

# 配置 Cisco AS5350 或 AS5400 ，以实现向外的调制解调器或 ISDN 呼叫

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## 简介

这个配置包括带有一个主速率接口(PRI) 的Cisco AS5400，支持23个调制解调器呼叫或ISDN呼叫，这取决于主机拨出或拨入。配置有四个 PRI 以允许异步和 ISDN 出站连接。我们已在每个 ISDN 或异步连接的拨号端上配置了静态拨号程序映射。我们正在连接两端使用静态IP路由，以避免不必要的动态路由协议开销。要添加远端位置，必须在拨号端的为新目的地添加拨号映射、用户名和静态路由。所有的远程节点都有固定的 IP 地址。

**注意：** 本文档不涉及 AS5350 或 AS5400 系列路由器上的传入调制解调器呼叫和 ISDN 呼叫。[有关部门这方面的更多信息，请参见为流入异步呼叫和ISDN呼叫配置AS5350/AS5400的章节。](#)

## 先决条件

### 要求

在尝试此配置前，请保证您符合这些要求：

- 请确保电信公司提供了用于拨出同步和异步的 ISDN PRI 电路。

### 使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行 Cisco IOS® 软件版本 12.2(6) 的 AS5400
- 一个有效的 T1 PRI
- 运行端口件 0.6.108.0 的 Nextport 调制解调器

因此配置只是实现基本的模拟和ISDN拨入，AS5350和AS5400支持的任何Cisco IOS软件版本都足以满足需求。要运行其它功能，参考软件建议工具选择IOS版本和特性组适当为您的需要。

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。

## 相关产品

该配置还可应用于 AS5350 或 AS5400 接入服务器。

可以对该配置进行修改以与 E1 PRI 端口一起使用。为 E1 控制器配置 Telco 提供的线性编码、成帧及其他物理特性。D 信道配置 (E1 的接口串行 x:15) 和这里显示的类似。

该配置非常类似于用于拨出访问的 AS5200 或 AS5300 配置。请参阅文档 [AS5300 以 ISDN/异步方式拨出 \(出站 DDR\)](#)。两者之间唯一的主要变化是在 AS5350 或 AS5400 中，使用命令 `dial-tdm-clock priority number t1_slot/port` 用来分配 T1 时钟优先级。

还可以对该配置进行修改以支持传入和传出呼叫。[如需了解更多信息，请参见“在同一条 T1/E1 PRI 电路上配置拨入和拨出”文档。](#)

