

H.323 T.38 팩스 릴레이 문제

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소개

T.38 팩스 릴레이 문제는 일반적으로 Cisco와 타사 T.38 팩스 게이트웨이 간의 상호 운용성 문제와 관련이 있습니다. 이 문서에서는 성공 및 실패한 T.38 팩스 릴레이 통화의 자세한 디버그 명령 예를 제공합니다. 이러한 **debug** 명령 출력에는 참조 지점을 제공하는 주석이 포함되어 있으므로 이러한 상호 운용성 문제를 식별하고 해결할 수 있습니다. 관련 문제 해결 및 확인 명령도 이 문서에서 제공됩니다.

사전 요구 사항

요구 사항

이 문서의 독자는 팩스 릴레이의 기본 개념을 잘 알고 있어야 합니다. 팩스 릴레이 개념 및 기본 문제 해결 단계에 대한 자세한 내용은 [팩스 릴레이 문제 해결 가이드](#)를 참조하십시오.

사용되는 구성 요소

이 문서는 특정 소프트웨어 및 하드웨어 버전으로 한정되지 않습니다.

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 현재 네트워크가 작동 중인 경우, 모든 명령어의 잠재적인 영향을 미리 숙지하시기 바랍니다.

[표기 규칙](#)

문서 규칙에 대한 자세한 내용은 [Cisco 기술 팁 표기 규칙을 참고하십시오.](#)

[T.38 기본 사항](#)

T.38 팩스 릴레이 문제의 일반적인 증상은 팩스 신호음이 들렸지만 팩스 협상이 완료되지 않고 통화가 결국 끊어진 음성 통화입니다. 이 문제는 Cisco T.38 게이트웨이 및 타사 T.38 게이트웨이 상호 운용성 문제와 관련이 있는 경우가 많습니다.

T.38 팩스 릴레이는 실시간 팩스 전송입니다. 두 팩스 사이에 직통전화로 있는 것처럼 서로 통신하는 두 개의 팩스 장치입니다. 팩스 릴레이는 음성 통화에 대해 이미 정의되고 구성된 게이트웨이 다이얼 피어에서 몇 가지 추가 명령으로 구성됩니다.

Cisco는 팩스 릴레이를 위한 두 가지 방법을 제공합니다. ITU-T.38 표준을 기반으로 하는 Cisco 독점 방법 및 방법. 대부분의 플랫폼에서 팩스 방법이 명시적으로 구성되지 않은 경우 Cisco 팩스 릴레이가 기본값입니다. Cisco 팩스 릴레이는 [Cisco 팩스 릴레이 구성에 설명되어 있습니다.](#)

[T.38 제한 사항](#)

이 시점에서 Cisco T.38 팩스 릴레이에는 다음과 같은 제한이 있습니다.

- T.38 상호 운용성을 위해서는 Cisco H.323 버전 2가 필요합니다.
- T.38은 VCM(Voice Compression Module)이 있는 Cisco MC3810 Series Concentrator에서 지원되지 않습니다.
- T.38은 MCM(Multimedia Conference Manager) H.323 프록시에서 지원되지 않습니다.
- H.323 T.38에는 UDP(User Datagram Protocol)만 구현됩니다.
- 일부 타사 게이트웨이 및 게이트키퍼는 T.38 팩스 릴레이용 Cisco 음성 게이트웨이와 호환되지 않습니다. 제조업체마다 게이트웨이 및 게이트키퍼에 구현하기 위해 H.323 및 T.38의 특정 부분을 선택할 수 있기 때문입니다. T.38 팩스 릴레이가 성공적일 수 있도록 타사 게이트웨이 및 게이트키퍼와의 음성 상호 운용성 테스트를 수행해야 합니다.

[T.38 협상](#)

이 섹션에서는 Cisco 게이트웨이 내에서 T.38 협상을 처리하는 방법에 대한 간략한 단계별 요약を提供합니다. 팩스 릴레이 기본 사항에 대한 자세한 내용은 [팩스 릴레이 문제 해결 가이드](#)를 참조하십시오.

1. 초기 설정 메시지에서 T.38 데이터 기능은 OGW(Originating Gateway)에서 발표합니다. TGW(Terminating Gateway)가 T.38 데이터 기능을 지원하는 경우 OGW로 전송된 후속 메시지의 해당 정보를 릴레이할 수 있습니다.
2. 음성 통화가 설정되고 TGW의 DSP(Digital Signal Processor)가 팩스 신호음을 감지하면 VTSP(Voice Telephony Service Provider) 상태 머신이 H.323 통화 레그를 알려주며, 이 레그는 OGW와 T.38 모드를 협상합니다.
3. T.38 모드를 승인하면 오디오 채널이 닫히고 T.38 논리 채널이 양쪽 끝에서 열립니다.
4. VTSP 코드 레벨에서 팩스 코드 디코더(codec) 다운로드가 수행됩니다.
5. T.38 OLC(Open Logical Channel) 및 코덱을 다운로드하면 VTSP가 팩스 모드로 들어갑니다.
6. 팩스 전송이 완료되면 통화가 음성 통화로 돌아갑니다. **참고:** T.38 모드를 협상하는 동안 상대

방이 T.38 모드를 승인하지 않으면 통화가 음성 통화로 되돌려지고 연결이 끊어집니다. T.38 OLC에 대해 반대쪽 끝에서 부정적인 승인을 받으면 통화도 음성 통화로 되돌아가서 연결이 끊깁니다.

T.38 문제 해결

H.323 또는 SIP T.38 팩스 릴레이의 문제 해결 팁

T.38 팩스 릴레이를 트러블슈팅하려면 다음 단계를 수행하십시오.

