AS5300 ISDN/Async(아웃바운드 DDR)를 사용하여 전화 걸기

목차

소개

이 컨피그레이션에는 4개의 PRI(Primary Rate Interfaces)가 포함된 AS5300이 있으며 96건의 모뎀 통화 또는 많은 수의 ISDN 통화가 지원됩니다. 비동기 및 ISDN 아웃바운드 연결을 허용하도록 4개의 PRI로 구성됩니다. 정적 다이얼러 맵은 각 ISDN/비동기 연결에 대해 다이얼링 측면에 구성됩니다. 고정 IP 경로는 동적 라우팅 프로토콜의 불필요한 오버헤드를 방지하기 위해 연결의 양쪽 끝에서 사용됩니다. 원격 위치를 추가하려면 다이얼링 측의 새 대상에 대해 다이얼러 맵, 사용자 이름 및 고정 경로를 추가해야 합니다. 모든 원격 노드에는 고정 IP 주소가 있습니다.

시작하기 전에

표기 규칙

문서 규칙에 대한 자세한 내용은 [Cisco 기술 팁 표기 규칙](#)을 참조하십시오.

사전 요구 사항

1단계 - 전화 걸기 클라이언트가 올바르게 설정되었는지 구성 및 확인합니다.

전화 걸기 구성 - 이 AS5300에서 전화를 거는 장치:

- PRI: 발신 비동기 및 ISDN 통화에 대해 PRI를 사용하여 Access Server 구성 - 문서에 제공된 중앙 사이트 AS5300 Series 라우터(호스트 이름 AS5300) 구성을 사용합니다.
- AS5300에서 걸려오는 전화를 받을 BRI: 다이얼러 프로필을 사용하여 ISDN DDR(Dial-on-Demand Routing) 구성 - 문서에 제공된 클라이언트 사이트 Cisco 2503 라우터(호스트 이름 remoteISDN01) 구성을 사용합니다.
- AS5300에서 수신 전화를 받을 비동기: 다이얼러 프로필을 사용하여 인터페이스 그룹-비동기 구성 - 문서에 제공된 클라이언트 사이트 Cisco 2511 라우터(호스트 이름 remoteAsync01) 구성을 사용합니다.

2단계 - Telco 회로가 제대로 작동하는지 확인합니다. **show isdn status** 명령을 사용하여 BRI 또는 PRI 회로가 올바르게 작동하는지 확인할 수 있습니다. 자세한 내용은 [BRI 문제 해결을 위해 show isdn status 명령 사용](#) 문서를 참조하십시오. 또한 아웃바운드 통화에 대해 T1/E1 PRI 회로를 활성화해야 합니다. 이 정보를 확인하려면 Telco에 문의하십시오.

사용되는 구성 요소

이 문서의 정보는 아래 소프트웨어 및 하드웨어 버전을 기반으로 합니다.

- Cisco AS5300, Cisco 2511 및 Cisco 2503
- Cisco IOS® 소프트웨어 릴리스 12.2(10b)
- 외부 비동기 모뎀

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 라이브 네트워크에서 작업하는 경우, 사용하기 전에 모든 명령의 잠재적인 영향을 이해해야 합니다.

배경 이론

경우에 따라 다이얼아웃 연결에 T1/E1 PRI 회로를 사용해야 할 수도 있습니다. 이렇게 하면 T1/E1 PRI 회로가 전화를 거는 클라이언트 또는 지사에서 네트워크에 중복된 사용자 이름과 비밀번호를 사용하여 전화를 거는 알 수 없는 사용자 대신 보안 ID가 됩니다.

관련 제품

이 컨피그레이션은 T1 또는 PRI 카드가 있는 모든 라우터와 함께 사용할 수 있습니다. 따라서 T1 또는 PRI 카드가 있는 AS5xxx 시리즈 라우터는 이 컨피그레이션을 사용할 수 있습니다. Cisco 2600 및 3600 Series 라우터는 T1/PRI WAN WIC(Interface Card) 또는 네트워크 모듈을 사용하여 ISDN 통화를 다이얼아웃하도록 구성할 수도 있습니다.

이 컨피그레이션은 E1 또는 PRI 포트와 함께 사용하도록 수정할 수도 있습니다. Telco에서 제공하는 라인 인코딩, 프레이밍 및 기타 물리적 특성으로 E1 컨트롤러를 구성합니다. D-channel 컨피그레이션(E1의 경우 Serial x:15 인터페이스)은 여기에 표시된 것과 유사합니다.

구성

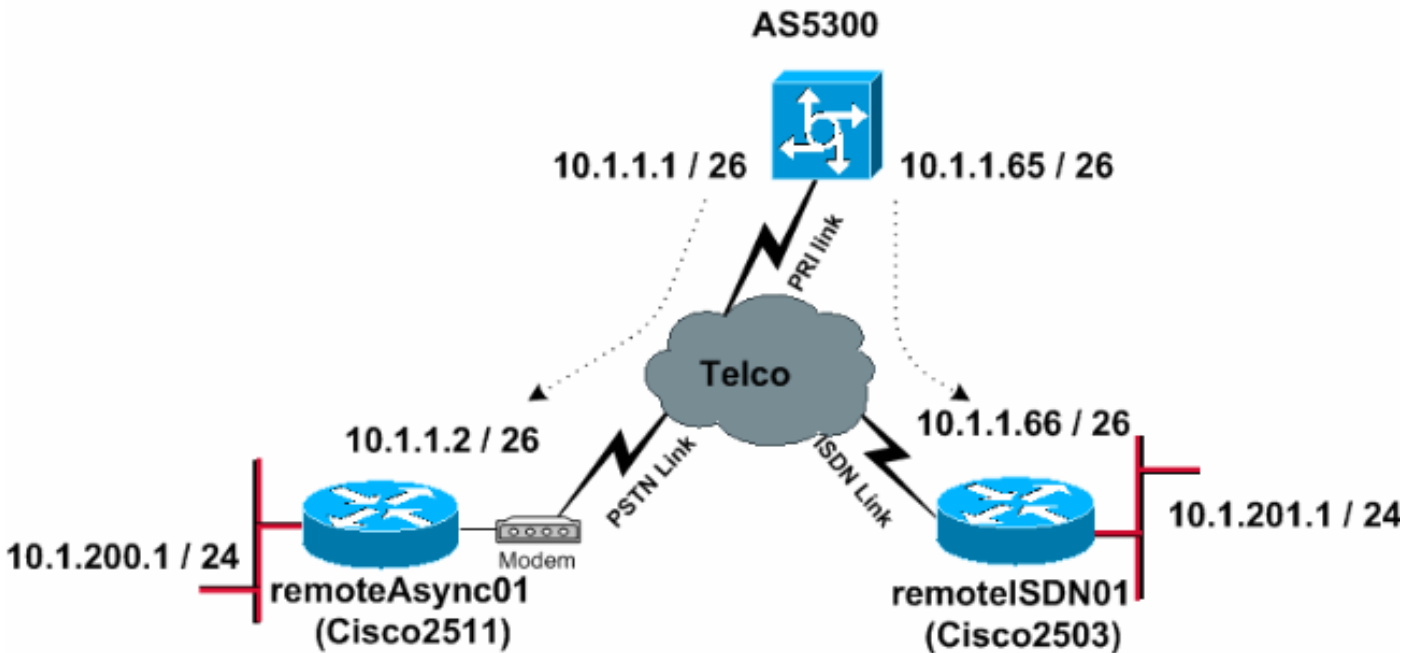이 섹션에는 이 문서에서 설명하는 기능을 구성하기 위한 정보가 표시됩니다. 이 네트워크에는 다음이 필요합니다.

