Distributed Routing Software

Systems Network Architecture Guide

Part Number: AA-QU5SC-TE

December 1997

This manual provides information about SNA interfaces and protocols for the Distributed Routing Software system.

Revision/Update Information: This is a revised manual.
Software Version: Distributed Routing Software V3.0

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Maynard, Massachusetts

This manual was produced by DIGITAL Information Design.

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Preface

Objectives

This manual explains how to use SDLC Relay to bridge and route SNA traffic across wide area networks. Specifically, this guide enables you to:

- Configure, monitor, and use the SDLC relay interfaces.
- Configure, monitor, and use SDLC Relay Protocol.

This preface describes how to use this book and the documentation set to which it belongs.

Audience

This manual is intended for persons who install and operate computer networks. Although experience with computer networking hardware and software is helpful, you do not need programming experience to configure, monitor, and manage your network.

Using This Guide

The following table helps you locate information in this guide:

If You Want Information About...	See Chapter or Appendix...
• Summary of Document Contents • Related Documentation • Document Set Structure • Documentation Conventions	Preface
• How SDLC Relay Works • Setting Up SDLC Relay • A Sample SDLC Relay Configuration	**1** Using SDLC Relay
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• SDLC MIB Support	**A** SDLC MIB Support

Using Related Documentation

DIGITAL Documents

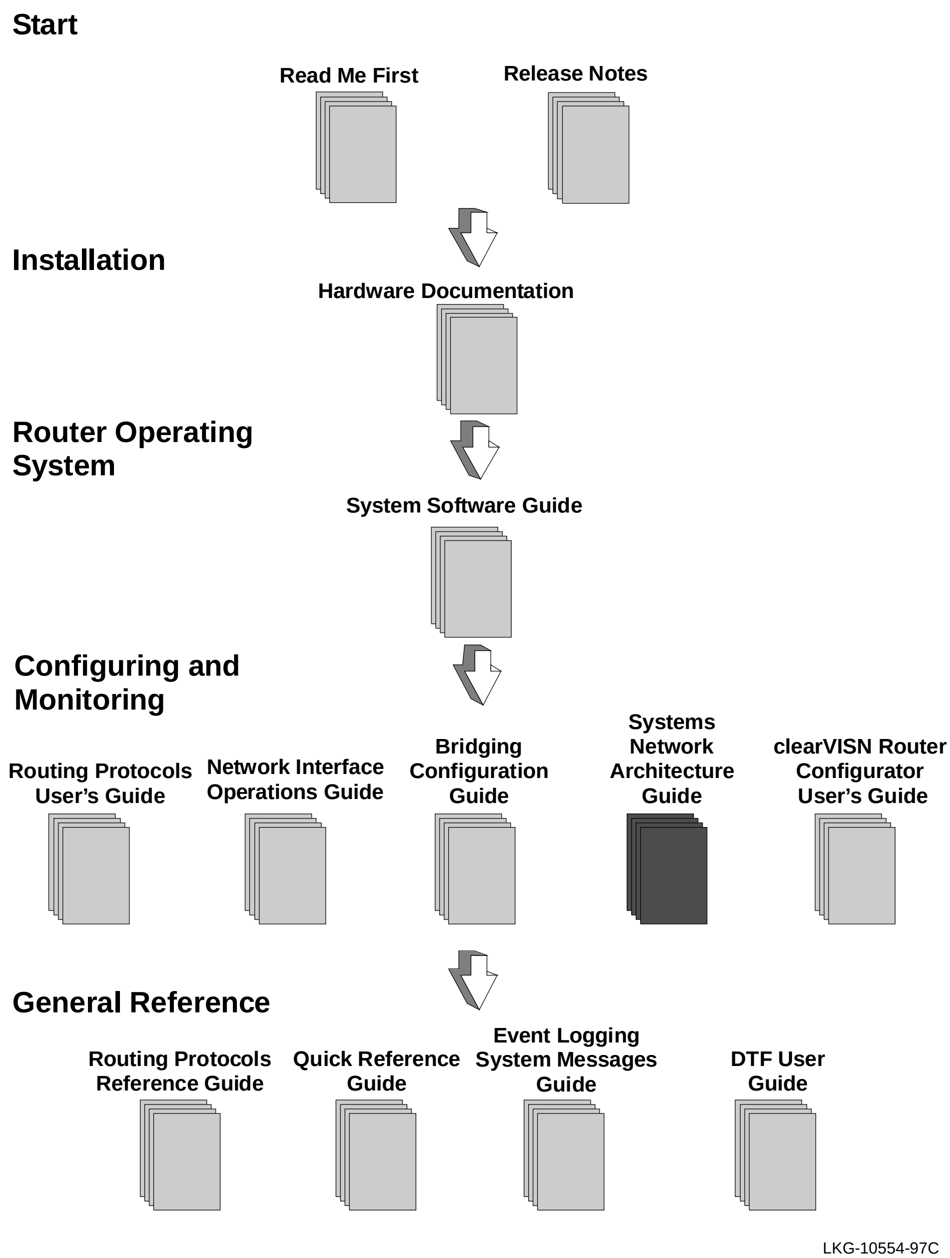
This Document...	Describes...
RouteAbout Access EI Installation EK-DEXBR-IN	Installation and use of the RouteAbout Access EI router.
RouteAbout Access EW Installation EK-DEX2R-IN	Installation and use of the RouteAbout Access EW router.
RouteAbout Access TW Installation EK-DEWTR-IN	Installation and use of the RouteAbout Access TW router.
RouteAbout Central EI Installation EK-DEZBR-IN	Installation and use of the RouteAbout Central EI router.
RouteAbout Central EP Installation EK-DEZPR-IN	Installation and use of the RouteAbout Central EP router.
RouteAbout Central EW Installation EK-DEZ8R-IN	Installation and use of the RouteAbout Central EW router.
Bridging Configuration Guide AA-QL29E-TE	The configuration and monitoring procedures for bridging methods. Bridging features that enhance system performance.
clearVISN Router Configurator User's Guide AA-R08YB-TE	The graphic user interface application which enables you to create and load a basic configuration for the bridging router.
DTF (DIGITAL Trace Facility) User Guide AA-R85DA-TE	How to install and use the DIGITAL Trace Facility, which enables you to trace packets within the protocol layers of the bridging router.
Event Logging System Messages Guide AA-QL2AE-TE	How events are logged, how to interpret Event Logging System (ELS) messages. Provides a description of each ELS message with a corresponding corrective action.
Network Interface Operations Guide AA-QL2BE-TE	Configuring and monitoring the network interfaces in the Distributed Routing Software bridging router.

