

IPv6 BGP Prefix-Based Outbound Route Filtering配置示例

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简介

本文提供帮助您配置BGP Prefix-Based Outbound Route Filtering的一配置示例使用IPv6。此功能使用BGP出站路由过滤器(ORF)最小化BGP更新数量被发送在对等`路由器之间的发送和接收功能。此功能的配置在过滤可帮助不需要的路由更新在来源。

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。

本文中的配置基于装有 Cisco IOS® 软件版本 15.0(1) 的 Cisco 7200 系列路由器。

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，路由器R1是根据的配置的通告前缀ORF发送功能到路由器R2。在另一端路由器上R2配置通知基于前缀的ORF接收功能到路由器R1。在BGP Prefix-Based Outbound Route Filtering功能可以启用发送或接收基于前缀的ORF通告前，BGP对等会话一定是正在运行的，并且BGP在路由器前的每个参与的路由器必须启用ORF功能。

本文使用[邻接or前缀过滤器](#)命令为了启用在路由器的ORF前缀列表功能。此命令在Cisco IOS软件版本12.0(11)ST介绍。

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 R1](#)
- [路由器 R2](#)

路由器 R1

```
!  
hostname R1  
!  
ipv6 unicast-routing  
ipv6 cef  
!  
!  
interface Loopback1  
no ip address  
ipv6 address 1111::1/128  
!  
!  
interface Loopback2  
no ip address  
ipv6 address 2222::1/128  
!  
!  
interface Serial1/0  
no ip address  
ipv6 address 2011:11:11:11::1/64  
serial restart-delay 0  
!  
!  
router bgp 6501  
no synchronization
```

```
no bgp default ipv4-unicast
bgp router-id 1.1.1.1
bgp log-neighbor-changes
neighbor 2011:11:11:11::2 remote-as 6502
neighbor 2011:11:11:11::2 ebgp-multihop 255
no auto-summary
!
address-family ipv6
  neighbor 2011:11:11:11::2 activate
  neighbor 2011:11:11:11::2 capability orf prefix-list
send
  neighbor 2011:11:11:11::2 prefix-list FILTER_IPv6 in
exit-address-family
!
!
ipv6 prefix-list FILTER_IPv6 seq 10 permit 1111::1/128
ipv6 prefix-list FILTER_IPv6 seq 20 permit 2222::1/128
!
!
end
```

路由器 R2

```
!
hostname R2
!
!
no ip domain lookup
ipv6 unicast-routing
ipv6 cef
!
interface Loopback1
  no ip address
  ipv6 address 1010::1/128
!
!
interface Loopback2
  no ip address
  ipv6 address 2020::1/128
!
interface Serial1/0
  no ip address
  ipv6 address 2011:11:11:11::2/64
  serial restart-delay 0
!
!
router bgp 6502
  no synchronization
  bgp router-id 2.2.2.2
  bgp log-neighbor-changes
  neighbor 2011:11:11:11::1 remote-as 6501
  neighbor 2011:11:11:11::1 ebgp-multihop 255
  no auto-summary
  !
  address-family ipv6

    network 1010::1/128
    network 2020::1/128
    neighbor 2011:11:11:11::1 activate
    neighbor 2011:11:11:11::1 capability orf prefix-list
receive
    neighbor 2011:11:11:11::1 prefix-list R2_list in
  exit-address-family
```

```
!  
ipv6 prefix-list R2_list seq 10 permit 1010::1/128  
ipv6 prefix-list R2_list seq 20 permit 2020::1/128  
!  
end
```

