

Configuring SNA Frame Relay Access Support

This chapter describes Frame Relay access support for Systems Network Architecture (SNA) devices. For a complete description of the commands mentioned in this chapter, refer to the “SNA Frame Relay Access Support Commands” chapter of the *Bridging and IBM Networking Command Reference*.

SNA Frame Relay Access Support Configuration Task List

To configure Frame Relay access support, perform the tasks described in the following sections:

- Configure Frame Relay Access Support
- Configure Frame Relay Boundary Access Node Support
- Configure Frame Relay Access Support Congestion Management
- Configure Frame Relay RSRB Dial Backup
- Monitor and Maintain Frame Relay Access Support

See the end of this chapter for “Frame Relay Access Support Configuration Examples.”

Configure Frame Relay Access Support

To configure Frame Relay access support (FRAS), perform one of the following tasks in interface configuration mode:

| Task | Command |
|--|---|
| Associate an LLC connection with a Frame Relay DLCI. | fras map llc <i>mac-address lan-lsap lan-rsap serial port</i> frame-relay dlc <i>fr-lsap fr-rsap [pfd2 afid2 fid4]</i> |
| Associate an SDLC link with a Frame Relay DLCI. | fras map sdlc <i>sdlc-address serial port</i> frame-relay dlc <i>fr-lsap fr-rsap [pfd2 afid2 fid4]</i> |

Because Frame Relay itself does not provide a reliable transport as required by SNA, the RFC 1490 support of SNA uses 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 (that is, RFC 1490) can take all LLC2 interface configuration commands.

Configure Frame Relay Boundary Access Node Support

To configure Frame Relay boundary access node (BAN), perform the following task in interface configuration mode:

| Task | Command |
|--|--|
| Associate a bridge to the Frame Relay BAN. | fras ban <i>local-ring bridge-number ring-group ban-dlci-mac dlci dlci#1 [dlci#2 . . . dlci#5] [bni mac-addr]</i> |

BAN simplifies router configuration when multiple LLC sessions are multiplexed over the same DLCI. By comparison, SAP multiplexing requires static definitions and maintenance overhead. By using BAN, the Token Ring MAC address is included in every frame to uniquely identify the LLC session. Downstream devices can be dynamically added and deleted with no configuration changes required on the router.

Configure Frame Relay Access Support Congestion Management

Frame Relay access support provides a congestion control mechanism based on the interaction between congestion notification bits in the Frame Relay packet and the dynamic adjustment of the LLC2 send window. This window is the number of frames the Cisco IOS software can send before waiting for an acknowledgment. The window size decreases with the occurrence of backward explicit congestion notification (BECN) and increases when no BECN frames are received.

To configure congestion management, perform the following tasks in interface configuration mode:

| Task | Command |
|--|---|
| Specify the maximum window size for each logical connection. | llc2 local-window <i>packet-count</i> ¹ |
| Enable the dynamic window flow-control mechanism. | llc2 dynwind [nw <i>nw-number</i>] [dwc <i>dwc-number</i>] |

1. This command is documented in the “LLC2 and SDLC Commands” chapter of the *Bridging and IBM Networking Command Reference*.

You can enable the dynamic window mechanism only if you are using Frame Relay IETF encapsulation.

Configure Frame Relay RSRB Dial Backup

When the Frame Relay network is down, the Cisco IOS software checks whether the dial backup feature is configured for the particular DLCI number. If it is configured, the software removes the FRAS to the downstream device connection and establishes the RSRB to this downstream device connection.

