

Configuring MS Callback Between a Router and a Windows PC

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Introduction

The Microsoft implementation of callback is not compliant with RFC 1570 . However, because of the large market share of the Microsoft dial-up networking client, Cisco has implemented the Microsoft Callback (MSCB) Control Protocol into Cisco IOS® Software Release 11.3(2)T and later.

Prerequisites

Requirements

Before you attempt this configuration, ensure that you meet these requirements:

- Configure the Network Access Server (NAS) to accept analog calls from the client. Callback is an additional feature of modem dial-in. Therefore, verify whether this aspect functions correctly. This can help you to troubleshoot.
- The T1/E1 circuit must be capable of dialout. Contact your telephone company (Telco) to verify this.

Components Used

The information in this document is based on Cisco IOS Software Release 11.3(2)T and later versions.

This scenario was tested on a PC with Windows dial-up networking.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Background Theory

Callback executes in this order:

1. A PC user (client) connects to the Cisco access server.
2. Callback process is negotiated in the Point-to-Point Protocol (PPP) link control protocol (LCP) phase.
3. PPP authentication is performed.
4. The Cisco IOS software validates callback rules for this user or line and disconnects the caller for callback.
5. The Cisco access server dials the client.

There are four types of MSCB:

1. No callback.
2. User-specified callback number.
3. Server-specified (preconfigured) callback number.
4. List of preconfigured callback number.

The default configuration is no callback (option 1). Options 2 or 3 can be configured:

- Locally (if no AAA server is used).
- In the TACACS+ or RADIUS user profile (if AAA is used).

If option 2 is configured, the user is prompted to enter his callback number. If option 3 is configured, the prompt only offers one choice, which is the administrator-defined number.

Cisco only implements the callback server functionality of MSCB and not the callback client functionality. This means that a Cisco router can be used only as an MSCB server and not as an MSCB client. In addition, the Cisco implementation of MSCB requires authentication to be performed on the client.

Configure

In this section, you are presented with the information to configure the features described in this document.

Configuration Summary

To enable MSCB, you must enable the **ppp callback accept** command under the receiving interface (for example, group-async). In addition, because authentication is required, you must enable Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP) authentication:

```
ppp authentication chap pap
```

Two chat-scripts are created automatically. These are the **offhook** and **callback** chat-scripts:

```
chat-script offhook "" "ATH1" OK
chat-script callback ABORT ERROR ABORT BUSY ""
"ATZ" OK "ATDT \T" TIMEOUT60 CONNECT \c
```

The chat-scripts are also automatically applied to the lines in use:

```
line 1 24
  script modem-off-hook offhook
  script callback callback
```

A user must be **authorized** to be called back. You can configure this locally on NAS or on the external AAA server (RADIUS or TACACS+), based on where the username and password information is stored.

This is a local configuration for a user who is called back at 5551212:

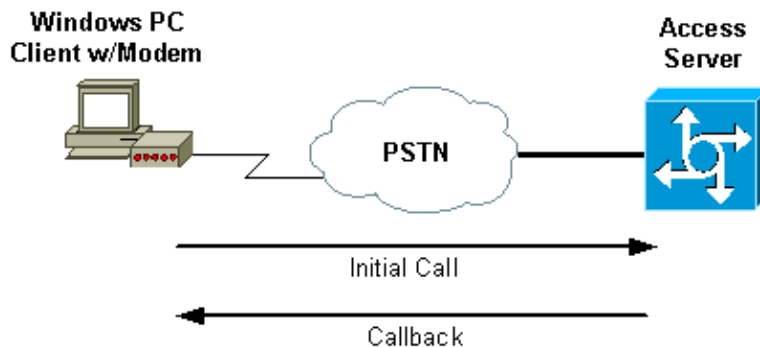
```
username callmeback callback-dialstring 5551212 password cisco
```

This local configuration is applicable to users who are allowed to specify their own callback number:

```
username callmeback callback-dialstring " " password cisco
```

Network Diagram

This document uses this network setup:



Configurations

This document uses this configuration:

- isdn2-2 (AS5200 Router)

isdn2-2 (AS5200 Router)

Current configuration:

```
!
version 11.3
service timestamps debug datetime msec
service password-encryption
no service udp-small-servers
no service tcp-small-servers
!
hostname isdn2-2
!
aaa new-model
aaa authentication login default none
aaa authentication login use-local local
aaa authentication ppp default local
aaa authorization network local

!--- Runs authorization for network-related service requests (Example: PPP).
```

```

!--- For an AAA server implementation, replace "local" with TACACS+ or RADIUS in
!--- these statements.

enable secret 5 <deleted>
!
username callmeback callback-dialstring "" password 7 <deleted>

!--- This is for mobile users. The client specifies the callback number.
!--- If a RADIUS server is used, this information can be offloaded to the server.

ip domain-name cisco.com
isdn switch-type primary-5ess
chat-script offhook "" "ATH1" OK
chat-script callback ABORT ERROR ABORT BUSY "" "ATZ" OK "ATDT \T" TIMEOUT 60 CONNECT \c

!--- The chat script "callback" is used for the callback connection.

clock timezone PST -8
clock summer-time PDT recurring
!
!
controller T1 0

!--- Active T1 Primary Rate Interface (PRI).

    framing esf
    clock source line secondary
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 1
    shutdown
!
interface Ethernet0
    ip address 172.16.25.52 255.255.255.240
!
interface Serial0
    no ip address
    shutdown
!
interface Serial1
    no ip address
    shutdown
!
interface Serial0:23

!--- D-channel for T1 0.

    ip unnumbered Ethernet0
    encapsulation ppp
    dialer-group 1
    isdn incoming-voice modem

!--- Allows incoming ISDN voice calls to be switched to the onboard modems.

peer default ip address pool default
!
interface Group-Async1
    ip unnumbered Ethernet0
    ip tcp header-compression passive
    encapsulation ppp
    async mode interactive
    peer default ip address pool default
    no cdp enable
    ppp max-bad-auth 3
    ppp callback accept