This Document...	Describes...
Quick Reference Guide AA-R7QAA-TE	How to configure and monitor the main protocols, features and interfaces, and lists the associated commands.
Routing Protocols Reference Guide AA-QL2CE-TE	Reference information about the micro-operating system structure, and the protocols and interfaces supported by bridging routers.
Routing Protocols User's Guide AA-QL2DE-TE	Configuring and monitoring the protocols in the Distributed Routing Software bridging router. How to use the DIGITAL Trace Facility.
System Software Guide AA-QL2EE-TE	Installing, configuring, and operating the Distributed Routing Software system software.

Document Set Structure

Figure 1 shows the structure of the documentation set.

Figure 1 Document Set Structure



Conventions

The following conventions are used in this manual:

`Monospace type`	Monospace type in examples indicates system output or user input.
`Boldface type`	Boldface type in examples indicates user input. Boldface type is also used for file names and command names within text.
lowercase italics	Lowercase italics in command syntax or examples indicate variables for which either the user or the system supplies a value.
[ ]	Brackets enclose operands or symbols that are either optional or conditional. Specify the operand and value if you want the condition to apply. Do not type the brackets in the line of code.
`key`	A key name in bold type indicates that you press the specified key.
`Ctrl/X`	Indicates that you hold the Ctrl key while pressing the key specified by the *X*. The server displays the key combination as ^X.
<u>under</u>score	Characters underlined in a command listing represent the fewest number of characters you must enter to identify that command to the interpreter.
2-3	In the Index, page reference numbers in bold type indicate a reference to a command description.

Symbols

C **M**

The configuring and monitoring chapters contain a description of all commands you can use to configure and monitor the protocol, feature, or interface.

C means you use the command to configure the router. You access configuration commands after you enter **talk 6** at the * prompt. Configuration commands change the router's nonvolatile database; a router restart is necessary to activate the change.

M means you use the command to monitor and dynamically configure the router. You access monitoring commands after you enter **talk 5** at the * prompt. Changes made in this mode take effect immediately, but are not made in the router's nonvolatile database (and therefore not preserved after a router restart).

C **M** means you use the command both to configure and to monitor the router.

Note: **Talk 5** monitoring commands are also referred to as console commands in this guide. **Talk 6** configuration commands are sometimes referred to as config commands.

Commands

Figure 2 shows the components of a command description.

Figure 2 Command Components

> **Command Name**
>
> Description of commands.
>
> **Syntax:** command-name
> parameter 1 . . .
> parameter 2 . . .
>
> **parameter 1** ***option***
>
> Description of parameter and options.
>
> **Example:**
>
> ```
> command name  parameter
> Prompt [Default value]?options
> ```

Command Name	The name of the command followed by an overview description.
Syntax:	The command followed by each parameter you can configure using that command. If an ellipsis follows a parameter, you need to enter additional information (*options*). When you enter a command, you can save time by typing only the underlined letters.
parameter	Description of each parameter.
option	Information (in italics) you must enter with the command and parameter.
Example:	An example of how you enter that command and its parameter.

Entering Commands

Instead of being prompted for options, you can save time by entering the complete command on one line. For example, you can enter the **set framesize** command shown in Figure 3 as follows:

```
set framesize 2048
```

If you abbreviate the command using the underlined letters, you can enter

```
s f 2048
```

Figure 3 Set Framesize Command

Set

Configures frame size and local address.

Syntax: set

framesize . . .

parameter 2 . . .

framesize ***1024*** or ***2048*** or ***4096***

The size of the network-layer portion of frames transmitted and received on the interface.

Example:

```
set framesize
Framesize in bytes (1024/2048/4096) [1024]? 2048
```

Accepting the Current Setting

When the software prompts you for information, the current setting appears in brackets [ ]. To accept the information in the brackets, press **Return**. In this example, the current setting is 1024.

```
Framesize in bytes (1024/2048/4096) [1024]?
```

Correspondence

Documentation Comments

If you have comments or suggestions about his document, send them to the DIGITAL Network Products Business Organization.

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1
Using SDLC Relay

This chapter describes Digital Equipment Corporation's implementation of Synchronous Data Link Control Relay (SRLY).

1.1 About SDLC Relay

SRLY is a method for consolidation of SDLC traffic onto the corporate multiprotocol backbone.

SDLC Relay does not terminate the SDLC data link to reduce the likelihood of session timeouts, and does nothing to help reduce congestion on the WAN link. What SRLY provides is a serviceable method for shipping bit-oriented protocol (SDLC, HDLC, LAPB) frames across WAN links.

