T1 CAS 信令的配置与故障排除

目录

简介

本文档说明实施T1信道关联信令(CAS)所需的配置。

先决条件

要求

尝试进行此配置之前，请确保满足以下要求：

本文档基于了解数字T1 CAS（强取位信令）在IOS网关中的工作原理。阅读本文档，了解各种类型的CAS信令方法。本文档还用作配置不同类型CAS信令的指南。

在Cisco AS5300路由器中实施E1 R2信令之前，请检查以确保您的Cisco IOS®软件版本与E1模块中的Cisco VCWare兼容。如果版本不兼容，则语音卡中的数字信号处理器(DSP)模块将不会加载，并且不会进行语音信号处理。请参阅Cisco AS5300的Cisco VCWare兼容性矩阵，确保您的版本兼容。

通常，如果Cisco VCW的版本与Cisco IOS软件不兼容，您可以通过输入**show vfc slot_number interface**命令来看到这一点，如下所示：

```
5300#show vfc 1 interface
Rx: in ptr 18, outptr 0
Tx: in ptr 14  outptr  14
0 in hw queue, 0 queue head , 0 queue tail
Hardware is VFC out-of-band channel
Interface : state RESET DSP instance (0x61048284)
```

```
dsp_number 0, Channel ID 0
TX outstanding 0, max TX outstanding 0
Received 18 packets, 1087 bytes, 0 giant packets
0 drops, 0 no buffers, 0 input errors
121 bytes output, 14 frames output
0 bounce errors 0

DSP module 1 is not installed
DSP module 2 is not installed
DSP module 3 is not installed
DSP module 4 is not installed
DSP module 5 is not installed
```

在上述输出中，“DSP module number is not installed”语句显示该模块号的版本不兼容。加载了正确Cisco VCWare版本的DSP模块示例如下所示：

```
5300#show vfc 1 interface
Rx: in ptr 24, outptr 0
TX: in ptr 15  outptr  15
0 in hw queue, 0 queue head , 0 queue tail
Hardware is VFC out-of-band channel
Interface : state RESET DSP instance (0x618C6088)
dsp_number 0, Channel ID 0
TX outstanding 0, max TX outstanding 0
Received 283288 packets, 15864278 bytes, 0 giant packets
0 drops, 0 no buffers, 0 input errors
1416459 bytes output,  141647 frames output
0 bounce errors 0

Slot 1, DSPM 1 (C542), DSP 1, Channel 1
State RESET, DSP instance (0x61914BDC)
TX outstanding 0, max TX outstanding 8
Received 0 packets, 0 bytes, 0 giant packets
0 drops, 0 no buffers, 0 input errors
0 bytes output,  0 frames output
0 bounce errors 0

Slot 1, DSPM 1 (C542), DSP 2, Channel 1
State RESET, DSP instance (0x6191510C)
TX outstanding 0, max TX outstanding 8
Received 0 packets, 0 bytes, 0 giant packets
0 drops, 0 no buffers, 0 input errors
0 bytes output,  0 frames output
0 bounce errors 0
```

要检查已安装的Cisco VCWare版本，请输入**show vfc slot_number version vcware命**令，如下所示：

```
5300#show vfc 1 version vcware
Voice Feature Card in Slot 1:
VCware Version : 4.10
ROM Monitor Version : 1.2
DSPware Version :
Technology :  C542
```

注意：确保Cisco VCWare技术版本（c549或c542）与已安装的语音功能卡DSP技术(DSPM-542:单密度语音支持，或DSPM-549:高密度语音支持)。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科AS5300路由器（所有版本）

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。

配置

要在Cisco 2600/3600系列路由器上运行CAS信令，需要高密度语音网络模块(NM-HDV)。

需要在T1控制器（**Cisco AS5xxx和2600/3600路由器）上定义命令ds0-group**(或**cas-group**，具体取决于Cisco IOS版本)。

使用以下步骤配置CAS:

1. 设置连接到专用自动交换机(PBX)或交换机的T1控制器。确保正确设置T1的成帧和线路编码。T1成帧：**ESF或SF**T1线路编码：**B8ZS或AMI**T1时钟源：**内部或线路注意：**请记住，不同的PBX对时钟源有不同的要求。
2. 使用以下命令序列定义AS5xxx平台上的线路信令：

```
5300(config)#controller T1 0

5300(config-controller)#
ds0-group 1 timeslots 1-24 type ?

e&m-fgb              E & M Type II FGB
e&m-fgd              E & M Type II FGD
e&m-immediate-start  E & M Immediate Start
fgd-eana             FGD Exchange Access North American
fgd-os               FGD Operator Services
fxs-ground-start     FXS Ground Start
fxs-loop-start       FXS Loop Start
none                 Null Signaling for External Call Control
r1-itu               R1 ITU
sas-ground-start     SAS Ground Start
sas-loop-start       SAS Loop Start
<cr>
```

