

Configuring DSPU and SNA Service Point Support

This chapter describes our support for Systems Network Architecture (SNA) downstream physical unit (DSPU) devices and SNA Service Point. For a complete description of the commands mentioned in this chapter, refer to the “DSPU Configuration Commands” chapter of the *Router Products Command Reference* publication.

Cisco’s Implementation of DSPU and SNA Service Point

DSPU is a software feature that enables the router to function as a physical unit (PU) concentrator for SNA PU type 2 nodes. PU concentration at the router simplifies the task of PU definition at the upstream host while providing additional flexibility and mobility for downstream PU devices.

The DSPU feature allows you to define downstream PU type 2 devices in the router. DSPU reduces the complexity of host configuration by letting you replace multiple PU definitions that represent each downstream device with one PU definition that represents the router.

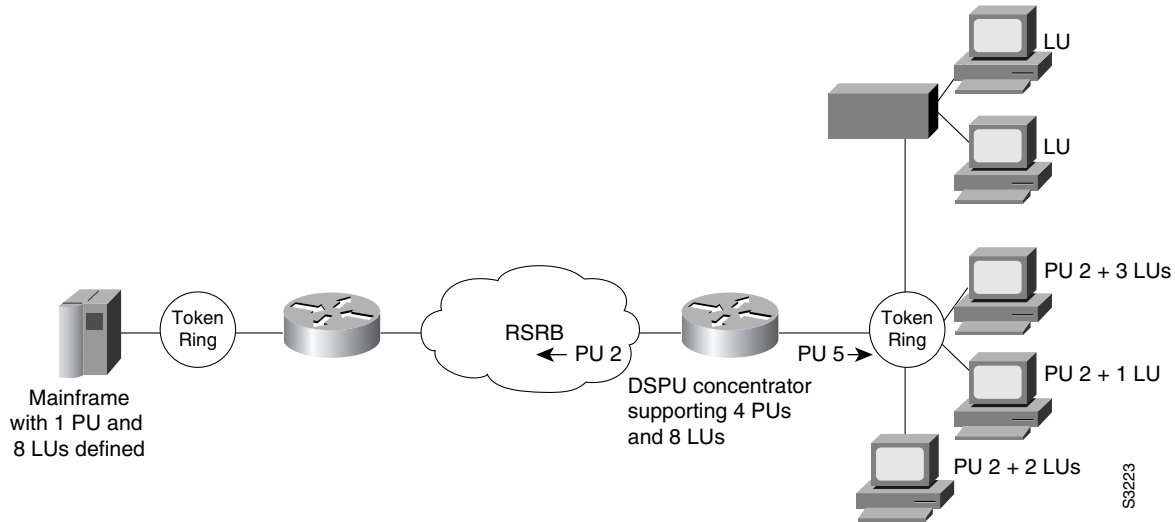
Because you define the downstream PUs at the router rather than the host, you isolate the host from changes in the downstream network topology. Therefore you can insert and remove downstream PUs from the network without making any changes on the host.

The concentration of downstream PUs at the router also reduces network traffic on the wide-area network (WAN) by limiting the number of sessions that must be established and maintained with the host. The termination of downstream sessions at the router ensures that idle session traffic does not appear on the WAN.

Our SNA Service Point support in the Cisco Router assumes NetView or an equivalent product at the SNA host. The user interacts with the network management feature in both the Router and at the SNA host. At the router you can configure the host connection, and show the status of this connection. At the SNA host you can use the Netview operator’s console to view Alerts, and to send and receive Cisco syntax commands to the router.

Figure 30-1 shows a router functioning as a DSPU concentrator.

Figure 30-1 Router Acting as a DSPU Concentrator

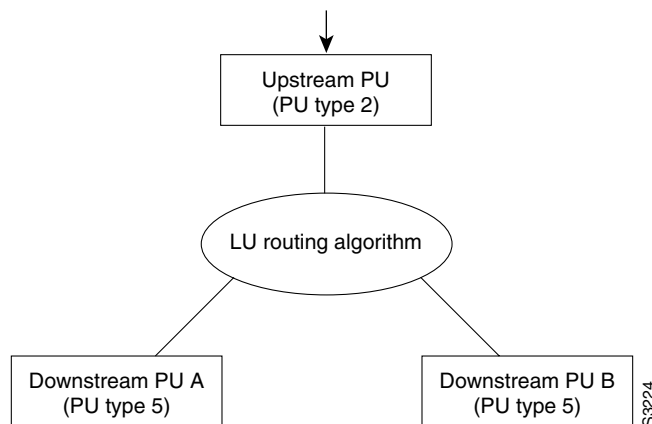


Typically, the router establishes one or more upstream connections with one or more hosts and many downstream connections with PU type 2 devices. From an SNA perspective, the router appears as a PU type 2 device to the upstream host and assumes the role of a system services control point (SSCP) appearing as a PU type 5 device to its downstream PUs.

The SSCP sessions established between the router and its upstream host are completely independent of the SSCP sessions established between the router and its downstream PUs. SNA traffic is routed at a logical unit (LU) level using a routing algorithm that maps downstream LUs onto upstream LUs.

Figure 30-2 illustrates the SNA perspective of DSPU.

Figure 30-2 SNA Perspective of DSPU



DSPU Configuration Task List

To configure DSPU, perform the tasks in the following sections. The last two tasks are optional.

