

Configuring an AS5350/AS5400 for Incoming Async and ISDN Calls

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Introduction

In many environments, it is necessary to configure an Access Server to accept incoming calls from both Async and ISDN users. These users would be able to seamlessly connect to the network as if physically present. Hence, this setup is commonly used to provide network connectivity for users who travel and telecommute, and also for Small Office–Home Office (SOHO) sites.

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 AS5400 with two Dial Feature Cards (DFCs), providing 216 NextPort modems, and an 8 T1 Card.
- Cisco IOS® Software Release 12.3 Mainline.
- One Active T1 PRI.
- Local Authentication, Authorization and Accounting (AAA). If you have an AAA Radius or Tacacs+ Server, you can use that server to provide AAA for the incoming calls. For more information, see Implementing the Server–Based AAA Subsystem.

This configuration is only for basic Analog and ISDN dialin. Therefore, any Cisco IOS software version supported on the AS5350 and AS5400 is sufficient. To run additional features, refer to the Software Advisor Tool (registered customers only) to select the Cisco IOS version and feature set appropriate for your needs.

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.

Related Products

This configuration can also be applied to the AS5350 or AS5400 Access Server.

Note: This configuration can also be modified to be used with E1 PRI Ports.

Note: Configure the E1 controller with the line coding, framing and other physical characteristics supplied by the Telco. The D-channel configuration (interface Serial x:15 for E1s) is similar to the one shown here.

This configuration is very similar to an AS5200 or AS5300 configuration for dialin access. For more information on how to configure an AS5200 or AS5300, see Configuring an Access Server with PRIs for incoming Async and ISDN Calls. The only major difference between the two is the **dial-tdm-clock priority number t1_slot/port** command used to assign the T1 clock priority in the AS5350 or AS5400.

Conventions

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

Background Information

This document covers how to configure an AS5350 or AS5400 series Access Server to accept incoming Async and ISDN calls on ISDN T1 PRI circuits. This configuration only includes the bare minimum required for the Network Access Server (NAS) to accept the call. You can add features to this configuration based on your needs.

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) .

Configurations

This document uses this configuration:

- 5400-NAS (5400)

5400-NAS (5400)

```
5400-NAS#show running-config
Building configuration...

Current configuration : 3209 bytes
!
version 12.3
no parser cache
no service single-slot-reload-enable
no service pad
service timestamps debug datetime msec
```

```
service timestamps log datetime msec
service password-encryption
!
hostname 5400-NAS
!
no boot startup-test
logging rate-limit console 10 except errors
aaa new-model
aaa authentication login default local
aaa authentication ppp default local
aaa authorization network default local

!--- PPP authentication and network authorization are local.
!--- Replace local with radius or tacacs if you use a AAA server.
!--- For more information, see Implementing the Server-Based AAA Subsystem.

enable secret 5 <deleted>
!
username admin password 7 <deleted>
username dude password 7 <deleted>
username cisco password 7 <deleted>

!--- Usernames for local authentication of the call. The client presents
!--- the username or password, and the NAS authenticates the peer.

!
resource-pool disable
dial-tdm-clock priority 1 7/1

!--- T1 port 7/1 is the primary clock source.
!--- This is indicated by priority 1 in the dial-tdm-clock command.
!--- Note: On the AS5200/AS5300 you can set the primary clock source with
!--- the clock source line primary command.

calltracker enable
calltracker history max-size 30
calltracker call-record verbose

!--- Calltracker is used for enhanced active call monitoring.
!--- For more information, see Call Tracker plus ISDN and AAA Enhancements.

spe call-record modem

!--- Enable modem call records for NextPort Universal Ports.
!--- This is equivalent to modem call-record terse used on MICA modem platforms.

!
voice-fastpath enable
ds0 busyout-threshold 12
ip subnet-zero
no ip source-route
no ip finger
ip domain-name cisco.com

!--- his instructs the NAS how to qualify DNS lookups.
!--- In this example, cisco.com is appended to the end of each name looked up.

ip name-server 172.22.70.10

!--- Specifies the primary name server.

ip name-server 172.22.10.70

!--- Specifies the secondary name server.

!
```

```
isdn switch-type primary-ni

!--- Switch-type for this NAS. Obtain this information from the Telco.

!
mta receive maximum-recipients 0
!
controller T1 7/0

!--- This T1 is unused.

shutdown
!
controller T1 7/1

!--- T1 PRI physical controller configuration.

framing esf

!--- Framing for this T1 is Extended Super Frame (ESF).
!--- Obtain this information from the telco.

linecode b8zs

!--- Line coding for this T1. Obtain this information from the telco.

pri-group timeslots 1-24

!--- For T1 PRI scenarios, all 24 T1 timeslots are assigned as ISDN PRI channels.
!--- The router now automatically creates the corresponding D-channel:
!--- interface Serial 1:23

!

!--- The configuration for unused T1 controllers is omitted to save space.
!--- Unused T1s can be shutdown as with controller t1 7/0.

!
interface Loopback0

!--- The IP pool for dialin async and ISDN users is in this subnet.
!--- This way, the routes for all clients are summarized and
!--- propagated to the backbone instead of 254 routes.

ip address 10.1.1.1 255.255.255.0
no ip mroute-cache
!
interface FastEthernet0/0
ip address 172.22.186.55 255.255.255.240
no ip mroute-cache
duplex auto
speed 10
!
interface FastEthernet0/1
ip address 192.168.1.1 255.255.255.0
no ip mroute-cache
duplex auto
speed auto
!

!--- Unused interface configuration is omitted.

!
interface Serial7/1:23
```

```

!--- D-channel configuration for T1 7/1.

no ip address
encapsulation ppp

!--- PPP encapsulation on this interface.

dialer rotary-group 1

!--- T1 0 is a member of rotary group 1.
!--- The rotary group configuration is in interface Dialer 1.

isdn switch-type primary-ni
isdn incoming-voice modem

!--- All incoming voice calls on this T1 are sent to the modems.
!--- This command is required if this T1 is to accept async calls.

no fair-queue
no cdp enable
!
interface Group-Async0

!--- This group-async interface is the configuration template for all modems.
!--- Individual async interfaces do not have to be configured since they can
!--- be cloned from one managed copy.

ip unnumbered Loopback0

!--- A Loopback interface is always up/up. For stability, you can unnumber to it.

encapsulation ppp
no ip mroute-cache
async mode interactive

!--- Users can dial in and get to a shell(Exec) or PPP session on that line.
!--- This command can be used in conjunction with autoselect ppp
!--- under the line configuration to auto detect the connection type.
!--- Use this command only if the async interface is to answer different
!--- connection types(exec,PPP,slip etc).
!--- If all users connect with PPP use the async mode dedicated command instead.

peer default ip address pool pool_dialup

!--- Clients are assigned addresses from the IP address pool named pool_dialup.

ppp authentication chap pap callin
group-range 1/00 2/107

!--- Modems 1/00 through 2/107 are members of this group async interface.

!
interface Dialer1

!--- Configuration for rotary group 1.
!--- The Dialer interface number (1) must exactly match the rotary group number
!--- configured on the physical interfaces (interface Serial 7/1:23).

ip unnumbered Loopback0

!--- A Loopback interface is always up/up. For stability, unnumber to it.

encapsulation ppp
no ip mroute-cache

