X.25 Version Configuration

The X.25 Version Configuration feature introduces the **x25 version** command. The **x25 version** command allows you to specify the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) X.25 recommendation and corresponding behavior set to be used by an interface or profile.

Feature History for the X.25 Version Configuration Feature

Release	Modification
12.3(8)T	This feature was introduced.
12.3(9)	This feature was integrated into Cisco IOS Release 12.3(9).

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn . You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About X.25 Version Configuration

X.25 Version Configuration

Cisco IOS X.25 support was designed to conform to the Consultative Committee for International Telegraph and Telephone (CCITT) 1984 X.25 recommendation, both because it represented the largest set of X.25 devices deployed at that time and because protocol conformance testing to the 1984 standard was readily available.

The introduction of the **x25 version** command allows you to specify alternative X.25 behavior sets as defined by the 1980, 1988, or 1993 X.25 recommendation. By default, Cisco IOS operates to the CCITT 1984 X.25 recommendation. The **X.25 version** command can be used to change the version for both X.25-class services (for example, X.25 and Connection-Mode Network Service (CMNS)) and X.25 configuration profiles.

A common use of the **X.25 version** command is the specification of 1980 X.25 behavior set in order to suppress the signaling of facilities that are not defined by that recommendation. This functionality benefits customers with an attached X.25 device that is not capable of correctly handling one or more of the facilities defined in the subsequent standards.

Note The Cisco IOS implementations of the 1980, 1988, and 1993 X.25 behavior sets have not been tested for compliance with the recommendations. For example, configuring an interface with the **x25 version 1988** command will not necessarily create an interface that offers an X.25 connection that is in full compliance with the 1988 recommendation; it only enables select features from the 1988 standard that are supported by the Cisco IOS X.25 implementation.

Typical Uses of the x25 version Command

The **x25 version** command is typically used to access functionality that is available in other X.25 behavior sets and to prevent problems that arise when a network is attached to X.25 devices that use nonstandard or older behavior sets. The table below describes some common problems that can be solved by specifying a particular X.25 behavior set.

Table 1: Common Problems That Are Solved by the x25 version Command

Problem	Cause	Solution
Some X.25 hosts reject calls that include Internetwork Call Redirection and Deflection Notification (ICRD) or Called Line Address Modification Notification (CLAMN).	X.25 hosts may conform to the 1980 standard, which does not support these facilities, or the host may be nonstandard.	Specify the 1980 X.25 behavior set on the interface or X.25 profile.

Problem	Cause	Solution
An incoming call that includes Protection QoS facilities (an ITU-T-specified DTE facility) is cleared by the Cisco router.	The interface defaults to the 1984 X.25 behavior set, which does not define the Protection QoS facility.	Specify the 1988 or 1993 behavior set on the interface to allow Protection QoS facilities to be encoded and passed through transparently by the router.
Incoming calls requesting a throughput of 64,000 bits per second (bps) are rejected while other calls requesting a throughput of 48,000 bps are accepted.	The throughput facility in the 1984 recommendation defines a maximum value of 48,000 bps.	Specify the 1988 behavior set for services where you need throughput facility values up to 64,000 bps, and the 1993 behavior set for services where you need throughput facility values up to 2,048,000 bps.
After a packet assembler/disassembler (PAD) call is initiated over X.25 over TCP (XoT), the Call packet is cleared by the router when the Call Confirm packet includes a modified destination address.	The called X.25 address has been modified on the Call Confirm by the remote X.25 host without signaling the fact by also encoding a CLAMN facility--a potential security issue.	If the security risks are acceptable, specify the 1980 behavior set on an X.25 profile configured for the XoT connection.