```

```

!--- Allows the group-async to accept a callback request to a remote host.

    ppp authentication chap

!--- CHAP, PAP, or both must be enabled for callback.

    group-range 1 12
!
router eigrp 202
    network 172.16.0.0
    distance 90 172.16.25.49 0.0.0.0
    no auto-summary
!
ip local pool default 172.16.25.59 172.16.25.62

!--- Default IP address pool for dial-in clients.

ip default-gateway 172.16.25.49

ip classless
dialer-list 1 protocol ip permit
!
line con 0
line 1 6
    autoselect during-login
    autoselect ppp
    script modem-off-hook offhook
    script callback callback

!--- Specifies a chat script to issue AT commands to the modem during a callback attempt.
!--- The chat-scripts "offhook" and "callback" were configured earlier.

    login authentication use-local
    modem InOut
    transport input all
line 7 12

!--- These modems are busied out and not used.

    autoselect during-login
    autoselect ppp
    login authentication use-local
    modem InOut
    modem busyout
    transport input all
line aux 0
    exec-timeout 0 0
    line vty 0 4
    password 7 <deleted>
!
end

```

Windows Client Configuration

Windows 95 and 98 Client Configuration

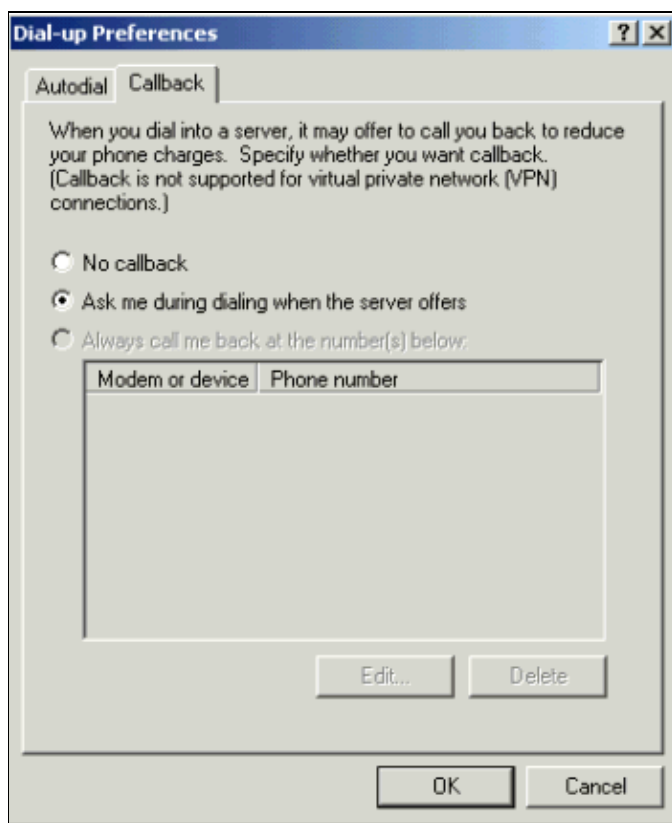
For Windows 95 and 98 PCs, there is no special client-side configuration for callback. The access server handles the callback features of the connection. The Windows 95 or 98 PC displays a "waiting for callback" message to indicate that a callback is in progress.

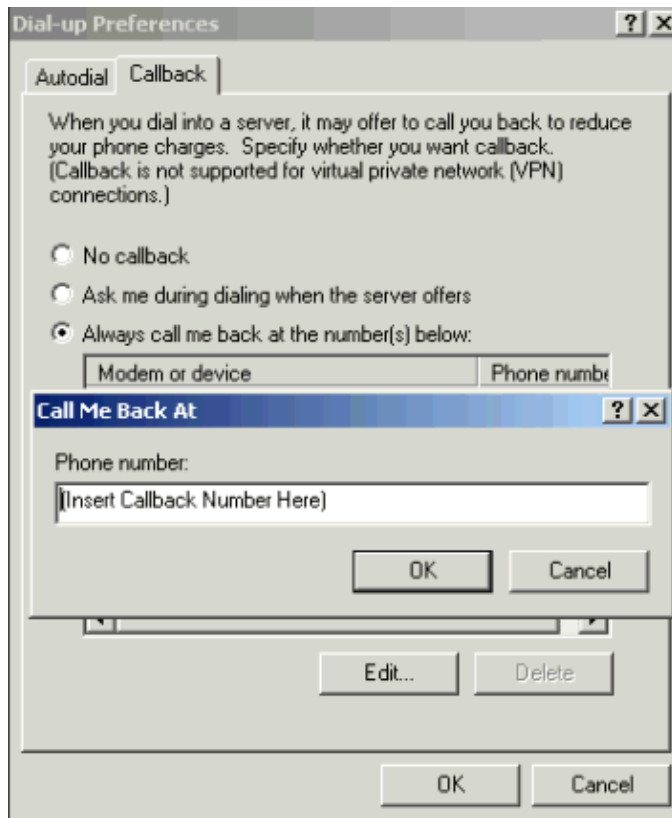
Windows NT and 2000 Client Configuration

Configure these platforms to request callback. Complete these steps to configure them:

1. Choose **Start > Programs > Accessories > Communications > Network and Dial-up Connections**.
2. Choose **Advanced > Dial-up Preferences** from the menu.
3. Click the **Callback** tab to access the callback features menu as shown in figure 1.
4. Configure your callback options as needed:
 - ◆ In order not to use the callback function, click the **No Callback** button.
 - ◆ To be prompted what to do when a server offers callback, click the **Ask Me During Dialing When The Server Offers** button.
 - ◆ To automatically accept callback offers, click the **Always Call Me Back At The Number(s) Below** button, and select the device to use from the list.
 - ◆ To change the callback phone number, select the device and click the **Edit** button. Enter the number in the **Phone Number** field as shown in Figure 1, and then click **OK** in the Call Me Back At dialog box.
5. Click the **Phone Number** field, and enter the number in the Call Me Back At dialog box (shown in figure 1). Click **OK** when you are finished.
6. When you are finished, click **OK** in the Dial-up Preferences dialog box.

Figure 1 Access the Callback Features





Verify

This section provides information you can use to confirm that your configuration is working properly.

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- **show isdn active** displays information about current incoming and outgoing ISDN calls. Use this command to verify whether the callback was successfully completed. If callback is successful, **show isdn active** shows the call as outgoing on the callback server.
- **show users** displays information about the active lines on the router. You can also use the **show caller** command if your version of Cisco IOS Software supports it.
- **show dialer** shows general diagnostic information for interfaces configured for Dial-on-Demand Routing (DDR).