```

```

dialer in-band

!--- Enable this dialer interface to be a DDR interface.
!--- This is required if you want to enforce the idle-timeout.

dialer idle-timeout 300

!--- Idle timeout for incoming calls is 300 seconds (5 minutes).
!--- Users who are idle for more than 300 seconds are dropped.
!--- If dialer in-band is used and a dialer idle-timeout is not defined,
!--- the default idle-timeout of 120 seconds (2 minutes) is applied.

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".
!--- See the Define Interesting Traffic and Idle Timeout for details.

peer default ip address pool pool_dialup

!--- Clients are assigned addresses from the IP address pool named pool_dialup.

no fair-queue
no cdp enable
ppp authentication chap pap callin
ppp multilink
!
ip local pool pool_dialup 10.1.1.2 10.1.1.254

!--- IP address pools for dialin clients.

ip classless
ip route 0.0.0.0 0.0.0.0 172.22.186.49
no ip http server
!
dialer-list 1 protocol ip permit

!--- Interesting traffic is defined by dialer-list 1.
!--- This is applied to interface Dialer 1 through dialer-group 1.
!--- Note: The specified dialer-list number must be the same as
!--- the dialer-group number. In this example, it is defined as "1".
!--- Interesting traffic is used to define what packets will reset the idle timer.

!
voice-port 7/1:D
!
line con 0
  exec-timeout 0 0
  transport input none
line aux 0
line vty 0 4
  password 7 <deleted>
line 1/00 2/107

!--- Line configuration for modems 1/00 through 2/107.
!--- This is the same modem range configured with the group-range command
!--- in interface Group-Async0.

no flush-at-activation

!--- Prevents the router from flushing the first few packets on a connection.
!--- This command is used to prevent PPP timeout issues, and can be used to
!--- avoid PPP startup issues.
!--- This is not required unless you encounter modem PPP call failures.

```

```

autoselect during-login

!--- Displays the username:password prompt after modems connect (during exec login).
!--- This command is not necessary if you use async mode dedicated under the
!--- group-async interface.

autoselect ppp

!--- Automatically launches PPP if the router detects incoming PPP packets.
!--- Without this command, the dialin client will need to manually
!--- launch PPP (from Exec mode). This command is not necessary if you use
!--- async mode dedicated under the group-async interface.

modem InOut

!--- Support incoming and outgoing modem calls.

transport input all
!
scheduler allocate 10000 400
end

```

Define Interesting Traffic and Idle Timeout

The NAS only handles incoming calls, and does not make outbound calls, but we still define the interesting traffic. The interesting traffic definition has different purposes for async users and ISDN users.