Description of Cisco IOS X.25 Behavior Sets

Cisco IOS Implementation of the 1980 X.25 Behavior Set

The 1980 X.25 behavior set differs from the default 1984 behavior set in the following ways:

- Only the facilities and facility value encodings defined by the CCITT 1980 X.25 recommendation will be accepted on packets received; receipt of a facility encoding not specified by that standard will cause the packet to be rejected as specified in the 1980 recommendation.
- Packets sent will use only the facilities and facility value encodings defined by the CCITT 1980 X.25 recommendation.
- The maximum Data packet size is 1024 bytes of user data. This limit affects configurable packet sizes (for example, PVCs and interface flow control default values) as well as flow control negotiation for X.25 switching.
- The maximum throughput facility value that can be encoded is 48,000 bps. This limit affects configurable throughput facility values, as well as truncating larger values when an X.25 Call packet is switched to the service.
- The maximum closed user group (CUG) that can be identified is 99. This limit affects configurable CUG facility values as well as interoperability for X.25 switching.
- The facility block that is used to encode X.25 facilities (for example, in a Call packet) cannot exceed 64 bytes.

- The Interrupt packet must have 1 byte of user data.
- A Clear packet cannot have an address block encoded.
- A Clear Confirm packet cannot have an address block encoded.
- A received Call Confirm packet is permitted to have a destination address that differs from the address encoded in the original Call packet.
- The cause and diagnostic codes encoded under various circumstances can differ from the default behavior.

Cisco IOS Implementation of the 1984 X.25 Behavior Set

The 1984 X.25 behavior set is the default X.25 behavior set used by Cisco IOS software and uses the following default protocol procedures:

- The 1984 X.25 behavior for both Layer 2 and Layer 3 has been tested for compliance with the NET2 and GOSIP test suites. This does not mean that all elements of the standard are implemented, but the protocol features implemented and tested were accepted as compliant.
- Only the facilities and facility value encodings defined by the CCITT 1984 X.25 recommendation will be accepted on packets received. Receipt of a facility encoding not specified by that standard will cause the packet to be rejected as specified in the 1984 recommendation.
- Packets sent will use only the facilities and facility value encodings defined by the CCITT 1984 X.25 recommendation.
- The maximum Data packet size is 4096 bytes of user data.
- The maximum throughput facility value that can be encoded is 48,000 bps. This limit affects configurable throughput facility values, as well as truncating larger values when an X.25 Call packet is switched to the service.
- The maximum closed user group (CUG) that can be identified is 9999.
- The facility block that is used to encode X.25 facilities (for example, in a Call packet) cannot exceed 110 bytes.
- The Interrupt packet can encode between 1 and 32 bytes of user data.
- A Clear packet may, under certain conditions, encode an address block.
- A Clear Confirm packet can encode an empty address block (that is, both address lengths are required to be 0).
- If a received Call Confirm or Clear packet encodes a destination address that differs from the address encoded in the original Call packet, the Call Confirm or Clear packet is also required to encode a CLAMN facility to signal the reason.

Cisco IOS Implementation of the 1988 X.25 Behavior Set

The 1988 X.25 behavior set differs from the default 1984 behavior set in the following ways:

- Only the facilities and facility value encodings defined by the CCITT 1988 X.25 recommendation will be accepted on packets received; receipt of a facility encoding not specified by that standard will cause the packet to be rejected as specified in the 1988 recommendation.

- Packets sent will use only the facilities and facility value encodings defined by the CCITT 1988 X.25 recommendation.
- The maximum throughput facility value that can be encoded is 64,000 bps. This limit affects configurable throughput facility values, and it truncates larger values when an X.25 Call packet is switched to the service.
- A Call, Call Confirm, Clear, or Clear Confirm packet that has the A-bit set is not treated as a bad General Format Identifier, but A-bit encoded addresses are not otherwise supported.
- The cause and diagnostic codes encoded under various circumstances can differ from the default behavior.