To configure RSRB dial backup, perform the following task in interface configuration mode:

| Task | Command |
|--|---|
| Activate Frame Relay RSRB dial backup. | fras backup rsrb <i>vmacaddr local-ring-number target-ring-number host-mac-address</i> |

Monitor and Maintain Frame Relay Access Support

To display information about the state of Frame Relay access support, perform the following command in privileged EXEC mode:

| Task | Command |
|---|----------------------|
| Display the mapping and connection state of the Frame Relay access support. | show fras map |

Frame Relay Access Support Configuration Examples

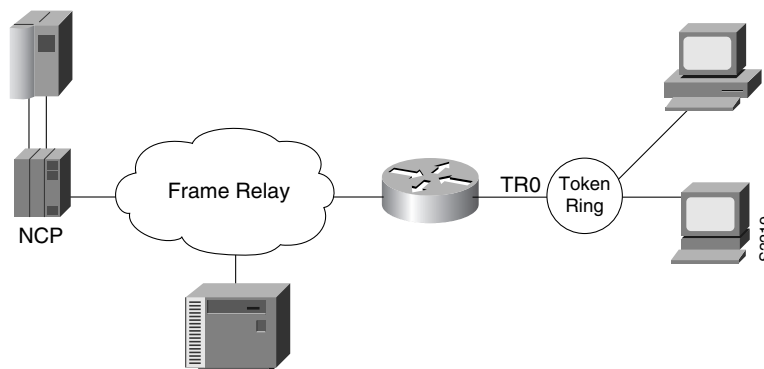
The following sections provide Frame Relay access support configuration examples:

- LAN-Attached SNA Devices Example
- SDLC-Attached SNA Devices Example
- Boundary Access Node Example

LAN-Attached SNA Devices Example

Figure 111 illustrates the configuration of SNA devices attached to a LAN.

Figure 111 LAN-Attached SNA Devices



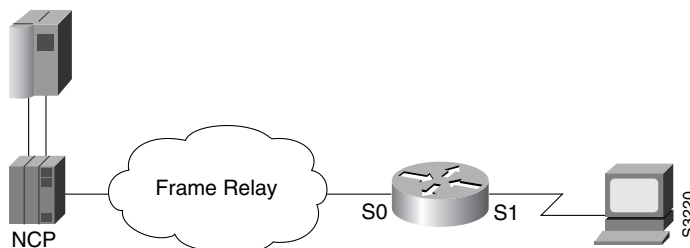
The following is the configuration for the network shown in Figure 111:

```
interface tokenring 0
no ip address
no keepalive
ring-speed 16
fras map llc 0800.5a8f.8802 4 4 serial 0 frame-relay 200 4 4
!
interface serial 0
mtu 2500
no ip address
encapsulation frame-relay IETF
keepalive 12
frame-relay lmi-type ansi
frame-relay map llc2 200
```

SDLC-Attached SNA Devices Example

Figure 112 illustrates the configuration of SDLC-attached SNA devices.

Figure 112 SDLC-Attached SNA Devices



The following is the configuration file for the network shown in Figure 112:

```

interface serial 1
no ip address
encapsulation sdhc
no keepalive
clockrate 56000
sdhc address C1
sdhc xid C1 05D01501
sdhc role primary
frans map sdhc C1 serial 0 frame-relay 200 4 4
!
interface serial 0
mtu 2500
no ip address
encapsulation frame-relay ietf
keepalive 12
frame-relay lmi-type ansi
frame-relay map llc2 200
    
```

Boundary Access Node Example

The following configuration shows FRANS BAN support for Token Ring and serial interfaces. You must specify the **source-bridge ring-group** global command before you configure the **frans ban** interface command. When Token Ring is configured, the **source-bridge** interface command includes the *local-ring*, *bridge-number*, and the *target-ring* values. The **source-bridge** command enables local source-route bridging on a Token Ring interface.

```

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
frans ban 120 1 200 4000.1000.2000 dlci 16 17
!
interface tokenring 0
source-bridge 100 5 200
    
```

For SDLC connections, you must include SDLC configuration commands:

```
interface serial 0
 encapsulation sdlc
  sdlc vmac 4000.1000.1000 110 5 200
  sdlc address C1
  sdlc partner 4000.4444.1000 C1
```

