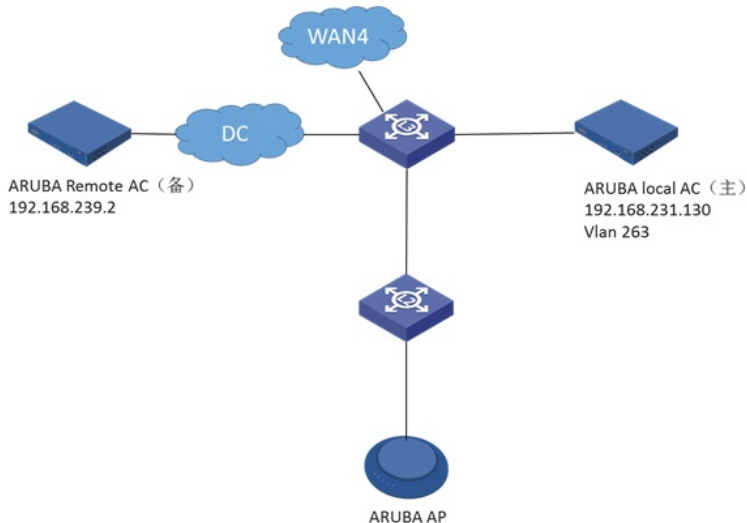


组网及说明



拓扑如上。

问题描述

ARUBA的AP不定期在主备AC之间切换，其间经过我们的二三层交换机，并且主AC上有心跳丢失的日志。

其中AP与local AC二层注册（vlan 263），AP与remote AC三层注册。S5120-SI作为二层交换机接入，图中省略了5120下挂的PoE交换机。

客户反馈WAN 4是新增线路，故障现象从WAN 4打开后开始出现，如果关闭WAN 4口，没有任何问题出现

过程分析

现场怀疑是L3交换机上有丢包，故障时直接在连AP的口进行了抓包操作，对抓包文件分析如下：

1. 下图主AC与192.168.231.165的AP的正常交互如红框。AC收到AP的PAPI（ARUBA的控制报文）报文后，更新了一次ARP表，随后进行回应。同理收到192.168.231.166的AP发过来的PAPI后，也进行了ARP请求，（抓包中所有AP与AC间交互PAPI时都会请求刷新一次ARP，怀疑是ARUBA本身的机制），但是并未收到响应，No.83104。0.2s后AC再次进行了ARP请求，No.83333，还是未收到响应

| | | | | | | |
|-------|-----------|-------------------|--------------------|--------|-----|---|
| 82942 | 70.626544 | 192.168.231.165 | 192.168.231.130 | PAPI | 144 | PAPI - Aruba AP Control Protocol |
| 82945 | 70.627652 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.165? Tell 192.168.231.130 |
| 82983 | 70.650477 | 7c:57:3c:cc:33:60 | ArubaNet_05:7e:20 | ARP | 60 | 192.168.231.165 is at 7c:57:3c:cc:33:60 |
| 82984 | 70.650643 | 192.168.231.130 | 192.168.231.165 | PAPI | 170 | PAPI - Aruba AP Control Protocol |
| 83102 | 70.756034 | 192.168.231.166 | 192.168.231.130 | PAPI | 627 | PAPI - Aruba AP Control Protocol |
| 83104 | 70.759155 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.166? Tell 192.168.231.130 |
| 83155 | 70.804932 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 929 | QoS Data, SN=3125, FN=0, Flags=p..R..T |
| 83156 | 70.804932 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 128 | QoS Data, SN=3126, FN=0, Flags=p..R..T |
| 83168 | 70.819207 | I-0Data_8f:0a:18 | Hangzhou_46:ac:... | 802.11 | 148 | QoS Data, SN=75, FN=0, Flags=p.....T |
| 83299 | 70.935521 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 128 | QoS Data, SN=3127, FN=0, Flags=p.....T |
| 83333 | 70.963979 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.193? Tell 192.168.231.130 |