Cisco IOS Implementation of the 1993 X.25 Behavior Set

The 1993 X.25 behavior set differs from the default 1984 behavior set in the following ways:

- The 1993 behavior set is the default for XoT service because it simplifies X.25 switching service configuration.
- Only the facilities and facility value encodings defined by the ITU-T 1993 X.25 recommendation will be accepted on packets received. Receipt of a facility encoding not specified by that standard will cause the packet to be rejected as specified in the 1993 recommendation.
- Packets sent will use only the facilities and facility value encodings defined by the ITU-T 1993 X.25 recommendation.
- The maximum throughput facility value that can be encoded is 2,048,000 bps using the extended throughput class negotiation facility, or 192,000 bps using the facility defined in the prior standards. This limit affects configurable throughput facility values, as well as truncating larger values when an X.25 Call packet is switched to the service.
- The Internetwork Call Redirection and Deflection (ICRD) facility can be encoded and decoded.
- A Call, Call Confirm, Clear, or Clear Confirm packet may be encoded up to a total length of 259 bytes.
- A Call, Call Confirm, Clear, or Clear Confirm packet that has the A-bit set is not treated as a bad General Format Identifier, but A-bit encoded addresses are not otherwise supported.
- The cause and diagnostic codes encoded under various circumstances can differ from the default behavior.

X.25 Facility Support

The table below lists the X.25 standard facilities and shows which X.25 versions permit those facilities to be encoded in each packet type. A dash (--) in a cell means that the facility is not permitted by any standard.

Table 2: Summary of X.25 Standard Facilities

Facility	Packet Types in Which the Facility May Be Used	Code						
Call Request	Incoming Call	Call Accepted	Call Connected	Clear Request	Clear Indication	DCE Clear Confirm		
Flow Control								
• Packet size	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	42
• Window size	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	43
• Extended window size	--	--	--	--	--	--	--	D5
Throughput								
• Basic	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	02
• Extended	1993	1993	1993	1993				4C
Closed User Group								
• Basic	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	--	--	03
• Extended	1984 1988 1993	1984 1988 1993	--	--	--	--	--	47
• CUGOA basic	1984 1988 1993	1984 1988 1993	--	--	--	--	--	09
• CUGOA extended	1984 1988 1993	1984 1988 1993	--	--	--	--	--	48

Facility	Packet Types in Which the Facility May Be Used	Code						
• Bilateral	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	--	--	41
Reverse Charging[1]	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	--	--	01
Fast Select	1980 1984 1988 1993	1980 1984 1988 1993	--	--	--	--	--	01
ICRD Status Selection	1993	--	--	--	--	--	--	01
NUI Selection	1984 1988 1993	--	1984 1988 1993[2]	--	--	--	--	C6
Charging Information								
• Request	1984 1988 1993	--	1984 1988 1993	--	--	--	--	04
• Monetary report	--	--	--	--	--	1984 1988 1993	1984 1988 1993	C5
• Segment report	--	--	--	--	--	1984 1988 1993	1984 1988 1993	C2
• Duration report	--	--	--	--	--	1984 1988 1993	1984 1988 1993	C1
ROA Selection								
• Basic	1980 1984 1988 1993	--	--	--	--	--	--	44
• Extended	1984 1988 1993	--	--	--	--	--	--	C4

Facility	Packet Types in Which the Facility May Be Used	Code					
Call Deflection Selection	--	--	--	--	--	1988 1993[3]	--	D1
Call Redirection or Call Deflection Notification	1993[4]	1984 1988 1993	--	--	--	--	--	C3
Called Line Address Modified Notification	--	--	1984 1988 1993[5]	1984 1988 1993	1984 1988 1993	1984 1988 1993[6]	--	08
Transit Delay	1984 1988 1993	1984 1988 1993	--	1984 1988 1993	--	--	--	49
Marker	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993	1980 1984 1988 1993[7]	00
Reserved	--	--	--	--	--	--	--	FF

1 The Reverse Charging, Fast Select and ICRD Status Selection values are encoded as bit fields in the single byte value of this facility code.

2 The NUI Selection facility can be encoded in a Call Accepted packet (for those Recommendations that permit it) only in conjunction with the NUI Subscription option.

3 A DTE cannot encode both the Call Deflection Selection and Called Line Address Modified Notification facilities in the same Clear Request packet.

4 A Call Redirection or Call Deflection Notification facility can only encode the reason "Calling DTE originated" in a Call Request packet.

5 The Called Line Address Modified Notification facility can only encode the reason "Called DTE originated" in a Call Accepted or Clear Request packet.

