532, internal link
  BGP version 4, remote router ID 22.22.22.22
  BGP state = Established, up for 00:11:11
  < some output omitted >
```

b. Next, issue the **show bgp ipv4 unicast** command and notice the 209.165.201.0/25 prefix is learned via internal BGP (iBGP).

```
R3# show bgp ipv4 unicast | begin Network
     Network          Next Hop            Metric LocPrf Weight Path
*>i  209.165.201.0/25 10.1.32.2                0    100      0 i
```

Part 2: Configure Two-Way Redistribution on R1

In this part of the lab, you will perform mutual EIGRP-to-OSPF and OSPF-to-EIGRP redistribution on R1.

Step 1: Redistribute EIGRP 64512 into OSPF.

By default, EIGRP routes redistributed into OSPF will be seen as external Type 2 (E2) routes. In this step, you will change the external Type 2 (E2) routes to external Type 1 (E1) routes and specify the **subnets** keyword.

Note: Best practice suggests always entering the keyword **subnets**. However, depending on the IOS version, the keyword **subnets** may automatically be appended to the **redistribute** command in OSPFv2.

```
R1(config)# router ospf 1
R1(config-router)# redistribute eigrp 64512 metric-type 1 subnets
R1(config-router)# exit
```

Step 2: Verify One-Way Redistribution on R3.

a. Issue the **show ip route ospf** on R3 to see the external OSPF routes are Type 1 with a cost of 22. Both E1 routes originated from EIGRP AS 64512.

```
R3# show ip route ospf | begin Gateway
Gateway of last resort is not set
      10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O IA     10.1.1.0/24 [110/17] via 10.1.23.2, 08:19:58, GigabitEthernet0/0/0
O E1     10.1.11.0/24 [110/22] via 10.1.23.2, 01:21:42, GigabitEthernet0/0/0
O        10.1.12.0/24 [110/2] via 10.1.23.2, 08:28:48, GigabitEthernet0/0/0
      198.51.100.0/25 is subnetted, 1 subnets
O E1     198.51.100.0 [110/22] via 10.1.23.2, 01:21:42, GigabitEthernet0/0/0
```

Step 3: Redistribute OSPF into EIGRP 64512.

By default, external EIGRP routes are given an administrative distance of 170 and a seed metric of infinity, which prevents the installation of the redistributed routes into the EIGRP topology table. This default path metric can be changed from infinity to a specific value for bandwidth, delay, reliability, load, and maximum transmission unit (MTU).

Redistribute OSPF into EIGRP 64512 and set the EIGRP K values as shown.

```
R1(config)# router eigrp 64512
R1(config-router)# redistribute ospf 1 metric 1000000 10 255 1 1500
R1(config-router)# end
```

Step 4: Verify Two-Way Redistribution on D1.

Issue the **show ip route eigrp | begin Gateway** on D1 to see four external EIGRP routes from OSPF.

```
D1# show ip route eigrp | begin Gateway
Gateway of last resort is not set
      10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D EX     10.1.1.0/24 [170/5376] via 10.1.11.1, 00:00:12, GigabitEthernet1/0/11
D EX     10.1.12.0/24
           [170/5376] via 10.1.11.1, 00:00:12, GigabitEthernet1/0/11
D EX     10.1.23.0/24
           [170/5376] via 10.1.11.1, 00:00:12, GigabitEthernet1/0/11
D EX     10.3.3.0/24 [170/5376] via 10.1.11.1, 00:00:12, GigabitEthernet1/0/11
```

Part 3: Configure Two-Way Redistribution on R3

In this part of the lab you will perform OSPF-to-BGP and BGP-to-OSPF redistribution on R3.

Step 1: Redistribute OSPF into BGP.

By default, when configuring redistribution of OSPF into BGP without any keywords, only OSPF intra–area and inter–area routes are redistributed. Your BGP configuration determines where the **redistribute** command is entered. When using an address family, the **redistribute** command is entered in the address family configuration mode, otherwise it is entered under the BGP process.

In this lab, the **redistribute** command is configured under the BGP IPv4 address family as shown. Notice that no additional keywords or sub-commands are configured.

```
R3(config)# router bgp 64532
R3(config-router)# address-family ipv4
R3(config-router-af)# redistribute ospf 1
R3(config-router-af)# exit
```


Step 2: Verify redistribution on D2.

a. Issue the **show bgp ipv4 unicast** on D2 to see the default behavior of OSPF being redistributed into BGP. Notice that only intra-area and inter-area routes are redistributed. All routes redistributed into BGP have the origin code set to incomplete (?) and the weight set to 32,768. Additionally, the MED / Metric value was set based on the OSPF cost on R3. The 10.1.1.0/24 was the inter-area route and shows a Metric of 17. The 10.1.12.0/24 route was an intra-area route with a Metric of 2. The 10.1.23.0/24 and 10.3.3.0/24 routes were directly connected via OSPF and show a Metric of 0.

