通過介面Null0配置IPv6黑洞

目錄

簡介

本文檔介紹如何通過介面Null0在IPv6中配置黑洞。通過動態地將流量路由到死介面或收集資訊以供調查的主機，黑洞路由允許管理員阻止不想要的流量(如來自非法來源的流量或由拒絕服務(DoS)攻擊生成的流量)，從而減輕攻擊對網路的影響。

必要條件

需求

嘗試此組態之前，請確保符合以下要求：

- 瞭解BGP路由協定及其操作
- 瞭解IPv6編址方案

採用元件

本檔案中的資訊是根據使用Cisco IOS®軟體版本15.0(1)的Cisco 7200系列路由器。
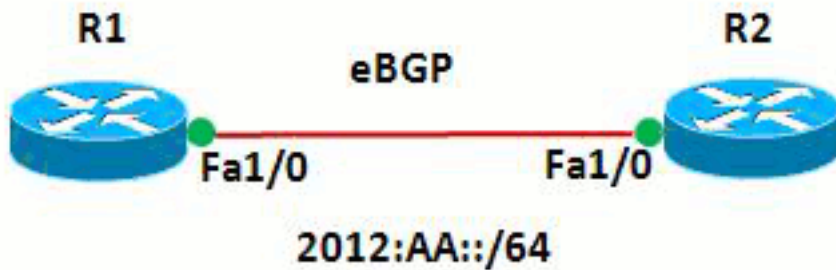
慣例

如需文件慣例的詳細資訊，請參閱思科技術提示慣例。

設定

本節提供用於設定本文件中所述功能的資訊。

註：使用Command Lookup Tool(僅限註冊客戶)可以查詢有關本文檔中使用的命令的詳細資訊。

網路圖表

本檔案會使用以下網路設定：

在此網路中，路由器與R1和R2之間形成eBGP關係。路由器使用OSPFv3進行內部通訊。在路由器R1中，通過配置Null0來實現黑洞，這樣，源地址為20:20::20/128的所有資料包都將指向Null0。換句話說，所有路由到Null0的流量都會被丟棄。

配置示例

本檔案會使用以下設定：

- 路由器R1
- 路由器R2

路由器R1

<pre>!
hostname R1
!
no ip domain lookup
ip cef
ipv6 unicast-routing
ipv6 cef
!
!
interface Loopback1
 no ip address
 ipv6 address AA::1/128
 ipv6 enable
 ipv6 ospf 10 area 0
!
interface Loopback10
 no ip address
 ipv6 address AA:10::10/128</pre>

```
 ipv6 enable
!
interface FastEthernet1/0
 no ip address
 speed auto
 duplex auto
 ipv6 address 2012:AA::1/64
 ipv6 enable
 ipv6 ospf 10 area 0
!
router bgp 6501
 bgp router-id 1.1.1.1
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor BB::1 remote-as 6502
 neighbor BB::1 ebgp-multihop 2
 neighbor BB::1 update-source Loopback1
 !
 address-family ipv4
 exit-address-family
 !
 address-family ipv6
  redistribute static
  network AA:10::10/128
  neighbor BB::1 activate
 exit-address-family
!
ipv6 route 20:20::20/128 Null0
ipv6 router ospf 10
 router-id 1.1.1.1
!
end
```

路由器R2

```
!
hostname R2
!
ipv6 unicast-routing
ipv6 cef
!
!
interface Loopback1
 no ip address
 ipv6 address BB::1/128
 ipv6 enable
 ipv6 ospf 10 area 0
!
interface Loopback20
 no ip address
 ipv6 address 20:20::20/128
 ipv6 enable
!
interface FastEthernet1/0
 no ip address
 speed auto
 duplex auto
 ipv6 address 2012:AA::2/64
 ipv6 enable
 ipv6 ospf 10 area 0
!
router bgp 6502
```

```
 bgp router-id 2.2.2.2
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor AA::1 remote-as 6501
 neighbor AA::1 ebgp-multihop 2
 neighbor AA::1 update-source Loopback1
 !
 address-family ipv4
 exit-address-family
 !
 address-family ipv6
  network 20:20::20/128
  neighbor AA::1 activate
 exit-address-family
!
ipv6 router ospf 10
 router-id 2.2.2.2
!
end
```

驗證

使用本節內容，確認您的組態是否正常運作。

輸出直譯器工具(僅供已註冊客戶使用)(OIT)支援某些show命令。使用OIT檢視show命令輸出的分析。

若要驗證eBGP配置，請在路由器R1中使用show ipv6 route bgp 和show bgp ipv6 unicast 命令。

路由器R1
show ipv6 route

```
R1#show ipv6 route bgp
IPv6 Routing Table - default - 7 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
!--- The router R2 advertises the network 20:20::20/128,
!--- but still the routing table is empty.
```
要檢查BGP接收的路由是什麼，請使用show bgp ipv6 unicast命令。
```
R1#show bgp ipv6 unicast
BGP table version is 3, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, *
valid, > best, I - internal,
              r RIB-failure, S Stale
Origin codes: I - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf
Weight Path
*  20:20::20/128    BB::1                     0
0 6502 I
```

```
*>                        ::                      0
32768 ?
*> AA:10::10/128    ::                      0
32768 I
 !--- Note that the route 20:20::20/128 is received, !--
- but it is not installed in the routing table.
```

使用源作為環回介面20，嘗試從路由器R2 ping路由器R1。

```
R2#ping ipv6 AA:10::10 source lo20

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to AA:10::10, timeout is 2 seconds:
Packet sent with a source address of 20:20::20
.....
Success rate is 0 percent (0/5)
```
!--- The reason is the ICMP packet reaches !--- router R1 with source address as !---
20:20::20/128 and therefore gets dropped.

嘗試在不使用環回介面作為源的情況下，從路由器R2 ping路由器R1。

```
R2#ping AA:10::10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to AA:10::10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/61/180 ms
```
!--- In this case, the ICMP packet has !--- the source address as BB::1.

如果從路由器R1上刪除了**ipv6 route 20:20::20/128 Null0**語句，則路由器R2通告的路由 20:20::20/128將安裝到路由器R1的路由表中。以下是示例輸出：

在路由器R1中

R1(config)#no ipv6 route 20:20::20/128 Null0

!--- The Null0 command in removed from router R1.
```
R1#show bgp ipv6 unicast BGP table version is 7, local
router ID is 1.1.1.1 Status codes: s suppressed, d
damped, h history, * valid, > best, I - internal, r RIB-
failure, S Stale Origin codes: I - IGP, e - EGP, ? -
incomplete Network Next Hop Metric LocPrf Weight Path *>
```
20:20::20/128   ::   0
```
32768 ?
*                   BB::1                   0
0 6502 I
*> AA:10::10/128    ::                      0
32768 I
```
!--- After the removal of the statement, !--- the route
20:20::20/128 is shown as best route. R1#**show ipv6 route**
bgp
```
IPv6 Routing Table - default - 7 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   20:20::20/128 [20/0]
    via BB::1

!--- You can see that the route is displayed in routing
table.
```

現在嘗試從路由器R2 ping路由器R1，將源介面作為環回介面Lo 20。

```
R2#ping ipv6  AA:10::10 source lo20

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to AA:10::10, timeout is 2 seconds:
Packet sent with a source address of 20:20::20
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/54/140 ms
!--- You can see that the ping is successful.
```

相關資訊

- 遠端觸發的黑洞過濾
- BGP技術支援
- IP第6版技術支援
- BGP 個案研究
- 技術支援與文件 - Cisco Systems