For ISDN Users (Corresponding to Interface Dialer 1):

The **dialer-group** and **dialer-list** commands are required on the dialer interface, regardless of whether you want to enforce idle-timeout or not. The **dialer-group** and **dialer-list** commands are necessary on the dialer interface to avoid encapsulation failures. This requirement is only for ISDN users, and not for async users and the group-async-interface.

To enforce idle timeout, add the **dialer in-band** and **dialer idle-timeout** commands. If **dialer in-band** is configured but **dialer idle-timeout** is not, the idle timeout defaults to two minutes for ISDN users.

If you want your ISDN users to be able to stay connected until they choose to disconnect, use **dialer idle-timeout 0**. The "zero" option for **dialer idle-timeout** was introduced in Cisco IOS Software Release 12.1(3)T. It sets a timeout of infinity.

For Async Users (Corresponding to Interface Group-Async 0):

To enforce an idle timeout for Async users, configure the following commands in the group-async interface: **dialer in-band**, **dialer idle-timeout**, and **dialer-group**. The corresponding **dialer-list** is also necessary. The **dialer-group** and **dialer-list** commands specify the interesting traffic on the group-async-interface.

For Async users, the interesting traffic is only used to reset the idle timeout. If interesting traffic is not defined, users will be disconnected after the **dialer idle-timeout** (default 120 seconds) expires, regardless of whether they are passing traffic on the link. With an interesting traffic definition, the NAS recognizes those packets and resets the idle timeout. This way, the NAS disconnects the user only when there is a truly idle link.

You can modify the interesting traffic such that, for example, only HTTP (web) traffic is interesting. In such a situation, if the user does not browse the web for 300 seconds (or for the specified **dialer idle-timeout**) the user is disconnected. Configure interesting traffic based on the traffic patterns of your users.

If you want your Async users to be able to stay connected until they choose to disconnect, remove these commands from the group-async-interface: **dialer in-band**, **dialer idle-timeout**, and **dialer-group** as shown in the configuration. You can also set the idle timeout to infinity with the help of **dialer idle-timeout 0**. The "zero" option for **dialer idle-timeout** was introduced in Cisco IOS Software Release 12.1(3)T, and it sets a timeout of infinity.

Verify

This section provides information you can use to confirm 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 status** ensures that the router communicates properly with the ISDN switch. In the output, verify that Layer 1 Status is ACTIVE, and that the Layer 2 Status state = MULTIPLE_FRAME_ESTABLISHED appears. This command also displays the number of active calls.
- **show ppp multilink** displays information on multilink bundles that are active. Use this command to verify the multilink connection.
- **show dialer [interface type number]** displays general diagnostic information for interfaces configured for DDR. If the dialer came up properly, the Dialer state is data link layer up message must appear. If physical layer up appears, it means that the line protocol came up, but the Network Control Protocol (NCP) did not. The source and destination addresses of the packet that initiated the dialing are shown in the Dial reason line. This **show** command also displays the configuration of the timer, and the duration before the connection times out.
- **show caller user username detail** shows parameters for a particular user such as the IP address assigned, PPP and PPP bundle parameters, and so on. If your version of Cisco IOS software does not support this command, use the **show user** command.
- **show dialer map** displays configured dynamic and static dialer maps. This command can be used to see if a dynamic dialer map was created. Without a dialer map, you cannot route packets.

Here are some **show** command outputs for successful calls. Pay attention to the sections in bold font, and the comments provided in the output samples. Compare the output that you obtain with the result shown here.

```
5400-NAS#show caller
```

| Line | User | Service | Active Time | Idle Time |
|---------------|--------------|------------|-------------|-----------|
| con 0 | - | TTY | 00:55:45 | 00:00:00 |
| tty 232 | cisco | Async | 00:00:33 | 00:00:03 |
| As1/16 | cisco | PPP | 00:00:29 | 00:00:03 |

```
!--- User cisco (the dialin client) uses interface Async 1/16.
```

```
5400-NAS#show caller ip
```

