

Configuring NCIA Client/Server Topologies

This chapter describes native client interface architecture (NCIA) support for Systems Network Architecture (SNA) devices. NCIA server and the NCIA client/server model extends the scalability of NCIA I, the earlier NCIA implementation, by minimizing the number of central-site remote source-route bridging (RSRB) or data-link switching plus (DLSw+) peer connections required to support a large number of NCIA clients. For a complete description of the NCIA client/server commands mentioned in this chapter, refer to the “NCIA Server Configuration Commands” chapter of the *Bridging and IBM Networking Command Reference*. To locate documentation of other commands that appear in this chapter, use the command reference master index or search online.

Cisco’s NCIA server feature implements RFC 2114, Data Link Switch Client Access Protocol.

NCIA Server Session to Local Token Ring Using DLSw+ Local Switch

The network configuration shown in includes NCIA clients that connect to a front-end processor (FEP) on a Token Ring through a local router (the NCIA server). The virtual ring is used in conjunction with DLSw+ local switch. The routing information field (RIF) of each circuit is terminated on the virtual ring. Figure 159 shows a logical view of an NCIA server session using a DLSw+ local switch (connected to a local Token Ring). In addition to Token Ring, an NCIA server also supports Ethernet, Synchronous Data Link Control (SDLC) Protocol, and Qualified Logical Link Control (QLLC) network connections as well as Channel Interface Processor (CIP) connections through a DLSw+ local switch. For more information on the different media types that a DLSw+ local switch supports, refer to the “Configuring DLSw+” chapter.

Figure 158 NCIA Server Session to Local Token Ring Using DLSw+ Local Switch

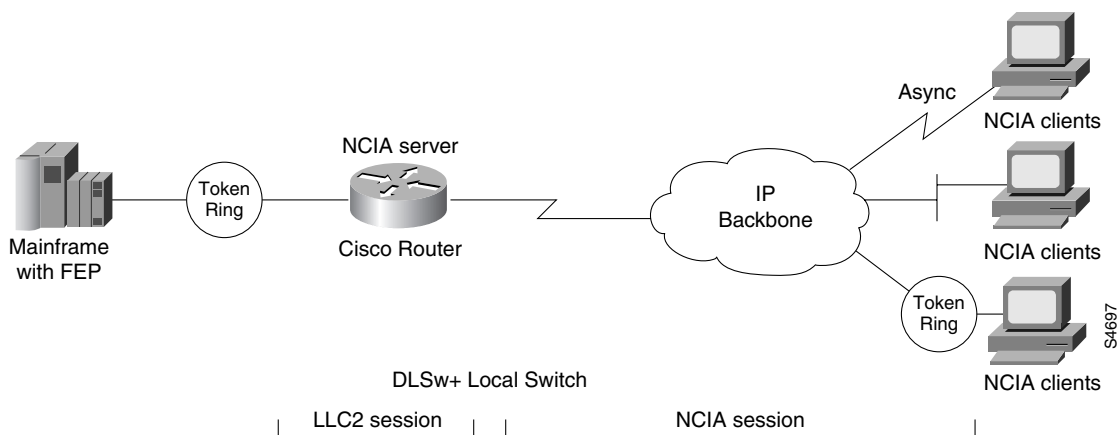
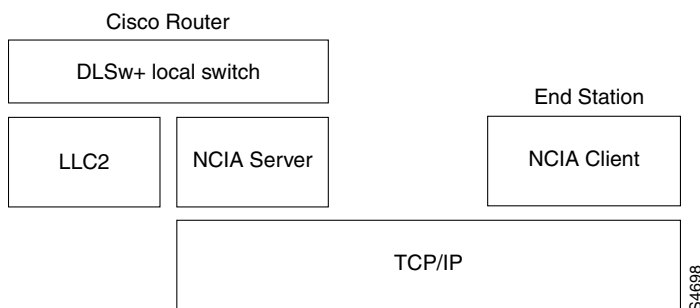


Figure 159 Logical View of NCIA Server Session to a Local Token Ring Using DLSw+ Local Switch



Configuration Task List

To configure an NCIA server session connected to a local Token Ring, perform the tasks in the following sections:

- Define a Source-Bridge Ring Group for DLSw+
- Define a DLSw+ Local Peer for the Router
- Configure an NCIA Server on the Router

For a configuration example, see “NCIA Server Session to Local Token Ring Using DLSw+ Local Switch Example” at the end of this chapter.

