Configure Route Redistribution on Nexus Switches

Contents

Introduction

This document describes how to configure Route Redistribution on Cisco Nexus NXOS® based switches.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Nexus NX-OS Software.
- Routing Protocols: Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Enhanced Interior Gateway Routing Protocol (EIGRP).

Components Used

The information in this document is based on Cisco Nexus 9000 with NXOS version 10.2.5.M.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Configure

Network Diagram
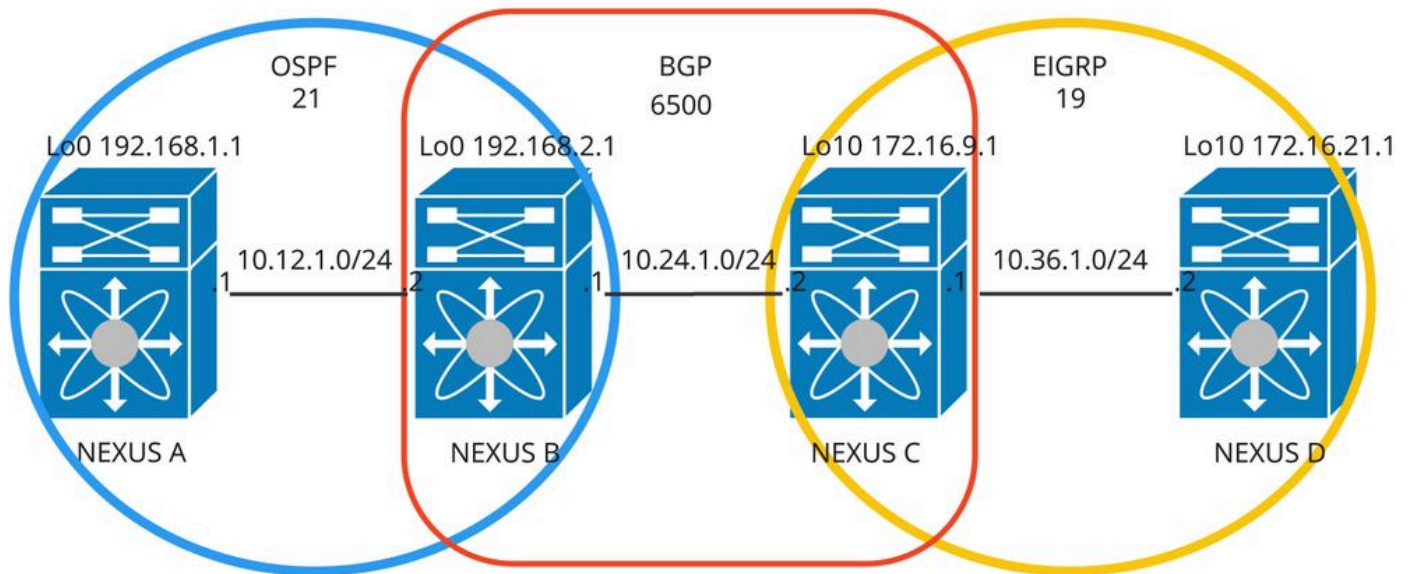
- NEXUS A is advertising the loopbacks in the OSPF process 21.

```
loopback0 192.168.1.1/32
```

- NEXUS B is advertising the loopbacks in the OSPF process 21.

```
loopback0 192.168.2.1/32
```