- Define DSPU Upstream Hosts
- Define Downstream PUs
- Define DSPU LUs
- Configure DSPU to Use a Data Link Control
- Define the Number of Outstanding, Unacknowledged Activation RUs
- Configure SNA Service Point Support
- Monitor DSPU Feature Status

See the end of this chapter for “DSPU Configuration Examples.”

Define DSPU Upstream Hosts

The upstream host provides LUs that the router will assign for use by its downstream PUs. Because one upstream host can only provide a maximum of 255 LUs, the DSPU feature supports multiple hosts. Multiple upstream host support allows the DSPU router to provide more than 255 LUs for use by its downstream PUs.

To define a DSPU host over TokenRing, Ethernet, or RSRB connections, perform the following task in global configuration mode:

Task	Command
Define a DSPU host over TokenRing/Ethernet or RSRB connections.	dspu host <i>host-name</i> xid-snd <i>xid</i> rmac <i>remote-mac</i> [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

To define a DSPU host over an SDLC connection, perform the following task in global configuration mode:

Task	Command
Define a DSPU host over an SDLC connection	dspu host <i>host-name</i> xid-snd <i>xid</i> sdlc <i>sdlc-addr</i> [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

To define a DSPU host over an X.25/QLLC connection, perform the following task in global configuration mode:

Task	Command
Define a DSPU host over an X.25/QLLC connection.	dspu host <i>host-name</i> xid-snd <i>xid</i> x25 <i>remote-x121-addr</i> [qllc <i>local-x121-sub-addr</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

Define Downstream PUs

To define a DSPU host over a Frame Relay connection, perform the following task in global configuration mode:

Task	Command
Define a DSPU host over a Frame Relay connection.	dspu host <i>host-name</i> xid-snd <i>xid</i> dldci <i>dldci-number</i> [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

Define Downstream PUs

To define the downstream PUs, perform either of the tasks in the following sections, depending on your circumstances:

- Explicitly Define a Downstream PU
- Enable the Default PU Option

Explicitly Define a Downstream PU

Explicitly define a downstream PU if you require the router to perform verification checking on incoming downstream connections or to initiate an outgoing downstream connection.

To explicitly define a downstream PU over TokenRing, Ethernet, or RSRB connections, perform the following task in global configuration mode:

Task	Command
Explicitly define a downstream PU over TokenRing, Ethernet, or RSRB connections.	dspu pu <i>pu-name</i> rmac <i>remote-mac</i> [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [xid-rcv <i>xid</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>]

To define a DSPU host over an SDLC connection, perform the following task in global configuration mode:

Task	Command
Explicitly define a downstream PU over an SDLC connection.	dspu pu <i>pu-name</i> xid-rcv <i>xid</i> [sdlc <i>sdlc-addr</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>]

To define a DSPU host over an X.25/QLLC connection, perform the following task in global configuration mode:

Task	Command
Explicitly define a downstream PU over an X.25/QLLC connection.	dspu pu <i>pu-name</i> [x25 <i>remote-x121-addr</i>] [qllc <i>local-x121-sub-addr</i>] [xid-rcv <i>xid</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>]

To define a DSPU host over a Frame Relay connection, perform the following task in global configuration mode:

Task	Command
Explicitly define a downstream PU over a Frame Relay connection.	dspu pu <i>pu-name</i> [dlci <i>dlci-number</i>] [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [xid-rcv <i>xid</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>]

Note that a PU definition must have either an **xid-rcv** parameter or an address (**rmac**, **sdlc**, **x25** or **dlci**) parameter.

If the router will perform verification checking on incoming downstream connections, there are several combinations of parameters that you can configure for verification matching. Note that the address parameter, when specified, is considered to be the primary key on the PU definition. Therefore, if both an address and **xid-rcv** are configured, the matching algorithm will match on the address and ignore the **xid-rcv** parameter.

- **xid-rcv** —Match on *xid* value only
User may define a downstream PU using only the **xid** parameter so that any connecting PU that specifies the value of the configured **xid** will match that PU definition.
- **xid-rcv** and **interface** — Match on *xid* and *interface*
User may define a downstream PU using the **xid** and **interface** parameters so that any PU connecting into the configured **interface** that specifies the value of the configured **xid** will match the PU definition.
- **addressing** —Match on *addressing* only
User may define a downstream PU using only the addressing parameters (**rmac/rsap/lsap**, **sdlc**, **dlci/rsap/lsap**, or **x25/qllc**) so that any connecting PU with addressing that matches the configured addressing will match that PU definition. If no PU definition is found to match the incoming RSAP, then a match is accepted on a PU that has the correct RMAC/LSAP or DLCI/LSAP.
- **addressing** and **interface** — Match on *addressing* and *interface*
User may define a downstream PU using the **interface** and addressing parameters (**rmac/rsap/lsap**, **sdlc**, **dlci/rsap/lsap**, or **x25/qllc**) so that any PU connecting into the configured **interface** with addressing that matches the configured addressing will match the PU definition. If no PU definition is found to match the incoming RSAP, then a match is accepted on a PU that has the correct RMAC/LSAP or DLCI/LSAP and interface.

The router will reject any incoming downstream connections that do not match the parameters of a defined downstream PU unless the default PU option is also enabled.

Enable the Default PU Option

Configure the DSPU default PU option if you do not require the router to verify incoming downstream connections. The default PU option allows the router to accept incoming downstream connections without an explicit definition for the downstream PU.

