

Redistribute OSPFv3 Routes in BGP Configuration Example

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Introduction

This document provides an example of redistributing Open Shortest Path First version 3 (OSPFv3) routes in to Multiprotocol BGP for IPv6. OSPFv3 expands on OSPF version 2 in order to provide support for IPv6 routing prefixes and the larger sized IPv6 addresses. Multiprotocol BGP is an enhanced BGP that carries routing information for multiple network layer protocol address families, such as, IPv6 address family and for IP multicast routes.

Prerequisites

Prerequisites

Make sure that you meet these requirements before you attempt this configuration:

- [Sample Configuration for OSPFv3](#)
- [Multiprotocol BGP for IPv6 Configuration Example](#)
- [Redistributing Routing Protocols](#)

Hardware and Software Versions

This document is not restricted to specific software and hardware versions.

The configurations in this document are based on the Cisco 3700 Series Router with Cisco IOS® Software Release 12.4 (15)T1.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

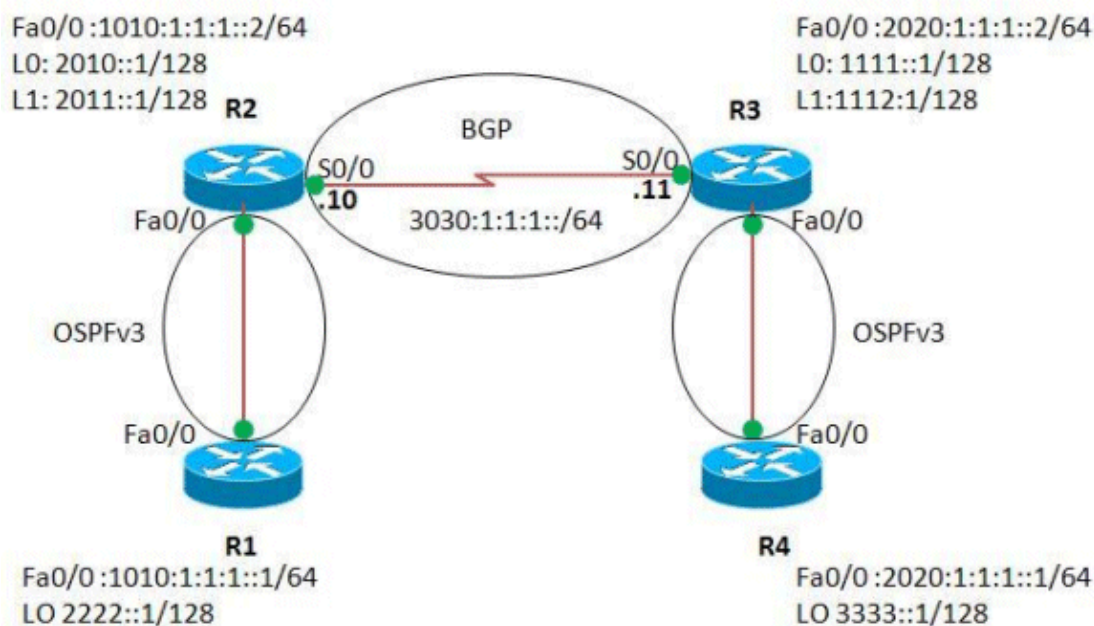
Configure

In this example, the routers R2 and R3 are connected through a serial interface and are configured with Multiprotocol BGP. Routers R2 and R3 communicate with their local routers R1 and R4 using OSPFv3. Loopback addresses are created in the routers for generating networks. Routers R2 and R3, which run both BGP and OSPFv3, use the **redistribute** command in order to redistribute OSPFv3 routes in to BGP. All the routers are configured with IPv6 addresses.

Note: Use the Command Lookup Tool (registered customers only) to find more information on the commands used in this document.

Network Diagram

This document uses this network setup:



Configurations

This document uses these configurations:

- Router R1
- Router R2
- Router R3
- Router R4

Router R1
<pre>! version 12.4 ! hostname R1 ! ip cef ! ipv6 unicast-routing</pre>

```

!--- Enables the forwarding of IPv6 packets.

!
interface Loopback0
  no ip address
  ipv6 address 2222::1/128
  ipv6 ospf 1 area 0

!--- Enables OSPFv3 on the interface and associates
!--- the interface loopback0 to area 0.

!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 1010:1:1:1::1/64
  ipv6 ospf 1 area 0

!--- Associates the Interface Fa0/0 to area 0.

!
ipv6 router ospf 1
  router-id 1.1.1.1

!--- Router R1 uses 1.1.1.1 as router ID.

  log-adjacency-changes
!
end

```

Router R2

```

!
version 12.4
!
hostname R2
!
ip cef
!
ipv6 unicast-routing
!
interface Loopback0
  no ip address
  ipv6 address 2010::1/128
  ipv6 ospf 1 area 1
!
interface Loopback1
  no ip address
  ipv6 address 2011::1/128
  ipv6 ospf 1 area 1
!
interface Loopback99
  no ip address
  ipv6 address 5050:55:55:55::55/128
!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 1010:1:1:1::2/64
  ipv6 ospf 1 area 0
!
interface Serial0/0
  no ip address

