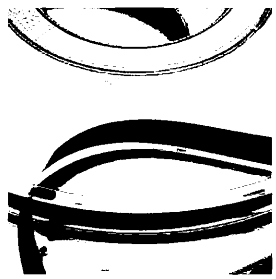
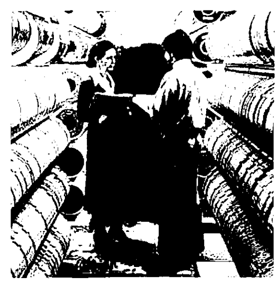
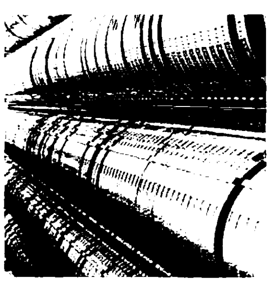
Prime Computer, Inc.

DOC8908-1LA PRIME/SNA™ Administrator's Guide Release 1.0

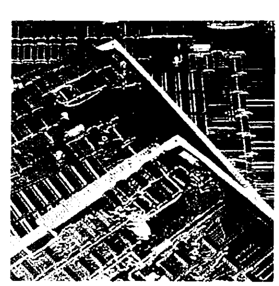












PRIME/SNA™ Administrator's Guide

First Edition

by

James FitzGerald

and

Richard Nollman

This guide documents the software operation of the Prime Computer and its supporting systems and utilities as implemented at Master Disk Revision Level 19.4.1 (Rev. 19.4.1).

Prime Computer, Inc.
Prime Park
Natick, Massachusetts 01760

COPYRIGHT INFORMATION

The information in this document is subject to change without notice and should not be construed as a commitment by Prime Computer Corporation. Prime Computer Corporation assumes no responsibility for any errors that may appear in this document.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

Copyright © 1985 by
Prime Computer, Inc.
Prime Park
Natick, Massachusetts 01760

PRIME and PRIMOS are registered trademarks of Prime Computer, Inc.

PRIME/SNA, PRIMENET, RINGNET, Prime INFORMATION, PRIMACS, MIDASPLUS, Electronic Design Management System, EDMS, PDMS, PRIMEWAY, Prime Producer 100, INFO/BASIC, PST 100, PT200, PW200, PW150, 2250, 9950, 9955, THE PROGRAMMER'S COMPANION, and PRISAM are trademarks of Prime Computer, Inc.

Digital Data Service (DDS) is a registered trademark of American Telephone and Telegraph.

CREDITS

Editor	Herbert Korn
Technical Support	Clifford Fuhrmann Keith Allchin John Davis Ian Breitner JoEllen Baird Roberta Beeson
Project Support	Betty B. Hoskins
Graphics Support	Marjorie Clark Bob Stuart Chris Forbes James FitzGerald
Production Support	Judy Gordon
Text Preparation	Gene Muir

PRINTING HISTORY — PRIME/SNA ADMINISTRATOR'S GUIDE

Edition	Date	Number	Software Release
First Edition	April 1985	DOC8908-1LA	1.0

CUSTOMER SUPPORT CENTER

Prime provides the following toll-free numbers for customers in the United States needing service:

1-800-322-2838 (within Massachusetts)
1-800-343-2320 (within other states)
1-800-541-8888 (within Alaska)
1-800-651-1313 (within Hawaii)

HOW TO ORDER TECHNICAL DOCUMENTS

Obtain an order form, a catalog, and a price list from one of the following:

Inside U.S.

Software Distribution
Prime Computer, Inc.
74 New York Ave.
Framingham, MA 01701
(617) 879-2960 X2053

Outside U.S.

Contact your local Prime subsidiary or distributor.

Contents

PART II - CREATING A CONFIGURATION

7 CONVERTING TO PRIME/SNA CONFIGURATIONS

PART III - IMPLEMENTING YOUR PRIME/SNA CONFIGURATION

8 INSTALLING PRIME/SNA

About This Book

The PRIME/SNA™ Administrator's Guide describes relevant portions of IBM's Systems Network Architecture (SNA) and the installation and configuration of PRIME/SNA for use within SNA networks.

This book is intended for a PRIME/SNA Administrator. The PRIME/SNA Administrator's duties include:

- Understanding basic concepts about SNA and PRIME/SNA
- Planning PRIME/SNA configurations
- Communicating PRIME/SNA requirements to personnel at IBM hosts
- Installing PRIME/SNA software and establishing system security
- Using the Server and 3270 configurators

When planning a PRIME/SNA installation, it is helpful (but not required) for you to have some basic knowledge of telecommunications. This book assumes the reader has an acquaintance with networks or telecommunications.

ORGANIZATION OF THE BOOK

This guide is organized into three parts and 10 chapters.

PART I, GENERAL INFORMATION, presents a broad overview of SNA and PRIME/SNA, as follows:

- Chapter 1 answers four frequently asked questions about SNA.
- Chapter 2 provides information about the fundamentals of SNA.
- Chapter 3 provides a PRIME/SNA overview and brief discussion of the Server and Interactive Subsystems, and the role of the ICS2.

PART II, CREATING A CONFIGURATION, provides information required to plan your configuration, as follows:

- Chapter 4 provides information useful in evaluating IBM host applications.
- Chapter 5 describes how to organize PRIME/SNA resources into a workable configuration.
- Chapter 6 provides information and worksheets to help coordinate your PRIME/SNA configuration with IBM host personnel.
- Chapter 7 presents information needed to use the Server and 3270 configurators.

PART III, IMPLEMENTING YOUR PRIME/SNA CONFIGURATION, discusses the actual configuration of PRIME/SNA, as follows:

- Chapter 8 provides information on installing PRIME/SNA software and establishing system security.
- Chapter 9 shows you how to use the Server Subsystem configurator.
- Chapter 10 shows you how to use the Interactive Subsystem configurator.

HOW TO USE THIS GUIDE

This book assumes a basic understanding of administering a Prime system, but not necessarily a familiarity with the features of PRIME/SNA. If you are already familiar with SNA, skip to Chapter 3 for information on PRIME/SNA.

PART II provides you with all the planning information and tools required to design your configuration.

PART III describes the actual installation and configuration of PRIME/SNA.

OTHER USEFUL PUBLICATIONS

Other books in the PRIME/SNA document set include:

- PRIME/SNA Operator's Guide (DOC8909-1LA), which includes detailed information on system operation of PRIME/SNA once the product is installed.
- PRIME/SNA Interactive Terminal User's Guide (DOC8910-1LA), which describes how to use the Prime PT200 terminal as an emulated IBM 3278 Display Station.

Users of this guide also should have the following Prime document available for reference:

- System Administrator's Guide (DOC5037-2LA), which describes commands techniques, stategy and advice for configuration, resource allocation, and administration of Prime systems and networks.

PRIME DOCUMENTATION CONVENTIONS

The following conventions are used in command formats, statement formats, and in examples throughout this document. Examples illustrate the uses of these commands and statements in typical applications. Terminal input may be entered in either uppercase or lowercase.

Convention	Explanation	Example
UPPERCASE	In command formats, words in uppercase indicate the actual names of commands, statements, and keywords. They can be entered in either uppercase or lowercase.	SLIST
lowercase	In command formats, words in lowercase indicate items for which the user must substitute a suitable value.	LOGIN user-id

Abbreviations	If a command or statement has an abbreviation, it is indicated by underlining. In cases where the command or directive itself contains an underscore, the abbreviation is shown below the full name, and the name and abbreviation are placed within braces.	LOGOUT { SET_QUOTA SQ }
Underlining in examples	In examples, user input is underlined but system prompts and output are not.	OK, RESUME MY_PROG This is the output of MY_PROG.CPL OK,
Brackets	Brackets enclose a list of two or more optional items. Choose none, one, or more of these items.	SPOOL [-LIST -CANCEL]
Braces	Braces enclose a list of items. Choose one and only one of these items.	CLOSE { filename ALL }
Ellipsis ...	An ellipsis indicates that the preceding item may be repeated.	item-x[,item-y]...
Parentheses ( )	In command or statement formats, parentheses must be entered exactly as shown.	DIM array (row,col)
Hyphen -	Wherever a hyphen appears as the first letter of an option, it is a required part of that option.	SPOOL -LIST

PART I

General Information

1

Four Questions About SNA and PRIME/SNA

WHY DO I NEED PRIME/SNA?

PRIME/SNA is a product that uses the specifications of IBM's Systems Network Architecture (SNA) to provide Prime users access to the resources within IBM networks. There are several reasons you may need PRIME/SNA:

- You must provide information to or retrieve information from an IBM data base.
- You want to use applications that have been specifically developed for an IBM host.
- You are replacing IBM hardware with Prime equipment and you want to continue using host-bound applications while new ones are under development on your Prime Machine.
- You are updating binary synchronous emulators (such as Prime's DPTX and RJE Phase II) to PRIME/SNA to take advantage of the flexibility of SNA and PRIME/SNA.

Whatever reason you may have for installing PRIME/SNA on your system, this book presents the basic information you need to know about IBM's SNA and PRIME/SNA, details how to configure PRIME/SNA to work with networking parameters specified by IBM host personnel, and, finally, explains how to install PRIME/SNA.

WHAT IS SNA?

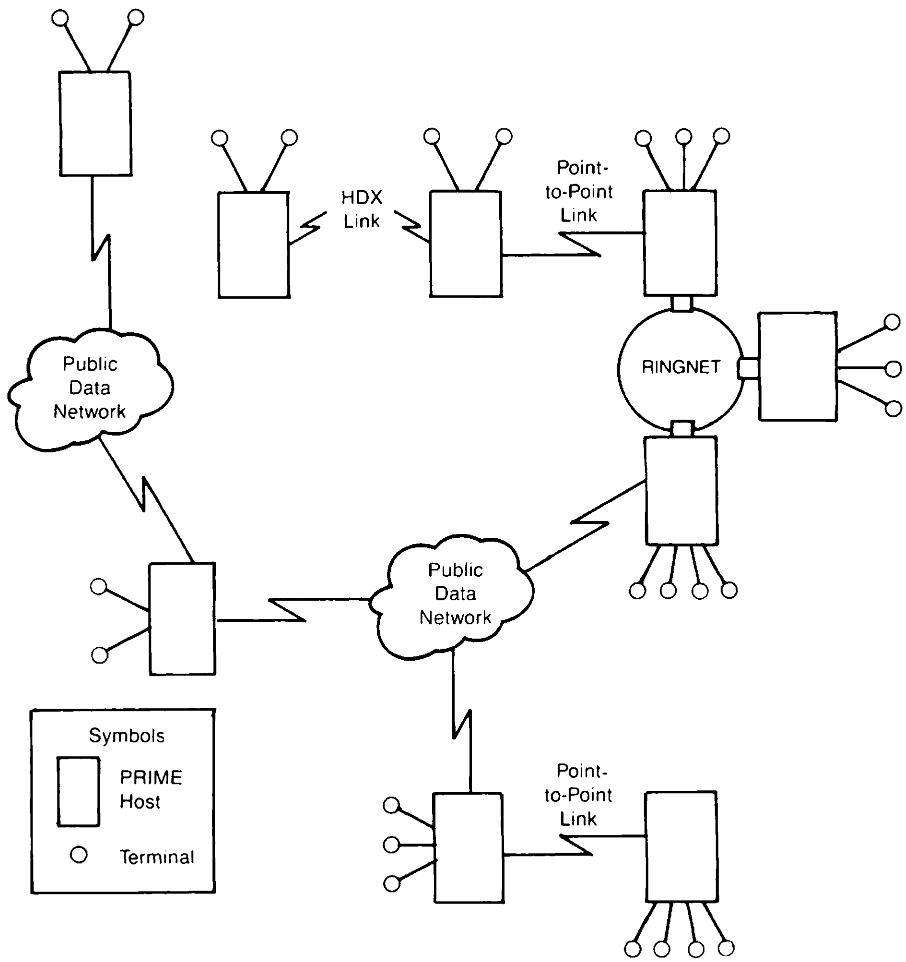
Systems Network Architecture is a design for a total communications system that embraces every part of IBM's communications network. Applications running on an IBM mainframe, remote terminals and processors, and the communications resources tying them together follow this common design. Some important goals of SNA design include the following:

- Reliable communications
- Transparent communications
- Ease of use

Many data communications vendors, Prime among them, share these goals. Unfortunately, the differing demands of vendors' software and hardware products have resulted in the implementation of differing network architectures. PRIME/SNA is a product for reconciling the differences between Prime and IBM.

Comparison of SNA to PRIMENET

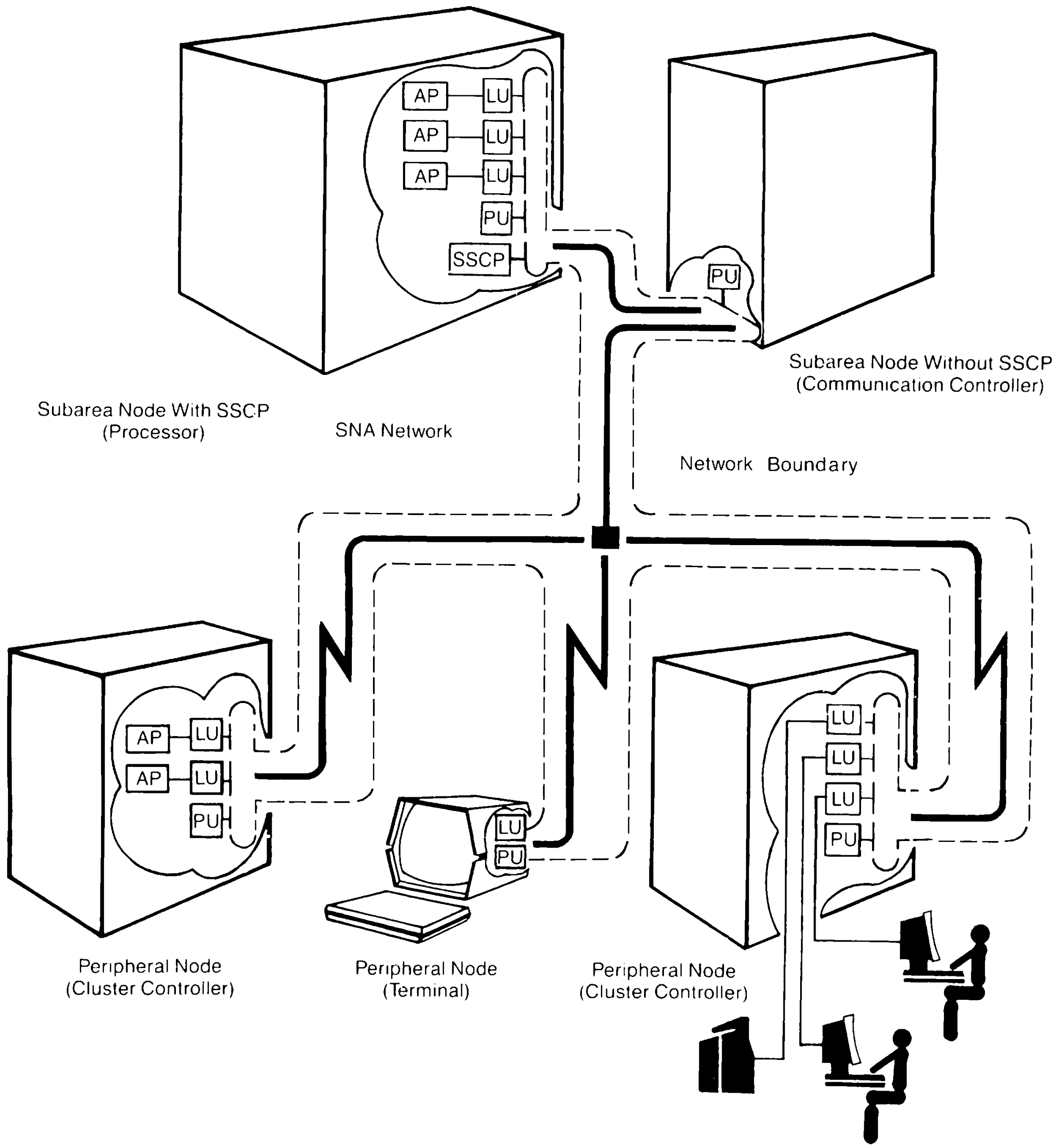
If you are familiar with PRIMENET, you may find a comparison to SNA useful. Although SNA and PRIMENET are not the same, they do have much in common. PRIMENET provides uniform user services between different systems over a variety of communications links. Figure 1-1 shows a typical PRIMENET configuration.



A Typical PRIMENET Configuration
Figure 1-1

Figure 1-1 represents uniform user services. What happens within the network is not really important to users or applications. What is important is that PRIMENET provides such services as remote login, remote file access, and inter-process communication throughout the network. And PRIMENET provides these services in a way that is reliable, transparent to users and applications, and easy to use. In order for PRIMENET to provide these services, the PRIMENET Administrator defines the topology of the network with a configurator.

You can think of IBM's SNA in the same way. IBM frequently describes SNA as a network that provides services for connecting end users with other end users. An end user can be a person at a terminal, an application program, or a printer; in short, anything that can be a source or a destination for data. End users are not considered part of the network itself. Figure 1-2 shows an SNA network connecting various end users and providing services similar to PRIMENET.



An SNA Network
Figure 1-2

Although the functions performed within the network and the machines and programs that comprise the SNA network may be more complex than those supported by PRIMENET, the functional outcome is the same. People at terminals and application programs are able to communicate with each other even though they reside at different points on the network. As does PRIMENET, SNA allows application programs and people to communicate reliably, transparently, and easily. An SNA network administrator requires a systems programmer to define a network through system generations (SYSGENs) before end users can communicate with SNA.

A Note on Complexity

Because Prime offers a single operating system (PRIMOS) and a family of processors that communicate as peers, the transparency of PRIMENET networks is easily achieved. Users can access remote files and machines much as if they were directly attached to a single system. Network configurations are comparatively straightforward.

On the other hand, IBM, with its array of processors, terminals, operating systems, and subsystems, has a more difficult task of achieving network transparency. The diversity of products within an SNA network is one reason for the complexity of SNA's design and the difficulty of configuring an SNA network.

WHAT DOES PRIME/SNA DO?

PRIME/SNA provides your end users a bridge to the application end users on IBM hosts. To do this, PRIME/SNA:

- Operates as a peripheral node on switched or leased lines
- Emulates characteristics of the IBM 3270 Information Display System of interactive terminals and printers
- Provides support for batch transfer of files

These capabilities represent the subsystems that comprise PRIME/SNA. The following material describes the duties each subsystem performs.

PRIME/SNA as a Peripheral Node

IBM defines a peripheral node as a device requiring the support of a host node or communications controller in order to use the services of an SNA network. The Server subsystem portion of PRIME/SNA allows your Prime CPU to appear to the SNA network to be as few as one or as many as eight peripheral nodes. The Server subsystem also allows you to create your own peripheral nodes on leased (nonswitched) lines or switched lines.

PRIME/SNA uses the term remote system to define the support an IBM host node and communications controller provide for a PRIME/SNA line and peripheral node. In order for your PRIME/SNA peripheral node to communicate in an SNA network, the support called for in the remote system network configuration must match the description of the line and peripheral node in the Server Subsystem. Both the Server Subsystem and the remote system work together to provide generic SNA services to other PRIME/SNA subsystems such as PRIME/SNA Interactive and PRIME/SNA Remote Job Entry (see below). Without the Server subsystem, the other PRIME/SNA subsystems would not have entry points (also known as ports) into the SNA network.

3270 Emulation

The PRIME/SNA Interactive Subsystem works closely with the Server subsystem to emulate characteristics of the IBM 3270 Information Display System. The 3270 family of terminals and printers is the system of choice when users want to communicate with IBM host applications on an interactive basis. There are a wide variety of applications that handle 3270 screen and printing formats.

The Server subsystem provides entry points into the SNA network. These ports have generic SNA capabilities; PRIME/SNA Interactive further defines the characteristics of ports in order to make the ports appear to the network as 3270 terminals and printers.

Batch File Transfers

PRIME/SNA Remote Job Entry (RJE) works with the Server subsystem to transfer files in a batch environment. PRIME/SNA RJE further defines the characteristics of ports provided by the Server subsystem with programs that emulate many features of the 3770 Data Communication System.

WHAT DOES THE PRIME/SNA ADMINISTRATOR DO?

The PRIME/SNA Administrator must complete three tasks before your end users can participate in an SNA network:

- Work with personnel at the IBM host site to make sure PRIME/SNA subsystems are properly defined within the SNA network.
- Create a configuration of PRIME/SNA resources that matches the definitions of PRIME/SNA used at the IBM host site.
- Install PRIME/SNA software and enter the data from your configuration of PRIME/SNA resources.

2
SNA Fundamentals

INTRODUCTION

This chapter provides background information on IBM's SNA. The information presented here is not meant to be comprehensive; it presents the fundamentals needed to create PRIME/SNA configurations and to communicate PRIME/SNA requirements to IBM host personnel. Some of the topics covered in this chapter include:

- Network topology and node classifications (Physical Units)
- Synchronous Data Link Control (SDLC)
- Logical Units (LUs)
- IBM software products
- Activation of SNA resources
- Multiple domains and their implications for PRIME/SNA

TOPOLOGY OF SNA NETWORKS

Systems Network Architecture is broad enough to allow different topologies to be included in its definition. This chapter introduces SNA concepts in the context of the most basic SNA network: a hierarchical, single domain network. A hierarchical SNA network has one node that controls the actions of other nodes. For the purposes of the first part of the chapter, you can think of a single domain network as a network controlled by one IBM mainframe. A domain includes all the devices and the communications lines under the control of the mainframe.

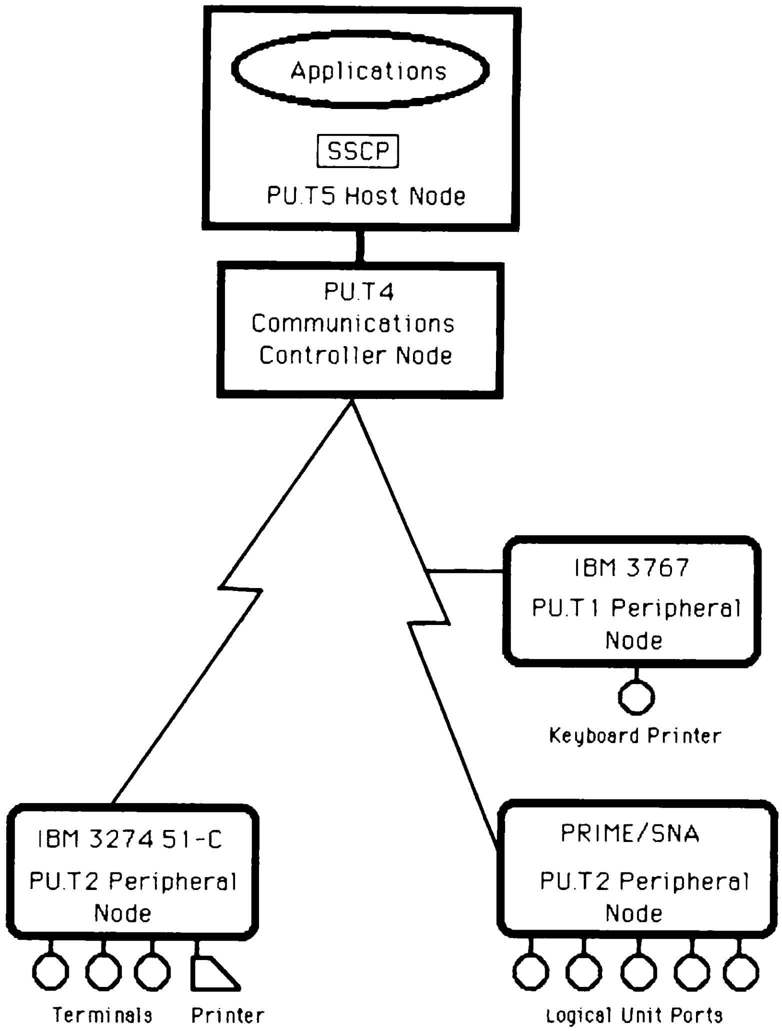
The Hierarchy of SNA Nodes

Hierarchical SNA networks normally include three types of nodes:

- Host nodes
- Communications controller nodes
- Peripheral nodes

These nodes are ranked according to their capability to control the resources attached to them. SNA has created an additional term -- physical units types -- to describe the nodes in its network. A physical unit (PU) is a component (either in hardware or software) that manages the physical resources of a node. A PU manages a node by monitoring communications links, handling error recovery, gathering statistics, and activating and deactivating resources under its control.

Figure 2-1 shows a simple, single domain network with four PU types: a host node, a communications controller node, and two types of peripheral nodes. A description of the nodes follows Figure 2-1.



Single Domain Network With PU Types 5, 4, 2, and 1
Figure 2-1

Host Nodes: A host node is at the top of the hierarchy in an SNA network. It is usually a System/370 class of mainframe (including the System/370, IBM 4300, 3030, 3080, and 3090 series), and provides data processing facilities for local and remote users.

Host nodes have a special feature that other types of nodes cannot duplicate. They contain a System Services Control Point (SSCP) that "owns" all the network resources shown in Figure 2-1. SNA classifies host nodes that contain an SSCP as PU Type 5 (PU.T5) nodes.

A host node's SSCP is implemented by a communications access method. An access method (see the section on VTAM, later in this chapter) provides all the facilities an SSCP needs to control network communications.

An SSCP:

- Monitors and manages all the resources in the host node's domain
- Starts up (activates) and shuts down (deactivates) parts of the network
- Establishes connections between end users
- Contains an interface to allow network operators to control a host's domain

Every SNA network contains at least one SSCP. Networks with a single SSCP are called single domain networks. Networks with more than one SSCP are called multiple domain networks. Multiple SSCP networks are covered at the end of the chapter.

<u>Note</u>

> There are a number of possible combinations of SSCPs and mainframes. Typically, a single domain network consists of a single mainframe, an access method, and the access method's SSCP. A single domain network can also include a group of mainframes called a <u>processor complex</u>. One of the mainframes in the processor complex supports the access method and SSCP.

A multiple domain network typically consists of two or more mainframes and their access methods, but it is possible for a single IBM mainframe to support a number of access methods and SSCPs. In the latter case, the IBM mainframe appears to the SNA network as a number of host nodes and the network is a multiple domain network.

<u>Communications Controller Nodes</u>: A communications controller node works under the supervision of an SSCP and assists the host node in managing the network. The IBM 3705-II and 3725 are communications controllers that are classified as PU Type 4 (PU.T4) nodes. Communications controllers contain a Network Control Program (NCP) that allows a controller to:

- Start up and shut down data links
- Manage links by receiving (polling) data from and sending (selecting) data to other nodes
- Buffer data sent from one node to another
- Route data to other nodes in the network

Peripheral Nodes: A peripheral node is a device that requires a host node's or communications controller's support to route data within the network. Peripheral nodes can be a single terminal, a cluster controller for a group of terminals and printers, or a remote processor. SNA assigns two PU types to peripheral nodes: PU Type 1 (PU.T1) and PU Type 2 (PU.T2). PU.T2 nodes can handle data in a more sophisticated fashion than PU.T1 nodes.

Examples of PU.T2 nodes include:

- A PRIME/SNA peripheral node
- A System/32/34/36
- A System/38
- An IBM 8100 Information System
- An IBM 3274 cluster controller
- An IBM 3776 RJE workstation
- An IBM PC

Two examples of PU.T1 nodes are:

- An IBM 3767 keyboard/printer
- An IBM 6670 Information Distributor

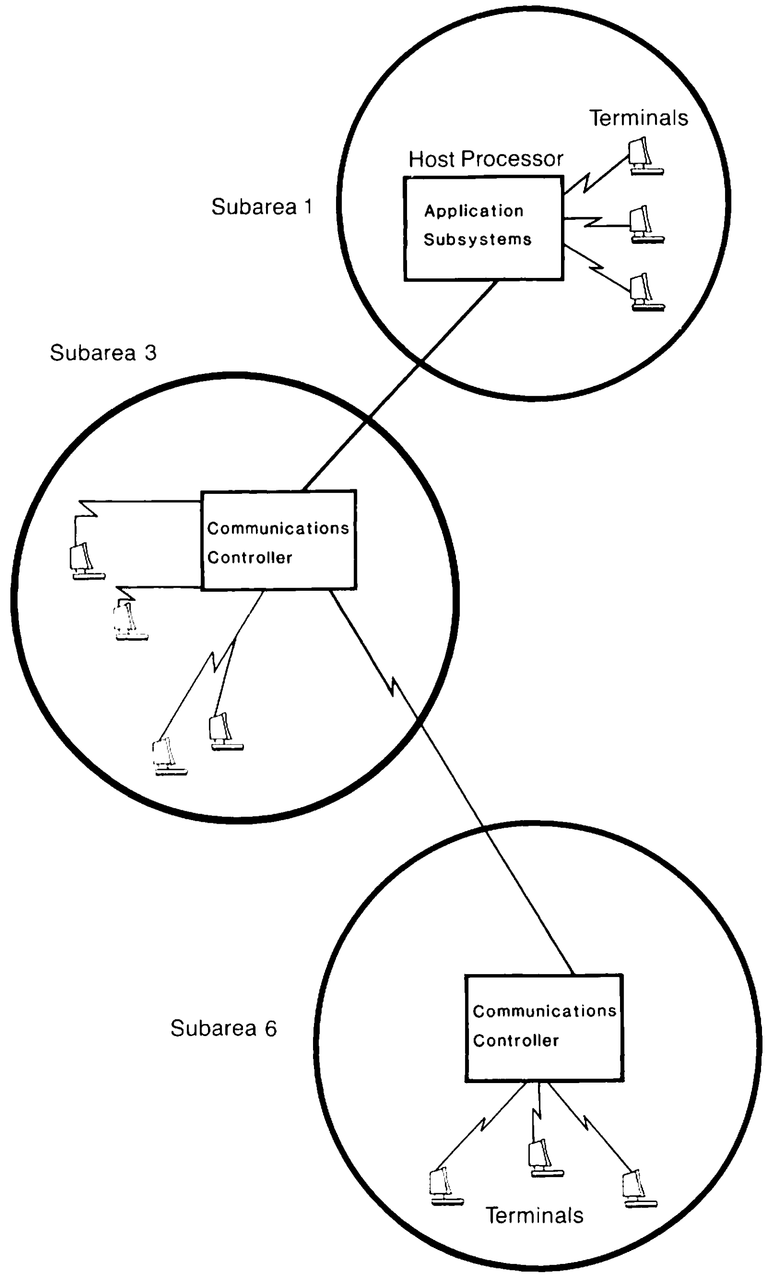
Note

IBM has not implemented a PU Type 3 node as of this writing.

Subareas

SNA defines a subarea as the portion of the network controlled by a host node or communications controller node. Host nodes and communications controller nodes route data for their peripheral nodes.

Figure 2-2 shows a single domain network with three subareas.

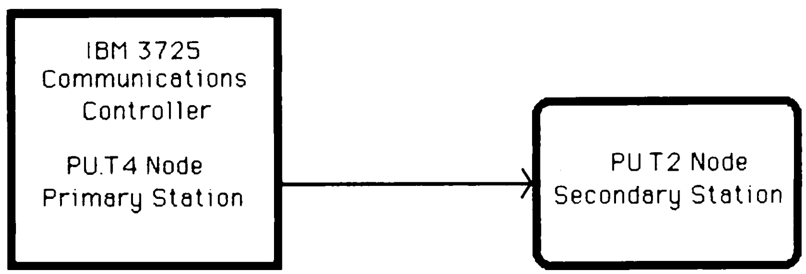


Single Domain Network With Three Subareas
Figure 2-2

In Figure 2-2, Subarea 1 refers to the locally-attached terminals and the application subsystems (such as CICS/VS and TSO) controlled by the host node. Subarea 3 refers to the terminals and lines supported by the locally-attached (connected directly with the host) communications controller. Subarea 6 refers to the terminals and lines controlled by a remote communications controller. Remote communications controllers always send their traffic to a host node through a locally-attached communications controller.

SDLC AND PERIPHERAL NODES

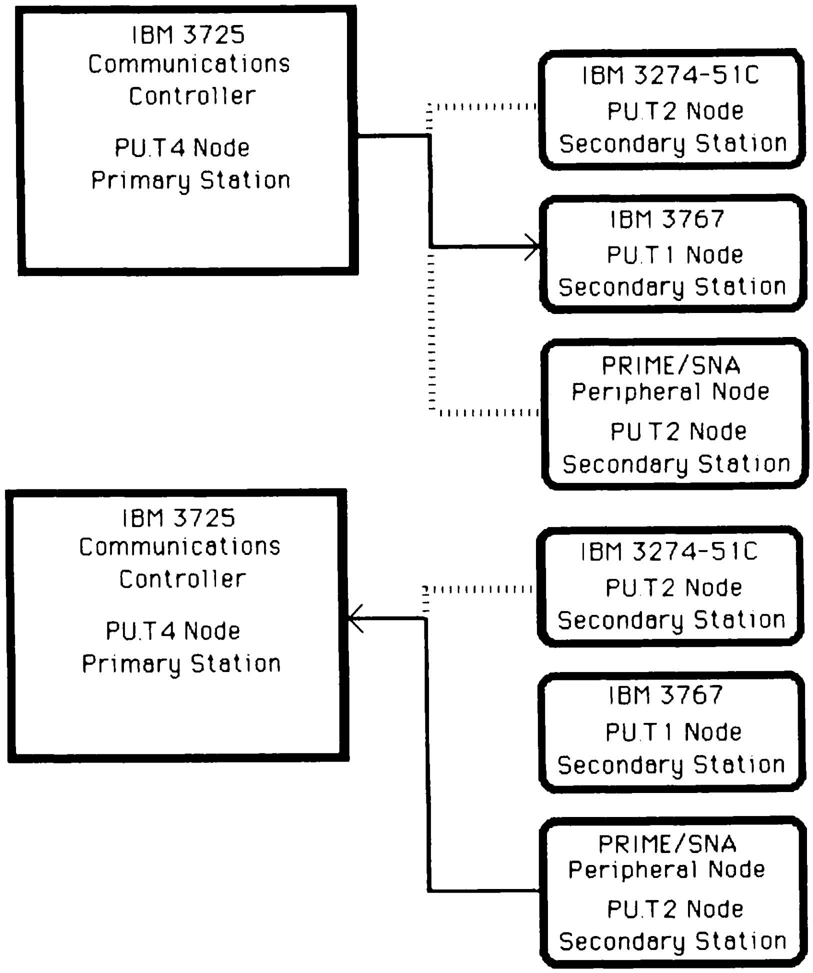
Synchronous Data Link Control (SDLC) is the line protocol IBM uses to tie peripheral nodes to communications controller nodes. It is a bit-oriented protocol that allows both point-to-point and multipoint line topologies on half-duplex and full-duplex electrical connections. Figure 2-3 shows a point-to-point connection on a switched line, and Figure 2-4 shows a multipoint connection on a leased line.



Point-to-point Connection on a Half-duplex Switched Line
Figure 2-3

Note

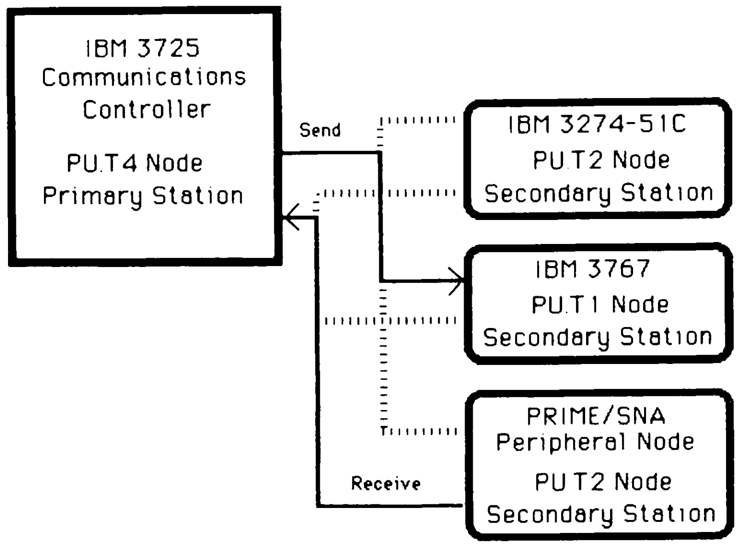
IBM access methods restrict switched lines to half-duplex point-to-point connections. When a peripheral node makes a switched connection to a communications controller, the controller issues an XID (Exchange ID) command that asks the peripheral node to identify itself with a unique number.



Multipoint Connection on a Half-duplex Leased Line
Figure 2-4

Multipoint lines are always nonswitched (leased). When a communication controller wants to send data to one of the peripheral nodes on a multipoint line, it tags the data with an SDLC station address that is unique on that line. A secondary station (peripheral node) listens for data traffic bearing its station address and transmits only when the primary station (communications controller) permits. This polling by the primary station allows many peripheral nodes to share a single line.

SDLC also supports a line topology called multi-multipoint (or duplex-multipoint) on full-duplex leased lines. Multi-multipoint allows the primary station to transmit data to one secondary station on the line's send leg and receive from another secondary station on the line's receive leg. Figure 2-5 shows a multi-multipoint line topology.



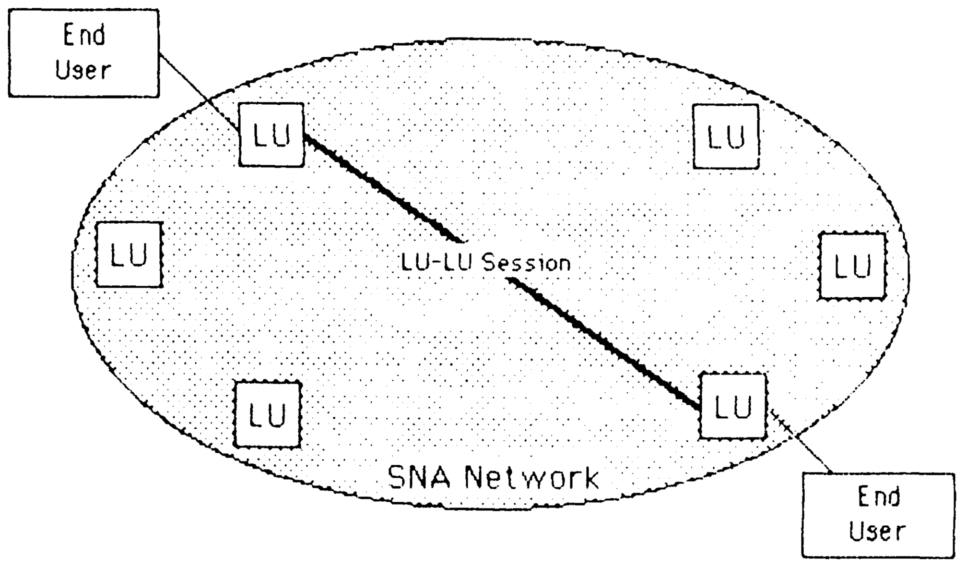
Multi-multipoint Full-duplex Line
Figure 2-5

Note

SDLC allows, and some peripheral nodes permit, a primary station to transmit to and receive from a peripheral node simultaneously. IBM calls this full-duplex data mode (as distinguished from full-duplex lines). A peripheral node can employ full-duplex data mode only on point-to-point or multi-multipoint lines that use full-duplex electrical signalling. Full-duplex data mode is more efficient than the more common half-duplex data mode because it reduces polling delays. The PRIME/SNA Server Subsystem supports the more efficient full-duplex data mode on full-duplex lines.

LOGICAL UNITS

Logical units are ports into the SNA network that allow end users to communicate with each other. Every end user (for example, a host application or a terminal user) needs a logical unit (LU) to pass data to other end users. When end users want to communicate with each other, their logical units create a temporary, logical connection called an LU-LU session. An LU-LU session continues for as long as the pair of LUs (session partners) agree. Figure 2-6 shows two end users communicating through their logical units in an LU-LU sesion.



An LU-LU Session
Figure 2-6

The following is some additional information you should know about logical units:

- Logical units provide the services needed to manage transmissions between end users. Logical unit services include: synchronizing the exchange of data; presenting data in a format LUs can use; and establishing error recovery procedures.
- Logical units can be implemented in software or hardware. The PRIME/SNA Server and Interactive subsystems (software) work together to implement logical units
- Every logical unit is supported by a physical unit. A PU can support a number of LUs, but the PU must be active within the network before LU-LU sessions take place.
- Every logical unit has a unique network name that other LUs specify when they want to enter into an LU-LU session.

- IBM has defined different logical unit types to reflect how LUs accept data. LU types also define the characteristics of their end users. PRIME/SNA Interactive supports LU Types 1, 2, and 3. Chapter 3 describes these LU types.

- Logical units must communicate with their SSCP before they initiate sessions. The SSCP checks to see if an LU is busy (engaged in another LU-LU session) and if the two LUs are compatible with the BIND command. The BIND command contains a set of rules the two LUs must abide by in their LU-LU session. IBM refers to the participants in LU-LU sessions as <u>session partners</u>.

IBM SOFTWARE PRODUCTS

The following are a number of software products from IBM you may encounter when configuring PRIME/SNA or discussing communications with host personnel.

- Data communications access methods
- Network Control Program (NCP)
- Communications Network Management (CNM) programs
- Transaction processing subsystems
- Interactive support programs
- Remote job entry subsystems

Note

This list is not meant to be a comprehensive list of the software PRIME/SNA supports.

Data Communications Access Methods

A <u>data communications access method</u> is a set of programs that allow a host processor to move data from host processor storage to remote input/output devices. Data communications access methods have these main features:

- Every access method has its own SSCP.

- The access method's SSCP monitors and controls the portion of the network under its control.

- The access method processes messages inbound to the host node and outbound to the network.
- The access method detects and corrects problems in the network.
- The access method includes facilities for network operators and allows them to reconfigure the network's resources.

There are two data communications access methods supported by SNA, the Virtual Telecommunications Access Method (VTAM) and the Telecommunications Access Method (TCAM). This book describes the support PRIME/SNA requires from the more modern access method, VTAM.

VTAM: VTAM logically connects terminals and applications, detects transmission errors, and initiates recovery measures. VTAM also manages its buffer pool in the host's main storage. Advanced Communication Function/VTAM (ACF/VTAM) permits other SSCPs to share communications lines, communications controllers, and peripheral nodes (serially) with its own SSCP.

VTAM requires all network resources under the control of its SSCP to be defined in lists. If a network resource (for example, a line or PRIME/SNA logical unit port) is not defined in a list of network resources, VTAM's SSCP has no knowledge of the resource and the SSCP cannot activate the resource for use.

A systems programmer at the IBM host site must define all the network resources in a system generation (SYSGEN). The VTAM systems programmer codes macro instructions and definition statements for peripheral nodes. These instructions and statements specify such important information as:

- Line speeds and characteristics
- Station identification and polling addresses for PUs
- Logical unit network names and characteristics

Chapter 6 discusses these and other VTAM parameters. For more information, see the IBM publication ACF/VTAM General Information: Concepts (GC27-0463).

Network Control Program

NCP is the program that resides in the 3705-II and 3725 communications controllers. NCP works under the direction of VTAM to provide a variety of network services. Network services jointly provided by the controller and NCP include:

- Dialing and answering switched lines

- Routing data through the network
- Polling peripheral nodes
- Recovering and reporting errors

The same SYSGEN the systems programmer provided for VTAM is used to define the Network Control Program. One of the final steps in the SYSGEN process creates a file that defines the resources in the communications controller's subarea. The SSCP loads this file when it brings up the network.

Note

Your PRIME/SNA configuration will contain parameters that match values in the VTAM and NCP SYSGEN coded by an IBM systems programmer. VTAM and NCP SYSGENs will most likely be different for each IBM host.

Chapter 6 discusses the parameters the systems programmer should specify for NCP system generation. For more information, see the IBM publication ACF/NCP/VS General Information (GC30-3058).

Communications Network Management

Communications Network Management (CNM) software provides host personnel with the tools to operate the network, determine the cause of problems, and measure performance. Network management software products include:

- Network Communications Control Facility (NCCF)
- Network Problem Determination Application (NPDA)
- Network Performance Monitor (NPM)

Network Communications Control Facility: NCCF allows network operators to control the network from any host processor. Various utilities permit operators to activate and deactivate network resources with VARY NET commands. To activate communications controllers, lines, PUs and LUs, the network operator issues the command:

```
VARY NET, ACTIVATE, ID=<network resource name>
```

To deactivate network resources, the network operator issues the command:

VARY NET, INACTIVATE, ID=<network resource name>

You may need to request that the network operator issue these commands occasionally.

NCCF also provides facilities for storing and retrieving network performance data. For more information, see the IBM publication Network Communications Control Facility General Information (GC27-0429).

Network Problem Determination Application: NPDA is an application that facilitates on-line analysis of network performance data collected and stored by NCCF. NPDA allows network operators to analyze network failures (such as line failures) or to interrogate peripheral nodes for statistical and maintenance data. For more information, see the IBM publication Network Problem Determination Application General Information (GC34-2010).

Network Performance Monitor: NPM is a program that helps track network performance and aids in network tuning. NPM analyzes causes of performance degradation such as high error rates or excessive line loading. For more information see the IBM publication Network Performance Monitor General Information (GH20-6359).

Transaction Processing Subsystems

Transaction processing subsystems provide data base and communications facilities for application programs. Transaction processing systems are responsible for loading application programs into the operating system, shuttling data back and forth between program and users, and terminating transactions. They rely on the host access method for network support.

Customer Information Control System/Virtual Storage: CICS/VS is a general purpose data communications monitor that accepts and queues inquiries, permits revision of input, and dispatches data to users. Concurrent terminal transactions are a major feature of CICS/VS. The Advanced Text Management System - II (ATMS-II) feature of CICS/VS allows the 3270 terminal user to enter, edit, store, proofread, and display textual material in the CICS/VS data base.

CICS/VS keeps track of all the LUs that can use its facilities. A CICS systems programmer must define each LU and its characteristics in a Terminal Control Table (TCT). Chapter 6 contains information on CICS support required by PRIME/SNA. For more information, see the IBM publication CICS/VS General Information (GC33-0066).

Information Management System/Virtual Storage: IMS/VS is a data base system geared toward interactive users of payroll, personnel, inventory control, and accounts receivable applications. The Interactive Query Facility of IMS/VS allows online inquiry, retrieval, and display of data in the IMS/VS data base by the use of simple commands. For more information, see the IBM publication IMS/VS General Information Manual (GH20-1260).

Interactive Support

Certain programs interact with IBM operating systems to provide interactive computing services for the terminal user.

These services include:

- VM/VCNA
- TSO
- VSPC
- ICCF

Virtual Machine/VTAM Communications Network Application: VM/VCNA provides access to the Virtual Machine Facility/370 (VM/370). This product allows each terminal user to have at his or her disposal the functional equivalent of a dedicated host processor. The Conversational Monitor System (VM/CMS) component of VM/VCNA allows a remote terminal user to control a virtual machine as if the user were at its system console. CMS is used extensively in program testing and development. SCRIPT/370 is the text editor that works in conjunction with CMS. For more information, see the IBM publication VM/VCNA General Information (GC27-0501).

Time Sharing Option: TSO is the component of the OS/VS2 (MVS) operating system that allows users to enter, edit, and manipulate data and Job Control Language (JCL) files. TSO has interfaces to remote job entry facilities in JES2 and JES3. TSO is frequently used to create and maintain system and program libraries. For more information, see the IBM publication OS/VS2 Systems Programming Library: TSO (GC28-0629).

Virtual Storage Personal Computing: VSPC is a user-oriented facility for developing source programs and submitting them for batch processing. VSPC is specially designed to be used with interactive programming languages like VS BASIC and VSPC FORTRAN. For more information, see the IBM publication VSPC General Information (GH20-9070).

Interactive Computing and Control Facility: ICCF is a program designed to assist the online development of application programs in a DOS/VSE environment. For more information, see the IBM publication ICCF General Information (SC33-6066).

Remote Job Entry Subsystems

RJE Subsystems support batch programming in a distributed environment. Jobs are entered from remote workstations and submitted to an OS/VS2 or DOS/VSE operating system for execution.

OS/VS Job Entry Subsystem 2: JES2 includes an RJE package for submitting jobs from remote workstations. Job output can be directed back to the submitting workstation or to another destination. JES2 commands allow workstation operators to inquire about jobs, devices, and output. For more information, see the IBM publication JES2 Introduction (GC23-0002).

