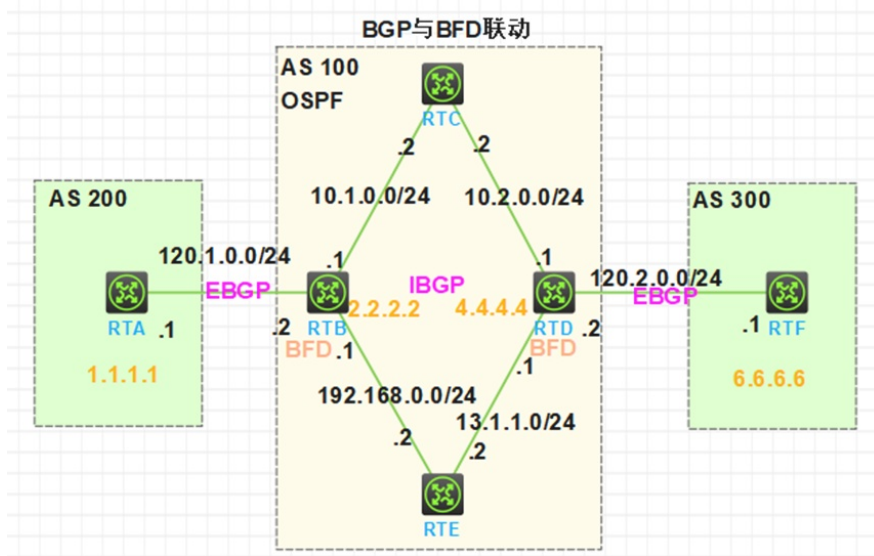


知 BGP与BFD典型联动

BGP BFD 爱通不通 2022-11-18 发表

组网及说明



组网设计：通过部署BGP和BFD联动，使RTA和RTF可以进行业务通信，并在RTB<->RTC<->RTD主链路故障时，BFD能够快速检测并通告BGP协议，使得迅速切换到RTB<->RTE<->RTD这条路径进行通信。

问题描述

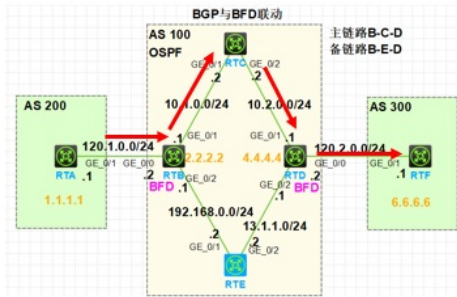
配置旨在通过部署BGP和BFD联动，使RTA和RTF可以进行业务通信，并在RTB<->RTC<->RTD主链路故障时，BFD能够快速检测并通告BGP协议，使得迅速切换到RTB<->RTE<->RTD这条路径进行通信。

配置时，需要 1. 在AS 100内使用OSPF作为IGP，保证设备间路由可达； 2配置RTA、RTB、RTD、RTF上的BGP功能； RTA与RTF的BGP配置类似，以RTA为例，启动BGP指定本地AS号为200。配置RTA和RTB建立EBGP连接。通过network的方式，将本地路由表中到达120.1.0.0/24网段的路由添加到BGP路由表中。 RTB与RTD的BGP配置类似，以RTB为例，启动BGP，指定本地AS号为100。配置RTB和RTA建立EBGP连接，配置RTB和RTD建立IBGP连接。（在BGP IPv4单播地址族视图下，使能RTB与对等体交换IPv4单播路由信息的能力，并配置向对等体10.2.0.101发布BGP路由时，将下一跳属性修改为自身的地址。） 3 配置RTB、RTD上的路由策略； 配置RTB、RTD上的路由策略；创建ACL 2000，允许源IP地址为120.1.0.0/24的报文通过。定义两个Route-policy，配置向对等体10.2.0.101发布的路由设置本地优先级为200，并配置IBGP路由优先级为100。

