

# Troubleshooting ISDN Connections

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This chapter presents troubleshooting information for Integrated Services Digital Network (ISDN) connectivity and performance problems. The sections in this chapter describe specific ISDN symptoms, the problems that are likely to cause each symptom, and the solutions to those problems.

- ISDN: Router Does Not Dial
- ISDN: Dial Does Not Go Through (BRI)
- ISDN: Dial Does Not Go Through (PRI)
- ISDN: No Communication with Remote Router
- ISDN: No Communication End-to-End
- ISDN: Second B Channel Does Not Come Up
- ISDN: Second B Channel Comes Up Too Late
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- ISDN: Line Disconnects Too Slowly
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## ISDN: Router Does Not Dial

**Symptom:** Router configured for ISDN does not dial.

Table 15-1 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-1 ISDN: Router Does Not Dial**

Possible Problem	Solution
Interface down	<p><b>Step 1</b> Enter the <b>show interfaces</b> EXEC command to check the status of the ISDN interface.</p> <p><b>Step 2</b> If the output of the <b>show interfaces</b> command indicates that the interface is administratively down, bring the interface back up using the <b>no shutdown</b> interface configuration command.</p> <p><b>Step 3</b> If the interface or line protocol is down, check all cabling and connections. Troubleshoot the hardware and the media. For more information, refer to the “Troubleshooting Hardware and Booting Problems” chapter and the “Troubleshooting Serial Line Problems” chapter.</p>
Missing or misconfigured <b>dialer map</b> commands	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see if there are <b>dialer map</b> interface configuration commands configured for the protocols you are using.</p> <p><b>Step 2</b> If there is not a dialer map configured for the protocol you are using, create a dialer map for each protocol.</p> <p>For example, if you want to configure a dialer map for IP, enter <b>dialer map</b> commands similar to the following on the interface:</p> <pre>dialer map ip 172.16.20.2 name C4000 speed 56 broadcast 14155551234 dialer map ip 172.16.20.2 name C4000 speed 56 broadcast 14155556789</pre> <p><b>Step 3</b> If there are already <b>dialer map</b> commands present, make sure that the next hop address is in the same subnet as the local interface address.</p> <p><b>Step 4</b> If you want broadcast traffic to trigger the dialer, make sure that the <b>broadcast</b> keyword is specified in your dialer map statements.</p>
No dialer group configured	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see if there are <b>dialer-group</b> interface configuration command entries present for the interface.</p> <p><b>Step 2</b> If the local interface does not belong to a dialer group, configure the interface as part of a dialer group using the <b>dialer-group group-number</b> interface configuration command. This command associates an interface with a dialer group.</p> <p><b>Step 3</b> Make sure that the <i>group-number</i> is the same number used in the associated <b>dialer-list</b> global configuration commands.</p>
Missing or misconfigured dialer lists	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see if there are <b>dialer-list</b> interface command entries present for the interface.</p> <p><b>Step 2</b> If there are no dialer lists configured, enter the <b>dialer-list protocol</b> or the <b>dialer-list list</b> global configuration command to associate a dialer group with an access list.</p> <p>In the following example, dialer group 1 is associated with access list 101:</p> <pre>dialer-list 1 list 101</pre> <p><b>Step 3</b> Make sure that <b>dialer-list</b> commands reference existing dialer groups and existing access lists, or create the appropriate dialer groups or access lists before attempting to dial.</p>

Possible Problem	Solution
Missing or misconfigured access lists	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see if the access list numbers specified in <b>dialer-list</b> commands refer to existing <b>access-list</b> command entries.</p> <p><b>Step 2</b> If the referenced access list is not defined, dialing will not occur. Configure access lists that define interesting traffic and make sure that the lists are referenced correctly by <b>dialer-list</b> commands.</p> <p>In the following example, IGRP routing updates are classified as uninteresting (they will not cause the router to dial), while all other IP packets are classified as interesting:</p> <pre>access-list 101 deny igrp 0.0.0.0 255.255.255.255 255.255.255.255 0.0.0.0 access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255</pre> <p><b>Step 3</b> If there are access lists already present and they are referenced correctly by <b>dialer-list</b> commands, make sure that the traffic you want to trigger the dialer is defined as interesting by the access list.</p>
Missing <b>pri-group</b> command	<p>On Cisco 7000 series routers, use the <b>pri-group</b> controller configuration command to specify ISDN PRI<sup>1</sup> on a channelized T1 card.</p> <p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see if there is a <b>pri-group</b> command entry.</p> <p><b>Step 2</b> If the command is not present, configure the controller with the <b>pri-group</b> command.</p> <p>Following is an example configuration for a Cisco 7000 series router with a channelized T1 card:</p> <pre>controller t1 0 framing esf line code b8zs pri-group timeslots 1-24</pre>

