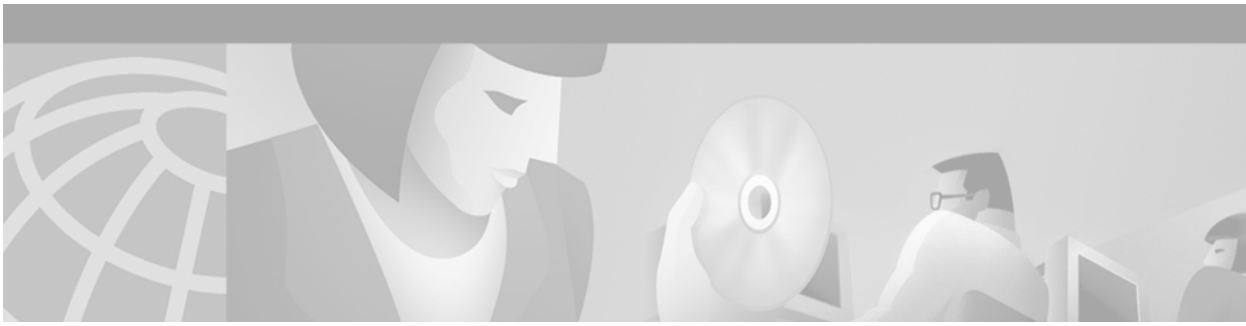

X.25 Failover

This feature module describes the X.25 Failover feature and includes the following sections:

Feature Overview

Before the introduction of the X.25 Failover feature, multiple routes could be configured in an X.25 routing table to allow one or more secondary or backup interfaces to be used when a preferred (primary) interface is not usable. Routes would be examined in the order in which they appeared in the X.25 routing table. The first matching route was taken. However, since X.25 traffic is circuit-oriented, once a connection was established via the secondary interface, the connection remained active even after the primary interface returned to service. This situation is undesirable when the path via the secondary interface is slower or more expensive than the path via the primary interface.

The X.25 Failover feature enables you to configure that secondary interface to reset once the primary interface has come back up and remained operational for a specified amount of time, terminating any connections that are still using the secondary interface. Subsequent calls will be forwarded over the preferred interface.

You can configure the X.25 Failover feature on an X.25 interface or X.25 profile. The feature supports Annex G (X.25 over Frame Relay).

Benefits

The X.25 Failover feature helps ensure that calls are forwarded over the preferred interface whenever possible. If the preferred interface goes down, the secondary interface takes over. As soon as the preferred interface becomes operational again and remains so for a specified amount of time, the X.25 failover mechanism resets the secondary interface, causing the preferred interface to resume handling new calls.

Restrictions

- This feature can be configured on X.25 interfaces or X.25 profiles only.
- This feature is not supported on XOT.

Related Documents

- *Cisco IOS Wide-Area Networking Configuration Guide*, Release 12.1
- *Cisco IOS Wide-Area Networking Command Reference*, Release 12.1

Supported Platforms

- Cisco 1600
- Cisco 1700
- Cisco 2500 series
- Cisco 2600
- Cisco 3600 series
- Cisco 3800 series
- Cisco 4000 series (Cisco 4000, 4000-M, 4500, 4500-M, 4700, 4700-M)
- Cisco 5200 series
- Cisco 7000 series
- Cisco 7100
- Cisco 7200 series
- Cisco 7500 series

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported are supported by this feature.

For descriptions of supported MIBs and how to use MIBs, see the Cisco MIB web site on Cisco Connection Online (CCO) at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.

RFCs

No new or modified RFCs are supported by this feature.

X.25 Failover Configuration Tasks

See the following sections for configuration tasks for the X.25 Failover feature. One of the following two tasks is required:

- Configuring X.25 Failover on an Interface
- Configuring X.25 Failover on an X.25 Profile

The following task is optional:

- Verifying X.25 Failover

Configuring X.25 Failover on an Interface

To configure X.25 failover on an interface, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# interface type number`	Configures an interface type and enters interface configuration mode.
Step 2	`Router(config-if)# encapsulation x25`	Specifies the operation of a serial interface as an X.25 device.
Step 3	`Router(config-if)# x25 fail-over seconds interface type number [dlci | MAC address]`	Specifies a secondary interface and sets the number of seconds for which the primary interface must be up before the secondary interface resets.

Configuring X.25 Failover on an X.25 Profile

To configure X.25 failover on an X.25 profile, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# x25 profile name {dce | dte | dxe}`	Configures an X.25 profile.
Step 2	`Router(config-x25)# x25 fail-over seconds interface type number [dlci | MAC address]`	Specifies a secondary interface and sets the number of seconds for which the primary interface must be up before the secondary interface resets.

Verifying X.25 Failover

To display information about the X.25 Failover feature, use the following EXEC command:

Command	Purpose
`Router# show x25 context`	Displays information about all X.25 links.

Monitoring and Maintaining X.25 Failover

To monitor the X.25 Failover feature, use the following EXEC command:

Command	Purpose
Router# **show x25 context**	Displays information about all X.25 links.

Configuration Examples

This section contains the X.25 failover configuration example.

