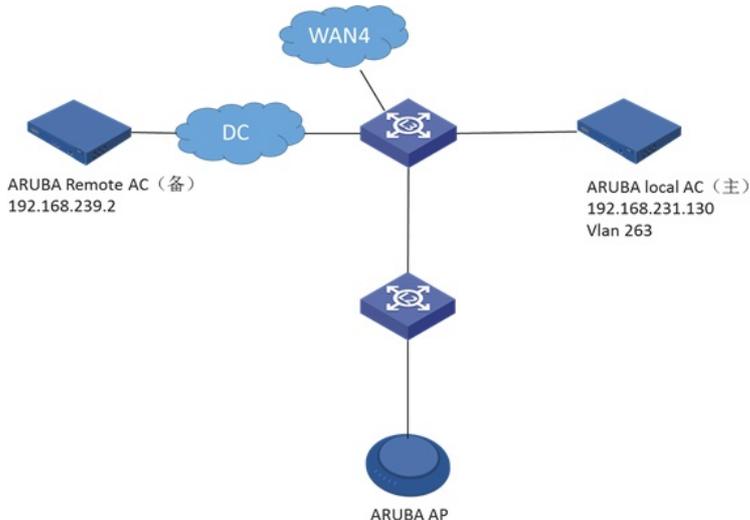


组网及说明



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:14	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)
#
```