1. PRI=Primary Rate Interface

## ISDN: Dial Does Not Go Through (BRI)

**Symptom:** ISDN router using a Basic Rate Interface (BRI) port successfully dials, but the call does not go through.

Table 15-2 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-2 ISDN: Dial Does Not Go Through (BRI)**

Possible Problem	Solution
Speed setting mismatch	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check the <b>dialer map</b> interface configuration command entries in the local and remote router. These entries will look similar to the following:</p> <pre>dialer map ip 131.108.2.5 speed 56 name C4000</pre> <p><b>Step 2</b> Compare the speed setting configured on the router interfaces to the speed of your ISDN service. The speeds must be the same. To set the speed on the router, use the <b>speed 56   64</b> keyword in the <b>dialer map</b> command.</p> <p><b>Step 3</b> If you do not know what the speed of your ISDN service is, contact your ISDN provider. Long distance calls are usually 56 Kbps.</p>
Misconfigured dialer map	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for <b>dialer map</b> interface configuration command entries.</p> <p><b>Step 2</b> Make sure that each dialer map contains the phone number of the remote BRI.</p> <p><b>Step 3</b> If the phone number of the remote BRI is properly specified in each dialer map statement but the dial does not go through, the first call failed and there are no numbers left to try.</p> <p><b>Step 4</b> Make sure that a phone number is configured, then clear the interface using the <b>clear interface</b> privileged EXEC command and try dialing again.</p>
Number in use	<p><b>Step 1</b> Turn on ISDN debugging using the following privileged EXEC commands:</p> <pre>C4000#debug isdn event ISDN events debugging is on C4000#debug isdn q931 ISDN Q931 packets debugging is on</pre> <p><b>Step 2</b> If the debug output says “User busy,” the remote ISDN number is probably in use.</p>
Misconfigured SPIDs	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for an <b>isdn spid1 spid-number</b> interface configuration command entry.</p> <p><b>Step 2</b> Verify that the SPID specified in the command is that assigned to you by your service provider.</p>
Incorrect cable	<p><b>Step 1</b> Make sure you use a straight-through RJ-45 cable. To check the cable, hold the RJ-45 cable ends side by side. If the pins are in the same order, the cable is straight-through. If the order of the pins is reversed, the cable is rolled.</p> <p><b>Step 2</b> If you are using a rolled cable, replace it with a straight-through cable.</p>
Port not attached to proper device or port	<p><b>Step 1</b> The ISDN BRI port of a router must be attached to an NT1 device. If the router does not have an internal NT1, obtain and connect an NT1 to the BRI port. (The Cisco 1004 router has an internal NT1. An internal NT1 is optional in the Cisco 2524 and 2525 routers.)</p> <p><b>Step 2</b> Make sure that the BRI or terminal adapter is attached to the S/T port of the NT1.</p>

