# Configuring SDLLC Media Translation

SDLLC is a software feature that enables a device on a Token Ring to communicate with a device on a serial link by translating between Logical Link Control, Type 2 (LLC2) and Synchronous Data Link Control (SDLC) at the link layer. SDLLC is proprietary to Cisco Systems.

For a complete description of the commands in this chapter, refer to the chapter "SDLLC Commands" in the *Router Products Command Reference* publication.

Cisco's Implementation of SDLLC Media Translation

Figure 1-1 illustrates how SDLLC provides link-level support for Systems Network Architecture (SNA) communication.

Figure 1-1   SNA Link-Level Support
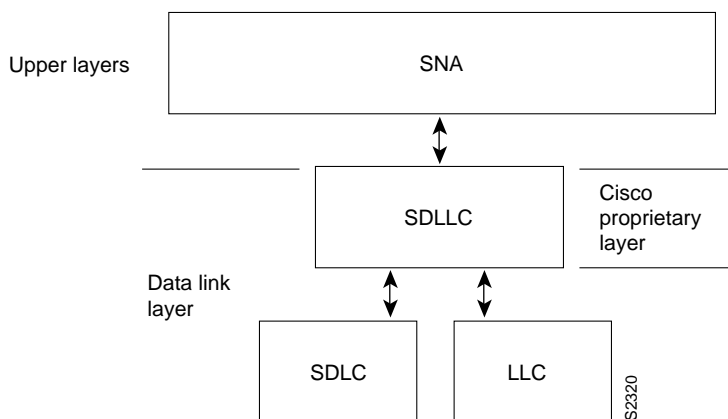
As Figure 1-1 shows, SNA uses SDLC and LLC2 as link-layer protocols to provide a reliable connection. The translation function between these industry-standard protocols takes place in the proprietary Cisco software.

The SDLLC software allows a physical unit (PU) 4, PU 2.1, or PU 2 to communicate with a PU 2 SDLC device as follows:

- SDLLC with direct connection—A 37x5 FEP on a Token Ring and the 3x74 cluster controller connected to a serial line are each connected to an interface on the same router configured with SDLLC.

- SDLLC with Remote Source-Route Bridging (RSRB)—A 37x5 FEP on a Token Ring and a 3x74 cluster controller connected to a serial line are connected to different routers. Only the router to which the 3x74 is connected is configured with SDLLC. The routers communicate via RSRB using direct encapsulation, RSRB over a Fast Sequenced Transport (FST) connection, or RSRB over a TCP connection.

- SDLLC with RSRB and local acknowledgment—A 37x5 front-end processor (FEP) on a Token Ring and a 3x74 cluster controller connected to a serial line are connected to different routers. Only the router to which the 3x74 is connected is configured with SDLLC. The routers communicate via RSRB over a TCP connection that has local acknowledgment enabled.

In all of these topologies, each IBM end node (the FEP and cluster controller) has no indication that its counterpart is connected to a different medium running a different protocol. The 37x5 FEP responds as if the 3x74 cluster controller were communicating over a Token Ring, whereas the 3x74 responds as though the 37x5 FEP were communicating over a serial line. That is, the SDLLC software provides translation between the two media to be transparent to the end nodes.

Virtual Token Ring Concept Implementation

Central to Cisco's SDLLC implementation is the concept of a virtual Token Ring device residing on a virtual Token Ring. Because the Token Ring device expects the node with which it is communicating also to be on a Token Ring, each SDLLC device on a serial line must be assigned an SDLLC virtual token ring address (SDLLC VTRA). Like real Token Ring addresses, SDLLC VTRAs must be unique across the network.

In addition to the SDLLC VTRA, an SDLLC virtual ring number (SDLLC VRN) also must be assigned to each SDLLC device on a serial line. (The SDLLC VRN differs from the virtual ring group numbers that are used to configure RSRB and multiport bridging.)

As part of its Virtual Telecommunications Access Method (VTAM) configuration, the IBM node on the Token Ring has knowledge of the SDLLC VTRA of the serial device with which it communicates. The SDLC VTRA and the SDLLC VRN are a part of the SDLLC configuration for the router's serial interface. When the Token Ring host sends out explorer packets with the SDLLC VTRA as the destination address in the Media Access Control (MAC) headers, the router configured with that SDLLC VTRA intercepts the frame, fills in the SDLLC VRNA and the bridge number in the routing information field (RIF), and then sends the response back to the Token Ring host. A route is then established between the Token Ring host and the router. After the router performs the appropriate frame conversion, it uses this route to forward frames to this serial device.

Resolving Differences in LLC2 and SDLC Frame Size

IBM nodes on Token Ring media normally use frame sizes greater than 1 KB, whereas the IBM nodes on serial lines normally limit frame sizes to 265 or 521 bytes. To reduce traffic on backbone networks and provide better performance, Token Ring nodes should send as large frames as possible. As part of the SDLLC configuration on the router's serial interface, the largest frame size the two media will support should be selected. The router can fragment the frames it receives from the Token Ring device before forwarding them to the SDLC device; however, it does not assemble the frames it receives from the serial device before forwarding them to the Token Ring device.

Maintaining a Dynamic RIF Cache

SDLCC maintains a dynamic RIF cache. SDLLC caches the entire RIF; that is, the RIF from the source station to destination station. The cached entry is based on the best path at the time the session began. SDLLC uses the RIF cache to maintain the LLC2 session between the router and the host FEP. SDLLC does not age these RIF entries. Instead, SDLLC places an entry in the RIF cache for a session when the session begins and flushes the cache when the session terminates. You cannot flush these RIFs because if you flushed the RIF entries randomly, the router would not be able to maintain the LLC2 session to the host FEP.

