

Configuring PPP Callback With TACACS+

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Introduction

This document shows configuration examples of a router and AAA server to do Point-to-Point Protocol (PPP) callback with TACACS+. Two examples are included that use the callback number specified by the AAA server or by the Windows 2000 client.

- Perform initial testing with local authentication and callback (remove the **aaa new-model** command). If callback does not work with local authentication, it does not work with TACACS+. Refer to [Configuring MS Callback Between a Router and a Windows PC](#) for an example of how to use local authentication.
- Perform further PPP authentication testing with TACACS+ without callback. If users FAIL authentication and/or authorization without callback, authentication and authorization do not work with callback.
- Once local authentication for callback and PPP authentication with TACACS+ work, add the information from the local user on the router (such as callback dial-string) to the user's profile on the server.

Note: The client in these tests is a Windows 2000 Professional Client, DUN, set up as usual for a PPP connection, with Microsoft Callback setup as "Ask me during dialing when the server offers." Microsoft Callback is supported in Cisco IOS® Software Releases 11.3.2.T and later.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco IOS Software Release 12.1(7)AA
- Cisco Secure ACS UNIX 2.3(2)
- Cisco Secure ACS for Windows 3.3
- TACACS Freeware Daemon 4.0(3)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

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

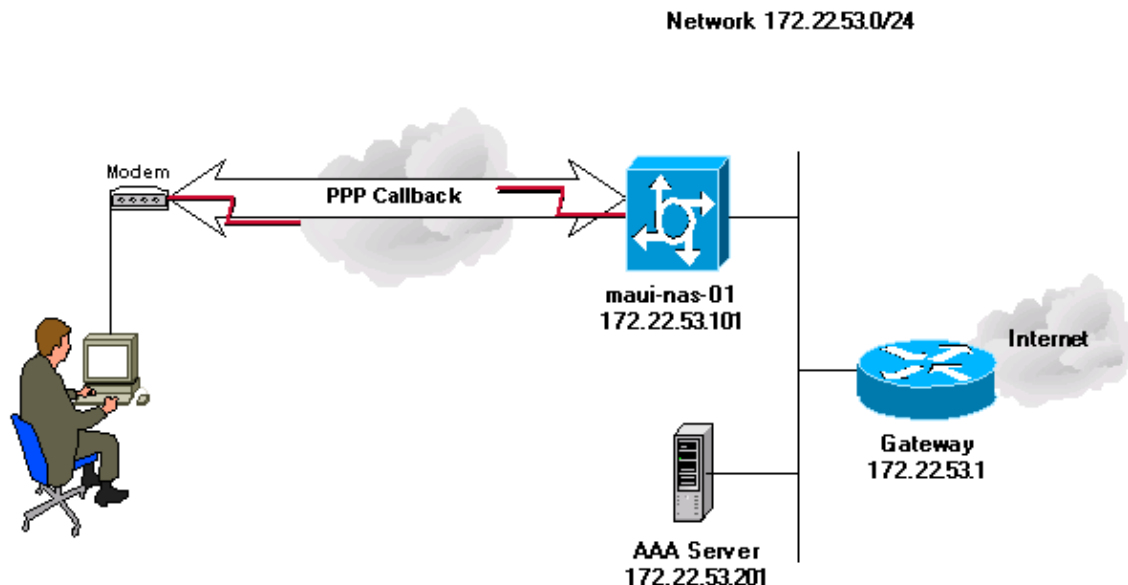
Configure

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

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only).

Network Diagram

This document uses the network setup shown in this diagram.



PPP Callback with Server-Specified Number

Server Configurations

These are the AAA server configurations for PPP callback with a telephone number specified by the AAA server.

Server Setup – Cisco Secure ACS for Windows

- To enable the LCP option for User and Group, go to the **Interface Configuration** screen, select **TACACS+ (Cisco IOS)**, and ensure that the **PPP IP** and **PPP LCP** options are checked for **User** and **Group**.
- Callback may be configured either in the Group or the User settings.
 - ◆ **Configure a group for callback:** On the Group Setup screen, under Callback, select the option to **Use Windows Database Callback Settings (in older version of ACS this option is known as "Use Microsoft NT Callback Settings")**. Then check the options for **PPP IP** and **PPP LCP**. Select **Callback line** and type **84007** in the blank field.

For a user that is a member of the group, go to the **User Setup screen** and select **Use group setting** under Callback. Click **Submit + Restart**.

- ◆ **Configure an individual user for callback:** On the User Setup screen, under Callback, select **Callback using this number** and type **84007** in the blank field. Then check the options for **PPP IP** and **PPP LCP**. Click **Submit + Restart**.

Server Setup – Cisco Secure UNIX

```
<coachella>/export/home/brownr> ViewProfile -p 9900 -u callback_user
User Profile Information
user = callback_user{
profile_id = 113
profile_cycle = 15
member = ccie_study
password = chap "*****"
service=ppp {
protocol=ip {
}
protocol=lcp {
set callback-dialstring=84007
}
}
}
```

Server Setup – TACACS+ Freeware

```
user = callback_user {
chap= cleartext "chapuser"
service = ppp protocol = lcp {
callback-dialstring=84007
}
service = ppp protocol = ip {
}
}
```

PPP Callback with User-Specified Number

The examples earlier in this document are of callback at a predefined number (specified in the AAA server). Callback may also be done at a user-specified number using the callback number and is specified as null in the AAA server. This causes the router to ask the user for a callback number. Initial testing should be done

with local callback specified. Refer to the asynchronous PPP callback between an access server and a PC example and note that the "callback-dialstring" is specified as quotes ("").

The client in these tests was a Windows 2000 Professional Client, set up as usual for a PPP connection, with Microsoft Callback set up as "Call me back at the numbers below."

Note: The network diagram and router configuration displayed apply to the callback configurations discussed here.

Server Configurations

Shown here are AAA server configurations for PPP callback with a telephone number specified by the user.

Server Setup – Cisco Secure for Windows

- To enable the LCP option for User and Group, go to the **Interface Configuration** screen, select **TACACS+ (Cisco IOS)**, and ensure that the **PPP IP** and **PPP LCP** options are checked for **User** and **Group**.
- Callback may be configured either in the Group or the User settings.

- ◆ **Configure a group for callback:** On the Group Setup screen, under **Callback**, select the option for **Dialup client specifies callback number**. Then check the options for **PPP IP** and **PPP LCP**.

For a user that is a member of the group, go to the **User Setup** screen and select **Use group setting** under **Callback**. Click **Submit + Restart**.