Possible Problem	Solution
Layer 1 logic states hung	<p><b>Step 1</b> Check the status lights on the NT1. For information on interpreting the status lights, refer to the hardware documentation for the NT1.</p> <p><b>Step 2</b> If the NT1 status lights do not indicate a problem, check the NT1 for a switch to set the ohm termination. If it is present, set the switch to 100 ohms.</p> <p><b>Step 3</b> Power cycle the NT1.</p> <p><b>Step 4</b> Check the output of the <b>show isdn status</b> privileged EXEC command. The command output should say "Layer 1 active."</p> <p><b>Step 5</b> If the router still does not dial, clear the BRI interface using the <b>clear interface bri</b> privileged EXEC command.</p> <p><b>Step 6</b> Again check the output of the <b>show isdn status</b> command to see if Layer 1 is active.</p> <p><b>Step 7</b> If Layer 1 is not active, contact your carrier to confirm the connection.</p>
Media problem	For information on troubleshooting WAN media, refer to the appropriate chapter for your media and WAN implementation elsewhere in this publication.
Hardware problem	<p><b>Step 1</b> Use the <b>show isdn status</b> privileged EXEC command. The output of this command should indicate "Layer 1 active."</p> <p><b>Step 2</b> If the output does not say "Layer 1 active," verify that the configured switch type is correct (check with your service provider to find out the correct switch type).</p> <p><b>Step 3</b> Check the cable connecting the BRI or terminal adapter to the telco jack or NT1. Replace the cable if it is damaged.</p> <p><b>Step 4</b> Make sure the NT1 is functioning correctly. If there is faulty or malfunctioning hardware, replace as necessary.</p> <p><b>Step 5</b> Make sure that the router is functioning correctly. If there is faulty or malfunctioning hardware, replace as necessary. For more information, refer to the "Troubleshooting Hardware and Booting Problems" chapter.</p>

## ISDN: Dial Does Not Go Through (PRI)

**Symptom:** ISDN router using a PRI port successfully dials, but the call does not go through.

Table 15-3 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-3 ISDN: Dial Does Not Go Through (PRI)**

Possible Problem	Solution
Speed setting mismatch	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check the <b>dialer map</b> interface configuration command entries in the local and remote router. These entries will look similar to the following:</p> <pre>dialer map ip 131.108.2.5 speed 56 name C4000</pre> <p><b>Step 2</b> Compare the speed setting configured on the router interfaces to the speed of your ISDN service. The speeds must be the same. To set the speed on the router, use the <b>speed 56   64</b> keyword in the <b>dialer map</b> command.</p> <p><b>Note:</b> If the speed is not explicitly specified, the <b>dialer map</b> defaults to 64 Kbps.</p> <p><b>Step 3</b> If you do not know what the speed of your ISDN service is, contact your ISDN provider. Long distance calls are usually 56 Kbps.</p>
Misconfigured dialer map	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for <b>dialer map</b> interface configuration command entries.</p> <p><b>Step 2</b> Make sure that each dialer map contains the phone number of the remote PRI.</p> <p><b>Step 3</b> If the phone number of the remote PRI is properly specified in each dialer map statement but the dial does not go through, the first call failed and there are no numbers left to try.</p> <p><b>Step 4</b> Make sure that a phone number is configured, then clear the interface using the <b>clear interface</b> privileged EXEC command and try dialing again.</p>
Number in use	<p><b>Step 1</b> Turn on ISDN debugging using the <b>debug isdn events</b> privileged EXEC command.</p> <p><b>Step 2</b> If the debug output says “User busy,” the remote ISDN number is probably in use.</p>
Mismatched framing or linecoding	<p><b>Step 1</b> Use the <b>show controllers t1</b> privileged EXEC command to see the framing and linecoding types currently configured on the MIP<sup>1</sup> card.</p> <p><b>Step 2</b> Compare the configured framing and linecoding with those configured on the CSU. (Refer to the vendor documentation for information on how to check the CSU configuration.) The framing and linecoding configured on the MIP card and the CSU must be the same.</p> <p><b>Step 3</b> Change the framing or linecoding types as necessary to make them the same on the MIP card and the CSU.</p> <p>On the router, use the following controller configuration commands to configure the framing and linecoding on the MIP card:</p> <pre>c7000(config)#controller t1 interface-number c7000(config-controller)#framing [esf sf] c7000(config-controller)#linecode [ami b8zs]</pre> <p>On the CSU, consult the vendor documentation for information on changing the configuration.</p>