## 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：**要查找本文档所用命令的其他信息，请使用 [命令查找工具](#)（仅限注册用户）。

## 网络图

本文档使用以下网络设置：

## 配置

本文档使用以下配置：

### 5400

```
!  
version 12.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname 5400  
!  
no boot startup-test
```

```
!  
username remoteISDN01 password open4u  
username remoteAsync01 password open4u  
!--- Usernames for remote routers and shared secret !---  
(used for CHAP authentication). !--- These usernames are  
for local authentication of the call. !--- The client  
presents the username/password and the NAS !---  
authenticates the peer. ! ! resource-pool disable ! ip  
subnet-zero ip cef no ip domain-lookup ! isdn switch-  
type primary-5ess ! fax interface-type fax-mail mta  
receive maximum-recipients 0 ! controller T1 7/0 !--- T1  
Physical interface controller configuration. !---  
Interfaces are addressed as controller slot/port.  
framing esf !--- Framing for this T1 is Extended Super  
Frame (ESF). !--- Obtain this information from the  
Telco. linecode b8zs !--- Linecoding for this T1. Obtain  
this information from the Telco. pri-group timeslots 1-  
24 !--- PRI T1 with 24 DSOs provided by the Telco. !---  
The PRI signaling is configured in global configuration  
or the !--- the serial 7/X:23 interface (d-channel). The  
signaling defined !--- under the d-channel takes  
precedence over the PRI signaling !--- defined in global  
configuration. ! !--- Unused T1 configuration omitted!  
interface FastEthernet0/0 ip address 172.68.186.54  
255.255.255.240 duplex auto speed auto ! interface  
FastEthernet0/1 no ip address shutdown duplex auto speed  
auto ! interface Serial0/0 no ip address shutdown  
clockrate 2000000 ! interface Serial0/1 no ip address  
shutdown clockrate 2000000 ! interface Serial7/0:23 no  
ip address encapsulation ppp dialer rotary-group 2 !---  
The D-channel is added to rotary-group 2. Interface  
Dialer 2 !--- provides the logical configuration for  
this interface. dialer-group 1 isdn switch-type primary-  
5ess isdn incoming-voice modem !--- This allows the PRI  
circuits to accept and place async modem calls. !  
interface Group-Async1 !--- This group-async interface  
is the configuration template for all modems. !---  
Individual async interface do not have to be configured  
since they !--- can be cloned from one managed copy. no  
ip address dialer in-band dialer rotary-group 1 !---  
This command links this interface to logical interface  
Dialer interface 1. !--- The Dialer 1 interface serves  
as template for this interface. group-range 1/00 6/107  
!--- Modems 1/00 through 6/107 belong to this group-  
async interface. !--- Make sure you configure line 1/00  
through 6/107 as well. !--- This command links all the  
modem ranges listed to this interface. ! interface  
Dialer1 !--- This interface is used for the modem DDR  
dialout. !--- This dialer controls rotary-group 1  
(configured under Group-Async 1). ! -- Remember that  
this is a rotary and not a Dialer Profile ip address  
10.1.1.1 255.255.255.192 encapsulation ppp dialer in-  
band !--- Makes this interface DDR capable. !--- If you  
do not configure a dialer idle-timeout, the default will  
be 120 !--- seconds. dialer idle-timeout 600 !--- Sets  
Idle timer to 600 seconds (10 minutes). dialer map ip  
10.1.1.2 name remoteAsync01 broadcast 4724125 !---  
Dialer map for the peer. !--- Note the ip address  
matches the one configure on the peer. !--- The name  
must also exactly match the one used to authenticate the  
peer. dialer-group 1 !--- Apply interesting traffic  
definition from dialer-list 1. !--- Note: The specified  
dialer-group number must be the same as !--- the dialer-  
list number; in this example, defined as "1". !---
```

```

Interesting traffic specifies the packets that should
reset the idle timer. ppp authentication chap !
interface Dialer2 !--- This interface will be used for
the ISDN DDR outbound calls. !--- This dialer controls
rotary-group 2 (configured under Serial 7/0:23). ! --
Remember that this is a rotary and not a Dialer Profile
ip address 10.1.1.65 255.255.255.192 encapsulation ppp
dialer in-band !--- If you do not configure a dialer
idle-timeout, the default will be 120 !--- seconds.
dialer idle-timeout 600 !--- Sets Idle timer to 600
seconds (10 minutes). dialer map ip 10.1.1.66 name
remoteISDN01 broadcast 6665800 dialer-group 1 !--- Apply
interesting traffic definition from dialer-list 1. !---
Note: The specified dialer-group number must be the same
as !--- the dialer-list number; in this example, defined
to be "1". !--- Interesting traffic specifies the
packets that should reset the idle timer. ppp
authentication chap ! 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. !--- Note the next hop IP address
is the peer router. !--- This also matches the ip
address in the dialer map !--- statement under int
Dialer 1. ip route 10.1.201.0 255.255.255.0 10.1.1.66 !-
-- Static route for the 10.1.201.0/24 network. !--- Note
the next hop IP address is the peer router. !--- This
also matches the ip address in the dialer map !---
statement under interface Dialer 2 no ip http server. !
dialer-list 1 protocol ip permit !--- Specifies all IP
traffic as interesting. Interesting traffic !---
specifies the packets that should reset the idle timer.
!--- This is applied to interface Group-Async 1 using
dialer-group 1. !--- Note: The specified dialer-list
number must be the same as the !--- dialer-group number;
in this example, defined to be "1". !! call rsvp-sync !
voice-port 7/0:D ! voice-port 7/1:D ! voice-port 7/2:D !
voice-port 7/3:D ! ! mgcp profile default ! ! line con 0
line aux 0 line vty 0 4 login line 1/00 1/107 !--- These
lines are linked to the modems. Note that this range
includes !--- the group-range configured under group-
async 1. modem InOut !--- Permit incoming and outgoing
calls on the modem. transport input all line 6/00 6/107
!--- These lines are linked to the modems. Note that
this line range is !--- included in the group-range
configured under group-async 1. modem InOut transport
input all ! scheduler allocate 10000 400 end

```

## remoteAsync01

```

remoteAsync01
!
version 12.0
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteAsync01
!
enable password <deleted>
!
username 5400 password open4u
!--- Username and password for the 5400. !--- The
shared secret password must be identical on both sides.
ip subnet-zero no ip domain-lookup ! 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 Serial11 no ip

```

```
address no ip directed-broadcast shutdown ! interface
Async1 !--- Async interface for the incoming modem call.
ip address 10.1.1.2 255.255.255.192 !--- IP address for
this interface. !--- Note: this ip address is the same
as the one configured in the !--- dialer map on the 5400
Dialer 1. no ip directed-broadcast encapsulation ppp ppp
authentication chap ! no ip http server ip classless ip
route 0.0.0.0 0.0.0.0 10.1.1.1 !--- Default router with
next hop being the 5400's dialer 1 ip address. ! line
con 0 transport input none line 1 8 !--- Line number
range includes line 1(corresponding to interface
async1). modem InOut transport input all speed 38400
flowcontrol hardware line aux 0 line vty 0 4 ! end
```