1.2 How SDLC Relay Works

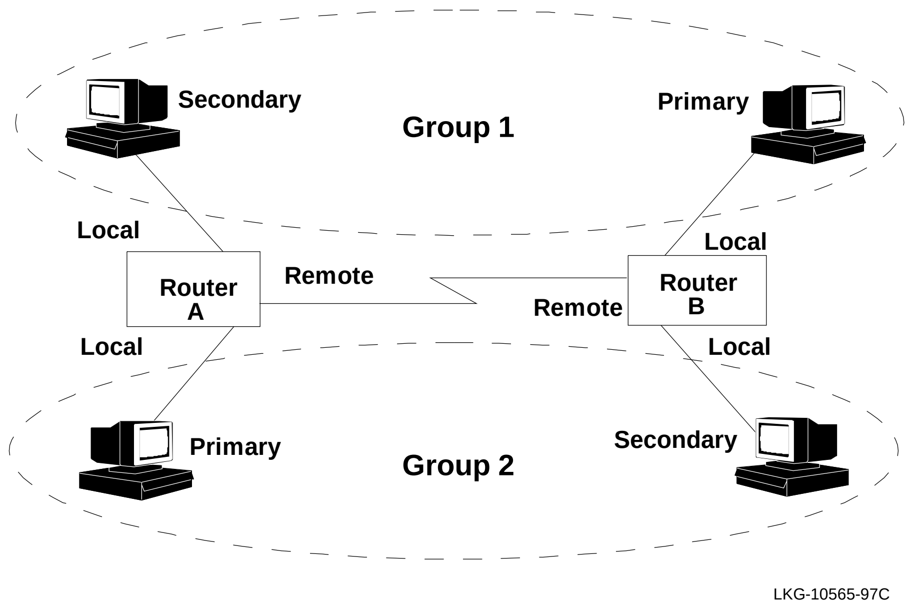
Despite its name, the SDLC Relay protocol (SRLY) is designed to handle other protocols besides SDLC. The protocol works by encapsulating SDLC or any bit-oriented protocol in UDP packets, and transmitting them through the IP cloud on a point-to-point connection to another SRLY device.

These connections are established by matching SRLY traffic to specific *ports* and *groups*. During configuration, each group has a unique group number assigned, and exactly two ports: one SDLC *primary* port, and one SDLC *secondary.* Matching SRLY traffic to group numbers and ports ensures that attached end stations can send packets only to the end stations for which they are intended.

Once packets are received, they are stripped of their UDP/IP header and transmitted to their destination address in their original protocol format.

1.2 How SDLC Relay Works

Figure 1–1 SDLC Primary/Secondary Stations and Local/Remote Ports



Encapsulation in UDP/IP packets allows for SDLC frames to be handled via IP routing techniques. And since each SDLC frame is encapsulated unchanged, SRLY is transparent to sending and receiving stations. This transparency allows SRLY to support all SNA PU Types.

1.2.1 SDLC Primary and Secondary Stations

When configuring SRLY, a router's primary port must be connected to its primary end station. Its secondary port must be connected to its secondary end station. Within the primary-secondary communication process, the primary end station is responsible for initiation, scheduling, and termination of the session. The secondary station does not initiate communication, but responds to commands from its primary partner.

When running balanced protocols such as LAPB or HDLC (or when running SDLC T2.1 negotiable link station traffic), you can assign roles arbitrarily as long as one device is primary, and its connected counterpart is secondary.

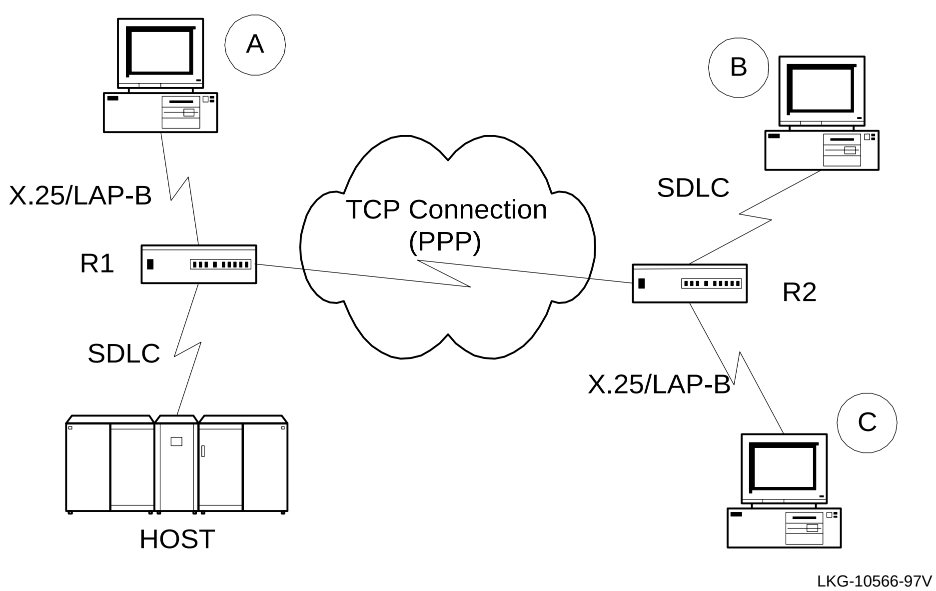
1.2.2 When to Use SDLC Relay

Generally, you would use SRLY when you need to exchange any bit-oriented protocol, such as LAPB, HDLC, or SDLC over a wide area, between SNA or non-SNA devices.

Protocol end-to-end acknowledgements (due to the lack of data link termination) should be tolerated, and the station traffic must be point-to-point, full duplex, modem control.

Since the UDP/IP messages generated by SRLY are recognized by the network as standard IP traffic, any medium or interface that will accommodate IP will also accommodate SRLY. For example, Figure 1–2 shows a PPP link between two routers, but the IP connection could also be Frame Relay (or even LAN-based) as requirements dictate.

Figure 1–2 SDLC Relay Configurations



1.3 Setting Up SDLC Relay

Configuring SDLC Relay (SRLY) involves performing these steps on each of two routers:

1. Set the data link on the serial line using the **set data-link** command and the appropriate interface number.
2. Assign a group number using the **add group** command. The group number must be the same on each SRLY router. Group number 1 is the default.
3. At the `SDLC Config>` prompt, add a local port with the **add local** command. Be sure you add this port to the group defined in step 2.
4. This port's data link type must be SDLC Relay (SRLY). Use the **set data-link** command at the `Config>` prompt to set the data link type for the port.
5. At the SDLC Relay Protocol `SDLC Config>` prompt, add a remote port with the **add remote** command. The IP address of the remote port is that of the cooperating SRLY router.
6. Repeat these steps for the second SRLY router. When prompted for the IP address of the remote port, provide the address of the first router.