Other Implementation Considerations

- As part of Cisco's SDLC implementation, only modulus 8 Normal Response Mode (NRM) sessions are maintained for the SDLC session.

- SDLC sessions are always locally acknowledged. LLC2 sessions can be optionally configured for local acknowledgment.

- SDLLC does not apply to SNA subarea networks, such as 37x5 FEP-to 37x5 FEP communication.

- Parameters such as the maximum number of information frames (I-frames) outstanding before acknowledgment, frequency of polls, and response time to poll frames can be modified per interface. If local acknowledgment is not enabled, these parameters are modified on the SDLC interface; if local acknowledgment is enabled, these parameters are modified on the Token Ring interface.

- Local acknowledgment only applies when the remote peer is defined for RSRB using Internet Protocol (IP) encapsulation over a TCP connection. If no local acknowledgment is used, the remote peer can be defined for RSRB using direct encapsulation, RSRB using IP encapsulation over an FST connection, or RSRB using IP encapsulation over a TCP connection.

SDLLC Configuration Task List

You can perform the tasks in the following sections to configure SDLLC:

- Configure SDLLC with Direct Connection

- Configure SDLLC with RSRB

- Configure SDLLC with RSRB and Local Acknowledgment

- Configure SDLLC with Ethernet and Translational Bridging

- Customize SDLLC Media Translation

- Monitor SDLLC Media Translation

See the end of this chapter for SDLLC configuration examples.

Configure SDLLC with Direct Connection

In the SDLLC configuration with direct connection, a 37x5 FEP on a Token Ring and a 3x74 cluster controller connected to a serial line are each connected to an interface on the same router configured with SDLLC. In this configuration, the LLC2 session extends from the 37x5 FEP across the Token Ring to the router. The SDLLC session extends from the router across the serial line to the 3x74 cluster controller. The SNA session extends across the Token Ring and the serial line to provide an end-to-end connection. The router is configured with source-route bridging (SRB).

To configure SDLLC with direct connection, you must perform the tasks in the following sections:

- Enable SDLLC Media Translation
- Associate a SAP Value
- Specify the XID Value
- Initiate Connection to Token Ring Host

For an example of how to configure SDLLC with direct connection, see the "Example of SDLLC with Direct Connection" later in this chapter.

Enable SDLLC Media Translation

The interfaces you will configure for SDLLC media translation are the serial interfaces that connect to the serial lines linking the remote SDLC devices. To configure them, perform the following task in interface configuration mode:

Task	Command
Enable SDLLC media translation on a serial interface.	**sdllc traddr** *xxxx.xxxx.xx00 lr bn tr*

Associate a SAP Value

You can associate a SAP value by performing the following task in interface configuration mode:

Task	Command
Associate a SAP value.	**sdllc sap** *sdlc-address ssap dsap*

Specify the XID Value

The exchange of identification (XID) value you define on the router must match that of the IDBLK and IDNUM system generation parameters defined in VTAM of the Token Ring host to which the SDLC device will be communicating. To define XID on the router, perform the following task in interface configuration mode:

Task	Command
Specify the XID value appropriate for the SDLC station to match VTAM values.	**sdllc xid** *address xxxxxxxx*

Initiate Connection to Token Ring Host

The Token Ring host is always kept in a state ready to accept a connection from the remote serial device. The remote serial device is responsible for initiating connections. The advantage of this scheme is that the serial device can communicate with the Token Ring host whenever it chooses without requiring personnel to be on the host site.

The router actually initiates the connection on behalf of the serial device. To initiate connections, both the MAC address of the Token Ring host and the SDLC line address are required. You must configure the router to define the Token Ring host as the partner of the serial device. To do so, perform the following task in interface configuration mode:

Task	Command
Enable connections for SDLLC.	**sdllc partner** *mac-address sdlc-address*

Configure SDLLC with RSRB

A router need not directly connect the two IBM end nodes: a 37x5 FEP on a Token Ring and a 3x74 cluster controller connected to a serial line can be connected to different routers. However, the router to which the 3x74 is connected must be configured with SDLLC. The routers communicate via RSRB using direct encapsulation, RSRB over an FST connection, or RSRB over a TCP connection. RSRB transports packets between Router A and Router B, while Router B performs all conversion between the LLC2 and SDLC protocols by means of the SDLLC software.

To configure the router for SDLLC with RSRB you must perform all the tasks in the "Configure SDLLC with Direct Connection" section earlier in this chapter. In addition, you must perform one of the sets of tasks in the following sections:

- Configure RSRB Using Direct Encapsulation

- Configure RSRB over FST Connection

- Configure RSRB over TCP Connection

For more information about configuring RSRB, see the chapter "Configuring Source-Route Bridging" in this manual and "Source-Route Bridging Commands" in the *Router Products Command Reference* publication.

Note   When you configure RSRB, you must configure include a **source-bridge remote peer** command on the router connected to the serial line and another **source-bridge remote peer** command on the one connected to the Token Ring. If you have more than one serial line connected to the same router, then you will have a **source-bridge remote peer** command for each interface in its configuration that will be using SDLLC with RSRB.

For an example of how to configure SDLLC with RSRB, see the section "Example of SDLLC with RSRB (Multiple 3x74s)" later in this chapter.