## remoteISDN01

```
!
version 12.0
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteISDN01
!
enable secret <deleted>
!
username 5400 password open4u
!--- Username and password for the 5400 router. !---
The shared secret password must be identical on both
sides. ip subnet-zero no ip domain-lookup ! isdn switch-
type basic-5ess ! 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 !--- BRI
interface for incoming call. ip address 10.1.1.66
255.255.255.192 !--- IP address is the same as that
configured on the 5400 Dialer 2 !--- dialer map
statement. !--- A dialer map is not needed on this
router. A dynamic map will be created !--- for incoming
calls. If this router is to be used for outgoing calls
!--- then a dialer map is needed. no ip directed-
broadcast encapsulation ppp dialer-group 1 !---
Interesting traffic definition from dialer-list 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 route points to ip address of
5400 dialer 2 interface. ! dialer-list 1 protocol ip
permit ! line con 0 transport input none line aux 0 line
vty 0 4 ! end
```

## 验证

本部分所提供的信息可用于确认您的配置是否正常工作。

[命令输出解释程序工具](#) ( [仅限注册用户](#) ) 支持某些 **show** 命令，使用此工具可以查看对 **show** 命令输出的分析。

- **show isdn status** - 状态应为：layer 1 = active layer 2 = MULTIPLE\_FRAMES\_ESTABLISHED 如果第 1 层无效，接线适配器或端口可能出现故障或未插入。如果第 2 层处于“TEI\_ASSIGNED”状态，则路由器未与交换机通信。有关详细信息，请参阅 [T1 PRI 故障排除](#) 文档。
- **show isdn service** - 用于检查 B 通道的状态。每个呼叫都应有一个繁忙状态的信道。

- **show caller** - 显示特定用户的参数，例如分配的IP地址、点对点协议(PPP)、PPP捆绑参数等。如果您的Cisco IOS版本软件不支持此指令，请使用**show users**命令。

## 故障排除

本部分提供的信息可用于对配置进行故障排除。

### 故障排除命令

[命令输出解释程序工具](#) ( [仅限注册用户](#) ) 支持某些 **show** 命令，使用此工具可以查看对 **show** 命令输出的分析。

**注意：** 在发出 **debug** 命令之前，请参阅[有关 Debug 命令的重要信息](#)。

如下所示，在全局配置中配置时间戳：

```
service timestamps debug datetime msec
service timestamps log datetime msec
```

使用下列命令排除故障：

- **debug dialer** - 在接口中启用按需拨号路由 (DDR) 时，该命令可以显示有关任何呼叫原因 (称为拨号原因) 的信息。
- **debug isdn q931** - 用于检查作为出站呼叫的 ISDN 连接是否启动。
- **debug ppp negotiation** - 用于查看客户端是否通过 PPP 协商。大量的并发 PPP 协商可能会使路由器 CPU 过载。
- **debug ppp authentication** - 看见客户端是否可以认证。
- **debug ppp error** - 显示和PPP连接协商与操作相关的协议错误以及统计错误。

对于调制解调器故障排除，请使用下列命令：

- **debug modem** - 用于查看路由器从调制解调器接收的信号是否正确。
- **debug modem csm** - 用于启用调制解调器管理呼叫交换模块 (CSM) 调试模式。

[如需了解nextport命令的更多信息，请参见Cisco AS5400通用网关的管理端口服务章节。](#)

### 调试输出示例

以下是成功呼叫的一些调试输出。注意在输出和备注中的粗体部分。比较您得到与如下所示的结果的输出。

#### 出站调制解调器呼叫

```
Router#show debug General OS: Modem control/process activation debugging is on Dial on demand:
Dial on demand events debugging is on CSM Modem: Modem Management Call Switching Module
debugging is on PPP: PPP authentication debugging is on PPP protocol errors debugging is on PPP
protocol negotiation debugging is on ISDN: ISDN events debugging is on ISDN Q931 packets
debugging is on ISDN events debug DSLs. (On/Off/No DSL:1/0/-) DSL 0 --> 31 1 - - - - -
- - - - - ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
DSL 0 --> 31 1 - - - - - Router#ping
10.1.1.2 Type escape sequence to abort. Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2
seconds: *Jan 2 01:07:19.085: As1/107 DDR: rotor dialout [priority] *Jan 2 01:07:19.085: As1/107
DDR: Dialing cause ip (s=10.1.1.1, d=10.1.1.2) *Jan 2 01:07:19.085: As1/107 DDR: Attempting to
dial 4724125 !--- The DDR process has detected interesting traffic destined for a device off !--
```

