终端DHCP地址偶发性获取异常

DHCP/DHCP Relay　柳志翔　2023-09-27 发表

组网及说明

核心连接POE交换机，POE交换机连接终端。

告警信息

终端偶发性无法通过DHCP获取地址。

问题描述

终端偶发性无法通过DHCP获取地址。

过程分析

在无法获取地址终端进行抓包发现有大量的源地址为DHCP服务器，目的地址为255的offer报文

```
.641914                    255.255.255.255          DHCP    0x63a3 (25507)
.641914                    255.255.255.255          DHCP    0x63a3 (25507)
.641914                    255.255.255.255          DHCP    0x63a3 (25507)
.641914                    255.255.255.255          DHCP    0x63a3 (25507)
.642346                    255.255.255.255          DHCP    0x63a3 (25507)
.642346                    255.255.255.255          DHCP    0x63a3 (25507)
```

```
Dynamic Host Configuration Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xd05c6dd1
    Seconds elapsed: 0
  ⌄ Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
      .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0
```

后面又发现有很多终端发送的都为DHCP request 中的broadcast位置为1。

```
2.126016    0.0.0.0    255.255.255.255    DHCP    0x0000 (0)
2.262888    0.0.0.0    255.255.255.255    DHCP    0x0000 (0)
2.324433    0.0.0.0    255.255.255.255    DHCP    0x0000 (0)
2.422068    0.0.0.0    255.255.255.255    DHCP    0x0000 (0)
```

```
> Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
> User Datagram Protocol, Src Port: 68, Dst Port: 67
⌄ Dynamic Host Configuration Protocol (Request)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0xc7490943
  > Seconds elapsed: 2
  ⌄ Bootp flags: 0x8000, Broadcast flag (Broadcast)
      1... .... .... .... = Broadcast flag: Broadcast
```

如果在DHCP Discovery / Request报文的Flags里明确告知服务器，通过设置“BROADCAST flag = 1”，服务器就广播来和客户端通信。

如果设置“BROADCAST flag = 0”，服务器就使用单播来和客户端通信。

```
===============display mac-address mac-move===============
122   XGE2/0/0/9   XGE2/0/0/10   2023-09-04 18:55:20   2
122   XGE2/0/0/9   XGE2/0/0/10   2023-09-06 09:25:40   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-05 15:31:36   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-06 09:53:09   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-05 14:05:10   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-06 09:50:58   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-05 16:10:03   4
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-06 11:07:00   2
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-06 09:53:04   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-06 09:51:05   2
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-05 17:40:21   1
126   XGE2/0/0/13   XGE2/0/0/12   2023-09-05 18:08:07   1
126   XGE2/0/0/12   XGE2/0/0/13   2023-09-05 15:33:28   1
```

抓包查看有大量的DHCP广播报文，怀疑网络中有环路，在核心上查看也有MAC地址漂移，需要进行环路排查。

解决方法

排除环路后广播报文减少，可以正常获取到IP地址。