- PRI 스위치 유형, 프레이밍 및 라인 코딩.

- 다이얼링할 모든 원격 노드의 사용자 이름 및 비밀번호. 나중에 TACACS+ 또는 RADIUS를 추가하려는 경우에도 라우터에 몇 개의 이름을 추가하여 행을 테스트합니다.
- IP 주소 지정 체계입니다.

참고: 이 문서에 사용된 명령에 대한 추가 정보를 찾으려면 명령 조회 도구(등록된 고객만 해당)를 사용합니다.

네트워크 다이어그램

이 문서에서는 아래 다이어그램에 표시된 네트워크 설정을 사용합니다.

구성

이 문서에서는 아래 표시된 구성을 사용합니다.

- AS5300
- remoteAsync01
- 원격ISDN01

AS5300

```
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname AS5300
!


!
username remoteISDN01 password 0 xxxx
username remoteAsync01 password 0 xxxx
!--- Usernames for local authentication of the call. !--
- The client presents the username/password !--- and the
AS5300 authenticates the peer. !--- This local database
of usernames and passwords are !--- compared when chap
```

PPP authentication is negotiated !--- between the AS5300 and remoteISDN01, remoteAsync01 routers. ! isdn switch-type primary-5ess *!--- Switch-type for this AS5300. Obtain this information from the Telco.* chat-script kelly "" "atdt\T" TIMEOUT 60 CONNECT \c *!--- A chat script is a string of text that defines the handshaking !--- that occurs between the router and the modem to sucessfully !--- handshake with the destination. !--- In this chat-script, "**kelly**" is the chat-script name. !---* The expect string "" is the null from the destination. !--- And the send string "ATDT\T" is to instruct the modem !--- to dial the telephone number in the dialer string command, !--- which is 9996200 in the Interface dialer 1 !--- TIMEOUT 60 CONNECT \C - waits up to 60 seconds for the input string "CONNECT", !--- and \C is an escape sequence to end the chat-script. !--- Refer to the [Modem-Router Connection Guide](#) and [Chat-script](#) for more information. ! controller T1 0 *!--- T1 PRI physical controller configuration.* framing esf *!--- Framing for this T1 is Extended Super Frame (ESF). !--- Obtain this information from the Telco.* clock source line primary *!--- T1 0 is the primary clock source for this AS5300. !--- Clock source must be specified for the timing !--- and synchronization of the T1 carrier.* linecode b8zs *!--- Linecoding for this T1. Obtain this information from the Telco.* pri-group timeslots 1-24 *!--- For T1 PRI scenarios, all 24 T1 timeslots are assigned !--- as ISDN PRI channels. The router will now automatically create the !--- corresponding D-channel: interface Serial 0:23.* ! controller T1 1 framing esf clock source line secondary 1 linecode b8zs pri-group timeslots 1-24 ! controller T1 2 framing esf clock source line secondary linecode b8zs pri-group timeslots 1-24 ! controller T1 3 framing esf clock source line secondary linecode b8zs pri-group timeslots 1-24 ! interface Ethernet0 ip address 171.68.186.54 255.255.255.240 no ip directed-broadcast ! interface Serial0:23 *!--- D-channel configuration for T1 0.* no ip address no ip directed-broadcast encapsulation ppp dialer rotary-group 2 *!--- T1 0 is a member of rotary group 2. !--- The rotary group configuration is in interface Dialer2. !--- This rotary group command enables the Dialin and Dialout for ISDN calls.* isdn switch-type primary-5ess isdn incoming-voice modem *!--- All incoming ISDN analog modem calls that come in !--- on an ISDN PRI receive signaling information !--- from the ISDN D channel. The D channel is used for !--- circuit-switched data calls and analog modem calls. !--- This enables all incoming ISDN voice calls to access the call !--- switch module and integrated modems. !--- Calls are passed to the modem and the call negotiates the !--- appropriate connection with the far-end modem.* no cdp enable ! interface Serial1:23 no ip address no ip directed-broadcast encapsulation ppp dialer rotary-group 2 isdn switch-type primary-5ess isdn incoming-voice modem no cdp enable ! interface Serial2:23 no ip address no ip directed-broadcast encapsulation ppp dialer rotary-group 2 isdn switch-type primary-5ess isdn incoming-voice modem no cdp enable ! interface Serial3:23 no ip address no ip directed-broadcast encapsulation ppp dialer rotary-group 2 isdn switch-type primary-5ess isdn incoming-voice modem no cdp enable ! interface FastEthernet0 no ip address no ip directed-broadcast shutdown ! interface Group-Async1 *!--- This interface is configured for Async*

```
Dialin and Dialout in the T1 PRI. !--- Without this
interface, Async calls cannot be made. no ip address no
ip directed-broadcast async mode interactive dialer in-
band dialer rotary-group 1 !--- Group-Async 1 is a
member of the rotary group. !--- The rotary group
configuration is in interface Dialer 1. no cdp enable
group-range 1 96 !--- Group-range indicates the
asynchronous interfaces !--- which come under the Group-
Async interface. ! interface Dialer1 ip address 10.1.1.1
255.255.255.192 no ip directed-broadcast encapsulation
ppp dialer in-band dialer idle-timeout 600 !--- Set an
idle-timeout to hold the ISDN line. !--- Idle timeout
for outgoing calls is 600 seconds (10 minutes). !--- If
the ISDN link is idle for more than 600 seconds, it will
be dropped. dialer map ip 10.1.1.2 name remoteAsync01
modem-script kelly broadcast 9996200
!--- Dialer map statements for the remote router
remoteAsync01. !--- The name must match the one used by
the remote router to identify itself. !--- Use the modem
chat script "kelly" for this connection.

 dialer-group 1
 !--- Apply interesting traffic definition from the
dialer-list 1. ppp authentication chap ! interface
Dialer2 !--- The dialer rotary-group 2 command in Int
s0:23 activates the interface !--- Dialer2 for inbound
and outbound ISDN calls.

 ip address 10.1.1.65 255.255.255.192
 no ip directed-broadcast
 encapsulation ppp
 dialer in-band
 dialer idle-timeout 600
 dialer map ip 10.1.1.66 name remoteISDN01 broadcast
9996100
 dialer-group 1
 ppp authentication chap
!
no ip http server
ip classless

ip route 10.1.200.0 255.255.255.0 10.1.1.2
!--- Static route for the 10.1.200.0/24 network. !---
Interesting Traffic for that network !--- will be sent
to interface Dialer1 and the router !--- will initiate
the outbound call for Asynchronous connectivity.

ip route 10.1.201.0 255.255.255.0 10.1.1.66
!--- Static route for the 10.1.201.0/24 network. !---
Interesting traffic for that network !--- will be sent
to interface Dialer2 and the router !--- will initiate
the outbound call for ISDN BRI connectivity.

!
dialer-list 1 protocol ip permit
!--- Interesting traffic is defined by the Protocol IP.
!--- This is applied to interface Dialer1 and Dialer2
using the dialer-group 1 command. !--- The specified
dialer-list number must be the same !--- as the dialer-
group number; in this example, defined to be "1."

!
line con 0
 transport input none
```

```
line 1 96

script dialer kelly
```
!--- Enables the chat script **kelly** configured globally.
```
 modem InOut
 transport preferred none
 transport output none
line aux 0
line vty 0 4
 login
!
end
```

