IOS PSTN入口网关到CVP (呼叫队列和收集)呼叫流的

目录

简介

思科客户语音门户(CVP)提供可通过电话访问的智能交互式语音应答(IVR)应用。有三种CVP配置类型：

- 独立服务
- CVP呼叫控制
- 呼叫队列和收集

本文档从呼叫队列和收集部署中基于H.323的IOS®入口网关的角度描述呼叫流。

在呼叫队列和收集部署中，CVP与智能联系管理(ICM)交互，以制定呼叫路由决策。ICM请求CVP为来电提供语音响应单元(VRU)处理，以便播放菜单提示和收集数字以确定要选择的技能组。当技能组已确定且技能组中的座席可用时，ICM会请求CVP通过Cisco CallManager将来电连接到座席IP电话。如果座席不可用，ICM会请求CVP提供呼叫队列处理（例如，播放通话等待音乐提示）。CVP使用VXML网关提供VRU或呼叫队列处理。

先决条件

要求

本文档没有任何特殊要求

使用的组件

本文档中的信息基于以下软件和硬件版本：

- IOS PSTN入口网关：思科2821、IOS 12.4(15)T1
- IOS网守：思科2651XM、IOS 12.4(7f)
- IOS VXML网关：思科AS5400XM、IOS 12.4(15)T1
- 思科语音门户：CVP 4.0
- 思科CallManager 5.1.2
- ASR/TTS服务器：Nuance ASR v8.5和TTS v4.0.6

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

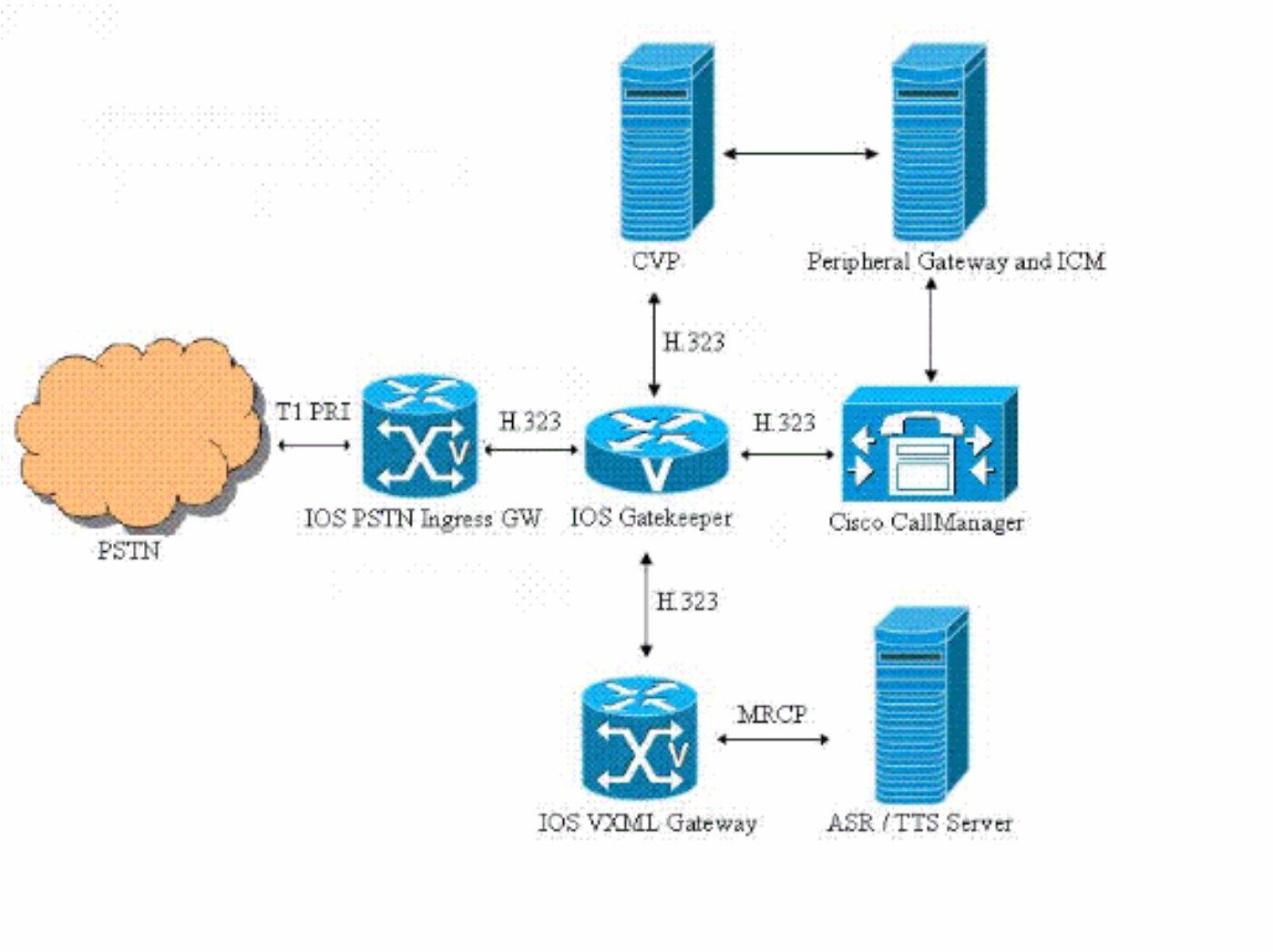
配置

本部分提供有关如何配置本文档所述功能的信息。

注意：使用命令查找工具(仅限注册客户)可查找有关本文档中使用的命令的详细信息。

网络图

本文档使用以下网络设置：



配置

本文档使用以下配置：

- 入口网关配置
- 网守配置
- VXML网关配置

入口网关配置

```
!--- Configure the IOS PSTN Ingress GW to register with
the IOS Gatekeeper. interface GigabitEthernet0/1 ip
address 14.50.201.11 255.255.255.0 h323-gateway voip
interface h323-gateway voip id IPCC-GW ipaddr
14.50.201.14 1719 h323-gateway voip h323-id PSTN-GW
h323-gateway voip bind srcaddr 14.50.201.11 !---
Configure the T1 PRI. controller T1 1/0/0 framing esf
linecode b8zs pri-group timeslots 1-24 !--- Configure
the ISDN switch type and incoming-voice under the D-
channel interface. interface Serial1/0/0:23 no ip
address encapsulation hdlc isdn switch-type primary-ni
isdn incoming-voice voice no cdp enable !--- Configure a
POTS dial-peer that will be used as inbound dial-peer
for calls !--- coming in across the T1 PRI line. dial-
peer voice 2 pots description PSTN PRI Circuit incoming
```

```
called-number . direct-inward-dial port 1/0/0:23 !--- Configure an outbound voip dial-peer to route calls to the CVP. !--- Gateway sends ARQ to Gatekeeper for call routing decision. dial-peer voice 1 voip description "To IPCC" destination-pattern 800..... session target ras tech-prefix 2# dtmf-relay rtp-nte codec g711ulaw no vad
```

网守配置

```
!--- Configure the local zones and zone prefixes. In this example, !--- VXML GW registers with Gatekeeper with Tech-Prefix 1# !--- CVP registers with Gatekeeper with Tech-Prefix 2# !--- CCM registers with CCM with Tech-Prefix 3# !--- CVP handles calls with called number in the 800555…. range !--- CCM handles calls with called numbers in the 75… range (agent dn range) !--- VXML Gateway handles calls with called numbers starting with 8001112222 (network vru label) gatekeeper zone local IPCC-GW cisco.com 14.50.201.14 zone local IPCC-VXML cisco.com zone local IPCC-CCM cisco.com zone local IPCC-CVP cisco.com zone prefix IPCC-CCM 75... zone prefix IPCC-CVP 800555.... zone prefix IPCC-VXML 8001112222* gw-type-prefix 1#* default-technology no shutdown!
```

