IPv6 BGP路由反射器配置示例

目录

简介

本文提供帮助您了解在边界网关协议(BGP)的路由反射器的一配置示例使用IPv6 (RR)功能。默认情况下，除非全网状配置形成在AS内的所有BGP路由器之间从iBGP对等体接收的路由没有发送给另一iBGP对等体。这导致可扩展性问题。使用BGP路由反射器导致更高的水平可扩展性。

配置路由反射器允许路由器通告或反射IBGP学到的路由到其他iBGP扬声器。路由器被认为路由反射器，当配置用neighbor route-reflector-client命令，并且命令指向的邻居是该RR的客户端。

先决条件

要求

尝试进行此配置之前，请确保满足以下要求：

- 了解 BGP 路由协议及其操作
- 了解 IPv6 编址方案

使用的组件

本文档不限于特定的软件和硬件版本。

在本文的配置根据Cisco 3700系列路由器用Cisco IOS软件版本12.4 (15)T1。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

配置

在本例中，因为RR和路由器RRClient1和RRClient2是路由器A的客户端，路由器A配置。所有路由器配置是AS 100，虽然路由器没有全网状配置。反而，它使用BGP RR功能为了与彼此联络。

注意： 使用命令查找工具（仅限注册用户）查找有关本文档所使用命令的详细信息。

网络图

本文档使用以下网络设置：

示例配置

本文档使用以下配置：

- 路由器 A
- RRClient1
- RRClient2

路由器 A

```
hostname Router-A
!
ip cef
!
ipv6 unicast-routing
!
interface Loopback0
 no ip address
 ipv6 address 2011:11:11:11::11/128
 ipv6 ospf 10 area 0
!
interface Serial0/0
 no ip address
 ipv6 address 2011:12:12:12::1/64
 ipv6 ospf 10 area 0
 clock rate 2000000
!
interface Serial0/1
 no ip address
 ipv6 address 2011:13:13:13::1/64
 ipv6 ospf 10 area 0
 clock rate 2000000
!
router bgp 100
 bgp router-id 1.1.1.1
 no bgp default ipv4-unicast
 bgp log-neighbor-changes
 neighbor 2011:22:22:22::22 remote-as 100
 neighbor 2011:22:22:22::22 update-source Loopback0
 neighbor 2011:33:33:33::33 remote-as 100
 neighbor 2011:33:33:33::33 update-source Loopback0
 !
 address-family ipv6
  neighbor 2011:22:22:22::22 activate
  neighbor 2011:22:22:22::22 route-reflector-client
!--- Configures the router RRClient1 as route reflector
client! neighbor 2011:33:33:33::33 activate neighbor
```

```
2011:33:33:33::33 route-reflector-client !--- Configures
the router RRClient2 as route reflector client! exit-
address-family ! ip forward-protocol nd ! ipv6 router
ospf 10 router-id 1.1.1.1 !--- Router ID of the route
reflector router A! log-adjacency-changes ! end
```

RRClient1

```
hostname RR-Client1
!
ip cef
!
ipv6 unicast-routing
!
interface Loopback0
 no ip address
 ipv6 address 2011:22:22:22::22/128
 ipv6 ospf 10 area 0
!
interface Loopback10
 no ip address
 ipv6 address 1010:10:10:10::10/128
!
interface Serial0/0
 no ip address
 ipv6 address 2011:12:12:12::2/64
 ipv6 ospf 10 area 0
 clock rate 2000000
!
router bgp 100
 bgp router-id 2.2.2.2
!--- Router ID of the RRClient1 no bgp default ipv4-
unicast bgp log-neighbor-changes neighbor
2011:11:11:11::11 remote-as 100 neighbor
2011:11:11:11::11 update-source Loopback0 ! address-
family ipv6 neighbor 2011:11:11:11::11 activate network
1010:10:10:10::10/128 exit-address-family ! ! ip
forward-protocol nd ! ipv6 router ospf 10 router-id
2.2.2.2 log-adjacency-changes ! ! end
```

RRClient2

```
hostname RR-Client2
!
ip cef
!
no ip domain lookup
ipv6 unicast-routing
!
!
interface Loopback0
 no ip address
 ipv6 address 2011:33:33:33::33/128
 ipv6 ospf 10 area 0
!
interface Loopback20
 no ip address
 ipv6 address 2020:20:20:20::20/128
!
interface Serial0/0
 no ip address
 ipv6 address 2011:13:13:13::2/64
 ipv6 ospf 10 area 0
 clock rate 2000000
!
router bgp 100
```

```
 bgp router-id 3.3.3.3
!--- Router ID of the RRClient2 no bgp default ipv4-
unicast bgp log-neighbor-changes neighbor
2011:11:11:11::11 remote-as 100 neighbor
2011:11:11:11::11 update-source Loopback0 ! address-
family ipv6 neighbor 2011:11:11:11::11 activate network
2020:20:20:20::20/128 exit-address-family ! ip forward-
protocol nd ! ipv6 router ospf 10 router-id 3.3.3.3 log-
adjacency-changes ! end
```