Define a Source-Bridge Ring Group for DLSw+

In DLSw+, the source-bridge ring group specifies the virtual ring that will appear to be the last ring in the RIF. This ring is transparent to the NCIA client. From the host’s point of view, all NCIA clients look like stations sitting on the virtual ring. To define a source-bridge ring group for DLSw+, use the following command in global configuration mode:

Command	Purpose
source-bridge ring-group <i>ring-group</i> [<i>virtual-mac-address</i>]	Define a ring group.

Define a DLSw+ Local Peer for the Router

Defining a DLSw+ local peer for a router enables DLSw+ local switch. You specify all local DLSw+ parameters as part of the local peer definition. To define a local peer, use the following command in global configuration mode:

Command	Purpose
dlsw local-peer [peer-id <i>ip-address</i>] [group <i>group</i>] [border] [cost <i>cost</i>] [If <i>size</i>] [keepalive <i>seconds</i>] [passive] [promiscuous] [biu-segment]	Define the DLSw+ local peer.

Configure an NCIA Server on the Router

Configuring an NCIA server on a router enables the router to perform two roles:

- Establish TCP/NDLC sessions with clients for the purpose of sending and receiving data.
- Use the standard interface (CLSI) to communicate with other software modules in the router, such as APPN, DLSw+, and downstream physical unit (DSPU), and act as the data intermediary between them and the clients of the NCIA server.

To configure an NCIA server, use the following command in global configuration mode:

Command	Purpose
<code>ncia server server-number server-ip-address server-virtual-mac-address virtual-mac-address virtual-mac-range [inbound-only] [keepalive seconds] [tcp_keepalive minutes]</code>	Configure the NCIA server.

NCIA Server Session with DLSw+

In the network configuration shown in Figure 159, the NCIA server uses DLSw+ to connect its clients to the FEP through a remote router. Figure 161 shows a logical view of the NCIA Server session with DLSw+.

Figure 160 NCIA Server Session with DLSw+

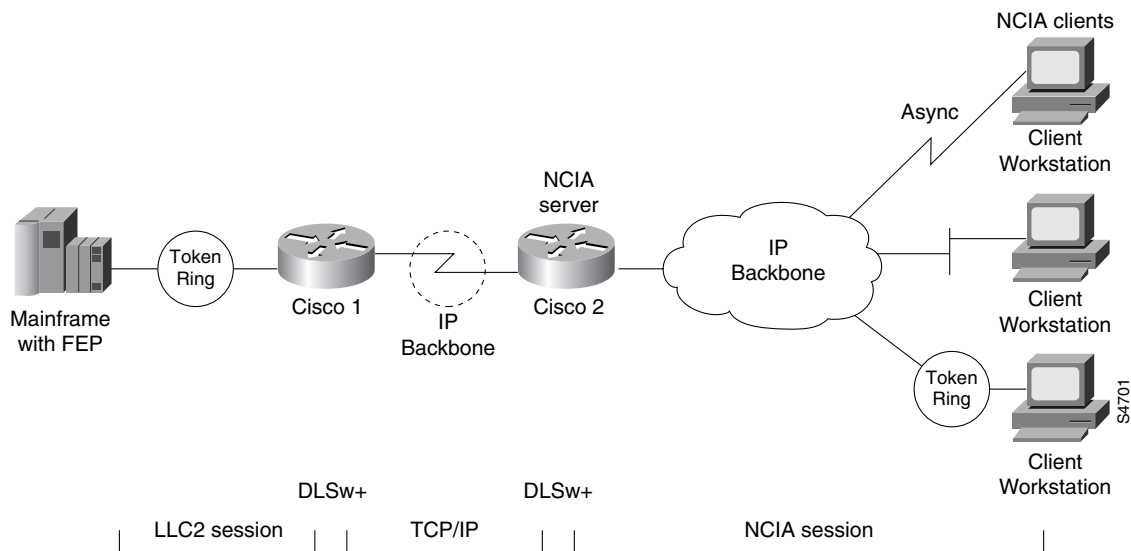
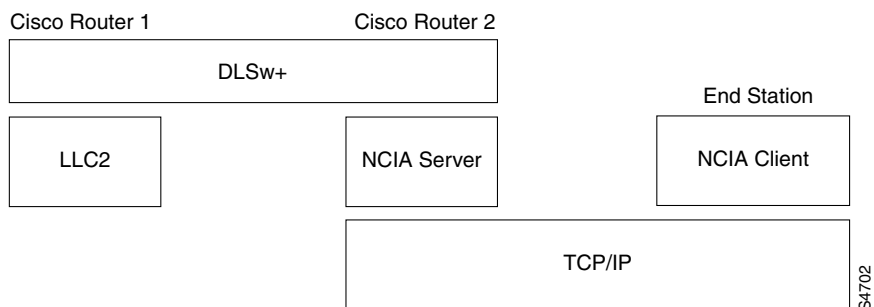