- dialer 1's interface and is indicating a call. \*Jan 2 01:07:19.085: CHAT1/107: Attempting  
async line dialer script \*Jan 2 01:07:19.085: CHAT1/107: no matching chat script found for  
4724125 \*Jan 2 01:07:19.085: CHAT1/107: Dialing using Modem script: d0efault-d0ials0cript &  
System script: none \*Jan 2 01:07:19.085: CHAT1/107: process started \*Jan . 2 01:07:19.085:  
CHAT1/107: Asserting DTR \*Jan 2 01:07:19.085: CHAT1/107: Chat script d0efault-d0ials0cript  
started \*Jan 2 01:07:20.533: CSM DSPLIB(1/107): Rcvd Dial String (4724125) \*Jan 2 01:07:20.533:  
CSM\_PROC\_IDLE: CSM\_EVENT\_MODEM\_OFFHOOK at slot 1, port 107 \*Jan 2 01:07:20.537:  
csm\_get\_signaling\_channel csm\_call\_info->bchan\_num 0xFFFFFFFF \*Jan 2 01:07:20.537:  
csm\_get\_signaling\_channel dchan\_index=16504,next\_index=0, dchan\_info=0x628C2BF0 \*Jan 2  
01:07:20.537: CSM\_PROC\_OC3\_COLLECT\_ALL\_DIGIT: CSM\_EVENT\_GET\_ALL\_DIGITS at slot 1, port 107 \*Jan  
2 01:07:20.537: CSM\_PROC\_OC3\_COLLECT\_ALL\_DIGIT: called party num: (4724125) at slot 1, port 107  
*!--- The Call Switch Module (CSM) is informed of the call. !--- The CSM allocates modem 1/107  
for the outbound call.* \*Jan 2 01:07:20.537: csm\_get\_signaling\_channel csm\_call\_info->bchan\_num  
0xFFFFFFFF \*Jan 2 01:07:20.537: csm\_get\_signaling\_channel dchan\_index=24935,next\_index=0,  
dchan\_info=0x628C2BF0 \*Jan 2 01:07:20.537: ISDN Se7/0:23: Outgoing call id = 0x800F, dsl 0 \*Jan  
2 01:07:20.537: CSM\_PROC\_OC3\_COLLECT\_ALL\_DIGIT: csm\_call\_info->bchan\_num 0xFFFFFFFF \*Jan 2  
01:07:20.537: ISDN Se7/0:23: VOICE\_I.SDNCALL Event: call id 0x800F, bchan 65535, ces 0 \*Jan 2  
01:07:20.537: ISDN Se7/0:23: process\_pri\_call(): call id 0x800F, number 4724125, speed 64, call  
type VOICE, redialed? f, csm call? t, pdata? f \*Jan 2 01:07:20.537: trying to get callinf from  
isdn\_info \*Jan 2 01:07:20.537: Don't know what calling number for later redial. \*Jan 2  
01:07:20.537: ISDN: Created entry call\_id 0x800F, speed 64, remote 4724125, calling \*Jan 2  
01:07:20.537: called type/plan overridden by call\_decode \*Jan 2 01:07:20.537: didn't copy oct3a  
reason: not CALLER\_NUMBER\_IE \*Jan 2 01:07:20.537: building outgoing channel id for call nfas\_int  
is 0 len is 0 \*Jan 2 01:07:20.537: ISDN Se7/0:23: **TX -> SETUP** pd = 8 callref = 0x000C \*Jan 2  
01:07:20.537: Bearer Capability i = 0x8090A2 \*Jan 2 01:07:20.537: Channel ID i = 0xA98397 \*Jan 2  
01:07:20.537: Called Party Number i = 0xA1, '4724125', Plan:ISDN, Type:National *!--- Outgoing  
Q.931 SETUP message. Indicates an outgoing call. !--- For more information on Q.931 refer to the  
document: !--- Troubleshooting ISDN Layer 3 using the debug isdn q931 Command.* \*Jan 2  
01:07:20.617: ISDN Se7/0:23: **RX <- CALL\_PROC** pd = 8 callref = 0x800C \*Jan 2 01:07:20.617:  
Channel. ID i = 0xA98397 *!--- The Call Proceeding Message is sent through the D-channel.* \*Jan 2  
01:07:20.617: ISDN Se7/0:23: LIF\_EVENT: ces/callid 1/0x800F CALL\_PROCEEDING \*Jan 2 01:07:20.617:  
ISDN Se7/0:23: CALL\_PROCEEDING id 0x800F \*Jan 2 01:07:20.617: ISDN Se7/0:23: PRI Event: 6, bchan  
= 22, call type = VOICE \*Jan 2 01:07:20.617: EVENT\_FROM\_ISDN: dchan\_idb=0x62C31CC0,  
call\_id=0x800F, ces=0x1 bchan=0x16, event=0x3, cause=0x0 \*Jan 2 01:07:20.617:  
