

Understanding debug isdn q931 Disconnect Cause Codes

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Introduction

This document explains how to interpret Integrated Services Digital Network (ISDN) disconnect cause codes. The ISDN disconnect cause code appears in the **debug isdn q931** command output, and indicates the reason for call disconnection.

Note: Activate the **debug isdn q931** command for this exercise. Remember that the **debug isdn q931** command generates a large volume of debugs. Refer to Important Information on Debug Commands for more information on the safe use of debugs.

Here is a sample output of the **debug isdn q931** command. The output indicates the disconnect cause code for a failed ISDN call:

```
Calling#ping 10.10.10.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.2, timeout is 2 seconds:
20:52:14: ISDN BR0: TX -> SETUP pd = 8 callref = 0x2E
20:52:14: Bearer Capability i = 0x8890
20:52:14: Channel ID i = 0x83 20:52:14: Keypad Facility i = '5551111'
20:52:15: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0xAE
20:52:15: Channel ID i = 0x89

20:52:16: ISDN BR0: RX <- PROGRESS pd = 8 callref = 0xAE
20:52:16: Progress Ind i = 0x8A81 - Call not end-to-end ISDN,
may have in-band info
20:52:16: Signal i = 0x01 - Ring back tone on
20:52:34: ISDN BR0: RX <- DISCONNECT pd = 8 callref = 0xAE
20:52:34: Cause i =0x829F08 - Normal,unspecified or Special intercept,
call blocked group restriction
20:52:34: ISDN BR0: TX -> RELEASE pd = 8 callref = 0x2E
20:52:34: ISDN BR0: RX <- RELEASE_COMP pd = 8 callref = 0xAE
```

The **0x** in the disconnect code indicates that the subsequent bytes are in hexadecimal format and are not part of the actual code. This table provides a breakdown of the code after you strip the 0x from the debug output:

Cause i =		0x829F08	
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Parsed Hex Bytes	82	9F	08
Description	Cause Code Origination Point	Disconnect Cause Code	Optional Diagnostic field

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document is based on the devices in a specific lab environment. All of the devices 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.

Cause Code Origination Point

The first byte (most significant) after 0x indicates the point in the circuit path where the disconnect cause code appears. Consider the sample output in the Introduction section. 82 indicates that the call disconnects from the local telco switch. Here is a list of cause code origination points that help you interpret where the call disconnects from:

- 80 the router
- 81 the private network near the local user (possibly a local private branch exchange [PBX])
- 82 the public network near the local user (local telco switch)
- 83 the transit network (in the ISDN cloud)
- 84 the public network near the remote user (remote telco switch)
- 85 the private the network near the remote user (possibly a remote PBX)
- 87 the international network
- 8A a network beyond the internetworking point

Disconnect Cause Code

The next byte (9F in the sample output) that follows the cause code origination point byte is the Disconnect Cause Code. This byte helps you to troubleshoot the disconnection.

Use this table to associate a Disconnect Cause Code (in Hex) and the Cause Description to determine the disconnect reason:

		Additional Information
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Hex Code	Cause Description	
80	Normal Disconnect	The call disconnects normally.
81	Unallocated or unassigned number	The switch receives the ISDN number in the correct format. However, the number does not belong to destination equipment.
82	No route to specified network	<p>The ISDN exchange receives a request to route the call through an unrecognized intermediate network.</p> <p>This cause indicates that the equipment receives a request to route the call through a particular transit network. However, the equipment does not recognize the network.</p> <p>The equipment that sends this cause does not recognize the transit network due to one of these reasons:</p> <ul style="list-style-type: none"> • The transit network does not exist. • The transit network exists, but does not serve the equipment that sends this cause. <p>This cause is supported on a network-dependent basis.</p>
83	No route to destination	<p>The call routes through an intermediate network that does not serve the destination address.</p> <p>This cause indicates that the called user is not reachable. A user is not reachable when the network used to route the call does not serve the required destination.</p> <p>This cause is supported on a network-dependent basis.</p>
84	Send special information tone	<p>The remote number you dialed is not reachable.</p> <p>Check the number you dial. Verify if you need any prefixes to access the network. For example, you need to dial 9 for outbound calls through a PBX. Contact your telco/PBX</p>