过程分析

正常状态下，走上行链路。

在RTB上查看120.2.0.0/24的路由信息，可以看出RTB通过RTB< ->RTC< ->RTD这条路径与120.2.0.0/



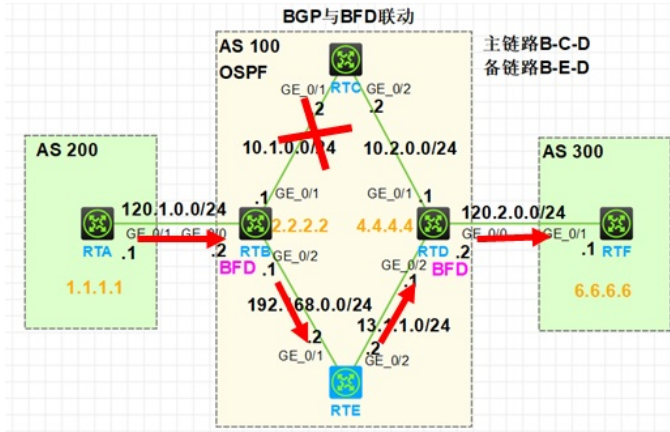
```
[RTB]display ip routing-table 120.2.0.0 24 verbose
Summary count : 3
Destination: 120.2.0.0/24
Protocol: BGP instance default
Process ID: 0
SubProtID: 0x1 Age: 00b00m47s
Cost: 0 Preference: 100
IpPre: N/A QoSLocalID: N/A
Tag: 0 State: Active Adv
OrigTblID: 0x0 OrigVrf: default-vrf
TableID: 0x2 OrigAs: 300
NibID: 0x16000001 LastAs: 300
AttrID: 0x3 Neighbor: 10.2.0.101
Flags: 0x10060 OrigNextHop: 10.2.0.101
Label: NULL RealNextHop: 10.1.0.2
BkLabel: NULL BkNextHop: N/A
SRLabel: NULL BkSRLabel: NULL
SIDIndex: 0 InLabel: 0
Tunnel ID: Invalid Interface: GigabitEthernet0/1
BkTunnel ID: Invalid BkInterface: N/A
FtnIndex: 0x0 TrafficIndex: N/A
Connector: N/A VpnPeerId: N/A
Dscp: N/A Exp: N/A
```

```
Destination: 120.2.0.0/24
Protocol: 0_ASE2
Process ID: 1
SubProtID: 0x8 Age: 02h14m43s
Cost: 1 Preference: 150
IpPre: N/A QoSLocalID: N/A
Tag: 1 State: Inactive Adv
OrigTblID: 0x0 OrigVrf: default-vrf
TableID: 0x2 OrigAs: 0
NibID: 0x13000005 LastAs: 0
AttrID: 0xffffffff Neighbor: 0.0.0.0
Flags: 0x41 OrigNextHop: 10.1.0.2
Label: NULL RealNextHop: 10.1.0.2
BkLabel: NULL BkNextHop: N/A
SRLabel: NULL BkSRLabel: NULL
SIDIndex: NULL InLabel: NULL
Tunnel ID: Invalid Interface: GigabitEthernet0/1
BkTunnel ID: Invalid BkInterface: N/A
FtnIndex: 0x0 TrafficIndex: N/A
Connector: 0.0.0.0 VpnPeerId: N/A
Dscp: N/A Exp: N/A

Destination: 120.2.0.0/24
Protocol: 0_ASE2
Process ID: 1
SubProtID: 0x8 Age: 02h14m43s
Cost: 1 Preference: 150
IpPre: N/A QoSLocalID: N/A
Tag: 1 State: Inactive Adv
OrigTblID: 0x0 OrigVrf: default-vrf
TableID: 0x2 OrigAs: 0
NibID: 0x13000007 LastAs: 0
AttrID: 0xffffffff Neighbor: 0.0.0.0
Flags: 0x41 OrigNextHop: 192.168.0.2
Label: NULL RealNextHop: 192.168.0.2
BkLabel: NULL BkNextHop: N/A
SRLabel: NULL BkSRLabel: NULL
SIDIndex: NULL InLabel: NULL
Tunnel ID: Invalid Interface: GigabitEthernet0/2
BkTunnel ID: Invalid BkInterface: N/A
FtnIndex: 0x0 TrafficIndex: N/A
Connector: 0.0.0.0 VpnPeerId: N/A
Dscp: N/A Exp: N/A
```