- **음성 통화를 할 수 있는지 확인합니다.** 팩스 연결을 조사하기 전에 일반 음성 통화를 완료할 수 있는지 확인합니다. 연결된 전화기가 없는 경우 팩스 장치를 분리하고 일반 전화기를 연결하십시오. 일반 음성 통화가 연결되지 않으면 VoX 관련 문제가 될 수 있으며, 팩스 문제 해결을 진행하기 전에 정상적인 음성 연결 문제로 문제를 해결할 수 있습니다.
- 원하는 팩스 프로토콜이 원래 게이트웨이와 종료 게이트웨이 모두에서 팩스 프로토콜 명령으로 설정되었는지 확인합니다.
- 팩스 프로토콜이 시작 게이트웨이와 종료 게이트웨이 모두에 대해 글로벌 컨피그레이션 레벨 또는 다이얼 피어 컨피그레이션 레벨에서 T.38로 구성되었는지 확인합니다.

debug 및 show 명령

T.38 팩스 릴레이를 트러블슈팅하는 데 사용되는 **debug** 및 **show** 명령은 다음과 같습니다.

- **debug voip capi inout**—이 명령은 호출 세션 응용 프로그램과 기본 네트워크 관련 소프트웨어 간의 인터페이스 역할을 하는 API(Call Control Application Program Interface)를 통해 실행 경로를 추적합니다. 이 명령의 출력을 사용하여 음성 게이트웨이에서 통화를 처리하는 방식을 이해할 수 있습니다.
- **debug vtsp all**—이 명령은 다음 **debug VTSP** 명령을 활성화합니다. **vtsp 세션 디버그**, **vtsp 오류 디버그** 및 **vtsp dsp 디버그**.
- **debug h245 asn1**—이 명령은 H.245 메시지의 ASN.1(Abstract Syntax Notation One) 내용을 표시합니다. 디버깅 출력을 비활성화하려면 이 명령의 **no** 형식을 사용합니다.
- **debug cch323 h245** - 이 명령은 처리된 이벤트를 기반으로 H.245 상태 시스템의 상태 전환 추적을 제공합니다. 디버깅 출력을 비활성화하려면 이 명령의 **no** 형식을 사용합니다.
- **show call active fax brief(통화 활성 팩스 브리핑 표시)** - 이 명령은 진행 중인 저장 및 전달 팩스 전송에 대한 통화 정보를 표시합니다.
- **show call history fax**—이 명령은 팩스에 대한 최근 통화 기록을 표시합니다.

성공한 T.38 통화 출력

이 섹션에서는 AS5300 Series 라우터와 Cisco 3640 Modular Access Router 간의 성공적인 T.38 팩스 설정 방법에 대해 자세히 설명합니다. **debug** 및 **show** 명령 출력은 Cisco AS5300 Universal Gateway에서 TGW IOS 12.2로 캡처되었습니다.