6 Both notes 3 and 4 apply

7 The 1988 CCITT Recommendation X.25 Table 29/X.25 indicates that a Marker facility is not permissible in a DCE Clear Confirmation packet, however that interpretation is not stated in the text of the Recommendation, nor does there seem to be such a restriction in the prior Recommendations. It is advisable to permit it.

The table below lists the X.25 ITU-T-Specified DTE facilities and shows which X.25 versions permit those facilities to be encoded in each packet type. A dash (--) in a cell means that the facility is not permitted by any standard.

Table 3: Summary of Support for X.25 ITU-T-Specified DTE Facilities (X.25 Annex G)

Facility	Packet Types in Which the Facility May Be Used	Code						
Call Request	Incoming Call	Call Accepted	Call Connected	Clear Request[8]	Clear Indication	DCE Clear Confirm		
Calling Address Extension	1984 1988 1993	1984 1988 1993	--	--	1988 1993[9]	--	--	CB
Called Address Extension	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	--	C9
Minimum Throughput Class Qos								
• Basic	1984 1988 1993	1984 1988 1993	--	--	1988 1993	--	--	0A
• Extended	1993	1993	--	--	1993	--	--	4D
End-to-End Transit Delay QoS	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	--	--	CA
Priority QoS	1988 1993	1988 1993	1988 1993	1988 1993	1988 1993	--	--	D2
Protection QoS	1988 1993	1988 1993	1988 1993	1988 1993	1988 1993	--	--	D3
Expedited Data Negotiation	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	1984 1988 1993	--	--	0B

8 The facilities specified for a Clear Request and Clear Indication packet can only be encoded if the virtual circuit is in state P3--that is, when an Incoming Call has been delivered to the DTE but no Call Accepted packet has been sent to the DCE (for a Clear Request) or received by the DCE (for a Clear Indication). The facilities specified for a Clear Request packet can only be encoded when the standard X.25 Call Deflection Selection facility is also encoded (1984 exempted).

9 The facilities specified for a Clear Request packet can only be encoded when the standard X.25 Call Deflection Selection facility is also encoded (1984 exempted).

How to Specify the X.25 Version

Specifying the X.25 Behavior Set to Be Used by an Interface or X.25 Profile

Perform this task to specify the X.25 behavior set that is to be used by an interface or X.25 profile.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **x25 version** {**1980** | **1984** | **1988** | **1993**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

Step 3	**interface** *type number*
	Example:
	Example:
	x25 profile *name* {**dce** | **dte** | **dxe**}
	Example:
	`Router(config)# interface serial 1`
	Example:
	`Router(config)# x25 profile`
		Configures an interface type and enters interface configuration mode.
		or
		Configures an X.25 profile and enters X.25 profile configuration mode.

Step 4	**x25 version** {**1980** | **1984** | **1988** | **1993**}	Specifies an X.25 behavior set.

	Command or Action	Purpose
	Example: `Router(config-if)# x25 version 1980`	• The behavior sets are defined by the CCITT 1980, 1984, and 1988 and ITU-T 1993 X.25 recommendations.

Verifying the X.25 Behavior Set for an Interface or X.25 Profile

Perform this task to verify which X.25 behavior set is being used by an interface or X.25 profile.

SUMMARY STEPS

1. **enable**
2. **show interfaces** [*type number*]
3. **show x25 profile** [*name*]
4. **show x25 context** [**xot** | **interface serial** *number* [**dlci** *number*] | *cmns-interface-type number* [**mac**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show interfaces** [*type number*] **Example:** `Router# show interfaces serial 0/1`	Displays statistics for all interfaces configured on the router or access server.
Step 3	**show x25 profile** [*name*] **Example:** `Router# show x25 profile profile1`	Displays details of the X.25 profiles on your router.
Step 4	**show x25 context** [**xot** | **interface serial** *number* [**dlci** *number*] | *cmns-interface-type number* [**mac** **Example:** *mac-address*]]	Displays operating configuration status details of an X.25 link.