EVENT\_FROM\_ISDN:(800F): DEV\_CALL\_PROC at slot 1 and port 107, bchan 22 on Serial7/0:23 \*Jan 2  
01:07:20.617: CSM\_PROC\_OC4\_DIALING: CSM\_EVENT\_ISDN\_BCHAN\_ASSIGNED at slot 1, port 107 \*Jan 2  
01:07:20.617: csm\_connect\_pri\_vdev: TS allocated at bp\_stream 0, bp\_Ch 9, vdev\_common 0x624BAD88  
1/107 \*Jan 2 01:07:20.617: CSM DSPLIB(1/107): np\_dsplib\_prepare\_modem \*Jan 2 01:07:20.625: CSM  
DSPLIB(1/107):DSPLIB\_MODEM\_INIT: Modem session transition to IDLE \*Jan 2 01:07:20.717: ISDN  
Se7/0:23: **RX <- ALERTING** pd = 8 callref = 0x800C \*Jan 2 01:07:20.717: ISDN Se7/0:23: LIF\_EVENT:  
ces/callid 1/0x800F CALL\_PROGRESS \*Jan 2 01:07:20.717: ISDN Se7/0:23: event CA.LL\_PROGRESS dsl 0  
\*Jan 2 01:07:20.797: ISDN Se7/0:23: **RX <- CONNECT** pd = 8 callref = 0x800C *!--- Received the  
Q.931 CONNECT.* \*Jan 2 01:07:20.797: ISDN Se7/0:23: LIF\_EVENT: ces/callid 1/0x800F CALL\_CONNECT  
\*Jan 2 01:07:20.797: ISDN Se7/0:23: Event CALL\_CONNECT dsl 0 \*Jan 2 01:07:20.797:  
EVENT\_FROM\_ISDN: dchan\_idb=0x62C31CC0, call\_id=0x800F, ces=0x1 bchan=0x16, event=0x4, cause=0x0  
\*Jan 2 01:07:20.797: EVENT\_FROM\_ISDN:(800F): DEV\_CONNECTED at slot 1 and port 107 \*Jan 2  
01:07:20.797: CSM\_PROC\_OC5\_WAIT\_FOR\_CARRIER: CSM\_EVENT\_ISDN\_CONNECTED at slot 1, port 107 \*Jan 2  
01:07:20.797: CSM DSPLIB(1/107): np\_dsplib\_call\_accept \*Jan 2 01:07:20.797: ISDN Se7/0:23:  
LIF\_EVENT: ces/callid 1/0x800F CALL\_PROGRESS \*Jan 2 01:07:20.797: ISDN Se7/0:23: event  
CALL\_PROGRESS dsl 0 \*Jan 2 01:07:20.797: ISDN Se7/0:23: **TX -> CONNECT\_ACK** pd = 8 callref =  
0x000C *!--- D-channel transmits a CONNECT\_ACK.* \*Jan 2 01:07:20.801: CSM  
DSPLIB(1/107):DSPLIB\_MODEM\_WAIT\_ACTIVE: Modem session transition to ACTIVE \*Jan 2 01:07:20.801:  
CSM DSPLIB(1/107): Modem state changed to (CONNECT\_STATE) \*Jan 2 01:07:26.797: %ISDN-6-CONNECT:  
Interface Serial7/0:22 is now connected to 4724125 \*Jan 2 01:07:26.893: CSM DSPLIB(1/107): Modem  
state changed to (LINK\_STATE) \*Jan 2 01:07:29.837: CSM DSPLIB(1/107): Modem state changed to  
(TRAINUP\_STATE) \*Jan 2 01:07:37.997: CSM DSPLIB(1/107): Modem state changed to  
(EC\_NEGOTIATING\_STATE) \*Jan 2 01:07:38.333: CSM DSPLIB(1/107): Modem state changed to  
(STEADY\_STATE) *!--- Modems have trained up and are in a steady state.* \*Jan 2 01:07:38.333:  
CHAT1/107: Chat script d0efault-d0ials0cript finished, status = Success \*Jan 2 01:07:38.333:  
TTY1/107: no timer type 1 to destroy \*Jan 2 01:07:38.333: TTY1/107: no timer type 0 to destroy  
\*Jan 2 01:07:38.333: Dil IPCP: Install route to 10.1.1.2 \*Jan 2 01:07:40.333: %LINK-3-UPDOWN:  
Interface Async1/107, changed state to up \*Jan 2 01:07:40.333: As1/107 DDR: Dialer statechange  
to up \*Jan 2 01:07:40.333: As1/107 DDR: Dialer call has been placed \*Jan 2 01:07:40.333: As1/107  
PPP: Treating connection as a callout \*Jan 2 01:07:40.333: As1/107 PPP: **Phase is ESTABLISHING,**

```

Active Open [0 sess, 1 load] !--- LCP negotiation begins. *Jan 2 01:07:42.469: As1/107 LCP: I
CONFREQ [REQsent] id 1 len 25 *Jan 2 01:07:42.469: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 2 01:07:42.469: As1/107 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 01:07:42.469: As1/107
LCP: MagicNumber 0x2862C096 (0x05062862C096) *Jan 2 01:07:42.469: As1/107 LCP: PFC (0x0702) *Jan