Possible Problem	Solution
Incorrect cable	<p><b>Step 1</b> Make sure you using a straight-through DB-15 cable.</p> <p><b>Step 2</b> If you are using any other cable, replace it with a straight-through DB-15 cable.</p>
Port not attached to proper device or port	The ISDN PRI port of a router must be attached to a CSU device. If the port is not connected to a CSU, obtain a CSU and attach the PRI port to it.
Layer 1 logic states hung	<p><b>Step 1</b> Check the status lights of the CSU. For information on interpreting the status lights, refer to your vendor documentation.</p> <p><b>Step 2</b> If the CSU status lights do not indicate a problem, power cycle the CSU.</p> <p><b>Step 3</b> Check the output of the <b>show isdn status</b> privileged EXEC command. The command output should say "Layer 1 active."</p> <p><b>Step 4</b> If the router still does not dial, clear the PRI interface using the <b>clear interface serial</b> privileged EXEC command.</p> <p><b>Step 5</b> Again check the output of the <b>show isdn status</b> command to see if Layer 1 is active.</p> <p><b>Step 6</b> If Layer 1 is not active, contact your carrier to confirm the connection.</p>
Media problem	For information on troubleshooting WAN media, refer to the appropriate chapter for your media elsewhere in this publication.
Hardware problem	<p><b>Step 1</b> Use the <b>show isdn status</b> privileged EXEC command. The output of this command should indicate "Layer 1 active."</p> <p><b>Step 2</b> If the output does not say "Layer 1 active," verify that the configured switch type is correct (check with your service provider to find out the switch type).</p> <p><b>Step 3</b> Check the cable connecting the PRI to the CSU. Replace the cable if it is damaged.</p> <p><b>Step 4</b> Make sure that the router is functioning correctly. If there is faulty or malfunctioning hardware, replace as necessary. For more information, refer to the "Troubleshooting Hardware and Booting Problems" chapter.</p>

1. MIP=MultiChannel Interface Processor

## ISDN: No Communication with Remote Router

**Symptom:** ISDN connection attempts are successful, but attempts to **ping** or otherwise communicate with the remote ISDN router interface fail.

Table 15-4 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-4 ISDN: No Communication with Remote Router**

Possible Problem	Solution
CHAP misconfigured	<p><b>Step 1</b> Use the <b>debug ppp chap</b> privileged EXEC command.</p> <p><b>Step 2</b> Try to <b>ping</b> the remote router. Look for the message, “Passed chap authentication.”</p> <p><b>Step 3</b> If you do not see this message, use the <b>show running-config</b> privileged EXEC command to view the router configuration. Make sure that the <b>ppp authentication chap</b> interface configuration command is configured on both the local and remote router.</p> <p><b>Step 4</b> Check <b>username</b> global configuration command entries. Make sure that username statements use the hostname of the remote router. Make sure that the passwords on both the local and remote router are identical. Use the <b>username</b> command to add or alter username entries. For more information, refer to the Cisco IOS configuration guides and command references.</p>
PPP encapsulation not configured on interface	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the interface state. Check the output to see if the <b>encapsulation ppp</b> interface configuration command is present.</p> <p><b>Step 2</b> If PPP encapsulation is not configured, configure the interface with the <b>encapsulation ppp</b> command.</p> <p><b>Step 3</b> Verify that PPP encapsulation is being used by checking the <b>show running-config</b> output again.</p>
No route to remote network	<p><b>Step 1</b> Enter the <b>show route</b> privileged EXEC command for the particular protocol you are using. For example, if you are using IP, enter <b>show ip route ip-address</b>. If the output says “Network not in table” there is no route to the remote network.</p> <p><b>Step 2</b> If there are no routes to remote networks, you need to add static routes using the appropriate command for the protocol you are running. For example, to configure static IP routes, use the <b>ip route</b> global configuration command.</p> <p><b>Step 3</b> You also need to configure floating static routes, so that there will be routes to the remote networks if the primary link goes down.</p> <p>For information on configuring floating static routes, refer to the Cisco IOS <i>Wide-Area Networking Configuration Guide</i> and <i>Wide-Area Networking Command Reference</i>.</p>
Misconfigured <b>dialer map</b> command	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for <b>dialer map</b> interface configuration command entries.</p> <p><b>Step 2</b> Make sure that the dialer maps point to the correct next hop address. Also ensure that the next hop address is in the same subnet as the local DDR interface address.</p>