remoteAsync01

```
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteAsync01
!

!
username AS5300 password 0 xxxx

!
modemcap entry default
```
!--- A modemcap named "default" will be applied !--- to lines one through eight of Async interfaces. ! interface Ethernet0 ip address 10.1.200.1 255.255.255.0 no ip directed-broadcast ! interface Serial0 no ip address no ip directed-broadcast shutdown ! interface Serial1 no ip address no ip directed-broadcast shutdown ! interface Async1 ip address 10.1.1.2 255.255.255.192 no ip directed-broadcast encapsulation ppp dialer idle-timeout 600 async mode interactive *!--- Enables the* **slip** and **ppp** EXEC commands.
```
 ppp authentication chap
!
no ip http server
ip classless

ip route 0.0.0.0 0.0.0.0 10.1.1.1
```
!--- Default static route for the outgoing packets. ! line con 0 transport input none line 1 8 login local modem InOut modem autoconfigure type default *!--- Apply the modemcap "default" (configured globally) to initialize the modem. !--- Refer to the* [Modem-Router Connection Guide](#) *for more information.* transport input all autoselect during-login autoselect ppp speed 38400 flowcontrol hardware line aux 0 line vty 0 4 ! end

원격ISDN01

```
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteISDN01
```

```
!
!
username AS5300 password 0 xxxx
!--- Usernames for local authentication of the call. !--
- The client presents the username/password !--- and the
AS5300 authenticates the peer. !--- This local database
of usernames and passwords are !--- compared when chap
PPP authentication is negotiated !--- between the AS5300
and remoteISDN01 routers. ! isdn switch-type basic-5ess
!--- Switch-type for this 2503. Obtain this information
from the Telco. . ! interface Ethernet0 ip address
10.1.201.1 255.255.255.0 no ip directed-broadcast !
interface Serial0 no ip address no ip directed-broadcast
shutdown ! interface Serial1 no ip address no ip
directed-broadcast shutdown ! interface BRI0 ip address
10.1.1.66 255.255.255.192 no ip directed-broadcast
encapsulation ppp dialer idle-timeout 600 dialer-group 1
isdn switch-type basic-5ess ppp authentication chap ! no
ip http server ip classless ip route 0.0.0.0 0.0.0.0
10.1.1.65 !--- Default static route for the outgoing
packets. ! dialer-list 1 protocol ip permit ! line con 0
transport input none line aux 0 line vty 0 4 ! end
```

다음을 확인합니다.

이 섹션에서는 컨피그레이션이 제대로 작동하는지 확인하는 데 사용할 수 있는 정보를 제공합니다.

일부 show 명령은 출력 인터프리터 툴 에서 지원되는데(등록된 고객만), 이 툴을 사용하면 show 명령 출력의 분석 결과를 볼 수 있습니다.

- **show isdn status** - 라우터가 ISDN 스위치와 제대로 통신하는지 확인합니다. 출력에서 Layer 1 Status(레이어 1 상태)가 ACTIVE이고 Layer 2 Status(레이어 2 상태) 상태 = MULTIPLE_FRAME_ESTABLISHED가 나타나는지 확인합니다. 이 명령은 활성 통화 수도 표시합니다.
- **show ppp multilink** - 활성 상태인 멀티링크 번들에 대한 정보를 표시합니다. 이 명령을 사용하여 멀티링크 연결을 확인해야 합니다.
- **show dialer [interface type number]** - DDR용으로 구성된 인터페이스에 대한 일반 진단 정보를 표시합니다. 다이얼러가 제대로 작동하면 다이얼러 상태가 데이터 링크 계층 위로 메시지입니다. 물리적 레이어가 나타나면 라인 프로토콜이 나타나지만 NCP(Network Control Protocol)는 나타나지 않았습니다. 다이얼링을 시작한 패킷의 소스 및 대상 주소가 다이얼 이유 줄에 표시됩니다. 또한 이 show 명령은 타이머의 컨피그레이션 및 연결 시간 초과까지의 시간도 표시합니다.
- **show caller user username detail** - 지정된 IP 주소, PPP 및 PPP 번들 매개변수 등 특정 사용자에 대한 매개변수를 표시합니다. 사용 중인 버전의 Cisco IOS 소프트웨어가 이 명령을 지원하지 않는 경우 show user 명령을 사용합니다.
- **show dialer map** - 구성된 동적 및 정적 다이얼러 맵을 표시합니다. 이 명령을 사용하여 동적 다이얼러 맵이 생성되었는지 확인할 수 있습니다. 다이얼러 맵이 없으면 패킷을 라우팅할 수 없습니다.
- **show isdn service** - B 채널의 상태를 확인합니다. (이 명령은 PRI/T1 컨트롤러를 지원하는 액세스 서버에만 적용됩니다.)
- **show user** - 현재 연결된 비동기/동기화 사용자를 표시합니다.

다음은 성공한 통화에 대한 show 명령 출력입니다. 굵게 표시된 섹션과 출력에 제공된 코멘트를 확

인합니다. 가져온 출력을 아래 표시된 결과와 비교합니다.

remoteISDN01 및 remoteAsync01 라우터와의 연결을 설정하기 전에 다음 출력을 얻습니다.

```
AS5300#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     171.68.0.0/28 is subnetted, 1 subnets
C       171.68.186.48 is directly connected, Ethernet0
     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.1.1.0/26 is directly connected, Dialer1
C       10.1.1.64/26 is directly connected, Dialer2
S       10.1.201.0/24 [1/0] via 10.1.1.66
S       10.1.200.0/24 [1/0] via 10.1.1.2
```