1.4 Sample SDLC Relay Configuration

Following is a complete SDLC Relay configuration. The example assumes that the router has not been configured for any other protocols or data links.

1.4.1 Context Diagram

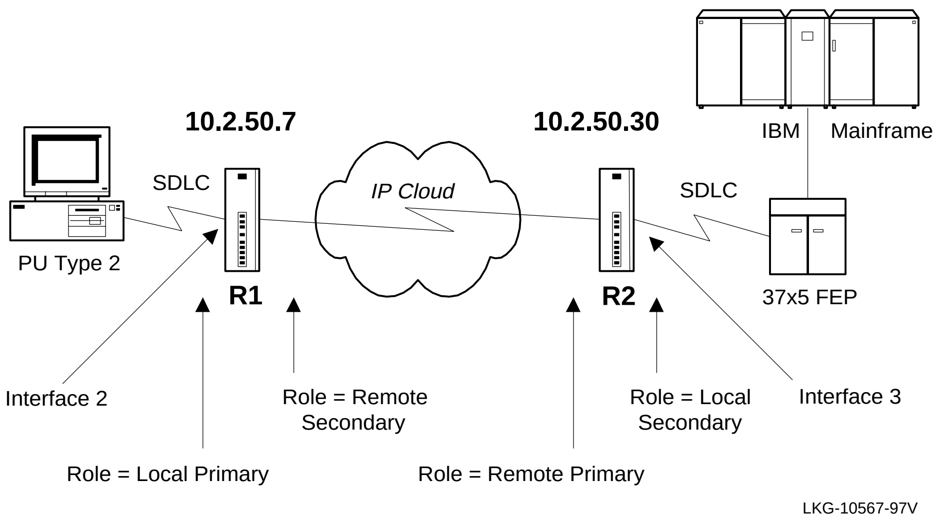
The example is based on the information shown in Figure 1–3. The IP connection between the two routers is over the serial line. The serial line supports NRZ or NRZ1, set in SRLY via the `set encoding` command.

Configuring R1 for SDLC Relay requires all of the information shown. This information includes the following:

- Group numbers for each group of SRLY ports
- Interface numbers for each SRLY port
- The internet addresses for each SRLY router

The example indicates where this information is provided in the course of the configuration procedure.

Figure 1–3 Context Diagram for SRLY Configuration



This example explains how to configure two routers for SRLY traffic. Router 1 (R1) is connected to a PU Type 2.0 node. Router 2 (R2) is connected to a front end processor (FEP).

1.4.2 Configuring SDLC Relay Network Interface

On R1, set the data link of interface 2 to an SDLC Relay device. Use the **set data-link** (abbreviated below) command shown here.

Example:

```
Config>set data srly 2
```

You can list the devices to confirm that an SDLC Relay device has been added.

Example:

```
Config>list dev
Ifc 0 (Token Ring): CSR 6000000, vector 28
Ifc 1 (WAN PPP): CSR  81620, CSR2  80D00, vector 93
Ifc 2 (WAN SDLC Relay): CSR  81640, CSR2  80E00, vector 92
```

1.4 Sample SDLC Relay Configuration

1.4.2.1 Set Serial Line Parameters

Next, optionally set the line speed and clocking type parameters for the SRLY line. You must also set encoding (NRZ or NRZI), frame size, and idle character. Note that the prompt for the SRLY configuration module is `SRLY # Config>`, where `#` is the number of the SRLY interface.

Example:

```
Config>network 2
SDLC relay interface user configuration
SRLY 2 Config>set encoding nrz
```

You can check the configuration with the **list** command as shown:

Example:

```
SRLY 2 Config>list
Synchronous serial line interface configuration
Maximum frame size in bytes = 2048
Encoding: NRZ
Idle State: Flag
Clocking: Internal
Cable type: RS-232 DCE
Internal Clock Speed: 56000
Transmit Delay Counter: 0
SRLY 2 Config>exit
```

1.4.3 Configuring the SDLC Relay Protocol

Configure the SDLC Relay protocol as shown:

Example:

```
Config>protocol sdlc
SDLC Relay protocol user configuration
SDLC Config>
```

As this example shows, the prompt for the SDLC Relay (SRLY) area is `SDLC Config>`. Commands entered at this prompt only affect the SDLC Relay protocol. **They have nothing to do with, and do not affect, SDLC data links or devices**.

You can exit the SDLC Relay configuration procedure at any time by entering **exit**.

1.4.3.1 Assign a Group Number

The group number provides the association/binding between the router's local and remote ports, as well as the correlation with the corresponding ports on the partner router. The group number is communicated by SRLY between the two routers.

1.4 Sample SDLC Relay Configuration

First, assign a group number with the **add group** command. This number is assigned to the *primary* and *secondary* ports on the router you are configuring for SRLY. The group number you designate must be the same for each router.

Example:

```
SDLC Config>add group
Group number: [1]?
```

Notice that the **list group** command shows that no ports have yet been configured for group 1.

Example:

```
SDLC Config>list group
Group number: [1]? 1

                         SDLC Relay Configuration
 Group Number     Port Status       Net    SDLC Station     IP Address
                                  Number  Address (hex)
------------  ----------------  -------  -------------    -----------
No ports configured for group  1
```

Note: The SDLC Station Address heading is currently not used. It is reserved for future use.

1.4.3.2 Add a Local Port

Next, add a local port to group 1. The port you add will be the SRLY line defined earlier. The local port is the serial interface over which the native SDLC (or HDLC or LAPB) traffic flows.

Example:

```
SDLC Config>add local
Group number: [1]?
Interface number: [0]? 2
(P)rimary or (S)econdary: [S]? p
```

Notice that the **list all** command shows that a local primary port has been configured for group 1.