| Line | User | IP Address | Local Number | Remote Number | <-> |
|--------|-------|------------|--------------|---------------|-----|
| As1/16 | cisco | 10.1.1.3 | 4085556170 | - | in |

```
5400-NAS#show caller user cisco
```

```
User: cisco, line tty 232, service Async
```

```
!--- Shows hardware level settings for user cisco.
```

```
Active time 00:01:14, Idle time 00:00:43
Timeouts:          Absolute Idle Idle
                  Session  Exec
```

```

Limits:          -          -          00:10:00
Disconnect in:  -          -          -
TTY: Line 1/16, running PPP on As1/16

!--- The call is terminated on interface Async 1/16.
!--- This interface is included in the group-async configuration.

Location: PPP: 10.1.1.3

!--- IP address for the peer.
!--- This address was obtained from the IP pool pool_dialup.

DS0: (slot/unit/channel)=7/1/0

!--- T1 channel on which the call arrived. The call arrived on channel 0 in T1 1.

Line: Baud rate (TX/RX) is 115200/115200, no parity, 1 stopbits, 8 databits
Status: Ready, Active, No Exit Banner, Async Interface Active
Capabilities: No Flush-at-Activation, Hardware Flowcontrol In
               Hardware Flowcontrol Out, Modem Callout, Modem RI is CD
               Line usable as async interface, Integrated Modem
Modem State: Ready

User: cisco, line As1/16, service PPP

!--- PPP setting for user cisco. Note that the call was terminated on int As1/16.

Active time 00:01:10, Idle time 00:00:44
Timeouts:          Absolute Idle
Limits:           -          -
Disconnect in:    -          -
PPP: LCP Open, CHAP (<- AAA), IPCP

!--- LCP and IPCP states are OPEN. If LCP and IPCP states are not OPEN,
!--- use the debug ppp negotiation command to isolate LCP issues.

IP: Local 10.1.1.1, remote 10.1.1.3

!--- NAS IP address as well as the IP address assigned to the peer.

Counts: 12 packets input, 654 bytes, 0 no buffer
        0 input errors, 0 CRC, 0 frame, 0 overrun
        14 packets output, 694 bytes, 0 underruns
        0 output errors, 0 collisions, 0 interface resets

!--- Packets are passing through the connection.

5400-NAS#show ip route connected
172.22.0.0/28 is subnetted, 1 subnets
C    172.22.186.48 is directly connected, FastEthernet0/0
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.1.1.3/32 is directly connected, Async1/16

!--- Directly connected route to the client.
!--- Note that the next hop is int Async 1/16, which is the async interface
!--- assigned to the client

C    10.1.1.0/24 is directly connected, Loopback0

```

Troubleshoot

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

Troubleshooting Commands

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

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

- **debug dialer** displays DDR debugging information about the packets received on a dialer interface. This information can help to ensure there is interesting traffic that can use the dialer interface.
- **debug isdn q931** shows call setup and tear down of the ISDN network connection (Layer 3).
- **debug modem** displays modem line activity on an access server. The output indicates when the modem line changes state.
- **debug csm modem** 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.

Note: This is equivalent to **debug modem csm** on the AS5200/AS5300. This debug was introduced in Cisco IOS Software Release 12.0(4)XL.

- **debug ppp negotiation** displays information on the PPP traffic and exchanges during the negotiation of Link Control Protocol (LCP), Authentication, and Network Control Protocol (NCP). A successful PPP negotiation will first open the LCP state, then Authenticate, and finally negotiate NCP. Multilink Parameters such as Maximum Receive Reconstructed Unit (MRRU) are established during LCP negotiation.
- **debug ppp authentication** displays PPP authentication protocol messages, including Challenge Handshake Authentication Protocol (CHAP) packet exchanges and Password Authentication Protocol (PAP) exchanges.
- **debug ppp error** displays protocol errors and error statistics associated with PPP connection negotiation and operation.

Sample Debug Output

Here are some **debug** outputs for successful calls. Pay attention to the sections in bold, and the comments provided in the output samples. Compare the output that you obtain with the result shown here.

For an analog call:

```
5400-NAS#debug isdn q931
ISDN Q931 packets debugging is on
5400-NAS#debug modem
Modem control/process activation debugging is on
5400-NAS#debug csm modem
Modem Management Call Switching Module debugging is on
5400-NAS#debug ppp negotiation
PPP protocol negotiation debugging is on
5400-NAS#debug ppp authentication
PPP authentication debugging is on
5400-NAS#debug ip peer
IP peer address activity debugging is on
5400-NAS#debug aaa authentication
AAA Authentication debugging is on
5400-NAS#debug aaa authorization
AAA Authorization debugging is on
5400-NAS#
5400-NAS#show debug
General OS:
  Modem control/process activation debugging is on
  AAA Authentication debugging is on
  AAA Authorization debugging is on
```

CSM Modem:
Modem Management Call Switching Module debugging is on
Generic IP:
IP peer address activity debugging is on
PPP:
PPP authentication debugging is on
PPP protocol negotiation debugging is on
ISDN:
ISDN Q931 packets debugging is on
ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
DSL 0 --> 31
- 1 - - - - -

5400-NAS#
5400-NAS#
*Jan 1 00:58:26.179: ISDN Se7/1:23: **RX** <- **SETUP** pd = 8 callref = 0x0006

*!--- Incoming Q.931 SETUP message. Indicates an incoming call.
!--- For more information on Q.931 refer to the document
!--- Troubleshooting ISDN Layer 3 using debug isdn q931.*