debug vtsp all 명령 출력

```
!---After the voice call setup: !--- Usually, after the  
call is connected, the ccCallConnect debug !--- message
```

```
is seen as follows: May 3 21:41:21.424: ccCallConnect
(callID=0x9), prog_ind = 0

May 3 21:41:21.424: ssaFlushPeerTagQueue cid(9) peer
list: (empty)

May 3 21:41:21.424: H.225 SM: process event
H225_EVENT_SETUP_CFM, for callID 9

May 3 21:41:21.424: cch323_run_h225_sm:
    received event H225_EVENT_SETUP_CFM while at state
H225_ALERT

May 3 21:41:21.424: H.225 SM:
    changing from H225_ALERT state to H225_ACTIVE state
for callID 9

May 3 21:41:21.424: ==== PI in
cch323_h225_generic_send_setup_cfm = 0

!---After the voice call is established, the TGW DSP
detected fax tone: May 3 21:41:26.741:
vtsp_process_dsp_message: MSG_TX_TONE_DETECT:
    type=0 trigger=1 tone_id=0

May 3 21:41:26.741: vtsp:[1:D (10), S_CONNECT,
E_DSP_TONE_DETECT]

May 3 21:41:26.745: vtsp_modem_proto_from_cdb:
cap_modem_proto 0

May 3 21:41:26.745: cc_api_call_feature:
(vdbPtr=0x624130C0,
    callID=0xA,feature_ind.type=1

!---Switched to fax mode: May 3 21:41:26.745:
act_lfax_switch:
    cap_modem_proto=16, fax_relay_on=1, state=19

May 3 21:41:26.745: vtsp_t38_switchover:2 - data_mode:1
!--- Note that 2 means T.38; 1 means Cisco proprietary.
May 3 21:41:26.745: cc_api_t38_fax_start
    (dstVdbPtr=0x61B45A90, dstCallId=0x9,
srcCallId=0xA,????
caps={codec=0x10000, fax_rate=0x2, vad=0x2,
modem=0x0codec_bytes=160, signal_type=1})

May 3 21:41:26.745: vtsp_timer: 2016656

May 3 21:41:26.745: sess_appl:
ev(28=CC_EV_CALL_FEATURE), cid(10), disp(0)

May 3 21:41:26.745:
cid(10)st(SSA_CS_ACTIVE)ev(SSA_EV_CALL_FEATURE)

oldst(SSA_CS_CONFERENCED_ALERT)cfid(5)csize(0)in(0)fDest
(0)

May 3 21:41:26.745: -
cid2(9)st2(SSA_CS_ACTIVE)oldst2(SSA_CS_CONFERENCING_ALER
T)
!---H245 ModeRequest was sent to the OGW: May 3
21:41:26.745: ccCallFeature (callID=0x9, feature.type=1)
Set new event H245_EVENT_MR, for callID 9 May 3
```

```
21:41:26.745: cch323_run_h245_mr_sm: received event
H245_EVENT_MR while at state H245_MR_NONE?
!---Above, state H245_MR_NONE refers to ModeRequest
state. May 3 21:41:26.745: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request :
requestMode :

??? {

????? sequenceNumber 1

????? requestedModes

?????{

??????? {

????????? {

????????????? type dataMode :

????????????? {

????????????????? application t38fax :

????????????????? {

????????????????????? t38FaxProtocol udp : NULL

????????????????????? t38FaxProfile

????????????????? ???#{

????????????????????? fillBitRemoval FALSE

????????????????????? transcodingJBIG FALSE

????????????????????? transcodingMMR FALSE

????????????????????? version 0

????????????????????? t38FaxRateManagement transferredTCF :
NULL

????????????????????? t38FaxUdpOptions

??????? ??????????#{

????????????????????? t38FaxMaxBuffer 200

????????????????????? t38FaxMaxDatagram 72

????????????????????? t38FaxUdpEC t38UDPRedundancy : NULL

????????????????????? }

????????????????????? }

????????????????????? }

????????????????????? bitRate 144

????????????????? }
```

```
????????? }

????????? }

????? }

??? }

May 3 21:41:26.753: changing from H245_MR_NONE state to
H245_MR_WAIT_FOR_ACK state

May 3 21:41:26.861: vtsp_process_dsp_message:
  MSG_TX_TONE_DETECT: type=0 trigger=0 tone_id=0

May 3 21:41:26.861: vtsp:[1:D (10),
S_LFAX_WAIT_CAPS_ACK, E_DSP_TONE_DETECT]

May 3 21:41:26.865: vtsp_process_event(): prev_state =
0.11 ,

state = S_LFAX_WAIT_CAPS_ACK, event = E_DSP_TONE_DETECT

?Invalid FSM? Input on channel 1:D
(10)h323chan_chn_process_read_socket:
fd (3) of type ACCEPTED has data PROCESS_READ: NOT
COMPLETE, rc 10, fd=3

May? 3 21:41:27.001: vtsp_process_dsp_message:
  MSG_TX_TONE_DETECT: type=0 trigger=1 tone_id=0

May? 3 21:41:27.001: vtsp:[1:D (10),
S_LFAX_WAIT_CAPS_ACK, E_DSP_TONE_DETECT]

May? 3 21:41:27.005: vtsp_process_event(): prev_state =
0.11 ,

?state = S_LFAX_WAIT_CAPS_ACK, event = E_DSP_TONE_DETECT

Invalid FSM?Input on channel 1:D (10)

May 3 21:41:27.101: vtsp_process_dsp_message:
  MSG_TX_TONE_DETECT: type=0 trigger=0 tone_id=0

May 3 21:41:27.101: vtsp:[1:D (10),
S_LFAX_WAIT_CAPS_ACK, E_DSP_TONE_DETECT]

May 3 21:41:27.105: vtsp_process_event(): prev_state =
0.11 ,

state = S_LFAX_WAIT_CAPS_ACK, event = E_DSP_TONE_DETECT

Invalid FSM Input on channel 1:D
(10)h323chan_chn_process_read_socket:
  fd (3) of type ACCEPTED has data

Hex representation of the received TPKT0321000827000100

May 3 21:41:27.173: ? state = 0 bytesLeftToDecode = 4

May 3 21:41:27.173: H245 MSC INCOMING ENCODE BUFFER::=
27 000100
!---Received ModeRequestAck from the OGW: May 3
21:41:27.173: H245 MSC INCOMING PDU ::=
```

```
value MultimediaSystemControlMessage ::= response :
requestModeAck :

??? {

????? sequenceNumber 1

????? response willTransmitMostPreferredMode : NULL

??? }

Set new event H245_EVENT_MR_CFM, for callID 9

May 3 21:41:27.173: cch323_run_h245_mr_sm: received
event
  H245_EVENT_MR_CFM while at state H245_MR_WAIT_FOR_ACK
  !---The voice LC is closed and the T.38 fax data LC is
opened: May 3 21:41:27.173: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request :
closeLogicalChannel :?
  !---In the previous line, LogicalChannel refers to the
voice LC. ??? { ?????? forwardLogicalChannelNumber 1

????? source user : NULL

??? }

May 3 21:41:27.173: H245 MSC OUTGOING ENCODE BUFFER::=
04 00000000

May 3 21:41:27.173: send result :0

May 3 21:41:27.173: changing from H245_OLC_DONE state to
H245_OLC_NONE state

May 3 21:41:27.173: cch323_update_new_codec_info: Remote
codec 17

May 3 21:41:27.173: cch323_update_new_codec_info:
negotiated_codec set(17)(40 bytes)

May 3 21:41:27.173: Changing to new event H245_EVENT_OLC

May 3 21:41:27.177: cch323_h245_olc_sm:
  received event H245_EVENT_OLC while at state
H245_OLC_NONE

May 3 21:41:27.177: changing from H245_OLC_NONE state to
H245_OLC_WAIT state

May 3 21:41:27.177: H245 MSC OUTGOING PDU ::=

value MultimediaSystemControlMessage ::= request :
openLogicalChannel :?
  !---In the previous line, LogicalChannel refers to the
T.38 or data LC. ??? { ?????? forwardLogicalChannelNumber
2

????? forwardLogicalChannelParameters

????? {
```

```

???????? dataType data :

???????? {

???????? application t38fax :

???????? {

???????? t38FaxProtocol udp : NULL

???????? t38FaxProfile

???????? {

???????? fillBitRemoval FALSE

???????? transcodingJBIG FALSE

???????? transcodingMMR FALSE

???????? version 0

???????? t38FaxRateManagement transferredTCF : NULL

???????? t38FaxUdpOptions

???????? ??{

???????? t38FaxMaxBuffer 200

???????? t38FaxMaxDatagram 72

???????? t38FaxUdpEC t38UDPRedundancy : NULL

???????? }

???????? }

???????? }

???????? maxBitRate 144

???????? }

???????? multiplexParameters
h2250LogicalChannelParameters :

???????? {

???????? sessionID 3?

!---The previous line refers to the data session ID.
???????? mediaControlChannel unicastAddress : ipAddress
: ????????? { ????????? network 'AB44BA66'H
???????? tsapIdentifier 17517 ????????? } ?????????
silenceSuppression FALSE ????????? } ????????? } ??? } May 3
21:41:27.181: H245 MSC OUTGOING ENCODE BUFFER::= 03
00000111 04118601 00805C01 00014007 C00200C8 01484000
90800B05 000300AB 44BA6644 6D00 May 3 21:41:27.181: send
result :0 May 3 21:41:27.181: OLC using T38Fax

May 3 21:41:27.181: changing from H245_MR_WAIT_FOR_ACK
state to H245_MR_NONE state