Example:

```
SDLC Config>list all
                         SDLC Relay Configuration
 Group Number     Port Status       Net    SDLC Station     IP Address
                                  Number  Address (hex)
------------  ----------------  -------  -------------    -----------
     1 (E)     Local  PRIMRY (E)    2
```

1.4 Sample SDLC Relay Configuration

The **(E)** shown within the Port Status column stands for “Enabled.” By default, SRLY ports are enabled; SRLY ports must remain enabled in order to use the feature.

1.4.3.3 Add a Remote Port

Next, add a remote port for group 1. This is the port that leads to the IP cloud. Each group must consist of a pair of ports, one primary, and the other secondary. The remote port added here must be secondary since the local port attached to it is primary.

The IP address provided is that of the router R2, on the other side of the IP cloud in Figure 1–3.

Example:

```
SDLC Config>add remote
Group number: [1]?
IP address of remote router: [0.0.0.0]? 10.2.50.30
(P)rimary or (S)econdary: [S]? S
SDLC Config>list all
                         SDLC Relay Configuration
 Group Number     Port Status       Net    SDLC Station     IP Address
                                  Number  Address (hex)
-------------  -----------------  -------  -------------    -----------
    1 (E)      Local   PRMRY (E)   2

    1 (E)      Remote SCNDRY (E)                            10.2.50.30
```

1.4.4 Configuring the Neighbor Router

Up to this point, this example has shown how to configure R1 in Figure 1–3. SRLY requires two routers, one on either side of the IP cloud. You must configure SRLY on each of them.

1.4.4.1 Set Data Link, Add Group, and Add Port

First, set up an SRLY data link for R2. Do this in the same manner as shown earlier for R1.

Next, add a group for R2, assigning the same group number (1, in this case) as that assigned on R1. Add a local port for the assigned group. This is the SRLY line you have already defined. In this case, the port type is *secondary* since a front end processor (FEP) (which, for peripheral “boundary” PU2 traffic, is always primary) is on the line.

Example:

```
SDLC Config>add local
Group number: [1]?
Interface number: [0]?
(P)rimary or (S)econdary: [S]?
SDLC Config>list all
                         SDLC Relay Configuration
 Group Number     Port Status       Net    SDLC Station     IP Address
                                   Number  address (hex)
-------------  -----------------  -------  -------------    -----------

    1 (E)      Local   SCNDRY (E)    0
```

1.4.4.2 Add a Remote Port

Finally, add a remote port for group 1. This is the port that leads to the IP cloud. Since the FEP is primary, this port is secondary. As mentioned earlier, each group must consist of a primary and secondary station.

Since R2 is being configured, the IP address of the remote router belongs to R1. See Figure 1–3 for the addresses of R1 and R2, and their roles in the overall SRLY configuration.

Example:

```
SDLC Config>add remote
Group number: [1]?
IP address of remote router: [0.0.0.0]? 10.2.50.7
(P)rimary or (S)econdary: [S]? p
SDLC Config>list all
                         SDLC Relay Configuration
 Group Number     Port Status       Net    SDLC Station     IP Address
                                   Number  address (hex)
-------------  -----------------  -------  -------------    -----------
    1 (E)      Remote PRMRY   (E)                           10.2.50.7
    1 (E)      Local  SCNDRY  (E)    0
```

2

Configuring and Monitoring SDLC Relay Protocol

This chapter describes the Synchronous Data Link Control (SDLC) Relay Protocol configuration and console commands.

For more information about the SDLC Relay protocol, refer to Chapter 1.

2.1 About SDLC Relay Protocol Configuration and Console Commands

Enter SDLC Relay configuration commands at the `SDLC Config>` prompt. Changes made to the router’s configuration do not take effect immediately. They affect the operating router only after it is restarted.

Conversely, you enter SDLC Relay console commands at the `SDLC>` prompt. These commands take effect immediately, but do not become part of the router’s configuration memory. Thus, while console commands allow you to make real-time changes to the router’s configuration, these changes are temporary. Any permanent changes you wish to make (by storing them in FLASH) should be made with SDLC Relay configuration commands.

Monitoring consists of these actions:

- Monitoring the protocols and network interfaces currently in use by the router
- Displaying Event Logging System (ELS) messages relating to router activities and performance
- Making real-time changes to the SDLC Relay configuration without permanently affecting the router’s nonvolatile configuration memory

2.2 Accessing the SDLC Relay Protocol Configuration Environment

Use the SDLC Relay protocol configuration process to change the configuration of the router. The new configuration takes effect when you restart the router.

To enter the configuration process, enter **talk 6**, or just **t 6**, at the * prompt. This brings you to the `Config>` prompt as shown:

Example:

```
MOS Operator Control
* talk 6
Config>
```

If the `Config>` prompt does not appear immediately, press the **`Return`** key again.

Enter SDLC Relay configuration commands at the `SDLC Config>` prompt. To access this prompt, enter **protocol sdlc** as shown:

Example:

```
Config>protocol sdlc
SDLC Relay user configuration
SDLC Config>
```

2.3 Accessing the SDLC Relay Protocol Console Environment

To enter the console environment, enter **talk 5**, or just **t 5**, at the * prompt. This brings you to the console environment as shown:

Example:

```
MOS Operator Control
* talk 5
+
```

Enter SDLC Relay console commands at the `SDLC>` prompt. To access this prompt, enter **protocol sdlc** at the + prompt as shown:

Example:

```
+ protocol sdlc
SDLC>
```

2.4 SDLC Relay Commands

Enter the SDLC Relay configuration commands at the `SDLC config>` prompt and console commands at the `SDLC>` prompt. Table 2–1 lists the SDLC Relay configuration and console commands.