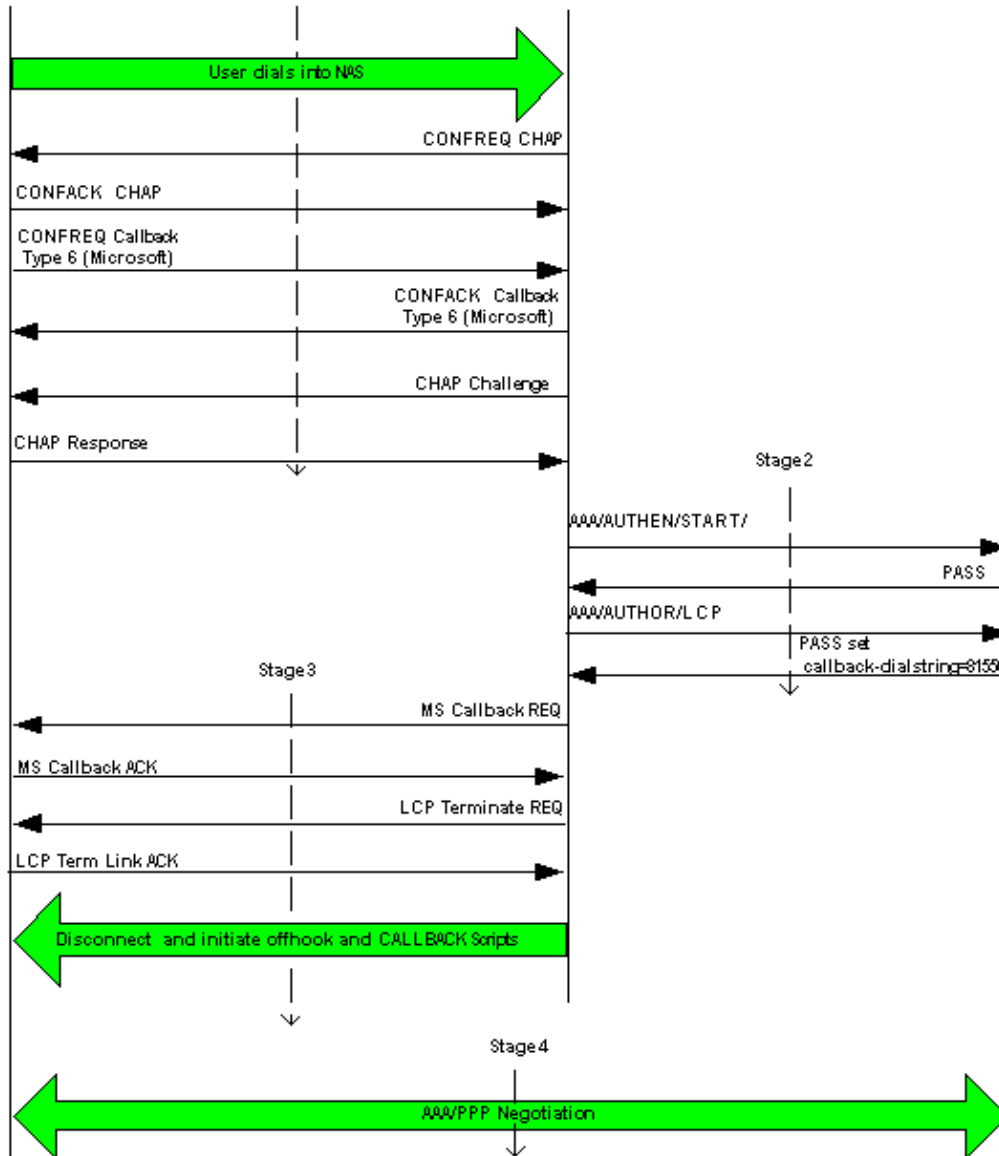
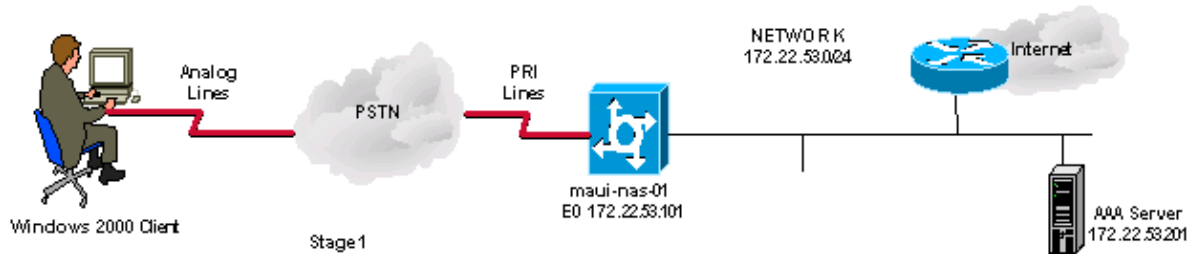
- ◆ **Configure an individual user for callback:** On the User Setup screen, under **Callback**, select the option for **Dialup client specifies callback number**. Then check the options for **PPP IP** and **PPP LCP**. Click **Submit + Restart**.

Server Setup – Cisco Secure UNIX

```
<coachella>ViewProfile -p 9900 -u callback_user
User Profile Information
user = callback_user{
profile_id = 113
profile_cycle = 15
member = ccie_study
password = chap "*****"
service=ppp {
protocol=ip {
}
}
protocol=lcp {
set callback-dialstring=""
}
}
}
```

Server Setup – TACACS+ Freeware

```
user = callback_user {
chap= cleartext "chapuser"
service = ppp protocol = lcp {
callback-dialstring=""
}
}
service = ppp protocol = ip {
}
}
```



Router Configurations

```

NAS Configuration
AS5200
maui-nas-01#show run
Building configuration...

Current configuration : 2882 bytes
!
version 12.1
no service pad
service tcp-keepalives-in