다음 출력은 remoteISDN01 및 remoteAsync01 라우터와의 연결을 설정한 후에 얻습니다.

```
AS5300#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     171.68.0.0/28 is subnetted, 1 subnets
C       171.68.186.48 is directly connected, Ethernet0
     10.0.0.0/8 is variably subnetted, 6 subnets, 3 masks
C       10.1.1.2/32 is directly connected, Dialer1
C       10.1.1.0/26 is directly connected, Dialer1
C       10.1.1.66/32 is directly connected, Dialer2
C       10.1.1.64/26 is directly connected, Dialer2
S       10.1.201.0/24 [1/0] via 10.1.1.66
S       10.1.200.0/24 [1/0] via 10.1.1.2


AS5300#show ip route connected
     171.68.0.0/28 is subnetted, 1 subnets
C       171.68.186.48 is directly connected, Ethernet0
     10.0.0.0/8 is variably subnetted, 6 subnets, 3 masks
C       10.1.1.2/32 is directly connected, Dialer1
C       10.1.1.0/26 is directly connected, Dialer1
C       10.1.1.66/32 is directly connected, Dialer2
C       10.1.1.64/26 is directly connected, Dialer2


AS5300#show controllers t1 0
T1 0 is up.
  Applique type is Channelized T1
  Cablelength is long gain36 0db
```

```
  No alarms detected.
   alarm-trigger is not set
   Version info of slot 0:  HW: 4, PLD Rev: 0

Manufacture Cookie Info:
   EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x42,
   Board Hardware Version 1.32, Item Number 800-2540-02,
   Board Revision A0, Serial Number 11493161,
   PLD/ISP Version 0.0, Manufacture Date 12-Dec-1998.


Framing is ESF, Line Code is B8ZS, Clock Source is Line Primary.
   Data in current interval (197 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
!--- Output suppressed. AS5300#show int s0:23
Serial0:23 is up, line protocol is up (spoofing)
  Hardware is DSX1
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set
  DTR is pulsed for 1 seconds on reset
  Last input 00:00:06, output 00:00:06, output hang never
  Last clearing of "show interface" counters 11:43:21
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/1/16 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 48 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     5075 packets input, 25767 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     2 input errors, 0 CRC, 1 frame, 0 overrun, 0 ignored, 1 abort
     5073 packets output, 25904 bytes, 0 underruns
     0 output errors, 0 collisions, 13 interface resets
     0 output buffer failures, 0 output buffers swapped out
     2 carrier transitions
  Timeslot(s) Used:24, Transmitter delay is 0 flags



AS5300#show users
    Line       User       Host(s)            Idle       Location
*  0 con 0                idle               00:00:00
   11 tty 11   remoteAsyn  Async interface    00:05:40   PPP: 10.1.1.2

Interface     User       Mode                   Idle     Peer Address
Se0:21        remoteISDN  Sync PPP           00:06:12   PPP: 10.1.1.66

remoteAsync01#show users
    Line       User       Host(s)            Idle       Location
*  0 con 0                idle               00:00:00
   1 tty 1     AS5300     Async interface    00:07:27   PPP: 10.1.1.1
   2 tty 2                Modem Autoconfigure 00:00:00
   3 tty 3                Modem Autoconfigure 00:00:00
   4 tty 4                Modem Autoconfigure 00:00:01
   5 tty 5                Modem Autoconfigure 00:00:00
   6 tty 6                Modem Autoconfigure 00:00:00
   7 tty 7                Modem Autoconfigure 00:00:00
   Interface     User       Mode                   Idle     Peer Address

remoteISDN01#show users
    Line       User       Host(s)            Idle       Location
```

```
*  0 con 0                  idle                  00:00:00
  Interface      User         Mode              Idle      Peer Address
  BR0:1          AS5300       Sync PPP          00:09:09   PPP: 10.1.1.65


AS5300#show isdn history
--------------------------------------------------------------------------------
                              ISDN CALL HISTORY
--------------------------------------------------------------------------------
Call History contains all active calls, and a maximum of 100 inactive calls.
Inactive call data will be retained for a maximum of 15 minutes.


--------------------------------------------------------------------------------
Call   Calling     Called      Remote  Seconds Seconds Seconds Charges
Type   Number      Number       Name   Used    Left    Idle    Units/Currency
--------------------------------------------------------------------------------

Out    ---N/A---   9996200  +oteAsync01    187                         0
Out    ---N/A---   9996200  +oteAsync01     56                         0
Out    ---N/A---   9996200  +oteAsync01    469     305     294         0
Out    ---N/A---   9996100  +moteISDN01    105     509      90         0
--------------------------------------------------------------------------------

AS5300#show isdn active
--------------------------------------------------------------------------------
                              ISDN ACTIVE CALLS
--------------------------------------------------------------------------------
Call   Calling     Called      Remote  Seconds Seconds Seconds Charges
Type   Number      Number       Name   Used    Left    Idle    Units/Currency
--------------------------------------------------------------------------------
Out    ---N/A---   9996100  +moteISDN01    152     449     150         0
Out    ---N/A---   9996200  +oteAsync01    133     491     108         0
--------------------------------------------------------------------------------


AS5300#show isdn status
Global ISDN Switchtype = primary-5ess
ISDN Serial0:23 interface
        dsl 0, interface ISDN Switchtype = primary-5ess
    Layer 1 Status:
        ACTIVE
    Layer 2 Status:
        TEI = 0, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED
    Layer 3 Status:
        2 Active Layer 3 Call(s)
        CCB:callid=809E, sapi=0, ces=0, B-chan=23, calltype=VOICE
        CCB:callid=809F, sapi=0, ces=0, B-chan=22, calltype=DATA
    Active dsl 0 CCBs = 2
    The Free Channel Mask:  0x801FFFFF
    Number of L2 Discards = 1, L2 Session ID = 10
!--- Output suppressed. AS5300#Ping 10.1.201.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.201.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 32/33/36 ms

AS5300#Ping 10.1.200.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.200.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 128/141/148 ms

AS5300#show isdn service
PRI Channel Statistics:
```

```
ISDN Se0:23, Channel [1-24]
  Configured Isdn Interface (dsl) 0
   Channel State (0=Idle 1=Proposed 2=Busy 3=Reserved 4=Restart 5=Maint_Pend)
    Channel :  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4
    State   :  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 2 3
   Service State (0=Inservice 1=Maint 2=Outofservice)
    Channel :  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4
    State   :  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2
!--- Output suppressed. AS5300#show modem
 Codes:
   * - Modem has an active call
   C - Call in setup
   T - Back-to-Back test in progress
   R - Modem is being Reset
   p - Download request is pending and modem cannot be used for taking calls
   D - Download in progress
   B - Modem is marked bad and cannot be used for taking calls
   b - Modem is either busied out or shut-down
   d - DSP software download is required for achieving K56flex connections
   ! - Upgrade request is pending

         Avg Hold   Inc calls   Out calls   Busied   Failed    No     Succ
   Mdm     Time     Succ  Fail   Succ  Fail   Out     Dial   Answer   Pct.
   1/0   00:00:00    0     0      0     0      0        0       0      0%
   1/1   00:00:00    0     0      0     0      0        0       0      0%
   1/2   00:00:00    0     0      0     0      0        0       0      0%
   1/3   00:00:00    0     0      0     0      0        0       0      0%
   1/4   00:00:00    0     0      0     0      0        0       0      0%
   1/5   00:00:00    0     0      0     0      0        0       0      0%
   1/6   00:00:00    0     0      0     0      0        0       0      0%
   1/7   00:00:00    0     0      0     0      0        0       0      0%
   1/8   00:00:00    0     0      0     0      0        0       0      0%
   1/9   00:00:00    0     0      0     0      0        0       0      0%
 * 1/10  00:02:21    0     0      5     5      0        0       0      50%
   1/11  00:03:11    0     0     23     6      0        0       0      79%
   1/12  00:00:00    0     0      0     0      0        0       0      0%
   1/13  00:00:00    0     0      0     0      0        0       0      0%
   1/14  00:00:00    0     0      0     0      0        0       0      0%
!--- Output suppressed.
```

문제 해결

이 섹션에서는 컨피그레이션 문제를 해결하는 데 사용할 수 있는 정보를 제공합니다.