VXML网关配置

```
!--- Define Hostname to IP Address mapping for ASR and TTS servers. ip host asrtts-en-us 14.50.201.16 !--- Define the amount of maximum memory to used for downloaded prompts. ivr prompt memory 15000 !--- Define the RTSP URI of ASR and TTS Server. ivr asr-server rtsp://asrtts-en-us/recognizer ivr tts-server rtsp://asrtts-en-us/synthesizer !--- Configure an application service for CVPError.tcl. application service cvperror flash:cvperror.tcl paramspace english language en paramspace english index 0 paramspace english location flash paramspace english prefix en !--- Configure an application service for CVP bootstrap.vxml and bootstrap.tcl. service new-call flash:bootstrap.vxml paramspace english language en paramspace english index 0 paramspace english location flash paramspace english prefix en ! service bootstrap flash:bootstrap.tcl paramspace english language en paramspace english index 0 paramspace english location flash paramspace english prefix en !--- Configure an application service for CVP handoff.tcl. service handoff flash:handoff.tcl paramspace english language en paramspace english index 0 paramspace english location flash paramspace english prefix en !--- Specify that the Gateway's RTP stream to the ASR / TTS to go around the !--- Content Service Switch instead of through the CSS. mrcp client rtpsetup enable !--- Specify the maximum memory size for the HTTP Client Cache. http client cache memory pool 15000 !--- Specify the maximum number of file that can be stored in the HTTP Client Cache. http client cache memory file 500 !--- Disable Persistent HTTP Connections. no http client connection persistent !--- Configure the VXML GW to register with the IOS Gatekeeper. interface GigabitEthernet0/0 ip address 14.50.201.15 255.255.255.0 h323-gateway voip interface h323-gateway voip id IPCC-VXML ipaddr 14.50.201.14 1719 h323-gateway voip h323-id
```

```
VXML-GW h323-gateway voip tech-prefix 1# h323-gateway
voip bind srcaddr 14.50.201.15 !--- Configure an inbound
voip dial-peer to block calls with called number !---
starting with 987654. voice translation-rule 1 rule 1
/987654/ // ! ! voice translation-profile block
translate called 1 dial-peer voice 987654 voip
description Dial-peer needed for PM Micro-App
translation-profile incoming block incoming called-
number 987654 !--- Configure a VoIP dial-peer that will
be used as inbound dial-peer for calls coming !--- in
from CVP. The "bootstrap"service is applied under this
dial-peer. !--- The "8001112222" in the destination-
pattern is the VRU label that is configured in ICM.
dial-peer voice 800 voip description ICM VRU Label
translation-profile incoming block service bootstrap
incoming called-number 8001112222T dtmf-relay rtp-nte
h245-signal h245-alphanumeric codec g711ulaw no vad
```

呼叫流示例

本节介绍此配置示例产生的呼叫流：

1. ISDN呼叫通过T1 PRI 1/0/0到达PSTN/VXML网关。
2. IOS网关将POTS拨号对等体2作为此呼叫的入站拨号对等体。
3. IOS网关将VoIP拨号对等体1作为此呼叫的出站拨号对等体。
4. IOS网关将tech-prefix "2#"预置到被叫号码，并向网守发送ARQ。
5. 网守将呼叫路由到CVP。
6. CVP应答呼叫，并在IOS入口网关和CVP之间建立RTP媒体连接。
7. CVP将新呼叫通知ICM。
8. ICM运行与此呼叫的被叫号码关联的脚本。
9. ICM请求CVP提供VRU处理以播放菜单提示(Main_Welcome_Menu.wav)并收集数字以标识技能组。1个TAC销售2ICM还将网络VRU的ICM标签(8001112222)发送到CVP。
10. CVP向网守发送ARQ请求（目的地为网络VRU标签）。
11. 网守在ACF响应中提供VXML网关的IP地址。
12. CVP向VXML网关发送H225设置，然后VXML网关建立到CVP的VXML会话。请参阅以下URL了解VXML网关和CVP，以及VXML网关和ASR/TTS服务器交互：MRCPv1MRCPv2
13. CVP通过发送H245空TCS断开其现有RTP媒体连接到入口网关。
14. CVP在入口网关和VXML网关之间建立RTP媒体连接。
15. PSTN主叫方输入数字“1”以选择“TAC”技能组。入口网关通过RTP NTE将DTMF发送到VXML网关16)VXML网关通过VXML将数字报告给CVP，然后VXML向ICM报告。
16. VXML网关通过VXML将数字报告给CVP，然后VXML再报告给ICM。
17. 然后，ICM从所选技能组中找到一个可用的座席，并通过发送座席的ICM标签(3#75001)请求CVP将呼叫路由到座席。
18. CVP断开入口网关和VXML网关之间的现有RTP媒体连接。
19. CVP向网守发送ARQ请求（目的地=代理标签）。
20. 网守在ACF响应中提供Cisco CallManager的IP地址。
21. CVP将H225设置发送到Cisco CallManager，然后Cisco CallManager将呼叫建立到座席IP电话。
22. CVP在入口网关和代理电话之间建立RTP媒体连接。
23. PSTN主叫方在完成与座席的对话后挂断呼叫。
24. 入口网关断开与CVP的呼叫，并通知网守有关呼叫终止的信息。
25. 然后，CVP断开与CCM的呼叫。

验证

使用本部分确认您的配置在IOS网守工作正常。

命令输出解释程序（仅限注册用户）(OIT) 支持某些 show 命令。使用 OIT 可查看对 show 命令输出的分析。

- **show gatekeeper endpoints**

```
GATEKEEPER ENDPOINT REGISTRATION

                    ================================

CallSignalAddr  Port  RASSignalAddr   Port  Zone Name         Type    Flags

--------------- ----- --------------- ----- ---------         ----    -----

14.50.201.11    1720  14.50.201.11    53981 IPCC-GW           VOIP-GW

    ENDPOINT-ID: 8527186C00000002  VERSION: 4  AGE: 32 secs  SupportsAnnexE: FALSE

    g_supp_prots: 0x00000050

    H323-ID: PSTN-GW

    Voice Capacity Max.=  Avail.=  Current.= 0

14.50.201.15    1720  14.50.201.15    62367 IPCC-VXML         VOIP-GW

    ENDPOINT-ID: 84DB194800000003  VERSION: 4  AGE: 27 secs  SupportsAnnexE: FALSE

    g_supp_prots: 0x00000050

    H323-ID: VXML-GW

    Voice Capacity Max.=  Avail.=  Current.= 0

172.18.110.75   1720  172.18.110.75   1719  IPCC-CVP          VOIP-GW

    ENDPOINT-ID: 84F5E78C00000001  VERSION: 5  AGE: 3 secs  SupportsAnnexE: FALSE

    g_supp_prots: 0x00000040

    H323-ID: CVP

    Voice Capacity Max.=  Avail.=  Current.= 0

172.18.110.84   43843 172.18.110.84   49600 IPCC-CCM          VOIP-GW

    ENDPOINT-ID: 852A9F2C00000004  VERSION: 5  AGE: 27 secs  SupportsAnnexE: FALSE

    g_supp_prots: 0x00000050

    H323-ID: CCM-GK-Trunk_1

    Voice Capacity Max.=  Avail.=  Current.= 0

Total number of active registrations = 4
```

- **show gatekeeper gw-type-prefix**

```
GATEWAY TYPE PREFIX TABLE

=========================
```

```
Prefix: 1#*    (Default gateway-technology)

  Zone IPCC-GW master gateway list:

    14.50.201.11:1720 PSTN-GW

  Zone IPCC-VXML master gateway list:

    14.50.201.15:1720 VXML-GW



Prefix: 2#*

  Zone IPCC-CVP master gateway list:

    172.18.110.75:1720 CVP



Prefix: 3#*

  Zone IPCC-CCM master gateway list:

    172.18.110.84:43843 CCM-GK-Trunk_1
```

使用此部分确认您的配置在IOS PSTN入口网**关上工作正常**。

- show call active voice brief

```
Call is connected to VXML Gateway



11E6 : 228 2061411860ms.1 +160 pid:2 Answer 9999 active

 dur 00:00:44 tx:1942/326256 rx:2221/354112

 Tele 1/0/0:23 (228) [1/0/0.1] tx:44300/44300/0ms g711ulaw noise:-79 acom:7
i/0:-44/-18 dBm



11E6 : 229 2061411870ms.1 +130 pid:1 Originate 2#8005555555 active

 dur 00:00:44 tx:2215/1169571516 rx:1942/310720

 IP 14.50.201.15:21134 SRTP: off rtt:0ms pl:35210/40ms lost:0/0/0 delay:55/55/65ms
g711ulaw TextRelay: off

 media inactive detected:n media contrl rcvd:n/a timestamp:n/a

 long duration call detected:n long duration call duration:n/a timestamp:n/a



Telephony call-legs: 1

SIP call-legs: 0

H323 call-legs: 1

Call agent controlled call-legs: 0
```

```
SCCP call-legs: 0

Multicast call-legs: 0

Media call-legs: 0

Total call-legs: 2
```

