



SNA Frame Relay Access Support Commands

This chapter describes the commands to configure Systems Network Architecture (SNA) Frame Relay access support. For SNA Frame Relay access support configuration tasks and examples, refer to the “Configuring SNA Frame Relay Access Support” chapter of the *Bridging and IBM Networking Configuration Guide*.

Note Because Frame Relay does not provide the reliable transport required by SNA, the RFC 1490 support of SNA uses Logical Link Control, type 2 (LLC2) as part of the encapsulation to provide link-level sequencing, acknowledgment, and flow control. The serial interface configured for Internet Engineering Task Force (IETF) encapsulation (RFC 1490) accepts all LLC2 interface configuration commands. For more information about LLC2 interface configuration commands, refer to the “LLC2 and SDLC Commands” chapter of this publication.

frame-relay map llc2

Use the **frame-relay map llc2** interface configuration command to map LLC2 traffic to a DLCI.

frame-relay map llc2 *dlci-number*

Syntax Description

dlci-number Frame Relay data-link connection identifier.

Default

No defaults are defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

Example

The following example maps LLC2 traffic to DLCI number 200:

```
frame-relay map llc2 200
```

frame-relay map rsrb

Use the **frame-relay map rsrb** interface configuration command to specify the DLCI number onto which the RSRB traffic is to be mapped.

frame-relay map rsrb *dlci-number*

Syntax Description

dlci-number Frame Relay data-link connection identifier.

Default

No defaults are defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

Example

The following example shows RSRB traffic mapped to DLCI number 30:

```
frame-relay map rsrb 30
```

Related Command

A dagger (†) indicates that the command is documented outside this chapter.

encapsulation frame-relay †

fras ban

Use the **fras ban** interface configuration command to associate bridging over a Frame Relay network using boundary access node (BAN). Use the **no** form of this command to cancel each association.

```
fras ban local-ring bridge-number ring-group ban-dlci-mac dlci dlci#1 [dlci#2 ... dlci#5]
[bni mac-addr]
no fras ban local-ring bridge-number ring-group ban-dlci-mac dlci dlci#1 [dlci#2 ... dlci#5]
[bni mac-addr]
```

Syntax Description

<i>local-ring</i>	Decimal number from 1 to 4095 describing the Token Ring interface.
<i>bridge-number</i>	Decimal number from 1 to 15 that uniquely identifies a bridge connecting two rings.
<i>ring-group</i>	Decimal number from 1 to 4095 representing a collection of Token Ring interfaces on one or more routers.
<i>ban-dlci-mac</i>	Frame Relay BAN PVC MAC address.
<i>dlci#1 [dlci#2 ... dlci#5]</i>	Frame Relay data-link connection identifier. Each DLCI number is unique and is a decimal within the range of 16 to 1007. The keyword dlci precedes the list of one or more DLCI numbers. If more than one DLCI number is needed for load balancing in the FRAS BAN configuration command, a maximum of five DLCI numbers are allowed.
bni mac-addr	(Optional) Boundary node identifier (BNI) MAC address of the NCP that receives frames from the router.

Default

No defaults are defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Multiples **fras ban** commands may be configured; however, each **fras ban** command must use a unique DLCI MAC address.

You must configure the **source-bridge ring-group** global configuration command prior to the **fras ban** command.

Example

The following configuration shows FRAS BAN support for Token Ring and serial interfaces:

```
source-bridge ring-group 200
!
interface serial 0
  mtu 4000
  encapsulation frame-relay ietf
  frame-relay lmi-type ansi
  frame-relay map llc2 16
  frame-relay map llc2 17
  fras ban 120 1 200 4000.1000.2000 dlc1 16 17
!
interface tokenring 0
  source-bridge 100 5 200
```

Related Command

A dagger (†) indicates that the command is documented outside this chapter.

source-bridge ring-group †

fras map llc

Use the **fras map llc** interface configuration command to associate an LLC connection with a Frame Relay connection. Use the **no** form of this command to cancel the association.

```
fras map llc mac-address lan-lsap lan-rsap serial port frame-relay dci fr-lsap fr-rsap
[pfid2 | afid2 | fid4]
no fras map llc mac-address lan-lsap lan-rsap serial port frame-relay dci fr-lsap
fr-rsap [pfid2 | afid2 | fid4]
```

Syntax Description

<i>mac-address</i>	Media Access Control (MAC) address of the downstream SNA device. It is a 48-bit dotted-triple address.
<i>lan-lsap</i>	Local service access point (SAP) address of the downstream SNA device in hexadecimal. For SNA, the address must be multiples of 4.
<i>lan-rsap</i>	Destination SAP address from the perspective of the downstream SNA device in hexadecimal. For SNA, the address must be multiples of 4.
serial port	Serial interface on which Frame Relay is configured.
frame-relay dci	Frame Relay data-link connection identifier.
<i>fr-lsap</i>	Local SAP address of the logical link connection on the Cisco Frame Relay access device (CFRAD).
<i>fr-rsap</i>	Destination SAP address on the host.
pfid2	(Optional) Format indicator 2 (FID2) SNA transmission header for SNA peripheral traffic.
afid2	(Optional) FID2 transmission header for Advanced Peer-to-Peer Networking (APPN) traffic.
fid4	(Optional) Transmission header used on SNA subarea flows.