```

```
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
service password-encryption
!
hostname maui-nas-01
!
logging buffered 4096 debugging
no logging console guaranteed
no logging console

!--- Basic AAA configuration using TACACS+ as the primary method,
!--- local if the ERROR is received during negotiation.
!--- Disable AAA authentication and authorization on console port.

aaa new-model
aaa authentication login default group tacacs+ local
aaa authentication login NO_AUTHEN none
aaa authentication ppp default if-needed group tacacs+ local
aaa authorization exec default group tacacs+ local
aaa authorization exec NO_AUTHOR none
aaa authorization network default group tacacs+ local
enable secret <snipped>
!
username admin password <snipped>
spe 1/0 1/23
firmware location feature_card_flash
spe 2/0 2/4
!
resource-pool disable
!
clock timezone CST -6
clock summer-time CST recurring
modem recovery action none
ip subnet-zero
no ip source-route
no ip finger
no ip domain-lookup
ip name-server 172.22.53.210
!
no ip bootp server
isdn switch-type primary-ni
!

!--- Chat scripts "offhook" and "CALLBACK"
!--- used intuitively to go offhook and callback clients.

chat-script CALLBACK ABORT ERROR ABORT BUSY "" "AT"
OK "ATDT \T" TIMEOUT 30 CONNECT \c
chat-script offhook "" "ATH1" OK \c
!
controller T1 0
framing esf
clock source line primary
linecode b8zs
pri-group timeslots 1-24
!
interface Ethernet0
ip address 172.22.53.101 255.255.255.0
no ip route-cache
no ip mroute-cache
no cdp enable
!
interface Serial0:23
no ip address
encapsulation ppp
no ip route-cache
```

```

isdn switch-type primary-ni
isdn incoming-voice modem
isdn bchan-number-order ascending
no cdp enable
!
interface Group-Async1
ip unnumbered Ethernet0
encapsulation ppp
no ip route-cache
ip tcp header-compression passive
no ip mroute-cache
async mode interactive
peer default ip address pool IP_POOL
no cdp enable

!--- Allows "group-async 1" to accept PPP callback requests from clients.
!--- Use Challenge Authentication Protocol (CHAP) for authentication
!--- on incoming calls.

ppp callback accept
ppp authentication chap callin
group-range 1 48
!
ip local pool IP_POOL 172.22.53.141 172.22.53.148
ip default-gateway 172.22.53.1
no ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.22.53.1
!
no cdp run
tacacs-server host 172.22.53.201 key <snipped>
!
line con 0
authorization exec NO_AUTHOR
login authentication NO_AUTHEN
transport input none
line 1 48

!--- Specifies chat scripts used during callback to clients.

script modem-off-hook offhook
script callback CALLBACK
modem InOut
transport preferred none
transport input all
transport output none
autoselect during-login
autoselect ppp
callback forced-wait 5
line aux 0
line vty 0 4
!
ntp server 172.22.53.1
end

```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

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

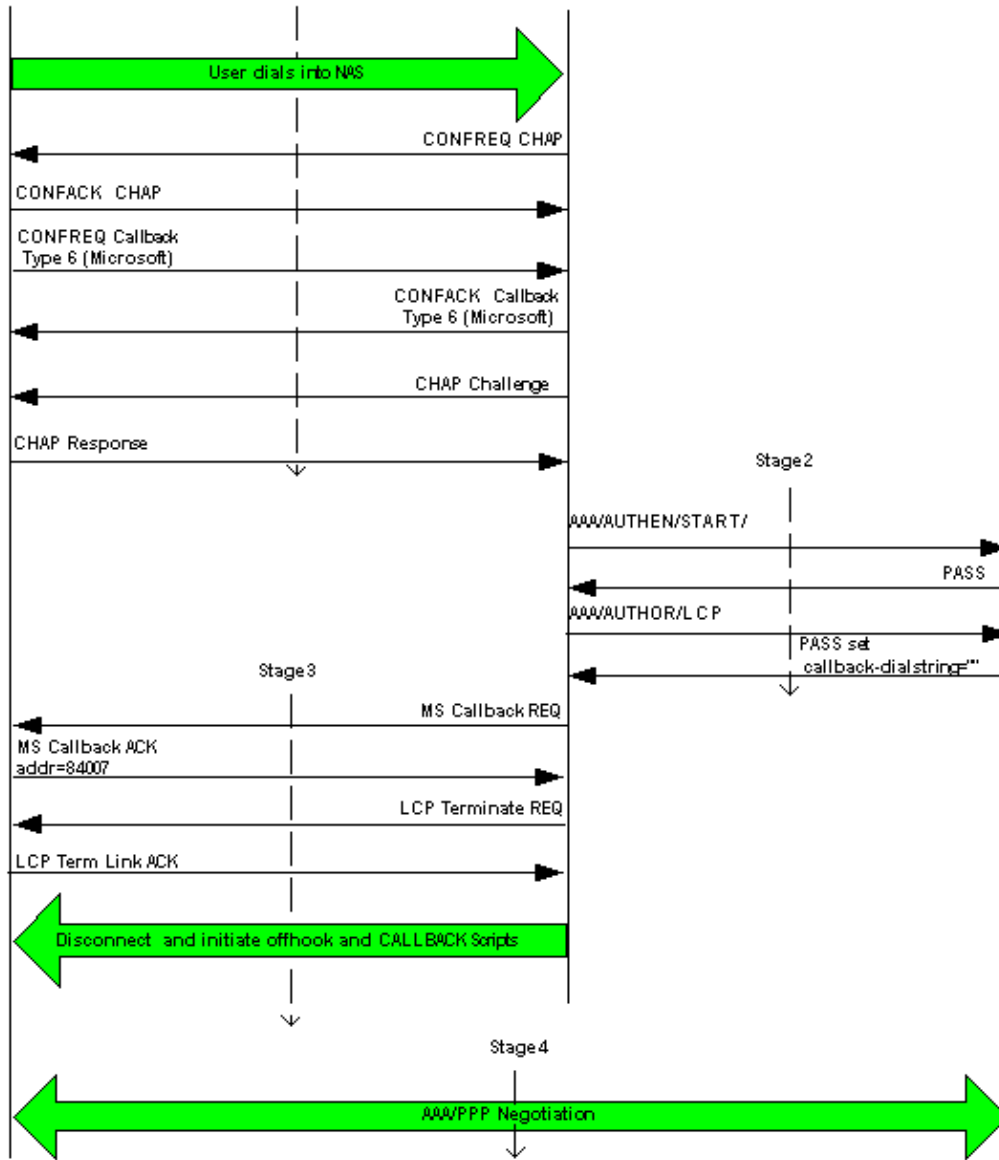
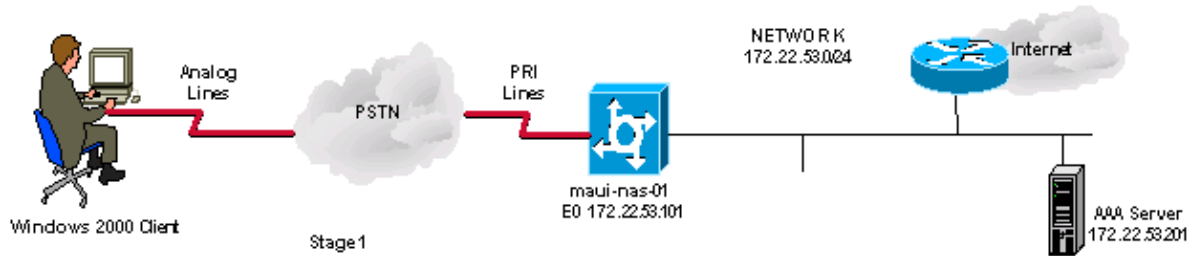
Troubleshooting Commands

Note: Before issuing **debug** commands, refer to Important Information on Debug Commands.