Call is connected to Agent IP Phone

```
11E6 : 228 2061411860ms.1 +160 pid:2 Answer 9999 active

 dur 00:01:06 tx:2848/478464 rx:3343/533632

 Tele 1/0/0:23 (228) [1/0/0.1] tx:66730/66730/0ms g711ulaw noise:-54 acom:7
i/0:-44/-44 dBm


11E6 : 229 2061411870ms.1 +130 pid:1 Originate 2#8005555555 active

 dur 00:01:06 tx:3336/1169571516 rx:2848/455680

 IP 14.50.202.26:17156 SRTP: off rtt:1ms pl:10290/0ms lost:0/0/0 delay:55/55/65ms
g711ulaw TextRelay: off

 media inactive detected:n media contrl rcvd:n/a timestamp:n/a

 long duration call detected:n long duration call duration:n/a timestamp:n/a


Telephony call-legs: 1

SIP call-legs: 0

H323 call-legs: 1

Call agent controlled call-legs: 0

SCCP call-legs: 0

Multicast call-legs: 0

Media call-legs: 0

Total call-legs: 2
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

配置IOS网关，使其在日志记录缓冲区中记录调试并禁用“日志记录控制台”。

这些命令用于配置网关，来将debug存储在网关的操作日志缓冲区中：

- service timestamps debug datetime msec
- 服务顺序
- no logging console
- logging buffered 5000000 debug
- clear log

以下是用于排除配置故障的debug命令：

注意：在使用debug命令之前，请参阅有关Debug命**令的**重要信息。

- debug isdn q931
- debug voip ccapi inout
- debug ras
- debug h225 asn1
- debug h245 asn1
- debug cch323 h225
- debug cch323 h245
- debug voip rtp session nte named-event

调试输出

此部分为此示例呼叫流提供debug输出：

1. 从PSTN到800-555-5555的来电
2. 入口网关与入站拨号对等体2匹配
3. 入口网关匹配出站拨号对等体1
4. 入口GW预置技术前缀“#2”，并向网守发送准入请求(ARQ)
5. 入口GW在POTS支路中发送ISDN呼叫进程
6. 入口GW从GK接收准入确认。目的IP地址是CVP的IP地址(172.18.110.75)
7. GW向CVP发送H225 FastStart设置消息
8. GW从CVP接收H225连接消息
9. GW向网守发送信息请求响应(IRR)
10. GW建立与CVP的H245 TCP连接，并向CVP发送终端功能集(TCS)和主从确定消息
11. GW从CVP接收TCS和MSD消息
12. 入口GW向CVP发送TCS确认和MSD确认
13. 入口网关从CVP接收TCS和MSD ACK
14. 现在，CVP将媒体连接重定向到VXML网关。入口GW从CVP接收空TCS
15. 入口GW通过向CVP发送CloseLogicalChannel(CLC)关闭其逻辑信道
16. 入口GW向CVP发送TCS ACK
17. 入口GW向网守发送带宽请求，以更新用于呼叫的当前带宽（零）
18. CVP通过将CLC发送到入口GW关闭其逻辑信道
19. 入口网关从CVP接收TCS和MSD。此TCS提供有关VXML网关的终端功能的信息
20. 入口网关将其TCS和MSD发送到CVP
21. 入口GW向CVP发送MSD确认和TCS确认
22. 入口GW将BRQ发送到网守，以更新用于呼叫的当前带宽(2*64=128 kbps)
23. 入口GW向CVP发送OLC请求
24. 入口GW从CVP接收OLC。CVP为RTCP连接提供VXML网关的IP地址

25. 入口GW向CVP发送OLC确认响应
26. 入口GW从CVP接收OLC Ack。CVP提供RTP连接的VXML网关的IP地址。在入口GW和VXML GW之间建立RTP连接
27. 网关检测DTMF数字“1”，并通过基于RTP NTE(RFC 2833)的DTMF中继事件将其发送到VXML GW
28. 现在，CVP将呼叫重定向到应答呼叫的座席IP电话。入口GW接收空TCS
29. 进行步骤15 - 18（未显示调试输出）
30. 入口网关从CVP接收TCS和MSD。此TCS提供有关IP电话终端功能的信息
31. 执行步骤20 - 23（未显示调试输出）
32. 入口GW从CVP接收OLC。CVP为RTCP连接提供CallManager的IP地址
33. GW向CVP发送OLC确认响应
34. GW从CVP接收OLC确认。CVP为RTP连接提供代理IP电话的IP地址。入口GW和IP电话之间的RTP连接已建立
35. 完成与座席的对话后，PSTN主叫方挂断呼叫。入口GW从PSTN接收ISDN断开
36. 入口GW通过向CVP发送H225 Release Complete消息终止IP支路上的H323呼叫
37. GW向网守发送SepserationRequest(DRQ)
38. GW和CVP之间的H245连接在交换CLC和EndSession命令后关闭

注意：由于空间限制，此部分输出中的某些行已移至第二行。

从PSTN到800-555-5555的来电

```
*Aug 17 17:21:15.777: ISDN Se1/0/0:23 Q931: RX <- SETUP pd = 8  callref = 0x0088
        Bearer Capability i = 0x8090A2
                Standard = CCITT
                Transfer Capability = Speech
                Transfer Mode = Circuit
                Transfer Rate = 64 kbit/s
        Channel ID i = 0xA98381
                Exclusive, Channel 1
        Progress Ind i = 0x8583 - Origination address is non-ISDN
        Calling Party Number i = 0x0080, '9999'
                Plan:Unknown, Type:Unknown
        Called Party Number i = 0xA1, '8005555555'
                Plan:ISDN, Type:National
*Aug 17 17:21:15.781: //-1/182F2991800A/CCAPI/cc_api_display_ie_subfields:
   cc_api_call_setup_ind_common:
   cisco-username=
   ----- ccCallInfo IE subfields -----
```

cisco-ani=9999

cisco-anitype=0

cisco-aniplan=0

cisco-anipi=0

cisco-anisi=0

dest=8005555555

cisco-desttype=2

cisco-destplan=1

cisco-rdie=FFFFFFFF

cisco-rdn=

cisco-rdntype=-1

cisco-rdnplan=-1

cisco-rdnpi=-1

cisco-rdnsi=-1

cisco-redirectreason=-1 fwd_final_type =0

final_redirectNumber =

hunt_group_timeout =0

入口网关与入站拨号对等体2匹配

*Aug 17 17:21:15.781: //-1/182F2991800A/CCAPI/cc_api_call_setup_ind_common:

Interface=0x46964DF8, Call Info(

Calling Number=9999,(Calling Name=)(TON=Unknown, NPI=Unknown, Screening=Not Screened, Presentation=Allowed),

Called Number=8005555555(TON=National, NPI=ISDN),

Calling Translated=FALSE, Subscriber Type Str=RegularLine, FinalDestinationFlag=TRUE,

Incoming Dial-peer=2, Progress Indication=ORIGINATING SIDE IS NON ISDN(3), Calling IE Present=TRUE,

Source Trkgrp Route Label=, Target Trkgrp Route Label=, CLID Transparent=FALSE), Call Id=-1

入口网关匹配出站拨号对等体1

*Aug 17 17:21:15.793: //228/182F2991800A/CCAPI/ccIFCallSetupRequestPrivate:

Interface=0x46A5D878, Interface Type=1, Destination=, Mode=0x0,

Call Params(Calling Number=9999,(Calling Name=)(TON=Unknown, NPI=Unknown, Screening=Not Screened, Presentation=Allowed),

```
   Called Number=8005555555(TON=National, NPI=ISDN), Calling Translated=FALSE,

   Subscriber Type Str=RegularLine, FinalDestinationFlag=TRUE, Outgoing Dial-peer=1,
Call Count On=FALSE,

   Source Trkgrp Route Label=, Target Trkgrp Route Label=, tg_label_flag=0,
Application Call Id=)
```

入口GW预置技术前缀“#2”，并向网守发送准入请求(ARQ)

```
*Aug 17 17:21:15.797: H225 NONSTD OUTGOING PDU ::=



value ARQnonStandardInfo ::=

    {

      sourceAlias

      {

      }

      sourceExtAlias

      {

      }

      callingOctet3a 128

      interfaceSpecificBillingId "ISDN 1/0/0:23"

      gtd '49414D2C0D0A50524E2C6973646E2A2C2C4E492A...'H

      ingressNetwork scn : NULL

    }
```

```
*Aug 17 17:21:15.797: H225 NONSTD OUTGOING ENCODE BUFFER::= 80000010A901800E18495
3444E20312F302F303A323380AC00A949414D2C0D0A50524E2C6973646E2A2C2C4E492A2A2A2C0D0A
5553492C726174652C632C732C632C310D0A5553492C6C6179312C756C61770D0A544D522C30300D0
A43504E2C30342C2C312C383030353535353535350D0A43474E2C30302C2C752C792C312C39393939
0D0A4350432C30390D0A4643492C2C2C2C2C2C2C792C0D0A4743492C313832663239393134633164
13164633830306130303137653061626138333380D0A0D0A0100

*Aug 17 17:21:15.801:

*Aug 17 17:21:15.801: RAS OUTGOING PDU ::=



value RasMessage ::= admissionRequest :