문제 해결 리소스

- 수신 ISDN 통화 문제 해결 - ISDN 통화 실패 문제 해결에 사용합니다.
- PRI ISDN Call - ISDN 통화 실패 문제 해결에 대한 추가 정보가 들어 있습니다.
- T1 문제 해결 순서도 - T1 회로가 제대로 작동하지 않는다고 생각되면 이 순서도를 사용합니다.
- T1 PRI 문제 해결 - ISDN PRI 회로에 대한 문제 해결 절차
- T1/56K 회선에 대한 루프백 테스트 - 라우터의 T1 포트가 올바르게 작동하는지 확인하기 위해 사용합니다.
- BRI 문제 해결을 위해 show isdn status 명령 사용 - BRI 문제 해결을 위해 이 문서를 사용합니다.
- debug isdn q931 명령을 사용하는 ISDN BRI Layer 3 문제 해결 - ISDN Layer 3 문제 해결에 이 문서를 사용합니다.

문제 해결 명령

일부 show 명령은 <u>출력 인터프리터 툴 에서 지원되는데(등록된 고객만), 이 툴을 사용하면</u> show 명령 출력의 분석 결과를 볼 수 있습니다.

참고: debug 명령을 실행하기 전에 <u>디버그 명령에 대한 중요 정보를 참조하십시오</u>.

- **디버그 다이얼러** - 인터페이스에서 DDR이 활성화된 경우 이 명령은 호출 원인(전화 걸기 원인)에 대한 정보를 표시합니다.
- **debug isdn q931** - 아웃바운드 통화가 시작될 때 ISDN 연결을 확인합니다.
- **debug ppp negotiation** - 클라이언트가 PPP 협상을 통과하고 있는지 확인합니다. 다수의 동시 PPP 협상이 라우터 CPU를 압도할 수 있습니다.
- **debug ppp authentication** - 클라이언트가 인증을 통과하는지 확인합니다. Cisco IOS 릴리스 11.2 이전 버전을 사용하는 경우 debug ppp chap 명령을 대신 사용합니다.
- **debug ppp error** - PPP 연결 협상 및 작업과 관련된 프로토콜 오류 및 오류 통계를 표시합니다.

모뎀 문제 해결 명령

- **디버그 채팅** - 통화가 시작될 때 채팅 스크립트의 실행을 확인합니다.
- **디버그 모뎀** - 라우터가 모뎀에서 올바른 신호를 수신하는지 확인합니다.
- **debug modem csm** - 모뎀 관리 CSM(Call Switching Module) 디버그 모드를 활성화합니다.

출력 문제 해결

다음은 성공적인 발신 통화에 대한 디버그 출력입니다. 굵게 표시된 섹션과 출력에 제공된 코멘트를 확인합니다. 가져온 출력을 아래 표시된 결과와 비교합니다.