- **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 chat** Displays characters sent between the Network Access Server (NAS) and the PC. A chat-script is a set of expect-send string pairs that define the handshaking between data terminal equipment (DTE)-DTE or DTE-data communications equipment (DCE) devices.
- **debug modem** Displays modem line activity on an access server.
- **debug ppp negotiation** Displays PPP packets transmitted during PPP startup, where PPP options are negotiated.
- **debug ppp authentication** Displays authentication protocol messages, including Challenge Authentication Protocol (CHAP) packet exchanges and Password Authentication Protocol (PAP) exchanges.
- **debug tacacs+** Displays detailed debugging information associated with TACACS+.

Sample Debug Output

The individual stages in this diagram correspond to the actual **debug** output that is displayed after this diagram. Note that some output has been wrapped onto two lines because of spacing considerations.



Stage 1

```
maui-nas-01#debug aaa authentication
maui-nas-01#debug aaa authorization
```

```
maui-nas-01#show debug
General OS:
AAA Authentication debugging is on
AAA Authorization debugging is on
```

```
!--- AAA negotiation begins, aborted because PPP is autoselected.
```

```
Aug 1 09:23:53.320 CST: AAA: parse name=tty6 idb type=10 tty=6
Aug 1 09:23:53.320 CST: AAA: name=tty6 flags=0x11 type=4 shelf=0 slot=0
adapter=0 port=6 channel=0
```

```
Aug 1 09:23:53.324 CST: AAA: parse name=Serial0:4 idb type=12 tty=-1
Aug 1 09:23:53.328 CST: AAA: name=Serial0:4 flags=0x51 type=1 shelf=0 slot=0
  adapter=0 port=0 channel=4
Aug 1 09:23:53.332 CST: AAA/MEMORY: create_user (0x2A0AA0) user='' ruser=''
  port='tty6' rem_addr='async/81560' authen_type=ASCII service=LOGIN priv=1
Aug 1 09:23:53.336 CST: AAA/AUTHEN/START (2776623843): port='tty6' list=''
  action=LOGIN service=LOGIN
Aug 1 09:23:53.340 CST: AAA/AUTHEN/START (2776623843): using "default" list
Aug 1 09:23:53.344 CST: AAA/AUTHEN/START (2776623843): Method=tacacs+ (tacacs+)
Aug 1 09:23:53.348 CST: TAC+: send AUTHEN/START packet ver=192 id=2776623843
Aug 1 09:23:53.572 CST: TAC+: ver=192 id=2776623843 received AUTHEN
  status = GETUSER
Aug 1 09:23:53.576 CST: AAA/AUTHEN (2776623843): status = GETUSER
Aug 1 09:23:55.548 CST: AAA/AUTHEN/ABORT: (2776623843) because Autoselected.
Aug 1 09:23:55.552 CST: TAC+: send abort reason=Autoselected
Aug 1 09:23:55.668 CST: AAA/MEMORY: free_user (0x2A0AA0) user='' ruser=''
  port='tty6' rem_addr='async/81560' authen_type=ASCII service=LOGIN priv=1
Aug 1 09:23:58.124 CST: %LINK-3-UPDOWN: Interface Async6, changed state to up
Aug 1 09:23:58.148 CST: As6 AAA/AUTHOR/FSM: (0): LCP succeeds trivially
Aug 1 09:23:58.912 CST: AAA: parse name=Async6 idb type=10 tty=6
Aug 1 09:23:58.916 CST: AAA: name=Async6 flags=0x11 type=4 shelf=0 slot=0
  adapter=0 port=6 channel=0
Aug 1 09:23:58.916 CST: AAA: parse name=Serial0:4 idb type=12 tty=-1
Aug 1 09:23:58.920 CST: AAA: name=Serial0:4 flags=0x51 type=1 shelf=0 slot=0
  adapter=0 port=0 channel=4
```

!--- AAA Authentication start packet is sent to AAA server.

```
Aug 1 09:23:58.924 CST: AAA/MEMORY: create_user (0x2984EC)
  user='callback_user' ruser='' port='Async6' rem_addr='async/81560'
  authen_type=CHAP service=PPP priv=1
Aug 1 09:23:58.932 CST: AAA/AUTHEN/START (3527356355): port='Async6' list=''
  action=LOGIN service=PPP
Aug 1 09:23:58.936 CST: AAA/AUTHEN/START (3527356355): using "default" list
Aug 1 09:23:58.936 CST: AAA/AUTHEN (3527356355): status = UNKNOWN
Aug 1 09:23:58.940 CST: AAA/AUTHEN/START (3527356355): Method=tacacs+ (tacacs+)
```

!--- Receive PASS from AAA server.

```
Aug 1 09:23:58.944 CST: TAC+: send AUTHEN/START packet ver=193 id=3527356355
Aug 1 09:23:59.172 CST: TAC+: ver=193 id=3527356355 received AUTHEN
  status = PASS
Aug 1 09:23:59.172 CST: AAA/AUTHEN (3527356355): status = PASS
```

!--- AAA Authorization request sent to AAA server for LCP.

```
Aug 1 09:23:59.180 CST: As6 AAA/AUTHOR/LCP: Authorize LCP
Aug 1 09:23:59.184 CST: As6 AAA/AUTHOR/LCP (1701401119): Port='Async6'
  list='' service=NET
Aug 1 09:23:59.188 CST: AAA/AUTHOR/LCP: As6 (1701401119) user='callback_user'
Aug 1 09:23:59.192 CST: As6 AAA/AUTHOR/LCP (1701401119): send AV service=ppp
Aug 1 09:23:59.196 CST: As6 AAA/AUTHOR/LCP (1701401119): send AV protocol=lcp
Aug 1 09:23:59.196 CST: As6 AAA/AUTHOR/LCP (1701401119): found list "default"
Aug 1 09:23:59.200 CST: As6 AAA/AUTHOR/LCP (1701401119):
  Method=tacacs+ (tacacs+)
```

*!--- Receive PASS from AAA server, set the callback dialstring
!--- via the "callback-dialstring" Attribute Value Pair.*

```
Aug 1 09:23:59.204 CST: AAA/AUTHOR/TAC+: (1701401119): user=callback_user
Aug 1 09:23:59.208 CST: AAA/AUTHOR/TAC+: (1701401119): send AV service=ppp
Aug 1 09:23:59.212 CST: AAA/AUTHOR/TAC+: (1701401119): send AV protocol=lcp
Aug 1 09:23:59.440 CST: TAC+: (1701401119): received author response status
  = PASS_ADD
Aug 1 09:23:59.448 CST: As6 AAA/AUTHOR (1701401119): Post authorization status
  = PASS_ADD
```

```
Aug 1 09:23:59.452 CST: As6 AAA/AUTHOR/LCP: Processing AV service=ppp
Aug 1 09:23:59.456 CST: As6 AAA/AUTHOR/LCP: Processing AV protocol=lcp
Aug 1 09:23:59.456 CST: As6 AAA/AUTHOR/LCP: Processing AV
callback-dialstring=81550
```

Stage 2

```
maui-nas-01#debug aaa authentication
maui-nas-01#debug aaa authorization
```

```
maui-nas-01#show debug
General OS:
AAA Authentication debugging is on
AAA Authorization debugging is on
```