		administrator for details.
85	Misdialled trunk prefix.	<p>The remote number you dialed is not reachable.</p> <p>Check the number you dial. Verify if you need any prefixes to access the network. For example, you need to dial 9 for outbound calls through a PBX. Contact your telco/PBX administrator for details.</p>
86	Channel unacceptable	<p>The service quality of the specified channel is insufficient to accept the connection. The call attempt fails because the channel is unusable.</p> <p>If you use a PBX, check the configuration of the PBX. For a PRI, find out how many channels your telco provides.</p>
87	Call awarded and delivered in established channel	<p>The user assigns an incoming call that connects to an already established call channel.</p> <p>This cause indicates that the user receives an incoming call, which connects to a channel already in use for similar calls (for example, packet-mode X.25 virtual calls).</p>
88	Preemption	<p>Your call is blocked. Calls are sometimes blocked if another call has a higher priority than your call. This situation is common with voice calls. Wait and call again later.</p> <p>If you use a PBX (or the remote site to which you connect uses a PBX), check the configuration of the PBX. If the condition persists, contact your telco.</p>
89	Preemption, circuit reserved for re-use	<p>Your call is blocked. Calls are sometimes blocked if another call has a higher priority than your call. This situation is common with voice calls. Wait and call again later.</p> <p>If either side uses a PBX, check the configuration of the PBX. If the condition persists, contact your telco.</p>
90		

	Normal call clearing	<p>Normal call clearing occurs. You do not need to perform any action.</p> <p>This cause indicates that the call disconnects because one of the users involved in the call has made a request to clear the call. Under normal situations, the network is not the source of this cause.</p> <p>If the call fails with this Disconnect Cause Code, the call most likely fails at a higher layer protocol such as PPP, authentication or idle timeout related issues. Verify the router configuration.</p> <p>Also, if you have requested a callback, the remote device disconnects the call, generates this code, and then calls you back.</p>
91	User busy	<p>The called system acknowledges the connection request. However, the system cannot accept the call because all B-channels are in use. The user equipment is compatible with the call in this situation.</p> <p>Note: If you have multiple ISDN circuits, the telco can configure them in a "hunt-group", in which calls switch to the next available circuit.</p>
92	No user response	<p>The connection fails because the destination does not respond to the call.</p> <p>This cause indicates that a user does not respond to a call establishment message within the prescribed period. The user must respond with either an alert or connect indication according to ITU-T Q.931, when either timer T303 or T310 expires.</p>
93	No answer from user	<p>The destination responds to the connection request but fails to complete the connection within the prescribed time. This cause indicates that a user has provided an alert indication, but has not provided a connect indication within a prescribed period. Q.931 procedures do not</p>

		<p>necessarily generate this cause. Internal network timers sometimes generate this cause.</p> <p>The problem is at the remote end of the connection.</p>
94	Subscriber absent	<p>The remote device you attempt to reach is unavailable and is disconnected from the ISDN network.</p> <p>Contact the person responsible for that device.</p>
95	Call rejected	<p>The destination is able to accept the call but rejects the call for an unknown reason.</p> <p>This cause indicates that the equipment that sends this cause does not want to accept this call.</p> <p>Note: The equipment <i>is able to</i> accept the call because the equipment that sends this cause is neither busy nor incompatible. However, the equipment rejects the call.</p>
96	Number changed	<p>The ISDN number used to set up the call does not belong to a system.</p> <p>A caller receives this cause when the called party number is no longer assigned. You can optionally include the new called party number in the diagnostic field. If a network does not support this capability, the caller receives cause No. 81, unassigned (unallocated) number.</p>
97	Redirection to new destination	<p>Your call is routed to a different ISDN number.</p> <p>Check the number you call. Also verify the PBX configuration (if you use PBX).</p>
99	Exchange routing error	<p>Your call cannot be successfully routed to the remote party.</p> <p>Check the number you call. Also verify the PBX configuration (if you use PBX).</p>
9A		