   注意：如果要收集T1控制器上的拨号号码识别服务(DNIS)信息，则必须在接入服务器上手动配置该信息。要在控制器T1配置下为E&M-fgb收集双音多频(DTMF)DNIS，请使用**ds0-group 0 timeslots 1-24 type e&m-fgb dtmf dnis**命令。要为E&M-fgb收集多频(MF)DNIS，请使用**ds0-group 0 timeslots 1-24 type e&m-fgb mf dnis**命令。
3. 使用以下命令序列定义Cisco 2600/3600平台上的线路信令：

```
3600(config)#controller T1 0
3600(config-controller)#
ds0-group 1 timeslots 1-24 type ?
```

```
e&m-delay-dial       E & M Delay Dial
e&m-fgd  E & M Type II FGD
e&m-immediate-start  E & M Immediate Start
e&m-wink-start       E & M Wink Start
ext-sig              External Signaling
fgd-eana             FGD-EANA BOC side
fxo-ground-start     FXO Ground Start
fxo-loop-start       FXO Loop Start
fxs-ground-start     FXS Ground Start
fxs-loop-start       FXS Loop Start
none                 Null Signaling for External Call Control
<cr>
```

在Cisco IOS软件版本11.3中，命令序列如下。

```
peggy(config)#controller T1 0

peggy(config-controller)#cas-group 1 timeslot 1-15 type ?

...
```

注意：如果从Cisco IOS软件版本11.3升级到版本12.0，则新命令将自动替换旧命令。

本文档使用以下配置：

- 为E&M-FGD DTMF DNIS配置的Cisco 5300
- 为E&M-FGB配置的Cisco 5300
- 为E&M FGB配置的Cisco 3600(wink-start)

为E&M-FGD DTMF DNIS配置的Cisco 5300

```
hostname 5300-fg-d

!

controller T1 0

 clock source line primary

 ds0-group 1 timeslots 1-24 type e&m-fgd dtmf dnis


 !--- With this configuration we will use DTMF and !---
request the DNIS information. ! voice-port 0:1 ! dial-
peer voice 123 pots destination-pattern 123 direct-
inward-dial !--- This will only work if the DNIS
information is recieved. port 0:1 prefix 123 ! dial-peer
voice 567 voip destination-pattern 567 session target
ipv4:2.0.0.2 !
```

为E&M-FGB配置的Cisco 5300

```
hostname 5300-fg-b
!

controller T1 0

 clock source line primary

 ds0-group 1 timeslots 1-24 type e&m-fgb

!

voice-port 0:1
```

```
!
dial-peer voice 123 pots

 destination-pattern 123

 port 0:1

 prefix 123

!

dial-peer voice 567 voip

 destination-pattern 567

 session target ipv4:2.0.0.2

!
```

为E&M FGB配置的Cisco 3600(wink-start)

```
hostname 3600-fg-b
!

controller T1 1/0

 clock source line primary

 ds0-group 1 timeslots 1-24 type e&m-wink-start

!

voice-port 1/0:1

!
dial-peer voice 123 pots

 destination-pattern 123

 port 1/0:1

 prefix 123

!

dial-peer voice 567 voip

 destination-pattern 567

 session target ipv4:2.0.0.2
```

验证

当前没有可用于此配置的验证过程。

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除步骤

请按照以下说明排除配置故障。有关故障排除的其他信息，请参阅使用cas-custom命令的E1 R2自定义。

1. 检验T1控制器0是否已打开。如果它关闭，请检查成帧、线路编码、时钟源、警报、更换电缆、重新拔插卡等。
2. 如果您使用的是Cisco AS5300，请使用show vfc slot number interface命令检查DSP是否**已正确安**装。
3. 对于FGD中继，在普通旧式电话服务(POTS)对等体上配置直接拨入(DID)，以便接收的数字用于选择传出对等体。**注意：**在Cisco AS5300上，您需要配置“dnis”选项以请求DNIS。
4. 打开下节所示的**debug**命令，并研究输出
5. 检查路由器与PBX或交换机之间的通信。线路被扣了吗？路由器是否接收/发送数字？找出哪一方正在清除呼叫。如果可能，请使用Cisco.com上提供的最新Cisco IOS软件版本。