    {
```

```
requestSeqNum 15287
callType pointToPoint : NULL
callModel direct : NULL
endpointIdentifier {"84B3CC1C00000004"}
destinationInfo
{
  dialedDigits : "2#8005555555"
}
srcInfo
{
  dialedDigits : "9999",
  h323-ID : {"PSTN-GW"}
}
bandWidth 1280
callReferenceValue 67
nonStandardData
{
  nonStandardIdentifier h221NonStandard :
  {
    t35CountryCode 181
    t35Extension 0
    manufacturerCode 18
  }
  data '80000010A901800E184953444E20312F302F303A...'H
}
conferenceID '182F29914C1D11DC800A0017E0ABA838'H
activeMC FALSE
answerCall FALSE
canMapAlias TRUE
callIdentifier
{
  guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
```

```
      }
      willSupplyUUIEs FALSE
    }
```

入口GW在POTS支路中发送ISDN呼叫进程

```
*Aug 17 17:21:15.805: ISDN Se1/0/0:23 Q931: TX -> CALL_PROC pd = 8  callref = 0x8088
        Channel ID i = 0xA98381
         Exclusive, Channel 1
```

入口GW从GK接收准入确认。目的IP地址是CVP的IP地址(172.18.110.75)

```
*Aug 17 17:21:15.861: RAS INCOMING PDU ::=

value RasMessage ::= admissionConfirm :
    {
      requestSeqNum 15287
      bandWidth 1280
      callModel direct : NULL
      destCallSignalAddress ipAddress :
      {
        ip 'AC126E4B'H
        port 1720
      }
      irrFrequency 240
      nonStandardData
      {
        nonStandardIdentifier h221NonStandard :
        {
          t35CountryCode 181
          t35Extension 0
          manufacturerCode 18
        }
        data '00020180CCCC400B004100720075006E002D0050...'H
```

```
}
willRespondToIRR FALSE
uuiesRequested
{
  setup FALSE
  callProceeding FALSE
  connect FALSE
  alerting FALSE
  information FALSE
  releaseComplete FALSE
  facility FALSE
  progress FALSE
  empty FALSE
}
usageSpec
{

  {
    when
    {
      end NULL
      inIrr NULL
    }
    callStartingPoint
    {
      connect NULL
    }
    required
    {
      nonStandardUsageTypes
      {
      }
```

```
            startTime NULL
            endTime NULL
            terminationCause NULL
          }
        }
      }
    }
```

GW向CVP发送H225 FastStart设置消息

```
*Aug 17 17:21:15.865: H245 FS OLC OUTGOING PDU ::=

value OpenLogicalChannel ::=
    {
      forwardLogicalChannelNumber 1
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
          mediaControlChannel unicastAddress : iPAddress :
          {
            network '0E32C90B'H
            tsapIdentifier 18491
          }
          silenceSuppression FALSE
        }
      }
    }




*Aug 17 17:21:15.869: H245 FS OLC OUTGOING ENCODE BUFFER::=
```

```
0000000C6013800B050001000E32C90B483B00

*Aug 17 17:21:15.869:

*Aug 17 17:21:15.869: H245 FS OLC OUTGOING PDU ::=


value OpenLogicalChannel ::=

    {

      forwardLogicalChannelNumber 1

      forwardLogicalChannelParameters

      {

        dataType nullData : NULL

        multiplexParameters none : NULL

      }

      reverseLogicalChannelParameters

      {

        dataType audioData : g711Ulaw64k : 20

        multiplexParameters h2250LogicalChannelParameters :

        {

          sessionID 1

          mediaChannel unicastAddress : iPAddress :

          {

            network '0E32C90B'H

            tsapIdentifier 18490

          }

          mediaControlChannel unicastAddress : iPAddress :

          {

            network '0E32C90B'H

            tsapIdentifier 18491

          }

          silenceSuppression FALSE

        }

      }

    }
```

```
*Aug 17 17:21:15.869: H245 FS OLC OUTGOING ENCODE BUFFER::=
4000000604010040C60138012150001000E32C90B483A000E32C90B483B00

*Aug 17 17:21:15.869:

*Aug 17 17:21:15.869: //229/182F2991800A/H323/generic_send_setup:

generic_send_setup: is_overlap = 0, info_complete = 0

*Aug 17 17:21:15.869: //229/182F2991800A/H323/generic_send_setup: sending calling IE

*Aug 17 17:21:15.869: //229/182F2991800A/H323/generic_send_setup: ====== PI = 3

*Aug 17 17:21:15.869: //229/182F2991800A/H323/generic_send_setup: Send infoXCap=128,
infoXRate=16, rateMult=0, xMode=128, info_layer1_prot=163

*Aug 17 17:21:15.869: //229/182F2991800A/H323/generic_send_setup:
src address = 14.50.201.11; dest address = 172.18.110.75

*Aug 17 17:21:15.869: H225 NONSTD OUTGOING PDU ::=


value H323_UU_NonStdInfo ::=

    {
      version 2
      protoParam qsigNonStdInfo :
      {
        iei 4
        rawMesg '04038090A21803A983811E0285836C0600803939...'H
      }
      progIndParam progIndIEinfo :
      {
        progIndIE '00000003'H
      }
    }




*Aug 17 17:21:15.873: H225 NONSTD OUTGOING ENCODE BUFFER::= E00102000104230403809 0A21803
A983811E0285836C06008039393939700BA1383030353535353535350A8006000400000003
```

```
*Aug 17 17:21:15.873:
*Aug 17 17:21:15.873: H225.0 OUTGOING PDU ::=

value H323_UserInformation ::=
    {
      h323-uu-pdu
      {
        h323-message-body setup :
        {
          protocolIdentifier { 0 0 8 2250 0 4 }
          sourceAddress
          {
            h323-ID : {"PSTN-GW"}
          }
          sourceInfo
          {
            vendor
            {
              vendor
              {
                t35CountryCode 181
                t35Extension 0
                manufacturerCode 18
              }
            }
            gateway
            {
              protocol
              {
                voice :
                {
                  supportedPrefixes
```

```
        {


          {
            prefix dialedDigits : "1#"
          }
        }
      },                h323 :
      {
        supportedPrefixes
        {
        }
      }
    }
  }
  mc FALSE
  undefinedNode FALSE
}
activeMC FALSE
conferenceID '182F29914C1D11DC800A0017E0ABA838'H
conferenceGoal create : NULL
callType pointToPoint : NULL
sourceCallSignalAddress ipAddress :
{
  ip '0E32C90B'H
  port 22143
}
callIdentifier
{
  guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
}
fastStart
{
```

```
            '0000000C6013800B050001000E32C90B483B00'H,
            '4000000604010040601380121500010000E32C90B...'H
          }
          mediaWaitForConnect FALSE
          canOverlapSend FALSE
          multipleCalls TRUE
          maintainConnection TRUE
          symmetricOperationRequired NULL
        }
        h245Tunneling TRUE
        nonStandardControl
        {

          {
            nonStandardIdentifier h221NonStandard :
            {
              t35CountryCode 181
              t35Extension 0
              manufacturerCode 18
            }
            data 'E0010200010423040380 90A21803A983811E0285...'H
          }
        }
      }
    }
```

GW从CVP接收H225连接消息

```
*Aug 17 17:21:15.913: H225.0 INCOMING PDU ::=

value H323_UserInformation ::=
    {
      h323-uu-pdu
```

```
{
  h323-message-body connect :
  {
    protocolIdentifier { 0 0 8 2250 0 5 }
    h245Address ipAddress :
    {
      ip 'AC126E4B'H
      port 19698
    }
    destinationInfo
    {
      gateway
      {
        protocol
        {
          voice :
          {
            supportedPrefixes
            {

              {
                prefix dialedDigits : "2#"
              }
            }
          }
        }
      }
      mc FALSE
      undefinedNode FALSE
    }
    conferenceID '182F29914C1D11DC800A0017E0ABA838'H
    callIdentifier
```

```
      {
        guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
      }
      fastStart
      {
        '4000800604010040C6013801215000100AC126E4B...'H,
        '0000000C6013801215000100AC126E4B406000AC...'H
      }
      multipleCalls FALSE
      maintainConnection TRUE
      presentationIndicator presentationAllowed : NULL
      screeningIndicator 2
      featureSet
      {
        replacementFeatureSet FALSE
        neededFeatures
        {
        }
        desiredFeatures
        {
        }
        supportedFeatures
        {
        }
      }
    }
    h245Tunneling FALSE
  }
}
```

```
*Aug 17 17:21:15.917: //-1/xxxxxxxxxxx/H323/cch323_h225_receiver:
Received msg of type SETUPCFM_CHOSEN

*Aug 17 17:21:15.917: //229/182F2991800A/H323/setup_cfm_ind: ====== PI = 0

*Aug 17 17:21:15.917: //229/182F2991800A/H323/setup_cfm_ind:
Set new event H225_EV_FS_SETUP_CFM_IND