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

Troubleshooting Commands

Note: Before issuing **debug** commands, please see Important Information on Debug Commands.

For more information on **debug** commands, see the Cisco IOS Release 12.0 Debug Command Reference.

- **debug aaa authentication** displays information on AAA authentication.
- **debug aaa authorization** displays information on AAA authorization.
- **debug callback** displays callback events when the router uses a modem and a chat script to call back on a terminal line.

- **debug modem** enables you to observe modem line activity on an access server.
- **debug ppp [*packet* | *negotiation* | *error* | *authentication*]** displays information on traffic and exchanges in an internetwork that implements PPP.
 - ◆ ***packet*** displays PPP packets being sent and received. (This command displays low-level packet dumps.)
 - ◆ ***negotiation*** displays PPP packets transmitted during PPP startup, when PPP options are negotiated.
 - ◆ ***error*** displays protocol errors and error statistics associated with PPP connection negotiation and operation.
 - ◆ ***authentication*** displays authentication protocol messages, which include CHAP and PAP exchanges.
- **debug chat** shows the handshake that occurs between the access server and its internal modem while the modem is instructed to dial out. A chat-script is a set of expect-send string pairs that define the handshake between data terminal equipment (DTE) and data communications equipment (DCE) devices.
- **debug isdn q931** displays the ISDN Q.931 (D channel) call setup and teardown messages and debugs. In this scenario, the modem call is carried as a voice bearer service over the Public Switched Telephone Network (PSTN).
- **debug modem csm** enables you to troubleshoot Call Switching Module (CSM) problems on routers with internal digital modems. With this command, you can trace the complete sequence of switching incoming and outgoing calls.

```
isdn2-2#show debug
```

```
General OS:
Modem control/process activation debugging is on
AAA Authentication debugging is on
AAA Authorization debugging is on
PPP:
PPP protocol negotiation debugging is on
ISDN:
ISDN Q931 packets debugging is on
Chat Scripts:
Chat scripts activity debugging is on
Modem Management:
Modem Management Call Switching Module debugging is on
isdn2-2#
```

```
!--- This is the initial call from the client.
```

```
*Mar 1 01:24:48.643: ISDN Se0:23: RX <- SETUP pd = 8 callref = 0x36
*Mar 1 01:24:48.647: Bearer Capability i = 0x9090A2
*Mar 1 01:24:48.651: Channel ID i = 0xA98393
*Mar 1 01:24:48.651: Called Party Number i = 0xC1, '4084327528'
*Mar 1 01:24:48.663: ISDN Se0:23: Incoming call id = 0xA
*Mar 1 01:24:48.671: EVENT_FROM_ISDN::dchan_idb=0x7F8EE0, call_id=0xA, ces=0x1
bchan=0x12, event=0x1, cause=0x0
*Mar 1 01:24:48.671: VDEV_ALLOCATE: slot 0 and port 3 is allocated.
*Mar 1 01:24:48.675: EVENT_FROM_ISDN:(000A): DEV_INCALL at slot 0 and port 3
*Mar 1 01:24:48.675: CSM_PROC_IDLE: CSM_EVENT_ISDN_CALL at slot 0, port 3
*Mar 1 01:24:48.679: Fast Ringing On at modem slot 0, port 3
*Mar 1 01:24:48.699: ISDN Se0:23: TX -> CALL_PROC pd = 8 callref = 0x8036
*Mar 1 01:24:48.703: Channel ID i = 0xA98393
*Mar 1 01:24:48.735: ISDN Se0:23: TX -> ALERTING pd = 8 callref = 0x8036
*Mar 1 01:24:49.699: Fast Ringing Off at modem slot 0, port 3
*Mar 1 01:24:49.699: CSM_PROC_IC1_RING: CSM_EVENT_MODEM_OFFHOOK at slot 0,
port 3
*Mar 1 01:24:49.711: ISDN Se0:23: TX -> CONNECT pd = 8 callref = 0x8036
*Mar 1 01:24:49.783: ISDN Se0:23: RX <- CONNECT_ACK pd = 8 callref = 0x36
*Mar 1 01:24:49.799: EVENT_FROM_ISDN::dchan_idb=0x7F8EE0, call_id=0xA, ces=0x1
bchan=0x12, event=0x4, cause=0x0
```

*Mar 1 01:24:49.799: EVENT_FROM_ISDN:(000A): DEV_CONNECTED at slot 0 and port 3
*Mar 1 01:24:49.803: CSM_PROC_IC4_WAIT_FOR_CARRIER:CSM_EVENT_ISDN_CONNECTED at slot 0, port 3

!--- Modem has established carrier.

*Mar 1 01:25:11.123: **TTY4: DSR came up**
*Mar 1 01:25:11.127: tty4: Modem: IDLE->READY
*Mar 1 01:25:11.131: TTY4: EXEC creation
*Mar 1 01:25:11.135: AAA/AUTHEN: create_user (0x7B009C) user='' ruser='' port='tty4' rem_addr='async/4084327528' authen_type=ASCII service=LOGIN priv=1
*Mar 1 01:25:11.139: AAA/AUTHEN/START (3134998138): port='tty4' list='use-local' action=LOGIN service=LOGIN
*Mar 1 01:25:11.143: AAA/AUTHEN/START (3134998138): found list use-local
*Mar 1 01:25:11.143: AAA/AUTHEN/START (3134998138): Method=LOCAL

!--- Local AAA.

*Mar 1 01:25:11.147: AAA/AUTHEN (3134998138): status = GETUSER
*Mar 1 01:25:13.951: TTY4: Autoselect(2) sample 7E
*Mar 1 01:25:13.955: TTY4: Autoselect(2) sample 7EFF
*Mar 1 01:25:13.959: TTY4: Autoselect(2) sample 7EFF7D
*Mar 1 01:25:13.959: TTY4: Autoselect(2) sample 7EFF7D23
*Mar 1 01:25:13.963: TTY4 **Autoselect cmd: ppp negotiate**
*Mar 1 01:25:13.967: AAA/AUTHEN/ABORT: (3134998138) because Autoselected.
*Mar 1 01:25:13.967: AAA/AUTHEN: free_user (0x7B009C) user='' ruser='' port='tty4' rem_addr='async/4084327528' authen_type=ASCII service=LOGIN priv=1
*Mar 1 01:25:13.975: TTY4: EXEC creation

!--- PPP has been autoselected and begins negotiation.

