某省移动局点CR16010-F和华为交换机对接ospfv3邻居建立起不来案例分析
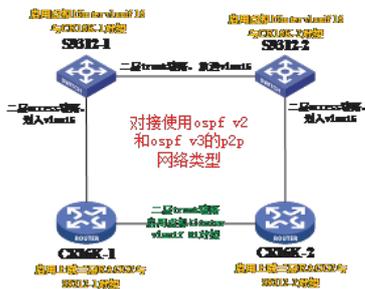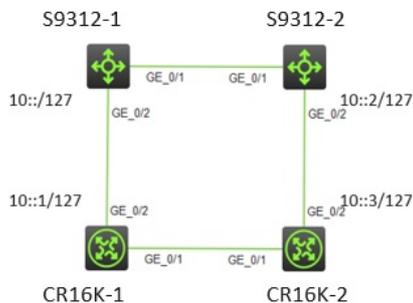
OSPF   zhiliao_uXUmY   2019-02-21 发表

组网及说明

问题描述

某省移动客户，割接之后CR16010-F与华为交换机对接时ospfv3邻居建立不起来，卡在init状态。

过程分析

用如上的故障组网，在模拟器上阐述分析过程，S9312-1的router-id是1.1.1.1，S9312-2的router-id是2.2.2.2，CR16K-1的route-id是3.3.3.3，CR16K-2的route-id是4.4.4.4，各网段信息如图所示。

ospfv3邻居建立不起来时，ospfv3 peer状态如下图，一直卡在init状态

```
<CR16K-1>dis ospfv3 peer

              OSPFv3 Process 1 with Router ID 3.3.3.3

 Area: 0.0.0.0
 ----------------------------------------------------------------
 Router ID       Pri State           Dead-Time InstID Interface
 2.2.2.2          1  Init/ -         00:00:31  0      GE0/2
```

```
<CR16K-2>dis ospfv3 peer

              OSPFv3 Process 1 with Router ID 4.4.4.4

 Area: 0.0.0.0
 ----------------------------------------------------------------
 Router ID       Pri State           Dead-Time InstID Interface
 1.1.1.1          1  Init/ -         00:00:39  0      GE0/2
```

从CR16K-2上抓包可以看到，现网中其他3台设备的hello报文都会接收到

```
 1066 3285.47487 fe80::40c2:5fff:fecff02::5              OSPF      94 Hello Packet
 1068 3286.39403 fe80::40c2:5aff:fe0ff02::5              OSPF      94 Hello Packet
 1073 3287.91781 fe80::40c2:49ff:fe7ff02::5              OSPF      94 Hello Packet
```

```
☐ Open Shortest Path First
  ☐ OSPF Header
      OSPF Version: 3
      Message Type: Hello Packet (1)
      Packet Length: 40
      Source OSPF Router: 1.1.1.1 (1.1.1.1)
      Area ID: 0.0.0.0 (Backbone)
      Packet Checksum: 0x710e [correct]
      Instance ID: 0 (IPv6 unicast AF)
      Reserved: 0
  ☐ OSPF Hello Packet
      Interface ID: 1413
      Router Priority: 1
    ⊞ Options: 0x000013 (R, E, V6)
      Hello Interval: 10 seconds
      Router Dead Interval: 40 seconds
      Designated Router: 0.0.0.0
      Backup Designated Router: 0.0.0.0
      Active Neighbor: 2.2.2.2
```

```
Open Shortest Path First
  OSPF Header
      OSPF Version: 3
      Message Type: Hello Packet (1)
      Packet Length: 40
      Source OSPF Router: 3.3.3.3 (3.3.3.3)
      Area ID: 0.0.0.0 (Backbone)
      Packet Checksum: 0x56a9 [correct]
      Instance ID: 0 (IPv6 unicast AF)
      Reserved: 0
  OSPF Hello Packet
      Interface ID: 3
      Router Priority: 1
      Options: 0x000013 (R, E, V6)
      Hello Interval: 10 seconds
      Router Dead Interval: 40 seconds
      Designated Router: 0.0.0.0
      Backup Designated Router: 0.0.0.0
      Active Neighbor: 2.2.2.2
```

```
Open Shortest Path First
  OSPF Header
      OSPF Version: 3
      Message Type: Hello Packet (1)
      Packet Length: 40
      Source OSPF Router: 2.2.2.2 (2.2.2.2)
      Area ID: 0.0.0.0 (Backbone)
      Packet Checksum: 0x66c7 [correct]
      Instance ID: 0 (IPv6 unicast AF)
      Reserved: 0
  OSPF Hello Packet
      Interface ID: 1413
      Router Priority: 1
      Options: 0x000013 (R, E, V6)
      Hello Interval: 10 seconds
      Router Dead Interval: 40 seconds
      Designated Router: 0.0.0.0
      Backup Designated Router: 0.0.0.0
      Active Neighbor: 1.1.1.1
```

从debug信息中，也可以看到CR16K-2的init邻居route-id为1.1.1.1，也就是图中的S9312-1，但该S9312-1的邻居却是2.2.2.2，并不是CR16K-2的4.4.4.4。

```
*Jan 28 20:25:26:263 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG:
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: OSPFv3 1: Receiving packets.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Source address: FE80::40C2:40FF:FE
2A:102
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Destination address: FF02::5
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Version 3, Type: 1, Length: 40.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Router: 1.1.1.1, Area: 0.0.0.0, Ch
ecksum: 28942, Instance: 0.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Interface id: 1413, Router Priorit
y: 1.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Option: -|-|-|-|-|R|-|x|E|V6.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Hello Interval: 10, Dead Interval:
 40
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: DR: 0.0.0.0, BDR: 0.0.0.0.
*Jan 28 20:25:32:038 2019 CR16K-2 OSPFV3/7/OSPFV3DEBUG: Neighbor: 2.2.2.2.
```

综合以上信息，可以猜测到，用户ospfv3网络中存在二层广播域，但配置的是P2P的网络类型，导致邻居建立同收到hello的先后顺序强相关。就如同上述实验所示，route-id为1.1.1.1的设备要跟route-id为2.2.2.2的设备建邻居，2.2.2.2要跟1.1.1.1建邻居，3.3.3.3要跟2.2.2.2建邻居，4.4.4.4要跟1.1.1.1建邻居，所以两台CR16K上收不到华为带我们设备router-id的hello报文，所以邻居状态无法进入2-way，该组网中需要去除广播域。与华为侧沟通后，发现在ospfv3网络中华为两交换机互联vlan的配置中，与CR16K相连的二层access链路划入了vlan16中，而其两台交换机相连的二层trunk链路也放通了vlan16，导致4台设备处于一个广播域中。

因此需要隔离广播域，把华为横联vlan同下联vlan区分开来，避免广播域的产生而影响P2P网络的正常运行，华为侧割接之后，ospfv3邻居正常建立。

解决方法

从以上的分析可以得出解决方案：通过隔离广播域，将华为横联vlan同下联vlan区分开，ospfv3邻居就能正常建立，p2p网络正常运行。

附件下载： 某省移动局点CR16010-F和华为交换机对接ospfv3邻居建立起不来案例分析.rar