```
D2# show bgp ipv4 unicast | begin Origin
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *>i  10.1.1.0/24      10.1.23.2               17    100      0 ?
 *>i  10.1.12.0/24     10.1.23.2                2    100      0 ?
 *>i  10.1.23.0/24     0.0.0.0                  0    100      0 ?
 *>i  10.3.3.0/24      0.0.0.0                  0    100      0 ?
 *>   209.165.201.0/25 10.1.32.2                0         32768 i
```

b. Next, on R3 issue the **redistribute** command again, and add the keyword **match** to redistribute internal and external Type 1 OSPF routes into BGP.

```
R3(config)# router bgp 64532
R3(config-router)# address-family ipv4
R3(config-router-af)# redistribute ospf 1 match internal external 1
R3(config-router-af)# exit
```

c. Issue the **show bgp ipv4 unicast** on D2, as shown, to see the two external OSPF routes redistributed into BGP. Notice the metric of 22 and origin code of incomplete (?). Remember that both prefixes originated in EIGRP AS 64512.

```
D2# show bgp ipv4 unicast | begin Network
     Network          Next Hop            Metric LocPrf Weight Path
 *>i  10.1.1.0/24      10.1.32.3               17    100      0 ?
 *>i  10.1.11.0/24     10.1.32.3               22    100      0 ?
 *>i  10.1.12.0/24     10.1.32.3                2    100      0 ?
 *>i  10.1.23.0/24     10.1.32.3                0    100      0 ?
 *>i  10.3.3.0/24      10.1.32.3                0    100      0 ?
 *>i  198.51.100.0/25  10.1.32.3               22    100      0 ?
 *>   209.165.201.0/25 0.0.0.0                  0         32768 i
```

Step 3: Redistribute BGP into OSPF.

In this step of the lab, you will redistribute BGP into OSPF.

Note: BGP is designed to support a large routing table, whereas, IGP's are not. Redistribution of BGP into an IGP on a router with a larger BGP routing table (for example the internet table with 800,000 plus routes) should use selective route redistribution. Otherwise the IGP can become unstable in the routing domain, which can lead to packet loss.

When redistributing BGP into OSPF, internal BGP routes are not redistributed, by default.

On R3 redistribute BGP into OSPF as shown, adding the **subnets** keyword and leaving the default OSPF external Type 2.

```
R3(config)# router ospf 1
```



```
R3(config-router)# redistribute bgp 64532 subnets
R3(config-router)# exit
```

Step 4: Verify Redistribution of BGP into OSPF on R1.

Issue the **show ip route ospf** on R1. Notice the internal BGP prefix 209.165.201.0/25 was not redistributed and missing from the OSPF routing table. Normally only external BGP routes are redistributed. However, in this lab there are no eBGP routes.

```
R1# show ip route ospf | begin Gateway
Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O        10.1.23.0/24 [110/2] via 10.1.12.2, 03:49:00, GigabitEthernet0/0/0
O        10.3.3.0/24 [110/3] via 10.1.12.2, 03:49:00, GigabitEthernet0/0/0
```

Step 5: Allow iBGP routes to be redistributed into OSPF.

To allow internal BGP routes to be redistributed into OSPF requires the **bgp redistribute-internal** command. This command is issued within the BGP address family process for IPv4, as shown.

```
R3(config)# router bgp 64532
R3(config-router)# address-family ipv4
R3(config-router-af)# bgp redistribute-internal
R3(config-router-af)# end
```

Step 6: Verify Redistribution of iBGP into OSPF on R1.

a. Issue the **show ip route ospf** on R1 to see the OSPF external Type 2 (E2) route from BGP. Notice the default seed metric of 1 for BGP routes redistributed into OSPF.

```
R1# show ip route ospf | begin Gateway
Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O        10.1.23.0/24 [110/2] via 10.1.12.2, 04:12:12, GigabitEthernet0/0/0
O        10.3.3.0/24 [110/3] via 10.1.12.2, 04:12:12, GigabitEthernet0/0/0
      209.165.201.0/25 is subnetted, 1 subnets
O E2     209.165.201.0 [110/1] via 10.1.12.2, 00:00:06, GigabitEthernet0/0/0
```

b. From D2 ping the 198.51.100.1 address on D1 using the Loopback 0 address on D2. The ping should be successful. This verifies full end-to-end connectivity and successful redistribution on R1 and R3.