*Aug 17 17:21:15.917: //229/182F2991800A/H323/setup_cfm_ind:
Rcvd CONNECT Display Info IE = rtpmscvp

*Aug 17 17:21:15.917: //229/182F2991800A/H323/cch323_h225_receiver:
SETUPCFM_CHOSEN: src address = 14.50.201.11; dest address = 172.18.110.75

*Aug 17 17:21:15.917: //229/182F2991800A/H323/run_h225_sm:
Received event H225_EV_FS_SETUP_CFM_IND while at state H225_REQ_FS_SETUP

*Aug 17 17:21:15.917: //229/182F2991800A/H323/cch323_h225_set_new_state:
Changing from H225_REQ_FS_SETUP state to H225_FS_ACTIVE state

*Aug 17 17:21:15.917: H245 FS OLC INCOMING ENCODE BUFFER::=
4000800604010040C6013801215000100AC126E4B406000AC126E4B406100

*Aug 17 17:21:15.917:

*Aug 17 17:21:15.917: H245 FS OLC INCOMING PDU ::=



value OpenLogicalChannel ::=

    {

      forwardLogicalChannelNumber 129

      forwardLogicalChannelParameters

      {

        dataType nullData : NULL

        multiplexParameters none : NULL

      }

      reverseLogicalChannelParameters

      {

        dataType audioData : g711Ulaw64k : 20

        multiplexParameters h2250LogicalChannelParameters :

        {

          sessionID 1

          mediaChannel unicastAddress : iPAddress :

          {

            network 'AC126E4B'H

            tsapIdentifier 16480
```

```
          }
          mediaControlChannel unicastAddress : iPAddress :
          {
            network 'AC126E4B'H
            tsapIdentifier 16481
          }
          silenceSuppression FALSE
        }
      }
    }
```

```
*Aug 17 17:21:15.921: H245 FS OLC INCOMING ENCODE BUFFER::=
0000000C6013801215000100AC126E4B406000AC126E4B406100

*Aug 17 17:21:15.921:

*Aug 17 17:21:15.921: H245 FS OLC INCOMING PDU ::=


value OpenLogicalChannel ::=

    {
      forwardLogicalChannelNumber 1
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
          mediaChannel unicastAddress : iPAddress :
          {
            network 'AC126E4B'H
            tsapIdentifier 16480
          }
```

```
          mediaControlChannel unicastAddress : iPAddress :
          {
            network 'AC126E4B'H
            tsapIdentifier 16481
          }
          silenceSuppression FALSE
        }
      }
    }
```

GW向网守发送信息请求响应(IRR)

```
*Aug 17 17:21:15.925: H225 NONSTD OUTGOING PDU ::=

value IRRperCallnonStandardInfo ::=
    {
      startTime 1187371275
    }




*Aug 17 17:21:15.925: H225 NONSTD OUTGOING ENCODE BUFFER::= 7046C5D90B
*Aug 17 17:21:15.925:
*Aug 17 17:21:15.925: RAS OUTGOING PDU ::=

value RasMessage ::= infoRequestResponse :
    {
      requestSeqNum 15288
      endpointType
      {
        vendor
        {
          vendor
```

```
    {
      t35CountryCode 181
      t35Extension 0
      manufacturerCode 18
    }
  }
  gateway
  {
    protocol
    {
      voice :
      {
        supportedPrefixes
        {

          {
            prefix dialedDigits : "1#"
          }
        }
      },            h323 :
      {
        supportedPrefixes
        {
        }
      }
    }
  }
  mc FALSE
  undefinedNode FALSE
}
endpointIdentifier {"84B3CC1C00000004"}
rasAddress ipAddress :
```

```
{
  ip '0E32C90B'H
  port 50363
}
callSignalAddress
{
  ipAddress :
  {
    ip '0E32C90B'H
    port 1720
  }
}
endpointAlias
{
  h323-ID : {"PSTN-GW"}
}
perCallInfo
{

  {
    nonStandardData
    {
      nonStandardIdentifier h221NonStandard :
      {
        t35CountryCode 181
        t35Extension 0
        manufacturerCode 18
      }
      data '7046C5D90B'H
    }
    callReferenceValue 67
    conferenceID '182F29914C1D11DC800A0017E0ABA838'H
```

```
          originator TRUE
          h245
          {
          }
          callSignaling
          {
          }
          callType pointToPoint : NULL
          bandWidth 1280
          callModel direct : NULL
          callIdentifier
          {
            guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
          }
          substituteConfIDs
          {
          }
          usageInformation
          {
            nonStandardUsageFields
            {
            }
            connectTime 1187371275
          }
        }
      }
      needResponse FALSE
      unsolicited TRUE
    }
```

GW建立与CVP的H245 TCP连接，并向CVP发送终端功能集(TCS)和主从确定消息

```
*Aug 17 17:21:15.953: H245 MSC OUTGOING PDU ::=
```

```
value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 1
      protocolIdentifier { 0 0 8 245 0 7 }
      multiplexCapability h2250Capability :
      {
        maximumAudioDelayJitter 20
        receiveMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
          {

            {
              centralizedControl FALSE
              distributedControl FALSE
              centralizedAudio FALSE
              distributedAudio FALSE
              centralizedVideo FALSE
              distributedVideo FALSE
            }
          }
        }
        transmitMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
          {
```

```
    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
receiveAndTransmitMultipointCapability
{
  multicastCapability FALSE
  multiUniCastConference FALSE
  mediaDistributionCapability
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
mcCapability
{
  centralizedConferenceMC FALSE
  decentralizedConferenceMC FALSE
}
```

```
  rtcpVideoControlCapability FALSE
  mediaPacketizationCapability
  {
    h261aVideoPacketization FALSE
  }
  logicalChannelSwitchingCapability FALSE
  t120DynamicPortCapability FALSE
}
capabilityTable
{

  {
    capabilityTableEntryNumber 34
    capability receiveRTPAudioTelephonyEventCapability :
    {
      dynamicRTPPayloadType 101
      audioTelephoneEvent "0-16"
    }
  },
  {
    capabilityTableEntryNumber 25
    capability receiveAndTransmitDataApplicationCapability :
    {
      application nonStandard :
      {
        nonStandardIdentifier h221NonStandard :
        {
          t35CountryCode 181
          t35Extension 0
          manufacturerCode 18
        }
        data '52747044746D6652656C6179'H
```

```
      }
      maxBitRate 0
    }
  },
  {
    capabilityTableEntryNumber 31
    capability receiveUserInputCapability : hookflash : NULL
  },
  {
    capabilityTableEntryNumber 30
    capability receiveUserInputCapability : dtmf : NULL
  },
  {
    capabilityTableEntryNumber 27
    capability receiveUserInputCapability : basicString : NULL
  },
  {
    capabilityTableEntryNumber 3
    capability receiveAudioCapability : g711Ulaw64k : 20
  }
}
capabilityDescriptors
{

  {
    capabilityDescriptorNumber 1
    simultaneousCapabilities
    {

      {
        3
      },
```

```
            {
              34,
              30,
              27,
              25
            },

            {
              31
            }
          }
        }
      }
    }
```

```
*Aug 17 17:21:15.961: H245 MSC OUTGOING ENCODE BUFFER::=
0270010600088175000780138000140001000001000001000000CC0010
00100058000218A061404302D31368000184810B50000120C52747044
746D6652656C6179000080001E83015080001D83014080001A8301108
0000220C013008001020000020300210001D001A001800001E

*Aug 17 17:21:15.961:

*Aug 17 17:21:15.961: //229/182F2991800A/H323/h245_cap_out_set_new_state:
changing from IDLE state to AWAITING_RESPONSE state

*Aug 17 17:21:15.961: //229/182F2991800A/H323/cch323_run_h245_ms_sm:
Received event H245_EVENT_MSD while at state H245_MS_NONE

*Aug 17 17:21:15.961: H245 MSC OUTGOING PDU ::=


value MultimediaSystemControlMessage ::= request : masterSlaveDetermination :

    {
      terminalType 60
      statusDeterminationNumber 9348
    }
```

GW从CVP接收TCS和MSD消息

```
*Aug 17 17:21:15.965: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 1
      protocolIdentifier { 0 0 8 245 0 11 }
      capabilityTable
      {

        {
          capabilityTableEntryNumber 1
          capability receiveAndTransmitAudioCapability : g711Ulaw64k : 20
        },
        {
          capabilityTableEntryNumber 2
          capability receiveAndTransmitUserInputCapability : basicString : NULL
        },
        {
          capabilityTableEntryNumber 3
          capability receiveAndTransmitUserInputCapability : dtmf : NULL
        },
        {
          capabilityTableEntryNumber 4
          capability receiveAndTransmitUserInputCapability : hookflash : NULL
        },
        {
          capabilityTableEntryNumber 5
          capability receiveAndTransmitUserInputCapability : iA5String : NULL
        },
        {
          capabilityTableEntryNumber 729
```

