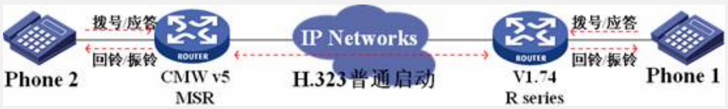
MSR系列路由器和v1.74 R系列路由器H323普通启动互通摘机无声音的经验案例

丘子隽 2008-04-23 发表

MSR系列路由器
和v1.74 R系列路由器H323普通启动互通摘机无声音的经验案例

一、组网和配置：

MSR和R路由器各挂一个话机，使用H323作为VoIP信令：



MSR配置

```
#
interface GigabitEthernet0/0
 port link-mode route
 ip address 10.153.43.118 255.255.255.0
#
voice-setup
 #
 dial-program
  #
  // 指向R路由器的VoIP实体1
  entity 1 voip
   address ip 10.153.43.254
   match-template 1
  #
  // 指向本地的Pots实体2
  entity 2 pots
   line 6/0
   match-template 2
 #
```

R路由器配置

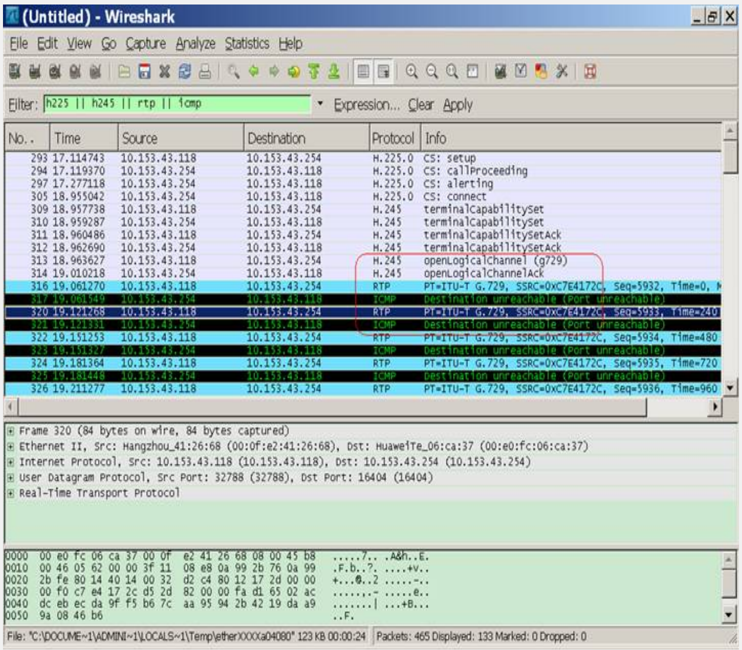
```
 !
 interface Ethernet0
  ip address 10.153.43.254 255.255.255.0
 !
 voice-setup
  !
  dial-program
   !
   // 本地Pots实体1
   entity 1 pots
    match-template 1
    line 1
   !
   // 指向MSR的VoIP实体2
   entity 2 voip
    address ip 10.153.43.118
    match-template 2
   !
```

二、问题描述：

无论Phone1呼叫Phone2还是Phone2呼叫Phone1，回铃音和振铃音都正常，被叫摘机后主叫和被叫都无法听到对方声音。

三、过程分析：

经过IP侧抓包分析，发现双方在打开逻辑通道后，只有MSR往R发送的RTP包，而没有R往MSR发送的RTP包，而且R路由器收到MSR发送的RTP包后向MSR发ICMP Destination Port Unreachable错误：


(Untitled) - Wireshark
File Edit View Go Capture Analyze Statistics Help
Filter:
Expression... Clear Apply

```
h225 || h245 || rtp || icmp
```