%LINK-3-UPDOWN: Interface Async4, changed state to up
*Mar 1 01:25:16.611: As4 PPP: Treating connection as a dedicated line
*Mar 1 01:25:16.611: As4 **PPP: Phase is ESTABLISHING**, Active Open

!--- LCP negotiation begins.

*Mar 1 01:25:16.615: As4 LCP: O CONFREQ [Closed] id 3 len 25
*Mar 1 01:25:16.619: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:25:16.623: As4 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 01:25:16.623: As4 LCP: MagicNumber 0x608D04A3 (0x0506608D04A3)
*Mar 1 01:25:16.627: As4 LCP: PFC (0x0702)
*Mar 1 01:25:16.627: As4 LCP: ACFC (0x0802)
*Mar 1 01:25:16.751: As4 LCP: I CONFACK [REQsent] id 3 len 25
*Mar 1 01:25:16.755: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:25:16.755: As4 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 01:25:16.759: As4 LCP: MagicNumber 0x608D04A3 (0x0506608D04A3)
*Mar 1 01:25:16.763: As4 LCP: PFC (0x0702)
*Mar 1 01:25:16.763: As4 LCP: ACFC (0x0802)
*Mar 1 01:25:17.003: As4 **LCP: I CONFREQ** [ACKrcvd] id 3 len 23

!--- Incoming CONFREQ.

*Mar 1 01:25:17.003: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:25:17.007: As4 LCP: MagicNumber 0x004A4A09 (0x0506004A4A09)
*Mar 1 01:25:17.007: As4 LCP: PFC (0x0702)
*Mar 1 01:25:17.011: As4 LCP: ACFC (0x0802)
*Mar 1 01:25:17.011: As4 **LCP: Callback 6** (0x0D0306)

!--- Peer requests MS Callback (Option 6).

!--- A PPP callback request uses Option 0.

*Mar 1 01:25:17.015: As4 **LCP: O CONFACK** [ACKrcvd] id 3 len 23
*Mar 1 01:25:17.015: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:25:17.019: As4 LCP: MagicNumber 0x004A4A09 (0x0506004A4A09)

```
*Mar 1 01:25:17.023: As4 LCP: PFC (0x0702)
*Mar 1 01:25:17.023: As4 LCP: ACFC (0x0802)
*Mar 1 01:25:17.023: As4 LCP: Callback 6 (0x0D0306)

!--- NAS CONFACKS all LCP parameters.
!--- If the NAS refuses Callback (completely or just MS Callback), LCP may fail.

*Mar 1 01:25:17.027: As4 LCP: State is Open

!--- Authentication begins.

*Mar 1 01:25:20.095: As4 PPP: Phase is AUTHENTICATING, by this end
*Mar 1 01:25:20.099: As4 CHAP: O CHALLENGE id 4 len 28 from "isdn2-2"
*Mar 1 01:25:20.187: As4 CHAP: I RESPONSE id 4 len 26 from "callmeback"
*Mar 1 01:25:20.191: AAA/AUTHEN: create_user (0x7ADEAC) user='callmeback'
ruser='' port='Async4' rem_addr='async/4084327528' authen_type=CHAP
service=PPP priv=1
*Mar 1 01:25:20.195: AAA/AUTHEN/START (44582883): port='Async4' list=''
action=LOGIN service=PPP
*Mar 1 01:25:20.199: AAA/AUTHEN/START (44582883): using "default" list
*Mar 1 01:25:20.199: AAA/AUTHEN/START (44582883): Method=LOCAL

!--- Authentication passes.

*Mar 1 01:25:20.203: AAA/AUTHEN (44582883): status = PASS

!--- Check authorization for LCP.
!--- With local AAA, this should pass.
!--- For server-based AAA, this must be explicitly configured on the server.

*Mar 1 01:25:20.207: AAA/AUTHOR/LCP As4: Authorize LCP
*Mar 1 01:25:20.207: AAA/AUTHOR/LCP: Async4: (3405067782): user='callmeback'
*Mar 1 01:25:20.211: AAA/AUTHOR/LCP: Async4: (3405067782): send AV service=ppp
*Mar 1 01:25:20.211: AAA/AUTHOR/LCP: Async4: (3405067782): send AV
protocol=lcp
*Mar 1 01:25:20.215: AAA/AUTHOR/LCP: Async4 (3405067782): Method=LOCAL
*Mar 1 01:25:20.219: AAA/AUTHOR (3405067782): Post authorization status =
PASS_ADD
*Mar 1 01:25:20.223: AAA/AUTHOR/LCP As4: Processing AV service=ppp
*Mar 1 01:25:20.223: AAA/AUTHOR/LCP As4: Processing AV protocol=lcp
*Mar 1 01:25:20.227: AAA/AUTHOR/LCP As4: Processing AV service=ppp
*Mar 1 01:25:20.227: AAA/AUTHOR/LCP As4: Processing AV protocol=lcp

!--- Callback-dialstring is null, so user is allowed to specify
!--- their own callback number.

*Mar 1 01:25:20.227: AAA/AUTHOR/LCP As4: Processing AV callback-dialstring=

!--- Authentication ACK is returned to client.

*Mar 1 01:25:20.235: As4 CHAP: O SUCCESS id 4 len 4

!--- Callback negotiation proceeds. Because callback-dialstring
!--- is null, MCB debug says "Callback Number - Client ANY".

*Mar 1 01:25:20.239: As4 MCB: User callmeback Callback Number - Client ANY

!--- The callback number of the client is requested. Client receives a dialog
!--- box that prompts the user to type in the callback number.
!--- Request is sent every two seconds. If the user is slow to type a response,
!--- the call remains in this phase for a long time.

*Mar 1 01:25:20.243: Async4 PPP: O MCB Request(1) id 20 len 9
*Mar 1 01:25:20.243: Async4 MCB: O 1 14 0 9 2 5 0 1 0
*Mar 1 01:25:20.247: As4 MCB: O Request Id 20 Callback Type Client-Num delay 0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Async4, changed state to up
```

```

*Mar 1 01:25:22.459: As4 MCB: Timeout in state WAIT_RESPONSE
*Mar 1 01:25:22.463: Async4 PPP: O MCB Request(1) id 21 len 9
*Mar 1 01:25:22.463: Async4 MCB: O 1 15 0 9 2 5 0 1 0
*Mar 1 01:25:22.467: As4 MCB: O Request Id 21 Callback Type Client-Num delay 0
*Mar 1 01:25:24.499: As4 MCB: Timeout in state WAIT_RESPONSE
*Mar 1 01:25:24.503: Async4 PPP: O MCB Request(1) id 22 len 9
*Mar 1 01:25:24.503: Async4 MCB: O 1 16 0 9 2 5 0 1 0
*Mar 1 01:25:24.507: As4 MCB: O Request Id 22 Callback Type Client-Num delay 0
*Mar 1 01:25:26.543: As4 MCB: Timeout in state WAIT_RESPONSE
*Mar 1 01:25:26.547: Async4 PPP: O MCB Request(1) id 23 len 9
*Mar 1 01:25:26.547: Async4 MCB: O 1 17 0 9 2 5 0 1 0
*Mar 1 01:25:26.551: As4 MCB: O Request Id 23 Callback Type Client-Num delay 0
*Mar 1 01:25:28.583: As4 MCB: Timeout in state WAIT_RESPONSE
*Mar 1 01:25:28.587: Async4 PPP: O MCB Request(1) id 24 len 9
*Mar 1 01:25:28.587: Async4 MCB: O 1 18 0 9 2 5 0 1 0
*Mar 1 01:25:28.591: As4 MCB: O Request Id 24 Callback Type Client-Num delay 0

!--- Client returned the callback number. Notice that the response
!--- is for the initial request id 20.

*Mar 1 01:25:29.763: Async4 PPP: I MCB Response(2) id 20 len 17
*Mar 1 01:25:29.767: Async4 MCB: I 2 14 0 11 2 D F 1 35 32 37 2D 39 36 35 31 0
*Mar 1 01:25:29.767: As4 MCB: Received response

!--- Response is ignored because the id is 20. There have
!--- been a few timeouts and id 24 (the last one sent) is expected.

*Mar 1 01:25:29.771: As4 MCB: Resp ignored. ID Expected 24, got id 20
*Mar 1 01:25:30.623: As4 MCB: Timeout in state WAIT_RESPONSE

!--- Send out new request (id 25).

*Mar 1 01:25:30.627: Async4 PPP: O MCB Request(1) id 25 len 9
*Mar 1 01:25:30.627: Async4 MCB: O 1 19 0 9 2 5 0 1 0
*Mar 1 01:25:30.631: As4 MCB: O Request Id 25 Callback Type Client-Num delay 0

!--- Client has cached user response, and so the callback number is
!--- returned right away.

*Mar 1 01:25:30.715: Async4 PPP: I MCB Response(2) id 25 len 17
*Mar 1 01:25:30.719: Async4 MCB: I 2 19 0 11 2 D F 1 35 32 37
2D 39 36 35 31 0
*Mar 1 01:25:30.723: As4 MCB: Received response

!--- Received client callback number is 527-9651.

*Mar 1 01:25:30.723: As4 MCB: Response CBK-Client-Num 2 13 15, addr
1-527-9651

!--- Callback number acknowledged.

*Mar 1 01:25:30.727: Async4 PPP: O MCB Ack(3) id 26 len 17
*Mar 1 01:25:30.731: Async4 MCB: O 3 1A 0 11 2 D F 1 35 32 37
2D 39 36 35 31 0
*Mar 1 01:25:30.731: As4 MCB: O Ack Id 26 Callback Type Client-Num delay 15
*Mar 1 01:25:30.735: As4 MCB: Negotiated MCB with peer

!--- Client hangs up and begins to wait for callback.
!--- This is indicated by an Incoming (I) TERMREQ.

*Mar 1 01:25:30.815: As4 LCP: I TERMREQ [Open] id 5 len 4
*Mar 1 01:25:30.815: As4 LCP: O TERMACK [Open] id 5 len 4
*Mar 1 01:25:30.819: As4 MCB: Peer terminating the link
*Mar 1 01:25:30.819: As4 PPP: Phase is TERMINATING
*Mar 1 01:25:30.819: As4 MCB: Link terminated by peer, Callback Needed