验证

使用本部分可确认配置能否正常运行。

命令输出解释程序（仅限注册用户）(OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

这些**显示**命令使用验证配置：

- show ipv6 route bgp
- show bgp ipv6单播

在RR客户端：

show ipv6 route bgp

在RRClient1中

```
RRClient1#sh ipv6 route bgp IPv6 Routing Table - 9
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
2020:20:20:20::20/128 [200/0] via 2011:33:33:33::33 !---
The iBGP route from RRClient2 is reflected
RRClient1#ping 2011:33:33:33::33 Type escape sequence to
abort. Sending 5, 100-byte ICMP Echos to
2011:33:33:33::33, timeout is 2 seconds: !!!!! Success
rate is 100 percent (5/5), round-trip min/avg/max =
16/24/32 ms !--- Ping to the RRClient2 from RRClient1 is
successful
```

在RRClient2中

```
RRCLlient2#sh ipv6 route bgp IPv6 Routing Table - 9
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
1010:10:10:10::10/128 [200/0] via 2011:22:22:22::22 !---
The iBGP route from RRClient1 is reflected
RRCLlient2#ping 1010:10:10:10::10 Type escape sequence
to abort. Sending 5, 100-byte ICMP Echos to
1010:10:10:10::10, timeout is 2 seconds: !!!!! Success
rate is 100 percent (5/5), round-trip min/avg/max =
40/50/76 ms !--- Ping to the RRClient1 from RRClient2 is
successful
```

在路由器A中：

show bgp ipv6单播*IPv6前缀*

```
RouterA#sh bgp ipv6 unicast 1010:10:10:10::10/128 BGP
routing table entry for 1010:10:10:10::10/128, version 3
Paths: (1 available, best #1, table Global-IPv6-Table)
Advertised to update-groups: 1 Local, (Received from a
RR-client) !--- Indicates that the route was received
from a route-reflector client router RRClient1
2011:22:22:22::22 (metric 64) from 2011:22:22:22::22
(2.2.2.2) Origin IGP, metric 0, localpref 100, valid,
internal, best
RouterA#show bgp ipv6 unicast 2020:20:20:20::20/128 BGP
routing table entry for 2020:20:20:20::20/128, version 2
Paths: (1 available, best #1, table Global-IPv6-Table)
Advertised to update-groups: 1 Local, (Received from a
RR-client) !--- Indicates that the route was received
from a route-reflector client router RRClient2
2011:33:33:33::33 (metric 64) from 2011:33:33:33::33
(3.3.3.3) Origin IGP, metric 0, localpref 100, valid,
internal, best
```

在RR客户端：

每当iBGP路由反射(即传播对另一iBGP对等体)，实现路由反射器的路由器(在我们的情况，路由器A)添附2个非传递属性：

- **创建人ID** ：这是非传递可选BGP属性。反射的iBGP路由将有路由接收作为其**创建人ID** iBGP对等体的路由器ID。在我们的示例中，是从RRClient 2的路由2020:20:20:20::20/128由路由器A (RR)反射， RRClient1的。结果，此路由将有RRClient2 (路由器ID的路由器ID ：3.3.3.3)作为其创建人ID。
- **团星ID** ：这是非传递可选BGP属性。如果团星id值没有配置，反射的iBGP路由将有RR的路由器ID作为其团星**ID**。在我们的示例中，路由2020:20:20:20::20/128没有团星id配置的并且路由器ID (路由器ID ：1.1.1.1)路由器A (RR)将是团星ID。

show bgp ipv6单播*ipv6-prefix*

在RRClient1中

```
show bgp ipv6 unicast 2020:20:20:20::20/128 BGP routing
table entry for 2020:20:20:20::20/128, version 3 Paths:
(1 available, best #1, table Global-IPv6-Table) Not
advertised to any peer Local 2011:33:33:33::33 (metric
128) from 2011:11:11:11::11 (1.1.1.1) Origin IGP, metric
0, localpref 100, valid, internal, best Originator:
3.3.3.3, Cluster list: 1.1.1.1 !--- Originator ID
3.3.3.3 is the router id of the RRClient2 from which the
route is received! !--- Similarly, Cluster ID 1.1.1.1 is
the router ID of the router reflector Router A!
```

在RRClient2中

```
show bgp ipv6 unicast 1010:10:10:10::10/128 BGP routing
table entry for 1010:10:10:10::10/128, version 3 Paths:
(1 available, best #1, table Global-IPv6-Table) Not
advertised to any peer Local 2011:22:22:22::22 (metric
128) from 2011:11:11:11::11 (1.1.1.1) Origin IGP, metric
0, localpref 100, valid, internal, best Originator:
2.2.2.2, Cluster list: 1.1.1.1 !--- Originator ID
2.2.2.2 is the router ID of the RRClient1 from which the
route is received! !--- Similarly, Cluster ID 1.1.1.1 is
the router ID of the router reflector Router A!
```

相关信息

- BGP 支持页
- IP 版本 6 支持页面
- BGP 案例分析
- 技术支持和文档 - Cisco Systems