情形 1：根据与表达式的前缀列表的过滤器路由

在此方案中，环回地址1000::1/45在interface loopback 0下的R1配置。前缀列表创建为了允许比前缀长度极大：的所有路由：/64。

注意：路由器配置R2依然是同以前给一样和R1配置更改如显示此处。在这些路由器的IP地址依然是同样。

路由器 R1

```
!--- Output omitted. ! interface Loopback0 no ip address  
ipv6 address 1000::1/45 !  
!--- Output omitted. router  
bgp 6501 no synchronization bgp router-id 1.1.1.1 bgp  
log-neighbor-changes neighbor 2011:11:11:11::2 remote-as  
6502 neighbor 2011:11:11:11::2 ebgp-multihop 255 no  
auto-summary ! address-family ipv6 network 1000::1/45  
network 1111::1/128  
network 2222::1/128  
neighbor 2011:11:11:11::2 activate  
neighbor 2011:11:11:11::2 prefix-list IPV6-LONG in  
!--- Applies the prefix-list and filters !--- the  
incoming updates from the neighbor 2011:11:11:11::2.  
exit-address-family ! ipv6 prefix-list IPV6-LONG  
description Match any prefix longer than /64  
ipv6 prefix-list IPV6-LONG seq 1 permit ::/0 ge 64  
!--- seq 1 permit ::/0 ge 64 permits anything !--- that  
is ge /64 subnet mask. ! 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 running-config|请求bgp](#)
- [show bgp ipv6单播邻居](#)

验证在发送模式配置的IPv6 BGP Prefix-Based Outbound Route Filtering

在路由器R1中：

```
show running-config|请求bgp
```

```
router bgp 6501
```

```
no synchronization
bgp router-id 1.1.1.1
bgp log-neighbor-changes
neighbor 2011:11:11:11::2 remote-as 6502
neighbor 2011:11:11:11::2 ebgp-multihop 255
no auto-summary
!
address-family ipv6
  neighbor 2011:11:11:11::2 activate
  neighbor 2011:11:11:11::2 capability orf prefix-list
send
!--- Indicates that the neighbor 2011:11:11:11::2 !---
is configured with the prefix-based !--- ORF feature in
send mode.
```

show bgp ipv6单播邻居

```
R1#show bgp ipv6 unicast neighbors 2011:11:11:11::2
BGP neighbor is 2011:11:11:11::2, remote AS 6502,
external link
  BGP version 4, remote router ID 2.2.2.2
  Session state = Established, up for 01:30:36
  Last read 00:00:44, last write 00:00:42, hold time is
180, keepalive interval is 60 seconds
  BGP multisession with 2 sessions (2 established), first
up for 01:31:26
  Neighbor sessions:
    2 active, is multisession capable
  Neighbor capabilities:
    Route refresh: advertised and received(new) on
session 1, 2
    Four-octets ASN Capability: advertised and received
on session 1, 2
    Address family IPv4 Unicast: advertised and received
    Address family IPv6 Unicast: advertised and received
!--- Output omitted. For address family: IPv6 Unicast
Session: 2011:11:11:11::2 session 2 BGP table version 1,
neighbor version 1/0 Output queue size : 0 Index 2
session 2 member 2 update-group member AF-dependant
capabilities: Outbound Route Filter (ORF) type (128)
Prefix-list:
!--- Shows that the neighbor 2011:11:11:11::2 !--- is
configured with the prefix-based !--- ORF feature in
send mode. Send-mode: advertised Receive-mode: received
Outbound Route Filter (ORF): sent; Incoming update
prefix filter list is FILTER_IPv6 Sent Rcvd Prefix
activity: ---- ---- Prefixes Current: 2 4 Prefixes
Total: 0 0 Implicit Withdraw: 1 0 Explicit Withdraw: 1 0
Used as bestpath: n/a 0 Used as multipath: n/a 0
Outbound Inbound Local Policy Denied Prefixes: -----
----- !--- Output omitted.
```

[验证在接收模式配置的IPv6 BGP Prefix-Based Outbound Route Filtering](#)

在路由器R2中：

show running-config|请求bgp