Table 2–1 SDLC Relay Commands

Command	Task	Function
? (Help)	Configure/ Monitor	Lists the configuration and console commands or parameters associated with a command.
Add	Configure	Adds groups, local ports, and remote ports.
Clear-Port-Statistics	Monitor	Clears SDLC statistics for the specified port.
Delete	Configure	Disables or temporarily suppresses groups, local ports, or remote ports.
Disable	Configure/ Monitor	Disables or temporarily suppresses groups and ports.
Enable	Configure/ Monitor	Enables groups and ports.
List	Configure/ Monitor	Displays SDLC Relay and group-specific configurations.
Exit	Configure/ Monitor	Exits the SDLC Relay configuration or console environment.

? (Help) C M

Lists the commands available from the current prompt level. You can also enter **?** after a specific command to list its options.

Syntax: ?

Example:

```
?
ADD
CLEAR-PORT-STATISTICS
DELETE
DISABLE
ENABLE
LIST
EXIT
```

2.4 SDLC Relay Commands

Add C

Adds group numbers, local ports, and remote ports.

Syntax: add

group
local-port
remote-port

group

Assigns a number to a group of primary or secondary ports added to the router.

Example:

```
add group
Group number: [1]? 1
```

Group number	The group number that you are designating for the port.

local-port

Identifies the interface that you are using for the local port.

Example:

```
add local-port
Group number: [1]?1
Interface number: [0]? 0
(P)rimary or (S)econdary:[S}? p
```

Group number	The group number for the port. This number must match one of the **add group** parameters configured previously.
Interface number	The interface number of the router that designates the local port.
Primary or Secondary	The port type, primary (P) or secondary (S).

remote-port

Identifies the IP address of the port directly connected to the serial line on the remote router.

Example:

```
add remote-port
Group number: [1]? 1
IP address of remote router:[0.0.0.0]? 128.185.121.97
(P)rimary or (S)econdary:[S]? s
```

Group number	The group number for the port. This number must match one of the **add group** parameters configured previously.
IP address of remote router	IP address of the interface on the remote router.
Primary or Secondary	The port type, primary (P) or secondary (S).

Clear-Port-Statistics M

Resets the SDLC Relay statistics for all ports. The statistics being cleared include the number of packets forwarded and the number of packets discarded for each group. You can display statistics with the **list group** and **list all** commands.

Syntax: clear-port-statistics

Example:

```
clear-port-statistics
Clear all port statistics? (Yes or No): Y
```

2.4 SDLC Relay Commands

Delete C

Removes group numbers, local ports, and remote ports.

Syntax: delete

group ...
local-port ...
remote-port ...

group ***group#***

Removes a group (group#) of SDLC Relay configured ports.

Example:

```
delete group 1
```

local-port ***interface#***

Removes the local port for the specified interface (interface#).

Example:

```
delete local-port 0
```

remote-port

Removes the remote port for the specified group.

Example:

```
delete remote-port
Group number: [1]? 1
(P)rimary or (S)econdary:[S}? S
```

Group number	The group number for the remote port.
Primary or Secondary	The port type, primary (P) or secondary (S).

Disable C M

Suppresses forwarding for an entire relay group or a specific relay port.

When you use this command within the console process, its effects are not stored in the router's nonvolatile configuration memory.

Syntax: disable

group ...
port ...

group ***group#***

Suppresses transfer of SDLC Relay frames to or from a specific group (group#).

Example:

```
disable group 1
```

port

Suppresses transfer of SDLC Relay frames to or from a specific local port.

Example:

```
disable port
Interface number: [0]? 0
(P)rimary or (S)econdary:[S]? s
```

Interface number	The interface number of the port that you want to disable.
Primary or Secondary	The port type, primary (P) or secondary (S).

Enable C M

Enables data transfer for an entire group or a specific local interface port.

When you use this command within the console process, its effects are not stored in the router's nonvolatile configuration memory.

Syntax: enable

group ...
port ...

2.4 SDLC Relay Commands

group ***group#***

Allows transfer of SDLC Relay frames to or from the specified group.

Example:

```
enable group 1
```

port

Allows transfer of SDLC Relay frames to or from the specified local port.

Example:

```
enable port
Interface number: [0]? 0
(P)rimary or (S)econdary:[S]? s
```

Interface number	The interface number of the port that you want to disable.
Primary or Secondary	The port type, primary (P) or secondary (S).

List **C M**

Displays the configuration or status of a specific group or of all groups.

Syntax: list

all

group ...

all

Displays the configurations of all local ports.

Example:

```
list all
 Group Number     Port Status       Net    SDLC Station     IP Address
                                  Number  address (hex)
-------------    ---------------  ------  --------------- ------------
 1 (E)           Local PRMRY (D)     2
 1 (E)           Remote SCNDRY (E)                          10.2.50.7
 2 (D)           Local PRMRY (D)     0
 2 (D)           Remote SCNDRY (D)                          10.2.50.7
```

Note: While the SDLC station address (hex) appears in the listing, it is currently not implemented.

Group Number	Group number and the status of the group, enabled (E) or disabled (D).
Port Status	Type of port (local/remote primary/secondary) and its status, enabled (E) or disabled (D).
Net Number	Interface number of the local port.
IP Address	IP address of the remote port.

group *group#*

Displays the configuration of a specified group.

Example:

`list group 1`

```
 Group Number     Port Status       Net    SDLC Station     IP Address
                                  Number  address (hex)
-------------   ---------------   ------  --------------- ------------


1 (E)           Local PRMRY (D)      2                     10.2.50.7
1 (E)           Remote SCNDRY (E)
```

Group Number	Group number and the status of the group, enabled (E) or disabled (D).
Port Status	Type of port (local/remote primary/secondary) and its status, enabled (E) or disabled (D).
Net Number	Interface number of the local port.
IP Address	IP address of the remote port.

Exit C M

Exits the SDLC Relay configuration or console process.

Syntax: exit

Example:

`exit`

A

SDLC MIB Support

Table A–1 lists the DIGITAL supported tables and traps for the SDLC MIB. These are defined in RFC 1747.

Table A–2 lists unsupported objects in the supported tables and groups.