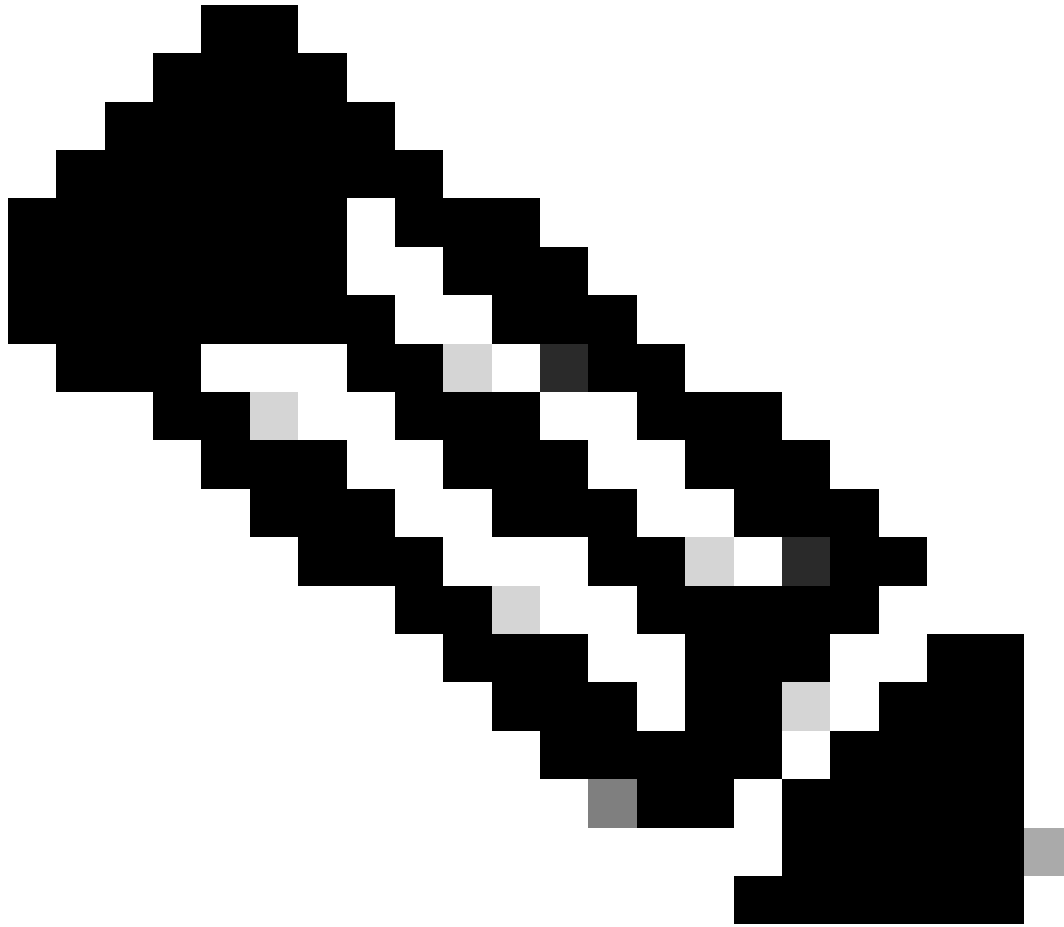- NEXUS C is advertising the loopbacks in the EIGRP process 19.

```
loopback10 172.16.9.1/32
```

- NEXUS D is advertising the loopbacks in the EIGRP process 19.

```
loopback10 172.16.21.1/32
```

Configurations

In this case, Nexus switches have established neighborship sessions using OSPF, iBGP, and EIGRP sessions.

Note: When redistributing between two or more routing protocols on a single router, the redistribution is not transitive. In simpler terms, if a router redistributes protocol 1 into protocol 2, and then protocol 2 redistributes into protocol 3, the routes from protocol 1 are not redistributed into protocol 3.

Redistribution into OSPF

NEXUS B:

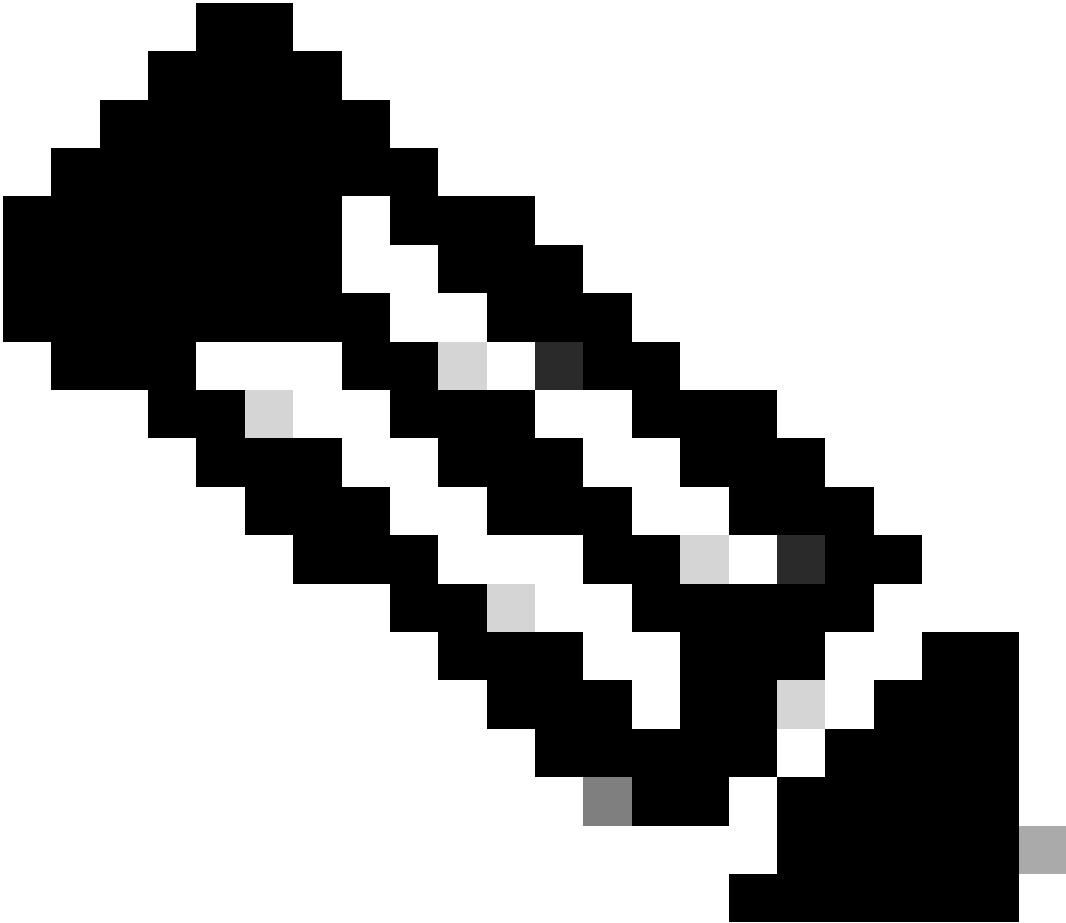Step 1. Configure a prefix-list with the prefixes that need to be redistributed.

```
Nexus-B(config)# ip prefix-list REDISTRIBUTION seq 5 permit 0.0.0.0/0 le 32
```
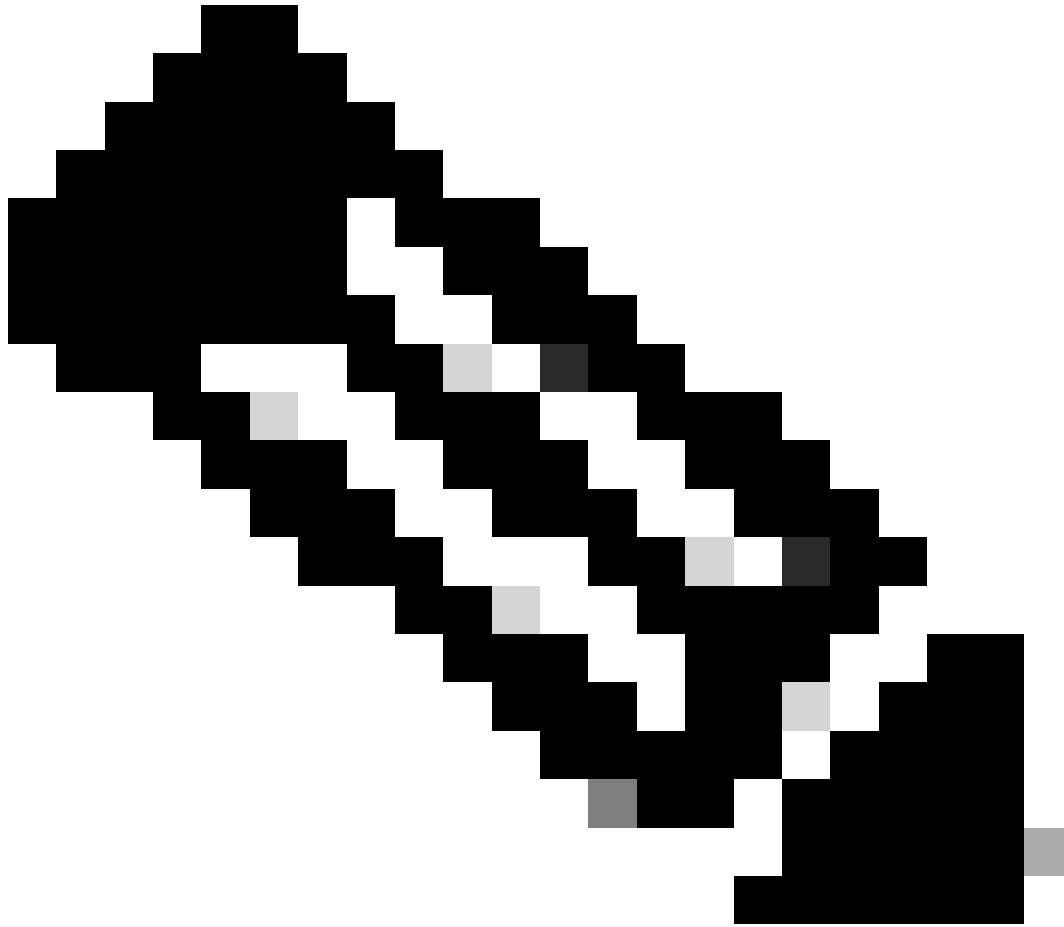
Note: It is possible to skip this step by configuring a blank route-map on step 2, 0.0.0.0/0 le 32 inside prefix-list permits all the routes, the intention of the prefix-list configuration in this article is to illustrate that you can select/filter the routes that are redistributed.

