

问题描述

现场问题:

现场采用AD Campus分布式网关部署方案组网, S12508X-AF角色为spine、向下直联S5560X-30C-EI (堆叠)角色为leaf, 网络中存在哑终端Ping 网关地址出现丢包问题、但是在同一网段下的电脑ping网关不丢包、哑终端与电脑互Ping不丢包。

问题分析:

1、首先判断哑终端Ping报文是否到达了网关?

因为采用了Vxlan分布式网关的结构VSI网关接口位于leaf设备, 在leaf设备上开启debug ip icmp发现电脑ping网关可以被debug到, 但是哑终端ping网关没有被debug到, 怀疑哑终端ping报文没有达到设备。

使用电脑Ping网关返回的debug信息:

ICMP Input:

```
ICMP Packet: src = 10.14.198.100, dst = 10.14.198.254
             type = 8, code = 0 (echo)
```

*Mar 18 18:34:03:860 2013 DQJ-JR-4F-R SOCKET/7/ICMP:

ICMP Output:

```
ICMP Packet: src = 10.14.198.254, dst = 10.14.198.100
             type = 0, code = 0 (echo-reply)
```

2、通过流量统计确认哑终端报文是否到达设备?

```
acl advanced 3900
```

```
rule 0 permit icmp source 10.14.198.2 0 destination 10.14.198.254 0
#
```

```
acl advanced 3901
```

```
rule 0 permit icmp source 10.14.198.254 0 destination 10.14.198.2 0
#
```

```
traffic classifier classifier_1 operator and
if-match acl 3900
```

```
#
```

```
traffic classifier classifier_2 operator and
if-match acl 3901
```

```
#
```

```
traffic behavior behavior_1
accounting packet
```

```
#
```

```
traffic behavior behavior_2
accounting packet
```

```
#
```

```
qos policy policy_in
```

```
classifier classifier_1 behavior behavior_1
```

```
#
```

```
qos policy policy_out
```

```
classifier classifier_2 behavior behavior_2
```

发现连接哑终端接口有收包但是没有发包, 确认哑终端报文已上送至设备。

```
[DQJ-JR-4F-R]dis qos policy interface GigabitEthernet 2/0/16
```

```
Interface: GigabitEthernet2/0/16
```

```
Direction: Inbound
```

```
Policy: policy_in
```

```
Classifier: classifier_1
```

```
Operator: AND
```

```
Rule(s) :
```

```
If-match acl 3900
```

```
Behavior: behavior_1
```

```
Accounting enable:
```

```
10 (Packets)
```

```
Interface: GigabitEthernet2/0/16
```

```
Direction: Outbound
```

```
Policy: policy_out
```

```
Classifier: classifier_2
```

```
Operator: AND
Rule(s) :
If-match acl 3901
Behavior: behavior_2
Accounting enable:
0 (Packets)
```

3、在leaf设备上的MAC信息及ARP信息:

```
[H3C]dis l2vpn mac-address | include 3099
```

```
1865-717e-3099 Mac-auth vsi3523          GE2/0/16    NotAging
```

```
[H3C]dis arp | include 10.14.198.
```

IP address	MAC address	VID	Interface/Link ID	Aging Type	
10.14.198.2	1865-717e-3099 25	1		584 D	\\哑终端
10.14.198.100	6045-cb2b-de04 25	0		1196 D	\\电脑

看到哑终端和电脑所携带的VSI ID不同, 进一步在哑终端抓包确认数据:

从抓包内容看设备Ping 10.14.198.2时, 源MAC地址为0000-0000-0198, 但是回应的目的MAC地址却是ac74-09ba-4e01?

反查leaf设备vsi 3523接口MAC地址, 发现发起MAC地址为0000-0000-0198没有问题, 但是客户端回应MAC地址为spine设备vsi接口的MAC地址。

```
interface Vsi-interface3523
ip binding vpn-instance vpn-default
ip address 10.14.198.254 255.255.255.0
mac-address 0000-0000-0198
local-proxy-arp enable
```

查看Spine设备vsi 3523接口MAC地址:

```
[H3C-S12508X-AF]dis int vsi 3523
Vsi-interface3523
Current state: UP
Line protocol state: UP
Description: Vsi-interface3523 Interface
Bandwidth: 1000000 kbps
Maximum transmission unit: 1500
Internet address: 10.14.198.254/24 (primary)
IP packet frame type: Ethernet II, hardware address: ac74-09ba-4e01
```

至此问题可以判断应该是哑终端学习到了Spine设备的arp导致的丢包, 那么为什么网关分布式部署情况下会出现arp学习错误问题呢?

此时注意到在DR2000上看到下发Spine配置出现错误, 于是手动下发配置至Spine。

```
[H3C-Vsi-interface3523]mac-address 0000-0000-0198
```

Not enough resources to complete the operation. 提示资源不足

查询设备日志后发现根因, 原因就是设备只能支持VSI接口最大配置16个MAC地址:

```
%Jul 16 19:06:38:569 2019 H3C DRVPLAT/3/VxlanErr: vsi-intf mac support only 8 for F-series module or 16 for H-series module.
```

现场设备刚好已经配置了16个MAC地址, 所有导致了VSI接口没有足够资源配置MAC地址。

```
[H3C]dis cu | in mac-address
irf mac-address persistent always
mac-address 0000-0000-0182
mac-address 0000-0000-0200
mac-address 0000-0000-0204
mac-address 0000-0000-0183
mac-address 0000-0000-0184
mac-address 0000-0000-0185
mac-address 0000-0000-0186
mac-address 0000-0000-0187
mac-address 0000-0000-0188
mac-address 0000-0000-0189
mac-address 0000-0000-0193
mac-address 0000-0000-0190
mac-address 0000-0000-0191
mac-address 0000-0000-0192
mac-address 0000-0000-0001
mac-address 0000-0000-1424
```

解决方法

分布式网关场景下一般VSI接口MAC地址只需要配置相同即可, 现场设备无特殊应用环境需要MAC地址不同, 因此手动修改Vsi-interface3524接口MAC地址后问题解决。

1、修改Spine设备上配置VSI接口MAC为0000-0000-0001。

```
interface Vsi-interface3523
ip binding vpn-instance vpn-default
ip address 10.14.198.254 255.255.255.0
mac-address 0000-0000-0001
local-proxy-arp enable
distributed-gateway local
```

2、修改leaf设备上MAC地址为0000-0000-0001。

```
interface Vsi-interface3523
ip binding vpn-instance vpn-default
ip address 10.14.198.254 255.255.255.0
mac-address 0000-0000-0001
local-proxy-arp enable
```

需要注意：

DR2000 AD Campus方案中二层网络域无法直接修改MAC，只能删除重新创建再下发。