Default

No defaults are defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

You can map multiple LLC sessions to a DLCI.

Example

The following example associates an LLC connection to a Frame Relay connection:

```
fras map llc 0800.5a8f.8802 4 4 serial 0 frame-relay 200 4 4
```

Related Command

frame-relay map llc2

fras map sdlc

Use the **fras map sdlc** interface configuration command to associate an SDLC link with a Frame Relay DLCI. Use the **no** form of this command to cancel the association.

```
fras map sdlc sdlc-address serial port frame-relay dcli fr-lsap fr-rsap [pfid2 | afid2 | fid4]
no fras map sdlc sdlc-address serial port frame-relay dcli fr-lsap fr-rsap [pfid2 | afid2 | fid4]
```

Syntax Description

<i>sdlc-address</i>	SDLC address of the downstream SNA device in hexadecimal.
serial <i>port</i>	Serial interface on which Frame Relay is configured.
frame-relay <i>dcli</i>	Frame Relay data-link connection identifier.
<i>fr-lsap</i>	Local SAP address of the logical link connection on the CFRAD.
<i>fr-rsap</i>	Destination SAP address on the host.
pfid	(Optional) FID2 SNA transmission header for SNA peripheral traffic.
afid2	(Optional) FID2 transmission header for APPN traffic.
fid4	(Optional) Transmission header used on SNA subarea flows.

Default

No defaults are defined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

You can map multiple SDLC links to a DLCI.

Example

The following example associates an SDLC link with a Frame Relay DLCI:

```
fras map sdlc c1 serial 0 frame-relay 200 4 4
```

Related Command

frame-relay map llc2

llc2 dynwind

Use the **llc2 dynwind** interface configuration command to enable dynamic window congestion management. Use the **no** form of this command to cancel the configuration.

```
llc2 dynwind [nw nw-number] [dwc dwc-number]  
no llc2 dynwind [nw nw-number] [dwc dwc-number]
```

Syntax Description

nw <i>nw-number</i>	(Optional) Specifies a number of frames that must be received to increment the working window value by 1. The default is 4.
dwc <i>dwc-number</i>	(Optional) Specifies the number by which the working window value is divided when backward explicit congestion notification (BECN) occurs. Valid numbers are 1, 2, 4, 8, and 16. 1 is a special value that indicates that the working window value should be set to 1 when BECN is indicated. The default is 1.

Defaults

The default *nw-number* value is 4 frames.

The default *dwc-number* value is 1.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

Example

The following example specifies that to increment the working window six frames must be received, and the working window value should be set to 1 when BECN occurs:

```
llc2 dynwind nw 6 dwc 1
```

show fras

Use the **show fras** privileged EXEC command to display information about the connection state in FRAS, as well as current BAN information configured.

show fras

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Sample Display

The following is sample output from the **show fras** command:

```
Router# show fras

Boundary Network Node (BNN):
DLCI: 200
  Type  Destination      Int  LSap  RSap  Role  State
  tr    0800.5a8f.8802  tr0  4     8     P     ls_contacted
  fr    -              s1   10    4     S     ls_contacted

Boundary Access Node (BAN):
DLCI: 300      BNI: 4fff.0000.0000
  Type  Destination      Int  LSap  RSap  Role  State
  tr    1000.5acc.88ab  tr1  4     4     P     ls_contacted
  fr    -              s0   4     4     S     ls_contacted

  tr    1000.5acc.77bb  tr1  4     4     P     ls_contacted
  fr    -              s0   4     4     S     ls_contacted
```

Table 44 describes significant fields shown in the display.

Table 44 Show FRAS Field Descriptions

Field	Description
Type	Connection type. The display example shows Token Ring and Frame Relay.
Destination	Destination MAC address from the perspective of the Cisco IOS software.
Int	Interface that the connection resides on.
LSap	Local SAP value.
RSap	Remote SAP value.
Role	Local link station role; P means Primary, S means Secondary.

Table 44 Show FRAS Field Descriptions (Continued)

Field	Description
State	Link station protocol machine state. This value may be one of the following states: ls_reset ls_RqOpnStnSent ls_ExchgXid ls_ConnRqSent ls_SigStnWait ls_ConnRspWait ls_ConnRspSent ls_Contacted ls_DiscWait
BNI	Boundary node identifier (BNI) that BAN uses as its destination MAC address. The BNI allows the NCP to identify BAN frames without being configured with the BAN DLCI MAC address. The BNI and the BAN DLCI MAC can be the same value. If the BNI and the BAN DLCI MAC are different values, the BNI column shows the DLCI MAC address value on the Token Ring connection.

show fras map

Use the **show fras map** privileged EXEC command to display the mapping and connection state of Frame Relay access support.

show fras map

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

Sample Display

The following is sample output from the **show fras map** command:

```
Router# show fras map

Type Destination  Int  LSap  RSap  Role  State
tr  0800.5a8f.8802 tr0   4     4     P     ls_contacted
fr  200              s0   4     4     S     ls_contacted
```

Table 45 describes significant fields shown in the display.

Table 45 Show FRAS Map Field Descriptions

Field	Description
Type	Interface type.
Destination	Destination address.
Int	Interface.
LSap	Local SAP.
RSap	Remote SAP.
Role	Local link station role; P means Primary, S means Secondary.
State	Link station protocol machine state.