*Jan 1 00:58:26.179: Bearer Capability i = 0x8090A2
*Jan 1 00:58:26.179: Channel ID i = 0xA98381
*Jan 1 00:58:26.179: Calling Party Number i = 0x80, Plan:Unknown,
Type:Unknown
*Jan 1 00:58:26.179: Called Party Number i = 0xA1, '4085556170',
Plan:ISDN, Type:National
*Jan 1 00:58:26.183: AAA/ACCT/DS0: channel=0, dsl=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:26.183: AAA/ACCT/DS0: channel=0, dsl=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:26.183: **VDEV_ALLOCATE: 1/16 is allocated**

*!--- The Call Switch Module (CSM) is informed of the call.
!--- The CSM allocates modem 1/16 to the incoming call.*

*Jan 1 00:58:26.183: AAA/ACCT/DS0: channel=0, dsl=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:26.183: EVENT_FROM_ISDN::dchan_idb=0x63B915AC, call_id=0x6,
ces=0x1 bchan=0x0, event=0x1, cause=0x0
*Jan 1 00:58:26.183: dev in call to isdn : set dnis_collected & fap_notify
*Jan 1 00:58:26.183: EVENT_FROM_ISDN:(0006): DEV_INCALL at slot 1 and port 16
*Jan 1 00:58:26.183: EVENT_FROM_ISDN: decode:calling Oct3 0x80, called oct3 0xA1,
oct3a 0x0,mask 0x25
*Jan 1 00:58:26.183: EVENT_FROM_ISDN: csm_call_info:calling Oct3 0x80, called oct3
0xA1, oct3a 0x0,mask 0x25
*Jan 1 00:58:26.183: CSM_PROC_IDLE: CSM_EVENT_ISDN_CALL at slot 1, port 16
*Jan 1 00:58:26.183: CSM_DSPLIB(1/16): np_dsplib_prepare_modem
*Jan 1 00:58:26.183: csm_connect_pri_vdev: TS allocated at bp_stream 0, bp_Ch 3,
vdev_common 0x627DDCC8
*Jan 1 00:58:26.183: ISDN Se7/1:23: **TX** -> **CALL_PROC** pd = 8 callref = 0x8006
*Jan 1 00:58:26.183: Channel ID i = 0xA98381

!--- Transmits CALL PROCEEDING. This means that the NAS is processing the call.

*Jan 1 00:58:26.183: ISDN Se7/1:23: **TX** -> **ALERTING** pd = 8 callref = 0x8006

!--- Transmits ALERTING. The modem now goes offhook and accepts the call.

*Jan 1 00:58:26.191: CSM_DSPLIB(1/16):DSPLIB_MODEM_INIT:
Modem session transition to IDLE
*Jan 1 00:58:26.191: CSM_DSPLIB(1/16): **Modem went offhook**

!--- Modem informs the CSM that it went offhook.

*Jan 1 00:58:26.191: CSM_PROC_IC2_RING: CSM_EVENT_MODEM_OFFHOOK at slot 1, port 16
*Jan 1 00:58:26.191: ISDN Se7/1:23: **TX** -> **CONNECT** pd = 8 callref = 0x8006