```



```
h323chan_chn_process_read_socket: fd (3) of type
ACCEPTED has data
```

```
Hex representation of the received
TPKT032100090400000000
```

```
May 3 21:41:27.185: ? state = 0 bytesLeftToDecode = 5
```

```
May 3 21:41:27.185: H245 MSC INCOMING ENCODE BUFFER::=
04 00000000
```

```
May 3 21:41:27.185:
```

```
May 3 21:41:27.185: H245 MSC INCOMING PDU ::=
```

```
value MultimediaSystemControlMessage ::= request :
closeLogicalChannel :??
!---In the previous line, LogicalChannel refers to the
voice LC. ??? { ????? forwardLogicalChannelNumber 1
????? source user : NULL ??? } May? 3 21:41:27.185: H245
MSC OUTGOING PDU ::=
```

```
value MultimediaSystemControlMessage ::= response
: closeLogicalChannelAck :???
!---In the previous line, LogicalChannel refers to the
voice LC. ??? { ????? forwardLogicalChannelNumber 1 ???
} May 3 21:41:27.185: H245 MSC OUTGOING ENCODE BUFFER::=
23 800000 May 3 21:41:27.185: H245 MSC INCOMING ENCODE
BUFFER::= 03 00000111 04118601 00805C01 00014007
C00200C8 01484000 90800B05 000300AC 10AF6941 7100 May 3
21:41:27.189: H245 MSC INCOMING PDU ::=
```

```
value MultimediaSystemControlMessage ::= request :
openLogicalChannel :?
!---In the previous line, LogicalChannel refers to the
T.38 or data LC. ??? { ????? forwardLogicalChannelNumber
2
```

```
????? forwardLogicalChannelParameters
```

```
????? {
```

```
????????? dataType data :
```

```
????????? {
```

```
??????????? application t38fax :
```

```
??????????? {
```

```
??????????????? t38FaxProtocol udp : NULL
```

```
??????????????? t38FaxProfile
```

```
??????????????? {
```

```
????????????????? fillBitRemoval FALSE
```

```
????????????????? transcodingJBIG FALSE
```

```
????????????????? transcodingMMR FALSE
```

```
????????????????? version 0
```

```
???????????????? t38FaxRateManagement transferredTCF : NULL

???????????????? t38FaxUdpOptions

???????????????? {

???????????????? t38FaxMaxBuffer 200

???????????????? t38FaxMaxDatagram 72

???????????????? t38FaxUdpEC t38UDPRedundancy : NULL

???????????????? }

???????????????? }

???????????????? }

???????????????? }

???????????????? maxBitRate 144

???????????????? }

???????????? multiplexParameters
h2250LogicalChannelParameters :

???????????? {

???????????? sessionID 3

???????????? mediaControlChannel unicastAddress : ipAddress
:

???????????? {

???????????????? network 'AC10AF69'H

???????????????? tsapIdentifier 16753

???????????????? }

???????????????? silenceSuppression FALSE

????? ???}

????? }

??? }
!---DSP started T.38 fax codec download: May 3
21:41:27.193: cc_api_t38_fax_start
      (dstVdbPtr=0x624130C0, dstCallId=0xA, srcCallId=0x9,

???? caps={codec=0x10000, fax_rate=0x2, vad=0x2,
modem=0x
      codec_bytes=160, signal_type=1})

May 3 21:41:27.193: vtsp:[1:D (10),
S_LFAX_WAIT_CAPS_ACK, E_CC_T38_START]

May 3 21:41:27.193: act_caps_ack_lfax_dnld

May 3 21:41:27.193: vtsp_timer_stop: 2016700

May 3 21:41:27.193: dsp_idle_mode: [1:D (10)]
      packet_len=8 channel_id=8481 packet_id=68
```

May 3 21:41:27.193: **cc_api_local_codec_dnld_done**
(dstVdbPtr=0x61B45A90, dstCallId=0x9, srcCallId=0xA)

May 3 21:41:27.193: vtsp_timer:
2016700cch323_h245_local_codec_dnld_done:
negotiatedCodec[17]