	Non-selected user clearing	The destination is able to accept the call. However, the destination rejects the call because the call is not assigned to a user.
9B	Destination out of order	<p>The destination is not reachable because of an interface malfunction. In addition, a signaling message cannot be delivered. This condition can be temporary. However, the condition can last for an extended period in some cases.</p> <p>This cause indicates that a signaling message could not be delivered to the remote user. For example, a physical layer or data link layer fails at the remote user end, and the user equipment is off-line (turned off).</p>
9C	Invalid number format	<p>The connection fails because the destination address is in an unrecognizable format, or is incomplete.</p> <p>Verify whether the format of the number is correct. This includes any appropriate digits for a PBX, and long distance.</p>
9D	Facility rejected	The network cannot provide the facility that the user requests.
9E	Response to STATUS ENQUIRY	The status message appears in direct response to the receipt of a status inquiry message.
9F	Normal, unspecified	This message reports the occurrence of a normal event when no standard cause applies. No action is required.
A1	Circuit out of order	The call cannot go through due to some problem in the ISDN network.
A2	No channel available	The connection fails because no appropriate channel is available to take the call.
A3	Destination unattainable	The destination is not reachable through the Telco network. Contact the Telco.
A4	Out of order	<p>Some part of the network necessary to route the call is out of order.</p> <p>The destination is not reachable because of a network malfunction.</p>

		<p>The condition can last for an extended period. An immediate attempt to reconnect will probably fail.</p> <p>If you use a long distance carrier, try to use a Presubscribed Inter-exchange Carrier (PIC). For example, you can use a 10-10-xyz carrier. A PIC enables you to verify whether the problem lies with the long distance carrier.</p>
A6	Network out of order	<p>The destination is not reachable because of a network malfunction. The condition can last for an extended period. An immediate attempt to reconnect will probably fail.</p> <p>If you use a long distance carrier, try to use a Presubscribed Inter-exchange Carrier (PIC). For example, you can use a 10-10-xyz carrier. A PIC enables you to verify whether the problem lies with the long distance carrier.</p>
A7	Permanent frame mode connection out of service	<p>This message indicates that equipment failure probably terminates the permanent connection.</p> <p>If the problem persists, contact your telco</p>
A8	Permanent frame mode connection operational	<p>This message occurs when the permanent connection is fully operational again after a termination. Equipment failure probably terminated the connection previously.</p>
A9	Temporary failure	<p>An error occurs because of a network malfunction. Contact the telco if the problem persists.</p>
AA	Switching equipment congestion	<p>The destination is not reachable because of a temporary overload on the network switching equipment. Try again later.</p>
AB	Access information discarded	<p>The network cannot provide the access information that the user requests.</p> <p>This cause indicates that the network is unable to deliver access information to the remote user. For example,</p>

		<p>user-to-user information, low layer compatibility, high layer compatibility, or a sub-address as the diagnostic indicates.</p> <p>Note: You have the option to include the particular type of discarded access information in the diagnostic.</p>
AC	Requested channel not available	The remote equipment cannot provide the channel that the user requests, due to an unknown reason. This problem is usually temporary.
AF	Resources unavailable, unspecified	The channel or service that the user requests is unavailable for an unknown reason. This problem is usually temporary.
B1	Quality of service (QoS) unavailable	<p>The network cannot provide the quality of service that the user requests. This issue can occur due to a subscription problem.</p> <p>This cause reports that the network cannot provide the QoS as defined in Recommendation X.213. For example, this cause code appears when the network cannot support throughput or transit delay.</p>
B2	Requested facility not subscribed	<p>The remote equipment supports the supplementary service by subscription only.</p> <p>This cause indicates that the network cannot provide the supplementary service that the user requests. The user has probably not completed the necessary administrative arrangements with the supporting networks.</p> <p>The ISDN network can also return this cause code when a user makes a call attempt, but does not enter the SPIDs, or enters the SPIDs incorrectly. Ensure that your SPIDs are correct, or contact your telco to verify your SPIDs.</p> <p>Also verify the speed of the outgoing call that the ISDN network supports (56k or 64k).</p>
B4		