确定Cisco AS5xxx路由器上的信令

通过查看路由器的调试，很难确定您拥有的信令类型。但是，可以对信号应该是什么进行很好的猜测。以下调**试**在确定信令类型时相当可靠（尤其是当所有信道都空闲时）。建议您首先通过这些调试验证您的信令，因为它们可以发现最常见且不太明显的调配错误。与往常一样，在路由器中打开调试时请谨慎。建议您不要启用调试，除非您熟悉其功能。请注意，并非所有调试都适用于每个网络接入服务器(NAS)平台。

故障排除命令

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。

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

- **debug serial interface** — 显示串行连接故障的信息。
- **show controller t1** — 显示特定于控制器硬件的控制器状态。
- **debug cas** — 用于Cisco AS5xxx平台上的线路信令。
- **debug vpm signal** — 用于Cisco 26xx/36xx平台上的线路信令。
- **debug vtsp all** — 启用PBX和路由器之间交换的所有消息（数字）的输出。

```
bosshog#debug serial interface
!--- This enables the output below. Serial network interface debugging is on bosshog#show
controller t1
T1 0 is up.
 No alarms detected.
 Version info of slot 0:  HW: 2, Firmware: 16, PLD Rev: 0
 Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x42,
 Board Hardware Version 1.0, Item Number 73-2217-4,
 Board Revision A0, Serial Number 07389920,
 PLD/ISP Version 0.0, Manufacture Date 3-Jan-1998.
 Framing is ESF, Line Code is B8ZS, Clock Source is Line Primary.
  Data in current interval (6 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
 Robbed bit signals state:
        timeslots     rxA rxB rxC rxD         txA txB txC txD
```

```
        1               0   0   0   0           0   0   0   0
        2               0   0   0   0           0   0   0   0
        <snip>
        23              0   0   0   0           0   0   0   0
        24              0   0   0   0           0   0   0   0

 !--- Looking at the above signals, we are receiving all 0s from the switch. !--- This looks
like some form of E&M Signaling. !--- We can determine the following when the line is idle.
timeslots rxA rxB rxC rxD txA txB txC txD 1 0 0 0 0 0 0 0 0 !--- Looks like an E&M variant. 2 0
1 0 1 0 1 0 1 !--- Looks like fxs-loop-start. 3 1 1 1 1 0 1 0 1 !--- Looks like fxs-ground-
start.
```

以下输出适用于Cisco AS5300上的E&M FGB。

```
5300-fg-b#show debug
CAS:

 Channel Associated Signaling debugging is on

5300-fg-b#
!--- Incoming call to router. *May 28 12:40:35.376: from Trunk(0): (1/0): Rx LOOP_CLOSURE
(ABCD=1111) !--- Switch is off hook. !--- Send wink back to the switch. Note we transition from
a on/off/on hook state. *May 28 12:40:35.600: from Trunk(0): (1/0): Tx LOOP_CLOSURE (ABCD=1111)
!--- Sending Wink back. Off hook. *May 28 12:40:35.800: from Trunk(0): (1/0): Tx LOOP_OPEN
(ABCD=0000) !--- End of wink ~200 ms duration. On hook. 5300-fg-b# 5300-fg-b# !--- The call is
now in an alerting state waiting for a connect. !--- Router goes off hook. Call is connected.
*May 28 12:40:37.352: from Trunk(0): (1/0): Tx LOOP_CLOSURE (ABCD=1111) !--- Router has gone off
hook. Send a connect. 5300-fg-b# 5300-fg-b# 5300-fg-b# !--- At this point, the call is torn down
in the direction of the PBX. *May 28 12:40:42.608: from Trunk(0): (1/0): Tx LOOP_OPEN
(ABCD=0000) !--- Router disconnects call on hook. *May 28 12:40:42.940: from Trunk(0): (1/0): Rx
LOOP_OPEN (ABCD=0000) !--- Switch terminates upon receipt on hook.
```