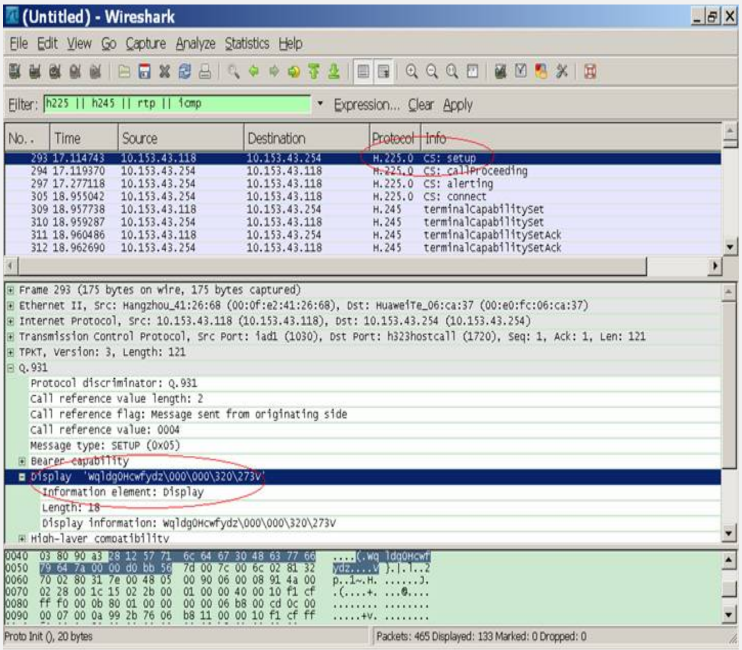
```
No. .  Time       Source          Destination     Protocol  Info
  293 17.114743  10.153.43.118   10.153.43.254   H.225.0   CS: setup
  294 17.119370  10.153.43.254   10.153.43.118   H.225.0   CS: callProceeding
  297 17.277118  10.153.43.254   10.153.43.118   H.225.0   CS: alerting
  305 18.955042  10.153.43.254   10.153.43.118   H.225.0   CS: connect
  309 18.957738  10.153.43.118   10.153.43.254   H.245     terminalCapabilitySet
  310 18.959287  10.153.43.254   10.153.43.118   H.245     terminalCapabilitySet
  311 18.960486  10.153.43.118   10.153.43.254   H.245     terminalCapabilitySetAck
  312 18.962690  10.153.43.254   10.153.43.118   H.245     terminalCapabilitySetAck
  313 18.963627  10.153.43.118   10.153.43.254   H.245     openLogicalChannel (g729)
  314 19.010218  10.153.43.254   10.153.43.118   H.245     openLogicalChannelAck
  316 19.061270  10.153.43.118   10.153.43.254   RTP       PT=ITU-T G.729, SSRC=0xC7E4172C, Seq=5932, Time=0, M
  317 19.061549  10.153.43.254   10.153.43.118   ICMP      Destination unreachable (Port unreachable)
  320 19.121268  10.153.43.118   10.153.43.254   RTP       PT=ITU-T G.729, SSRC=0xC7E4172C, Seq=5933, Time=240
  321 19.121331  10.153.43.254   10.153.43.118   ICMP      Destination unreachable (Port unreachable)
  322 19.151253  10.153.43.118   10.153.43.254   RTP       PT=ITU-T G.729, SSRC=0xC7E4172C, Seq=5934, Time=480
  323 19.151327  10.153.43.254   10.153.43.118   ICMP      Destination unreachable (Port unreachable)
  324 19.181364  10.153.43.118   10.153.43.254   RTP       PT=ITU-T G.729, SSRC=0xC7E4172C, Seq=5935, Time=720
  325 19.181448  10.153.43.254   10.153.43.118   ICMP      Destination unreachable (Port unreachable)
  326 19.211277  10.153.43.118   10.153.43.254   RTP       PT=ITU-T G.729, SSRC=0xC7E4172C, Seq=5936, Time=960
```

```
⊞ Frame 320 (84 bytes on wire, 84 bytes captured)
⊞ Ethernet II, Src: Hangzhou_41:26:68 (00:0f:e2:41:26:68), Dst: HuaweiTe_06:ca:37 (00:e0:fc:06:ca:37)
⊞ Internet Protocol, Src: 10.153.43.118 (10.153.43.118), Dst: 10.153.43.254 (10.153.43.254)
⊞ User Datagram Protocol, Src Port: 32788 (32788), Dst Port: 16404 (16404)
⊞ Real-Time Transport Protocol
```

```
0000  00 e0 fc 06 ca 37 00 0f  e2 41 26 68 08 00 45 b8   .....7.. .A&h..E.
0010  00 46 05 62 00 00 3f 11  08 e8 0a 99 2b 76 0a 99   .F.b..?. ....+v..
0020  2b fe 80 14 40 14 00 32  d2 c4 80 12 17 2d 00 00   +...@..2 .....-..
0030  00 f0 c7 e4 17 2c d5 2d  82 00 00 fa d1 65 02 ac   .....,.- .....e..
0040  dc eb ec da 9f f5 b6 7c  aa 95 94 2b 42 19 da a9   .......| ...+B...
0050  9a 08 46 b6                                        ..F.
```

```
File: "C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\etherXXXXa04080" 123 KB 00:00:24   Packets: 465 Displayed: 133 Marked: 0 Dropped: 0
```