!--- D-channel transmits a CONNECT.

```

*Jan 1 00:58:26.203: ISDN Se7/1:23: RX <- CONNECT_ACK pd = 8 callref = 0x0006

!--- Received the Q.931 CONNECT_ACK.

*Jan 1 00:58:26.203: ISDN Se7/1:23: CALL_PROGRESS: CALL_CONNECTED call id 0x6,
bchan 0, dsl 1
*Jan 1 00:58:26.203: EVENT_FROM_ISDN::dchan_idb=0x63B915AC, call_id=0x6,
ces=0x1 bchan=0x0, event=0x4, cause=0x0
*Jan 1 00:58:26.203: EVENT_FROM_ISDN:(0006): DEV_CONNECTED at slot 1 and port 16
*Jan 1 00:58:26.203: CSM_PROC_IC6_WAIT_FOR_CONNECT:
CSM_EVENT_ISDN_CONNECTED at slot 1, port 16
*Jan 1 00:58:26.203: CSM DSPLIB(1/16): np_dsplib_call_accept
*Jan 1 00:58:26.203: %ISDN-6-CONNECT:
Interface Serial7/1:0 is now connected to N/A N/A

!--- Call is connected at the ISDN layer.

*Jan 1 00:58:26.207: CSM DSPLIB(1/16):DSPLIB_MODEM_WAIT_ACTIVE:
Modem session transition to ACTIVE
*Jan 1 00:58:26.207: CSM DSPLIB(1/16): Modem state changed to (CONNECT_STATE)
*Jan 1 00:58:32.379: CSM DSPLIB(1/16): Modem state changed to (LINK_STATE)
*Jan 1 00:58:35.655: CSM DSPLIB(1/16): Modem state changed to (TRAINUP_STATE)
*Jan 1 00:58:43.775: CSM DSPLIB(1/16): Modem state changed to (EC_NEGOTIATING_STATE)
*Jan 1 00:58:44.107: CSM DSPLIB(1/16): Modem state changed to (STEADY_STATE)

!--- Modem transitions to Steady State.

*Jan 1 00:58:44.975: TTY1/16: DSR came up

!--- Indicates that the modem trainup is complete.

*Jan 1 00:58:44.975: tty1/16: Modem: IDLE->(unknown)
*Jan 1 00:58:44.975: TTY1/16: EXEC creation
*Jan 1 00:58:44.975: AAA: parse name=tty1/16 idb type=10 tty=232
*Jan 1 00:58:44.975: AAA: name=tty1/16 flags=0x11 type=4 shelf=0
slot=0 adapter=0 port=232 channel=0
*Jan 1 00:58:44.975: AAA: parse name=Serial7/1:0 idb type=12 tty=-1
*Jan 1 00:58:44.975: AAA: name=Serial7/1:0 flags=0x55 type=1 shelf=0
slot=7 adapter=0 port=1 channel=0
*Jan 1 00:58:44.975: AAA/ACCT/DS0: channel=0, dsl=1, t3=0, slot=7,
ds0=117444608
*Jan 1 00:58:44.975: AAA/MEMORY: create_user (0x63CBD608) user='NULL'
ruser='NULL' port='tty1/16' rem_addr='async/4085556170' authn_type=ASCII
service=LOGIN priv=1
*Jan 1 00:58:44.975: AAA/AUTHEN/START (1231800673): port='tty1/16' list=''
action=LOGIN service=LOGIN
*Jan 1 00:58:44.975: AAA/AUTHEN/START (1231800673): using "default" list
*Jan 1 00:58:44.975: AAA/AUTHEN/START (1231800673): Method=LOCAL
*Jan 1 00:58:44.975: AAA/AUTHEN (1231800673): status = GETUSER
*Jan 1 00:58:44.975: TTY1/16: set timer type 10, 30 seconds
*Jan 1 00:58:46.215: TTY1/16: Autoselect(2) sample 7E

!--- Beginning of a PPP Frame.

*Jan 1 00:58:46.215: TTY1/16: Autoselect(2) sample 7EFF
*Jan 1 00:58:46.215: TTY1/16: Autoselect(2) sample 7EFF7D
*Jan 1 00:58:46.215: TTY1/16: Autoselect(2) sample 7EFF7D23
*Jan 1 00:58:46.215: TTY1/16 Autoselect cmd: ppp negotiate

!--- The NAS detects PPP frames (indicated by 7EFF7D23) and
!--- automatically launches PPP. The command autoselect ppp under the
!--- line configuration and async mode interactive under the group-async
!--- allowed the NAS to detect PPP frames and switch to PPP mode.
!--- If the NAS does not detect PPP frames then the call will remain in exec mode.

```

```
*Jan 1 00:58:46.215: AAA/AUTHEN/ABORT: (1231800673) because Autoselected.
*Jan 1 00:58:46.215: AAA/AUTHEN/ABORT: (1231800673) because Autoselected.
*Jan 1 00:58:46.215: AAA/MEMORY: free_user (0x63CBD608) user='NULL' ruser='NULL'
port='tty1/16' rem_addr='async/4085556170' authen_type=ASCII service=LOGIN priv=1
*Jan 1 00:58:46.215: TTY1/16: EXEC creation
*Jan 1 00:58:46.215: TTY1/16: create timer type 1, 600 seconds
*Jan 1 00:58:46.215: As1/16: ip_get_pool using pool pool_dialup
*Jan 1 00:58:46.215: As1/16: Pools to search : pool_dialup
*Jan 1 00:58:46.215: As1/16: Pool pool_dialup returned address = 10.1.1.3
*Jan 1 00:58:46.215: TTY1/16: destroy timer type 1
*Jan 1 00:58:46.215: TTY1/16: no timer type 0 to destroy
*Jan 1 00:58:46.215: As1/16 LCP: I CONFREQ [Closed] id 3 len 20
```

!--- Incoming LCP CONFREQ.