To enable the default PU option, perform the following task in global configuration mode:

Task	Command
Enable the default PU option.	dspu default-pu [window <i>window-size</i>] [maxiframe <i>max-iframe</i>]

Define DSPU LUs

Specify the LU routing algorithm used to map the upstream LUs to the downstream LUs and to define all LUs for each upstream and downstream PU.

The DSPU feature assigns upstream LUs to downstream LUs based on the selected LU routing algorithm and performs the mapping necessary for SNA data transfer.

The DSPU feature supports two alternative mapping algorithms that are described in the following sections:

- Dedicated LU Routing
- Pooled LU Routing

An upstream host PU or downstream PU can support up to 255 LU sessions. The DSPU feature allows each LU to be individually configured for either dedicated LU routing or pooled LU routing.

Dedicated LU Routing

You can configure an upstream LU so that it is reserved, or dedicated, for use by a specific downstream LU.

To define a dedicated LU or a range of dedicated LUs for an upstream host and downstream PU, perform the following task in global configuration mode:

Task	Command
Define a dedicated LU or a range of dedicated LUs for a downstream PU.	dspu lu <i>lu-start</i> [<i>lu-end</i>] host <i>host-name</i> <i>host-lu-start</i> [pu <i>pu-name</i>]

See the “Dedicated LU Routing Example” section later in this chapter for an example of dedicated LU routing.

Pooled LU Routing

You can configure an upstream host LU so that it is a member of a pool of LUs. When a downstream connection is established and the downstream LU is configured as a pooled LU, the router selects an upstream LU from the pool for assignment to the downstream LU.

Pooled LU routing allows a limited number of upstream host LUs to be shared (at different times) among many downstream PUs.

To define a host LU or a range of host LUs in an LU pool, perform the following task in global configuration mode:

Task	Command
Define a host LU or a range of host LUs in an LU pool.	dspu pool <i>pool-name</i> host <i>host-name</i> lu <i>lu-start</i> [<i>lu-end</i>] [inactivity-timeout <i>inactivity-minutes</i>]

You can configure a downstream LU as a pooled LU. When a downstream connection is established and the downstream LU is configured as a pooled LU, the router selects an upstream LU from the specified pool for assignment to the downstream LU.

To define a pooled LU or a range of pooled LUs for a downstream PU, perform the following task in global configuration mode:

Task	Command
Define a pooled LU or a range of pooled LUs for a downstream PU.	dspu lu <i>lu-start</i> [<i>lu-end</i>] pool <i>pool-name</i> [pu <i>pu-name</i>]

See the “Pooled LU Routing Example” section later in this chapter for an example of pooled LU routing.

Configure DSPU to Use a Data Link Control

The final step in configuring DSPU is to define the data link controls that will be used for upstream host and downstream PU connections.

The DSPU feature supports the data link controls described in the following sections:

- Configure DSPU to Use Token Ring or Ethernet
- Configure DSPU to Use RSRB
- Configure DSPU to Use RSRB with Local Acknowledgment
- Configure DSPU to Use SDLC
- Configure DSPU to Use QLLC
- Configure DSPU to Use Frame Relay

Configure DSPU to Use Token Ring or Ethernet

You can configure DSPU to use the Token Ring and/or Ethernet data link controls by enabling a Service Access Point (SAP) address on the interface. Each interface can support up to 255 local SAPs enabled for either upstream or downstream connections; a local SAP cannot be enabled for both upstream and downstream connections on the same interface.

To enable a local SAP on the Token Ring or Ethernet interfaces for use by upstream hosts, perform the following task in interface configuration mode:

Task	Command
Enable local SAP for upstream hosts.	dspu enable-host [lsap <i>local-sap</i>]

To enable a local SAP on the Token Ring or Ethernet interfaces for use by downstream PUs, perform the following task in interface configuration mode:

Task	Command
Enable local SAP for downstream PUs.	dspu enable-pu [lsap <i>local-sap</i>]

To initiate a connection with a remote upstream host or downstream PU, perform the following task in interface configuration mode:

Task	Command
Initiate connection with upstream host or downstream PU via Token Ring or Ethernet.	<code>dspu start host-name pu-name</code>

Configure DSPU to Use RSRB

To configure DSPU to use RSRB you must create a DSPU/RSRB data link control.

Similar to our implementation of SDLLC, the DSPU/RSRB data link control uses the concept of a virtual Token Ring device residing on a virtual Token Ring to represent the router to upstream hosts and downstream PUs across an RSRB network.

Because the upstream host and/or downstream PU expects its peer to also be on a Token Ring, you must assign a virtual Token Ring address (the DSPU virtual MAC address) to the DSPU/RSRB data link control. Like real Token Ring addresses, the DSPU virtual MAC address must be unique across the network.

In addition to assigning the DSPU virtual MAC address, you must also assign a DSPU virtual ring number to the DSPU/RSRB data link control. The DSPU virtual ring number must be unique across the network.

Note The DSPU virtual ring number is a different number from the virtual ring group numbers that you use to configure RSRB and multiport bridging.

The combination of the DSPU virtual MAC address and the DSPU virtual ring number identifies the DSPU/RSRB data link control interface to the rest of an RSRB network.

When an end station (either an upstream host or a downstream PU) attempts to connect with the DSPU router, the following events occur:

- 1 The end station sends explorer packets with the LAA-defined MAC on the router interface to which the end station is connected.
- 2 The router configured with that LAA or with the BIA intercepts the frame, fills in the DSPU virtual ring number and the DSPU bridge number in the routing information field (RIF), and sends the response back to the end station.
- 3 The end station establishes a session with the DSPU router.