```

!--- Initiate callback to client; sleeps for ten seconds.

*Mar 1 01:25:30.823: As4 MCB: **Initiate Callback for callmeback at 527-9651**
using Async
*Mar 1 01:25:30.827: As4 MCB: Async-callback in progress

!--- Drop modem and B-channel for initial call from client.

*Mar 1 01:25:31.499: CSM_PROC_IC5_OC6_CONNECTED: CSM_EVENT_MODEM_ONHOOK at
slot 0, port 3
*Mar 1 01:25:31.503: VDEV_DEALLOCATE: slot 0 and port 3 is deallocated
*Mar 1 01:25:31.503: ISDN Se0:23: Event: Hangup call to call id 0xA
%ISDN-6-DISCONNECT: **Interface Serial0:18 disconnected from unknown , call
lasted 41 seconds**

!--- Call is completely disconnected.

*Mar 1 01:25:31.523: ISDN Se0:23: TX -> DISCONNECT pd = 8 callref = 0x8036
*Mar 1 01:25:31.523: Cause i = 0x8090 - Normal call clearing
*Mar 1 01:25:31.583: ISDN Se0:23: RX <- RELEASE pd = 8 callref = 0x36
*Mar 1 01:25:31.655: ISDN Se0:23: TX -> RELEASE_COMP pd = 8 callref = 0x8036
%LINEPROTO-5-UPDOWN: Line protocol on Interface Async4, changed state to down
*Mar 1 01:25:31.851: TTY4: Async Int reset: Dropping DTR
*Mar 1 01:25:33.695: As4 LCP: TIMEOUT: Time = 0x4E521C State = TERMSent
*Mar 1 01:25:33.699: As4 LCP: State is Closed
*Mar 1 01:25:33.699: As4 PPP: Phase is DOWN
*Mar 1 01:25:33.703: As4 PPP: Phase is ESTABLISHING, Passive Open
*Mar 1 01:25:33.707: As4 LCP: State is Listen
%LINK-5-CHANGED: Interface Async4, changed state to reset
*Mar 1 01:25:33.879: As4 LCP: State is Closed
*Mar 1 01:25:33.879: As4 PPP: Phase is DOWN
*Mar 1 01:25:33.883: As4 IPCP: Remove route to 172.16.25.61
%LINK-3-UPDOWN: Interface Async4, changed state to down
*Mar 1 01:25:38.887: As4 LCP: State is Closed
*Mar 1 01:25:38.887: As4 PPP: Phase is DOWN

!--- Cleanup from previous call is finished.