```
router bgp 6502
no synchronization
```

```

bgp router-id 2.2.2.2
bgp log-neighbor-changes
neighbor 2011:11:11:11::1 remote-as 6501
neighbor 2011:11:11:11::1 ebgp-multihop 255
no auto-summary
!
address-family ipv6
  network 1010::1/128
  network 2020::1/128
  neighbor 2011:11:11:11::1 activate
  neighbor 2011:11:11:11::1 capability orf prefix-list
receive
!--- Indicates that the neighbor 2011:11:11:11::1 !--- is configured with the prefix-based !--- ORF feature in receive mode.

```

show bgp ipv6单播邻居

```

R2#show bgp ipv6 unicast nei 2011:11:11:11::1
BGP neighbor is 2011:11:11:11::1, remote AS 6501,
external link
  BGP version 4, remote router ID 1.1.1.1
  Session state = Established, up for 01:47:11
  Last read 00:00:44, last write 00:00:32, hold time is
180, keepalive interval is 60 seconds
multisession with 2 sessions (2 established), first up
for 01:48:02
  Neighbor sessions:
    2 active, is multisession capable
  Neighbor capabilities:
    Route refresh: advertised and received(new) on
session 1, 2
    Four-octets ASN Capability: advertised and received
on session 1, 2
    Address family IPv4 Unicast: advertised and received
    Address family IPv6 Unicast: advertised and received
    Multisession Capability: advertised and received
!--- Output omitted. For address family: IPv6 Unicast
Session: 2011:11:11:11::1 session 2 BGP table version 3,
neighbor version 3/0 Output queue size : 0 Index 3
session 2 member 3 update-group member AF-dependant
capabilities: Outbound Route Filter (ORF) type (128)
Prefix-list:
!--- Shows that the neighbor 2011:11:11:11::1 !--- is configured with the prefix-based !--- ORF feature in receive mode. Send-mode: received Receive-mode:
advertised Outbound Route Filter (ORF): received (2
entries) Incoming update prefix filter list is R2_list
Sent Rcvd Prefix activity: ---- ---- Prefixes Current: 2
5 Prefixes Total: 0 0 Implicit Withdraw: 0 0 Explicit
Withdraw: 2 0 !--- Output omitted.

```

验证方案1：过滤根据与表达式的前缀列表的路由

发出show ipv6 route bgp命令在路由器R1为了显示IPv6 BGP路由表的当前内容。

show ipv6 route bgp

在路由器R1中：

```

R1#show ipv6 route bgp
IPv6 Routing Table - default - 9 entries

```

```
Codes: C - Connected, L - Local, S - Static, U - Per-
user Static route
      B - BGP, HA - Home Agent, MR - Mobile Router, R -
RIP
      I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea,
IS - ISIS summary
      D - EIGRP, EX - EIGRP external, ND - Neighbor
Discovery
      O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext
1, OE2 - OSPF ext 2
      ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
B   1010::1/128 [20/0]
    via 2011:11:11:11::2
B   2020::1/128 [20/0]
    via 2011:11:11:11::2
!--- In this ouput, 1000::1/45 is not !--- displayed
because the network is lesser !--- than ::/64 prefix and
its filtered.
```

请使用显示IPv6前缀列表命令为了显示关于IPv6前缀列表或IPv6前缀列表条目的信息。

显示IPv6前缀列表

在路由器R1中：

```
R1#show ipv6 prefix-list detail
```

```
Prefix-list with the last deletion/insertion: IPV6-LONG
ipv6 prefix-list IPV6-LONG:
  Description: Match any prefix longer than /64
  count: 1, range entries: 1, sequences: 1 - 1,
  refcount: 3
  seq 1 permit ::/0 ge 64 (hit count: 14, refcount: 1)
```

```
R1#show ipv6 prefix-list summary
```

```
Prefix-list with the last deletion/insertion: IPV6-LONG
ipv6 prefix-list IPV6-LONG:
  Description: Match any prefix longer than /64
  count: 1, range entries: 1, sequences: 1 - 1,
  refcount: 3
```

```
R1#show ipv6 prefix-list IPV6-LONG
```

```
ipv6 prefix-list IPV6-LONG: 1 entries
seq 1 permit ::/0 ge 64
```

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](#)