2. ARP请求这一过程持续了多次，期间AP也有试图与AC进行GRE、PAPI报文的交互，但是都未收到AC的响应（按ARUBA提供的信息GRE是心跳报文、PAPI是控制报文）

| | | | | | | |
|-------|-----------|-------------------|--------------------|--------|-----|--|
| 84378 | 71.758555 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.166? Tell 192.168.231.130 |
| 84516 | 71.832906 | I-0Data_8f:0a:18 | Hangzhou_46:ac:... | 802.11 | 148 | QoS Data, SN=76, FN=0, Flags=p.....T |
| 84650 | 71.963714 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.193? Tell 192.168.231.130 |
| 84811 | 72.091137 | I-0Data_8f:0b:3d | Hangzhou_46:ac:... | 802.11 | 148 | QoS Data, SN=202, FN=0, Flags=p.....T |
| 84997 | 72.208463 | 192.168.231.166 | 192.168.231.130 | GRE | 102 | Encapsulated ARUBA WLAN |
| 85018 | 72.223421 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 156 | QoS Data, SN=3132, FN=0, Flags=p..R..T |
| 85039 | 72.243527 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 156 | QoS Data, SN=3133, FN=0, Flags=p..R..T |
| 85086 | 72.288203 | ArubaNet_05:7e:20 | Spanning-tree(... | STP | 60 | RST. Root = 32768/0/00:1a:1e:05:7e:20 Cost = 0 |
| 85154 | 72.342402 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 664 | QoS Data, SN=3134, FN=0, Flags=p.....T |
| 85218 | 72.396023 | I-0Data_8f:0a:9e | Hangzhou_46:ac:... | 802.11 | 159 | QoS Data, SN=2293, FN=0, Flags=p.....T |
| 85518 | 72.692042 | I-0Data_8f:0a:9e | Hangzhou_46:ac:... | 802.11 | 159 | QoS Data, SN=2294, FN=0, Flags=p.....T |
| 85566 | 72.732482 | I-0Data_8f:0a:c6 | Hangzhou_46:ac:... | 802.11 | 128 | QoS Data, SN=3135, FN=0, Flags=p.....T |
| 85617 | 72.758696 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.166? Tell 192.168.231.130 |
| 85810 | 72.900813 | 192.168.231.166 | 192.168.231.130 | PAPI | 460 | PAPI - Aruba AP Control Protocol |
| 85811 | 72.900829 | 192.168.231.166 | 192.168.231.130 | PAPI | 222 | PAPI - Aruba AP Control Protocol |
| 85870 | 72.963306 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | who has 192.168.231.193? Tell 192.168.231.130 |

3. 经过10s，按照0.2s发一次ARP-req算就是发了50个包，抓到了.166故障AP的ARP-reply。同时A

P向AC发起的多次ICMP探测均失败。怀疑ICMP探测时AC上的ARP仍未更新

| | | | | | | |
|-------|-----------|--------------------|-------------------|--------|-----|--|
| 94198 | 80.670761 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | Who has 192.168.231.166? Tell 192.168.231.130 |
| 94214 | 80.682065 | 7c:57:3c:cc:32:8e | ArubaNet_05:7e:20 | ARP | 60 | 192.168.231.166 is at 7c:57:3c:cc:32:8e |
| 94215 | 80.682174 | I-0Data0_8f:0a:1b4 | Broadcast | 802.11 | 162 | Data, SN=0, FN=0, Flags=p....F. |
| 94216 | 80.682336 | 192.168.231.166 | 192.168.231.130 | ICMP | 190 | Destination unreachable (Protocol unreachable) |
| 94273 | 80.743946 | I-0Data0_8f:0b:b7 | Broadcast | 802.11 | 164 | Data, SN=0, FN=0, Flags=p....F. |
| 94275 | 80.744111 | Buffalo_46:1b:d6 | Broadcast | 802.11 | 164 | Data, SN=0, FN=0, Flags=p....F. |
| 94276 | 80.744111 | 192.168.231.166 | 192.168.231.130 | ICMP | 192 | Destination unreachable (Protocol unreachable) |
| 94277 | 80.744112 | 192.168.231.166 | 192.168.231.130 | ICMP | 192 | Destination unreachable (Protocol unreachable) |
| 94316 | 80.770692 | I-0Data0_8f:08:42 | Broadcast | 802.11 | 182 | Data, SN=0, FN=0, Flags=p....F. |
| 94317 | 80.770661 | 192.168.231.166 | 192.168.231.130 | ICMP | 210 | Destination unreachable (Protocol unreachable) |
| 94329 | 80.782294 | I-0Data0_8f:0a:13 | Broadcast | 802.11 | 162 | Data, SN=0, FN=0, Flags=p....F. |
| 94330 | 80.782294 | 192.168.231.166 | 192.168.231.130 | ICMP | 190 | Destination unreachable (Protocol unreachable) |
| 94333 | 80.783595 | Hangzhou_46:ac:fa | I-0Data0_8f:0a:13 | 802.11 | 134 | QoS Data, SN=0, FN=0, Flags=p....F. |
| 94334 | 80.783596 | 192.168.231.166 | 192.168.231.130 | ICMP | 162 | Destination unreachable (Protocol unreachable) |