May 3 21:41:27.197: Changing to new event
H245_EVENT_OLC_IND

May 3 21:41:27.197: cch323_h245_olc_sm:
received event H245_EVENT_OLC_IND while at state
H245_OLC_WAIT

May 3 21:41:27.197: H245 MSC **OUTGOING** PDU ::=

value MultimediaSystemControlMessage ::= response
: **openLogicalChannelAck** :

??? {

????? **forwardLogicalChannelNumber 2**

????? forwardMultiplexAckParameters
h2250LogicalChannelAckParameters :

????? {

??????? sessionID 1

??????? mediaChannel unicastAddress : ipAddress :

??????? {

????????? network 'AB44BA66'H

????????? tsapIdentifier 17516

??????? }

????? ??mediaControlChannel unicastAddress : ipAddress :

??????? {

????????? network 'AB44BA66'H

????????? tsapIdentifier 17517

??????? }

??????? flowControlToZero FALSE

????? }

??? }

May 3 21:41:27.197: H245 MSC OUTGOING ENCODE BUFFER:
:= 22 C0000104 80145C00 00AB44BA 66446C00 AB44BA66
446D0300 0100

May 3 21:41:27.589: ? state = 0 bytesLeftToDecode = 4

May 3 21:41:27.589: H245 MSC INCOMING ENCODE BUFFER::=

```
23 800000

May 3 21:41:27.589:

May 3 21:41:27.589: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= response :
closeLogicalChannelAck :

??? {

????? forwardLogicalChannelNumber 1

??? }

May 3 21:41:27.789: H245 MSC INCOMING ENCODE BUFFER:
:= 22 C0000104 80145C00 00AC10AF 69417000 AC10AF69
41710300 0100

May 3 21:41:27.789: H245 MSC INCOMING PDU ::=

value MultimediaSystemControlMessage ::= response :
openLogicalChannelAck :

??? {

????? forwardLogicalChannelNumber 2

????? forwardMultiplexAckParameters
h2250LogicalChannelAckParameters :

????? {

????????? sessionID 3

????????? mediaChannel unicastAddress : ipAddress :

????????? {

????????????? network 'AC10AF69'H

????????????? tsapIdentifier 16752

????????? }

????????? mediaControlChannel unicastAddress : ipAddress :

????????? {

????????????? network 'AC10AF69'H

????????????? tsapIdentifier 16753

????????? }

????????? flowControlToZero FALSE

????? }

??? }

May 3 21:41:27.793: Changing to new event
H245_EVENT_OLC_CFM
```

```
May 3 21:41:27.793: cch323_h245_olc_sm:
  received event H245_EVENT_OLC_CFM while at state
H245_OLC_WAIT

May 3 21:41:27.793: changing from H245_OLC_WAIT state to
H245_OLC_DONE state

May 3 21:41:27.793: cc_api_t38_fax_start
  (dstVdbPtr=0x624130C0, dstCallId=0xA, srcCallId=0x9,
  ??? caps={codec=0x10000, fax_rate=0x2, vad=0x2,
  modem=0x0 codec_bytes=160, signal_type=1})

May 3 21:41:27.793: H.225 SM: process event
H225_EVENT_H245_SUCCESS, for callID 9

May 3 21:41:27.793: cch323_run_h225_sm:
  received event H225_EVENT_H245_SUCCESS while at state
H225_ACTIVE

May 3 21:41:27.793: cc_api_remote_codec_dnld_done
  (dstVdbPtr=0x624130C0, dstCallId=0xA, srcCallId=0x9)

May 3 21:41:27.793: vtsp:[1:D (10), S_LFAX_WAIT_FAX,
E_CC_T38_START]

May 3 21:41:27.793: vtsp:[1:D (10), S_LFAX_WAIT_FAX,
E_CC_T30_CAP_ACK]

May 3 21:41:27.793: act_t38_lfax_mode

May 3 21:41:27.793: vtsp_timer_stop: 2016760

May 3 21:41:27.793: cc_api_set_fax_mode
  (dstVdbPtr=0x61B45A90, dstCallId=0x9, srcCallId=0xA)

May 3 21:41:27.793: dsp_idle_mode: [1:D (10)]
  packet_len=8 channel_id=8481 packet_id=68

May 3 21:41:27.793: dsp_encap_config: T38

May 3 21:41:27.793: dsp_fax_mode: [1:D (10)] FaxRate
0x2, Codec 0x10000?
dsp_fax_mode() ECM_DISABLE not set,
debug_info not requested

May 3 21:41:27.793: dsp_fax_mode:[1:D (10)]
  packet_len=28 channel_id=8481 packet_id=69
  max_trans=6 info_size=20,
  fax_protocol_type=3,hs_data_len=40, ls_data_red=0,
  hs_data_red=0,
  tcf_handling=2, fax_relay_cntl=0x0 nsf_country =
0xAD, nsf_mfg = 0x0051

May 3 21:41:29.621: ccGetCallActive
  (next=1, setup_time=0x0, index=0x0, p=0x6293A8C0)

May 3 21:41:29.621: ccGetCallActive
  (next=1, setup_time=0x1EC241, index=0x1,
p=0x6293A8C0)
```

실패한 T.38 통화의 예

다음은 실패한 T.38 호출에 대한 debug 명령 출력의 예입니다.