*Mar 1 01:25:40.863: CHAT4: **Matched chat script offhook to string offhook**
*Mar 1 01:25:40.867: CHAT4: Asserting DTR

!--- Modem goes offhook.

*Mar 1 01:25:40.867: CHAT4: Chat script offhook started
*Mar 1 01:25:40.871: CHAT4: Sending string: ATH1
*Mar 1 01:25:40.871: CHAT4: Expecting string: OK
*Mar 1 01:25:40.911: CSM_PROC_IDLE: CSM_EVENT_MODEM_OFFHOOK at slot 0, port 3
*Mar 1 01:25:40.963: CHAT4: Completed match for expect: OK
*Mar 1 01:25:40.967: CHAT4: **Chat script offhook finished, status = Success**

!--- Chat script "offhook" was successfully completed.

*Mar 1 01:25:40.967: CHAT4: **Matched chat script callback to string callback**

!--- Chat script "callback" is initiated.

*Mar 1 01:25:40.971: CHAT4: Asserting DTR
*Mar 1 01:25:40.975: CHAT4: Chat script callback started

!--- Reset modem to known state.

*Mar 1 01:25:40.975: CHAT4: Sending string: ATZ
*Mar 1 01:25:40.979: CSM_PROC_OC1_REQUEST_DIGIT: CSM_EVENT_MODEM_ONHOOK at
slot 0, port 3
*Mar 1 01:25:40.983: VDEV_DEALLOCATE: slot 0 and port 3 is deallocated
*Mar 1 01:25:40.979: CHAT4: Expecting string: OK

*Mar 1 01:25:42.123: CHAT4: Completed match for expect: OK

!--- Dial the callback number of the client.

*Mar 1 01:25:42.127: CHAT4: Sending string: **ATDT \T<527-9651>**
*Mar 1 01:25:42.131: CHAT4: Expecting string: CONNECT
*Mar 1 01:25:43.199: CSM_PROC_IDLE: CSM_EVENT_MODEM_OFFHOOK at slot 0, port 3

!--- Modem/ISDN needs to collect the digits from IOS before it makes the call.

*Mar 1 01:25:43.327: DSX1_MAIL_FROM_NEAT: DC_READY_RSP: mid = 5, slot = 2, unit = 1
*Mar 1 01:25:43.331: CSM_PROC_OC1_REQUEST_DIGIT:
CSM_EVENT_DIGIT_COLLECT_READY at slot 0, port 3
*Mar 1 01:25:43.331: CSM_PROC_OC1_REQUEST_DIGIT:
CSM_EVENT_ADDR_INFO_COLLECTED at slot 0, port 3
*Mar 1 01:25:44.327: DSX1_MAIL_FROM_NEAT: DC_FIRST_DIGIT_RSP: mid = 5, slot = 2, unit = 1
*Mar 1 01:25:44.331: CSM_PROC_OC2_COLLECT_1ST_DIGIT:
CSM_EVENT_GET_1ST_DIGIT at slot 0, port 3
*Mar 1 01:25:47.331: DSX1_MAIL_FROM_NEAT: DC_ALL_DIGIT_RSP: mid = 5, slot = 2, unit = 1
*Mar 1 01:25:47.331: CSM_PROC_OC3_COLLECT_ALL_DIGIT:
CSM_EVENT_GET_ALL_DIGITS at slot 0, port 3
*Mar 1 01:25:47.335: CSM_PROC_OC3_COLLECT_ALL_DIGIT: **called party num: (5279651) at slot 0, port 3**

!--- Digits have been collected; ISDN call is made.

*Mar 1 01:25:47.339: process_pri_call making a voice_call.
*Mar 1 01:25:47.351: ISDN Se0:23: TX -> SETUP pd = 8 callref = 0x0005
*Mar 1 01:25:47.355: **Bearer Capability i = 0x8090A2**

!--- Bearer cap indicates call is an analog call.

*Mar 1 01:25:47.355: Channel ID i = 0xE1808397
*Mar 1 01:25:47.359: **Called Party Number i = 0xA1, '5279651'**
*Mar 1 01:25:47.431: ISDN Se0:23: RX <- CALL_PROC pd = 8 callref = 0x8005
*Mar 1 01:25:47.435: Channel ID i = 0xA98397
*Mar 1 01:25:47.451: EVENT_FROM_ISDN::dchan_idb=0x7F8EE0, call_id=0xA005, ces=0x1 bchan=0x16, event=0x3, cause=0x0
*Mar 1 01:25:47.451: EVENT_FROM_ISDN:(A005): DEV_CALL_PROC at slot 0 and port 3
*Mar 1 01:25:47.455: CSM_PROC_OC4_DIALING:
CSM_EVENT_ISDN_BCHAN_ASSIGNED at slot 0, port 3
*Mar 1 01:25:48.147: ISDN Se0:23: RX <- ALERTING pd = 8 callref = 0x8005
*Mar 1 01:25:48.151: Progress Ind i = 0x8388 - In-band info or appropriate now available
*Mar 1 01:25:50.835: ISDN Se0:23: RX <- CONNECT pd = 8 callref = 0x8005
*Mar 1 01:25:50.851: EVENT_FROM_ISDN::dchan_idb=0x7F8EE0, call_id=0xA005, ces=0x1 bchan=0x16, event=0x4, cause=0x
*Mar 1 01:25:50.855: EVENT_FROM_ISDN:(A005): DEV_CONNECTED at slot 0 and port 3
*Mar 1 01:25:50.859: CSM_PROC_OC5_WAIT_FOR_CARRIER:
CSM_EVENT_ISDN_CONNECTED at slot 0, port 3

!--- ISDN call is connected.

*Mar 1 01:25:50.867: ISDN Se0:23: **TX -> CONNECT_ACK** pd = 8 callref = 0x0005
*Mar 1 01:25:53.735: AAA/AUTHEN: free_user (0x7ADEAC) user='callmeback' ruser='' port='Async4' rem_addr='async/4084327528' authen_type=CHAP service=PPP priv=1

!--- Modems have established carrier.