!--- AAA negotiation begins, aborted because PPP is autoselected.

```
Aug 1 09:23:53.320 CST: AAA: parse name=tty6 idb type=10 tty=6
Aug 1 09:23:53.320 CST: AAA: name=tty6 flags=0x11 type=4 shelf=0 slot=0
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Aug 1 09:23:55.668 CST: AAA/MEMORY: free_user (0x2A0AA0) user='' ruser=''
port='tty6' rem_addr='async/81560' authen_type=ASCII service=LOGIN priv=1
Aug 1 09:23:58.124 CST: %LINK-3-UPDOWN: Interface Async6, changed state to up
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Aug 1 09:23:58.916 CST: AAA: name=Async6 flags=0x11 type=4 shelf=0 slot=0
adapter=0 port=6 channel=0
Aug 1 09:23:58.916 CST: AAA: parse name=Serial0:4 idb type=12 tty=-1
Aug 1 09:23:58.920 CST: AAA: name=Serial0:4 flags=0x51 type=1 shelf=0 slot=0
adapter=0 port=0 channel=4
```

!--- AAA Authentication start packet is sent to AAA server.

```
Aug 1 09:23:58.924 CST: AAA/MEMORY: create_user (0x2984EC)
user='callback_user' ruser='' port='Async6' rem_addr='async/81560'
authen_type=CHAP service=PPP priv=1
Aug 1 09:23:58.932 CST: AAA/AUTHEN/START (3527356355): port='Async6' list=''
action=LOGIN service=PPP
Aug 1 09:23:58.936 CST: AAA/AUTHEN/START (3527356355): using "default" list
Aug 1 09:23:58.936 CST: AAA/AUTHEN (3527356355): status = UNKNOWN
Aug 1 09:23:58.940 CST: AAA/AUTHEN/START (3527356355): Method=tacacs+ (tacacs+)
```

!--- Receive PASS from AAA Server.

```
Aug 1 09:23:58.944 CST: TAC+: send AUTHEN/START packet ver=193 id=3527356355
Aug 1 09:23:59.172 CST: TAC+: ver=193 id=3527356355 received AUTHEN
status = PASS
Aug 1 09:23:59.172 CST: AAA/AUTHEN (3527356355): status = PASS
```

!--- AAA Authorization request sent to AAA server for LCP.

```
Aug 1 09:23:59.180 CST: As6 AAA/AUTHOR/LCP: Authorize LCP
Aug 1 09:23:59.184 CST: As6 AAA/AUTHOR/LCP (1701401119): Port='Async6'
  list='' service=NET
Aug 1 09:23:59.188 CST: AAA/AUTHOR/LCP: As6 (1701401119) user='callback_user'
Aug 1 09:23:59.192 CST: As6 AAA/AUTHOR/LCP (1701401119): send AV service=ppp
Aug 1 09:23:59.196 CST: As6 AAA/AUTHOR/LCP (1701401119): send AV protocol=lcp
Aug 1 09:23:59.196 CST: As6 AAA/AUTHOR/LCP (1701401119): found list "default"
Aug 1 09:23:59.200 CST: As6 AAA/AUTHOR/LCP (1701401119):
  Method=tacacs+ (tacacs+)
```

```
!--- Receive PASS from AAA Server, set the callback dialstring
!--- via the "callback-dialstring" Attribute Value Pair.
```

```
Aug 1 09:23:59.204 CST: AAA/AUTHOR/TAC+: (1701401119): user=callback_user
Aug 1 09:23:59.208 CST: AAA/AUTHOR/TAC+: (1701401119): send AV service=ppp
Aug 1 09:23:59.212 CST: AAA/AUTHOR/TAC+: (1701401119): send AV protocol=lcp
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  = PASS_ADD
Aug 1 09:23:59.448 CST: As6 AAA/AUTHOR (1701401119): Post authorization status
  = PASS_ADD
Aug 1 09:23:59.452 CST: As6 AAA/AUTHOR/LCP: Processing AV service=ppp
Aug 1 09:23:59.456 CST: As6 AAA/AUTHOR/LCP: Processing AV protocol=lcp
Aug 1 09:23:59.456 CST: As6 AAA/AUTHOR/LCP: Processing AV
  callback-dialstring=81550
```

Stage 3

```
maui-nas-01#show debug
```

```
General OS:
Modem control/process activation debugging is on
PPP:
PPP protocol negotiation debugging is on
Chat Scripts:
Chat scripts activity debugging is on
Callback:
Callback activity debugging is on
```

```
Aug 1 09:33:38.862 CST: As7 MCB: User callback_user Callback Number
  - Server 81550
Aug 1 09:33:38.870 CST: Async7 PPP: O MCB Request(1) id 1 len 7
Aug 1 09:33:38.874 CST: Async7 MCB: O 1 1 0 7 3 3 0
Aug 1 09:33:38.874 CST: As7 MCB: O Request Id 1 Callback Type
  Server-Num delay 0
Aug 1 09:33:38.878 CST: As7 PPP: Phase is CBCP
Aug 1 09:33:39.018 CST: Async7 PPP: I MCB Response(2) id 1 len 7
Aug 1 09:33:39.022 CST: Async7 MCB: I 2 1 0 7 3 3 C
Aug 1 09:33:39.026 CST: As7 MCB: Received response
Aug 1 09:33:39.026 CST: As7 MCB: Response CBK-Server-Num 3 3 12
Aug 1 09:33:39.034 CST: Async7 PPP: O MCB Ack(3) id 2 len 7
Aug 1 09:33:39.034 CST: Async7 MCB: O 3 2 0 7 3 3 C
Aug 1 09:33:39.038 CST: As7 MCB: O Ack Id 2 Callback Type Server-Num delay 12
Aug 1 09:33:39.042 CST: As7 MCB: Negotiated MCB with peer
```

```
!--- NAS sends LCP Terminate Request from client.
```

```
Aug 1 09:33:39.182 CST: As7 LCP: I TERMREQ [Open] id 6 len 16
  (0x566260A7003CCD7400000000)
```

```
!--- NAS receives Terminate Acknowledge from client.
```

```
Aug 1 09:33:39.186 CST: As7 LCP: O TERMACK [Open] id 6 len 4
Aug 1 09:33:39.190 CST: As7 MCB: Peer terminating the link
Aug 1 09:33:39.194 CST: As7 MCB: Link terminated by peer, Callback Needed
Aug 1 09:33:39.198 CST: As7 MCB: Initiate Callback for callback_user
  at 81550 using Async
Aug 1 09:33:39.202 CST: As7 MCB: Async-callback in progress
```