debug vtsp all 명령 출력

```
!---When the ModeRequest was sent, T35 nonStandard was
sent instead of T38: *Jun 14 15:35:01.743: PDU DATA =
61593960 value MultimediaSystemControlMessage ::=
request : requestMode :

??? {
????? sequenceNumber 12
????? requestedModes
????? {
??????? {
????????? {
????????????? type dataMode :
????????????? {
????????????????? application nonStandard :
????????????????? {
????????????????????? nonStandardIdentifier h221NonStandard :
????????????????????? {
????????????????????????? t35CountryCode 181
? ??????????????????????????t35Extension 0
????????????????????????? manufacturerCode 20
????????????????????????? }
????????????????????????? data '543338466178554450'H
????????????????????? }
????????????????????? bitRate 144
????????????????? }
????????????? }
????????? }
?????? }

Set new event H245_EVENT_MR_IND, for callID C

*Jun 14 15:35:01.751: cch323_run_h245_mr_sm: received
event H245_EVENT_MR_IND wh
```

```
ile at state H245_MR_NONE

*Jun 14 15:35:01.751: Scan Preferred List for g729r8PDU
DATA = 61593960

value MultimediaSystemControlMessage ::= response :
requestModeAck :

??? {

????? sequenceNumber 12

????? response willTransmitMostPreferredMode : NULL

??? }

RAW_BUFFER::=

27 000C00

*Jun 14 15:35:01.751: PDU DATA = 61593960

value MultimediaSystemControlMessage ::= request :
closeLogicalChannel :

??? {

?? ???forwardLogicalChannelNumber 2

????? source user : NULL

??? }

RAW_BUFFER::=

04 00000100

*Jun 14 15:35:01.751:

*Jun 14 15:35:01.751: changing from H245_OLC_DONE state
to H245_OLC_NONE state

*Jun 14 15:35:01.751: cch323_update_new_codec_info:
Remote codec 17

*Jun 14 15:35:01.751: cch323_update_new_codec_info:
negotiated_codec set(17)(40

bytes)

*Jun 14 15:35:01.751: Changing to new event
H245_EVENT_OLC

*Jun 14 15:35:01.751: cch323_h245_olc_sm:
received event H245_EVENT_OLC while atstate
H245_OLC_NONE

*Jun 14 15:35:01.751: changing from H245_OLC_NONE state
to H245_OLC_WAIT state

PDU DATA = 61593960

value MultimediaSystemControlMessage ::= request :
```

```
openLogicalChannel :
??? {
????? forwardLogicalChannelNumber 3
????? forwardLogicalChannelParameters
????? {
??????? dataType data :
??????? {
????????? application nonStandard :
????????? {
????????????? nonStandardIdentifier h221nonStandard :
????????????? {
????????????????? t35CountryCode 181
????????????????? t35Extension 0
????????????????? manufacturerCode 18
? ?????????????}
????????????? data '543338466178554450'H
????????????? }
????????????? maxBitRate 144
????????? }
????????? multiplexParameters
h2250LogicalChannelParameters :
????????? {
????????????? sessionID 3
????????????? mediaControlChannel unicastAddress : ipAddress
:
????????? ???{
????????????????? network 'C95C381E'H
????????????????? tsapIdentifier 18101
????????????? }
????????? }
?????? }
??? }
RAW_BUFFER::=
```


03 00000210 08B50000 12095433 38466178 55445000 90800A04
000300C9 5C381E46 B5

*Jun 14 15:35:01.759:

*Jun 14 15:35:01.759: OLC using T38Fax

*Jun 14 15:35:01.783: Changing to new event
H245_PROCESS_H245CONTROL

*Jun 14 15:35:01.783:
cch323_h245_connection_sm:H245_CONNECT: received event
H24

5_PROCESS_H245CONTROL while at H245_CONNECTED state

RAW_BUFFER::=

04 80000100 800100

*Jun 14 15:35:01.783: PDU DATA = 61593960

value MultimediaSystemControlMessage ::= request :
closeLogicalChannel :

??? {

????? forwardLogicalChannelNumber 2

????? source user : NULL

????? reason unknown : NULL

??? }

PDU DATA = 61593960

value MultimediaSystemControlMessage ::= response :
closeLogicalChannelAck :

??? {

????? forwardLogicalChannelNumber 2

??? }

RAW_BUFFER::=

23 800001

*Jun 14 15:35:01.787:

*Jun 14 15:35:01.787: Changing to new event
H245_PROCESS_H245CONTROL

*Jun 14 15:35:01.787:
cch323_h245_connection_sm:H245_CONNECT: received event
H24

5_PROCESS_H245CONTROL while at H245_CONNECTED state

RAW_BUFFER::=

03 00000310 08B50000 14095433 38466178 55445000 90800300

0003

*Jun 14 15:35:01.787: PDU DATA = 61593960

value MultimediaSystemControlMessage ::= request :
openLogicalChannel :

??? {

????? forwardLogicalChannelNumber 4

????? forwardLogicalChannelParameters

????? {

??????? dataType data :

??????? {

????????? application nonStandard :

????????? {

????????????? nonStandardIdentifier h221NonStandard :

?? ?????????? {

????????????????? t35CountryCode 181

????????????????? t35Extension 0

????????????????? manufacturerCode 20

????????????? }

????????????? data '543338466178554450'H

????????????? }

????????????? maxBitRate 144

????????? }

????????? multiplexParameters

h2250LogicalChannelParameters :