Figure 161 Logical View of NCIA Server with DLSw+



DLSw+ Configuration Task List

To configure an NCIA server session connected to a remote router using DLSw+, perform the tasks in the following sections:

- Define a Source-Bridge Ring Group for DLSw+
- Define a DLSw+ Local Peer for the Router
- Define a DLSw+ Remote Peer
- Configure an NCIA Server on the Local Router

For a configuration example, see “NCIA Server Session with DLSw+ Example” at the end of this chapter.

Define a Source-Bridge Ring Group for DLSw+

The source-bridge ring can be shared between DLSw+ and SRB/RSRB. In DLSw+, the source-bridge ring group specifies the virtual ring that will appear to be the last ring in the RIF. Because RIFs are terminated at the router, there is no correlation between the ring-group number specified in DLSw+ peers. The numbers can be the same for management simplicity, but they do not have to be. To define a source-bridge ring group for DLSw+, use the following command in global configuration mode:

Command	Purpose
source-bridge ring-group <i>ring-group</i> [<i>virtual-mac-address</i>]	Define a ring group.

Define a DLSw+ Local Peer for the Router

Defining a DLSw+ local peer for a router enables DLSw+. You specify all local DLSw+ parameters as part of the local peer definition. To define a local peer, use the following command in global configuration mode:

Command	Purpose
dlsw local-peer [peer-id <i>ip-address</i>] [group <i>group</i>] [border] [cost <i>cost</i>] [If <i>size</i>] [keepalive <i>seconds</i>] [passive] [promiscuous] [biu-segment]	Define the DLSw+ local peer.

Define a DLSw+ Remote Peer

To configure TCP encapsulation on a remote peer, use the following command in global configuration mode:

Command	Purpose
dlsw remote-peer <i>list-number</i> tcp <i>ip-address</i> [backup-peer <i>ip-address</i>] [bytes-netbios-out <i>bytes-list-name</i>] [cost <i>cost</i>] [dest-mac <i>mac-address</i>] [dmac-output-list <i>access-list-number</i>] [dynamic] [host-netbios-out <i>host-list-name</i>] [inactivity <i>minutes</i>] [keepalive <i>seconds</i>] [lf <i>size</i>] [linger <i>minutes</i>] [lsap-output-list <i>list</i>] [no-llc <i>minutes</i>] [priority] [tcp-queue-max <i>size</i>] [timeout <i>seconds</i>]	Define a TCP encapsulation remote peer.

Configure an NCIA Server on the Local Router

Configuring an NCIA server on the local router enables the router to perform two roles:

- Establish TCP/NDLC sessions with clients to send and receive data.
- Use the standard interface (CLSI) to communicate with other software modules in the router, such as APPN, DLSw+, and DSPU, and act as the data intermediary between them and the NCIA clients.

To configure an NCIA server, use the following command in global configuration mode:

Command	Purpose
ncia server <i>server-number</i> <i>server-ip-address</i> <i>server-virtual-mac-address</i> <i>virtual-mac-address</i> <i>virtual-mac-range</i> [inbound-only] [keepalive <i>seconds</i>] [tcp_keepalive <i>minutes</i>]	Configure the NCIA server.

NCIA Server Session with DSPU

In the network configuration shown in Figure 162, the NCIA server uses DSPU to connect its clients to the FEP through a remote router. Figure 163 shows a logical view of the NCIA server session with RSRB/DLSw+ and DSPU.