Configure RSRB Using Direct Encapsulation

To configure SDLLC with RSRB using direct encapsulation, perform the following tasks in global configuration mode:

Task	Command
Define a ring group.	**source-bridge ring-group** *ring-group*
Define a remote peer.	**source-bridge remote-peer** *ring-group* **interface** *interface-name* [*mac-address*]

Configure RSRB over FST Connection

To configure SDLLC with RSRB over an FST connection, perform the following tasks in global configuration mode:

Task	Command
Define a ring group.	**source-bridge ring-group** *ring-group*
For FST connection only, set up an FST peer name.	**source-bridge fst-peer***name local-interface-address*
Define a remote peer.	**source-bridge remote-peer** *ring-group* **fst** *ip-address*

Configure RSRB over TCP Connection

To configure SDLLC with RSRB over a TCP connection, perform the following tasks in global configuration mode:

Task	Command
Define a ring group.	**source-bridge ring-group** *ring-group*
Define a remote peer.	**source-bridge remote-peer** *ring-group* **tcp** *ip-address*

Configure SDLLC with RSRB and Local Acknowledgment

RSRB can be configured for only local acknowledgment with RSRB using IP encapsulation over a TCP connection. Configuring SDLLC local acknowledgment can reduce time-outs and keepalive traffic on the connection.

If LLC2 local acknowledgment is configured, it must be configured on the serial interface of the router on the 3x74 cluster controller side of the connection and on the Token Ring interface of the router on the 37x5 FEP side of the connection. Whether or not local acknowledgment is configured, the SNA session extends end-to-end and the SDLC session extends from the router configured with the serial interface to the 3x74 cluster controller. However, the LLC2 session extends from the 37x5 FEP to the router with the Token Ring interface configured. The LLC2 session is locally terminated at that router. A TCP session is then established across the wide-area network (WAN) to router on the 3x74 side of the connection.

To configure the router for SDLLC with RSRB and local acknowledgment, you must perform all the tasks in the "Configure SDLLC with Direct Connection" section earlier in this chapter. In addition, you must perform the following tasks in global configuration mode:

Task	Command
Define a ring group.	**source-bridge ring-group** *ring-group*
Define a remote peer with the local acknowledgment feature.	**source-bridge remote-peer** *ring-group* **tcp** *ip-address* **local-ack**
Enable local acknowledgment for connections involving SDLLC media translation.	**source-bridge sdllc-local-ack**

Local acknowledgment is not supported when the LLC2 device is attached to an Ethernet rather than to a Token Ring.

For an example of how to configure SDLCC with RSRB and local acknowledgment, see the section "Example of SDLLC with RSRB and Local Acknowledgment" later in this chapter.

For more information about configuring RSRB and local acknowledgment, see the chapter "Configuring Source-Route Bridging" in this manual and "Source-Route Bridging Commands" in the *Router Products Command Reference* publication.

Configure SDLLC with Ethernet and Translational Bridging

SDLLC support over Ethernet combines translational bridging with Ethernet support of 37x5 FEP connections. Figure 1-2 shows SDLLC with Ethernet and translational bridging. The 3x75 FEP is attached to Router A through Ethernet. The same router is configured for translational bridging, which translates Ethernet packets into Token Ring packets and passes them across the WAN to Router B connected to the 3x74 cluster controller via a serial line. The LLC2 session terminates at the Router B connected to the 3x74 cluster controller. In addition, Router B maintains an SDLC session from itself to the cluster controller.

Figure 1-2   SDLLC with Ethernet and Translational Bridging
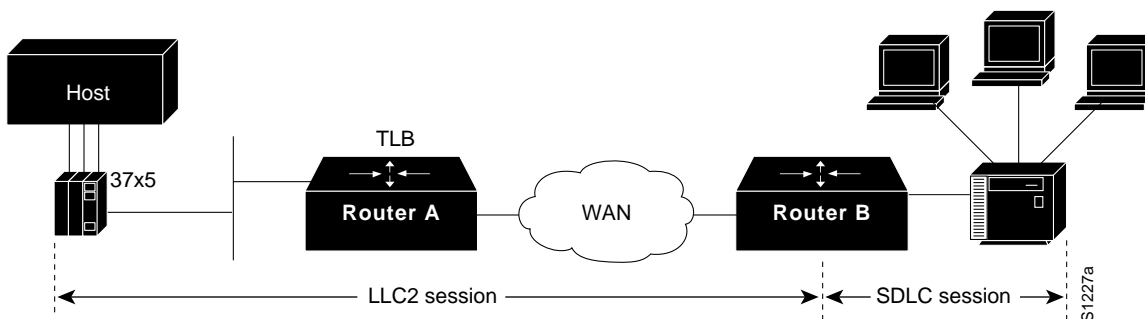
Customize SDLLC Media Translation

To increase performance on connections involving SDLLC media translation, perform the tasks in the following sections:

- Set the Largest LLC2 I-Frame Size
- Set the Largest SDLC I-Frame Size
- Increase the SDLC Line Speed

Note the additional information in the section "Other Customizing Considerations" later in this chapter.

Set the Largest LLC2 I-Frame Size

Generally, the router and the LLC2 device with which it communicates should support the same maximum SDLC I-frame size. The larger this value, the better the line is used, thus increasing performance.

Faster screen updates to 3278-style terminals often result by configuring the Token Ring FEP to send as large an I-frame as possible and then allowing the router to segment the frame into multiple SDLC I-frames.

After the Token Ring FEP has been configured to send the largest possible I-frame, it is best to configure the router to support the same maximum I-frame size. The default is 516 bytes. The maximum value the router can support is 8144 bytes.