????????? {

????????????? sessionID 3

????????? }

????? }

??? }

*Jun 14 15:35:01.831: Changing to new event

H245_PROCESS_H245CONTROL

*Jun 14 15:35:01.831:

cch323_h245_connection_sm:H245_CONNECT: received event

H24

5_PROCESS_H245CONTROL while at H245_CONNECTED state

```
RAW_BUFFER::=
23 800001
*Jun 14 15:35:01.831: PDU DATA = 61593960
value MultimediaSystemControlMessage ::= response :
closeLogicalChannelAck :
??? {
????? forwardLogicalChannelNumber 2
??? }
*Jun 14 15:35:01.883: Changing to new event
H245_PROCESS_H245CONTROL
*Jun 14 15:35:01.883:
cch323_h245_connection_sm:H245_CONNECT: received event
H24
5_PROCESS_H245CONTROL while at H245_CONNECTED state
RAW_BUFFER::=
22 C0000204 800C5804 00875C34 CB1B4801 0100
*Jun 14 15:35:01.883: PDU DATA = 61593960
value MultimediaSystemControlMessage ::= response :
openLogicalChannelAck :
??? {
????? forwardLogicalChannelNumber 3
????? forwardMultiplexAckParameters
h2250LogicalChannelAckParameters :
????? {
????????? sessionID 3
????????? mediaChannel unicastAddress : ipAddress :
????????? {
????????????? network '875C34CB'H
????????????? tsapIdentifier 6984
????????? }
????????? flowControlToZero FALSE
????? }
??? }
*Jun 14 15:35:01.887: Changing to new event
H245_EVENT_OLC_CFM
```

```

*Jun 14 15:35:01.887: cch323_h245_olc_sm:
  received event H245_EVENT_OLC_CFM while at state
H245_OLC_WAIT

*Jun 14 15:35:01.887: changing from H245_OLC_WAIT state
to H245_OLC_DONE state

cch323_h245_local_codec_dnld_done: negotiatedCodec[17]

*Jun 14 15:35:01.979: Changing to new event
H245_EVENT_OLC_IND

*Jun 14 15:35:01.979: cch323_h245_olc_sm: received event
H245_EVENT_OLC_IND whil

e at state H245_OLC_DONE
!---Session ID was sent as voice session ID, fallback to
voice and the call disconnected: PDU DATA = 61593960
value MultimediaSystemControlMessage ::= response :
openLogicalChannelAck : ??? { ?????
forwardLogicalChannelNumber 4 ?????
forwardMultiplexAckParameters
h2250LogicalChannelAckParameters : ????? { ?????
sessionID 1

??????? mediaChannel unicastAddress : ipAddress :

??????? {

??? ??????network 'C95C381E'H

????????? tsapIdentifier 18100

??????? }

??????? mediaControlChannel unicastAddress : ipAddress :

??????? {

????????? network 'C95C381E'H

????????? tsapIdentifier 18101

??????? }

??????? flowControlToZero FALSE

????? }

??? }

RAW_BUFFER::=

22 C0000304 80145C00 00C95C38 1E46B400 C95C381E 46B50300
0100

*Jun 14 15:35:01.983:

```

이 섹션에서는 AS5300 Series 라우터와 Cisco 3640 Modular Access Router 간의 성공적인 T.38 팩스 설정 방법에 대해 자세히 설명합니다. debug 및 show 명령 출력은 TGW IOS 12.4로 Cisco 3640 모듈형 액세스 라우터의 debug vtsp all 명령에서 캡처되었습니다.