Step 2. Create a route-map matching the conditions specified in the prefix-list.

```
Nexus-B(config)# route-map BGP-TO-OSPF permit 10
Nexus-B(config-route-map)# match ip address prefix-list REDISTRIBUTION
Nexus-B(config-route-map)# match route-type internal
```

> **Note**: The **match route-type internal** command is a requirement for iBGP routes to be redistributed, by default, only eBGP routes are redistributed.

Step 3. Redistribute the routes into OSPF coming from another protocol, in this case, iBGP.

```
Nexus-B(config)# router ospf 21
Nexus-B(config-router)# router-id 2.2.2.2
Nexus-B(config-router)# redistribute bgp 6500 route-map BGP-TO-OSPF
```

Redistribution into BGP

NEXUS B:

Step 1. Configure a prefix-list with the prefixes that need to be redistributed.

```
Nexus-B(config)# ip prefix-list REDISTRIBUTION seq 5 permit 0.0.0.0/0 le 32
```

Step 2. Create a route-map that matches the conditions specified in the prefix-list.

```
Nexus-B(config)# route-map OSPF-TO-BGP permit 10
Nexus-B(config-route-map)# match ip address prefix-list REDISTRIBUTION
```

Step 3. Redistribute the routes into BGP coming from another protocol, in this case, OSPF.

```
Nexus-B(config)# router bgp 6500
Nexus-B(config-router)# address-family ipv4 unicast
Nexus-B(config-router-af)# redistribute ospf 21 route-map OSPF-TO-BGP
Nexus-B(config-router-af)# neighbor 10.24.1.2
Nexus-B(config-router-neighbor)# remote-as 6500
Nexus-B(config-router-neighbor)# address-family ipv4 unicast
```

NEXUS C:

Step 1. Configure a prefix-list with the prefixes that need to be redistributed.

```
Nexus-C(config)# ip prefix-list REDISTRIBUTION seq 5 permit 0.0.0.0/0 le 32
```

Step 2. Create a route-map matching the conditions specified in the prefix-list.

```
Nexus-C(config)# route-map EIGRP-TO-BGP permit 10
Nexus-C(config-route-map)# match ip address prefix-list REDISTRIBUTION
```

Step 3. Redistribute the routes into BGP coming from another protocol, in this case, EIGRP.

```
Nexus-C(config)# router bgp 6500
Nexus-C(config-router)# address-family ipv4 unicast
Nexus-C(config-router-af)# redistribute eigrp 19 route-map EIGRP-TO-BGP
Nexus-C(config-router-af)# neighbor 10.24.1.1
Nexus-C(config-router-neighbor)# remote-as 6500
Nexus-C(config-router-neighbor)# address-family ipv4 unicast
```