OS/VS2 Job Entry Subsystem 3: JES3 includes the Remote Job Processing facility for submitting and controlling the submission of remote batch jobs to a multi-system environment. Job output can be directed to the submitting workstation or another destination. For more information, see the IBM publication JES3 Introduction (GC28-0607).

DOS/VSE/POWER: DOS/VSE/POWER has an RJE feature to submit jobs and output spooled to one or more devices. For more information, see the IBM publication VSE/POWER General Information (GH12-5128).

ACTIVATION AND DEACTIVATION OF NETWORK RESOURCES

Before end users initiate LU-LU sessions to accomplish their work, the SSCP must activate certain resources in the network. The SSCP activates network resources according to the following hierarchy:

- Lines
- PUs
- LUs

When the SSCP activates a network resource, it establishes control (ownership) over the resource and it becomes part of the host node's domain. An SSCP establishes ownership by sending commands that establish sessions with PUs and LUs. These sessions allow the SSCP to communicate with PUs and LUs and to monitor and control their resources.

SNA requires an SSCP-PU session before the SSCP can communicate with a peripheral node's logical units. The following events describe the sequence of events leading to an SSCP-PU session.

1. Operators at the host node ready its SSCP to manage the network.

2. Network operators start the communications controller and its NCP control resources in the peripheral node's subarea.

3. NCP activates its primary stations on SDLC lines.

4. The communications controller uses its automatic calling unit to establish the connection with the peripheral node's modem.

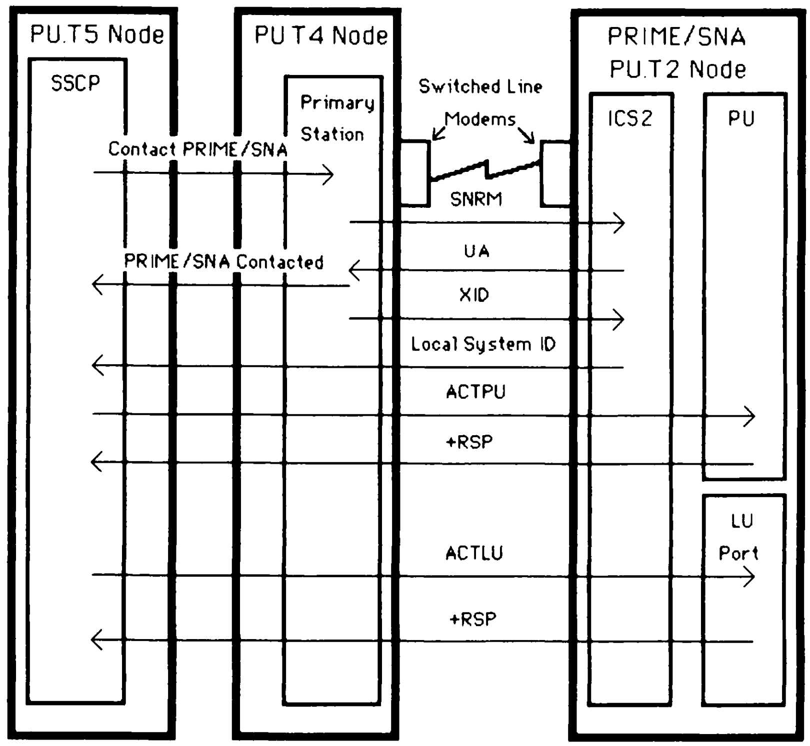
5. NCP verifies that the modems and the peripheral node are powered on and ready to communicate. NCP does this by sending the SDLC command Set Normal Response Mode (SNRM) to the peripheral node's SDLC station address and receiving a positive response in the form of an Unnumbered Acknowledgement (UA).

6. If the peripheral node is on a switched line, the SSCP sends an Exchange ID (XID) command to the peripheral node. The peripheral node returns a unique number that identifies the peripheral node's PU in VTAM's list of switched line peripheral nodes.

7. The SSCP sends an Activate Physical Unit (ACTPU) command to the peripheral node's PU. The ACTPU command usually contains the ID of the SSCP which sent the request.

8. The peripheral node's PU returns a positive response (+RSP) to the ACTPU request. The SSCP and the peripheral node's PU now have an SSCP-PU session that will endure for the length of time the peripheral node is active in the network.

Figure 2-7 shows steps 5 through 8.



Establishing an SSCP-PU Session With a Peripheral Node
Figure 2-7

Once the SSCP controls a peripheral node's PU through an SSCP-PU session, the SSCP sends an Activate Logical Unit (ACTLU) command to the node's logical units. When a peripheral node's logical unit returns a positive response to the ACTLU command, it accepts the SSCP-LU session and is ready to process requests to initiate LU-LU sessions. A logical unit requires an SSCP-LU session to initiate LU-LU sessions.

LU-LU sessions can be initiated in several ways:

- A logical unit in a host node (primary LU) requests a session with a logical unit in a peripheral node (Secondary LU). SNA refers to this as an acquire operation.
- A Secondary LU (SLU) requests a session with a Primary LU (PLU) via a logon message.
- A third logical unit requests a primary LU to acquire a secondary LU for an LU-LU session. (This can happen if a terminal user asks an application program to send a print job to a printer.)

- The network operator asks the SSCP to initiate a session between the two LUs. (This is not very common.)

The following steps show the sequence of events in the first few types of session initiation requests listed above.

1. If the secondary LU wants a session with a primary LU (for example, a terminal user wants to use TSO), it submits a logon to the SSCP for processing. The SSCP then informs the primary LU of the name of the secondary LU requesting an LU-LU session.

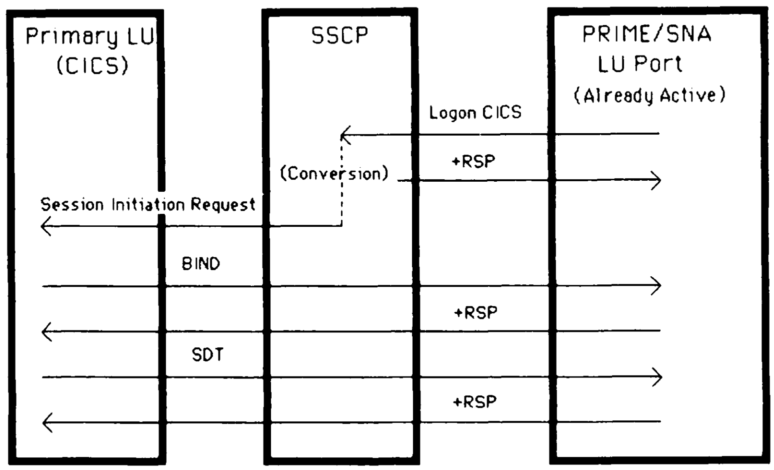
2. If a primary LU wants to initiate (via an acquire operation) or wishes to permit (via a logon), an LU-LU session with the peripheral node's LU, it sends a BIND command to the secondary LU. The BIND command specifies the rules that the two LUs should agree to for the duration of the session.

   Because LUs vary greatly in their characteristics, the primary LU needs a source of information to construct BINDs. A primary LU can form a BIND from definition statements within the primary LU (for example, terminal control tables within CICS) or reference BIND information within VTAM's logon mode table entry. A VTAM systems programmer associates a particular logon mode table entry for every peripheral node LU as part of the SYSGEN process.

3. The secondary LU examines the BIND command sent from the primary LU. If it can agree to the rules specified in the BIND, it returns a positive response. If it cannot agree, it rejects the BIND and indicates its reasons in a negative response to the BIND command.

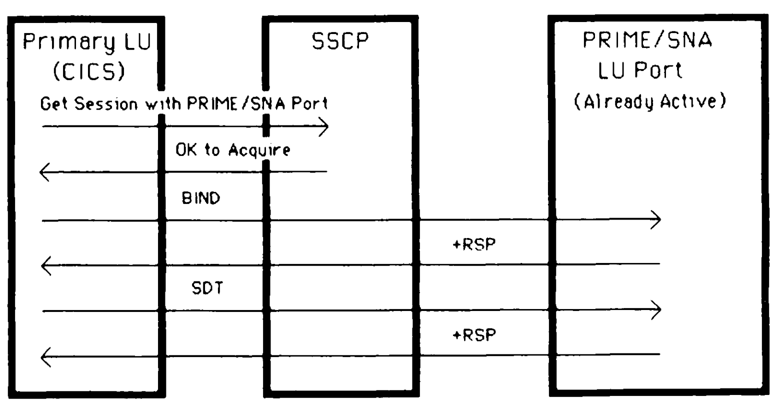
4. The primary LU notifies the secondary LU to Start Data Traffic (SDT). When the secondary LU returns a positive response to the SDT request, the LU-LU session has been successfully initiated and data can begin flowing between the two session partners and their end users.

Figure 2-8 shows a secondary LU establishing an LU-LU session.



A Secondary Logical Unit Initiating an LU-LU session.
Figure 2-8

Figure 2-9 shows a primary LU acquiring a secondary LU.



A Primary Logical Unit Acquiring a Secondary Logical Unit
Figure 2-9

Points to Remember About Sessions

Here are some points to remember about sessions:

- End users need LU-LU sessions to communicate with each other.
- LUs require their PU to engage in an SSCP-PU session before the LUs can use the network.
- Every LU-LU session requires an SSCP-LU session
- Secondary LUs can request sessions with primary LUs with a logon.
- Primary LUs issue BIND commands when they want sessions with secondary LUs. Primary LUs receive BIND information about LUs from definition statements within their subsystems or from Logon Mode Table Entries within VTAM.
- Secondary LUs accept BINDs to enter into LU-LU sessions.

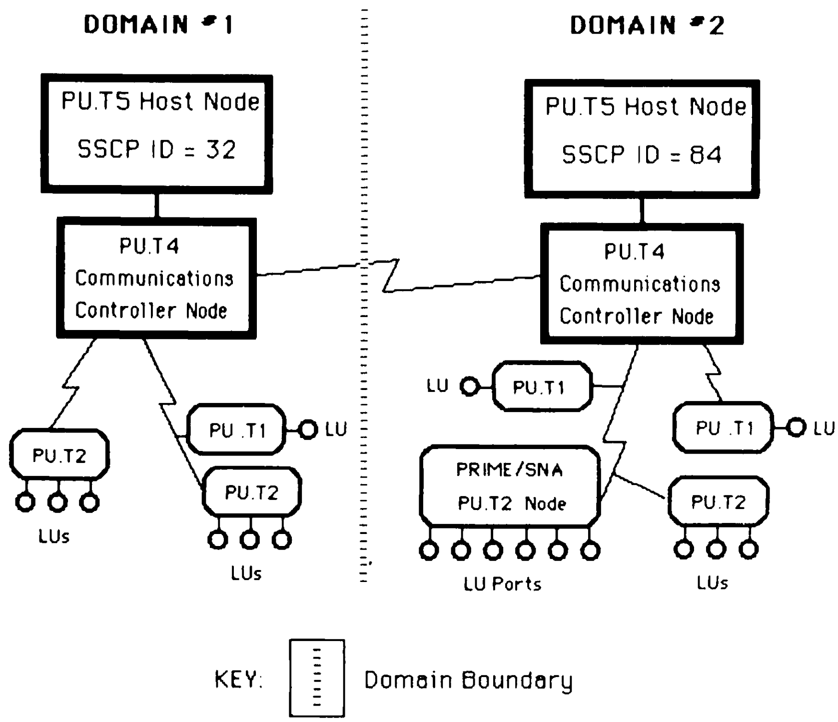
MULTIPLE DOMAINS

Multiple domain networks include two or more SSCPs and their network resources. Often, these SSCPs reside on different host processors, but it is possible for a single IBM mainframe to support a number of SNA access methods. A host processor with several access methods (and SSCPs) appears to the SNA network as several host nodes. SNA networks with several SSCPs may affect the way you configure PRIME/SNA.

A peripheral node encounters multiple domains when:

- A peripheral node's secondary LUs establish sessions with primary LUs located in other domains.
- Different SSCPs can connect to a peripheral node with switched lines.
- An SSCP relinquishes ownership of a peripheral node to another SSCP.

Figure 2-10 shows a multiple-domain network joined by an SDLC link between their communications controllers.



Multiple Domain Network
Figure 2-10

Note

It is possible for an organization to have two or more domains that are not connected together to form a multiple domain network. SNA considers these unconnected domains as separate SNA networks.

When a peripheral node (such as PRIME/SNA) encounters multiple domains, it affects the node's definition within VTAM and NCP. The following pages describe the effects cross-domain communications have on peripheral nodes.

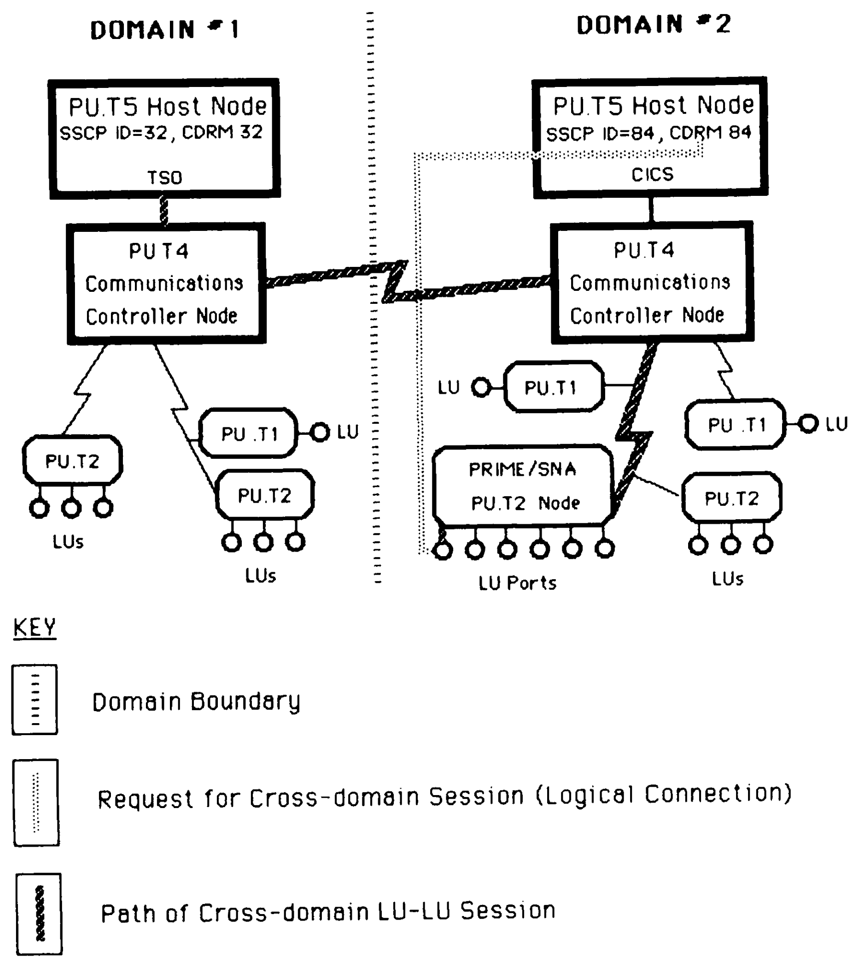
Cross-domain LU-LU Sessions

A peripheral node's LUs are one of the most common users of multiple domains. A peripheral node's secondary LUs and a host node's primary LUs initiate cross-domain LU-LU sessions for their end users.

Many organizations use cross-domain sessions to reduce the duplication of application programs and host resources within their networks. Cross-domain sessions allow authorized end users access to resources outside their own domains.

How are end users authorized to use cross-domain sessions? A VTAM systems progammer at each host site compiles a list of the LUs in other domains. This list of LUs comprises the host node's Cross-Domain Resources (CDRSC). Every host node in the multiple domain network has a Cross-Domain Resource Manager (CDRM) to manage cross-domain LU-LU sessions. If the VTAM systems programmer has not listed a primary LU as a cross-domain resource, a peripheral node's LUs cannot initiate sessions with it. Conversely, if a VTAM systems programmer does not list a peripheral node's LUs as cross-domain resources, a primary LU in a different domain cannot acquire those LUs.

Figure 2-11 shows how a peripheral node's initiates a cross-domain LU-LU session with a logon.



Initiating a Cross-domain Session
Figure 2-11

Switched Connections to Different SSCPs

A peripheral node encounters multiple SSCPs (and owners) when different host nodes establish switched connections with it. These host nodes may or may not be tied together in a multiple domain network, but the peripheral node should be aware of the identifiers of the SSCPs that will establish ownership. The peripheral node can keep a list of authorized SSCP IDs as a security measure. The VTAM systems programmer at each host site can provide you with the SSCP ID of a host node.

Changing a Peripheral Node's SSCP

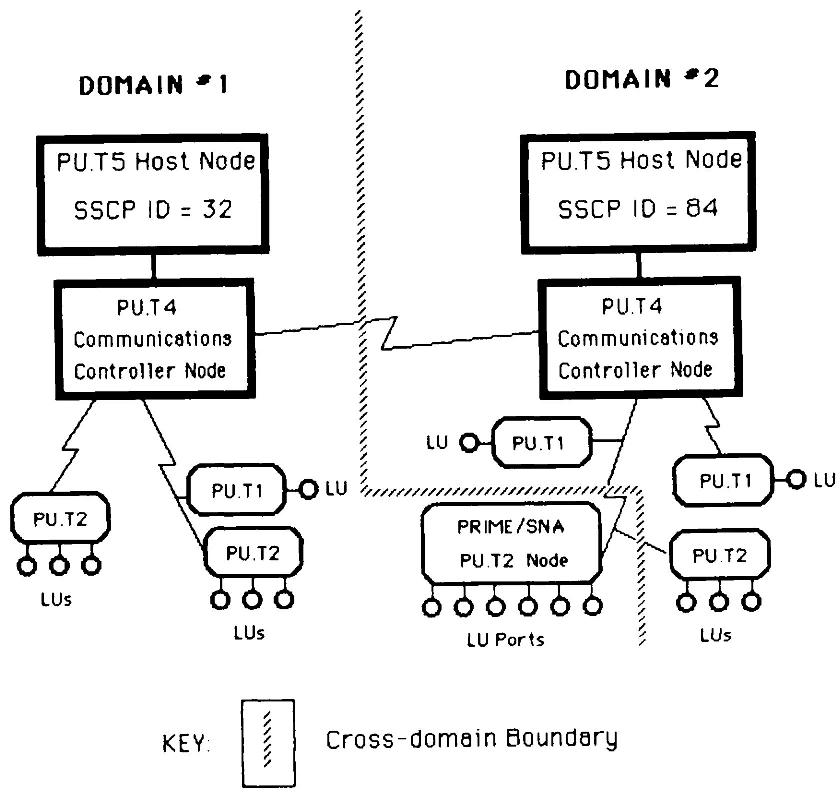
In some multiple domain networks, a peripheral node's SSCP can change. There are two main reasons for this:

- The SNA network's operations staff modifies a host node's domain to include the peripheral node.
- The SSCP (and host) owning the peripheral node's PU fails and another SSCP provides backup service.

Modifying a Domain: The SNA network's operation staff can modify the boundaries of the host nodes' domains to suit the needs of the entire network. If an organization's network spans several time zones, the operations staff may want to shift interactive data base applications and network traffic to other hosts as the end of the working day approaches. These shifts involve a change in a peripheral node's SSCP owner.

SNA allows different SSCPs to share ownership of a communications controller node and nonswitched (leased) lines, but only one SSCP can own a peripheral node's PU and LUs at a time. SSCPs share ownership of a peripheral node's resources serially.

When an SSCP wants to relinquish control of a peripheral node, it sends a Deactivate Physical Unit (DACTPU) command to the peripheral node; it then allows one of the communication controller's co-owners to activate the peripheral node's PU. Figure 2-12 shows the same network resource shown in Figure 2-10, but notice how the boundaries of Domain A have shifted to include a peripheral node on a nonswitched, multipoint line.



Modifying a Domain
Figure 2-12

Note

To allow a peripheral node to shift to a new SSCP owner, the peripheral node's configuration file should include the SSCP ID of all its potential owners. Also, the new SSCP owner must have the same SYSGEN information about the peripheral node as the former SSCP owner.

Backup Procedures: What happens to LU-LU sessions when a peripheral node's SSCP fails? Of course, all the LU-LU sessions using that host node are terminated. But what happens to cross-domain LU-LU sessions and the resources that the failed host node once owned?

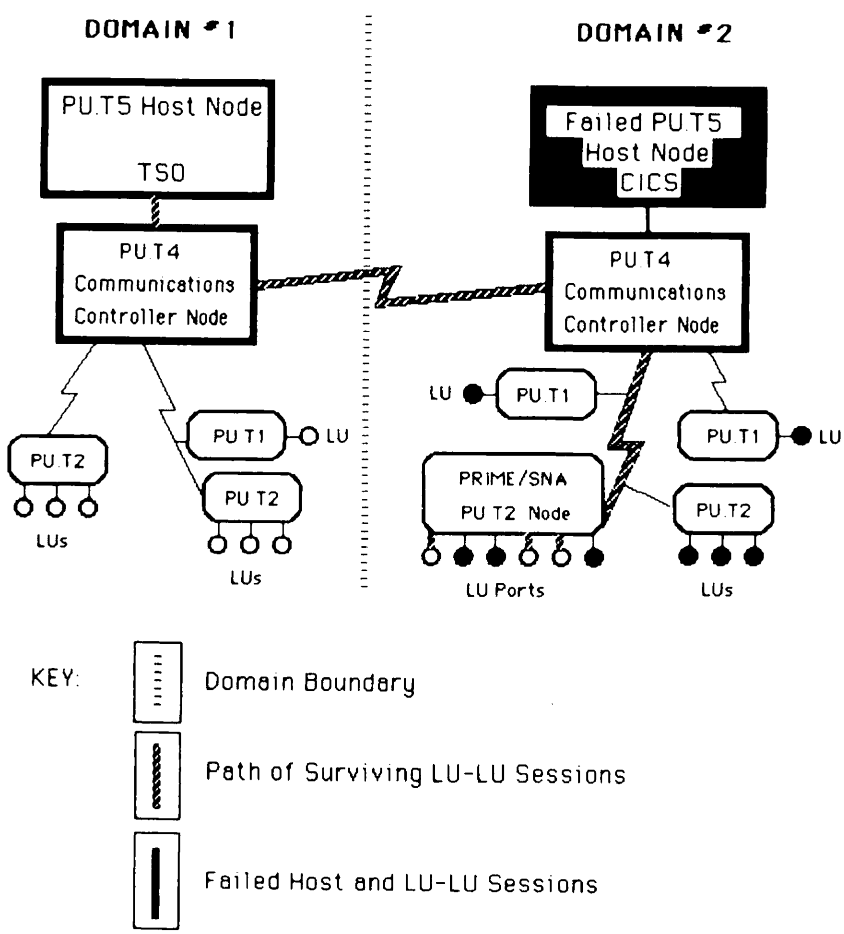
Cross-domain LU-LU sessions continue uninterrupted as long as they do not require assistance from an SSCP for error recovery. A peripheral node's PU and LUs remain ownerless until another SSCP initiates backup procedures. While a peripheral node is ownerless, no new LU-LU sessions can take place; the CDRM in the host node's SSCP failed with the host.

What happens when another SSCP asserts control of a failed host's resources? The peripheral node's new SSCP owner sends an ACTPU ERP (Error Recovery Procedure) and ACTLU ERPs to the peripheral node's PU and LUs. The ERP option of the ACTPU and ACTLUs preserves the existing cross-domain LU-LU sessions and permits new sessions to take place.

Note

PRIME/SNA supports the error recovery options for the ACTPU and ACTLU commands.

Figure 2-13 shows the backup procedure for a peripheral node.



Backup Procedure for a Peripheral Node
Figure 2-13

3 PRIME/SNA Overview

INTRODUCTION

This chapter describes the role PRIME/SNA can play in SNA and PRIMENET networks. It also describes two PRIME/SNA components, the Server Subsystem and the Interactive Subsystem.

How Does PRIME/SNA Appear to SNA Networks?

Although PRIME/SNA uses a single CPU to provide its services, it can appear to an SNA network to be a number of PU.T2 peripheral nodes. The number of peripheral nodes depends on your PRIME/SNA configuration.

PRIME/SNA can perform the following tasks in an SNA network:

- Support up to eight PRIME/SNA peripheral nodes concurrently
- Control up to four SDLC lines concurrently
- Emulate features of IBM devices such as the 3270 Information Display System and the 3770 Remote Job Entry workstation
- Allow remote PRIMENET users access to the SNA network

Multiple PRIME/SNA Peripheral Nodes: PRIME/SNA supports as few as one and as many as eight active peripheral nodes. You can configure each peripheral node with different characteristics to match the needs of different network environments. For example, if you are using a switched line to connect your Prime machine to different points in SNA networks, you might require five terminals at one connection and eighteen at another. With PRIME/SNA, you can create a peripheral node for each connection and tailor its configuration to suit your requirements. Keep in mind, however, that only one PRIME/SNA peripheral node can be active at a time on a switched line.

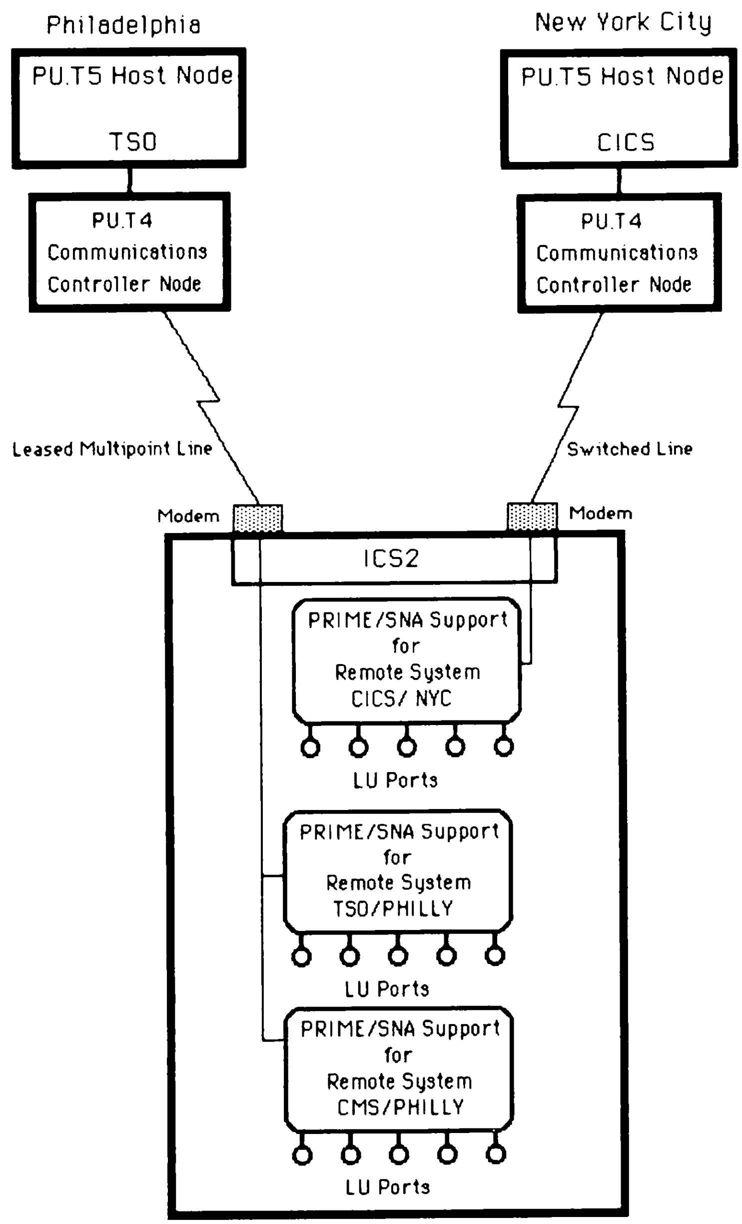
If you are using a nonswitched (leased) SDLC line, a PRIME/SNA remote system (secondary station) can engage in a point-to-point connection with the communications controller (primary station). A PRIME/SNA peripheral node can share a multipoint line with other IBM peripheral nodes, and up to eight Prime peripheral nodes can share the same nonswitched line and modem.

You can create a configuration that distributes these eight peripheral nodes over leased and switched lines.

Controlling SDLC Lines: With PRIME/SNA, you can configure and use four SDLC lines. These lines can operate with a variety of characteristics, including:

- Switched or nonswitched (leased) lines
- Point-to-point or multipoint lines
- V.24 (RS-232C) or V.35 (DDS) interfaces
- Internal or external clocking

Figure 3-1 shows PRIME/SNA supporting three peripheral nodes and three remote system connections with two IBM hosts on two communications lines. Both IBM host nodes contain VTAM/NCP SYSGENs which define host and communication controller support for the PRIME/SNA PU.T2 peripheral nodes. PRIME/SNA mirrors this remote system support in its Server Subsystem configuration of the three peripheral nodes.



PRIME/SNA Remote Systems
Figure 3-1

Emulating IBM Devices: PRIME/SNA has two subsystems -- PRIME/SNA Interactive and PRIME/SNA RJE -- that allow Prime remote systems to emulate characteristics of the IBM 3270 Information Display System and the IBM 3770 Remote Job Entry workstation.

PRIME/SNA Interactive permits PT200 terminal users to work with IBM applications. The Interactive Subsystem and the PT200 terminal work together to emulate most of the features of the 3274 cluster controller and 3278 terminals. PRIME/SNA Interactive also emulates 3287 and 3289 printers.

PRIME/SNA RJE transfers batch data between a Prime system and an IBM host node. The PRIME/SNA RJE Subsystem can share lines and remote systems with PRIME/SNA Interactive.

PRIME/SNA and PRIMENET: PRIME/SNA is fully compatible with PRIMENET. PRIMENET, working in conjunction with PRIME/SNA, allows users to:

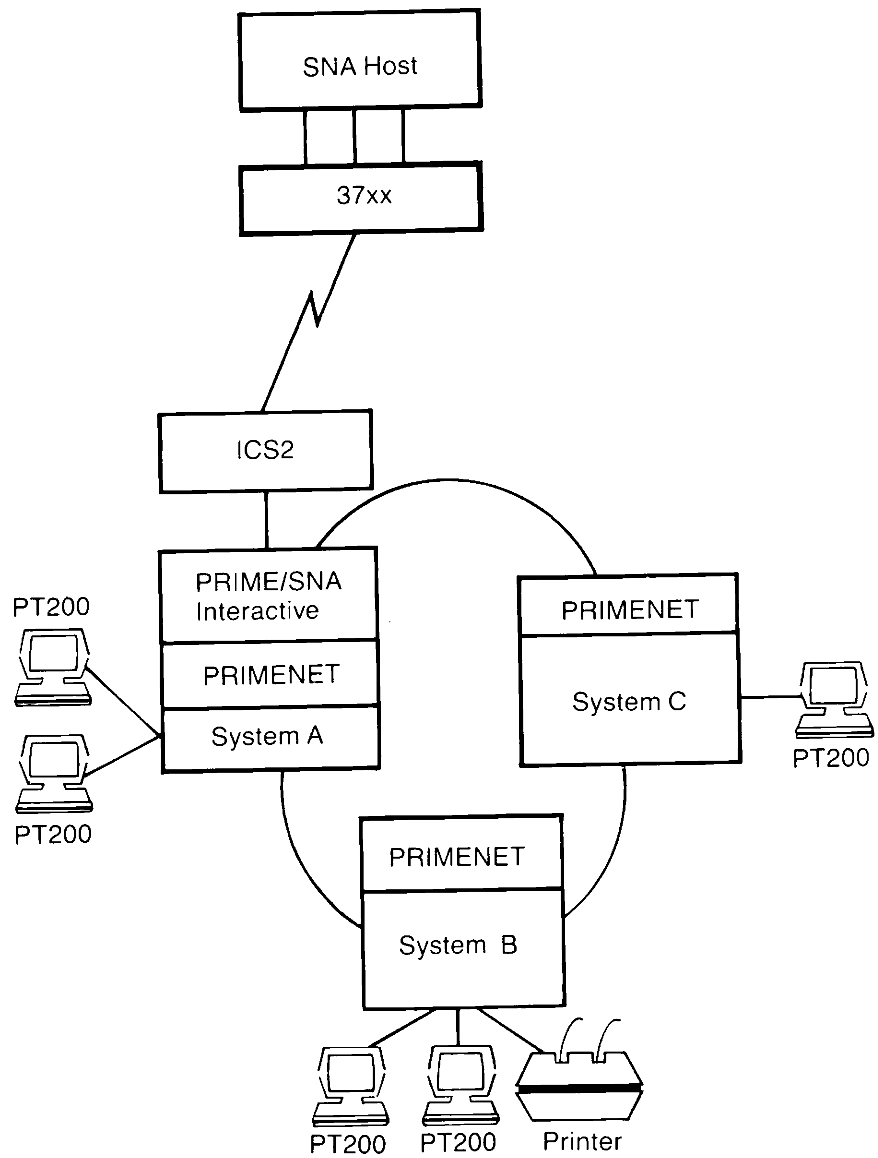
- Login to the PRIME/SNA machine from remote machines and access IBM host nodes
- Direct print data from IBM host nodes to local and remote spool queues
- Distribute batch data received from IBM hosts to remote machines
- Direct batch data from remote Prime machines to the PRIME/SNA machine for transmission to IBM host nodes

Figure 3-2 shows PRIME/SNA being used with PRIMENET.

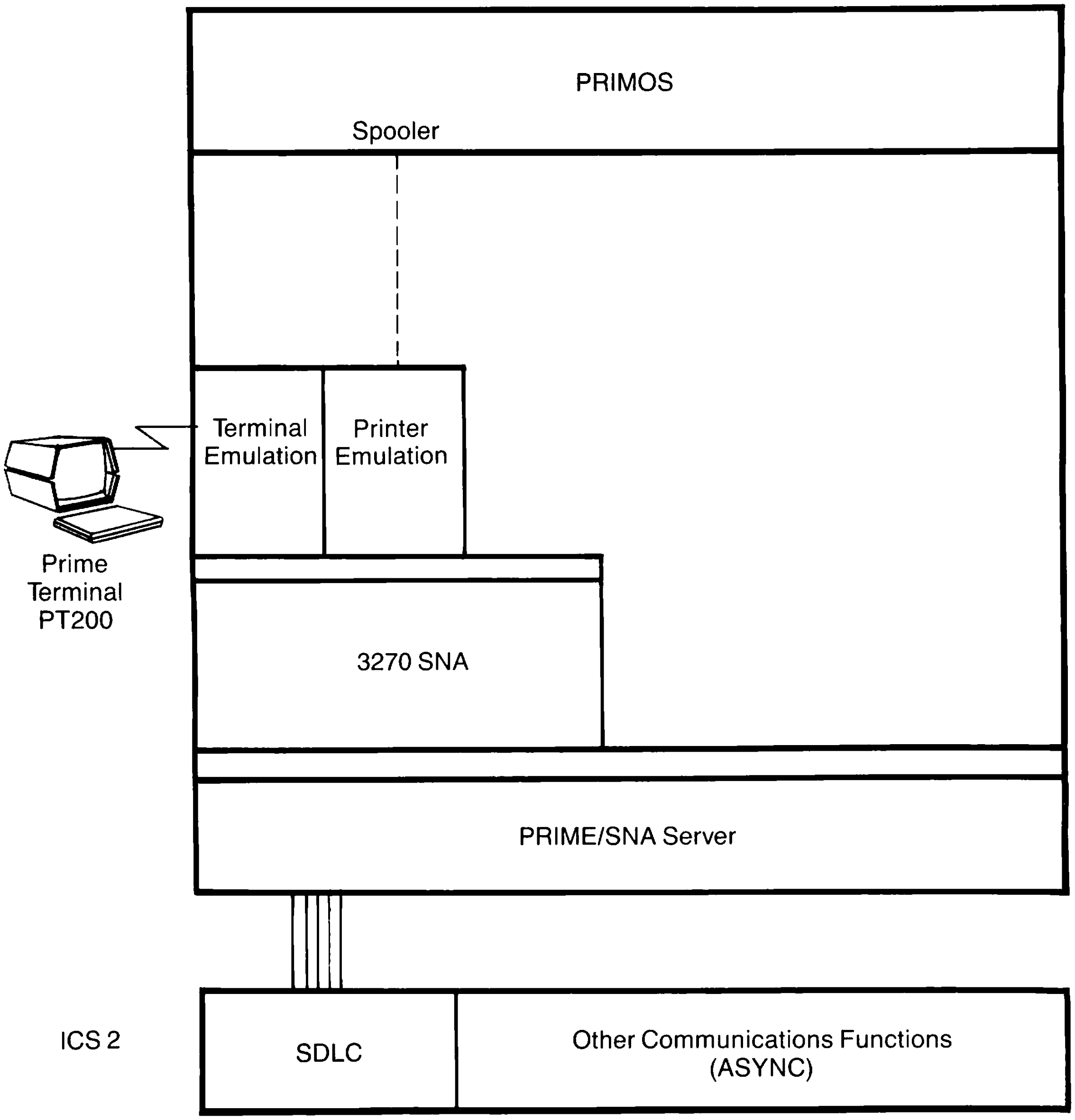
HOW IS PRIME/SNA STRUCTURED?

Figure 3-3 shows PRIME/SNA's three major subsystems and their components:

- The Server Subsystem
- The Interactive Subsystem
- The Remote Job Entry Subsystem



Using PRIME/SNA With PRIMENET
Figure 3-2



PRIME/SNA Components
Figure 3-3

Note

Prime refers to the Interactive and RJE Subsystems as <u>LU subsystems</u> because they implement the characteristics <u>of specific</u> logical unit types. This chapter discusses only the Server and Interactive Subsystems.

THE SERVER SUBSYSTEM

The Server Subsystem is the kernel for the PRIME/SNA family of products. The Server presents the Prime machine to the SNA network as one or more generic peripheral nodes. LU subsystems build on the services provided by the Server and allow PRIME/SNA to emulate particular types of LUs. The Server Subsystem performs the following tasks:

- Handles one to four SDLC lines
- Supports one to eight remote system connections as PU.T2 peripheral nodes
- Provides basic support for a peripheral node's logical units
- Helps your operations staff administer PRIME/SNA
- Helps you configure support for PRIME/SNA peripheral nodes

Server Subsystem software executes both within the Prime Intelligent Communications Subsystem II (ICS2) and the Prime CPU.

SDLC Support in the ICS2

The ICS2 handles the bulk of SDLC support for PRIME/SNA. The ICS2 has its own microprocessor and software which allow it to monitor communications lines and respond to normal SDLC events, such as polls, without notifying the Prime CPU. This is an efficient way of managing synchronous lines and conserving Prime CPU resources.

The ICS2 acts as a secondary station for each Prime remote system. Thus, the ICS2 appears to the SNA network as one to eight secondary stations, the number depending on the number of active remote systems. The ICS2 can also handle asynchronous and synchronous traffic concurrently.

Software in the Prime CPU assists the ICS2 in supporting SDLC. This assistance includes:

- Loading the proper software into the controller
- Processing requests to start up and shut down lines
- Supervising controller activity and event logging

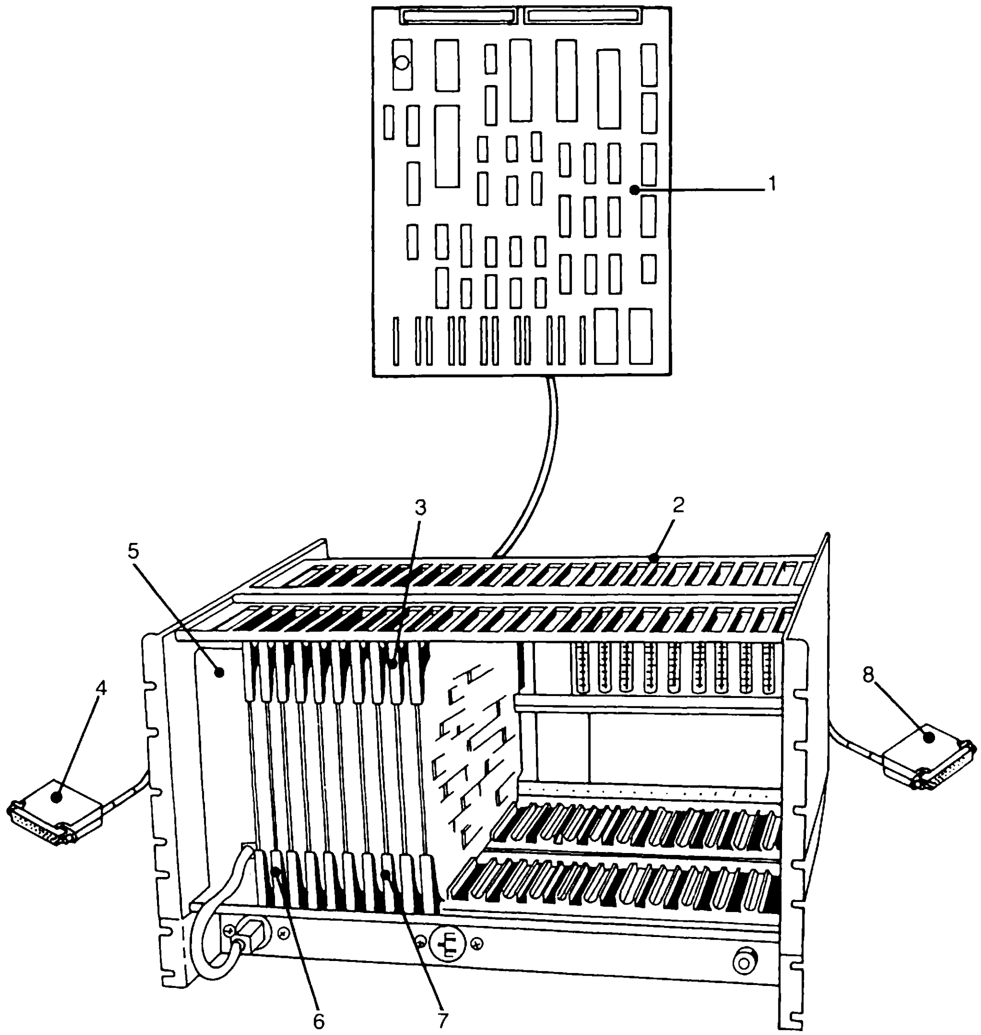
Loading ICS2 Software: When you cold start your Prime CPU, PRIMOS loads a binary file into the ICS2. This binary file contains basic synchronous support and any asynchronous support the controller requires. When you start the Server Subsystem and activate an SDLC line, the portion of the Server in the Prime CPU sends additional information to the ICS2 describing some of the following configuration information for a line:

- The ICS2 synchronous line number
- Signal encoding (NRZ or NRZI)
- Line interface (V.24 or V.35)
- Half-duplex or full-duplex electrical connection
- Internal or external clocking for modems
- Point-to-point or multipoint operation
- Full or half-duplex data mode

Later, when you start the local support for a remote system connection on the the line, the Server will tell the ICS2 which SDLC secondary station address the ICS2 should monitor.

Because line configuration information is not included in the ICS2 binary load file, you can use different SDLC line configurations with the same ICS2 synchronous connection.

ICS2 Hardware: The ICS2 requires special hardware to support synchronous data traffic. Figure 3-4 shows the major assemblies in an ICS2 supporting SDLC; assemblies that differ from the asynchronous-only model are underlined in the key that accompanies the figure.



ICS2 and Synchronous Support Hardware
Figure 3-4

Key to Figure 3-4

1. Controller Board
2. Card Cage
3. V.35 (DDS) Synchronous LAC
4. CBL8780 - V.35 Data Adapter Cable
5. Power Supply
6. Asynchronous LACs
7. V.24 (RS-232C) Synchronous LAC
8. CBL6127 - V.24 Modem Cable

If you own an asynchronous-only version of the ICS2 you will need to upgrade the ICS2 controller board to accommodate SDLC software. Contact your Prime Customer Support Center for more information on ICS2 upgrades.

Each synchronous Line Adapter Card (LAC) supports two synchronous connections. V.24 (RS-232C) LACs operate at speeds up to 19,200 bps, while V.35 (DDS) LACs operate at speeds up to 64,000 bps.

Notes

- The Server Subsystem supports only one V.35 line operating at speeds in excess of 19,200 bps. If you have heavy asynchronous traffic running with SDLC on the same ICS2, you should consider sharing the asynchronous load with other controllers.

- You can have more than two LACs (4 lines) installed on an ICS2, but a Server configuration file can only support four ICS2 synchronous connections. You can use multiple Server configuration files to support your ICS2 LACs.

- The ICS2 supports any manufacturer's modems adhering to the V.24 (RS-232C) standard and any manufacturer's data adapter units adhering to the V.35 standard (including AT&T's DDS).

The remainder of the Server Subsystem resides in the Prime CPU and runs as a single phantom process.

Physical Unit Type 2 Support

The Server handles PU.T2 support for connections with remote systems. The Server performs the following tasks for remote systems and LU subsystems:

- Establishes and terminates SSCP-PU sessions

- Responds to SNA commands

- Answers XID requests on switched lines

- Processes errors

Logical Unit Support

In addition to providing PU.T2 support for remote system connections, the Server provides generic logical unit services for Prime LUs. The Server performs these services for a PRIME/SNA peripheral node's LUs:

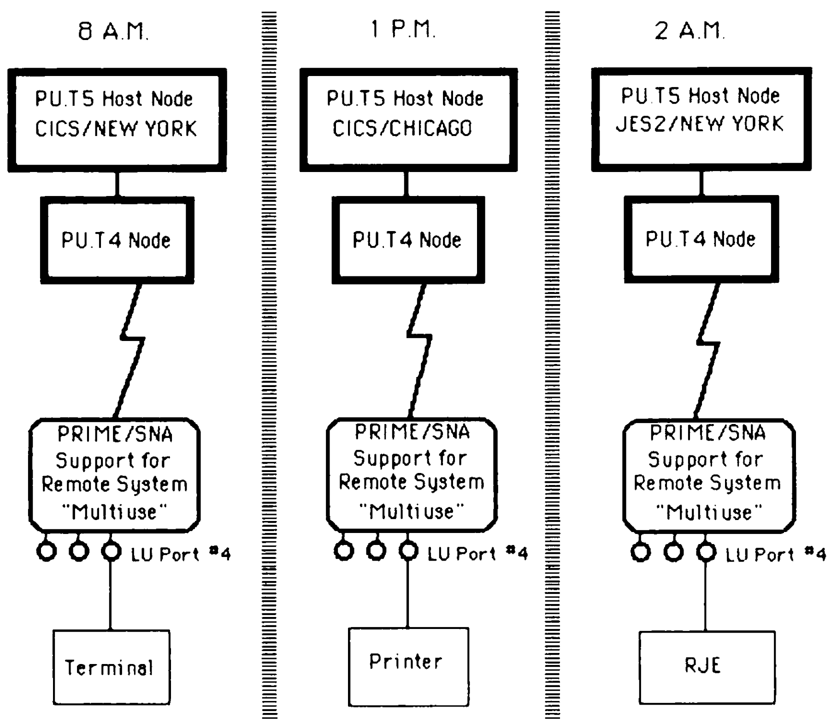
- Establishes, monitors, and terminates SSCP-LU sessions

- Assists in establishing and terminating LU-LU sessions

- Responds to SNA commands at the request of LU subsystems

- Routes data to and from LU subsystems and their users

From the Server's perspective, all the LUs on a PRIME/SNA peripheral node appear the same -- they are the sources and destinations of end user data. The PRIME/SNA Server refers to a peripheral node's LUs as ports because they represent entry points into the SNA network. The Server makes the same LU services available to all PRIME/SNA ports; LU subsystems differentiate the capabilities of ports and make the ports appear to the SNA network as particular devices. The independence of ports from device characteristics permits the same port to have different device characteristics at different times. Figure 3-5 shows a single PRIME/SNA peripheral node supporting three remote system connections at three times of day. Note that a single logical unit port, number four, is handling three types of device characteristics in that timeframe.



A Port Handling Different Device Characteristics
Figure 3-5

SNA allows each PU.T2 node or remote system connection to support 254 logical units. In practice, few IBM PU.T2 nodes support 254 LUs. Nevertheless, the PRIME/SNA Server lets you configure up to 254 LUs for each remote system connection.

Because PRIME/SNA shares your CPU with other applications, Prime restricts the count of active ports to a number based on your CPU model. Table 3-1 shows the maximum number of LU-LU sessions (active ports) each Prime CPU can handle.