4. 多次ICMP探测失败后，.166故障AP最终与backup AC建立控制隧道进行交互，注册到远端

| | | | | | | |
|-------|-----------|-------------------|-------------------|--------|------|--|
| 94330 | 80.782294 | 192.168.231.166 | 192.168.231.130 | ICMP | 190 | Destination unreachable (Protocol unreachable) |
| 94333 | 80.783595 | Hangzhou_46:ac:fa | I-0Data0_8f:0a:13 | 802.11 | 134 | QoS Data, SN=0, FN=0, Flags=p....F. |
| 94334 | 80.783596 | 192.168.231.166 | 192.168.231.130 | ICMP | 162 | Destination unreachable (Protocol unreachable) |
| 94484 | 80.925026 | 192.168.231.166 | 192.168.231.130 | PAPI | 307 | PAPI - Aruba AP Control Protocol |
| 94563 | 81.002885 | 192.168.231.166 | 192.168.231.130 | PAPI | 299 | PAPI - Aruba AP Control Protocol |
| 94564 | 81.003187 | 192.168.231.166 | 192.168.231.130 | PAPI | 1182 | PAPI - Aruba AP Control Protocol |
| 94587 | 81.027249 | 192.168.231.166 | 192.168.239.2 | PAPI | 318 | PAPI - Aruba AP Control Protocol |
| 94589 | 81.027884 | ArubaNet_05:7e:20 | Broadcast | ARP | 56 | Who has 192.168.231.202? Tell 192.168.231.130 |
| 94594 | 81.030184 | 192.168.239.2 | 192.168.231.166 | PAPI | 192 | PAPI - Aruba AP Control Protocol |

通过上述抓包分析可以推测出大概原因：

1. ARUBA AC的ARP老化时间可能较短
2. 每次ARUBA AC应答AP的心跳或控制报文时需要先更新ARP（也可能是先探测一下AP还在不在）

ARP更新失败导致AC无法应答AP发过来的心跳报文。

问题转向怀疑为什么从下行口广播了ARP-req后，经过10s才收到响应。继续向下排查L2交换机。检查L2交换机（S5120-SI）上和arp相关的配置如下：

```
#
vlan 1143
  arp snooping enable
#
vlan 361
  arp snooping enable
#
.....
```

所有无线用户vlan内都使能了arp snooping，但是vlan 263（AC-AP管理vlan）内没有任何arp相关配置，讲道理263内的arp广播应该不受影响。

经确认配置arp snooping enable后，vlan内收到的所有arp报文（包括路过的）都会上送CPU处理。通过debug softcar rxtx 29发现设备的arp softcar只有100 pps，怀疑是arp上送CPU超速丢弃。进一步确认发现S5120SI使用的是Marvell 2代的芯片，该芯片无法区分vlan信息，所以不管哪个vlan下配置了arp snooping，其他vlan内上来的arp都会上送到CPU，至此问题基本定位。

结合客户反馈的WAN 4口开启后才会出现故障，检查L3交换机WAN 4口的配置，发现该口被划到了vlan 263，同时wan 4口开启时抓包发现有大量arp广播进来，符合上面arp超限速的分析。

解决方法

将S5120-SI上全部vlan内的arp snooping配置删掉

```
#
vlan 1143
  arp snooping enable (undo)
#
vlan 361
  arp snooping enable (undo)
#
```