```
      capability receiveAndTransmitAudioCapability : g729 : 2
    }
  }
  capabilityDescriptors
  {

    {
      capabilityDescriptorNumber 1
      simultaneousCapabilities
      {

        {
          1,
          2,
          3,
          4,
          5,
          729
        },

        {
          1,
          729
        },

        {
          1
        }
      }
    }
  }
}
```

```
*Aug 17 17:21:15.969: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : masterSlaveDetermination :
    {
      terminalType 50
      statusDeterminationNumber 767617
    }
```

入口GW向CVP发送TCS确认和MSD确认

```
*Aug 17 17:21:15.969: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : terminalCapabilitySetAck :
    {
      sequenceNumber 1
    }

*Aug 17 17:21:15.969: //229/182F2991800A/H323/MSDetermination:
Am MASTER, ccb->h245.h245_mdStatus = 0x1
*Aug 17 17:21:15.969: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : masterSlaveDeterminationAck :
    {
      decision slave : NULL
    }
```

入口网关从CVP接收TCS和MSD ACK

```
*Aug 17 17:21:15.973: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= response : terminalCapabilitySetAck :
    {
      sequenceNumber 1
    }
```

```
*Aug 17 17:21:15.973: h245_decode_one_pdu: H245ASNDecodePdu rc = 0, bytesLeftToDecode = 0

*Aug 17 17:21:15.973: h245_decode_one_pdu: Read Pkt body: more_pdus:0 rc:0 asn_rc:0

*Aug 17 17:21:15.973: //229/182F2991800A/H323/cch323_run_h245_cap_out_sm:
Received H245_EVENT_CAP_CFM while at state AWAITING_RESPONSE

*Aug 17 17:21:15.973: //229/182F2991800A/H323/h245_cap_out_set_new_state:
changing from AWAITING_RESPONSE state to IDLE state

*Aug 17 17:21:15.973: //229/182F2991800A/H323/run_h245_iwf_sm:
received IWF_EV_CAP_CFM while at state IWF_AWAIT_CAP_MSD_RESP

*Aug 17 17:21:15.977: //229/182F2991800A/H323/h245_iwf_set_new_state:
changing from IWF_AWAIT_CAP_MSD_RESP state to IWF_AWAIT_MSD_RESP state

*Aug 17 17:21:15.977: h323chan_chn_process_read_socket

*Aug 17 17:21:15.977: h323chan_chn_process_read_socket: fd=4 of type CONNECTED has data

*Aug 17 17:21:15.977:  h323chan_chn_process_read_socket: h323chan accepted/connected fd=4



*Aug 17 17:21:15.977: h245_decode_one_pdu: more_pdus = 0, bytesLeftToDecode = 2

*Aug 17 17:21:15.977: H245 MSC INCOMING ENCODE BUFFER::= 2080

*Aug 17 17:21:15.977:

*Aug 17 17:21:15.977: H245 MSC INCOMING PDU ::=



value MultimediaSystemControlMessage ::= response : masterSlaveDeterminationAck :

    {

      decision master : NULL

    }
```

现在，CVP将媒体连接重定向到VXML网关。入口GW从CVP接收空TCS

```
*Aug 17 17:21:15.985: H245 MSC INCOMING PDU ::=



value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :

    {

      sequenceNumber 2

      protocolIdentifier { 0 0 8 245 0 11 }

    }
```

入口GW通过向CVP发送CloseLogicalChannel(CLC)关闭其逻辑信道

```
*Aug 17 17:21:15.985: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request : closeLogicalChannel :
    {
      forwardLogicalChannelNumber 1
      source user : NULL
    }
```

入口GW向CVP发送TCS ACK

```
*Aug 17 17:21:15.985: H245 MSC OUTGOING ENCODE BUFFER::= 0400000000

*Aug 17 17:21:15.985:

*Aug 17 17:21:15.985: //229/182F2991800A/H323/h245_olc_out_set_new_state:
Changing from H245_OLC_OUT_STATE_ESTABLISHED state to H245_OLC_OUT_STATE_IDLE state

*Aug 17 17:21:15.985: //229/182F2991800A/H323/h245_iwf_set_new_state:
changing from IWF_OLC_DONE state to IWF_OLC_IN_DONE state

*Aug 17 17:21:15.985: //229/182F2991800A/H323/cch323_run_h245_cap_in_sm:
Received H245_EVENT_CAP_RESP while at state AWAITING_RESPONSE

*Aug 17 17:21:15.985: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : terminalCapabilitySetAck :
    {
      sequenceNumber 2
    }
```

入口GW向网守发送带宽请求，以更新用于呼叫的当前带宽（零）

```
*Aug 17 17:21:15.985: H245 MSC OUTGOING ENCODE BUFFER::= 218002

*Aug 17 17:21:15.985:

*Aug 17 17:21:15.985: //229/182F2991800A/H323/h245_cap_in_set_new_state:
changing from AWAITING_RESPONSE state to IDLE state

*Aug 17 17:21:15.989: RAS OUTGOING PDU ::=

value RasMessage ::= bandwidthRequest :
    {
```

```
      requestSeqNum 15289
      endpointIdentifier {"84B3CC1C00000004"}
      conferenceID '182F29914C1D11DC800A0017E0ABA838'H
      callReferenceValue 67
      bandWidth 0
      callIdentifier
      {
        guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
      }
      answeredCall FALSE
    }
```

CVP通过将CLC发送到入口GW关闭其逻辑信道

```
*Aug 17 17:21:15.989: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : closeLogicalChannel :
    {
      forwardLogicalChannelNumber 129
      source user : NULL
      reason unknown : NULL
    }




*Aug 17 17:21:15.989: h245_decode_one_pdu: H245ASNDecodePdu rc = 0, bytesLeftToDecode = 0
*Aug 17 17:21:15.989: h245_decode_one_pdu: Read Pkt body: more_pdus:0 rc:0 asn_rc:0
*Aug 17 17:21:15.989: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : closeLogicalChannelAck :
    {
      forwardLogicalChannelNumber 129
    }
```

入口网关从CVP接收TCS和MSD。此TCS提供有关VXML网关的终端功能的信息

```
*Aug 17 17:21:16.129: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 3
      protocolIdentifier { 0 0 8 245 0 11 }
      multiplexCapability h2250Capability :
      {
        maximumAudioDelayJitter 20
        receiveMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
          {

            {
              centralizedControl FALSE
              distributedControl FALSE
              centralizedAudio FALSE
              distributedAudio FALSE
              centralizedVideo FALSE
              distributedVideo FALSE
            }
          }
        }
        transmitMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
```

```
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
receiveAndTransmitMultipointCapability
{
  multicastCapability FALSE
  multiUniCastConference FALSE
  mediaDistributionCapability
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
mcCapability
{
  centralizedConferenceMC FALSE
```

```
    decentralizedConferenceMC FALSE
  }
  rtcpVideoControlCapability FALSE
  mediaPacketizationCapability
  {
    h261aVideoPacketization FALSE
  }
  logicalChannelSwitchingCapability FALSE
  t120DynamicPortCapability FALSE
}
capabilityTable
{

  {
    capabilityTableEntryNumber 34
    capability receiveRTPAudioTelephonyEventCapability :
    {
      dynamicRTPPayloadType 101
      audioTelephoneEvent "0-16"
    }
  },
  {
    capabilityTableEntryNumber 31
    capability receiveUserInputCapability : hookflash : NULL
  },
  {
    capabilityTableEntryNumber 30
    capability receiveUserInputCapability : dtmf : NULL
  },
  {
    capabilityTableEntryNumber 27
    capability receiveUserInputCapability : basicString : NULL
```

```
    },
    {
      capabilityTableEntryNumber 3
      capability receiveAudioCapability : g711Ulaw64k : 20
    }
  }
  capabilityDescriptors
  {

    {
      capabilityDescriptorNumber 1
      simultaneousCapabilities
      {

        {
          3
        },

        {
          34,
          30,
          27
        },

        {
          31
        }
      }
    }
  }
}
```

入口网关将其TCS和MSD发送到CVP

```
*Aug 17 17:21:16.141: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 2
      protocolIdentifier { 0 0 8 245 0 7 }
      multiplexCapability h2250Capability :
      {
        maximumAudioDelayJitter 20
        receiveMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
          {

            {
              centralizedControl FALSE
              distributedControl FALSE
              centralizedAudio FALSE
              distributedAudio FALSE
              centralizedVideo FALSE
              distributedVideo FALSE
            }
          }
        }
        transmitMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
```

```
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
receiveAndTransmitMultipointCapability
{
  multicastCapability FALSE
  multiUniCastConference FALSE
  mediaDistributionCapability
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
mcCapability
{
  centralizedConferenceMC FALSE
```