Table 3-1
Maximum Number of Active Ports by CPU Model

CPU Model	Maximum Number of Active LU Ports
400	16
150	16
250I	16
350	16
2250	16
9950	48
9955	48
All Others	32

Port Numbers and Names: SNA uses a decimal number to identify the logical units belonging to a physical unit. This number ranges from 2 to 255 and is called a LOCADDR. The definition of a remote system connection with a peripheral node in the host node's VTAM/NCP SYSGEN lists the LOCADDRs of all the peripheral node's logical unit ports.

In addition to numbering ports, the Server allows you to assign a 32-character name to each port. Although PRIME/SNA port names mean nothing to the SNA network, they make your peripheral node's ports easier to identify.

Server Operations

The Server Subsystem gives your operations staff the tools they need to manage the Server Subsystem's SDLC lines and connections to remote systems. These tools include:

- Commands to start, stop, and check the status of lines and remote systems
- Message logging of PRIME/SNA events
- Statistics gathering

Server Commands: The Server has special commands for PRIME/SNA Administrators and operators. The commands allow you and your staff to issue directives for a single line or remote system connection or for a group of lines and remote system connections.

You can group PRIME/SNA resources such as lines and remote systems when you configure the Server Subsystem. Grouping lines and remote systems in a sensible way expedites many routine activities your operations staff performs. Chapter 5 provides more information on line and remote system groups.

The Server's commands allows you to control and monitor lines and remote systems with the following commands:

- SNA_SERVER -START
- SNA_SERVER -STATUS
- SNA_SERVER -STOP
- SNA_SERVER -MESSAGE_LEVEL
- SNA_SERVER -STATISTICS

You can issue these commands from any terminal. If you want to prevent unauthorized personnel from using these commands, you can create ACLs when installing PRIME/SNA software. Chapter 8 discusses PRIME/SNA security features you can implement on your machine.

You use the SNA_SERVER -START command to activate PRIME/SNA resources under the control of the Server Subsystem. When you enter

```
SNA_SERVER -START -LINE BOS-PHILLY
```

the Server collects information about the Boston-Philadelphia line from your Server configuration file and sends it to the ICS2. The command also prepares the line for the remote system connection assigned to the line.

When you enter

```
SNA_SERVER -START -REMOTE_SYSTEM_GROUP 8AM/START
```

the Server checks your Server configuration file for the names of the remote systems in the remote system group, 8AM/START. When the Server finds the names of the remote systems, it creates an environment to support the connection to remote systems and then notifies you of the results of the start request as shown below.

```
The request is being processed....

Remote system being started          : TSO/PHILLY
Remote system being started          : CMS/PHILLY
```

When the Server informs you that the remote systems are being started, you know that the Server has enabled support on the Prime side for two remote system connections, one called TSO/PHILLY and the other CMS/PHILLY. The two peripheral nodes they represent are ready to communicate with the remote system's SSCP and enter into SSCP-PU sessions.

If you want to check the status of the remote systems while they are working, enter:

```
SNA_SERVER -STATUS
```

The Server displays the status of the resources you activated, as follows:

```
                    SNA SERVER STATUS
                    =================

SNA Configuration File: <SNASRV>PRIME/SNA*>SNA.CONFIG

Remote System Name      Server Status    Name of Associated Line

TSO/PHILLY                 Started             BOS-PHILLY
CMS/PHILLY                 Started             BOS-PHILLY
CICS/NYC                   Started             BOS-NYC
```

The SNA_SERVER -STOP command closes out Server support for lines and remote systems. You can issue the STOP command with a range of options that indicate the immediacy of the stop request.

The following commands illustrate the range of STOP options available to you:

- SNA_SERVER -STOP IDLE -REMOTE_SYSTEM CICS/NYC causes the Server to close out support for the remote system connection CICS/NYC after the last LU-LU session on the peripheral node finishes. The Server does not permit new LU-LU sessions after the command was issued. This is the preferred way of closing out support for a remote system connection.

- SNA_SERVER -STOP FINISH -REMOTE_SYSTEM CICS/NYC causes the Server to close out support for the remote system connection CICS/NYC when all the peripheral node's LUs have finished the transactions they were working on at the time the command was issued. The Server does not permit new LU-LU sessions to be started.

- SNA_SERVER -STOP NOW -REMOTE_SYSTEM CICS/NYC causes the Server to terminate LU subsystem activity immediately. The Server uses SNA commands to tell the SSCP on the remote system connection CICS/NYC to terminate the SSCP-PU session.

- SNA_SERVER -STOP KILL -REMOTE_SYSTEM CICS/NYC causes the Server to drop all Server support for the remote system connection. The peripheral node represented by the CICS/NYC connection then appears dead to its SSCP owner. Use the KILL option rarely. Using this option may send an alert to the network operator at the IBM host site.

Message Logging: The Server has a message log that records events such as an operator starting a remote system connection. The Server keeps the log in a file and appends new messages to the end of the file.

The SNA_SERVER -MESSAGE_LEVEL command lets you filter the log's messages before they are added to the log file. You can use the SNA_SERVER -MESSAGE_LEVEL command to specify one of three logging levels:

- BRIEF

- MEDIUM

- DETAILED

When you first start the Server, the default logging level is BRIEF. You can change the logging level any time after the Server is running. If you encounter a problem with a PRIME/SNA resource, the Server allows you to single out a particular line, remote system connection, or group of remote system connections for more complete message logging. Figures 3-6, 3-7, and 3-8 show the same time period recorded at BRIEF, MEDIUM, and DETAILED logging levels.

```
*
RWLOCK *>SNA_SERVER_LOGS>LOG.08-MAR-85 UPDT
*
R SNA_SERVER_PROCESS.RUN <SNASRV>PRIME/SNA*>ETS.CONFIG
                         24                          0
PRIME/SNA0001 08-MAR-85 16:45:31.65   PRIME/SNA Server [01.00.00] started.
              [SNA_SERVER_PROCESS Revision 1.0 - 19.4] is PRIMOS user 87
              Using SNA Configuration File
              <SNASRV>PRIME/SNA*>ETS.CONFIG.
PRIME/SNA0002 08-MAR-85 16:45:37.54   -RS TSO/PHILLY
              Local support has been started using SDLC [01.00.00].
              CONTROLLER: 10,     LINE: 304,     STATION ADDRESS: 0A
PRIME/SNA0003 08-MAR-85 16:45:39.41   -RS TSO/PHILLY
              Connection established.
              The remote system's SSCP ID is 00032.
PRIME/SNA0005 08-MAR-85 16:58:56.94   -RS TSO/PHILLY
              Local support has been stopped.
PRIME/SNA0006 08-MAR-85 16:59:05.00   PRIME/SNA Server terminated.

SNA_SERVER (user 87) logged out Friday, 08 Mar 85 16:59:04.
Time used: 00h 13m connect, 00m 22s CPU, 00m 04s I/O.
```

Messages Logged at the BRIEF Level
Figure 3-6

```
RWLOCK *>SNA_SERVER_LOGS>LOG.08-MAR-85 UPDT
*
R SNA_SERVER_PROCESS.RUN <SNASRV>PRIME/SNA*>ETS.CONFIG
                         24                          0
PRIME/SNA0001 08-MAR-85 16:45:31.65   PRIME/SNA Server [01.00.00] started.
              [SNA_SERVER_PROCESS Revision 1.0 - 19.4] is PRIMOS user 87
              Using SNA Configuration File
              <SNASRV>PRIME/SNA*>ETS.CONFIG.
PRIME/SNA0002 08-MAR-85 16:45:37.54   -RS TSO/PHILLY
              Local support has been started using SDLC [01.00.00].
              CONTROLLER: 10,     LINE: 304,     STATION ADDRESS: 0A
PRIME/SNA0020 08-MAR-85 16:45:38.32   -RS TSO/PHILLY
              Message Level changed from BRIEF to MEDIUM.
PRIME/SNA0003 08-MAR-85 16:45:39.41   -RS TSO/PHILLY
              Connection established.
              The remote system's SSCP ID is 00032.
PRIME/SNA0065 08-MAR-85 16:53:13.19   -RS TSO/PHILLY
              Connection reset:  SNA session not reset.
              SNRM received while SNA session active.
PRIME/SNA0066 08-MAR-85 16:53:13.45   -RS TSO/PHILLY
              Connection reset:  SNA sessions reset.
              ACTPU(cold) received while LU-LU/SSCP-LU sessions active.
              The remote system's SSCP ID is 00000.
PRIME/SNA0254 08-MAR-85 16:53:20.62   -RS TSO/PHILLY
              Traffic on the SSCP-LU session reset.
              ACTLU(erp) received.
              Port Number:     2
PRIME/SNA0260 08-MAR-85 16:53:22.51   -RS TSO/PHILLY
              LU-LU session not activated.
              BIND rejected:  SNA sense data 08090000
              Port Number:     2      Port Index:     1
PRIME/SNA0160 08-MAR-85 16:58:34.80   -RS TSO/PHILLY
              Session resource being closed:  ID     2
              Port Number:     2      Port index:     1
              Initiated by LU Subsystem while data outstanding.
PRIME/SNA0005 08-MAR-85 16:58:56.94   -RS TSO/PHILLY
              Local support has been stopped.
PRIME/SNA0006 08-MAR-85 16:59:05.00   PRIME/SNA Server terminated.

SNA_SERVER (user 87) logged out Friday, 08 Mar 85 16:59:04.
Time used: 00h 13m connect, 00m 22s CPU, 00m 04s I/O.
```

Messages Logged at the MEDIUM Level
Figure 3-7

```
*
RWLOCK *>SNA_SERVER_LOGS>LOG.08-MAR-85 UPDT
*
R SNA_SERVER_PROCESS.RUN <SNASRV>PRIME/SNA*>ETS.CONFIG
                    24                         0
PRIME/SNA0001 08-MAR-85 16:45:31.65   PRIME/SNA Server [01.00.00] started.
              [SNA_SERVER_PROCESS Revision 1.0 - 19.4] is PRIMOS user 87
              Using SNA Configuration File
              <SNASRV>PRIME/SNA*>ETS.CONFIG.
PRIME/SNA0002 08-MAR-85 16:45:37.54   -RS TSO/PHILLY
              Local support has been started using SDLC [01.00.00].
              CONTROLLER: 10,     LINE: 304,     STATION ADDRESS: 0A
PRIME/SNA0020 08-MAR-85 16:45:38.32   -RS TSO/PHILLY
              Message Level changed from BRIEF to DETAILED.
PRIME/SNA0003 08-MAR-85 16:45:39.41   -RS TSO/PHILLY
              Connection established.
              The remote system's SSCP ID is 00032.
PRIME/SNA0201 08-MAR-85 16:45:40.57   -RS TSO/PHILLY
              SSCP-LU session activated.
              OPEN_LU required.
              Port Number:    2
PRIME/SNA0100 08-MAR-85 16:47:31.54   -RS TSO/PHILLY
              LU resource being opened:          ID    1
PRIME/SNA0101 08-MAR-85 16:47:32.60   -RS TSO/PHILLY
              LU resource opened:                ID    1
              Port Number:    2
PRIME/SNA0203 08-MAR-85 16:47:50.60   -RS TSO/PHILLY
              LU-LU session activated.
              GET_SESSION required.
              Port Number:    2       Port Index:    1
PRIME/SNA0102 08-MAR-85 16:47:50.69   -RS TSO/PHILLY
              Session resource being opened:  ID    2
PRIME/SNA0103 08-MAR-85 16:47:51.93   -RS TSO/PHILLY
              Session resource opened:           ID    2
              Port Number:    2       Port index:    1
PRIME/SNA0065 08-MAR-85 16:53:13.19   -RS TSO/PHILLY
              Connection reset:  SNA session not reset.
              SNRM received while SNA session active.
PRIME/SNA0066 08-MAR-85 16:53:13.45   -RS TSO/PHILLY
              Connection reset:  SNA sessions reset.
              ACTPU(cold) received while LU-LU/SSCP-LU sessions active.
              The remote system's SSCP ID is 00000.
PRIME/SNA0254 08-MAR-85 16:53:20.62   -RS TSO/PHILLY
              Traffic on the SSCP-LU session reset.
              ACTLU(erp) received.
              Port Number:    2
PRIME/SNA0260 08-MAR-85 16:53:22.51   -RS TSO/PHILLY
              LU-LU session not activated.
              BIND rejected:  SNA sense data 08090000
              Port Number:    2       Port Index:    1
PRIME/SNA0160 08-MAR-85 16:58:34.80   -RS TSO/PHILLY
              Session resource being closed:  ID    2
              Port Number:    2       Port index:    1
              Initiated by LU Subsystem while data outstanding.
PRIME/SNA0105 08-MAR-85 16:58:35.49   -RS TSO/PHILLY
              LU resource closed:                ID    1
              Port Number:    2
PRIME/SNA0005 08-MAR-85 16:58:56.94   -RS TSO/PHILLY
              Local support has been stopped.
PRIME/SNA0006 08-MAR-85 16:59:05.00   PRIME/SNA Server terminated.

SNA_SERVER (user 87) logged out Friday, 08 Mar 85 16:59:04.
Time used: 00h 13m connect, 00m 22s CPU, 00m 04s I/O.
```

Messages Logged at the DETAILED Level
Figure 3-8

Notes

- The Server Subsystem creates a new log file each day the Server is started. Thus, if you leave the Server Subsystem running for several days, the messages logged after the first day are appended to the first day's file. On the other hand, if you start and stop the Server Subsystem several times in the course of a single day, the Server creates only the one log file for that day.
- You should check the size of the log file on a regular basis to make sure that it does not include outdated information. This preserves disk space.

Statistics: The SNA_SERVER -STATISTICS command lets you change the name of the file where the Server keeps statistics data. Issuing the SNA_SERVER -NO_STATISTICS command prevents the Server from keeping statistics data. Figure 3-9 shows some of the data the Server keeps.

```
08-MAR-85 16:45:37.99
   File Opened.

08-MAR-85 16:45:38.77
   SDLC station activated.

08-MAR-85 16:45:39.37
   SSCP-PU session activated.

08-MAR-85 16:58:56.31
   Reason collected: Connection terminated.
   Remote system    : CICS/NYC

      RECFMS statistics :
         SDLC test frames received                :          0
         SDLC test frames transmitted             :          0
         Communications adapter errors            :          0
         SNA negative responses                   :          3
         Receive overruns                         :          0
         Write retrys                             :          0
         Overruns                                 :          0
         Underruns                                :          0
         FCS errors                               :          0
         Primary SDLC station aborts              :          0
         Command rejects                          :          0
         Implementation data                      :          0

      PRIME/SNA statistics :
         PIUs: Sent by the Server                 :        145
               Transmitted by SDLC                :        199
               Retransmitted by SDLC              :         54
         PIU bytes: Sent by the Server            :       1464
                    Transmitted by SDLC           :       2050
                    Retransmitted by SDLC         :        586
         RUs sent by the Server                   :        145
         SNA RU bytes sent by the server          :        159
         SNA header bytes sent by the Server      :       1305
         SDLC frames transmitted by SDLC          :       2324
            Information frames                    :        199
            Unnumbered frames                     :          3
            Supervisory frames                    :       2122
         RNRs transmitted by SDLC                 :          0
         Unproductive polls processed by SDLC     :       2122

         PIUs: Received by the Server             :        416
               Received by SDLC                   :        416
         PIU bytes: Received by the Server        :      74587
                    Received by SDLC              :      74587
         RUs received by the Server               :        144
         SNA RU bytes received by the Server      :      71659
         SNA header bytes received by the Server  :       2928
         SDLC frames received by SDLC             :       2737
            Information frames                    :        416
            Unnumbered frames                     :          3
            Supervisory frames                    :       2318
         RNRs received by SDLC                    :          0

         Unexpected data set signal changes       :          0
         LAC cable disconnections from the LAC    :          0
         Polls missed due to no SDLC buffers      :          0
         Frames lost due to no SDLC buffers       :          0
         Too-short frames received by SDLC        :          0
         Non-octet frames received by SDLC        :          0
         Unknown commands received by SDLC        :          0
```

Sample Statistics Data Kept by the Server Subsystem
Figure 3-9

Note

The Server Subsystem creates a new statistics file each day the Server is started, the same as it creates a new log file each day. (See the previous section, Message Logging.)

Help Facility: If you should forget a command or its syntax, you can type the command SNA_SERVER -HELP to get a list of the commands that work with the Server Subsystem. The Server help facility can also give you information in greater detail on each one of the Server commands.

The Server Configurator: The Server configurator, SNA_SERVER_CONFIG, is an easy-to-use tool to help you create Server Subsystem configurations. You can use SNA_SERVER_CONFIG with any terminal to create, modify, and delete Server configuration files, even while PRIME/SNA is running. SNA_SERVER_CONFIG prompts you for all the required information, and a HELP function guides you if you forget a particular term or procedure.

When you use SNA_SERVER_CONFIG, you define the characteristics of lines and remote systems to match the characteristics defined by systems programmers at the IBM host. You also list the LOCADDRs of the LUs defined in the VTAM/NCP SYSGEN. SNA_SERVER_CONFIG stores your definitions in a configuration file.

The Server allows you to create multiple configuration files if a single configuration file cannot contain all your line and remote system definitions. When you start the Server subsystem, you can specify the name of a Server configuration file or use the default configuration file. The Server can only work with one configuration file at a time.

A single Server configuration file meets the needs of most users. Each Server configuration file allows you to configure the resources shown in Table 3-2.

Table 3-2
PRIME/SNA Resource Allocation

Resource	Maximum Number Configured	Maximum Number Active
Lines	4	4
Remote Systems	8*	8
Logical Unit Ports	254 per remote system	**

* PRIME/SNA allows you to distribute these eight remote system connections across all your lines according to your needs. You could assign all eight to a single leased line or all eight to a switched line. A switched line can accommodate only a single remote system connection.

** The maximum number of active logical unit ports or devices depends on your CPU model. Table 3-1 presents these maximum values.

Note

The most frequently used configuration file should be the default configuration file, PRIME/SNA*>SNA.CONFIG. You do not have to specify the name of the default configuration file when starting the Server Subsystem, saving you and your operators a step.

Figures 3-10, 3-11, and 3-12 show sample screens from SNA_SERVER_CONFIG. Chapters 6 and 7 discuss the contents of these screens.

```
SNA_SERVER_CONFIG                                  Adding line "BOS-PHILLY"


Name of group containing the line, if any:
ICS2 Controller number in octal (10, 11, 36, 37)                 : 10

ICS2 line number in octal (0, 4, 20, 24, ... 364)                : 304
NRZI signal encoding for the line                           (Y,N): N

RS232 interface or V.35 digital interface                   (R,V): R
Half duplex or Full duplex data set control                 (H,F): F
Baud rate for internal clock, or "0" for external clocking       : 0
Point-to-point or Multipoint                                (P,M): M
Leased or Switched line                                     (L,S): L
Auto-answer modem on the line                               (Y,N): N
Auto-disconnect idle time in seconds, or blank                   :


Options:   C = Change line parameters    D = Delete line    F = Finish
           RETURN = Configure remote systems for this line
Selection: _
```

Configuring a PRIME/SNA Line
Figure 3-10

```
SNA_SERVER_CONFIG      Adding remote system "TSO/PHILLY" on line "BOS-PHILLY"

Name of group containing remote system, if any: 8AM/START

Time limit for connect attempt in minutes, or blank        : 5

Attempt automatic recovery of connection              (Y,N): Y

Local system ID in hex, or blank           (00001 - FFFFF):

Remote system SSCP IDs - none, one, or more (00000 - 65535): 84

Local system SDLC station address                (01 - FE): 0A

Half duplex or full duplex data mode                  (H,F): H


Options:   C = Change system parameters    D = Delete system    F = Finish
           RETURN = Configure ports for this remote system
Selection: _
```

Configuring a PRIME/SNA Remote System
Figure 3-11

```
SNA_SERVER_CONFIG                          LU ports for remote system "TSO/PHILLY"



2     LU61A02                          3     LU61A03
4     LU61A04                          5     LU61A05
6     LU61A06                          7     LU61A07
8     LU61A08








Options:   <port number> = Add, change, or delete port with this number
           RETURN = Finish
Selection: _
```

Adding Logical Unit Ports to a Remote System
Figure 3-12

THE INTERACTIVE SUBSYSTEM

The Interactive Subsystem allows PT200 terminal users to access numerous applications in an SNA network and host application end users to send data to the Prime spooler. The Interactive Subsystem builds on the Server's logical unit support by adding functions to the ports of Prime remote systems. PRIME/SNA Interactive provides a subset of the functions offered by the IBM 3274 Model 51C cluster controller and attached 3278 terminals and 3287/3289 printers.

The Interactive Subsystem has four parts:

- The 3270 LU Manager
- Terminal emulation
- Printer emulation
- The Interactive Subsystem configurator

The 3270 LU Manager runs as a single phantom process. The terminal emulation program SNADSC runs as a user's process and works with special microcode found in the PT200 to support 3278 emulation. Printer emulation can run as a user or a phantom process.

3270 LU Manager

The 3270 LU Manager is the main component of PRIME/SNA Interactive. The 3270 LU Manager provides services for terminal emulation and printer emulation. It also provides tools to help you and your operations staff manage the Interactive Subsystem.

The 3270 LU Manager handles the following tasks:

- Supports Logical Unit Types 1, 2, and 3
- Checks BIND commands sent from primary LUs
- Processes 3270 commands, orders, and data
- Routes data to and from terminal users and emulated printers

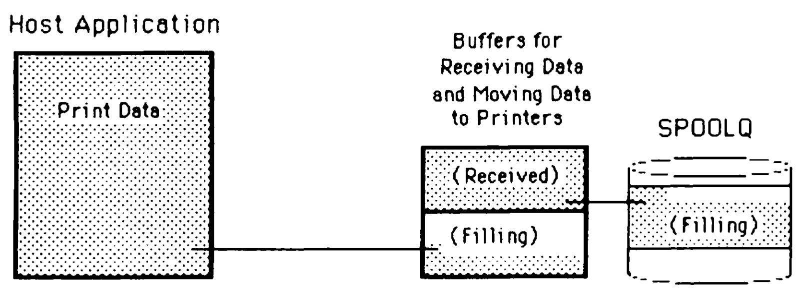
Logical Unit Types: SNA has defined several types of logical units for different end users. Each logical unit type specializes in the services it offers end users. There are logical unit types for terminals, printers, and application programs. The 3270 LU Manager supports three logical unit types.

The three logical unit types are:

- Type 1 Logical Units for SCS printing
- Type 2 Logical Units for 3278 emulation
- Type 3 Logical Units for 3270 Data Stream printing

Type 1 Logical Units (LU.T1) use the SNA Character String (SCS) for printing. An LU.T1 printer handles sophisticated print formats by interpreting SCS commands. An LU.T1 printer employs at least two buffers; one to send data to the printer and the others to accept data from a primary logical unit. An LU.T1 printer is an efficient user of network resources because it disposes of print data continuously.

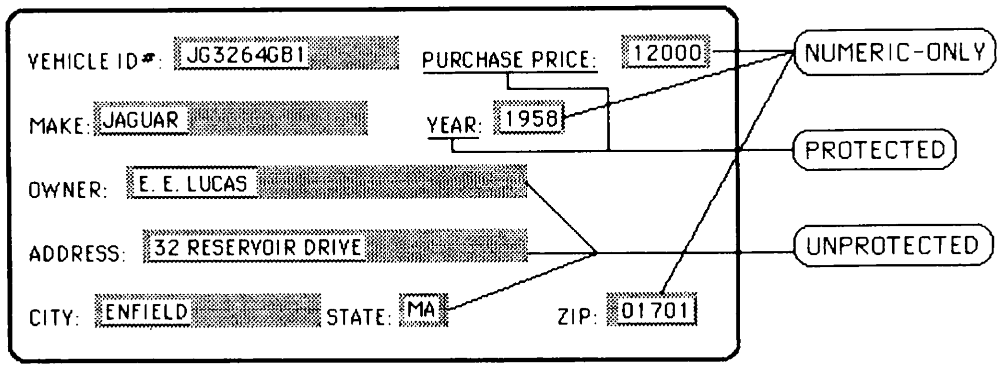
Figure 3-13 shows an LU.T1 handling a print job.



LU.T1 Printing
Figure 3-13

Type 2 Logical Units (LU.T2) use the 3270 Data Stream to communicate with primary LUs in an interactive environment. A terminal is an example of an LU.T2. The 3270 Data Stream formats screenfuls of data and organizes them into protected, unprotected, and numeric-only fields. Character output can be either normal (high intensity), displayed, or non-displayed.

Figure 3-14 shows an example of a screenful of data with different fields.



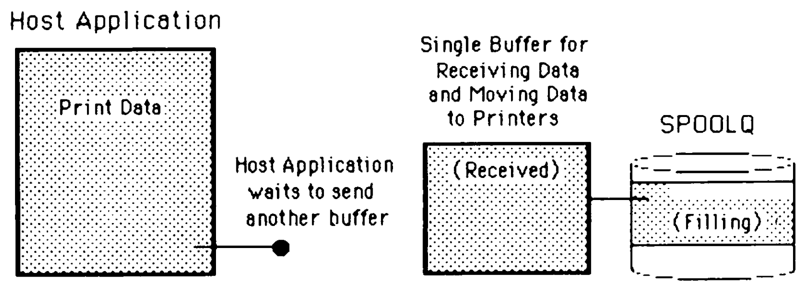
LU.T2 Screen and Field Types
Figure 3-14

Type 3 Logical Units (LU.T3) use the 3270 Data Stream to handle printing. Normally, LU.T3 printers employ a single buffer to both send data to the printer and receive data from a primary logical unit. LU.T3 printing is less efficient than LU.T1 printing because a Type 3 logical unit must pause to send a response acknowledging the receipt of each buffer of information from the primary LU. Table 3-3 shows the rows and columns supported by each LU.T3 buffer size.

Table 3-3
LU.T3 Buffer Sizes

Buffer Size	Rows	Columns	Characters
STANDARD	12	80	960
	24	80	1920
EXTENDED	32	80	2560
	43	80	3440
	27	132	3564

Figure 3-15 shows an LU.T3 printer handling a print job.



LU.T3 Printing
Figure 3-15

Checking BINDs: Both the Server and the LU Manager check BIND commands sent from primary logical units. The Server does some preliminary checking of a BIND to see if a port can support an upcoming LU-LU session. The Server then passes the BIND to the 3270 LU Manager. The LU Manager checks its Interactive Subsystem configuration to see if the device (terminal or printer) configured for the port can support all the options stated in the BIND. If the terminal or printer device can support the LU-LU session, the LU Manager tells the Server to accept the BIND.

Command Processing: The 3270 LU Manager allows you or your operations staff to start, stop, and display the status of terminals and printers associated with ports and remote system connections. The format of commands affecting the Interactive Subsystem resembles those used for Server resources.

Terminal Emulation

There are two parts to terminal emulation — SNADSC and microcode in the PT200 terminal. SNA Data Stream Compatibility (SNADSC) is a program run by a user to make the PT200 emulate an IBM 3278 display. SNADSC converts screen formatting commands from those used by an IBM 3278 Model 2 or Model 5 Display to those used by the PT200 terminal.

PT200 microcode signals SNADSC when a user presses certain keys on the terminal. These keys signal that the user has a request to send to the Interactive Subsystem or the primary LU. This relieves the SNADSC program from monitoring all terminal traffic.

Special Features: In addition to closely mapping IBM function, attention, and session control keys from the 3278 to the PT200, PRIME/SNA provides a number of special features to terminal users. These features include:

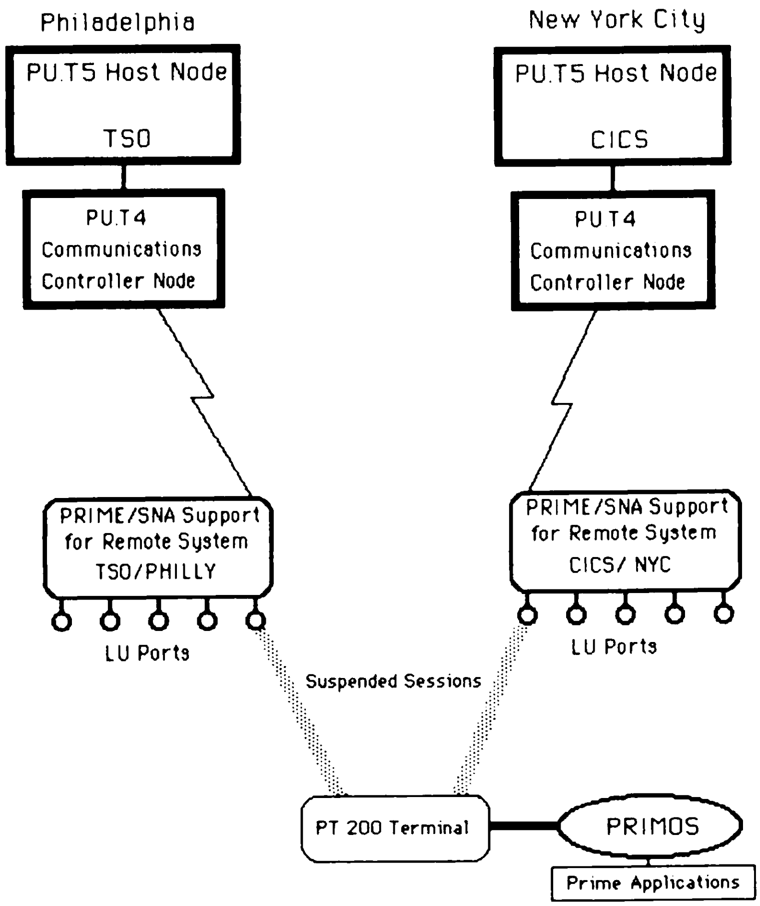
- Reproduction of familiar 3278 icons (busy clock, X-inhibit keyboard, and so on)
- Copying screens to the Prime spooler
- Copying screens to a file
- Suspending an LU-LU session to return to PRIMOS
- Maintaining up to three suspended sessions per terminal

Users can copy screen contents to the Prime spooler if you, the System Administrator, permit screen copying in the Interactive configuration. The PT200 has keys for printing and filing the contents of screens.

A PT200 user can temporarily suspend LU-LU sessions by pressing the SUSPEND key. SNADSC receives the suspend request and instructs the 3270 LU Manager to tell the terminal's session partner it is busy if the session partner attempts to send data. Once the LU-LU session is suspended, the user can return to PRIMOS or initiate another LU-LU session. From the Server's point of view, each suspended session requires one active LU port on a remote system. PRIME/SNA Interactive allows a user to maintain up to three suspended LU-LU sessions.

With suspended sessions, a user can access an IBM application, press the SUSPEND key, run a Prime application, and then return to the IBM application where he or she left off. A user can also suspend sessions with IBM applications located on different host nodes.

Figure 3-16 shows a terminal connected to two IBM applications with suspended sessions on two remote system connections.



PT200 Terminal User With Two Suspended Sessions
Figure 3-16

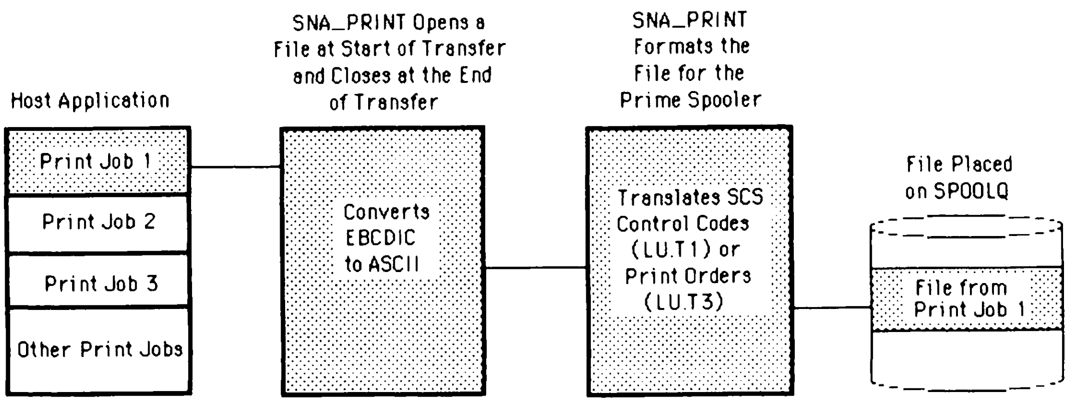
Note

If a user logs out of PRIMOS while several LU-LU sessions are suspended, the user can lose those LU-LU sessions.

Printer Emulation

PRIME/SNA Interactive provides LU.T1 and LU.T3 printing by emulating the IBM 3287 and 3289 printers. Prime refers to each printer in an Interactive configuration as a logical printer. A logical printer accepts data from a session partner, converts the data's format, and sends the data to the Prime spooler. In this manner, a single physical printer can handle the needs of several logical printers.

Figure 3-17 shows how logical printers handle printer emulation.



A Logical Printer Handling Data
Figure 3-17

An Interactive Subsystem program called SNA_PRINT controls printer emulation. You can start SNA_PRINT as a phantom or from a terminal. When you operate SNA_PRINT from a terminal, you can control up to four logical printers -- starting, stopping, and displaying their status. You can also emulate the use of the PA1, PA2, and CANCEL keys that appear on the IBM 3289 LU.T1 printer. IBM applications define the use of the PA keys. Typically, a print operator uses them to signal the primary LU to restart the entire print job or restart the job from the previous page.

If you start SNA_PRINT as a phantom process, you cannot stop the logical printers associated with the phantom unless you log the phantom out. Each SNA_PRINT phantom handles up to four logical printers.

To assist you in formatting the data sent to the Prime spooler, PRIME/SNA printer emulation also includes an Electronic Forms Unit (EFU). You can use the EDIT_EFU command to create EFU files. EFU files define the page format the Prime spooler uses when printing data from a PRIME/SNA logical printer.

Figure 3-18 shows an example of an EFU page format used by a logical printer.

```
OK, EDIT_EFU -DISPLAY
[EDIT_EFU Revision 1.0 - 19.4]
Format:  PAGE
Top margin:  1
Bottom margin:  66
Left margin:  1
Right margin:  132
Line truncing is enabled.
Channel#      Skips to line(s)#
    1      -       1
OK,
```

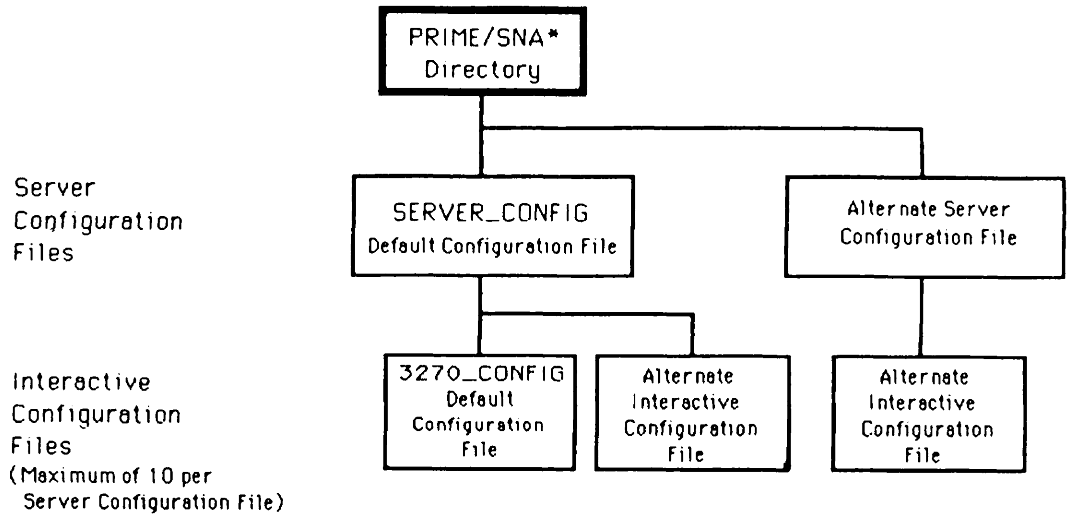
Example of an EFU Page Format
Figure 3-18

Interactive Subsystem Configurator

The Interactive Subsystem requires you to configure the devices you plan to use with PRIME/SNA. Each device matches up with a port listed in a Server configuration. There is a limit of 40 configured Interactive devices for each remote system connection.

SNA_3270_CONFIG is an online utility that lets you create one to ten Interactive Subsystem configuration files for every Server configuration file.

Figure 3-19 shows the relationship of Server and Interactive configuration files in the PRIME/SNA* directory.



Relationship of Server and Interactive Configuration Files
Figure 3-19

Note

If you are using more than one Server configuration or Interactive configuration with PRIME/SNA, be sure to tell your operations staff that they must specify the correct Interactive configuration file name when starting the SNA_3270 phantom process.

SNA_3270_CONFIG lets you create, edit, and delete Interactive configuration files while PRIME/SNA Interactive is running, and you can use SNA_3270_CONFIG with a variety of terminals. Different SNA_3270_CONFIG screens let you select different device characteristics for terminals (CRTs) and logical printers.

Figures 3-20 and 3-21 show how to configure terminals and logical printers with SNA_3270_CONFIG.

```
SNA_3270_CONFIG                                                  Port "LU61A02"

Device name                              : FERMI/CRT

Device group name, if any                : MOD5/CRT
Remote system group name, if any         : 8AM/START

Device type                              : CRT

Default screen size                      : 24x80
Alternate screen size                    : 27x132

Local copy to printer allowed            : Y
Local copy print options, if any         : SPOOL -FORM WHITE

Local copy to file allowed               : Y
Local copy file destination, if any      : <ATOM>FERMI>PROJ

Options:   C = Change device parameters    D = Delete device
           F or RETURN = Finish
Selection: _
```

Configuring a PRIME/SNA Terminal
Figure 3-20

```
SNA_3270_CONFIG
                                                                 Port "LU61A08"
Device name                              : ATOMPRINT

Device group name, if any                : PRINTERS

Remote system group name, if any         : 8AM/START

Device type                              : PRINTER

3270DS, SCS, or BOTH                     : BOTH

Default buffer size                      : STANDARD

Alternate buffer size                    : EXTENDED

Options:   C = Change device parameters    D = Delete device
           F or RETURN = Finish
Selection: _
```

Configuring a PRIME/SNA Logical Printer
Figure 3-21

PART II

Creating a Configuration

4

Evaluating Host Applications

INTRODUCTION

There are two ways you can approach the task of configuring PRIME/SNA resources. The approach you use depends on whether:

- PRIME/SNA will replace IBM equipment that is already operating at your site

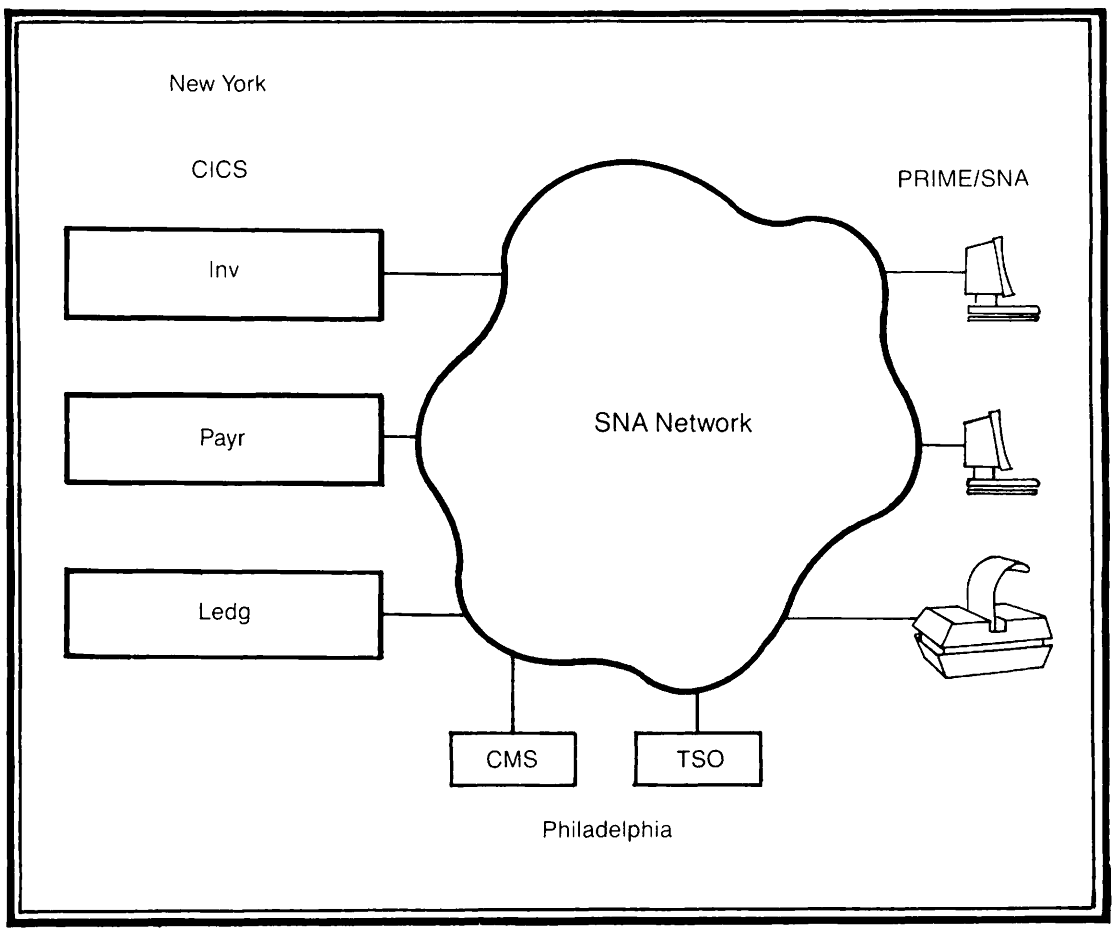
- PRIME/SNA will provide services for new users of the SNA network

The first situation is easier to configure than the second. When you replace IBM cluster controllers, terminals, and printers with PRIME/SNA resources, you have an existing NCP/VTAM SYSGEN. Your task is to reflect that NCP/VTAM SYSGEN in the Server and Interactive Subsystems' configurations and request any needed changes from personnel at the IBM host site. Chapter 6 provides you with the information you need to communicate to personnel at the IBM host or hosts, and you can skim over the material in Chapters 4 and 5.

The second situation often requires more thought from you as Administrator. If host personnel do not strictly prescribe a configuration, you may find yourself fashioning a configuration of lines, remote systems, and devices that is bewilderingly complex. This chapter is the first of two that will help you fashion a workable configuration. Once you accomplish this, host personnel will be able to modify their network configuration to include PRIME/SNA.

What Does the Configuration Process Do?

Figure 4-1 shows a typical situation. On one side of the SNA network are all the applications you want to use. On the other side are your terminal users and printers that require LU-LU sessions to accomplish their work. Your task is to provide the resources and a configuration that will allow both sides to communicate. The configuration you create should also permit your operations staff to start, stop, and check the status of PRIME/SNA resources easily.



The Administrator's Task: How Do I Connect Both Sides?
Figure 4-1

What Steps Are Involved?

There are a number of steps you can take to determine the configuration that will work best for you. These steps include:

1. Determining what applications are needed
2. Discovering the requirements for each application
3. Listing the people or printers using each application
4. Organizing the applications by location, time of day, and application subsystem used
5. Assigning the applications to lines and remote system connections
6. Defining terminals and printers to logical unit ports
7. Assembling lines, remote systems, and ports into groups

This chapter will help you through the first three of these seven steps. The following chapter will help you organize, assign, define, and assemble the information you will gather about the various applications you will evaluate.

Why Begin with Applications?

A lot of the information you can gather easily about the applications you need will guide you toward an optimal configuration. A little prior work in this area can help you select a workable configuration that pays steady dividends in day-to-day operations. Certain application types, although different, can complement each other nicely when they share the same communications line. Segregating applications on different remote system connections may make operations tasks easier for both Prime and IBM operators. These are just two benefits from studying each application's characteristics and requirements.

When you evaluate applications, you should ask yourself a number of questions:

- What are the names, types, and location of applications?
- What application subsystems on the host do the applications work with?
- How many LU ports (displays and printers) are required?
- Are sessions host-initiated or operator-initiated?
- What screen sizes and printer formats (LU.T3) will be used?

Relationship with Host Personnel: There are a number of questions about applications and IBM communications software that can only be answered effectively by personnel at the host site. You should initiate the installation process by asking the host's data processing manager to assign a person who will act as the focal point for your questions.

When evaluating applications, and interactive applications in particular, you should ask to see each one in use. This will give you a feel for the environment in which they are used, response-time and usage characteristics, and individual needs such as forms printing and screen sizes.

USING THE WORKSHEET IN THE EVALUATION PROCESS

Because applications vary so widely in their requirements, you may find it difficult to keep track of and balance all their needs. This chapter includes a worksheet to help you organize your findings. Copy and fill out the worksheet below for each application you will use. The text that follows the worksheet explains the worksheet categories in greater detail.

APPLICATION WORKSHEET Page _____

GENERAL INFORMATION

Name of application: ____

Network Location and SSCP ID: ________________________________

Using Application Subsystem (CICS, TSO, etc.): __________________

Time used: from ______ am pm to ______ am pm on the following days
(circle all that apply): M Tu W Th F Sat Sun

Type of application (circle one): Inquiry Transaction Data Entry
Time Sharing RJE

How critical is response time to users of this application?
(circle one): Important Normal Less Important

INTERACTIVE APPLICATIONS

Number of Terminal Users

List the people who will use this application and place an asterisk before people who need guaranteed access:

______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________
______________ ______________ ______________ ______________

How many users need guaranteed access? _______

Do you want to put a limit on the number of people using an application at a given time? ______ users

Initiation of Terminal Sessions

Who initiates terminal sessions? (circle one): Terminal User

Host Application

Page _____

Screen Sizes

Does the application use a single screen size (circle one): Yes No

What is the normal screen size? _______ rows by _______ columns

What is the alternate screen size, if any? ____ rows by _____ columns

Copying Screen Contents

Will users be able to copy screen contents to the Prime spooler? ____
Are any print options required for these users?
Please list ____

Will users be able to copy screen contents to a file? _____ What is the PRIMOS pathname of the file? ___________________________________

Printing

How will the application handle printing? (Check all that apply)

[ ] Application will initiate copying of screens to the Prime spooler

[ ] Application will send plain-paper print files to the Prime spooler

[ ] Application will send special forms to the Prime spooler

How many logical printers will you need for general printing? _______

If an application requires forms printing, how many form types will the application use? _______

How many logical printers will you need for forms printing? _______

Page _____

Data Streams and Buffer Sizes

Which data stream will the application use for general printing?
(circle one) SCS 3270 Data Stream Both

Which data stream will the application use for forms printing?
(circle one) SCS 3270 Data Stream Both

If the application uses the 3270 Data Stream for printing, you must pick a default buffer size for normal operation and an alternate size, if needed. There are two buffer sizes, STANDARD and EXTENDED.

STANDARD can be used with 960 or 1920 character printouts. Prints 12 rows by 80 columns and 24 rows by 80 columns.

EXTENDED can be used with 2560, 3440 or 3564 character printouts. Prints 32 rows by 80 columns, 43 rows by 80 columns, or 27 rows by 132 columns.

Logical Printer ________________

Default buffer size: ____________________

Alternate buffer size, if any: __________________

Logical Printer ________________

Default buffer size: ____________________

Alternate buffer size, if any: __________________

Logical Printer ________________

Default buffer size: ____________________

Alternate buffer size, if any: __________________

Logical Printer ________________

Default buffer size: ____________________

Alternate buffer size, if any: __________________

GENERAL INFORMATION

Name and Location

After filling in the name of an application, determine its location in the network. In some cases, this may be as simple as listing the name of the city where the host running the application resides. In other cases, you may have to specify the particular CPU in a processor complex or the cross-domain resource manager (CDRM) that handles the application. Further, if an application runs on a virtual machine (such as VM/370), you should note the particular operating system associated with it. The surest way to avoid confusion is to request the ID of the SSCP that controls access to the application from your contact at the host site.

Application Subsystems

Host applications usually send data to end users in an SNA network through application subsystems. One portion of an application subsystem formats data in accordance with the characteristics of a device. For example, in order to handle screens and printers, an interactive application program called "PAYR" might use the facilities of the application subsystem CICS to insert special formatting information into the application's output. If this is the case, you will want to be sure your terminals are properly defined to the application subsystem to avoid improper data formats. In fact, some application subsystems require programmers to list all the terminals using an application subsystem's programs.

Period of Use

Some applications are available to users for a specific period each day. The host site might keep a transaction application active only from 7 a.m. to 6 p.m., while a remote job entry (batch) application might operate only late at night. Record the time period and the day or days of the week when you expect to use the application.

