



APPENDIX **A**

Appendix: X.25 Cause and Diagnostic Codes

This appendix covers the X.25 cause and diagnostic codes that can appear in output from the **debug x25 all**, **debug x25 events**, and **debug x25 vc** commands documented in the “Debug Commands” chapter. For more information on these codes, see the 1984 ITU-T X.25 Recommendation.

**Note**

The ITU-T carries out the functions of the former Consultative Committee for International Telegraph and Telephone (CCITT).

**Note**

The router reports the decimal value of a cause or diagnostic code, whereas other X.25 equipment may report these codes in hexadecimal notation. For this reason, this appendix lists both the decimal and hexadecimal values of the cause and diagnostic codes.

[Table 415](#) describes the differences between our implementation of certain X.25 network-generated, “international problem” diagnostic fields and the definitions provided in Annex E of ITU-T Recommendation X.25. The Annex E Table E-1/X.25 includes the complete diagnostic field listing.

Table 415 **Annex E International Problem Diagnostic Code Differences**

Decimal Value	Annex E, Rec. X.25 Diagnostic Description	Cisco Proprietary Definition of Diagnostic Codes
112	International problem	Not used.
113	Remote network problem	Not used.
114	International protocol problem	Not used.
115	International link out of order	Indicates one of the following failures: failed when initializing a switched permanent virtual circuit (PVC); in TCP tunneling, failed when initiating or resetting a PVC; or, failed when packet assembler/disassembler (PAD) PVC circuit was initiated or reset.
116	International link busy	Not used.
117	Transit network facility problem	Not used.
118	Remote network facility problem	Not used.

Table 415 Annex E International Problem Diagnostic Code Differences (continued)

Decimal Value	Annex E, Rec. X.25 Diagnostic Description	Cisco Proprietary Definition of Diagnostic Codes
119	International routing problem	Indicates the following failure: in TCP tunneling of X.25 when session is closed by network. In addition to its standard meaning, Cisco routers use this code to signal an abnormal X.25-over-TCP (XOT) condition. This code is used when an X.25 Virtual Circuit connection is initiated using XOT, but the remote XOT peer closed the TCP connection. This commonly occurs when the remote XOT peer could not route the received call.
120	Temporary routing problem	Indicates the following failure: when tunneling X.25 through TCP/IP and the remote network is identified as unreachable. In addition to its standard meaning, Cisco routers use this code to signal an abnormal X.25-over-TCP (XOT) condition. This code is used when an X.25 Virtual Circuit connection cannot be initiated using XOT because the TCP connection fails due to an unreachable remote XOT peer.
121	Unknown called DNIC	Not used.
122	Maintenance action (may apply to maintenance action within a national network)	For CMNS, indicates the following: router fails to route the call due to setup or unreachability of destination; when VC is cleared using the clear x25 vc-number command; when router CLEARs a VC when its idle timer expires.

X.25 Cause Codes

A cause code indicates an event that triggered an X.25 packet. The cause code can only appear in entries for CLEAR REQUEST, REGISTRATION CONFIRMATION, RESET REQUEST, and RESTART packets. Values for the cause code can vary, depending on the type of packet. Because the REGISTRATION exchange is not supported, those cause codes are not documented in this section.

Table 416 describes the meanings of cause codes for CLEAR REQUEST packets.

Table 416 Cause Code Descriptions for CLEAR REQUEST Packets

Code (Hex)	Code (Dec)	Description
00	0 (or 128 to 255)	DTE originated
01	1	Number busy
03	3	Invalid facility request
05	5	Network congestion
09	9	Out of order
0B	11	Access barred
0D	13	Not obtainable
11	17	Remote procedure error
13	19	Local procedure error
15	21	RPOA out of order
19	25	Reverse charging not accepted
21	33	Incompatible destination
29	41	Fast select not accepted
39	57	Ship absent

Table 417 describes the meanings of cause codes for RESET REQUEST packets.