	Command or Action	Purpose
	Example: `Router# show x25 context interface serial 1/1`	

Configuration Examples for X.25 Version Configuration

Specifying the X.25 Version to Be Used by an Interface in a Hunt Group Example

The X.25 hunt group feature will signal a Call's destination device of the hunt group handling by forwarding the Call with a Call Redirection or Call Deflection Notification (CRCDN) facility. In addition, the Call's originating device will be notified by forwarding a Call Confirm reply back with a Called Line Address Modified Notification (CLAMN) facility.

The following example configures an interface to use the 1980 X.25 behavior set:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# interface serial 3/2
Router(config-if)# x25 version 1980
Router(config-if)# end
```

This interface, on receipt of a Call packet that is processed through a hunt group, will now suppress the CLAMN facility on the returned Call Confirm, as demonstrated by the following output of the **x25 debug** command:

```
  *14:14:51.899: Serial3/2: X.25 I R1 Call (13) 8 lci 1024
  *14:14:51.899:   From (6): 170093 To (2): 91
  *14:14:51.899:   Facilities: (0)
  *14:14:51.899:   Call User Data (4): 0xCC000000 (ip)
  *14:14:51.899: Serial3/3: X.25 O R1 Call (22) 8 lci 1
  *14:14:51.899:   From (6): 170093 To (6): 170091
  *14:14:51.899:   Facilities: (7)
  *14:14:51.899:     Call redirection/deflection notice, reason 0x80 specified by source
(6): 170091
  *14:14:51.899:   Call User Data (4): 0xCC000000 (ip)
  *14:14:51.903: Serial3/3: X.25 I R1 Call Confirm (3) 8 lci 1
  *14:14:51.903:     : X.25 Stripped facility: Called Line Address Modified notice
  *14:14:51.903: Serial3/2: X.25 O R1 Call Confirm (9) 8 lci 1024
  *14:14:51.903:   From (6): 170093 To (2): 91
  *14:14:51.903:   Facilities: (0)
```

Specifying the X.25 Version to Be Used by Both Interfaces in a Hunt Group Example

The following example configures the 1980 X.25 behavior set on both interfaces participating in a hunt group:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
```

```
Router(config)# interface serial 3/2
Router(config-if)# x25 version 1980
Router(config)# interface serial 3/3
Router(config-if)# x25 version 1980
Router(config-if)# end
```

The interfaces, on receipt of a Call packet that is processed through a hunt group, will now suppress both the CRCDN facility on the forwarded Call packet and the CLAMN facility on the returned Call Confirm, as demonstrated by the following output of the **x25 debug** command:

```
*14:16:33.167: Serial3/2: X.25 I R1 Call (13) 8 lci 1024
*14:16:33.167:   From (6): 170093 To (2): 91
*14:16:33.167:   Facilities: (0)
*14:16:33.171:   Call User Data (4): 0xCC000000 (ip)
*14:16:33.171:   : X.25 Stripped facility: Call redirection/deflection notice
*14:16:33.171: Serial3/3: X.25 O R1 Call (15) 8 lci 1
*14:16:33.171:   From (6): 170093 To (6): 170091
*14:16:33.171:   Facilities: (0)
*14:16:33.171:   Call User Data (4): 0xCC000000 (ip)
*14:16:33.171: Serial3/3: X.25 I R1 Call Confirm (3) 8 lci 1
*14:16:33.171:     : X.25 Stripped facility: Called Line Address Modified notice
*14:16:33.171: Serial3/2: X.25 O R1 Call Confirm (9) 8 lci 1024
*14:16:33.171:   From (6): 170093 To (2): 91
*14:16:33.171:   Facilities: (0)
```

Verifying the X.25 Version for an Interface or X.25 Profile

The following examples show output for the commands that can be used to verify X.25 version configuration.