Types of Applications and Response Time

Classifying applications is another way to assess the interplay one application can have with another. For instance, mixing batch traffic with transaction processing on a single line can degrade terminal users' response times. The following paragraphs describe the five basic types of applications found within SNA networks and some of the response-time criteria associated with each one. Placing your application into one of these five categories will help you estimate the amount and direction of data traffic and its affect on response time.

The five categories are:

- Inquiry
- File update and transaction processing
- Data entry
- Time sharing
- Remote job entry

Inquiry: Inquiry-type applications are interactive. A person at a display terminal examines files and records to obtain or verify information. An application program that allows users to examine inventory levels or credit reports without allowing changes is an example of an inquiry application. An inquiry application usually consists of a short message or inquiry entered from a keyboard, followed by a response from the application. The length of this response varies from application to application and is important in determining user response times to inquiries.

File Update and Transaction Processing: File update applications are interactive and involve locating and updating records on a real-time basis. Transactions are units of work; that is, a transaction is not considered complete until all the data has been entered and accepted by the application. File updates and transactions generally require a minimal amount of input from users and a few screens of output. The importance of user response time generally depends on the environment in which you plan to use the application. A telephone order entry system is more time sensitive than a payroll records program. Many inquiry and transaction processing applications use CICS as the application subsystem.

Data Entry: With interactive data entry, keyboard input is the primary task. The application program provides the facilities for entering, changing, and storing text or data. There is a more even balance between user input and application output than in the two previous application types. The Document Composition Facility of SCRIPT/VS is an example of a data entry application. User response time depends more on the mix of data entry to editing changes, but is often an important consideration.

Time Sharing: Time sharing allows a number of users to develop and execute programs concurrently and interact with programs during execution. In time sharing, information flows in both directions and the lengths of the messages are completely variable, depending upon the operation being performed. It is harder to gauge performance requirements for time sharing than for the previous types of applications, but CPU execution time is often greater than transmission delays. Therefore, user response time tends to be less of an issue. TSO and CMS are examples of time-sharing application subsystems.

Remote Job Entry (RJE): Batch transmission typifies remote job entry. Users prepare data or programs for processing on a remote system. After the application finishes, output is directed back to the user or other users within the network. Remote job entry applications involve moving large amounts of data, but response times are far less critical than in the previous interactive application types. Remote job entry applications use application subsystems such as JES2 and POWER.

INTERACTIVE APPLICATIONS

The following information applies to interactive applications. Some of the determinations pertain to administration issues and others to emulation of the IBM 3270 Information Display System. You may need the assistance of host personnel to help determine the latter, but your observation of the application in action may provide the information you need.

Number of Terminal Users

In order to share PRIME/SNA resources with other applications and end users, list the people who will use the application. Some of these terminal users need to use the application more than others. Your office, for instance, may be using an inquiry application to check the status of building contracts. Twenty or thirty people may use the application in the course of a day, but only three people have job responsibilities that require immediate use of the inquiry application. These three people will need guaranteed access to the application.

Limiting Number of Users: If you plan on running several applications simultaneously, you may want to restrict the number of people using a particular application. This prevents monopolization of the LU session resources on your Prime system, and is especially important on smaller machines that support fewer active sessions.

Initiation of Terminal Sessions

Whether sessions are initiated by the application or the terminal user may also affect your configuration. The following paragraphs will help you determine if the application's sessions with your terminal users will be application-initiated or operator-initiated.

Application-initiation: In some SNA networks, operators work with a single application program all day. (Examples include order-entry and airline reservation programs.) Often, these applications request the SSCP portion of VTAM to initiate sessions with terminals in the network at the start of the day. If a terminal user is not ready to enter into sessions with the application, the SSCP will retry the connection until the terminal is ready. Most likely, you will want to guarantee sessions for applications that initiate sessions with terminals. Applications initiate all sessions with printers.

Operator-initiation: In SNA networks where people use their terminals with a variety of applications, users initiate their sessions by logging on to a particular application subsystem, such as CICS, and selecting their application. You can grant guaranteed or general access to operator-initiated sessions according to your system's needs.

Screen Sizes

Because IBM offers many different sizes of screens with their 3270 Information Display System, terminal screen sizes may differ from application to application. PRIME/SNA Interactive accommodates the screen sizes shown in Table 4-1 below:

Table 4-1
Screen Sizes of IBM 3278 Terminals

Model	Screen Size	Characters	PT200 Emulation
2	24x80	1920	Full Screen
5	27x132	3564	Full Screen

Most screen-oriented applications work with two models of the 3278 terminal — Models 2 and 5. Applications use the 24x80 size screen most often with inquiry, transaction processing, and data entry programs, and the 27x132 size screen in program development work and time-sharing environments.

Determine the screen size your application uses and record it as the normal screen size. If the application supports two different screen sizes or terminals, write in the screen size you prefer as the "normal screen size" and the other screen size as the "alternate".

Copying the Contents of Screens

PRIME/SNA Interactive allows users to copy the contents of screens to printers and files. There are three ways to print screens:

- Using the PRT SCN key in conjunction with a printer attached to the PT200's auxiliary port
- Using the O-P key to copy the screen buffer to the spool queue
- Using an application that initiates copies of screens automatically

The first method is popular with remote terminal users. The PRT SCN key behaves with PRIME/SNA Interactive the same as with other PRIMOS programs.

Using the O-P key does not require a dedicated printer and can use the various options of the PRIMOS spool queue. You can restrict the use of screen copies on a logical unit port-by-port basis. This can help you prevent unauthorized printing of confidential records. You can use the following PRIMOS spool options and their arguments when configuring each terminal user's port:

-AS <alias>

-AT <destination>

-COPIES <number>

-DEFER <time>

-FORM <type>

-LNUM (This option numbers each print line.)

-NOHEAD (This option deletes header and trailer pages.)

To specify different spool options for each terminal user, attach a list of users and the spool options they require to the application worksheet. For more information on PRIMOS SPOOL options, see the <u>PRIMOS Commands Reference Guide</u>.

The third method — using an application that initiates copies of screens automatically — does not require you to configure a logical unit port for printing. When PRIME/SNA Interactive receives a screenful of information from the application, it checks the Write Control Character (WCC) of the 3270 Data Stream. If the WCC has the

START PRINT bit set, that screen image is moved to the PRIMOS spool queue automatically. The screen then is printed according to the spool options associated with the terminal user. A financial application that requires a hard-copy audit trail might be a user of automatic screen printing.

Note

Some IBM application subsystems allow a user to copy the contents of a screen by pressing a PA key on the terminal, causing the application to read the screen's contents and send the data to a printer.

Copying to Files: Users can also copy the screen contents to files. For security or privacy reasons, you can restrict who uses this copy function on a port-by-port basis. To allow a user to copy screens to files, specify the PRIMOS pathname of the file that will contain copies of the screens. Again, if you want to specify different file names for each user, you should add a list to the application worksheet. Screen copy files append the latest copy request to earlier requests.

Printing

When you assess an application, pay close attention to the type of printing required. There are two basic types of printing:

- General printing
- Forms printing

General Printing: General printing is a print format that covers the needs of a wide variety of applications. Screen copies and plain paper printouts are examples of printer requirements that can be met with a single print format.

Forms Printing: Forms printing is a special print format that can change with each application. Envelopes, labels, checks, and pre-printed forms are all examples of forms printing.

On the Application Worksheet, check off the ways the application will handle printing.

Determining the Number of Printers Needed: Because logical printers differ in their characteristics, they are usually assigned to specific PRIME/SNA logical unit ports in much the same way as guaranteed terminal users. Therefore, it is important for you to determine how many logical printers are required for general printing and how many are required for forms printing.

PRIME/SNA logical printers use a disk-based spool mechanism. Whether you are counting the number of logical printers needed for forms or general printing, keep in mind that Logical printers can:

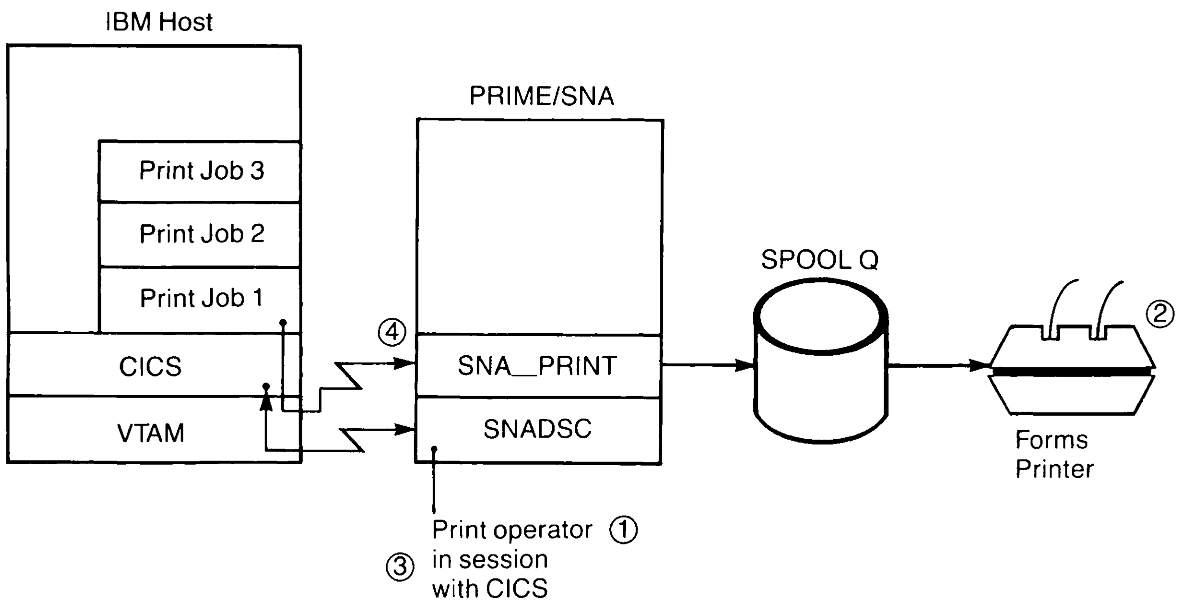
- Accept information at a much faster rate than physical printer and are not constrained by the usual limitations of buffer space and printer speed
- Service the printing needs of a large number of terminals efficiently without using large numbers of logical unit ports for printers
- Continue accepting print requests even though the printer (or printers) servicing the print queue has been stopped temporarily for ribbon or paper changing

A single logical printer port may be able to service the general printing needs of many interactive users.

Application-initiated screen copying does not require you to configure a PRIME/SNA printer. The Interactive Subsystem sends screen copies directly to the spool queue based on the spool options you specified in the previous worksheet section.

On the worksheet, record the number of logical printers the application needs for general printing.

There are several ways your organization can handle forms printing. The one you select will determine the number of logical printers the application requires. Figures 4-2, 4-3, and 4-4 show several ways of handling forms printing.



Simple Logical Printer Configuration
Figure 4-2

If you select the printer configuration in Figure 4-2, you designate one of your PRIME/SNA Interactive terminal users as a print operator. There are four steps in this print process.

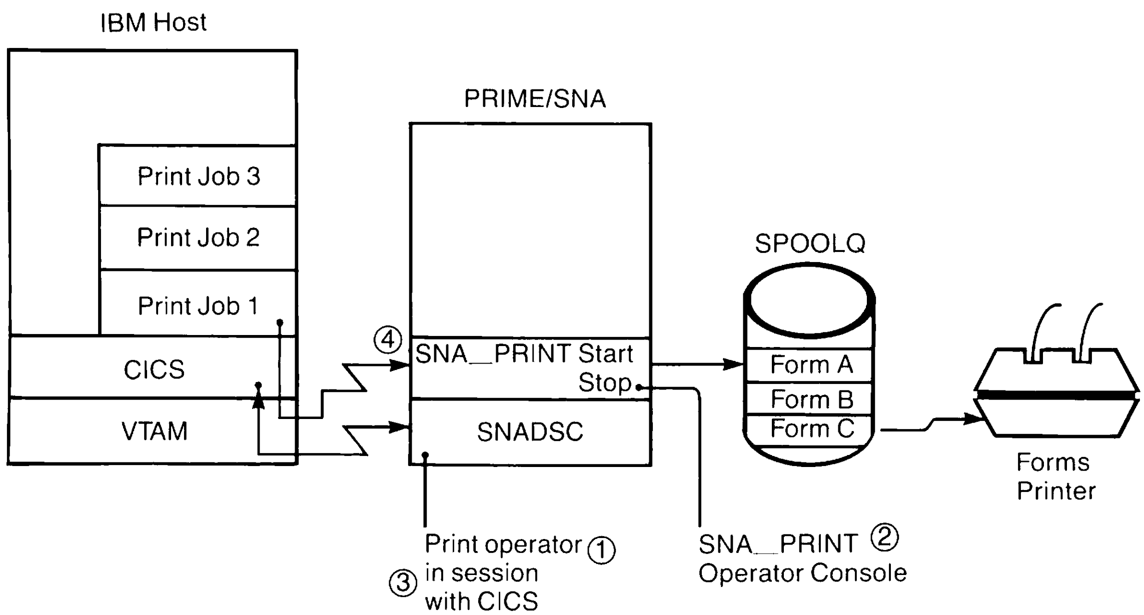
1. The print operator assesses the requirements of a particular print job by interrogating the application subsystem.

2. The print operator loads the proper forms and sets up the proper printing environment.

3. The operator releases the print job from the application subsystem's list.

4. The print job is written into a PRIMOS spool file and printed.

This type of printer environment most resembles the conditions found within a 3270 cluster. It makes little use of the capabilities of the Prime spooler, but is relatively simple to operate and uses only a single logical unit port for printing.



Single Logical Printer and Prime Spooler
Figure 4-3

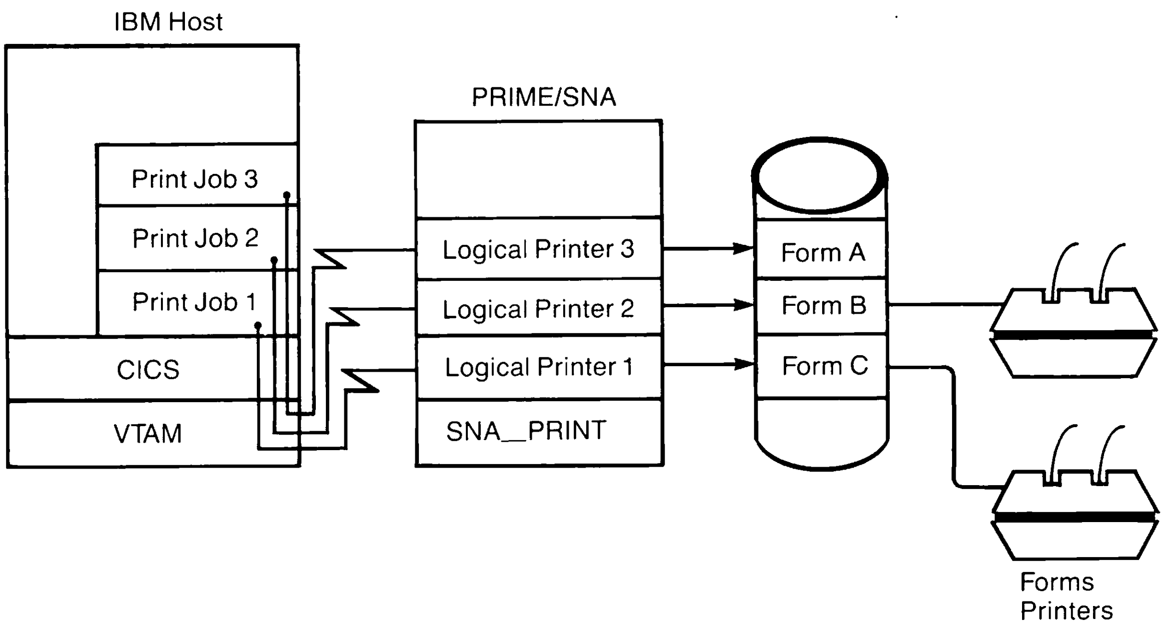
The print configuration in Figure 4-3 employs only a single logical unit port, but takes greater advantage of the PRIMOS spooling mechanism. The print operator uses two terminals to control the printing process, one to communicate with the print manager for the application subsystem (such as DSPRINT), and another to run SNA_PRINT. There are four steps to this print process.

1. The operator determines the printing requirements of jobs in the list and associates those requirements with form types that are equivalent in the Prime spooler.

2. The operator starts or restarts the logical printer associated with the logical unit port and assigns the proper form type to it. (If a printer is not presently running that particular form type, the spool queue holds the information until printing is convenient.)

3. The operator signals the application subsystem to release the print job.

4. The data is written into a spool file and saved for printing. This type of printing arrangement may be useful if you have a large number of form types to work with. However, print jobs requiring such an arrangement are infrequent.



Multiple Logical Printers and Prime Spooler
Figure 4-4

The print configuration in Figure 4-4 may or may not require a print operator. In this case, different printing environments are assigned to particular logical unit ports, and data is sent to the spool queue where it can be printed when convenient. There is no need for a terminal operator to control the release of print jobs through the application subsystem. SNA_PRINT governs the logical unit ports with a terminal console, as in the previous configurations, or with a phantom process.

Record the number of forms that the application will generate and the number of logical printers you have decided on.

SCS and 3270 Data Streams: Interactive applications can use one of two different data streams to handle printing. Of the two, SNA Character String (SCS) is the more complex. It can contain numerous tabbing and formatting commands to enhance printing speed and flexibility. If the application uses an SNA character string for forms or general printing, configure the appropriate logical printers to handle SCS print jobs. A single logical printer can handle both SCS and 3270 Data Streams.

The 3270 Data Stream is an older and simpler method of handling print information. Many of the formatting commands and printing constraints are based on screen commands. If the application uses the 3270 Data Stream, configure the appropriate logical printer in a like manner.

3270 Data Stream Buffer Sizes: For applications using the 3270 Data Stream, you must specify one of two buffer sizes — STANDARD or EXTENDED — for printouts. Table 4-2 shows the printout size each buffer accommodates.

Table 4-2
Printer Buffer Sizes

Buffer Size	Rows	Columns	Characters
STANDARD	12	80	960
	24	80	1920
EXTENDED	32	80	2560
	43	80	3440
	27	132	3564

Assign the smaller buffer size to the DEFAULT buffer for each logical printer. If a logical printer uses the larger buffer size, you should include it as an alternate buffer.

SAMPLE APPLICATION WORKSHEET

The sample worksheet below gives an example of some of the information you might gather about one of your applications. The application "INV" (inventory control) runs under the application subsystem CICS on a mainframe located in New York City. The ID of the SSCP that controls access to CICS is 00032. Another mainframe in Philadelphia has a backup version of the application in case of network problems or program maintenance. The SSCP ID associated with the Philadelphia version is 00084. The application is normally active from 8 a.m. to 6 p.m. Monday through Friday.

INV, a transaction processing type of application, is used every morning to note the changes in stock levels due to the previous day's sales. The application solicits information from terminal users through a series of screens. Response time is important to users. The whole process of updating the central data base in New York City with inventory information should take no more than a half-hour.

Five people in the office use this application, but only one on a daily basis. That person needs guaranteed access. Access to the application is limited to three users at any time, with the other four competing for a pool of two logical unit ports.

The application initiates terminal sessions daily at 8 a.m.

The application uses only 24-row by 80-column screen sizes. Users can copy their screens to the Prime spooler with the options noted on the worksheet and to a file with the pathname noted on the worksheet.

The application generates both general and forms output. One logical printer is able to handle all the general printing requirements on plain paper. The application uses three different form types, but only one logical printer is needed to handle these forms. A print operator uses the resources of SNA_PRINT to start and stop the appropriate -FORM <type> for each print job.

The application sends only an SNA Character String data stream to the logical printer devoted to forms printing. The logical printer that handles general printing receives both SCS and 3270 Data Streams. Because the application sends only a 3270 Data Stream print format of 24 rows by 80 columns, only a standard buffer size is needed for both default and alternate buffer sizes.

APPLICATION WORKSHEET Page 1

GENERAL INFORMATION

Name of application: INV

Network Location and SSCP ID: NYC, SSCPID = 00032 Philly, SSCPID = 00084

Using Application Subsystem (CICS, TSO, etc.): CICS

Time used: from 8 am pm to 6 am pm on the following days
(circle all that apply): M Tu W Th F Sat Sun

Type of application (circle one): Inquiry Transaction Data Entry
Time Sharing RJE

How critical is response time to users of this application?
(circle one): Important Normal Less Important

INTERACTIVE APPLICATIONS

Number of Terminal Users

List the people who will use this application and place an asterisk before people who need guaranteed access:

George Mattey	* Susan Lee	Jane Ricci	Tom Reed
Mel Katz			

How many users need guaranteed access? 1

Do you want to put a limit on the number of people using an application at a given time? ______ users

Initiation of Terminal Sessions

Who initiates terminal sessions? (circle one): Terminal User
Host Application

Page 2

Screen Sizes

Does the application use a single screen size (circle one): Yes No

What is the normal screen size? 24 rows by 80 columns

What is the alternate screen size, if any? 24 rows by 80 columns

Copying Screen Contents

Will users be able to copy screen contents to the Prime spooler? Yes
Are any print options required for these users?
Please list - Form WHITE - At Building 8

Will users be able to copy screen contents to a file? Yes What is the PRIMOS pathname of the file? <FINAN > INV > SCRN

Printing

How will the application handle printing? (Check all that apply)

[ ] Application will initiate copying of screens to the Prime spooler

[✓] Application will send plain-paper print files to the Prime spooler

[✓] Application will send special forms to the Prime spooler

How many logical printers will you need for general printing? 1

If an application requires forms printing, how many form types will the application use? 3
How many logical printers will you need for forms printing? 1

Page ____

Data Streams and Buffer Sizes

Which data stream will the application use for general printing?
(circle one) SCS 3270 Data Stream Both

Which data stream will the application use for forms printing?
(circle one) SCS 3270 Data Stream Both

If the application uses the 3270 Data Stream for printing, you must pick a default buffer size for normal operation and an alternate size, if needed. There are two buffer sizes, STANDARD and EXTENDED.

STANDARD can be used with 960 or 1920 character printouts. Prints 12 rows by 80 columns and 24 rows by 80 columns.

EXTENDED can be used with 2560, 3440 or 3564 character printouts. Prints 32 rows by 80 columns, 43 rows by 80 columns, or 27 rows by 132 columns.

Logical Printer GEN. PRT 1

Default buffer size: STANDARD

Alternate buffer size, if any: STANDARD

Logical Printer ____________

Default buffer size: ____________

Alternate buffer size, if any: ____________

Logical Printer ____________

Default buffer size: ____________

Alternate buffer size, if any: ____________

Logical Printer ____________

Default buffer size: ____________

Alternate buffer size, if any: ____________

5 Organizing PRIME/SNA Resources

CREATING A WORKABLE CONFIGURATION FROM WORKSHEETS

The application worksheets you prepared in the previous chapter will give you a good data base from which to create workable configurations. In this chapter, you will learn:

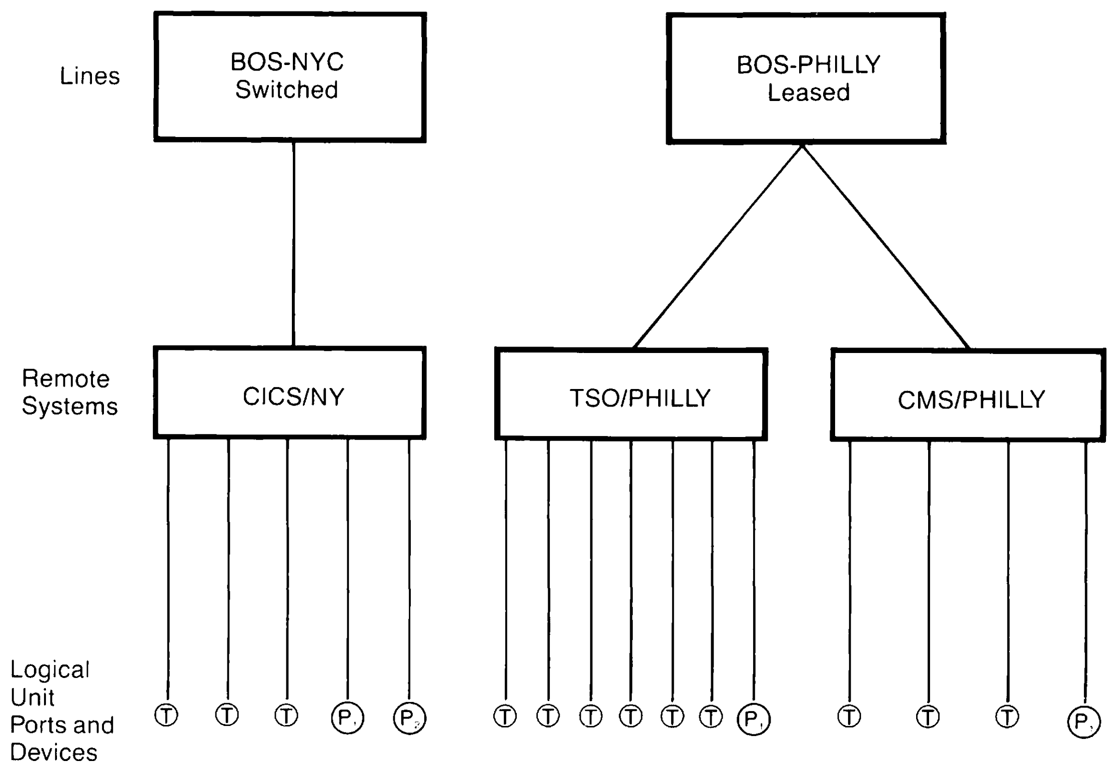
- How PRIME/SNA resources form a hierarchy
- What principles to follow when assigning applications to lines and remote system connections
- How to define terminals and printers
- How to assemble lines, remote systems, and ports into groups to make things easier for your operations staff

After the chapter introduces the PRIME/SNA hierarchy of lines, remote systems, and devices, there are examples of how to organize PRIME/SNA resources on your machine. The last part of the chapter includes a worksheet to record the configuration you will devise.

Hierarchy of PRIME/SNA Resources

Like IBM's SNA, PRIME/SNA follows a hierarchy of lines, remote systems, and logical unit ports. This hierarchy brings order to the hundreds of elements within a network and makes the task of network operations much easier than it might be without it. When you devise a configuration for your system, you are essentially creating a hierarchy that takes into account performance, network operations, and resource sharing.

One feature of a hierarchy is that a lower level cannot run unless the higher levels are in place. For instance, a terminal user cannot start a session with another logical unit unless the remote system connection and the terminal's logical unit port are active and the communications line is running. Figure 5-1 shows the PRIME/SNA hierarchy.



Hierarchy of PRIME/SNA Resources
Figure 5-1

Limits on PRIME/SNA Resources: Although PRIME/SNA allows you to configure a large number of resources, it limits the number you can start and use at a given time. Table 5-1 shows the maximum number of configured resources and the maximum amount of active resources.

Table 5-1
PRIME/SNA Resource Allocation

Resource	Maximum Number Configured	Maximum Number Active
Lines	4	4
Remote Systems	8*	8
Logical Unit Ports (Server Subsystem)	254 per remote system	**
Devices	40 per remote system	**

* PRIME/SNA allows you to distribute these eight remote system connections across all your lines according to your needs. You could assign all eight to a single leased line or all eight to a switched line. A switched line can accommodate only one remote system connection at a given time.

** The maximum number of active logical unit ports or devices depends on your CPU model.

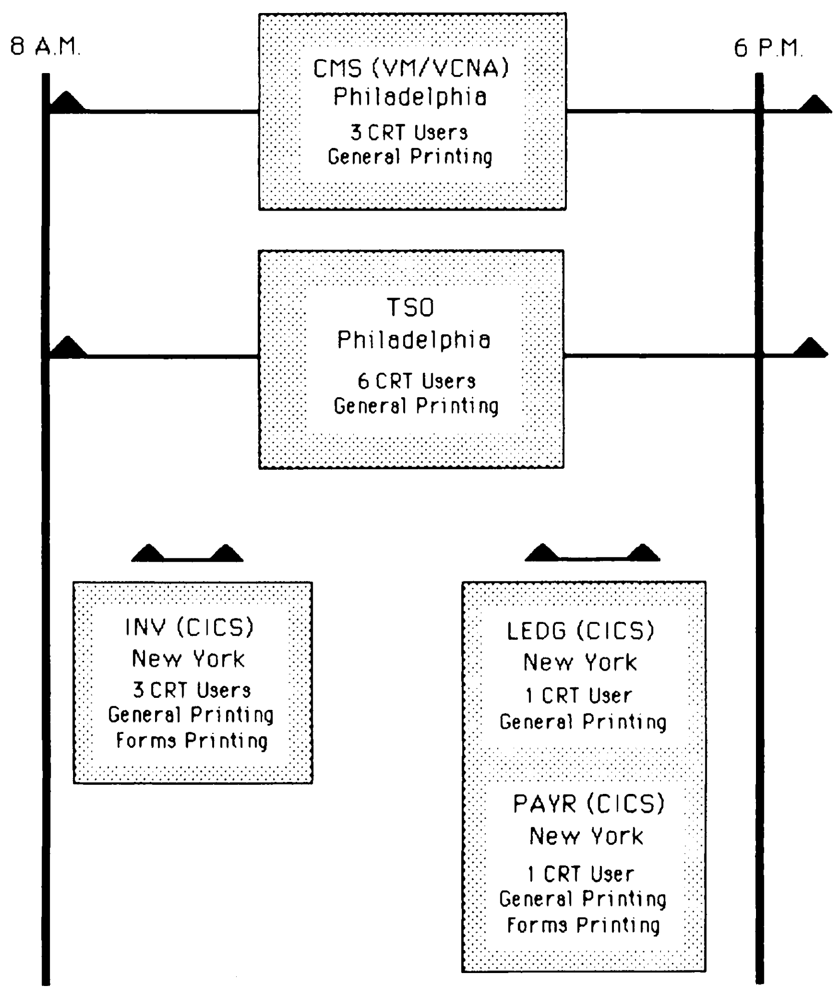
Keep these limits in mind when allocating resources among different applications. Table 5-2 presents the maximum number of active logical unit ports for your Prime CPU model:

Table 5-2
Maximum Number of Active Ports by CPU Model

CPU Model	Maximum Number of Active LU Ports
400	16
150	16
250I	16
350	16
2250	16
9950	48
9955	48
All Others	32

Determining Periods of Use

A good way to start assigning PRIME/SNA resources to applications is to determine when an application is used with other applications. A time chart, such as the one shown in Figure 5-2, can show you the relationships applications have with one another.



Time Chart Showing Application Use
Figure 5-2

Notice in Figure 5-2 that there are three CICS applications in New York City that are used for administrative purposes. Three people use INV in the morning for a half-hour to an hour, beginning around eight o'clock. One person uses PAYR to submit attendance and working hour figures toward the end of the day; another person prefers to use LEDG in the late afternoon to check expense account postings to the general ledger.

Figure 5-2 also shows that nine other users are using the time-sharing resources of VM/VCNA (CMS) and TSO on a large system in Philadelphia, and these users need access from eight a.m. to eight p.m.

Charting the period of use for each application suggests some of the organizational tools you can apply.

Assigning Applications to Lines

In most SNA networks, assigning resources to lines is straightforward. People choose line routes and make connections directly to the location of the applications in question. In the case of the applications shown on the time chart in Figure 5-2, at least two communications lines would be required: one to New York City to handle CICS applications; and another to Philadelphia to handle TSO and CMS traffic.

Other SNA networks have an elaborate system of lines and communications controllers that route messages over several "hops". Two features of the host access method, the Advanced Communications Function (ACF) and the Multisystem Networking Facility (MSNF), allow one line to handle traffic destined for different locations in the network. The applications in Figure 5-2 could be handled by a single line to Philadelphia. Data traffic bound for CICS in New York could then be routed across links between the New York and Philadelphia hosts. If you plan to use the facilities of ACF and MSNF to route data from one subarea (in this case Philadelphia) to another subarea (New York), you should contact IBM host personnel at both sites for more information.

Leased or Switched Lines?

Once you have decided on the number and routing of your communications lines, you need to decide whether leased or switched lines are appropriate for each. You should consider the following when making decisions:

- How long will the line be used each day?
- How much traffic will pass over the line?
- Is response time critical?
- Are multipoint services needed?

Although leased lines are generally more expensive than switched lines, they handle more data at faster rates. They do so because their error rate is lower, and they are normally full duplex and do not have turn-around time delays associated with half-duplex switched connections. Leased lines can also handle multipoint configurations with several devices sharing a single line.

In the example in Figure 5-2, the line to Philadelphia will be leased because the time people use TSO and CMS applications each day would make a switched connection prohibitive. A leased line allows faster response time and the assignment of CMS and TSO users to different remote system connections, if desired.

Since the line to New York City serves a small group of users who need a connection for two short periods each day, in this case a switched connection seems to make the most sense.

Assigning Applications to Remote Systems

The way you assign applications to a remote system connection should reflect your operations needs, resource sharing, and performance requirements.

Operation Needs: At some IBM host sites, the operations staff starts up and shuts down applications and their applications subsystems at different times. Often, network operators find it useful to start up and shut down parts of a network associated with an application subsystem on a peripheral node or PU basis. If this is the case, you should consider grouping numbers of applications using the same application subsystem on the same remote system connection. The ability to start and stop a remote system connection allows you to control when people in your own organization use a particular group of applications.

In the example in Figure 5-2, the line to Philadelphia will have two remote system connections, one for CMS users and another for TSO users. This will allow both Prime and IBM host personnel to start up and shut down TSO sessions easily.

There are other ways you can assign PRIME/SNA resources to remote systems. You can:

- Create several PRIME/SNA peripheral nodes on a switched line you use to connect with different locations. Tailor each PRIME/SNA peripheral node to a remote system's requirements
- Create a separate peripheral node for PRIMENET users
- Use a PRIME/SNA peripheral node as a direct replacement for an existing IBM cluster controller or other device

Resource Sharing: Sometimes, when you group several applications under one PRIME/SNA peripheral node, you can economize on the number of devices you need to configure, especially printers. A single logical printer may be able to handle the general printing requirements for several applications. One or two logical printers may be able to handle the forms printing needs of several applications.

Performance Requirements: There are performance macros within NCP and VTAM that can improve response time for applications and their users. These performance macros allow IBM host personnel to tailor polling sequences, pacing, and message sizes so that one PRIME/SNA peripheral node or PU on a multipoint line receives different service from another.

If, for example, you had some transaction and time-sharing applications on the same line, you might assign the transaction applications to one remote system connection. This would give that remote system connection better service than the time-sharing applications on the other remote system connection.

Be aware that dividing PRIME/SNA resources between two remote system connections on a multipoint line increases polling delays.

Multiple Remote Systems on a Switched Line

If you are using a switched line to contact several locations within the SNA network, you may find your requirements change at each one. PRIME/SNA allows you to configure multiple remote system connections with different characteristics for each host or location with which you connect. An XID exchange between the location's SSCP and PRIME/SNA makes sure that the SSCP activates the correct remote system connection with the PRIME/SNA peripheral node.

Deciding About Devices

Once you have decided on your configuration of lines and remote systems, you must decide on the number and characteristics of the devices associated with them. Examining your time chart will show which applications will run concurrently. Examining your application worksheets will give you an idea of the terminal and printing requirements of each application. You can then start combining redundant resources.

In Figure 5-2, there are three CICS applications used with the same remote system connection. INV requires three terminals and two logical printers (one for forms printing and one for general printing). PAYR requires a single terminal, general printing, and forms printing once a week. LEDG, which will run at the same time as PAYR, requires a terminal and general printing.

Since CICS users need only three terminals at a given time, you should configure three terminals with characteristics that permit them to be used with any of the three applications. INV and PAYR use a 24-row by 80-column screen size, while the user of LEDG prefers the 27-row by 132-column format. When these terminals are configured, 24x80 will be the default size and 27x132 the alternate screen size.

All printing needs can be met with two logical printers, one for forms printing and one for general printing. Because both INV and PAYR use the SNA character string for forms printing, one logical printer can be set up to handle SCS exclusively. For general printing, INV and PAYR require the same printer characteristics, but LEDG uses the 3270 Data Stream and an EXTENDED buffer size. Thus, EXTENDED should be an alternate buffer size on the logical printer covering general printing.

USING THE ORGANIZATIONAL WORKSHEET

You can use the following organizational worksheet to organize your applications and create configurations from your time chart. This worksheet will help you communicate your configuration needs to IBM host personnel.

One optional feature of PRIME/SNA lets you assign lines, remote systems, and devices to groups for ease of operation. Grouping your lines and remote systems can expedite routine activities of your operations staff, such as starting, stopping, and checking status. Assigning devices to groups allows users to select a set of terminals with the same characteristics. The following paragraphs describe the use of line groups, remote system groups, and device groups.

Line Groups

You group lines by giving a separate name to each group. Operators can then use the name to check with the Server Subsystem on the status of the lines. Grouping communications lines in a sensible way expedites many routine tasks of operations and reduces the chances of starting and stopping the wrong line.

There are several ways you can name line groups:

- Name them according to geographical location, such as "NORTHEAST", "MIDWEST", or "PACIFIC".
- Divide your lines into "SWITCHED" or "LEASED" groups.
- Name the line groups after the time of day the operations staff should activate them; for example, "EARLYBIRD", "MIDDAY", or "NIGHT_OWL".

However you assign a name to a group of lines, the most important consideration is that the lines have characteristics in common.

Remote System Groups

Remote system groups make it easier for your operations staff to start, stop, and inquire about the status of remote system connections. When creating a remote system group, keep the following questions in mind:

- Do the applications and the remote systems associated with them share a common start up and shut down time?
- Do you want to divide your remote system groups on the basis of geographical location or on the basis of the communications lines they use?
- Do you want to separate those peripheral nodes that the host access method acquires from your other PRIME/SNA peripheral nodes?

Interactive Device Groups

Device groups are chiefly useful to terminal users. When a user issues the SNADSC command and specifies a device group, the user receives a session with the first available device in the device group. The session will reflect the characteristics that you have configured for the device, including screen sizes and screen copy options. Thus, make sure that all the devices within a device group share the same characteristics.

The text that comes after the following organizational worksheet explains how to fill in each section of the worksheet. A sample organizational worksheet, based on the time chart in Figure 5-2, ends the chapter.

ORGANIZATIONAL WORKSHEET Page _____
From ____ am pm to ____ am pm

Listing Applications and Their Locations

What applications will be active in this period? (Name each application and list the application subsystem and location associated with each application.)

	Application Name	Application Subsystem	Location
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Assigning Applications to Lines

How will you assign these applications to different communications lines? (Name each line and list the line group name and the application number(s) associated with each line.)

	Name of Line	Line Group	Application Number(s)
1.			
2.			
3.			
4.			

Assigning Applications to Remote Systems

How do you want to divide these applications to remote systems and remote system groups? (List the application number(s) and remote system group associated with each remote system.)

	Remote System	Remote System Group	Application Numbers
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

Page _____

Allocating Logical Unit Ports

Based on your CPU model, how many logical unit ports can be in session simultaneously? (circle one) 16 32 48

CPU Model	Maximum Number of Active LU Ports
400	16
150	16
250I	16
350	16
2250	16
9950	48
9955	48
All Others	32

How many logical unit ports will each remote system need? (List and total the numbers of terminal users and printers required for each remote system connection.)

Remote System	Terminal Users	General and Forms Printers	Subtotal
1.______	______	______	______
2.______	______	______	______
3.______	______	______	______
4.______	______	______	______
5.______	______	______	______
6.______	______	______	______
7.______	______	______	______
8.______	______	______	______
		LU PORT TOTAL:	===========

Note

If you plan to make use of PRIME/SNA's suspended session feature for terminals, make sure you include the number of suspended sessions in your totals.

How many logical unit ports are free for expansion? (Subtract the previous total from the maximum number of active sessions allowed on your CPU model.) ______

Page ______

DEVICE CHARACTERISTICS

How do you want to configure terminals and logical printers for each remote system?

Remote System Name ____________________

CRT Terminals and Screen Sizes

24 x 80 ______

24 x 80 (default), 27 x 132 (alternate) ______

General Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

Forms Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

Listing Applications and Their Locations

Using your time chart of application use as a guide, sort through your application worksheets and list those applications that will be active on the same part of the week and at the same time of day. Record the application subsystem each application uses and its location in the network. The number next to the application name is the application number. It identifies the application and is a sort of shorthand for use within the organizational worksheet.

Assigning Applications to Lines and Line Groups

PRIME/SNA allows you to configure and operate up to four lines at a time. The way you assign applications and other resources to a given line depends on procedures at the host site. If you are in a position to determine the number and routing of lines, the information in the application worksheets and the first part of this chapter should give you some insight into how many and what type you need. Name each line and the associated line group (if any) and give the number(s) of the application(s) using the line.

If any of the applications on the line are controlled by another SSCP (using ACF/VTAM cross-domain resources), make a note on the worksheet that the devices using that application will require some additional configuration work by host personnel.

Assigning Applications to Remote Systems

You can configure a line with up to eight remote system connections, but a Server configuration file can contain only eight remote system connections distributed over all your communications lines. If you configure a switched line for several remote systems, remember that only one remote system connection with a PRIME/SNA peripheral node can be active at a time. List the application number(s) associated with each remote system and the remote system group, if any.

Allocating Logical Unit Ports

In order for your terminals and logical printers to start sessions, each device must have a logical unit port assigned to it. This section helps you determine the allocation of logical unit ports.

Maximum Number of Sessions: Table 5-1 shows how many active sessions each CPU model can handle. Circle the number that applies to your system and use it as a guide when allocating devices to each remote system connection.

Determining the Number of Logical Unit Ports: Once you have assigned applications to remote systems, you can start determining how many logical unit ports you will need for terminals and printers. First, examine the group of applications on a remote system that represents peak demand for resources. Add up the number of terminal users each application requires (include users of suspended sessions), and deduct from the total any redundant users. (A redundant user is a person whose name appears more than once in the application worksheets. These people will, most likely, require only a single session at a time and should be counted only once.)

Following the guidelines given earlier in this chapter, determine the number of logical printers you need for general and forms printing with a particular remote system. Write that number down next to the number of terminal users on that remote system connection.

The subtotal in the last column is the number of devices associated with each remote system.

Repeat this process for each of the remote system connections in your configuration and total the number of devices across all remote systems.

If the number of devices you need is less than the maximum number allowed on your CPU model, you have some room for expansion. If you find that the number of devices exceeds the maximum number allowed on your CPU model, you can either reduce the number of devices associated with each remote system connection or arrange for your operations staff to start and stop certain remote system connections to accommodate user needs. Otherwise, users and print operators will compete for access to sessions on a first-come, first-served basis.

DEVICE CHARACTERISTICS

This section of the worksheet shows the characteristics you will assign to terminals and logical printers associated with each remote system connection. Fill in the name of the remote system on the top of the worksheet. If you have more than one remote system in your configuration, copy the last two pages of the worksheet for each one.

Terminals

All the terminals associated with a remote system may employ the same screen size, or you may specify different screen characteristics and assign the terminals to different device groups. Following the guidelines given earlier in this chapter, and using the information from your application worksheets, determine what the default and alternate screen sizes should be in each group.

Determine how many terminals you need in each screen size and write the number on the worksheet. If you want to assign a device group to a number of terminals with the same screen size, note the name on the worksheet.

General Printing

Following the guidelines given earlier in this chapter, determine how many logical printers you will need to handle general printing requirements of your applications and their characteristics.

If applications differ in their required printer characteristics, make sure that the characteristics you record here reflect the needs of all the applications, especially in regard to 3270 Data Stream printing and buffer sizes. This may mean expanding a logical printer's characteristics beyond that required on your application worksheets.

Determine how many logical printers you need in each category and write the number on the worksheet.

Forms Printing

Once you have determined how many forms printers you will need, list characteristics of each, just as you did for logical printers in the general printing section.

SAMPLE ORGANIZATIONAL WORKSHEET

The worksheet below contains all the pertinent information for the applications and configuration shown in Figure 5-2.

ORGANIZATIONAL WORKSHEET
From 8 am pm to 8 am pm

Page 16

Listing Applications and Their Locations

What applications will be active in this period? (Name each application and list the application subsystem and location associated with each application.)

Application Name	Application Subsystem	Location
1. INV	CICS	NYC
2. PAYR	CICS	NYC
3. LED6	CICS	NYC
4. CMS	VCNA	Philly
5. TSO	TSO	Philly
6.		
7.		
8.		
9.		

Assigning Applications to Lines

How will you assign these applications to different communications lines? (Name each line and list the line group name and the application number(s) associated with each line.)

Name of Line	Line Group	Application Number(s)
1. BOS-NYC	NORTHEAST	1, 2, 3
2. BOS-PHILLY	NORTHEAST	4, 5
3.		
4.		

Assigning Applications to Remote Systems

How do you want to divide these applications to remote systems and remote system groups? (List the application number(s) and remote system group associated with each remote system.)

Remote System	Remote System Group	Application Numbers
1. CICS/NYC	8 A.M.-START	1, 2, 3
2. CMS/PHILLY	8 A.M.-START	4
3. TSO/PHILLY	8 A.M.-START	5
4.		
5.		
6.		
7.		
8.		

Page 17

Allocating Logical Unit Ports

Based on your CPU model, how many logical unit ports can be in session simultaneously? (circle one) 16 32 48

CPU Model	Maximum Number of Active LU Ports
400	16
150	16
250I	16
350	16
2250	16
9950	48
9955	48
All Others	32

How many logical unit ports will each remote system need? (List and total the numbers of terminal users and printers required for each remote system connection.)

Remote System	Terminal Users	General and Forms Printers	Subtotal
1. CICS/NYC	3	2	5
2. CMS/PHILLY	3	1	4
3. TSO/PHILLY	6	1	7
4.			
5.			
6.			
7.			
8.			
		LU PORT TOTAL:	16

Note

If you plan to make use of PRIME/SNA's suspended session feature for terminals, make sure you include the number of suspended sessions in your totals.

How many logical unit ports are free for expansion? (Subtract the previous total from the maximum number of active sessions allowed on your CPU model.) 16

Page 18

DEVICE CHARACTERISTICS

How do you want to configure terminals and logical printers for each remote system?

Remote System Name CICS/NYC

CRT Terminals and Screen Sizes

24 x 80 ______

24 x 80 (default), 27 x 132 (alternate) 3

General Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers 1

Forms Printing

SCS 1

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

Page 19

DEVICE CHARACTERISTICS

How do you want to configure terminals and logical printers for each remote system?

Remote System Name CMS/PHILLY

CRT Terminals and Screen Sizes

24 x 80 ______

24 x 80 (default), 27 x 132 (alternate) 3

General Printing

SCS 1

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

Forms Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

Page 20

DEVICE CHARACTERISTICS

How do you want to configure terminals and logical printers for each remote system?

Remote System Name TSO/PHILLY

CRT Terminals and Screen Sizes

24 x 80 ______

24 x 80 (default), 27 x 132 (alternate) 6

General Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers 1

Forms Printing

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

6
Working With Host Personnel

INTRODUCTION

This chapter discusses in detail the information you need to pass on to IBM host personnel about PRIME/SNA. Because IBM network software treats switched and leased lines differently, you will find two separate sections dealing with PRIME/SNA resources in those environments. This chapter also provides the worksheets, fact sheets, and sample forms (suitable for reproducing) that you will need to submit to IBM host personnel. The last part of the chapter discusses the way VTAM, CICS, and TSO handle BINDs, and what you have to do to get the terminal and printing characteristics you need.

Replacing IBM Equipment

If you are using PRIME/SNA to replace existing IBM equipment, you have a VTAM/NCP SYSGEN that you probably want to match. PRIME/SNA can accommodate many of the same VTAM and NCP parameters that the IBM equipment takes, but a few may have to change. The material in this chapter describes the support PRIME/SNA needs from software at the IBM host.

If the IBM equipment you are replacing resides on a switched line, read through the material that describes switched lines and remote systems. Submit an NCP switched line worksheet to the host personnel at every location you connect to in the SNA network. Attach and send a remote system worksheet for every cluster controller or PU you are replacing. If the equipment uses a leased (or nonswitched) line, read through the appropriate material and submit the worksheets and forms pertaining to leased lines and remote systems. The information that host personnel return to you will provide the input for configuring PRIME/SNA, as discussed in the next chapter.

Note

PRIME/SNA may require changes to the logon mode table entries and CICS/VS TCTs your IBM equipment used. Send copies of the appropriate BIND material, sample logon mode table entries and CICS/VS information to IBM host personnel.