AS5300 T1 PRI에서 remoteAsync01 라우터로 전화 접속 연결 디버깅

```
AS5300#debug isdn q931
ISDN Q931 packets debugging is on
AS5300#debug chat
Chat scripts activity debugging is on
AS5300#debug dialer events
Dial on demand events debugging is on
AS5300#show debug
Dial on demand:
  Dial on demand events debugging is on
PPP:
  PPP protocol negotiation debugging is on
ISDN:
  ISDN Q931 packets debugging is on
  ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
  DSL  0 --> 7
  1 1 1 1 - - - -


Chat Scripts:
Chat scripts activity debugging is on


AS5300#ping 10.1.200.1
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.200.1, timeout is 2 seconds:


Dec 30 17:59:16.675: As12 DDR: rotor dialout [priority]
Dec 30 17:59:16.675: As12 DDR: Dialing cause ip (s=10.1.1.1, d=10.1.200.1)
```
!--- The dialing cause is a ping for 10.1.200.1. !--- ICMP is tagged as interesting. Dec 30
17:59:16.675: As12 DDR: Attempting to dial 9996200 Dec 30 17:59:16.675: CHAT12: Attempting async
line dialer script Dec 30 17:59:16.675: CHAT12: Dialing using Modem script: **kelly**
 & System script: none
 !--- Uses the Chat script **kelly** *to Dialout.*

```
Dec 30 17:59:16.675: CHAT12: process started
Dec 30 17:59:16.675: CHAT12: Asserting DTR
Dec 30 17:59:16.675: CHAT12: Chat script kelly started
Dec 30 17:59:16.675: CHAT12: Sending string: atdt\T<9996200>
```
!--- The Chat script kelly uses the Telephone no in Interface Dialer 1 to Dialout. Dec 30
17:59:16.675: CHAT12: Expecting string: CONNECT Dec 30 17:59:16.755: ISDN Se0:23: **TX -> SETUP pd
= 8 callref = 0x00B1**
!--- Outgoing ISDN Q.931 SETUP message. Dec 30 17:59:16.755: Bearer Capability i = 0x8090A2 Dec
30 17:59:16.755: Channel ID i = 0xA98397 Dec 30 17:59:16.759: Called Party Number i = 0xA1,
'9996200', Plan:ISDN, Type:National Dec 30 17:59:16.823: ISDN Se0:23: RX <- CALL_PROC pd = 8
callref = 0x80B1 Dec 30 17:59:16.823: Channel ID i = 0xA98397 Dec 30 17:59:17.023: ISDN Se0:23:
RX <- ALERTING pd = 8 callref = 0x80B1..... Success rate is 0 percent (0/5) AS5300# Dec 30
17:59:26.115: ISDN Se0:23: **RX <- CONNECT pd = 8 callref = 0x80B1**
!--- Received Q.931 CONNECT message. Dec 30 17:59:26.119: ISDN Se0:23: TX -> CONNECT_ACK pd = 8
callref = 0x00B1 Dec 30 17:59:32.119: %ISDN-6-CONNECT: Interface Serial0:22 is now connected to
9996200 Dec 30 17:59:49.347: CHAT12: Completed match for expect: CONNECT Dec 30 17:59:49.347:
CHAT12: Sending string: \c Dec 30 17:59:49.347: CHAT12: Chat script kelly finished, status =
Success Dec 30 17:59:49.351: **Di1 IPCP: Install route to 10.1.1.2**
!--- A route to the peer is installed. Dec 30 17:59:51.351: **%LINK-3-UPDOWN: Interface Async12,
changed state to up**
```
Dec 30 17:59:51.351: As12 DDR: Dialer statechange to up
Dec 30 17:59:51.351: As12 DDR: Dialer call has been placed
Dec 30 17:59:51.351: As12 PPP: Treating connection as a callout
Dec 30 17:59:51.351: As12 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
Dec 30 17:59:51.351: As12 LCP: O CONFREQ [Closed] id 149 len 25
Dec 30 17:59:51.351: As12 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:59:51.351: As12 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:59:51.351: As12 LCP:    MagicNumber 0x4A997A3A (0x05064A997A3A)
Dec 30 17:59:51.351: As12 LCP:    PFC (0x0702)
Dec 30 17:59:51.351: As12 LCP:    ACFC (0x0802)
Dec 30 17:59:53.351: As12 LCP: TIMEout: State REQsent
Dec 30 17:59:53.351: As12 LCP: O CONFREQ [REQsent] id 150 len 25
Dec 30 17:59:53.351: As12 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:59:53.351: As12 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:59:53.351: As12 LCP:    MagicNumber 0x4A997A3A (0x05064A997A3A)
Dec 30 17:59:53.351: As12 LCP:    PFC (0x0702)
Dec 30 17:59:53.351: As12 LCP:    ACFC (0x0802)
Dec 30 17:59:53.511: As12 LCP: I CONFREQ [REQsent] id 53 len 25
Dec 30 17:59:53.511: As12 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:59:53.511: As12 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:59:53.511: As12 LCP:    MagicNumber 0x67B12AE8 (0x050667B12AE8)
Dec 30 17:59:53.511: As12 LCP:    PFC (0x0702)
Dec 30 17:59:53.511: As12 LCP:    ACFC (0x0802)
Dec 30 17:59:53.511: As12 LCP: O CONFACK [REQsent] id 53 len 25
Dec 30 17:59:53.511: As12 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:59:53.511: As12 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:59:53.511: As12 LCP:    MagicNumber 0x67B12AE8 (0x050667B12AE8)
Dec 30 17:59:53.511: As12 LCP:    PFC (0x0702)
Dec 30 17:59:53.511: As12 LCP:    ACFC (0x0802)
Dec 30 17:59:53.543: As12 LCP: I CONFACK [ACKsent] id 150 len 25
Dec 30 17:59:53.543: As12 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:59:53.543: As12 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:59:53.543: As12 LCP:    MagicNumber 0x4A997A3A (0x05064A997A3A)
```

```
Dec 30 17:59:53.543: As12 LCP:    PFC (0x0702)
Dec 30 17:59:53.543: As12 LCP:    ACFC (0x0802)
Dec 30 17:59:53.543: As12 LCP: State is Open
```
!--- LCP negotiation is complete. Dec 30 17:59:53.543: As12 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] Dec 30 17:59:53.543: As12 CHAP: O CHALLENGE id 25 len 27 from "AS5300" Dec 30 17:59:53.655: As12 CHAP: I CHALLENGE id 27 len 34 from "remoteAsync01" Dec 30 17:59:53.655: As12 CHAP: O RESPONSE id 27 len 27 from "AS5300" Dec 30 17:59:53.671: As12 CHAP: I RESPONSE id 25 len 34 from "remoteAsync01" Dec 30 17:59:53.671: As12 CHAP: O SUCCESS id 25 len 4 Dec 30 17:59:53.783: As12 CHAP: I SUCCESS id 27 len 4 *!--- Two-way CHAP authentication is successful.*
Dec 30 17:59:53.783: As12 PPP: Phase is UP [0 sess, 1 load] Dec 30 17:59:53.783: As12 IPCP: O CONFREQ [Closed] id 25 len 10 Dec 30 17:59:53.783: As12 IPCP: Address 10.1.1.1 (0x03060A010101) Dec 30 17:59:53.783: As12 CDPCP: O CONFREQ [Closed] id 25 len 4 Dec 30 17:59:53.783: As12 IPCP: I CONFREQ [REQsent] id 27 len 10 Dec 30 17:59:53.783: As12 IPCP: Address 10.1.1.2 (0x03060A010102) Dec 30 17:59:53.783: As12 IPCP: O CONFACK [REQsent] id 27 len 10 Dec 30 17:59:53.783: As12 IPCP: Address 10.1.1.2 (0x03060A010102) Dec 30 17:59:53.911: As12 IPCP: I CONFACK [ACKsent] id 25 len 10 Dec 30 17:59:53.911: As12 IPCP: Address 10.1.1.1 (0x03060A010101) Dec 30 17:59:53.911: As12 IPCP: State is Open Dec 30 17:59:53.911: As12 DDR: dialer protocol up Dec 30 17:59:53.927: As12 LCP: I PROTREJ [Open] id 54 len 10 protocol CDPCP (0x820701190004) Dec 30 17:59:53.927: As12 CDPCP: State is Closed Dec 30 17:59:54.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async12, changed state to up Dec 30 17:59:54.783: As12 PPP: Outbound cdp packet dropped, CDPCP is Closed [starting negotiations] Dec 30 17:59:54.783: As12 CDPCP: State is Closed Dec 30 17:59:54.783: As12 PPP: Outbound cdp packet dropped, CDPCP is Closed [starting negotiations] Dec 30 17:59:54.783: As12 CDPCP: State is Closed Dec 30 17:59:54.783: As12 PPP: Outbound cdp packet dropped, CDPCP is Closed [starting negotiations] Dec 30 17:59:54.783: As12 CDPCP: State is Closed Dec 30 17:59:54.787: As12 CDPCP: TIMEout: State Closed Dec 30 17:59:54.787: As12 CDPCP: State is Listen remoteAsync01#**debug ppp negotiation**

```
PPP protocol negotiation debugging is on
remoteAsync01#
Dec 30 17:58:54: As1 LCP: I CONFREQ [Closed] id 150 len 25
Dec 30 17:58:54: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:58:54: As1 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:58:54: As1 LCP:    MagicNumber 0x4A997A3A (0x05064A997A3A)
Dec 30 17:58:54: As1 LCP:    PFC (0x0702)
Dec 30 17:58:54: As1 LCP:    ACFC (0x0802)
Dec 30 17:58:54: As1 LCP: Lower layer not up, Fast Starting
Dec 30 17:58:54: As1 PPP: Treating connection as a dedicated line
Dec 30 17:58:54: As1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load]
Dec 30 17:58:54: As1 LCP: O CONFREQ [Closed] id 53 len 25
Dec 30 17:58:54: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:58:54: As1 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:58:54: As1 LCP:    MagicNumber 0x67B12AE8 (0x050667B12AE8)
Dec 30 17:58:54: As1 LCP:    PFC (0x0702)
Dec 30 17:58:54: As1 LCP:    ACFC (0x0802)
Dec 30 17:58:54: As1 LCP: O CONFACK [REQsent] id 150 len 25
Dec 30 17:58:54: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:58:54: As1 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:58:54: As1 LCP:    MagicNumber 0x4A997A3A (0x05064A997A3A)
Dec 30 17:58:54: As1 LCP:    PFC (0x0702)
Dec 30 17:58:54: As1 LCP:    ACFC (0x0802)
Dec 30 17:58:54: %LINK-3-UPDOWN: Interface Async1, changed state to up
Dec 30 17:58:55: As1 LCP: I CONFACK [ACKsent] id 53 len 25
Dec 30 17:58:55: As1 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Dec 30 17:58:55: As1 LCP:    AuthProto CHAP (0x0305C22305)
Dec 30 17:58:55: As1 LCP:    MagicNumber 0x67B12AE8 (0x050667B12AE8)
Dec 30 17:58:55: As1 LCP:    PFC (0x0702)
Dec 30 17:58:55: As1 LCP:    ACFC (0x0802)
Dec 30 17:58:55: As1 LCP: State is Open
```

!--- LCP negotiation is complete. Dec 30 17:58:55: As1 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load] Dec 30 17:58:55: As1 CHAP: O CHALLENGE id 27 len 34 from "remoteAsync01" Dec 30 17:58:55: As1 CHAP: I CHALLENGE id 25 len 27 from "AS5300" Dec 30 17:58:55: As1 CHAP: O RESPONSE id 25 len 34 from "remoteAsync01" Dec 30 17:58:55: As1 CHAP: I RESPONSE id 27 len 27 from "AS5300" Dec 30 17:58:55: As1 CHAP: I SUCCESS id 25 len 4 Dec 30 17:58:55: As1 CHAP: O SUCCESS id 27 len 4 *!--- Two-way CHAP authentication is successful.* Dec 30 17:58:55: As1 PPP: Phase is