```
    decentralizedConferenceMC FALSE
  }
  rtcpVideoControlCapability FALSE
  mediaPacketizationCapability
  {
    h261aVideoPacketization FALSE
  }
  logicalChannelSwitchingCapability FALSE
  t120DynamicPortCapability FALSE
}
capabilityTable
{

  {
    capabilityTableEntryNumber 34
    capability receiveRTPAudioTelephonyEventCapability :
    {
      dynamicRTPPayloadType 101
      audioTelephoneEvent "0-16"
    }
  },
  {
    capabilityTableEntryNumber 25
    capability receiveAndTransmitDataApplicationCapability :
    {
      application nonStandard :
      {
        nonStandardIdentifier h221NonStandard :
        {
          t35CountryCode 181
          t35Extension 0
          manufacturerCode 18
```

```
        }
        data '52747044746D6652656C6179'H
      }
      maxBitRate 0
    }
  },
  {
    capabilityTableEntryNumber 31
    capability receiveUserInputCapability : hookflash : NULL
  },
  {
    capabilityTableEntryNumber 30
    capability receiveUserInputCapability : dtmf : NULL
  },
  {
    capabilityTableEntryNumber 27
    capability receiveUserInputCapability : basicString : NULL
  },
  {
    capabilityTableEntryNumber 3
    capability receiveAudioCapability : g711Ulaw64k : 20
  }
}
capabilityDescriptors
{

  {
    capabilityDescriptorNumber 1
    simultaneousCapabilities
    {

      {
```

```
              3

            },


            {

              34,

              30,

              27,

              25

            },


            {

              31

            }

          }

        }

      }

    }
```

```
*Aug 17 17:21:16.149: H245 MSC OUTGOING ENCODE BUFFER::=
0270020600088175000780138000140001000001000001000000CC0010
00100058000218A061404302D31368000184810B50000120C52747044
746D6652656C6179000080001E83015080001D83014080001A8301108
0000220C013008001020000020300210001D001A001800001E

*Aug 17 17:21:16.149:

*Aug 17 17:21:16.149: //229/182F2991800A/H323/h245_cap_out_set_new_state:
changing from IDLE state to AWAITING_RESPONSE state

*Aug 17 17:21:16.149: //229/182F2991800A/H323/cch323_run_h245_ms_sm:
Received event H245_EVENT_MSD while at state H245_MS_NONE

*Aug 17 17:21:16.149: H245 MSC OUTGOING PDU ::=



value MultimediaSystemControlMessage ::= request : masterSlaveDetermination :

    {

      terminalType 60
```

```
      statusDeterminationNumber 3855

    }
```

入口GW向CVP发送MSD确认和TCS确认

```
*Aug 17 17:21:16.153: H245 MSC OUTGOING PDU ::=


value MultimediaSystemControlMessage ::= response : masterSlaveDeterminationAck :

    {

      decision slave : NULL

    }




*Aug 17 17:21:16.153: H245 MSC OUTGOING ENCODE BUFFER::= 20A0

*Aug 17 17:21:16.153:

*Aug 17 17:21:16.153: //229/182F2991800A/H323/cch323_run_h245_ms_sm:
MS_Determine_indication to Appl: Sent MSD ACK!

*Aug 17 17:21:16.153: //229/182F2991800A/H323/h245_ms_set_new_state:
Changing from H245_MS_OUTGOING_WAIT state to H245_MS_INCOMING_WAIT state

*Aug 17 17:21:16.153: //229/182F2991800A/H323/run_h245_iwf_sm:
received IWF_EV_MSD_ACK_SENT while at state IWF_AWAIT_MSD_RESP

*Aug 17 17:21:16.153: //229/182F2991800A/H323/h245_iwf_common_msdacksent:
Negotiated codecs and dtmf are initialised in ccb

*Aug 17 17:21:16.153: h323chan_chn_process_read_socket

*Aug 17 17:21:16.153: h323chan_chn_process_read_socket: fd=4 of type CONNECTED has data

*Aug 17 17:21:16.153:  h323chan_chn_process_read_socket: h323chan accepted/connected fd=4



*Aug 17 17:21:16.153: h245_decode_one_pdu: more_pdus = 0, bytesLeftToDecode = 3

*Aug 17 17:21:16.153: H245 MSC INCOMING ENCODE BUFFER::= 218002

*Aug 17 17:21:16.153:

*Aug 17 17:21:16.153: H245 MSC INCOMING PDU ::=


value MultimediaSystemControlMessage ::= response : terminalCapabilitySetAck :

    {
```

```
      sequenceNumber 2
    }
```

入口GW将BRQ发送到网守，以更新用于呼叫的当前带宽(2*64=128 kbps)

```
*Aug 17 17:21:16.157: RAS OUTGOING PDU ::=
 value RasMessage ::= bandwidthRequest :
    {
      requestSeqNum 15290
      endpointIdentifier {"84B3CC1C00000004"}
      conferenceID '182F29914C1D11DC800A0017E0ABA838'H
      callReferenceValue 67
      bandWidth 1280
      callIdentifier
      {
        guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
      }
      answeredCall FALSE
    }

*Aug 17 17:21:16.173: RAS INCOMING PDU ::=

value RasMessage ::= bandwidthConfirm :
    {
      requestSeqNum 15290
      bandWidth 1280
    }
```

入口GW向CVP发送OLC请求

```
*Aug 17 17:21:16.173: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request : openLogicalChannel :
    {
      forwardLogicalChannelNumber 2
```

```
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
          mediaControlChannel unicastAddress : iPAddress :
          {
            network '0E32C90B'H
            tsapIdentifier 18491
          }
          silenceSuppression FALSE
        }
      }
    }
```

入口GW从CVP接收OLC。CVP为RTCP连接提供VXML网关的IP地址

```
*Aug 17 17:21:16.177: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : openLogicalChannel :
    {
      forwardLogicalChannelNumber 258
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
          mediaControlChannel unicastAddress : iPAddress :
          {
            network '0E32C90F'H
            tsapIdentifier 21135
```

```
          }
        }
      }
    }
```

GW向CVP发送OLC确认响应

```
*Aug 17 17:21:16.181: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : openLogicalChannelAck :
    {
      forwardLogicalChannelNumber 258
      forwardMultiplexAckParameters h2250LogicalChannelAckParameters :
      {
        mediaChannel unicastAddress : iPAddress :
        {
          network '0E32C90B'H
          tsapIdentifier 18490
        }
        mediaControlChannel unicastAddress : iPAddress :
        {
          network '0E32C90B'H
          tsapIdentifier 18491
        }
        flowControlToZero FALSE
      }
    }
```

GW从CVP接收OLC确认。CVP提供RTP连接的VXML网关的IP地址。在入口GW和VXML GW之间建立RTP连接

```
*Aug 17 17:21:16.185: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= response : openLogicalChannelAck :
    {
```

```
      forwardLogicalChannelNumber 2
      forwardMultiplexAckParameters h2250LogicalChannelAckParameters :
      {
        sessionID 1
        mediaChannel unicastAddress : iPAddress :
        {
          network '0E32C90F'H
          tsapIdentifier 21134
        }
        mediaControlChannel unicastAddress : iPAddress :
        {
          network '0E32C90F'H
          tsapIdentifier 21135
        }
      }
    }
```

网关检测DTMF数字“1”，并通过基于RTP NTE(RFC 2833)的DTMF中继事件将其发送到VXML GW

```
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2543 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:03 00 00  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2544 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:03 00 00  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2545 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:03 00 00  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2546 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:03 01 90  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2547 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:03 03 20  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2548 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:83 03 38  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x2549 timestamp 0x16EE0
Pt:101    Evt:1       Pkt:83 03 38  <Snd>>>
s=DSP d=VoIP payload 0x65 ssrc 0x1D5E sequence 0x254A timestamp 0x16EE0
```

```
Pt:101    Evt:1       Pkt:83 03 38  <Snd>>>
```

现在，CVP将呼叫重定向到应答呼叫的座席IP电话。GW接收空TCS

```
*Aug 17 17:22:05.349: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 4
      protocolIdentifier { 0 0 8 245 0 11 }
    }
```

入口网关从CVP接收TCS和MSD。此TCS提供有关IP电话终端功能的信息

```
*Aug 17 17:22:09.569: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : terminalCapabilitySet :
    {
      sequenceNumber 5
      protocolIdentifier { 0 0 8 245 0 11 }
      multiplexCapability h2250Capability :
      {
        maximumAudioDelayJitter 60
        receiveMultipointCapability
        {
          multicastCapability FALSE
          multiUniCastConference FALSE
          mediaDistributionCapability
          {

            {
              centralizedControl FALSE
              distributedControl FALSE
              centralizedAudio FALSE
```