```

```

ipv6 address 3030:1:1:1::10/64
clock rate 2000000
!
router bgp 65000
  bgp router-id 1.1.1.1
  no bgp default ipv4-unicast

!--- Without configuring "no bgp default ipv4-unicast" only
!--- IPv4 will be advertised.

  bgp log-neighbor-changes
  neighbor 3030:1:1:1::11 remote-as 65000
  neighbor 3030:1:1:1::11 update-source Serial0/0
  !
  address-family ipv6
    neighbor 3030:1:1:1::11 activate
    network 5050:55:55:55::55/128
    redistribute connected
    redistribute ospf 1 match internal external 1 external 2

!--- This redistributes all OSPF routes into BGP.

    no synchronization
  exit-address-family
  !
  ipv6 router ospf 1
    router-id 2.2.2.2
    log-adjacency-changes
  !
end

```

Router R3

```

!
version 12.4
!
hostname R3
!
ip cef
!
ipv6 unicast-routing
!
interface Loopback0
  no ip address
  ipv6 address 1111::1/128
  ipv6 ospf 1 area 1
!
interface Loopback1
  no ip address
  ipv6 address 1112::1/128
  ipv6 ospf 1 area 1
!
interface Loopback99
  no ip address
  ipv6 address 6060:66:66:66::66/128
!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 2020:1:1:1::2/64
  ipv6 ospf 1 area 0
!
interface Serial0/0
  no ip address

```

```

ipv6 address 3030:1:1:1::11/64
clock rate 2000000
!
router bgp 65000
  bgp router-id 2.2.2.2
  no bgp default ipv4-unicast
  bgp log-neighbor-changes
  neighbor 3030:1:1:1::10 remote-as 65000
  neighbor 3030:1:1:1::10 update-source Serial0/0
  !
  address-family ipv6
    neighbor 3030:1:1:1::10 activate
    network 6060:66:66:66::66/128
    redistribute connected
    redistribute ospf 1 match internal external 1 external 2
    no synchronization
  exit-address-family
  !
  ipv6 router ospf 1
    router-id 3.3.3.3
    log-adjacency-changes
  !
end

```

Router R4

```

!
version 12.4
!
hostname R4
!
ip cef
!
ipv6 unicast-routing
!
interface Loopback0
  no ip address
  ipv6 address 3333::1/128
  ipv6 ospf 1 area 0
!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 2020:1:1:1::1/64
  ipv6 ospf 1 area 0
!
ipv6 router ospf 1
  router-id 5.5.5.5
  log-adjacency-changes
!
end

```

Verify

Use this section in order to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

These show commands are used to verify the configuration:

- **show ipv6 route ospf**
- **show ipv6 route bgp**

Verify OSPFv3 Configuration

In order to verify that OSPFv3 is configured properly, use the **show ipv6 route ospf** command in routers R1 and R4.

show ipv6 route ospf
<p>In router R1</p> <pre>R1#show ipv6 route ospf IPv6 Routing Table - 6 entries Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP U - Per-user Static route, M - MIPv6 I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2 ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2 D - EIGRP, EX - EIGRP external OI 2010::1/128 [110/10] via FE80::C001:16FF:FEDC:0, FastEthernet0/0 OI 2011::1/128 [110/10] via FE80::C001:16FF:FEDC:0, FastEthernet0/0</pre> <p>In router R4</p> <pre>R4#show ipv6 route ospf IPv6 Routing Table - 6 entries Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP U - Per-user Static route, M - MIPv6 I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2 ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2 D - EIGRP, EX - EIGRP external OI 1111::1/128 [110/10] via FE80::C002:16FF:FEDC:0, FastEthernet0/0 OI 1112::1/128 [110/10] via FE80::C002:16FF:FEDC:0, FastEthernet0/0</pre>

Verify BGP Configuration

In order to verify whether the OSPFv3 routes are redistributed in to BGP, use the **show ipv6 route bgp** command in routers R2 and R3.

show ipv6 route bgp
<p>In router R2</p> <pre>R2#show ipv6 route bgp IPv6 Routing Table - 14 entries Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP U - Per-user Static route, M - MIPv6 I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2 ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2 D - EIGRP, EX - EIGRP external B 1111::1/128 [200/0] via 3030:1:1:1::11 B 1112::1/128 [200/0]</pre>

```
    via 3030:1:1:1::11
B   2020:1:1:1::/64 [200/0]
    via 3030:1:1:1::11
B   3333::1/128 [200/10]
    via 3030:1:1:1::11
```

*!--- The above routes are OSPFv3 routes
!--- that are redistributed in to BGP.*

```
B   6060:66:66:66::66/128 [200/0]
    via 3030:1:1:1::11
```

In router R3

```
R3#show ipv6 route bgp
```

```
IPv6 Routing Table - 14 entries
```

```
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
```

```
       U - Per-user Static route, M - MIPv6
```

```
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
```

```
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
```

```
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
```

```
       D - EIGRP, EX - EIGRP external
```

```
B   1010:1:1:1::/64 [200/0]
```

```
    via 3030:1:1:1::10
```

```
B   2010::1/128 [200/0]
```

```
    via 3030:1:1:1::10
```

```
B   2011::1/128 [200/0]
```

```
    via 3030:1:1:1::10
```

```
B   2222::1/128 [200/10]
```

```
    via 3030:1:1:1::10
```

*!--- The above routes are OSPFv3 routes
!--- that are redistributed in to BGP.*

```
B   5050:55:55:55::55/128 [200/0]
    via 3030:1:1:1::10
```

Related Information

- [IPv6 Support Page](#)
- [OSPF Support Page](#)
- [BGP Support Page](#)
- [Technical Support & Documentation – Cisco Systems](#)

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