Preliminary Steps

Use your organizational worksheet to determine which remote system connections will be used with switched lines and which will be used with leased lines.

In the case of switched lines:

- Make a copy of the WORKSHEET FOR SWITCHED LINES -- NCP that appears below for every switched line in your configuration.
- Make a copy of the WORKSHEET FOR VTAM SWITCHED NODES that appears below for every remote system connection you plan to configure.
- Determine how many terminals and logical printers you need on each remote system and the characteristics each should have.

In the case of leased lines, or as they are called in IBM parlance, nonswitched links:

- Make a copy of the first page of the WORKSHEET FOR LEASED LINES -- NCP and VTAM that appears below for every leased line in your configuration.
- Copy the rest of the WORKSHEET FOR LEASED LINES once for every remote system connection on that line.
- Determine how many terminals and logical printers you need for each remote system connection and the characteristics each should have.

Whether your PRIME/SNA resources reside on switched or leased lines, follow these steps when preparing information to send to IBM host personnel:

1. Collect and review the information about your communications hardware (modems, data adapter units, and so on).

2. NCP operands control the characteristics of your lines. Read the material that accompanies the worksheets and describes the operands. If you think your site needs a specific value for an operand, attach a note to the pertinent worksheet.

3. Attach those worksheets or portions of worksheets that describe the characteristics of remote system connections to the worksheet that describes the line on which they reside.

4. Assemble a package from material in this chapter that describes the characteristics of the devices using each remote system connection. Such a package might include fact sheets on acceptable BIND parameters, sample VTAM logon mode and sample Terminal Control Tables (TCTs) for CICS.

5. Send the package to your contact person at the IBM host site, and set a date for the return of the filled-in worksheets. If you plan to use the same line to access applications in other subareas and domains, send copies of the package to personnel at the other host sites.

6. With the filled-in worksheets completed, go to the next chapter. The material there shows you how to interpret IBM parameters and convert them for use with SNA_SERVER_CONFIG and SNA_3270_CONFIG.

SWITCHED LINES

In order for PRIME/SNA to communicate with the SNA network on an electrical or physical level, the Network Control Program (NCP) resident in the IBM communications controller must reflect the communications hardware at both ends of the connection. If you already have the synchronous modem you plan to use with PRIME/SNA, you may need to explain its characteristics to IBM host personnel. That way, they can match the modem in speed, clocking, and other parameters.

If you plan to use the same PRIME/SNA line configuration to contact several hosts, you should be aware that the values of four NCP operands must be the same on all the communications controllers PRIME/SNA connects to. The four NCP operands that must be the same from switched connection to connection are:

- NRZI
- SPEED
- CLOCKNG
- AUTO

The following worksheet and text will help you determine what line parameters in NCP must match your equipment. Remember to attach a note to the switched line worksheet if you require a specific value for an operand.

WORKSHEET FOR SWITCHED LINES
NCP

FOR PRIME/SNA ADMINISTRATOR ONLY

Line ____________ of Line Group ________________

Line# (octal) _______ on ICS2 Controller ________

FOR IBM HOST PERSONNEL: Configure the NCP Group, Line, or PU macros with the operands specified, or fill in the operand that you select or that NCP takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

*DIAL=YES This is meant to be a switched link.

LNCTL=SDLC This is an SDLC link.

REPLYTO=_______ What is the timeout value for the link?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate the link when NCP is brought up?

*SPEED=_______ What is the speed of this link in bps?

DUPLEX=HALF Switched links are half-duplex.

*CLOCKNG=INT|EXT Will the clocking on this line come from the IBM communications controller?

*NRZI=YES|NO Does this link use NRZI encoding?

RETRIES=(_____,_____,_____) How will NCP handle errors on the link?

CALL=IN|OUT|INOUT (VTAM-only) How will the secondary station establish a connection on the link?

*AUTO=? Does this link have an automatic calling unit? (Yes No)

REDIAL=(_____,_____,_____) How should the automatic calling unit attempt dial error recovery?

PUTYPE=2 or (1,2) This link must be able to handle a Type 2 physical unit.

MAXLU=_______ How many LU-LU sessions will NCP allow on this link?

* Indicates a value matched in a PRIME/SNA Server configuration file.

FILLING OUT THE WORKSHEET

Labeling the Line

In the space provided, write the name you gave to the line on your organizational worksheet and the line group to which it belongs. The octal line and ICS2 controller number are covered in the following chapter. Leave those spaces blank for the moment.

DIAL

The DIAL operand with the value YES is used by NCP to denote a switched line.

LNCTL

Because PRIME/SNA requires Synchronous Data Link Control (SDLC) as its line control, LNCTL should be coded SDLC.

REPLYTO

The REPLYTO operand and its value specify the timeout value in seconds (and tenths of seconds) for this line. If NCP does not receive a response to polling, selection, or message text at the expiration of this interval, NCP makes no further attempt to communicate with the PRIME/SNA peripheral node on the link and indicates that a timeout error has occured.

If the IBM systems programmer codes REPLYTO=NONE, no timeout errors will be indicated, no matter how long it takes the PRIME/SNA peripheral node to respond to NCP.

If the IBM systems programmer neglects to code a value for REPLYTO, NCP assumes, as a default, the value of 1.0 seconds. This default works well in most situations, but a noisy line with long propagation delays may cause NCP to timeout before the peripheral node has a chance to reply. A slightly higher value might be better in such a situation, but avoid too generous a value. Long REPLYTO values extend the recovery period needed for missed polls. The RETRIES operand (covered below) specifies the recovery procedure for a line timeout.

ISTATUS

ISTATUS is an operand that denotes whether VTAM will activate the resource in question when it brings up the SNA network. If ISTATUS=ACTIVE, the line and the communications controller will be ready to communicate when the network operator starts up the network. If ISTATUS=INACTIVE, the network operator responsible for the communications controller will have to activate the line with a VARY NET, ACTIVE command before you can use the line.

SPEED

The SPEED operand specifies the data rate for the line in bits per second (bps). If the modems on your switched line have dual rates, the SPEED value should be coded at the greater of the two values. If the modems on your line use internal clocking (see CLOCKNG operand below), the value of the SPEED operand will set the clocking rate for the modem.

PRIME/SNA supports any SPEED value up to 19200 bps on externally-clocked modems.

DUPLEX

The DUPLEX operand specifies whether the connection is half-duplex or full duplex. Switched lines are always half-duplex in an SNA environment.

CLOCKNG

The CLOCKNG operand tells NCP whether the modems on the line use internal (INT) or external (EXT) clocking. Both your modem and the modem attached to the communications controller must use the same type of clocking. NCP provides the internal clocking rate to the two modems according to the SPEED operand described above.

NRZI

The NRZI operand specifies whether Non-Return-to-Zero-Inverted (NRZI) or Non-Return-to-Zero (NRZ) encoding will be used in transmission on the link. NRZI=YES indicates the line will use NRZI encoding. NRZI=NO indicates the line will use NRZ encoding. YES is the default value for NRZI.

Some modems maintain communications between data transmissions by transmitting pad characters. If the IBM systems programmer selects NRZI=YES, the controller's modem will send pad characters in a repeated binary 10-bit pattern. Many non-IBM modems are sensitive to this repeated 10-bit pattern when they encounter long sequences of the pattern in message data. This can cause the modem to lose synchronism.

Note

If you think that your modem might be sensitive to NRZI bit patterns, attach a note to the worksheet requesting the systems programmer specify NRZI=NO.

RETRIES

The RETRIES operand specifies the number of attempts NCP will make to recover from errors that occur during transmission. If the systems programmer specifies RETRIES=NONE, NCP makes no attempt at error recovery. The values for RETRIES are coded as RETRIES=(m,t,n). m equals the number of retransmission attempts within a sequence; t equals the length of the pause (in seconds) between attempts; and n indicates the total number of retransmission attempt sequences.

The values for RETRIES should be set high enough so that temporary disturbances on dialup lines do not cause termination of the connection.

CALL

The CALL operand describes how VTAM will connect with its network of switched nodes. CALL=IN denotes that you can dial up this connection. CALL=OUT will not allow incoming calls to this connection, but VTAM will contact PRIME/SNA through the dialing of the network operator or through an automatic calling unit (see below). CALL=INOUT allows both inbound and outbound calling.

AUTO

In the case of the AUTO operand, you do not need to know the value that accompanies it, merely whether the line has an automatic calling unit to contact PRIME/SNA. If your modem does not support auto-answer, or if you do not want automatic calling for security reasons, make sure you note this on the worksheet for IBM host personnel.

REDIAL

The REDIAL operand specifies how the auto-call unit should attempt recovery from dialing errors. The values for REDIAL form a sequence and are coded as REDIAL=(t1,n,t2). t1 indicates the pause in multiples of three seconds between call attempts; n indicates the number of calling sequences; and t2 indicates the pause (in seconds) between call recovery sequences.

PUTYPE

The values that accompany PUTYPE on a switched line specify the physical unit types that can use that line. Because PRIME/SNA is a PU.T2 node, PUTYPE must be coded as PUTYPE=2 or PUTYPE=(1,2). PUTYPE=2 signifies that only type 2 PUs can use the line; PUTYPE=(1,2) signifies that both PU types 1 and 2 can use the line.

MAXLU

The MAXLU operand sets an upper limit on the number of logical unit sessions the line and communications controller will support on your remote system connection.

Note

> You can configure a number of devices for use on a switched remote system connection that is larger than that allowed with MAXLU. If you do, the users who establish sessions first will receive sessions. Requests for sessions above the count allowed in MAXLU will simply be denied. An appropriate value for MAXLU prevents users from degrading response times by squeezing too many LU-LU sessions on to one line, but does not prevent your users from obtaining sessions.

SWITCHED REMOTE SYSTEMS

Although the Network Control Program does not allow more than one remote system connection or peripheral node to communicate on a switched line at the same time, you can configure more than one remote system on that line. The value of the IDNUM operand on the WORKSHEET FOR VTAM SWITCHED NODES will determine which remote system VTAM will activate when the communications controller establishes a connection with PRIME/SNA. These IDNUM values must be different for each peripheral node on a switched line.

If you plan to use a single peripheral node to contact several different SSCPs, you should be aware that three VTAM operands that define the peripheral node should be the same for each SSCP. The three VTAM operands that must be the same from remote system connection to connection are:

- ADDR
- IDNUM
- DISCNT

Make a copy of the following worksheet for each remote system on a switched line. The text which follows the VTAM switched node worksheet describes each of the operands and the values that accompany it. If you think that your remote system requires a particular value, attach a note to the worksheet for the systems programmer at the IBM host site.

Page _____

WORKSHEET FOR VTAM SWITCHED NODES

FOR PRIME/SNA ADMINISTRATOR

Remote System ____________ of Remote System Group ______________

on Line ______________ of Line Group _________________

FOR IBM HOST PERSONNEL

Configure the VTAM Group, Line, or PU macros with the operands specified, or fill in the operand you select or that VTAM takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

What is the network name for this PU? ______________________________

SSCPID=_______ What is the SSCP ID of the owner of this PU?

TYPE=SWNET This is a definition of a switched node.

PUTYPE=2 This PU must be configured as a Type 2.

*ADDR=_______ What is the SDLC station address for this PU?

IDBLK=FFF PRIME/SNA requires this value.

*IDNUM=________ What is the identification number for this PU?

MAXOUT=________ How many frames will NCP send before requesting a response?

MAXDATA=_______ What is the maximum amount of data NCP will send to this PU? (MAXDATA should be no less than 64 bytes and no more than 265 bytes.)

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate this PU when NCP is brought up?

*DISCNT=YES|NO (VTAM-only) Will VTAM automatically disconnect this PU when the last of its LUs finishes its session?

* Indicates a value matched in a PRIME/SNA Server configuration file.

Configuring PRIME/SNA Logical Units

Page _____

FOR PRIME/SNA ADMINISTRATOR

How many logical units should the IBM systems programmer create in each of these categories?

CRT Terminals and Screen Sizes

24 x 80 ______

24 x 80 (default), 27 x 132 (alternate) ______

Printers

SCS ______

3270DS with STANDARD Buffer (960/1920 characters) ______

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) ______

SCS and 3270DS with STANDARD Buffer ______

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers ______

FOR IBM HOST PERSONNEL

Create logical units for the devices above. Assign the characteristics to the device through the default logon mode table. Specify SSCPFM=USSSCS and ENCR=NONE for each LU.

RU Sizes: You should code an outbound RU size that is between 64 and 5120 bytes for PRIME/SNA logical units. If you code an outbound RU size equal to 0, PRIME/SNA will return a negative response to any RU greater than 5120 bytes in length. Values for the inbound RU size should be between 64 and 2048 bytes.

Pacing: PRIME/SNA logical units cannot be paced 0 on the primary-to-secondary leg. Prime recommends a second stage receive pacing count of PACING=(7,1) for all devices, including printers. Set an appropriate value for VPACING that is larger than the value you code for PACING. Prime suggests a first stage primary send pacing count of VPACING=7 or VPACING=14.

Even though the sample logon mode table entries you received from the PRIME/SNA Administrator include primary send and secondary receive pacing counts, you should code PACING and VPACING values.

Page _____

FOR IBM HOST PERSONNEL

Fill in the operands associated with the following LUs. Indicate at the bottom of the page what device characteristics are associated with each default logon mode table (24x80 CRT, SCS Printer, etc.).

<table>
<tr><th>Network Name</th><th>LOCADDR</th><th>BATCH</th><th>PACING</th><th>ISTATUS</th><th>LOGAPPL</th><th>DLOGMOD</th></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>YES|NO</td><td>___,___</td><td></td><td></td><td></td></tr>
</table>

DLOGMOD ____________ = ____________ DLOGMOD ____________ = ____________

FILLING OUT THE WORKSHEET

Labeling the Line and Remote System

In the space provided on the worksheet, write the name of the switched line and the line group to which it belongs, if any. Also write in the name of the remote system and remote sytem group.

Network Name

Resources defined to VTAM such as Physical Units (PUs) or peripheral nodes have a name which identifies them to the SNA network. It is useful to know the network name of the peripheral node when discussing communications issues with IBM host personnel.

SSCPID

The SSCPID operand identifies the SSCP that owns the PU or remote system. The values for the SSCP identifier range from 0 through 65535 (decimal). Although only one SSCP can own a physical unit at a given time, you may want several SSCPs to establish ownership of your peripheral node in the course of your daily operations. If you plan to use the same peripheral node when connecting to IBM hosts in different cities, PRIME/SNA should know the SSCP identifiers of each one. Likewise, if a number of SSCPs can establish ownership of the communications controllers you connect with, PRIME/SNA should know those SSCP identifiers. If you suspect that your peripheral node will encounter several different SSCPs, make sure you get the proper SSCP identifiers from IBM host personnel.

TYPE

TYPE=SWNET denotes that this remote system can be connected to VTAM only through a switched link.

PUTYPE

PUTYPE specifies the physical unit type of this peripheral node. PRIME/SNA is a PU.T2 node, and the operand should be coded as PUTYPE=2.

ADDR

ADDR assigns an eight-bit SDLC station address to the physical unit on the line. The eight-bit address is represented by a two-digit hexadecimal number. It is extremely important that the station address specified in the ADDR operand match the one you configure for PRIME/SNA.

If you are using this peripheral node to contact different communications controllers, this SDLC station address must be the same for each VTAM definition of the remote system connection. Attach a note to the worksheet to make sure that the systems programmer at the IBM host understands that these should be the same.

IDBLK

VTAM uses the values that accompany the IDBLK operand and the following IDNUM operand to create a 48-bit station identifier for switched nodes. VTAM asks for this number (using the XID exchange) during dial connection attempts to make sure it has connected the correct PRIME/SNA peripheral node. The value of IDBLK forms the first part of this 48-bit station identifier.

Note

PRIME/SNA requires that the system programmer specify IDBLK=FFF.

IDNUM

IDNUM and its 20-bit (five digits in hexadecimal) value form the identification number for this peripheral node.

Notes

- If you plan to use this peripheral node to contact different SSCPs, the value the systems programmer codes for IDNUM must be the same for every VTAM definition of this node.
- IDNUM must be different for each remote system connection you have configured on this switched line. In this situation, VTAM uses the station identifier to select the proper peripheral node on the line with the XID command and reply.

MAXOUT

MAXOUT and its value determine the maximum number of SDLC frames NCP should send the PRIME/SNA peripheral node before requesting a response. On switched lines, there is a seven-frame limit on the number of frames outstanding a response. Normally, your IBM systems programmer will specify MAXOUT=7. However, if the communications facilities between you and the communications controller are error-prone, the programmer may lessen the MAXOUT count to speed up error recovery. A larger value for MAXOUT is more efficient.

MAXDATA

The value for MAXDATA sets an upper limit on the amount of data NCP will send the peripheral node. Larger values of MAXDATA increase the efficiency of the link by cutting down on the number of SDLC frames needed to convey a given amount of information. Lower values of MAXDATA tend to make more efficient use of buffer space within IBM communications controllers because a number of SNA commands and responses are short in length.

Note

> PRIME/SNA supports a minimum of 64 bytes and a maximum of 265 bytes for MAXDATA.

ISTATUS

ISTATUS is an operand that denotes whether VTAM will activate the resource in question when it brings up the SNA network. If ISTATUS=ACTIVE, the line and the communications controller will be ready to communicate when the network operator starts up the network. If ISTATUS=INACTIVE, the network operator responsible for the communications controller will have to activate the peripheral node with a VARY NET, ACTIVE command before you can use it.

DISCNT

VTAM uses the DISCNT operand to determine if it should break the dialed connection between the communications controller and your peripheral node after the last LU-LU session using the link finishes. Terminating switched connections in this manner can lessen telephone usage charges, or it may tend to break a switched connection prematurely.

DISCNT=YES denotes that VTAM will break the switched line connection when the last LU-LU session terminates. When DISCNT=YES, VTAM will reject any disconnection requests from your peripheral node. If

DISCNT=NO, VTAM will permit the peripheral node to send requests to disconnect.

LOGICAL UNIT DEFINITION

IBM host personnel will use the second and third pages of the VTAM switched node worksheet to define the logical units using the remote system connection. In order for the systems programmer to assign the proper characteristics to your terminals and logical printers, you must inform the programmer what BIND characteristics PRIME/SNA should accept. You will find that information in the last part of the chapter. Attach to the switched node worksheet copies of the BIND parameter fact sheets for LU.T1 SCS printing, LU.T2 terminal emulation, and LU.T3 3270 Data Stream printing. Also attach copies of any sample logon mode tables that generate the device characteristics you need.

Configuring PRIME/SNA Logical Units

Using information from your organizational worksheet, write down on the second page of the VTAM switched node worksheet how many devices you need of each type.

Pacing

Pacing is an SNA facility that is vitally important to the performance of PRIME/SNA. Pacing controls the amount of data a primary logical unit (for example, an applications subsystem) can send a secondary logical unit such a terminal or logical printer. You can also use pacing to restrict the amount of data a secondary logical unit sends to its session partner. Proper pacing prevents a session partner from swamping its mate, and allows the mate to control its resources better.

PRIME/SNA uses two-stage pacing values to control data sent from the host. The first stage tells the application subsystem how much data it can send to the communications controller you connect with. The second stage tells the Network Control Program (NCP) how much data it can send to one of your logical units before NCP requires a positive pacing response from the secondary logical unit. Positive pacing responses indicate that the controller or secondary LU can accept more data. The value for the first-stage pacing value must be the same or greater than the second-stage pacing value; this prevents the communications controller from running low on data to send to your logical unit. First-stage pacing values are multiples of second- stage pacing values.

The VTAM operands VPACING and PACING control the first and second stages, respectively, of data flowing outbound from the host LU to your secondary LU. These pacing values will be used in a given LU-LU session unless different values are stipulated in the BIND command at the start of a session. The BIND command can also stipulate if inbound pacing should occur from the secondary LU to the primary LU to prevent the secondary logical unit from swamping the primary logical unit. There are no VTAM operands to control inbound pacing.

Caution

Most IBM 3270 displays are not paced. PRIME/SNA requires you to pace the logical units associated with its peripheral nodes. Prime suggests the system programmer specify PACING=(7,1) or a similarly high value for all PRIME/SNA logical units. A VPACING count of 7 should allow the communications controller to keep up with the secondary LU's needs on switched lines. The systems programmer must code a valid value for VPACING in order for pacing to take effect.

Network Name

The network name is the name the systems programmer gives to the logical unit. The name of the logical unit is unique in the network, and it can help a network operator identify one of your terminals or logical printers quickly in the event of a problem.

LOCADDR

The decimal value associated with LOCADDR specifies a logical unit's local address (port number) on your peripheral node. A PU.T2 node such as your PRIME/SNA peripheral node can support local addresses ranging from 1 through 255. Although LOCADDR values are often sequential and start low, they do not have to be consecutive.

You cannot use the first two LOCADDR addresses (LOCADDR=0 and LOCADDR=1) for 3270 LU-LU sessions. VTAM uses LOCADDR=0 to communicate with the PU Services portion of your peripheral node and LOCADDR=1 to communicate with an RJE operator console.

Note

PRIME/SNA Interactive restricts the number of LOCADDRs or logical unit ports it supports to 40.

BATCH

The BATCH operand sets a priority level for data transfers from NCP to your logical units. The systems programmer should code the BATCH operand as BATCH=NO for interactive or low-volume data. All your terminal logical units should be coded as BATCH=NO, the VTAM/NCP default.

If you have a printer that floods the line with low-priority print data, to the detriment of other logical units on your peripheral node, specifying BATCH=YES tells NCP to send data to those logical units ahead of the one labelled BATCH=NO.

ISTATUS

ISTATUS denotes whether VTAM will activate the resource in question when VTAM brings up the SNA network. If ISTATUS=ACTIVE, VTAM will attempt to activate the logical unit after it activates the peripheral node. If ISTATUS=INACTIVE, the network operator responsible for the communications controller will have to activate the logical unit with a VARY NET, ACTIVE command before you can use it.

LOGAPPL

VTAM automatically logs a logical unit on to the application name accompanying the LOGAPPL operand. Thus, the application program receives control of the logical unit immediately after a dialed connection exists. The systems programmer has the option of leaving this operand out of his VTAM definition of an LU.

DLOGMOD

DLOGMOD specifies which logon mode table entry VTAM should use when a terminal user fails to specify one at the time of initiating a session. Because many users do not specify a particular logon mode table, it is very important that the default logon mode table entry (DLOGMOD) reflect characteristics PRIME/SNA or your SNA_3270_CONFIG entries can accept. A logon mode table entry specifies what the BIND command will look like in many instances. For more information on BINDs and logon mode tables, see the last part of the chapter.

LEASED LINES

Leased lines are communications channels that do not have to use the switched facilities of the public telephone network. For the purposes of NCP and VTAM configurations the following types of lines are considered leased lines:

- Multipoint lines
- Conditioned lines
- Direct connections between communications controllers and the ICS2

The last type of line is not a line in the usual sense of a connection through the telephone network. A direct connection refers to a local hookup of a communications controller and the ICS2 without modems. In this case, a null modem cable no more than a few meters in length connects the controller with the ICS2 on the Prime machine. A null modem requires the connection to be clocked internally by either the ICS2 or the IBM communications controller.

The following worksheet and text will help you determine what line parameters in NCP must match your equipment, and what performance operands can help you achieve better performance.

Page _____

WORKSHEET FOR LEASED LINES
NCP and VTAM

FOR PRIME/SNA ADMINISTRATOR ONLY

Line ____________ of Line Group ________________

Line# (octal) _______ on ICS2 Controller ________

FOR IBM HOST PERSONNEL

Configure the following NCP Group or Line macros with the operands specified, or fill in the operand you select or that NCP takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

What is the network name for this line? ____________________________

*DIAL=NO This is meant to be a nonswitched link.

LNCTL=SDLC This is an SDLC link.

REPLYTO=_______ What is the timeout value for the link?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate the link when NCP is brought up?

*DUPLEX=HALF|FULL What is the transmission mode for this link?

*SPEED=_______ What is the speed of this link in bps?

Is the line interface V.24 (RS-232C) or V.35 (DDS)? V.24 V.35

*CLOCKNG=INT|EXT Will the clocking on this line come from the IBM communications controller?

*Is this line point-to-point or multipoint? __________________

*NRZI=YES|NO Does this link use NRZI encoding?

NEWSYNC=YES|NO Will NCP supply the new sync signal to its modem?

RETRIES=(_____,_____,_____) How will NCP handle errors on the link?

* Indicates a value matched in a PRIME/SNA Server configuration file.

Page _____

FOR PRIME/SNA ADMINISTRATOR ONLY

Remote System ________________ of Remote System Group____________

FOR IBM HOST PERSONNEL

Define a PU and fill in the operand values associated with the following Group, Line, or PU macros of NCP.

What is the network name of this PU? ________________________

*SSCPID=________ (VTAM-only) What is the SSCP ID of the owner of this PU? (If this PU can have more than one owner [SSCP takeovers], list the other SSCP IDs on this sheet.)

*ADDR=_______ What is the SDLC station address for this PU?

MAXOUT=_______ How many frames will NCP send before requesting a response?

MAXDATA=_______ What is the maximum amount of data NCP will send to this PU? (MAXDATA should be no less than 64 bytes and no more than 265 bytes.)

PASSLIM=_______ How many consecutive frames will NCP send this PU?

PUTYPE=2 This PU must be configured as a Type 2.

IRETRY=YES|NO Will NCP immediately retry polling if it encounters a timeout?

ANS=STOP|CONT Should NCP continue to service the link even though NCP has lost contact with its access method?

*DATMODE=HALF|FULL How will NCP transmit and receive with this PU?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate this PU when NCP is brought up?

* Indicates a value matched in a PRIME/SNA Server configuration file.

Configuring PRIME/SNA Logical Units

Page _____

FOR PRIME/SNA ADMINISTRATOR

How many logical units should the IBM systems programmer create in each of these categories?

CRT Terminals and Screen Sizes

24 x 80 _____

24 x 80 (default), 27 x 132 (alternate) _____

Printers

SCS _____

3270DS with STANDARD Buffer (960/1920 characters) _____

3270DS with STANDARD (default) and EXTENDED (2560/3440/3564 characters) Buffers (alternate) _____

SCS and 3270DS with STANDARD Buffer _____

SCS and 3270DS with STANDARD (default) and EXTENDED (alternate) Buffers _____

FOR IBM HOST PERSONNEL

Create logical units for the devices above. Assign the characteristics to the device through the default logon mode table. Specify SSCPFM=USSSCS and ENCR=NONE for each LU.

RU Sizes: You should code an outbound RU size that is between 64 and 5120 bytes for PRIME/SNA logical units. If you code an outbound RU size equal to 0, PRIME/SNA will return a negative response to any RU greater than 5120 bytes in length. Values for the inbound RU size should be between 64 and 2048 bytes.

Pacing: PRIME/SNA logical units cannot be paced 0 on the primary-to-secondary leg. Prime recommends a second stage receive pacing count of PACING=(7,1) for all devices, including printers. Set an appropriate value for VPACING that is larger than the value you code for PACING. Prime suggests a first stage primary send pacing count of VPACING=7 or VPACING=14.

Even though the sample logon mode table entries you received from the PRIME/SNA Administrator include primary send and secondary receive pacing counts, you should code PACING and VPACING values.

Page ____

FOR IBM HOST PERSONNEL

Fill in the operands associated with the following LUs. Indicate at the bottom of the page what device characteristics are associated with each default logon mode table (24x80 CRT, SCS Printer, etc.).

Network Name	LOCADDR	BATCH	PACING	ISTATUS	LOGAPPL	DLOGMOD
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			
		YES | NO	___,___			

DLOGMOD ____________ = ____________ DLOGMOD ____________ = ____________

FILLING OUT THE WORKSHEET

Labeling the Line

In the space provided, write the name you gave to the line on your organizational worksheet and the line group to which it belongs. The octal line and ICS2 controller number will be covered in the following chapter. Leave those spaces blank for the moment.

DIAL

The DIAL operand with the value NO is used by NCP to denote a leased (nonswitched) line. NO is the default value for DIAL.

LNCTL

Because PRIME/SNA requires Synchronous Data Link Control (SDLC) as its line control, LNCTL should be coded SDLC.

REPLYTO

The REPLYTO operand and its value specify the timeout value in seconds (and tenths of seconds) for this line. If NCP does not receive a response to polling, selection, or message text at the end of this interval, it makes no further attempt to communicate with the peripheral node on the link and indicates that a timeout error has occured.

If the IBM systems programmer specifies REPLYTO=NONE, no timeout errors will be indicated, no matter how long it takes the peripheral node to respond to NCP.

If the IBM systems programmer neglects to code a value for REPLYTO, NCP assumes, as a default, the value of 1.0 seconds. This default works well in most situations, but a noisy line with long propagation delays may cause NCP to timeout before the peripheral node has a chance to reply. A slightly higher value might be better in such a situation, but you should avoid too generous a value. Long REPLYTO values extend the recovery period needed for missed polls. The RETRIES operand (covered below) specifies the recovery procedure for a line timeout.

ISTATUS

ISTATUS is an operand that denotes whether VTAM will activate the resource in question when VTAM brings up the SNA network. If ISTATUS=ACTIVE, the line and the communications controller will be ready to communicate with PRIME/SNA at network startup. If ISTATUS=INACTIVE, the network operator responsible for the communications controller will have to activate the line with a VARY NET, ACTIVE command before you can use it.

DUPLEX

The DUPLEX operand specifies whether the connection is half-duplex or full duplex. If your modem can handle a full duplex (4-wire) connection, make note of this on the worksheet for personnel at the IBM host site. DUPLEX=FULL will allow you take advantage of your modem's capabilities and override the NCP default of DUPLEX=HALF.

V.35 lines are configured full duplex for NCP.

SPEED

The SPEED operand specifies the data rate for the line in bits per second (bps). If the modems on your switched line have dual rates, the SPEED value should be coded at the greater of the two values. If the modems on your line use internal clocking (see CLOCKNG operand below), the value of the SPEED operand will set the clocking rate for the two modems on the line.

PRIME/SNA supports any SPEED value up to 19200 bps on externally-clocked modems with a V.24 (RS-232C) line interface.

Note

> If the systems programmer codes SPEED=56000 or a similarly high value, you can assume that the line uses the V.35 (Digital Data Service) line interface. Otherwise, rely on the programmer's answer to the question on line interfaces that follows.

V.24 or V.35

This question asks the systems programmer if the line uses the V.24 line interface and modems or the V.35 high-speed digital interface. V.35 lines use data adapter units instead of modems.

CLOCKNG

The CLOCKNG operand tells NCP whether it should supply transmit and receive clocking for the line. CLOCKNG=EXT is used on lines where either the modems or the Prime ICS2 supply the transmit and receive clocks for the connection. If CLOCKNG=INT, the IBM communications controller will supply the clocking for the connection at the rate specified in the SPEED operand described above.

Note

If this leased line is a local hookup using a null modem cable, the line must be clocked internally by either the IBM communications controller or the ICS2. If you decide to let the communications controller supply the clock signals, your IBM systems programmer can specify fairly high clocking rates through the SPEED operand, depending on the length of the cable. If the ICS2 supplies the clocking, the IBM systems programmer should code CLOCKNG=EXT. Long cable runs increase capacitance and decrease signal quality, so line speeds should be decreased accordingly.

Point-to-point or Multipoint

This question asks the systems programmer responsible for defining the line whether other stations or peripheral nodes will share the line.

NRZI

The NRZI operand specifies whether Non-Return-to-Zero-Inverted (NRZI) or Non-Return-to-Zero (NRZ) encoding will be used in transmission on the link. NRZI=YES indicates the line will use NRZI encoding. NRZI=NO indicates the line will use NRZ encoding. YES is the default value for NRZI.

Some modems maintain communications between data transmissions by transmitting pad characters. If the IBM systems programmer selects NRZI=YES, the controller's modem will send pad characters in a repeated binary 10-bit pattern. Many non-IBM modems are sensitive to this repeated 10-bit pattern when they encounter long sequences of the pattern in message data. This can cause the modem to lose synchronism.

Caution

All communications equipment on a multipoint line must share the same value for NRZI. Mixing the types of encoding used on a line will result in a total lack of communication between stations on the line.

NEWSYNC

The systems programmer at the IBM host should code the NEWSYNC operand as NEWSYNC=YES only if all of the following apply:

- This is a multipoint line
- Your modem does not send the carrier signal continuously to the modem at the communications controller
- The modem at the controller has the NEWSYNC feature

Note

> Your modem sends the carrier signal continuously if it is wired to do so internally or if it continuously sends the Request-To-Send (RTS) signal to the modem at the communications controller.

If you suspect that your multipoint line may need the new sync signal, attach a note to the worksheet asking host site personnel to investigate their controller's modem.

RETRIES

The RETRIES operand specifies the number of attempts NCP will make to recover from errors that occur during transmission. If RETRIES=NONE, NCP makes no attempt at error recovery. The values for RETRIES form a sequence and are coded as RETRIES=(m,t,n). m equals the number of retransmission attempts within a sequence; t equals the length of the pause (in seconds) between attempts; and n indicates the total number of retransmission attempt sequences.

The values for RETRIES do not have to be set as high as those on switched lines. Leased lines generally have lower error rates and are less subject to interference than switched lines.

LEASED REMOTE SYSTEMS

The second page of the leased line worksheet asks the systems programmer at the IBM host site how he or she coded the various NCP/VTAM operands affecting a remote system connection.

If the leased line connects multiple peripheral nodes or PUs, be sure the systems programmer assigns different station addresses to each one. Make a copy of the second through fourth pages of the worksheet for each remote system connection on the line and attach them to the first page dealing with line characteristics.

Labeling the Remote System

Write in the name of the remote system and remote system group.

Network Name

Resources within VTAM such as PUs or peripheral nodes have a name which identifies them to the SNA network. It is useful to know the network name of your PRIME/SNA peripheral nodes when discussing communications issues with IBM host personnel.

SSCPID

The SSCPID operand identifies the SSCP that owns the physical unit (PU) or peripheral node. The values for the SSCP identifier can range from 0 through 65535 (decimal). Although only one SSCP can own a physical unit at a given time, several SSCPs may establish ownership of your peripheral node in the course of operations. If a number of SSCPs can establish ownership of the communications controller you connect with, PRIME/SNA should know those SSCP identifiers. If you suspect that your peripheral node will encounter several different SSCPs, make sure you get the proper SSCP identifiers from IBM host personnel.

ADDR

ADDR assigns an eight-bit SDLC station address to the physical unit on the line. The eight-bit address is represented by a two-digit hexadecimal number. It is extremely important that the station address specified in the ADDR operand match the one you configure for PRIME/SNA.

If this peripheral node is located on a multipoint line, all the peripheral nodes and other PUs which reside on the line must have different ADDR values. This prevents the communications controller sending the same information to two different PUs or peripheral nodes.

MAXOUT

MAXOUT and its value determine the maximum number of SDLC frames NCP should send the peripheral node before requesting a response. There is normally a seven frame limit on the number of frames outstanding a response. Often, your IBM systems programmer will specify MAXOUT=7, but if the communications facilities between you and the communications controller are error-prone, the programmer may lessen the MAXOUT count to speed up error recovery. A larger value for MAXOUT is more efficient.

MAXDATA

The value for MAXDATA sets an upper limit on the amount of data NCP will send the peripheral node. Larger values of MAXDATA increase the efficiency of the link by cutting down on the number of SDLC frames needed to convey a given amount of information. Lower values of MAXDATA tend to make more efficient use of buffer space within IBM communications controllers because a number of SNA commands and responses are short.

Note

PRIME/SNA supports a minimum value of 64 bytes for MAXDATA and a maximum of 265 bytes.

PASSLIM

If you have a multipoint line, the PASSLIM operand has the greatest performance effect of any NCP operand that controls data transfer between the communications controller and your peripheral node. The value that accompanies PASSLIM specifies the maximum number of SDLC frames NCP will send to your remote system before polling the next PU or peripheral node on the line.

High values of PASSLIM prevent "peppering" or the "windowshade effect" and keep the screens on your peripheral node's screens properly painted. Low values of PASSLIM prevent one peripheral node or PU from monopolizing the link. If the systems programmer at the IBM host site omits this operand, NCP assumes a default of PASSLIM=1. PASSLIM=1 denotes that NCP will service the next PU or remote system on the link after sending a single frame.

As a rule of thumb, the PASSLIM count should be incremented by one for every logical unit associated with your PRIME/SNA peripheral node.

PUTYPE

PUTYPE specifies the physical unit type of this peripheral node. PRIME/SNA is a PU.T2 node and the operand should be coded PUTYPE=2.

IRETRY

The IRETRY operand tells NCP whether it should attempt recovery immediately after it detects a polling timeout or if it should service the next peripheral node or PU on the link. IRETRY=YES denotes that NCP should attempt an immediate retry; IRETRY=NO denotes that NCP should continue servicing other stations on the link.

ANS

The ANS (Automatic Network Shutdown) operand specifies how NCP will handle your remote system in the event of automatic network shutdown. NCP enters automatic shutdown when it can no longer communicate with its access method or SSCP. This can happen when the IBM host fails or the connection to the controller is broken. For those peripheral nodes that the systems programmer codes as ANS=STOP, all communications will stop when NCP enters automatic shutdown. If ANS=CONTINUE, the Network Control Program allows the devices on your peripheral node to continue any LU-LU sessions they may have running with different SSCPs.

DATMODE

The DATMODE operand tells NCP whether it can send and receive data simultaneously from your peripheral node. The DATMODE operand must be coded with the value HALF if the communications line is physically half-duplex. DATMODE can also be coded HALF when the line is physically full duplex. If DATMODE=HALF, NCP will send to another station on the link or wait while it receives data from your peripheral node, or vice versa.

DATMODE=FULL works only with full duplex modems. If DATMODE=FULL, NCP can both send and receive data from your peripheral node simultaneously. You can gain some performance by running DATMODE=FULL.

Note

In order for DATMODE=FULL, your modem must transmit the carrier signal continuously. You can do this either by "strapping" (internally connecting) your modem to perform that way, or by having the modem at the communications controller activate its Request-To-Send (RTS) signal continuously.

ISTATUS

ISTATUS denotes whether VTAM will activate the resource in question when it brings up the SNA network. If ISTATUS=ACTIVE, VTAM will attempt to activate the remote system connection with your peripheral node after the line connection is established. If ISTATUS=INACTIVE, the network operator resposible for the communications controller will have to activate the remote system connection with a VARY NET, ACTIVE command before you can use it.

LOGICAL UNIT DEFINITION

IBM host personnel will use the second and third pages of the VTAM switched node worksheet to define the logical units using your remote system connection. In order for the systems programmer to assign the proper characteristics to your terminals and logical printers, you must inform the programmer what BIND characteristics PRIME/SNA should accept. You will find that information in the last part of the chapter. Attach copies of the BIND parameter fact sheets for LU.T1 SCS printing, LU.T2 terminal emulation, and LU.T3 3270 Data Stream printing to the Leased Line Worksheet. Also attach copies of any sample logon mode tables which generate the device characteristics you need.

Configuring PRIME/SNA Logical Units

Using information from your organizational worksheet, write down how many devices you need of each type on the third page of the leased line worksheet.

Pacing

Pacing is an SNA facility that is vitally important to the performance of PRIME/SNA. Pacing controls the amount of data a primary logical unit (for example, an applications subsystem) can send a secondary logical unit (such as one of your terminals or logical printers). You can also use pacing to restrict the amount of data a secondary logical unit sends to its session partner. Proper pacing prevents a session partner from swamping its mate and allows the mate to control its resources better.

PRIME/SNA uses two-stage pacing values to control data sent from the host application subsystem. The first stage tells the application how much data it can send to the communications controller you connect with. The second stage tells the Network Control Program how much data it can send to one of your logical units before NCP requires a positive pacing response back from the secondary logical unit. The first stage pacing value must be the same or greater than the second stage pacing value. This prevents the communications controller from running low on data to send to your logical unit.

The VTAM operands VPACING and PACING control the first and second stages, respectively, of data flowing outbound from the host LU to your secondary LU. These pacing values will be used in a given LU-LU session <u>unless</u> different values are stipulated in the BIND command at the start of the session. The BIND command can also stipulate if inbound pacing should occur from the secondary LU to the primary LU to prevent the secondary logical unit from swamping the primary logical unit. There are no VTAM operands to control inbound pacing.

Caution

Most IBM 3270 displays are not paced. PRIME/SNA requires you to pace the logical units associated with it. Prime suggests that the system programmer specify PACING=(7,1) or a similarly high value for all PRIME/SNA logical units. A VPACING count of 7 should allow the communications controller to keep up with the secondary LU's needs on lines up to 7200 bps. You should use a VPACING count of 14 on 9600 bps lines and a count of 21 on lines running at 19200 bps or higher. The systems programmer must code a valid value for VPACING in order for pacing to take effect.

Network Name

The network name is the name the systems programmer gives to the logical unit. The name of the logical unit is unique in the network and can help a network operator identify one of your terminals or logical printers quickly in the event of a problem.

LOCADDR

The decimal value associated with LOCADDR specifies a logical unit's local address (port number) on your peripheral node. A PU.T2 node such as your PRIME/SNA peripheral node can support local addresses ranging from 1 through 255. Although LOCADDR values are often sequential and start low, they do not have to be consecutive.

You cannot use the first two LOCADDR addresses (LOCADDR=0 and LOCADDR=1) for 3270 LU-LU sessions. VTAM uses LOCADDR=0 to communicate with the PU Services portion of your peripheral node and LOCADDR=1 to communicate with an RJE operator console.

Note

PRIME/SNA Interactive restricts the number of LOCADDRs or logical unit ports it supports to 40.

BATCH

The BATCH operand sets a priority level for data transfers from NCP to your logical units. The systems programmer should code the BATCH operand as BATCH=NO for interactive or low volume data. All your terminal logical units should be coded as BATCH=NO, the VTAM/NCP default.

If you have a printer that floods the line with low-priority print data, to the detriment of other logical units on your peripheral node, specifying BATCH=YES tells NCP to send data to those logical units ahead of the one labelled BATCH=NO.

ISTATUS

ISTATUS denotes whether VTAM will activate the resource in question when it brings up the SNA network. If ISTATUS=ACTIVE, VTAM will attempt to activate the logical unit after it activates the peripheral node. If ISTATUS=INACTIVE, the network operator responsible for the communications controller will have to activate the logical unit with a VARY NET, ACTIVE command before you can use it.

LOGAPPL

VTAM automatically logs a logical unit on to the application name accompanying the LOGAPPL operand. Thus, the application program receives control of the logical unit immediately after VTAM establishes contact with your peripheral node.

DLOGMOD

DLOGMOD specifies which logon mode table entry VTAM should use when a terminal user fails to specify one at the time of initiating a session. Because many users do not specify a particular logon mode table, it is very important that the default logon mode table entry (DLOGMOD) reflect characteristics PRIME/SNA or your SNA_3270_CONFIG entries can accept. A logon mode table entry specifies what the BIND command will look like in many instances. For more information on BINDs and logon mode tables, see the following pages.

BINDS

An SNA network can include a wide variety of devices, ranging from the 3270 Information Display System to the 3660 Supermarket System to the 8100 Information System. Obviously, these systems have particular requirements that an application subsystem must meet before systems enter into sessions with host applications. How does SNA ensure that each LU-LU session meets the requirements of both primary and secondary logical units? VTAM sends the BIND command with information that spells out in detail what each LU can expect from its session partner. If the two LUs cannot agree on the parameters of a BIND, no LU-LU session can occur. This assures that both sides can process the proper protocol sequences, and prevents LUs from entering into sessions in which they do not possess all the required capabilities.

PRIME/SNA logical units, represented by terminals and logical printers, have requirements that the primary logical unit must recognize before sessions can begin. You need to communicate those requirements to personnel at the host sites your LUs come into contact with. The requirements help host personnel define your logical units the way you want and prevent PRIME/SNA from rejecting BINDs unnecessarily. The following pages describe some of the requirements of PRIME/SNA Interactive and ways to fulfill them.

Acceptable BIND Parameters

There are three different categories of BIND parameters PRIME/SNA Interactive finds acceptable. These categories correspond to the LU type of device or service you want to emulate:

- LU.T1 — SNA Character String (SCS) printing
- LU.T2 — 3278 terminal emulation
- LU.T3 — 3270 Data Stream printing

Each of these categories supports a wide variety of options (such as screen and buffer sizes). Therefore, PRIME/SNA must inspect each BIND's bit settings to determine the rules the primary and secondary logical units will follow in an LU-LU session.

The following FACT SHEETS show in detail the bit settings and options PRIME/SNA can accept for SCS printing, terminal emulation, and 3270 Data Stream printing. IBM host personnel may find this material useful when configuring your logical units. You should include a copy of the fact sheets in any package you send to host personnel.

FACT SHEET FOR LU.T1 BIND PARAMETERS ACCEPTED BY PRIME/SNA

FOR IBM HOST PERSONNEL

The following table shows in detail the BIND parameters PRIME/SNA Interactive can accept for LU.T1 SNA Character String printing.

LU.T1 BIND Parameters

Byte	Bit	Value	Explanation
0		X'31'	BIND command code.
1		X'01'	Nonnegotiable BIND with format 0.
2		X'03'	Function management (FM) profile 3.
3		X'03'	Transmission services profile 3.
4	0	0	The PLU can send only single-element chains.
		or 1	The PLU can send single or multiple-element chains.
4	1	0	The PLU uses immediate request mode.
4	2-3	01	The PLU can request only exception responses.
		or 10	The PLU can request only definite responses.
		or 11	The PLU can request definite or exception responses.
4	4-5	00	Reserved.
4	6	0	The PLU cannot send compressed data.
4	7	1	The PLU can send the End Bracket.
5	0	0	The SLU can send only single-element chains.
		or 1	The SLU can send single or multiple-element chains.

Byte	Bit	Value	Explanation
5	1	0	The SLU uses immediate request mode. (NOTE: The SLU will accept this BIND but will always use immediate request mode.)
5	2-3	01 or 10 or 11	The SLU can request only exception responses. The SLU can request only definite responses. The SLU can request definite or exception responses.
5	4-5	00	Reserved.
5	6	0 or 1	The SLU cannot send compressed data. The SLU can send compressed data. (NOTE: The SLU will accept this BIND parameter but will never send compressed data.)
5	7	0 or 1	The SLU cannot send the EB. The SLU can send the EB. (NOTE: The SLU will accept this BIND parameter but will never send the EB.)
6	0	0	Reserved.
6	1	0	The PLU and the SLU cannot exchange FM headers.
6	2	1	Both the PLU and the SLU must use bracket protocols.
6	3	1	Bracket termination rule 1 is used.
6	4	0	Both the PLU and the SLU must use EBCDIC.
6	5-7	000	Reserved.

Byte	Bit	Value	Explanation
7	0-1	10	This session uses half-duplex flip-flop transmissions.
7	2	0	The PLU is responsible for error recovery.
7	3	0	The SLU is always the first speaker.
7	4-6	000	Reserved.
7	7	0	Contention is resolved in favor of the SLU.
8	0	0	Inbound pacing occurs in one stage.
8	1	0	Reserved.
8	2-7	Any	Inbound pacing count. If 000000, pacing is not used. (NOTE: Although any inbound pacing count will be accepted in the BIND, the PRIME/SNA Server will purposely limit the amount of inbound traffic per LU.)
9	0-1	00	Reserved.
9	2-7	000001 to 000111	Outbound pacing count (1-7).
10		X'ab'	Maximum inbound RU size. (NOTE: The value for X'ab' must be greater than or equal to 64 bytes. Bit 0 must be 1. BINDs up to the maximum representable will be accepted, but the SLU will never send RUs greater than 1024 bytes.)
11		X'cd'	Maximum outbound RU size. (NOTE: The value for X'cd' must be no less than 64 bytes and no more than or equal to 5120 bytes. If the value is set to 0, PRIME/SNA will return a negative response if it receives an RU greater than 5120 bytes.)

Byte	Bit	Value	Explanation
12		Any	Ignored by the SLU.
13		Any	Ignored by the SLU.
14		X'01'	Type 1 print function using SCS Data Stream.
15		X'00'	Reserved.
16		X'00'	Reserved.
17	0-6	Any	Reserved.
17	7	0	Read Partition-Query and Query Reply structured fields not supported by the SLU.
18	0-3	X'0'	Base SCS Data Streams may be sent from the host.
		or X'8'	Full-base SCS Data Streams may be sent from the host.
		or X'C'	Full-base plus Set Horizontal Format SCS Data Streams may be sent from the host.
		or X'E'	Full-base plus Set Horizontal Format and Set Vertical Format SCS Data Streams may be sent from the host.
		or X'F'	Full-base plus Set Horizontal Format, Set Vertical Format, and Vertical Channel Select SCS Data Streams may be sent from the host.
18	4	0	The Set Line Density SCS code may not be sent from the host.
		or 1	The Set Line Density SCS code may be sent from the host. (NOTE: The SLU will accept this BIND parameter but will ignore this code when received in a Data Stream.)
18	5	0	Reserved.

Byte	Bit	Value	Explanation
18	6	0	The Bell SCS code may not be sent from the host.
		or 1	The Bell SCS code may be sent from the host. (NOTE: The SLU will accept this BIND parameter but will ignore this code when received in a Data Stream.)
18	7	0	The Transparent and Interchange Record Separator SCS codes may not be sent from the host.
		or 1	The Transparent and Interchange Record Separator SCS codes may be sent from the host.
19		X'00'	Reserved.
20		Any	Not supported by this LU type.
21		Any	Not supported by this LU type.
22		Any	Not supported by this LU type.
23		Any	Not supported by this LU type.
24		Any	Not supported by this LU type.
25		Any	Reserved.
26		X'00'	No cryptography options are supported.
27+		Any	Reserved.

FACT SHEET FOR LU.T2 BIND PARAMETERS ACCEPTED BY PRIME/SNA

FOR IBM HOST PERSONNEL

The following table shows in detail the BIND parameters PRIME/SNA can accept for LU.T2 terminals.

LU.T2 BIND Parameters

Byte	Bit	Value	Explanation
0		X'31'	BIND command code.
1		X'01'	Nonnegotiable BIND with format 0.
2		X'03'	Function Management (FM) profile 3.
3		X'03'	Transmission services profile 3.
4	0	0	The PLU can send only single element chains.
		or 1	The PLU can send single or multiple-element chains.
4	1	0	The PLU uses immediate request mode.
4	2-3	01	The PLU can request only exception responses.
		or 10	The PLU can request only definite responses.
		or 11	The PLU can request definite or exception responses.
4	4-5	00	Reserved.
4	6	0	The PLU cannot send compressed data.
4	7	1	The PLU can send the End Bracket.

Byte	Bit	Value	Explanation
5	0	1	The SLU can send single or multiple-element chains.
5	1	0	The SLU uses immediate request mode.
5	2-3	01	The SLU can request only exception responses.
		or 10	The SLU can request only definite responses.
		or 11	The SLU can request definite or exception responses.
5	4-5	00	Reserved.
5	6	0	The SLU cannot send compressed data.
		or 1	The SLU can send compressed data.
			(NOTE: The SLU will accept this BIND parameter, but will never send compressed data.)
5	7	0	The SLU cannot send the EB.
		or 1	The SLU can send the EB.
			(NOTE: The SLU will accept this BIND parameter, but will never send the EB.)
6	0	0	Reserved.
6	1	0	The PLU and the SLU cannot exchange FM headers.
6	2	1	Both the PLU and the SLU must use bracket protocols.
6	3	1	Bracket termination rule 1 is used.
6	4	0	Both the PLU and the SLU must use EBCDIC.
6	5-7	000	Reserved.

Byte	Bit	Value	Explanation
7	0-1	10	This session uses half-duplex flip-flop transmissions.
7	2	0	The PLU is responsible for error recovery.
7	3	0	The SLU is always the first speaker.
7	4-6	000	Reserved.
7	7	0	Contention is resolved in favor of the SLU.
8	0	0	Inbound pacing occurs in one stage.
8	1	0	Reserved.
8	2-7	Any	Inbound pacing count. If 000000, pacing is not used. (NOTE: Although any inbound pacing count will be accepted in the BIND, the PRIME/SNA Server will purposely limit the amount of inbound traffic per LU.)
9	0-1	00	Reserved.
9	2-7	000001 to 000111	Outbound pacing count (1-7). (NOTE: PRIME/SNA cannot have 0 outbound pacing. This might allow the PLU to send unlimited amounts of data. The pacing count should be set in the range 3 - 7.)
10		X'ab'	Maximum inbound RU size. (NOTE: The value for X'ab' must be greater than or equal to 64 bytes. Bit 0 must be 1. BINDs up to the maximum representable will be accepted, but the SLU will never send RUs greater than 1024 bytes.)
11		X'cd'	Maximum outbound RU size. (NOTE: The value for X'cd' must be greater than or equal to 64 bytes and less than or equal to 5120 bytes. If the value is set to 0, PRIME/SNA will return a negative response if it receives an RU greater than 5120 bytes.)

Byte	Bit	Value	Explanation
12		Any	Ignored by the SLU.
13		Any	Ignored by the SLU.
14		X'02'	Type 2 3270 Data Stream mode.
15	0	0	Read Partition-Query and Query Reply structured fields not supported by the SLU.
15	1-7	Any	Reserved.
16		X'00'	Reserved.
17		X'00'	Reserved.
18		X'00'	Reserved.
19		X'00'	Reserved.
20		X'01' to X'2B'	Number of rows for default screen size (1-43). This byte is meaningful only if byte 24, bits 4-7, are X'E' or X'F'.
21		X'50' or X'84'	80 columns for default screen size. 132 columns for default screen size. (NOTE: If this value is used then byte 20 must be less than or equal to X'1B'. This byte is meaningful only if byte 24, bits 4-7, are X'E' or X'F'.)
22		X'01' to X'2B'	Number of rows for alternate screen size (1-43). This byte is meaningful only if byte 24, bits 4-7, are X'F'.
23		X'50' or X'84'	80 columns for default screen size. 132 columns for alternate screen size. (NOTE: If the X'84' value is used, then byte 22 must be less than or equal to X'1B'. This byte is meaningful only if byte 24, bits 4-7, are X'F'.)

Byte	Bit	Value	Explanation
24	0	0	Reserved.
24	1-7	0000000	A default screen size of 24 x 80 is used, and no alternate screen size is used.
		or 0000010	A default screen size of 24 x 80 is used, and no alternate screen size is used.
		or 1111110	The default screen size is defined in bytes 20 and 21, and no alternate screen size is used.
		or 1111111	The default screen size is defined in bytes 20 and 21, and the alternate screen size is defined in bytes 22 and 23.
25		Any	Reserved.
26		X'00'	No cryptography options are supported.
27+		Any	Reserved.

FACT SHEET FOR LU.T3 BIND PARAMETERS ACCEPTED BY PRIME/SNA

FOR IBM HOST PERSONNEL

The following table shows in detail the BIND parameters PRIME/SNA can accept for LU.T3 3270 Data Stream printing.

LU.T3 BIND Parameters

Byte	Bit	Value	Explanation
0		X'31'	Bind command code.
1		X'01'	Nonnegotiable Bind with format 0.
2		X'03'	Function Management (FM) profile 3.
3		X'03'	Transmission services profile 3.
4	0	0	The PLU can send only single element chains.
		or 1	The PLU can send single-element or multiple-element chains.
4	1	0	The PLU uses immediate request mode.
4	2-3	01	The PLU can request only exception responses.
		or 10	The PLU can request only definite responses.
		or 11	The PLU can request definite or exception responses.
4	4-5	00	Reserved.
4	6	0	The PLU cannot send compressed data.
4	7	1	The PLU can send the EB.
5	0	1	The SLU can send single-element or multiple-element chains.
5	1	0	The SLU uses immediate request mode.

Byte	Bit	Value	Explanation
5	2-3	01	The SLU can request only exception responses.
		or 10	The SLU can request only definite responses.
		or 11	The SLU can request definite or exception responses.
5	4-5	00	Reserved.
5	6	0	The SLU cannot send compressed data.
		or 1	The SLU can send compressed data.
			(NOTE: The SLU will accept this BIND parameter but will never send compressed data.)
5	7	0	The SLU cannot send the EB.
		or 1	The SLU can send the EB.
			(NOTE: The SLU will accept this BIND parameter but will never send the EB.)
6	0	0	Reserved.
6	1	0	The PLU and the SLU cannot exchange FM headers.
6	2	1	Both the PLU and the SLU must use bracket protocols.
6	3	1	Bracket termination rule 1 is used.
6	4	0	Both the PLU and the SLU must use EBCDIC.
6	5-7	000	Reserved.
7	0-1	10	This session uses half-duplex flip-flop transmissions.
7	2	0	The PLU is responsible for error recovery.
7	3	0	The SLU is always the first speaker.
7	4-6	000	Reserved.
7	7	0	Contention is resolved in favor of the SLU.

Byte	Bit	Value	Explanation
8	0	0	Inbound pacing occurs in one stage.
8	1	0	Reserved.
8	2-7	Any	Inbound pacing count. If 000000, pacing is not used. (NOTE: Although any inbound pacing count will be accepted in the BIND, the PRIME/SNA Server will purposely limit the amount of inbound traffic per LU.)
9	0-1	00	Reserved.
9	2-7	000001 to 000111	Outbound pacing count (1-7). (NOTE: PRIME/SNA cannot have 0 outbound pacing. This might allow the PLU to send unlimited amounts of data. The pacing count should be set in the range 3 - 7.)
10		X'ab'	Maximum inbound RU size. (NOTE: The value for X'ab' must be greater than or equal to 64 bytes. Bit 0 must be 1. Binds up to the maximum representable will be accepted, but the SLU will never send RUs greater than 1024 bytes.)
11		X'cd'	Maximum outbound RU size. (NOTE: The value for X'cd' must be no less than 64 bytes and no more than 5120 bytes. If the value is set to 0, PRIME/SNA will return a negative response if it receives an RU greater than 5120 bytes.)
12		Any	Ignored by the SLU.
13		Any	Ignored by the SLU.
14		X'03'	Type 3 print function using 3270 Data Stream.

Byte	Bit	Value	Explanation
15	0	0	Read Partition-Query and Query Reply structured fields not supported by the SLU.
15	1-7	Any	Reserved.
16		X'00'	Reserved.
17		X'00'	Reserved.
18		X'00'	Reserved.
19		X'00'	Reserved.
20		X'0C'	12 rows for default print buffer size.
		or X'18'	24 rows for default print buffer size.
		or X'1B'	27 rows for default print buffer size.
		or X'20'	32 rows for default print buffer size.
		or X'2B'	43 rows for default print buffer size. This byte is meaningful only if byte 24, bits 4-7, are X'E' or X'F'.
21		X'50'	80 columns for default print buffer size.
		or X'84'	132 columns for default print buffer size. If this value is used, then byte 20 must be less than or equal to X'1B'. This byte is meaningful only if byte 24, bits 4-7, are X'E' or X'F'.
22		X'0C'	12 rows for alternate print buffer size.
		or X'18'	24 rows for alternate print buffer size.
		or X'1B'	27 rows for alternate print buffer size.
		or X'20'	32 rows for alternate print buffer size.
		or X'2B'	43 rows for alternate print buffer size. This byte is meaningful only if byte 24, bits 4-7, are X'F'.

Byte	Bit	Value	Explanation
23		X'50'	80 columns for alternate print buffer size.
		or X'84'	132 columns for alternate print buffer size. If this value is used, then byte 22 must be less than or equal to X'1B'. This byte is meaningful only if byte 24, bits 4-7, are X'F'.
24	0	0	Reserved.
24	1-7	0000000	No default print buffer size is specified, and no alternate print buffer size is used. Wrap occurs at the end of the buffer whose size is either the standard (1920 byte) or extended (3564 byte) size given in the PRIME/SNA configuration.
		or 0000010	A default print buffer size of 24 x 80 is used, and no alternate print buffer size is used.
		or 1111110	The default print buffer size is defined in bytes 20 and 21, and no alternate print buffer size is used.
		or 1111111	The default print buffer size is defined in bytes 20 and 21, and the alternate print buffer size is defined in bytes 22 and 23.
25		Any	Reserved.
26		X'00'	No cryptography options are supported.
27+		Any	Reserved.

Sources of BINDs

If the fact sheets describe what BIND parameters PRIME/SNA Interactive accepts, how does a primary logical unit specify a BIND that PRIME/SNA can accept? The primary LU needs a source of acceptable BINDs. There are two sources of BIND information a primary LU can use to formulate a BIND:

- Logon mode tables within VTAM
- Definition statements within application subsystems

Most application programs and subsystems reference VTAM's logon mode tables when acquiring secondary logical units (the application initiates the session without requiring a logon), or when accepting logons from terminal users. Application programs may use all of the information contained within a logon mode table or supplant part of the BIND information with its own material.

A few application subsystems do not use the BIND information contained within logon mode tables. Instead, they record the requirements of logical units in definition statements that are a part of the subsystem. CICS/VS is an example of an application subsystem that records the characteristics of all the logical units which can use CICS.

Logon Mode Tables

Logon mode tables contain all the BIND parameters secondary LUs can accept. Figure 6-1 shows the typical logon mode table format.

```
MODETAB <title>

MODEENT Logon Mode <name> Session Parameter Set 1
MODEENT Logon Mode <name> Session Parameter Set 2
MODEENT Logon Mode <name> Session Parameter Set 3
    .
    .
    .
MODEENT Logon Mode <name> Session Parameter Set n
MODEEND
```

Form of a Logon Mode Table
Figure 6-1

Each of the terms in Figure 6-1 is described below.

MODETAB: MODETAB gives the title of the logon mode table. IBM provides a default logon mode table for VTAM titled ISTICLM. ISTICLM contains logon mode table entries for most IBM devices found in an SNA network. The systems programmer at the IBM host site may use this MODETAB for PRIME/SNA devices by adding appropriate logon mode table entries to ISTICLM, or the programmer may create or add PRIME/SNA logon mode tables entries to other logon mode tables. If the systems programmer includes PRIME/SNA logon mode table entries in a logon mode table other than ISTICLM, the programmer will have to specify the name of that logon mode table in the LU's definition statement by using the MODETAB operand.

MODEENT: Every type of device requires a separate logon mode table entry and a unique logon mode name. Each mode table entry spells out a set of BIND parameters acceptable to secondary LUs that call for that MODEENT at session initiation. The default logon mode table entry for an IBM 3278 Model 2 would look like this:

```
D4C32782    MODEENT LOGMODE=D4C32782,FMPROF=X'03',TSPROF=X'03',
                  PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
                  RUSIZES=X'87F8',PSERVIC=X'020000000000185000007E00'
```

How does an LU call for a MODEENT? Most LUs rely on the default logon mode table entry named in the DLOGMOD operand in their LU definition statement. (The last pages of the VTAM switched node worksheet and the leased line worksheet will show what DLOGMOD will be for each PRIME/SNA LU.) When a user logs on to the host system or an application subsystem, he or she does not normally specify a logon mode table entry the LU should use for sessions; the name the systems programmer supplied to the DLOGMOD operand points to the correct logon mode table entry.

To use a different logon mode table entry when starting a session, the user specifies the MODEENT name by typing in the name of the logon mode table entry. A user might want to specify a logon mode table entry other than the default if a session requires characteristics different from that allowed with the default logon mode table entry.

MODEEND: MODEEND marks the end of a logon mode table. The next pages contain sample logon mode table entries for the different device characteristics you can specify with SNA_3270_CONFIG. Make a copy of those logon mode table entries that comply with the device characteristics you specified under the Configuring PRIME/SNA Logical Units portion of your worksheets. Append these sample MODEENTs to the package you are preparing for IBM host personnel.

Note

If you need a logical printer with both SCS and 3270 Data Stream characteristics, make sure you append a copy of both the sample LU.T1 (SCS) MODEENT and the appropriate LU.T3 MODEENT.

SAMPLE LOGON MODE TABLE ENTRY FOR
LU.T1 PRINTING (SCS)

VTAM

FOR IBM HOST PERSONNEL

Create a logon mode table entry with the following characteristics.

```
MODEENT   LOGMODE=________________,

          FMPROF=X'03',

          TSPROF=X'03',

          PRIPROT=X'B1',

          SECPROT=X'90',

          COMPROT=X'3080',

          RUSIZES=X'87C6',

          PSERVIC=X'01000000E100000000000000',

          PSNDPAC=X'0E',

          SRCVPAC=X'07',

          SSNDPAC=X'0'
```

Fill in the name you give to the logon mode table entry and note any changes you make to the MODEENT. Return a copy of this sheet to the PRIME/SNA Administrator.

SAMPLE LOGON MODE TABLE ENTRY FOR LU.T2 TERMINALS WITH 24 ROWS BY 80 COLUMNS

VTAM

FOR IBM HOST PERSONNEL

Create a logon mode table entry with the following characteristics.

```
MODEENT   LOGMODE=_______________,
          FMPROF=X'03',
          TSPROF=X'03',
          PRIPROT=X'B1',
          SECPROT=X'90',
          COMPROT=X'3080',
          RUSIZES=X'87F8',
          PSERVIC=X'020000000000185000007E00',
          PSNDPAC=X'0C',
          SRCVPAC=X'07',
          SSNDPAC=X'0',
```

Fill in the name you give to the logon mode table entry and note any changes you make to the MODEENT. Return a copy of this sheet to the PRIME/SNA Administrator.

SAMPLE LOGON MODE TABLE ENTRY FOR
LU.T2 TERMINALS WITH 24 ROWS BY 80 COLUMNS AS DEFAULT
AND 27 ROWS BY 132 COLUMNS AS ALTERNATE

VTAM

FOR IBM HOST PERSONNEL

Create a logon mode table entry with the following characteristics.

```
MODEENT   LOGMODE=________________,
          FMPROF=X'03',
          TSPROF=X'03',
          PRIPROT=X'B1',
          SECPROT=X'90',
          COMPROT=X'3080',
          RUSIZES=X'87F8',
          PSERVIC=X'020000000000185018847F00',
          PSNDPAC=X'0C',
          SRCVPAC=X'07',
          SSNDPAC=X'0',
```

Fill in the name you give to the logon mode table entry and note any changes you make to the MODEENT. Return a copy of this sheet to the PRIME/SNA Administrator.

SAMPLE LOGON MODE TABLE ENTRY FOR
LU.T3 PRINTING (3270 Data Stream)
STANDARD BUFFER SIZE ONLY

VTAM

FOR IBM HOST PERSONNEL

Create a logon mode table entry with the following characteristics.

```
MODEENT   LOGMODE=_______________,

          FMPROF=X'03',

          TSPROF=X'03',

          PRIPROT=X'B1',

          SECPROT=X'90',

          COMPROT=X'3080',

          RUSIZES=X'8787',

          PSERVIC=X'030000000000185018507F00',

          PSNDPAC=X'0C',

          SRCVPAC=X'07',

          SSNDPAC=X'0'
```

Fill in the name you give to the logon mode table entry and note any changes you make to the MODEENT. Return a copy of this sheet to the PRIME/SNA Administrator.

SAMPLE LOGON MODE TABLE ENTRY FOR
LU.T3 PRINTING (3270 Data Stream)
STANDARD BUFFER SIZE (DEFAULT)
AND EXTENDED BUFFER SIZE (ALTERNATE)

VTAM

FOR IBM HOST PERSONNEL

Create a logon mode table entry with the following characteristics.

```
MODEENT  LOGMODE=_______________,
         FMPROF=X'03',
         TSPROF=X'03',
         PRIPROT=X'B1',
         SECPROT=X'90',
         COMPROT=X'3080',
         RUSIZES=X'8787',
         PSERVIC=X'03000000000018502B507F00',
         PSNDPAC=X'0C',
         SRCVPAC=X'07',
         SSNDPAC=X'0'
```

Fill in the name you give to the logon mode table entry and note any changes you make to the MODEENT. Return a copy of this sheet to the PRIME/SNA Administrator.

Definition Statements Within Application Subsystems

Some application subsystems supplant part or all of the logon mode table entry with their own information when forming BINDs. The following information tells you how some IBM application subsystems handle BINDs.

TSO: TSO generates most of the BIND image for secondary LUs within routines inaccessible to the IBM systems programmer. TSO will take some information about data sizes and terminal characteristics from the RUSIZES and PSERVIC parameters of the logon mode table associated with the terminal device. Use the sample VTAM logon mode table entries for TSO BIND images.

CICS/VS: CICS/VS ignores the logon mode table entry as a source for BINDs and uses instead its own Terminal Control Tables (TCTs). Every LU using CICS must have its own TCT. If you plan to use CICS with PRIME/SNA, CICS programmers at the IBM host site will want to know what DFHTCT macro instructions and values PRIME/SNA supports. In your package of information for IBM Host personnel, include copies of the CICS/VS PROGRAMMER'S FACT SHEET (which follows) and also include copies of the sample terminal control tables in your package of information headed for IBM host personnel.

CICS/VS PROGRAMMER'S FACT SHEET

FOR CICS/VS PROGRAMMER

You can use the following DFHTCT macro instructions and values to describe PRIME/SNA logical units.

TYPE=TERMINAL	
TRMTYPE=SCSPRT	(for LU.T1 logical units)
=LUTYPE2	(for LU.T2 logical units)
=LUTYPE3	(for LU.T3 logical units)
ACCMETH=VTAM	
BUFFER=______	(The buffer size for outbound data should be between 64 and 5120 bytes for all PRIME/SNA logical units.)

Note

If you code BUFFER=0, PRIME/SNA will accept RUs up to 5120 bytes in length. If PRIME/SNA receives an RU greater than 5120 bytes, PRIME/SNA will return a negative response for that RU.

DEFSCRN=(24,80)	(for LU.T2 and LU.T3 logical units)
ALTSCRN=(27,132)	(for LU.T2 and LU.T3 logical units)
TRMMODL=2	(for LU.T2 and LU.T3 logical units)
ERRATT=NO	(for all PRIME/SNA logical units)
=(LASTLINE,INTENSIFY)	(for LU.T2 logical units)
FEATURE=AUDALARM	(for LU.T2 logical units)
=DCKYBD	(for LU.T2 logical units)
=3270E	(for LU.T2 and LU.T3 logical units)

Note

PRIME/SNA LU.T2 logical units do not support the COLOR, EXTDS, HILIGHT, and APLKYBD features of the 3270 Information Display System.

BRACKET=YES	(for all PRIME/SNA logical units)
CHNASSY=YES	(for all PRIME/SNA logical units)
CLASS=HARDCOPY	(for LU.T1 logical units)
RUSIZE=______	(The buffer size for inbound data should be no less than 64 or no greater than 2048 bytes for all PRIME/SNA logical units. PRIME/SNA will never send RUs greater than 2048 bytes in length to CICS/VS.)
HF=NO	(for LU.T1 logical units)
=YES	(for LU.T1 logical units)
VF=NO	(for LU.T1 logical units)
=YES	(for LU.T1 logical units)

SAMPLE TERMINAL CONTROL TABLE FOR LU.T1 PRINTING (SCS)

CICS

FOR CICS/VS PROGRAMMER

Create TCTs with the following characteristics.

```
DFHTCT    TYPE=TERMINAL,
          TRMTYPE=SCSPRT,
          TRMIDNT=__________,
          ACCMETH=VTAM,
          BRACKET=YES,
          BUFFER=256,
          CHNASSY=YES,
          CLASS=HARDCOPY,
          ERRATT=NO,
          FF=YES,
          GMMSG=NO,
          HF=YES,
          NETNAME=____________________,
          RELREQ=YES,
          TCTUAL=32
```

Note any changes you make to the TCT and the NETNAMEs of LUs with those characteristics.

The LUs with this type of TCT have the following NETNAMEs:

______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________

Send a copy of this sheet back to the PRIME/SNA Administrator.

SAMPLE TERMINAL CONTROL TABLE FOR
LU.T2 TERMINALS WITH 24 ROWS BY 80 COLUMNS

CICS

FOR CICS/VS PROGRAMMER

Create TCTs with the following characteristics.

```
DFHTCT    TYPE=TERMINAL,
          TRMTYPE=LUTYPE2,
          TRMIDNT=____________,
          ACCMETH=VTAM,
          BUFFER=1536,
          DEFSCRN=(24,80),
          TRMMODL=2
          ERRATT=(LASTLINE,INTENSIFY),
          FEATURE=(AUDALARM,DCKYBD),
          GMMSG=YES,
          RELREQ=(YES,YES),
          NETNAME=____________________,
          BRACKET=YES,
          CHNASSY=YES,
          RUSIZE=256,
          TCTUAL=32,
          TIOAL=(300,2048),
          TRMSTAT=(INTLOG,TRANSCEIVE)
```

Note any changes you make to the TCT and the NETNAMEs of LUs with those characteristics.

The LUs with this type of TCT have the following NETNAMEs:

______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________

Send a copy of this sheet back to the PRIME/SNA Administrator.

SAMPLE TERMINAL CONTROL TABLE FOR LU.T2 TERMINALS WITH 24 ROWS BY 80 COLUMNS (DEFAULT) AND 27 ROWS BY 132 COLUMNS (ALTERNATE)

CICS

FOR CICS/VS PROGRAMMER

Create TCTs with the following characteristics.

```
DFHTCT    TYPE=TERMINAL,
          TRMTYPE=LUTYPE2,
          TRMIDNT=____________,
          ACCMETH=VTAM,
          BUFFER=1536,
          DEFSCRN=(24,80),
          ALTSCRN=(27,132),
          TRMMODL=2
          ERRATT=(LASTLINE,INTENSIFY),
          FEATURE=(AUDALARM,DCKYBD),
          GMMSG=YES,
          RELREQ=(YES,YES),
          NETNAME=____________________,
          BRACKET=YES,
          CHNASSY=YES,
          RUSIZE=256,
          TCTUAL=32,
          TIOAL=(300,2048),
          TRMSTAT=(INTLOG,TRANSCEIVE)
```

Note any changes you make to the TCT and the NETNAMEs of LUs with those characteristics.

The LUs with this type of TCT have the following NETNAMEs:

______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________

Send a copy of this sheet back to the PRIME/SNA Administrator.

SAMPLE TERMINAL CONTROL TABLE FOR LU.T3 PRINTING (3270 Data Stream) STANDARD BUFFER SIZE ONLY

CICS

FOR CICS/VS PROGRAMMER

Create TCTs with the following characteristics.

```
DFHTCT    TYPE=TERMINAL,
          TRMTYPE=LUTYPE3,
          TRMIDNT=__________,
          ACCMETH=VTAM,
          BUFFER=256,
          DEFSCRN=(24,80),
          TRMMODL=2,
          GMMSG=NO,
          RELREQ=(YES,YES),
          NETNAME=_____________________,
          BRACKET=YES,
          CHNASSY=YES,
          RUSIZE=256,
          ERRATT=NO,
          TCTUAL=32,
          TIOAL=(300,2048),
          TRMSTAT=(INTLOG,TRANSCEIVE)
```

Note any changes you make to the TCT and the NETNAMEs of LUs with those characteristics.

The LUs with this type of TCT have the following NETNAMEs:

________	________	________	________
________	________	________	________
________	________	________	________
________	________	________	________
________	________	________	________
________	________	________	________
________	________	________	________

Send a copy of this sheet back to the PRIME/SNA Administrator.

SAMPLE TERMINAL CONTROL TABLE FOR
LU.T3 PRINTING (3270 Data Stream)
STANDARD BUFFER SIZE (DEFAULT)
EXTENDED BUFFER SIZE (ALTERNATE)

CICS

FOR CICS/VS PROGRAMMER

Create TCTs with the following characteristics.

```
DFHTCT    TYPE=TERMINAL,
          TRMTYPE=LUTYPE3,
          TRMIDNT=__________,
          ACCMETH=VTAM,
          BUFFER=256,
          DEFSCRN=(24,80),
          ALTSCRN=(27,132),
          TRMMODL=2,
          GMMSG=NO,
          RELREQ=(YES,YES),
          NETNAME=______________________,
          BRACKET=YES,
          CHNASSY=YES,
          RUSIZE=256,
          ERRATT=NO,
          TCTUAL=32,
          TIOAL=(300,2048),
          TRMSTAT=(INTLOG,TRANSCEIVE)
```

Note any changes you make to the TCT and the NETNAMEs of LUs with those characteristics.

The LUs with this type of TCT have the following NETNAMEs:

Send a copy of this sheet back to the PRIME/SNA Administrator.

PREPARING YOUR PACKAGE FOR IBM HOST PERSONNEL

At this point, you have covered all the information you need to present to IBM host personnel. Use the following checklists to make sure that you have included all the worksheets for PRIME/SNA resources located on switched lines and leased lines.

SWITCHED LINE CHECKLIST

[ ] Have you made copies of the Switched Line Worksheet for all the dial connections you plan to make?

[ ] Have you reviewed your switched line needs and prepared packages for all the locations you will connect with?

[ ] Have you made copies of the VTAM Switched Node Worksheet for all your remote system connections on switched lines?

[ ] Have you included the right VTAM switched node worksheet in the package you are sending to different locations?

[ ] Have you specified your terminal and logical printer needs for the system programmer?

[ ] Have you included BIND Parameter Fact Sheets in each of your packages?

[ ] Have you included the Sample Logon Mode Table Entries for your terminals and logical printers

[ ] If you are using CICS/VS, have you included the CICS Programmer's Fact Sheet?

[ ] Have you included sample TCTs for your devices.

LEASED LINE CHECKLIST

[ ] Have you made a copy of the Leased Line Worksheet and reviewed the information for each of your leased lines?

[ ] Have you made copies of the second, third and fourth pages of the Leased Line Worksheet for each remote system connection on a leased line?

[ ] Have you specified your terminal and logical printer needs for the systems programmers?

[ ] Have you included BIND Parameter Fact Sheets in each of your packages?

[ ] Have you included the Sample Logon Mode Table Entries for your terminals and logical printers?

[ ] If your are using CICS/VS, have you included the CICS Programmer's Fact Sheet?

[ ] Have you included sample TCTs for your devices?

7

Converting to PRIME/SNA Configurations

INTRODUCTION

This chapter tells you how to convert the filled-in worksheets from IBM host personnel into PRIME/SNA configurations. There are three parts to the chapter. The first deals with PRIME/SNA resources residing on switched lines. You will learn how to translate your IBM NCP line and VTAM PU and LU definitions into formats accepted by Prime's Server configurator, SNA_SERVER_CONFIG. The second part shows you how to perform the same task for PRIME/SNA resources on leased lines. The third part shows you how to assign device characteristics to PRIME/SNA logical units.

After you finish this chapter you will be able to sit down with PRIME/SNA's SNA_SERVER_CONFIG and SNA_SERVER_CONFIG and enter the required data in a straightforward fashion.

SWITCHED LINES

Before you begin this section, take a moment to look over the switched line worksheet. Did the systems programmer at the IBM host select values for the SPEED, CLOCKNG, NRZI, and AUTO operands that work with your modem? If not, or if you anticipate other problems, speak to your contact person at the IBM host.

If you are using the same switched line to connect to different SSCPs and hosts, make sure that host personnel sent back all the switched line worksheets for the line. The values for SPEED, CLOCKNG, NRZI, and AUTO operands should be the same from worksheet to worksheet.

Translating NCP Parameters

The next three pages show you an example of a filled-in worksheet from IBM host personnel, a filled-in SNA_SERVER_CONFIG line worksheet for the same example, and a blank worksheet you can copy for your own switched lines. Explanatory text follows the blank SNA_SERVER_CONFIG line worksheet.

WORKSHEET FOR SWITCHED LINES
NCP

Page 21

FOR PRIME/SNA ADMINISTRATOR ONLY

Line BOS - NYC of Line Group NORTHEAST

Line# (octal) '300 on ICS2 Controller '10

FOR IBM HOST PERSONNEL: Configure the NCP Group, Line, or PU macros with the operands specified, or fill in the operand that you select or that NCP takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

*DIAL=YES This is meant to be a switched link.

LNCTL=SDLC This is an SDLC link.

REPLYTO= 1.1 What is the timeout value for the link?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate the link when NCP is brought up?

*SPEED= 4800 What is the speed of this link in bps?

DUPLEX=HALF Switched links are half-duplex.

*CLOCKNG=INT|EXT Will the clocking on this line come from the IBM communications controller?

NRZI=YES|NO Does this link use NRZI encoding?

RETRIES=(15 , 3 , 2) How will NCP handle errors on the link?

CALL=IN|OUT|INOUT (VTAM-only) How will the secondary station establish a connection on the link?

*AUTO=? Does this link have an automatic calling unit? (Yes No)

REDIAL=(10 , 3 , 5) How should the automatic calling unit attempt dial error recovery?

PUTYPE=2 or (1,2) This link must be able to handle a Type 2 physical unit.

MAXLU= 8 How many LU-LU sessions will NCP allow on this link?

* Indicates a value matched in PRIME/SNA SNA_SERVER_CONFIG.

Page 28

WORKSHEET FOR SNA_SERVER_CONFIG
SWITCHED LINES

What is the name of this line? BOS/NYC

What is the name of the group containing the line? NORTHEAST

What is the controller number of the ICS2 this line will use? ?/0

What is the line number (in octal) for this line? 300

Does this line use NRZI encoding? YES NO

Does this line use the V.24 (RS-232C) or V.35 interface? V.24

Does this line use half-duplex or full duplex modems? HALF

How should the Server set clocking on this line? 0

Is the connection point-to-point or multipoint? POINT-TO-POINT

Is this line leased or switched? SWITCHED

Is there an auto-answer modem on the line? YES NO

What is the line's auto-disconnect idle time? 300 seconds

Page ____

WORKSHEET FOR SNA_SERVER_CONFIG
SWITCHED LINES

What is the name of this line? ____________________

What is the name of the group containing the line? ________________

What is the controller number of the ICS2 this line will use? _______

What is the line number (in octal) for this line? __________

Does this line use NRZI encoding? YES NO

Does this line use the V.24 (RS-232C) or V.35 interface? V.24

Does this line use half-duplex or full duplex modems? HALF

How should the Server set clocking on this line? __________________

Is the connection point-to-point or multipoint? POINT-TO-POINT

Is this line leased or switched? SWITCHED

Is there an auto-answer modem on the line? YES NO

What is the line's auto-disconnect idle time? _____________________

FILLING OUT THE WORKSHEET

Line Name

Write in the name you want to give to the line. You must give this line a name with 32 characters or less. Line names must follow PRIMOS filename conventions.

Line Group

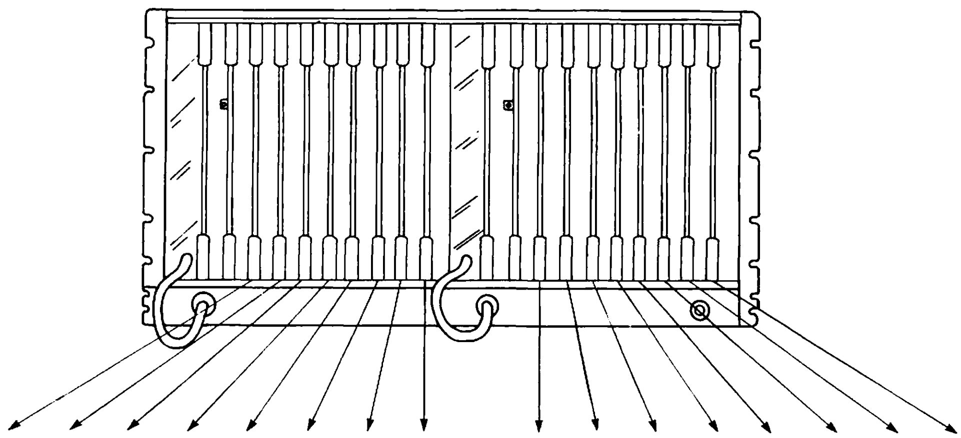
Write in the name (32 characters or less) of the line group the line belongs to. Line group names are optional. However, they help your operational staff in starting up, shutting down, and checking the status of lines. Line group names must be 32 characters or less.

ICS2 Controller Number

The ICS2 controller number identifies the ICS2 this line uses for SDLC support. The ICS2 controller number is the same as the device address used in the PRIMOS SYNC directive (octal 36, 37, 10, and 11). For more information see the Prime Administrator's Guide.

ICS2 Line Number

All your ICS2 synchronous lines should have their octal line numbers clearly labelled on the system bulkhead or on the female connectors. If your ICS2 synchronous lines are not labelled, see Figure 7-1. It shows you the relationship between a synchronous Line Adapter Cards's (LAC) position and its octal line number.



LAC #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Line # Mapping (in octal)	0	20	40	60	100	120	140	160	200	220	240	260	300	320	340	360
	4	24	44	64	104	124	144	164	204	224	244	264	304	324	344	364

Determining ICS2 Synchronous Line Numbers
Figure 7-1

To determine if the ICS2 line comes from the top or bottom of the synchronous LAC, check the female connectors on the bulkhead. The one labeled "J1" comes from the top of the LAC; "J2" comes from the bottom.

NRZI

Answer this question directly from the switched line worksheet that host personnel returned to you.

Line Interface

Switched lines always use modems and the V.24 (RS-232C) line interface.

Full Duplex or Half-duplex

Switched lines to IBM communications controllers are always half-duplex.

Clocking

If the modems on your switched line use external clocking, the systems programmer should have specified CLOCKNG=EXT. If CLOCKNG=EXT, or if the IBM communications controller is supplying transmit and receive clocking (CLOCKNG=INT), you should write in a clocking value of 0. This causes the ICS2 to take its clock signals from the line.

Connection Type

IBM switched lines are always point-to-point.

Line Type

This is a switched line.

Auto-answer Modem

If the IBM systems programmer specified CALL=OUT or CALL=INOUT, you should examine your modem to see how it handles automatic answering. Some intelligent modems respond to the Ring Indicator (RI) independent of the ICS2. If you have such a modem, circle NO.

If you have a modem that passes the Ring Indicator on to the ICS2, circle YES. The ICS2 will then handle automatic answering.

Auto-disconnect

SNA_SERVER_CONFIG allows the Server Subsystem to set a timer when the last LU-LU session on a line finishes. If another LU-LU session is not initiated before the timer expires, the Server ignores all activity on the line. This triggers the communication controller's timeout value (specified in the REPLYTO operand) and initiates the error recovery sequence called for in the RETRIES operand. After the recovery attempts by the communications controller fail, the controller will disconnect the line to the peripheral node. Select a time interval that will save you telephone costs but does not conflict with your users' needs for sessions. If you do not want the Server to attempt disconnection, write in the words LEAVE BLANK.

Note

If any of the remote system connections on a switched line have the VTAM operand DISCNT coded DISCNT=YES, write in the words LEAVE BLANK. VTAM will perform the disconnection automatically.

SWITCHED REMOTE SYSTEMS

The following pages tell you how to configure a remote system on a switched line. If you plan on using the peripheral node to contact several SSCPs or hosts, make sure the VTAM switched node worksheets that host personnel returned to you agree in their ADDR, IDNUM, and DISCNT values.

Translating VTAM Parameters

The next three pages show you an example of a filled-in worksheet from IBM host personnel, a filled-in SNA_SERVER_CONFIG remote system worksheet for the same example, and a blank worksheet you can copy for your own remote systems on switched lines. Explanatory text follows the blank SNA_SERVER_CONFIG remote system worksheet.

Page 22

WORKSHEET FOR VTAM SWITCHED NODES

FOR PRIME/SNA ADMINISTRATOR

Remote System CICS/NYC of Remote System Group 8 A.M. - START

on Line BOS-NYC of Line Group NORTHEAST

FOR IBM HOST PERSONNEL

Configure the VTAM Group, Line, or PU macros with the operands specified, or fill in the operand you select or that VTAM takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

What is the network name for this PU? PU 61723

SSCPID=00032 What is the SSCP ID of the owner of this PU?

TYPE=SWNET This is a definition of a switched node.

PUTYPE=2 This PU must be configured as a Type 2.

*ADDR=02 What is the SDLC station address for this PU?

IDBLK=FFF PRIME/SNA requires this value.

*IDNUM=CAFE 8 What is the identification number for this PU?

MAXOUT=7 How many frames will NCP send before requesting a response?

MAXDATA=265 What is the maximum amount of data NCP will send to this PU? (MAXDATA should be no less than 64 bytes and no more than 521 bytes.)

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate this PU when NCP is brought up?

*DISCNT=YES|NO (VTAM-only) Will VTAM automatically disconnect this PU when the last of its LUs finishes its session?

* Indicates a value matched in PRIME/SNA SNA_SERVER_CONFIG.

Page 29

WORKSHEET FOR SNA_SERVER_CONFIG
REMOTE SYSTEM ON A SWITCHED LINE

What is the name of the line this remote system will use? BOS-NYC

What is the name of the remote system? CICS/NYC

What is the name of the group containing this remote system? 8 A.M.-START

What is the time limit for a connect attempt? 5 minutes

Will the Server automatically attempt recovery of a connection?
YES NO

What is the local system's ID (in hexadecimal)? CAFE 8

What are the IDs of the SSCPs that will establish ownership of this remote system?

00032
00084

What is the remote system's SDLC station address? 02

What data mode will this remote system use? HALF

What are the port numbers and port names associated with this remote system?

Port Number	Port Name	Port Number	Port Name
2	LU 6172302		
3	6172303		
4	6172304		
5	6172305		
6	6172306		

Page ______

WORKSHEET FOR SNA_SERVER_CONFIG
REMOTE SYSTEM ON A SWITCHED LINE

What is the name of the line this remote system will use? ____________

What is the name of the remote system? ______________________________

What is the name of the group containing this remote system? ________

What is the time limit for a connect attempt? _______________________

Will the Server automatically attempt recovery of a connection?
YES NO

What is the local system's ID (in hexadecimal)? _____________________

What are the IDs of the SSCPs that will establish owhership of this remote system?

______________	______________	______________	______________
______________	______________	______________	______________
______________	______________	______________	______________

What is the remote system's SDLC station address? ___________________

What data mode will this remote system use? HALF

What are the port numbers and port names associated with this remote system?

Port Number	Port Name	Port Number	Port Name

FILLING OUT THE WORKSHEET

Remote System Name

Write in the name for this remote system connection. You must assign a unique name to all your remote systems. This name must be 32 characters or less and follow PRIMOS filename conventions.

Remote System Group

Write in the name (32 characters or less) of the group this remote system connection belongs to. Remote system group names are optional. However, they help your operations staff when starting, stopping, or checking the status of remote system connections.

Connect Attempt Time Limit

The Server Subsystem allows you to set an upper limit (in minutes) for attempts to establish an SSCP-PU session with your peripheral node. If the SSCP has not established a connection before the timer expires, the Server marks the connection attempt as a failure.

The connect attempt time limit serves two purposes. First, it prevents the Server from expending expensive telephone time unproductively. Second, it alerts you and your operations staff that VTAM may have marked your remote system as INACTIVE.

If the PU's ISTATUS=INACTIVE and the network operator has not issued the "VARY NET, ACT" command for your peripheral node since network startup, VTAM will regard the remote system connection with your peripheral node as INACTIVE.

A connect attempt time of one minute should be adequate for most switched lines. If the timer frequently expires, you should confer with the network operator at the IBM host site about the cause and whether a larger timer value is needed.

Connection Recovery

If the systems programmer at the IBM host specified RETRIES on the switched line worksheet with numeric values, the Server should attempt automatic recovery of the connection. In this case, circle YES.

If the programmer specified RETRIES=NONE, circle NO.

Local System ID

The local system ID for your remote system is the same as the value coded with the IDNUM operand.

SSCP IDs

List the IDs of the SSCPs that this remote system will come into contact with.

If you are using this remote system with several hosts or SSCPs, the SSCP IDs will most likely be different for every location you dial. Thus, you should gather the information from the several switched node worksheets for this remote system.

Although SNA_SERVER_CONFIG does not require you to list SSCP IDs, the Server keeps a table of the ones you enter and checks them before a connection begins. This protects your remote system from unwanted or unwarranted connections. If you decline to list any SSCP IDs for a remote system, any SSCP can establish contact with your remote system.

SDLC Station Address

Take this value from the ADDR operand.

Data Mode

IBM switched lines always operate in a half-duplex data mode.

Adding Port Numbers

The port numbers for a remote system are the same as the logical unit addresses (LOCADDRs) that the systems programmer created for the remote system. You should find a list of LOCADDRs on the third page of your VTAM switched node worksheet.

Note

> Remember that LOCADDRs and port numbers 0 and 1 are not assigned to devices associated with the Interactive Subsystem.

Adding Port Names

SNA_SERVER_CONFIG allows you to give a name to each of the logical unit ports on your remote system. This name can contain up to 32 characters or numbers and must be unique among the port names on the same remote system connection.

Note

> Prime suggests that you name a logical unit port after the network name the systems programmer assigned to the LU. This may help you identify an LU promptly when conferring with host personnel. Adding a "/CRT" or "/PRT" suffix to a network name will help you when you use SNA_SERVER_CONFIG. You will find LU network names on the third page of the switched node worksheet.

LEASED LINES

Before you begin this section, take a moment to look over the leased line worksheet. Did the systems programmer at the IBM host select values for the DUPLEX, SPEED, CLOCKNG, NRZI, and NEWSYNC operands that work with your modem? If not, or if you anticipate problems, speak to your contact person at the IBM host.

If your system is connected to a communications controller with a null modem cable and the ICS2 is supplying the connection's clock signals, make sure the programmer coded CLOCKNG=EXT.

Translating NCP Parameters

The next three pages show you an example of a filled-in worksheet from IBM host personnel, a filled-in SNA_SERVER_CONFIG line worksheet for the same example, and a blank worksheet you can copy for your own leased lines. Explanatory text follows the blank SNA_SERVER_CONFIG line worksheet.

Page 25

WORKSHEET FOR LEASED LINES
NCP and VTAM

FOR PRIME/SNA ADMINISTRATOR ONLY

Line BOS-PHILLY of Line Group NORTHEAST

Line# (octal) '304 on ICS2 Controller '10

FOR IBM HOST PERSONNEL

Configure the following NCP Group or Line macros with the operands specified, or fill in the operand you select or that NCP takes as a default. Return a copy of this worksheet to the PRIME/SNA Administrator.

What is the network name for this line? 61710

*DIAL=NO This is meant to be a nonswitched link.

LNCTL=SDLC This is an SDLC link.

REPLYTO= 1.0 What is the timeout value for the link?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate the link when NCP is brought up?

*DUPLEX=HALF|FULL What is the transmission mode for this link?

*SPEED= 9600 What is the speed of this link in bps?

Is the line interface V.24 (RS-232C) or V.35 (DDS)? V.24 V.35

*CLOCKNG=INT|EXT Will the clocking on this line come from the IBM communications controller?

*Is this line point-to-point or multipoint? Multipoint

*NRZI=YES|NO Does this link use NRZI encoding?

NEWSYNC=YES|NO Will NCP supply the NEW SYNC signal to its modem?

RETRIES=(15 , 3 , 2) How will NCP handle errors on the link?

* Indicates a value matched in PRIME/SNA SNA_SERVER_CONFIG.

Page 30

WORKSHEET FOR SNA_SERVER_CONFIG
LEASED LINES

What is the name of this line? BOS-PHILLY

What is the name of the group containing the line? NORTHEAST

What is the controller number of the ICS2 this line will use? '10

What is the line number (in octal) for this line? '304

Does this line use NRZI encoding? YES NO

Does this line use the V.24 (RS-232C) or V.35 interface? V.24 V.35

Is this line half-duplex or full duplex? HALF FULL

How should the Server set clocking on this line? 0

Is the line point-to-point or multipoint? Multipoint

Is this line leased or switched? LEASED

Is there an auto-answer modem on the line? NO

What is the line's auto-disconnect idle time? LEAVE BLANK

Page _____

WORKSHEET FOR SNA_SERVER_CONFIG
LEASED LINES

What is the name of this line? ____________________

What is the name of the group containing the line? ________________

What is the controller number of the ICS2 this line will use? _______

What is the line number (in octal) for this line? __________

Does this line use NRZI encoding? YES NO

Does this line use the V.24 (RS-232C) or V.35 interface? V.24 V.35

Is this line half-duplex or full duplex? HALF FULL

How should the Server set clocking on this line? _________________

Is the line point-to-point or multipoint? _________________________

Is this line leased or switched? LEASED

Is there an auto-answer modem on the line? NO

What is the line's auto-disconnect idle time? LEAVE BLANK

FILLING OUT THE WORKSHEET

Line Name

Write in the name you want to give to the line. You must assign a name to this line that is 32 characters or less. Line names must follow PRIMOS filename conventions.

Line Group

Write in the name (32 characters or less) of the line group the line belongs to. Line group names are optional. However, they aid your operations staff in starting up, shutting down and checking the status of lines.

ICS2 Controller Number

The ICS2 controller number identifies the ICS2 this line uses for SDLC support. The ICS2 controller number is the same as the device address used in the PRIMOS SYNC directive (octal 36, 37, 10, and 11). For more information see the Prime Administrator's Guide.

