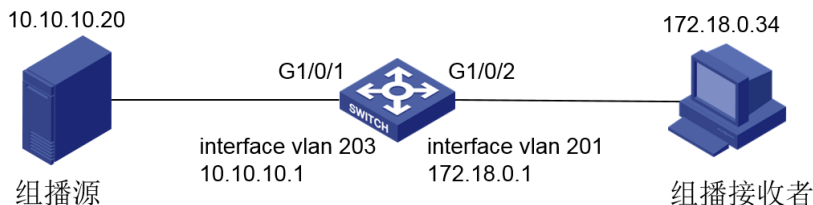


某局点S7003E 三层组播不通问题排查案例

组播VLAN 徐猛 2019-07-11 发表

组网及说明

现场拓扑如下图，组播源直连在设备的G1/0/1接口，组播接收者直连在设备的G1/0/2接口，组播源的网关为设备上的interface vlan 203接口，组播接收者的网关为设备上的interface vlan 201接口。



问题描述

如上连接拓扑，经过组播业务测试发现，组播源和组播接收者在同一个vlan，组播源和组播接收者IP同网段时，进行二层组播测试正常，但是跨了三层以后，组播接收者无法接收组播视频。

过程分析

(1) 查看组播组注册情况，有相应终端的IGMP注册信息：

```
[H3C]dis igmp group
```

```
IGMP groups in total: 3
```

```
Vlan-interface201(172.18.0.1):
```

```
IGMP groups reported in total: 3
```

Group address	Last reporter	Uptime	Expires	
224.2.2.9	172.18.0.34	00:03:29	00:04:17	//172.18.0.34为测试终端
224.2.2.17	172.18.2.0	00:00:31	00:04:19	//172.18.2.0为测试的电视，该终端地址掩码

为22位

```
239.255.255.250 172.18.1.241 00:03:35 00:04:19
```

(2) 查看组播路由表项，发现组播源无法加表，组播路由表项无法看到上行接口，组播流下行接口学习正常。

```
[H3C]dis pim routing-table
```

```
Total 3 (*, G) entries; 0 (S, G) entries
```

```
(*, 224.2.2.9)
```

```
Protocol: pim-dm, Flag: WC
```

```
UpTime: 00:03:30
```

```
Upstream interface: NULL
```

```
Upstream neighbor: NULL
```

```
RPF prime neighbor: NULL
```

```
Downstream interface information:
```

```
Total number of downstream interfaces: 1
```

```
1: Vlan-interface201
```

```
Protocol: igmp, UpTime: 00:03:30, Expires: -
```

```
(*, 224.2.2.17)
```

```
Protocol: pim-dm, Flag: WC
```

```
UpTime: 00:00:32
```

```
Upstream interface: NULL
```

```
Upstream neighbor: NULL
```

```
RPF prime neighbor: NULL
```

```
Downstream interface information:
```

```
Total number of downstream interfaces: 1
```

```
1: Vlan-interface201
```

```
Protocol: igmp, UpTime: 00:00:32, Expires: -
```

```
(*, 239.255.255.250)
```

```
Protocol: pim-dm, Flag: WC
```

```
UpTime: 00:03:36
```

```
Upstream interface: NULL
```

```

Upstream neighbor: NULL
RPF prime neighbor: NULL
Downstream interface information:
Total number of downstream interfaces: 1
1: Vlan-interface201
Protocol: igmp, UpTime: 00:03:36, Expires: -

```

(3) 1/0/1口和1/0/2口均是处于STP的Forwarding转发状态的，而且连接组播源的G1/0/1口下有组播包计数：

```

GigabitEthernet1/0/7
Current state: UP
Line protocol state: UP
Input (total): 124097622173 packets, 169020955287638 bytes
5005 unicasts, 48 broadcasts, 124097617106 multicasts, 0 pauses

```

(4) 查看现场设备配置也并未发现问题：

```

interface Vlan-interface201 //接收者所在的vlan为201，对应vlan接口下开启IGMP协议
ip address 172.18.0.1 255.255.252.0
igmp enable
#
multicast routing
#
interface Vlan-interface203 //组播源的网关接口下开启PIM路由协议
ip address 10.10.10.1 255.255.255.0
pim dm