Aug 1 09:33:39.206 CST: As7 PPP: Phase is TERMINATING

!--- NAS disconnects and initiates offhook and CALLBACK chat scripts.

```
Aug 1 09:33:39.210 CST: TTY7 Callback PPP process creation
Aug 1 09:33:39.218 CST: TTY7 Callback process initiated, user: dialstring 81550
Aug 1 09:33:40.110 CST: %ISDN-6-DISCONNECT: Interface Serial0:5 disconnected
    from unknown , call lasted 19 seconds
Aug 1 09:33:40.294 CST: TTY7: Async Int reset: Dropping DTR
Aug 1 09:33:41.210 CST: As7 LCP: TIMEout: State TERMsent
Aug 1 09:33:41.210 CST: As7 LCP: State is Closed
Aug 1 09:33:41.214 CST: As7 PPP: Phase is DOWN
Aug 1 09:33:41.218 CST: As7 PPP: Phase is ESTABLISHING, Passive Open
Aug 1 09:33:41.226 CST: As7 LCP: State is Listen
Aug 1 09:33:42.298 CST: %LINK-5-CHANGED: Interface Async7,
    changed state to reset
Aug 1 09:33:42.318 CST: As7 LCP: State is Closed
Aug 1 09:33:42.318 CST: As7 PPP: Phase is DOWN
Aug 1 09:33:45.302 CST: As7 IPCP: Remove route to 172.22.53.147
Aug 1 09:33:45.306 CST: TTY7 Callback forced wait = 5 seconds
Aug 1 09:33:47.302 CST: %LINK-3-UPDOWN: Interface Async7, changed state to down
Aug 1 09:33:47.322 CST: As7 LCP: State is Closed
Aug 1 09:33:50.310 CST: CHAT7: Matched chat script offhook to string offhook
Aug 1 09:33:50.314 CST: CHAT7: Asserting DTR
Aug 1 09:33:50.318 CST: CHAT7: Chat script offhook started
Aug 1 09:33:50.322 CST: CHAT7: Sending string: ATH1
Aug 1 09:33:50.322 CST: CHAT7: Expecting string: OK
Aug 1 09:33:50.634 CST: CHAT7: Completed match for expect: OK
Aug 1 09:33:50.638 CST: CHAT7: Sending string: \c
Aug 1 09:33:50.638 CST: CHAT7: Chat script offhook finished, status = Success
Aug 1 09:33:50.642 CST: CHAT7: Matched chat script CALLBACK to string CALLBACK
Aug 1 09:33:50.650 CST: CHAT7: Asserting DTR
Aug 1 09:33:50.650 CST: CHAT7: Chat script CALLBACK started
Aug 1 09:33:50.654 CST: CHAT7: Sending string: AT
Aug 1 09:33:50.658 CST: CHAT7: Expecting string: OK
Aug 1 09:33:50.686 CST: CHAT7: Completed match for expect: OK
Aug 1 09:33:50.686 CST: CHAT7: Sending string: ATDT \T<81550>
Aug 1 09:33:50.694 CST: CHAT7: Expecting string: CONNECT
Aug 1 09:34:04.051 CST: %ISDN-6-CONNECT: Interface Serial0:0 is now
    connected to 81550
Aug 1 09:34:17.543 CST: CHAT7: Completed match for expect: CONNECT
Aug 1 09:34:17.547 CST: CHAT7: Sending string: \c
Aug 1 09:34:17.547 CST: CHAT7: Chat script CALLBACK finished, status = Success
```

Stage 4

```
maui-nas-01#debug aaa authentication
maui-nas-01#debug aaa authorization
maui-nas-01#debug ppp authentication
```

```
maui-nas-01#show debug
General OS:
AAA Authentication debugging is on
AAA Authorization debugging is on
PPP:
PPP authentication debugging is on
PPP protocol negotiation debugging is on
```

!--- AAA/ PPP negotiation begins.

```
Aug 1 09:42:15.096 CST: TTY8: Callback starting PPP directly with
    valid auth info
Aug 1 09:42:15.104 CST: TTY8: destroy timer type 1
Aug 1 09:42:15.104 CST: TTY8: destroy timer type 0
Aug 1 09:42:15.160 CST: As8 LCP: I CONFREQ [Closed] id 0 len 47
Aug 1 09:42:15.164 CST: As8 LCP: ACCM 0x00000000 (0x020600000000)
```