To set the largest LLC2 I-frame size, perform the following task in interface configuration mode:

Task	Command
Specify the largest I-frame size that can be sent or received by the designated LLC2 primary station.	**sdllc ring-largest-frame** *value*

Set the Largest SDLC I-Frame Size

Generally, the router and the SDLC device with which it communicates should support the same maximum SDLC I-frame size. The larger this value, the better the line is utilized, thus increasing performance.

After the SDLC device has been configured to send the largest possible I-frame, you must configure the router to support the same maximum I-frame size. The default is 265 bytes. The maximum value the router can support must be less than the value of the LLC2 largest frame value defined when setting the largest LLC2 I-frame size.

To set the largest SDLC I-frame size, perform the following task in interface configuration mode:

Task	Command
Set the largest I-frame size that can be sent or received by the designated SDLC station.	**sdlc sdlc-largest-frame** *address value*

Increase the SDLC Line Speed

You can increase the data transfer rate by increasing the SDLC line speed on the serial interface. If possible, increase the link speed of the 3x74 to 19.2 kbps on older units, or to 64 kbps on new units.

To increase the SDLC line speed, perform the following tasks in interface configuration mode:

Task	Command
Adjust the clock rate on the serial interface of the SCI and MCI cards to an acceptable bit rate.	**clockrate** *speed*[1]

1. This command is documented in the "Interface Commands" chapter of the *Router Products Command Reference* publication.

Other Customizing Considerations

In addition to adjusting the SDLLC parameters described in this section, you can improve performance on the connection by adjusting the LLC2 and SDLC parameters described in the chapter, "Configuring LLC2 and SDLC Parameters."

For IBM host configuration consider changing the default MAXOUT (window size) value. Widely used installation guides for IBM equipment show a MAXOUT value of 1 in the VTAM-switched major node for the 3174 PU. Changing this value to 7 improves the performance, because VTAM can send seven frames before requiring an acknowledgment.

Monitor SDLLC Media Translation

To monitor connections using SDLLC media translation, perform the following monitoring tasks in EXEC mode:

Task	Command
Display information about SDLC and LLC2 connections involving interfaces on which SDLLC media translation has been enabled.	**show interfaces**
Display the current state of any connections using local acknowledgment for LLC2 and SDLLC connections.	**show sdllc local-ack**
Display information about LLC2 connections involving interfaces on which SDLLC media translation has been enabled.	**show llc2**[1]

1. This command is documented in the "LLC2 and SDLC Commands" chapter of the *Router Products Command Reference* publication.

In **show llc2** output, look for the LLC2 connections that correspond to the MAC addresses you assigned to the SDLLC interfaces using the **sdllc traddr** command. For information about these commands, see the chapter "LLC2 and SDLC Commands" and "SDLLC Commands" in the *Router Products Command Reference* publication.

SDLLC Configuration Examples

The following sections provide SDLLC configuration examples:

- Example of SDLLC with Direct Connection
- Example of SDLLC with Single Router Using RSRB
- Example of SDLLC with RSRB (Single 3x74)
- Example of SDLLC with RSRB (Multiple 3x74s)
- Example of SDLLC with RSRB and Local Acknowledgment
- NCP and VTAM Sysgen Parameters

Example of SDLLC with Direct Connection

Figure 1-3 shows a router configuration when the router directly connects the Token Ring and the serial line. The router is configured with SRB.

Figure 1-3   SDLLC Communication between a 37x5 and a 3x74 Connected to the Same Router (Direct Connection)
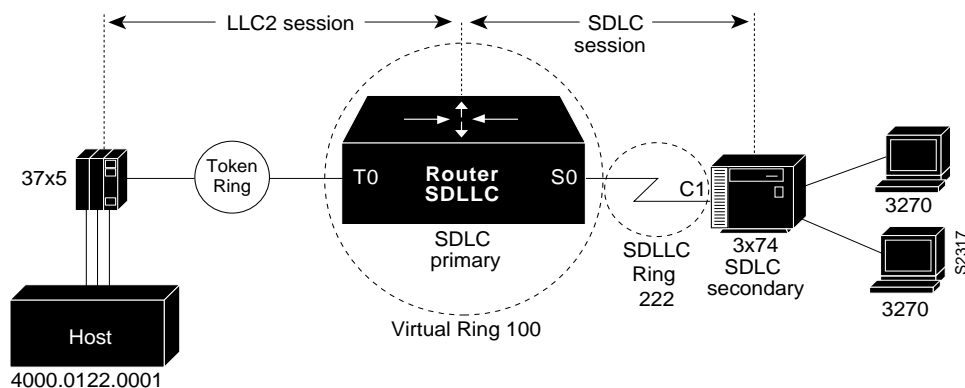
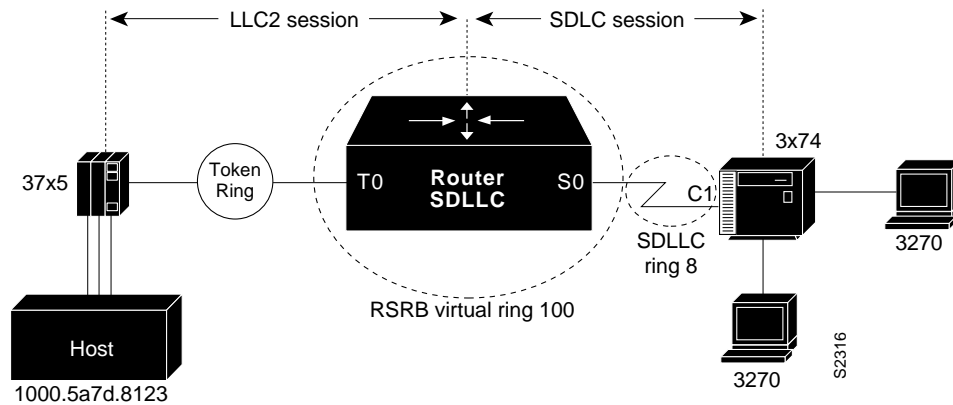A configuration file that enables direct connection follows:

```
source-bridge ring-group 100
!
interface tokenring 0
source-bridge 111 1 100
!
interface serial 0
encapsulation sdlc-primary
sdlc address c1
sdllc traddr 0110.2222.3300 222 2 100
sdllc partner 4000.0122.0001 c1
sdllc xid c1 1720001
```