UP [0 sess, 1 load] Dec 30 17:58:55: As1 IPCP: O CONFREQ [Closed] id 27 len 10 Dec 30 17:58:55:
As1 IPCP: Address 10.1.1.2 (0x03060A010102) Dec 30 17:58:55: As1 IPCP: I CONFREQ [REQsent] id 25
len 10 Dec 30 17:58:55: As1 IPCP: Address 10.1.1.1 (0x03060A010101) Dec 30 17:58:55: As1 IPCP: O
CONFACK [REQsent] id 25 len 10 Dec 30 17:58:55: As1 IPCP: Address 10.1.1.1 (0x03060A010101) Dec
30 17:58:55: As1 CDPCP: I CONFREQ [Not negotiated] id 25 len 4 Dec 30 17:58:55: As1 LCP: O
PROTREJ [Open] id 54 len 10 protocol CDPCP (0x820701190004) Dec 30 17:58:55: As1 IPCP: I CONFACK
[ACKsent] id 27 len 10 Dec 30 17:58:55: As1 IPCP: Address 10.1.1.2 (0x03060A010102) Dec 30
17:58:55: As1 IPCP: State is Open Dec 30 17:58:55: **As1 IPCP: Install route to 10.1.1.1**

!--- A route to the peer is installed. Dec 30 17:58:56: %LINEPROTO-5-UPDOWN: **Line protocol on**
Interface Async1,
  changedstate to up

AS5300에서 remoteISDN01 라우터로 디버깅 다이얼아웃

AS5300#**show debug**
Dial on demand:
  Dial on demand events debugging is on
PPP:
  PPP protocol negotiation debugging is on
ISDN:
  ISDN Q931 packets debugging is on
  ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
  DSL 0 --> 7
  1 1 1 1 - - - -
Chat Scripts:
  Chat scripts activity debugging is on
AS5300#**ping 10.1.201.1**

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.201.1, timeout is 2 seconds:

Dec 30 18:12:42.811: Se0:23 DDR: rotor dialout [priority]
Dec 30 18:12:42.815: **Se0:23 DDR: Dialing cause ip (s=10.1.1.65, d=10.1.201.1)**
!--- The dialing cause is a ping for 10.1.201.1. !--- ICMP is tagged as interesting. Dec 30
18:12:42.815: Se0:23 DDR: Attempting to dial 9996100 Dec 30 18:12:42.815: **ISDN Se0:23: TX -**
>SETUP pd = 8 callref = 0x00B2
!--- Outgoing ISDN Q.931 SETUP message. Dec 30 18:12:42.815: Bearer Capability i = 0x8890 Dec 30
18:12:42.815: Channel ID i = 0xA98396 Dec 30 18:12:42.819: Called Party Number i = 0xA1,
'9996100', Plan:ISDN, Type:National Dec 30 18:12:42.867: ISDN Se0:23: RX <- CALL_PROC pd = 8
callref = 0x80B2 Dec 30 18:12:42.867: Channel ID i = 0xA98396 Dec 30 18:12:43.127: ISDN Se0:23:
RX <- CONNECT pd = 8 callref = 0x80B2 *!--- Received Q.931 CONNECT message.* Dec 30 18:12:43.135:
%LINK-3-UPDOWN: Interface Serial0:21, changed state to up Dec 30 18:12:43.135: Se0:21 PPP:
Treating connection as a callout Dec 30 18:12:43.135: Se0:21 PPP: Phase is ESTABLISHING, Active
Open [0 sess, 1 load] Dec 30 18:12:43.135: Se0:21 LCP: O CONFREQ [Closed] id 25 len 15 Dec 30
18:12:43.139: Se0:21 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:12:43.139: Se0:21 LCP:
MagicNumber 0x4AA54104 (0x05064AA54104) Dec 30 18:12:43.139: ISDN Se0:23: TX -> CONNECT_ACK pd =
8 callref = 0x00B2 Dec 30 18:12:43.167: Se0:21 LCP: I CONFREQ [REQsent] id 55 len 15 Dec 30
18:12:43.167: Se0:21 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:12:43.167: Se0:21 LCP:
MagicNumber 0x575DC27D (0x0506575DC27D) Dec 30 18:12:43.167: Se0:21 LCP: O CONFACK [REQsent] id
55 len 15 Dec 30 18:12:43.167: Se0:21 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:12:43.167:
Se0:21 LCP: MagicNumber 0x575DC27D (0x0506575DC27D) Dec 30 18:12:43.175: Se0:21 LCP: I CONFACK
[ACKsent] id 25 len 15 Dec 30 18:12:43.175: Se0:21 LCP: AuthProto CHAP (0x0305C22305) Dec 30
18:12:43.175: Se0:21 LCP: MagicNumber 0x4AA54104 (0x05064AA54104) Dec 30 18:12:43.179: Se0:21
LCP: State is Open
!--- LCP negotiation is complete. Dec 30 18:12:43.179: Se0:21 PPP: Phase is AUTHENTICATING, by
both [0 sess, 1.!!!! Success rate is 80 percent (4/5), round-trip min/avg/max = 32/33/36
msAS5300# load] Dec 30 18:12:43.179: Se0:21 CHAP: O CHALLENGE id 13 len 27 from "AS5300" Dec 30
18:12:43.227: Se0:21 CHAP: I CHALLENGE id 36 len 33 from "remoteISDN01" Dec 30 18:12:43.227:
Se0:21 CHAP: O RESPONSE id 36 len 27 from "AS5300" Dec 30 18:12:43.251: Se0:21 CHAP: I SUCCESS
id 36 len 4 Dec 30 18:12:43.263: Se0:21 CHAP: I RESPONSE id 13 len 33 from "remoteISDN01" Dec 30

```
18:12:43.263: Se0:21 CHAP: O SUCCESS id 13 len 4
```
!--- Two-way CHAP authentication is successful. Dec 30 18:12:43.263: Se0:21 PPP: Phase is UP [0 sess, 1 load] Dec 30 18:12:43.263: Se0:21 IPCP: O CONFREQ [Closed] id 13 len 10 Dec 30 18:12:43.267: Se0:21 IPCP: Address 10.1.1.65 (0x03060A010141) Dec 30 18:12:43.287: Se0:21 IPCP: I CONFREQ [REQsent] id 36 len 10 Dec 30 18:12:43.287: Se0:21 IPCP: Address 10.1.1.66 (0x03060A010142) Dec 30 18:12:43.287: Se0:21 IPCP: O CONFACK [REQsent] id 36 len 10 Dec 30 18:12:43.287: Se0:21 IPCP: Address 10.1.1.66 (0x03060A010142) Dec 30 18:12:43.287: Se0:21 CDPCP: I CONFREQ [Not negotiated] id 36 len 4 Dec 30 18:12:43.291: Se0:21 LCP: O PROTREJ [Open] id 26 len 10 protocol CDPCP (0x820701240004) Dec 30 18:12:43.307: Se0:21 IPCP: I CONFACK [ACKsent] id 13 len 10 Dec 30 18:12:43.307: Se0:21 IPCP: Address 10.1.1.65 (0x03060A010141) Dec 30 18:12:43.307: Se0:21 IPCP: State is Open Dec 30 18:12:43.307: Se0:21 DDR: dialer protocol up Dec 30 18:12:43.307: Di2 **IPCP: Install route to 10.1.1.66**

