

## X.25 Cause and Diagnostic Codes

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This appendix covers the X.25 cause and diagnostic codes, as referred to in the **debug x25 all** command of the “Debug Commands” chapter. For more information on these codes, see the 1984 ITU-T X.25 Recommendation.

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

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**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.

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Table A-1 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 A-1 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 PVC; in TCP tunneling, failed when initiating or resetting a PVC; or, failed when 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.  |

## X.25 Cause Codes

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| 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.<br><br>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 <b>clear x25-vc EXEC</b> 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. Possible 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 A-2 describes the meanings of cause codes for CLEAR REQUEST packets.

**Table A-2 Cause Code Descriptions for CLEAR REQUEST Packets**

| <b>Code (Hex)</b> | <b>Code (Dec)</b> | <b>Description</b>            |
|-------------------|-------------------|-------------------------------|
| 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 A-3 describes the meanings of cause codes for RESET REQUEST packets.

**Table A-3 Cause Code Descriptions for RESET REQUEST Packets**

| <b>Code (Hex)</b> | <b>Code (Dec)</b> | <b>Description</b>       |
|-------------------|-------------------|--------------------------|
| 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 A-4 describes the meanings of cause codes for RESTART packets.

**Table A-4 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.

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**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.

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Table A-5 describes the meanings of possible diag codes.

**Table A-5 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 |

| <b>Code<br/>(Hex)</b> | <b>Code<br/>(Dec)</b> | <b>Description</b>  |
|-----------------------|-----------------------|---|
| 1B                    | 27                    | Packet type invalid for state D1                            |
| 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                        |
| 4E                    | 78                    | Maximum number of call redirections or deflections exceeded |

## X.25 Diagnostic Codes

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| Code (Hex) | Code (Dec) | Description  |
|------------|------------|--|
| 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 ( <b>clear x25 vc</b> command 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.