Example of SDLLC with Single Router Using RSRB

Figure 1-4 shows a router configuration in which the router directly connects the Token Ring and the serial line but uses RSRB to create a virtual ring 100. This configuration has the following characteristics:

* The FEP sees c1 3174 at MAC address 0110.2222.33c1

* The RIF from the FEP to the devices would appear as:

   ring 1—bridge 1—ring 100—bridge 1—ring 8

Figure 1-4   SDLLC with Single Router with RSRB

The following sample configuration file is for SDLLC with a single router using RSRB:

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.1.1
source-bridge remote-peer 100 tcp 131.108.2.2

interface tokenring 0
ip address 131.108.2.2 255.255.255.0
source-bridge 111 1 100

interface serial 0
encapsulation sdlc-primary
sdlc address c1
sdllc traddr 0110.2222.3300 8 1 100
sdllc partner 1000.5a7d.8123 c1
sdllc xid c1 17200c1
```

Example of SDLLC with RSRB (Single 3x74)

In Figure 1-5, SDLLC with RSRB connects an FEP and a single 3x74 cluster controller. The host wants to communicate with a single 3174 that its FEP sees on a Token Ring. However, the 3x74 seen by the FEP is in fact SDLC device C1 connected by means of a serial link through a remote router.

Figure 1-5   SDLLC with RSRB with Single 3x74
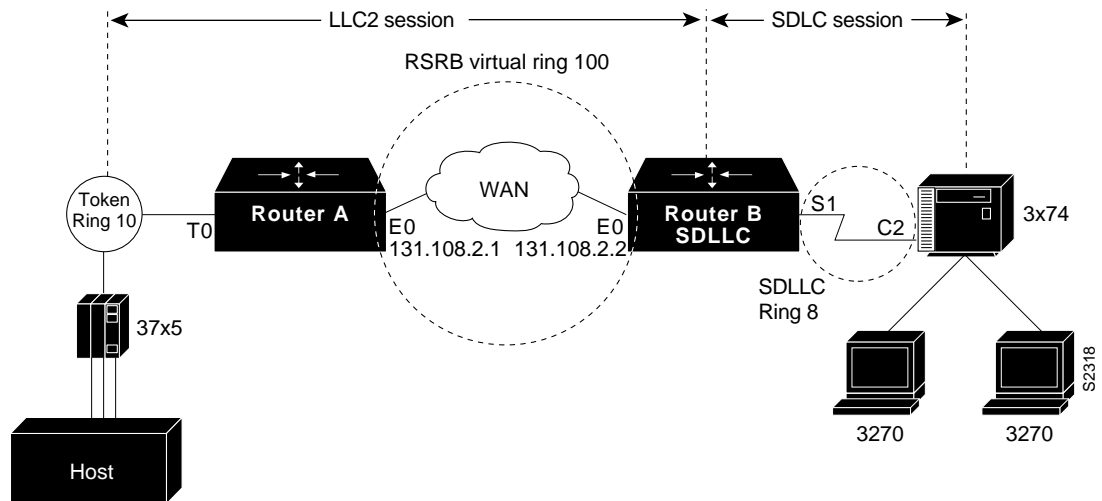
The configuration files for the network shown in Figure 1-5 follow.

Configuration for Router A

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.2
!
interface tokenring 0
ip address 131.108.1.1 255.255.255.0
source-bridge 10 1 100
!
interface ethernet 0
ip address 131.108.2.1 255.255.255.0
```

