

# X.25 Facility Handling

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This appendix provides reference material describing how X.25 facilities are handled by the Cisco IOS software.

## Facility Handling in Encapsulated X.25 Virtual Circuits

A router either originates or accepts encapsulation switched virtual circuits (SVCs) to transport LAN traffic through an X.25 network.

When the router originates a call for LAN traffic encapsulation, the facilities in the call are controlled by the facilities configured for the interface and the map statement that specifies the LAN and X.25 encapsulation. Because a router can be attached to a public data network (PDN), the interface and map configurations allow a number of facilities to be specified in outgoing calls. These facilities are specified in all originated calls relating to the given interface and map with one exception—the incoming and outgoing maximum packet sizes proposed are lowered if the lower layer (LAPB) cannot support the specified data packet size.

When the router accepts an encapsulation call, many facilities are simply ignored. The maximum packet sizes are lowered if the lower layer (LAPB) cannot support the sizes proposed. A reverse-charge call is cleared if neither the interface nor the map allows it. A call that specifies a network user identification (NUID) is cleared if the user authentication fails.

## Facility Handling in Routed X.25 Virtual Circuits

Routed X.25 traffic might have facilities added, deleted, or modified.

### Standard (1984 X.25) Facilities

Table 54 describes how standard (1984 X.25) facilities are treated when routing a switched virtual circuit (SVC). To configure these facilities, refer to the “Configure X.25 User Facilities” section in the “Configuring X.25 and LAPB” chapter of the *Wide-Area Networking Configuration Guide*.

**Table 54 Treatment of Standard X.25 Facilities**

Facility	Treatment
Flow Control Negotiation (negotiation of window size and maximum packet size)	The Cisco IOS software adds, removes, or changes flow control parameter values to match the values on both interfaces, as described in the following cases:
<ul style="list-style-type: none"> <li>Requested flow control values do not match the outgoing interface's defaults.</li> <li>Requested values match the outgoing interface's defaults.</li> <li>Requested maximum packet size exceeds the capability of either interface.</li> <li>Call is routed from a modulo 128 interface to a modulo 8 interface.</li> <li>Call is remotely routed over a TCP connection.</li> <li>Call is received from an X.25 over a TCP connection without one or more flow control parameter values.</li> <li>Accepted flow control parameter values are different, for any reason, from the values proposed for the incoming call.</li> </ul>	<ul style="list-style-type: none"> <li>Inserts flow control parameters into the outgoing switched call.</li> <li>Strips parameter values from the outgoing switched call.</li> <li>Lowers the packet size to the largest value that can be supported by the two interfaces.</li> <li>Lowers the larger requested window size to 7.</li> <li>Ensures that both proposed maximum packet sizes and proposed window sizes for a call are present.</li> <li>By default, forces the call to use the maximum packet sizes (128/128) and window sizes (2/2). If the <b>x25 routing use-tcp-if-defs</b> command and keyword are specified, the router supplies the call with the default values of the outgoing serial interface. In either case, the Call Confirm packet sent back over the X.25-over-TCP (XOT) connection indicates the final flow control values negotiated for the connection.</li> <li>Sends an outgoing Call Accepted packet that indicates the accepted flow control values.</li> </ul>
Throughput Negotiation	Forwards the incoming Throughput facility.
Closed User Group Selection	Forwards a basic format Closed User Group (CUG) selection facility; any other format of CUG selection (extended format, CUG with outgoing access or Bilateral CUG) will be stripped.
Reverse Charging	Forwards an incoming Reverse Charging facility.
Fast Select	Forwards an incoming Fast Select facility.
Network User Identification (NUID)	Forwards an incoming NUID facility on a Call packet; an NUID facility on a Call Accepted packet is stripped.
Charging Information	Strips any Charging Information or Request.
RPOA Selection	Strips any RPOA Selection.
Called Line Address Modified Notification	Forwards a Called Line Address Modified Notification.
Call Redirection Notification	Strips a Call Redirection Notification.
Transit Delay Selection	Forwards an incoming Transit Delay facility.

The implementation of X.25 prior to Release 9.1(4.1) software did not insert flow control parameter values into Call packets sent over X.25-over-TCP (XOT) connections. When such an XOT call is received by Release 9.1(4.1) or later, the call is forced to use the standard flow control values. This use may cause migration problems when the router is connecting X.25 equipment that is not capable of negotiating flow control parameters; you can use the optional **use-tcp-if-defs** keyword of the **x25 routing** command if you encounter this problem.

## ITU-T-Specified Marker Facilities

Table 55 describes how CCITT/ITU-T-specified marker facilities are treated when routing an SVC.

**Table 55 Default Treatment of ITU-T-Specified Marker Facilities**

Facility	Treatment
Calling Address Extension	Forwards an incoming Calling Address Extension facility.
Called Address Extension	Forwards an incoming Called Address Extension facility.
Quality of Service Negotiation	Strips any of the Quality of Service facilities.
Expedited Data Negotiation	Strips an Expedited Data Negotiation facility.

The router requires the Calling Address Extension facility to route to a CMNS host.

The encoding of any CCITT/ITU-T facilities is preceded by a marker, as displayed in the output of the **debug x25** command.

## Local Marker Facilities Specified for DDN or BFE X.25

Table 56 describes how local marker facilities are treated when routing an SVC.

**Table 56 Default Treatment of Local Marker Facilities Specified for DDN or BFE X.25**

Facility	Treatment
DDN Service Type	Strips an incoming DDN Service Type facility from a call, but inserts DDN Service Type if a forwarded Call Accepted packet specifies a DDN precedence facility.
DDN Precedence	Forwards an incoming DDN Precedence facility. However, both the input and output interfaces need to be configured for DDN X.25 encapsulation. To configure treatment of this facility, see the “Define IP Precedence Handling” section in the “Configuring X.25 and LAPB” chapter of the <i>Wide-Area Networking Configuration Guide</i> .
BFE Emergency Mode Addressing	Strips an incoming BFE Emergency Mode Addressing facility. To configure treatment of this facility, see the “Configure Blacker Front End (BFE) X.25” section in the “Configuring X.25 and LAPB” chapter of the <i>Wide-Area Networking Configuration Guide</i> .

The Cisco IOS software supports DDN Standard service but not DDN Basic service. Consequently, the DDN Service Type facility does not have to be configured.