```

(5) 经过以上步骤排查后，并未发现什么异常，现场目前主要的问题是，组播源无法加入组播路由表。正常情况下，组播源发组播源网关接口上以后，组播路由设备应该就能正常加表了。于是我们进行抓包分析，发现组播源侧，确实发送了许多组播数据报文，但是设备收到后为什么不将组播源地址加表呢？

Time	Source	Destination	Protocol
19 2019-07-09 14:23:00.435376000	10.10.10.20	224.2.2.43	MPEG TS
20 2019-07-09 14:23:00.435499000	10.10.10.20	224.2.2.3	MPEG TS
21 2019-07-09 14:23:00.435618000	10.10.10.20	224.2.2.54	MPEG TS
22 2019-07-09 14:23:00.435746000	10.10.10.20	224.2.2.40	MPEG TS
23 2019-07-09 14:23:00.435747000	10.10.10.20	224.2.2.50	MPEG TS
24 2019-07-09 14:23:00.435956000	10.10.10.20	224.2.2.4	MPEG TS
25 2019-07-09 14:23:00.436292000	10.10.10.20	224.2.2.29	MPEG TS
26 2019-07-09 14:23:00.436418000	10.10.10.20	224.2.2.25	MPEG TS
27 2019-07-09 14:23:00.436419000	10.10.10.20	224.2.2.40	MPEG TS
28 2019-07-09 14:23:00.436534000	10.10.10.20	224.2.2.43	MPEG TS
29 2019-07-09 14:23:00.436534000	10.10.10.20	224.2.2.3	MPEG TS
30 2019-07-09 14:23:00.436535000	10.10.10.20	224.2.2.26	MPEG TS
31 2019-07-09 14:23:00.436772000	10.10.10.20	224.2.2.47	MPEG TS
32 2019-07-09 14:23:00.436951000	10.10.10.20	224.2.2.4	MPEG TS
33 2019-07-09 14:23:00.437223000	10.10.10.20	224.2.2.29	MPEG TS

于是我们继续分析抓包报文中的内容，发现组播源发送的所有组播报文中，携带的TTL数值均为0。由于TTL数值，每经过一个三层设备转发，都会进行减1操作，当三层设备收到TTL值为0的报文时，会将报文直接进行丢弃，进而不再进行处理。

```

12 2019-07-09 14:23:00.434293000 10.10.10.20 224.2.2.25 MPEG TS

```

```

> Frame 12: 1362 bytes on wire (10896 bits), 1358 bytes captured (10864 bits)
> Ethernet II, Src: Shenzhen_06:5d:cc (28:51:32:06:5d:cc), Dst: IPv4mcast_02:02:19 (01:00:5e:02:02:19)
< Internet Protocol Version 4, Src: 10.10.10.20, Dst: 224.2.2.25
  0100 ... = Version: 4
  ... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 1344
    Identification: 0x33af (13231)
  > Flags: 0x02 (Don't Fragment)
    Fragment offset: 0
    Time to live: 0 ← TTL值
    Protocol: UDP (17)
    Header checksum: 0x4bc5 [validation disabled]
    [Header checksum status: Unverified]
    Source: 10.10.10.20
    Destination: 224.2.2.25
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
  > User Datagram Protocol, Src Port: 10000, Dst Port: 5001
  > ISO/IEC 13818-1 PID=0x121 CC=10
  Reassembled in: 114

```

根据分析的情况，协调现场的组播源服务器进行确认发包的TTL数值，发现其设置值确实为0，后续让现场调整组播源的TTL为256后，组播业务正常，组播源加表正常，问题解决。

解决方法

根据分析的情况，协调现场的组播源服务器进行确认发包的TTL数值，发现其设置值确实为0，后续让现场调整组播源的TTL为256后，组播业务正常，组播源加表正常，问题解决。

对于我们日常使用的组播软件，以VLC组播软件为例，在session选项下，新建组播会话时，有个TTL值选项，建议直接配置为最大值256使用。