Configuration for Router B

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.1.1
source-bridge remote-peer 100 tcp 131.108.2.2
!
interface tokenring 0
ip address 131.108.2.2 255.255.255.0
source-bridge 1 1 100
!
interface serial 0
encapsulation sdlc-primary
sdlc address c1
sdllc traddr 0110.2222.3300 8 1 100
sdllc partner 1000.5a7d.8123 c1
sdllc xid c1 17200c1
```

Example of SDLLC with RSRB (Multiple 3x74s)

In the setup shown in Figure 1-6, Router A needs no SDLLC configuration, Router B has the SDLLC configuration and supports multipoint on the SDLC link with a modem-sharing device and Router C is also configured with SDLLC. For information about the NCP and VTAM system generation (sysgen) parameters that are used in this configuration see the "NCP and VTAM Sysgen Parameters" section later in this chapter

Figure 1-6   SDLLC with RSRB (Multiple 3x74s)
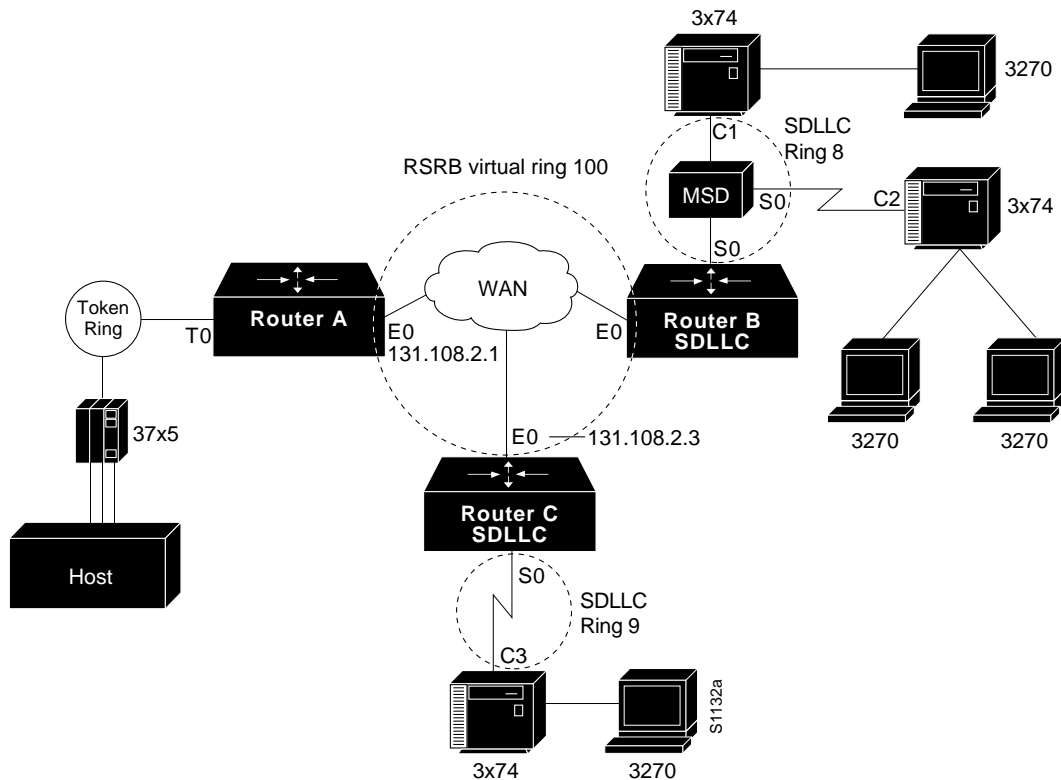
The following configuration files describe the network shown in Figure 1-6. The note references to the right of the configuration files refer to the "Notes" section at the end of this chapter.

Configuration for Router A

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1
source-bridge remote-peer 100 tcp 131.108.2.2
source-bridge remote-peer 100 tcp 131.108.2.3
!
interface tokenring 0
ip address 131.108.1.1 255.255.255.0
source-bridge 10 1 100
!
interface ethernet 0
ip address 131.108.2.1 255.255.255.0
```

Configuration for Router B

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1
source-bridge remote-peer 100 tcp 131.108.2.2
source-bridge remote-peer 100 tcp 131.108.2.3
!
interface ethernet 0
ip address 131.108.2.2 255.255.255.0
!
interface serial 0
encapsulation sdlc-primary
sdlc address c1
sdllc traddr 0110.2222.3300 7 1 100
sdllc partner 1000.5a7d.8123 c1
sdllc xid c1 17200c1
!
interface serial 1
encapsulation sdlc-primary
sdlc address c2
sdllc traddr 0220.3333.4400 7 1 100
sdllc partner 1000.5a7d.8123 c2          MUST MATCH TIC LOCADD, NOTE 2
sdllc xid c2 17200c2                      MUST MATCH VTAM IDBLK/IDNUM, NOTE 4
```

Configuration for Router C

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1
source-bridge remote-peer 100 tcp 131.108.2.2
source-bridge remote-peer 100 tcp 131.108.2.3
!
interface ethernet 0
ip address 131.108.2.3 255.255.255.0
!
interface serial 0
encapsulation sdlc-primary
sdlc address c3
sdllc traddr 0110.2222.3300 9 1 100
sdllc partner 1000.5a7d.8123 c3          MUST MATCH TIC LOCADD, NOTE 2
sdllc xid c3 17200c3                      MUST MATCH VTAM IDBLK/IDNUM, NOTE 4
```

Example of SDLLC with RSRB and Local Acknowledgment

The configuration shown in Figure 1-7 enables local acknowledgment for Router B, which means that the LLC session terminates at Router A. However, the LLC2 session between Router A and Router C is not locally acknowledged and terminates at Router C.

For information about the NCP and VTAM system generation (sysgen) parameters that are used in this configuration see the "NCP and VTAM Sysgen Parameters" section later in this chapter.