再经过仔细比对H225、H245和分析v1.74 H323实现和v5平台实现之间的区别，发现在MSR所发送的H245 Setup（作为主叫时发送）和Connect（作为被叫时发送）中的Q.931中Display字段为“**Wqldg0Hcwfydz**”而R系列路由器的Display字段为“**Vrp Gateway**”：


(Untitled) - Wireshark
File Edit View Go Capture Analyze Statistics Help
Filter:
Expression... Clear Apply

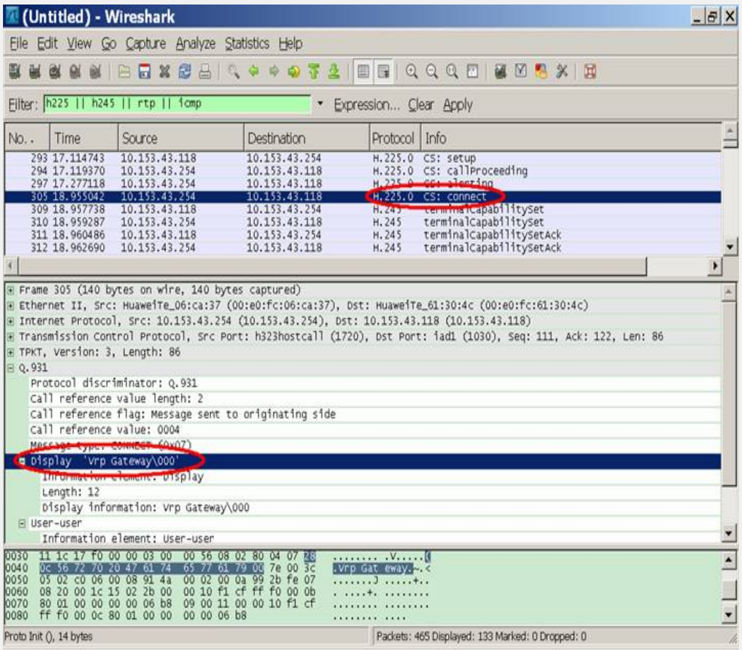
```
h225 || h245 || rtp || icmp
```

```
No. .  Time       Source          Destination     Protocol  Info
  293 17.114743  10.153.43.118   10.153.43.254   H.225.0   CS: setup
  294 17.119370  10.153.43.254   10.153.43.118   H.225.0   CS: callProceeding
  297 17.277118  10.153.43.254   10.153.43.118   H.225.0   CS: alerting
  305 18.955042  10.153.43.254   10.153.43.118   H.225.0   CS: connect
  309 18.957738  10.153.43.118   10.153.43.254   H.245     terminalCapabilitySet
  310 18.959287  10.153.43.254   10.153.43.118   H.245     terminalCapabilitySet
  311 18.960486  10.153.43.118   10.153.43.254   H.245     terminalCapabilitySetAck
  312 18.962690  10.153.43.254   10.153.43.118   H.245     terminalCapabilitySetAck
```

```
⊞ Frame 293 (175 bytes on wire, 175 bytes captured)
⊞ Ethernet II, Src: Hangzhou_41:26:68 (00:0f:e2:41:26:68), Dst: HuaweiTe_06:ca:37 (00:e0:fc:06:ca:37)
⊞ Internet Protocol, Src: 10.153.43.118 (10.153.43.118), Dst: 10.153.43.254 (10.153.43.254)
⊞ Transmission Control Protocol, Src Port: iad1 (1030), Dst Port: h323hostcall (1720), Seq: 1, Ack: 1, Len: 121
⊞ TPKT, Version: 3, Length: 121
⊟ Q.931
    Protocol discriminator: Q.931
    Call reference value length: 2
    Call reference flag: Message sent from originating side
    Call reference value: 0004
    Message type: SETUP (0x05)
  ⊞ Bearer capability
  ⊟ Display  'wqldg0Hcwfydz\000\000\320\273V'
      Information element: Display
      Length: 18
      Display information: wqldg0Hcwfydz\000\000\320\273V
  ⊞ High-layer compatibility
```

```
0040  03 80 90 a3 28 12 57 71  6c 64 67 30 48 63 77 66   ....(.wq ldg0Hcwf
0050  79 64 7a 00 00 d0 bb 56  7d 00 7c 00 6c 02 81 32   ydz....V }.|.l..2
0060  70 02 80 31 7e 00 48 05  00 90 06 00 08 91 4a 00   p..1~.H. ......J.
0070  02 28 00 1c 15 02 2b 00  01 00 00 40 00 10 f1 cf   .(....+. ...@....
0080  ff f0 00 0b 80 01 00 00  00 00 06 b8 00 cd 0c 00   ........ ........
0090  00 07 00 0a 99 2b 76 06  b8 11 00 00 10 f1 cf ff   .....+v. ........
```

```
Proto Init (), 20 bytes   Packets: 465 Displayed: 133 Marked: 0 Dropped: 0
```