!--- For more information on interpreting PPP debugs refer to the document

!--- Dialup Technology: Troubleshooting Techniques.

```
*Jan 1 00:58:46.215: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:46.215: As1/16 LCP: MagicNumber 0x552722A5 (0x0506552722A5)
*Jan 1 00:58:46.215: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:46.215: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:46.215: As1/16 LCP: Lower layer not up, Fast Starting
*Jan 1 00:58:46.215: As1/16 PPP: Treating connection as a dedicated line
*Jan 1 00:58:46.215: As1/16 PPP: Phase is ESTABLISHING, Active Open
[0 sess, 0 load]
*Jan 1 00:58:46.219: As1/16 AAA/AUTHOR/FSM: (0): LCP succeeds trivially
*Jan 1 00:58:46.219: As1/16 LCP: O CONFREQ [Closed] id 1 len 25
*Jan 1 00:58:46.219: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:46.219: As1/16 LCP: AuthProto CHAP (0x0305C22305)
*Jan 1 00:58:46.219: As1/16 LCP: MagicNumber 0x30CCCD68 (0x050630CCCD68)
*Jan 1 00:58:46.219: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:46.219: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:46.219: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:46.219: As1/16 LCP: O CONFACK [REQsent] id 3 len 20
*Jan 1 00:58:46.219: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:46.219: As1/16 LCP: MagicNumber 0x552722A5 (0x0506552722A5)
*Jan 1 00:58:46.219: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:46.219: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:46.219: %LINK-3-UPDOWN: Interface Async1/16, changed state to up
*Jan 1 00:58:48.215: As1/16 LCP: I CONFREQ [ACKsent] id 4 len 20
*Jan 1 00:58:48.215: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:48.215: As1/16 LCP: MagicNumber 0x552722A5 (0x0506552722A5)
*Jan 1 00:58:48.215: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:48.215: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:48.215: As1/16 LCP: O CONFACK [ACKsent] id 4 len 20
*Jan 1 00:58:48.215: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:48.215: As1/16 LCP: MagicNumber 0x552722A5 (0x0506552722A5)
*Jan 1 00:58:48.215: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:48.215: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:48.219: As1/16 LCP: TIMEOUT: State ACKsent
*Jan 1 00:58:48.219: As1/16 LCP: O CONFREQ [ACKsent] id 2 len 25
*Jan 1 00:58:48.219: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:48.219: As1/16 LCP: AuthProto CHAP (0x0305C22305)
*Jan 1 00:58:48.219: As1/16 LCP: MagicNumber 0x30CCCD68 (0x050630CCCD68)
*Jan 1 00:58:48.219: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:48.219: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:48.367: As1/16 LCP: I CONFACK [ACKsent] id 2 len 25
*Jan 1 00:58:48.367: As1/16 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Jan 1 00:58:48.367: As1/16 LCP: AuthProto CHAP (0x0305C22305)
*Jan 1 00:58:48.367: As1/16 LCP: MagicNumber 0x30CCCD68 (0x050630CCCD68)
*Jan 1 00:58:48.367: As1/16 LCP: PFC (0x0702)
*Jan 1 00:58:48.367: As1/16 LCP: ACFC (0x0802)
*Jan 1 00:58:48.367: As1/16 LCP: As1/16 LCP: State is Open
```

!--- LCP negotiation is complete.

```
*Jan 1 00:58:48.367: As1/16 PPP: Phase is AUTHENTICATING,
by this end [0 sess, 0 load]
*Jan 1 00:58:48.367: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7,
ds0=117444608
*Jan 1 00:58:48.367: As1/16 CHAP: O CHALLENGE id 1 len 29 from "5400-NAS"
*Jan 1 00:58:48.495: As1/16 CHAP: I RESPONSE id 1 len 26 from "cisco"

!--- Incoming CHAP response.

*Jan 1 00:58:48.495: AAA: parse name=Async1/16 idb type=10 tty=232
*Jan 1 00:58:48.495: AAA: name=Async1/16 flags=0x11 type=4 shelf=0
slot=0 adapter=0 port=232 channel=0
*Jan 1 00:58:48.495: AAA: parse name=Serial7/1:0 idb type=12 tty=-1
*Jan 1 00:58:48.495: AAA: name=Serial7/1:0 flags=0x55 type=1 shelf=0
slot=7 adapter=0 port=1 channel=0
*Jan 1 00:58:48.495: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:48.495: AAA/MEMORY: create_user (0x63CBD608) user='cisco'
ruser='NULL' port='Async1/16' rem_addr='async/4085556170' authen_type=CHAP
service=PPP priv=1
*Jan 1 00:58:48.495: AAA/AUTHEN/START (2776021080): port='Async1/16' list=''
action=LOGIN service=PPP
*Jan 1 00:58:48.495: AAA/AUTHEN/START (2776021080): using "default" list
*Jan 1 00:58:48.495: AAA/AUTHEN/START (2776021080): Method=LOCAL
*Jan 1 00:58:48.495: AAA/AUTHEN (2776021080): status = PASS
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP: Authorize LCP
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP (3070946770): Port='Async1/16'
list='' service=NET
*Jan 1 00:58:48.495: AAA/AUTHOR/LCP: As1/16 (3070946770) user='cisco'
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP (3070946770): send AV service=ppp
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP (3070946770): send AV protocol=lcp
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP (3070946770): found list "default"
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP (3070946770): Method=LOCAL
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR (3070946770): Post authorization
status = PASS_REPL
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP: Processing AV service=ppp
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/LCP: Processing AV protocol=lcp
*Jan 1 00:58:48.495: As1/16 CHAP: O SUCCESS id 1 len 4
```

!--- Authentication is successful.

```
*Jan 1 00:58:48.495: As1/16 PPP: Phase is UP [0 sess, 0 load]
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM: (0): Can we start IPCP?
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM (3087015830): Port='Async1/16'
list='' service=NET
*Jan 1 00:58:48.495: AAA/AUTHOR/FSM: As1/16 (3087015830) user='cisco'
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM (3087015830): send AV service=ppp
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM (3087015830): send AV protocol=ip
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM (3087015830): found list "default"
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM (3087015830): Method=LOCAL
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR (3087015830): Post authorization
status = PASS_REPL
*Jan 1 00:58:48.495: As1/16 AAA/AUTHOR/FSM: We can start IPCP
*Jan 1 00:58:48.495: As1/16 IPCP: O CONFREQ [Closed] id 1 len 10
```

!--- IPCP negotiation begins.

```
*Jan 1 00:58:48.495: As1/16 IPCP: Address 10.1.1.1 (0x03060A010101)
*Jan 1 00:58:48.619: As1/16 IPCP: I CONFREQ [REQsent] id 3 len 10
*Jan 1 00:58:48.619: As1/16 IPCP: Address 0.0.0.0 (0x030600000000)
*Jan 1 00:58:48.619: As1/16 AAA/AUTHOR/IPCP: Start. Her address 0.0.0.0,
we want 10.1.1.3
```

!--- Address obtained from the Address Pool named pool_dialup.

```
*Jan 1 00:58:48.619: As1/16 AAA/AUTHOR/IPCP: Processing AV service=ppp
*Jan 1 00:58:48.619: As1/16 AAA/AUTHOR/IPCP: Processing AV protocol=ip
```

```

*Jan 1 00:58:48.619: As1/16 AAA/AUTHOR/IPCP: Authorization succeeded
*Jan 1 00:58:48.619: As1/16 AAA/AUTHOR/IPCP: Done. Her address 0.0.0.0,
we want 10.1.1.3
*Jan 1 00:58:48.619: As1/16 IPCP: O CONFNAK [REQsent] id 3 len 10
*Jan 1 00:58:48.619: As1/16 IPCP: Address 10.1.1.3 (0x03060A010103)
*Jan 1 00:58:48.623: As1/16 IPCP: I CONFACK [REQsent] id 1 len 10
*Jan 1 00:58:48.623: As1/16 IPCP: Address 10.1.1.1 (0x03060A010101)
*Jan 1 00:58:48.731: As1/16 IPCP: I CONFREQ [ACKrcvd] id 4 len 10
*Jan 1 00:58:48.731: As1/16 IPCP: Address 10.1.1.3 (0x03060A010103)
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Start. Her address 10.1.1.3,
we want 10.1.1.3
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): Port='Async1/16'
list='' service=NET
*Jan 1 00:58:48.731: AAA/AUTHOR/IPCP: As1/16 (3141581943) user='cisco'
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): send AV service=ppp
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): send AV protocol=ip
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): send AV addr*10.1.1.3
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): found list "default"
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP (3141581943): Method=LOCAL
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR (3141581943):
Post authorization status = PASS_REPL
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Reject 10.1.1.3, using 10.1.1.3
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Processing AV service=ppp
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Processing AV protocol=ip
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Processing AV addr*10.1.1.3
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Authorization succeeded
*Jan 1 00:58:48.731: As1/16 AAA/AUTHOR/IPCP: Done.
Her address 10.1.1.3, we want 10.1.1.3
*Jan 1 00:58:48.731: As1/16 IPCP: O CONFACK [ACKrcvd] id 4 len 10
*Jan 1 00:58:48.731: As1/16 IPCP: Address 10.1.1.3 (0x03060A010103)
*Jan 1 00:58:48.731: As1/16 IPCP: State is Open

!--- IPCP negotiation is complete. The user is now connected.

*Jan 1 00:58:48.731: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:48.731: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:48.731: AAA/ACCT/DS0: channel=0, ds1=1, t3=0, slot=7, ds0=117444608
*Jan 1 00:58:48.731: As1/16 IPCP: Install route to 10.1.1.3

!--- A route to the client is installed in the routing table.
!--- You can verify this with the show ip route command.

*Jan 1 00:58:49.495: %LINEPROTO-5-UPDOWN:
Line protocol on Interface Async1/16, changed state to up

!--- Interface Async 1/16 is up.

```

Troubleshooting Resources

Use these troubleshooting resources as required:

- Incoming Modem Call Troubleshooting For Analog Call Failure Troubleshooting
 - PRI Async Modem Callin Additional Information on troubleshooting Analog Call Failures
 - Incoming ISDN Call Troubleshooting For ISDN Call Failure Troubleshooting
 - PRI ISDN Callin Additional Information on troubleshooting ISDN Call failures
 - T1 Troubleshooting Flowchart Use this flowchart if you suspect that the T1 circuit is faulty.
 - Loopback Tests for T1/56K Lines To verify that the T1 Port on the router is functioning correctly.
-

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