*Mar 1 01:26:13.487: CHAT4: Completed match for expect: CONNECT
*Mar 1 01:26:13.491: CHAT4: Sending string: \c
*Mar 1 01:26:13.491: CHAT4: Chat script callback finished, status = Success

```
*Mar 1 01:26:15.415: TTY4: DSR came up
*Mar 1 01:26:15.419: tty4: Modem: IDLE->READY
*Mar 1 01:26:15.439: TTY4: EXEC creation
*Mar 1 01:26:15.443: AAA/AUTHEN: create_user (0x7ADEA4) user='' ruser=''
port='tty4' rem_addr='async/5279651' authen_type=ASCII service=LOGIN priv=1
*Mar 1 01:26:15.447: AAA/AUTHEN/START (2043462211): port='tty4'
list='use-local' action=LOGIN service=LOGIN
*Mar 1 01:26:15.451: AAA/AUTHEN/START (2043462211): found list use-local
*Mar 1 01:26:15.451: AAA/AUTHEN/START (2043462211): Method=LOCAL
*Mar 1 01:26:15.455: AAA/AUTHEN (2043462211): status = GETUSER
```

!--- PPP negotiation begins again.

```
*Mar 1 01:26:16.631: TTY4: Autoselect(2) sample 7E
%LINK-3-UPDOWN: Interface Async4, changed state to up
*Mar 1 01:26:18.663: As4 PPP: Treating connection as a dedicated line
*Mar 1 01:26:18.663: As4 PPP: Phase is ESTABLISHING, Active Open
*Mar 1 01:26:18.667: As4 LCP: O CONFREQ [Closed] id 5 len 25
*Mar 1 01:26:18.671: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:26:18.675: As4 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 01:26:18.675: As4 LCP: MagicNumber 0x608DF70C (0x0506608DF70C)
*Mar 1 01:26:18.679: As4 LCP: PFC (0x0702)
*Mar 1 01:26:18.679: As4 LCP: ACFC (0x0802)
*Mar 1 01:26:18.779: As4 LCP: I CONFACK [REQsent] id 5 len 25
*Mar 1 01:26:18.783: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:26:18.787: As4 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 01:26:18.787: As4 LCP: MagicNumber 0x608DF70C (0x0506608DF70C)
*Mar 1 01:26:18.791: As4 LCP: PFC (0x0702)
*Mar 1 01:26:18.791: As4 LCP: ACFC (0x0802)
*Mar 1 01:26:19.707: As4 LCP: I CONFREQ [ACKrcvd] id 3 len 20
*Mar 1 01:26:19.711: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:26:19.711: As4 LCP: MagicNumber 0x004B3EF5 (0x0506004B3EF5)
*Mar 1 01:26:19.715: As4 LCP: PFC (0x0702)
*Mar 1 01:26:19.715: As4 LCP: ACFC (0x0802)
*Mar 1 01:26:19.719: As4 LCP: O CONFACK [ACKrcvd] id 3 len 20
*Mar 1 01:26:19.723: As4 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 01:26:19.723: As4 LCP: MagicNumber 0x004B3EF5 (0x0506004B3EF5)
*Mar 1 01:26:19.727: As4 LCP: PFC (0x0702)
*Mar 1 01:26:19.727: As4 LCP: ACFC (0x0802)
*Mar 1 01:26:19.731: As4 LCP: State is Open
```

!--- Reauthenticate the user.

```
*Mar 1 01:26:22.779: As4 PPP: Phase is AUTHENTICATING, by this end
*Mar 1 01:26:22.783: As4 CHAP: O CHALLENGE id 6 len 28 from "isdn2-2"
*Mar 1 01:26:22.887: As4 CHAP: I RESPONSE id 6 len 26 from "callmeback"
*Mar 1 01:26:22.895: AAA/AUTHEN: create_user (0x8F1DAC) user='callmeback'
ruser='' port='Async4' rem_addr='async/5279651' authen_type=CHAP
service=PPP priv=1
*Mar 1 01:26:22.899: AAA/AUTHEN/START (2174906802): port='Async4' list=''
action=LOGIN service=PPP
*Mar 1 01:26:22.899: AAA/AUTHEN/START (2174906802): using "default" list
*Mar 1 01:26:22.903: AAA/AUTHEN/START (2174906802): Method=LOCAL
*Mar 1 01:26:22.903: AAA/AUTHEN (2174906802): status = PASS
*Mar 1 01:26:22.907: AAA/AUTHOR/LCP As4: Authorize LCP
*Mar 1 01:26:22.911: AAA/AUTHOR/LCP: Async4: (3262137315): user='callmeback'
*Mar 1 01:26:22.911: AAA/AUTHOR/LCP: Async4: (3262137315): send AV service=ppp
*Mar 1 01:26:22.915: AAA/AUTHOR/LCP: Async4: (3262137315): send AV
protocol=lcp
*Mar 1 01:26:22.915: AAA/AUTHOR/LCP: Async4 (3262137315): Method=LOCAL
*Mar 1 01:26:22.923: AAA/AUTHOR (3262137315):
Post authorization status =PASS_ADD
*Mar 1 01:26:22.927: AAA/AUTHOR/LCP As4: Processing AV service=ppp
*Mar 1 01:26:22.927: AAA/AUTHOR/LCP As4: Processing AV protocol=lcp
*Mar 1 01:26:22.931: AAA/AUTHOR/LCP As4: Processing AV service=ppp
*Mar 1 01:26:22.931: AAA/AUTHOR/LCP As4: Processing AV protocol=lcp
```

*Mar 1 01:26:22.931: AAA/AUTHOR/LCP As4: Processing AV callback-dialstring=
*Mar 1 01:26:22.939: As4 CHAP: O SUCCESS id 6 len 4
*Mar 1 01:26:22.943: As4 PPP: Phase is UP
*Mar 1 01:26:22.947: AAA/AUTHOR/FSM As4: (0): Can we start IPCP?
*Mar 1 01:26:22.947: AAA/AUTHOR/FSM: Async4: (345798021): user='callmeback'
*Mar 1 01:26:22.951: AAA/AUTHOR/FSM: Async4: (345798021): send AV service=ppp
*Mar 1 01:26:22.951: AAA/AUTHOR/FSM: Async4: (345798021): send AV protocol=ip
*Mar 1 01:26:22.955: AAA/AUTHOR/FSM: Async4 (345798021): Method=LOCAL
*Mar 1 01:26:22.955: AAA/AUTHOR (345798021):
Post authorization status = PASS_REPL

!--- Negotiate IPCP.