!--- A route to the peer is installed. Dec 30 18:12:44.263: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:21,**
 changed state to up
```
Dec 30 18:12:49.135: %ISDN-6-CONNECT: Interface Serial0:21 is now connected to
 9996100 remoteISDN01


remoteISDN01#debug ppp negotiation
PPP protocol negotiation debugging is on
remoteISDN01#debug isdn q931
ISDN Q931 packets debugging is on
remoteISDN01#show debug
PPP:
  PPP protocol negotiation debugging is on
ISDN:
  ISDN Q931 packets debugging is on
remoteISDN01#
Dec 30 18:13:04: ISDN BR0: RX <- SETUP pd = 8  callref = 0x1B
Dec 30 18:13:04:          Bearer Capability i = 0x8890
Dec 30 18:13:04:          Channel ID i = 0x89
Dec 30 18:13:04:          Signal i = 0x40 - Alerting on – pattern 0
Dec 30 18:13:04:          Called Party Number i = 0xA1, '2019996100', Plan:ISDN,
 Type:National
Dec 30 18:13:04: ISDN BR0: Event: Received a DATA call from <unknown> on B1 at
 64 Kb/s
Dec 30 18:13:04: ISDN BR0: Event: Accepting the call id 0x2D
Dec 30 18:13:04: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
Dec 30 18:13:04: BR0:1 PPP: Treating connection as a callin
Dec 30 18:13:04: BR0:1 PPP: Phase is ESTABLISHING, Passive Open [0 sess, 1 load]
Dec 30 18:13:04: BR0:1 LCP: State is Listen
Dec 30 18:13:04: ISDN BR0: TX -> CALL_PROC pd = 8  callref = 0x9B
```
!--- Outgoing ISDN Q.931 SETUP message. Dec 30 18:13:04: Channel ID i = 0x89 Dec 30 18:13:04: ISDN BR0: TX -> CONNECT pd = 8 callref = 0x9B Dec 30 18:13:05: BR0:1 LCP: I CONFREQ [Listen] id 25 len 15 Dec 30 18:13:05: BR0:1 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:13:05: BR0:1 LCP: MagicNumber 0x4AA54104 (0x05064AA54104) Dec 30 18:13:05: BR0:1 LCP: O CONFREQ [Listen] id 55 len 15 Dec 30 18:13:05: BR0:1 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:13:05: BR0:1 LCP: MagicNumber 0x575DC27D (0x0506575DC27D) Dec 30 18:13:05: BR0:1 LCP: O CONFACK [Listen] id 25 len 15 Dec 30 18:13:05: BR0:1 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:13:05: BR0:1 LCP: MagicNumber 0x4AA54104 (0x05064AA54104) Dec 30 18:13:05: ISDN BR0: RX <- CONNECT_ACK pd = 8 callref = 0x1B *!--- Received Q.931 CONNECT message.* Dec 30 18:13:05: Signal i = 0x4F - Alerting off Dec 30 18:13:05: BR0:1 LCP: I CONFACK [ACKsent] id 55 len 15 Dec 30 18:13:05: BR0:1 LCP: AuthProto CHAP (0x0305C22305) Dec 30 18:13:05: BR0:1 LCP: MagicNumber 0x575DC27D (0x0506575DC27D) Dec 30 18:13:05: BR0:1 LCP: State is Open Dec 30 18:13:05: BR0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] Dec 30 18:13:05: BR0:1 CHAP: O CHALLENGE id 36 len 33 from "remoteISDN01" Dec 30 18:13:05: BR0:1 CHAP: I CHALLENGE id 13 len 27 from "AS5300" Dec 30 18:13:05: BR0:1 CHAP: Waiting for peer to authenticate first Dec 30 18:13:05: BR0:1 CHAP: I RESPONSE id 36 len 27 from "AS5300" Dec 30 18:13:05: BR0:1 CHAP: O SUCCESS id 36 len 4 Dec 30 18:13:05: BR0:1 CHAP: Processing saved Challenge, id 13 Dec 30 18:13:05: BR0:1 CHAP: O RESPONSE id 13 len 33 from "remoteISDN01" Dec 30 18:13:05: BR0:1 CHAP: I SUCCESS id 13 len 4 *!--- Two-way CHAP authentication is successful.* Dec 30 18:13:05: BR0:1 PPP: Phase is UP [0 sess, 0 load] Dec 30 18:13:05: BR0:1 IPCP: O CONFREQ [Closed] id 36 len 10 Dec 30 18:13:05: BR0:1 IPCP: Address 10.1.1.66 (0x03060A010142) Dec 30 18:13:05: BR0:1 CDPCP: O CONFREQ [Closed] id 36 len 4 Dec 30 18:13:05: BR0:1 IPCP: I CONFREQ [REQsent] id 13 len 10 Dec 30 18:13:05: BR0:1 IPCP: Address

```
10.1.1.65 (0x03060A010141) Dec 30 18:13:05: BR0:1 IPCP: O CONFACK [REQsent] id 13 len 10 Dec 30
18:13:05: BR0:1 IPCP: Address 10.1.1.65 (0x03060A010141) Dec 30 18:13:05: BR0:1 IPCP: I CONFACK
[ACKsent] id 36 len 10 Dec 30 18:13:05: BR0:1 IPCP: Address 10.1.1.66 (0x03060A010142) Dec 30
18:13:05: BR0:1 IPCP: State is Open Dec 30 18:13:05: BR0:1 LCP: I PROTREJ [Open] id 26 len 10
protocol CDPCP (0x8207 01240004) Dec 30 18:13:05: BR0:1 CDPCP: State is Closed Dec 30 18:13:05:
BR0 IPCP: Install route to 10.1.1.65
!--- A route to the peer is installed. Dec 30 18:13:06: %LINEPROTO-5-UPDOWN: Line protocol on
Interface BRI0:1,
 changed state to up
Dec 30 18:13:06: BR0:1 PPP: Outbound cdp packet dropped, CDPCP is Closed
 [starting negotiations]
Dec 30 18:13:06: BR0:1 CDPCP: State is Closed
Dec 30 18:13:06: BR0:1 PPP: Outbound cdp packet dropped, CDPCP is Closed
 [starting negotiations]
Dec 30 18:13:06: BR0:1 CDPCP: State is Closed
Dec 30 18:13:06: BR0:1 PPP: Outbound cdp packet dropped, CDPCP is Closed
 [starting negotiations]
Dec 30 18:13:06: BR0:1 CDPCP: State is Closed
Dec 30 18:13:06: BR0:1 CDPCP: TIMEout: State Closed
Dec 30 18:13:06: BR0:1 CDPCP: State is Listen
Dec 30 18:13:10: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to AS5300
```

관련 정보

- 수신 비동기 및 ISDN 통화에 대해 PRI를 사용하여 액세스 서버 구성
- 동일한 T1/E1 PRI 회로에서 전화 접속 및 전화 걸기 구성
- 기본 다이얼 액세스를 위한 NAS 구성
- 다이얼 솔루션 구성 가이드
- 디버그 isdn q931 연결 해제 원인 코드 이해
- 전화 접속 기술: 문제 해결 기법
- T1 PRI 문제 해결
- 모뎀 문제 해결
- 모뎀 디버그 명령
- 전화 접속 및 액세스 기술 지원
- 기술 지원 및 문서 – Cisco Systems