ICS2 Line Number

All your ICS2 synchronous lines should have their octal line numbers clearly labelled on the system bulkhead or on the female connectors. If your ICS2 synchronous lines are not labelled, see Figure 7-1. It shows you the relationship between a synchronous Line Adapter Cards's (LAC) position and its octal line number.

NRZI

Answer this question directly from the switched line worksheet host personnel returned to you.

Line Interface

Circle the line interface the systems programmer indicated on the leased line worksheet.

Full Duplex or Half-duplex

Check the DUPLEX operand to see if the line is full duplex or half-duplex.

Clocking

If the modems on your leased line use external clocking, the systems programmer should have specified CLOCKNG=EXT. Writing in a clocking value of 0 tells SNA_SERVER_CONFIG you have externally-clocked modems.

You should specify internal clocking only on a local point-to-point connection using a null modem cable when the IBM systems programmer has coded CLOCKNG=EXT. The ICS2 will supply clocking for the connection at one of the following speeds:

Internal Clock Rates Supported by PRIME/SNA

1200 bps	4800 bps
1800 bps	7200 bps
2400 bps	9600 bps
3600 bps	19200 bps

Note

> If you are using a null modem for a point-to-point connection, the PRIME/SNA operator must start the remote system connection before VTAM activates the line at the IBM communications controller.

If you have internally-clocked modems, CLOCKNG=INT. The IBM communications controller will supply transmit and receive clocking. Enter a value of 0 for such lines.

Connection Type

Duplicate the systems programmer's response to the point-to-point or multipoint question.

Line Type

This is a leased line.

Auto-answer Modem

This applies to switched lines only.

Auto-Disconnect

This applies to switched lines only.

LEASED REMOTE SYSTEMS

The following pages tell you how to configure a remote system connection on a leased line.

Translating NCP Parameters

The next three pages show you an example of a filled-in portion of a leased line worksheet from IBM host personnel, a filled-in SNA_SERVER_CONFIG remote system worksheet for the same example, and a blank worksheet you can copy for your remote systems on leased lines. Explanatory text follows the blank SNA_SERVER_CONFIG remote system worksheet.

Page 26

FOR PRIME/SNA ADMINISTRATOR ONLY

Remote System TSO/PHILLY of Remote System Group 8 A.M. - START

FOR IBM HOST PERSONNEL

Define a PU and fill in the operand values associated with the following Group, Line, or PU macros of NCP.

What is the network name of this PU? LU61A

*SSCPID= 00084 (VTAM-only) What is the SSCP ID of the owner of this PU? (If this PU can have more than one owner [SSCP takeovers], list the other SSCP IDs on this sheet.)
00032

*ADDR= 05 What is the SDLC station address for this PU?

MAXOUT= 7 How many frames will NCP send before requesting a response?

MAXDATA= 265 What is the maximum amount of data NCP will send to this PU? (MAXDATA should be no less than 64 bytes and no more than 521 bytes.)

PASSLIM= 7 How many consecutive frames will NCP send this PU?

PUTYPE=2 This PU must be configured as a Type 2.

IRETRY=YES|NO Will NCP immediately retry polling if it encounters a timeout?

ANS=STOP|CONT Should NCP continue to service the link even though NCP has lost contact with its access method?

*DATMODE=HALF|FULL How will NCP transmit and receive with this PU?

ISTATUS=ACTIVE|INACTIVE (VTAM-only) Will VTAM automatically activate this PU when NCP is brought up?

* Indicates a value matched in PRIME/SNA SNA_SERVER_CONFIG.

Page 32

WORKSHEET FOR SNA_SERVER_CONFIG
REMOTE SYSTEM ON A LEASED LINE

What is the name of the line this remote system will use? BOS-PHILLY

What is the name of the remote system? TSO/PHILLY

What is the name of the group containing this remote system? 8A.M.-START

What is the time limit for a connect attempt? 3 Minutes

Will the Server automatically attempt recovery of a connection?
YES NO

What is the local system's ID (in hexadecimal)? LEAVE BLANK

What are the IDs of the SSCPs that will establish ownership of this remote system?

00084
00032

What is the remote system's SDLC station address? 05

What data mode will this remote system use? HALF FULL

What are the port numbers and port names associated with this remote system?

Port Number	Port Name	Port Number	Port Name
2	LU61A02		
3	LU61A03		
4	LU61A04		
5	LU61A05		
6	LU61A06		
7	LU61A07		
8	LU61A08		

Page _____

WORKSHEET FOR SNA_SERVER_CONFIG
REMOTE SYSTEM ON A LEASED LINE

What is the name of the line this remote system will use? __________

What is the name of the remote system? ____________________________

What is the name of the group containing this remote system? _______

What is the time limit for a connect attempt? _____________________

Will the Server automatically attempt recovery of a connection?
YES NO

What is the local system's ID (in hexadecimal)? LEAVE BLANK

What are the IDs of the SSCPs that will establish ownership of this remote system?

What is the remote system's SDLC station address? _________________

What data mode will this remote system use? HALF FULL

What are the port numbers and port names associated with this remote system?

Port Number	Port Name	Port Number	Port Name

FILLING OUT THE WORKSHEET

Remote System Name

Write in the name of this remote system. You must assign a unique name to all your remote systems. Remote system names must be 32 characters or less and follow PRIMOS filename conventions.

Remote System Group

Write in the name (32 characters or less) of the group this remote system belongs to. Remote system group names are optional. However, they help your operations staff when starting, stopping, or checking the status of remote system connections.

Connect Attempt Time Limit

The Server Subsystem allows you to set an upper limit (in minutes) for attempts to establish an SSCP-PU session with your peripheral node. If the SSCP has not established a connection before the timer expires, the Server marks the connection attempt as a failure.

Unless the line is experiencing difficulties or there is a configuration mismatch, the connect attempt time limit can alert you and your operations staff that VTAM may have marked your remote system as INACTIVE.

VTAM will mark your remote system connection inactive in the following circumstances:

- The PU's ISTATUS=INACTIVE and the network operator has not issued the "VARY NET, ACT" command for your peripheral node since network startup.
- VTAM attempted to activate your peripheral node before you started PRIME/SNA and failed. The RETRIES operand specifies if and how long VTAM will attempt to contact your peripheral node before marking the resource as INACTIVE.

A connect attempt time limit under ten minutes should be adequate for most leased lines. If the timer expires frequently, you should confer with the network operator at the IBM host site about the cause and whether a larger timer value is needed.

Connection Recovery

If the systems programmer at the IBM host specified RETRIES on the switched line worksheet with numeric values, the server should attempt automatic recovery of the connection. In this case, circle YES.

If the programmer specified RETRIES=NONE, circle NO.

Local System ID

Local system IDs do not apply to peripheral nodes on leased lines.

SSCP IDs

List the IDs of the SSCPs that this peripheral node will come into contact with.

If your peripheral node is subject to an SSCP takeover (replacing a communication controller's owner), you should list all the SSCP IDs of potential owners. If the systems programmer coded the operand ANS as ANS=CONT, this is a good clue that your remote system might be subject to an SSCP takeover.

Although SNA_SERVER_CONFIG does not require you to list SSCP IDs, the Server keeps a table of the ones you enter and checks them before a connection commences. This protects your peripheral node from unwanted or unwarranted connections. If you decline to list any SSCP IDs for a remote system, any SSCP can establish contact with this peripheral node.

SDLC Station Address

Take this value from the ADDR operand.

Data Mode

Answer this question from the value specified with the DATMODE operand.

Adding Port Numbers

The port numbers for a peripheral node are the same as the logical unit addresses (LOCADDRs) the systems programmer created for the peripheral node. You should find a list of LOCADDRs on th third page of your switched node worksheet.

Note

Remember that LOCADDRs and port numbers 0 and 1 are not assigned to your Interactive Subsystem devices.

Adding Port Names

SNA_SERVER_CONFIG allows you to give a name to each of the logical unit ports on your peripheral node. This name can contain up to 32 characters or numbers and must be unique among the PRIME/SNA port names on a remote system connection.

Note

Prime suggests that you name a logical unit port after the network name the systems programmer assigned to the LU. This may help you identify an LU promptly when conferring with host personnel. Adding a "/CRT" or "/PRT" suffix to a network name will help you when you use SNA_SERVER_CONFIG. You will find LU network names on the third page of the switched node worksheet.

ASSIGNING DEVICE CHARACTERISTICS

PRIME/SNA requires you to describe the characteristics of a logical unit port to the PRIME/SNA Interactive Subsystem. There are two types of devices, terminals (CRTs) and logical printers. Both device types are handled similarly by SNA_3270_CONFIG.

Be aware that the device characteristics you select for a logical unit port determine in part whether PRIME/SNA will accept a BIND for the port. The following material will guide you in selecting characteristics for your devices.

CRTs

Because SNA_3270_CONFIG requires you to configure LU ports individually, you may want to copy the worksheet below for use with your CRT devices. Explanatory text follows the worksheet.

Page _____

WORKSHEET FOR SNA_3270_CONFIG
CRT DEVICES

What is the port number associated with this device? ______________

What is the name of the device? ______________________________

What is the name of the CRT's device group? ____________________

What is the remote system group name of this CRT? ________________

What is the device type? CRT

What is the CRT's default screen size? ____x_____

What is the CRT's alternate screen size? ____x_____

Will this CRT use local copy? YES NO

Are there any spooler options? (list) _________________________

Will this CRT be able to copy screens to files? YES NO

What will the default pathname be for those files? _______________

Port Number

The port number matches the port number in SNA_SERVER_CONFIG.

Device Name

You can assign a name of up to 32 characters to this CRT, or use the default name supplied from the logical unit port name. Because a user can request a particular terminal by name with the SNADSC command, the device name may be important if the CRT has unique characteristics.

Note

You may want to give a CRT a distinctive name and not identify it with a particular device group (see below). Some of the reasons for doing this include:

- The CRT's screen sizes are unique.
- The CRT has special privileges for screen copying.
- The CRT has access to a specific application subsystem, such as CICS/VS.
- The CRT's user needs guaranteed access to the terminal. (Check your application worksheet for guaranteed users' names.)
- The application will initiate sessions with the CRT. (Check the LOGAPPL operand on the worksheets returned by host personnel.)

A distinctive name for a device might be a person's name (Ed_Larsen) or an application program (TSO).

Device Group Name

A device group name is used to identify a collection of devices. Terminal users can request sessions with the SNADSC command and specify a device group name. PRIME/SNA Interactive will link them up with the first available CRT in the device group.

Note

Because PRIME/SNA Interactive selects the first available CRT when a user issues the SNADSC <device group name> command, all CRTs in a device group should share the same characteristics. Device group names must differ from device names.

Remote System Group Name

If you assigned this device's remote system to a remote system group with SNA_SERVER_CONFIG, SNA_3270_CONFIG will automatically assign the device to that remote system group. You can specify a remote system group name when starting and stopping devices with the SNA_3270 command.

Device Type

This device is a CRT.

Default Screen Size

The default screen size should correspond to the default screen size specified in the default logon mode table entry and the terminal control table (CICS/VS users only). The default screen size will be 24x80.

Alternate Screen Size

If the systems programmer created an alternate screen size for this terminal in the default logon mode table entry or CICS/VS terminal control table, write in the alternate screen size. Alternate screen sizes should be 27x132. If a CRT only uses a single screen size, specify the same screen size you selected for the default screen size.

Local Copy

PRIME/SNA allows you to restrict copies made of screens on a terminal-by-terminal basis. This can help you prevent unwarranted copying of confidential records.

Spooler Options

Specify the PRIMOS spool options and their arguments that a CRT will use. Valid spool options include:

-AS <alias>

-AT <destination>

-COPIES <number>

-DEFER <time>

-FORM <type>

-LNUM (This option numbers each print line.)

-NOHEAD (This option deletes header and trailer pages.)

Copy to File

Users can also copy the contents of screens to files. You can restrict this ability on a terminal-by-terminal basis for security reasons.

File Pathname

Give the full PRIMOS file pathname that the CRT will use as a default. If you do not specify the full PRIMOS pathname, PRIME/SNA Interactive will create a screen copy file relative to the user's last attach point before entering SNADSC.

Screen copy files append the last copy request to earlier requests.

LOGICAL PRINTERS

Use copies of the following worksheet to record the options you want to use with your logical printers.

Page _____

WORKSHEET FOR SNA_3270_CONFIG
PRINTER DEVICES

What is the port number associated with this device? ______________

What is the name of the device? ______________________________

What is the name of the printer's device group? ______________

What is the remote system group name of this printer? ______________

What is the device type? PRINTER

What type of data streams will this printer handle?

[ ] 3270DS [ ] SCS [ ] Both 3270DS and SCS

For 3270DS Printing:

What is the default buffer size? STANDARD EXTENDED

What is the alternate buffer size? STANDARD EXTENDED

Port Number

The port number matches the port number in SNA_SERVER_CONFIG.

Device Name

You can assign a name of up to 32 characters to this logical printer, or use the default name supplied from the logical unit port name. Because a print operator can request a particular logical printer by name with the SNA_PRINT command, the device name may be important if the logical printer has unique characteristics.

Note

> If the logical printer has unique characteristics (SCS printing, 3270 Data Stream buffer sizes, access to CICS/VS, and so on) you may want to give it a distinctive name and not identify it with a particular device group (see below). A distinctive name might be a linked to an application program (CICS.PRINT).

Device Group Name

A device group name is used to identify a collection of devices. Print operators can request sessions with the first available logical printer in a device group.

Note

> Because PRIME/SNA Interactive selects the first available logical printer, all the logical printers in a device group should share the same characteristics. Device group names must differ from device names.

Remote System Group Name

If you assigned this device's remote system to a remote system group with SNA_SERVER_CONFIG, SNA_3270_CONFIG will automatically assign the device to that remote system group. You can specify a remote system group name when starting and stopping devices with the SNA_3270 command.

Device Type

This is a printer.

Data Streams

In order to determine whether this logical printer should accept the SCS Data Stream, the 3270 Data Stream (3270DS), or both, consult with host personnel.

3270 Data Stream Buffer Sizes

If this logical printer will use the 3270 Data Stream exclusively or alternate 3270DS with SCS printing, you need to specify the logical printer's buffer sizes. Table 7-1 shows the printout size for each buffer:

Table 7-1
Printer Buffer Sizes

Buffer Size	Rows	Columns	Characters
STANDARD	12	80	960
	24	80	1920
EXTENDED	32	80	2560
	43	80	3440
	27	132	3564

Default Buffer Size: The default buffer size should conform to the size specified in the default logon mode table entry and the terminal control table (CICS/VS users only).

Alternate Buffer Size: The alternate buffer size should conform to the size specified in the logon mode table entry or the terminal control table within CICS/VS. If the logical printer has only one buffer size, repeat the entry under the default buffer size.

THE NEXT STEP

Now you have assembled all the information you need to configure PRIME/SNA remote systems and devices. The next three chapters will show you how to install PRIME/SNA software and how to use the SNA_SERVER_CONFIG and SNA_3270_CONFIG.

PART III

Implementing Your PRIME/SNA Configuration

8
Installing PRIME/SNA

Installation of PRIME/SNA involves the following actions:

- Installing a synchronous-capable ICS2 (with synchronous LACs)
- Installing PRIME/SNA software
- Modifying selected PRIMOS CONFIG directives
- Modifying PRIMOS.COMI
- Setting access rights required by PRIME/SNA software
- Providing security for SNA configuration file(s)
- Setting access rights for PRIME/SNA Administrators and operators
- Providing additional security (optional)
- Preparing for Printer Emulation

INSTALLING AN ICS2

PRIME/SNA requires that an ICS2 be installed on your PRIME system. PRIME/SNA supports only one ICS2. This ICS2 requires at least one synchronous LAC to run PRIME/SNA.

There are two types of synchronous LACS: one for the RS232 interface and one for the V.35 interface. Each LAC has two lines that may be configured for use by PRIME/SNA in the PRIME/SNA Server configuration file.

INSTALLING PRIME/SNA SOFTWARE

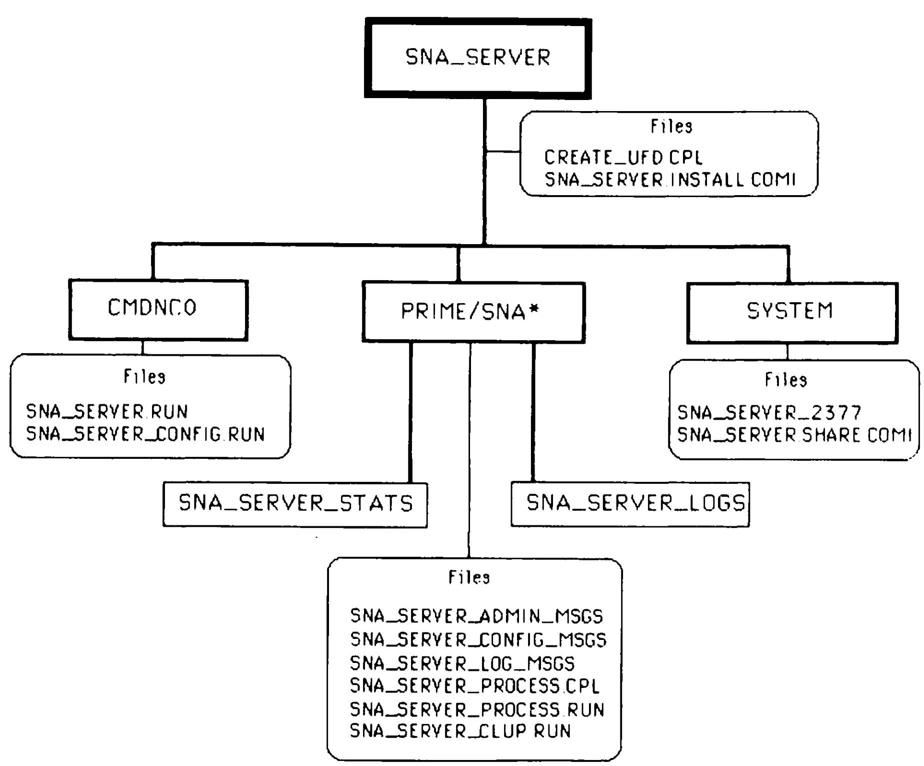
When you purchase the PRIME/SNA Server Subsystem and the PRIME/SNA Interactive Subsystem, two install UFDs are provided on tape: SNA_SERVER and SNA_INTERACTIVE.

Copy these UFDs to your system using the PRIMOS MAGRST command.

Within the install UFDs are install, share, and UFD creation files (shown in Figures 8-1 and 8-2). Run the appropriate INSTALL.COMI file to install the PRIME/SNA Server and Interactive Subsystems software. Examples of installation output are provided in the following sections.

SNA_SERVER

Figure 8-1 illustrates the contents of the SNA_SERVER installation UFD.



The SNA_SERVER Installation UFD
Figure 8-1

The SNA_SERVER directory contains the PRIME/SNA Server Subsystem software and installation files. SNA_SERVER contains three subdirectories and two installation files. The installation files, listed below, are involved in the installation of PRIME/SNA software:

SNA_SERVER.INSTALL.COMI

CREATE_UFD.CPL

SNA_SERVER.INSTALL.COMI runs CREATE_UFD.CPL, copies SNA_SERVER_2377 and SNA_SERVER.SHARE.COMI into the system directory, and copies the run files and text files required to operate the Server Subsystem to PRIME/SNA* and CMDNC0.

CREATE_UFD.CPL is invoked by the first command in the SNA_SERVER.INSTALL.COMI file. CREATE_UFD.CPL creates the PRIME/SNA* directory (if it does not exist) and the SNA_SERVER_LOGS and SNA_SERVER_STATS subdirectories (if they do not exist).

The PRIME/SNA* Directory

The PRIME/SNA* directory contains the following files:

File	Purpose
SNA_SERVER_PROCESS.CPL	Spawns the PRIME/SNA Server phantom process
SNA_SERVER_PROCESS.RUN	Is the program executed by the Server phantom process
SNA_SERVER_CLUP.RUN	Cleans up the program that is executed when SNA_SERVER_PROCESS.RUN terminates abnormally
SNA_SERVER_CONFIG_MSGS	Contains text used by the PRIME/SNA Server Subsystem Configurator
SNA_SERVER_ADMIN_MSGS	Contains text used by the SNA_SERVER command
SNA_SERVER_LOG_MSGS	Contains text used by the Server phantom process for logging messages

After initial installation, PRIME/SNA* also contains the following subdirectories:

Subdirectory	Purpose
SNA_SERVER_LOGS	Contains como files created whenever the Server phantom is spawned (These files contain messages logged by the Server phantom.)
SNA_SERVER_STATS	Contains SNA/SDLC statistics files created by the Server phantom

The CMDNC0 Directory

After installation, the CMDNC0 directory contains the run files for the PRIME/SNA Server and the PRIME/SNA Server configurator commands: SNA_SERVER and SNA_SERVER_CONFIG.

The SYSTEM Directory

After installation, SYSTEM contains SNA_SERVER_2377 and SNA_SERVER.SHARE.COMI.

SNA_SERVER_2377 is the initial segment image to be shared by the SNA_SERVER.SHARE.COMI file at coldstart.

SNA_SERVER.SHARE.COMI shares the segment required by the PRIME/SNA Server phantom for its processing. This file must be executed at the system console prior to starting the Server or Interactive Subsystems.

Installing the Server Subsystem

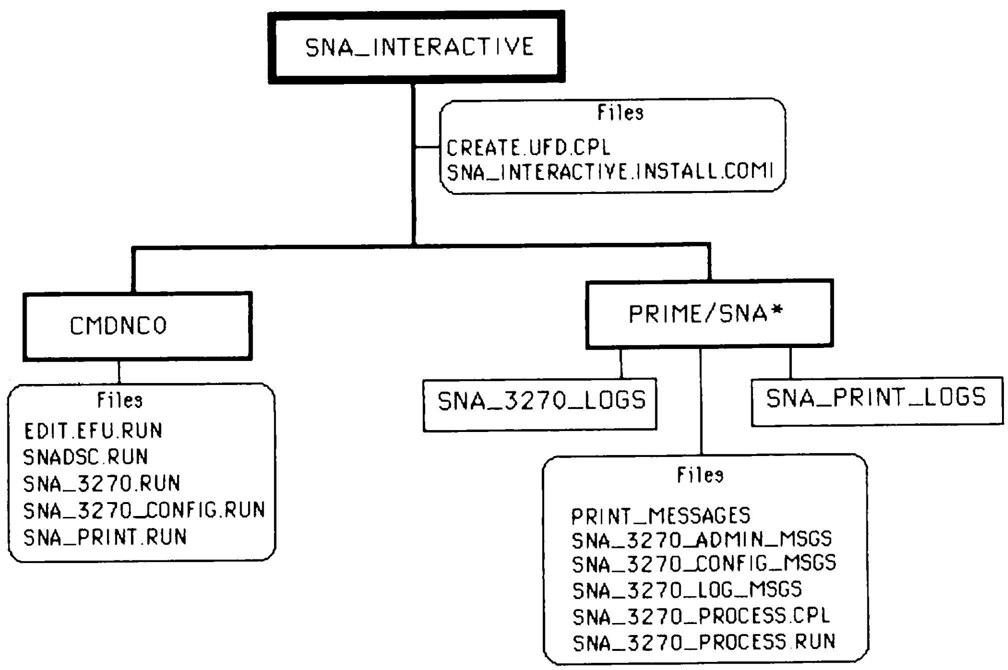
To install the PRIME/SNA Server Subsystem, attach to the SNA_SERVER installation UFD and run SNA_SERVER.INSTALL.COMI as follows:

```
OK, a sna_server
OK, co sna_server.install.comi
OK, /* SNA_SERVER.INSTALL.COMI, SNA_SERVER, SNA DEPARTMENT, 01/07/85
OK, /* Install the PRIME/SNA Server support into System Directories.
OK, /* Copyright (c) 1984, Prime Computer, Inc., Natick, MA 01760
OK, /*                     All Rights Reserved.
OK, /*
OK, /* TITLE : SNA_SERVER.INSTALL.COMI - Install the PRIME/SNA Server
OK, /*
OK, /* START-HISTORY :
OK, /*
OK, /* Date     Programmer      Description of modification
OK, /* -------- --------------- -----------------------------------------
OK, /* 01/07/85 DAVID OPPENHEIM Added SYSTEM>SNA_SERVER_2377 to copies.
OK, /* 06/18/84 CLIFF FUHRMANN  Initial coding.
OK, /*
OK, /* END-HISTORY
OK, /*
OK, /* START-DESCRIPTION :
OK, /*
OK, /* This COMI file will install the PRIME/SNA Server Product into the
OK, /* requisite system UFDs. It will also create the PRIME/SNA* Directory
OK, /* if it does not exist.
OK, /*
OK, /* END-DESCRIPTION
OK, /*
OK, /* START-CODE :
OK, /*
OK, /* Commencing install of the PRIME/SNA Server
OK, /* ******************************************
OK, /*
OK, CPL SNA_SERVER>CREATE_UFD.CPL
    ATTACH PRIME/SNA*
Top-level directory not found or inaccessible. PRIME/SNA* (ATTACH)
    ATTACH MFD XXXXXX
    CREATE PRIME/SNA*
    EDAC   PRIME/SNA*  SNA_SERVER:ALL  SNA_3270:ALL  -NQ
    ATTACH PRIME/SNA*
    CREATE SNA_SERVER_LOGS
    CREATE SNA_SERVER_STATS
    ATTACH <SRVSRC>SNA_SERVER
OK, /*
OK, COPY  SNA_SERVER>CMDNC0>@@  CMDNC0>==  -NQ -REPORT
"SNA_SERVER>CMDNC0>SNA_SERVER_CONFIG.RUN" copied to "CMDNC0>SNA_SERVER_CONFIG.RUN".
"SNA_SERVER>CMDNC0>SNA_SERVER.RUN" copied to "CMDNC0>SNA_SERVER.RUN".
OK, /*
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_LOG_MSGS    PRIME/SNA*>==
-NQ -REPORT"SNA_SERVER>PRIME/SNA*>SNA_SERVER_LOG_MSGS" copied to
"PRIME/SNA*>SNA_SERVER_LOG_MSGS".
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_ADMIN_MSGS    PRIME/SNA*>==   -NQ -REPORT
"SNA_SERVER>PRIME/SNA*>SNA_SERVER_ADMIN_MSGS" copied to "PRIME/SNA*>SNA_SERVER_ADMIN_MSGS".
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_CONFIG_MSGS    PRIME/SNA*>==  -NQ -REPORT
"SNA_SERVER>PRIME/SNA*>SNA_SERVER_CONFIG_MSGS" copied to "PRIME/SNA*>SNA_SERVER_CONFIG_MSGS".
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_PROCESS.RUN    PRIME/SNA*>==  -NQ -REPORT
"SNA_SERVER>PRIME/SNA*>SNA_SERVER_PROCESS.RUN" copied to "PRIME/SNA*>SNA_SERVER_PROCESS.RUN".
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_PROCESS.CPL    PRIME/SNA*>==  -NQ -REPORT
"SNA_SERVER>PRIME/SNA*>SNA_SERVER_PROCESS.CPL" copied to "PRIME/SNA*>SNA_SERVER_PROCESS.CPL".
OK, COPY  SNA_SERVER>PRIME/SNA*>SNA_SERVER_CLUP.RUN    PRIME/SNA*>==     -NQ -REPORT
"SNA_SERVER>PRIME/SNA*>SNA_SERVER_CLUP.RUN" copied to "PRIME/SNA*>SNA_SERVER_CLUP.RUN".
OK, COPY  SNA_SERVER>SNA_SERVER.SHARE.COMI    SYSTEM>==  -NQ -REPORT
"SNA_SERVER>SNA_SERVER.SHARE.COMI" copied to "SYSTEM>SNA_SERVER.SHARE.COMI".
OK, COPY  SNA_SERVER>SYSTEM>SNA_SERVER_2377    SYSTEM>==  -NQ -REPORT
"SNA_SERVER>SYSTEM>SNA_SERVER_2377" copied to "SYSTEM>SNA_SERVER_2377".
OK, /*
OK, /* Completed install of PRIME/SNA Server
OK, /*
OK, CO -CONTINUE 6
OK, CO -END
```

When the installation is complete, update PRIMOS.COMI to COMINPUT the SNA_SERVER.SHARE.COMI file. You should then consider the level of security necessary for your system, and set file and UFD access rights accordingly. Security measures for PRIME/SNA files and directories are described later in this chapter.

SNA_INTERACTIVE

Figure 8-2 illustrates the contents of the SNA_INTERACTIVE installation UFD.



The SNA_INTERACTIVE Installation UFD
Figure 8-2

The SNA_INTERACTIVE directory contains the PRIME/SNA Interactive Subsystem software and installation files. SNA_INTERACTIVE contains two subdirectories and two installation files. The files, listed below, are involved in the installation of PRIME/SNA software.

SNA_INTERACTIVE.INSTALL.COMI
CREATE_UFD.CPL

SNA_INTERACTIVE.INSTALL.COMI runs CREATE_UFD.CPL and copies the run files and text files required to operate the Interactive Subsystem to the PRIME/SNA* and CMDNC0 directories.

CREATE_UFD.CPL is invoked by the first command in the SNA_INTERACTIVE.INSTALL.COMI file. CREATE_UFD.CPL creates the PRIME/SNA* directory (if it does not exist) and the SNA_3270_LOGS and SNA_PRINT_LOGS subdirectories (if they do not exist).

The PRIME/SNA* Directory

The PRIME/SNA* directory contains the following files:

File	Purpose
SNA_3270_PROCESS.CPL	Spawns the PRIME/SNA 3270 process which manages PRIME/SNA Interactive sessions
SNA_3270_PROCESS.RUN	Contains the program executed by the 3270 phantom process
SNA_3270_CONFIG_MSGS	Contains text used by the PRIME/SNA Interactive Subsystem Configurator (SNA_3270_CONFIG)
SNA_3270_ADMIN_MSGS	Contains text used by the SNA_3270 command
PRINT_MESSAGES	Contains text and formatting information used by the SNA_PRINT command
SNA_3270_LOG_MSGS	Contains text used by the 3270 phantom process for logging messages

PRIME/SNA* also contains the SNA_3270_LOGS subdirectory, which contains como files created by the 3270 phantom whenever it is spawned. These como files contain messages logged by the 3270 phantom.

In addition, PRIME/SNA* contains the SNA_PRINT_LOGS subdirectory, which contains messages logged by SNA_PRINT.

The CMDNC0 Directory

After installation, CMDNC0 contains the run files for the following commands: EDIT_EFU, SNADSC, SNA_3270, SNA_3270_CONFIG, and SNA_PRINT.

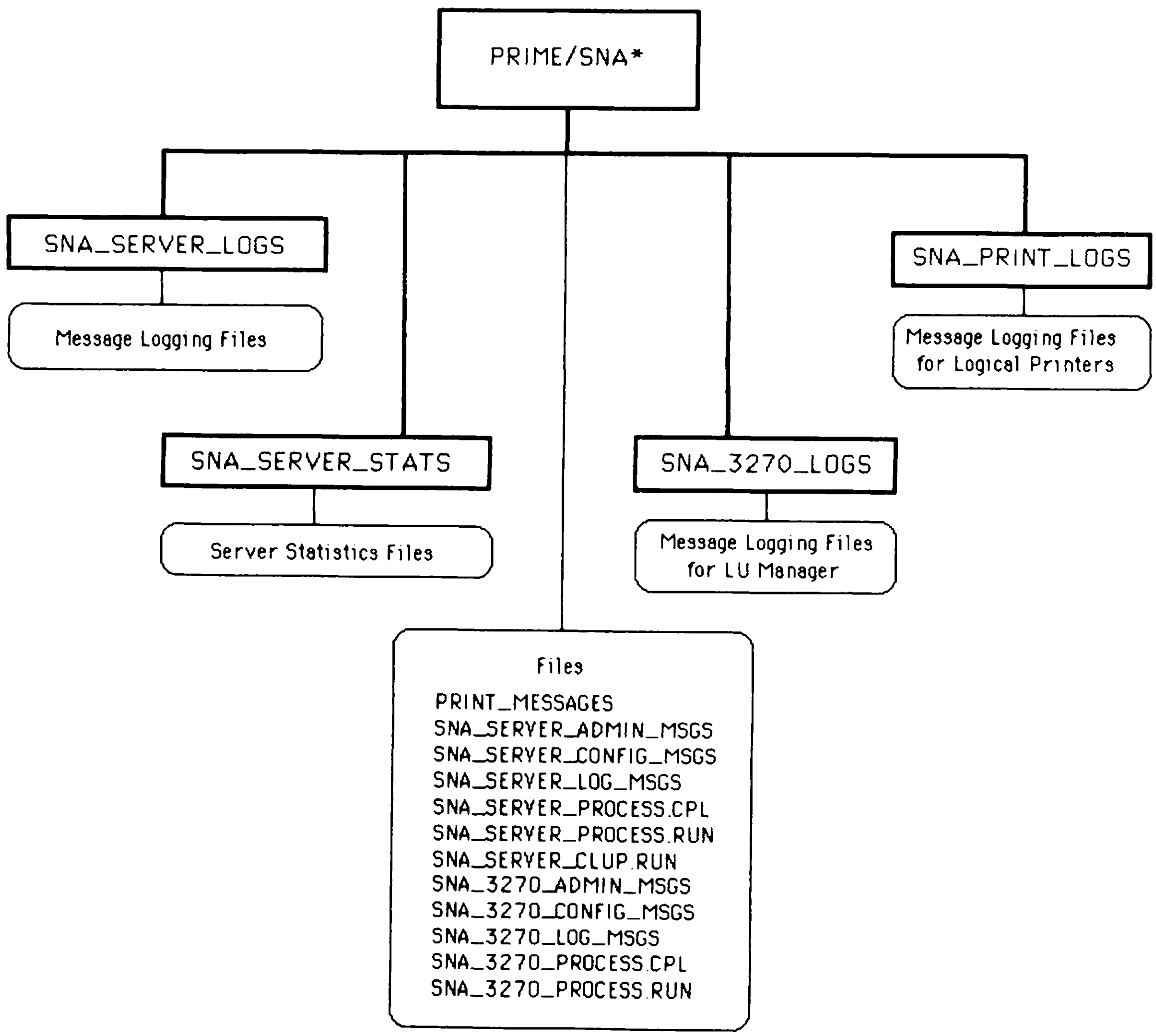
Installing the Interactive Subsystem

To install the PRIME/SNA Interactive Subsystem, run SNA_INTERACTIVE.INSTALL.COMI as follows:

```
OK, a sna_interactive
OK, co sna_interactive.install.comi
OK, /* SNA_INTERACTIVE.INSTALL.COMI, SNA_INTERACTIVE, SNA DEPARTMENT, 02/08/85
OK, /* Install PRIME/SNA Interactive into System Directories.
OK, /* Copyright (c) 1984, Prime Computer, Inc., Natick, MA 01760
OK, /*                    All Rights Reserved.
OK, /*
OK, /* TITLE : SNA_INTERACTIVE.INSTALL.COMI - Install PRIME/SNA Interactive
OK, /*
OK, /* START-HISTORY :
OK, /*
OK, /* Date     Programmer      Description of modification
OK, /* -------- --------------- ------------------------------------------
OK, /* 02/08/85 Ian Breitner    Added Admin_messages.
OK, /* 06/18/84 Ian Breitner    Initial coding.
OK, /*
OK, /* END-HISTORY
OK, /*
OK, /* START-DESCRIPTION :
OK, /*
OK, /* This COMI file will install the PRIME/SNA Interactive Product into the
OK, /* requisite system ufds. It will also create the PRIME/SNA* Directory
OK, /* if it does not exist.
OK, /*
OK, /* END-DESCRIPTION
OK, /*
OK, /* START-CODE :
OK, /*
OK, /* Commencing install of PRIME/SNA Interactive
OK, /* ******************************************
OK, /*
OK, CPL SNA_INTERACTIVE>CREATE_UFD.CPL
    ATTACH PRIME/SNA*
    CREATE SNA_3270_LOGS
    CREATE SNA_PRINT_LOGS
    ATTACH <SRVSRC>SNA_INTERACTIVE
OK, /*
OK, COPY  SNA_INTERACTIVE>CMDNC0>@@  CMDNC0>== -NQ -REPORT
"SNA_INTERACTIVE>CMDNC0>SNA_3270.RUN" copied to "CMDNC0>SNA_3270.RUN".
"SNA_INTERACTIVE>CMDNC0>SNA_3270_CONFIG.RUN" copied to "CMDNC0>SNA_3270_CONFIG.RUN".
"SNA_INTERACTIVE>CMDNC0>SNADSC.RUN" copied to "CMDNC0>SNADSC.RUN".
"SNA_INTERACTIVE>CMDNC0>EDIT_EFU.RUN" copied to "CMDNC0>EDIT_EFU.RUN".
"SNA_INTERACTIVE>CMDNC0>SNA_PRINT.RUN" copied to "CMDNC0>SNA_PRINT.RUN".
OK, /*
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_LOG_MSGS    PRIME/SNA*>==    -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_LOG_MSGS" copied to "PRIME/SNA*>SNA_3270_LOG_MSGS".
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_ADMIN_MSGS    PRIME/SNA*>== -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_ADMIN_MSGS" copied to "PRIME/SNA*>SNA_3270_ADMIN_MSGS".
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_CONFIG_MSGS    PRIME/SNA*>== -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_CONFIG_MSGS" copied to "PRIME/SNA*>SNA_3270_CONFIG_MSGS"
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_PROCESS.CPL    PRIME/SNA*>== -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_PROCESS.CPL" copied to "PRIME/SNA*>SNA_3270_PROCESS.CPL"
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_PROCESS.RUN    PRIME/SNA*>== -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>SNA_3270_PROCESS.RUN" copied to "PRIME/SNA*>SNA_3270_PROCESS.RUN"
OK, COPY  SNA_INTERACTIVE>PRIME/SNA*>PRINT_MESSAGES    PRIME/SNA*>== -NQ -REPORT
"SNA_INTERACTIVE>PRIME/SNA*>PRINT_MESSAGES" copied to "PRIME/SNA*>PRINT_MESSAGES".
OK, /*
OK, /* Completed install of PRIME/SNA Interactive
OK, /*
OK, CO -CONTINUE 6
OK, CO -END
```

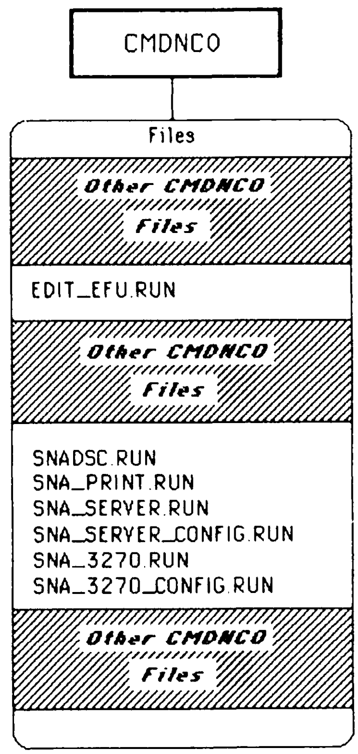
When the installation is complete, you should consider the level of security necessary for your system, and set file access rights accordingly. Security measures for PRIME/SNA files and directories are described later in this chapter.

Figure 8-3 shows the PRIME/SNA* directory after PRIME/SNA software is installed.



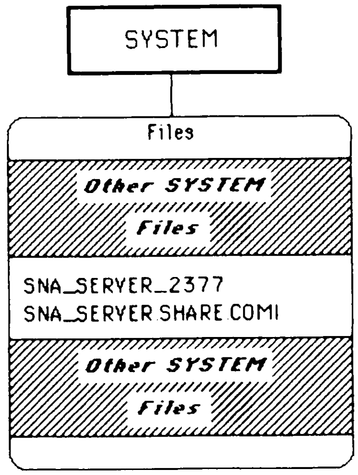
PRIME/SNA* Directory After PRIME/SNA Installation
Figure 8-3

Figure 8-4 shows the CMDNC0 directory after PRIME/SNA software is installed.



CMDNC0 Directory After PRIME/SNA Installation
Figure 8-4

Figure 8-5 shows the SYSTEM directory after PRIME/SNA software is installed.



SYSTEM Directory After PRIME/SNA Installation
Figure 8-5

NOTES ON REINSTALLING PRIME/SNA

If PRIME/SNA software is reinstalled, the SNA_SERVER_LOGS and SNA_SERVER_STATS subdirectories are not overwritten.

You should make sure of the following: that users are not using PRIME/SNA*; that the PRIME/SNA phantom processes are not running; and that no users who were previously running PRIME/SNA commands still have PRIME/SNA commands mapped into their users' space as an EPF.

If a user does have a PRIME/SNA command mapped into his or her user space when PRIME/SNA is reinstalled, PRIMOS will create RPO files. You should delete these files to conserve disk space.

One way to ensure proper reinstallation is to coldstart the system and reinstall PRIME/SNA from the system console before allowing other users to login. Alternatively, each user previously using a PRIME/SNA command can issue the Initialize Command Environment (ICE) command.

CHANGING PRIMOS CONFIG DIRECTIVES

The following PRIMOS configuration directives and commands must be changed to allow for the most efficient operation of PRIME/SNA:

- SYNC (SMLC) CNTRLR
- NPUSR
- AMLBUF

- AMLIBL
- ICS INPQSZ
- ICS INTRPT
- REMBUF
- AMLC (command)

The following sections describe only aspects of configuration directives and commands that relate to PRIME/SNA operation. Refer to the Prime System Administrator's Guide, Revision 19.4 (or later), for additional information on the configuration directives or the AMLC command.

SYNC (SMLC) CNTRLR

Use the SYNC CNTRLR configuration directive to specify the address of the ICS2 that is to run the SDLC protocol for PRIME/SNA. The SYNC directive must be specified to enable an ICS2 controller to be used for synchronous communications. The specified controller is downline loaded with support for the SDLC protocol.

The format of the SYNC CNTRLR directive is as follows:

```
SYNC CNTRLR controller-number [device-address] [protocol]
```

The logical controller number must be either 0 or 1. Giving any other number produces the error message, BAD SMLC CONTROLLER MAPPING COMMAND, during coldstart.

The device-address must be one of the following (in octal): '10, '11, '36, or '37. This is the number you define as the ICS2 controller number in the Server configuration file.

Common device addresses are:

- First ICS2 at '10
- Second ICS2 at '11
- Third ICS2 at '36
- Fourth ICS2 at '37

The protocol type that will be downline loaded must be either SDLC or ASYNC_SDLC. Use SDLC if the ICS2 will run only SDLC lines. Use ASYNC_SDLC if the ICS2 will run asynchronous and SDLC lines.

NPUSR

SNA_SERVER and SNA_3270 run as phantoms. It may be necessary for you to increase the NPUSR configuration directive by two to reflect this increase in the number of phantoms.

If you plan to run SNA_PRINT as a phantom or multiple phantoms, you may need to increase NPUSR by three or more (two for the SNA_SERVER and SNA_3270 and one or more for each SNA_PRINT phantom).

Refer to the Prime System Administrator's Guide for information on the NPUSR configuration directive.

AMLBUF

Large amounts of data are transmitted between the PRIME system and a terminal in session with a remote system. Therefore, it is possible that data sent from the terminal could be lost or that throughput to the terminal could be diminished when running the PRIME/SNA Interactive Subsystem. AMLBUF is one of several PRIMOS configuration directives and commands that you can use to control buffer sizes and flow control to the PRIME system in order to minimize data and throughput loss.

Bear in mind that when you increase buffer sizes, you also increase the amount of wired memory (which decreases the amount of memory available for other purposes). For systems which may be memory constrained, you must consider this in deciding how to increase buffer size.

The AMLBUF directive sets input, output, and DMQ buffer sizes on a per line basis. It applies to terminals connected to either AMLC, ICS1, or ICS2 controllers. The input buffer size has an effect on whether data sent to the PRIME system is lost. If the input buffer becomes full and additional data is sent by the terminal, the data will be lost. The output and DMQ buffer sizes affect the throughput obtained in sending data to the terminal.

The recommended input buffer size depends on the size of the terminal screen, as follows:

Screen Size	Input Buffer Size (in octal)
24x80 (1920 chars)	2000
27x132 (3564 chars)	4000

The recommended output buffer size depends on the bps (bits per second) rate of the line for which the buffer size is to be changed. Use the following formula to calculate the recommended output buffer size:

Output buffer size = (line bps rate / 10) / 4

Convert the result of this calculation to octal for use with the AMLBUF directive.

For example, the recommended output buffer size for a 9600 bps line is calculated as follows:

Output buffer size = (9600 / 10) / 4 = 240

Convert 240 to octal (which is '360).

The required DMQ buffer size also depends on the bps rate of the line and the interrupt rate at which the controllers are serviced. The interrupt rate for AMLC controllers is equal to the line bps rate of the last AMLC line divided by 10. The interrupt rate for ICS1 and ICS2 controllers is equal to the default of 10 or the value specified by the ICS INTRPT directive. Use the following formula to calculate the DMQ buffer size:

DMQ buffer size = (line bps rate / 10) / interrupt rate

Round the result of this calculation up to the nearest power of 2 and covert to octal.

For example, the recommended DMQ buffer size for a 9600 bps line with an interrupt rate of 30, would be calculated as follows:

DMQ buffer size = (9600 / 10) / 30 = 32

Convert 32 to octal (which is '40).

Note

AMLBUF must be used to increase the buffer sizes for any line on which a terminal will be used to run SNADSC. If a user runs SNADSC remotely, AMLBUF must be increased on the system to which the user's terminal is physically attached.

AMLIBL

The AMLIBL directive sets the size of the tumble tables for all AMLC controllers. The tumble table sizes can be increased if data sent from terminals connected to AMLC controllers is lost. If you specify a size of 0 (or no size) with the AMLIBL directive, all available memory is used. A size of 0 is recommended if your PRIME system is not constrained by a lack of memory. Otherwise, you must make a tradeoff between memory and reliability.

Note

AMLIBL must be used to increase the buffer sizes for any line on which a terminal will be used to run SNADSC. If a user runs SNADSC remotely, AMLIBL mus be increased on the system to which the user's terminal is physically attached.

ICS INPQSZ

The ICS INPQSZ directive sets the size of the input queue for ICS1 and ICS2 controllers. These input queue sizes can be increased to reduce the chance that data will be lost when sent from terminals connected to either ICS1 or ICS2 controllers. The recommended octal values are either 1777 or 777 depending on the memory constraints of your PRIME system.

ICS INTRPT

The ICS INTRPT directive sets the asynchronous line interrupt rate for ICS1 and ICS2 controllers. The recommended value is 36 (octal). Note that this corresponds to the bps rate of the last line for an AMLC controller equal to 300.

REMBUF

The REMBUF directive sets the size of input and output buffers for remote users. If users will be logging in remotely through NETLINK or remote login to use PRIME/SNA, REMBUF should be used on the local system (that is, the one running PRIME/SNA) to increase the size of the remote user input and output buffers to 1000 (octal) each.

In addition, increase the size of each remote user's input and output buffers to 1000 (octal) on any intermediate Prime system through which PRIME/SNA users will NETLINK or remotely login to the PRIME/SNA system.

AMLC

For terminals connected to ICS1 and ICS2 controllers, use the AMLC command to enable Reverse Flow Control. This allows the Prime system to direct the terminal to stop sending data until told to continue. This can prevent data loss caused by the Prime system input buffers becoming full and the terminal still sending data. To enable Reverse Flow Control, bit 11 must be set in the configuration word specified with the AMLC command.

CHANGING PRIMOS.COMI

You should add the following command to the PRIMOS.COMI file, in order that the command will be executed at coldstart:

```
CO SYSTEM>SNA_SERVER.SHARE.COMI file-unit#
```

Execution of the SNA_SERVER.SHARE.COMI file shares the segment required by the PRIME/SNA Server phantom for its processing.

Note

> Make sure that the file-unit number is different from the one executing for PRIMOS.COMI. Otherwise, execution of PRIMOS.COMI will stop after processing this command.

If you want to bring up the Server and LU Manager at coldstart, add the following commands to PRIMOS.COMI:

```
SNA_SERVER -START

SNA_3270 -START
```

Before adding these commands to PRIMOS.COMI, you should understand how they operate. There are main options and resource options that you can specify with these commands. Refer to the *PRIME/SNA Operator's Guide* for a description of how to use these commands.

SETTING ACCESS RIGHTS REQUIRED BY PRIME/SNA SOFTWARE

The Server and 3270 LU Manager, both of which run as phantom processes, require ALL access to the PRIME/SNA* directory. When setting access rights, the user ID of the Server process is SNA_SERVER; the user ID of the 3270 LU Manager is SNA_3270.