Figure 1-7   SDLLC with RSRB and Local Acknowledgment
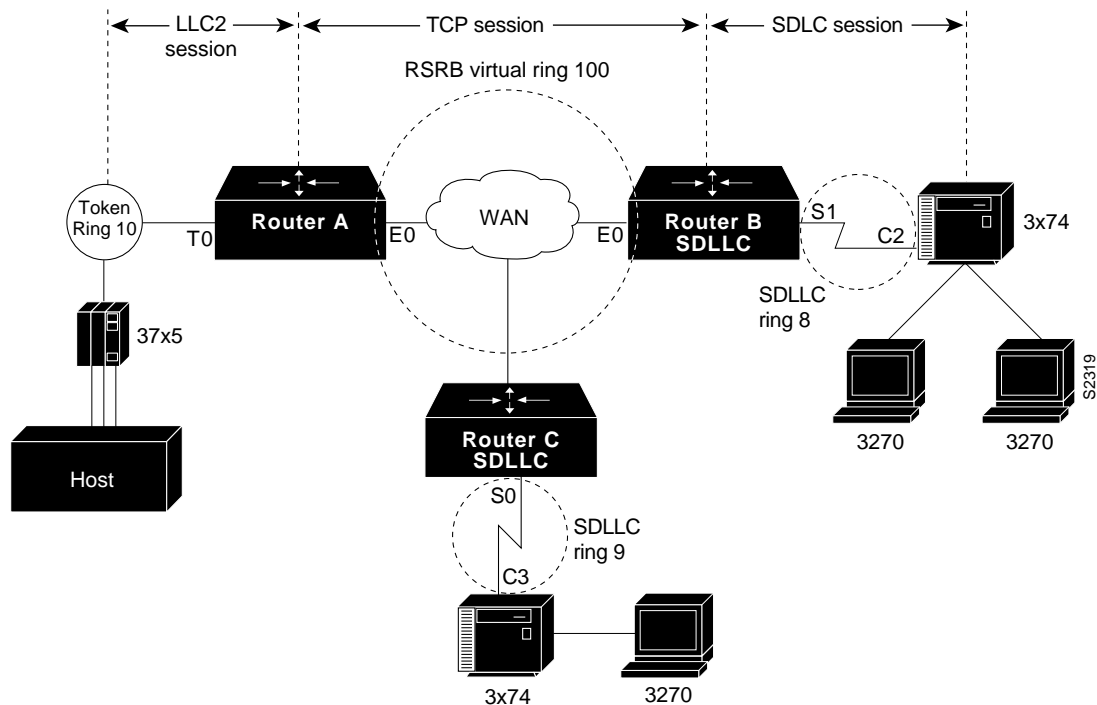
The following sample configuration files describe the network shown in Figure 1-7. (The notes in the sample configuration files refer to the "Notes" section at the end of this chapter.)

Configuration for Router A

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1
source-bridge remote-peer 100 tcp 131.108.2.2 local-ack
source-bridge remote-peer 100 tcp 131.108.2.3
!
interface tokenring 0
ip address 131.108.1.1 255.255.255.0
source-bridge 1 1 100
!
interface ethernet 0
ip address 131.108.2.1 255.255.255.0
```

Configuration for Router B

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1 local-ack
source-bridge remote-peer 100 tcp 131.108.2.2
source-bridge remote-peer 100 tcp 131.108.2.3

source-bridge sdllc local-ack
!
interface ethernet 0
ip address 131.108.2.2 255.255.255.0
!
interface serial 0
encapsulation sdlc-primary
sdlc address c1
sdllc traddr 4000.3174.0b0d 7 1 100
sdllc partner 1000.5a7d.8123 c1
!Must match TIC LOCADD [See NOTE 2]
sdllc xid c1 017200c1
!Must match VTAM IDBLK/IDNUM [See NOTE 4]
interface serial 1
encapsulation sdlc-primary
sdlc address c2
sdllc traddr 0110.2222.3200 8 1 100
sdllc partner 1000.5a7d.8123 c2
!Must match TIC LOCADD [See NOTE 2]
sdllc xid c2 017200c2
!Must match VTAM IDBLK/IDNUM [See NOTE 4]
```

Configuration for Router C

```
source-bridge ring-group 100
source-bridge remote-peer 100 tcp 131.108.2.1
source-bridge remote-peer 100 tcp 131.108.2.2
source-bridge remote-peer 100 tcp 131.108.2.3
!
interface ethernet 0
ip address 131.108.2.3 255.255.255.0
!
interface serial 0
encapsulation sdlc-primary
sdlc address c3
sdllc traddr 4000.3174.0c00 9 1 100
sdllc partner 1000.5a7d.8123 c3
Must match TIC LOCADD [See NOTE 2]
sdllc xid c3 017200c3
!Must match VTAM IDBLK/IDNUM [See NOTE 4]
```

NCP and VTAM Sysgen Parameters

The sample system generation (sysgen) parameters in this section show typical NCP and VTAM values that correspond with the Router A, Router B, and Router C configurations shown in Figure 1-6 and Figure 1-7.

IBM's ACF/NCP uses a function called NTRI (NCP/Token Ring Interconnection) to support Token Ring-attached SNA devices. NTRI also provides translation from Token Ring-attached SNA devices (Physical Units) to switched (dial-up) devices. VTAM provides the resolution for these devices in a Switched Major Node. VTAM treats these devices on NTRI logical lines as switched devices. (For more information consult IBM documentation *NCP/SSP/EP Resource Definition Reference*, SC30-3448-04.)

Using SDLLC, the Cisco router translates SDLC leased line protocol into Token Ring LLC2
protocol, then the NTRI function in ACF/NCP translates Token Ring LLC2 protocol into an SNA
switched protocol.