*Mar 1 01:26:22.959: AAA/AUTHOR/FSM As4: We can start IPCP
*Mar 1 01:26:22.963: As4 IPCP: O CONFREQ [Closed] id 1 len 16
*Mar 1 01:26:22.967: As4 IPCP: CompressType VJ 15 slots (0x0206002D0F00)
*Mar 1 01:26:22.967: As4 IPCP: Address 172.16.25.52 (0x0306AC101934)
*Mar 1 01:26:23.019: As4 IPCP: I CONFREQ [REQsent] id 1 len 40
*Mar 1 01:26:23.023: As4 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
*Mar 1 01:26:23.027: As4 IPCP: Address 0.0.0.0 (0x030600000000)
*Mar 1 01:26:23.027: As4 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
*Mar 1 01:26:23.031: As4 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
*Mar 1 01:26:23.035: As4 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
*Mar 1 01:26:23.035: As4 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
*Mar 1 01:26:23.039: AAA/AUTHOR/IPCPC As4: Start. Her address 0.0.0.0, we
want 0.0.0.0
*Mar 1 01:26:23.039: AAA/AUTHOR/IPCPC As4: Processing AV service=ppp
*Mar 1 01:26:23.043: AAA/AUTHOR/IPCPC As4: Processing AV protocol=ip
*Mar 1 01:26:23.043: AAA/AUTHOR/IPCPC As4: Authorization succeeded
*Mar 1 01:26:23.047: AAA/AUTHOR/IPCPC As4: Done. Her address 0.0.0.0, we
want 0.0.0.0
*Mar 1 01:26:23.047: As4 IPCP: Using pool 'default'
*Mar 1 01:26:23.051: As4 IPCP: Pool returned 172.16.25.60
*Mar 1 01:26:23.051: As4 IPCP: O CONFREQ [REQsent] id 1 len 28
*Mar 1 01:26:23.055: As4 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
*Mar 1 01:26:23.059: As4 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
*Mar 1 01:26:23.059: As4 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
*Mar 1 01:26:23.063: As4 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
*Mar 1 01:26:23.067: As4 IPCP: I CONFREQ [REQsent] id 1 len 16
*Mar 1 01:26:23.067: As4 IPCP: CompressType VJ 15 slots (0x0206002D0F00)
*Mar 1 01:26:23.071: As4 IPCP: Address 172.16.25.52 (0x0306AC101934)
*Mar 1 01:26:23.139: As4 IPCP: I CONFREQ [ACKrcvd] id 2 len 16
*Mar 1 01:26:23.139: As4 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
*Mar 1 01:26:23.143: As4 IPCP: Address 0.0.0.0 (0x030600000000)
*Mar 1 01:26:23.147: AAA/AUTHOR/IPCPC As4: Start. Her address 0.0.0.0, we
want 172.16.25.60
*Mar 1 01:26:23.147: AAA/AUTHOR/IPCPC As4: Processing AV service=ppp
*Mar 1 01:26:23.151: AAA/AUTHOR/IPCPC As4: Processing AV protocol=ip
*Mar 1 01:26:23.151: AAA/AUTHOR/IPCPC As4: Authorization succeeded
*Mar 1 01:26:23.151: AAA/AUTHOR/IPCPC As4: Done. Her address 0.0.0.0, we
want 172.16.25.60
*Mar 1 01:26:23.155: As4 IPCP: O CONFREQ [ACKrcvd] id 2 len 10
*Mar 1 01:26:23.159: As4 IPCP: Address 172.16.25.60 (0x0306AC10193C)
*Mar 1 01:26:23.255: As4 IPCP: I CONFREQ [ACKrcvd] id 3 len 16
*Mar 1 01:26:23.259: As4 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
*Mar 1 01:26:23.263: As4 IPCP: Address 172.16.25.60 (0x0306AC10193C)
*Mar 1 01:26:23.263: AAA/AUTHOR/IPCPC As4: Start. Her address
172.16.25.60, we want 172.16.25.60
*Mar 1 01:26:23.267: AAA/AUTHOR/IPCPC As4: Async4: (3819567164): user='callmeback'
*Mar 1 01:26:23.271: AAA/AUTHOR/IPCPC As4: Async4: (3819567164): send AV
service=ppp
*Mar 1 01:26:23.271: AAA/AUTHOR/IPCPC As4: Async4: (3819567164): send AV
protocol=ip

```
*Mar 1 01:26:23.275: AAA/AUTHOR/IPCP: Async4: (3819567164): send AV
addr*172.16.25.60
*Mar 1 01:26:23.275: AAA/AUTHOR/IPCP: Async4 (3819567164): Method=LOCAL
*Mar 1 01:26:23.279: AAA/AUTHOR (3819567164): Post authorization status =
PASS_REPL
*Mar 1 01:26:23.283: AAA/AUTHOR/IPCP As4: Reject 172.16.25.60, using
172.16.25.60
*Mar 1 01:26:23.287: AAA/AUTHOR/IPCP As4: Processing AV service=ppp
*Mar 1 01:26:23.291: AAA/AUTHOR/IPCP As4: Processing AV protocol=ip
*Mar 1 01:26:23.291: AAA/AUTHOR/IPCP As4: Processing AV addr*172.16.25.60
*Mar 1 01:26:23.295: AAA/AUTHOR/IPCP As4: Authorization succeeded
*Mar 1 01:26:23.295: AAA/AUTHOR/IPCP As4: Done. Her address 172.16.25.60,
we want 172.16.25.60
*Mar 1 01:26:23.299: As4 IPCP: O CONFACK [ACKrcvd] id 3 len 16
*Mar 1 01:26:23.303: As4 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
*Mar 1 01:26:23.303: As4 IPCP: Address 172.16.25.60 (0x0306AC10193C)
*Mar 1 01:26:23.307: As4 IPCP: State is Open
*Mar 1 01:26:23.323: As4 IPCP: Install route to 172.16.25.60
%LINEPROTO-5-UPDOWN: Line protocol on Interface Async4, changed state to up

!--- Client is connected.
```

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