解决方法

上行链路断掉后，从RTA上ping RTF的IP地址，可以互通。



```
[RTB-GigabitEthernet0/1]display ip routing-table 120.2.0.0/24 verbose
Summary count : 2
Destination: 120.2.0.0/24
  Protocol: BGP instance default
  Process ID: 0
  SubProtID: 0x1
  Cost: 0
  IpPre: N/A
  Tag: 0
  OrigTblID: 0x0
  TableID: 0x2
  NibID: 0x16000001
  AttrID: 0x3
  Flags: 0x10060
  Label: NULL
  BkLabel: NULL
  SRLabel: NULL
  SIDIndex: 0
  Tunnel ID: Invalid
  BkTunnel ID: Invalid
  FtnIndex: 0x0
  Connector: N/A
  Dscp: N/A
  Age: 00h00m42s
  Preference: 100
  QoSLocalID: N/A
  State: Active Adv
  OrigVrf: default-vrf
  OrigAs: 300
  LastAs: 300
  Neighbor: 10.2.0.101
  OrigNextHop: 10.2.0.101
  RealNextHop: 192.168.0.2
  BkNextHop: N/A
  BkSRLabel: NULL
  InLabel: 0
  Interface: GigabitEthernet0/2
  BkInterface: N/A
  TrafficIndex: N/A
  VpnPeerId: N/A
  Exp: N/A
Destination: 120.2.0.0/24
  Protocol: O_ASE2
  Process ID: 1
  SubProtID: 0x8
  Cost: 1
  IpPre: N/A
  Tag: 1
  OrigTblID: 0x0
  TableID: 0x2
  NibID: 0x13000006
  AttrID: 0xffffffff
  Flags: 0x41
  Label: NULL
  BkLabel: NULL
  SRLabel: NULL
  SIDIndex: NULL
  Tunnel ID: Invalid
  BkTunnel ID: Invalid
  FtnIndex: 0x0
  Connector: 0.0.0.0
  Dscp: N/A
  Age: 00h00m42s
  Preference: 150
  QoSLocalID: N/A
  State: Inactive Adv
  OrigVrf: default-vrf
  OrigAs: 0
  LastAs: 0
  Neighbor: 0.0.0.0
  OrigNextHop: 192.168.0.2
  RealNextHop: 192.168.0.2
  BkNextHop: N/A
  BkSRLabel: NULL
  InLabel: NULL
  Interface: GigabitEthernet0/2
  BkInterface: N/A
  TrafficIndex: N/A
  VpnPeerId: N/A
  Exp: N/A
```

有BFD，20:18:16断开上行链路，BFD指导BGP直接断

```
[RTB]%Oct 9 20:18:16:901 2022 RTB BFD/5/BFD_CHANGE_FSM: Sess[10.1.0.1/10.2.0.1, LD/RD: 33793/33793, Interface:N/A, SessType:Ctrl, LinkType:INET], Ver:1, Sta: UP->DOWN, Diag: 1 (Control Detection Time Expired)
```

```
%Oct 9 20:18:16:901 2022 RTB BGP/5/BGP_STATE_CHANGED:
```

```
BGP.: 10.2.0.1 state has changed from ESTABLISHED to IDLE for session down event received from BFD.
```

没有BFD，20:26:11断开上行链路

```
[RTB] %Oct 9 20:28:06:967 2022 RTB BGP/5/BGP_STATE_CHANGED:
```

```
BGP.: 10.2.0.1 state has changed from ESTABLISHED to IDLE for TCP_Connection_Failed event received.
```