	Outgoing calls barred	There is some restriction on outgoing calls. The ISDN network does not allow you to make outgoing calls.
B5	Outgoing calls barred within CUG ¹	There is some restriction on outgoing calls. The ISDN network does not allow you to make outgoing calls.
B6	Incoming calls barred	The ISDN network does not allow you to receive calls. Contact your telco.
B7	Incoming calls barred within CUG ¹	The ISDN network does not allow you to receive calls. Contact your telco.
B9	Bearer capability not authorized	A subscription problem usually causes this issue. This cause indicates that the user requests a bearer capability that the equipment implements, but the user does not have the authorization to use the capability.
BA	Bearer capability not presently available	The network normally provides the bearer capability that the user requests. However, if the capability is unavailable currently, this cause appears. A temporary network problem or a subscription problem can cause this issue. If the incoming call is Analog (modem call), verify whether you have an ISDN incoming voice-modem under the PRI or BRI physical interface.
BF	Service/option not available, unspecified	The network or remote equipment cannot provide the service option that the user requests, due to an unspecified reason. A subscription problem can cause this issue.
C1	Bearer capability not implemented	The network cannot provide the bearer capability that the user requests. Contact the telco to troubleshoot further.
C2	Channel type not implemented	The network or the destination equipment does not support the channel type that the user requests.

C5	Requested facility not implemented	The remote equipment does not support the supplementary service that the user requests.
C6	Only restricted digital info bearer capability available	The network cannot provide unrestricted digital information bearer capability. This cause indicates that a device requests an unrestricted bearer service. However, the equipment only supports the restricted version of the bearer capability.
CF	Service/option not implemented, unspecified	The network or remote equipment cannot provide the service option that the user requests, due to an unspecified reason. A subscription problem can cause this issue.
D1	Invalid call reference value	The remote equipment receives a call with a call reference that is not currently in use on the user-network interface.
D2	Identified channel does not exist	The user requests the receiving equipment to use a channel that is not activate on the interface for calls. This cause indicates that the equipment receives a request to use an inactive channel on the interface for a call. For example, if a user subscribes to those channels on a primary rate interface numbered from 1 to 12 and the user equipment or the network attempts to assign a call to channels 13 through 23, this cause code appears.
D3	Suspended call exists, but call id does not	The network receives a call resume request. The call resume request contains a Call Identify (ID) information element that indicates the call ID that represents a suspended call. This cause indicates that a user attempts to resume a call with a call ID which differs from the ID in use for any currently suspended call(s).
D4	Call id in use	The network receives a call resume request. The call resume request contains a Call ID information

		<p>element that indicates the resume request is for a suspended call.</p> <p>This cause indicates that the network receives a call suspend request. The call suspend request contains a call ID (including the null call ID). This ID is already in use for a suspended call within the domain of interfaces over which the call can be resumed.</p>
D5	No call suspended	<p>The network receives a call resume request when there is no suspended call pending. You can resolve this transient error through successive call retries.</p> <p>This cause code indicates that the network receives a call resume request. The call resume request contains a call ID information element that currently does not indicate any suspended call within the domain interfaces over which calls can be resumed.</p>
D6	Call with requested call id has been cleared	<p>This cause indicates that the network receives a call resume request. The call resume request contains a call ID information element that originally indicated a suspended call. However, either a network timeout or a remote user clears the suspended call.</p>
D7	User not member of CUG ¹	<p>Your call does not go through, probably due to one of these reasons:</p> <ul style="list-style-type: none"> • You dial an incorrect ISDN number. • You request a service that you are not authorized to use (you have not subscribed to this service). • The remote device is not authorized to use a service that you use. <p>Check the number you call. If the problem persists, contact your telco.</p>
D8	Incompatible destination	<p>This cause indicates an attempt to connect to non-ISDN equipment. For example, an analog line.</p>