此示例适用于Cisco 3600上的传出E&M FGB。

```
3600-fg-b#show debug

Voice Port Module signaling debugging is on
3600-fg-b#
!--- Outgoing call from router. *Mar 3 04:01:35.167: htsp_process_event: [2/1:1(1), EM_ONHOOK,
E_HTSP_SETUP_REQ ]em_onhook_setup !--- On hook state. *Mar 3 04:01:35.167: em_offhook
(0)[recEive and transMit2/1:1(1)] set signal st ate = 0x8 *Mar 3 04:01:35.167:
htsp_process_event: [2/1:1(1), EM_BRANCH, EM_EVENT_WINK] *Mar 3 04:01:35.167: em_start_timer:
550 ms *Mar 3 04:01:35.167: htsp_timer - 550 msec *Mar 3 04:01:35.415: htsp_process_event:
[2/1:1(1), EM_WAIT_WINKUP, E_DSP_SIG_1 100]em_wink_offhook !--- Router sends off hook. *Mar 3
04:01:35.415: em_stop_timers *Mar 3 04:01:35.415: htsp_timer_stop *Mar 3 04:01:35.415:
em_start_timer: 1200 ms *Mar 3 04:01:35.415: htsp_timer - 1200 msec *Mar 3 04:01:35.619:
htsp_process_event: [2/1:1(1), EM_WAIT_WINKDOWN, E_DSP_SIG _0000]em_wink_onhook !--- Router
sends on hook. *Mar 3 04:01:35.623: em_stop_timers *Mar 3 04:01:35.623: htsp_timer_stop
htsp_wink_ind *Mar 3 04:01:35.623: htsp_timer - 70 msec *Mar 3 04:01:35.695: htsp_process_event:
[2/1:1(1), EM_WAIT_DIALOUT_DELAY, E_HT SP_EVENT_TIMER]em_imm_send_digits em_send_digits
htsp_dial !--- At this point we send the digits. *Mar 3 04:01:36.507: htsp_process_event:
[2/1:1(1), EM_WAIT_FOR_ANSWER, E_DSP_D IALING_DONE]em_offhook_digit_done htsp_progress *Mar 3
04:01:36.507: ===== state 0x630852C0 *Mar 3 04:01:37.035: htsp_process_event: [2/1:1(1),
EM_WAIT_FOR_ANSWER, E_DSP_S IG_1100]em_wait_answer_offhook !--- Router is waiting for far end to
connect. *Mar 3 04:01:37.035: em_stop_timers *Mar 3 04:01:37.035: htsp_timer_stop *Mar 3
04:01:37.035: htsp_timer_stop2
```

此示例适用于Cisco 2600上的FXS环路启动。

```
FXS Loop-start Signal Map
```

```
*Mar 1 01:55:51.091: Foreign Exchange Station 1/1:1(22) rx_signal_map:
0 F F F
5 F 5 F
F F F F
F F F F
*Mar 1 01:55:51.095: Foreign Exchange Station 1/1:1(22) tx_signal_map:
4 4 4 4
4 4 4 4
C C C C
C C C C

!--- FXS Loop-start incoming call. *Mar 1 02:02:13.743: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0xC timestamp=26688 systime=733374 *Mar 1 02:02:13.743: [1/1:1(1), FXSLS_ONHOOK,
E_DSP_SIG_1100] fxsls_onhook_offhook htsp_setup_ind *Mar 1 02:02:13.751: [1/1:1(1),
FXSLS_WAIT_SETUP_ACK, E_HTSP_SETUP_ACK] *Mar 1 02:02:14.871: [1/1:1(1), FXSLS_OFFHOOK,
E_HTSP_PROCEEDING] htsp_alert_notify *Mar 1 02:02:15.163: [1/1:1(1), FXSLS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 02:02:15.607: [1/1:1(1), FXSLS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 02:02:15.607: [1/1:1(1), FXSLS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] !--- Call is ringing now. !--- Is answered below. vdtl-2600-