Table A–1 SDLC Supported MIB Tables

SDLC Table or Group Name	Supported	Not Supported
sdlcPortAdminTable	Y	
sdlcPortOperTable	Y	
sdlcPortStatsTable	Y	
sdlcLSAdminTable	Y	
sdlcLSOperTable	Y	
sdlcLSStatsTable	Y	
sdlcTraps		Y

Table A–2 SDLC Unsupported Objects in Supported Tables

Supported MIB Table	Unsupported Objects in Supported Tables
sdlcPortOperTable	sdlcPortOperLastFailTime sdlcPortOperLastModifyTime sdlcPortOperLastFailCause
sdlcPortStatsTable	sdlcPortStatsPhysicalFailures sdlcPortStatsInvalidAddresses sdlcPortStatsDwarfFrames sdlcPortStatsProtocolErrs sdlcPortStatsActivityTOs sdlcPortStatsRNRLIMITs sdlcPortStatsRetriesExps sdlcPortStatsRetransmitsIn sdlcPortStatsRetransmitsOut
sdlcLSOperTable	sdlcLSOperLastModifyTime sdlcLSOperLastFailTime sdlcLSOperLastFailCause sdlcLSOperLastFailCtrlIn sdlcLSOperLastFailCtrlOut sdlcLSOperLastFailFRMRInfo sdlcLSOperLastFailREPLYTOs
sdlcLSStatsTable	sdlcLSStatsProtocolErrs sdlcLSStatsActivityTOs sdlcLSStatsRNRLIMITs sdlcLSStatsRetriesExps sdlcLSStatsRetransmitsIn sdlcLSStatsRetransmitsOut

Glossary

A

Advanced Peer-to-Peer Networking

See APPN.

Advanced Program-to-Program Communication

See APPC.

APPC

Advanced Program-to-Program Communication. The general facility characterizing the LU 6.2 architecture and its various implementations in products.

APPN

Advanced Peer-to-Peer Networking. An extension of traditional SNA. APPN features greater distributed network control, avoiding critical hierarchical dependencies, and thereby isolating the effects of single points of failure. It also features dynamic exchange of network topology information among network nodes, fostering ease of connection and reconfiguration, adaptive route selection, simplified network definition, and distributed directory lookup.

B

basic transmission unit

The unit of data and control information passed between path control components.

bit-oriented protocol

A protocol that sends data between devices as a steady stream of bits. Clocks at source and destination are synchronized to use a predetermined time interval to determine where characters begin and end. Examples include SDLC and LAPB.

C

cache

An optional part of a directory database in network nodes where frequently used directory information can be stored to speed directory searches.

cluster controller

A device that controls the input/output operations of multiple devices attached to it.

D

datagram delivery protocol

A protocol, such as IP or UDP, designed to deliver data in a series of discrete packets. The packets may take different routes to the same destination, and their delivery may not be guaranteed.

data link layer

The second layer in the OSI protocol stack, and the one in which bridging occurs.

Data Link Connection Identifier

See DLCI.

DCE

Data Circuit-terminating Equipment. The X.25 term for a device (a modem, for instance), to which an end node attaches.

DLCI

Data Link Connection Identifier. A 10-bit field in the Frame Relay header identifying the permanent virtual circuit between the user and Frame Relay device.

DSAP

Destination SAP. The Service Access Point associated with a destination port.

DTE

Data Terminal Equipment. The X.25 term for an end node, such as a terminal.

dynamic routing

Routing that adjusts automatically to network topology or traffic changes, based on information from routing protocol transmissions.

E

encapsulation

The insertion of protocol information into the data area of another protocol, such as IP or UDP, for transport across a wide area network.

end system

See ES.

End System Hello

See ESH.

ES

End system. In the OSI protocol, a host system that performs the functions of all of the layers of the OSI reference model.

ESH

End System Hello. A packet originating in an end system and passing information to an intermediate system.

F

FR

Frame Relay.

frame

Informal name for a data link packet data unit. Control information in the frame provides addressing, sequencing, flow control, and error control to the respective protocol levels.

H

HDLC

High-level Data Link Control. An ISO standard bit-oriented data link protocol that specifies the encapsulation method of data on synchronous data links.

Hello/I-H-U

Hello and I-Heard-You. An EGP protocol that requests and confirms neighbor reachability.

High-level Data Link Control

See HDLC.

I

I-Frame

Information Frame.

IGP

Interior Gateway Protocol. A protocol that distributes routing information to the routers within an autonomous system.

IP

Internet Protocol. The Department of Defense (DoD) Internet standard protocol that defines the Internet datagram as the unit of information passed across the Internet. IP corresponds to the OSI reference model layer 3 and provides connectionless datagram service.

IP datagram

A packet containing IP control information exchanged between network entities.

L

link station

An SDLC station with which a link has been established. Each SDLC link station has either a primary or secondary role in the communication process.

logical unit

See LU.

Low-Entry Networking

A capability in Type 2.1 nodes, allowing them to attach directly to one another using peer-to-peer protocols and allowing them to support multiple parallel sessions between logical units. LEN nodes have no APPN routing capability.

LU

Logical Unit. A type of network accessible unit that enables end users to gain access to network resources and communicate with one another.

LU type

The classification of an LU in terms of the specific subset of SNA protocols and options it supports for a given session.

M

MAC

Media Access Control. The sublayer of the data link control layer that supports media-dependent functions. It includes the medium-access port. MAC protocols put packets from upper-level protocols into the frame format of the destination network.

Media Access Control

See MAC.

MIB

Management information base. A database of managed objects accessed from a network management protocol.

modem eliminator

A device permitting the connection of two DTE devices without a modem.

MOSPF

Multicast OSPF.

N

NAU

Network accessible unit. A logical unit (LU), physical unit (PU), system services control point (SSCP), or control point (CP).