		<p>This cause indicates that the equipment receives a request to establish a call that has a low layer compatibility, high layer compatibility, or other compatibility attributes (for example, data rate) that the equipment cannot accommodate.</p> <p>This code often appears when the calling device dials the wrong number, and reaches a non-ISDN device. Therefore, ensure that you dial the correct number.</p> <p>This cause can also occur when a a data call is made to a voice number, or a voice call is made to a number that only supports data. If the number is correct, check whether the telco has configured their switch incorrectly.</p>
DA	Non-existent CUG ¹	<p>Your call does not go through, probably due to one of these reasons:</p> <ul style="list-style-type: none"> • You dial an incorrect ISDN number. • You request a service that you are not authorized to use (you have not subscribed to this service). • The remote device is not authorized to use a service that you use. <p>Check the number you dial. If the problem persists, contact your telco.</p>
DB	Invalid transit network selection	<p>The device requests the ISDN exchange to route the call through an unrecognized intermediate network.</p> <p>This cause indicates that the ISDN exchange receives a transit network identification of an incorrect format. Annex C of ITU-T Q.931 provides this definition.</p>
DF	Invalid message, unspecified	<p>An invalid message appears with no standard cause. This problem usually occurs due to a D-channel error. If the error occurs systematically, report the error to your ISDN service provider.</p>
E0		

	Mandatory IE missing	<p>The receiving equipment receives a message that does not include one of the mandatory information elements.</p> <p>This cause indicates that the equipment receives a message that does not contain an information element that is necessary for the equipment to process the message.</p> <p>This problem occurs due to a D-channel error. Ensure that you configure the switch type correctly. Upgrade your Cisco IOS® Software on the router to solve this issue. If the error occurs systematically, report the error to your ISDN service provider.</p>
E1	Message type not implemented	<p>The receiving equipment receives an unrecognized message, because either the message type is invalid, or the equipment does not support the message type. A problem with the remote configuration or with the local D-channel causes this issue.</p>
E2	Message not compatible with call state or not implemented	<p>The remote equipment receives an invalid message with no standard cause.</p> <p>This cause indicates that the equipment receives a message that is not permissible in the call state according to the procedures. This cause can also indicate that the equipment receives a STATUS message to indicate an incompatible call state.</p> <p>The issue occurs due to a D-channel error. If the error recurs, report the error to your ISDN service provider.</p>
E3	IE not implemented	<p>The remote equipment receives a message that includes information elements that the equipment cannot recognize.</p> <p>This cause indicates that the equipment receives a message that includes information elements that the device cannot recognize. This problem can occur when the equipment does</p>

		<p>not define or implement the information element identifier. However, the message does not need to contain the information element in order for the equipment to process the message.</p> <p>This issue occurs due to a D-channel error. If the error recurs, report the error to your ISDN service provider.</p>
E4		<p>The remote equipment receives a message that includes invalid information in the information element.</p> <p>This cause indicates that the equipment receives an information element that is implemented, but one or more of the fields in the information element are coded differently.</p> <p>This issue occurs due to a D-channel error.</p>
E5	Message not compatible with call state	<p>The remote equipment receives an expected message that does not correspond to the current state of the connection.</p> <p>This issue occurs due to a D-channel error.</p>
E6	Recovery on time expiry	<p>Your call does not go through, probably because an error occurs. For example, a state synchronization error.</p> <p>Wait and try again later. If the problem persists, contact your ISDN service provider.</p>
E7	Parameter not implemented	<p>Your call does not go through because the ISDN network does not support a service you need to use.</p> <p>Contact your ISDN service provider.</p>
EF	Protocol error, unspecified	<p>This cause indicates an unspecified D-channel error with no other standard cause.</p>
FF	Interworking, unspecified	<p>This cause indicates that an event occurs, but the network does not provide causes for the action. The</p>

		precise problem is unknown.
??	Unknown Cause value	The cause value is unknown.

¹ **CUG:** Closed User Group is a facility in X.25 and ISDN networks that allows a called number to be available only to a limited number of other users (in a virtual private network). Contact your telco for more information.

Optional Diagnostic field

The last two hexadecimal digits (**08** in the example) are optional. You do not commonly use these digits for diagnostic purposes. However, you can sometimes use this byte to furnish additional information for the Disconnect Cause Code. The **debug isdn q931** output can sometimes contain these digits.

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- **Using the show isdn status Command for BRI Troubleshooting**
- **Troubleshooting ISDN BRI Layer 3 using the debug isdn q931 Command**
- **ISDN Debug Command Reference**
- **ISDN Switch Types, Codes, and Values**
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