show interfaces Sample Output: Example

```
Router# show interfaces serial 1/1
Serial1/1 is up, line protocol is up
  Hardware is CD2430 in sync mode
  Description: connected to stroll Serial1/1
  Internet address is 1.0.0.2/8
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation X25, loopback not set
  X.25 DCE, version 1984, address 170092, state R1, modulo 8, timer 0
      Defaults: idle VC timeout 0
        cisco encapsulation
        input/output window sizes 2/2, packet sizes 128/128
      Timers: T10 60, T11 180, T12 60, T13 60
      Channels: Incoming-only none, Two-way 10-100, Outgoing-only 200-210
      RESTARTs 1/0 CALLs 0+0/0+0/0+0 DIAGs 0/0
  LAPB DCE, state CONNECT, modulo 8, k 7, N1 12056, N2 20
 .
 .
 .
```

show x25 profile Sample Output: Example

```
Router# show x25 profile profile1
X.25 profile name: profile1
  PROFILE DTE, version 1993, address <none>, state R/Inactive, modulo 8, timer 0
      Defaults: idle VC timeout 0
        input/output window sizes 2/2, packet sizes 128/128
      Timers: T20 180, T21 200, T22 180, T23 180
      Channels: Incoming-only none, Two-way 1-1024, Outgoing-only none
```

show x25 context Sample Output: Examples

```
Router# show x25 context interface serial 1/1
  X.25 DCE, version 1984, address 170092, state R1, modulo 8, timer 0
      Defaults: idle VC timeout 0
        cisco encapsulation
        input/output window sizes 2/2, packet sizes 128/128
      Timers: T10 60, T11 180, T12 60, T13 60
      Channels: Incoming-only none, Two-way 10-100, Outgoing-only 200-210
      RESTARTs 0/0 CALLs 0+0/0+0/0+0 DIAGs 0/0
  LAPB DCE, state CONNECT, modulo 8, k 7, N1 12056, N2 20
      T1 3000, T2 0, interface outage (partial T3) 0, T4 0
      VS 2, VR 2, tx NR 2, Remote VR 2, Retransmissions 0
      Queues: U/S frames 0, I frames 0, unack. 0, reTx 0
      IFRAMEs 2/2 RNRs 0/0 REJs 0/0 SABM/Es 1/0 FRMRs 0/0 DISCs 0/0


Router# show x25 context xot
XOT
station DXE/DTE, version 1993, address <none>, state R1, modulo 8
      Defaults: idle VC timeout 0
        input/output window sizes 2/2, packet sizes 128/128
      Timers: T20 180, T21 200, T22 180, T23 180
      RESTARTs 0/0 CALLs 0+1/0+0/0+0 DIAGs 0/0


Router# show x25 context interface serial 1/0

Serial1/0 DLCI 16
  PROFILE dxe/DTE, version 1993, address 2001510, state R1, modulo 8, timer 0
      Defaults: idle VC timeout 0
        input/output window sizes 2/2, packet sizes 128/128
      Timers: T20 180, T21 200, T22 180, T23 180
      Channels: Incoming-only none, Two-way 1-4095, Outgoing-only none
      RESTARTs 0/0 CALLs 0+0/0+0/0+0 DIAGs 0/0
  LAPB dxe/DTE, state CONNECT, modulo 8, k 7, N1 12056, N2 20
      T1 3000, T2 0, interface outage (partial T3) 0, T4 0
      VS 1, VR 1, tx NR 1, Remote VR 1, Retransmissions 0
      Queues: U/S frames 0, I frames 0, unack. 0, reTx 0
      IFRAMEs 1/1 RNRs 0/0 REJs 0/0 SABM/Es 1/0 FRMRs 0/0 DISCs 0/0
```

Additional References

Related Documents

Related Topic	Document Title
X.25 configuration information	Wide-Area Networking Protocols
X.25 commands	*Cisco IOS Wide-Area Networking Command Reference*
Information about X.25 facility handling	X.25 Facility Handling

Standards

Standards	Title
CCITT 1980 Recommendation X.25	Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit
CCITT 1984 Recommendation X.25	Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit
CCITT 1988 Recommendation X.25	Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit
ITU-T 1993 Recommendation X.25	Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit

MIBs

MIBs	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
None	--

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml