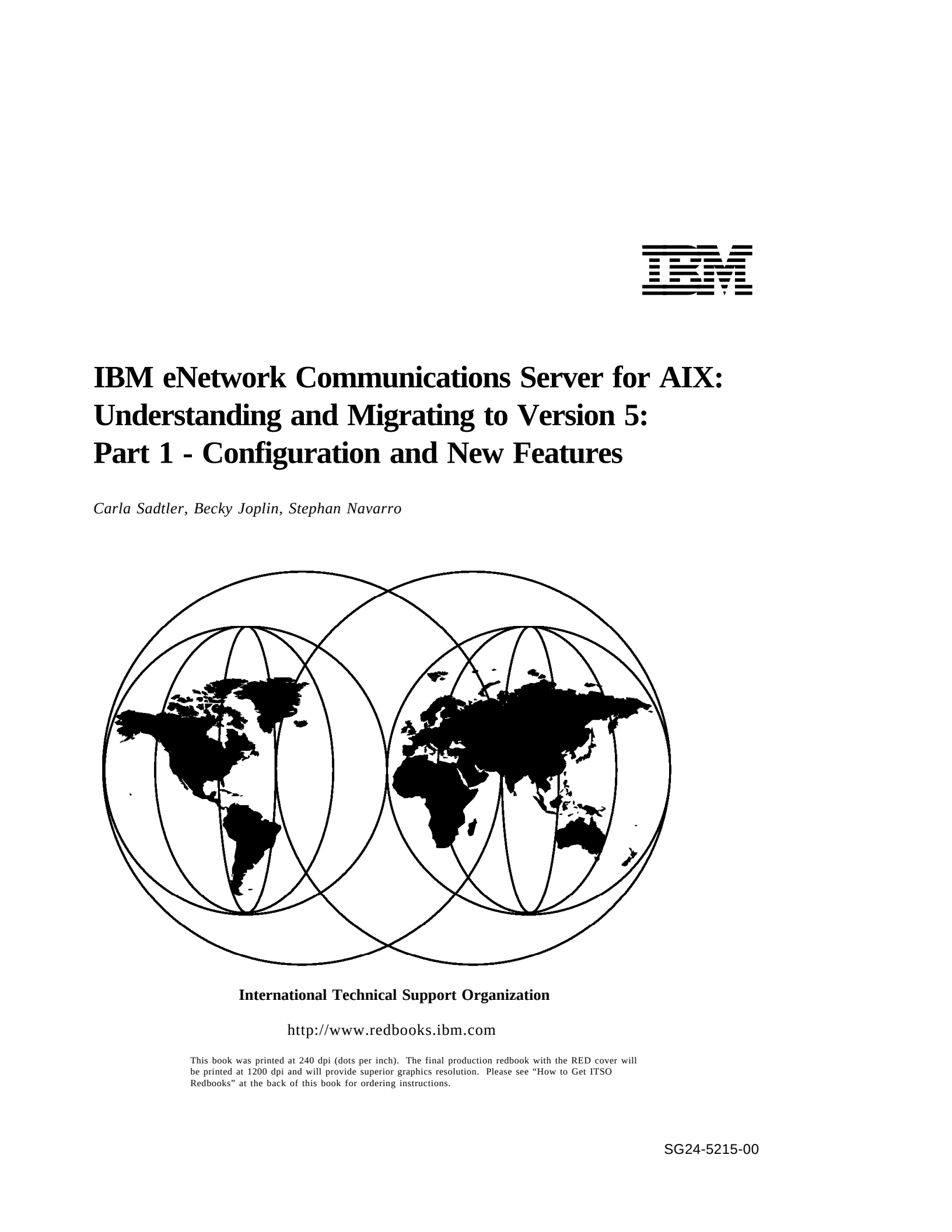

IBM eNetwork Communications Server for AIX: Understanding and Migrating to Version 5: Part 1 - Configuration and New Features

Carla Sadtler, Becky Joplin, Stephan Navarro

International Technical Support Organization

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February 1998

Take Note!

Before using this information and the product it supports, be sure to read the general information in Appendix D, “Special Notices” on page 199.

First Edition (February 1998)

This edition applies to Version 5 of IBM eNetwork Communications Server for AIX, Program Number 5765-D20 for use with the AIX Version 4.1.5 System or later.

Comments may be addressed to:
IBM Corporation, International Technical Support Organization
Dept. HZ8 Building 678
P.O. Box 12195
Research Triangle Park, NC 27709-2195

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Contents

Preface

The new IBM eNetwork Communications Server for AIX Version 5 is very different from the previous releases. Although the functions are basically the same, with some very interesting additions, the customer interface is drastically different. This redbook addresses migration steps and issues. In addition, it gives a broad understanding of the new features and functions.

The first four chapters take you through the migration process. It helps the reader understand the process for migrating from previous releases of Communications Server for AIX and gives examples.

The rest of the book explores the new functions. It starts by giving the reader an in-depth overview of the Motif Administration function which replaces smit configuration for CS/AIX. The next chapters show the reader how to configure the new functional additions to CS/AIX including MPC, HPR, DDDLU, DLUR, ATM, TN Server, frame relay, and network management RCF.

The Team That Wrote This Redbook

This redbook was produced by a team of specialists from around the world working at the Systems Management and Networking ITSO Center, Raleigh.

Carla Sadtler is a Senior ITSO Specialist for Communications Server for AIX and network integration projects at the Systems Management and Networking ITSO Center, Raleigh. She also has responsibility for Lotus Notes and MVS system programming in the ITSO Center in Raleigh. Before joining the ITSO 13 years ago, Carla worked in the Raleigh branch office as a program support representative.

Becky Joplin is a Technical Marketing Support Representative in the Advanced Technical Support organization. She has been working with AIX for five years and SNA for three years.

Stephan Navarro is a System Software Specialist in France He has three years of experience in SNA and TCP/IP networks. He has worked at IBM for four years.

Thanks to the following people for their invaluable contributions to this project:

Donna Wooten
IBM Networking Strategy and Technology

Paul Landay
IBM AIX Networking Test

Dirk Tysmans
IBM AIX Networking Test

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Chapter 1. Communications Server for AIX V5 Overview

There are many differences between IBM eNetwork Communications Server for AIX V5 (referred to as CS/AIX V5) and past versions of Communications Server for AIX and SNA Server for AIX. This chapter gives an overview of the changes.

The major changes introduced with CS/AIX V5 are:

- The configuration is stored in text files.
- Configuration updates are immediate.
- Configuration profiles must be added in order.
- The default/template profiles can't be modified.
- The xsnaadmin and snaadmin interfaces are used for configuration updates.

1.1 Communications Server for AIX V5 Configuration Model

Previous releases of Communications Server for AIX used two databases for configuration. New and changed profiles were put in a working database. Before the profiles could be used, they had to be verified and put in the committed database. SMIT was the primary configuration and management tool. Figure 1 represents the configuration model for CS/AIX V4.2.

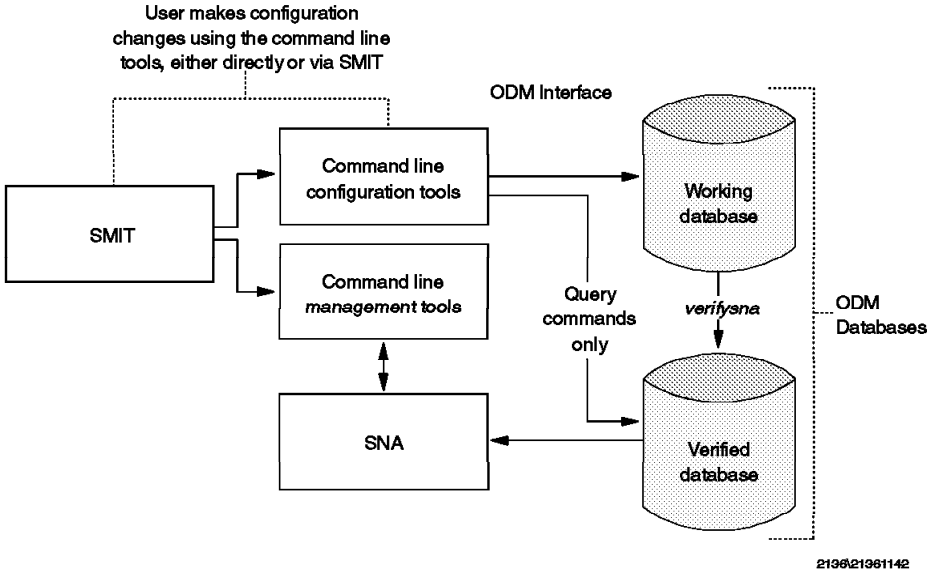

Figure 1. CS/AIX V4.2 Configuration Model

With CS/AIX V5, the profiles are stored in one place and all changes are immediate. A new graphical interface, xsnaadmin, has been introduced as the main configuration and management tool. The snaadmin line command is also available for configuration and management. Figure 2 on page 2 represents the configuration model for CS/AIX V5:

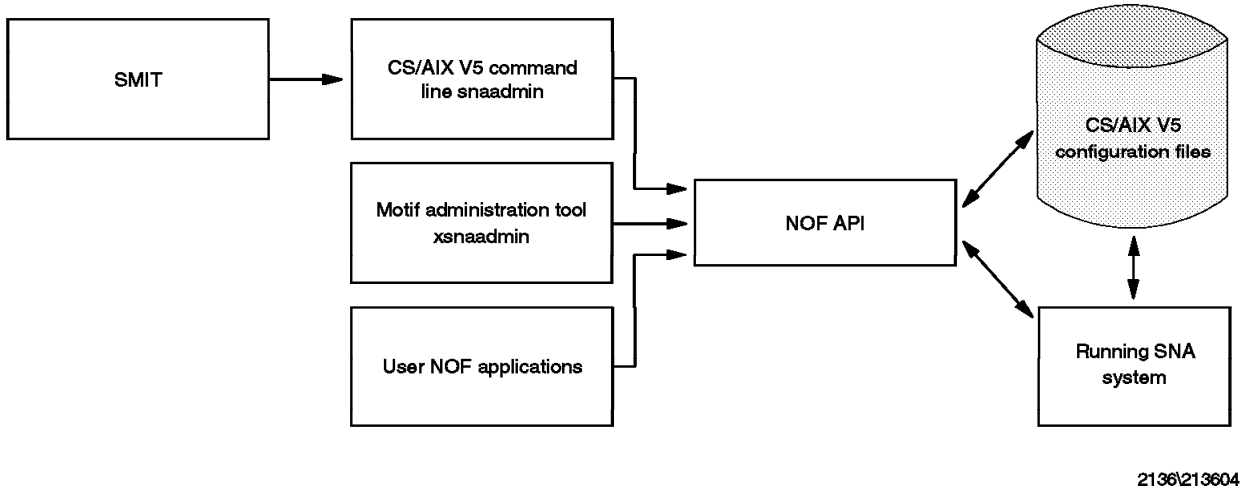

Figure 2. CS/AIX V5 Configuration Model

1.1.1 Configuration Storage

With CS/AIX V5, the configuration is not stored in an ODM database. It is stored in text files. The default path is /etc/sna and the default files are:

sna_domn.cfg	CPIC side_info profiles and CS/AIX version information
sna_tps	auto started transaction program profiles
sna_node.cfg	all other profiles

There is no concept of working and verified profile databases.

You must have root authority to edit these configuration files and you should not edit these files while the CS/AIX V5 node is active.

1.1.2 Immediate Updates

Working and committed databases gave CS/AIX 4.2 and SNA Server the ability to do delayed updates. This means you could make a configuration change that wouldn't take effect until you ran the verifysna command and in some cases, restarted the resource. With CS/AIX V5 this is not possible.

The configuration file is written out each time a change is made. You cannot make a configuration change to an active resource.

1.1.3 Configuration In Logical Order

Using delayed updates in previous versions of CS/AIX and SNA Server allowed you to add configurations out of the logical order. For example, you could add a dependent session for a link station that didn't exist. With CS/AIX V5, definitions must be built in logical order. First you configure the node, then a port, then a link station, then a session. Resources are defined in the same order as the SNA architecture stack.

Table 1. SNA Architecture Stack

Architecture Layer	**Corresponding Resource(s)**
Transaction Services	Transaction Program Profile
Presentation Services	Session
Data Flow Control	Session, Link Station
Transmission Control	Link Station
Path Control	Port, DLC
Data Link Control	Port, DLC
Physical Control	Adapter and Cable

1.1.4 Cannot Modify Defaults

In previous versions of CS/AIX there were default profiles and it was possible to change parameters in these profiles. In CS/AIX V5, the default values are built into the product and there are no editable default profiles or configuration files.

1.1.5 New Configuration Tools

The preferred way to administer and configure CS/AIX V5 is with the xsnaadmin tool. You can still use SMIT and you can use the snaadmin command to do the same tasks. The xsnaadmin tool will guide you through the steps you need to complete and offers extensive help. For more information on xsnaadmin, refer to Chapter 6, "The Motif Administration Utility" on page 43. For more information on the snaadmin command, refer to 1.4.1.2, "The snaadmin Command" on page 8.

1.2 Communications Server for AIX V5 File Structure

In previous versions of CS/AIX and SNA Server, all the SNA related files were in the /usr/lpp/sna and /var/sna directories. In CS/AIX V5, files are stored in the following locations:

Table 2. CS/AIX File Locations	
Directory	**Contents**
/usr/bin	executables
/usr/bin/X11	executables
/usr/lpp/sna	installation and system files
/usr/lib/sna	libraries and product executables
/etc/sna	configuraton files
/var/sna	log and trace files

1.3 Communications Server for AIX V5 Profile Changes

There are many changes in the CS/AIX V5 configuration file compared to previous versions of CS/AIX and SNA Server. The following changes affect all profiles:

- The profile name field is retired except for the side_info profile and LU1-3 session profiles. These exceptions are made to maintain compatibility with back-level transaction programs.
- No distinction between system and user profiles.

This table shows each CS/AIX V4.2 profile, what changes CS/AIX V5 makes to the profile and where to configure the information in CS/AIX V5. Many profile parameter names were shortened but it is intuitive which parameter it used to be. Those parameters are not included in this table.

Table 3 (Page 1 of 4). Configuration Profile Changes		
CS/AIX V4.2 Profile Name	**Profile Changes**	**CS/AIX V5 Configuration Options**
Control Point Profile	Network name and control point names are concatenated to form a fully qualified control point name. Additional node type of LEN.	• xsnaadmin: Add Node • snaadmin define_node
SNA System Defaults Profile	Combined with Control Point profile to form the node definition. Dynamic inbound partner LUs allowed changed to implicit_plu_forbidden. (logic reversed)	• xsnaadmin: Add Node • snaadmin define_node • snaadmin define_defaults • snaadmin define_trusted_groups

Table 3 (Page 2 of 4). Configuration Profile Changes

CS/AIX V4.2 Profile Name	Profile Changes	CS/AIX V5 Configuration Options
SNA DLC Profile	Datalink Device name changed to adapter_number.	• xsnaadmin: Define Port (includes DLC) • snaadmin define_dlc and snaadmin define_port.
Link Station Profile	SNA DLC Profile name is now Port name. Activate link station at SNA startup is now initially_active. XID Node ID is now Local Node ID.	• xsnaadmin-Add a Link Station • snaadmin define_type_ls where type is token-ring, Ethernet, etc.
LU1, LU2, and LU3 Session Profiles	Local LU address is now nau_address. Link station profile name is now pu_name. LU type is now lu_model.	• xsnaadmin: Add Session type 0-3 • snaadmin define_lu_0_to_3
LU6.2 Local LU Profile	Link Station name is now pu_name. 'Local LU is dependent?' parameter is retired. If the LU is independent, nau_address=0. If the LU is dependent, nau_address is equal to a non-zero number.	• xsnaadmin: Add APPC Local LU • snaadmin define_local_lu
LU6.2 Partner LU Profile	Conversation security level is now conv_security_ver and 'none' is no longer supported for that field.	• xsnaadmin: Add APPC Partner LU • snaadmin define_partner_lu
LU6.2 Mode Profile	No changes	• xsnaadmin-Add APPC Mode • snaadmin define_mode
LU6.2 Side Information Profile	Profile name is now sym_dest_name	• xsnaadmin-Add APPC CPI-C Symbolic Destination Name • snaadmin define_cpic_side_info

Table 3 (Page 3 of 4). Configuration Profile Changes

CS/AIX V4.2 Profile Name	Profile Changes	CS/AIX V5 Configuration Options
Partner LU6.2 Location Profile	location_method is retired. The configuration you add depends on what the location method will be. All other fields are the same.	If the location method is owning cp: • xsnaadmin: Add APPC Parter LU on Remote Node • snaadmin defind_directory_entry. If the location method is link station: • xsnaadmin: Add APPC Parter LU on Link Station • snaadmin define_ls_routing
LU6.2 TPN Profile	No major changes.	• xsnaadmin: Add APPC Transaction Program • snaadmin define_tp and define_tp_load
LU6.2 Session Timeout Profile	The 'LU6.2 sessions below should be included or excluded' field is retired.	• snaadmin define_lu62_timeout
LU6.2 Conversation Security Access List Profile	No changes	• xsnaadmin: Add APPC Conversation Level Security • snaadmin define_security_access_list
LU6.2 Resource Security Access List Profile	No changes	• xsnaadmin: Add APPC Security Access List • snaadmin define_security_access_list
Generic LU Address Registration Profile	Address 1-255 is now nau_address.	• xsnaadmin-ADD LU type 0-3 • snaadmin define_lu_0_to_3
LU 0 Primary LU Profile	Secondary LU address is now nau_address.	• xsnaadmin: Add LU0 Primary Line • snaadmin define_primary_lu0
LU 0 Secondary LU Profile	Secondary LU address is now nau_address.	• xsnaadmin: Add LU type 0-3 • snaadmin define_lu_0_to_3
Remote Focal Point Configuration	Only the first defined backup focal point is migrated; all others are discarded.	• snaadmin define_focal_point

Table 3 (Page 4 of 4). Configuration Profile Changes

CS/AIX V4.2 Profile Name	Profile Changes	CS/AIX V5 Configuration Options
Gateway Host Definition Profile	Host Link Station Profile name is now pu_name. LU addresses are replaced with nau_addresses. The pool class name field is retired. The ″minimize link useage″ field is now called ″fake_logon″.	• xsnaadmin: Add LU type 0-3 • snaadmin definne_lu_0_to_3
Gateway LU Host Group Profile	Each gateway host group is mapped to one pool automatically, so the pool related fields are retired. The LU address is now nau_address.	• xsnaadmin: Add LU type 0-3 and Add LU Pool • snaadmin define_lu_0_to_3 and define_lu_pool
Downstream Workstation LU Definition Profile	Downstream LU address is nau_address.	• xsnaadmin: Add SNA Gateway New Downstream LU • snaadmin define_downstream_lu
APPC over TCP/IP Environment Settings Profile	No changes	• xsnaadmin: Add Anynet APPC over TCP/IP Parameters • snaadmin define_anynet_appcip_defaults
APPC/IP Routing Preference Profile	Profile retired	Defined in the Partner LU configuration preference setting
Sockets over SNA Minimum Configuration Profile	No changes	xsnaadmin: Add Anynet Sockets over SNA Parameters • snaadmin define_anynet_snackets_defaults
Remote Address Mapping Profile	No changes	• xsnaadmin: Add Anynet Sockets over SNA Extra Configuration, Remote Address Mapping • snaadmin define_anynet_ip_address_map
SNA Mode to Socket Port Assignment Profile	No changes	• xsnaadmin: Add Anynet Port to Mode Mapping • snaadmin define_anynet_ip_port_map
Static Route to Sockets over SNA Gateway Profile	No changes	• xsnaadmin: Add Anynet Static Routes • snaadmin define_anynet_ip_gateway

For more information on any of the profile changes, please refer to the *IBM eNetwork Communications Server for AIX Installation and Migration Guide*.

1.4 Communications Server for AIX V5 Command Changes

Several commands from previous versions of CS/AIX and SNA Server are available in CS/AIX V5, but CS/AIX V5 also introduces many new commands.

1.4.1 New Commands

The following is a list of the new commands:

- xsnaadmin
- snaadmin
- sna start
- snamig
- snagetpd
- snatrcfmt
- snafilter
- snawhat
- snatpinstall

1.4.1.1 The xsnaadmin Motif Administration

xsnaadmin is a graphical interface used for configuring and administering CS/AIX V5. It replaces the xsna graphical tool but adds many functions that xsna lacked. For more information refer to Chapter 6, “The Motif Administration Utility” on page 43.

1.4.1.2 The snaadmin Command

The snaadmin command allows configuration and administration of CS/AIX V5 from the command line. It replaces some functions of the sna command and adds many more options. snaadmin has the following subcommands:

activate_session	add_dlc_trace
anynet_map_ip_address	aping
change_session_limit	deactivate_conv_group
deactivate_lu_0_to_3	deactivate_session
define_adjacent_len_node	define_anynet_appcip_defaults
define_anynet_ip_address_map	define_anynet_ip_gateway
define_anynet_ip_port_map	define_anynet_snackets_defaults
define_channel_dlc	define_channel_ls
define_channel_port	define_cn
define_cos	define_cpic_side_info
define_default_pu	define_defaults
define_directory_entry	define_dlur_defaults
define_domain_config_file	define_downstream_lu
define_downstream_lu_range	define_dspu_template

define_ethernet_dlc	define_ethernet_ls
define_ethernet_port	define_fddi_dlc
define_fddi_ls	define_fddi_port
define_focal_point	define_internal_pu
define_local_lu	define_ls_routing
define_lu62_timeout	define_lu_0_to_3
define_lu_0_to_3_range	define_lu_lu_password
define_lu_pool	define_mode
define_mpc_dlc	define_mpc_ls
define_mpc_port	define_node
define_partner_lu	define_primary_line
define_primary_lu0	define_qllc_dlc
define_qllc_ls	define_qllc_port
define_rcf_access	define_sdlc_dlc
define_sdlc_ls	define_sdlc_port
define_security_access_list	define_tn3270_access
define_tn3270_association	define_tn3270_defaults
define_tp	define_tp_load_info
define_tr_dlc	define_tr_ls
define_tr_port	define_trusted_groups
define_userid_password	delete_adjacent_len_node
delete_anynet_appcip_defaults	delete_anynet_ip_address_map
delete_anynet_ip_gateway	delete_anynet_ip_port_map
delete_anynet_snackets_defaults	delete_cn
delete_cos	delete_cpic_side_info
delete_directory_entry	delete_dlc
delete_downstream_lu	delete_downstream_lu_range
delete_dspu_template	delete_focal_point
delete_internal_pu	delete_local_lu
delete_ls	delete_ls_routing
delete_lu62_timeout	delete_lu_0_to_3
delete_lu_0_to_3_range	delete_lu_lu_password
delete_lu_pool	delete_mode
delete_partner_lu	delete_port
delete_primary_line	delete_primary_lu0
delete_rcf_access	delete_security_access_list
delete_tn3270_access	delete_tn3270_association
delete_tp	delete_tp_load_info
delete_userid_password	init_node
initialize_session_limit	path_switch
query_active_transaction	query_adjacent_nn
query_anynet_appcip	query_anynet_appcip_defaults
query_anynet_ip_address_map	query_anynet_ip_gateway
query_anynet_ip_port_map	query_anynet_snackets
query_anynet_snackets_defaults	query_available_tp
query_buffer_availability	query_cn
query_cn_port	query_cos
query_cos_node_row	query_cos_tg_row
query_cpic_side_info	query_default_pu
query_defaults	query_directory_entry
query_directory_lu	query_directory_stats
query_dlc	query_dlc_trace
query_dlur_defaults	query_dlur_lu
query_dlur_pu	query_dlus
query_domain_config_file	query_downstream_lu
query_downstream_pu	query_dspu_template

query_focal_point	query_isr_session
query_kernel_memory_limit	query_local_lu
query_local_topology	query_log_file
query_log_type	query_ls
query_ls_routing	query_lu62_timeout
query_lu_0_to_3	query_lu_lu_password
query_lu_pool	query_mds_application
query_mds_statistics	query_mode
query_mode_definition	query_mode_to_cos_mapping
query_nmvt_application	query_nn_topology_node
query_nn_topology_stats	query_nn_topology_tg
query_node	query_node_all
query_node_limits	query_partner_lu
query_partner_lu_definition	query_port
query_primary_line	query_primary_lu0
query_pu	query_rcf_access
query_rtp_connection	query_security_access_list
query_session	query_statistics
query_tn3270_access_def	query_tn3270_association
query_tn3270_defaults	query_tn_server_trace
query_tp	query_tp_definition
query_tp_load_info	query_trace_file
query_trace_type	query_trusted_groups
query_userid_password	remove_dlc_trace
reset_session_limit	set_buffer_availability
set_kernel_memory_limit	set_log_file
set_log_type	set_tn_server_trace
set_trace_file	set_trace_type
start_dlc	start_internal_pu
start_ls	start_port
status_all	status_anynet
status_connectivity	status_dependent_lu
status_dlur	status_lu62
status_node	stop_dlc
stop_internal_pu	stop_ls
stop_port	term_node

For information on all of these options, refer to the *IBM eNetwork Communications Server for AIX Administration Command Reference*.

1.4.1.3 sna start

The sna start command is used to enable CS/AIX V5. It reads the configuration file and starts the daemons necessary to administer and configure CS/AIX V5. The command uses configuration files in /etc/sna as input but you can specify non-default files with the -n, -d, and -t flags. Refer to 3.1.2.1, “Enabling CS/AIX V5” on page 27 for an example.

1.4.1.4 snamig

The snamig command is used to migrate CS/AIX V4.2 profiles to CS/AIX V5 profile format. Refer to 2.4.3, “Migrating to CS/AIX V5” on page 20 for more information.

1.4.1.5 snagetpd

The snagetpd command collects files that contain helpful information for problem resolution. It uses the tar and compress commands to put all the files in one file. The syntax is:

```
snagetpd filename
```

where `filename` is the name of the output file created. This command replaces getsnapd but getsnapd is aliased to snagetpd. For more information on snagetpd, refer to 15.9, “Sending Data to Support” on page 150.

1.4.1.6 snatrcfmt

The snatrcfmt formats binary trace files into text files. This command replaces the snaformat command. There are two formats you can put text files into with snatrcfmt: a message flow diagram or a message dump file. The message flow diagram file contains a summary drawing that shows the message flows. The message dump file contains a list of the data in each trace message. For more information on tracing, see 15.2, “Traces” on page 121. For more information on the snatrcfmt command see 15.4, “Interpreting Log and Trace Data” on page 125.

1.4.1.7 snafilter

The snafilter command allows you to select certain types of entries from the binary trace file to be formatted. This way you can get trace output on only the information you need. This command is explained in more detail in 15.4, “Interpreting Log and Trace Data” on page 125.

1.4.1.8 snawhat

The snawhat command reads tags in SNA applications that identify what code level of CS/AIX the application is written for. The syntax is:

```
snawhat filename
```

where `filename` is an executable application file.

1.4.1.9 snatpinstall

snatpinstall is a tool used to install transaction programs (TPs). It can be called from a product’s installation scripts. The CS/AIX V5 ASUITE target TPs (AREXECD, AFTPD, etc.) are not automatically added to /etc/sna/sna_tps at install time. To make the ASUITE target TPs available you should run `snatpinstall -a /etc/sna/asuite.tps`. This is not needed if you have migrated from CS/AIX V4.2.

1.4.2 Existing Commands

The commands from previous versions of CS/AIX and SNA Server that are still available in CS/AIX V5 include:

- sna
- migratesna
- profile manipulation commands

1.4.2.1 sna

The following parameters are still available:

- sna -start/stop sna
- sna -start/stop session
- sna -start/stop link_station
- sna -display link_station
- sna -display session
- sna -display s123
- sna -display session_limits
- sna -display global
- sna -getsense <sense code>

1.4.2.2 migratesna

The migratesna command is still used to convert profiles from SNA Services/6000 V1.2 to CS/AIX V4.2 format. This step must be completed before using the snamig command to change the profile format to CS/AIX V5. See Chapter 2, “Migration” on page 15 for more information.

1.4.2.3 Profile Manipulation Commands

The following profile manipulation commands are available for a subset of the profiles:

- chsnaobj
- mksnaobj
- rmsnaobj
- lssnaobj
- qrysnaobj

The above profile manipulation commands are available only for the profiles below:

- SNA Node Profile (not supported for rmsnaobj or lssnaobj)
- Control Point Profile (not supported for rmsnaobj or lssnaobj)
- Link Station Profile
- SNA DLC Profile
- LU 6.2 Local LU Profile
- LU 6.2 Side Information Profile

- LU 6.2 Partner LU Profile
- LU 6.2 Mode Profile
- LU 6.2 TPN Profile
- Partner LU 6.2 Location Profile
- LU 1,2 and 3 Session Profile

Chapter 2. Migration

You can migrate to Communications Server for AIX V5 from all past versions of Communications Server, SNA Server and SNA Services. Follow the steps below, based on what version of SNA you are migrating from:

2.1.1.1 SNA Services/6000 V1 - V1.2

Migration Step	More Information
Export Your Configuration	2.2.1, “Exporting SNA Services/6000 Configuration” on page 16
Upgrade AIX to V4.1.5 or higher	
Install CS/AIX V5	2.3, “Installing Communication Server for AIX V5” on page 17
Use the sna_update.awk script to convert profiles to SNA V1.2.1 format	2.4.1, “Migrating SNA Services V1 to SNA Services V1.2.1” on page 19
Use migratesna to convert the profiles to CS/AIX V4.2 format	2.4.2, “Migrating from SNA Services V1.2.1 to Communications Server V4.2” on page 19
Go to 2.4.3, “Migrating to CS/AIX V5” on page 20	

2.1.1.2 SNA Services/6000 V1.2.1

Migration Step	More Information
Export Your Configuration	2.2.1, “Exporting SNA Services/6000 Configuration” on page 16
Update AIX to V4.1.5 or higher	
Install CS/AIX V5	2.3, “Installing Communication Server for AIX V5” on page 17
Use migratesna to convert the profiles for CS/AIX V4.2 format	2.4.2, “Migrating from SNA Services V1.2.1 to Communications Server V4.2” on page 19
Go to 2.4.3, “Migrating to CS/AIX V5” on page 20	

2.1.1.3 SNA Server/6000 V2.1

Migration Step	More Information
Export Your Configuration	2.2.2, “Exporting SNA Server and Communications Server Configuration” on page 16
Update AIX to V4.1.5 or higher	
Install CS/AIX V5	2.3, “Installing Communication Server for AIX V5” on page 17

Migration Step	More Information
Go to see 2.4.3, “Migrating to CS/AIX V5” on page 20	

2.1.1.4 Communications Server V3.1 - V4.2

Migration Step	More Information
Export Your Configuration	2.2.2, “Exporting SNA Server and Communications Server Configuration”
Install CS/AIX V5	2.3, “Installing Communication Server for AIX V5” on page 17
Go to 2.4.3, “Migrating to CS/AIX V5” on page 20	

2.2 Save the Current Configuration

Before saving your configuration, it is a good idea to remove any profiles that may be defined but not ever used. Cleaning up your profile database can prevent errors later in the migration.

2.2.1 Exporting SNA Services/6000 Configuration

There are two steps to save your SNA Services/6000 configuration. First run `exportsna -f <filename>`. This saves all the configuration profiles except the LU0 information. If you are using LU0, run `lu0config` and select the **Print Configuration File** option. The system exports the LU0 configuration to /var/lu0/lu0confg.rpt. After you have these files, put them on a diskette or transfer them to another machine before you upgrade AIX. You might even want to print out a copy of the files. You will run the migratesna tool two times, once with each of the files.

2.2.2 Exporting SNA Server and Communications Server Configuration

You can use SMIT or the exportsna command to save your configuration. The SMIT path is **smit sna** → **Configure SNA Profiles** → **Advanced Configuration** → **Export Configuration Profiles**.

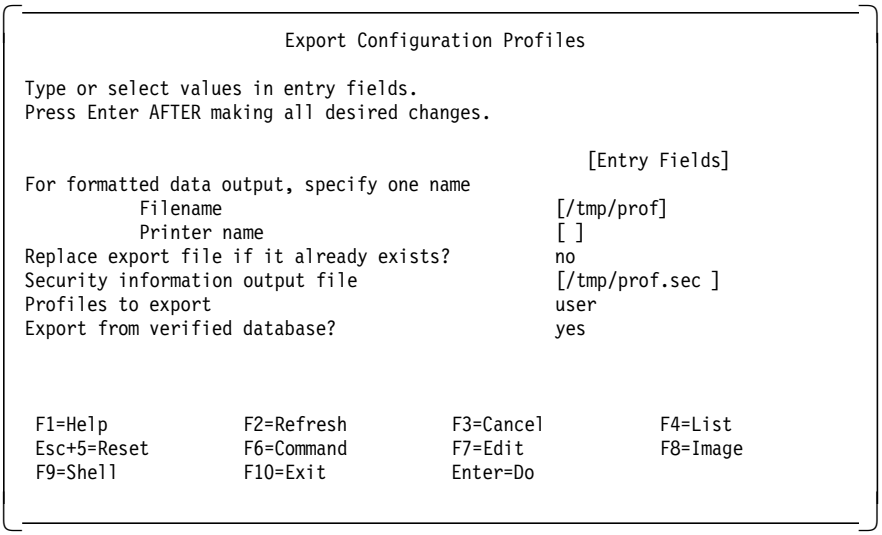

Figure 3. Smit Export Configuration Profiles Panel

The equivalent exportsna command syntax is:

```
exportsna -A -f /tmp/prof -U -C
```

Note: Do *not* save the profiles in the /usr/lpp/sna directory. Move the saved profiles off the system to diskette or transfer them to another system if you need to upgrade the AIX level.

2.3 Installing Communication Server for AIX V5

Before installing CS/AIX V5, stop the SNA subsystem with the following command:

```
sna -stop sna
```

Install CS/AIX V5 using the standard AIX installation procedures. You must have AIX V4.1.5 or higher installed before you can install CS/AIX V5. The smit install path on AIX V4.1.5 is: **smit install** → **Install and Update Software** → **Install and Update from LATEST Available Software**.

```
                Install and Update from LATEST Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                        [Entry Fields]
* INPUT device / directory for software                 /dev/cd0
* SOFTWARE to install                                   all
  PREVIEW only? (install operation will NOT occur)      no
  COMMIT software updates?                              yes
  SAVE replaced files?                                  no
  AUTOMATICALLY install requisite software?             yes
  EXTEND file systems if space needed?                  yes
  OVERWRITE same or newer versions?                     no
  VERIFY install and check file sizes?                  no
  Include corresponding LANGUAGE filesets?              yes
  DETAILED output?                                      no


F1=Help             F2=Refresh          F3=Cancel           F4=List
Esc+5=Reset         F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 4. SMIT Install Screen

For more detailed installation instructions, refer to *IBM eNetwork Communications Server for AIX Quick Beginnings*.

2.3.1 The presnamig Script

The install process will run /usr/bin/presnamig. This script saves commands, libraries, and configuration files that will be used by snamig to migrate your configuration. The commands and libraries saved by presnamig are stored using a dummy path and are removed by the postsnamig script. For information on the postsnamig script, refer to 2.6, “The postsnamig Script” on page 23. The configuration files are saved in /etc/sna.

The presnamig script saves the following commands and libraries:

- rmsnaobj
- exportsna
- sna_display
- libisna.a
- libmsfprec.a
- sharedgpe.a

The presnamig script saves the following configuration files:

basename.rfp	back-level remote focal point definitions
basename	back-level text config file
basename.sec	back-level binary security file

The default basename is /etc/sna/sna_mig.

2.4 Migration Methods

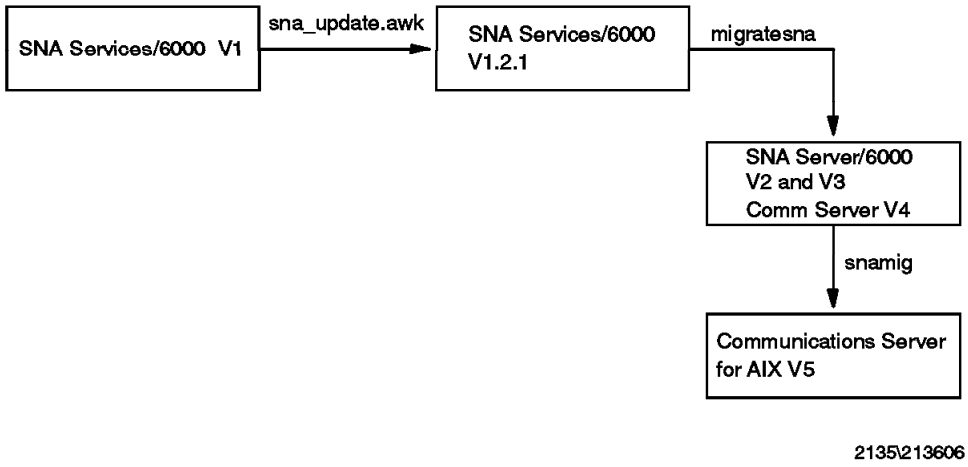

Figure 5. Migration Path

2.4.1 Migrating SNA Services V1 to SNA Services V1.2.1

The following command migrates profiles from SNA Services versions previous to V1.2.1 to SNA Services V1.2.1 format:

```
awk -f /usr/lib/sna/sna_update.awk source_file > target_file
```

The source_file is the output from exportsna. The target_file will be used as input into the migratesna command.

2.4.2 Migrating from SNA Services V1.2.1 to Communications Server V4.2

To convert SNA Services V1.2.1 profiles into the CS/AIX V4.2 format, use the command:

```
migratesna -s source_file -t target_file
```

The source_file came from either exporting V1.2.1 profiles or using the sna_update.awk script to convert to V1.2.1 profiles. The target_file will be used by the snamig command as input.

2.4.3 Migrating to CS/AIX V5

After installing Communications Server for AIX V5 and completing any necessary steps to get your profiles into CS/AIX V4.2 format, you will need to migrate your configuration to CS/AIX V5 format using the snamig command. If you are migrating from SNA Server V3.1 or CS/AIX V4 or higher you can run snamig without any parameters. The -o parameter will be needed if this is not the first run and the output files exist. By default it uses the profiles that were exported to /etc/sna/sna_mig during the installation of CS/AIX V5 by the presnamig script.

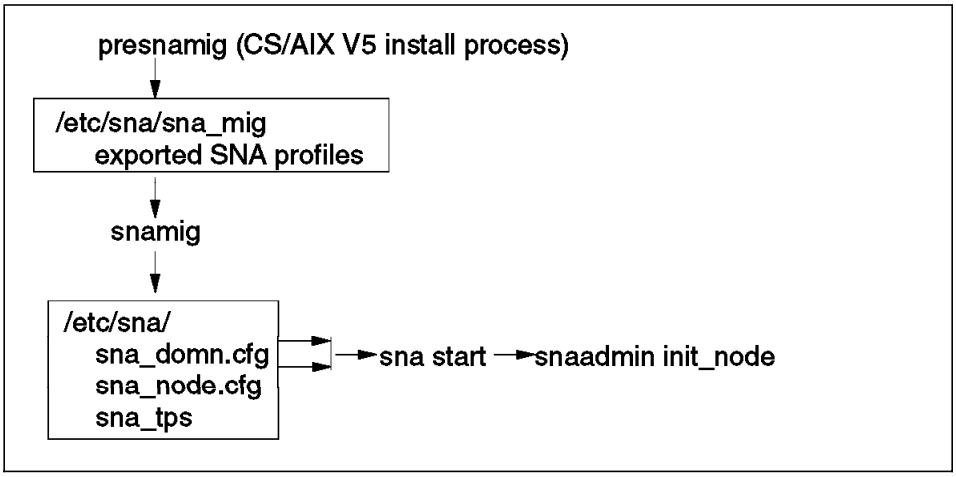

Figure 6. Profile Migration Overview

The snamig command will create 3 files in the /etc/sna/ directory:

- sna_domn.cfg - containing product version and CPIC side information
- sna_node.cfg - containing CP, port, link station, LUs, etc.
- sna_tps - containing TP (transaction program) definitions

You can specify non-default input and output filenames for the snamig command. Issue the snamig -h command and you will see the following help information about snamig parameters:

```
Usage: snamig [-o <overwrite the default output files>]
              [-r <back-level remote focal point definitions>]
              [-f <back-level text config file>]
              [-S <back-level binary security file>]
              [-n <new node configuration file>]
              [-d <new domain configuration file>]
              [-t <new TP load configuration file>]
```

If you have migrated your profiles from an earlier version of SNA, you should use the above flags to specify the correct input file for snamig.

The following are the input and output filenames snamig uses by default.

File Type	Default File Name
Back-level remote focal point file	/etc/sna/sna_mig.rfp
Back-level text config file	/etc/sna/sna_mig
Back-level binary security file	/etc/sna/sna_mig.sec
New node configuration file	/etc/sna/sna_node.cfg
New domain configuration file	/etc/sna/sna_domn.cfg
New TP load configuration file	/etc/sna/sna_tps

Messages and errors during migration are written to the /var/sna/snamig.out file.

2.5 Start CS/AIX V5

In previous versions of Communications Server for AIX and SNA Server for AIX, the `sna -start sna` command started the SNA related daemons and initialized the node. Initializing the node meant to start any SNA resources that were configured to activate when SNA itself activated. With CS/AIX V5, this command's duties have been split into two commands. Now you enable CS/AIX V5 and enable the CS/AIX V5 node.

2.5.1 Enable CS/AIX V5

To enable CS/AIX V5, run `sna start`. This command starts daemons that must be running before you can enable the CS/AIX V5 node. This command must be run after the snamig command. By default this command uses the /etc/sna/sna_node.cfg and /etc/sna/sna_domn.cfg files as input. Use the -n flag to specify a different node config file and use the -d flag to specify a different domain config file. If the node or domain config files you specify contain errors, the sna start command will not complete successfully.

Note: snamig will detect whether the sna daemons are running or not. If they are up, snamig will stop the daemons, do the migration, and then start the daemons again. If they are not up, snamig will run but will not automatically start the daemons.

Errors during sna start will be recorded in the /var/sna/sna.err file. The sna start command must complete successfully before you can continue with the next step, enabling the CS/AIX V5 node. An example of an error during sna start is shown in 3.1.2.2, "SNA Start Error" on page 28.

2.5.2 Enable the CS/AIX V5 Node

There are several methods you can use to enable the CS/AIX V5 node. You can:

- Use the xsnaadmin tool (see Chapter 6, “The Motif Administration Utility” on page 43)
- Run snaadmin init_node
- Or issue the INIT_NODE verb from an NOF application

At this point, any link stations you configured to activate at SNA startup will activate, as well as their dependent sessions. You can use xsnaadmin to add/delete configurations or activate and inactivate resources.

2.5.3 Automatically Enabling SNA

By default, snaadmin init_node is commented out of the /etc/rc.sna file. If you would like the SNA node to be enabled when the system reboots, uncomment the line that runs snaadmin init_node from /etc/rc.sna. This is equivalent to uncommenting `/usr/bin/sna -start sna` from a system running CS/AIX V4.2.

```
if [ -f /var/sna/.rc_script_running ]
then
echo CS/AIX can not be started now.
echo Reboot, or run /etc/rc.sna to start it.
else
echo start CS/AIX
echo start CS/AIX > /var/sna/.rc_script_running
sync
sleep 1
ddload -l -t
/usr/sbin/strload -f /etc/pse.sna.conf
ddload -l -s
ddload -l -g
sna start
#------------------------------------------------------------------#
# Note for administrators                                          #
#                                                                  #
# Uncomment the following line to start the node after a reboot    #
#------------------------------------------------------------------#
#
# snaadmin init_node


#------------------------------------------------------------------#
# Note for administrators                                          #
#                                                                  #
# AnyNet Sockets over SNA Gateway function requires forwarding     #
# of ip packets to be enabled                                      #
#                                                                  #
# Uncomment the following line to enable ip forwarding             #
#------------------------------------------------------------------#
# no -o ipforwarding=1
fi
rm -f /var/sna/.rc_script_running
sync
```

Figure 7. /etc/rc.sna

2.6 The postsnamig Script

The postsnamig script removes the commands and configuration files that were saved by the presnamig script during CS/AIX V5 installation. It does this by running rmsnaobj -A to remove the back-level ODM database and removing the exportsna, rmsnaobj, and sna -display commands. This is an optional step. If you do not run postsnamig, CS/AIX V5 will operate without errors but you will have old information on your system.

postsnamig is run without any parameters. The full path is /usr/bin /postsnamig. When you run the command you will see messages stating that the old profiles are being removed. For an example of the message you will see, refer to Figure 17 on page 30.

Chapter 3. Migration from CS/AIX V4.2 to CS/AIX V5

This chapter shows the process for migrating a CS/AIX V4.2 system to CS/AIX V5 using the installation procedures and migration steps outlined earlier. The RS/6000, RS60007, will be referred to by its TCP/IP host name, or node name. The following sections take you through the process.

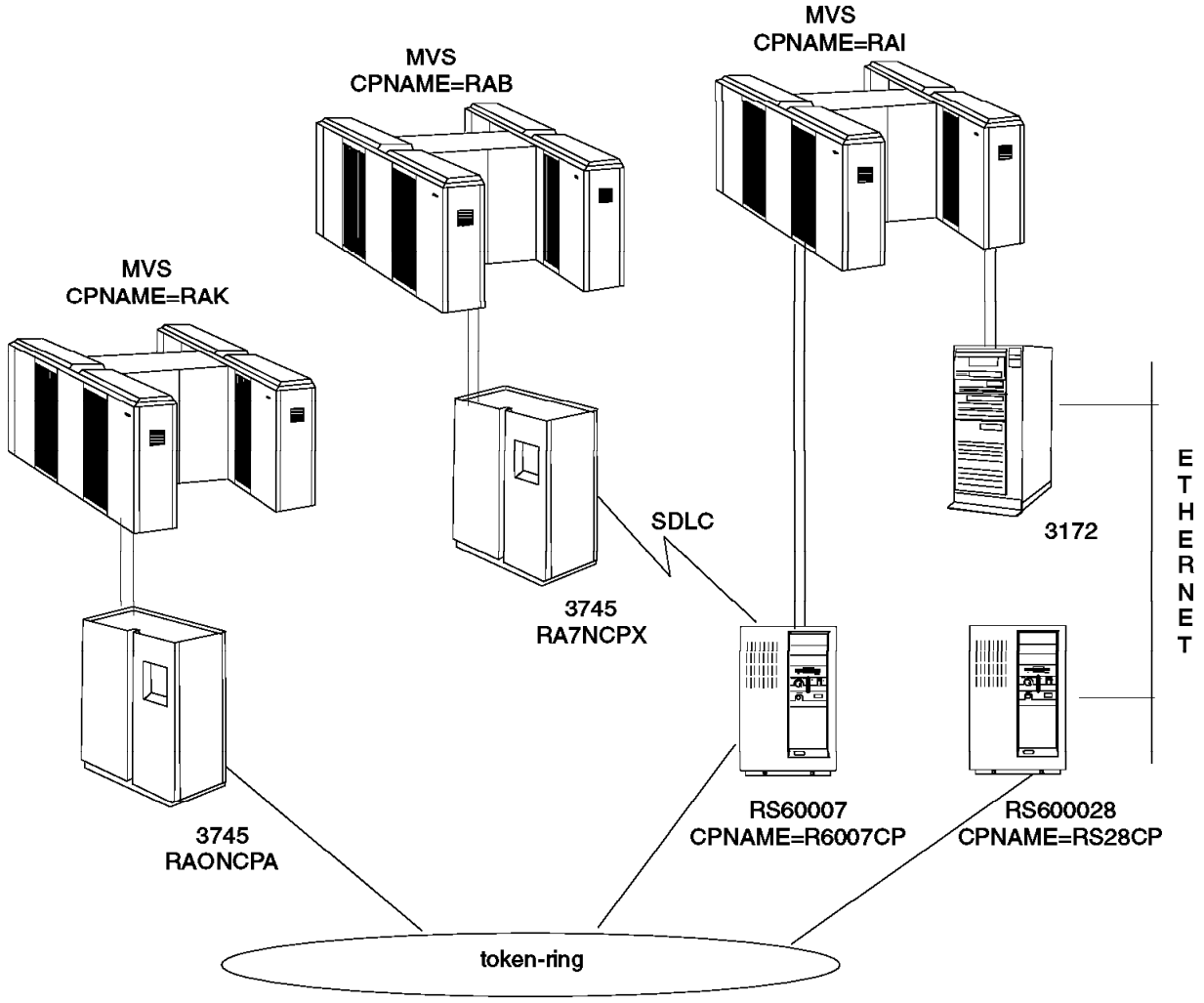

Figure 8. Network Overview

3.1 RS60007 Example

RS60007 is an RS/6000 running AIX V4.2 and CS/AIX V4.2. It has an ESCON channel link station, an SDLC link station, and a token-ring link station. The ESCON and SDLC link stations are used for 3270 emulation and the APPC Application Suite. The token-ring link station is used for SNA gateway sessions between RS60007 and RS600028. RS60007 is the downstream node in our configuration.

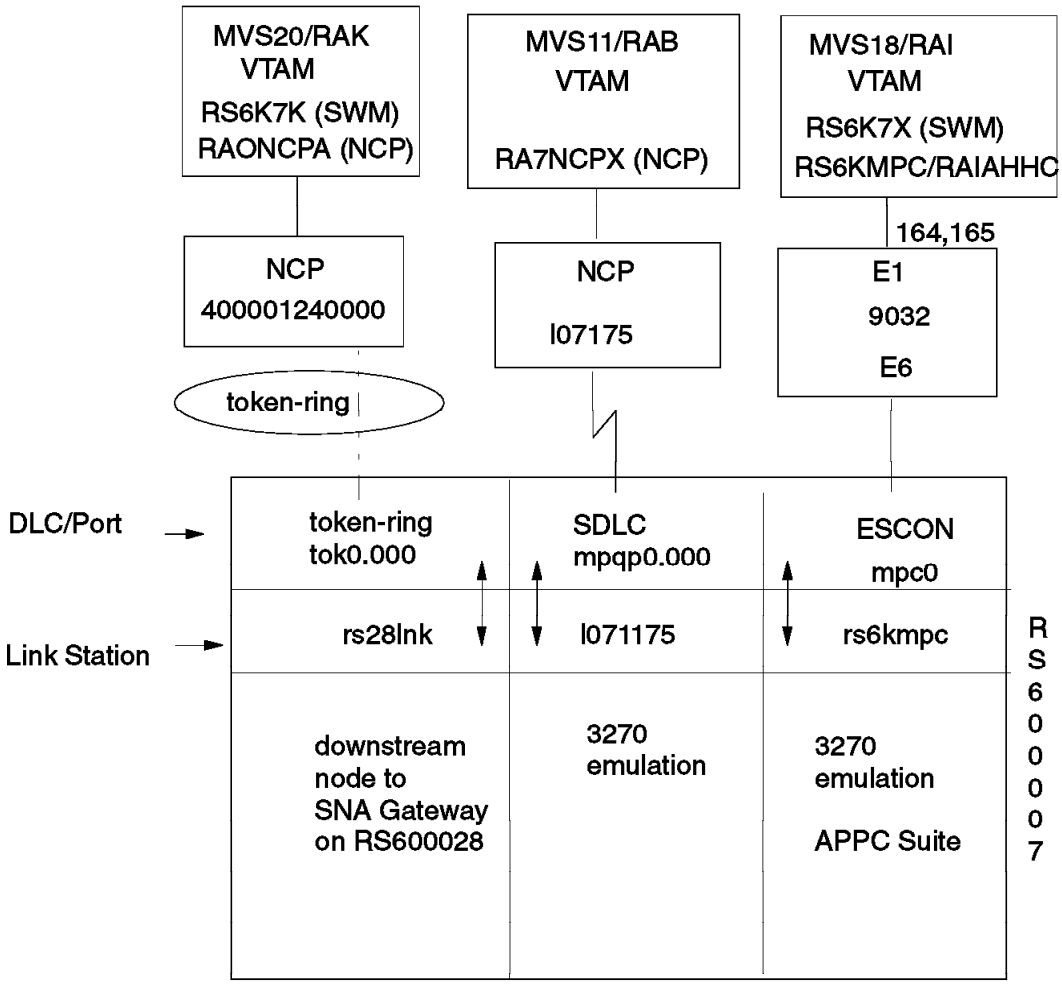

Figure 9. RS60007 Overview

CS/AIX V5 was installed using the standard installation procedures outlined in 2.3, “Installing Communication Server for AIX V5” on page 17. During the installation, the presnamig script saved the configuration profiles.

3.1.1 Migrating the Configuration

After installation, the snamig command was run to migrate the profiles saved by presnamig to the CS/AIX V5 format. The messages snamig wrote to the console are shown in Figure 10.

```
Profile type 'sna' name 'sna' ADDED.
Profile type 'control_pt' name 'node_cp' ADDED.
Profile type 'session_lu2' name '71175lu6' ADDED.
Profile type 'session_lu2' name '71175lu7' ADDED.
Profile type 'session_lu2' name 'mpclu2' ADDED.
Profile type 'session_lu2' name 'mpclu3' ADDED.
Profile type 'partner_lu6.2' name 'APING' ADDED.
Profile type 'partner_lu6.2_location' name 'aping' ADDED.
Profile type 'side_info' name 'aping' ADDED.
Profile type 'link_station_token_ring' name 'TRSAP0' ADDED.
Profile type 'link_station_eia232d' name '1071175' ADDED.
Profile type 'link_station_channel' name 'rs6kmpc' ADDED.
Profile type 'sna_dlc_token_ring' name 'TOKEN0' ADDED.
Profile type 'sna_dlc_eia232d' name 'mpq0.00001' ADDED.
Profile type 'sna_dlc_channel' name 'mpc0' ADDED.
Profile type 'mode' name 'DFLTMODE' ADDED.
Profile type 'mode' name 'SNACKETS' ADDED.
Profile type 'mptn_env' name 'env_values' ADDED.

Configuration file '/etc/sna/sna_mig.sec' imported.


Configuration file 'rs742.script' imported.
```

Figure 10. Snamig Command Output for RS60007

Any errors are logged in /var/sna/snamig.out. If the migration fails, the last message of the output will state that the migration failed. There is no final "success" message if the migration was successful.

3.1.2 Starting the New Configuration

Once the profiles are migrated, CS/AIX must be started. A successful profile migration does not guarantee a successful start.

3.1.2.1 Enabling CS/AIX V5

Enable CS/AIX with the sna start command. This command starts daemons that are necessary for the node to be enabled. If the command is successful, you will see the following message:

```
SNA software is initializing...

SNA software has been initialized.
```

Figure 11. Sna Start Command Output

3.1.2.2 SNA Start Error

In this example there is an error in the profiles. The first time SNA is started the following messages were written to the console.

```
SNA software is initializing...

SNA software failed to initialize, reason:

  Failed to start Config Daemon
  - Invalid record in configuration file
  - Further details may be in the error log file /var/sna/sna.err
```

Figure 12. Sna Start Error

This is an example of one of the errors you could run into. Information about the error is written to /var/sna/sna.err. Figure 13 shows the errors for this example.

```
Failed to read the config file - parameter is specified incorrectly.
Filename  = /etc/sna/sna_node.cfg
Parameter = lu_name
The failing record begins:
[define_lu_0_to_3.]
lu_name = 71175lu6
description = ""
pu_name = A1071175
nau_address = 6
lu_model = 3270_DISPLAY_MODEL_2
pool_name = <0000000000000000>
sscp_id = 0
priority = MEDIUM
timeout = 0
secondary_key = 71175lu6
remote_lu_name = <00000000000000000000000000000000>
lu_use = NONE
host_app = ""
log_mode = ""
plu_partner = ""
init_self = NO
session_term = TERM_SELF
api_trace = NO
```

Figure 13. Error Entries in sna.err

The problem was resolved by reviewing the requirements of the failing parameter. The error messages point to lu_name parameter as the failing definition. An lu_name must begin with an alphabetic character and this began with a number. The snamig process set the lu_name field to the same value as the profile name since the lu_name was not specifically set in the back-level profile. By specifying a correct lu_name in

/etc/sna/sna_node.cfg file the sna start command was executed without errors.

3.1.2.3 Enabling the CS/AIX Node

After starting SNA, the next step is to enable the CS/AIX node with the `snaadmin init_node` command. This command is the equivalent of starting the SNA subsystem in previous levels of CS/AIX and SNA Server for AIX. If the command is successful, you will receive the following messages.

```
rs60007:/tmp > snaadmin init_node

------------------------------------------------------------------
init_node command completed successfully

------------------------------------------------------------------
```

Figure 14. The snaadmin init_node Command

The sna start command must complete successfully before you can run the snaadmin init_node command.

3.1.2.4 Displaying Node Status

Now you can display the status of your node with the `snaadamin status_all` command. You should see output similar to that in Figure 15.

```
rs60007:/tmp > snaadmin status_all
14:03:36 EST 13 Nov 1997
================================================================================
Node           Status         Role           Description
--------------------------------------------------------------------------------
rs60007        Active         Master
--------------------------------------------------------------------------------
DLC       Port      LS        PU        Type Status         Description
--------------------------------------------------------------------------------
mpc0                                     MPC  Active
          mpc0                           MPC  Active
                    rs6kmpc              MPC  Starting

TOKEN0                                   TR   Inactive

mpq0.000                                 SDLC Active
```

Figure 15. The snaadmin Status Display

3.1.3 Testing the Configuration

To test our configuration we used APING from the APPC Application Suite to contact remote nodes over the defined link stations. The server program APINGD is no longer a separate TP, but is internal to the node.

```
IBM APING version 2.44 APPC echo test with timings.
Licensed Materials - Property of IBM
(C) Copyright 1994,1995 by IBM Corp. All rights reserved.

Allocate duration:      120 ms
Program startup and Confirm duration:       30 ms

Connected to a partner running on: CS/AIX 5.0.0
        Duration        Data Sent        Data Rate        Data Rate
        (msec)          (bytes)          (KB/s)           (Mb/s)
        --------        ---------        ---------        ---------
              40              200              4.9            0.039
              30              200              6.5            0.052
Totals:       70              400              5.6            0.045
Duration statistics: Min = 30 Ave = 35 Max = 40
```

Figure 16. APING USIBMRA.RS28CP

This APING test shows that we are connected and can communicate to RS600028.

3.1.4 Postmigration

Once the migration was successful, the postsnamig script was used to remove back-level files and profiles. See 2.6, “The postsnamig Script” on page 23 for more information on the postsnamig script. Figure 17 shows the output of the postsnamig command.

```
rs60007:/usr/bin > postsnamig
1 profile(s) type 'session_lu2' name '71175lu6' REMOVED.
1 profile(s) type 'session_lu2' name '71175lu7' REMOVED.
1 profile(s) type 'session_lu2' name 'mpclu2' REMOVED.
1 profile(s) type 'session_lu2' name 'mpclu3' REMOVED.
1 profile(s) type 'partner_lu6.2' name 'APING' REMOVED.
1 profile(s) type 'partner_lu6.2_location' name 'aping' REMOVED.
1 profile(s) type 'side_info' name 'aping' REMOVED.
1 profile(s) type 'link_station_eia232d' name '1071175' REMOVED.
1 profile(s) type 'link_station_channel' name 'rs6kmpc' REMOVED.
1 profile(s) type 'sna_dlc_eia232d' name 'mpq0.00001' REMOVED.
1 profile(s) type 'sna_dlc_channel' name 'mpc0' REMOVED.
1 profile(s) type 'mode' name 'DFLTMODE' REMOVED.
1 profile(s) type 'mode' name 'SNACKETS' REMOVED.
13 profile(s) removed.
```

Figure 17. POSTSNAMIG Output

3.1.4.1 What Does the New Configuration Look Like?

The following figure shows how RS60007′s configuration looks after the migration.

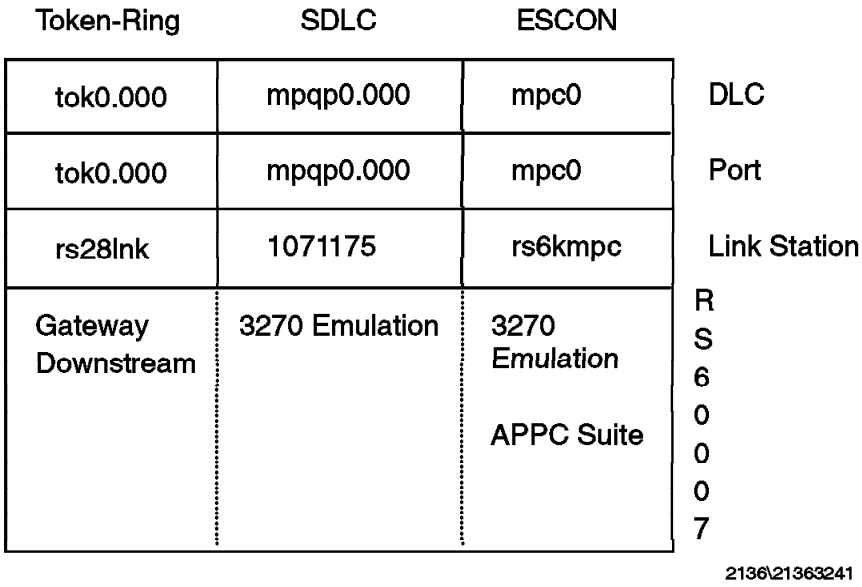

Figure 18. RS60007 after Migration

None of the existing profiles were changed significantly during migration. Port definitions were added for each adapter type. The ports represent the local end of a communications link as a unique access point in the network.

For the complete listings of RS60007′s profiles and the host definitions see:

- Appendix A, “CS/AIX V4.2 Configuration for RS60007” on page 161.
- Appendix B, “CS/AIX V5 Configuration for RS60007” on page 171.

3.2 SNA Client Access Migration

With CS/AIX V5 you have two choices for TN3270/TN3270E client connections. You can use the integrated TN Server function or SNA Client Access for AIX. For information on the TN Server, refer to Chapter 7, “TN Server” on page 57. This section is intended for customers who migrate to CS/AIX V5 and plan to continue to use SNA Client Access. It will explain how the profiles related to SNA Client Access change during migration and what you need to do to use SNA Client Access after migration.

SNA Client Access uses LU pools that reference a link station profile and LU address. These two references *must* match after the migration.

3.2.1 SNA Client Access and CS/AIX V4.2

When configuring SNA Client Access with CS/AIX V4.2, Client Access adds the appropriate CS/AIX definitions automatically. Figure 19 shows the relationship between SNA Client Access definitions and the CS/AIX V4.2 profiles added to support them. The CS/AIX profiles in the figure have been exported in anticipation of the CS/AIX migration to V5. Only the most important parameters are present in Figure 19; the others have been removed.

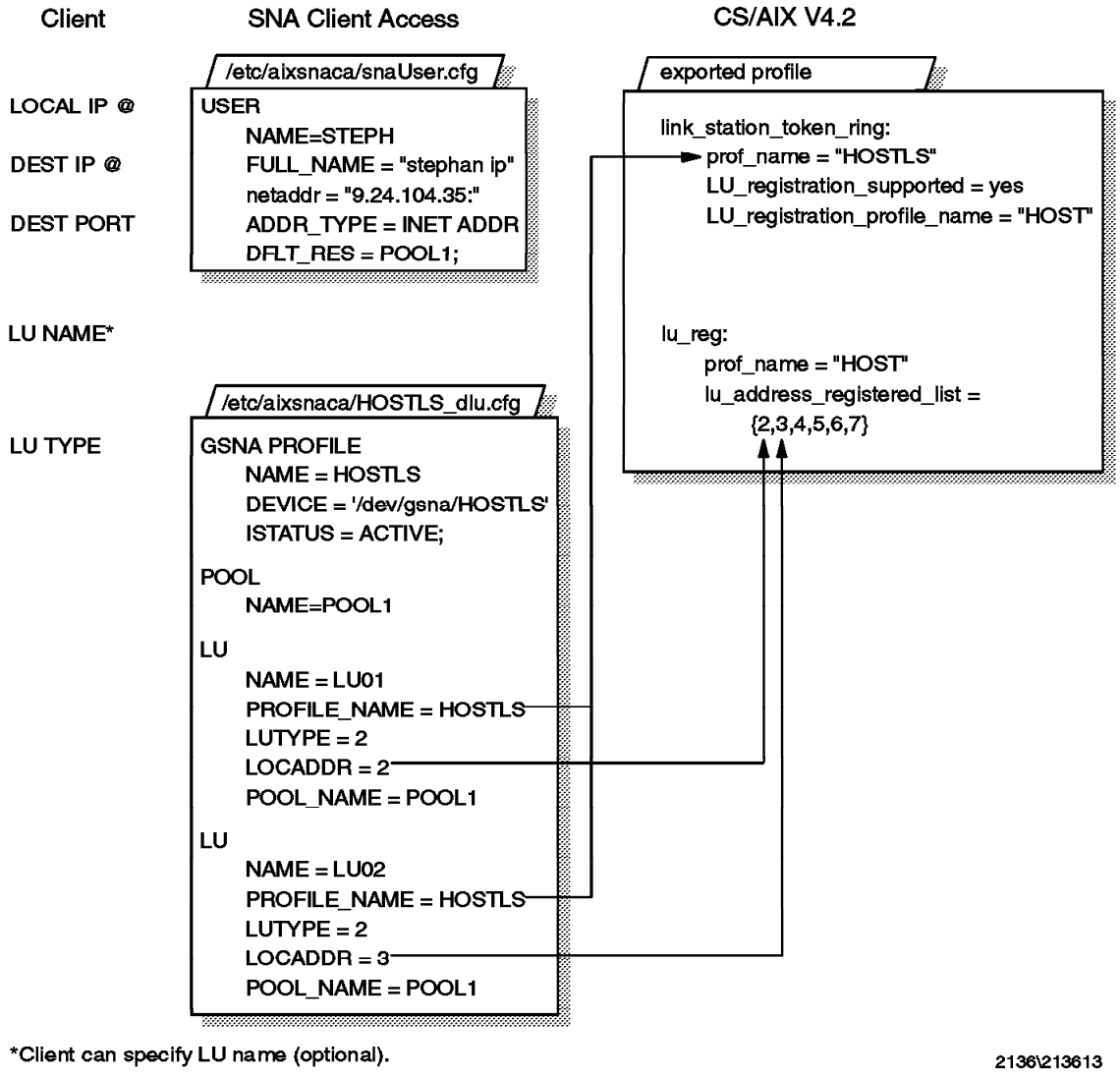

Figure 19. Relation between SNA CA and CS/AIX V4.2 Parameters

- The /etc/aixsnaca/snacaUser.cfg file gives client workstations access to an LU or an LU pool.
- The /etc/aixsnaca/HOST_dlu.cfg file defines the LUs, the LU pools and the CS/AIX link station to be used.
- On the exported profiles, the link station provides information necessary to connect to the host. It shows that the LU registration profile name ″HOST″ will be used.
- The LU registration profile name ″HOST″ indicates that LUs with nau_addresses 1, 2, 3, 4, 5 ,6 and 7 will be used on this link station.

3.2.2 SNA Client Access and CS/AIX V5

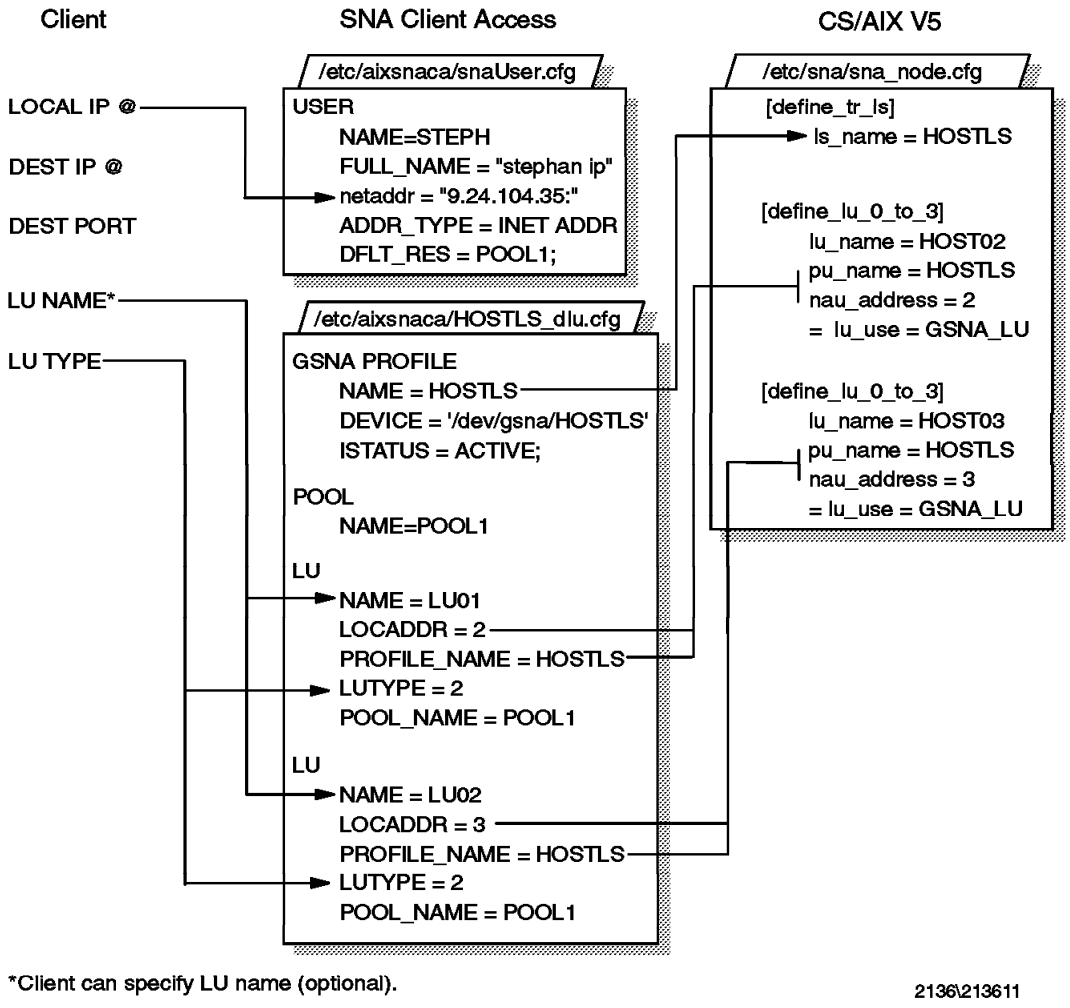

Figure 20. Relation between SNA CA and CS/AIX V5 Parameters

In CS/AIX V4.2, the LUs created by SNA Client Access were added to an LU registration profile. LU registration profiles are not available in CS/AIX V5. Instead the LUs are defined specifically to the link station. After migration of the CS/AIX V4.2 profiles to CS/AIX V5:

- The lu_name will be the LU registration profile name + 2 digits of the locaddr. In our example the LU registration profile name is HOST.
- The LUTYPE will be unrestricted.
- The lu_use field is set to GSNA_LU. GSNA is short for generic SNA.

Note: SNA Client Access no longer adds the link station and LU profiles for you when you define a dependent server. You must use one of the CS/AIX configuration methods to add the link station and LU definitions. Then modify the SNA Client Access configuration files to use the new link station and LUs.

Note: SNA Client Access will not start the CS/AIX deamons, node, or link station. All CS/AIX resources need to active before SNA Client Access.

Chapter 4. SNA Services/6000 to CS/AIX V5 Migration

This chapter gives a brief example of migrating an SNA Services/6000 system to Communications Server for AIX V5 following the steps in Chapter 2, “Migration” on page 15. The SNA Services/6000 profiles were at the V1.2.1 format.

4.1.1 Save the Configuration

The first step was to export the profiles using `exportsna -f /tmp/snaprofiles`. This configuration did not have any LU0 definitions, so running the lu0config command was not necessary.

The tar command was used to put the /tmp/snaprofiles file on a diskette.

4.1.2 Upgrade AIX

The AIX system was then upgraded to AIX V4.2.

4.1.3 Install CS/AIX V5

CS/AIX V5 was installed following the instructions in 2.3, “Installing Communication Server for AIX V5” on page 17. The tar command was used to retrieve the SNA Services V1.2.1 profiles back from diskette.

4.1.4 Migrate the Configuration Profiles

Migration from SNA Services V1.2.1 to CS/AIX V5 took two steps.

4.1.4.1 Migratesna

First the SNA Services V1.2.1 profiles were migrated to CS/AIX V4.2 format using the migratesna command as described in 2.4.2, “Migrating from SNA Services V1.2.1 to Communications Server V4.2” on page 19.

```
migratesna -s /tmp/snaprofiles -t profile.v42 -l USIBMRA.R6007CP -w
Converted profiles will be sent to 'profile.v42'.

Invalid profiles will be sent to 'profile.err'.

Reading source stanzas...

Source profiles will be read from 'profile'.

Converting source stanzas...

Verifying converted stanzas...

0105-0347 At least one entry was written to the error file 'profile.err'.
          Check the file for further details.
```

Figure 21. The migratesna Command

An error occurred during migration. The error messages in profile.err are shown in Figure 22.

```
# 0105-0346 The following profile stanza could not be processed due
# to an invalid value in the line 'sscp_id = 0'.
#
#

lu_lu2_LOCALLU:
        type = LOCALLU
        profile_name = lu_lu2
        local_lu_name = LU21
        network_name =
        lu_type = lu2
        independent_lu = no
        tpn_list_name =
        local_lu_address = 2
        sscp_id = 050000000000
        number_of_rows = 24
        number_of_columns = 80
```

Figure 22. Migration Log from the migratesna Command

This is just a warning message; the profiles were still migrated to CS/AIX V4.2 format. In SNA Services V1.2 and below, it was possible to associate an LU with a specific SSCP. With SNA Services V1.2.1 and above, the LU is associated with a link station, which has an XID Node ID field. The SSCP ID comes from the link station. The converted dependent LU types 1, 2 and 3 now use the xid_node_id field from the link station profile. In this local LU session profile the value of sscpid is set to ″0″.

To see the migrated profiles, refer to C.2, “Profiles Migrated from SNA Sevices/6000 V1R21 to CS/AIX V4.2” on page 194.

4.1.4.2 SNAMIG

The next step is to convert the profiles from CS/AIX V4.2 to V5 using the snamig command. The migrated files were put in the /tmp directory. Refer to 2.4.3, “Migrating to CS/AIX V5” on page 20 for more information on this command.

```
snamig -f profile.v42 -n /tmp/node.cfg -d /tmp/dom.cfg -t /tmp/tp.cfg

Profile type 'link_station_token_ring' name 'dsw_ls' ADDED.
Profile type 'control_pt' name 'node_cp' ADDED.
Profile type 'session_lu1' name 'rx.lu1.1' ADDED.
Profile type 'session_lu2' name 'dsw_ls' ADDED.
Profile type 'session_lu2' name 'rx.lu2.1' ADDED.
Profile type 'session_lu3' name 'rx.lu3.1' ADDED.
Profile type 'side_info' name 'rx.lu62' ADDED.
Profile type 'local_lu_lu6.2' name 'chang' ADDED.
Profile type 'local_tp' name 'tpn2' ADDED.
Profile type 'mode' name 'mode1' ADDED.
Profile type 'mode' name 'mode2' ADDED.
Profile type 'sna' name 'sna' ADDED.
Profile type 'sna_dlc_token_ring' name 'dsw_ls' ADDED.
Profile type 'partner_lu6.2' name 'rx.lu62' ADDED.

Configuration file '/tmp/node.cfg' imported.


Configuration file 'profile.v42' imported.

WARNING - LU6.2 Partner LU Profile 'rx.lu62' specifies that no security
is to be used with this partner LU.  This function has
changed in CS/AIX 5.0 and attachs with security data will be
accepted, provided they comply with the TP security
requirements.  See the Migration Guide for details. 1

WARNING - Group 'system' could not be found in /etc/passwd.
This group is no longer a trusted group.
```

1 This warning is due to a design application change.

Figure 23. snamig Output Messages

4.1.5 Start SNA

Next, SNA was enabled with the sna start command. Since the migrated profiles were put in the /tmp directory, the sna start command was issued with flags specifying the location of the files.

```
sna start -n /tmp/node.cfg -d /tmp/dom.cfg -t /tmp/tp.cfg

SNA software is initializing...

SNA software failed to initialize, reason:

     Failed to start Config Daemon
     - Invalid record in configuration file
     - Further details may be in the error log file /usr/lib/sna/sna.err
```

Figure 24. Starting SNA with Non-default Files

The sna.err log contained the following message:

```
Failed to read the config file - parameter is specified incorrectly.
Filename  = /tmp/node.cfg
Parameter = lu_name
The failing record begins:
[define_lu_0_to_3]
lu_name = dsw_ls
```

Figure 25. sna.err File

This error is due to the underscore in the lu_name parameter. By editing /tmp/node.cfg and substituting dsw_ls with dswlu, sna start ran without errors.

Next, the CS/AIX V5 node was enabled by starting xsnaadmin and selecting the options to activate the node. As you see in the following figure, the node activated without problems.

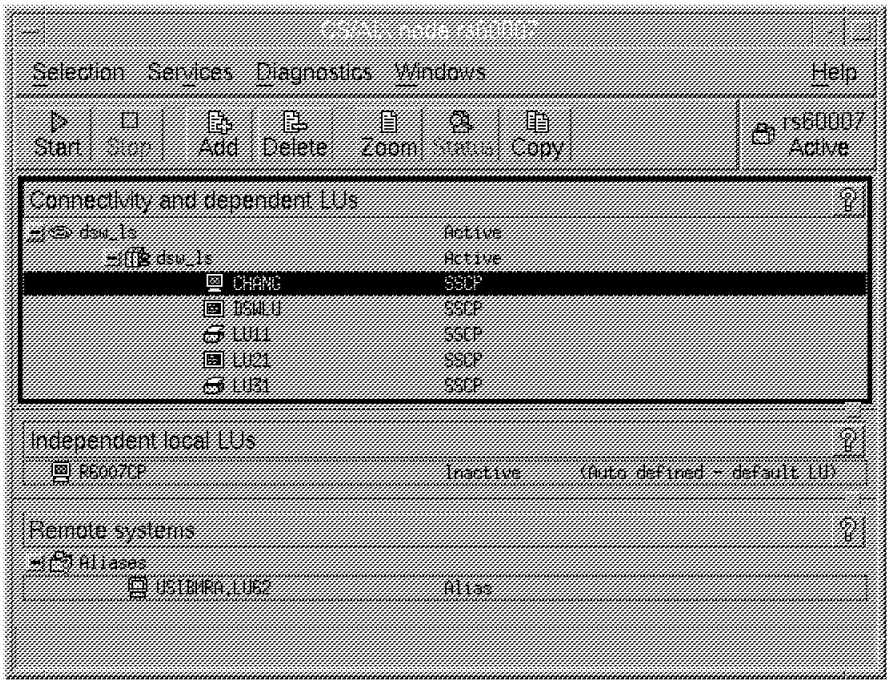

Figure 26. The Final Result

Chapter 5. Communications Server for AIX V5 New Features

CS/AIX V5 offers many new features and tools. The following chapters will provide information on the topics below:

- A new Motif tool: xsnaadmin
- Integrated TN3270E server: TN Server
- Support over frame relay using TPS/SoftFRAD from TPS Systems
- Dynamic Definition of Dependent LUs (DDDLU), also known as Self-defining Dependent LUs (SDDLU)
- HPR RTP support
- Channel MPC support *
- Dependent LU Requester support (DLUR) *
- Support of ATM using LAN emulation *
- New programming APIs
- New diagnostic and problem determination tools
- New network management tools

*Available in CS/AIX V4.2 through PTFs

Chapter 6. The Motif Administration Utility

Communications Server for AIX V5 introduces xsnaadmin, a new graphic interface that allows you to start and stop SNA resources and configure SNA profiles from a user-friendly graphical interface. This can be done from any X-windows server.

Figure 27 shows the initial xsnaadmin window, called the node window. The four main parts of the node window are the tool bar, the connectivity pane, the independent LUs pane, and the remote systems pane.

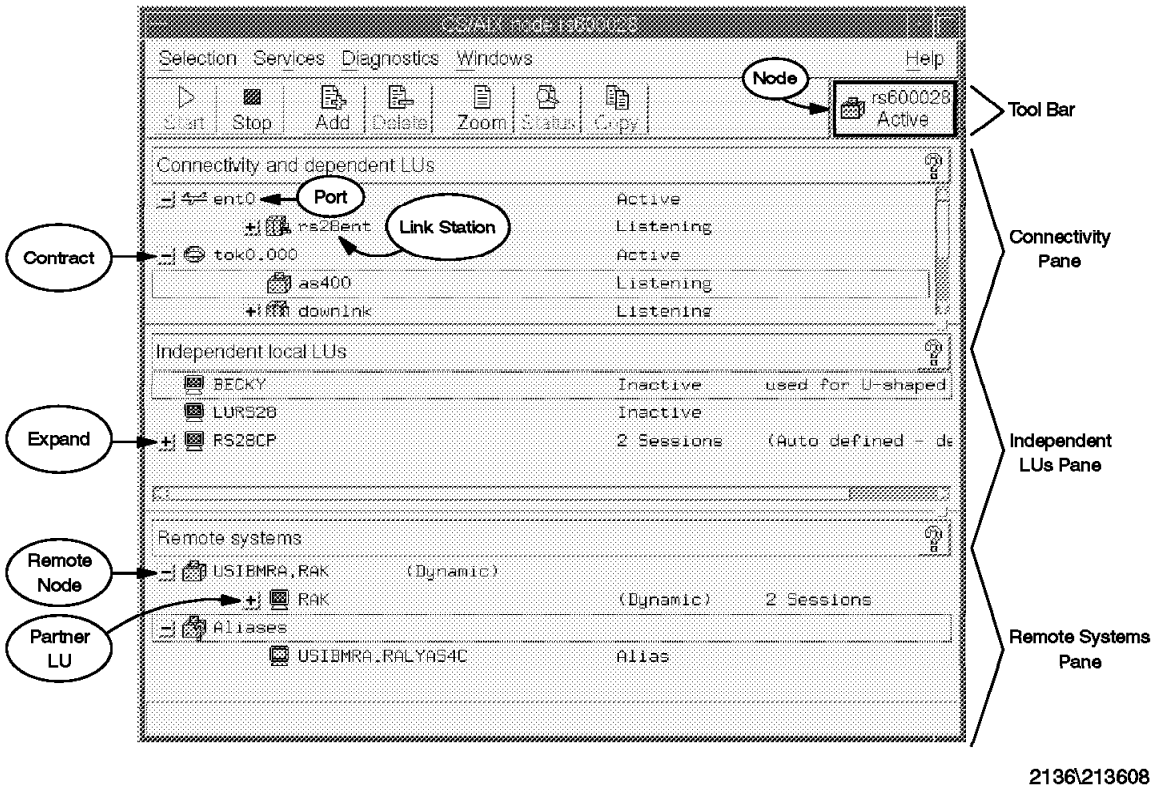

Figure 27. xsnaadmin Node Window

6.1 Starting xsnaadmin for the First Time

The SNA daemons need to be started before you can start the xsnaadmin utility. To start SNA, type `sna start` on a command line.

```
rs60007:/ > sna start

SNA software is initializing...

SNA software has been initialized.

rs60007:/ >
```

Once SNA has been started you can start the xsnaadmin utility.

```
rs60007:/> export DISPLAY=saturn:0
rs60007:/> xsnaadmin &
```

The first time xsnaadmin is started, the contextual help will come up.

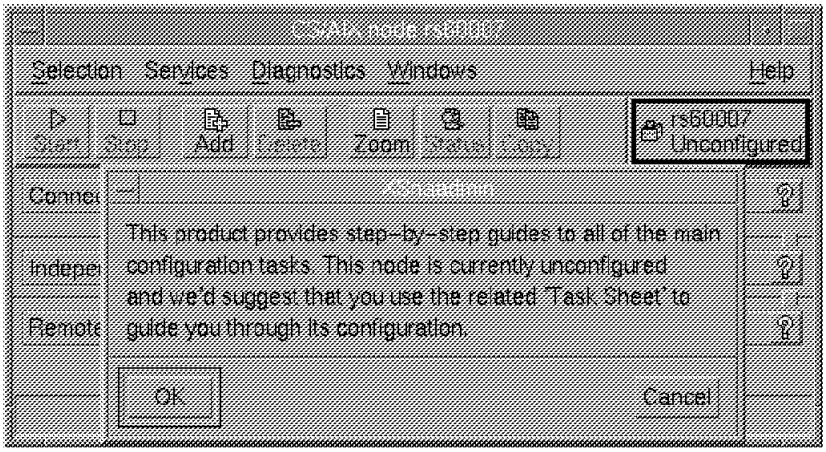

Figure 28. xsnaadmin Initial Screen

The highlighted box in the upper right corner is the node name of the RS/6000 (not necessarily the CP name). This is taken from the TCP/IP hostname.

6.2 Defining the Node

If you are installing Communications Server for the first time, you will need to configure the node when you start xsnaadmin for the first time. If you have migrated from a previous release, the node has been configured for you. To configure the node, click on **Services** → **Configure node parameters**.

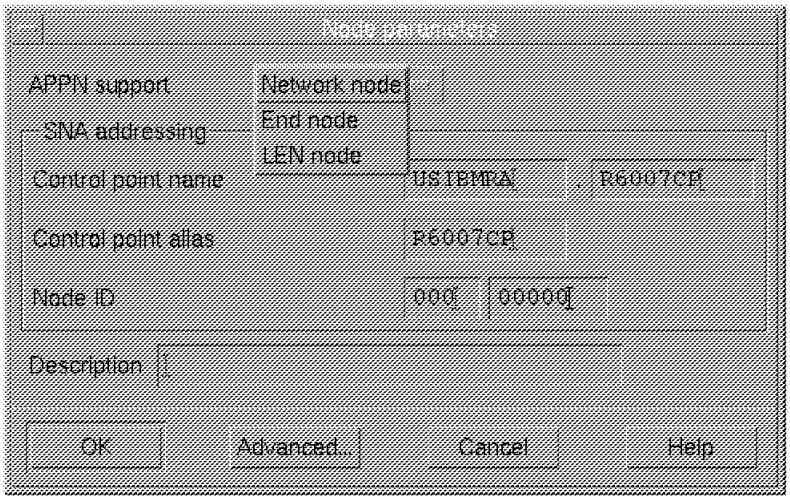

Figure 29. xsnaadmin Node Configuration

Choose the APPN support for this node.

Network node This node will provide APPN directory and routing services for LUs on this node and for end and LEN nodes in its domain.

End node This node will only maintain directory services for local resources. It will establish a CP-CP session with a network node to request directory and routing services for nodes not directly connected to it.

LEN node This node can be connected to an APPN network and can use independent LU6.2 for peer communication but does not support APPN functions.

Fill in the APPN CP name for this node, a control point alias for local APPC applications to use for access to CP, and the node ID if needed for XID exchanges.

6.3 Defining Connectivity

xsnaadmin implements a hierarchy that does not exist with smit. For example, with smit you can create a PARTNER LU6.2 without having a link station defined. This is not possible with the new Motif administration tool. Now that the node has been defined, connectivity resources need to be defined. The connectivity resources in Communications Server for AIX V5 are:

- DLCs - the component responsible for communication over a physical link using a specific data link protocol. A DLC can manage one or more ports.
- Ports - the local end of a communications link as a unique access point in the network, usually corresponding to an adapter card. A port uses one specific DLC and more than one port can use the same DLC. There may be more than one port for an adapter. For example, two ports with two separate SAP addresses can use the same adapter.
- Link Stations - a logical path to a remote node. A link station is associated with a specific port. More than one link station can use the same port.
- Connection Networks - a logical network allowing direct connectivity between nodes connected to a shared-access transport facility (SATF), for example, a token-ring, Ethernet, or FDDI network. Ports are defined to use the connection network by specifying the same virtual routing node (VRN) as part of each port definition on the SATF. This eliminates the need to define link stations to each node on the SATF for direct communication.

The structure of the connectivity resources is shown in Figure 30.

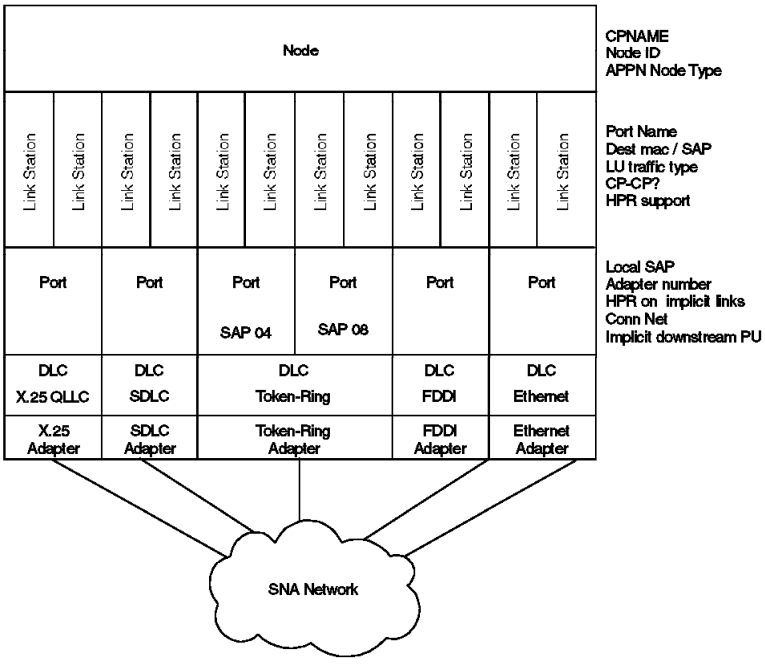

Figure 30. Connectivity Resources

6.3.1 Defining a PORT

Port definitions are the first connectivity resources you must define. As part of the port configuration, the DLC is automatically configured. DLC information is not shown separately in the Motif administration program. Command-line administration will treat it separately. The port depends on the available hardware adapters. In this example we are configuring a token-ring link, so we create a port using the token-ring adapter.

To begin the definition you can do one of the following:

- Click on the Node (in Figure 27 on page 43 it is the box in the upper right corner that says ′rs600028 Active′) and click on **Add**.

  Or,

- Click on the connectivity and dependent LUs pane and **Add**.

  Or,

- Click on **Services** → **Connectivity** → **New port**

  Or,

- Click on **Selection** → **New....**

Any one of these actions will have the same result, bringing you to the panel where you define a Port and DLC.

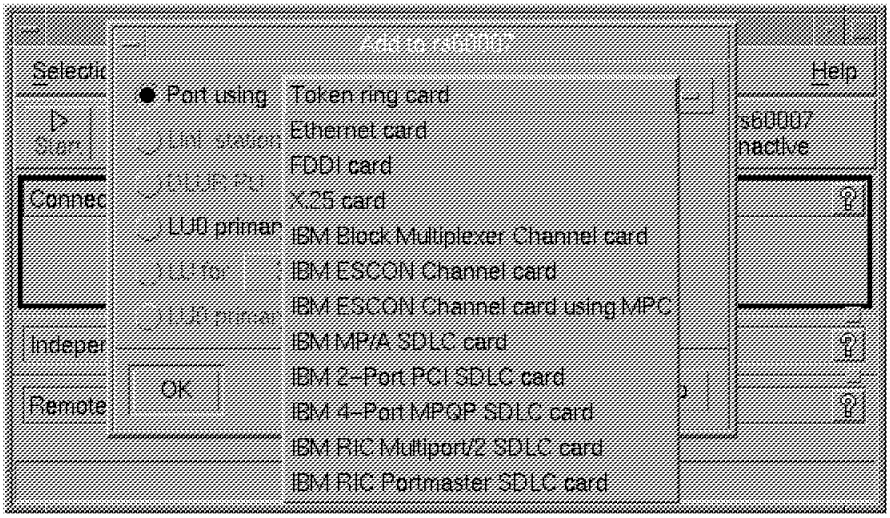

Figure 31. xsnaadmin - Adding a Port

The default will be to use token-ring. Click on the bar that says token-ring to change this to another adapter. Once you have chosen the correct port type, click on **OK**.

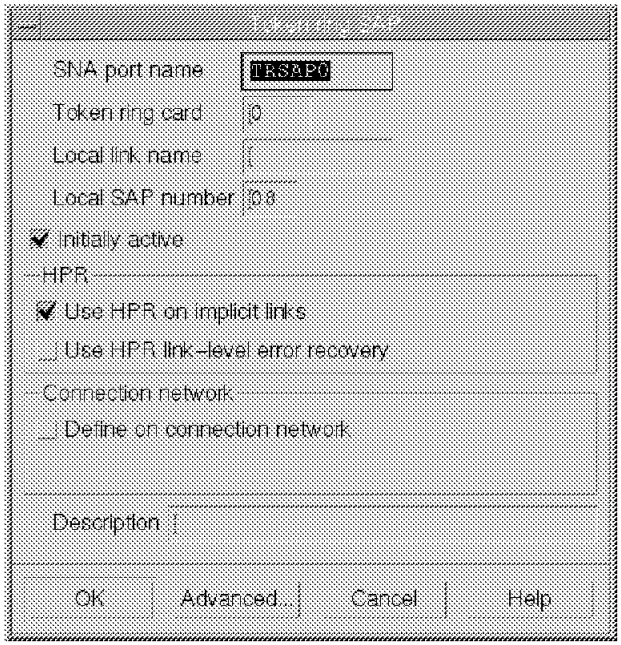

Figure 32. xsnaadmin - Port Definition

On the next panel fill in the local SAP number you want to use (the default is 04) and click on **OK**.

The port is created on the local SAP.

6.3.2 Creating the Link Station

The next step is to create a link station for the port. More than one link station can point to the same port.

6.3.2.1 Link Station to an End Node or LEN Node

To create the token-ring link station do any one of the following:

- Highlight the port and click on **Add** → **OK**.

  Or,

- Click on **Services** → **Connectivity** → **New link station**

  Or,

- Highlight a port and click on **Selection** → **New link station.**

The window shown in Figure 33 on page 49 will appear. Fill in the parameters to create the link station.

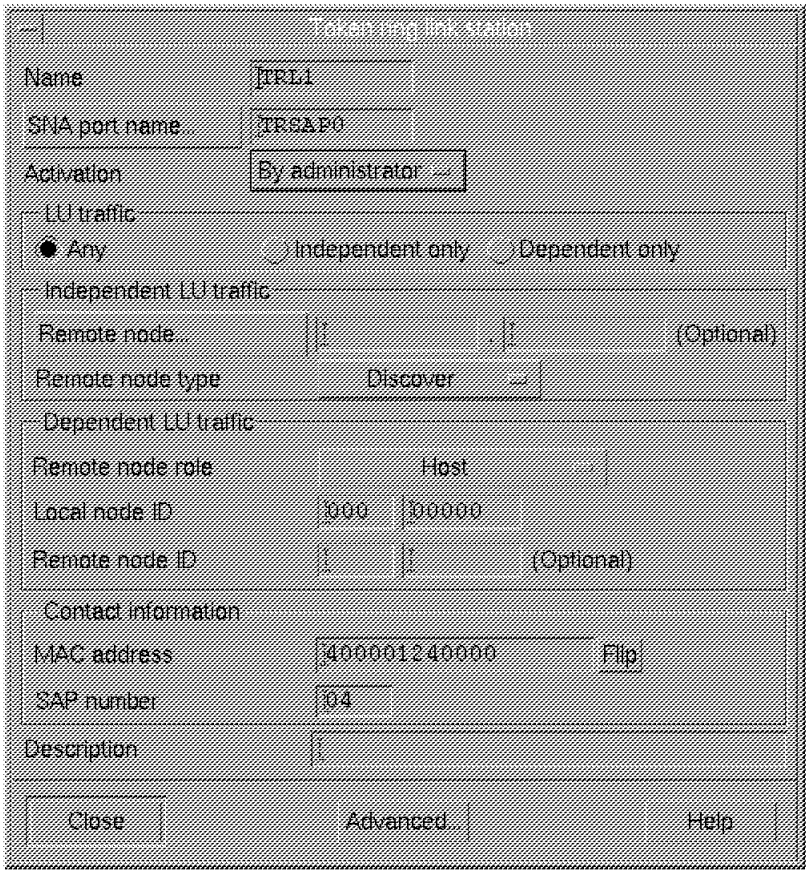

Figure 33. xsnaadmin Token-Ring Link Station

In this example, the new link station will be called TRL1. It will be a link to a host network node through an NCP gateway.

1. Activation

   By administrator The link station will not be activated at node startup. It must be started manually.

   On node startup The link station will be activated at node startup.

   On demand The link station will not be activated at node startup but a program, APING for example, will be allowed to start the link station.

2. LU traffic

   Dependent only — LU0,1,2,3, dependent LU6.2 traffic only

   Independent only — Independent LU6.2 traffic only

   Any — Either dependent or independent traffic

3. Remote node role (for dependent LUs)

   HOST — If this link station will be used to connect to a host

   Downstream — To define an explicit link to a downstream PU (CS/AIX is a gateway).

4. MAC address

   In this example, we are adding a token-ring link station to the host. Since the host is also a network node, the only parameter to fill in is the MAC address of the gateway to the host. The flip button allows you to convert a canonical address to a non-canonical address.

6.4 Session Resources

The next step is to add session resources. This includes LUs, LU pools, modes and class of service, and directory information.

6.4.1 Dependent LUs

There are two ways to reach the panel needed to define a dependent LU to link TRL1:

- Highlight the link station on the node window. Then click on:

  Add → **LU for** →

  - **3270 display** (LU2)
  - **3270 printer** (LU1 and LU3)
  - **Dependent APPC** (dependent LU6.2)

  Or:

- **Services** → **3270** →

  - **New 3270 display LU** (LU2)
  - **New 3270 printer LU** (LU1 and LU3)
  - **APPC** → **New dependent local LU** (LU6.2).

For dependent LU6.2, local LU definitions are required for every dependent LU on the local node, and partner LUs must be defined for dependent LU6.2 sessions.

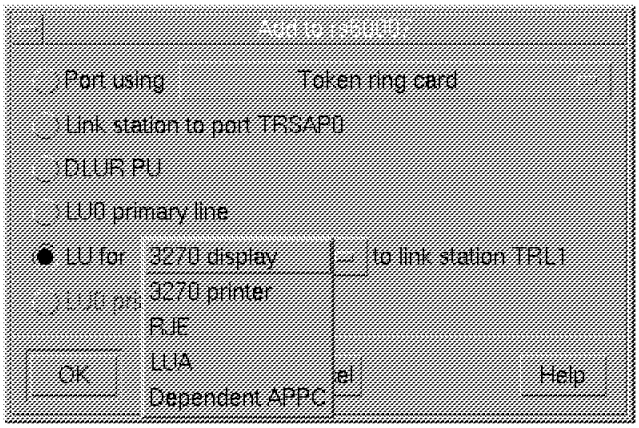

Figure 34. Adding LUs

The next panel will allow creation of up to 254 identical LUs.

In this example, we are going to create seven LU2s with the same characteristics. This panel also allows the creation of a pool for SNA gateway.

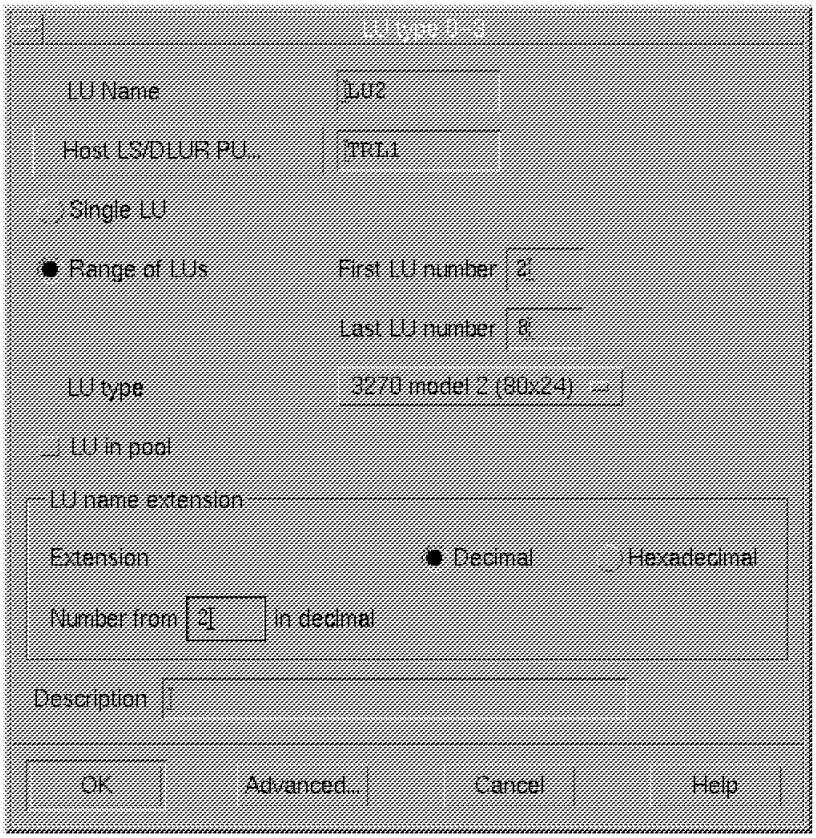

Figure 35. Defining a Range of LUs

The host LS/DLUR PU field will be filled in if you reached this screen by highlighting a link station and clicking on **Add**. Otherwise, you must fill this in with the resource this LU or range of LUs will be associated with. The LUs defined here can be associated with a pool.

6.4.2 Independent LUs

In an APPN network the node CP can serve as a local LU for independent LU6.2 sessions. Partner LUs are not required but can be defined for independent LU6.2 sessions to support specific session requirements.

6.4.2.1 Local LUs

To create a local independent LU, select the **Independent local LUs** pane in the node window and click on **Add**. Fill in the local LU name and local LU alias. Click on **OK** to make the local LU available.

6.4.3 Partner LUs

Defining a partner LU6.2 is also very simple. Partner LUs can be defined in several ways, depending on how you want to specify the location of the remote LU. If you are on an APPN network node and would like to define partner LUs (this is optional), do the following:

- Highlight the **Remote systems** pane in the node window and click on **Add** → **Define partner LU alias** → **OK**
- Fill in the partner LU name and alias and click on **OK**

When this node is connected to a LEN or end node and is using LU6.2 sessions, you can define partner LUs to route the bind to the owning resource.

When defining partner LUs in Communications Server for AIX V4.2, you had to define a location. This was done with the owning CP or the link station name.

With Communications Server for AIX V5, a partner LU is defined to a location by selecting **Services** → **APPC** → **New partner LUs**.

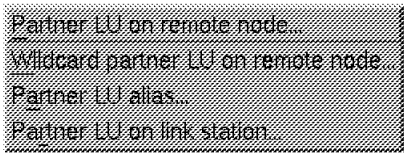

Figure 36. Adding a Partner LU

The options shown in Figure 36 will allow the following types of routing for partner LUs:

- Partner LU on remote node: Use a CP name to route the request for this LU.
- Wildcard partner LU on remote node: route all requests for LUs starting with the same characters to a CP name.
- Partner LU alias: Create a partner LU6.2 without specifying a location.
- Partner LU on link station: route the request for the LU to a link station.

6.5 The Tool Bar Functions

The tool bar at the top of the node window can be used as a shortcut for configuration or for management functions.

6.5.1 Start/Stop Buttons

These buttons allows you to start/stop a resource. By highlighting a resource, we can start or stop it.

Resources that can be started with the start button are:

- Node
- Ports
- Link station
- LU6.2 Sessions

Dependent LUs can't be started or stopped.

To start an SNA resource, highlight it and click on **Start**. No parameters are needed, except for LU6.2 sessions. To start an LU6.2 session, select an independent local LU and click on **Start**. A pop-up menu will come up asking for a partner LU name or alias (if you have previously defined it), a mode name, and a polarity for the session.

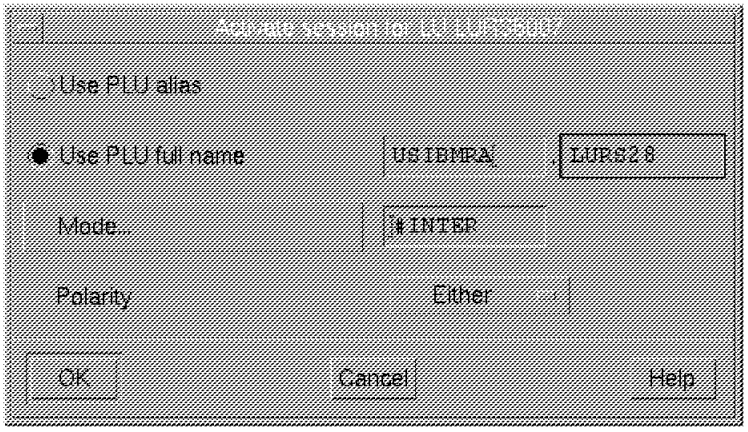

Figure 37. Starting an LU6.2 Session

To stop an active LU6.2 session, use the independent LU pane in the node window to select either the particular session to stop, or the independent local LU. If you select an active LU6.2 session and click on **Stop**, the session will stop. If you select the local independent LU, all sessions connected to this LU will be stopped.

6.5.2 Add

Resources can be added to the configuration by clicking on the **Add** button. The pull-down presented will vary depending on the resource that is highlighted when Add is clicked.

Table 4. Add Action Table

Highlighted Resource	Default Action of Add	What You Can Add
Node	Add a port	Add a port, DLUR PU, LU0 primary line
PORT	Add a link station to the selected port	Add a link station to any existing port
Link station	Add a dependent LU	Add a dependent LU.
Independent Local LUs window	Add an independent local LU	Add an independent local LU
Remote systems window	Define partner LU alias	Define partner LU alias, Define a remote node

Clicking on the Add button has the same effect as clicking on **Selection** → **New**.

6.5.3 Delete

The Delete button allows you to delete a resource. To be deleted, a resource *must* be stopped. Deleting a resource will delete all dependent resources. For example, if we delete a port, all link stations defined on this port and all dependent LUs defined on the link station will be deleted.

6.5.4 Zoom

Zoom allows modification of an SNA resource. Highlighting a resource and clicking on **Zoom** will present a panel to modify that resource. To modify a resource it *must* be stopped. However, Zoom will warn you if it is active and show you the configuration.

6.5.5 Status

The Status button will give information about the selected resource.

Selected Resource	Effect
PORT	XIDs exchanged, local MAC address and SAP (TR, ETH, FDDI)
Link Station	Remote system information and statistics on the link station
LUs	Local LU, partner LU, mode, session limits

Chapter 7. TN Server

Communications Server for AIX V5 now integrates TN3270, TN3270E, and TN3287 server functions including diagnostics into the TN Server.

The TN server allows TCP/IP users with TN3270 programs to establish SNA 3270 sessions to a host by using CS/AIX as a TCP/IP-to-SNA gateway.

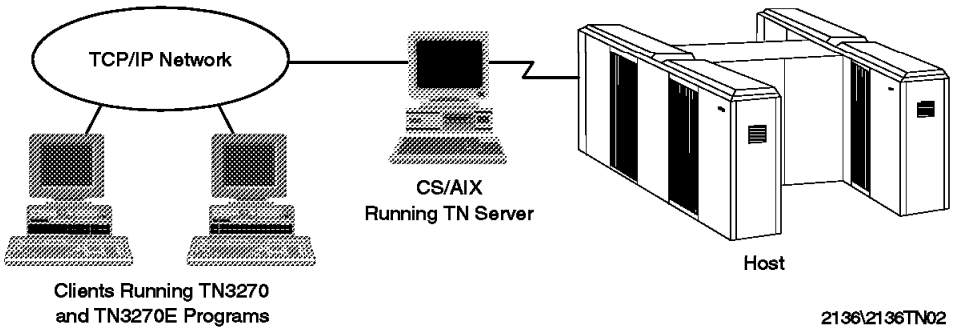

Figure 38. TN Server

The TN server support can be configured and managed from the graphic administration tools.

7.1.1 TN Server Overview

The steps to configure the TN server are:

1. Configure the node.
2. Configure a port and a link station to the host.
3. Create the dependent LUs.
4. Create an LU pool (optional).
5. Configure the TN server.

The first three steps are covered in Chapter 6, “The Motif Administration Utility” on page 43.

The TN server configuration allows you to create access records defining how users access the host. An access record can be the default record to allow access for any TN3270 client, or it can be specific to a user TCP/IP address or name.

Figure 39 on page 58 shows an overview of the effects of access records in defining the TN Server. In this figure a token-ring link station called TRL1 has been defined with eight dependent LUs, seven LU2s (LU002-LU008) and one printer LU (PRT).

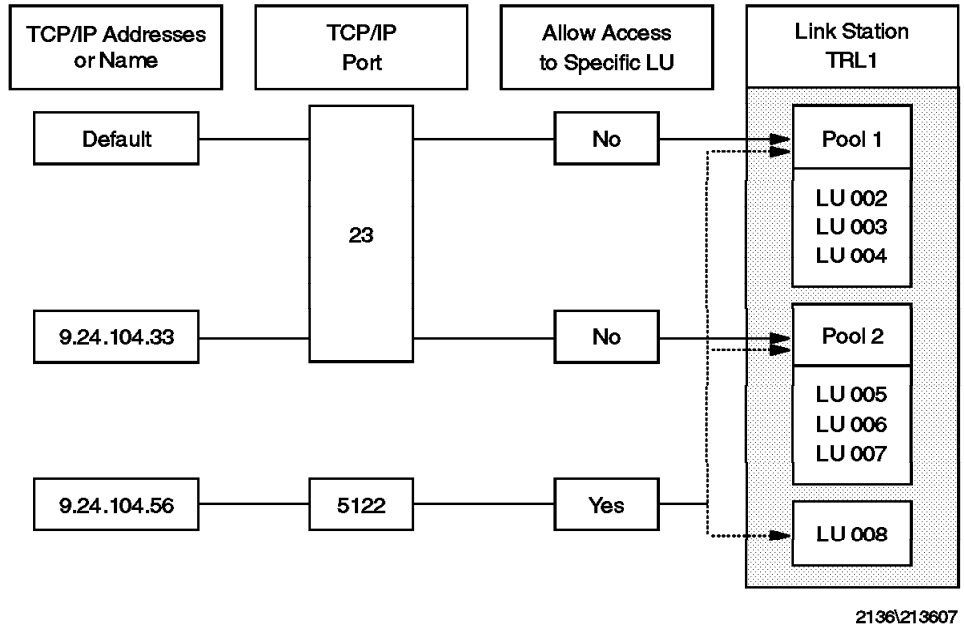

Figure 39. TN3270 Configuration Overview

In Figure 39 when the user at 9.24.104.33 uses a TN3270 program to access CS/AIX at TCP/IP port 23, TN Server will establish a connection with the host for this user using an LU from POOL2. Because there is an access record for this IP address, the user is restricted to using port 23 and LUs from POOL2.

7.1.2 Creating the LU Pools

LU pools group dependent LUs in a pool that the TN Server or SNA gateway functions will use to allow a client to access a host. If a client is allowed access to an LU pool, it will be connected to the first available LU in the pool.

LU pools should group only the same LU type (printers, dependent LUs, etc.).

Prior to creating an LU pool, you must define the dependent LUs. Dependent LU definition was covered in 6.4.1, “Dependent LUs” on page 50.

In order to create an LU pool click on:

- **Windows → LU pools**
- Then **Add → Add new pool**.

A window will appear giving you the choice to **Add a new pool** or **Add LUs to pool** (this option will be available only if an LU pool already exists). Choose the appropriate option. Select the LUs you want to be in the LU pool and click on **<-Add**. The selected LU names will move from the **LUs available** box to the **New LUs to add** box.

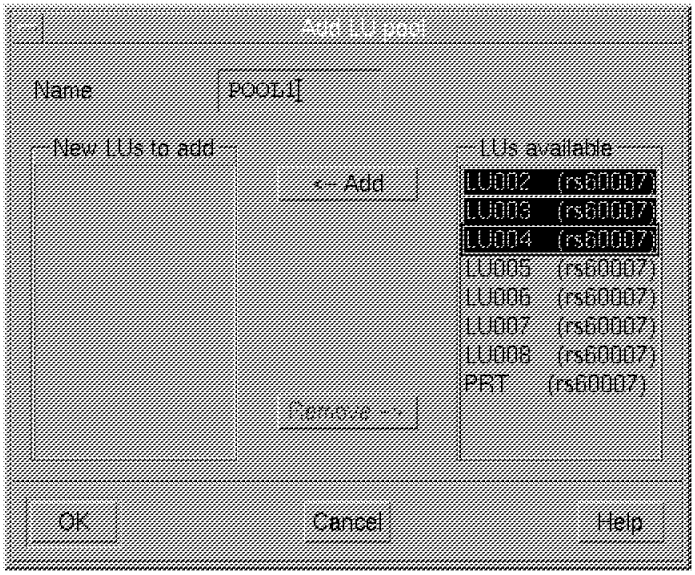

Figure 40. Add an LU Pool

Click on **<-Add** and a new LU pool will be created with the selected LUs. Figure 40 shows POOL1 being created for this example.

7.1.3 Configuring the TN Server

To configure the TN server, start xsnaadmin and click on **Services** → **TN server** → **TN server**. The following panel will appear.

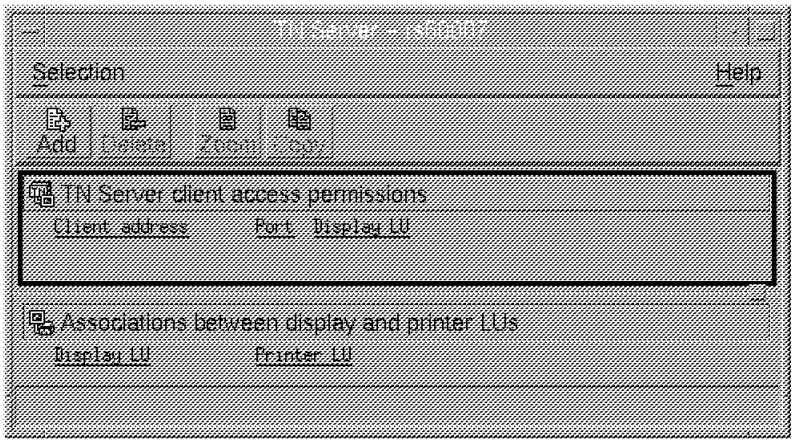

Figure 41. TN Server

Make sure the TN Server client access permissions window is selected and click on **Add**.

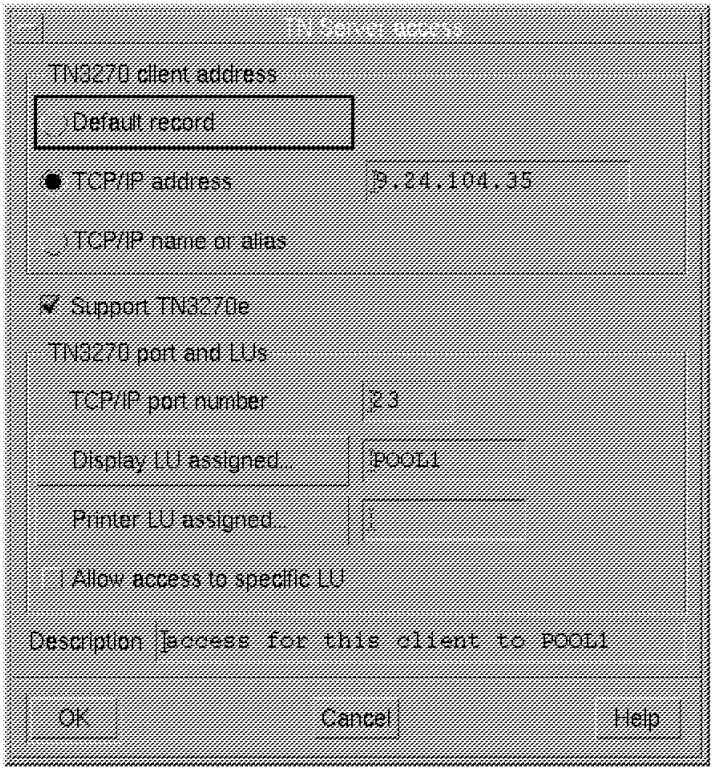

Figure 42. Creating Access for a Client

CS/AIX V5 allows you to define which client, based on TCP/IP addresses, will access the TN server. The three ways to do this are:

Default Allow any client to use the TN server.

TCP/IP Address Allow the client at this TCP/IP address to access the TN server.

TCP/IP Name or Alias Allow the client having this TCP/IP name to access the TN server.

You have a choice whether to allow the client to support TN3270E functions or not.

In the TN3270 Port and LUs section, define which port the TN server will use to listen. To use the standard Telnet port, please see 7.1.4, “Sharing Port 23” on page 64. Otherwise, choose a new port number and add it to the /etc/services file.

Then you can choose to allow those clients access to an LU pool or to a particular LU name (display or printer).

Note: You have to support TN3270E to have a TN3270 printer.

Some TN3270 emulators allow the user to indicate which LU they want to use for a connection. If you have not selected this option for clients, they can′t use use this function. If it is used, this will bypass any restriction to access a specific LU pool.

Note: If a client has an access record, then it can only access the ports and the LUs defined in the access record. This allows a security policy in which the default is to allow client access to many ports, but where specific clients are only allowed to access to particular ports and LUs.

Figure 42 on page 60 shows definitions allowing the client with IP address 9.24.104.35 to access an LU pool called POOL1 on TCP/IP port 23.

Next, we create a default record so that all other clients running TN3270 will use POOL2. On the Motif admin panel, click on **Services** → **TN server** → **LU Pools...** . Then click on **Add** → **Add new pool** → **OK**. Fill in the LU pool name and select the LUs to add in the pool. Figure 43 on page 62 shows the creation of POOL2 including LU005, LU006, and LU007 for this example.

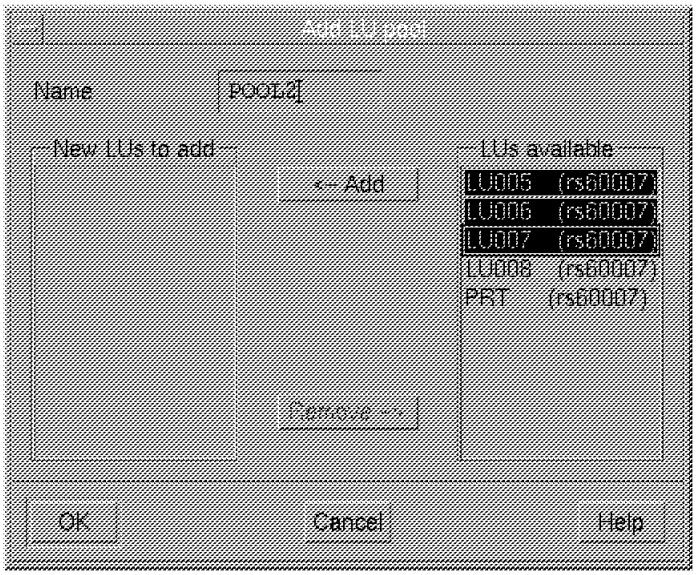

Figure 43. TN Server POOL2 Creation

Now we have to allow all clients to access POOL2. Click on **Services** → **TN server** → **TN server** then **Add**.

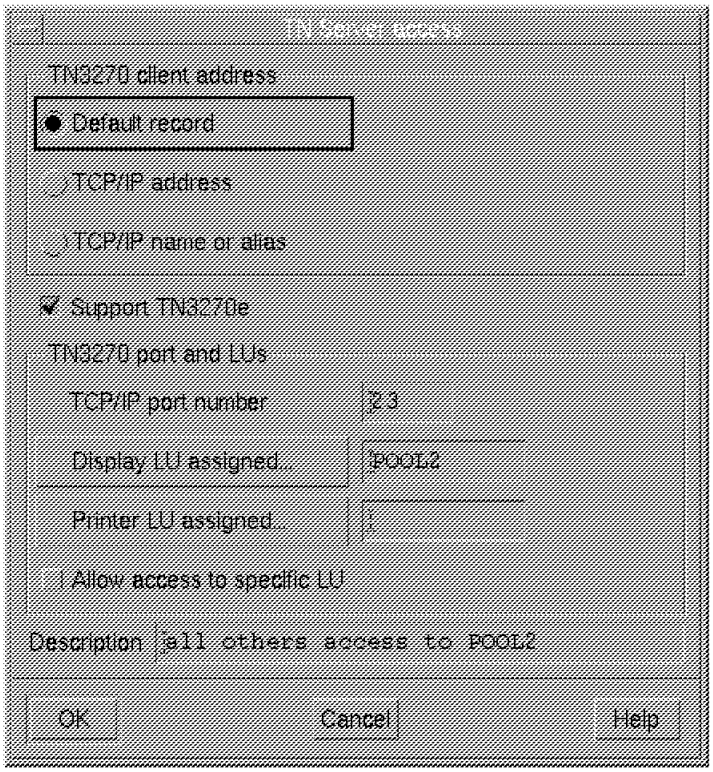

Figure 44. Creating the Default TN Server Access to LU Pool POOL2

Click on the default record option, fill in the port and pool, and specify if TN3270E is supported. Creating a default access record allows all TN3270 clients to access the host by using the specified port. Restrictions for users can be added by creating an access record specifying the user address. If an access record exists for a user, the user is restricted to the definitions in the access record. The default access record will not apply for this user.

If a user attempts to connect to the TN server using the incorrect port, an error will be logged in /var/sna/sna.err.

```
Client 13: TCP/IP address 9.24.104.151 not configured to use TN Server on
002.
```

The Motif administration tool allows you to view active sessions and shows which clients are using which LUs. From the node window, click on **Windows** → **LU pools**. The LU pools window (shown in Figure 45 on page 64) will show the pools, their LUs, and the LU usage.

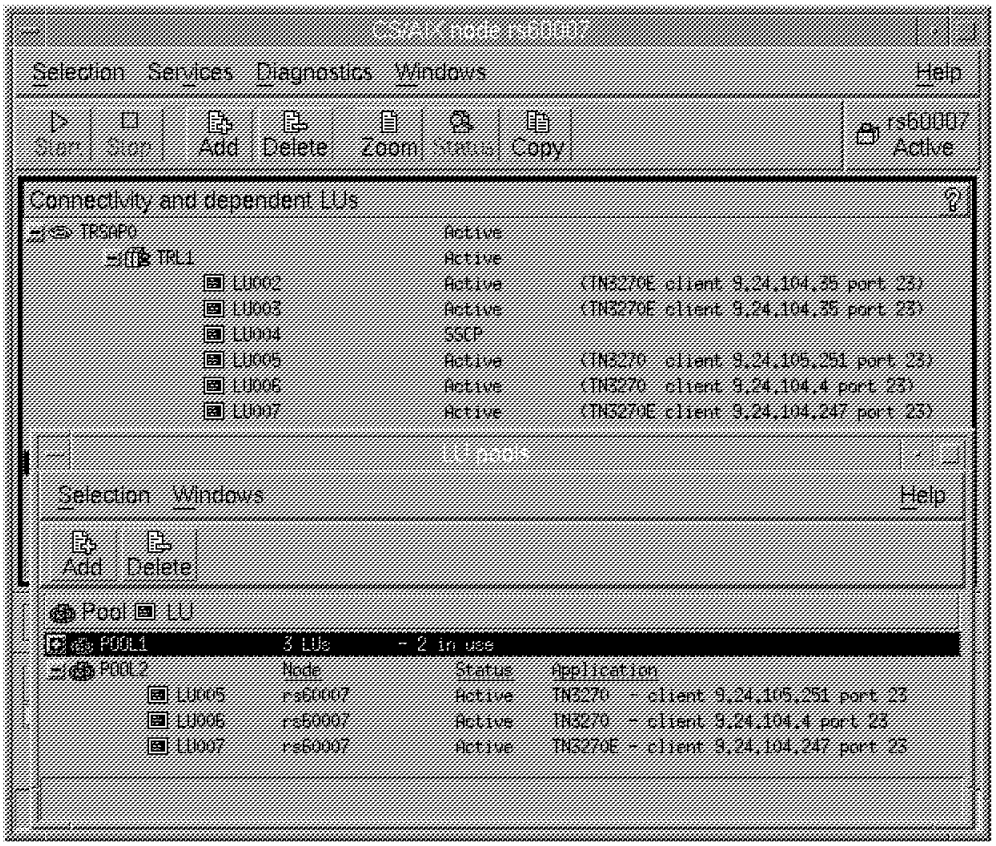

Figure 45. Viewing Active Sessions

7.1.4 Sharing Port 23

TCP/IP uses ports to route IP datagrams to the right application. These ports are called well-known ports and are referenced in the /etc/services files. Port 23 is the port used by Telnet.

Note: TCP/IP ports are not related to SNA ports.

If this port will also be used for TN3270, you will need to share this port between Telnet and the TN3270 server. In order to do this, use the following procedure:

1. Stop CS/AIX or ensure that it is not started.
2. Edit /etc/inetd.conf and put in remark with a # the line regarding Telnet.

```
## service  socket  protocol  wait/  user    server    server program
##  name     type             nowait         program     arguments
##
ftp     stream  tcp     nowait  root    /usr/sbin/ftpd         ftpd
#telnet  stream  tcp     nowait  root    /usr/sbin/telnetd      telnetd
```

Figure 46. The /etc/inetd.conf Modified File

3. Create an ASCII file /etc/snainetd.conf and put server program and server program arguments from the remarked lines in the previous step.

```
/usr/sbin/telnetd        telnetd
```

Figure 47. The /etc/snainetd.conf File

4. Get the inetd process ID and kill it.
5. Start the SNA internet daemons by running the `snainetd` command.
6. Start the inetd daemon by entering `inetd`.
7. Start CS/AIX.

Steps 4 through 7 will have to be done each time the machine is rebooted. This can be done by calling a script file in /etc/inittab to run before CS/AIX is started. Figure 48 shows an example script.

```
#!/bin/ksh
A=`ps -eaf|grep snainetd|grep -v grep`
if [ ! -n $A=0 ]
then exit
fi
kill `ps -eaf|grep inetd|grep -v grep|awk '{print $2}'`
snainetd
inetd
```

Figure 48. Script to Share TCP/IP Port 23 at Startup

Note: This script *must* be run before SNA is started.

Chapter 8. Frame Relay

Communication Server for AIX V5 now supports frame relay connections via the TPS/SoftFRAD product from TPS Systems. The TPS/SoftFRAD product allows frame relay WAN access for 802.5 protocols. Please contact TPS Systems for a list of supported adapters. Information regarding TPS Systems products can be seen on the Web at http://www.tpssys.com.

8.1.1 SNA over Frame Relay

Frame relay is a fast packet switching technology. It is connection oriented with virtual circuits defined between end stations. Switching is done by frame relay frame handlers.

RFC 1490 details how data should be encapsulated when sent over a frame relay network. RFC 1490 distinguishes between two types of encapsulated protocol data units (PDUs): routed and bridged. The SoftFRAD product supports the RFC 1490 Bridged Frame Format for encapsulation of SNA traffic over frame relay networks. When sending bridged frames, the frame relay connection is used as a virtual LAN identified by a DLCI at each end. On this LAN, MAC addresses must be assigned to both ends of the DLCI.

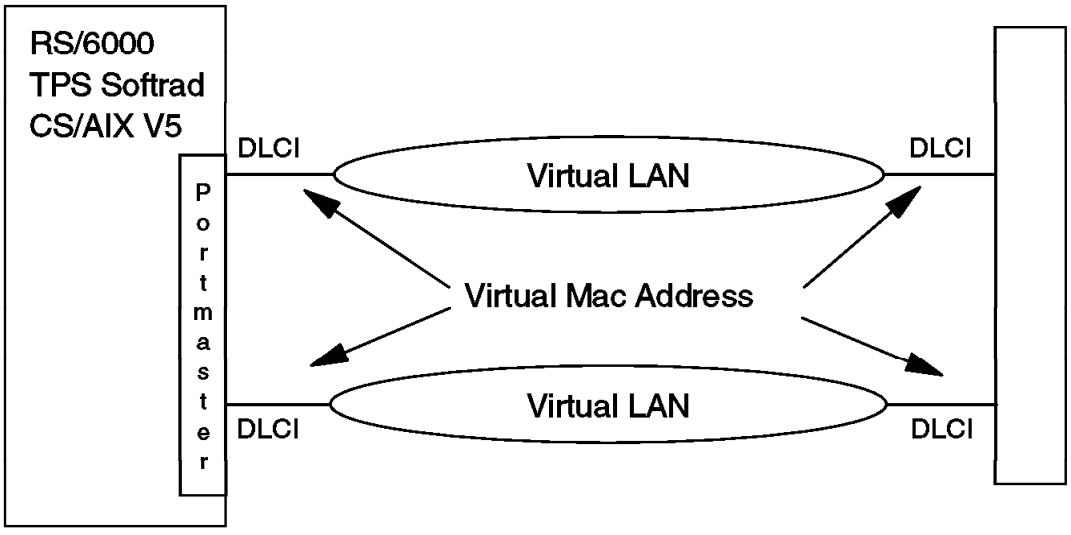

Figure 49. Frame Relay Overview

8.1.1.1 DLCIs

The concept of virtual circuits allows an end station to maintain multiple connections to multiple end stations on a single user-network interface at

the same time. Data Link Connection Identifiers (DLCIs) are used to uniquely identify a virtual circuit. The DLCIs used along the path of a virtual circuit may be different at each hop. They only have local significance.

8.1.1.2 Local Management Interface (LMI)

LMI is a set of procedures and messages defined to operate between a user device and a frame relay network, that provides status and outage notification for frame relay permanent virtual connections (PVCs). PVCs are logical dedicated paths with an assigned priority and bandwidth.

LMI has been defined by both the ANSI and the CCITT standards organizations. SoftFRAD supports both formats.

8.1.1.3 Transmission Security

Since frame relay does not provide transmission security, if a frame is lost in the frame relay network, the application above the frame relay network will be responsible for resending the missing frame. In order to assume data integrity, CS/AIX V5 uses Logical Link Layer Type II (LLC2 IEEE 802.2) over frame relay.

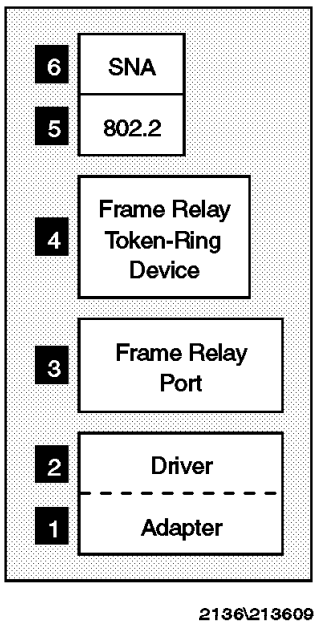

Figure 50. 802.2 over Frame Relay

Figure 50 shows an overview of the CS/AIX frame relay structure.

- The frame relay interface is an adapter **1** and device driver **2**.

- 3 SoftFRAD software defines a port and provides emulation so CS/AIX can interface with the device as if it were a token-ring adapter.
- 4 A frame relay device is defined with the SoftFrad software.
- 5 and 6 The CS/AIX definitions are the same as if they were going to an actual token-ring adapter. The TPS software uses the IBM AIX token-ring device driver (devices.mca.8fc8).

8.1.2 TPS/SoftFRAD

The SoftFRAD product is seen by SNA as a token-ring adapter. CS/AIX uses this connection by defining a token-ring port specifying this adapter.

To configure the frame relay connection you will need:

1. The DLCI needed to reach the remote node. The DLCI indicates the channel this token-ring device will send and receive traffic on. You will have to ask to local frame relay switch administrator to give you the DLCI number to reach the remote node.
2. The MAC address for the remote end of the virtual LAN. This will be used in the CS/AIX link station definition.
3. The MAC address for the local end of the virtual LAN. This is defined in the SoftFRAD Frame Relay Token Ring Device definition.

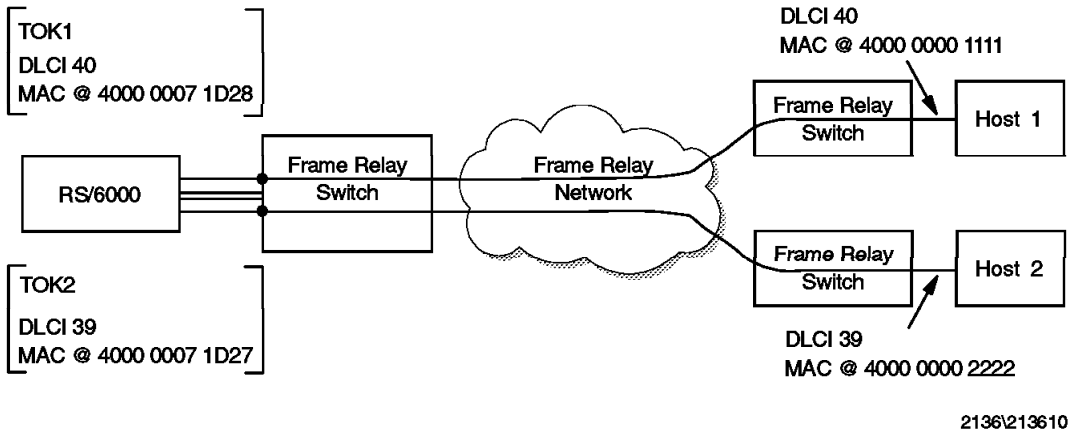

Figure 51. SNA over a Frame Relay Network

A frame relay virtual token-ring adapter for each host in Figure 51 we'll want to reach must be created. In fact we have to create one for each DLCI used.

In Figure 51 the network administrator has assigned DLCI 40 to Host 1, and DLCI 39 to Host 2. The RS/6000 has been assigned DLCI 29 (not shown).

When creating the tok1 frame relay token ring device on the RS/6000, you would specify DLCI 40 since this is the DLCI of Host 1. For tok2 you specify a DLCI of 39 since this is the DLCI of Host 2.

In CS/AIX V5 you create a port using the token-ring adapter and if needed, an SNA link station for each remote node. If a link station is needed to Host 1, the destination MAC address would be 400000001111. If a link station is needed to Host 2, the destination MAC address would be 400000002222.

8.1.3 Configuring the TPS/SoftFRAD Software

8.1.3.1 Creating the Frame Relay Port

The next step is to configure the frame relay adapter. This assumes that the adapter used is in the available state.

To configure the frame relay port you must know:

- The parent adapter used. The parent adapter will be chosen from the list of installed adapters. If you have two Portmaster cards they will be listed as rstrpcom0 and rstrpcom1. Choose one of these and configure the frame relay port for that card.
- The interface used.
- The encoding used. This must match the network/frame relay switch.
- The LMI type. This must match the frame relay network setting.

To begin the configuration of SoftFRAD, enter `smitty tpsfrel`. Choose **Manage Frame Relay Ports** → **Add a Frame relay Port**.

Select the parent adapter. The following panel will appear. The port is created from this information and named fr0 if this is the first port created (fr1 for the second, etc.).

```
                          Add a Frame Relay Port

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  Parent Streams Port                                 rstrpcom0
  Physical Link Type                                  EIA232D                 +
  Encoding                                            NRZ                     +
  Baud Rate                                           []                       #
  State                                               up                      +
  LMI Type                                            ANSI                    +
  LMI Link Verification Polling Timer                 [10]                     #
  LMI Full Status Polling Counter                     [6]                      #
  LMI Error Threshold                                 [3]                      #
  LMI Monitored Events Count                          [4]                      #

F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 52. Frame Relay TPS/SoftFRAD Port (fr0)

The LMI support can be either ANSI or CCITT. There are four counters and timers that can be specified. The specification will depend on your frame relay environment.

Choose the interface used to connect to your network, the LMI type used, and then Enter to make the frame relay port available.

8.1.3.2 Adding Frame Relay Token-Ring Devices

Now that the frame relay port is available, we have to create the token-ring device so that CS/AIX V5 will be able to communicate over the frame relay network.

To do this you need to know two things: the DLCI number of the destination and the local MAC address. To begin the configuration type `smitty tpsfrel`. Then choose **Manage Frame Relay Token Ring Devices** → **Add a Frame Relay Token Ring Device**.

```
                    Add a Frame Relay Token Ring Device

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  Parent Frame Relay Device                          fr0
  DLCI Number                                        [40]                    #
  MAC Address                                        [400000071d28]          X
  System Transmit Queue Number                       [64]                    #
  SNA Frame Relay Access Support                      yes                   +

F1=Help             F2=Refresh          F3=Cancel           F4=List
F5=Reset            F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

This will create a token-ring interface. In this case, there is already one physical token-ring adapter installed, tok0, so the new frame relay token-ring device will be called tok1. The `lsdev -Cc tpsfr` command can be used to see the new interfaces.

The SNA Frame Relay Access Support field is set to yes if the frame relay network supports routing of DLCIs. In this case the local MAC address is not needed. The MAC address is only needed if source route bridging is used, and thus SNA frame relay access support is turned off.

For this configuration we'll create another frame relay token-ring device with the following parameters:

DLCI number 39

TR adapter MAC @ 4000 0007 1D27

```
 lsdev -Cc tpsfr
tok1 Available 00-01-00-00-00 Frame Relay Token Ring device driver
tok2 Available 00-01-00-00-00 Frame Relay Token Ring device driver
```

The display shows two token-ring adapters emulated, one to each node.

8.1.4 CS/AIX Configuration

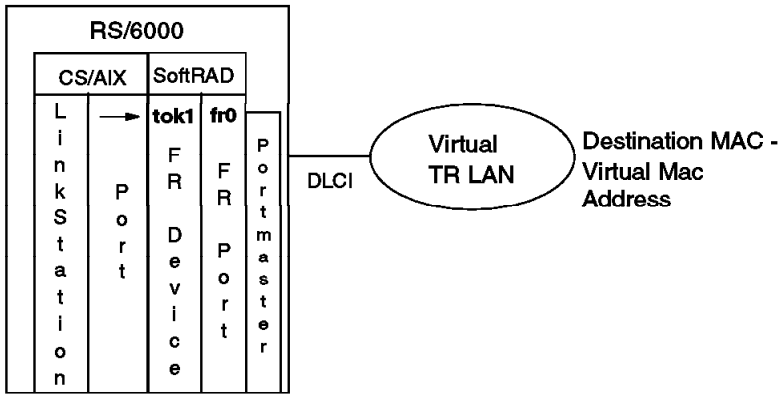

Figure 53. Frame Relay Configuration Overview

The SoftFRAD configuration created two token-ring interfaces, tok1 and tok2. Ports need to be defined in CS/AIX using these ″adapters″. Next a link station can be configured for the port if needed. The CS/AIX configurations using the frame relay token-ring devices are no different from the standard token-ring configurations.

Chapter 9. DDDLU

DDDLU is an acronym for Dynamic Definition of Dependent LUs. As a VTAM host feature it is sometimes referred to as Self-Defining Dependent LUs (SDDLU). This feature allows dependent LU definitions to be dynamically created on the host side when they are needed. The dependent LU definitions must still be defined on the CS/AIX V5 node. There are no configuration changes in CS/AIX V5 when connecting to DDDLU capable hosts.

If the host is DDDLU capable it will send information to CS/AIX V5 when the link station activates to indicate it supports DDDLU. When the LU is needed, CS/AIX will send in a Reply PSID NMVT with the required information the host needs to dynamically define the dependent LUs.

The benefits of DDDLU are that the number of static definitions on the host is reduced and expansion is easier.

9.1 CS/AIX Definitions

Using DDDLU requires no special definitions on the CS/AIX side. The link station and all dependent LUs still must be defined. The difference is that there may not be a host VTAM LU definition to match each LU defined on the link station.

9.2 The VTAM DDDLU Process

DDDLU on the VTAM host involves three things:

- The VTAM SDDLU exit routine (ISTEXCSD)
- A PU definition for the CS/AIX node with LUGROUP and LUSEED coded
- An LUGROUP major node

Figure 54 on page 76 shows an overview of the VTAM SDDLU process.

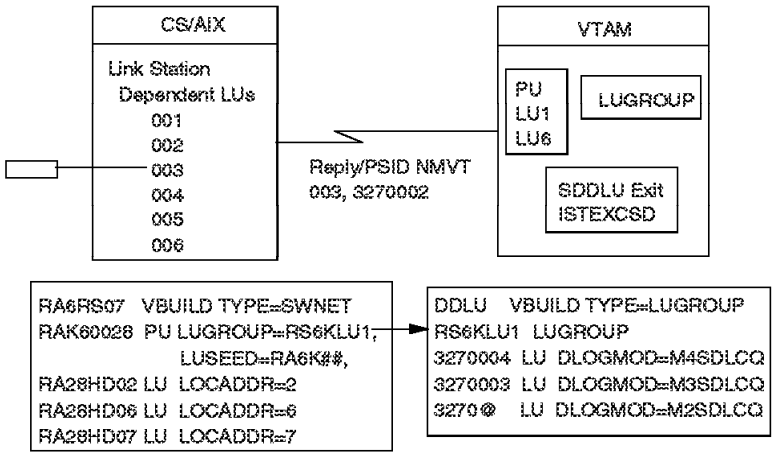

Figure 54. VTAM DDDLU Process

1. CS/AIX requires an LU that has not been activated, for example, a TN Server connection is being requested using that LU. CS/AIX sends a Reply PSID NMVT to VTAM indicating it needs an LU with LOCADDR 03 emulating a device type 3270 Model 002.
2. VTAM uses the Reply PSID NMVT to:
   a. Check the PU definition for an LU at address 03, and if not,
   b. Determine if the PU has LUGROUP coded, indicating DDDLU support.
3. VTAM matches the name in the PU's LUGROUP parameter with an active LUGROUP definition.
4. The default VTAM SDDLU exit routine (ISTEXCSD) uses the device and model type (3270002 in this case) to find a matching model LU statement in the appropriate LUGROUP.
5. The SDDLU exit uses the LUSEED value to generate an LU name. The # symbols indicate how many positions to fill in with a numeric value. In this case, using the default SDDLU routine, the LU name will be RA6K03.
6. VTAM builds a dynamic definition for the LU.

9.3 CS/AIX DDDLU Example

When CS/AIX initially starts an SSCP-PU session with the VTAM host, any dependent LUs on the CS/AIX link station that are defined statically in the

PU definition on the host will become active. CS/AIX dependent LUs that are not defined in the host PU definition will remain inactive until something in CS/AIX attempts to activate them. For instance, if the dependent LU is defined to a TN server connection and the client attempts to use the connection, CS/AIX will attempt to activate the LU.

CS/AIX does this by sending a Reply PSID NMVT to the host, indicating the type of LU being emulated (for example, a 3270 Model 002), and the LU address (host LOCADDR). This NMVT triggers VTAM to build an LU definition if necessary by passing the request to the SDDLU exit routine (ISTEXCSD).

The exit routine will use the LUGROUP parameter coded in the PU statement, and the LUSEED parameter on the PU to build the dynamic LU definition. The model/type information in the NMVT will be used to match an entry in the LUGROUP specifying the session characteristics, such as logmode.

Figure 55 shows a switched major node for the CS/AIX node. No LUs have been defined, although you could define any LUs that you don't want defined dynamically. The name specified on the LUGROUP parameter matches the label on the LUGROUP definition in Figure 56 on page 78. The LUSEED parameter defines the naming convention for the LU. The # signs will be replaced by numbers.

```
RA6KS28 VBUILD MAXGRP=10,                                      X
               MAXNO=18,                                       X
               TYPE=SWNET
RAK60028 PU    ADDR=13,                                        X
               IDBLK=071,                                      X
               IDNUM=05294,                                    X
               LUGROUP=RS6KLU1,                                X
               LUSEED=RA6K##,                                  X
               MAXPATH=2,                                      X
               MAXDATA=265,                                    *
               MAXOUT=7,                                       *
               PACING=7,                                       *
               ANS=CONTINUE,                                   *
               PASSLIM=7,                                      *
               PUTYPE=2,                                       *
               DISCNT=(NO),                                    *
               MODETAB=ISTINCLM,                               X
               DLOGMOD=D4C32XX3,                               X
               USSTAB=US327X,                                  X
               SSCPFM=USSSCS,                                  X
               ISTATUS=ACTIVE,                                 *
               VPACING=8
```

Figure 55. VTAM Switched Major Node for RS600028 (RS6K28A)

```
RA6RS07 VBUILD TYPE=LUGROUP
RS6KLU1  LUGROUP
3270@    LU    DLOGMOD=D4C32XX3,USSTAB=US327X
```

Figure 56. VTAM LUGROUP Major Node for RS600028 (RS6KLUG)

Note: The "@" symbol is a wildcard. Any model/type string starting with these characters will use this entry if a more specific entry is not found.

Characters sent in by CS/AIX V5 for the LUGROUP device and model depend on the LU type chosen when defining the dependent LU in CS/AIX. For example, choosing 3270 Model 2 on the LU definition screen in Figure 57 will cause CS/AIX to send "32700002" as the model/type in the NMVT.

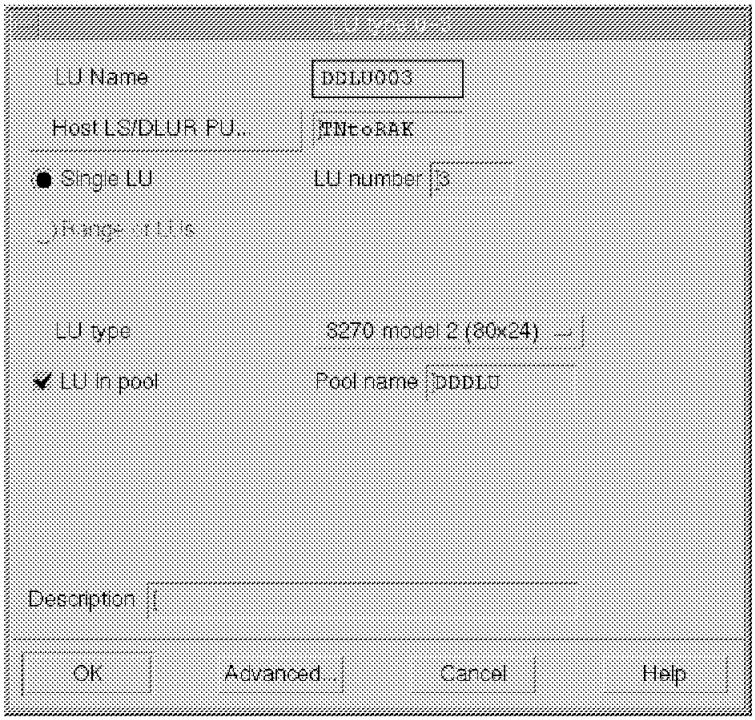

Figure 57. CS/AIX Dependent LU Definition

9.3.1 Reply PSID NMVT

Figure 58 on page 79 shows the Reply Product Set ID (PSID) NMVT taken from a trace. A request for the LU prompted CS/AIX to send the NMVT to VTAM, requesting an LU with an address of 03 and the device type of

32700002. The device type is matched to an entry in the VTAM LUGROUP to determine the characteristics of the session that should be used.

The host will then respond with a positive response for the NMVT and follow it with an ACTLU.

```
SND>> NMVT    RQD1                      LFSID:00000 TOKEN0.tok0.TNtoRAK
TH:   2C 00 00 00 00 00  BBIU EBIU          OAF:00 DAF:00 SNF:0000
RH:   0B 80 00        FMD FI                      BC EC
RU:   41038D00 00000010 003F0090 0A0400100   ................ A........?......
      00000000 00030D82 0510F0F0 F0032001   .......b..000... ..............  .
      03300219 10001611 09130012 F3F2F7F0  .............3270 .0..............
      F0F0F2F0 F0F0F0F0 F0F0F0F0 0B010910   002000000000.... ................
      610C160D 353B00                      /......          a...5;.
------------------------------------------------ 08:53:59.540 EST  22 Dec 1997
<<RCV NMVT    +RSP                      LFSID:00000 TOKEN0.tok0.TNtoRAK
TH:   2C 00 00 00 00 00  BBIU EBIU          OAF:00 DAF:00 SNF:0000
RH:   8B 80 00        FMD FI
RU:   41038D                               ...              A..
------------------------------------------------ 08:53:59.570 EST  22 Dec 1997
<<RCV ACTLU   RQD1                      LFSID:03000 TOKEN0.tok0.TNtoRAK
TH:   2D 00 03 00 02 F1  BBIU EBIU EFI      OAF:00 DAF:03 SNF:02F1
RH:   6B 80 00        SC  FI                      BC EC
RU:   0D0201                               ...              ...
------------------------------------------------ 08:53:59.570 EST  22 Dec 1997
SND>> ACTLU   +RSP                      LFSID:03000 TOKEN0.tok0.TNtoRAK
TH:   2D 00 00 03 02 F1  BBIU EBIU EFI      OAF:03 DAF:00 SNF:02F1
RH:   EB 80 00        SC  FI
RU:   0D010100 85800000 0C060100 01000000   ....e........... ................
```

Figure 58. Reply PSID NMVT Trace Entry

Notes:

1. ″41038D″ - NMVT Header. The header is 8 bytes followed by MS subvectors.
2. ″003F0090″ - Reply PSID subvector. The length is X′3F′ bytes. The key for this subvector is ″0090″. Bytes X′4′-X′3F′ are subvectors. The subvectors start with a 1-byte length followed by a 1-byte key.
3. ″0A04″ - SNA Address List subvector. The last byte indicates the address ″03″.
4. ″0D82″ - Port-Attached Device Configuration Description subvector.
5. ″1910″ - Product Set ID subvector.
6. ″1611″ - Product ID subfield, containing the model and type.
7. ″0B01″ - Date/Time subvector.

For more information on the Reply PSID NMVT see *Systems Network Architecture: Management Services Formats*, GC31-8302.

Chapter 10. High Performance Routing

High Performance Routing (HPR) is a routing protocol for SNA APPN sessions. Communications Server for AIX V5 now supports HPR RTP in addition to HPR ANR protocols. In this chapter we will describe HPR, show how it is integrated into Communications Server for AIX, and provide an example of how it is used.

10.1 What is HPR?

The main features of HPR are:

- Non-disruptive session rerouting
- Exploits high-speed network technologies like ATM and frame relay
- Extension of APPN providing a seamless migration path
- Improves reliability and throughput
- Runs on existing hardware
- Uses class of service for route calculation
- Low implementation costs

HPR is divided into two functions, Automatic Network Routing (ANR) and Rapid Transport Protocol (RTP).

10.1.1 Automatic Network Routing (ANR)

ANR is a low-level routing mechanism that minimizes cycles and storage requirements for routing packets through intermediate nodes. It is estimated to be 3 to 10 times faster than current APPN routing. No intermediate or pre-committed buffers are needed. It provides the transport path between any two RTP endpoints in the network. The orginator of the packet explicitly defines the exact path on which the packet is to flow through the network; thus, ANR is a special implementation of a source-routing protocol. It is this source-routing quality that makes ANR so efficient. Each node only needs to read a small header to determine where to send the packet next. ANR is used to route all session traffic in an HPR network.

10.1.2 Rapid Transport Protocol (RTP)

The RTP layer of HPR provides end-to-end error recovery, selective retransmission, and non-disruptive session rerouting. It is a connection oriented, full-duplex protocol that piggybacks control information with data. There is minimal handshaking and fast connection setup and dissolution. It doesn′t handle session or presentation protocols. RTP segments to the size needed for the smallest link, ensuring that intermediate nodes do not have to segment and reassemble packets. RTP reassembles segments, provides

sequence checking, provides in-order delivery, and uses Adaptive Rate-Based (ARB) flow and congestion control. RTP uses connection time-outs to determine when to reroute a session. Path information is retained at RTP endpoints for management. The node must support RTP to be an connection end-point.

RTP establishes connections that are associated with a class of service. More than one session can flow over the connection. The data is transported using ANR. The connection path can be automatically rerouted in case of path failure. An HPR subnet is a group of contiguously interconnected HPR nodes. A node must be part of an HPR subnet before it can take advantage of HPR features.

10.1.2.1 Adaptive Rate-Based (ARB) Flow and Congestion Control

ARB is implemented at RTP endpoints, regulating the flow of data over an RTP connection by adaptively changing the sender′s rate based on feedback on the receiver′s rate. Rate-based flow control provides a much higher link utilization than earlier window-based flow control algorithms over high-speed networks. ARB prevents congestion instead of trying to correct congestion problems. This leads to less packet loss.

10.1.3 HPR vs. ISR

The traditional APPN routing method is called Intermediate Session Routing (ISR). With ISR, each node in the path is responsible for all the routing-related functions such as packet forwarding, flow control, segmentation/reassembly, and error recovery/retransmission. With HPR the functions are divided. HPR endpoints have the RTP function and do congestion control, segmentation/reassembly, error recovery and retransmission. In between the RTP endpoints are nodes with the ANR function. These nodes are responsible for packet forwarding and transmission priority.

ISR uses hop-by-hop window-based flow control (adaptive session-level pacing). HPR uses ARB, which is much better for today′s high-speed networks.

HPR is an evolutionary extension of APPN and migration is an easy task. It is implemented by software changes. No new hardware is necessary.

HPR nodes have full APPN functionality including ISR. They have the same control point functions including CP-CP sessions, topology database, directory service, and route selection. HPR nodes have APPN (pre-HPR) compatibility, supporting the same priorities as APPN and connection networks.

10.2 HPR and CS/AIX

Communications Server for AIX V4.2 included support for the ANR portion of HPR. Communications Server for AIX V5 has added support for the RTP portion of HPR. Now the RS/6000 can participate in an HPR network as an RTP connection endpoint for LU to LU sessions.

Configuration of HPR in CS/AIX is a simple task. The related parameters are in the port and link station profiles. xsnaadmin is a good way to see the parameters.

10.2.1 Port Definition

The HPR parameters on the port definition defined HPR capabilities on implicit link stations. The two parameters are:

`Use HPR on implicit links`

and

`Use HPR link-level error recovery`

By default the first parameter is set on and the second is set off.

10.2.2 Link Station Definition

The HPR parameters are in the advanced parameter section of the link station definition. The two parameters are:

`Use HPR`

and

`Use HPR link-level error recovery`

Both of these parameters are set on by default.

Setting these parameters on enables CS/AIX V5 to act as either an HPR endpoint or intermediate node. If the CS/AIX node is an endpoint for the APPC session, then the CS/AIX node will be an RTP endpoint. If it is not an endpoint for the APPC session, it will act as an intermediate, using ANR routing.

If the remote node the link station is connecting to does not support HPR, the link station will still activate but pre-HPR protocols will be used.

10.2.3 Displaying Status of RTP Sessions

The RTP status for this node can be seen by using the xsnaadmin tool. Click on **Services** → **HPR**. The window will show the remote LU names this node is connected to. Activating the link station and CP-CP sessions will

not create an RTP connection. RTP connections will be established once an LU-LU session using the link station is activated.

If you follow the above xsnaadmin path, you will see the following window:

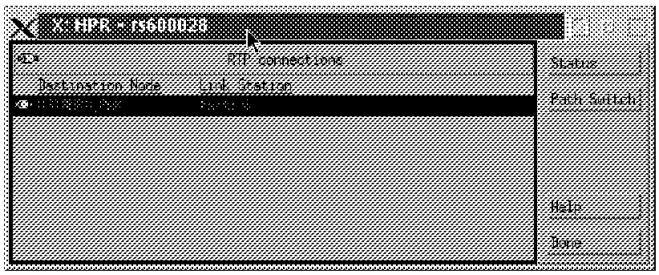

Figure 59. xsnaadmin HPR Information

You can see the status of each RTP connection or request a path switch. This is what you see when selecting status information:

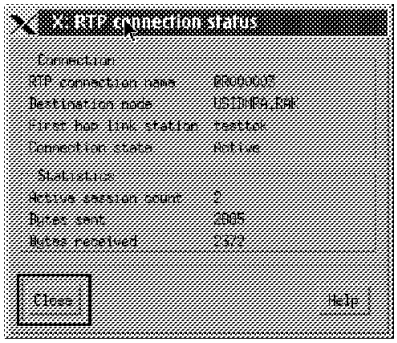

Figure 60. xsnaadmin RTP Status Information

10.3 HPR Example

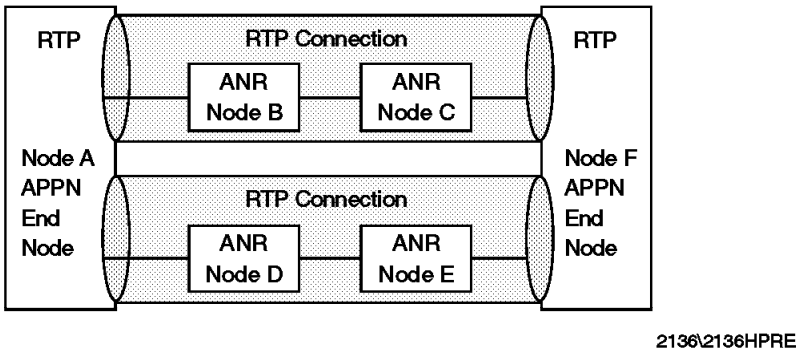

Figure 61. HPR Example Network

Assume that all the nodes in Figure 61 are RS/6000s running CS/AIX V5 and are configured to support HPR. When all the link stations between Node A and Node F are activated, two RTP connections are formed: one from Node A to Node F, going over Nodes B and C, and another from Node A to Node F, going over Nodes D and E.

An LU6.2 application is being used to transfer data from Node A to Node F. When the link station from Node A to Node B is activated, labels are assigned to each node for outgoing traffic over that link. This happens each time any link station that supports HPR traffic is activated. When the application starts sending data, these labels are used to establish the path the data will take through the network.

Nodes A and F are endpoints for the LU6.2 session so they become the RTP connection endpoints. Nodes B, C, D and E are intermediate nodes and provide ANR routing.

When the application first starts sending data, the RTP connection over Nodes B and C is used. The HPR components are communicating and know when a node has stopped responding to their communication.

If Node C becomes congested due to other traffic and stops responding to Node A′s requests, Node A will dynamically reroute the session traffic that was traveling over the above path to a new RTP connection. A new path must be available and support the same class of service that the session traffic requires. A new path in our network would be over Nodes D and E, assuming it met all the requirements above. The LU6.2 application never knows that there was a failure. The sessions run over the RTP connection and the RTP connection is what really gets rerouted. The sessions are not interrupted and any data that may have been lost is selectively retransmitted - all handled by HPR.

You can see that you must plan your HPR network carefully to take advantage of its benefits. Any mission-critical applications must have at least one backup path available to ensure rerouting.

Chapter 11. MultiPath Channel Protocol

There are two channel link types, Channel Data Link Control (CDLC) and MultiPath Channel (MPC). Until CS/AIX V4.2 enhancements, CDLC was the only protocol supported by CS/AIX. The PTFs required to use MPC with CS/AIX V4.2 can be found in the *Communications Server for AIX Channel Connectivity User's Guide*. CS/AIX V5 includes support for MPC without any PTFs.

MultiPath Channel protocol has several features and limitations including the following:

- Requires ESCON
- Requires MVS VTAM V4R3 or later
- Requires separate link stations for APPN and dependent traffic
- Offers newer, faster, and better availability
- Uses separate subchannels for read and write, which reduces control delay
- Uses SNA frame sizes up to 4 KB, but the frames may be blocked together so that up to 60 KB can be sent in a single channel transmission

The most important differences between MPC and CDLC are that MPC uses separate subchannels for reading and writing and frame sizes are independent of the IOBUF parameter. The CDLC protocol uses one channel for both reading and writing and the frame size is set with the VTAM IOBUF parameter. IOBUF is a global parameter, which makes tuning the CDLC channel connection very difficult.

11.1 MPC Configuration

Figure 62 on page 88 represents an ESCON connection between a RS/6000 (RS60007) and a S/390 running MVS (MVS18). Two subchannels are used for write operations and two for read. The subchannels defined for write on MVS must be defined for read on the RS/6000. The ESCON channels are routed through an ESCON Director.

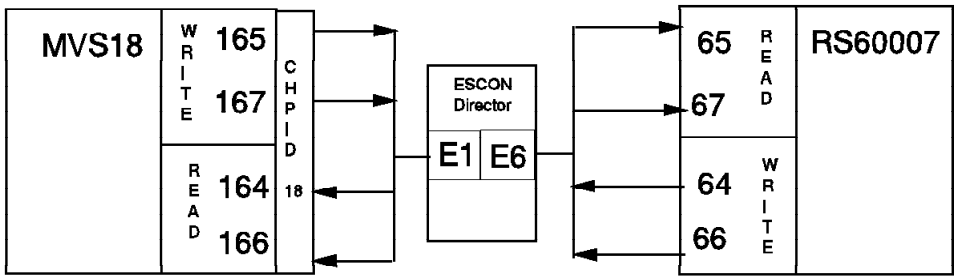

Figure 62. ESCON Channel Connection

Configuration is required on both the AIX and the host side.

11.1.1 AIX Configuration

Configuration for ESCON connectivity is done in two steps, ESCON definitions and CS/AIX definitions.

- Add ESCON subchannel definitions
- Add a fiber definition
- Add an MPC group definition

- Add a CS/AIX port definition
- Add a CS/AIX link station definition
- Add CS/AIX session definitions

11.1.1.1 Add Subchannel Definitions

To add a subchannel definition, use the fastpath **smit esca** → **Subchannel Definitions** → **Add a Subchannel**.

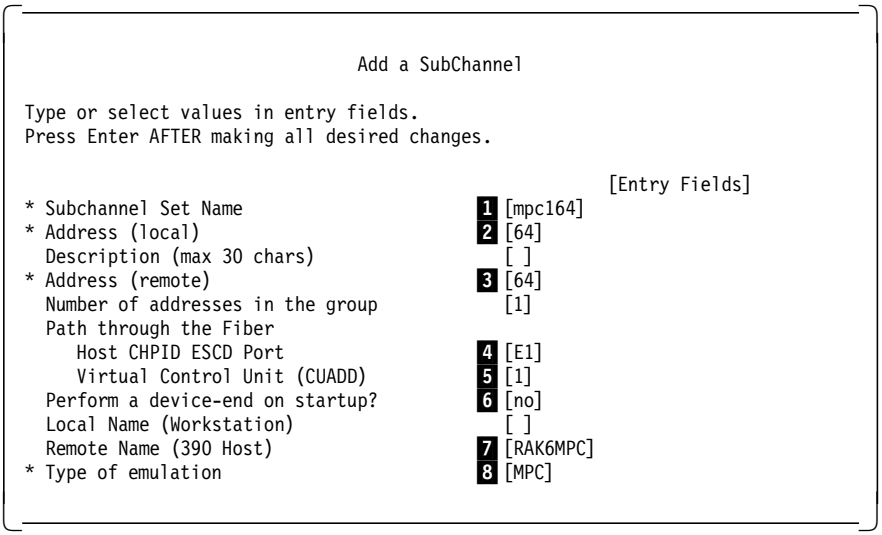

Figure 63. Adding an ESCON Subchannel

Notes:

1 Referenced in the Fiber and MPC Group definitions.

2, **3** The local and remote subchannel address for the link. They will usually match. The address is taken from the range of addresses in the IOCP UNITADD parameter.

4 If an ESCON director (ESCD) is being used, put the ESCD port number that has the fiber leading to the host.

5 Must match the CUADD parameter in the host IOCP.

6 Always no for SNA.

7 Doesn't need to match any AIX or host parameter.

8 Set to MPC. If you don't have the option to choose MPC, it means not all the necessary software is installed.

Figure 63 shows subchannel definitions being added for address 64. The same was done for 65, 66 and 67.

Changes or additions to subchannel definitions will not take effect until a reboot or the adapter has been taken offline and back online.

11.1.1.2 Add a Fiber Definition

From the smit esca fastpath, choose **Fiber Definitions** → **Add a Fiber**.

```
                          Add a Fiber Definition

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* Fiber label                            [RS6K7]
  Description (max 30 chars)             [ ]
* Location (slot number)                 1 [5]
* Subchannel-Set Name List               2 [mpc164 mpc165 mpc166 mpc167]
```

Figure 64. Adding an ESCON Fiber Definition

Notes:

1 Run the `lsdev -Cc adapter` command after adding the subchannel. The SCSI bus and slot number are listed.

2 The Subchannel Set Names are defined when the subchannels are defined.

Changes or additions to fiber definitions will not take effect until a reboot or the adapter has been taken offline and back online.

11.1.1.3 Add MPC Group Definition

From the smit esca fastpath, choose **Multipath Channel** → **MPC Group Definitions** → **Add an MPC Group**.

```
                            Add an MPC Group

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                            [Entry Fields]
* MPC Group Name                           [sna]
  Description (max 30 chars)               [ ]
* Inbound Subchannels                     1 [mpc165 mpc167]
* Outbound Subchannels                    2 [mpc164 mpc166]
```

Figure 65. Adding an ESCON MPC Group

Notes:

1 The Subchannel Set Names that will be used for reading by CS/AIX. They must be defined as ″write″ on the host end.

2 The Subchannel Set Names that will be used for writing by CS/AIX. They must be defined as ″read″ on the host end.

11.1.1.4 Add a Port Definition to CS/AIX

Use xsnaadmin and click on **Services** → **Connectivity** → **New Port** → **ESCON Channel card using MPC** to get the following window:

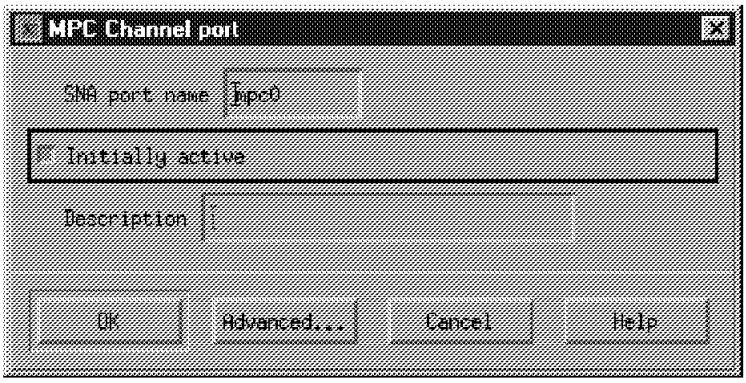

Figure 66. MPC Port Definition

11.1.1.5 Add a Link Station Definition

Use xsnaadmin and highlight the ESCON MPC port you just added. Click **Add** from the button list. Keep the default link station selection of port mpc0 and click **OK**. Figure 67 on page 92 shows the port definition for this example.

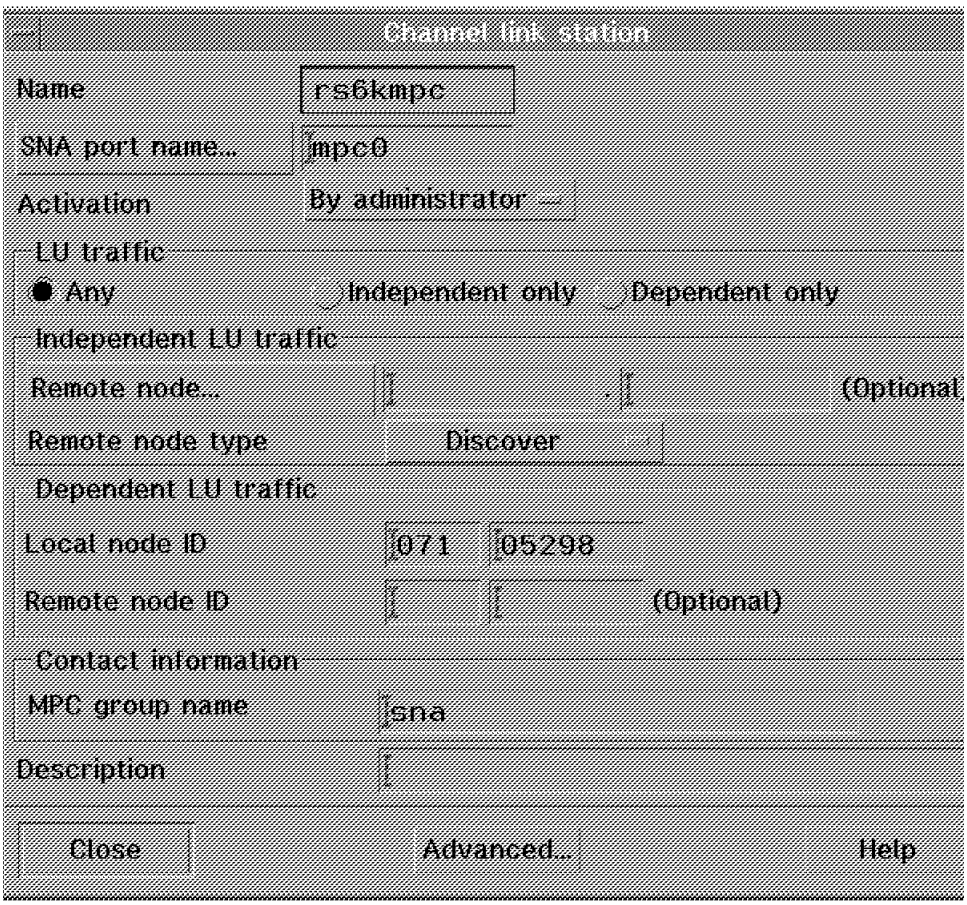

Figure 67. MPC Link Station

11.1.2 Host Configuration

Figure 68 on page 93 shows the IOCP definitions used on a 9121-480 running VM with the MVS system as a guest. The host and RS/6000 are connected over ESCON running through a 9032 ESCON director. Note that if you have run SNA over ESCON channels previously, this will look different from the definitions you were using. IOCP definitions for SNA connections prior to MPC used a UNIT type of 3791L. The UNIT type to specify for MPC is 3088.

```
         CHPID PATH=((18)),TYPE=CNC,SWITCH=E1
*
         CNTLUNIT CUNUMBR=160,UNIT=3088 1 ,PATH=(18) 2 ,
               CUADD=1 3 ,LINK=(E6) 4 ,UNITADD=((60,32) 5 )
DEV160   IODEVICE UNIT=3088,ADDRESS=(160,32) 6 ,CUNUMBR=(160)
*
```

Figure 68. IOCP Definitions for the ESCON MPC Channel Connection

1 UNIT=3088 is specified for MPC connections.

2 The fiber to the 9032 director is connected to host CHPID 18.

3 CUADD specifies a virtual control unit image on the AIX workstation. It must match the CUADD parameter in the AIX ESCON subchannel definitions (Figure 63 on page 89).

4 E6 is the 9032 port the RS6000 fiber is connected to.

5 The UNITADD parameter specifies a range of subchannel addresses defined with this definition. This CNTLUNIT entry defines 32 subchannel addresses starting with 60.

6 The IODEVICE macro assigns host addresses to the subchannel range specified in the CNTLUNIT macro. This system uses address 160 for subchannel 60, 161 for subchannel 61, and so on.

In our environment we are running MVS guests under VM. The IOCP and the MVS HCD are maintained separately. Figure 69 shows the HCD definitions for the MPC ESCON channel at address 164. There are HCD device definitions for each address we use (164-167).

```
                View Device Parameter / Feature Definition
Command ===> ____________________________________________

Configuration ID . : ESCON
Device number  . . : 0164           Device type  . . . : SCTC
Generic / VM device type  . . . . : SCTC

ENTER to continue.

Parameter/  Value    Req.  Description
Feature
OFFLINE     No             Device considered online or offline at IPL
DYNAMIC     No             Device has been defined to be dynamic
LOCANY      No             UCB can reside in 31 bit storage
```

Figure 69. HCD Definitions for the ESCON MPC Channel Connection

An MVS missing interrupt handler entry must be added for each MPC address to prevent reads from timing out on the channel. Figure 70 on page 94 shows the missing interrupt handler entries for these addresses in IECIOSxx in SYS1.PARMLIB.

```
MIH TIME=00:00,DEV=(164-165)                                    00022101
MIH TIME=00:00,DEV=(166-167)                                    00022201
```

Figure 70. MVS Missing Interrupt Handler

To run an MPC connection with VTAM, you must define a local major node and a transport resource list (TRLE) definition.

```
RAIAHHC VBUILD  TYPE=TRL
RA6K7CA 1 TRLE   LNCTL=MPC,                                     *
              READ=(164,166), 2                                 *
              WRITE=(165,167),                                  *
              MAXBFRU=9,      3                                 *
              REPLYTO=3.0     4
```

Figure 71. VTAM Definitions for the ESCON MPC Channel Connection

1 This must match the TRLE name specified in the PU macro for the connection (see Figure 72 on page 95).

2 Verify that the channel addresses you are reading from in VTAM are the addresses you are writing from in AIX.

3 MAXBFRU specifies the number of 4 KB buffer pages VTAM uses to receive data. The total buffer space used is:

```
MAXBFRU x 4K x number of read subchannels
```

The range for MAXBFRU is 1-16. The VTAM TNSTAT start option can be used to get statistics useful for determining how to tune this.

4 REPLYTO specifies how long VTAM waits for completion of an MPC XID I/O operation. If this timeout expires, a message is written indicating a timeout has occurred. After the XID completes, REPLYTO has no meaning.

```
RA6KLOC VBUILD TYPE=LOCAL
RA6KMPC  PU    TRLE=RA6K7CA,     1                          * X
               XID=YES,                                     * X
               HPR=YES,          2                          X
               LUGROUP=RS6KLU1,  3                          X
               LUSEED=RA6K##,    3                          X
               CONNTYPE=APPN,                               *
               DELAY=0.00,                                  * X
               CPCP=YES
RAMPC2 LU      LOCADDR=2,USSTAB=US327X,DLOGMOD=D4C3XX3   4
RAMPC3 LU      LOCADDR=3,USSTAB=US327X,DLOGMOD=D4C3XX3
RAMPC4 LU      LOCADDR=4,USSTAB=US327X,DLOGMOD=D4C3XX3
```

Figure 72. VTAM Definitions for the ESCON MPC Channel Connection

- **1** This must match the TRLE name in the TRL major node.
- **2** HPR RTP and ANR are supported over MPC.
- **3** Definitions to enable DDDLU for this PU.
- **4** Static dependent LU definitions.

Chapter 12. Dependent LU Requester (DLUR)

DLUR is an APPN feature that allows dependent LU sessions without a direct connection to a host. The Dependent LU Requester (DLUR) communicates with a Dependent LU Server (DLUS) over an APPN network. DLUR must be available on the node where the LUs are located but DLUR is not required on any intermediate nodes in the session route. The DLUS must have SSCP capabilities.

DLUR was previously available for LU types 1-3 and dependent LU6.2. Communications Server for AIX V5 extends that support to sessions that use generic SNA, secondary LU 0, and the new LUA API.

The session route between DLUR and DLUS can span multiple nodes and can take advantage of APPN features such as network management, dynamic resource location, and route calculation facilities.

A CP-CP session is established between the DLUR and DLUS and the dependent LU sessions are carried over an LU6.2 session between them. The LU6.2 session uses a special logmode, CPSVRMGR. Figure 73 on page 98 shows an overview of the DLUR function.

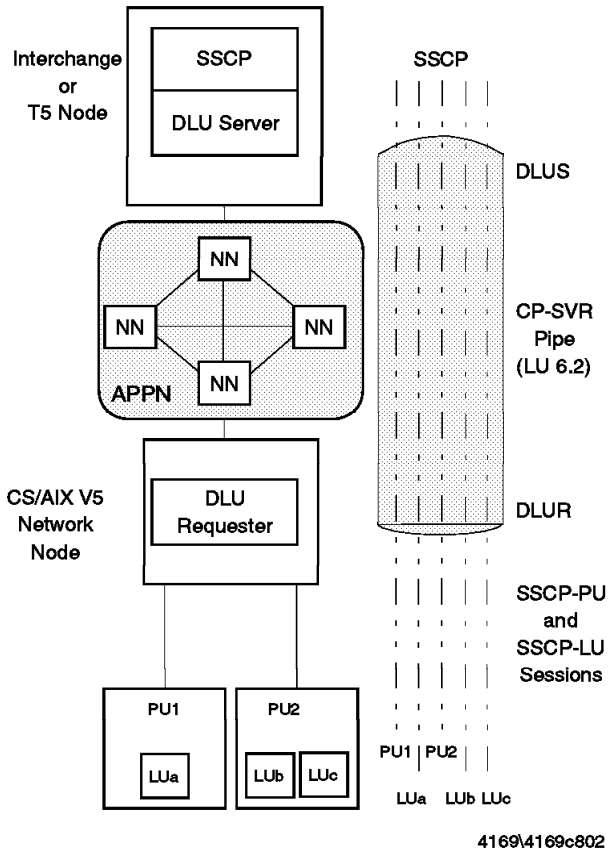

Figure 73. DLUR Overview

12.1 DLUR and Communications Server for AIX V5

There are two ways to configure DLUR with CS/AIX V5.

- As an APPN end node, to allow the RS/6000 to connect to an APPN network and use dependent LUs locally.
- As an APPN network node, to allow the RS/6000 to provide passthrough facilities for downstream nodes.

Note: You cannot configure DLUR on an APPN LEN Node.

Both the *IBM eNetwork Communications Server for AIX Administration Guide* and the *IBM eNetwork Communications Server for AIX Quick Beginnings* contain configuration steps for each type of DLUR configuration.

In the following sections, we will go into more detail and show you how a sample configuration would look.

12.1.1 CS/AIX as an APPN End Node

The configuration steps outlined in the *IBM eNetwork Communications Server for AIX Administration Guide* are:

- Define the node
- Configure connectivity to the APPN network
- Define a DLUR PU
- Define the local LUs

12.1.1.1 Define the Node

If this is the first configuration in CS/AIX V5, you will need to define the node. From xsnaadmin, click on **Services** → **Configure Node Parameters**. Figure 74 shows the node definitions for this example.

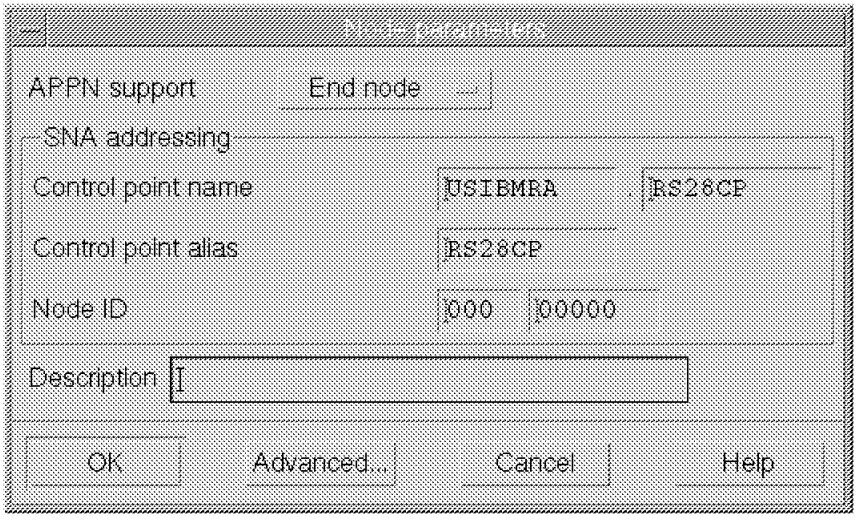

Figure 74. Node Definition

12.1.1.2 Connectivity to the APPN Network

If this is the first connection over an adapter, define a new port using xsnaadmin **Services** → **Connectivity** → **New Port** and select the appropriate card. In this example, the connection is over token-ring and all defaults were taken except the name.

Next, define a link station to the APPN network node server using the new port. Click on the new port and select **Add** from the button list. The option

to add a link station is selected by default, just click **OK**. Figure 75 on page 100 shows the new link station definition.

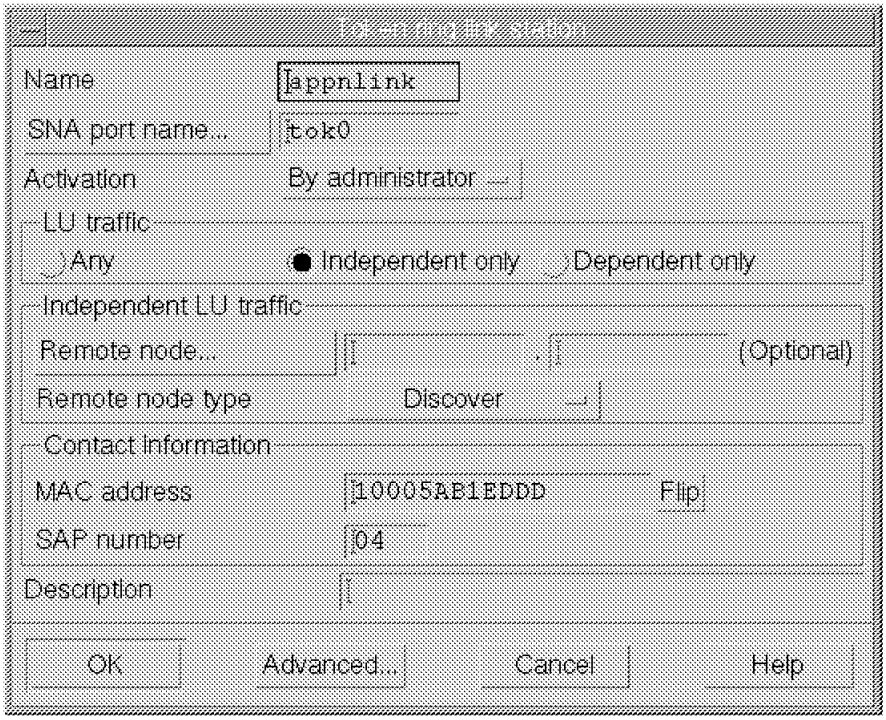

Figure 75. Link Station Definition

The APPN network node this link station connects to is another RS/6000 so there is no XID value. Only independent LU traffic will flow across this link. This field could also be set to Any.

12.1.1.3 Define a DLUR PU

The DLUR PU definition defines the dependent LU server (DLUS) name and the XID to be sent to the host. The XID will be used by the host to associate PU and LU definitions with this node. Using xsnaadmin, click on **Services** → **Connectivity** → **Add New DLUR PU**. Figure 76 on page 101 shows the definition.

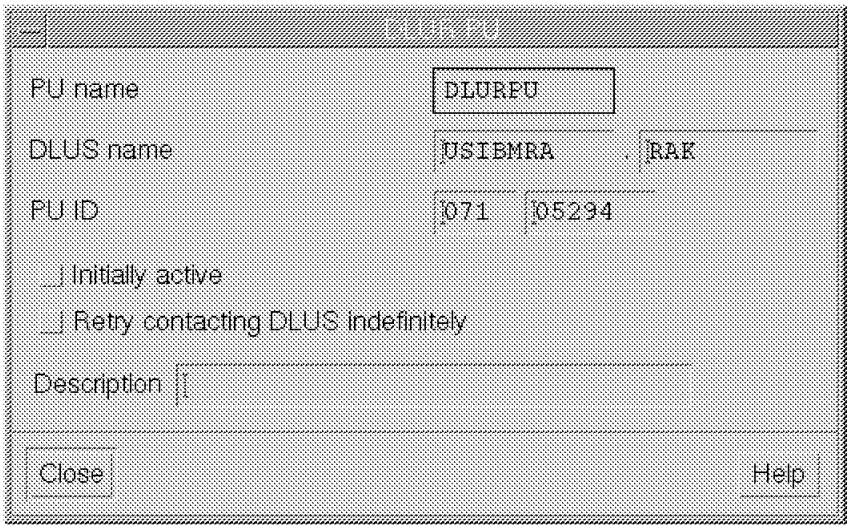

Figure 76. DLUR PU Definition

The PU name doesn't have to match anything. The DLUS name is the fully qualified control point name of the host acting as the DLUS.

The PU ID is the IDNUM/IDBLK value of a defined PU on the DLUS. You can specifically define the PU or have user-defined exits on the host that create the PU but the PU must be valid and have the dependent LUs that you want to use defined to it. If the connection to the host is a link station directly to the host (no intermediate nodes), the DLUR PU ID must be different from the node ID. Using the same IDNUM/IDBLK value for both will cause a sense code 08520002, duplicate session activation request. In this case there will be two PUs defined on the host, one for the node and one for the DLUR PU.

You must be able to locate the DLUS over the APPN network you are connected to.

12.1.1.4 Define the Local LUs

Now you define the dependent LUs that you will be using. With xsnaadmin, highlight the DLUR PU definition and select **Add** from the button list. Select the type of LU you are adding. The default is an LU for 3270 display. Figure 77 on page 102 shows the LU configuration for a range of LUs from address 2 through 10.

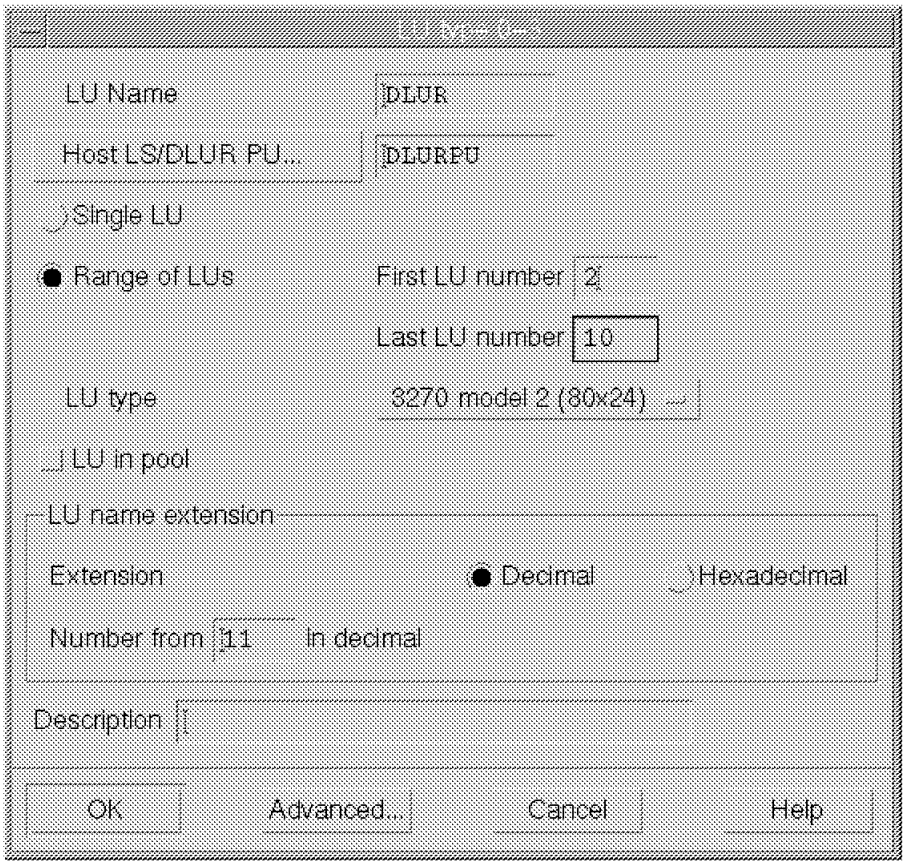

Figure 77. LU Definition

12.1.1.5 Activating the Resources

Now that the definitions have been added, they need to be activated in the following order:

- Activate the node.
- Start the link station to the APPN network. You should see two CP-CP sessions start.
- Start the DLUR PU.

The resources can be started by using xsnaadmin and clicking the **Start** button. Once everything is active, the xsnaadmin node window will look like Figure 78 on page 103.

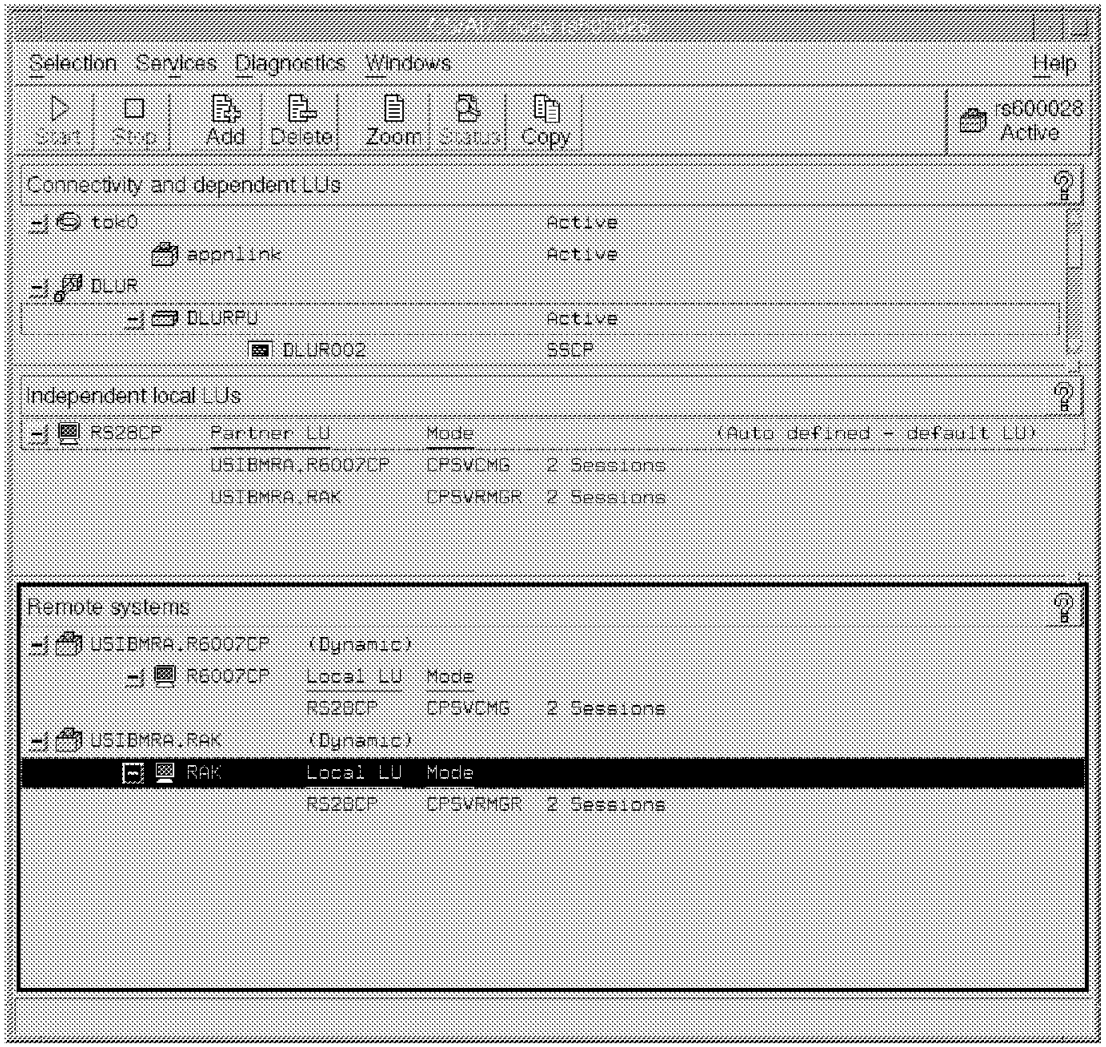

Figure 78. DLUR Configuration

Under the DLUR PU are the LUs with addresses 2-10. The scroll bar prevents you from seeing them all at the same time.

Notice the CPSVRMGR mode sessions. They are activated when the DLUR becomes active and are used for communication between the DLUR and DLUS.

12.1.2 CS/AIX as an APPN Network Node

DLUR is just one of the passthrough services that CS/AIX V5 supports. The RS/6000 in this scenario basically acts as a normal APPN network node. The RS/6000 has a link station to the host or to an APPN network with access to the host and it has link stations to downstream nodes. The downstream nodes have their own DLUR capability and pass through the RS/6000 on the way to the host DLU Server. The LUs are defined on the host side and the downstream node. The RS/6000 is the entry point into the APPN network for the downstream node.

Configuration is much shorter for passthrough DLUR. You need to do the following:

- Define the node
- Configure connectivity to the downstream node

12.1.2.1 Define the Node

For information on defining the node, refer to Figure 74 on page 99. The only difference is that now you select **Network Node** for the APPN support parameter.

12.1.2.2 Connectivity to the Downstream Node

There are several ways you can configure the link station to the downstream node. The options are:

- Add a specific link station to the downsteam node
- Add a non-selective link station
- Connect from the downstream node to the CS/AIX V5 port dynamically

To see a link station definition example, refer to Figure 75 on page 100. If the link station is non-selective, the remote link address parameter is blank. Only one non-selective link station is allowed per port.

It is not necessary to configure a DLUR PU or LUs on the CS/AIX V5 system.

12.1.3 DLUR In Action

CS/AIX V5 adds the capability for DLUR to provide access to dependent LUs for the new CS/AIX V5 TN Server function and for SNA Client Access for AIX. Using the configuration defined earlier, TN Server and SNA Client Access can be configured to use the DLUR connection. In this case, the RS/6000 is acting as a TN3270 or SNA Client Access server even though it has no direct connection to a host. The only SNA network connection is a link to another RS/6000 that is connected to a VTAM host. DLUR allows the APPN network to be used to transport dependent LU connections.

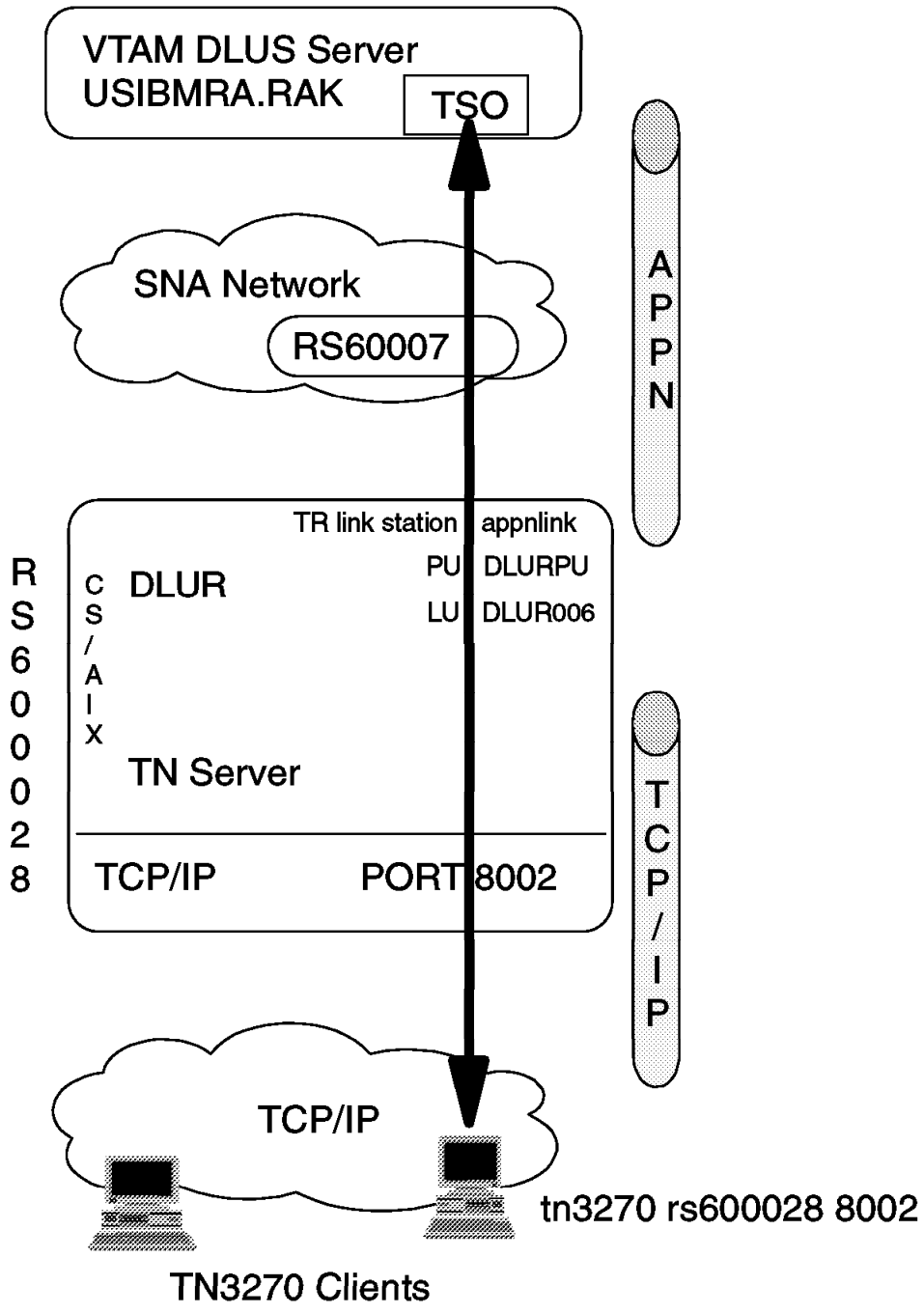

Figure 79. TN Server over DLUR

12.1.3.1 DLUR with TN Server

For assistance configuring the TN Server, refer to Chapter 7, “TN Server” on page 57. The node and DLUR link station were defined earlier in this chapter. The TN Server configuration is shown in Figure 80.

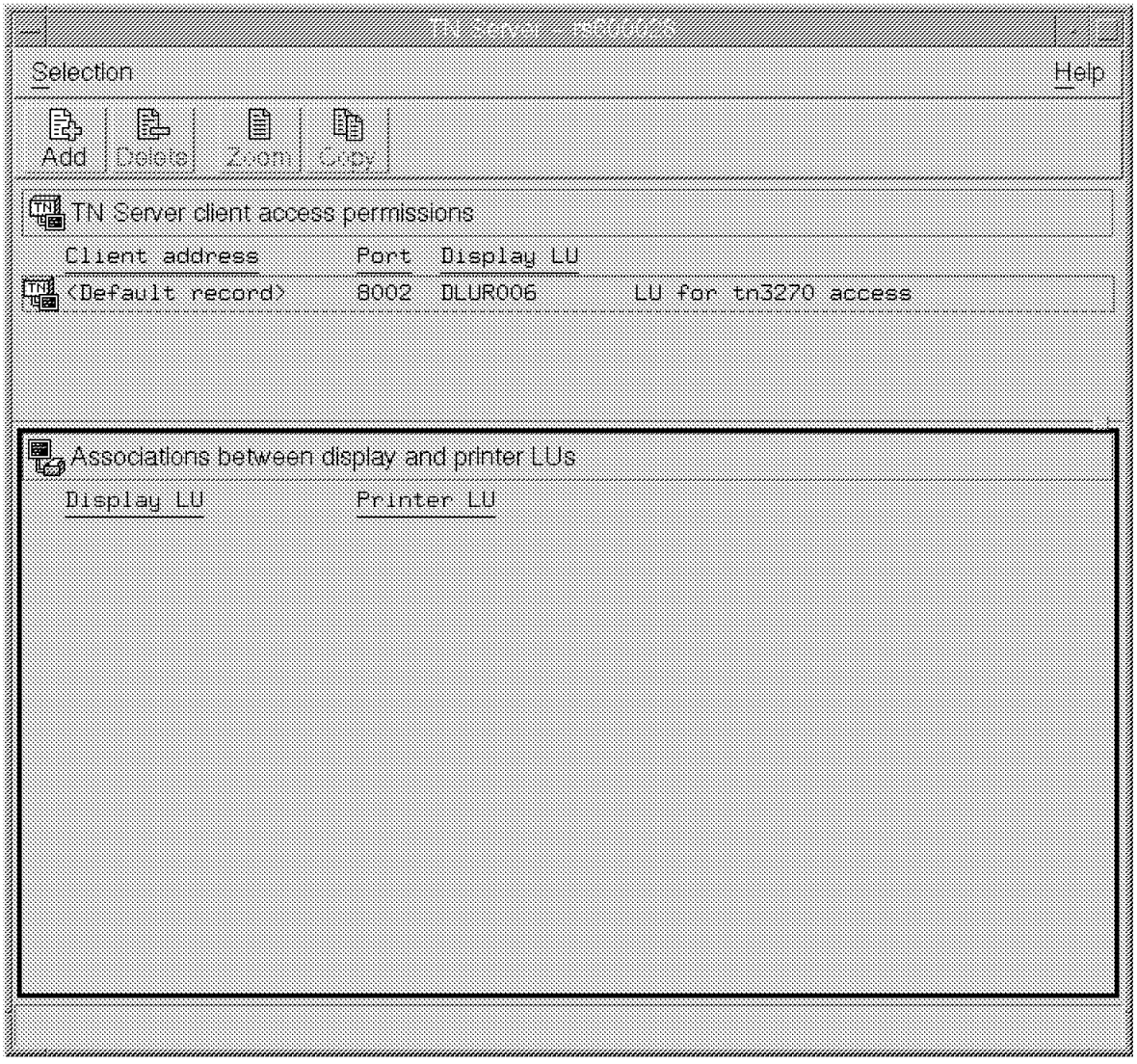

Figure 80. TN Server Configuration

The LU selected for the TN Server configuration was from the list of LUs defined to DLUR. Port 8002 was chosen at random to avoid having to share the Telnet port (23). A line for port 8002 was added to the /etc/services file.

Next, a TN3270 session was activated from a TCP/IP client by running:

```
tn3270 hostname port-number
```

and a host login screen was received. Figure 81 shows the xsnaadmin node window display while the session was active.

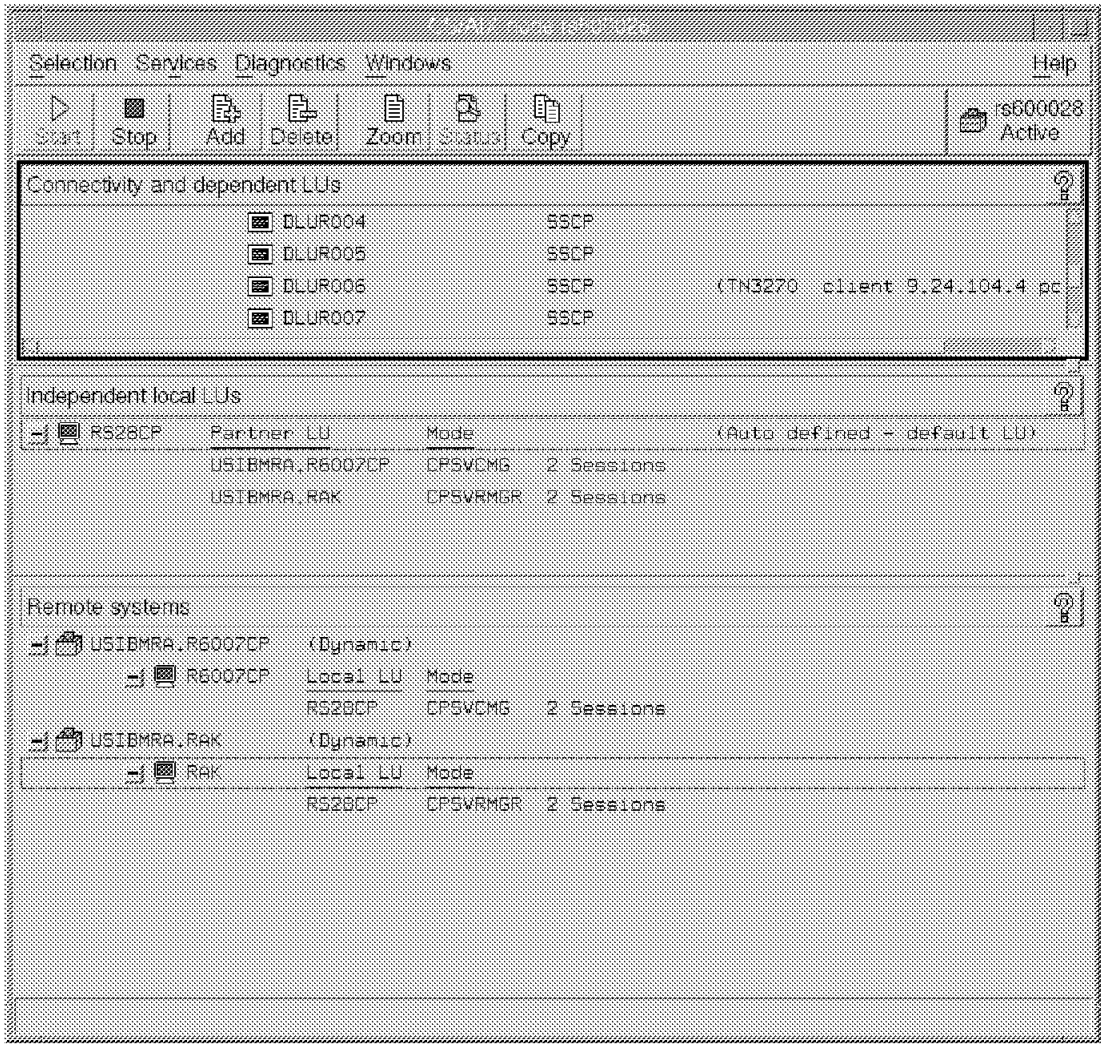

Figure 81. xsnaadmin Display with Active LU

You can see that DLUR006 has information to the right about what kind of session is established over the LU.

12.1.3.2 DLUR with SNA Client Access for AIX

The only change to use SNA Client Access as the tn3270 server for the DLUR LUs is to change the SNA Client Access configuration file to point to the DLUR PU and DLUR LUs instead of a separate link station and separate LUs added specifically for SNA Client Access.

12.1.3.3 VTAM Definitions

The definitions on VTAM for the DLUR PU are defined in a switched major node since the network connectivity is over a LAN. If the connection between CS/AIX and VTAM is a direct connection, the IDNUM value must be unique for the DLUR PU. It can not be the same as the IDNUM value (node ID) used for the CP-CP session.

```
RSCSAIX  VBUILD MAXGRP=10,                                          X
                MAXNO=18,                                           X
                TYPE=SWNET
RACSDLUR PU     ADDR=13,                                            X
                IDBLK=071,                                          X
                IDNUM=05294,                                        X
                LUGROUP=RS6KLU1,                                    X
                LUSEED=RA6KD##,                                     X
                MAXPATH=2,                                          X
                MAXDATA=265,                                        *
                MAXOUT=7,                                           *
                PACING=7,                                           *
                ANS=CONTINUE,                                       *
                PASSLIM=7,                                          *
                PUTYPE=2,                                           *
                DISCNT=(NO),                                        *
                MODETAB=ISTINCLM,                                   X
                DLOGMOD=D4C32XX3,                                   X
                USSTAB=US327X,                                      X
                SSCPFM=USSSCS,                                      X
                ISTATUS=ACTIVE,                                     *
                VPACING=8
RADLU2   LU     LOCADDR=2,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU3   LU     LOCADDR=3,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU4   LU     LOCADDR=4,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU5   LU     LOCADDR=5,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU6   LU     LOCADDR=6,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU7   LU     LOCADDR=7,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU8   LU     LOCADDR=8,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU9   LU     LOCADDR=9,DLOGMOD=D4C3XX3,USSTAB=US327X
RADLU10  LU     LOCADDR=10,DLOGMOD=D4C3XX3,USSTAB=US327X
```

Figure 82. VTAM Switched Major Node for the DLUR PU

A separate switched major node is needed to define the CS/AIX node in the case of direct connectivity between CS/AIX and VTAM. This would not be needed for the example in this chapter because there is an intermediate node between CS/AIX and VTAM. The definition in Figure 83 on page 109 is included for information only.

The switched major node definition is chosen by VTAM on activation by matching the CPNAME in the definition to the CP name sent in by CS/AIX. If the VTAM switched major node had been coded to use IDBLK and IDNUM instead of CPNAME, the value of IDBLK and IDNUM would have to match the node ID on the CS/AIX node definition.

```
RSCSAIX VBUILD MAXGRP=10,                                      X
               MAXNO=18,                                       X
               TYPE=SWNET
RACSAIX1 PU    ADDR=13,                                        X
               CPNAME=RS28CP,                                  X
               LUGROUP=RS6KLU1,                                X
               LUSEED=RA6K##,                                  X
               MAXPATH=2,                                      X
               MAXDATA=265,                                    *
               MAXOUT=7,                                       *
               PACING=7,                                       *
               ANS=CONTINUE,                                   *
               PASSLIM=7,                                      *
               PUTYPE=2,                                       *
               DISCNT=(NO),                                    *
               MODETAB=ISTINCLM,                               X
               DLOGMOD=D4C32XX3,                               X
               USSTAB=US327X,                                  X
               SSCPFM=USSSCS,                                  X
               ISTATUS=ACTIVE,                                 *
               VPACING=8
```

Figure 83. Switched Major Node Definition for the CS/AIX Node

Chapter 13. ATM

Communications Server for AIX V5 can connect through ATM networks using ATM LAN emulation (LANE). Depending on the configuration, the ATM software will emulate a token-ring or an Ethernet device.

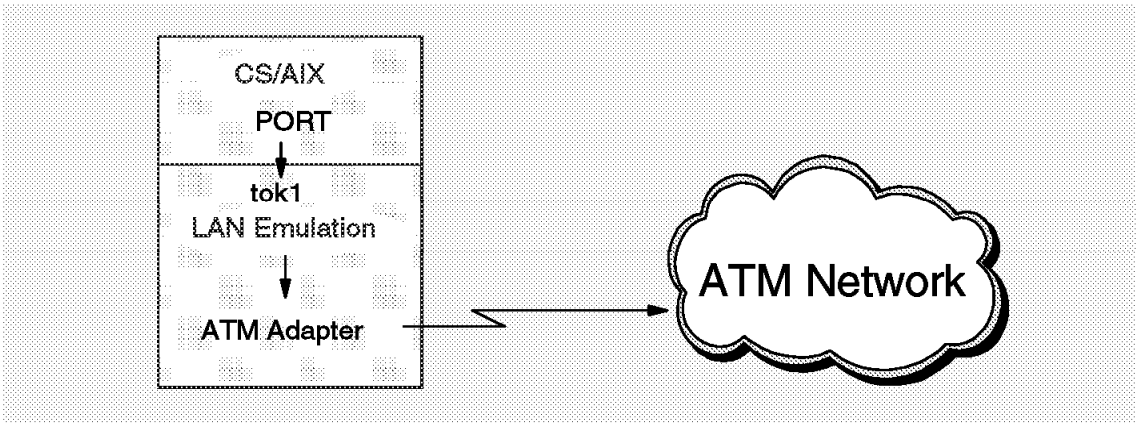

Figure 84. CS/AIX SNA over ATM

The steps for configuring SNA over ATM LANE are:

1. Configure the adapter.
2. Create the ATM LAN emulation definitions (Ethernet or token-ring).
3. Create the CS/AIX port.
4. Create the CS/AIX link station.

Note: ATM LAN emulation is supported on AIX 4.1.5 with RPQ P91164 and is also supported with AIX V4.2.1

13.1 Configuring the ATM Adapter

Configuring the ATM adapter should not be a problem if you have installed the corresponding file set. Table 5 shows some of the supported adapters and the corresponding file sets.

Table 5 (Page 1 of 2).

Adapter Bus type	Adapter name	Corresponding file sets
MCA	Turboways 100 ATM Adapter	devices.mca.8f7f

Table 5 (Page 2 of 2).		
Adapter Bus type	**Adapter name**	**Corresponding file sets**
MCA	Turboways 155 ATM Adapter	devices.mca.8f67
MCA	Turboways 155 UTP/STP	devices.mca.8f64
PCI	Turboways 155 MMF ATM Adapter	devices.pci.14107c00
PCI	Turboways 25 ATM Adapter	devices.pci.14105300
PCI	Turboways 155 UTP	devices.pci.14104e00

The ATM adapter **atm0** was automatically detected after installing the adapter and rebooting AIX. The ATM network card configuration is done with the smit path **smitty atm** → **Adapter** → **Change / Show Characteristics of an ATM adapter**.

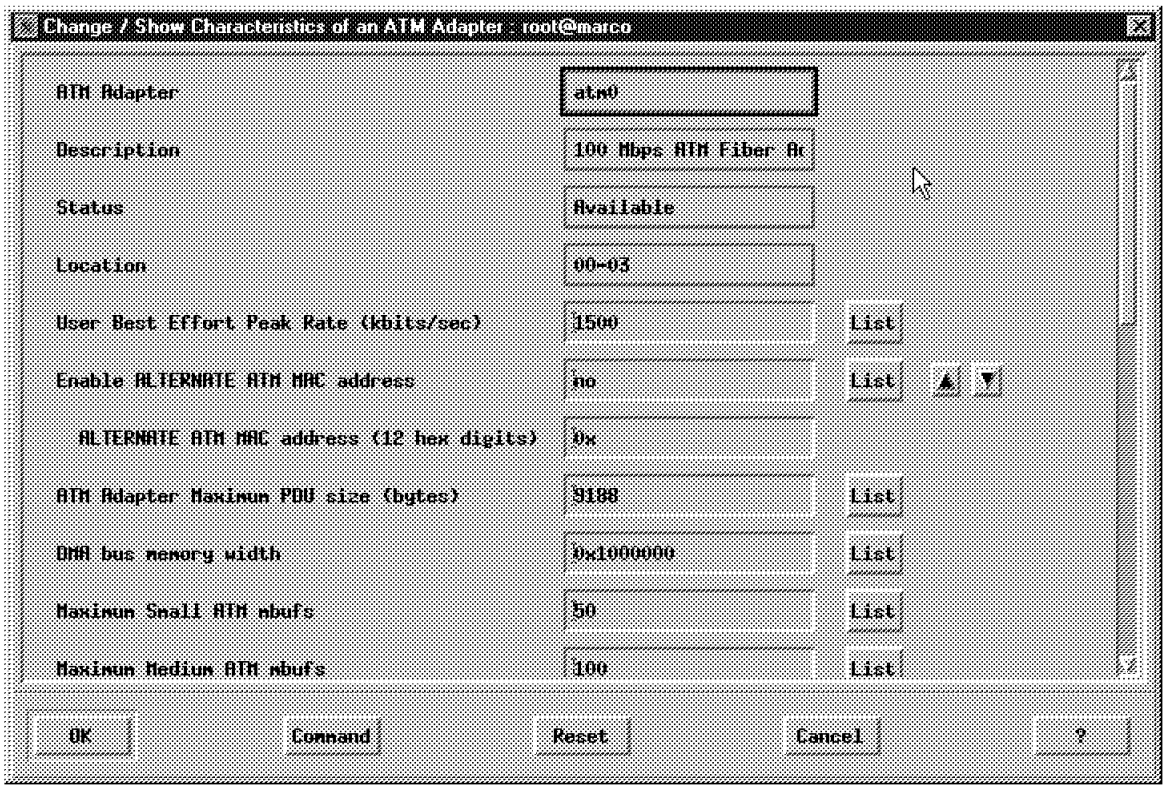

Figure 85. ATM Adapter

13.2 Configuring Turboways 100 Mbps for LAN Emulation

Configuration for the ATM Adapter LAN emulation is done from SMIT. You can reach the configuration screens by selecting **SMIT** → **Devices** → **Communication** → **ATM Adapter** → **Services** → **LAN Emulation**. Figure 86 shows the ATM LAN emulation screen for Ethernet.

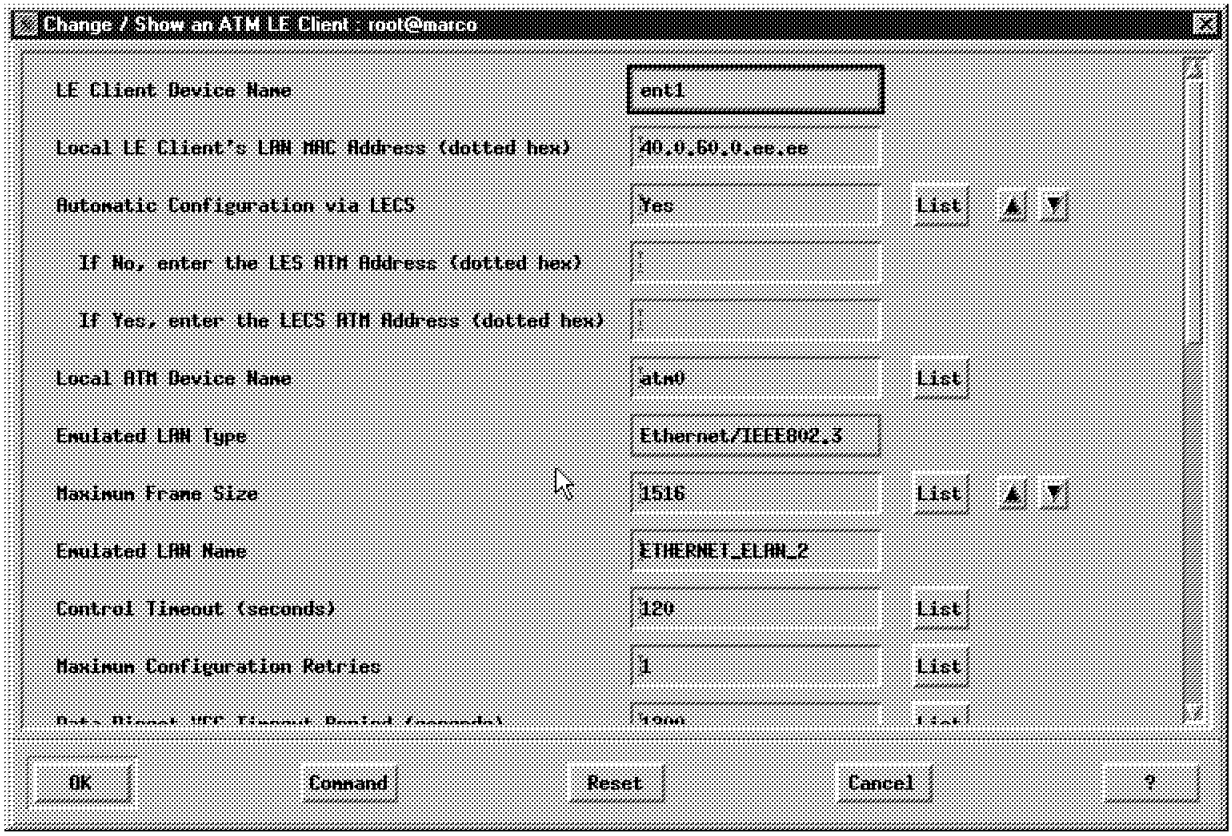

Figure 86. ATM Adapter Ethernet LAN Emulation

Figure 87 on page 114 shows the ATM LAN Emulation screen for token-ring.

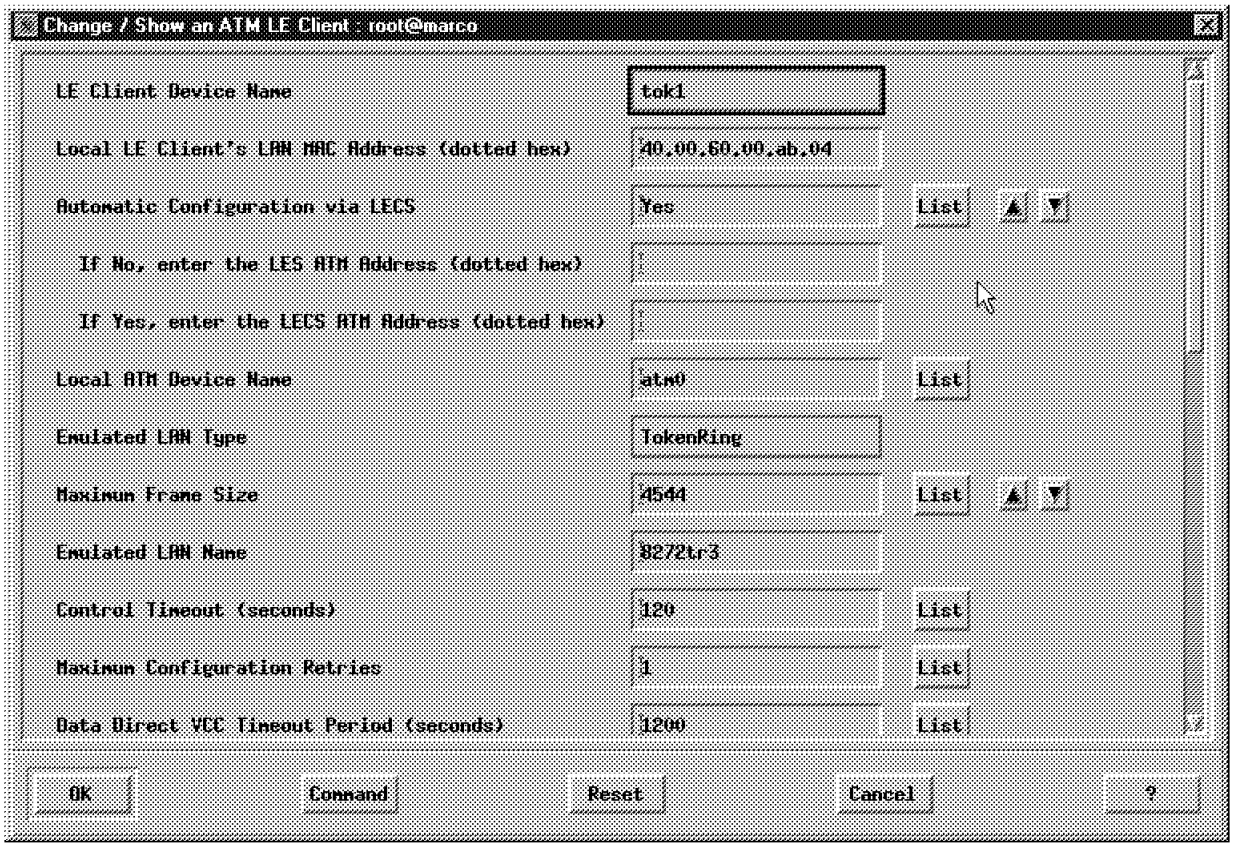

Figure 87. ATM Adapter Token-Ring LAN Emulation

Once the LAN emulation is defined the devices can be seen with the `lsdev -C -S a` command. In Figure 88 on page 115 you can see the real token-ring adapter is called tok0 and the real Ethernet adapter is called ent0. Further down in the list, you see the token-ring ATM LAN emulation interface, tok1, and the Ethernet ATM LAN emulation interface, ent1. A CS/AIX port needs to be defined to use each interface.

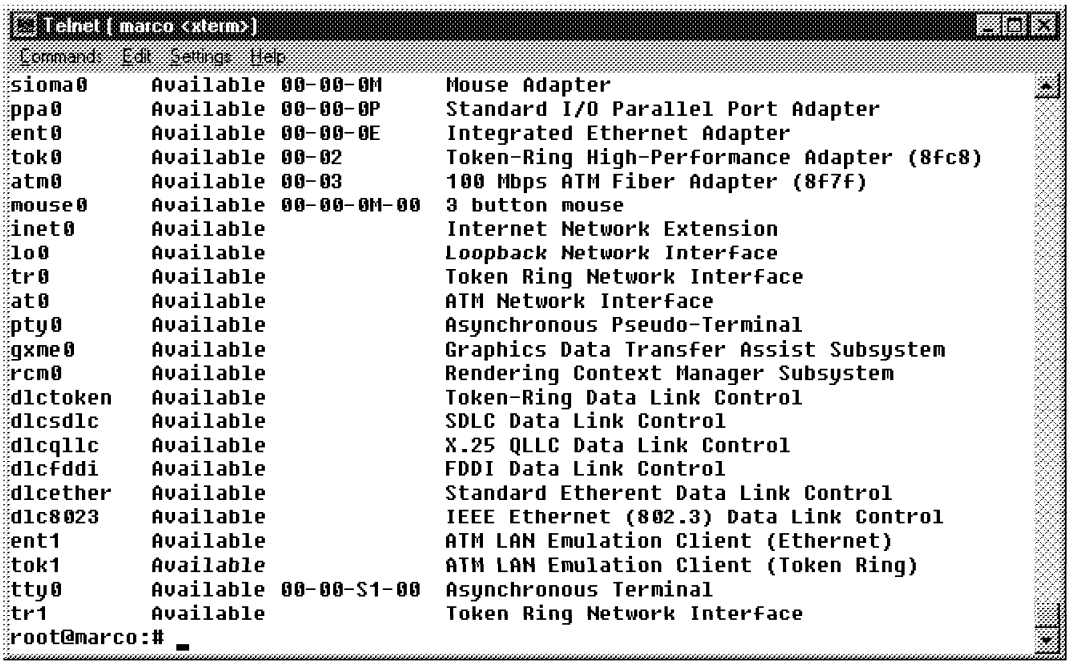

Figure 88. Adapter Listing

13.3 CS/AIX Configuration

From this point on, the CS/AIX configuration is normal. A port must be defined to use the LAN emulation devices. For example, a port for the token-ring LAN emulation interface would look like Figure 89 on page 116.

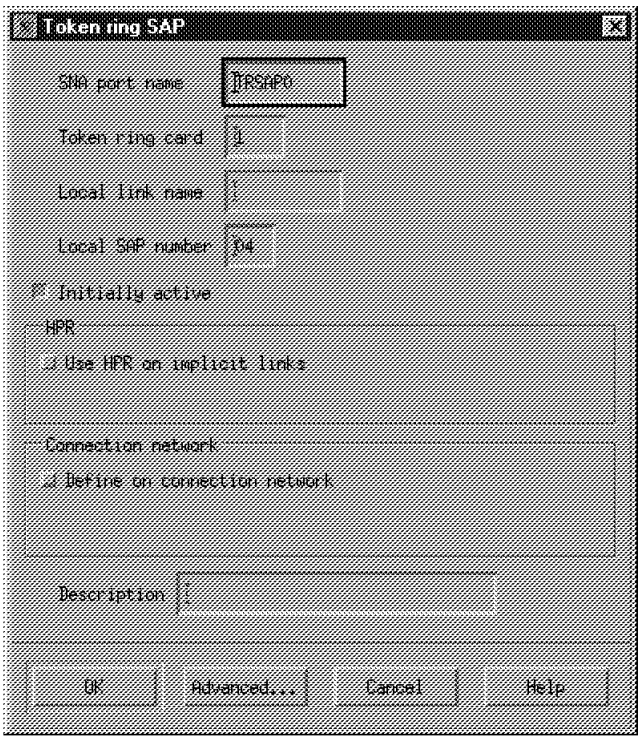

Figure 89. CS/AIX Port Definition for ATM LAN Emulation

The token-ring card field is the numeric part of the device name for the driver. In this case, the driver is tok1, so the token-ring card field is set to 1.

Links configured to use the ports would use the MAC address of the LAN emulation client, not the MAC (ESI) address of the ATM card (that is, not the MAC address registered with the ATM switch). This MAC address is found on an RS/6000 by entering `lscfg -v | more`.

```
tok1                            ATM LAN Emulation Client (Token
                                Ring)

      Network Address.............40006000AB04
      Displayable Message.........ATM TokenRing LAN Emulation
```

Chapter 14. Communications Server for AIX V5 Application Programming Interfaces

CS/AIX V5 provides APIs that are more compatible with the APIs provided by other products in the Communications Server family. The older CS/AIX APIs are supported for existing applications but any new applications should be written with the new APIs.

Transaction Programs (TPs) written for CS/AIX V4.2 are binary compatible with the APIs for CS/AIX V5. No modification is necessary. If your TP ran with CS/AIX V4.2, it will run with CS/AIX V5.

14.1 What APIs are Available?

The new APIs include:

- LUA

  This API is used for writing TPs to communicate over LU 0,1,2, or 3 sessions to a host. It uses RUs to send and receive over both the SSCP_LU and PLU-SLU sessions.

- NOF

  The NOF API is used to write applications to administer and configure CS/AIX. The xsnaadmin motif tool is an NOF application.

- CPI-C

  The CPI-C API is enhanced to support CPI-C Version 2.0+ and is backwards compatible with existing CPI-C applictions written for CS/AIX.

- APPC

  The APPC API is used to write either independent or dependent LU6.2 TPs.

- Common Service Verb (CSV)

  This API provides utility verbs that enable a TP to perform functions such as character set conversion and trace file control.

- Management Services (MS)

  This API supports network messaging functions.

The older APIs that are still supported in existing transaction programs include:

- Generic SNA
- LU 0

- Operating System Subroutines (LU types 1,2,3 and 6.2)
- Library Subroutines for TP Conversations (LU types 1,2,3 and 6.2)
- Library Subroutines for Network Management
- Management Services

14.2 Where to Go for Help

There is a programming reference available for each of the new APIs. The publications for IBM eNetwork Communications Server for AIX are listed in Appendix E, “Related Publications” on page 203

Chapter 15. Communications Server for AIX V5 Problem Determination and Diagnostics

This chapter describes the different types of problem determination tools that are available in CS/AIX V5. This includes logs, traces, online help and HTML publications.

15.1 Logs

By default when you start SNA, two logs are created and logging is started. They are the /var/sna/sna.err and /var/sna/sna.aud files.

15.1.1 sna.err

The sna.err file contains problem and exception information. The following screen is an example entry from the sna.err file.

```
10:43:48 EST  02 Dec 1997 512-261(0-10) P (rs600028)
ACTLU received for LU which is not defined locally,
and implicit LU definition is not supported.
Sense code         = 0x08060000
PU name            = RS28PU
NAU address        = 08
ACTLU RU :
0D0201
```

Figure 90. The sna.err File

This error message corresponds to a negative response to an ACTLU request sent in the line trace in Figure 96 on page 127. The trace entry is the one marked **7**. The negative response is sent because there is no session defined with the nau_address and link station name in CS/AIX V5 that matches the ACTLU request.

15.1.2 System Event Information

The sna.aud file contains normal system event information. The following screen is an example of an entry from the sna.aud file.

```
14:05:03 EST  02 Dec 1997 512-115(0-10) A (rs600028)
HPR-capable link station started.
Port name                 = tok0.000
LS name                   = RS28PU
Adjacent CP name          = USIBMRA.RAK
Adjacent CP type          = 02
TG number                 = 21
Last TG number            = 21
ANR Label                 = 90FF
Link level error recovery = 01
Adjacent RTP support      = 01
```

Figure 91. The sna.aud File

Note: This message shows that a link station was started.

There are two modes of logging, succinct and verbose. You can control the logging mode with xsnaadmin or the set_log_file command. If you choose succinct logging, you can use the snahelp command to get more detailed error information. The syntax is

```
snahelp message number
```

For example, snahelp provides the following information about the error in the sna.err file example, 512-261:

```
rs600028:/var/sna > snahelp 512-261
APPN     Message: 512 - 261, Cause Type: SNA

Cause:  ACTLU received for LU which is not defined locally, and
implicit LU definition is not supported. This typically indicates
a mismatch between this node and the host configuration.  The LU-SSCP
session will not be started; an ACTLU -ve response with the sense code
shown will be sent.
Action:  Either define the LU locally (using DEFINE_LOCAL_LU or
DEFINE_LU_0_TO_3 or DEFINE_LU_0_TO_3_RANGE), remove the LU
from the host configuration, or ignore if you do not want to use
this LU.
```

Figure 92. The snahelp Command

By default, CS/AIX V5 writes some error messages both to the console and to the sna.err file. You can suppress the messages at the console by starting SNA with the command:

```
sna start -s
```

15.2 Traces

There are three main types of traces: line traces, API traces, and TN server traces. It is recommended that you do not run traces unless you receive errors that require tracing to resolve, because traces degrade system performance.

15.2.1 Line Traces

Line traces capture data between the node and the DLC layer. You can trace a specific resource, such as a port, link station or session. The output is binary but can be formatted with the snatrcfmt command. The output is a standard SNA packet trace. This is equivalent to a link station trace in previous versions of CS/AIX. You would use this type of trace to debug problems starting link stations or sessions.

15.2.2 API Traces

API traces are available for each of the APIs. The output contains the input and output for each function and is written to a text file. You would use this trace to find problems within an SNA transaction program (TP). Usually you set up API tracing by using the SNATRC environment variable.

15.2.3 TN Server Traces

TN Server traces capture messages flowing between a CS/AIX TN server and its TN3270 client. The trace is written to text files and is used to track problems between the server and client.

15.3 Controlling Logs and Traces

In most cases, the logs and traces are controlled by either the xsnaadmin tool, the snaadmin command or both. Exceptions are explained in each section.

15.3.1 Logs

It is easiest to control logging from xsnaadmin. Just click on **Diagnostics** → **Logging**. You will get the following box. Make your selections and then click **OK**.

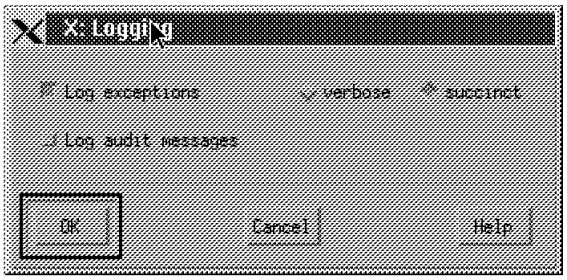

Figure 93. XSNAADMIN Log Window

You can also control the logs using the snaadmin command. The subcommands are query_log_type, set_log_type, query_log_file, and set_log_file. For more information on these commands refer to *IBM eNetwork Communications Server for AIX Administration Commands Reference*.

15.3.2 Traces

Each type of trace has specific commands or procedures for controlling it.

15.3.2.1 Line Traces

You can control line traces with xsnaadmin and the snaadmin command. From the main xsnaadmin window, select **Diagnostics** → **Node tracing**. Choose the type of trace(s) you want and then click **OK**. The following is the xsnaadmin Node trace window:

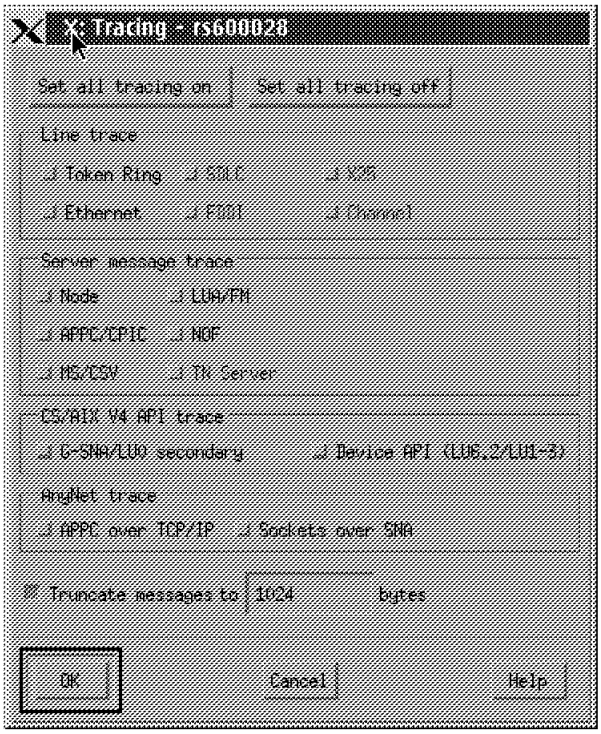

Figure 94. XSNAADMIN Trace Window

The snaadmin subcommands for controlling line traces are:

- set_trace_file
- add_dlc_trace
- query_dlc_trace
- query_trace_file
- query_trace_type
- remove_dlc_trace
- set_trace_type

15.3.2.2 API Traces

CS/AIX V4 API traces are controlled with xsnaadmin. CS/AIX V5 API traces are controlled with environment variables, not xsnadamin or the snaadmin command.

To start a CS/AIX V4 API trace, use xsnaadmin and choose **Diagnostics** → **Node tracing** as with a line trace. Select which type of API trace you would like to run and click **OK**. To see the Node tracing window, refer to Figure 94.

The following table defines and describes the environment variables used for CS/AIX V5 API traces.

Table 6. Environment Variables for API Tracing

Variable Name	Description	Example
SNATRC	Used to define the trace output file names and to determine when tracing begins. You can specify two file names, a backup and a primary. If you make the last field a colon, tracing is controlled by the transaction program with the CSV DEFINE_TRACE verb. You cannot specify the name of a device, such as /dev/tty1 or a print spooler as the trace file name.	export SNATRC=
SNATRACESIZE	Used to specify the maximum file size if you specify two file names with the SNATRC variable. If you only specify one file name, the size is unlimited.	export SNATRACESIZE=
SNACTL	Used to override the ability of a transaction program to control API tracing. Set this variable to any nonblank string to enable it. To cancel SNACTL, set it to a blank character.	export SNACTL=nonblank
SNATRUNC	Specifies the maximum size in bytes of each entry in the trace file.	export SNATRUNC=1024
SNATRCRESET	Determines if the trace file should be reset when the first trace entry is written. A value of YES means the trace file is reset; a value of NO keeps the trace file from being reset. The trace files will always be reset when the maximum size is reached.	export SNATRCRESET=NO, the default is YES

You can control tracing in automatically started TPs in the data file for that TP.

15.3.2.3 TN Server Traces

These traces capture messages between a CS/AIX TN server and its TN3270 client across the LAN. You can control them with xsnaadmin and the snaadmin command. The xsnaadmin path is the same as for starting a line trace (refer to Figure 94 on page 123).

The snaadmin subcommands are set_tn_server_trace and query_tn_server_trace. The output goes to /var/sna/snatnsv1.trc and /var/sna/snatnsv2.trc.

15.4 Interpreting Log and Trace Data

The logs are written to text files and no tools are needed to interpret them. The snahelp command is available for more information about error messages if you have succinct logging enabled. Refer to Figure 92 on page 120 for an example.

15.4.1 Interpreting Traces

The snafilter and snatrcfmt utilities are available to interpret line traces.

15.4.1.1 snafilter

The snafilter utility allows you to select specific entries from an unformatted, internal trace file. This allows you to diagnose your specific problem faster. The default input file name is /var/sna/sna1.trc. The default output file name is /var/sna/snafil.trc. You can filter based on the type of message, the PID of the TP, the conversation ID, the session ID, the lfsid, the instance ID, and by start/end date. Once the input is filtered, you can format it with the snatrcfmt command.

15.4.1.2 snatrcfmt

The snatrcfmt command formats the binary trace data into text files. The default input file name is /var/sna/sna1.trc. The default base name for output files is /var/sna/snatrc. One of more files will be created, depending on the type of trace. You will get a message data listing (.dmp) and/or a drawing showing the messages flowing between the CS/AIX V5 components (.drw). The type of output and the input and output file names are controlled by parameters. The following are some of the most commonly used snatrcfmt parameters:

```
-f  - set input file name. (Use -f - to read from standard input.)
-o  - set output file root
-r  - write dump file in raw hex format
-d  - write dump file with detailed message formatting
-D  - detailed formatting of RH and TH
-S  - summary formatting of DLC line trace
-b  - dump both send and dispatch records for a signal
-w  - create dump file only
-W  - create draw file only
-p  - set page size to nnn
-P  - produce continuous output
```

Figure 95. The snatrcfmt Command

15.4.2 Interpreting API Traces

API trace output is in text format, hex, EBCDIC, and ASCII. The format varies by the type of API. The file names are set by the API trace variables.

15.4.3 Interpreting TN Server Traces

TN Server trace output is in text format and is in hexidecimal, EBCDIC, and ASCII formats.

15.5 Line Trace Example

This example shows activating a token-ring link station to an IBM host. The link station has several LU2 sessions defined and HCON was used to start a 3270 emulation session.

```
1
SND>> CNCT_OUT REQ                                  tok0.000.tok0.000.RS2
------------------------------------------------ 10:44:08.790 EST  02 Dec
<<RCV CNCT_OUT RSP OK                               tok0.000.tok0.000.RS2
------------------------------------------------ 10:44:08.790 EST  02 Dec
SND>> XID (NULL)                                    tok0.000.tok0.000.RS2
------------------------------------------------ 10:44:08.800 EST  02 Dec
<<RCV XID (NULL)                                    tok0.000.tok0.000.RS2
------------------------------------------------ 10:44:08.800 EST  02 Dec
2
SND>> XID FMT:3 ID:07105294 ESI:PRE_NEG LR
:SEC      tok0.000.tok0.000.RS2
XID   32610710 52940000 003BD100 00000080   ./...m....J..... 2a..R....;..
      00010B41 000FDC00 00000001 000E0FF4   ...............4 ...A........
      E4E2C9C2 D4D9C14B D9E2F2F8 C3D71031   USIBMRA.RS28CP.. .......K....
      00301104 0E02F5F7 F6F5C4F2 F0F0F0F5   ......5765D20005 .0..........
      F0F01F06 C9C2D440 C3D6D4D4 E4D5C9C3   00..IBM COMMUNIC .......@....
      C1E3C9D6 D5E240E2 C5D9E5C5 D961C1C9   ATIONS SERVER/AI ......@.....
      E7                                    X                .
------------------------------------------------ 10:44:08.810 EST  02 Dec
<<RCV XID FMT:3 ID:FFFFFFFC ESI:PRE_NEG LR:NEG      tok0.000.tok0.000.RS2
XID   3479FFFF FFFC0000 10CB4100 00000080   .@@@.......... 4y........A.
      00010B70 000FDB00 00000007 00460909   ............... ...p........
      80000002 00000018 0E0CF4E4 E2C9C2D4   ..........4USIBM ............
      D9C14BD9 C1D20E08 F1D9C1D6 D5C3D7C1   RA.RAK..1RAONCPA ..K.........
      10370016 11011300 11F3F7F4 F5F1F7F0   .........3745170 .7..........
      F0F0F0F0 F3F0F0F1 F2201104 0E02F5F6   000030012.....56 ......... ..
      F4F8F0F6 F3F0F0F3 F0F30804 F0F7F0F3   4806300303..0703 ............
      F0F00709 96020910 32                  00..o....        ........2
------------------------------------------------ 10:44:09.020 EST  02 Dec
SND>> XID FMT:3 ID:07105294 ESI:NEG_PRCDG LR:SEC    tok0.000.tok0.000.RS2
XID   32670710 52940000 0037D100 00000080   .....m....J..... 2g..R....7..
      15010B41 000FDC00 00000001 000E0FF4   ...............4 ...A........
      E4E2C9C2 D4D9C14B D9E2F2F8 C3D71031   USIBMRA.RS28CP.. .......K....
      00301104 0E02F5F7 F6F5C4F2 F0F0F0F5   ......5765D20005 .0..........
      F0F01F06 C9C2D440 C3D6D4D4 E4D5C9C3   00..IBM COMMUNIC .......@....
      C1E3C9D6 D5E240E2 C5D9E5C5 D961C1C9   ATIONS SERVER/AI ......@.....
      E7610420 000190                       X/.....          .a. ...
------------------------------------------------ 10:44:09.030 EST  02 Dec
3
<<RCV RCVD_SET_MODE                                 tok0.000.tok0.000.RS2
------------------------------------------------ 10:44:09.040 EST  02 Dec
SND>> SET_MODE REQ (SEC)                            tok0.000.tok0.000.RS2
```

Figure 96 (Part 1 of 8). Line Trace Example

```
---------------------------------------------- 10:44:09.040 EST  02 Dec
<<RCV SET_MODE RSP OK                            tok0.000.tok0.000.RS2
---------------------------------------------- 10:44:09.040 EST  02 Dec
 4
SND>> BIND    RQD1                    LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 00 02 80 02  BBIU EBIU EFI ODAI OAF:02 DAF:00 SNF:8002
RH:   6B 81 00        SC  FI    PI               BC EC
RU:   31001307 B0B050B3 07878787 87070602   ......&..gggg... 1.....P.....
      00000000 00004014 2300000E E4E2C9C2   ...... .....USIB ......@.#...
      D4D9C14B D9E2F2F8 C3D72F00 0802C3D7   MRA.RS28CP....CP ...K....../.
      E2E5C3D4 C7090301 FB2B3B57 D81A490F   SVCMG.......Q... .........+;W
      04E4E2C9 C2D4D9C1 4BD9E2F2 F8C3D70A   .USIBMRA.RS28CP. ........K...
      1300E549 B7A5E06C 42CE000B E4E2C9C2   ..V..v\%....USIB ...I...lB...
      D4D9C14B D9C1D260 17E6FB2B 3B57D81A   MRA.RAK-.W....Q. ...K......+
      490EE4E2 C9C2D4D9 C14BD9E2 F2F8C3D7   ..USIBMRA.RS28CP I........K..
---------------------------------------------- 10:44:09.050 EST  02 Dec
<<RCV IPM                               LFSID:00010 tok0.000.tok0.000.RS2
TH:   2D 00 00 01 00 00  BBIU EBIU EFI      OAF:01 DAF:00 SNF:0000
RH:   83 01 00        FMD       PI
RU:   007FFF                                ."@              .[?.
---------------------------------------------- 10:44:09.080 EST  02 Dec
 5
<<RCV ACTPU   RQD1                      LFSID:00000 tok0.000.tok0.000.RS2
TH:   2D 00 00 00 06 F5  BBIU EBIU EFI      OAF:00 DAF:00 SNF:06F5
RH:   6B 80 00        SC  FI                   BC EC
RU:   11020105 00000000 14                  .........        .........
---------------------------------------------- 10:44:09.090 EST  02 Dec
SND>> ACTPU   +RSP                      LFSID:00000 tok0.000.tok0.000.RS2
TH:   2D 00 00 00 06 F5  BBIU EBIU EFI      OAF:00 DAF:00 SNF:06F5
RH:   EB 80 00        SC  FI
RU:   11124040 40404040 40400000 07010000   ..        ......  ..@@@@@@@@..
      00000000                              ....              ....
---------------------------------------------- 10:44:09.410 EST  02 Dec
 6
<<RCV ACTLU   RQD1                      LFSID:02000 tok0.000.tok0.000.RS2
TH:   2D 00 02 00 06 F6  BBIU EBIU EFI      OAF:00 DAF:02 SNF:06F6
RH:   6B 80 00        SC  FI                   BC EC
RU:   0D0201                                ...               ...
---------------------------------------------- 10:44:09.410 EST  02 Dec
SND>> ACTLU   +RSP                      LFSID:02000 tok0.000.tok0.000.RS2
TH:   2D 00 00 02 06 F6  BBIU EBIU EFI      OAF:02 DAF:00 SNF:06F6
RH:   EB 80 00        SC  FI
RU:   0D010100 85800000 0C060100 01000000   ....e...........  ............
---------------------------------------------- 10:44:09.430 EST  02 Dec
<<RCV ACTLU   RQD1                      LFSID:08000 tok0.000.tok0.000.RS2
TH:   2D 00 08 00 06 FC  BBIU EBIU EFI      OAF:00 DAF:08 SNF:06FC
RH:   6B 80 00        SC  FI                   BC EC
RU:   0D0201                                ...               ...
---------------------------------------------- 10:44:09.490 EST  02 Dec
 7
SND>> ACTLU   -RSP 08060000             LFSID:08000 tok0.000.tok0.000.RS2
TH:   2D 00 00 08 06 FC  BBIU EBIU EFI      OAF:08 DAF:00 SNF:06FC
RH:   EF 90 00        SC  FI SD
RU:   08060000 0D                           .....             .....
---------------------------------------------- 10:44:09.500 EST  02 Dec
```

Figure 96 (Part 2 of 8). Line Trace Example

```
---------------------------------------------- 10:44:09.910 EST  02 Dec
<<RCV BIND    +RSP                     LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 02 00 80 02  BBIU EBIU EFI ODAI OAF:00 DAF:02 SNF:8002
RH:   EB 80 00        SC  FI
RU:   31001307 B0B050B3 00808787 80000602   ......&...gg.... 1.....P.....
      00000000 00000000 23000000 21000802   ............... ........#...
      C3D7E2E5 C3D4C709 0302FB2B 3B57D81A   CPSVCMG.......Q. ...........+
      490C05E4 E2C9C2D4 D9C14BD9 C1D20000   ...USIBMRA.RAK.. I.........K.
      6017E6FB 2B3B57D8 1A490EE4 E2C9C2D4   -.W....Q...USIBM ...+;W..I..
      D9C14BD9 E2F2F8C3 D7                  RA.RS28CP        ..K......
---------------------------------------------- 10:44:09.920 EST  02 Dec
 8
SND>> ATTACH  RQE1                     LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 00 02 00 01  BBIU EBIU     ODAI OAF:02 DAF:00 SNF:0001
RH:   0B 91 20        FMD FI    PI              CD BC EC
RU:   300502FF 0003D000 000422F0 F0F10017   ...@..}....001.. 0.........".
      0EE4E2C9 C2D4D9C1 4BD9E2F2 F8C3D7B0   .USIBMRA.RS28CP. ........K...
      A661B9ED 9B000108 010002BE 0A472CA0   w/.............. .a..........
      000C12C1 00000000 82840000            ...A....bd..     ............
---------------------------------------------- 10:44:09.920 EST  02 Dec
<<RCV IPM                              LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 02 00 00 00  BBIU EBIU EFI ODAI OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000002                           ...                 ...
---------------------------------------------- 10:44:10.070 EST  02 Dec
<<RCV FMD     RQE1                     LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 02 00 00 01  BBIU EBIU     ODAI OAF:00 DAF:02 SNF:0001
RH:   03 91 01        FMD       PI          CEB    BC EC
RU:   000C12C1 00000000 FEBE4000            ...A...... .     ..........@.
---------------------------------------------- 10:44:10.080 EST  02 Dec
SND>> IPM                              LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 00 02 00 00  BBIU EBIU EFI ODAI OAF:02 DAF:00 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000001                           ...                 ...
---------------------------------------------- 10:44:10.080 EST  02 Dec
SND>> ATTACH  RQD3                     LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 00 02 00 02  BBIU EBIU     ODAI OAF:02 DAF:00 SNF:0002
RH:   0B A1 81        FMD FI    PI    BB    CEB    BC EC
RU:   300502FF 0003D000 400422F0 F0F20017   ...@..}. ..002.. 0.......@.".
      0EE4E2C9 C2D4D9C1 4BD9E2F2 F8C3D7B0   .USIBMRA.RS28CP. ........K...
      A661B9ED 9B000108 010002C8 0A472DA0   w/.........H.... .a..........
      003712C3 03803006 370A4F22 B8123C00   ...C........... .7....0.7.O"
      F4E4E2C9 C2D4D9C1 4BD9E2F2 F8C3D706   4USIBMRA.RS28CP. ........K...
      370A4F22 B8123D00 F3E4E2C9 C2D4D9C1   ........3USIBMRA 7.O"..=.....
      4BD3E4D9 E2F2F8                       .LURS28          K......
---------------------------------------------- 10:44:10.090 EST  02 Dec
<<RCV IPM                              LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 02 00 00 00  BBIU EBIU EFI ODAI OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000003                           ...                 ...
---------------------------------------------- 10:44:10.250 EST  02 Dec
<<RCV FMD     +RSP                     LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 02 00 80 02  BBIU EBIU     ODAI OAF:00 DAF:02 SNF:8002
RH:   83 A0 00        FMD
```

Figure 96 (Part 3 of 8). Line Trace Example

```
------------------------------------------------ 10:44:10.300 EST  02 Dec
<<RCV BIND    RQD1                     LFSID:00020 tok0.000.tok0.000.RS2
TH:   2D 00 00 02 07 09  BBIU EBIU EFI      OAF:02 DAF:00 SNF:0709
RH:   6B 80 00        SC  FI                      BC EC
RU:   31001307 B0B050B3 3F879797 873F0602   ......&..gppg... 1.....P.?...
      00000000 00000000 2300000B E4E2C9C2   ............USIB ........#...
      D4D9C14B D9C1D221 000802C3 D7E2E5C3   MRA.RAK....CPSVC ...K...!....
      D4C70903 01D3D164 28ED87E2 0C04E4E2   MG...LJ...gS..US .......d(...
      C9C2D4D9 C14BD9C1 D2000EE4 E2C9C2D4   IBMRA.RAK..USIBM .....K......
      D9C14BD9 E2F2F8C3 D76014F8 D3D16428   RA.RS28CP-.8LJ.. ..K........
      ED87E20B E4E2C9C2 D4D9C14B D9C1D22B   .gS.USIBMRA.RAK. ...........K
      1B010119 46178015 0EE4E2C9 C2D4D9C1   .........USIBMRA ....F.......
      4BD9E2F2 F8C3D723 80000018 2C0A0708   .RS28CP......... K......#....
      C3D7E2E5 C3D4C740                     CPSVCMG          .......@
------------------------------------------------ 10:44:10.300 EST  02 Dec
SND>> BIND    +RSP                     LFSID:00020 tok0.000.tok0.000.RS2
TH:   2D 00 02 00 07 09  BBIU EBIU EFI      OAF:00 DAF:02 SNF:0709
RH:   EB 80 00        SC  FI
RU:   31001307 B0B050B3 00809787 80000602   ......&...pg.... 1.....P.....
      00000000 00004010 23000000 1D000802   ...... ......... ......@.#...
      C3D7E2E5 C3D4C702 03020F05 E4E2C9C2   CPSVCMG.....USIB ............
      D4D9C14B D9E2F2F8 C3D70000 2B1B0101   MRA.RS28CP...... ...K........
      19461780 150EE4E2 C9C2D4D9 C14BD9E2   ......USIBMRA.RS .F..........
      F2F8C3D7 23800000 186014F8 D3D16428   28CP.....-.8LJ.. ....#......
      ED87E20B E4E2C9C2 D4D9C14B D9C1D2     .gS.USIBMRA.RAK  ...........K
------------------------------------------------ 10:44:10.550 EST  02 Dec
<<RCV ATTACH  RQE1                     LFSID:00020 tok0.000.tok0.000.RS2
TH:   2C 00 00 02 00 01  BBIU EBIU          OAF:02 DAF:00 SNF:0001
RH:   0B 91 20        FMD FI    PI              CD BC EC
RU:   0E0502FF 0003D000 000422F0 F0F1000C   ...@..}....001.. ..........".
      12C10000 0000FEBE 4000                .A...... .       ........@.
------------------------------------------------ 10:44:10.560 EST  02 Dec
SND>> IPM                              LFSID:00020 tok0.000.tok0.000.RS2
TH:   2D 00 02 00 00 00  BBIU EBIU EFI      OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000001                           ...             ...
```

Figure 96 (Part 4 of 8). Line Trace Example

```
---------------------------------------------- 10:44:10.790 EST  02 Dec
SND>> ATTACH  RQD3                    LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 00 02 00 03  BBIU EBIU     ODAI OAF:02 DAF:00 SNF:0003
RH:   0B A0 81        FMD FI          BB    CEB    BC EC
RU:   300502FF 0003D000 400423F0 F0F10017   ...@..}. ..001.. 0.......@.#.
      0EE4E2C9 C2D4D9C1 4BD9E2F2 F8C3D7B0   .USIBMRA.RS28CP. ........K...
      A661B9ED 9B000108 010002D6 0A472EA0   w/.........O.... .a..........
      014D1310 00381311 19810901 E4E2C9C2   .(.......a..USIB .M...8......
      D4D9C108 02D9E2F2 F8C3D706 0323F0F3   MRA..RS28CP...03 ............
      F0168209 01E4E2C9 C2D4D9C1 0502D9C1   0.b..USIBMRA..RA ............
      D2060323 F0F3F105 9000E000 002E1549   K...031...\..... ...#........
      13010901 E4E2C9C2 D4D9C108 02D9E2F2   ....USIBMRA..RS2 ............
      F8C3D706 0423F0F3 F0110200 00000207   8CP...030....... .....#......
      CD0C02DF 2C0A0000 000000E3 121200DF   ...........T.... ....,.......
      00000E91 00010D00 FF000000 00000000   ...j....@....... ............
      0B920000 01311747 30252104 93102228   .k.........1... .....1.G0%!.
      96060110 23102206 81311032 C00D8200   o.......a...{.b. ....#.".1.2
      A911E2D5 C1E2E5C3 D4C70982 00110008   z.SNASVCMG.b.... ............
      40000704 8120121E 471C60E6 FB2B3B57    ...a.....-W.... @.... ..G..
      D81A480E E4E2C9C2 D4D9C14B D9E2F2F8   Q...USIBMRA.RS28 ..H........K
      C3D70000 003B050E 100009D9 E2F2F8C3   CP.........RS28C .....;......
      D7404000 F42B1100 12E4E2C9 C2D4D9C1   P  .4....USIBMRA .@@..+......
      4BD9E2F2 F8C3D740 404000F3 12E4E2C9   .RS28CP   .3.USI K......@@@..
      C2D4D9C1 4BD9C1D2 40404040 404000F3   BMRA.RAK      .3 ....K...@@@@
      33100030 11040E02 F5F7F6F5 C4F2F0F0   ........5765D200 3..0........
      F0F5F0F0 1F06C9C2 D440C3D6 D4D4E4D5   0500..IBM COMMUN .........@..
      C9C3C1E3 C9D6D5E2 40E2C5D9 E5C5D961   ICATIONS SERVER/ ........@...
      C1C9E70A 01081061 0C020F2B 37         AIX..../.....    .......a...+
---------------------------------------------- 10:44:10.970 EST  02 Dec
<<RCV FMD     RQD3                    LFSID:00020 tok0.000.tok0.000.RS2
TH:   2C 00 00 02 00 03  BBIU EBIU          OAF:02 DAF:00 SNF:0003
RH:   03 A1 00        FMD       PI                BC EC
RU:   00A71310 00381311 16810901 E4E2C9C2   .x.......a..USIB .....8......
      D4D9C105 02D9C1D2 060323F0 F1F11982   MRA..RAK...011.b ..........#.
      0901E4E2 C9C2D4D9 C10802D9 E2F2F8C3   ..USIBMRA..RS28C ............
      D7060323 F0F1F105 9000E000 00331549   P...011...\..... ...#........
      16010A01 E4E2C9C2 D4D9C140 0A02D9C1   ....USIBMRA ..RA ...........@
      D2C1D540 40400A04 23F0F1F1 40404040   KAN   ...011     ...@@@..#...
      0F020000 014E0061 0C020A2A 1500E900   .....+./......Z. .....N.a...*
      38121200 3480F002 E12E210A 0123F0F3   ......0.......03 8...4.....!.
      F5404040 40040200 000A10E4 E2C9C2D4   5    ......USIBM .@@@@.......
      D9C1400A 11D9C1D2 40404040 400A1223   RA ..RAK     ... ..@.....@@@@
      F0F3F540 404040                       035              ...@@@@
---------------------------------------------- 10:44:10.970 EST  02 Dec
---------------------------------------------- 10:44:10.970 EST  02 Dec
SND>> IPM                             LFSID:00020 tok0.000.tok0.000.RS2
TH:   2D 00 02 00 00 00  BBIU EBIU EFI      OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000001                          ...              ...
---------------------------------------------- 10:44:10.970 EST  02 Dec
SND>> FMD     +RSP                    LFSID:00020 tok0.000.tok0.000.RS2
TH:   2C 00 02 00 80 02  BBIU EBIU          OAF:00 DAF:02 SNF:8002
RH:   83 A0 00        FMD
```

Figure 96 (Part 5 of 8). Line Trace Example

```
------------------------------------------------- 10:44:10.970 EST  02 Dec
<<RCV FMD     +RSP                      LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 02 00 80 03  BBIU EBIU     ODAI OAF:00 DAF:02 SNF:8003
RH:   83 A0 00        FMD
------------------------------------------------- 10:44:10.980 EST  02 Dec
SND>> ATTACH  RQD3                      LFSID:02001 tok0.000.tok0.000.RS2
TH:   2E 00 00 02 00 04  BBIU EBIU     ODAI OAF:02 DAF:00 SNF:0004
RH:   0B A1 81        FMD FI    PI    BB    CEB    BC EC
RU:   300502FF 0003D000 400423F0 F0F10017   ...@..}. ..001.. 0.......@.#.
      0EE4E2C9 C2D4D9C1 4BD9E2F2 F8C3D7B0   .USIBMRA.RS28CP. ........K...
      A661B9ED 9B000108 010002D8 0A472EA0   w/.........Q.... .a..........
      014D1310 00381311 19810901 E4E2C9C2   .(.......a..USIB .M...8......
      D4D9C108 02D9E2F2 F8C3D706 0323F0F3   MRA..RS28CP...03 ............
      F0168209 01E4E2C9 C2D4D9C1 0502D9C1   0.b..USIBMRA..RA ............
      D2060323 F0F3F105 9000E000 002E1549   K...031...\..... ...#........
      13010901 E4E2C9C2 D4D9C108 02D9E2F2   ....USIBMRA..RS2 ............
      F8C3D706 0423F0F3 F0110200 00000307   8CP...030....... .....#......
      CD0C020F 2C0A0000 000000E3 121200DF   ...........T.... ....,.......
      00000E91 00010D00 FF000000 00000000   ...j....@....... ............
      0B920000 01311747 30252104 93102228   .k.........l... .....1.G0%!.
      96060110 23102206 81311032 C00D8200   o.......a...{.b. ....#.".1.2
      A911C3D7 E2E5C3D4 C7400982 00110080   z.CPSVCMG .b.... .........@..
      14000104 8120121E 471C60E6 FB2B3B57   ....a.....-W.... ..... ..G..
      D81A470E E4E2C9C2 D4D9C14B D9E2F2F8   Q...USIBMRA.RS28 ..G........K
      C3D70000 003B050E 100009D9 E2F2F8C3   CP.........RS28C .....;......
      D7404000 F42B1100 12E4E2C9 C2D4D9C1   P  .4....USIBMRA .@@..+......
      4BD9E2F2 F8C3D740 404000F3 12E4E2C9   .RS28CP   .3.USI K......@@@..
      C2D4D9C1 4BD9C1D2 40404040 404000F3   BMRA.RAK      .3 ....K...@@@@
      33100030 11040E02 F5F7F6F5 C4F2F0F0   ........5765D200 3..0........
      F0F5F0F0 1F06C9C2 D440C3D6 D4D4E4D5   0500..IBM COMMUN .........@..
      C9C3C1E3 C9D6D5E2 40E2C5D9 E5C5D961   ICATIONS SERVER/ ........@...
      C1C9E70A 01081061 0C020F2B 37         AIX..../.....    .......a...+
------------------------------------------------- 10:44:10.980 EST  02 Dec
<<RCV IPM                               LFSID:02001 tok0.000.tok0.000.RS2
TH:   2F 00 02 00 00 00  BBIU EBIU EFI ODAI OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000004                            ...             ...
------------------------------------------------- 10:44:11.160 EST  02 Dec
<<RCV FMD     RQD3                      LFSID:00020 tok0.000.tok0.000.RS2
TH:   2C 00 00 02 00 04  BBIU EBIU          OAF:02 DAF:00 SNF:0004
RH:   03 A1 00        FMD       PI                BC EC
RU:   00A71310 00381311 16810901 E4E2C9C2   .x.......a..USIB .....8......
      D4D9C105 02D9C1D2 060323F0 F1F11982   MRA..RAK...011.b ..........#.
      0901E4E2 C9C2D4D9 C10802D9 E2F2F8C3   ..USIBMRA..RS28C ............
      D7060323 F0F1F105 9000E000 00331549   P...011...\..... ...#........
      16010A01 E4E2C9C2 D4D9C140 0A02D9C1   ....USIBMRA ..RA ...........@
      D2C1D540 40400A04 23F0F1F1 40404040   KAN   ...011     ...@@@..#...
      0F020000 014F0061 0C020A2A 1500E900   ......./......Z. .....0.a...*
      38121200 3480F002 E12E210A 0123F0F1   ......0.......01 8...4.....!.
      F5404040 40040200 000A10E4 E2C9C2D4   5    ......USIBM .@@@@.......
      D9C1400A 11D9C1D2 40404040 400A1223   RA ..RAK     ... ..@.....@@@@
      F0F1F540 404040                       015              ...@@@@
```

Figure 96 (Part 6 of 8). Line Trace Example

```
---------------------------------------------- 10:44:11.160 EST  02 Dec
SND>> IPM                              LFSID:00020 tok0.000.tok0.000.RS2
TH:   2D 00 02 00 00 00  BBIU EBIU EFI      OAF:00 DAF:02 SNF:0000
RH:   83 01 00        FMD       PI
RU:   000001                           ...              ...
---------------------------------------------- 10:44:11.160 EST  02 Dec
SND>> FMD     +RSP                     LFSID:00020 tok0.000.tok0.000.RS2
TH:   2C 00 02 00 80 02  BBIU EBIU          OAF:00 DAF:02 SNF:8002
RH:   83 A0 00        FMD
---------------------------------------------- 10:44:11.170 EST  02 Dec
---------------------------------------------- 10:44:13.590 EST  02 Dec
 9
SND>> NOTIFY  RQD1                     LFSID:07000 tok0.000.tok0.000.RS2
TH:   2C 00 00 07 00 00  BBIU EBIU          OAF:07 DAF:00 SNF:0000
RH:   0B 80 00        FMD FI                    BC EC
RU:   8106200C 0E030001 00000040 40404040   a...........      .. ........@
      404040                                                  @@@
---------------------------------------------- 10:44:13.760 EST  02 Dec
<<RCV NOTIFY  +RSP                     LFSID:07000 tok0.000.tok0.000.RS2
TH:   2C 00 07 00 00 00  BBIU EBIU          OAF:00 DAF:07 SNF:0000
RH:   8B 80 00        FMD FI
RU:   810620                           a..              ..
---------------------------------------------- 10:44:13.770 EST  02 Dec
 10
RU:   4015D4E2 C7F1F040 E2D5C115 4015C9D5    .MSG10 SNA. .IN @......@....
      E3C5D9D5 C1E3C9D6 D5C1D340 E3C5C3C8   TERNATIONAL TECH ...........@
      D5C9C3C1 D340E2E4 D7D7D6D9 E340C3C5   NICAL SUPPORT CE .....@......
      D5E3C5D9 4015C696 99409396 87969540   NTER .For logon  ....@....@..
      83969494 81958440 A2A895A3 81A76B40   command syntax,  .......@....
      979985A2 A2408595 A3859940 15401540   press enter . .  .....@.....@
      15401540 4015405C 5C5C5C5C 5C404040   . .  . ******    .@.@@.@\\\\\
      40405C5C 5C5C5C40 40404040 5C5C5C5C     *****     **** @@\\\\\@@@@@
      5C5C4040 40404040 5C5C5C5C 40155C5C   **      **** .** \\@@@@@@\\\\
      40404040 405C4040 405C5C40 40405C5C        *   **   ** @@@@@\@@@\\@
      4040405C 40404040 40405C5C 40405C5C      *      **  ** @@@\@@@@@@\\
      40404040 5C5C4015 5C5C4040 40404040       ** .**       @@@@\\@.\\@@
      4040405C 5C404040 5C5C4040 40404040      **   **       @@@\\@@@\\@@
      40404040 5C5C4040 5C5C4040 40405C5C       **  **    ** @@@@\\@@\\@@
      40154040 5C5C5C5C 5C404040 405C5C5C    .  *****    *** @.@@\\\\\@@@
      5C5C5C5C 40404040 405C5C5C 5C5C5C40   ****     ******  \\\\@@@@@\\\
      40405C5C 40404040 5C5C4015 40404040     **    ** .     @@\\@@@@\\@.
      4040405C 5C40405C 5C404040 5C5C4040      **  **   **   @@@\\@@\\@@@
      405C5C40 40404040 40404040 5C5C4040    **         **   @\\@@@@@@@@@
      40405C5C 40154040 40404040 405C5C40     ** .       **  @@\\@.@@@@@@
---------------------------------------------- 10:44:13.810 EST  02 Dec
SND>> FMD     +RSP                     LFSID:07000 tok0.000.tok0.000.RS2
TH:   2C 00 00 07 00 01  BBIU EBIU          OAF:07 DAF:00 SNF:0001
RH:   83 80 00        FMD
```

Figure 96 (Part 7 of 8). Line Trace Example

```
---------------------------------------------- 10:44:16.440 EST  02 Dec
 11
SND>> NOTIFY  RQD1                      LFSID:07000 tok0.000.tok0.000.RS2
TH:   2C 00 00 07 00 01  BBIU EBIU          OAF:07 DAF:00 SNF:0001
RH:   0B 80 00        FMD FI                      BC EC
RU:   8106200C 0E010001 00000040 40404040   a.........      .. ........@
      404040                                             @@@
---------------------------------------------- 10:44:16.660 EST  02 Dec
<<RCV NOTIFY  +RSP                      LFSID:07000 tok0.000.tok0.000.RS2
TH:   2C 00 07 00 00 01  BBIU EBIU          OAF:00 DAF:07 SNF:0001
RH:   8B 80 00        FMD FI
RU:   810620                                a..             ..
---------------------------------------------- 10:44:18.700 EST  02 Dec
```

Figure 96 (Part 8 of 8). Line Trace Example

Notes:

1 Here the RS/6000 is sending a frame to the hardware address or LAA in the remote link address field of the link station definition. If there is no response, the address is not valid or something is keeping the remote node from receiving the request. Possible problems are source-route bridging disabled on token-ring networks, mismatched Ethernet protocol types or a down hub or bridge. You can find more information about this frame in the architecture manual specific to your physical link type.

2 This is the beginning of the XID 3 negotiation. At this time the control point names of each node and the capabilities of each node such as HPR support and the type of APPN node are exchanged.

3 RECVD_SET_MODE is equivalent to a SABME or SNRM request. It is sent by the node determined to be primary during XID 3 negotiation. SABME is sent over LAN connections and SNRM is sent over SDLC connections.

4 This is a BIND request for one of the control point-to-control point sessions. If during the XID 3 negotiation, it is determined that CP-CP sessions should activate, they activate as soon as the PU/link become active.

5 This is the ACTPU request. This RU is sent if the PU is enabled for SSCP-LU sessions, after the XID 3 negotiation is complete.

6 This is an ACTLU request from the host. It sends a ACTLU request for each dependent session defined under the PU that is not in an INOP or erroneous state.

7 The RS/6000 responds with a negative response to this particular ACTLU request because there is no 3270 definition for the nau_address of 8 over this link station in CS/AIX.

8 From here until note **9** is CP-CP session activation traffic. The sessions are established and LU information is exchanged.

9 The Notify request asked the host to enable the LU. This means that the MSG10 screen is sent to the RS/6000 and the user can log in.

10 Here you can see the MSG10 screen that is sent over the LU2 session.

11 This Notify requests the LU to be disabled. In our example, this is triggered by the <cntl>D <cntl>D sequence in an HCON session.

15.6 API Trace Example

Following is an API trace of the APPC Application Suite program, APING. U-shaped sessions betweem USIBMRA.RS6000CP and USIBMRA.ATEST were used for the test.

```
rs600028:/tmp/becky > aping USIBMRA.ATEST
IBM APING version 2.44 APPC echo test with timings.
Licensed Materials - Property of IBM
(C) Copyright 1994,1995 by IBM Corp. All rights reserved.
Licensed Materials - Property of IBM
(C) Copyright 1994,1995 by IBM Corp. All rights reserved.

Allocate duration:      160 ms
Program startup and Confirm duration:       20 ms

Connected to a partner running on: CS/AIX 5.0.0
        Duration        Data Sent        Data Rate        Data Rate
        (msec)          (bytes)          (KB/s)           (Mb/s)
        --------        ---------        ---------        ---------
              20              200              9.8            0.078
              30              200              6.5            0.052
Totals:       50              400              7.8            0.062
Duration statistics: Min = 20 Ave = 25 Max = 30
```

Figure 97. APING Test

The corresponding API trace for the APING follows.

```
]23302.00 CPIC   -------------------------------- 12:01:32.05 EST  03 Dec
 1
]23302.00 CPIC   CMINIT request
]23302.00 CPIC    Sym dest name = APINGD
]23302.00 NOF    -------------------------------- 12:01:32.05 EST  03 Dec
]23302.00 NOF    OPEN_FILE request, target 0
]23302.00 NOF    ---- Verb Parameter Block at address 2ff222a8 ----
]23302.00 NOF      F0040000 00000000 00000000 02000000     0.............
.............
]23302.00 NOF      00000000 00000000 00000000 00000000     .............
.............
]23302.00 NOF      00000000 00000000 00000000 00000000     .............
.............
]23302.00 NOF      00000000 00000000 00000000 00000000     .............
.............
]23302.00 NOF      00000000 00000000 00000000 00000000     .............
.............
]23302.00 NOF      00000000 00000000 00000000 00000000     .............
.............
```

Figure 98 (Part 1 of 12). API Trace

```
]23302.00 NOF      00000000                                ....@@@@@@@@@@
]23302.00 NOF    -------------------------------- 12:01:32.07 EST  03 Dec
]23302.00 NOF    OPEN_FILE response, target 1000000 ,result = OK
]23302.00 NOF    ---- Verb Parameter Block at address 2ff222a8 ----
]23302.00 NOF      F0040000 00000000 00000000 02017273     0.............
...........rs
]23302.00 NOF      36303030 32382020 20202020 20202020     .............
028
]23302.00 NOF      20202020 20202020 20202020 20202020     .............
]23302.00 NOF      20202020 20202020 20202020 20202020     .............

]23302.00 NOF      20202020 20202020 20202020 20202F65     .............
         /e
]23302.00 NOF      74632F73 6E612F73 6E615F64 6F6D6E2E     ....>/..>/[.?_
sna/sna_domn.
]23302.00 NOF      63666700                                ....@@@@@@@@@@
.
]23302.00 NOF    -------------------------------- 12:01:32.07 EST  03 Dec
]23302.00 NOF    QUERY_CPIC_SIDE_INFO request, target 1000000
]23302.00 NOF    ---- Verb Parameter Block at address 2ff22350 ----
]23302.00 NOF      21210001 00000000 00000000 2FF22378     .............2
........./.#x
]23302.00 NOF      000000D4 00000000 00010000 04004150     ...M..........
...........AP
]23302.00 NOF      494E4744 20200000                       .+......@@@@@@
D  ..
]23302.00 NOF    -------------------------------- 12:01:32.07 EST  03 Dec
]23302.00 NOF    QUERY_CPIC_SIDE_INFO response, target 1000000 ,result =
ER_CHECK
]23302.00 NOF    ---- Verb Parameter Block at address 2ff22350 ----
]23302.00 NOF      21210001 01000000 58100000 2FF22378     .............2
.....X.../.#x
]23302.00 NOF      00000000 00000000 00000000 04004150     .............
...........AP
]23302.00 NOF      494E4744 20200000                       .+......@@@@@@
]23302.00 NOF    -------------------------------- 12:01:32.08 EST  03 Dec
]23302.00 NOF    CLOSE_FILE request, target 1000000
]23302.00 NOF    ---- Verb Parameter Block at address 2ff22450 ----
]23302.00 NOF      F0050000 00000000 00000000              0...........@@
.........
]23302.00 NOF    -------------------------------- 12:01:32.08 EST  03 Dec
]23302.00 NOF    CLOSE_FILE response, target 1000000 ,result = OK
]23302.00 NOF    ---- Verb Parameter Block at address 2ff22450 ----
]23302.00 NOF      F0050000 00000000 00000000              0...........@@
.........
```

Figure 98 (Part 2 of 12). API Trace

```
]23302.00 CPIC   -------------------------------- 12:01:32.09 EST  03 Dec
]23302.00 CPIC   CMINIT response, result = CM_PROGRAM_PARAMETER_CHECK
]23302.00 CPIC    Conversation ID = 01000000
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Conversation type = CM_BASIC_CONVERSATION
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 CPIC    Error direction = CM_RECEIVE_ERROR
]23302.00 CPIC    Sync level = CM_NONE
]23302.00 CPIC    Fill type = CM_FILL_LL
]23302.00 CPIC    Prepare to receive type = CM_PREP_TO_RECEIVE_SYNC_LEVEL
]23302.00 CPIC    Receive type = CM_RECEIVE_AND_WAIT
]23302.00 CPIC    Send type = CM_BUFFER_DATA
]23302.00 CPIC    Conversation security type = XC_SECURITY_NONE
]23302.00 CPIC    Log data pointer = 0
]23302.00 CPIC    Log data length = 0
]23302.00 CPIC    Sym dest name =
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 CPIC     00                                      .@@@@@@@@@@@@@
]23302.00 CPIC    Mode name =
]23302.00 CPIC     00000000 00000000                       ........@@@@@@
.....
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 CPIC   -------------------------------- 12:01:32.10 EST  03 Dec
]23302.00 CPIC   CMINIT request
]23302.00 CPIC    Sym dest name =
]23302.00 CPIC   -------------------------------- 12:01:32.10 EST  03 Dec
]23302.00 CPIC   CMINIT response, result = CM_OK
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Conversation type = CM_MAPPED_CONVERSATION
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 CPIC    Error direction = CM_RECEIVE_ERROR
]23302.00 CPIC    Sync level = CM_NONE
]23302.00 CPIC    Fill type = CM_FILL_LL
]23302.00 CPIC    Prepare to receive type = CM_PREP_TO_RECEIVE_SYNC_LEVEL
]23302.00 CPIC    Receive type = CM_RECEIVE_AND_WAIT
]23302.00 CPIC    Send type = CM_BUFFER_DATA
]23302.00 CPIC    Conversation security type = XC_SECURITY_SAME
]23302.00 CPIC    Log data pointer = 0
]23302.00 CPIC    Log data length = 0
]23302.00 CPIC    Sym dest name =
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     20202020 20202020 20202020 20202020     ..............

]23302.00 CPIC     20                                      .@@@@@@@@@@@@@
```

Figure 98 (Part 3 of 12). API Trace

```
]23302.00 CPIC    Mode name =
]23302.00 CPIC     40404040 40404040                                @@@@@@
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.10 EST  03 Dec
 2
]23302.00 CPIC   CMSPLN request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     55534942 4D52412E 4245434B 59202020     ....(.........
BMRA.ATEST
]23302.00 CPIC     20                                      .@@@@@@@@@@@@@

]23302.00 CPIC    Partner LU name length = 13
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     20202020 20202020 20202020 20202020     ..............

]23302.00 CPIC     20                                      .@@@@@@@@@@@@@

]23302.00 CPIC   -------------------------------- 12:01:32.11 EST  03 Dec
]23302.00 CPIC   CMSPLN response, result = CM_OK
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     E4E2C9C2 D4D9C14B C2C5C3D2 E8404040     USIBMRA.BECKY
....K.....@@@
]23302.00 CPIC     40                                       @@@@@@@@@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.11 EST  03 Dec
]23302.00 CPIC   CMSSL request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Sync level = CM_CONFIRM
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Sync level = CM_NONE
]23302.00 CPIC   -------------------------------- 12:01:32.11 EST  03 Dec
]23302.00 CPIC   CMSSL response, result = CM_OK
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Sync level = CM_CONFIRM
]23302.00 CPIC   -------------------------------- 12:01:32.11 EST  03 Dec
]23302.00 CPIC   CMSTPN request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     4150494E 47440000 20202020 20202020     .&.+.........
]23302.00 CPIC     20202020 20202020 20202020 20202020     .............

]23302.00 CPIC     20202020 20202020 20202020 20202020     .............

]23302.00 CPIC     20202020 20202020 20202020 20202020     .............
```

Figure 98 (Part 4 of 12). API Trace

```
]23302.00 CPIC    TP name length = 6
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.11 EST  03 Dec
]23302.00 CPIC   CMSTPN response, result = CM_OK
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     C1D7C9D5 C7C44040 40404040 40404040     APINGD
...@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMEMN request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMEMN response, result = CM_OK
]23302.00 CPIC    Mode name =
]23302.00 CPIC     00000000 2006524C                       .......<@@@@@@
. .RL
]23302.00 CPIC    Mode name length = 0
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMSMN request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Mode name =
]23302.00 CPIC     23494E54 45520000                       ..+.....@@@@@@
TER..
]23302.00 CPIC    Mode name length = 6
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Mode name =
]23302.00 CPIC     40404040 40404040                                 @@@@@@
@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMSMN response, result = CM_OK
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Mode name =
]23302.00 CPIC     7BC9D5E3 C5D94040                       #INTER  @@@@@@
...@@
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMEPLN request
]23302.00 CPIC    Conversation ID = 01000001
```

Figure 98 (Part 5 of 12). API Trace

```
]23302.00 CPIC   -------------------------------- 12:01:32.12 EST  03 Dec
]23302.00 CPIC   CMEPLN response, result = CM_OK
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     55534942 4D52412E 4245434B 59000000     ....(.........
BMRA.ATEST...
]23302.00 CPIC     00                                     .@@@@@@@@@@@@@
]23302.00 CPIC    Partner LU name length = 13
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   CMEMN request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   CMEMN response, result = CM_OK
]23302.00 CPIC    Mode name =
]23302.00 CPIC     23494E54 45520000                      ..+.....@@@@@@
TER..
]23302.00 CPIC    Mode name length = 6
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   XCECST request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   XCECST response, result = CM_OK
]23302.00 CPIC    Conversation security type = XC_SECURITY_SAME
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   XCECSU request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
]23302.00 CPIC   XCECSU response, result = CM_OK
]23302.00 CPIC    Security user ID =
]23302.00 CPIC     20000000 00000000                      ........@@@@@@
.....
]23302.00 CPIC    Security user ID length = 1
]23302.00 CPIC   -------------------------------- 12:01:32.13 EST  03 Dec
 3
]23302.00 CPIC   CMALLC request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Conversation type = CM_MAPPED_CONVERSATION
]23302.00 CPIC    Return control = CM_WHEN_SESSION_ALLOCATED
]23302.00 CPIC    Sync level = CM_CONFIRM
]23302.00 CPIC    Conversation security type = XC_SECURITY_SAME
]23302.00 CPIC    Partner LU name =
]23302.00 CPIC     E4E2C9C2 D4D9C14B C2C5C3D2 E8404040     USIBMRA.ATEST
....K.....@@@
]23302.00 CPIC     40                                      @@@@@@@@@@@@@

]23302.00 CPIC    Mode name =
]23302.00 CPIC     7BC9D5E3 C5D94040                      #INTER  @@@@@@
...@@
]23302.00 CPIC    Partner TP name =
]23302.00 CPIC     C1D7C9D5 C7C44040 40404040 40404040     APINGD
...@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 CPIC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
```

Figure 98 (Part 6 of 12). API Trace

```
]23302.00 APPC   -------------------------------- 12:01:32.14 EST  03 Dec
]23302.00 APPC   TP_STARTED request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00140000 00000000 00000000 00000000     ..............
............
]23302.00 APPC     00000000 00000000 00000000 C3D7C9C3     ............CP
]23302.00 APPC     6DC4C5C6 C1E4D3E3 6DE3D7D5 C1D4C540     _DEFAULT_TPNAM
.....m......@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040 40404040 40404040 00000000                 ..
@@@@@@@@@@....
]23302.00 APPC   -------------------------------- 12:01:32.15 EST  03 Dec
]23302.00 APPC   TP_STARTED response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00140000 00000000 00000000 00000000     ..............
............
]23302.00 APPC     00000000 00000000 01000000 C3D7C9C3     ............CP
............
]23302.00 APPC     6DC4C5C6 C1E4D3E3 6DE3D7D5 C1D4C540     _DEFAULT_TPNAM
.....m......@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040 40404040 40404040 00000000                 ..
@@@@@@@@@@....
]23302.00 APPC   -------------------------------- 12:01:32.16 EST  03 Dec
]23302.00 APPC   MC_ALLOCATE request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00010101 00000000 00000000 00000000     ..............
............
]23302.00 APPC     01000000 00000000 00010000 00000000     ..............
............
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
............
]23302.00 APPC     7BC9D5E3 C5D94040 C1D7C9D5 C7C44040     #INTER  APINGD
...@@......@@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@@
]23302.00 APPC     40404040                                    @@@@@@@@@@
@
]23302.00 APPC   -------------------------------- 12:01:32.17 EST  03 Dec
]23302.00 APPC   MC_ALLOCATE response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00010101 00000000 00000000 00000000     ..........
............
]23302.00 APPC     01000000 09000057 01010000 00000000     ..........
]23302.00 APPC     09000092 00000000 00000000 00000000     ...k..........
............
```

Figure 98 (Part 7 of 12). API Trace

```
]23302.00 APPC     7BC9D5E3 C5D94040 C1D7C9D5 C7C44040     #INTER  APINGD
...@@.....@@
]23302.00 APPC     40404040 40404040 40404040 40404040
@@@@@@@@@@@@
]23302.00 CPIC   -------------------------------- 12:01:32.17 EST  03 Dec
]23302.00 CPIC   CMALLC response, result = CM_OK
]23302.00 CPIC   -------------------------------- 12:01:32.17 EST  03 Dec
 4
]23302.00 CPIC   CMSEND request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   ---- Buffer at address 20004138 ----
]23302.00 CPIC     01022C02 43532F41 49582035 2E302E30     ..............
.CS/AIX 5.0.0
]23302.00 CPIC    Send length = 16
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Send type = CM_BUFFER_DATA
]23302.00 CPIC    Prepare to receive type = CM_PREP_TO_RECEIVE_SYNC_LEVEL
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 APPC   -------------------------------- 12:01:32.18 EST  03 Dec
]23302.00 APPC   MC_SEND_DATA request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     ..............
............
]23302.00 APPC     01000000 09000057 00000010 20004138     ..............
....W.... .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
.
]23302.00 APPC   ---- Data at address 20004138 ----
]23302.00 APPC     01022C02 43532F41 49582035 2E302E30     ..............
.CS/AIX 5.0.0
]23302.00 APPC   -------------------------------- 12:01:32.18 EST  03 Dec
]23302.00 APPC   MC_SEND_DATA response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     ..............
............
]23302.00 APPC     01000000 09000057 00000010 20004138     ..............
....W.... .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
.
]23302.00 CPIC   -------------------------------- 12:01:32.18 EST  03 Dec
]23302.00 CPIC   CMSEND response, result = CM_OK
]23302.00 CPIC    Request to send received = CM_REQ_TO_SEND_NOT_RECEIVED
]23302.00 CPIC   -------------------------------- 12:01:32.18 EST  03 Dec
 5
]23302.00 CPIC   CMRCV request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Requested length = 32763
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Conversation type = CM_MAPPED_CONVERSATION
]23302.00 CPIC    Fill type = CM_FILL_LL
]23302.00 CPIC    Receive type = CM_RECEIVE_AND_WAIT
```

Figure 98 (Part 8 of 12). API Trace

```
]23302.00 APPC   -------------------------------- 12:01:32.19 EST  03 Dec
]23302.00 APPC   MC_RECEIVE_AND_WAIT request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000B0100 00000000 00000000 00000000     ............
............
]23302.00 APPC     01000000 09000057 00000101 00007FFB     ............
....W.......
]23302.00 APPC     00000000 20004138 00000000 00000000     ............
. .A8........
]23302.00 APPC   -------------------------------- 12:01:32.20 EST  03 Dec
]23302.00 APPC   MC_RECEIVE_AND_WAIT response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000B0100 00000000 00000000 00000000     ............
............
]23302.00 APPC     01000000 09000057 02010101 00007FFB     ............
....W.......
]23302.00 APPC     00110000 20004138 00000000 00000000     ............
. .A8........
]23302.00 APPC   ---- Data at address 20004138 ----
]23302.00 APPC     01022C02 43532F41 49582035 2E302E30     ............
.CS/AIX 5.0.0
]23302.00 APPC     00                                      .@@@@@@@@@@@@@

]23302.00 CPIC   -------------------------------- 12:01:32.20 EST  03 Dec
]23302.00 CPIC   CMRCV response, result = CM_OK
]23302.00 CPIC    Buffer empty
]23302.00 CPIC    Data received type = CM_COMPLETE_DATA_RECEIVED
]23302.00 CPIC    Received length = 17
]23302.00 CPIC    Status received = CM_SEND_RECEIVED
]23302.00 CPIC    Request to send received = CM_REQ_TO_SEND_NOT_RECEIVED
]23302.00 CPIC   -------------------------------- 12:01:32.21 EST  03 Dec
]23302.00 CPIC   CMSEND request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   ---- Buffer at address 20004138 ----
]23302.00 CPIC     01022C02 43532F41 49582035 2E302E30     ..........
.CS/AIX 5.0.0
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..........
............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..........
............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..........
............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..........
............
]23302.00 CPIC     00000000 00000000 00000000 00000000     ..........
]23302.00 CPIC    Send length = 100
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Send type = CM_BUFFER_DATA
]23302.00 CPIC    Prepare to receive type = CM_PREP_TO_RECEIVE_SYNC_LEVEL
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 APPC   -------------------------------- 12:01:32.21 EST  03 Dec
]23302.00 APPC   MC_SEND_DATA request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     ............
............
```

Figure 98 (Part 9 of 12). API Trace

```
]23302.00 APPC     01000000 09000057 00000064 20004138     ..............
....W...d .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
]23302.00 APPC    ---- Data at address 20004138 ----
]23302.00 APPC     01022C02 43532F41 49582035 2E302E30     ..............
.CS/AIX 5.0.0
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     00000000 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     00000000                                ....@@@@@@@@@@
.
]23302.00 APPC    -------------------------------- 12:01:32.21 EST  03 Dec
]23302.00 APPC    -------------------------------- 12:01:32.21 EST  03 Dec
]23302.00 APPC    MC_SEND_DATA response, result = OK
]23302.00 APPC    ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     01000000 09000057 00000064 20004138     ..............
....W...d .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
]23302.00 CPIC    -------------------------------- 12:01:32.22 EST  03 Dec
]23302.00 CPIC    CMSEND response, result = CM_OK
]23302.00 CPIC     Request to send received = CM_REQ_TO_SEND_NOT_RECEIVED
]23302.00 CPIC    -------------------------------- 12:01:32.22 EST  03 Dec
]23302.00 CPIC    CMRCV request
]23302.00 CPIC     Conversation ID = 01000001
]23302.00 CPIC     Requested length = 32763
]23302.00 CPIC    Conversation characteristics
]23302.00 CPIC     Conversation type = CM_MAPPED_CONVERSATION
]23302.00 CPIC     Fill type = CM_FILL_LL
]23302.00 CPIC     Receive type = CM_RECEIVE_AND_WAIT
]23302.00 APPC    -------------------------------- 12:01:32.22 EST  03 Dec
]23302.00 APPC    MC_RECEIVE_AND_WAIT request
]23302.00 APPC    ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000B0100 00000000 00000000 00000000     ..............
..............
]23302.00 APPC     01000000 09000057 00000101 00007FFB     ..............
....W........
]23302.00 APPC     00000000 20004138 00000000 00000000     ..............
. .A8........
]23302.00 APPC    -------------------------------- 12:01:32.23 EST  03 Dec
]23302.00 APPC    MC_RECEIVE_AND_WAIT response, result = OK
]23302.00 APPC    ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000B0100 00000000 00000000 00000000     ..............
]23302.00 APPC     01000000 09000057 02010101 00007FFB     ..............
....W........
]23302.00 APPC     00640000 20004138 00000000 00000000     ..............
. .A8........
]23302.00 APPC    ---- Data at address 20004138 ----
```

Figure 98 (Part 10 of 12). API Trace

```
]23302.00 APPC     01022C02 43532F41 49582035 2E302E30     .............
.CS/AIX 5.0.0
]23302.00 APPC     00000000 00000000 00000000 00000000     .............
.............
]23302.00 APPC     00000000 00000000 00000000 00000000     .............
]23302.00 CPIC   -------------------------------- 12:01:32.24 EST  03 Dec
]23302.00 CPIC   CMRCV response, result = CM_OK
]23302.00 CPIC    Buffer empty
]23302.00 CPIC    Data received type = CM_COMPLETE_DATA_RECEIVED
]23302.00 CPIC    Received length = 100
]23302.00 CPIC    Status received = CM_SEND_RECEIVED
]23302.00 CPIC    Request to send received = CM_REQ_TO_SEND_NOT_RECEIVED
]23302.00 CPIC   -------------------------------- 12:01:32.31 EST  03 Dec
]23302.00 CPIC   CMSEND request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   ---- Buffer at address 20004138 ----
]23302.00 CPIC     01022C02 43532F41 49582035 2E302E30     .............
.CS/AIX 5.0.0
]23302.00 CPIC     00000000 00000000 00000000 00000000     .............
]23302.00 CPIC    Send length = 100
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Send type = CM_BUFFER_DATA
]23302.00 CPIC    Prepare to receive type = CM_PREP_TO_RECEIVE_SYNC_LEVEL
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 APPC   -------------------------------- 12:01:32.32 EST  03 Dec
]23302.00 APPC   MC_SEND_DATA request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     .............
.............
]23302.00 APPC     01000000 09000057 00000064 20004138     .............
....W...d .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
.
]23302.00 APPC   ---- Data at address 20004138 ----
]23302.00 APPC     01022C02 43532F41 49582035 2E302E30     .............
.CS/AIX 5.0.0
]23302.00 APPC     00000000 00000000 00000000 00000000     .............
.............
]23302.00 APPC     00000000 00000000 00000000 00000000     .............
]23302.00 APPC   -------------------------------- 12:01:32.33 EST  03 Dec
]23302.00 APPC   MC_SEND_DATA response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     000F0100 00000000 00000000 00000000     .............
]23302.00 APPC     01000000 09000057 00000064 20004138     .............
....W...d .A8
]23302.00 APPC     00000000                                ....@@@@@@@@@@
.
]23302.00 CPIC   -------------------------------- 12:01:32.33 EST  03 Dec
]23302.00 CPIC   CMSEND response, result = CM_OK
]23302.00 CPIC    Request to send received = CM_REQ_TO_SEND_NOT_RECEIVED
]23302.00 CPIC   -------------------------------- 12:01:32.33 EST  03 Dec
]23302.00 CPIC   CMRCV request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Requested length = 32763
```

Figure 98 (Part 11 of 12). API Trace

```
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Conversation type = CM_MAPPED_CONVERSATION
]23302.00 CPIC    Fill type = CM_FILL_LL
]23302.00 CPIC    Receive type = CM_RECEIVE_AND_WAIT
]23302.00 APPC   -------------------------------- 12:01:32.33 EST  03 Dec
 6
]23302.00 CPIC   CMSDT request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_FLUSH
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_SYNC_LEVEL
]23302.00 CPIC   -------------------------------- 12:01:32.50 EST  03 Dec
]23302.00 CPIC   CMSDT response, result = CM_OK
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_FLUSH
]23302.00 CPIC   -------------------------------- 12:01:32.50 EST  03 Dec
]23302.00 CPIC   CMDEAL request
]23302.00 CPIC    Conversation ID = 01000001
]23302.00 CPIC   Conversation characteristics
]23302.00 CPIC    Deallocate type = CM_DEALLOCATE_FLUSH
]23302.00 CPIC    Log data pointer = 0
]23302.00 CPIC    Log data length = 0
]23302.00 APPC   -------------------------------- 12:01:32.50 EST  03 Dec
]23302.00 APPC   MC_DEALLOCATE request
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00050101 00000000 00000000 00000000     ..............
.............
]23302.00 APPC     01000000 09000057 00010000 00000000     ..............
....W........
]23302.00 APPC     00000000 00000000 00000000              ............@@
.........
]23302.00 APPC   -------------------------------- 12:01:32.51 EST  03 Dec
]23302.00 APPC   MC_DEALLOCATE response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2006524c ----
]23302.00 APPC     00050101 00000000 00000000 00000000     ..............
.............
]23302.00 APPC     01000000 09000057 00010000 00000000     ..............
....W........
]23302.00 APPC     00000000 00000000 00000000              ............@@
.........
]23302.00 APPC   -------------------------------- 12:01:32.52 EST  03 Dec
]23302.00 APPC   TP_ENDED request
]23302.00 APPC   ---- Verb Parameter Block at address 2ff226e8 ----
]23302.00 APPC     00130000 00000000 00000000 00000000     ..............
.............
]23302.00 APPC     01000000 01000000                       ........@@@@@@
]23302.00 APPC   -------------------------------- 12:01:32.52 EST  03 Dec
]23302.00 APPC   TP_ENDED response, result = OK
]23302.00 APPC   ---- Verb Parameter Block at address 2ff226e8 ----
]23302.00 APPC     00130000 00000000 00000000 00000000     ..............
.............
]23302.00 APPC     01000000 01000000                       ........@@@@@@
.....
]23302.00 CPIC   -------------------------------- 12:01:32.53 EST  03 Dec
]23302.00 CPIC   CMDEAL response, result = CM_OK
```

Figure 98 (Part 12 of 12). API Trace

Notes:

1. CMINIT is used to initialize the conversation. The only input is the CPI-C side information profile, also known as the symbolic destination name. If no valid side information profile is provided, the TP defaults to using the local CP name as the Local LU6.2 LU and sets the other parameters with CPI-C subroutine calls.

2. CMSPLN is used to set the Partner LU name. CPI-C TPs set many variables and then allocate the conversation.

3. CMALLC is used to allocate the conversation, using the characteristics set with previous CPI-C subroutine calls. TPs should check the return parameters to make sure the conversation was allocated and if not, what kind of error occurred.

4. CMSEND puts data in the local LU's send buffer. The data is not actually sent until the buffer is full or a CPI-C call is issued that flushes the buffer.

5. CMRCV receives a buffer from the partner LU.

6. CMSDT tells the program how to deallocate the conversation. The deallocate actually takes place when the CMDEAL call is issued.

To really understand CPI-C programming you should study the *IBM eNetwork Communications Server for AIX CPI-C Programmer's Guide, Version 5*.

15.7 Alerts

Alerts are automatically generated and sent across the first host link station found. NetView on the host is the most common program used to process and view alerts. Refer to Chapter 16, "Network Management" on page 153 for more information on network management and alerts.

15.8 HELP!

There are many ways to get help with Communications Server for AIX V5. Man pages are available for the commands and the product manuals are available in HTML format as well as hard copy format. There is also contextual and task-oriented online help available from the xsnaadmin tool.

15.8.1 Man Pages

To use the man pages, just type:

```
man command
```

where command is the command you need information on. You will receive a standard man entry for the command.

15.8.2 HTML Documentation

All the CS/AIX V5 manuals are available in HTML format. To access the manual from a local Web browser use the URL:

```
file:///usr/share/man/info/$LANG/sna/SNABOOKS.HTM
```

For instance:

```
file:///usr/share/man/info/en_US/sna/SNABOOKS.HTM
```

If your RS/6000 has an ICSS Web server you can add a routing statement to allow access from other systems. For instance, the following screen shows the Web interface for the ICSS server administration routing statements on RS600028. The line added at statement 13 defines a path to the CS/AIX documents using an alias of csdoc. After this is done, a Web browser can enter the URL http://rs600028/csdoc/SNABOOKS.HTM and be presented with the CS/AIX documentation.

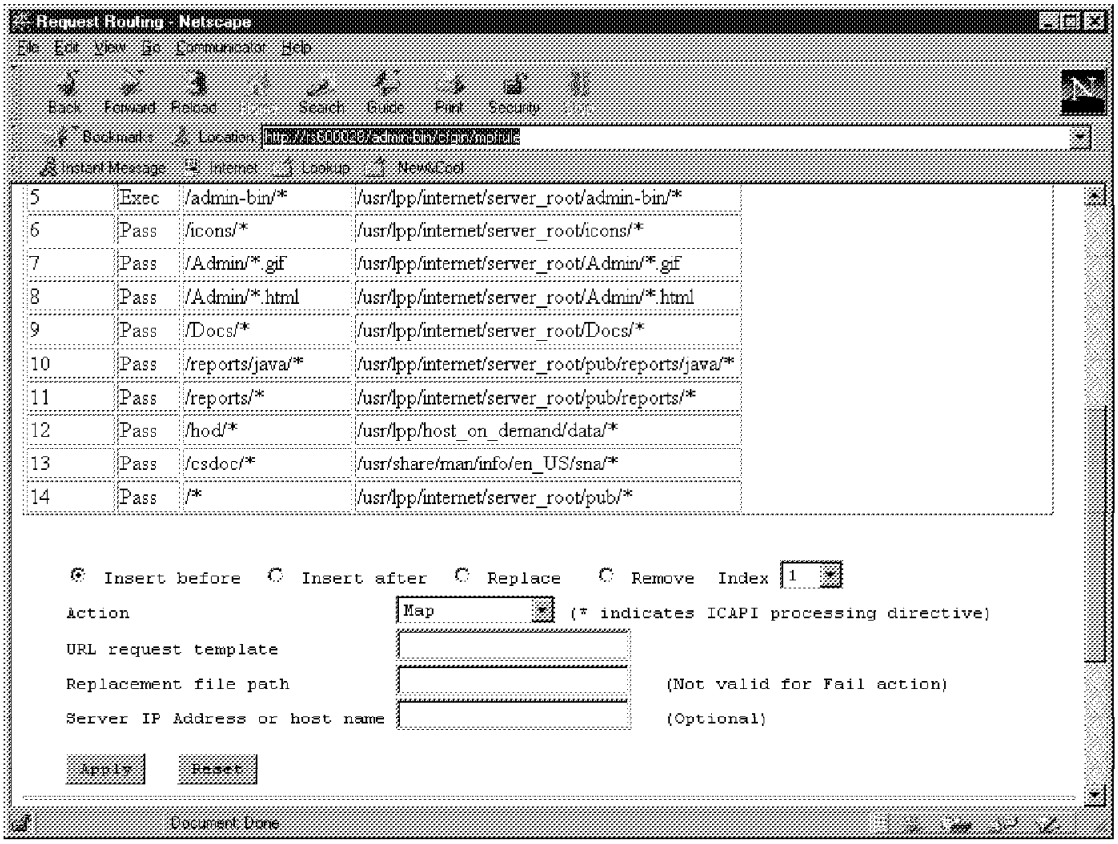

Figure 99. ICSS Routing Table

15.8.3 xsnaadmin Help

Several types of information are available from xsnaadmin. You can select a resource and click on the Help option. You will receive contextual help about the specific resource. You can also search for information by selecting Help in the upper right corner of the xsnaadmin window. Index is the search option.

In addition, you can get step-by-step directions for completing a task, and there are also preconfiguration worksheets available to plan for future tasks.

15.9 Sending Data to Support

Use the /usr/bin/snagetpd command to pull all the log and trace data together into one file. The file will be tarred and compressed, ready to send to your support organization. You can supply a file name to the command.

If you don't supply a name, the output file name will be pd.tar.Z. For more information on snagetpd, refer to *IBM eNetwork Communications Server for AIX Diagnostics Guide*.

Chapter 16. Network Management

There are several new network management features included in Communications Server for AIX V5, including:

- Service Point Command Facility (SPCF)
- UNIX Command Facility (UCF)
- 3270 Response Time Monitor

CS/AIX V5 still includes support for storing and forwarding NMVT alerts, using SNMP MIBs, and programming with a Management Services API. NetView Service Point/6000 will work with CS/AIX V5 but PTFs are required. Contact your local IBM representative to receive those PTFs.

16.1 Service Point Command Facility and UNIX Command Facility

Both of these features are part of a Remote Command Facility (RCF) that operates in conjunction with the NetView program on a S/390 host. Service Point Command Facility (SPCF) allows you to issue commands from a host NetView screen to manage CS/AIX nodes. You can issue all the subcommands of the snaadmin command.

UNIX Command Facility (UCF) allows you to issue AIX commands from a host NetView screen. You can only run commands that complete without further user interaction.

16.1.1 Configuring SPCF and UCF

To configure and use SPCF and UCF, complete these steps:

- Establish connectivity to the host
- Find your service point name
- Get the necessary user IDs and passwords
- Add the RCF configuration to CS/AIX

16.1.1.1 Connectivity to the Host

For the example in this chapter, CP-CP connectivity to the host was established over the token-ring connection defined in 12.1.1, “CS/AIX as an APPN End Node” on page 99.

16.1.1.2 Service Point Name

The Service Point name you use is determined by the type of sessions you have between the CS/AIX node and the host. The two types of sessions to consider are:

- CP-CP: Use the CS/AIX control point name as the service point name.

- SSCP_PU: Use the VTAM PU name as the service point name. The PU name is not necessarily the link station name; it is the the PU label in the VTAM definitions.

If you have both CP-CP and SSCP-PU sessions with the host, you can use either the CS/AIX CP name or the PU name.

To see if you have CP-CP sessions between CS/AIX and the host, use xsnaadmin. Activate the link station to the host and display the independent LUs that the CS/AIX control point is connected to. You will see the host CP name and mode CPSVCMG if the sessions are active.

If you choose to use SSCP-PU sessions, be sure to select either Any or Dependent only for the LU traffic in the link station definition.

16.1.1.3 User IDs

You need to request a NetView user ID and password from your host administrator.

You also need to add an AIX user with ″sna″ as its primary group. It is recommended that you make this a special user ID for UCF only. The AIX user ID does not have to match the host NetView user ID.

16.1.1.4 Adding RCF Configuration

The snaadmin define_rcf_access command adds the RCF configuration. The command syntax we used is below:

```
rs600028:/ > snaadmin define_rcf_access,ucf_username=ucfuser,spcf_permissions=ALLOW_ACTION_LOCAL

------------------------------------------------------------------------
define_rcf_access command completed successfully

------------------------------------------------------------------------
```

The ucf_username is the AIX user ID we added above. It cannot be root. When you use runcmd to run an AIX command (UCF), a shell gets started on the RS/6000 and the command runs within that shell as if the ucf_user were executing the command. Only commands that the ucf_user can execute in a normal AIX shell can be executed using runcmd.

The available options for spcf_permissions are:

- NONE - No permission.
- ALLOW_QUERY_LOCAL - Permission to run query_* commands only.
- ALLOW_DEFINE_LOCAL - Permission to define_*, set_*, delete_*, add_*, remove_*, query_*, and init_node.

- ALLOW_ACTION_LOCAL - Permission to start_*, stop_*, activate_*, deactivate_*, aping, initialize_session_limit, change_session_limit, and reset_session_limit.

16.1.2 SPCF and UCF Examples

There is a specific runcmd syntax to use with CS/AIX V5. There are three parameters: sp, appl, and commandtext.

sp The Service Point name, refer to 16.1.1.2, " Service Point Name" on page 153 for more information about choosing the Service Point name.

appl Set appl=node if you want to run a CS/AIX command. Set appl=unix if you want to run an AIX command.

commandtext The command you want to run. The runcmd command is not case sensitive. You don't have to specify snaadmin when using appl=node, just the snaadmin subcommand.

16.1.2.1 SPCF Example

The following is an example of executing a CS/AIX command from NetView using SPCF.

```
* RAKAN    RUNCMD SP=RS28CP,APPL=NODE,QUERY_NODE
-          ---------------------------------------
-          description = ""
-          node_type = END_NODE
-          fqcp_name = USIBMRA.RS28CP
-          cp_alias = RS28CP
-          mode_to_cos_map_supp = NO
-          mds_supported = YES
-          node_id = <00000000>
-          max_locates = 100
-          dir_cache_size = 255
-          max_dir_entries = 0
-          locate_timeout = 60
-          reg_with_nn = YES
-          reg_with_cds = YES
-          mds_send_alert_q_size = 100
-          cos_cache_size = 24
-          tree_cache_size = 40
-          tree_cache_use_limit = 40
-          max_tdm_nodes = 0
-          max_tdm_tgs = 0
-          max_isr_sessions = 1000
-          isr_sessions_upper_threshold = 900
-          isr_sessions_lower_threshold = 800
-          isr_max_ru_size = 16384
-          isr_rcv_pac_window = 8
-          store_endpt_rscvs = NO
-          store_isr_rscvs = NO
-          store_dlur_rscvs = NO
-          dlur_support = YES
-          pu_conc_support = YES
-          nn_rar = 128
-          hpr_support = TRANSPORT
-          ptf_flags = NONE
-          max_ls_exception_events = 0
-          ms_support = NORMAL
-          queue_nmvts = YES
-          up_time = 372882
-          nn_functions_supported = NONE
-          en_functions_supported = SEGMENT_GENERATION + LOCATE_CDINIT +
          REG_WITH_NN
-          nn_status = UNCONGESTED
-          nn_frsn = 0
-          nn_rsn = 0
-          def_ls_good_xids = 2
-          def_ls_bad_xids = 0
-          dyn_ls_good_xids = 0
-          dyn_ls_bad_xids = 0
-          dlur_release_level = 1
-          fq_nn_server_name = USIBMRA.RAK
-          current_isr_sessions = 0
```

Figure 100. NetView RUNCMD for CS/AIX Command

16.1.2.2 UCF Example

The following is an example of executing an AIX command from NetView using UCF.

```
* RAKAN    RUNCMD SP=RS28CP,APPL=UNIX,WHO
-          === UNIX COMMAND ISSUED ===
-          root        lft0        Dec 04 16:17
-          root        pts/1       Dec 16 10:10    (:0.0)
-          root        pts/0       Dec 04 16:17
-          root        pts/2       Dec 15 12:09
-          root        pts/4       Dec 15 10:34    (:0.0)
-          root        pts/5       Dec 16 12:31
-          root        pts/7       Dec 15 12:26
-          root        pts/8       Dec 15 13:26    (wtr05135.itso.ra)
-          === UNIX COMMAND COMPLETED ===
--------------------------------------------------------------------------
```

Figure 101. NetView RUNCMD for UNIX Command

Chapter 17. CS/AIX V5 and SMIT

The SMIT interface screens for CS/AIX have changed dramatically from CS/AIX V4.2 to CS/AIX V5. The SMIT screens now correspond to the new configuration model and to the xsnaadmin motif tool. SMIT screens have been included for ease of migration. The preferred method of configuring and managing CS/AIX is with xsnaadmin.

If you run SMIT without a fastpath, the path to CS/AIX V5 is **Communications Applications and Services** → **Communications Server**. The smit fastpath is **sna**. You can run **smit sna** or **smitty sna**.

As you can see in the figure below, you can still configure and administer CS/AIX through SMIT but some of the terms and panel locations have changed.

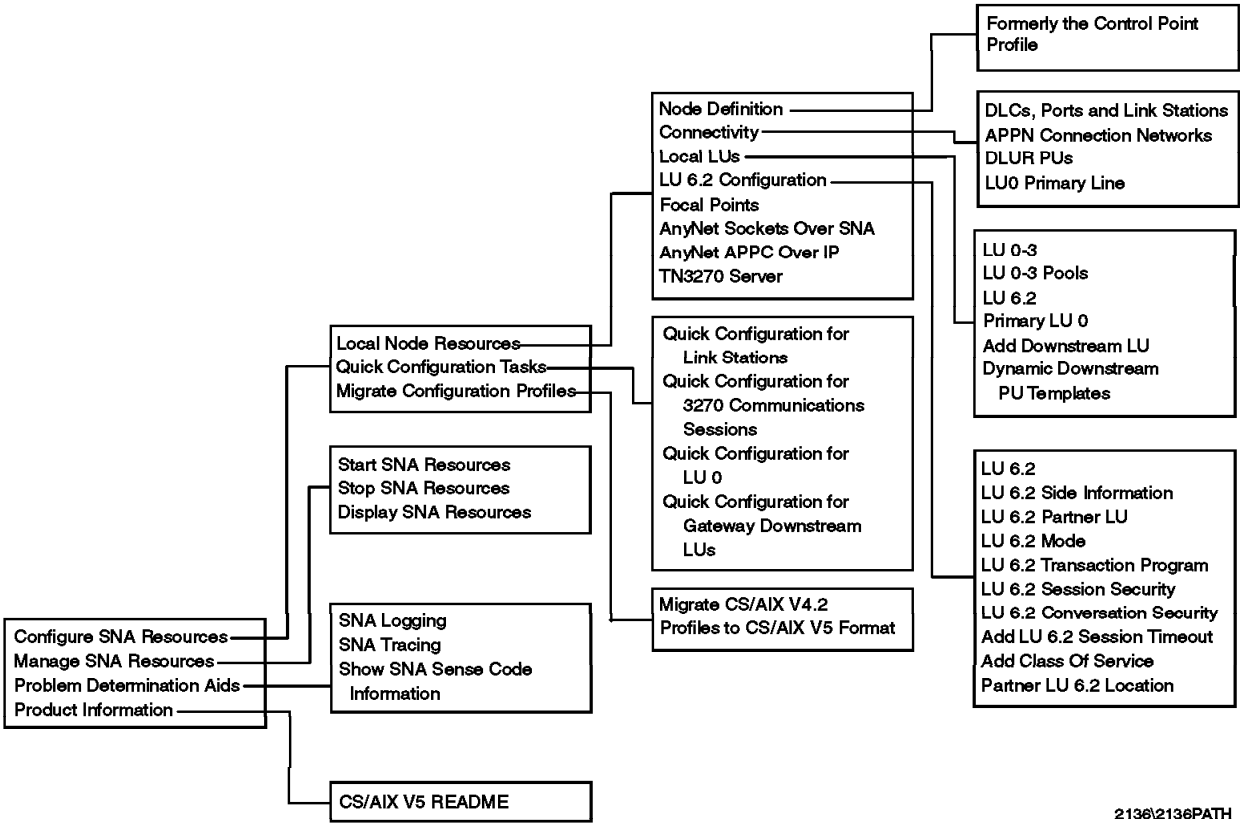

Figure 102. SMIT Design

Appendix A. CS/AIX V4.2 Configuration for RS60007

This is a listing of the exported profiles for RS60007 at the CS/AIX V4.2 level. This file would look the same whether the exportsna -A command was used, or whether it is the output of the presnamig process (stored in /etc/sna/sna_mig).

```
sna:
    prof_name                                       = "sna"
    max_sessions                                    = 200
    max_conversations                               = 200
    restart_action                                  = once
    dynamic_inbound_partner_lu_definitions_allowed = yes
    standard_output_device                          = "/dev/console"
    standard_error_device                           = "/var/sna/sna.stderr"
    nmvt_action_when_no_nmvt_process                = reject
    reqdisc_type                                    = normal
    trusted_group_ids                               = {system}
    sense_detail_level                              = specific
    start_snmp_subagent                             = no
    limited_resource_timeout                        = no
    limited_resource_timeout_value                  = 15
    comments                                        = ""


control_pt:
    prof_name                                       = "node_cp"
    xid_node_id                                     = "*"
    network_name                                    = "USIBMRA"
    control_pt_name_alias                           = "R6007CP"
    control_pt_name                                 = "R6007CP"
    control_pt_node_type                            = appn_end_node
    max_cached_trees                                = 500
    max_nodes_in_topology_database                  = 500
    route_addition_resistance                       = 128
    comments                                        = ""


session_lu2:
    prof_name                                       = "71175lu6"
    link_station_profile_name                       = "1071175"
    local_lu_name                                   = ""
    network_name                                    = ""
    remote_lu_name                                  = ""
    comments                                        = ""
    local_lu_address                                = 6
    sscp_id                                         = *
    max_rows                                        = 24
    max_columns                                     = 80
    comments                                        = ""
```

```
session_lu2:
    prof_name                           = "71175lu7"
    link_station_profile_name           = "1071175"
    local_lu_name                       = ""
    network_name                        = ""
    remote_lu_name                      = ""
    comments                            = ""
    local_lu_address                    = 7
    sscp_id                             = *
    max_rows                            = 24
    max_columns                         = 80
    comments                            = ""


session_lu2:
    prof_name                           = "mpclu2"
    link_station_profile_name           = "rs6kmpc"
    local_lu_name                       = ""
    network_name                        = ""
    remote_lu_name                      = ""
    comments                            = ""
    local_lu_address                    = 2
    sscp_id                             = *
    max_rows                            = 24
    max_columns                         = 80
    comments                            = ""


session_lu2:
    prof_name                           = "mpclu3"
    link_station_profile_name           = "rs6kmpc"
    local_lu_name                       = ""
    network_name                        = ""
    remote_lu_name                      = ""
    comments                            = ""
    local_lu_address                    = 3
    sscp_id                             = *
    max_rows                            = 24
    max_columns                         = 80
    comments                            = ""


partner_lu6.2:
    prof_name                           = "APING"
    fq_partner_lu_name                  = "USIBMRA.RAIAZ"
    partner_lu_alias                    = "APING"
    session_security_supp               = no
    parallel_session_supp               = yes
    conversation_security_level         = conversation
    comments                            = ""
```

```
partner_lu6.2_location:
    prof_name                                   = "aping"
    fq_partner_lu_name                          = "USIBMRA.RAIAZ"
    partner_location_method                     = owning_cp
    fq_partner_owning_cp_name                   = "USIBMRA.RAB"
    local_node_is_network_server_for_len_node   = no
    fq_node_server_name                         = ""
    local_lu_name                               = ""
    link_station_profile_name                   = ""
    comments                                    = ""


side_info:
    prof_name                                   = "aping"
    local_lu_or_control_pt_alias                = "R6007CP"
    partner_lu_alias                            = "APING"
    fq_partner_lu_name                          = ""
    mode_name                                   = "#INTER"
    remote_tp_name_in_hex                       = no
    remote_tp_name                              = ""
    comments                                    = ""
```

```
link_station_token_ring:
prof_name                              = "TRSAP0"
use_control_pt_xid                     = yes
xid_node_id                            = "*"
sna_dlc_profile_name                   = "TOKEN0"
stop_on_inactivity                     = no
time_out_value                         = 0
LU_registration_supported              = no
LU_registration_profile_name           = ""
link_tracing                           = no
trace_format                           = long
access_routing_type                    = link_address
remote_link_name                       = ""
remote_link_address                    = 0x10005ab1ac7d
remote_sap                             = 0x04
call_out_on_activation                 = yes
verify_adjacent_node                   = no
net_id_of_adjacent_node                = ""
cp_name_of_adjacent_node               = ""
xid_node_id_of_adjacent_node           = "*"
node_type_of_adjacent_node             = learn
solicit_sscp_sessions                  = yes
activate_link_during_system_init       = no
activate_link_on_demand                = no
cp_cp_sessions_supported               = yes
cp_cp_session_support_required         = no
adjacent_node_is_preferred_server      = no
initial_tg_number                      = 0
restart_on_normal_deactivation         = no
restart_on_abnormal_deactivation       = no
restart_on_activation                  = no
TG_effective_capacity                  = 4300800
TG_connect_cost_per_time               = 0
TG_cost_per_byte                       = 0
TG_security                            = nonsecure
TG_propagation_delay                   = lan
TG_user_defined_1                      = 128
TG_user_defined_2                      = 128
TG_user_defined_3                      = 128
comments                               = ""
```

```
link_station_eia232d:
    prof_name                                = "1071175"
    use_control_pt_xid                       = yes
    xid_node_id                              = "*"
    sna_dlc_profile_name                     = "mpq0.00001"
    stop_on_inactivity                       = no
    time_out_value                           = 0
    LU_registration_supported                = no
    LU_registration_profile_name             = ""
    link_tracing                             = yes
    trace_format                             = long
    hpr_support                              = yes
    secondary_local_station_address          = 193
    station_type                             = secondary
    remote_secondary_station_address         = 1
    call_out_on_activation                   = yes
    verify_adjacent_node                     = no
    net_id_of_adjacent_node                  = ""
    cp_name_of_adjacent_node                 = ""
    xid_node_id_of_adjacent_node             = "*"
    node_type_of_adjacent_node               = learn
    solicit_sscp_sessions                    = yes
    activate_link_during_system_init         = yes
    activate_link_on_demand                  = no
    cp_cp_sessions_supported                 = yes
    cp_cp_session_support_required           = no
    adjacent_node_is_preferred_server        = no
    initial_tg_number                        = 0
    restart_on_normal_deactivation           = yes
    restart_on_abnormal_deactivation         = yes
    TG_effective_capacity                    = 9600
    TG_connect_cost_per_time                 = 0
    TG_cost_per_byte                         = 0
    TG_security                              = nonsecure
    TG_propagation_delay                     = telephone
    TG_user_defined_1                        = 128
    TG_user_defined_2                        = 128
    TG_user_defined_3                        = 128
    comments                                 = ""
```

```
link_station_channel:
    prof_name                               = "rs6kmpc"
    use_control_pt_xid                      = yes
    xid_node_id                             = "*"
    sna_dlc_profile_name                    = "mpc0"
    stop_on_inactivity                      = no
    time_out_value                          = 0
    LU_registration_supported               = no
    LU_registration_profile_name            = ""
    link_tracing                            = no
    trace_format                            = long
    connection_name                         = "sna"
    verify_adjacent_node                    = no
    net_id_of_adjacent_node                 = ""
    cp_name_of_adjacent_node                = ""
    xid_node_id_of_adjacent_node            = "*"
    node_type_of_adjacent_node              = learn
    solicit_sscp_sessions                   = no
    activate_link_during_system_init        = yes
    activate_link_on_demand                 = no
    cp_cp_sessions_supported                = yes
    cp_cp_session_support_required          = no
    adjacent_node_is_preferred_server       = no
    initial_tg_number                       = 0
    restart_on_normal_deactivation          = yes
    restart_on_abnormal_deactivation        = yes
    TG_effective_capacity                   = 39321600
    TG_connect_cost_per_time                = 128
    TG_cost_per_byte                        = 128
    TG_security                             = nonsecure
    TG_propagation_delay                    = minimum
    TG_user_defined_1                       = 128
    TG_user_defined_2                       = 128
    TG_user_defined_3                       = 128
    comments                                = ""
    hpr_support                             = yes
```

```
sna_dlc_token_ring:
    prof_name                                   = "TOKEN0"
    datalink_device_name                        = "tok0"
    force_timeout                               = 120
    user_defined_max_i_field                    = no
    max_i_field_length                          = 30729
    max_active_link_stations                    = 100
    num_reserved_inbound_activation             = 0
    num_reserved_outbound_activation            = 0
    transmit_window_count                       = 127
    dynamic_window_increment                    = 1
    retransmit_count                            = 8
    receive_window_count                        = 1
    priority                                    = 0
    inact_timeout                               = 48
    response_timeout                            = 4
    acknowledgement_timeout                     = 1
    link_name                                   = ""
    local_sap                                   = 0x04
    retry_interval                              = 60
    retry_limit                                 = 20
    dynamic_link_station_supported              = yes
    trace_base_listen_link_station              = no
    trace_base_listen_link_station_format       = long
    dynamic_lnk_solicit_sscp_sessions           = yes
    dynamic_lnk_cp_cp_sessions_supported        = yes
    dynamic_lnk_cp_cp_session_support_required  = no
    dynamic_lnk_TG_effective_capacity           = 4300800
    dynamic_lnk_TG_connect_cost_per_time        = 0
    dynamic_lnk_TG_cost_per_byte                = 0
    dynamic_lnk_TG_security                     = nonsecure
    dynamic_lnk_TG_propagation_delay            = lan
    dynamic_lnk_TG_user_defined_1               = 128
    dynamic_lnk_TG_user_defined_2               = 128
    dynamic_lnk_TG_user_defined_3               = 128
    comments                                    = ""
```

```
sna_dlc_eia232d:
    prof_name                                = "mpq0.00001"
    datalink_device_name                     = "mpq0"
    force_timeout                            = 120
    user_defined_max_i_field                 = no
    max_i_field_length                       = 265
    max_active_link_stations                 = 1
    num_reserved_inbound_activation          = 0
    num_reserved_outbound_activation         = 0
    encoding                                 = nrzi
    RTS_signal                               = controlled
    DTR_signal                               = dtr
    clocking                                 = external
    transmit_rate                            = 1200
    network_type                             = nonswitched
    answer_mode                              = automatic
    transmit_window_count                    = 7
    retransmit_count                         = 10
    retransmit_threshold                     = 10
    secondary_inactivity_timeout             = 30
    primary_repoll_frequency                 = 30
    primary_repoll_threshold                 = 10
    primary_repoll_count                     = 15
    link_type                                = point_to_point
    primary_idlelist_poll_frequency          = 60
    primary_slowlist_poll_frequency          = 1
    retry_interval                           = 60
    retry_limit                              = 20
    comments                                 = ""


sna_dlc_channel:
    prof_name                                = "mpc0"
    datalink_device_name                     = "mpc"
    force_timeout                            = 600
    user_defined_max_i_field                 = no
    max_i_field_length                       = 4096
    retry_interval                           = 60
    retry_limit                              = 0
    comments                                 = ""


mode:
    prof_name                                = "DFLTMODE"
    mode_name                                = "DFLTMODE"
    max_sessions                             = 8
    min_conwinner_sessions                   = 4
    min_conloser_sessions                    = 0
    auto_activate_limit                      = 0
    max_adaptive_receive_pacing_window       = 16
    receive_pacing_window                    = 7
    max_ru_size                              = 1024
    min_ru_size                              = 256
    class_of_service_name                    = "#CONNECT"
    comments                                 = ""
```

```
mode:
    prof_name                                = "SNACKETS"
    mode_name                                = "SNACKETS"
    max_sessions                             = 100
    min_conwinner_sessions                   = 50
    min_conloser_sessions                    = 0
    auto_activate_limit                      = 0
    max_adaptive_receive_pacing_window       = 16
    receive_pacing_window                    = 7
    max_ru_size                              = 3840
    min_ru_size                              = 128
    class_of_service_name                    = "#CONNECT"
    comments                                 = ""


mptn_env:
    prof_name                                = "env_values"
    sna_suffix                               = "SNA.IBM.COM"
    connection_retry                         = 300
    connection_wait                          = 30
    inactivity_timer                         = 120
    mptn_well_known_port                     = 397
    unacknowledged_dg_retry                  = 30
    unsent_dg_retry                          = 3
    comments                                 = ""
```

Appendix B. CS/AIX V5 Configuration for RS60007

The following is a listing of the CS/AIX V5 profiles built by the snamig command for RS60007. The file is /etc/sna/sna_node.cfg.

```
[define_node_config_file]
major_version = 5
minor_version = 1
update_release = 1
revision_level = 3


[define_node]
node_name = rs60007
cp_alias = R6007CP
description = ""
fqcp_name = USIBMRA.R6007CP
node_type = END_NODE
mode_to_cos_map_supp = NO
mds_supported = YES
node_id = <00000000>
max_locates = 100
dir_cache_size = 255
max_dir_entries = 0
locate_timeout = 60
reg_with_nn = YES
reg_with_cds = YES
mds_send_alert_q_size = 100
cos_cache_size = 24
tree_cache_size = 40
tree_cache_use_limit = 40
max_tdm_nodes = 0
max_tdm_tgs = 0
max_isr_sessions = 1000
isr_sessions_upper_threshold = 900
isr_sessions_lower_threshold = 800
isr_max_ru_size = 16384
isr_rcv_pac_window = 8
store_endpt_rscvs = NO
store_isr_rscvs = NO
store_dlur_rscvs = NO
dlur_support = YES
pu_conc_support = YES
nn_rar = 128
max_ls_exception_events = 0
ms_support = BACK_LEVEL
queue_nmvts = NO
ptf_flags = NONE
```

```
[define_mpc_dlc]
dlc_name = mpc0
description = ""
neg_ls_supp = YES
initially_active = YES
stats_support = YES


[define_tr_dlc]
dlc_name = tok0.000
description = ""
neg_ls_supp = YES
card_type = GDLC_TOKEN_RING
initially_active = NO
adapter_number = 0
max_saps = 16


[define_sdlc_dlc]
dlc_name = mpq0.000
description = ""
neg_ls_supp = YES
card_type = GDLC_SDLC_MPQP
initially_active = YES
adapter_number = 0


[define_mpc_port]
port_name = mpc0
description = ""
dlc_name = mpc0
initially_active = NO
max_rcv_btu_size = 4096
tot_link_act_lim = 255
inb_link_act_lim = 0
out_link_act_lim = 0
ls_role = LS_NEG
act_xid_exchange_limit = 9
nonact_xid_exchange_limit = 5
ls_xmit_rcv_cap = LS_TWS
max_ifrm_rcvd = 7
target_pacing_count = 7
max_send_btu_size = 4096
implicit_cp_cp_sess_support = NO
implicit_limited_resource = NO
implicit_deact_timer = 30
effect_cap = 78643200
connect_cost = 0
byte_cost = 0
security = SEC_NONSECURE
prop_delay = PROP_DELAY_MINIMUM
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
react_timer = 60
```

```
[define_tr_port]
port_name = tok0.000
description = ""
dlc_name = tok0.000
port_type = PORT_SATF
port_number = 0
lsap_address = 0x04
initially_active = YES
implicit_hpr_support = YES
implicit_link_lvl_error = NO
max_rcv_btu_size = 4105
tot_link_act_lim = 255
inb_link_act_lim = 0
out_link_act_lim = 0
ls_role = LS_NEG
implicit_dspu_services = NONE
implicit_dspu_template = ""
implicit_ls_limit = 0
act_xid_exchange_limit = 9
nonact_xid_exchange_limit = 5
ls_xmit_rcv_cap = LS_TWS
max_ifrm_rcvd = 7
target_pacing_count = 7
max_send_btu_size = 4105
mac_address = <000000000000>
implicit_cp_cp_sess_support = YES
implicit_limited_resource = NO
implicit_deact_timer = 30
effect_cap = 3993600
connect_cost = 0
byte_cost = 0
security = SEC_NONSECURE
prop_delay = PROP_DELAY_LAN
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
local_name = ""
xid_timeout = 8
xid_retry_limit = 2
t1_timeout = 8
t1_retry_limit = 2
ack_time = 1
inact_time = 48
force_time = 120
pkt_prty = 0
dyna_wnd = 1
```

```
[define_sdlc_port]
port_name = mpq0.000
description = ""
dlc_name = mpq0.000
port_number = 0
initially_active = NO
implicit_hpr_support = YES
tot_link_act_lim = 1
inb_link_act_lim = 0
out_link_act_lim = 1
port_type = PORT_NONSWITCHED
spec_port_type = LEASED
address = 0x00
ls_role = LS_SEC
physical_link = RS232
max_rcv_btu_size = 768
max_ifrm_rcvd = 7
implicit_dspu_services = NONE
implicit_dspu_template = ""
implicit_ls_limit = 0
act_xid_exchange_limit = 10
nonact_xid_exchange_limit = 10
ls_xmit_rcv_cap = LS_TWA
target_pacing_count = 7
max_send_btu_size = 768
implicit_cp_cp_sess_support = NO
implicit_limited_resource = NO
implicit_deact_timer = 30
effect_cap = 9600
connect_cost = 0
byte_cost = 0
security = SEC_NONSECURE
prop_delay = PROP_DELAY_TELEPHONE
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
np_rcv_timer = 30000
np_rcv_timer_retry = 1
write_timer = 1000
write_timer_retry = 5
```

```
link_conn_timer = 1000
link_conn_timer_retry = 1
idle_timer = 1000
idle_timer_retry = 60
pri_fdplx = NO
sec_fdplx = NO
use_rej = NO
max_xid_size = 256
max_retry_count = 10
opt1 = NRZI
opt2 = NONE
linesp = 1200
rcv_pool_size = 8
poll_wait = 1
hmod_data = ""
re_tx_threshold = 10
repoll_threshold = 10
x21_retry_count = 1
x21_retry_delay = 300
v25_tx_delay = 0
cdstl = NO
contact_timer = 3000
contact_timer_retry = 10
contact_timer2 = 10000
contact_timer_retry2 = 65535
disc_timer = 10000
disc_timer_retry = 2
nve_poll_timer = 60000
nve_poll_timer_retry = 65535
nve_poll_timer2 = 1000
nve_poll_timer_retry2 = 65535
no_resp_timer = 3000
no_resp_timer_retry = 15
rem_busy_timer = 2000
rem_busy_timer_retry = 10
rr_timer = 0
poll_frame = XID
poll_on_iframe = YES
secondary_key = mpq0.00001
react_timer = 60
react_timer_retry = 20
```

```
[define_tr_ls]
ls_name = rs28lnk
description = ""
port_name = tok0.000
adj_cp_name = <00000000000000000000000000000000>
adj_cp_type = HOST_XID3
dspu_services = NONE
dspu_name = <0000000000000000>
dlus_name = <00000000000000000000000000000000>
bkup_dlus_name = <00000000000000000000000000000000>
local_node_id = <00000000>
adj_node_id = <00000000>
mac_address = <10005ab1ac7d>
lsap_address = 0x04
max_send_btu_size = 4105
ls_attributes = SNA
cp_cp_sess_support = NO
hpr_supported = NO
hpr_link_lvl_error = NO
auto_act_supp = NO
tg_number = 0
limited_resource = NO
solicit_sscp_sessions = YES
pu_name = RS28LNK
disable_remote_act = NO
default_nn_server = NO
link_deact_timer = 30
use_default_tg_chars = YES
effect_cap = 4300800
connect_cost = 0
byte_cost = 0
security = SEC_NONSECURE
prop_delay = PROP_DELAY_LAN
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
target_pacing_count = 7
ls_role = USE_PORT_DEFAULTS
max_ifrm_rcvd = 0
dlus_retry_timeout = 0
dlus_retry_limit = 0
need_vrfy_fixup = NO
initially_active = NO
react_timer = 30
react_timer_retry = 65535
xid_timeout = 4
xid_retry_limit = 8
t1_timeout = 4
t1_retry_limit = 8
ack_time = 1
inact_time = 48
force_time = 120
pkt_prty = 0
dyna_wnd = 1
```

```
[define_sdlc_ls]
ls_name = 1071175
description = ""
port_name = mpq0.000
adj_cp_name = <00000000000000000000000000000000>
adj_cp_type = LEARN_NODE
dspu_services = NONE
dspu_name = <0000000000000000>
dlus_name = <00000000000000000000000000000000>
bkup_dlus_name = <00000000000000000000000000000000>
local_node_id = <00000000>
adj_node_id = <00000000>
address = 0xc1
max_send_btu_size = 768
tg_number = 0
limited_resource = NO
solicit_sscp_sessions = YES
pu_name = A1071175
disable_remote_act = NO
link_deact_timer = 30
use_default_tg_chars = NO
ls_attributes = SNA
cp_cp_sess_support = YES
default_nn_server = NO
hpr_supported = YES
auto_act_supp = NO
effect_cap = 9600
connect_cost = 0
byte_cost = 0
security = SEC_NONSECURE
```

```
prop_delay = PROP_DELAY_TELEPHONE
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
target_pacing_count = 7
ls_role = USE_PORT_DEFAULTS
max_ifrm_rcvd = 0
dlus_retry_timeout = 0
dlus_retry_limit = 0
need_vrfy_fixup = NO
initially_active = YES
react_timer = 60
react_timer_retry = 20
contact_timer = 3000
contact_timer_retry = 10
contact_timer2 = 10000
contact_timer_retry2 = 65535
disc_timer = 10000
disc_timer_retry = 2
nve_poll_timer = 60000
nve_poll_timer_retry = 65535
nve_poll_timer2 = 1000
nve_poll_timer_retry2 = 65535
no_resp_timer = 3000
no_resp_timer_retry = 15
rem_busy_timer = 2000
rem_busy_timer_retry = 10
rr_timer = 0
poll_frame = XID
poll_on_iframe = YES
opt1 = NRZI
linesp = 1200
hmod_data = ""
re_tx_threshold = 10
repoll_threshold = 10
x21_sequence = ""
x21_retry_count = 0
x21_retry_delay = 0
v25_tx_delay = 0
cdstl = NO
port_profile_name = mpq0.00001
physical_link = RS232
station_type = LS_SEC
call_out_on_activation = YES
```

```
[define_mpc_ls]
ls_name = rs6kmpc
description = ""
port_name = mpc0
adj_cp_name = <00000000000000000000000000000000>
adj_cp_type = LEARN_NODE
local_node_id = <00000000>
adj_node_id = <00000000>
mpc_group_name = sna
max_send_btu_size = 4096
ls_attributes = SNA
cp_cp_sess_support = YES
default_nn_server = NO
hpr_supported = YES
auto_act_supp = NO
tg_number = 0
limited_resource = NO
solicit_sscp_sessions = NO
pu_name = <0000000000000000>
disable_remote_act = NO
link_deact_timer = 30
use_default_tg_chars = NO
effect_cap = 39321600
connect_cost = 128
byte_cost = 128
security = SEC_NONSECURE
prop_delay = PROP_DELAY_MINIMUM
user_def_parm_1 = 128
user_def_parm_2 = 128
user_def_parm_3 = 128
target_pacing_count = 7
ls_role = USE_PORT_DEFAULTS
max_ifrm_rcvd = 0
dlus_retry_timeout = 0
dlus_retry_limit = 0
need_vrfy_fixup = NO
initially_active = YES
react_timer = 60
react_timer_retry = 0
port_profile_name = mpc0


[define_partner_lu]
plu_alias = APING
description = ""
fqplu_name = USIBMRA.RAIAZ
plu_un_name = RAIAZ
parallel_sess_supp = YES
appcip_routing_preference = USE_DEFAULT_PREFERENCE
max_mc_ll_send_size = 0
conv_security_ver = NO
secondary_key = APING
```

```
[define_mode]
mode_name = DFLTMODE
description = ""
max_neg_sess_lim = 8
plu_mode_session_limit = 8
min_conwin_src = 4
min_conloser_src = 0
auto_act = 0
receive_pacing_win = 7
max_receive_pacing_win = 16
default_ru_size = NO
max_ru_size_upp = 1024
max_ru_size_low = 256
cos_name = #CONNECT


[define_mode]
mode_name = SNACKETS
description = ""
max_neg_sess_lim = 100
plu_mode_session_limit = 100
min_conwin_src = 50
min_conloser_src = 0
auto_act = 0
receive_pacing_win = 7
max_receive_pacing_win = 16
default_ru_size = NO
max_ru_size_upp = 3840
max_ru_size_low = 0
cos_name = #CONNECT


[define_lu_0_to_3]
lu_name = LU26
description = ""
pu_name = A1071175
nau_address = 6
lu_model = 3270_DISPLAY_MODEL_2
pool_name = <0000000000000000>
sscp_id = 0
priority = MEDIUM
timeout = 0
secondary_key = 71175lu6
remote_lu_name = <00000000000000000000000000000000>
lu_use = NONE
host_app = ""
log_mode = ""
plu_partner = ""
init_self = NO
session_term = TERM_SELF
api_trace = NO
ls_name = 1071175
```

```
[define_lu_0_to_3]
lu_name = LU27
description = ""
pu_name = A1071175
nau_address = 7
lu_model = 3270_DISPLAY_MODEL_2
pool_name = <0000000000000000>
sscp_id = 0
priority = MEDIUM
timeout = 0
secondary_key = 71175lu7
remote_lu_name = <00000000000000000000000000000000>
lu_use = NONE
host_app = ""
log_mode = ""
plu_partner = ""
init_self = NO
session_term = TERM_SELF
api_trace = NO
ls_name = 1071175


[define_directory_entry]
resource_name = USIBMRA.RAB
resource_type = NNCP_RESOURCE
description = ""
parent_name = <00000000000000000000000000000000>
parent_type = ENCP_RESOURCE


[define_directory_entry]
resource_name = USIBMRA.RAIAZ
resource_type = LU_RESOURCE
description = ""
parent_name = USIBMRA.RAB
parent_type = NNCP_RESOURCE
secondary_key = aping


[define_defaults]
description = ""
mode_name = ""
implicit_plu_forbidden = NO
specific_security_codes = YES
limited_timeout = 65535

[define_trusted_groups]
```

Appendix C. Migration from SNA Services to CS/AIX V5 Profiles

C.1 SNA Services/6000 V1R21 Profiles

The following is a listing of the SNA Services/6000 V1.2.1 profiles used for the migration example in Chapter 4, “SNA Services/6000 to CS/AIX V5 Migration” on page 35. The default profiles have been removed.

```
#SNA  01.02.0101.0315   ***DO NOT MODIFY OR REMOVE***
dsw_ls_CONNECTION:
    type = CONNECTION
    profile_name = dsw_ls
    attachment_profile_name = dsw_ls
    local_lu_profile_name = dsw_ls
    network_name =
    remote_lu_name =
    stop_connection_on_inactivity = no
    lu_type = lu2
    interface_type = extended
    remote_tpn_list_name = RDEFAULT
    mode_list_name = MDEFAULT
    node_verification = no
    inactivity_timeout_value = 0
    notify = no
    parallel_sessions = single
    negotiate_session_limits = no
    security_accepted = none
    conversation_security_access_list_name =


rx.lu1.1_CONNECTION:
    type = CONNECTION
    profile_name = rx.lu1.1
    attachment_profile_name = dsw_ls
    local_lu_profile_name = test_lu1
    network_name = LU
    remote_lu_name = T1
    stop_connection_on_inactivity = yes
    lu_type = lu1
    interface_type = extended
    remote_tpn_list_name =
    mode_list_name =
    node_verification = no
    inactivity_timeout_value = 1
    notify = yes
    parallel_sessions = single
    negotiate_session_limits = no
    security_accepted = none
    conversation_security_access_list_name =
```

```
rx.lu2.1_CONNECTION:
    type = CONNECTION
    profile_name = rx.lu2.1
    attachment_profile_name = dsw_ls
    local_lu_profile_name = lu_lu2
    network_name = LU
    remote_lu_name = T2
    stop_connection_on_inactivity = yes
    lu_type = lu2
    interface_type = extended
    remote_tpn_list_name =
    mode_list_name =
    node_verification = no
    inactivity_timeout_value = 1
    notify = yes
    parallel_sessions = single
    negotiate_session_limits = no
    security_accepted = none
    conversation_security_access_list_name =


rx.lu3.1_CONNECTION:
    type = CONNECTION
    profile_name = rx.lu3.1
    attachment_profile_name = dsw_ls
    local_lu_profile_name = lu_lu3
    network_name = LU
    remote_lu_name = T3
    stop_connection_on_inactivity = yes
    lu_type = lu3
    interface_type = extended
    remote_tpn_list_name =
    mode_list_name =
    node_verification = no
    inactivity_timeout_value = 1
    notify = yes
    parallel_sessions = single
    negotiate_session_limits = no
    security_accepted = none
    conversation_security_access_list_name =
```

```
rx.lu62_CONNECTION:
    type = CONNECTION
    profile_name = rx.lu62
    attachment_profile_name = dsw_ls
    local_lu_profile_name = chang
    network_name = USIBMRA
    remote_lu_name = LU62
    stop_connection_on_inactivity = yes
    lu_type = lu6.2
    interface_type = extended
    remote_tpn_list_name = rtplist
    mode_list_name = modelist
    node_verification = no
    inactivity_timeout_value = 2
    notify = no
    parallel_sessions = single
    negotiate_session_limits = no
    security_accepted = none
    conversation_security_access_list_name =


dsw_ls_LOCALLU:
    type = LOCALLU
    profile_name = dsw_ls
    local_lu_name =
    network_name =
    lu_type = lu2
    independent_lu = no
    tpn_list_name = TDEFAULT
    local_lu_address = 5
    sscp_id = *
    number_of_rows = 24
    number_of_columns = 80


test_lu1_LOCALLU:
    type = LOCALLU
    profile_name = test_lu1
    local_lu_name = LU11
    network_name =
    lu_type = lu1
    independent_lu = no
    tpn_list_name =
    local_lu_address = 3
    sscp_id = *
    number_of_rows = 1
    number_of_columns = 1
```

```
lu_lu2_LOCALLU:
    type = LOCALLU
    profile_name = lu_lu2
    local_lu_name = LU21
    network_name =
    lu_type = lu2
    independent_lu = no
    tpn_list_name =
    local_lu_address = 2
    sscp_id = 050000000000
    number_of_rows = 24
    number_of_columns = 80



lu_lu3_LOCALLU:
    type = LOCALLU
    profile_name = lu_lu3
    local_lu_name = LU31
    network_name =
    lu_type = lu3
    independent_lu = no
    tpn_list_name =
    local_lu_address = 4
    sscp_id = 050000000000
    number_of_rows = 24
    number_of_columns = 80



chang_LOCALLU:
    type = LOCALLU
    profile_name = chang
    local_lu_name = CHANG
    network_name = USIBMRA
    lu_type = lu6.2
    independent_lu = no
    tpn_list_name = tpnlist
    local_lu_address = 6
    sscp_id = *
    number_of_rows = 1
    number_of_columns = 1
```

```
dsw_ls_ATTACHMENT:
    type = ATTACHMENT
    profile_name = dsw_ls
    control_point_profile_name = dsw_ls
    logical_link_profile_name = dsw_ls
    physical_link_profile_name = dsw_ls
    logical_link_type = token_ring
    restart_on_deactivation = no
    stop_attachment_on_inactivity = no
    station_type = secondary
    physical_link_type = token_ring
    remote_secondary_station_address = 1
    smart_modem_command_sequence =
    length_of_command_sequence = 0
    call_type = call
    x25_level = 1984
    listen_name = IBMQLLC
    autolisten = no
    timeout_value = 0
    remote_link_name_ethernet =
    remote_link_name_token_ring =
    remote_link_address = 400001240000
    selection_sequence =
    length_of_selection_sequence = 0
    network_type = switched
    access_routing = link_address
    remote_sap_address = 04
    remote_sap_address_range_lower = 04
    remote_sap_address_range_upper = EC
    virtual_circuit_type = permanent
    remote_station_X.25_address =
    optional_X.25_facilities = no
    logical_channel_number_of_PVC = 1
    reverse_charging = no
    rpoa = no
    default_packet_size = no
    default_window_size = no
    default_throughput_class = no
    closed_user_group = no
    closed_user_group_outgoing = no
    network_user_id = no
    network_user_id_name =
    data_network_identification_code =
    packet_size_for_received_data = 128
    packet_size_for_transmit_data = 128
    window_size_for_received_data = 2
    window_size_for_transmit_data = 2
    throughput_class_for_received_data = 1200
    throughput_class_for_transmit_data = 1200
    index_to_selected_closed_user_group = 0
    lu_address_registration = no
    lu_address_registration_name = LDEFAULT
```

```
sna_SNA:
    type = SNA
    profile_name = sna
    total_active_open_connections = 200
    total_sessions = 200
    total_conversations = 200
    server_synonym_name = sna
    nmvt_action_when_no_nmvt_process = reject
    restart_action = once
    stdin = /dev/null
    stdout = /dev/console
    stderr = /dev/console
    sna_error_log = yes



tpn1_REMOTETPN:
    type = REMOTETPN
    profile_name = tpn1
    tpn_name = TPN1
    tpn_name_hex = E3D7D5F1
    pip_data = no
    conversation_type = basic
    recovery_level = no_reconnect
    sync_level = confirm
    tpn_name_in_hex = no



rtplist_REMOTETPNLIST:
    type = REMOTETPNLIST
    Listname = rtplist
    list_members = tpn1
```

```
tpn2_TPN:
    type = TPN
    profile_name = tpn2
    tpn_name = TPN2
    tpn_name_hex = E3D7D5F2
    conversation_type = basic
    pip_data = no
    sync_level = none
    recovery_level = no_reconnect
    full_path_to_tpn_executable = /bin/svr
    multiple_instances = yes
    user_id = 200
    server_synonym_name = tpn2
    restart_action = once
    communication_type = signals
    stdin = /dev/null
    stdout = /dev/null
    stderr = /dev/null
    subfields = 0
    communication_ipc_queue_key = 0
    tpn_name_in_hex = no
    security_required = none
    resource_security_access_list_name =


tpnlist_TPNLIST:
    type = TPNLIST
    Listname = tpnlist
    list_members = tpn2



dsw_ls_CONTROLPOINT:
    type = CONTROLPOINT
    profile_name = dsw_ls
    xid_node_id = 00000000
    network_name = USIBMRA
    cp_name = R600CP



mode1_MODE:
    type = MODE
    profile_name = mode1
    mode_name = MODE1
    maximum_number_of_sessions = 1
    minimum_contention_winners = 0
    minimum_contention_losers = 1
    auto_activations_limit = 0
    receive_pacing = 0
    send_pacing = 0
    maximum_ru_size = 512
    recovery_level = no_reconnect
```

```
mode2_MODE:
    type = MODE
    profile_name = mode2
    mode_name = MODE2
    maximum_number_of_sessions = 4
    minimum_contention_winners = 0
    minimum_contention_losers = 4
    auto_activations_limit = 0
    receive_pacing = 0
    send_pacing = 0
    maximum_ru_size = 512
    recovery_level = no_reconnect



modelist_MODELIST:
    type = MODELIST
    Listname = modelist
    list_members = mode1,mode2



sna_ALIAS_sna:
    type = ALIAS
    alias_name = sna
    profile_name = sna
    node_name =
    profile_type = sna


dsw_ls_ALIAS_connection:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = connection



rx.lu1.1_ALIAS_connection:
    type = ALIAS
    alias_name = rx.lu1.1
    profile_name = rx.lu1.1
    node_name =
    profile_type = connection



rx.lu2.1_ALIAS_connection:
    type = ALIAS
    alias_name = rx.lu2.1
    profile_name = rx.lu2.1
    node_name =
    profile_type = connection
```

```
rx.lu3.1_ALIAS_connection:
    type = ALIAS
    alias_name = rx.lu3.1
    profile_name = rx.lu3.1
    node_name =
    profile_type = connection



rx.lu62_ALIAS_connection:
    type = ALIAS
    alias_name = rx.lu62
    profile_name = rx.lu62
    node_name =
    profile_type = connection



dsw_ls_ALIAS_local_lu:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = local_lu



test_lu1_ALIAS_local_lu:
    type = ALIAS
    alias_name = test_lu1
    profile_name = test_lu1
    node_name =
    profile_type = local_lu



lu_lu2_ALIAS_local_lu:
    type = ALIAS
    alias_name = lu_lu2
    profile_name = lu_lu2
    node_name =
    profile_type = local_lu



lu_lu3_ALIAS_local_lu:
    type = ALIAS
    alias_name = lu_lu3
    profile_name = lu_lu3
    node_name =
    profile_type = local_lu
```

```
chang_ALIAS_local_lu:
    type = ALIAS
    alias_name = chang
    profile_name = chang
    node_name =
    profile_type = local_lu



dsw_ls_ALIAS_attachment:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = attachment



tpn1_ALIAS_transact:
    type = ALIAS
    alias_name = tpn1
    profile_name = tpn1
    node_name =
    profile_type = transact



tpn2_ALIAS_transact:
    type = ALIAS
    alias_name = tpn2
    profile_name = tpn2
    node_name =
    profile_type = transact



dsw_ls_ALIAS_control_pt:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = control_pt



mode1_ALIAS_mode:
    type = ALIAS
    alias_name = mode1
    profile_name = mode1
    node_name =
    profile_type = mode
```

```
mode2_ALIAS_mode:
    type = ALIAS
    alias_name = mode2
    profile_name = mode2
    node_name =
    profile_type = mode



dsw_ls_ALIAS_logicallinks:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = logicallinks



dsw_ls_ALIAS_physicalinks:
    type = ALIAS
    alias_name = dsw_ls
    profile_name = dsw_ls
    node_name =
    profile_type = physicalinks



dsw_ls_TOKENRINGLOGICAL:
    type = TOKENRINGLOGICAL
    profile_name = dsw_ls
    retry_limit = 20
    transmit_window_count = 10
    dynamic_window_increment = 1
    retransmit_count = 8
    receive_window_count = 127
    ring_access_priority = 0
    inactivity_timeout = 48
    drop_link_on_inactivity = yes
    response_timeout = 2
    acknowledgement_timeout = 1
    force_disconnect_timeout = 120
    link_trace = yes
    trace_entry_size = long
    logical_link_type = token_ring
    maximum_i_field = user_defined
    maximum_i_field_size = 1000
    physical_link_type = token_ring
```

```
dsw_ls_TOKENRINGPHYSICAL:
    type = TOKENRINGPHYSICAL
    profile_name = dsw_ls
    device_name = tok0
    local_link_name =
    local_sap_address = 04
    physical_link_type = token_ring
    maximum_number_of_logical_links = 32
```

C.2 Profiles Migrated from SNA Sevices/6000 V1R21 to CS/AIX V4.2

The following is a listing of the CS/AIX V4.2 format of the profiles used for the migration example in Chapter 4, “SNA Services/6000 to CS/AIX V5 Migration” on page 35. The default profiles have been removed.

```
link_station_token_ring:
        prof_name                       = "dsw_ls"
        sna_dlc_profile_name            = "dsw_ls"
        LU_registration_supported       = no
        LU_registration_profile_name    = ""
        cp_cp_sessions_supported        = no
        link_tracing                    = yes
        trace_format                    = long
        xid_node_id                     = 00000000
        use_control_pt_xid              = no
        call_out_on_activation          = yes
        restart_on_activation           = no
        remote_link_name                = ""
        remote_link_address             = 400001240000
        access_routing_type             = link_address
        remote_sap                      = 04



control_pt:
        prof_name                       = "node_cp"
        network_name                    = "USIBMRA"
        control_pt_name                 = "R6007CP"



session_lu1:
        prof_name                       = "rx.lu1.1"
        link_station_profile_name       = "dsw_ls"
        local_lu_name                   = "LU11"
        local_lu_address                = 3
        sscp_id                         = "*"
        network_name                    = "LU"
        remote_lu_name                  = "T1"
```

```
session_lu2:
        prof_name                       = "dsw_ls"
        link_station_profile_name       = "dsw_ls"
        local_lu_name                   = ""
        local_lu_address                = 5
        sscp_id                         = "*"
        network_name                    = ""
        remote_lu_name                  = ""
        max_rows                        = 24
        max_columns                     = 80


session_lu2:
        prof_name                       = "rx.lu2.1"
        link_station_profile_name       = "dsw_ls"
        local_lu_name                   = "LU21"
        local_lu_address                = 2
        sscp_id                         = "0"
        network_name                    = "LU"
        remote_lu_name                  = "T2"
        max_rows                        = 24
        max_columns                     = 80


session_lu3:
        prof_name                       = "rx.lu3.1"
        link_station_profile_name       = "dsw_ls"
        local_lu_name                   = "LU31"
        local_lu_address                = 4
        sscp_id                         = "0"
        network_name                    = "LU"
        remote_lu_name                  = "T3"
        max_rows                        = 24
        max_columns                     = 80


side_info:
        prof_name                       = "rx.lu62"
        local_lu_or_control_pt_alias    = "CHANG"
        fq_partner_lu_name              = "USIBMRA.LU62"
        remote_tp_name                  = "TPN1"
        remote_tp_name_in_hex           = no
        mode_name                       = "MODE1"
```

```
local_lu_lu6.2:
        prof_name                       = "chang"
        local_lu_name                   = "CHANG"
        local_lu_address                = 6
        link_station_prof_name          = "dsw_ls"
        sscp_id                         = "*"
        local_lu_alias                  = "CHANG"
        local_lu_dependent              = yes


local_tp:
        prof_name                       = "tpn2"
        tp_name                         = "TPN2"
        conversation_type               = basic
        pip_data_present                = no
        sync_level                      = none
        full_path_tp_exe                = "/bin/svr"
        multiple_instances              = yes
        user_id                         = 200
        server_synonym_name             = "tpn2"
        restart_action                  = once
        communication_type              = signals
        standard_input_device           = "/dev/null"
        standard_output_device          = "/dev/null"
        standard_error_device           = "/dev/null"
        pip_data_subfields_number       = 0
        ipc_queue_key                   = 0
        tp_name_in_hex                  = no
        resource_security_level         = none
        resource_access_list_profile_name   = ""


mode:
        prof_name                       = "mode1"
        mode_name                       = "MODE1"
        max_sessions                    = 1
        min_conwinner_sessions          = 0
        min_conloser_sessions           = 1
        auto_activate_limit             = 0
        receive_pacing_window           = 0
        max_ru_size                     = 512


mode:
        prof_name                       = "mode2"
        mode_name                       = "MODE2"
        max_sessions                    = 4
        min_conwinner_sessions          = 0
        min_conloser_sessions           = 4
        auto_activate_limit             = 0
        receive_pacing_window           = 0
        max_ru_size                     = 512
```

```
sna:
        prof_name                           = "sna"
        max_sessions                        = 200
        max_conversations                   = 200
        restart_action                      = once
        standard_output_device              = "/dev/console"
        standard_error_device               = "/dev/console"
        nmvt_action_when_no_nmvt_process    = reject


sna_dlc_token_ring:
        prof_name                           = "TLINKDEFAULT"
        datalink_device_name                = "tok0"
        force_timeout                       = 120
        user_defined_max_i_field            = no
        max_i_field_length                  = 30729
        retry_limit                         = 20
        link_name                           = ""
        local_sap                           = 04
        max_active_link_stations            = 32
        transmit_window_count               = 127
        dynamic_window_increment            = 1
        retransmit_count                    = 8
        receive_window_count                = 1
        priority                            = 0
        inact_timeout                       = 48
        response_timeout                    = 4
        acknowledgement_timeout             = 1



sna_dlc_token_ring:
        prof_name                           = "dsw_ls"
        datalink_device_name                = "tok0"
        force_timeout                       = 120
        user_defined_max_i_field            = yes
        max_i_field_length                  = 1000
        retry_limit                         = 20
        link_name                           = ""
        local_sap                           = 04
        max_active_link_stations            = 32
        transmit_window_count               = 127
        dynamic_window_increment            = 1
        retransmit_count                    = 8
        receive_window_count                = 1
        priority                            = 0
        inact_timeout                       = 48
        response_timeout                    = 4
        acknowledgement_timeout             = 1
```

```
partner_lu6.2:
        prof_name                       = "rx.lu62"
        fq_partner_lu_name              = "USIBMRA.LU62"
        parallel_session_supp           = no
        conversation_security_level     = none
        session_security_supp           = no
```

Appendix D. Special Notices

This publication is intended to help technical professionals understand the new features and functions of the IBM eNetwork Communications Server for AIX Version 5 product. The information in this publication is not intended as the specification of any programming interfaces that are provided by Communications Server for AIX. See the PUBLICATIONS section of the IBM Programming Announcement for IBM eNetwork Communications Server for AIX Version 5 for more information about what publications are considered to be product documentation.

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Appendix E. Related Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

E.1 International Technical Support Organization Publications

For information on ordering these ITSO publications see “How to Get ITSO Redbooks” on page 205.

- *Campus ATM Configuration Examples*, SG24-2126
- *IBM Frame Relay Guide*, GG24-4463

E.2 Redbooks on CD-ROMs

Redbooks are also available on CD-ROMs. **Order a subscription** and receive updates 2-4 times a year at significant savings.

CD-ROM Title	Subscription Number	Collection Kit Number
System/390 Redbooks Collection	SBOF-7201	SK2T-2177
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AS/400 Redbooks Collection	SBOF-7270	SK2T-2849
RS/6000 Redbooks Collection (HTML, BkMgr)	SBOF-7230	SK2T-8040
RS/6000 Redbooks Collection (PostScript)	SBOF-7205	SK2T-8041
Application Development Redbooks Collection	SBOF-7290	SK2T-8037
Personal Systems Redbooks Collection	SBOF-7250	SK2T-8042

E.3 Other Publications

These publications are also relevant as further information sources:

- *IBM eNetwork Communications Server for AIX General Information*, GC31-8584
- *IBM eNetwork Communications Server for AIX Installation and Migration Guide*, SC31-8585
- *IBM eNetwork Communications Server for AIX Quick Beginnings*, GC31-8583
- *IBM eNetwork Communications Server for AIX Administration Guide*, SC31-8586
- *IBM eNetwork Communications Server for AIX Administration Command Reference*, SC31-8587

- *IBM eNetwork Communications Server for AIX CPI-C Programmer's Guide*, SC31-8591
- *IBM eNetwork Communications Server for AIX APPC Programmer's Guide*, SC31-8590
- *IBM eNetwork Communications Server for AIX CSV Programmer's Guide*, SC31-8592
- *IBM eNetwork Communications Server for AIX MS Programmer's Guide*, SC31-8594
- *IBM eNetwork Communications Server for AIX NOF Programmer's Guide*, SC31-8595
- *IBM eNetwork Communications Server for AIX Diagnostics Guide*, SC31-8588
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- *IBM eNetwork Communications Server for AIX AnyNet Guide to Sockets over SNA*, GC31-8597
- *IBM eNetwork Communications Server for AIX APPC Application Suite User's Guide*, SC31-8596
- *IBM eNetwork Communications Server for AIX Channel Connectivity User's Guide*, SC31-8219

How to Get ITSO Redbooks

This section explains how both customers and IBM employees can find out about ITSO redbooks, CD-ROMs, workshops, and residencies. A form for ordering books and CD-ROMs is also provided.

This information was current at the time of publication, but is continually subject to change. The latest information may be found at URL http://www.redbooks.ibm.com.

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- **PUBORDER** — to order hardcopies in United States
- **GOPHER link to the Internet** - type GOPHER.WTSCPOK.ITSO.IBM.COM
- **Tools disks**

  To get LIST3820s of redbooks, type one of the following commands:

  ```
  TOOLS SENDTO EHONE4 TOOLS2 REDPRINT GET SG24xxxx PACKAGE
  TOOLS SENDTO CANVM2 TOOLS REDPRINT GET SG24xxxx PACKAGE (Canadian users only)
  ```

  To get BookManager BOOKs of redbooks, type the following command:

  ```
  TOOLCAT REDBOOKS
  ```

  To get lists of redbooks:

  ```
  TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET ITSOCAT TXT
  TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET LISTSERV PACKAGE
  ```

  To register for information on workshops, residencies, and redbooks:

  ```
  TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ITSOREGI 1996
  ```

  For a list of product area specialists in the ITSO:

  ```
  TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ORGCARD PACKAGE
  ```

- **Redbooks Home Page on the World Wide Web**

  http://w3.itso.ibm.com/redbooks

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