```
D2# ping 198.51.100.1 source 209.165.201.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 198.51.100.1, timeout is 2 seconds:
Packet sent with a source address of 209.165.201.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/4 ms
```

Part 4: Filter and Verify Redistribution using a Prefix List and Route Map

In this part of the lab, you will use a prefix list and router map on R3 to filter specific OSPF prefixes from being redistributed into BGP.

Step 1: Create a prefix list named LOOPBACK and specify the action for each statement.

Permit only the Loopback addresses on D1, R1 and R3, as shown. The last sequence 20 statement filters all other prefixes. If not explicitly set, the deny statement is implied similar to using an ACL.

```
R3(config)# ip prefix-list LOOPBACK seq 5 permit 198.51.100.0/25
R3(config)# ip prefix-list LOOPBACK seq 10 permit 10.1.1.0/24
R3(config)# ip prefix-list LOOPBACK seq 15 permit 10.3.3.0/24
R3(config)# ip prefix-list LOOPBACK seq 20 deny 0.0.0.0/0 le 32
```

Step 2: Apply the IP prefix list using a route map.

Create a route map named OSPF-into-BGP. Next, apply the prefix-list LOOPBACK to the route map which allows redistribution of prefixes into BGP. Any prefixes matching the named prefix list LOOPBACK with a permit statement, will be redistributed into BGP.

```
R3(config)# route-map OSPF-into-BGP permit 10
R3(config-route-map)# match ip address prefix-list LOOPBACK
R3(config-route-map)# exit
```

Step 3: Apply the route map to the redistribute command.

Apply the route map named OSPF-into-BGP at the end of the redistribute command, as shown.

```
R3(config)# router bgp 64532
R3(config-router)# address-family ipv4
R3(config-router-af)# redistribute ospf 1 match internal external 1 route-map
OSPF-into-BGP
R3(config-router-af)# end
```

Step 4: Verify Redistribution Filtering.

a. Issue the **show ip prefix-list detail** command on R3 to verify the hit count for each sequence in the prefix list. Notice in our example each Loopback address has 2 hits, while the deny statement has 6 hits.

```
R3# show ip prefix-list detail
Prefix-list with the last deletion/insertion: LOOPBACK
ip prefix-list LOOPBACK:
   count: 4, range entries: 1, sequences: 5 - 20, refcount: 3
   seq 5 permit 198.51.100.0/25 (hit count: 2, refcount: 1)
   seq 10 permit 10.1.1.0/24 (hit count: 2, refcount: 1)
   seq 15 permit 10.3.3.0/24 (hit count: 2, refcount: 2)
   seq 20 deny 0.0.0.0/0 le 32 (hit count: 6, refcount: 1)
```

b. Issue the **show bgp ipv4 unicast** to verify filtering of OSPF prefixes into BGP. Notice only the Loopback addresses on D1, R1 and R3 are redistributed into BGP.

```
D2# show bgp ipv4 unicast | begin Network
     Network          Next Hop            Metric LocPrf Weight Path
 *>i  10.1.1.0/24      10.1.32.3               17    100      0 ?
 *>i  10.3.3.0/24      10.1.32.3                0    100      0 ?
 *>i  198.51.100.0/25  10.1.32.3               22    100      0 ?
 *>   209.165.201.0/25 0.0.0.0                  0         32768 i
```

c. From D2 ping the 198.51.100.1 address on D1. The ping should not be successful.

```
D2# ping 198.51.100.1
```



```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 198.51.100.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

d. From D2 ping the 198.51.100.1 address on D1 using the Loopback 0 address on D2. The ping should be successful. This verifies full end-to-end connectivity and successful redistribution on R1 and R3 as well as redistribution filtering on R3 using a prefix list and route map.

```
D2# ping 198.51.100.1 source 209.165.201.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 198.51.100.1, timeout is 2 seconds:
Packet sent with a source address of 209.165.201.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/4 ms
```

Reflection Questions

1. Why does the ping to 198.51.100.1 fail when you do not specify the source Loopback 209.165.201.1 on D2?

2. By default, routes redistributed into BGP have the origin code, weight, and MED have which values?

3. By default, which OSFP prefixes are redistributed into BGP using the **redistribute ospf 1** command?

4. Redistributed routes into OSPF have a metric of 20, with the exception of redistributed BGP routes which has a seed metric of _____ ?

Router Interface Summary Table

Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)

Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
4221	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
4300	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)

Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.