To define the DSPU/RSRB data link control interface, perform the following tasks in global configuration mode:

Task	Command
Define an RSRB ring group.	source-bridge ring-group <i>ring-group</i> ¹
Define a remote peer with the local acknowledgment feature.	source-bridge remote-peer <i>ring-group tcp ip-address</i> ²
Define the DSPU/RSRB interface.	dspu rsrb <i>local-virtual-ring bridge-number target-virtual-ring virtual-macaddr</i>

1. This command is documented in the “Source-Route Bridging Commands” chapter of the *Router Products Commands Reference* publication.
2. This command is documented in the “Remote Source-Route Bridging Commands” chapter of the *Router Products Command Reference* publication.

After you define the DSPU RSRB data link control, you configure DSPU to use the RSRB data link control by enabling a local SAP for either upstream or downstream connections.

To enable a local SAP on RSRB for use by upstream hosts, perform the following task in global configuration mode:

Task	Command
Enable local SAP for upstream hosts.	dspu rsrb enable-host [<i>lsap local-sap</i>]

To enable a local SAP on RSRB for use by downstream PUs, perform the following task in global configuration mode:

Task	Command
Enable local SAP for downstream PUs.	dspu rsrb enable-pu [<i>lsap local-sap</i>]

To initiate a connection with a remote upstream host or downstream PU over RSRB, perform the following task in global configuration mode:

Task	Command
Initiate connection with upstream host or downstream PU via RSRB.	dspu rsrb start <i>host-name</i>

Configure DSPU to Use RSRB with Local Acknowledgment

Configuring DSPU to use RSRB with local acknowledgment is identical to configuring RSRB with local acknowledgment. If you add the **local-ack** keyword to the **source-bridge remote-peer** configuration command, DSPU will use local-acknowledgment for any end stations that connect to DSPU from that peer.

To configure DSPU to use RSRB with local acknowledgment, perform the following tasks in global configuration mode:

Task	Command
Define an RSRB ring group.	source-bridge ring-group <i>ring-group</i> ¹
Define a remote peer with the local acknowledgment feature.	source-bridge remote-peer <i>ring-group tcp ip-address local-ack</i> ²

Task	Command
Define the DSPU/RSRB interface.	dspu rsrb <i>local-virtual-ring bridge-number target-virtual-ring virtual-macaddr</i>
<p>1. This command is documented in the “Source-Route Bridging Commands” chapter of the <i>Router Products Commands Reference</i> publication.</p> <p>2. This command is documented in the “Remote Source-Route Bridging Commands” chapter of the <i>Router Products Command Reference</i> publication.</p>	

Configure DSPU to Use SDLC

Before DSPU may be configured to use the SDLC data link control, the serial interface must be defined for SDLC encapsulation and assigned an SDLC role. The SDLC role must be primary if DSPU will be initiating connections to the SDLC partner; the SDLC role must be secondary if the SDLC partner will be initiating connections with DSPU.

To define the serial interface to use SDLC, perform the following tasks in interface configuration mode:

Task	Command
Enable SDLC encapsulation on the serial interface.	encapsulation sdlc ¹
Specify the SDLC role of the router.	sdlc role { primary secondary } ¹
<p>1. This command is documented in the “LLC2 and SDLC Commands” chapter of the <i>Router Products Command Reference</i> publication.</p>	

The SDLC address(es) used on the SDLC link must also be defined. If the SDLC role is primary, the SDLC address identifies the SDLC partner to which a connection will be initiated. If the SDLC role is secondary, the SDLC address identifies the address to which a connection will be accepted.

To configure the SDLC address, perform the following task in interface configuration mode:

Task	Command
Define the SDLC address.	sdlc address <i>sdlc-address</i> ¹
<p>1. This command is documented in the “LLC2 and SDLC Commands” chapter of the <i>Router Products Command Reference</i> publication.</p>	

Finally, the SDLC address must be enabled for use by DSPU. Each interface can support up to 255 SDLC addresses enabled for either upstream or downstream connections; an SDLC address cannot be enabled for both upstream and downstream connections on the same interface.

To enable an SDLC address for use by upstream host connections, perform the following task in interface configuration mode:

Task	Command
Enable SDLC address for upstream host.	dspu enable-host sdlc <i>sdlc-address</i>

To enable an SDLC address for use by downstream PU connections, perform the following task in interface configuration mode:

Task	Command
Enable SDLC address for downstream PU.	dspu enable-pu sdlc <i>sdlc-address</i>

Note To initiate connection with remote SDLC device, it is not necessary to configure the **dspu start pu-name**. If the **sdlc role** is primary, the connection will be initiated when the SDLC address is enabled for DSPU.

Configure DSPU to Use QLLC

Before DSPU may be configured to use the QLLC data link control, the serial interface must be defined for X.25 encapsulation and assigned an X.121 address.

To define the serial interface to use X.25, perform the following tasks in interface configuration mode:

Task	Command
Enable X.25 encapsulation on serial interface.	encapsulation x25 [dce] ¹
Define an X.121 address.	x25 address local-x121-addr ¹

1. This command is documented in the “X.25 and LAPB Commands” chapter of the *Router Products Command Reference* publication.

X.25 routing must also be configured so that incoming calls to the local X.121 address can be appropriately routed to the serial interface and mapped into the QLLC data link control.