2 01:07:42.469: As1/107 LCP: ACFC (0x0802) !--- Incoming LCP CONFREQ. !--- For more information
on interpreting PPP debugs refer to the document: !--- Dialup Technology: Troubleshooting
Techniques *Jan 2 01:07:42.469: As1/107 LCP: O CONFACK [REQsent] id 1 len 25 *Jan 2
01:07:42.469: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:42.469: As1/107 LCP:
AuthProto CHAP (0x0305C22305) *Jan 2 01:07:42.469: As1/107 LCP: MagicNumber 0x2862C096
(0x05062862C096) *Jan 2 01:07:42.469: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:42.469: As1/107
LCP: ACFC (0x0802) *Jan 2 01:07:44.333: As1/107 LCP: O CONFREQ [ACKsent] id 29 len 25 *Jan 2
01:07:44.333: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:44.333: As1/107 LCP:
AuthProto CHAP (0x0305C22305) *Jan 2 01:07:44.333: As1/107 LCP: MagicNumber 0x081D8CEC
(0x0506081D8CEC) *Jan 2 01:07:44.333: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:44.333: As1/107
LCP: ACFC (0x0802) *Jan 2 01:07:44.461: As1/107 LCP: I CONFACK [ACKsent] id 29 len 25 *Jan 2
01:07:44.461: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:44.461: As1/107 LCP:
AuthProto CHAP (0x0305C22305) *Jan 2 01:07:44.461: As1/107 LCP: MagicNumber 0x081D8CEC
(0x0506081D8CEC) *Jan 2 01:07:44.461: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:44.461: As1/107
LCP: ACFC (0x0802) *Jan 2 01:07:44.461: As1/107 LCP: State is Open ! --- LCP negotiation is
complete. *Jan 2 01:07:44.461: As1/107 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load]
*Jan 2 01:07:44.461: As1/107 CHAP: O CHALLENGE id 16 len 27 from "Router" *Jan 2 01:07:44.477:
As1/107 CHAP: I CHALLENGE id 1 len 34 from "remoteAsync01" *Jan 2 01:07:44.477: As1/107 CHAP: O
RESPONSE id 1 len 27 from "Router" *Jan 2 01:07:44.581: As1/107 CHAP: I RESPONSE id 16 len 34
from "remoteAsync01" *Jan 2 01:07:44.581: As1/107 CHAP: O SUCCESS id 16 len 4 *Jan 2
01:07:44.601: As1/107 CHAP: I SUCCESS id 1 len 4 !--- CHAP authentication is successful. !--- If
this fails, verify that the username and password are correct. !--- Refer to Dialup Technology:
Troubleshooting Techniques. *Jan 2 01:07:44.601: As1/107 PPP: Phase is UP [0 sess, 1 load] *Jan
2 01:07:44.601: As1/107 IPCP: O CONFREQ [Closed] id 6 len 10 *Jan 2 01:07:44.601: As1/107 IPCP:
Address 10.1.1.1 (0x03060A010101) *Jan 2 01:07:44.601: As1/107 CDPCP: O CONFREQ [Closed] id 5
len 4 *Jan 2 01:07:44.701: As1/107 IPCP: I CONFREQ [REQsent] id 1 len 10 *Jan 2 01:07:44.701:
As1/107 IPCP: Address 10.1.1.2 (0x03060A010102) *Jan 2 01:07:44.701: As1/107 IPCP: O CONFACK
[REQsent] id 1 len 10 *Jan 2 01:07:44.701: As1/107 IPCP: Address 10.1.1.2 (0x03060A010102) *Jan
2 01:07:44.705: As1/107 CDPCP: I CONFREQ [REQsent] id 1 len 4 *Jan 2 01:07:44.705: As1/107
CDPCP: O CONFACK [REQsent] id 1 len 4 *Jan 2 01:07:44.733: As1/107 IPCP: I CONFACK [ACKsent] id
6 len 10 *Jan 2 01:07:44.733: As1/107 IPCP: Address 10.1.1.1 (0x03060A010101) *Jan 2
01:07:44.733: As1/107 IPCP: State is Open *Jan 2 01:07:44.733: As1/107 DDR: dialer protocol up
!--- The route has been successfully negotiated and installed in the routing table. *Jan 2
01:07:44.737: As1/107 CDPCP: I CONFACK [ACKsent] id 5 len 4 *Jan 2 01:07:44.737: As1/107 CDPCP:
State is Open *Jan 2 01:07:45.601: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async1/107,
changed state to up *Jan 2 01:07:48.321: TTY0: timer type 1 expired *Jan 2 01:07:48.321: TTY0:
Exec timer (continued)