6d#htsp_connect: no_offhook 0
*Mar 1 02:02:26.239: [1/1:1(1), FXSLS_OFFHOOK, E_HTSP_CONNECT]
fxsls_offhook_connect[Foreign Exchange Station 1/1:1(1)] set signal state = 0x6

!--- Call is disconnected from T1 side below. vdtl-2600-6d# !--- Near end disconnect (from T1
side). vdtl-2600-6d# *Mar 1 02:02:37.299: htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0x4
timestamp=50246 systime=735730 *Mar 1 02:02:37.299: [1/1:1(1), FXSLS_CONNECT, E_DSP_SIG_0100]
fxsls_offhook_onhook *Mar 1 02:02:37.299: htsp_timer - 600 msec *Mar 1 02:02:37.899: [1/1:1(1),
FXSLS_CONNECT, E_HTSP_EVENT_TIMER] fxsls_connect_wait_release_req *Mar 1 02:02:37.899:
htsp_timer_stop htsp_release_req: cause 16, no_onhook 0 *Mar 1 02:02:37.919: [1/1:1(1),
FXSLS_WAIT_RELEASE_REQ, E_HTSP_RELEASE_REQ] fxsls_waitrls_req_rlshtsp_report_onhook_sig *Mar 1
02:02:37.923: vnm_dsprm_close_cleanup !--- FXS loop-start outgoing call. *Mar 1 03:42:05.067:
[1/1:1(2), FXSLS_ONHOOK, E_HTSP_SETUP_REQ] fxsls_onhook_setup[Foreign Exchange Station 1/1:1(2)]
set signal state = 0x0htsp_alert *Mar 1 03:42:05.327: [1/1:1(2), FXSLS_WAIT_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] fxsls_waitoff_voice *Mar 1 03:42:05.763: [1/1:1(2),
FXSLS_WAIT_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] fxsls_waitoff_voice *Mar 1 03:42:05.763:
[1/1:1(2), FXSLS_WAIT_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] fxsls_waitoff_voice !--- Call is
ringing now.
!--- Call is answered below.
*Mar 1 03:42:30.039: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0x4 timestamp=14102 systime=1335004
*Mar 1 03:42:30.039: [1/1:1(1), FXSLS_ONHOOK, E_DSP_SIG_0100]
*Mar 1 03:42:30.087: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0xC timestamp=14144 systime=1335008
*Mar 1 03:42:30.087: [1/1:1(2), FXSLS_WAIT_OFFHOOK, E_DSP_SIG_1100]
fxsls_waitoff_offhook[Foreign Exchange Station 1/1:1(2)]
set signal state = 0x4[Foreign Exchange Station 1/1:1(2)]
set signal state = 0x6 htsp_dial

!--- Call is disconnected via VoIP side below. vdtl-2600-6d#htsp_release_req: cause 16,
no_onhook 0
*Mar 1 03:43:27.855: [1/1:1(2), FXSLS_CONNECT, E_HTSP_RELEASE_REQ] fxsls_connect_disc
*Mar 1 03:43:27.855: htsp_timer_stop [Foreign Exchange Station 1/1:1(2)]
set signal state = 0xC[Foreign Exchange Station 1/1:1(2)] set signal state = 0x4
*Mar 1 03:43:27.859: htsp_timer - 950 msec
*Mar 1 03:43:28.811: [1/1:1(2), FXSLS_CPC, E_HTSP_EVENT_TIMER] fxsls_cpc_timer
*Mar 1 03:43:28.811: htsp_timer - 30000 msec
*Mar 1 03:43:28.815: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0xC timestamp=8470 systime=1340881
*Mar 1 03:43:28.815: [1/1:1(2), FXSLS_WAIT_ONHOOK, E_DSP_SIG_1100]
```