Redistribution into EIGRP

NEXUS C:

Step 1. Configure a prefix-list with the prefixes that need to be redistributed.

```
Nexus-C(config)# ip prefix-list REDISTRIBUTION seq 5 permit 0.0.0.0/0 le 32
```

Step 2. Create a route-map that matches the conditions specified in the prefix-list.

```
Nexus-C(config)# route-map BGP-TO-EIGRP permit 10
Nexus-C(config-route-map)# match ip address prefix-list REDISTRIBUTION
Nexus-C(config-route-map)# match route-type internal
```

Step 3. Redistribute the routes into EIGRP coming from another protocol, in this case, OSPF.

```
Nexus-C(config)# router eigrp 19
Nexus-C(config-router)# address-family ipv4 unicast
Nexus-C(config-router-af)# autonomous-system 17
Nexus-C(config-router-af)# router-id 11.11.11.11
Nexus-C(config-router-af)# redistribute bgp 6500 route-map BGP-TO-EIGRP
```

Verify

Once redistribution is configured, the Nexus devices start to receive the routes coming from the other protocols. These routes are displayed as external routes.

Nexus-A Routing Table:

```
Nexus-A# show ip route ospf-21
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

172.16.21.1/32, ubest/mbest: 1/0
    *via 10.12.1.2, Eth1/36, [110/1], 00:00:57, ospf-21, type-2, tag 6500 <<<< this prefix is external

192.168.2.1/32, ubest/mbest: 1/0
    *via 10.12.1.2, Eth1/36, [110/2], 00:00:57, ospf-21, intra


Nexus-A# show ip route direct
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
```

```
10.12.1.0/24, ubest/mbest: 1/0, attached
    *via 10.12.1.1, Eth1/36, [0/0], 01:37:21, direct
192.168.1.1/32, ubest/mbest: 2/0, attached
    *via 192.168.1.1, Lo0, [0/0], 23:42:19, direct
```

Nexus-B Routing Table:

```
Nexus-B# show ip route ospf-21
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

192.168.1.1/32, ubest/mbest: 1/0
    *via 10.12.1.1, Eth1/49, [110/2], 00:15:08, ospf-21, intra
```

```
Nexus-B# show ip route bgp-6500
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

172.16.21.1/32, ubest/mbest: 1/0
    *via 10.24.1.2, [200/128576], 00:19:49, bgp-6500, internal, tag 6500 <<< This prefix is learned by
```

Nexus-C Routing Table:

```
Nexus-C# show ip route bgp-6500
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

192.168.1.1/32, ubest/mbest: 1/0
    *via 10.24.1.1, [200/2], 00:15:59, bgp-6500, internal, tag 6500 <<< This prefix is coming from iBGP
```

```
Nexus-C# show ip route eigrp-19
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

172.16.21.1/32, ubest/mbest: 1/0
    *via 10.36.1.2, Eth1/49, [90/128576], 00:26:03, eigrp-19, internal
```

Redistribution statistics, exclusive for EIGRP:

```
Nexus-C# show ip eigrp 19 route-map statistics redistribute bgp 6500
IP-EIGRP Route-map Traffic Statistics for AS 17 VRF default
C: No. of comparisions, M: No. of matches

route-map BGP-TO-EIGRP permit 10
  match ip address prefix-list REDISTRIBUTION              C: 2      M: 2
  match route-type internal                                C: 2      M: 2

Total accept count for policy: 2
Total reject count for policy: 0
```

Nexus-D Routing Table:

```
Nexus-D# show ip route eigrp-19
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

172.16.9.1/32, ubest/mbest: 1/0
    *via 10.36.1.1, Eth1/2, [90/128576], 00:29:14, eigrp-19, internal
192.168.1.1/32, ubest/mbest: 1/0
    *via 10.36.1.1, Eth1/2, [170/51456], 00:12:49, eigrp-19, external, tag 6500 <<< This prefix is exte


Nexus-D# sh ip route direct
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

10.36.1.0/24, ubest/mbest: 1/0, attached
    *via 10.36.1.2, Eth1/2, [0/0], 1d00h, direct
172.16.21.1/32, ubest/mbest: 2/0, attached
    *via 172.16.21.1, Lo10, [0/0], 01:47:30, direct
```