Figure 162 NCIA Server Session with DSPU

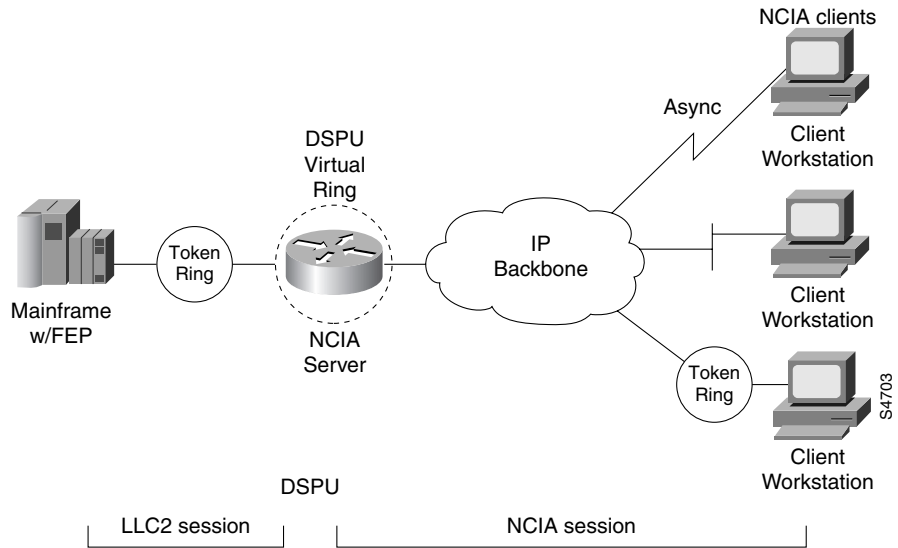
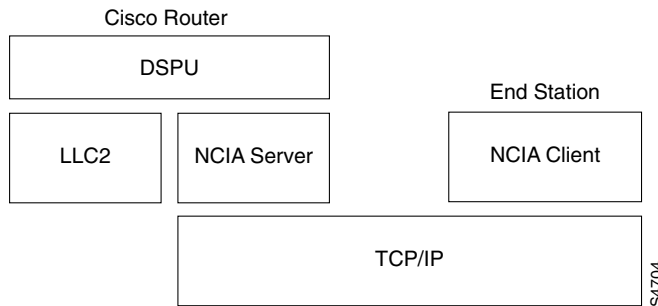


Figure 163 Logical View of NCIA Server with DSPU



DSPU Configuration Task List

To configure an NCIA server session connected to a remote router using DSPU, perform the tasks in the following sections:

- Define a DSPU Upstream Host
- Explicitly Define DSPU
- Define Dedicated LU
- Configure the NCIA Server as the Underlying Transport Mechanism

For a configuration example, see “NCIA Server Session with DSPU Example” at the end of this chapter.

Define a DSPU Upstream Host

To define a DSPU host over Token Ring, Ethernet, Fiber Distributed Data Interface (FDDI), RSRB, or virtual data link control (VDLC) connections, use the following command in global configuration mode:

Command	Purpose
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]	Define a DSPU host over Token Ring, Ethernet, FDDI, RSRB, or virtual data link control connections.

Explicitly Define DSPU

To explicitly define a DSPU over Token Ring, Ethernet, FDDI, RSRB, VDLC, or NCIA connections, use the following command in global configuration mode:

Command	Purpose
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>]	Explicitly define a DSPU over Token Ring, Ethernet, FDDI, RSRB, VDLC, or NCIA connections.

Define Dedicated LU

To define a dedicated logical unit (LU) or a range of dedicated LUs for an upstream host and DSPU, use the following command in global configuration mode:

Command	Purpose
dspu lu <i>lu-start</i> [<i>lu-end</i>] { host <i>host-name</i> <i>host-lu-start</i> pool <i>pool-name</i> } [pu <i>pu-name</i>]	Define a dedicated LU or a range of dedicated LUs for a DSPU.

Configure the NCIA Server as the Underlying Transport Mechanism

To configure the NCIA server as the underlying transport mechanism, use the following command in global configuration mode:

Command	Purpose
dspu ncia [<i>server-number</i>]	Configure the NCIA server as the underlying transport mechanism.

To enable a local Service Access Point (SAP) on the NCIA server for use by DSPUs, use the following command in global configuration mode:

Command	Purpose
dspu ncia enable-pu [lsap <i>local-sap</i>]	Enable local SAP for DSPUs.

NCIA Server Session with RSRB

The network configuration shown in Figure 163 includes NCIA clients that connect to a FEP on a Token Ring through a remote router. Figure 165 shows a logical view of the NCIA Server session with RSRB (to a remote Token Ring). Because DLSw+ is the latest technology provided by Cisco, Cisco does not encourage using the NCIA Server feature with RSRB. If the router on the host side is running DLSw+, RSRB should not be used. Support for the NCIA Server feature with RSRB is provided to encourage RSRB users to migrate to DLSw+.