Possible Problem	Solution
Missing <b>dialer-group</b> command	<p><b>Step 1</b> A dialer group must be configured on the local and remote router interfaces. Use the <b>show running-config</b> privileged EXEC command to view the remote router configuration. Look for a <b>dialer-group</b> interface configuration command entry.</p> <p><b>Step 2</b> If the remote router interface has no <b>dialer-group</b> command entry, you must configure a dialer group on the interface. Use the <b>dialer-group group-number</b> interface configuration command. Make sure that the group number corresponds to the group number referenced in <b>dialer list</b> command entries.</p> <p>For more information, refer to the Cisco IOS <i>Wide-Area Networking Configuration Guide</i> and <i>Wide-Area Networking Command Reference</i>.</p>

## ISDN: No Communication End-to-End

**Symptom:** ISDN connection attempts are successful, but attempts to **ping** or otherwise communicate end-to-end over an ISDN connection are unsuccessful.

Table 15-5 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-5**      **ISDN: No Communication End-to-End**

Possible Problem	Solution
No default gateway configured on end systems	<p><b>Step 1</b> Check the configuration of local and remote end systems. Make certain that end systems are configured with a default-gateway specification.</p> <p><b>Step 2</b> If end systems are not configured with a default gateway, you must configure one. For information on configuring your end system, refer to the vendor documentation.</p> <p><b>Step 3</b> If there is already a default gateway specification, make sure that it points to the correct address.</p> <p>The default gateway should point to a local router LAN interface.</p>
No route to remote network	<p><b>Step 1</b> Enter the <b>show route</b> privileged EXEC command for the particular protocol you are using. For example, if you are using IP, enter <b>show ip route ip-address</b>. If the output says “Network not in table” then there is no route to the remote network.</p> <p><b>Step 2</b> If there are no routes to remote networks, you need to add static routes using the appropriate command for the protocols you are running. For example, to configure static IP routes, use the <b>ip route</b> global configuration command.</p> <p><b>Step 3</b> You also need to configure floating static routes so there will be routes to the remote networks after the primary link goes down.</p> <p>For information on configuring floating static routes, refer to the Cisco IOS <i>Wide-Area Networking Configuration Guide</i> and <i>Wide-Area Networking Command Reference</i>.</p>
LAN media problem	Make certain that your LAN media is functioning properly and that addressing and other configurations are correct. For more information on troubleshooting LAN problems, refer to the “Troubleshooting LAN Media Problems” chapter.
Hardware problem	<p><b>Step 1</b> Check all hardware on end systems (workstations and servers). Replace any damaged or malfunctioning hardware.</p> <p><b>Step 2</b> Check all router hardware. Replace any damaged or malfunctioning router hardware. For more information, refer to the “Troubleshooting Hardware and Booting Problems” chapter.</p>

## ISDN: Second B Channel Does Not Come Up

**Symptom:** When using a second B channel as a backup connection to a single destination, the second B channel does not come up.

Table 15-6 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-6 ISDN: Second B Channel Does Not Come Up**

Possible Problem	Solution
Missing or misconfigured <b>dialer load-threshold</b> command	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer load-threshold</b> interface configuration command entry.</p> <p><b>Step 2</b> If the command is not present, configure the router interface with the <b>dialer load-threshold load</b> command. This command specifies what the load on the first B channel must be before the second B channel is activated.</p> <p><b>Note:</b> The range is from 1 to 255.</p> <p><b>Step 3</b> If the command is already configured, make sure that the load value specified is not too high. Reduce the specified load in increments of 25 or 50 to see if the second channel will come up.</p>
No dialer map configured for second B channel	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for <b>dialer map</b> interface configuration command entries.</p> <p><b>Step 2</b> If there is not a dialer map configured for the second remote ISDN telephone number, configure one for the missing telephone number.</p> <p>In some topologies (PRIs, or a BRI with a 5ESS switch), one telephone number refers to both B channels. If this is the case, you will not be able to add a second <b>dialer map</b> statement.</p>
No SPID specified for second B channel (BRI only)	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Look for <b>isdn spid1</b> interface configuration command entries.</p> <p><b>Step 2</b> Make sure that there are <b>isdn spid1</b> command entries for each of the B channels. Make sure that the specified SPIDs are those assigned to you by your service provider.</p>
No second B channel on remote router	The remote ISDN router must have at least two B channels for the local router to be able to use its second B channel. Contact your service provider to find out whether the remote ISDN router has at least two B channels.