Network accessible unit

See NAU.

network layer

Layer 3 of the OSI reference model at which all routers operate.

network name

The symbolic identifier by which end users refer to a network accessible unit, a link, or a link station within a given network.

node type

A designation of a node according to the protocols it supports and the network accessible units that it can contain.

NRZ

Non-return to zero.

NRZI

Non-return to zero inverted.

NSAP

Network Service Access Point. The point at the layer boundary where the communications capability of the network layer is made available to its users. An OSI network address.

O

Open Shortest Path First

See OSPF.

OSI

Open Systems Interconnection. The ISO architecture for internetworking.

OSI reference model

The seven-layer model of computer network architecture and its data functions, specified by ISO.

OSPF

Open Shortest Path First. A link-state protocol that IGPs use to exchange routing information between routers.

P

packet

A self-contained block of data containing control and user information transmitted across a network.

packet switching

A data transfer scheme in which information is broken into individual packets, transferred across a communications link, and reassembled at the receiving end. In a packet-switching system, each node through which the packet travels determines the route to the next receiver with no previously established communication path.

peer-to-peer communication

Communication between two nodes in an SNA network not requiring explicit mediation by a system services control point.

physical unit

See PU.

PLU

Primary logical unit. The logical unit that sends a BIND to activate a session with its partner LU.

port

The representation of a physical connection to the link hardware.

Primary logical unit

See PLU.

PU

Physical unit. The component that manages and monitors the resources associated with a node, as requested by an SSCP via an SSCP-PU session. This term applies to Type 2.0, Type 4, and Type 5 nodes.

R

RIF

Routing Information Field. A field in the Token Ring 802.5 header generated by a source node and used by a source route bridge to determine the path a packet must use when passing through a Token Ring network segment.

RIP

Routing Information Protocol. A distance-vector IGP used to exchange routing information between routers.

route

An ordered sequence of nodes that represent a path from an origin node to a destination node traversed by the traffic exchanged between them.

routing

The assignment of a path by which a message can reach its destination.

Routing Information Field

See RIF.

Routing Information Protocol

See RIP.

RS-232

A type of serial interface.

S

SAP

Service Access Point. The interface between a layer in the OSI protocol stack and the layer above. Generally, SAP is preceded by a letter denoting the layer providing the service (for example, network layer services are NSAPs). Well-known services are associated with well-known SAP numbers.

SDLC

Synchronous Data Link Control. A link level protocol designed for transfer of information in LAN environments. Transmission exchanges may be full-duplex or half-duplex over switched or nonswitched links. The configuration of the link connection can be point-to-point, multipoint, or looped.

SDLC Relay

A Digital product that supports exchange of bit-oriented protocols across the wide area.

segment number

A number that identifies an individual LAN, such as a single Token Ring or a serial line.

serial interface

An interface that supports connections via serial line.

Service Access Point

See SAP.

session

A logical connection between two network accessible units that can be activated, tailored to provide various protocols, and deactivated as requested. Each session is uniquely identified in a transmission header accompanying messages exchanged during transmission.

session limit

The maximum number of concurrently active LU-LU sessions that a particular LU can support.

SNA

Systems Network Architecture. A proprietary networking architecture used by IBM and IBM-compatible mainframes.

SNA network

The part of a user-application network that conforms to SNA formats and protocols. It enables reliable transfer of data among end users and provides protocols for controlling the resources of various network configurations. It consists of network accessible units: boundary function, gateway function, intermediate session routing function components, and the transport network.

SRLY

See SDLC Relay.

SSAP

Source SAP.

SSCP

System Services Control Point. A component within a subarea network for managing the configuration, coordinating network operator and problem determination requests, and providing directory services and other session services for end users of an SNA network. Multiple SSCPs can cooperate as peers, dividing the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its own domain.

SSCP-PU session

A session between a System Services Control Point and a physical unit.

subarea

A portion of the SNA network consisting of a subarea node, any attached peripheral nodes, and their associated resources. Within a subarea node, all network accessible units, links, and adjacent link stations that are addressable within the subarea share a common subarea address and have distinct element addresses.

subarea network

Interconnected subareas, their directly attached peripheral nodes, and the transmission groups that connect them.

subnet

In IP, a distinct network within a network. In OSI, the connection from the IS to the subnetwork.

subnet address

An extension of the IP addressing scheme that allows a site to use a single IP address for multiple physical networks.

Synchronous Data Link Control

See SDLC.

System Services Control Point

See SSCP.

T

TCP

Transmission Control Protocol. A protocol in the TCP/IP suite of protocols that implements transport functions on the internet.

TCP/IP

Transmission Control Protocol/Internet Protocol.

token

In a local area network, the symbol of authority passed among data stations to indicate the station temporarily in control of the transmission medium. The token becomes a frame when a station appends data to it.

Token Ring

A network with a ring topology that passes tokens from one attaching device to another. Examples include FDDI networks and the IBM Token Ring network.

transparent bridging

A bridging mechanism implemented by software on bridges and invisible (transparent) to end stations.

Type 2.0 node

An SNA peripheral node that requires the services of a PU5 (T5) subarea host in order to communicate. Type 2.0 nodes are known as PU2.0 or T2.0 nodes; the terms are used interchangeably. A 3270 terminal cluster controller (for example, an IBM 3174) is an example of a T2.0 node. T2.0 nodes do not perform dynamic link configuration, and when SDLC-attached, function only as SDLC secondary devices.

Type 2.1 node

An SNA peripheral node (T2.1) that has the capability to support communication with another T2.1 node without the mediation of a PU5 (T5) subarea host node. T2.1 nodes come in three basic types with increasing network capabilities: LEN nodes, APPN End Nodes (ENs), and APPN Network Nodes (NN). All three perform dynamic link configuration using XID3s during link activation negotiation. When SDLC-attached, T2.1 nodes can function as SDLC secondary or primary devices (including initial dynamic link role negotiation). An IBM AS/400 is an example of a T2.1 node.

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Page reference numbers in bold type indicate a reference to a command description.