Figure 164 NCIA Server Session with RSRB

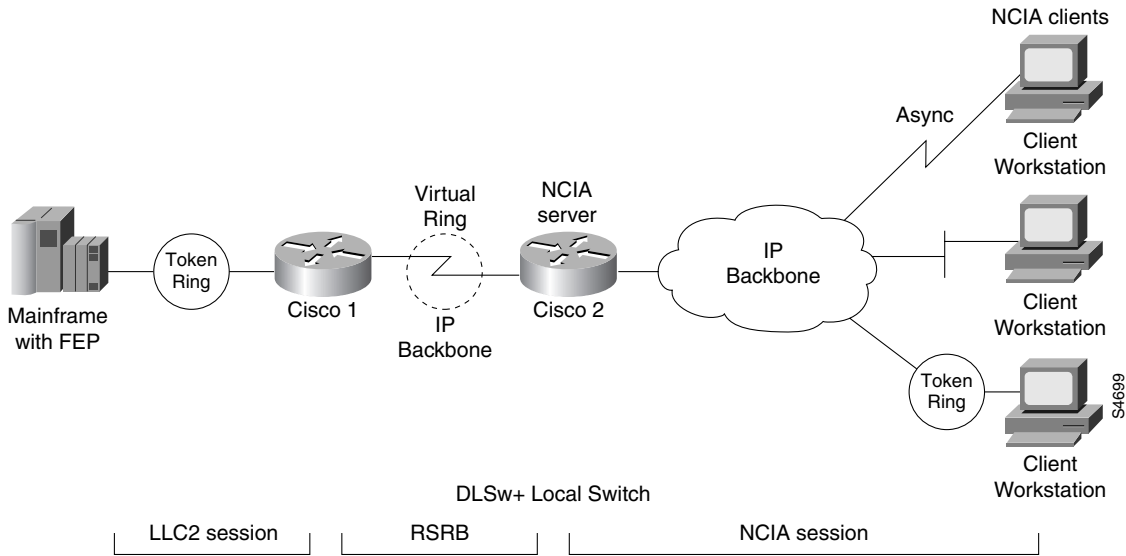
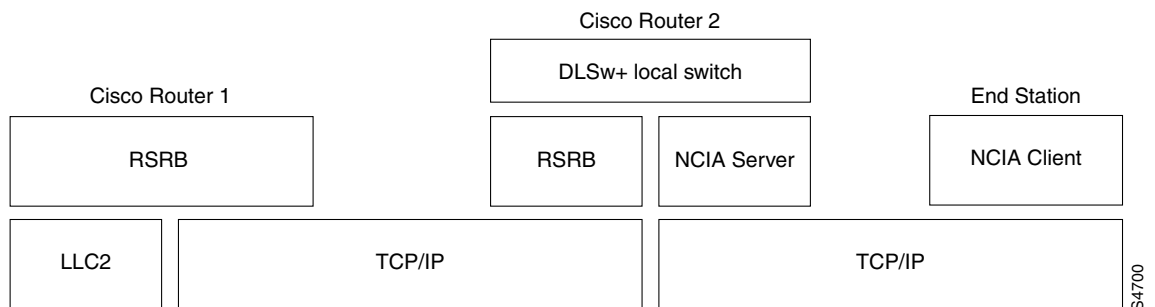


Figure 165 Logical View of NCIA Server Session with RSRB (Remote Token Ring)



RSRB Configuration Task List

To configure an NCIA server session connected to a remote Token Ring using RSRB, perform the tasks in the following sections:

- Define a Source-Bridge Ring Group for DLSw+ and RSRB
- Identify the Remote Peer (TCP Connection)
- Define a DLSw+ Local Peer for the Local Router

- Configure an NCIA Server on the Router
- Configure an RSRB Ring for the NCIA Server on the Local Router

For a configuration example, see “NCIA Server Session with DLSw+ Example” at the end of this chapter.

Define a Source-Bridge Ring Group for DLSw+ and RSRB

The source-bridge virtual ring can be shared between DLSw+ and SRB/RSRB. In DLSw+, the source-bridge ring group specifies the virtual ring that will appear to be the last ring in the RIF. Because RIFs are terminated at the router, the ring group numbers specified in commands to set up DLSw+ peers can be different. The ring group numbers can be the same for management simplicity, but they do not have to be.

To define a source-bridge ring group for DLSw+, use the following command in global configuration mode:

Command	Purpose
source-bridge ring-group <i>ring-group</i> [<i>virtual-mac-address</i>]	Define a ring group.