To define X.25 routing, perform the following tasks in global configuration mode:

Task	Command
Enable X.25 routing.	x25 routing ¹
Enable routing of X.25 packets to serial interface	x25 route ^local-x121-addr.* alias serial slot/port1

1. This command is documented in the “X.25 and LAPB Commands” chapter of the *Router Products Command Reference* publication.

To define the which calls get mapped into QLLC, perform the following task in interface configuration mode:

Task	Command
Define remote X.121 address for mapping into QLLC.	x25 map qllc remote-x121-addr ¹

1. This command is documented in the “IBM Network Media Translation Commands” chapter of the *Router Products Command Reference* publication.

Finally, the local X.121 subaddress must be enabled for use by DSPU. An X.121 subaddress can be enabled for either upstream or downstream connections; an X.121 subaddress cannot be enabled for both upstream and downstream connections on the same interface.

To enable an X.121 subaddress for use by upstream host connections via QLLC, perform the following task in interface configuration mode:

Task	Command
Enable X.121 subaddress for upstream host.	dspu enable-host qllc x121-sub-addr

Configure DSPU to Use a Data Link Control

To enable an X.121 subaddress for use by downstream PU connections via QLLC, perform the following task in interface configuration mode:

Task	Command
Enable X.121 subaddress for downstream PU.	dspu enable-pu qlhc <i>x121-sub-addr</i>

To initiate a connection with a remote upstream host or downstream PU, perform the following task in interface configuration mode:

Task	Command
Initiate connection with upstream host or downstream PU via QLLC/X.25.	dspu start <i>host-name lpu-name</i>

Configure DSPU to Use Frame Relay

Before DSPU may be configured to use the LLC2/FrameRelay data link control, the serial interface must be defined for Frame Relay encapsulation.

To define the serial interface for Frame Relay encapsulation, perform the following task in interface configuration mode:

Task	Command
Enable Frame Relay encapsulation on a serial interface.	encapsulation frame-relay IETF ¹

1. This command is documented in the “Frame Relay Commands” chapter of the *Router Products Command Reference publication*.

The DLCI used on the Frame Relay link must be mapped into LLC2

To configure the mapping of a DLCI into LLC2, perform the following task in interface configuration mode:

Task	Command
Configure DLCI mapping into LLC2.	frame-relay map llc2 <i>dldci-number</i> ¹

1. This command is documented in the “SNA Frame Relay Access Support Commands” chapter of the *Router Products Command Reference publication*.

Finally, the local SAP address must be enabled for use by DSPU. A SAP address can be enabled for either upstream or downstream connections; a SAP address cannot be enabled for both upstream and downstream connections on the same interface.

To enable a local SAP on the LLC2/FrameRelay interface for use by upstream hosts, perform the following task in interface configuration mode:

Task	Command
Enable local SAP for upstream hosts.	dspu enable-host [lsap <i>local-sap</i>]

To enable a local SAP for the LLC2/FrameRelay interface for use by downstream PUs, perform the following task in interface configuration mode:

Task	Command
Enable local SAP for downstream PUs.	dspu enable-pu [<i>lsap local-sap</i>]

To initiate a connection with a remote upstream host or downstream PU, perform the following task in interface configuration mode:

Task	Command
Initiate connection with upstream host or downstream PU via LLC2/FrameRelay.	dspu start <i>host-name</i> <i>pu-name</i>

Define the Number of Outstanding, Unacknowledged Activation RUs

The DSPU feature allows you to define the number of activation request units (RUs) such as ACTLUs or DDDLUs NMVTs that can be sent by the router before waiting for responses from the remote PU.

The DSPU activation window provides pacing to avoid depleting the router buffer pool during PU activation. Increasing the window size allows more LUs to become active in a shorter amount of time (assuming the required buffers for activation RUs are available). Decreasing the window size limits the amount of buffers the DSPU may use during PU activation. Typically, you do not need to change the default window size.

To define the number of unacknowledged activation RUs that can be outstanding, perform the following task in global configuration mode:

Task	Command
Define the number of unacknowledged activation RUs.	dspu activation-window <i>window-size</i>

Configure SNA Service Point Support

Our implementation of SNA Service Point support includes support for three commands, Alerts, RUNCMD, and Vital Product Data support.

Alert support is provided as the router sends unsolicited Alerts to Netview (or an equivalent network management application) at the host. This function occurs at the various router interfaces and protocol layers within the router.

RUNCMD support enables you to send router commands to the router from the Netview console using the Netview RUNCMD facility, and the router sends the relevant replies back to the RUNCMD screen.

Vital Product Data support allows you to request Vital Product Data from the Netview console. The router replies to Netview with the relevant information.

To configure SNA Service Point support, perform the tasks in the following sections:

- Define a Link to an SNA Host
- Configure Service Point Support to Use a Data Link Control
- Specify Names for All Attached LANs
- Specify the Physical Location of the Router

Define a Link to an SNA Host

To define a link to an SNA host over TokenRing, Ethernet, or RSRB connections, perform the following task in global configuration mode:

Task	Command
Define a link to an SNA host over TokenRing/Ethernet or RSRB connections.	sna host <i>host-name</i> xid-snd <i>xid</i> rmac <i>remote-mac</i> [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

To define a link to an SNA host over an SDLC connection, perform the following task in global configuration mode:

Task	Command
Define a link to an SNA host over an SDLC connection.	sna host <i>host-name</i> xid-snd <i>xid</i> sdlc <i>sdlc-addr</i> [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

To define a link to an SNA host over an X.25/QLLC connection, perform the following task in global configuration mode:

Task	Command
Define a link to an SNA host over an X.25/QLLC connection.	sna host <i>host-name</i> xid-snd <i>xid</i> x25 <i>remote-x121-addr</i> [qllc <i>local-x121-sub-addr</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

To define a link to an SNA host over a Frame Relay connection, perform the following task in global configuration mode:

Task	Command
Define a link to an SNA host over a Frame Relay connection.	sna host <i>host-name</i> xid-snd <i>xid</i> dlci <i>dlci-number</i> [rsap <i>remote-sap</i>] [lsap <i>local-sap</i>] [interface <i>slot/port</i>] [window <i>window-size</i>] [maxiframe <i>max-iframe</i>] [retries <i>retry-count</i>] [retry-timeout <i>retry-timeout</i>] [focalpoint]

Configure Service Point Support to Use a Data Link Control

To configure Service Point to use a data link control, perform the tasks in one of the following sections:

- Configure Service Point to Use Token Ring or Ethernet
- Configure Service Point to Use RSRB
- Configure Service Point to Use RSRB with Local Acknowledgment
- Configure Service Point Support for Frame Relay
- Configure Service Point Support for SDLC
- Configure Service Point Support for X.25

Note You do not need to perform this task if you have configured a DSPU host with the **focalpoint** parameter and have configured the DSPU host to use a data link control.

Configure Service Point to Use Token Ring or Ethernet

To enable a local SAP on the Token Ring or Ethernet interfaces for use by SNA Service point, perform the following task in interface configuration mode:

Task	Command
Enable local SAP for Service Point.	sna enable-host [lsap local-sap]

To initiate a connection with a remote host, perform the following task in interface configuration mode:

Task	Command
Initiate connection with host via Token Ring or Ethernet.	sna start host-name

Configure Service Point to Use RSRB

To define the Service Point/RSRB data link control interface, perform the following tasks in global configuration mode:

Task	Command
Define an RSRB ring group.	source-bridge ring-group ring-group¹
Define the Service Point/RSRB interface.	sna rsrb local-virtual-ring bridge-number target-virtual-ring virtual-macaddr

1. This command is documented in the “Source-Route Bridging Commands” chapter of the *Router Products Command Reference* publication.

To enable a local SAP on RSRB for use by hosts, perform the following task in global configuration mode:

Task	Command
Enable local SAP for hosts.	sna rsrb enable-host [lsap local-sap]

To initiate a connection with a remote host over RSRB, perform the following task in global configuration mode:

Task	Command
Initiate connection with host via RSRB.	sna rsrb start host-name

Configure Service Point to Use RSRB with Local Acknowledgment

To configure Service Point to use RSRB with local acknowledgment, perform the following tasks in global configuration mode:

Task	Command
Define an RSRB ring group.	source-bridge ring-group ring-group¹

Task	Command
Define a remote peer with the local acknowledgment feature.	source-bridge remote-peersname ring-group ring-group tcp ip-address local-ack
Define the Service Point/RSRB interface.	sna rsrbr local-virtual-ring bridge-number target-virtual-ring virtual-macaddr

1. This command is documented in the “Source-Route Bridging Commands” chapter of the *Router Products Command Reference* publication

Configure Service Point Support for Frame Relay

To configure Service Point support for Frame Relay, perform the following tasks in interface configuration mode:

Task	Command
Define DLCI mapping into LLC2.	frame-relay map llc2 dlc-number¹
Enable a local SAP for hosts.	sna enable-host lsap lsap-addr

1. This command is documented in the “SNA Frame Relay Access Support Commands” chapter of the *Router Products Command Reference* publication.

Configure Service Point Support for SDLC

To configure Service Point support for SDLC, perform the following tasks in interface configuration mode:

Task	Command
Specify the SDLC role of the router.	sdlc role {primary secondary}¹
Define the SDLC address.	sdlc address sdlc-addr1
Enable the SDLC address for the host.	sna enable-host sdlc sdlc-addr

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

Configure Service Point Support for X.25

To configure Service Point support for Frame Relay, perform the following tasks in interface configuration mode:

Task	Command
Define an X.121 address.	x25 address x121-addr¹
Define remote X.121 address for mapping to QLLC.	x25 map qllc remote-x121-addr²
Enable QLLC subaddress for host.	sna enable-host qllc x121-sub-addr
Enable routing of X.25 packets to serial interface.	x25 route ^x121-addr.* alias serial interface¹

1. This command is documented in the “X.25 and LAPB Commands” chapter of the *Router Products Command Reference* publication.

2. This command is documented in the “IBM Network Media Translation Commands” chapter of the *Router Products Command Reference* publication.

Specify Names for All Attached LANs

You can specify names for all Token Ring or Ethernet LANs attached to the router. These names are used to identify the LAN when the router sends an Alert to the host. To specify names for all attached LANs, perform the following tasks in interface configuration mode:

Task	Command
Define a name for a LAN.	lan-name <i>lan-name</i>

Specify the Physical Location of the Router

You can specify the physical location of the router if you intend requesting Vital Product Data from the router. To specify the physical location of the router, perform the following tasks in interface configuration mode:

Task	Command
Define the physical location of the router.	location <i>physical-location</i> (up to 50 characters, including blanks)

Monitor DSPU Feature Status

You can monitor the status of the DSPU feature. To display information about the state of the DSPU feature, perform the following tasks in EXEC mode:

Task	Command
Show the status of all DSPU resources.	show dspu
Show the status of DSPU hosts or downstream PUs.	show dspu pu { <i>host-name</i> <i>pu-name</i> } [all]
Show the status of a DSPU pool.	show dspu pool <i>pool-name</i> [all]
Show the status of all SNA hosts.	show sna
Show the status of an SNA host.	show sna pu <i>host-name</i> [all]

DSPU Configuration Examples

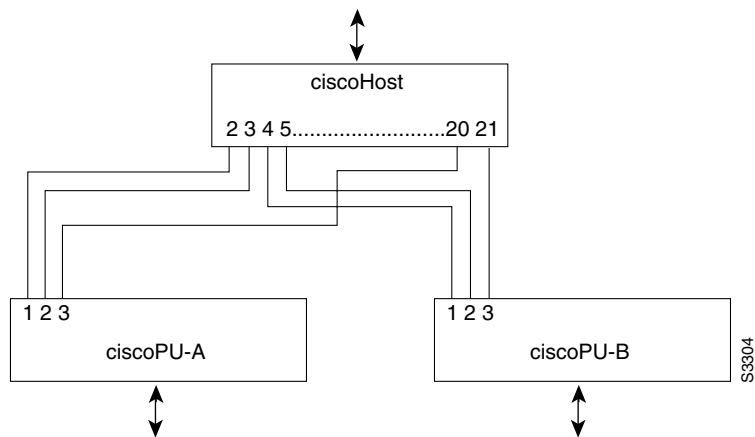
The following sections provide DSPU configuration examples:

- Dedicated LU Routing Example
- Pooled LU Routing Example
- Upstream Host via RSRB DSPU Configuration Example
- Downstream PU via SDLC DSPU Configuration Example
- Upstream host via SDLC DSPU Configuration Example
- Downstream PU via QLLC/X.25 DSPU Configuration Example
- Upstream Host via Frame Relay DSPU Configuration Example
- SNA Service Point Support Configuration Example

Dedicated LU Routing Example

Figure 30-3 illustrates the use of dedicated LU routing. Each upstream host LU is dedicated for use by a specific downstream LU.

Figure 30-3 Dedicated LU Routing



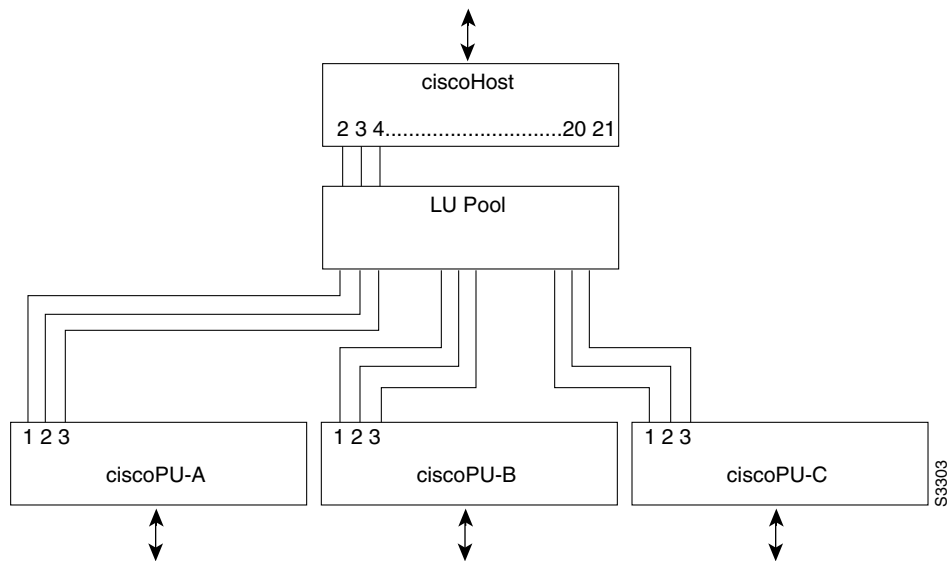
The following is a configuration file for the dedicated LU routing shown in Figure 30-3:

```
dspu host ciscohost xid-snd 06500001 rmac 4000.3745.0001
dspu pu ciscopu-a xid-rcv 05D00001 rmac 1000.5AED.0001
dspu lu 1 2 host ciscohost 2
dspu lu 3 3 host ciscohost 20
dspu pu ciscopu-b xid-rcv 05D00002 rmac 1000.5AED.0002
dspu lu 1 2 host ciscohost 4
dspu lu 3 3 host ciscohost 21
```

Pooled LU Routing Example

Figure 30-4 illustrates the use of pooled LU routing. Each upstream LU is configured in the LU pool and each downstream LU is configured as a pooled LU.

Figure 30-4 Pooled LU Routing



The following is the configuration example for the pooled LU routing shown in Figure 30-4:

```
dspu host ciscohost xid-snd 06500001 rmac 4000.3745.0001
dspu pool lupool host ciscohost lu 2 21
dspu pu ciscopu-a xid-rcv 05D00001 rmac 1000.5AED.0001
dspu lu 1 3 pool lupool
dspu pu ciscopu-b xid-rcv 05D00002 rmac 1000.5AED.0002
dspu lu 1 3 pool lupool
dspu pu ciscopu-c xid-rcv 05D00003 rmac 1000.5AED.0003
dspu lu 1 3 pool lupool
```

Upstream Host via RSRB DSPU Configuration Example

The following configuration example represents one possible definition for the network topology shown earlier in Figure 30-1.