Table 417 Cause Code Descriptions for RESET REQUEST Packets

Code (Hex)	Code (Dec)	Description
00	0 (or 128 to 255)	DTE originated
01	1	Out of order
03	3	Remote procedure error
05	5	Local procedure error
07	7	Network congestion
09	9	Remote DTE operational
0F	15	Network operational
11	17	Incompatible destination
1D	29	Network out of order

Table 418 describes the meanings of cause codes for RESTART packets.

Table 418 Cause Code Descriptions for RESTART Packets

Code (Hex)	Code (Dec)	Description
00	0 (or 128 to 255)	DTE restarting
01	1	Local procedure error
03	3	Network congestion
07	7	Network operational
7F	127	Registration/cancellation confirmed

X.25 Diagnostic Codes

The X.25 diag (diagnostic) code provides an additional hint as to what, if anything, went wrong. This code can only appear in entries for CLEAR REQUEST, DIAGNOSTIC, RESET REQUEST, and RESTART packets. Unlike the cause codes, the diag codes do not vary depending upon the type of packet.



Note

These diagnostic codes can be produced by any equipment handling a given virtual circuit, and are then propagated through all equipment handling that virtual circuit. Thus, receipt of a diagnostic code may not indicate a problem with the router.

Table 419 describes the meanings of possible diagnostic codes.

Table 419 X.25 Diagnostic Field Code Descriptions

Code (Hex)	Code (Dec)	Description
00	00	No additional information
01	01	Invalid P(S)
02	02	Invalid P(R)
10	16	Packet type invalid
11	17	Packet type invalid for state R1
12	18	Packet type invalid for state R2
13	19	Packet type invalid for state R3
14	20	Packet type invalid for state P1
15	21	Packet type invalid for state P2
16	22	Packet type invalid for state P3
17	23	Packet type invalid for state P4
18	24	Packet type invalid for state P5
19	25	Packet type invalid for state P6
1A	26	Packet type invalid for state P7
1B	27	Packet type invalid for state D1

Table 419 X.25 Diagnostic Field Code Descriptions (continued)

Code (Hex)	Code (Dec)	Description
1C	28	Packet type invalid for state D2
1D	29	Packet type invalid for state D3
20	32	Packet not allowed
21	33	Unidentifiable packet
22	34	Call on one-way logical channel
23	35	Invalid packet type on a permanent virtual circuit
24	36	Packet on unassigned LCN
25	37	Reject not subscribed to
26	38	Packet too short
27	39	Packet too long
28	40	Invalid GFI (General Format Identifier)
29	41	Restart or registration packet with nonzero LCI
2A	42	Packet type not compatible with facility
2B	43	Unauthorized interrupt confirmation
2C	44	Unauthorized interrupt
2D	45	Unauthorized reject
30	48	Timer expired
31	49	Timer expired for incoming call
32	50	Timer expired for clear indication
33	51	Timer expired for reset indication
34	52	Timer expired for restart indication
35	53	Timer expired for call deflection
40	64	Call setup, clearing, or registration problem
41	65	Facility code not allowed
42	66	Facility parameter not allowed
43	67	Invalid called address
44	68	Invalid calling address
45	69	Invalid facility length
46	70	Incoming call barred
47	71	No logical channel available
48	72	Call collision
49	73	Duplicate facility requested
4A	74	Nonzero address length
4B	75	Nonzero facility length
4C	76	Facility not provided when expected
4D	77	Invalid ITU-T-specified DTE facility

Table 419 X.25 Diagnostic Field Code Descriptions (continued)

Code (Hex)	Code (Dec)	Description
4E	78	Maximum number of call redirections or deflections exceeded
50	80	Miscellaneous
51	81	Improper cause code for DTE
52	82	Octet not aligned
53	83	Inconsistent Q bit setting
54	84	NUI (Network User Identification) problem
70	112	International problem
71	113	Remote network problem
72	114	International protocol problem
73	115	International link out of order
74	116	International link busy
75	117	Transit network facility problem
76	118	Remote network facility problem
77	119	International routing problem
78	120	Temporary routing problem
79	121	Unknown called DNIC
7A	122	Maintenance action (clear x25 vc-number command is issued)

Diagnostic codes with values of 80 or greater in hexadecimal, or with values of 128 or greater in decimal, are specific to a particular network. To learn the meanings of these codes, contact the administrator for that network.