Identify the Remote Peer (TCP Connection)

In our implementation, whenever you connect Token Rings using non-Token Ring media, you must treat that non-Token Ring media as a virtual ring by assigning it to a ring group. Every router with which you want to exchange Token Ring traffic must be a member of this same ring group. For more information about defining a ring group, see the “Define a Ring Group in SRB Context” section of the “Configuring Source-Route Bridging” chapter of this document.

To identify the remote peers, use the following command in global configuration mode:

Command	Purpose
source-bridge remote-peer <i>ring-group</i> tcp <i>ip-address</i> [If <i>size</i>] [tcp-receive-window <i>wsize</i>] [local-ack] [priority]	Identify the IP address of a peer in the ring group with which to exchange source-bridge traffic using TCP.

Specify one **source-bridge remote-peer** command for each peer router that is part of the virtual ring. Also specify one **source-bridge remote-peer** command to identify the IP address of the local router.

NCIA server supports only RSRB pass-through mode. Local acknowledgment is not supported.

Define a DLSw+ Local Peer for the Local Router

Defining a DLSw+ local peer for the local router enables DLSw+. You specify all local DLSw+ parameters as part of the local peer definition. To define a local peer, use the following command in global configuration mode:

Command	Purpose
dsw local-peer [peer-id <i>ip-address</i>] [group <i>group</i>] [border] [cost <i>cost</i>] [If <i>size</i>] [keepalive <i>seconds</i>] [passive] [promiscuous] [biu-segment]	Define the DLSw+ local peer.

Configure an NCIA Server on the Router

Configuring an NCIA server on a router enables the router to perform two roles:

- Establish TCP/NDLC sessions with clients for the purpose of sending and receiving data.
- Use the standard interface (CLSI) to communicate with other software modules in the router, such as APPN, DLSw+, and DSPU, and to act as the data intermediary between them and the NCIA clients.

To configure an NCIA server, use the following command in global configuration mode:

Command	Purpose
ncia server <i>server-number server-ip-address server-virtual-mac-address virtual-mac-address virtual-mac-range [inbound-only] [keepalive seconds] [tcp_keepalive minutes]</i>	Configure the NCIA server.

Configure an RSRB Ring for the NCIA Server on the Local Router

Configuring an RSRB ring to associate with the NCIA server on the local router provides the virtual ring that connects the DLSw ring within the local router and the target ring between the local router and the remote router.

To configure an RSRB ring for the NCIA server on the local router, use the following command in global configuration mode:

Command	Purpose
ncia rsrb <i>virtual-ring local-bridge local-ring ncia-bridge ncia-ring virtual-mac-address</i>	Define the NCIA/RSRB interface.

Monitor and Maintain an NCIA Server Network

You can monitor and maintain the operation of an NCIA server network. To display information about the state of the NCIA server feature and perform maintenance tasks, use the following commands in EXEC mode:

Command	Purpose
show ncia server [<i>server-number</i>]	Show the status of the NCIA server.
show ncia client [sap-list] [<i>ip-address</i>]	Show the status of the NCIA client.
clear ncia client [<i>ip-address</i>]	Terminate an NCIA client connection.
show ncia circuits [<i>id-number</i>]	Show the status of an NCIA circuit.
clear ncia circuit [<i>id-number</i>]	Drop an NCIA circuit.
clear ncia client registered [<i>ip-address</i>]	Terminate the active connection to the specified client and release all control blocks of the registered client.
ncia stop	Stop an NCIA server.
ncia start	Restart an NCIA server.

NCIA Server Configuration Examples

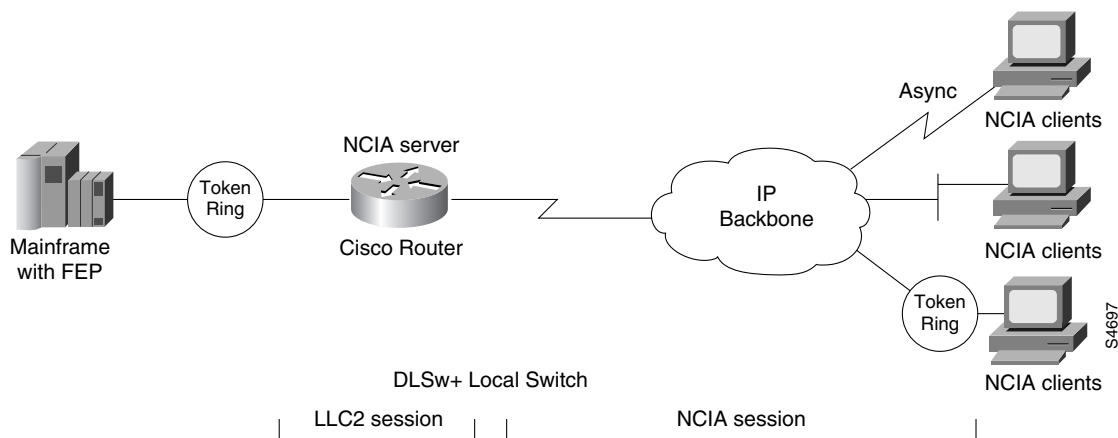
The following sections provide NCIA server configuration examples:

- NCIA Server Session to Local Token Ring Using DLSw+ Local Switch Example
- NCIA Server Session with DLSw+ Example
- NCIA Server Session with DSPU Example
- NCIA Server Session with RSRB Example

NCIA Server Session to Local Token Ring Using DLSw+ Local Switch Example

Figure 165 illustrates the use of DLSw+ local peer with an NCIA server session to a local Token Ring.

Figure 166 NCIA Server Session to Local Token Ring Using DLSw+ Local Switch



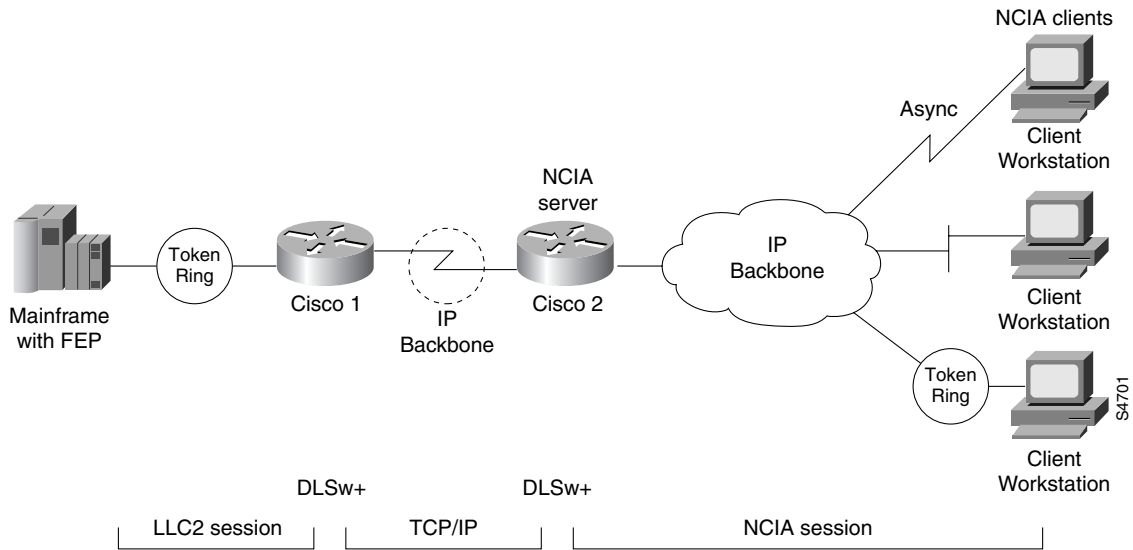
The following is a configuration file for the network example shown in Figure 165:

```
source-bridge ring-group 44
dlsw local-peer
ncia server 1 10.2.20.4 4000.3174.0001 4000.0000.0001 128
!
interface token ring 0
ring-speed 16
source-bridge 21 3 44
```

NCIA Server Session with DLSw+ Example

Figure 165 illustrates the use of DLSw+ with an NCIA server session.