(Untitled) - Wireshark
File Edit View Go Capture Analyze Statistics Help
Filter: h225 || h245 || rtp || icmp
Expression... Clear Apply

```
No. .  Time       Source           Destination      Protocol  Info
   293 17.114743  10.153.43.118    10.153.43.254    H.225.0   CS: setup
   294 17.119370  10.153.43.254    10.153.43.118    H.225.0   CS: callProceeding
   297 17.277118  10.153.43.254    10.153.43.118    H.225.0   CS: alerting
   305 18.955042  10.153.43.254    10.153.43.118    H.225.0   CS: connect
   309 18.957738  10.153.43.118    10.153.43.254    H.245     terminalCapabilitySet
   310 18.959287  10.153.43.254    10.153.43.118    H.245     terminalCapabilitySet
   311 18.960486  10.153.43.118    10.153.43.254    H.245     terminalCapabilitySetAck
   312 18.962690  10.153.43.254    10.153.43.118    H.245     terminalCapabilitySetAck

⊞ Frame 305 (140 bytes on wire, 140 bytes captured)
⊞ Ethernet II, Src: HuaweiTe_06:ca:37 (00:e0:fc:06:ca:37), Dst: HuaweiTe_61:30:4c (00:e0:fc:61:30:4c)
⊞ Internet Protocol, Src: 10.153.43.254 (10.153.43.254), Dst: 10.153.43.118 (10.153.43.118)
⊞ Transmission Control Protocol, Src Port: h323hostcall (1720), Dst Port: iad1 (1030), Seq: 111, Ack: 122, Len: 86
⊞ TPKT, Version: 3, Length: 86
⊟ Q.931
    Protocol discriminator: Q.931
    Call reference value length: 2
    Call reference flag: Message sent to originating side
    Call reference value: 0004
    Message type: CONNECT (0x07)
  ⊟ Display  'Vrp Gateway\000'
      Information element: Display
      Length: 12
      Display information: Vrp Gateway\000
  ⊟ User-user
      Information element: User-user

0030  11 1c 17 f0 00 00 03 00  00 56 08 02 80 04 07 28   ........ .V.....(
0040  0c 56 72 70 20 47 61 74  65 77 61 79 00 7e 00 3c   .Vrp Gat eway.~.<
0050  05 02 c0 06 00 08 91 4a  00 02 00 0a 99 2b fe 07   .......J .....+..
0060  08 20 00 1c 15 02 2b 00  00 10 f1 cf ff f0 00 0b   . ....+. ........
0070  80 01 00 00 00 00 06 b8  09 00 11 00 00 10 f1 cf   ........ ........
0080  ff f0 00 0c 80 01 00 00  00 00 06 b8               ........ ....

Proto Init (), 14 bytes          Packets: 465 Displayed: 133 Marked: 0 Dropped: 0
```