# ISDN: Second B Channel Comes Up Too Late

**Symptom:** When using a second B channel as a backup connection to a single destination, the load on the first B channel is higher than desired before the second B channel comes up.

Table 15-7 outlines the problems that might cause this symptom and describes solutions to those problems.

Table 15-7      ISDN: Second B Channel Comes Up Too Late

Possible Problem	Solution
Misconfigured <b>dialer load-threshold</b> command	<div><div><b>Step 1</b></div><div>Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check the <b>dialer load-threshold</b> interface configuration command entry.</div><div><b>Step 2</b></div><div>Make sure that the value configured by this command is not too high. This command specifies what the load on the first B channel must be before the second B channel is activated.</div><div><b>Note:</b> The range is from 1 to 255.</div><div><b>Step 3</b></div><div>If the load value specified is too high, decrease the specified load in increments of 25 or 50 to allow the second B channel to dial earlier.</div></div>

## ISDN: Second B Channel Comes Up Too Early

**Symptom:** When using a second B channel as a backup connection to a single destination, the second B channel comes up before the load on the first B channel is high enough.

Table 15-8 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-8**      **ISDN: Second B Channel Comes Up Too Early**

Possible Problem	Solution
Misconfigured <b>dialer load-threshold</b> command	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check the <b>dialer load-threshold</b> interface configuration command entry.</p> <p><b>Step 2</b> Make sure that the value configured by this command is not too low. This command specifies what the load on the first B channel must be before the second B channel is activated.</p> <p><b>Note:</b> The range is from 1 to 255.</p> <p><b>Step 3</b> If the load value specified is too low, increase the specified load in increments of 25 or 50 to allow the load on the first B channel to reach a greater value before the second B channel dials.</p>

## ISDN: Slow Performance

**Symptom:** ISDN connections are successfully established and communication occurs, but performance across the link is slow.

Table 15-9 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-9 ISDN: Slow Performance**

Possible Problem	Solution
Hold queues too small	<p><b>Step 1</b> Check for input or output drops on the ISDN interface:</p> <ul style="list-style-type: none"> <li>For a BRI interface, use the <b>show interfaces bri number 1 2</b> privileged EXEC command</li> <li>For a PRI interface, use the <b>show interfaces serial slot/port</b> privileged EXEC command</li> <li>For a serial interface, use the <b>show interfaces serial number</b> privileged EXEC command</li> </ul> <p>Look for drops in the command output. The output line looks similar to the following:</p> <pre>output queue 0/40 0 drops; input queue 0/75 0 drops</pre> <p><b>Step 2</b> If there are excessive drops on the interface, use the appropriate <b>clear counters</b> privileged EXEC command to clear the interface counters. Check for drops on the interface again. If the values are incrementing, you should increase the size of the input or output hold queues.</p> <p><b>Step 3</b> Increase the hold queue for the interface that is dropping packets. Use the <b>hold-queue length out</b> or the <b>hold-queue length in</b> interface configuration command, depending on whether you are seeing output or input drops on the interface.</p> <p>Increase these queues by small increments (for instance, 25%) until you no longer see drops in the <b>show interfaces</b> output.</p>
Poor line quality	<p><b>Step 1</b> Check for input or output errors on the ISDN interface.</p> <ul style="list-style-type: none"> <li>For a BRI interface, use the <b>show interfaces bri number 1 2</b> privileged EXEC command</li> <li>For a PRI interface, use the <b>show interfaces serial slot/port</b> privileged EXEC command</li> <li>For a serial interface, use the <b>show interfaces serial number</b> privileged EXEC command.</li> </ul> <p>Look for errors in the command output. The output lines look similar to the following:</p> <pre>0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort   0 packets output, 0 bytes, 0 underruns   0 output errors, 0 collisions, 2 interface resets</pre> <p><b>Step 2</b> If there are excessive errors on the interface, use the appropriate <b>clear counters</b> privileged EXEC command to clear the interface counters. Check for errors on the interface again. If the values are incrementing, it is probably the result of poor line quality.</p> <p><b>Step 3</b> Reduce the line speed to 56 Kbps to see if the error rate slows or stops.</p> <p><b>Step 4</b> Contact your carrier to see if something can be done to improve the line quality. Make sure the DCE device is configured properly as well.</p>

## ISDN: Line Disconnects Too Slowly

**Symptom:** ISDN connections are successfully established but idle connections do not disconnect quickly enough.

Table 15-10 outlines the problems that might cause this symptom and describes solutions to those problems.