debug vtsp all 명령 출력

```
Router# debug vtsp all
```

```
Voice telephony call control all debugging is on
!--- At this point, the VTSP is not aware of anything.
The format of this message is //callid/GUID/VTSP:(voice-
port):T1-channel_number:DSP_number:DSP_channel_number:
•CallEntry ID is -1. •GUID is xxxxxxxxxxxx. •The voice
port is blank. •Channel ID is -1. •DSP ID is -1. •DSP
channel ID is -1. *Mar 1 08:23:10.869: //-
1/xxxxxxxxxxxxx/VTSP():-1:-1:-
1/vtsp_do_regxrule_translate: !--- The original and the
translated calling number are the same (55555) and the
original and the translated called number are the same
(888545). These numbers are often the same because if a
translation rule is applied, it will be on the dial
peers or the ports, both of which comes later than these
VTSP messages in the Cisco IOS code execution. *Mar 1
08:23:10.869: //-1/xxxxxxxxxxxxx/VTSP():-1:-1:-1/vtsp
_do_regxrule_translate: calling_number(original)=
calling_number(xlated)=55555 called_number(original)=
called_number(xlated)=888545 redirectNumber(original)=
redirectNumber(xlated)= !--- The VTSP got a call setup
indicator from the TSP layer with called number 888545
and calling number 55555. There is no awareness of the
CallEntry ID (-1) or the GUID (xxxxxxxxxxxx). *Mar 1
08:23:10.873: //-1/xxxxxxxxxxxxx/VTSP():-1:-1:-
1/vtsp_tsp_call_setup_ind: (sdb=0x634C90EC,
tdm_info=0x0, tsp_info=0x63083950, calling_number=55555
calling_oct3 = 0x80, called_number=888545 called_oct3 =
0x80, oct3a=0x0): peer_tag=10002 *Mar 1 08:23:10.873:
//-1/xxxxxxxxxxxxx/VTSP():-1:-1:-
1/vtsp_tsp_fill_setup_ind : ev.clg.clig is 0
ev.clg.clid_transparent is 0 ev.clg.null_orig_clg is 0
ev.clg.calling_translated is false *Mar 1 08:23:10.873:
//-1/xxxxxxxxxxxxx/VTSP():-1:-1:-
1/vtsp_do_call_setup_ind: . *Mar 1 08:23:10.873: //-
1/xxxxxxxxxxxxx/VTSP():-1:-1:-1/vtsp_allocate_cdb: ,cdb
0x635FC480 *Mar 1 08:23:10.873: //-
1/xxxxxxxxxxxxx/VTSP():-1:-1:-1/vtsp_do_call_setup_ind:
*Mar 1 08:23:10.873: source route label !--- At this
point, the VTSP is not aware of anything. The format of
this message is //callid/GUID/VTSP:(voice-port):T1-
channel_number:DSP_number:DSP_channel_number: •CallEntry
ID is -1. •GUID is D2F6429A8A8A. •The voice port is
1/0:23 where 23 indicates D channel. •The T1 channel is
still unknown at this point (-1). •The digital signal
processor (DSP) is 0. •The DSP channel is 4. *Mar 1
08:23:10.873: //-1/D2F6429A8A8A/VTSP:(1/0:23):-
1:0:4/vtsp_do_call_setup_ind: Call ID=101002,
guid=635FCB08 !--- The VTSP learns about the B channel
(changed from -1 to 22), and the CallEntry ID is still
unknown (-1). *Mar 1 08:23:10.873: //-
1/D2F6429A8A8A/VTSP:
(1/0:23):22:0:4/vtsp_do_call_setup_ind: type=0,
under_spec=1615186336, name=, id0=23, id1=0, id2=0,
calling=55555,called=888545
subscriber=RegularLinevtsp_do_call_setup_ind: redirect
DN = reason = -1 *Mar 1 08:23:10.877: //-
1/xxxxxxxxxxxxx/VTSP():-1:-1:-
1/vtsp_do_normal_call_setup_ind: . !--- The VTSP learns
the CallEntry ID. The format of this message is
```

```
//callid/GUID/VTSP:(voice-port):T1-
channel_number:DSP_number:DSP_channel_number: •CallEntry
ID is 899 (changed from -1 to 899) •GUID is D2F6429A8A8A
•The voice port is 1/0:23 where 23 indicates D channel
•The T1 channel is 22 •The DSP is 12 •The DSP channel is
4 *Mar 1 08:23:10.877: //899/D2F6429A8A8A/VTSP:(1/0:23)
:22:12:4/vtsp_insert_cdb:,cdb 0x635FC480, CallID=899
*Mar 1 08:23:10.877:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_open_voice
_and_set_params: . !--- In these outputs, VTSP sets some
of the voice parameters for this call: •Modem capability
•Playout delay •Dial-peer tag 10003 •Digit timeouts *Mar
1 08:23:10.877: //899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_modem_proto_from_cdb: cap_modem_proto 0
*Mar 1 08:23:10.881:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/set_playout_cdb
:playout default *Mar 1 08:23:10.881:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_dsp_echo_c
anceller_control: echo_cancel: 1 *Mar 1 08:23:10.885:
//899/D2F6429A8A8A/VTSP:
(1/0:23):22:12:4/vtsp_save_dialpeer_tag: tag = 10003
*Mar 1 08:23:10.885: //899/D2F6429A8A8A/VTSP:
(1/0:23):22:12:4/vtsp_report_digit_control:
vtsp_report_digit_control: enable=0: *Mar 1
08:23:10.885: //899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_report_digit_control: digit reporting
disabled *Mar 1 08:23:10.885:
//899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_get_digit_timeouts: :
vtsp_get_digit_timeouts !--- VTSP sends out a call-
proceeding message to the POTS leg *Mar 1 08:23:10.885:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_process_ev
ent:vtsp:[1/0:23:899, S_SETUP_INDICATED,
E_CC_PROCEEDING] *Mar 1 08:23:10.885:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/act_proceeding:
. *Mar 1 08:23:10.941: //899/D2F6429A8A8A/VTSP:
(1/0:23):22:12:4/vtsp_get_dialpeer_tag: tag = 10003 *Mar
1 08:23:10.949: //899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_get_dialpeer_tag: tag = 10003 !--- VTSP
sends out an alerting to the POTS leg; the phone is
ringing at this time. *Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:
(1/0:23):22:12:4/vtsp_process_event: vtsp:[1/0:23:899,
S_PROCEEDING, E_CC_ALERT] *Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/act_alert: .
*Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_timer_stop
:3019095 *Mar 1 08:23:18.769:
//899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_get_dialpeer_tag: tag = 10003 !--- The
phone gets answered here, a bridge is now set up between
the two call legs. *Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:
(1/0:23):22:12:4/vtsp_process_event: vtsp:[1/0:23:899,
S_PROCEEDING, E_CC_ALERT] *Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/act_alert: .
*Mar 1 08:23:10.949:
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_timer_stop
:3019095 *Mar 1 08:23:18.769:
//899/D2F6429A8A8A/VTSP:(1/0:23):
22:12:4/vtsp_get_dialpeer_tag: tag = 10003 !--- The call
is now connected. Mar 1 08:23:18.769:
//899/D2F6429A8A8A/VTSP:(1/0:23)
:22:12:4/vtsp_process_event: vtsp:[1/0:23:899,
```

```
S_ALERTING, E_CC_CONNECT] *Mar 1 08:23:18.769:  
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/act_alert_conne  
ct: . *Mar 1 08:23:18.773:  
//899/D2F6429A8A8A/VTSP:(1/0:23):22:12:4/vtsp_ring_noan_  
timer_stop: 3019877
```

관련 정보

- [VoIP로 팩스 릴레이 구성\(T.38\)](#)
- [팩스 릴레이 문제 해결 가이드](#)
- [Cisco AVVID Gateway Support for Fax Relay and Fax Pass-Through](#)
- [음성 전화 통신 서비스 공급자 디버깅](#)
- [팩스 문제 해결](#)
- [음성 기술 지원](#)
- [음성 및 통합 커뮤니케이션 제품 지원](#)
- [Cisco IP 텔레포니 문제 해결](#)
- [기술 지원 및 문서 - Cisco Systems](#)