X.25 Failover Configuration Example

In the following example, X.25 failover is configured on a network that is also configured for Annex G. If data-link connection identifier (DLCI) 13 or DLCI 14 on serial interface 1/0 goes down, dialer interface 1 will serve as the secondary interface. After DLCI 13 or 14 comes back up and remains up for 20 seconds, dialer interface 1 will reset, sending all calls back to the primary interface.

```
interface serial1/0
 encapsulation frame-relay
 frame-relay interface-dlci 13
 x25-profile frame1
  exit
 frame-relay interface-dlci 14
 x25-profile frame1
  exit
!
interface dialer1
 encapsulation x25
   exit

x25 route ^1234 interface serial1/0 dlci 13
x25 route ^1234 interface serial1/0 dlci 14
x25 route ^1234 interface dialer1
!
x25 profile frame1 dte
 x25 fail-over 20 interface dialer1
  exit
!
```

Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **x25 fail-over**
- **show x25 context**

x25 fail-over

To configure a secondary interface and set the number of seconds for which a primary interface must be up before the secondary interface resets, use the **x25 fail-over** command in the appropriate configuration mode. To prevent the secondary interface from resetting, use the **no** form of this command.

x25 fail-over *seconds* **interface** *type number* [*dlci* | *mac-address*]

no x25 fail-over *seconds* **interface** *type number* [*dlci* | *mac-address*]

Syntax Description

seconds	Number of seconds for which the primary interface must be up before the secondary interface resets.
interface	Secondary interface.
type	Interface type.
number	Interface number.
dlci	(Optional) DLCI number.
mac-address	(Optional) MAC address.

Defaults

No default behavior or values.

Command Modes

Interface configuration

X.25 profile configuration

Command History

Release	Modification
Release 12.1(1)T	This command was introduced.

Usage Guidelines

The **x25 fail-over** command can be configured on a primary X.25 interface or an X.25 profile only.

Examples

In the following example, X.25 failover is configured on a network that is also configured for Annex G. If data-link connection identifier (DLCI) 13 or DLCI 14 on serial interface 1/0 goes down, dialer interface 1 will serve as the secondary interface. After DLCI 13 or 14 comes back up and remains up for 20 seconds, dialer interface 1 will reset, sending all calls back to the primary interface.

```
interface serial1/0
 encapsulation frame-relay
 frame-relay interface-dlci 13
 x25-profile frame1
  exit
 frame-relay interface-dlci 14
 x25-profile frame1 dte
  exit
!
interface dialer1
 encapsulation x25
   exit

x25 route ^1234 interface serial1/0 dlci 13
x25 route ^1234 interface serial1/0 dlci 14
x25 route ^1234 interface dialer1
!
x25 profile frame1
 x25 fail-over 20 interface dialer1
  exit
!
```

Related Commands

Command	Description
show x25 context	Displays information about X.25 links.
x25 profile	Configures an X.25 profile without specifying any hardware-specific information.

show x25 context

To view operating configuration status details of an X.25 link, use the **show x25 context** EXEC command.

show x25 context [**interface** *number* **dlci** *number*]

Syntax Description

interface *number*	(Optional) Specific logical X.25 virtual circuit interface.
dlci *number*	(Optional) Specific DLCI link.

Command Modes

EXEC

Command History

Release	Modification
12.0(3)T	This command was introduced.
12.1(5)T	This command was modified to display information about X.25 Failover.

Examples

The following is sample output from the **show x25 context** command:

```
Router# show x25 context
Serial1 DLCI 20
PROFILE DCE, address <none>, state R1, modulo 8, timer 0
      Defaults: idle VC timeout 0
        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 1-1024, Outgoing-only none
      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
      T1 3000, T2 0, interface outage (partial T3) 0, T4 0
      VS 7, VR 6, tx NR 6, Remote VR 7, Retransmissions 0
      Queues: U/S frames 0, I frames 0, unack. 0, reTx 0
      IFRAMEs 111/118 RNRs 0/0 REJs 0/0 SABM/Es 14/1 FRMRs 0/0 DISCs 0/0
```

The following is sample output from the **show x25 context** command when the X.25 Failover feature is configured. The "Fail-over delay" field appears when the primary interface has gone down and come back up again. The number of seconds indicates the time remaining until the secondary interface will reset.

```
Router# show x25 context
Serial1 DLCI 33
  PROFILE dxe/DCE, address 3032, 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 12/0 CALLs 5+4/0+0/0+0 DIAGs 0/0
      Fail-over delay:16 seconds remaining on Dialer0
  LAPB dxe/DCE, 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 97/88 RNRs 0/0 REJs 0/0 SABM/Es 55490/12 FRMRs 186/0 DISCs
```

Table 1 describes significant fields shown in the display.

Table 1 show x25 context Field Descriptions

Field	Description
address	Address to which the interface is connected.
state	State of the interface. Possible values are: R1- normal ready state R2 - DTE restarting state R3 - DCE restarting state If state is R2 or R3, the interface is awaiting acknowledgment of a Restart packet.
modulo	Modulo packet sequence numbering scheme.
timer	Interface timer value (zero unless the interface state is R2 or R3).
Defaults: idle VC timeout	Inactivity time before clearing VC.
input/output window sizes	Default window sizes (in packets) for the interface. The **x25 facility** interface configuration command can be used to override these default values for the switched virtual circuits originated by the router.
packet sizes	Default maximum packet sizes (in bytes) for the interface. The **x25 facility** interface configuration command can be used to override these default values for the switched virtual circuits originated by the router.
Timers	Values of the X.25 timers: T10 through T13 for a DCE device T20 through T23 for a DTE device
Channels	Virtual circuit ranges for this interface.
RESTARTs	Restart packet statistics for the interface using the format Sent/Received.

Table 1 show x25 context Field Descriptions (continued)

Field	Description
CALLs	(Number of successful calls sent + calls failed)/(calls received + calls failed)/(calls forwarded + calls failed). Calls forwarded are counted as calls sent.
DIAGs	Number of diagnostic messages sent and received.
Fail-over delay	Number of seconds remaining until secondary interface resets.

Related Commands

Command	Description
show x25 profile	Displays information about configured X.25 profiles.
show x25 vc	Displays information about active X.25 virtual circuits.
x25 profile	Configures an X.25 profile without allocating any hardware-specific information.