**Table 15-10 ISDN: Line Disconnects Too Slowly**

Possible Problem	Solution
No <b>dialer hold-queue</b> command configured	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer hold-queue</b> interface configuration command entry.</p> <p><b>Step 2</b> Configure the <b>dialer hold-queue packets</b> command on the outgoing interface if it is not present already. This command allows interesting outgoing packets to be queued until a modem connection is established.</p> <p>The number of packets specified by this command should be under 20.</p>
Misconfigured <b>dialer idle-timeout</b> command	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer idle-timeout</b> interface configuration command entry.</p> <p>If the command is not present under the interface, the interface will use the default of 120 seconds.</p> <p><b>Step 2</b> Check the value specified by this command. If the ISDN line disconnects too slowly when idle, the value is probably set too high.</p> <p><b>Step 3</b> Decrease the value specified by the <b>dialer idle-timeout</b> command. This will force connections to disconnect more quickly when they are idle.</p>
<b>dialer fast-idle</b> time too high	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer fast-idle</b> interface configuration command entry.</p> <p>This command will not appear in the configuration unless it has been changed from the default.</p> <p><b>Step 2</b> Check the value specified by this command. If there is contention for an ISDN line but an idle connection does not disconnect quickly enough, the value is probably set too high.</p> <p><b>Step 3</b> Decrease the value specified by the <b>dialer fast-idle</b> command. This will force idle connections to disconnect more quickly when there is contention for the line.</p>
Dialer list <b>access-list</b> commands not restrictive enough	<p><b>Step 1</b> Use the <b>show access-list</b> privileged EXEC command to see the access lists configured on the router. Access lists determine which packets will cause dialing to occur and which packets will reset the idle-timer, keeping the connection up.</p> <p><b>Step 2</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check to see which access lists are applied to the interface with <b>dialer-list</b> commands.</p> <p><b>Step 3</b> Examine the specified access lists to make sure that the line is not being kept up for uninteresting traffic. The access lists need to be more restrictive if the line never goes down.</p> <p>In particular, make sure that routing updates or SNMP packets do not reset the idle timer or bring the line up.</p> <p><b>Step 4</b> If necessary, modify access lists to restrict uninteresting traffic.</p>

# ISDN: Line Disconnects Too Quickly

**Symptom:** ISDN connections are successfully established but connections disconnect too quickly when idle.

Table 15-11 outlines the problems that might cause this symptom and describes solutions to those problems.

Table 15-11      ISDN: Line Disconnects Too Quickly

Possible Problem	Solution
Misconfigured <b>dialer idle-timeout</b> command	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer idle-timeout</b> interface configuration command entry. If the command is not present on the interface, the interface will use the default of 120 seconds.</p> <p><b>Step 2</b> Check the value specified by this command. If the ISDN line disconnects too quickly when idle, the value is probably set too low.</p> <p><b>Step 3</b> Increase the value specified by the <b>dialer idle-timeout</b> command. This will allow connections to stay idle longer before disconnecting.</p>
<b>dialer fast-idle</b> time too high	<p><b>Step 1</b> Use the <b>show running-config</b> privileged EXEC command to view the router configuration. Check for a <b>dialer fast-idle</b> interface configuration command entry. This command will not appear in the configuration unless it has been changed from the default of 20 seconds.</p> <p><b>Step 2</b> Check the value specified by this command. If there is contention for an ISDN line and the line disconnects too quickly, the value is probably set too low.</p> <p><b>Step 3</b> Increase the value specified by the <b>dialer fast-idle</b> command. This will allow idle connections to stay connected longer when there is contention for the line.</p>