该字段是用于判断厂家，如果该字段一致，则认为是相同厂家设备，如果不同则认为是不同厂家设备。

基于v1.74的路由器根据厂家不同或相同会进行不同的处理：

1、如果相同则在H245协商阶段中不进行Master-Slave-Determination（主从协商），直接打开逻辑通道传输话音；

2、如果不同，则必须要等待对端发起MSD协商，只有MSD协商完毕才能打开逻辑通道；

3、无论何种条件，v1.74路由器都不会主动进行MSD协商，只会被动响应。

基于v5平台的路由器则不考虑厂家是否相同：

1、无论何种条件，v5路由器都不会主动进行MSD协商，只会被动响应。

MSD协商和开逻辑通道OLC是相互独立的，所以在该组网中v1.74在等待MSR发送MSD协商，但我司实现都不会主动发送MSD协商，所以v1.74即使对OLC进行响应依然无法正常打开RTP通道，会给MSR回目的端口不可达的ICMP错误。

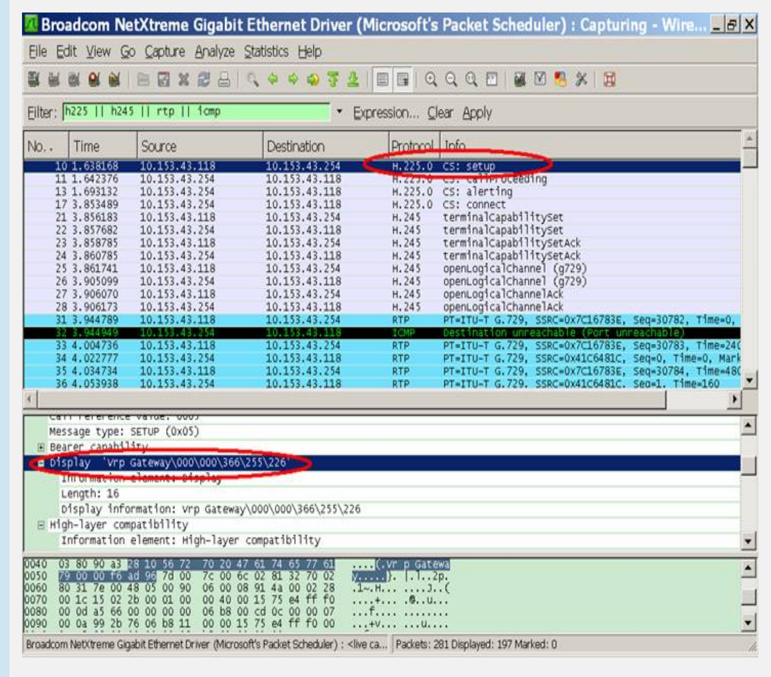
四、解决方案

在MSR上修改，使其Display和R系列一致，R路由器就不会等待MSD协商，正常打开RTP通道。

MSR配置

```
#
interface GigabitEthernet0/0
 port link-mode route
 ip address 10.153.43.118 255.255.255.0
#
voice-setup
 // 添加h323-description Vrp Gateway和R路由器保持一致
 voip h323-descriptor Vrp Gateway
 #
 dial-program
  #
   entity 1 voip
   address ip 10.153.43.254
   match-template 1
  #
  entity 2 pots
   line 6/0
   match-template 2
 #
```