This example demonstrates the configuration of an upstream host via RSRB (with local-acknowledgment) and downstream PUs via Token Ring.

```
source-bridge ring-group 99
source-bridge remote-peer 99 tcp 150.10.13.1
source-bridge remote-peer 99 tcp 150.10.13.2 local-ack

dspu rsrb 88 1 99 4000.ffff.0001
dspu rsrb enable-host lsap 4

dspu host ciscohost xid-snd 06500001 rmac 4000.3172.0001 rsap 4 lsap 4
dspu pool ciscopool host ciscohost lu 2 8
dspu rsrb start ciscohost

dspu pu ciscopu1 xid-rcv 05d00001
dspu lu 2 3 pool ciscopool

dspu pu ciscopu2 xid-rcv 05d00002
dspu lu 2 4 pool ciscopool

dspu pu ciscopu3 xid-rcv 05d00003
dspu lu 2 2 pool ciscopool
```

```
dspu pu ciscopu4 xid-rcv 05d00004
dspu lu 2 2 pool ciscopool
dspu lu 3 3 host ciscohost 9

interface TokenRing 0
description TokenRing connection for downstream PUs
ring-speed 16
dspu enable-pu lsap 8
```

Downstream PU via SDLC DSPU Configuration Example

This example demonstrates the configuration of downstream PUs via SDLC and an upstream host via Token Ring.

```
dspu host ciscohost xid-snd 06500001 rmac 4000.3172.0001 rsap 4 lsap 12
dspu pool ciscopool host ciscohost lu 2 11

dspu pu pu-sdlc0 sdlc C1 interface Serial0
dspu lu 2 6 pool ciscopool

dspu pu pu-sdlc1 sdlc C1 interface Serial1
dspu lu 2 6 pool ciscopool

interface Serial0
description SDLC connection for pu-sdlc0
encapsulation sdlc
sdlc role primary
sdlc address C1
dspu enable-pu sdlc C1
clockrate 56000

interface Serial1
description SDLC connection for pu-sdlc1
encapsulation sdlc
sdlc role primary
sdlc address C1
dspu enable-pu sdlc C1
clockrate 56000

interface TokenRing 0
description TokenRing connection for ciscohost
ring-speed 16
dspu enable-host lsap 12
dspu start ciscohost
```

Upstream host via SDLC DSPU Configuration Example

This example demonstrates the configuration of an upstream host via SDLC and downstream PUs via Token Ring and Ethernet.

```
dspu host ciscohost xid-snd 06500001 sdlc C1 interface Serial0
dspu pool ciscopool host ciscohost lu 2 11

dspu pu pu-token rmac 4000.4444.0001 rsap 4 lsap 8
dspu lu 2 6 pool ciscopool

dspu pu pu-ether rmac 0200.2222.0001 rsap 4 lsap 8
dspu lu 2 6 pool ciscopool

interface Serial0
description SDLC connection for ciscohost
encapsulation sdlc
```

```

sdlc role secondary
sdlc address C1
dspu enable-host sdlc C1
clockrate 56000

interface TokenRing 0
description TokenRing connection for pu-token
ring-speed 16
dspu enable-pu lsap 8

interface Ethernet0
description Ethernet connection for pu-ether
dspu enable-pu lsap 8

```

Downstream PU via QLLC/X.25 DSPU Configuration Example

This example demonstrates the configuration of a downstream PU via QLLC/X.25 and upstream host via Ethernet.

```

x25 routing

dspu host ciscohost xid-snd 06500001 rmac 0200.2222.0001 rsap 4 lsap 12
dspu pool ciscopool host ciscohost lu 2 11

dspu pu pu-qllc x25 320108 qllc 08
dspu lu 2 11 pool ciscopool

interface Serial0
description QLLC connection for pu-qllc
encapsulation x25
x25 address 3202
x25 map qllc 320108
dspu enable-pu qllc 8

interface Ethernet0
description Ethernet connection for pu-ether
dspu enable-host lsap 12
dspu start ciscohost

x25 route ^3202.* alias Serial0

```

Upstream Host via Frame Relay DSPU Configuration Example

This example demonstrates the configuration of an upstream host via Frame Relay and downstream PUs via Token Ring and Ethernet.

```

dspu host ciscohost xid-snd 06500001 dlci 200 rsap 4 lsap 12
dspu pool ciscopool host ciscohost lu 2 11

dspu pu pu-token rmac 4000.4444.0001 rsap 4 lsap 8
dspu lu 2 6 pool ciscopool

dspu pu pu-ether rmac 0200.2222.0001 rsap 4 lsap 8
dspu lu 2 6 pool ciscopool

interface Serial0
description Frame Relay connection for ciscohost
encapsulation frame-relay ietf
frame-relay map llc2 200
dspu enable-host lsap 12
dspu start ciscohost

```

```
interface TokenRing 0
description TokenRing connection for pu-token
ring-speed 16
dspu enable-pu lsap 8

interface Ethernet0
description Ethernet connection for pu-ether
dspu enable-pu lsap 8
```

SNA Service Point Support Configuration Example

The following is an example of an RSRB configuration that implements SNA Service Point:

```
source-bridge ring-group 99
source-bridge remote-peer 99 tcp 150.10.13.2 local-ack

sna rsrb 88 1 99 4000.ffff.0001

sna host CNM02 xid-snd 05dbc000 rmac 4001.3745.1088 rsap 4 lsap 4 focalpoint
sna rsrb enable-host lsap 4
sna rsrb start CNM02
```