此示例适用于Cisco 2600上的FXO环路启动。

```
FXO Loop-start Channel Map
```

```
*Mar 1 03:48:30.055: Foreign Exchange Office 1/1:1(24) rx_signal_map:
F F F F
5 F F F
F F F F
F F F F[Foreign Exchange Office 1/1:1(24)] set signal state = 0x4
*Mar 1 03:48:30.055: Foreign Exchange Office 1/1:1(24) tx_signal_map:
0 0 4 4
4 4 4 4
C C C C
C C C C

!--- FXO loop-start incoming call. *Mar 1 03:52:56.271: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0x0 timestamp=50660 systime=1397627 *Mar 1 03:52:56.271: [1/1:1(1), FXOLS_ONHOOK,
E_DSP_SIG_0000] fxols_onhook_ringing *Mar 1 03:52:56.271: htsp_timer - 10000 msec *Mar 1
03:52:58.267: htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0x4 timestamp=52658 systime=1397826
*Mar 1 03:52:58.271: [1/1:1(1), FXOLS_RINGING, E_DSP_SIG_0100] *Mar 1 03:52:58.271:
fxols_ringing_not *Mar 1 03:52:58.271: htsp_timer_stop htsp_setup_ind *Mar 1 03:52:58.275:
[1/1:1(1), FXOLS_WAIT_SETUP_ACK, E_HTSP_SETUP_ACK] *Mar 1 03:52:58.275: fxols_wait_setup_ack:
[Foreign Exchange Office 1/1:1(1)] set signal state = 0xC !--- Call is ringing and is answered
(dial tone). !--- Entering destination for the call now. *Mar 1 03:53:09.019: [1/1:1(1),
FXOLS_PROCEEDING, E_HTSP_PROCEEDING] fxols_offhook_proc *Mar 1 03:53:09.019: htsp_timer - 120000
msechtsp_alert_notify *Mar 1 03:53:09.311: [1/1:1(1), FXOLS_PROCEEDING,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 03:53:09.759: [1/1:1(1), FXOLS_PROCEEDING,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 03:53:09.759: [1/1:1(1), FXOLS_PROCEEDING,
E_HTSP_VOICE_CUT_THROUGH] htsp_connect: no_offhook 0 *Mar 1 03:53:12.711: [1/1:1(1),
FXOLS_PROCEEDING, E_HTSP_CONNECT] fxols_offhook_connect *Mar 1 03:53:12.711: htsp_timer_stop !--
- Call is disconnected via VoIP side. vdtl-2600-6d#htsp_release_req: cause 16, no_onhook 0
*Mar 1 03:53:44.079: [1/1:1(1), FXOLS_CONNECT, E_HTSP_RELEASE_REQ]
fxols_offhook_release
*Mar 1 03:53:44.079: htsp_timer_stop [Foreign Exchange Office 1/1:1(1)]
set signal state = 0x4
*Mar 1 03:53:44.079: htsp_timer - 2000 msec
*Mar 1 03:53:44.079: vnm_dsprm_close_cleanup
*Mar 1 03:53:46.079: [1/1:1(1), FXOLS_GUARD_OUT,
E_HTSP_EVENT_TIMER] fxols_guard_out_timeout

!--- FXO loop-start outgoing call. *Mar 1 03:50:47.099: [1/1:1(2), FXOLS_ONHOOK,
E_HTSP_SETUP_REQ] fxols_onhook_setup[Foreign Exchange Office 1/1:1(2)] set signal state = 0xC
*Mar 1 03:50:47.099: htsp_timer - 1300 msec *Mar 1 03:50:48.399: [1/1:1(2),
FXOLS_WAIT_DIAL_TONE, E_HTSP_EVENT_TIMER] fxols_wait_dial_timer htsp_dial *Mar 1 03:50:50.407:
[1/1:1(2), FXOLS_WAIT_DIAL_DONE, E_DSP_DIALING_DONE] fxols_wait_dial_done htsp_alert *Mar 1
03:50:50.659: [1/1:1(2), FXOLS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar 1 03:50:50.695:
[1/1:1(2), FXOLS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar 1 03:50:50.707: [1/1:1(2),
FXOLS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] !--- Call is answered now. Debugs shown because of lack
of answer supervision. !--- The next thing that happens is a VoIP side disconnect. vdtl-2600-
6d#htsp_release_req: cause 16, no_onhook 0
*Mar 1 03:51:06.483: [1/1:1(2), FXOLS_OFFHOOK,
E_HTSP_RELEASE_REQ] fxols_offhook_release
*Mar 1 03:51:06.483: htsp_timer_stop
[Foreign Exchange Office 1/1:1(2)] set signal state = 0x4
*Mar 1 03:51:06.483: htsp_timer - 2000 msec
*Mar 1 03:51:06.487: vnm_dsprm_close_cleanup
*Mar 1 03:51:08.483: [1/1:1(2), FXOLS_GUARD_OUT,
E_HTSP_EVENT_TIMER] fxols_guard_out_timeout
```