再抓包看一下，MSR发送的Setup消息中Display字段和正常RTP通话过程：


Broadcom NetXtreme Gigabit Ethernet Driver (Microsoft's Packet Scheduler) : Capturing - Wire...
File Edit View Go Capture Analyze Statistics Help
Filter:
Expression... Clear Apply

Filter: h225 || h245 || rtp || icmp

```
No. .  Time      Source          Destination     Protocol Info
  10 1.638168  10.153.43.118   10.153.43.254   H.225.0  CS: setup
  11 1.642376  10.153.43.254   10.153.43.118   H.225.0  CS: callProceeding
  13 1.693132  10.153.43.254   10.153.43.118   H.225.0  CS: alerting
  17 3.853489  10.153.43.254   10.153.43.118   H.225.0  CS: connect
  21 3.856183  10.153.43.118   10.153.43.254   H.245    terminalCapabilitySet
  22 3.857682  10.153.43.254   10.153.43.118   H.245    terminalCapabilitySet
  23 3.858785  10.153.43.118   10.153.43.254   H.245    terminalCapabilitySetAck
  24 3.860785  10.153.43.254   10.153.43.118   H.245    terminalCapabilitySetAck
  25 3.861741  10.153.43.118   10.153.43.254   H.245    openLogicalChannel (g729)
  26 3.905099  10.153.43.254   10.153.43.118   H.245    openLogicalChannel (g729)
  27 3.906070  10.153.43.118   10.153.43.254   H.245    openLogicalChannelAck
  28 3.906173  10.153.43.254   10.153.43.118   H.245    openLogicalChannelAck
  31 3.944789  10.153.43.118   10.153.43.254   RTP      PT=ITU-T G.729, SSRC=0x7C16783E, Seq=30782, Time=0,
  32 3.944949  10.153.43.254   10.153.43.118   ICMP     Destination unreachable (Port unreachable)
  33 4.004736  10.153.43.118   10.153.43.254   RTP      PT=ITU-T G.729, SSRC=0x7C16783E, Seq=30783, Time=24(
  34 4.022777  10.153.43.254   10.153.43.118   RTP      PT=ITU-T G.729, SSRC=0x41C6481C, Seq=0, Time=0, Mark
  35 4.034734  10.153.43.118   10.153.43.254   RTP      PT=ITU-T G.729, SSRC=0x7C16783E, Seq=30784, Time=48(
  36 4.053938  10.153.43.254   10.153.43.118   RTP      PT=ITU-T G.729, SSRC=0x41C6481C, Seq=1, Time=160
```

```
    Message type: SETUP (0x05)
  ⊞ Bearer capability
  ⊟ Display  'Vrp Gateway\000\000\366\255\226'
      Information element: Display
      Length: 16
      Display information: Vrp Gateway\000\000\366\255\226
  ⊟ High-layer compatibility
      Information element: High-layer compatibility
```

```
0040  03 80 90 a3 28 10 56 72  70 20 47 61 74 65 77 61   ....(.Vr p Gatewa
0050  79 00 00 f6 ad 96 7d 00  7c 00 6c 02 81 32 70 02   y.....}. |.l..2p.
0060  80 31 7e 00 48 05 00 90  06 00 08 91 4a 00 02 28   .1~.H... ....J..(
0070  00 1c 15 02 2b 00 01 00  00 40 00 15 75 e4 ff f0   ....+... .@..u...
0080  00 0d a5 66 00 00 00 00  06 b8 00 cd 0c 00 00 07   ...f.... ........
0090  00 0a 99 2b 76 06 b8 11  00 00 15 75 e4 ff f0 00   ...+v... ...u....
```

Broadcom NetXtreme Gigabit Ethernet Driver (Microsoft's Packet Scheduler) : <live ca... | Packets: 281 Displayed: 197 Marked: 0