Aug 1 09:42:15.168 CST: As8 LCP: MagicNumber 0x5FA259DE (0x05065FA259DE)
Aug 1 09:42:15.172 CST: As8 LCP: PFC (0x0702)
Aug 1 09:42:15.172 CST: As8 LCP: ACFC (0x0802)
Aug 1 09:42:15.176 CST: As8 LCP: MRRU 1614 (0x1104064E)
Aug 1 09:42:15.180 CST: As8 LCP: EndpointDisc 1 Local
Aug 1 09:42:15.184 CST: As8 LCP: (0x131701DC57FC8B1CEA4CCEA064C0D958)
Aug 1 09:42:15.188 CST: As8 LCP: (0x82667300000000)
Aug 1 09:42:15.192 CST: As8 LCP: Lower layer not up, Fast Starting
Aug 1 09:42:15.196 CST: As8 PPP: Treating connection as a callout
Aug 1 09:42:15.200 CST: As8 PPP: Phase is ESTABLISHING, Active Open
Aug 1 09:42:15.204 CST: AAA/MEMORY: dup_user (0x4DDDF8) user='callback_user'
ruser='' port='Async8' rem_addr='async/81560' authen_type=CHAP service=PPP
priv=1 source='AAA dup lcp_reset'
Aug 1 09:42:15.212 CST: AAA/MEMORY: free_user (0x2F5418) user='callback_user'
ruser='' port='Async8' rem_addr='async/81560' authen_type=CHAP service=PPP
priv=1
Aug 1 09:42:15.216 CST: As8 AAA/AUTHEN: Method=IF-NEEDED: no authentication
needed. user='callback_user' port='Async8' rem_addr='async/81560'
Aug 1 09:42:15.224 CST: As8 AAA/AUTHOR/FSM: (0): LCP succeeds trivially
Aug 1 09:42:15.228 CST: As8 LCP: O CONFREQ [Closed] id 2 len 20
Aug 1 09:42:15.232 CST: As8 LCP: ACCM 0x000A0000 (0x0206000A0000)
Aug 1 09:42:15.236 CST: As8 LCP: MagicNumber 0x6530AEA5 (0x05066530AEA5)
Aug 1 09:42:15.240 CST: As8 LCP: PFC (0x0702)
Aug 1 09:42:15.240 CST: As8 LCP: ACFC (0x0802)
Aug 1 09:42:15.248 CST: As8 LCP: O CONFREQ [REQsent] id 0 len 8
Aug 1 09:42:15.252 CST: As8 LCP: MRRU 1614 (0x1104064E)
Aug 1 09:42:15.260 CST: %LINK-3-UPDOWN: Interface Async8, changed state to up
Aug 1 09:42:15.368 CST: As8 LCP: I CONFACK [REQsent] id 2 len 20
Aug 1 09:42:15.372 CST: As8 LCP: ACCM 0x000A0000 (0x0206000A0000)
Aug 1 09:42:15.376 CST: As8 LCP: MagicNumber 0x6530AEA5 (0x05066530AEA5)
Aug 1 09:42:15.380 CST: As8 LCP: PFC (0x0702)
Aug 1 09:42:15.384 CST: As8 LCP: ACFC (0x0802)
Aug 1 09:42:15.404 CST: As8 LCP: I CONFREQ [ACKrcvd] id 1 len 43
Aug 1 09:42:15.408 CST: As8 LCP: ACCM 0x00000000 (0x020600000000)
Aug 1 09:42:15.412 CST: As8 LCP: MagicNumber 0x5FA259DE (0x05065FA259DE)
Aug 1 09:42:15.412 CST: As8 LCP: PFC (0x0702)
Aug 1 09:42:15.416 CST: As8 LCP: ACFC (0x0802)
Aug 1 09:42:15.420 CST: As8 LCP: EndpointDisc 1 Local
Aug 1 09:42:15.424 CST: As8 LCP: (0x131701DC57FC8B1CEA4CCEA064C0D958)
Aug 1 09:42:15.428 CST: As8 LCP: (0x82667300000000)
Aug 1 09:42:15.432 CST: As8 LCP: O CONFACK [ACKrcvd] id 1 len 43
Aug 1 09:42:15.436 CST: As8 LCP: ACCM 0x00000000 (0x020600000000)
Aug 1 09:42:15.440 CST: As8 LCP: MagicNumber 0x5FA259DE (0x05065FA259DE)
Aug 1 09:42:15.444 CST: As8 LCP: PFC (0x0702)
Aug 1 09:42:15.448 CST: As8 LCP: ACFC (0x0802)
Aug 1 09:42:15.452 CST: As8 LCP: EndpointDisc 1 Local
Aug 1 09:42:15.456 CST: As8 LCP: (0x131701DC57FC8B1CEA4CCEA064C0D958)
Aug 1 09:42:15.460 CST: As8 LCP: (0x82667300000000)
Aug 1 09:42:15.460 CST: As8 LCP: State is Open
Aug 1 09:42:15.468 CST: As8 AAA/AUTHOR/LCP: Authorize LCP
Aug 1 09:42:15.468 CST: As8 AAA/AUTHOR/LCP (2679858087): Port='Async8' list=''
service=NET
Aug 1 09:42:15.472 CST: AAA/AUTHOR/LCP: As8 (2679858087) user='callback_user'
Aug 1 09:42:15.476 CST: As8 AAA/AUTHOR/LCP (2679858087): send AV service=ppp
Aug 1 09:42:15.480 CST: As8 AAA/AUTHOR/LCP (2679858087): send AV protocol=lcp
Aug 1 09:42:15.484 CST: As8 AAA/AUTHOR/LCP (2679858087): found list "default"
Aug 1 09:42:15.488 CST: As8 AAA/AUTHOR/LCP (2679858087): Method=tacacs+ (tacacs+)
Aug 1 09:42:15.492 CST: AAA/AUTHOR/TAC+: (2679858087): user=callback_user
Aug 1 09:42:15.492 CST: AAA/AUTHOR/TAC+: (2679858087): send AV service=ppp
Aug 1 09:42:15.496 CST: AAA/AUTHOR/TAC+: (2679858087): send AV protocol=lcp
Aug 1 09:42:15.724 CST: TAC+: (2679858087): received author response status
= PASS_ADD
Aug 1 09:42:15.732 CST: As8 AAA/AUTHOR (2679858087): Post authorization status
= PASS_ADD
Aug 1 09:42:15.736 CST: As8 AAA/AUTHOR/LCP: Processing AV service=ppp
Aug 1 09:42:15.740 CST: As8 AAA/AUTHOR/LCP: Processing AV protocol=lcp