此示例适用于Cisco 2600上的FXS接地启动。

```
!--- FXS ground-start signal map. *Mar 1 04:04:13.334: Foreign Exchange Station 1/1:1(16)
rx_signal_map: 0 F F F 5 F 5 F F F F F F F F F *Mar 1 04:04:13.338: Foreign Exchange Station
1/1:1(16) tx_signal_map: 0 0 0 0 4 4 4 4 8 8 8 8 C C C C !--- FXS ground-start incoming call.
*Mar 1 04:05:22.650: %SYS-5-CONFIG_I: Configured from console by console *Mar 1 04:05:26.982:
htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0x0 timestamp=15488 systime=1472698 *Mar 1
```

```
04:05:26.982: [1/1:1(1), FXSGS_ONHOOK, E_DSP_SIG_0000] fxsgs_onhook_ringgnd[Foreign Exchange
Station 1/1:1(1)] set signal state = 0x4 *Mar 1 04:05:26.982: htsp_timer - 900 msec *Mar 1
04:05:27.142: htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0xC timestamp=15648 systime=1472714
*Mar 1 04:05:27.142: [1/1:1(1), FXSGS_WAIT_LOOPCLOSE, E_DSP_SIG_1100] fxsgs_wait_loopclose *Mar
1 04:05:27.142: htsp_timer_stop htsp_setup_ind *Mar 1 04:05:27.150: [1/1:1(1),
FXSGS_WAIT_SETUP_ACK, E_HTSP_SETUP_ACK] fxsgs_wait_setup_rcv_ack[Foreign Exchange Station
1/1:1(1)] set signal state = 0x4 *Mar 1 04:05:28.282: [1/1:1(1), FXSGS_OFFHOOK,
E_HTSP_PROCEEDING] htsp_alert_notify *Mar 1 04:05:28.598: [1/1:1(1), FXSGS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 04:05:28.626: [1/1:1(1), FXSGS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] *Mar 1 04:05:28.638: [1/1:1(1), FXSGS_OFFHOOK,
E_HTSP_VOICE_CUT_THROUGH] !--- Call is ringing now. !--- Call is answered below. vdtl-2600-
6d#htsp_connect: no_offhook 0
*Mar 1 04:05:35.262: [1/1:1(1), FXSGS_OFFHOOK, E_HTSP_CONNECT]
fxsgs_offhook_connect[Foreign Exchange Station 1/1:1(1)] set signal state = 0x6

!--- Call is disconnected via T1 side. *Mar 1 04:05:42.822: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0x4 timestamp=31328 systime=1474282 *Mar 1 04:05:42.822: [1/1:1(1),
FXSGS_CONNECT, E_DSP_SIG_0100] fxsgs_connect_onhookhtsp_release_req: cause 16, no_onhook 0 *Mar
1 04:05:42.850: [1/1:1(1), FXSGS_WAIT_RELEASE_REQ, E_HTSP_RELEASE_REQ]
fxsgs_wait_release_req_release[Foreign Exchange Station 1/1:1(1)] set signal state = 0xC *Mar 1
04:05:42.850: vnm_dsprm_close_cleanup *Mar 1 04:05:42.854: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0x4 timestamp=8983 systime=1474285 *Mar 1 04:05:42.854: [1/1:1(1),
FXSGS_ONHOOK, E_DSP_SIG_0100] vdtl-2600-6d# !--- FXS ground-start outgoing call. *Mar 1
04:26:50.578: [1/1:1(1), FXSGS_ONHOOK, E_HTSP_SETUP_REQ] fxsgs_onhook_setup[Foreign Exchange
Station 1/1:1(1)] set signal state = 0x0htsp_alert *Mar 1 04:26:50.834: [1/1:1(1),
FXSGS_WAIT_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] fxsgs_waitoff_voice *Mar 1 04:26:51.282:
[1/1:1(1), FXSGS_WAIT_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] fxsgs_waitoff_voice *Mar 1
04:26:51.282: [1/1:1(1), FXSGS_WAIT_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] fxsgs_waitoff_voice !---
Call rings and is then answered. *Mar 1 04:27:02.234: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0xC timestamp=974 systime=1602223 *Mar 1 04:27:02.234: [1/1:1(1), FXSGS_WAIT_OFFHOOK,
E_DSP_SIG_1100] fxsgs_waitoff_offhook[Foreign Exchange Station 1/1:1(1)] set signal state = 0x4
*Mar 1 04:27:02.238: htsp_timer_stop [Foreign Exchange Station 1/1:1(1)] set signal state = 0x6
!--- Call is disconnected via VoIP side below. vdtl-2600-6d#htsp_release_req: cause 16,
no_onhook 0
*Mar 1 04:27:16.146: [1/1:1(1), FXSGS_CONNECT, E_HTSP_RELEASE_REQ]
fxsgs_connect_release[Foreign Exchange Station 1/1:1(1)] set signal state = 0xC
*Mar 1 04:27:16.190: htsp_dsp_message: SEND/RESP_SIG_STATUS:
state=0x0 timestamp=14928 systime=1603619
*Mar 1 04:27:16.194: [1/1:1(1), FXSGS_WAIT_ONHOOK, E_DSP_SIG_0000]
```