Figure 167 NCIA Server Session with DLSw+



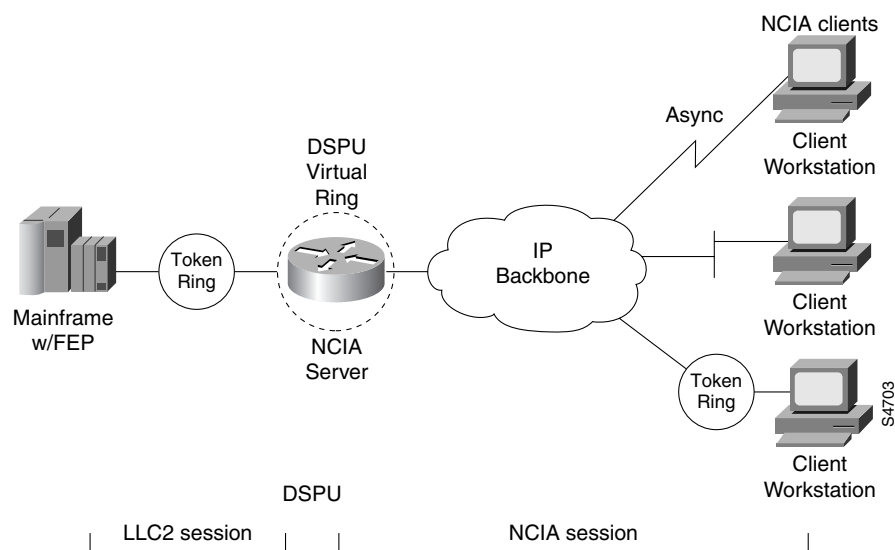
The following is a configuration file for the network example shown in Figure 165:

```
source-bridge ring-group 44
dlsw local-peer peer-id 10.2.20.4
dlsw remote-peer 0 tcp 10.2.20.3
ncia server 1 10.2.20.4 4000.3174.0001 4000.0000.0001 128
```

NCIA Server Session with DSPU Example

Figure 168 illustrates an NCIA server session with RSRB/DLSw+ and DSPU.

Figure 168 NCIA Server Session with RSRB/DLSw+ and DSPU



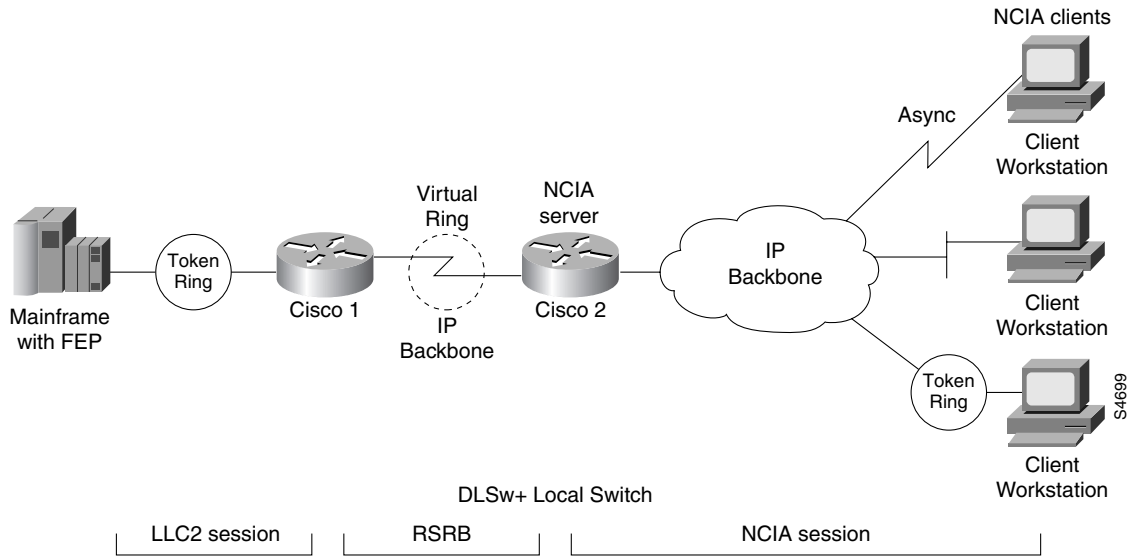
The following is a configuration file for the network example shown in Figure 168:

```
ncia server 1 10.2.20.4 4000.3745.0001 4000.0000.0001 128
!
dspu ncia 1
dspu ncia enable-pu lsap 8
!
dspu host HOST-9370 xid-snd 11100001 rmac 4000.1060.1000 rsap 4 lsap 4
!
dspu pu CISCOPU-A xid-rcv 01700001
dspu lu 2 6 host HOST-9370 2
!
interface TokenRing 0
ring-speed 16
llc2 xid-retry-time 0
dspu enable-host lsap 4
dspu start HOST-9370
```

NCIA Server Session with RSRB Example

Figure 168 illustrates the use of RSRB with an NCIA server session.

Figure 169 NCIA Server Session with RSRB



The following is a configuration file for router Cisco 2 for the network example shown in Figure 168:

```

source-bridge ring-group 44
source-bridge ring-group 22
source-bridge remote-peer 22 tcp 10.2.20.3
source-bridge remote-peer 22 tcp 10.2.20.4
dlsw local-peer
ncia server 1 10.2.20.4 4000.3174.0001 4000.0000.0001 128
ncia rsrb 22 2 33 4 44 1111.1111.2222
    
```