Aug 1 09:42:15.740 CST: As8 AAA/AUTHOR/LCP: Processing AV
callback-dialstring=81550
Aug 1 09:42:15.748 CST: As8 PPP: Phase is UP
Aug 1 09:42:15.752 CST: As8 AAA/AUTHOR/FSM: (0): Can we start IPCP?
Aug 1 09:42:15.756 CST: As8 AAA/AUTHOR/FSM (3644410406): Port='Async8' list=''
service=NET
Aug 1 09:42:15.760 CST: AAA/AUTHOR/FSM: As8 (3644410406) user='callback_user'
Aug 1 09:42:15.764 CST: As8 AAA/AUTHOR/FSM (3644410406): send AV service=ppp
Aug 1 09:42:15.768 CST: As8 AAA/AUTHOR/FSM (3644410406): send AV protocol=ip
Aug 1 09:42:15.768 CST: As8 AAA/AUTHOR/FSM (3644410406): found list "default"
Aug 1 09:42:15.772 CST: As8 AAA/AUTHOR/FSM (3644410406): Method=tacacs+ (tacacs+)
Aug 1 09:42:15.776 CST: AAA/AUTHOR/TAC+: (3644410406): user=callback_user
Aug 1 09:42:15.780 CST: AAA/AUTHOR/TAC+: (3644410406): send AV service=ppp
Aug 1 09:42:15.784 CST: AAA/AUTHOR/TAC+: (3644410406): send AV protocol=ip
Aug 1 09:42:16.016 CST: TAC+: (3644410406): received author response status
= PASS_ADD
Aug 1 09:42:16.020 CST: As8 AAA/AUTHOR (3644410406): Post authorization status
= PASS_ADD
Aug 1 09:42:16.028 CST: As8 AAA/AUTHOR/FSM: We can start IPCP
Aug 1 09:42:16.032 CST: As8 IPCP: O CONFREQ [Closed] id 1 len 16
Aug 1 09:42:16.036 CST: As8 IPCP: CompressType VJ 15 slots (0x0206002D0F00)
Aug 1 09:42:16.040 CST: As8 IPCP: Address 172.22.53.101 (0x0306AC163565)
Aug 1 09:42:16.048 CST: As8 LCP: I IDENTIFY [Open] id 2 len 18 magic
0x5FA259DEMSRASV5.00
Aug 1 09:42:16.052 CST: As8 LCP: I IDENTIFY [Open] id 3 len 29 magic
0x5FA259DEMSRAS-1-RBROWN-LAPTOP
Aug 1 09:42:16.056 CST: As8 CCP: I CONFREQ [Not negotiated] id 4 len 10
Aug 1 09:42:16.060 CST: As8 CCP: MS-PPC supported bits 0x00000001
(0x120600000001)
Aug 1 09:42:16.068 CST: As8 LCP: O PROTREJ [Open] id 3 len 16 protocol CCP
(0x80FD0104000A120600000001)
Aug 1 09:42:16.080 CST: As8 IPCP: I CONFREQ [REQsent] id 5 len 40
Aug 1 09:42:16.084 CST: As8 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Aug 1 09:42:16.088 CST: As8 IPCP: Address 0.0.0.0 (0x030600000000)
Aug 1 09:42:16.092 CST: As8 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
Aug 1 09:42:16.096 CST: As8 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
Aug 1 09:42:16.100 CST: As8 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
Aug 1 09:42:16.104 CST: As8 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
Aug 1 09:42:16.108 CST: As8 AAA/AUTHOR/IPCP: Start. Her address 0.0.0.0, we
want 172.22.53.148
Aug 1 09:42:16.112 CST: As8 AAA/AUTHOR/IPCP: Processing AV service=ppp
Aug 1 09:42:16.116 CST: As8 AAA/AUTHOR/IPCP: Processing AV protocol=ip
Aug 1 09:42:16.120 CST: As8 AAA/AUTHOR/IPCP: Authorization succeeded
Aug 1 09:42:16.120 CST: As8 AAA/AUTHOR/IPCP: Done. Her address 0.0.0.0, we want
172.22.53.148
Aug 1 09:42:16.128 CST: As8 IPCP: O CONFREQ [REQsent] id 5 len 22
Aug 1 09:42:16.132 CST: As8 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
Aug 1 09:42:16.136 CST: As8 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
Aug 1 09:42:16.144 CST: As8 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
Aug 1 09:42:16.184 CST: As8 IPCP: I CONFACK [REQsent] id 1 len 16
Aug 1 09:42:16.188 CST: As8 IPCP: CompressType VJ 15 slots (0x0206002D0F00)
Aug 1 09:42:16.192 CST: As8 IPCP: Address 172.22.53.101 (0x0306AC163565)
Aug 1 09:42:16.680 CST: As8 IPCP: I CONFREQ [ACKrcvd] id 6 len 22
Aug 1 09:42:16.684 CST: As8 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Aug 1 09:42:16.688 CST: As8 IPCP: Address 0.0.0.0 (0x030600000000)
Aug 1 09:42:16.692 CST: As8 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
Aug 1 09:42:16.696 CST: As8 AAA/AUTHOR/IPCP: Start. Her address 0.0.0.0, we
want 172.22.53.148
Aug 1 09:42:16.700 CST: As8 AAA/AUTHOR/IPCP: Processing AV service=ppp
Aug 1 09:42:16.704 CST: As8 AAA/AUTHOR/IPCP: Processing AV protocol=ip
Aug 1 09:42:16.708 CST: As8 AAA/AUTHOR/IPCP: Authorization succeeded
Aug 1 09:42:16.708 CST: As8 AAA/AUTHOR/IPCP: Done. Her address 0.0.0.0, we
want 172.22.53.148
Aug 1 09:42:16.716 CST: As8 IPCP: O CONFNAK [ACKrcvd] id 6 len 16

```

Aug 1 09:42:16.720 CST: As8 IPCP: Address 172.22.53.148 (0x0306AC163594)
Aug 1 09:42:16.724 CST: As8 IPCP: PrimaryDNS 172.22.53.210 (0x8106AC1635D2)
Aug 1 09:42:16.748 CST: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async8,
changed state to up
Aug 1 09:42:16.852 CST: As8 IPCP: I CONFREQ [ACKrcvd] id 7 len 22
Aug 1 09:42:16.856 CST: As8 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Aug 1 09:42:16.860 CST: As8 IPCP: Address 172.22.53.148 (0x0306AC163594)
Aug 1 09:42:16.864 CST: As8 IPCP: PrimaryDNS 172.22.53.210 (0x8106AC1635D2)
Aug 1 09:42:16.868 CST: As8 AAA/AUTHOR/IPCP: Start. Her address 172.22.53.148,
we want 172.22.53.148
Aug 1 09:42:16.876 CST: As8 AAA/AUTHOR/IPCP (4022385425): Port='Async8'
list='service=NET
Aug 1 09:42:16.880 CST: AAA/AUTHOR/IPCP: As8 (4022385425) user='callback_user'
Aug 1 09:42:16.884 CST: As8 AAA/AUTHOR/IPCP (4022385425): send AV service=ppp
Aug 1 09:42:16.888 CST: As8 AAA/AUTHOR/IPCP (4022385425): send AV protocol=ip
Aug 1 09:42:16.892 CST: As8 AAA/AUTHOR/IPCP (4022385425):
send AV addr*172.22.53.148
Aug 1 09:42:16.892 CST: As8 AAA/AUTHOR/IPCP (4022385425): found list "default"
Aug 1 09:42:16.896 CST: As8 AAA/AUTHOR/IPCP (4022385425): Method=tacacs+ (tacacs+)
Aug 1 09:42:16.900 CST: AAA/AUTHOR/TAC+: (4022385425): user=callback_user
Aug 1 09:42:16.904 CST: AAA/AUTHOR/TAC+: (4022385425): send AV service=ppp
Aug 1 09:42:16.908 CST: AAA/AUTHOR/TAC+: (4022385425): send AV protocol=ip
Aug 1 09:42:16.912 CST: AAA/AUTHOR/TAC+: (4022385425):
send AV addr*172.22.53.148
Aug 1 09:42:17.140 CST: TAC+: (4022385425): received author response status
= PASS_REPL
Aug 1 09:42:17.148 CST: As8 AAA/AUTHOR (4022385425): Post authorization status
= PASS_REPL
Aug 1 09:42:17.156 CST: As8 AAA/AUTHOR/IPCP: Reject 172.22.53.148,
using 172.22.53.148
Aug 1 09:42:17.164 CST: As8 AAA/AUTHOR/IPCP: Processing AV service=ppp
Aug 1 09:42:17.164 CST: As8 AAA/AUTHOR/IPCP: Processing AV protocol=ip
Aug 1 09:42:17.168 CST: As8 AAA/AUTHOR/IPCP: Processing AV addr*172.22.53.148
Aug 1 09:42:17.172 CST: As8 AAA/AUTHOR/IPCP: Authorization succeeded
Aug 1 09:42:17.176 CST: As8 AAA/AUTHOR/IPCP: Done. Her address 172.22.53.148,
we want 172.22.53.148
Aug 1 09:42:17.180 CST: As8 IPCP: O CONFACK [ACKrcvd] id 7 len 22
Aug 1 09:42:17.184 CST: As8 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Aug 1 09:42:17.192 CST: As8 IPCP: Address 172.22.53.148 (0x0306AC163594)
Aug 1 09:42:17.196 CST: As8 IPCP: PrimaryDNS 172.22.53.210 (0x8106AC1635D2)
Aug 1 09:42:17.200 CST: As8 IPCP: State is Open
Aug 1 09:42:17.220 CST: As8 IPCP: Install route to 172.22.53.148

```

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