```

## 出站 ISDN 呼叫

以下是成功的 ISDN 出站呼叫的一些调试输出。注意在输出和备注中的粗体部分。比较您得到与如下所示的结果的输出。

```

Router#show debug Dial on demand: Dial on demand events debugging is on PPP: PPP authentication
debugging is on PPP protocol errors debugging is on PPP protocol negotiation debugging is on
ISDN: ISDN events debugging is on ISDN Q931 packets debugging is on ISDN events debug DSLs.
(On/Off/No DSL:1/0/-) DSL 0 --> 31 1 - - - - -
- ISDN Q931 packets de ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-) DSL 0 --> 31 1 - - -
- - - - - Router#ping 10.1.1.66 Type escape
sequence to abort. Sending 5, 100-byte ICMP Echos to 10.1.1.66, timeout is 2 seconds: *Jan 2
02:00:59.937: Se7/0:23 DDR: rotor dialout [priority] *Jan 2 02:00:59.937: Se7/0:23 DDR: Dialing
cause ip (s=10.1.1.65, d=10.1.1.66) *Jan 2 02:00:59.937: Se7/0:23 DDR: Attempting to dial
6665800 !--- The DDR process has detected interesting traffic destined for a device off !---
dialer 1's interface and is inticating a call. *Jan 2 02:00:59.937: ISDN Se7/0:23: Outgoing call
id = 0x8016, dsl 0 *Jan 2 02:00:59.937: ISDN Se7/0:23: Event: Call to 4724125 at 64 Kb/s *Jan 2
02:00:59.937: ISDN Se7/0:23: process_pri_call(): call id 0x8016, number 6665800, speed 64, call
type DATA, redialed? f, csm call? f, pdata? f *Jan 2 02:00:59.937: called type/plan overridden
by call_decode *Jan 2 02:00:59.937: did't copy oct3a reason: not CALLER_NUMBER_IE *Jan 2
02:00:59.941: building outgoing channel id for call nfas_int is 0 len is 0 *Jan 2 02:00:59.941:

```



ISDN Se7/0:23: **TX** -> **SETUP** pd = 8 callref = 0x0013 \*Jan 2 02:00:59.941: Bearer Capability i = 0x8890 \*Jan 2 02:00:59.941: Channel ID i = 0xA98397 \*Jan 2 02:00:59.941: Called Pa.rty Number i = 0xA1, '6665800', Plan:ISDN, Type:National *!--- Outgoing Q.931 SETUP message. Indicates an outgoing call. !--- For more information on Q.931 refer to the document. !--- Troubleshooting ISDN Layer 3 using the debug isdn q931 Command.* \*Jan 2 02:01:00.017: ISDN Se7/0:23: RX <- CALL\_PROC pd = 8 callref = 0x8013 \*Jan 2 02:01:00.017: Channel ID i = 0xA98397 *!--- The Call Proceeding Message is sent through the D-channel.* \*Jan 2 02:01:00.017: ISDN Se7/0:23: LIF\_EVENT: ces/callid 1/0x8016 CALL\_PROCEEDING \*Jan 2 02:01:00.017: ISDN Se7/0:23: CALL\_PROCEEDING id 0x8016 \*Jan 2 02:01:00.021: ISDN Se7/0:23: PRI Event: 6, bchan = 22, call type = DATA \*Jan 2 02:01:00.093: ISDN Se7/0:23: **RX** <- **CONNECT** pd = 8 callref = 0x8013 *!--- Received the Q.931 CONNECT.* \*Jan 2 02:01:00.097: ISDN Se7/0:23: LIF\_EVENT: ces/callid 1/0x8016 CALL\_CONNECT \*Jan 2 02:01:00.097: ISDN Se7/0:23: Event CALL\_CONNECT dsl 0 \*Jan 2 02:01:00.097: %LINK-3-UPDOWN: Interface Serial7/0:22, changed state to up \*Jan 2 02:01:00.097: Se7/0:22 PPP: Treating connection as a callout \*Jan 2 02:01:00.097: Se7/0:22 PPP: **Phase is ESTABLISHING, Active Open** [0 sess, 1 load] *!--- LCP negotiation begins.* \*Jan 2 02:01:00.097: Se7/0:22 LCP: **O CONFREQ** [Closed] id 7 len 15 \*Jan 2 02:01:00.097: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) \*Jan 2 02:01:00.097: Se7/0:22 LCP: MagicNumber 0x084E600A (0x0506084E600A) *!--- Outgoing LCP CONFREQ. !--- For more information on interpreting PPP debugs refer to the document !--- Dialup Technology: Troubleshooting Techniques.* \*Jan 2 02:01:00.097: ISDN Se7/0:23: LIF\_EVENT: ces/callid 1/0x8016 CALL\_PROGRESS \*Jan 2 02:01:00.097: ISDN Se7/0:23: event CALL\_PROGRESS dsl 0 \*Jan 2 02:01:00.097: ISDN Se7/0:23: **TX** -> **CONNECT\_ACK** pd = 8 callref = 0x0013 *!--- D-channel transmits a CONNECT\_ACK.* \*Jan 2 02:01:00.105: Se7/0:22 LCP: I CONFREQ [REQsent] id 30 len 15 \*Jan 2 02:01:00.105: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) \*Jan 2 02:01:00.105: Se7/0:22 LCP: MagicNumber 0x28938B8C (0x050628938B8C) \*Jan 2 02:01:00.105: Se7/0:22 LCP: O CONFACK [REQsent] id 30 len 15 \*Jan 2 02:01:00.105: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) \*Jan 2 02:01:00.109: Se7/0:22 LCP: MagicNumber 0x28938B8C (0x050628938B8C) \*Jan 2 02:01:00.109: Se7/0:22 LCP: I CONFACK [ACKsent] id 7 len 15 \*Jan 2 02:01:00.109: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) \*Jan 2 02:01:00.109: Se7/0:22 LCP: MagicNumber 0x084E600A (0x0506084E600A) \*Jan 2 02:01:00.109: Se7/0:22 **LCP: State is Open ! --- LCP negotiation is complete.** \*Jan 2 02:01:00.109: Se7/0:22 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] \*Jan 2 02:01:00.109: Se7/0:22 CHAP: O CHALLENGE id 7 len 27 from "Router" \*Jan 2 02:01:00.121: Se7/0:22 CHAP: I CHALLENGE id 25 len 33 from "remoteISDN01" \*Jan 2 02:01:00.121: Se7/0:22 CHAP: O RESPONSE id 25 len 27 from "Router" \*Jan 2 02:01:00.129: Se7/0:22 CHAP: I SUCCESS id 25 len 4 \*Jan 2 02:01:00.137: Se7/0:22 CHAP: I RESPONSE id 7 len 33 from "remoteISDN01" \*Jan 2 02:01:00.137: Se7/0:22 CHAP: O SUCCESS id 7 len 4 *!--- CHAP authentication is successful. !--- If this fails verify that the username and password are correct. !--- Refer to Dialup Technology: Troubleshooting Techniques.* \*Jan 2 02:01:00.137: Se7/0:22 PPP: Phase is UP [0 sess, 1 load] \*Jan 2 02:01:00.137: Se7/0:22 IPCP: O CONFREQ [Closed] id 2 len 10 \*Jan 2 02:01:00.137: Se7/0:22 IPCP: Address 10.1.1.65 (0x03060A010141) \*Jan 2 02:01:00.145: Se7/0:22 IPCP: I CONFREQ [REQsent] id 3 len 10 \*Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.66 (0x03060A010142) \*Jan 2 02:01:00.145: Se7/0:22 IPCP: O CONFACK [REQsent] id 3 len 10 \*Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.66 (0x03060A010142) \*Jan 2 02:01:00.145: Se7/0:22 IPCP: I CONFACK [ACKsent] id 2 len 10 \*Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.65 (0x03060A010141) \*Jan 2 02:01:00.145: Se7/0:22 IPCP: State is Open \*Jan 2 02:01:00.145: Se7/0:22 DDR: dialer protocol up \*Jan 2 02:01:00.145: Di2 IPCP: **Install route to 10.1.1.66 !--- The Route has been successfully negotiated and installed in the routing table.** \*Jan 2 02:01:01.137: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial7/0:22, changed state to up \*Jan 2 02:01:06.097: %ISDN-6-CONNECT: Interface Serial7/0:22 is now connected to 6665800 remoteISDN01

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