此示例适用于Cisco 2600上的FXO接地启动。

```
!--- FXO ground-start signal map. *Mar 1 04:31:34.166: Foreign Exchange Office 1/1:1(1)
rx_signal_map: 0 F F F 5 F F F F F F F F F F F *Mar 1 04:31:34.166: Foreign Exchange Office
1/1:1(1) tx_signal_map: 0 0 0 0 4 4 4 4 8 8 8 8 C C C C !--- FXO ground-start incoming call.
*Mar 1 04:35:26.194: htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0x0 timestamp=46190
systime=1652619 *Mar 1 04:35:26.194: [1/1:1(1), FXOGS_ONHOOK, E_DSP_SIG_0000]
fxogs_onhook_ringing *Mar 1 04:35:26.194: htsp_timer_stop *Mar 1 04:35:28.194: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0x4 timestamp=48188 systime=1652819 *Mar 1 04:35:28.194: [1/1:1(1),
FXOGS_RINGING, E_DSP_SIG_0100] *Mar 1 04:35:28.194: fxogs_ringing_not: *Mar 1 04:35:28.194:
htsp_timer_stop htsp_setup_ind *Mar 1 04:35:28.198: [1/1:1(1), FXOGS_WAIT_SETUP_ACK,
E_HTSP_SETUP_ACK] *Mar 1 04:35:28.202: fxogs_wait_setup_ack: [Foreign Exchange Office 1/1:1(1)]
set signal state = 0xC vdtl-2600-6d# !--- Call is answered. Entering digits to route the call
further. vdtl-2600-6d# *Mar 1 04:35:37.458: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_PROCEEDING]
htsp_alert_notify *Mar 1 04:35:37.750: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar
1 04:35:37.782: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar 1 04:35:37.798:
[1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] !--- VoIP side connected. vdtl-2600-
6d#htsp_connect: no_offhook 0
*Mar 1 04:35:43.350: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_CONNECT] fxogs_proc_voice

!--- Call disconnected from T1 side. vdtl-2600-6d# *Mar 1 04:36:02.890: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0xC timestamp=17354 systime=1656289 *Mar 1 04:36:02.894: [1/1:1(1),
```

```
FXOGS_OFFHOOK, E_DSP_SIG_1100] fxogs_offhook_disc *Mar 1 04:36:02.894: htsp_timer_stop [Foreign
Exchange Office 1/1:1(1)] set signal state = 0x4 *Mar 1 04:36:02.894: htsp_timer - 2000
msechtsp_release_req: cause 16, no_onhook 0 *Mar 1 04:36:02.918: [1/1:1(1), FXOGS_GUARD_OUT,
E_HTSP_RELEASE_REQ] fxogs_onhook_release *Mar 1 04:36:02.922: vnm_dsprm_close_cleanup *Mar 1
04:36:04.894: [1/1:1(1), FXOGS_GUARD_OUT, E_HTSP_EVENT_TIMER] !--- FXO ground-start outgoing
call. *Mar 1 04:33:08.838: [1/1:1(1), FXOGS_ONHOOK, E_HTSP_SETUP_REQ] fxogs_onhook_setup[Foreign
Exchange Office 1/1:1(1)] set signal state = 0x0 *Mar 1 04:33:08.838: htsp_timer - 10000 msec
*Mar 1 04:33:09.214: htsp_dsp_message: SEND/RESP_SIG_STATUS: state=0x4 timestamp=40280
systime=1638921 *Mar 1 04:33:09.218: [1/1:1(1), FXOGS_WAIT_TIP_GROUND, E_DSP_SIG_0100]
fxogs_start_dial *Mar 1 04:33:09.218: htsp_timer_stop [Foreign Exchange Office 1/1:1(1)] set
signal state = 0xC *Mar 1 04:33:09.218: htsp_timer - 1000 msec *Mar 1 04:33:10.218: [1/1:1(1),
FXOGS_WAIT_DIAL_TONE, E_HTSP_EVENT_TIMER] fxogs_wait_dial_timer htsp_dial *Mar 1 04:33:12.226:
[1/1:1(1), FXOGS_WAIT_DIAL_DONE, E_DSP_DIALING_DONE] fxogs_wait_dial_donehtsp_connect:
no_offhook 0htsp_alert *Mar 1 04:33:12.226: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_CONNECT]
fxogs_proc_voice *Mar 1 04:33:12.478: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar 1
04:33:12.514: [1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] *Mar 1 04:33:12.526:
[1/1:1(1), FXOGS_OFFHOOK, E_HTSP_VOICE_CUT_THROUGH] !--- Call connects and is answered. !--- No
signaling is reported (no answer supervision for ground-start). !--- Call disconnected from VoIP
leg below. vdtl-2600-6d#htsp_release_req: cause 16, no_onhook 0 *Mar 1 04:33:22.590: [1/1:1(1),
FXOGS_OFFHOOK, E_HTSP_RELEASE_REQ] fxogs_offhook_release *Mar 1 04:33:22.590: htsp_timer_stop
*Mar 1 04:33:22.590: htsp_timer_stop2 [Foreign Exchange Office 1/1:1(1)] set signal state = 0x4
*Mar 1 04:33:22.590: htsp_timer - 2000 msec *Mar 1 04:33:22.778: htsp_dsp_message:
SEND/RESP_SIG_STATUS: state=0xC timestamp=53840 systime=1640278 *Mar 1 04:33:22.778: [1/1:1(1),
FXOGS_WAIT_ONHOOK, E_DSP_SIG_1100] fxogs_waitonhook_onhook *Mar 1 04:33:22.778: htsp_timer_stop
*Mar 1 04:33:22.778: htsp_timer - 2000 msec *Mar 1 04:33:22.782: vnm_dsprm_close_cleanup *Mar 1
04:33:24.778: [1/1:1(1), FXOGS_GUARD_OUT, E_HTSP_EVENT_TIMER]
```

相关信息

- 了解数字T1 CAS（Rob Bit信令）在IOS网关中的工作原理
- T1 故障排除
- E1 故障排除
- 模拟E&M故障排除指南
- 语音技术支持
- 语音和统一通信产品支持
- 语音和统一通信软件
- 技术支持和文档 - Cisco Systems