```
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
transmitMultipointCapability
{
  multicastCapability FALSE
  multiUniCastConference FALSE
  mediaDistributionCapability
  {

    {
      centralizedControl FALSE
      distributedControl FALSE
      centralizedAudio FALSE
      distributedAudio FALSE
      centralizedVideo FALSE
      distributedVideo FALSE
    }
  }
}
receiveAndTransmitMultipointCapability
{
  multicastCapability FALSE
  multiUniCastConference FALSE
  mediaDistributionCapability
  {

    {
      centralizedControl FALSE
```

```
        distributedControl FALSE
        centralizedAudio FALSE
        distributedAudio FALSE
        centralizedVideo FALSE
        distributedVideo FALSE
      }
    }
  }
  mcCapability
  {
    centralizedConferenceMC FALSE
    decentralizedConferenceMC FALSE
  }
  rtcpVideoControlCapability FALSE
  mediaPacketizationCapability
  {
    h261aVideoPacketization FALSE
  }
  logicalChannelSwitchingCapability FALSE
  t120DynamicPortCapability FALSE
}
capabilityTable
{

  {
    capabilityTableEntryNumber 1
    capability receiveAudioCapability : g711Ulaw64k : 40
  },
  {
    capabilityTableEntryNumber 2
    capability receiveAndTransmitUserInputCapability : dtmf : NULL
  },
```

```
  {
    capabilityTableEntryNumber 3
    capability receiveAndTransmitUserInputCapability : basicString : NULL
  },
  {
    capabilityTableEntryNumber 44
    capability receiveAndTransmitUserInputCapability : hookflash : NULL
  }
}
capabilityDescriptors
{

  {
    capabilityDescriptorNumber 0
    simultaneousCapabilities
    {

      {
        1
      },

      {
        2,
        3
      },

      {
        44
      }
    }
  }
}
```

```
    }

*Aug 17 17:22:09.589: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : masterSlaveDetermination :
    {
      terminalType 50
      statusDeterminationNumber 767617
    }
```

入口GW从CVP接收OLC。CVP为RTCP连接提供CallManager的IP地址

```
*Aug 17 17:22:09.597: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : openLogicalChannel :
    {
      forwardLogicalChannelNumber 259
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
          mediaControlChannel unicastAddress : iPAddress :
          {
            network 'AC126E54'H
            tsapIdentifier 4001
          }
        }
      }
    }
```

GW向CVP发送OLC确认响应

```
*Aug 17 17:22:09.613: H245 MSC OUTGOING PDU ::=
```

```
value MultimediaSystemControlMessage ::= response : openLogicalChannelAck :
    {
      forwardLogicalChannelNumber 259
      forwardMultiplexAckParameters h2250LogicalChannelAckParameters :
      {
        mediaChannel unicastAddress : iPAddress :
        {
          network '0E32C90B'H
          tsapIdentifier 18490
        }
        mediaControlChannel unicastAddress : iPAddress :
        {
          network '0E32C90B'H
          tsapIdentifier 18491
        }
        flowControlToZero FALSE
      }
    }
```

GW从CVP接收OLC确认。CVP为RTP连接提供代理IP电话的IP地址。入口GW和IP电话之间的RTP连接已建立

```
*Aug 17 17:22:09.609: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request : openLogicalChannel :
    {
      forwardLogicalChannelNumber 3
      forwardLogicalChannelParameters
      {
        dataType audioData : g711Ulaw64k : 20
        multiplexParameters h2250LogicalChannelParameters :
        {
          sessionID 1
```

```
          mediaControlChannel unicastAddress : iPAddress :
          {
            network '0E32C90B'H
            tsapIdentifier 18491
          }
          silenceSuppression FALSE
        }
      }
    }

*Aug 17 17:22:09.633: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= response : openLogicalChannelAck :
    {
      forwardLogicalChannelNumber 3
      forwardMultiplexAckParameters h2250LogicalChannelAckParameters :
      {
        sessionID 1
        mediaChannel unicastAddress : iPAddress :
        {
          network '0E32CA1A'H
          tsapIdentifier 17156
        }
        mediaControlChannel unicastAddress : iPAddress :
        {
          network '0E32CA1A'H
          tsapIdentifier 17157
        }
      }
    }
```

完成与座席的对话后，PSTN主叫方挂断呼叫。入口GW从PSTN接收ISDN断开

```
*Aug 17 17:22:56.329: ISDN Se1/0/0:23 Q931: RX <- DISCONNECT pd = 8  callref = 0x0088

        Cause i = 0x8290 - Normal call clearing

*Aug 17 17:22:56.329: %ISDN-6-DISCONNECT: Interface Serial1/0/0:0  disconnected from 9999 ,
call lasted 100 seconds

*Aug 17 17:22:56.333: ISDN Se1/0/0:23 Q931: TX -> RELEASE pd = 8  callref = 0x8088

*Aug 17 17:22:56.333: //228/182F2991800A/CCAPI/cc_api_call_disconnected:

   Cause Value=16, Interface=0x46964DF8, Call Id=228

*Aug 17 17:22:56.333: //228/182F2991800A/CCAPI/cc_api_call_disconnected:

   Call Entry(Responsed=TRUE, Cause Value=16, Retry Count=0)
```

入口GW通过向CVP发送H225 Release Complete消息终止IP支路上的H323呼叫

```
*Aug 17 17:22:56.337: H225.0 OUTGOING PDU ::=


value H323_UserInformation ::=

    {
      h323-uu-pdu
      {
        h323-message-body releaseComplete :
        {
          protocolIdentifier { 0 0 8 2250 0 4 }
          callIdentifier
          {
            guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
          }
        }
        h245Tunneling FALSE
        nonStandardControl
        {


          {
            nonStandardIdentifier h221NonStandard :
            {
              t35CountryCode 181
```

```
            t35Extension 0
            manufacturerCode 18
          }
          data '6001020001082C080282901C269E810003677464...'H
        }
      }
      tunnelledSignallingMessage
      {
        tunnelledProtocolID
        {
          id tunnelledProtocolAlternateID :
          {
            protocolType "gtd"
          }
        }
        messageContent
        {
          '52454C2C0D0A50524E2C6973646E2A2C2C4E492A...'H
        }
        tunnellingRequired NULL
      }
    }
  }
```

GW向网守发送SepserationRequest(DRQ)

```
*Aug 17 17:22:56.341: RAS OUTGOING PDU ::=

value RasMessage ::= disengageRequest :
    {
      requestSeqNum 15295
      endpointIdentifier {"84B3CC1C00000004"}
      conferenceID '182F29914C1D11DC800A0017E0ABA838'H
```

```
callReferenceValue 67
disengageReason normalDrop : NULL
nonStandardData
{
  nonStandardIdentifier h221NonStandard :
  {
    t35CountryCode 181
    t35Extension 0
    manufacturerCode 18
  }
  data '40001A52454C2C0D0A50524E2C6973646E2A2C2C...'H
}
callIdentifier
{
  guid '182FC5B94C1D11DC8298DF9092AE2C6A'H
}
answeredCall FALSE
usageInformation
{
  nonStandardUsageFields
  {

    {
      nonStandardIdentifier h221NonStandard :
      {
        t35CountryCode 181
        t35Extension 0
        manufacturerCode 18
      }
      data '4800'H
    }
  }
```

```
        connectTime 1187371275
        endTime 1187371375
      }
      terminationCause releaseCompleteCauseIE : '08028090'H
    }
```

GW和CVP之间的H245连接在交换CLC和EndSession命令后关闭

```
*Aug 17 17:22:56.357: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= request : closeLogicalChannel :
    {
      forwardLogicalChannelNumber 259
      source user : NULL
      reason unknown : NULL
    }




*Aug 17 17:22:56.357: h245_decode_one_pdu: H245ASNDecodePdu rc = 0, bytesLeftToDecode = 0
*Aug 17 17:22:56.357: h245_decode_one_pdu: Read Pkt body: more_pdus:0 rc:0 asn_rc:0
*Aug 17 17:22:56.357: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= response : closeLogicalChannelAck :
    {
      forwardLogicalChannelNumber 259
    }

*Aug 17 17:22:56.357: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= command : endSessionCommand : disconnect : NULL
```

```
*Aug 17 17:22:56.357: h245_decode_one_pdu: H245ASNDecodePdu rc = 0, bytesLeftToDecode = 0

*Aug 17 17:22:56.357: h245_decode_one_pdu: Read Pkt body: more_pdus:0 rc:0 asn_rc:0

*Aug 17 17:22:56.357: H245 MSC OUTGOING PDU ::=


value MultimediaSystemControlMessage ::= command : endSessionCommand : disconnect : NULL
```

相关信息

- 语音技术支持
- 语音和统一通信产品支持
- Cisco IP 电话故障排除
- 技术支持和文档 - Cisco Systems