NCP Generation Definitions

```
********************************************************************
***              SAMPLES BASED ON ACF/NCP V5 R4.
***          NOT ALL NCP PARAMETERS ARE SHOWN
********************************************************************
*
********************************************************************
*     OPTIONS DEFINITION STATEMENT
********************************************************************
NCPOPTOPTIONS      NEWDEFN=YESNTRI GENERATION, MUST BE FIRST STMT
*
********************************************************************
*     BUILD MACRO
********************************************************************
NCPBU BUILD        LOCALTO=1.5,NTRI ACK TIMER FOR LOCAL TOKEN RINGS
                   REMOTTO=2.5,NTRI ACK TIMER FOR REMOTE TOKEN RINGS
                           USED IN SDLLC CONFIGURATIONS, NOTE 1
*
********************************************************************
*     DYNAMIC RECONFIGURATION POOL SPACE
********************************************************************
DRPOOLLUDRPOOL     NUMTYP2=50 RESERVE 50 LUS ON PU. T2 PUS
*
********************************************************************
*     PHYSICAL GROUP FOR NTRI TIC #1, DEFINITIONS FOR THE TOKEN RING
*     ADAPTER TO ESTABLISH PHYSICAL CONNECTIVITY
********************************************************************
EPHYG GROUP        ECLTYPE=PHYSICAL
*
EPHYL LINE         ADAPTER=TIC2,          TYPE OF ADAPTER
                   ADDRESS=(16,FULL),     INTERNAL FEP TIC ADDRESS
                   PORTADD=0,
                   LOCADD=10005a7d8123,TIC ADDRESS, NOTE 2
                   RCVBUFC=1440,
                   MAXTSL=2012,
                   TRSPEED=16             TOKEN RING SPEED
*
EPHYPUPU
*
EPHYLULU           ISTATUS=INACTIVE
*
********************************************************************
*     NTRI PERIPHERAL LOGICAL LINE GROUP, LINE AND PU PAIRS ARE
*     GENERATED BY THE AUTOGEN PARAMETER.
********************************************************************
ELOGG GROUP        ECLTYPE=LOGICAL,
                   PHYPORT=0,
                   CALL=INOUT,
                   AUTOGEN=3              ONE PER SDLLC CONTROLLER,
                                         NOTE 3
********************************************************************
```

VTAM Definitions

```
*******************************************************************
*         VTAM SWITCHED MAJOR NODE, BASED ON ACF/VTAM V3 R4.
*         THE CODING BELOW SUPPORTS DIAL IN OPERATION ONLY. TYPICALLY,
*         NTRI IMPLEMENTATIONS USE ONLY DIAL IN. IF DIAL OUT FROM AN
*         APPLICATION IS REQUIRED, PATH MACROS MUST BE USED. CONSULT
*         THE APPROPRIATE VTAM INSTALLATION REFERENCE MANUAL.
*******************************************************************
VSWITCH  VBUILD         TYPE=SWNET
*
VPU1     PU             ADDR=13,      COULD BE ANYTHING (NOT USED)
                        IDBLK=017,    XID PARM, NOTE 4
                        IDNUM=200c1,  XID PARM, NOTE 4
                        MAXOUT=7,
                        MAXDATA=265,
                        MODETAB=AMODETAB,
                        DLOGMOD=US327X,
                        PUTYPE=2,
                        USSTAB=USS327X
*
VLU1A    LU             LOCADDR=2,
VLU1B    LU             LOCADDR=3
*
VPU2     PU             ADDR=13,      COULD BE ANYTHING (NOT USED)
                        IDBLK=017,    XID PARM, NOTE 4
                        IDNUM=200c2,  XID PARM, NOTE 4
                        MAXOUT=7,
                        MAXDATA=265,
                        MODETAB=AMODETAB,
                        DLOGMOD=US327X,
                        PUTYPE=2,
                        USSTAB=USS327X
*
VLU2A    LU             LOCADDR=2,
VLU2B    LU             LOCADDR=3
*
VPU3     PU             ADDR=13,      COULD BE ANYTHING (NOT USED)
                        IDBLK=017,    XID PARM, NOTE 4
                        IDNUM=200c3,  XID PARM, NOTE 4
                        MAXOUT=7,
                        MAXDATA=265,
                        MODETAB=AMODETAB,
                        DLOGMOD=US327X,
                        PUTYPE=2,
                        USSTAB=USS327X
*
VLU3A    LU             LOCADDR=2,
VLU3B    LU             LOCADDR=3
*
```

Notes

In these sample definitions:

1   REMOTTO is the NCP's T1 timer for remote Token Rings. All SDLLC connections use RIF information and therefore look like remote Token Ring devices. The default is 2.5 seconds, which is adequate for most situations; however, when slow-speed links are used, this parameter should be reviewed to ensure enough time for link-level acknowledgments.

2   The LOCADD parameter defines the locally administered address of the TIC in the NCP. The Cisco routers, configured for SDLLC, will insert this address as the 802.5 destination address field in TEST and XID frames to establish connectivity and then in data frames during the session. The **sdllc partner** command defines this connection in the Cisco routers. Each SDLC control unit is defined with an **sdllc partner** command.

3   The AUTOGEN parameter specifies the number of LINE and PU pairs that are automatically generated by NDF (Network Definition Facility). Each SDLLC-attached controller requires a LINE and PU definition in the ELCTYPE LOGICAL group. These represent control block space in the NCP simulating switched line as described earlier.

4   The IDBLK and IDNUM parameters in VTAM are used to identify incoming connection requests. IDBLK is typically unique for each type of IBM device. IDNUM is any five hex digit combination. The Cisco routers configured for SDLLC must associate an IDBLK/IDNUM combination with a controller by using the **sdllc xid** command. During activation, an XID will be sent to the NCP containing the specific IDBLK/IDNUM. NCP will send these values to VTAM in an SNA command called REQCONT. VTAM will search its switched major nodes to find a match. If found, VTAM will establish sessions with the device by sending activation commands (ACTPU, ACTLUs).