The ACL for PRIME/SNA* is set automatically when you initially install the Server and Interactive Subsystems and should look like this:

SNA_SERVER: ALL

SNA_3270: ALL

Subsequent reinstallations do not change the existing ACLs on PRIME/SNA*. Thus, if you change the access rights for SNA_SERVER and SNA_3270, a reinstallation will not reset them to ALL.

PROTECTING SERVER AND INTERACTIVE SUBSYSTEM CONFIGURATION FILES

Individual PRIME/SNA configurations are stored in SEGSAM files in the PRIME/SNA* directory. Protect these files by setting ACL rights or by specifying a directory password. It is only necessary to allow read and write access to users who are responsible for maintaining the PRIME/SNA configuration. In addition, ADD access rights in PRIME/SNA* are required by users who will create new Server configuration files. Thus you should give yourself, as a PRIME/SNA Administrator, ADD access rights.

You may want to allow operators to look at, but not edit or create, Server configuration files. Therefore, only assign them LIST, USE, and READ rights to PRIME/SNA*.

Each PRIME/SNA configuration file is a SEGSAM file consisting of a Server configuration portion and one or more Interactive configuration entries. Each Interactive entry is created and maintained using the Interactive configurator and is identified by an entry ID. A Server configuration can have several Interactive entries associated with it.

You may want to allow some users to edit the Interactive entries, but restrict their access to the Server configuration portion of the file, or vice versa. Since the SEGSAM file contains both Server and Interactive configurations, users of either configurator require access to the entire file. Thus, ACL protection on the SEGSAM file does not prevent a user from changing either part of the file.

To prevent this, protection can be placed on the configurator commands SNA_SERVER_CONFIG and SNA_3270_CONFIG (located in the system command directory CMDNC0). In this way, Interactive configurator users who are not permitted access to the SNA_SERVER_CONFIG command cannot change the Server configuration file. Conversely, Server configurator users who are not permitted access to the SNA_3270_CONFIG command cannot change the Interactive configuration portion of the file.

SETTING ACCESS RIGHTS FOR PRIME/SNA ADMINISTRATORS AND OPERATORS

PRIME/SNA Administrators (including USER 1 — the system console) require LIST, USE, and READ access to the PRIME/SNA* UFD. Do this by setting the ACL for the PRIME/SNA* UFD for the appropriate users.

In addition, register all users of the SNA_SERVER command (such as operators who will start, stop and maintain the Server) in the ACL group .SNA$. The .SNA$ ACL group is used internally by the Server as a security mechanism. Only users that are members of the ACL group can use the Server commands.

ADDITIONAL SECURITY

If you want to allow users other than the system console (USER 1) to be able to issue SNA_SERVER and SNA_3270 commands, create the following access categories (ACATs) in the PRIME/SNA* directory and grant READ access rights to the appropriate users.

ACAT	Command to be Protected
SERVER_ADMIN.ACAT	SNA_SERVER
INTERACTIVE_ADMIN_ACAT	SNA_3270

These ACATs are used internally by PRIME/SNA* software as a security mechanism.

When you create these ACATs, the system console no longer automatically has the ability to run the SNA_SERVER and SNA_3270 commands and must be granted access rights explicitly.

Note

> Individual user names must be used in these ACATs. PRIME/SNA does not allow ACL groups to be used with these ACATs.

Note that membership in the INTERACTIVE_ADMIN_ACAT does not prevent users from running the -STATUS option of the SNA_3270 command. By default, the -STATUS option of the SNA_3270 command can be run by any user. However, to run SNA_SERVER -STATUS users must be assigned to the .SNA$ group.

You may want to allow selected users to spawn the Server or 3270 LU Manager as a phantom process when they are not running. You accomplish this by placing ACL protection on the SNA_SERVER_PROCESS.CPL and SNA_3270_PROCESS.CPL files in PRIME/SNA* UFD. These files run the Server and 3270 LU Manager as a spawned phantom process. Only

Administrators with at least READ access to either can spawn the respective phantoms using the -START option.

You can restrict access to PRIME/SNA commands in CMDNC0 by setting ACLs or access categories for individual run files or by moving run files to a separate directory.

For example, some of your users will use the SNADSC command. You can restrict access to the SNADSC command by creating an ACL group such as .SNADSC_USER and giving selected users READ access rights to the command while setting REST$:NONE.

Security Implementation Checklist

Use this checklist as an aid in setting access rights for PRIME/SNA:

- Set security on the PRIME/SNA* directory to allow the Server process (user ID SNA_SERVER) and the 3270 LU Manager process (user ID SNA_3270) ALL access rights, and to allow PRIME/SNA Administrators (including the system console, if required) at least USE access.

- Use EDIT_PROFILE to register all users (other than the system console) of the SNA_SERVER command in ACL group .SNA$.

- Place ACL protection on the PRIME/SNA configuration files.

- Create access categories SERVER_ADMIN.ACAT and/or INTERACTIVE_ADMIN.ACAT in PRIME/SNA* for the SNA_SERVER and SNA_3270 commands respectively. This allows operators (other than the system console) to use the -START, -STOP, -STATISTICS, and -MESSAGE_LEVEL options.

- Place ACL protection on the SNA_SERVER_PROCESS.CPL and SNA_INTERACTIVE_PROCESS.CPL phantom files to allow spawning of the Server and 3270 LU Manager processes.

- Place ACL protection on the following CMDNC0 run files:

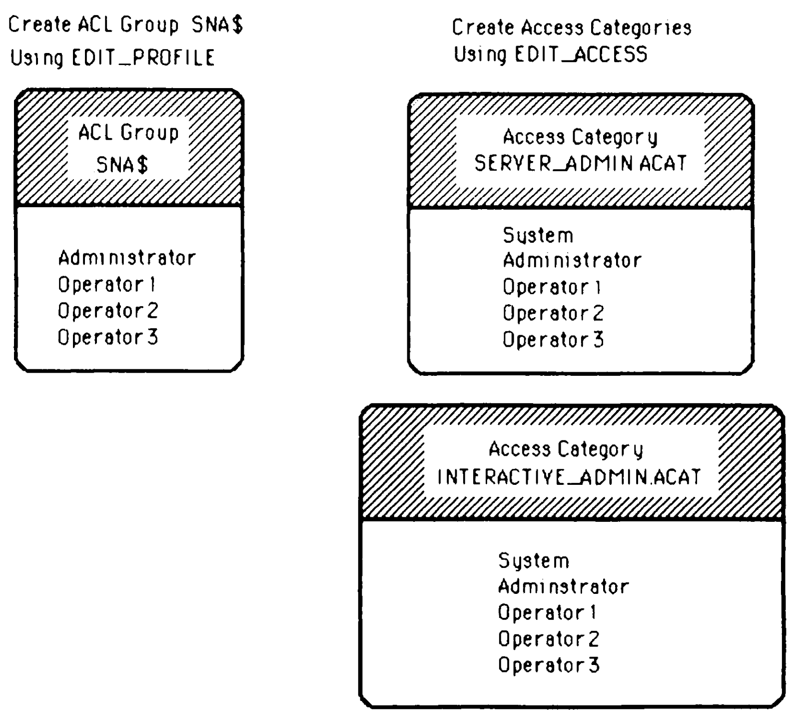
  - SNA_SERVER
  - SNA_3270
  - SNA_SERVER_CONFIG
  - SNA_3270_CONFIG
  - SNADSC
  - SNA_PRINT
  - EDIT_EFU

AN EXAMPLE OF MODERATE SECURITY

Figures 8-6 through 8-8 demonstrate a moderate security plan. In Figure 8-6, the PRIME/SNA Administrator and operators are assigned to the .SNA$ ACL group and SERVER_ADMIN.ACAT and INTERACTIVE_ADMIN.ACAT. In this plan, the Server and 3270 LU MANAGER phantom processes can be started and stopped from terminals other than the system console by both the Administrator and the operators because they are assigned to these ACATs.

Note that SYSTEM is assigned to both ACATs explicitly. Otherwise, the SNA_SERVER and SNA_3270 commands could not be run from the system console.

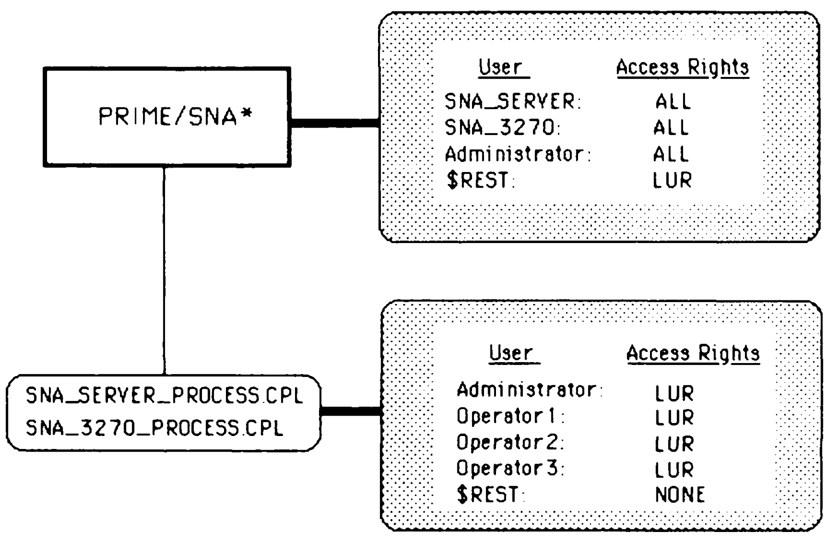
Because no other users are assigned to .SNA$, only the Administrator and operators can display the status for the Server Subsystem. However, all users can obtain the status for the 3270 LU Manager phantom process via the SNA_3270 command with the -STATUS option.



PRIME/SNA ACL Groups and ACATs - Moderate Security
Figure 8-6

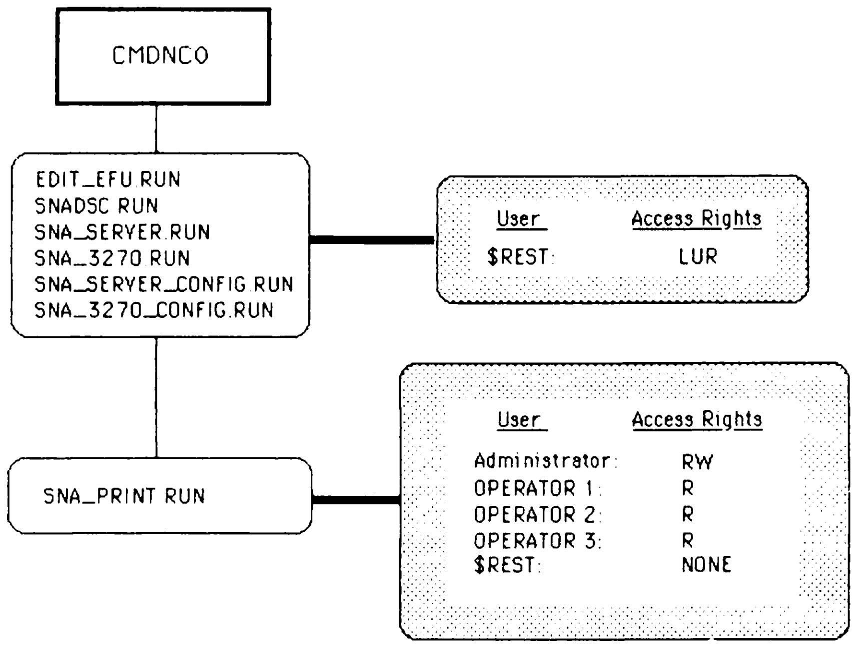
The access rights for PRIME/SNA* are shown in Figure 8-7. SNA_SERVER and SNA_3270 are allowed ALL access rights as required by PRIME/SNA software. The PRIME/SNA Administrator also is allowed ALL access. All other users are assigned LIST, USE, and READ access, which permits them to run PRIME/SNA software. However, because only the Administrator and operators have been added to the .SNA$ ACL group and to the Server and Interactive ACATs, other users are prevented from starting and stopping the Server and 3270 LU Manager phantom processes.

In addition, because they are allowed READ access to the SNA_SERVER_PROCESS.CPL and SNA_3270_PROCESS.CPL files, only the PRIME/SNA Administrator and operators can start and stop the Server and 3270 LU Manager phantom processes.



Access Rights for the PRIME/SNA* Directory - Moderate Security
Figure 8-7

As shown in Figure 8-8, users other than the Administrator and operators are prevented from using the SNA_PRINT command.



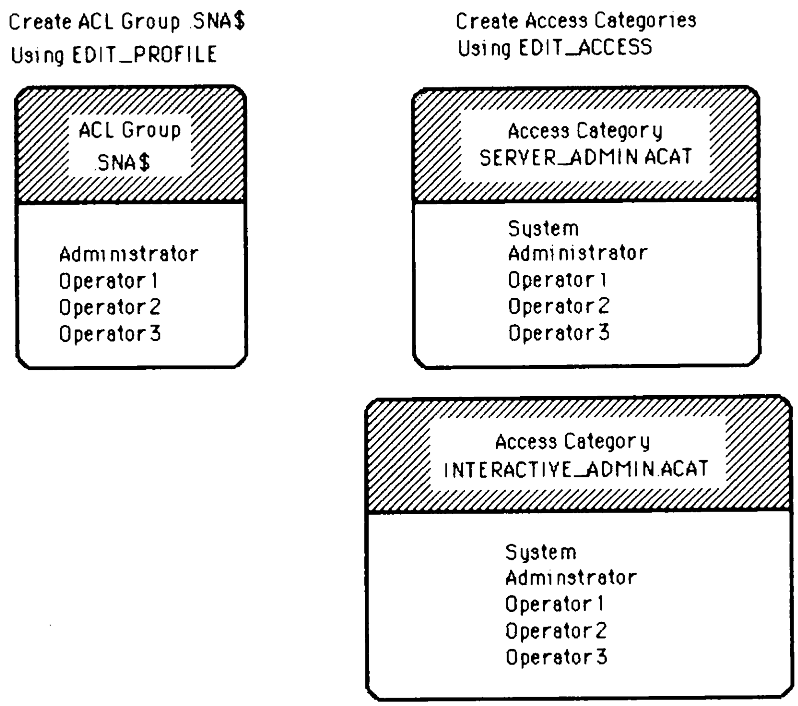
Access Rights for the CMDNCO Directory - Moderate Security
Figure 8-8

Users other than the Administrator and operators can run the following commands: EDIT_EFU, SNADSC, SNA_SERVER_CONFIG, and SNA_3270_CONFIG. They also can invoke the SNA_SERVER and SNA_3270 commands, but, because they are not members of the Server and Interactive ACATs, they do not have sufficient privilege to start and stop the Server or 3270 LU Manager phantom processes.

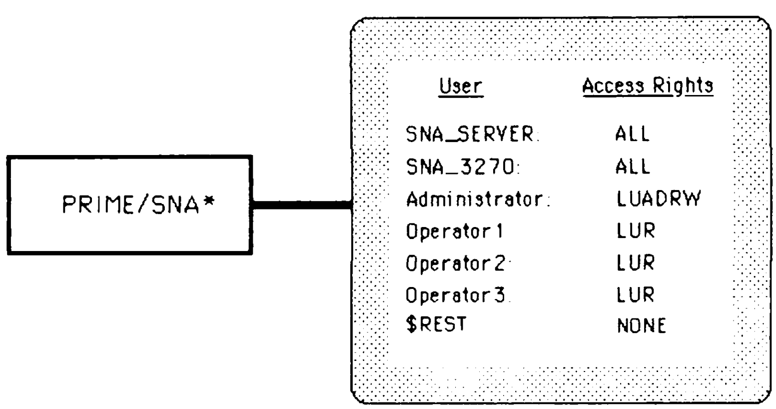
Although users can run the configurators, they cannot create or edit PRIME/SNA configuration files because they have not been permitted ADD and WRITE access to the PRIME/SNA* directory.

AN EXAMPLE OF TIGHT SECURITY

Figures 8-9 through 8-11 demonstrate a tight security plan. In Figure 8-9, the PRIME/SNA Administrator and the operators are assigned to the .SNA$ ACL group and to SERVER_ADMIN.ACAT and INTERACTIVE_ADMIN.ACAT in the same manner as the moderate security plan. The same restrictions apply to the security assignments for .SNA$ and for the Server and Interactive Subsystem ACATs described for the moderate security plan.



PRIME/SNA ACL Groups and ACATs - Tight Security
Figure 8-9

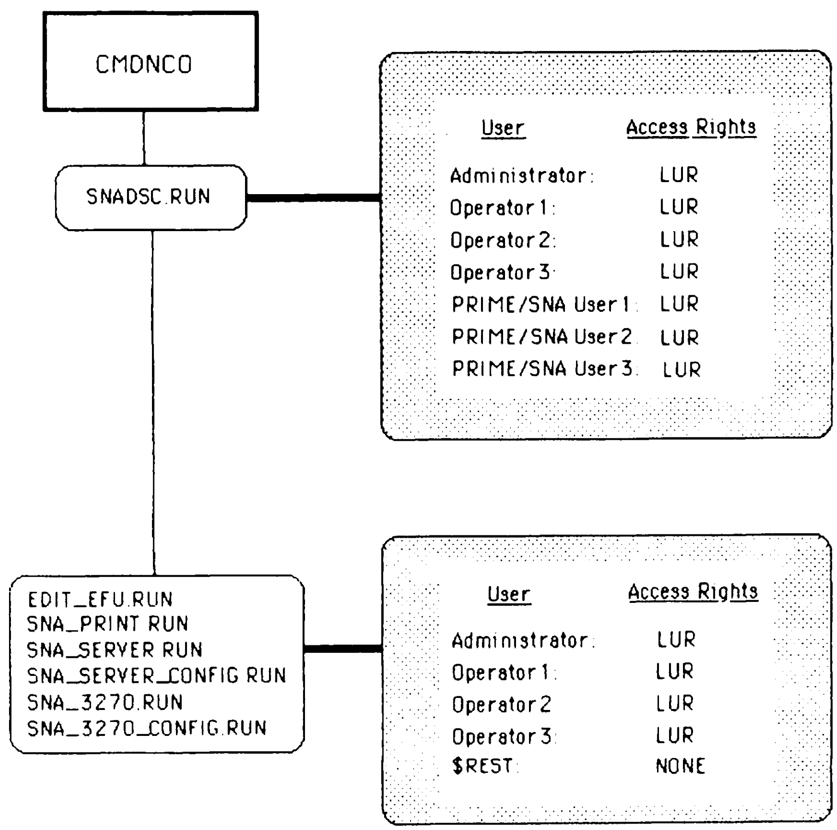


Access Rights for the PRIME/SNA* Directory - Tight Security
Figure 8-10

ACL protection for the PRIME/SNA* directory is shown in Figure 8-10. SNA_SERVER and SNA_3270 receive ALL access rights. The PRIME/SNA Administrator is permitted all rights except PROTECT. It may be that the System Administrator and PRIME/SNA Administrator are different people. The System Administrator may want to retain control over setting protection for all files and UFDs on the system.

The operators receive the same rights for PRIME/SNA* as in the moderate security plan.

In CMDNC0, as shown in Figure 8-11, users other than the Administrator and operators are only permitted to use the SNADSC command.



Access Rights for the CMDNC0 Directory - Tight Security
Figure 8-11

9

Configuring the Server Subsystem

INTRODUCTION

The Server configurator is an online utility for configuring lines and remote systems for the Server Subsystem. The configurator also enables you to edit, copy, delete, or list the Server configuration file.

The Server configurator is invoked with the PRIMOS external command SNA_SERVER_CONFIG. This chapter describes the format and options for SNA_SERVER_CONFIG, and gives instructions for operating the Server configurator.

Command Line Versus Menu-Driven Operation

The Server configurator operates in either of two modes, depending on the options you include on the command line when invoking SNA_SERVER_CONFIG. In command line mode the configurator performs a particular function and then terminates. This mode is used whenever you include the -DISPLAY, -LISTING, or -SPOOL option on the command line. In menu-driven mode you run the configurator interactively by making selections from a series of menus. This mode is used whenever you include no options on the command line, or you include a valid combination of the following options: -CREATE, -EDIT, and -TERMINAL_TYPE. Both of these modes are described in more detail in the sections that follow.

Help Facility

The Server configurator has a built-in help facility that you can use while working in menu-driven mode. When the cursor is located at a prompt or in a field, pressing the appropriate "Help" key, followed by the RETURN key, displays a help message relating to that prompt or field. If your terminal is a PT200 or PST 100, use the HELP key in the top row for this function. For all other terminal types, use the question mark (?) key or the tilde (~) key as the "Help" key. (If the key you wish to use is already defined as your kill or erase character, you can use the TERM command to redefine this character.)

COMMAND LINE FORMAT FOR SNA_SERVER_CONFIG

The format of the SNA_SERVER_CONFIG command is as follows:

```
SNA_SERVER_CONFIG [config-pathname] [options]
```

config-pathname specifies the pathname of a SEGSAM file that is to be used to create a new SNA configuration file, or the pathname of an existing SNA configuration file (segment directory).

Valid command line options and their actions are as follows:

Option	Description
-EDIT	Starts a session to modify an existing Server configuration file. -EDIT can be used alone or with -TERMINAL_TYPE.
-CREATE	Starts a session to create a new configuration file. -CREATE can be used alone or with -TERMINAL_TYPE.
{ -TERMINAL_TYPE | -TTP } terminal-type	Specifies the terminal type you are using: either PT200, PST100, or PT45, or TTY (teletype) for any other type. This parameter determines the cursor addressing and clear-screen sequences applicable to your terminal. If no terminal type is specified, the Server configurator uses the default value of TTY or the global variable .TERMINAL_TYPE$ for terminal type (if set up). -TERMINAL_TYPE is used alone, or with -CREATE or -EDIT.
-DISPLAY	Displays the configuration on the terminal. The display pauses every

	23 lines and waits for you to indicate whether to display the next part of the configuration or terminate the display. -DISPLAY can be used with -NO_WAIT.
{ -NO_WAIT / -NW }	Allows the display to continue without interruption. -NO_WAIT can only be used when -DISPLAY is used.
-LISTING [output-file]	Writes the configuration to the disk file specified by output-file. If you omit the output filename, the Server configurator deletes the .CONFIG extension of the configuration filename (if present). Then it appends _SERVER.LIST to the filename if the resultant name is 32 characters or less. If the resultant file name is greater than 32 characters, L_ is added to the beginning of the current filename, and .CONFIG is omitted.
-SPOOL [spool-options]	Spools the configuration to a printer using the SPOOL command options you specify. Any of the following SPOOL options may be given: -AS alias, -AT destination, -COPIES n, -DEFER [time], -FORM [type], -LNUM, -NOHEAD. -SPOOL is only used with these options.
-HELP	Provides online information about the SNA_SERVER_CONFIG command. -HELP cannot be combined with other options.

COMMAND LINE MODE

The Server configurator operates in command line mode when you use the following command line format and options. If you do not specify a configuration pathname, PRIME/SNA*>SNA.CONFIG is assumed.

```
SNA_SERVER_CONFIG [config-pathname]  { -DISPLAY [-NO_WAIT]  }
                                     { -LISTING             }
                                     { -SPOOL               }
                                     {  [spool-options]     }
```

MENU-DRIVEN MODE

To invoke the Server configurator in menu-driven mode, use the following command line format and options.

```
SNA_SERVER_CONFIG [config-pathname] [ { -CREATE }          ]
                                    [ { -EDIT   }          ]
                                    [ -TERMINAL_TYPE        ]
                                    [   terminal-type       ]
```

config-pathname is the pathname of an existing configuration file or the pathname of a configuration file you want to create. If you do not specify a pathname, the Server configurator requests that you supply one, as follows:

```
Configuration file pathname: [prime/sna*>sna.config] _
```

Enter a pathname and press RETURN, or accept the default pathname, PRIME/SNA*>SNA.CONFIG by pressing RETURN.

Typically you create new configuration files with a name other than the default, such as SNA_01JUN85.CONFIG. Then when you are ready to use the new configuration file, you rename it with the default name.

Note

> If you specify an existing configuration pathname and the -CREATE option on the command line, the configurator displays the following message and terminates:
>
> The specified configuration file already exists.

The Server configurator attempts to open the configuration file. If the file exists, the Server configurator checks the type and format. If either the type or format are not valid, the Server configurator assumes the file is not a SNA configuration file, displays an error message, and terminates.

If the file is verified, the screen displays the menu depicted in Figure 9-1. Notice that on the initial invocation of the SNA_SERVER_CONFIG command and on the Main Menu screen, the revision numbers of the PRIME/SNA and PRIMOS software are presented at the top left corner of the display.

Note

> If you include -CREATE or -EDIT on the command line, as soon as you supply a valid configuration pathname, the configurator displays the Line Name Menu (Figure 9-4), bypassing the Main Menu.

```
SNA_SERVER_CONFIG Revision 1.0 - 19.4        Configuration file "<config-file>"

<title/comments>


File created on <dd mmm yy at hh:mm:ss> by <user>
Last edited  on <dd mmm yy at hh:mm:ss> by <user>



         1.  Edit configuration
         2.  Create configuration
         3.  Display configuration on the terminal
         4.  List configuration on a disk file
         5.  Spool configuration to a printer
         6.  Change configuration title
         7.  Save configuration to the disk file
         8.  Quit configuration session



         Enter selection:
```

The Server Configurator Main Menu
Figure 9-1

The functions of the Main Menu selections are as follows:

Main Selection	Function
1. Edit configuration	Change the existing configuration.
2. Create configuration	Create a new configuration.
3. Display configuration on terminal	Display the configuration on the terminal screen.
4. List configuration to a disk file	List the configuration file to a specified text file.
5. Spool configuration to printer	Direct listing of the configuration file to a spool queue for printing.
6. Change configuration title	Change the title/comment field.
7. Save configuration to disk file	Write out the configuration file file to disk file.
8. Quit configuration session	Exit from Server configurator.

CREATING A CONFIGURATION — GENERAL STEPS

You display the Server configurator Main Menu by invoking the Server configurator with a new SNA configuration file pathname (or accepting the default configuration file pathname). To create a Server configuration, you select Option 2 (Create configuration) from the Main Menu. The Server configurator presents a series of menus that allow you to define or modify the components of a Server configuration. Figure 9-2 shows the hierarchy of menus in the Server configurator.

To demonstrate how to create a simple configuration, this section uses the hierarchy shown in Figure 9-2 in conjunction with a list of general steps . The next section presents all the Server configurator menus and explains the available options for each menu.

The configuration consists of one line, one remote system, and two LU ports, as follows:

LINE: LINE1

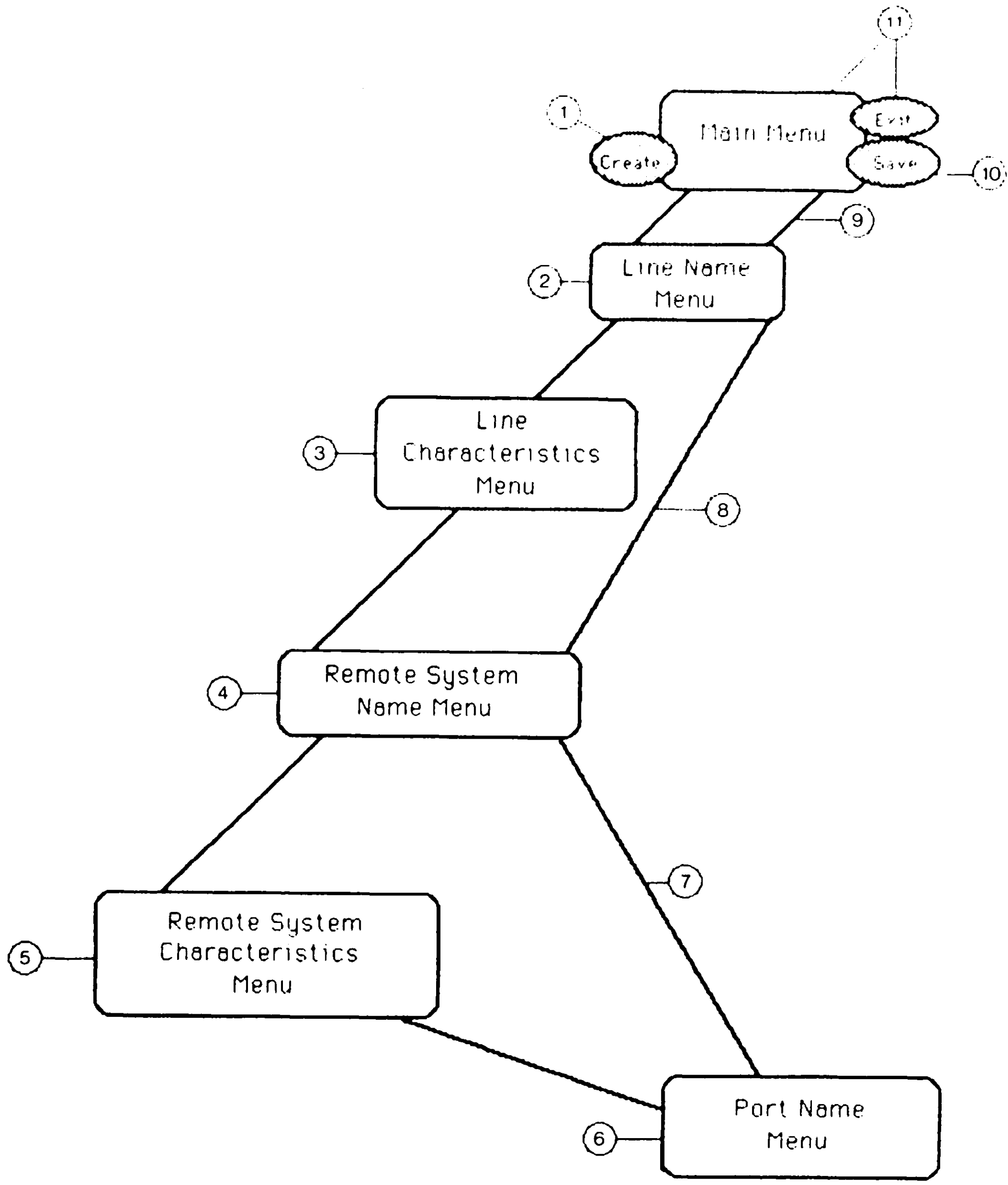
REMOTE SYSTEM: REMOTESYS1

LU PORT 1: CRT1

LU PORT 2: PRINTER1

The numbered steps below correspond to the circled numbers in Figure 9-2. Use the steps, along with the accompanying diagram, to familiarize yourself with the layout of the Server configurator menus. Later, when you run the Server configurator, you can use the diagram as a map to guide you through the hierarchy of menus.

1. Select Option 2 from the Main Menu.
2. On the Line Name Menu, add LINE1.
3. On the Line Characteristics Menu, define LINE1 characteristics.
4. On the Remote System Menu, add REMOTESYS1.
5. On the Remote System Characteristics Menu, define characteristics for REMOTESYS1.
6. On the Port Name Menu, add LU ports CRT1 and PRINTER1.
7. Return to the Remote System Name Menu.
8. Return to the Line Name Menu.
9. Return to the Main Menu.
10. Save the configuration.
11. Exit or invoke another Main Menu option.



Hierarchy of Menus for a Simple Configuration
Figure 9-2

A more complex configuration (such as one with two remote systems and five logical devices) requires a few more steps and a different diagram. Suppose you want to create a configuration of the following PRIME/SNA resources:

LINE: LINE1

REMOTE SYSTEM: REMOTESYS1

LU PORT 1: CRT1

LU PORT 2: CRT2

LU PORT 3: PRINTER1

REMOTE SYSTEM: REMOTESYS2

LU PORT 1: CRT3

LU PORT 2: PRINTER2

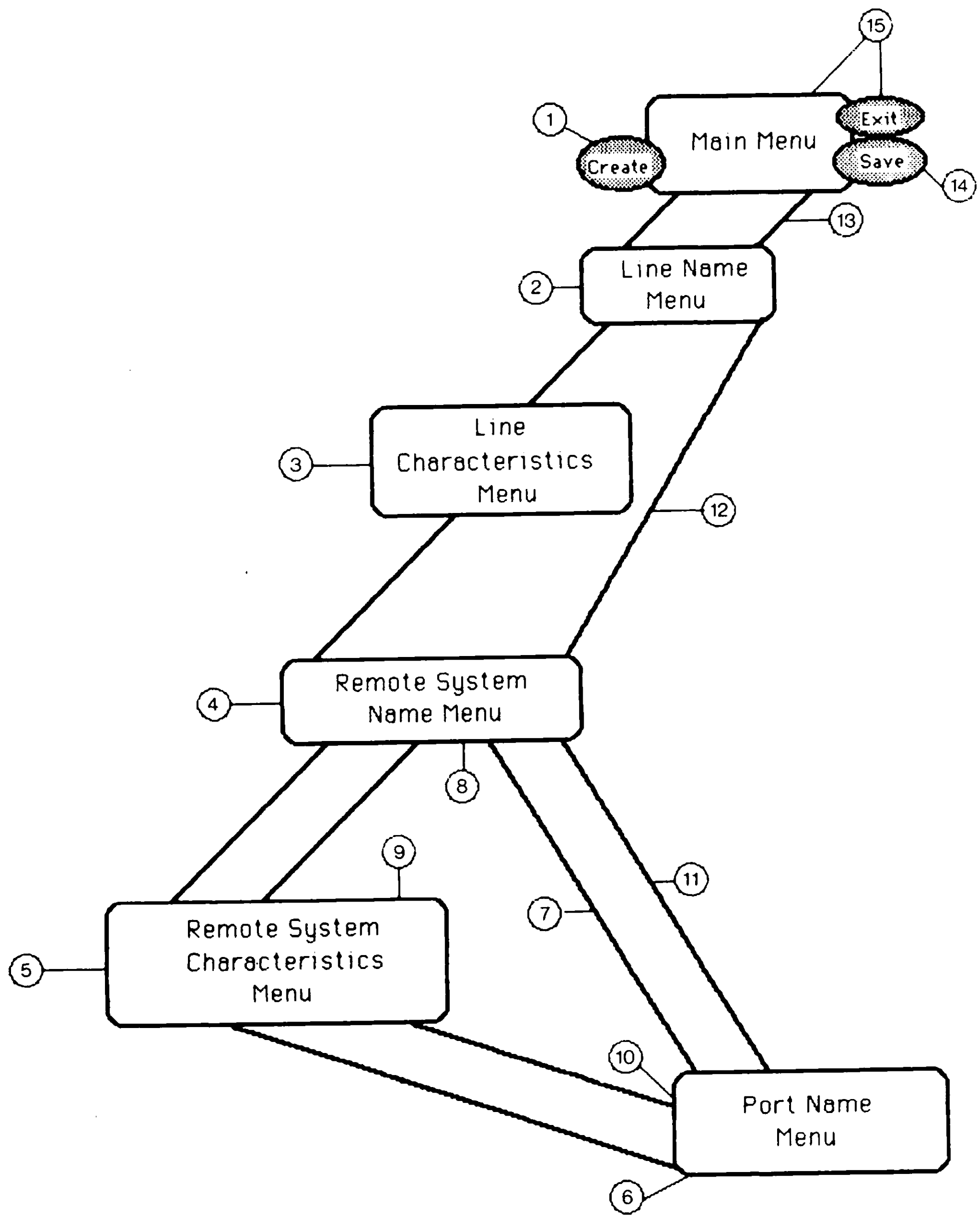
Figure 9-3 shows a hierarchy of menus for this configuration. The numbers in Figure 9-3 correspond with the numbered steps in the following list:

1. Select the Create configuration option from the Main Menu.
2. On the Line Name menu, add LINE1.
3. On the Line Characteristics Menu, define characteristics for LINE1.
4. On the Remote System Menu, add REMOTESYS1.
5. On the Remote System Characterisitcs Menu, define characteristics for REMOTESYS1.
6. On the Port Name Menu, add LU ports CRT1 and PRINTER1.
7. Return to the Remote System Name Menu.
8. Add REMOTESYS2.
9. On the Remote System Characteristics Menu, define characteristics for REMOTESYS2.
10. On the Port Name Menu, add LU ports CRT2 and CRT3.
11. Return to the Remote System Name Menu.
12. Return to the Line Name Menu.

13. Return to the Main Menu.

14. Save the configuration.

15. Exit or invoke another Main Menu option.



Hierarchy of Menus for a More Complex Configuration
Figure 9-3

SERVER CONFIGURATOR MENUS AND OPTIONS

In this section, all Server configurator menus are displayed and the options for each menu are described.

```
SNA_SERVER_CONFIG                          Configuration file "<config-file>"



The following lines are configured:

    1.  <linename1>                        2. <linename2>








Options:    <item number> = Change or delete line with this number
            A = Add a line      F = Finish
RETURN = Change or delete line selected by ->           Selection:
```

Line Name Menu
Figure 9-4

Option	Result
Enter item number and press RETURN	Selects the specified line for editing. The Line Characteristics Menu (Figure 9-5) is displayed, allowing you to define or modify characteristics of the selected line.
Enter A and press RETURN	Requests the name of new line to add. If you supply a line name, the Line Characteristics Menu (Figure 9-5) is displayed, allowing you to define the characteristics of the new line. If you press RETURN without supplying a line name, you are returned to the main prompt.
Enter F and press RETURN	Returns you to the Main Menu (Figure 9-1).

Press RETURN	Selects the line at the arrow-pointer and displays the Line Characteristics Menu (Figure 9-5), allowing you to define or modify characteristics of the line. When you return from the Line Characteristics Menu, the arrow-pointer automatically moves to the next defined line on the display. This allows you to edit successive lines without having to move the arrow-pointer.

```
SNA_SERVER_CONFIG                                         Adding line "<linename>"


Name of group containing the line, if any:
ICS2 Controller number in octal (10, 11, 36, 37)                 : <n>
ICS2 line number in octal (0, 4, 20, 24, ... 364)                : <n>
NRZI signal encoding for the line                           (Y,N): <Y or N>
RS232 interface or V.35 digital interface                   (R,V): <R or V>
Half duplex or Full duplex data set control                 (H,F): <H of F>
Baud rate for internal clock, or "0" for external clocking       : <n>
Point-to-point or Multipoint                                (P,M): <P or M>
Leased or Switched line                                     (L,S): <L or S>
Auto-answer modem on the line                               (Y,N): <Y or N>
Auto-disconnect idle time in seconds, or blank                   : <n>



Options:   C = Change line parameters     D = Delete line     F = Finish
           RETURN = Configure remote systems for this line
Selection:
```

Line Characteristics Menu
Figure 9-5

Option	Result
Enter C and press RETURN	Positions the cursor adjacent to the colon (:) prompt in the first field on display screen. Modify the data and/or press RETURN to move to the next field. The cursor returns to the main prompt after the last field is entered.

	If you define the electrical interface (RS232 or V.35) as V (V.35), the remaining fields on the display screen are not applicable to V.35. You can skip through the remaining fields by entering ; (a semicolon) in the next field.
Enter D and press RETURN	Requests verification to delete the line. Enter Y or N (YES, YE, and NO are also valid responses). Y deletes the line and returns the cursor to the main prompt; N simply returns the cursor to the main prompt.
Enter F and press RETURN	Returns you to the Line Name Menu. This option does not appear if no remote systems are defined.
Press RETURN	Displays the Remote System Name Menu.

```
SNA_SERVER_CONFIG            Configuring remote systems for line "<linename>"


  1.  <remote-system-name1>              2.  <remote-system-name2>








Options:   <item number> = Change or delete remote system with this number
           A = Add a remote system     D = Delete line     F or RETURN = Finish
Selection:
```

Remote System Name Menu
Figure 9-6

Option	Result
Enter item number and press RETURN	Moves the arrow-pointer to the remote system you selected and displays the Remote System Characteristics Menu. This allows you to modify the characteristics of the remote system.
Enter A and press RETURN	Requests the name of the remote system to add. Enter the name and press RETURN. The Remote System Characteristics Menu is displayed, enabling you to define the characteristics of the remote system.
Enter D and press RETURN	Requests verification to delete the line for which the remote systems on the display screen are configured. Enter Y or N (YES, YE, and NO are also valid responses). Y deletes the line and all associated remote system and port information from the configuration, and returns you to the Line Name Menu. N simply returns the cursor to the main prompt.
Enter F and press RETURN	Returns you to the Line Name Menu. This option does not appear if no remote systems are defined.
Press RETURN	Selects the remote system positioned at the arrow-pointer and displays the Remote System Characteristics Menu. This allows you to modify the characteristics of that remote system.

```
SNA_SERVER_CONFIG           Adding remote system "<rsname>" on line "<lname>"


Name of group containing remote system, if any: <groupname>

Time limit for connect attempt in minutes, or blank       : <time-limit>

Attempt automatic recovery of connection              (Y,N): <Y or N>

Local system ID in hex, or blank            (00001 - FFFFF): <local-system-ID>

Remote system SSCP IDs - none, one, or more (00000 - 65535): <SSCP-ID>  <SSCP-ID>


Local system SDLC station address                 (01 - FE): <station-address>

Half duplex or full duplex data mode                  (H,F): <H or F>

Options:  C = Change system parameters    D = Delete system    F = Finish
          RETURN = Configure ports for this remote system
Selection:
```

Remote System Characteristics Menu
Figure 9-7

Option	Result
Enter C and press RETURN	Positions the cursor adjacent to the colon (:) prompt in the first field on the display screen. Modify the data and/or press RETURN to move to the next field. The cursor returns to the main prompt after the last field is entered. A valid local system SDLC station address must be entered. If you leave the field blank or enter an invalid address, a message requests that you enter a valid address. Valid addresses are those that are unique among all remote systems for a line.
Enter D and press RETURN	Requests verification to delete the remote system. Enter Y or N (YES, YE, and NO are also valid responses). Y deletes the remote system and returns the cursor to the main prompt; N simply returns you to the main prompt.

Enter F and press RETURN	Returns you to the Line Name Menu. This option does not appear if no LU ports are defined.
Press RETURN	Displays the LU Port Menu, allowing you to create or modify an LU port configuration for a remote system.

```
SNA_SERVER_CONFIG                    LU ports for remote system "<rsname>"



2     <portname1>                    3     <portname2>
4     <portname3>                    5     <portname4>









Options:   <port number> = Add, change, or delete port with this number
           RETURN = Finish
Selection:
```

LU Port Menu
Figure 9-8

Option	Result
Enter LU port number and press RETURN	Moves the cursor to the existing LU port number you selected, or adds the LU port number to the next available position in the display. You then can modify or delete an existing LU port number. If you delete the port number, the port name automatically disappears from the display and you are returned to the main prompt. If you add or modify the port number and press RETURN, the cursor moves to the port name field. Modify or delete the LU port name and press RETURN to return to the main prompt.

	To delete an existing port, blank out its port number. To delete an existing port name without deleting the port, blank out the port name only.
Press RETURN	Returns you to the Remote System Characteristics Menu.

A SAMPLE CONFIGURATION SESSION

This section explains and demonstrates a sample configuration session. The sample configuration consists of switched line BOS-NY connected to remote system CICS/NY, and leased line BOS-PHILLY connected to remote systems TSO/PHILLY and CMS/PHILLY.

The information provided in the sample worksheets defines the characteristics of each line and remote system as well as the port assignments for each remote system. The following list is a summary of the data from the sample configuration worksheet.

LINE	: BOS-NY
Group	: NORTHEAST
Controller number	: 10
Line number	: 300
Signal encoding	: NRZI
Communications interface	: RS232
Clocking	: external
Point-to-point or multipoint	: point-to-point
Data set control	: half-duplex
Line type	: switched
Auto-answer	: yes
Auto-disconnect idle time	: 300
REMOTE SYSTEM	: CICS/NYC
Group	: 8AM/START
Connection time limit	: 5
Automatic recovery	: yes
Local system ID	: FF010
SSCP IDs	: 32 84
SDLC station address	: 01
Data transmission mode	: half-duplex

LOGICAL UNIT PORTS:

NO.	NAME	NO.	NAME
2	CICS/CRT1	3	CICS/CRT2
4	CICS/CRT3	5	CICS/GENPRINT1
6	CICS/FORMSPRINT1		

LINE	: BOS-PHILLY
Group	: NORTHEAST
Controller number	: 10
Line number	: 304
Signal encoding	: non-NRZI
Communications interface	: RS232
Clocking	: external
Point-to-point or multipoint	: multipoint
Data set control	: full-duplex
Line type	: leased
Auto-answer	: no
Auto-disconnect idle time	: —

REMOTE SYSTEM	: TSO/PHILLY
Group	: 8AM/START
Connection time limit	: 5
Automatic recovery	: yes
Local system ID	: none
SSCP IDs	: 84
SDLC station address	: 0A
Data transmission mode	: half-duplex

LOGICAL UNIT PORTS:

NO.	NAME	NO.	NAME
2	TSO/CRT1	3	TSO/CRT2
4	TSO/CRT3	5	TSO/GENPRINT1
6	FREE/CRT1	7	FREE/CRT2
8	FREE/CRT3		

REMOTE SYSTEM	: CMS/PHILLY
Group	: 8AM/START
Connection time limit	: 5
Automatic recovery	: yes
Local system ID	: none
SSCP IDs	: 84
SDLC station address	: 0B
Data transmission mode	: half-duplex

LOGICAL UNIT PORTS:

NO.	NAME	NO.	NAME
2	CMS/CRT1	3	CMS/CRT2
4	CMS/CRT3	5	CMS/GENPRINT1

The sample menus presented in the following section demonstrate how to create a portion of the configuration file. Only the screens related to line BOS-PHILLY, remote system TSO/PHILLY, and the LU ports associated with TSO/PHILLY are presented.

Actual messages and options may differ slightly from those presented in the sample screen displays. For example, when no lines are defined for a configuration, the Line Name Menu displays the message "No lines are configured." After a line is added, the message changes to "The following lines are configured."

Note that default values are displayed automatically in most fields when a line or remote system is being defined initially. The following examples demonstrate what the screens would look like after the data values have been changed to conform to the new configuration.

After you have selected the Create option from the Server configurator Main Menu, the Line Name Menu indicates that no lines have been configured. To add line BOS-PHILLY, enter A, press RETURN, supply the new line name, and press RETURN. The Line Characteristics Menu appears.

Enter C, press RETURN, and modify the appropriate fields (using information from your configuration worksheet). After you enter the data, the screen appears as depicted in Figure 9-9.

```
SNA_SERVER_CONFIG                                         Adding line "BOS-PHILLY"


Name of group containing the line, if any:
ICS2 Controller number in octal (10, 11, 36, 37)                 : 10

ICS2 line number in octal (0, 4, 20, 24, ... 364)                : 304
NRZI signal encoding for the line                           (Y,N): N

RS232 interface or V.35 digital interface                   (R,V): R
Half duplex or Full duplex data set control                 (H,F): F
Baud rate for internal clock, or "0" for external clocking       : 0
Point-to-point or Multipoint                                (P,M): M
Leased or Switched line                                     (L,S): L
Auto-answer modem on the line                               (Y,N): N
Auto-disconnect idle time in seconds, or blank                   :


Options:   C = Change line parameters     D = Delete line    F = Finish
           RETURN = Configure remote systems for this line
Selection:
```

Line Characteristics Menu
Figure 9-9

Press RETURN. The Remote System Name Menu appears, indicating that no remote systems have been configured. To add remote system TSO/PHILLY, enter A, press RETURN, supply the new remote system name, and press RETURN. The Remote System Characteristics Menu appears. The cursor is positioned at the beginning of the first field on the screen. Modify the appropriate fields. After you have entered the data, the screen appears as depicted in Figure 9-10.

```
SNA_SERVER_CONFIG      Adding remote system "TSO/PHILLY" on line "BOS-PHILLY"

Name of group containing remote system, if any: 8AM/START

Time limit for connect attempt in minutes, or blank        : 5

Attempt automatic recovery of connection              (Y,N): Y

Local system ID in hex, or blank          (00001 - FFFFF):

Remote system SSCP IDs - none, one, or more (00000 - 65535): 84

Local system SDLC station address                 (01 - FE): 0A

Half duplex or full duplex data mode                  (H,F): H


Options:   C = Change system parameters    D = Delete system    F = Finish
           RETURN = Configure ports for this remote system
Selection:
```

Remote System Characteristics Menu
Figure 9-10

Press RETURN. The LU Port Menu appears. Add the LU port numbers and names from your worksheet by entering a number, pressing RETURN, and enter the LU port name. After you have defined the LU ports, the screen appears as depicted in Figure 9-11.

```
SNA_SERVER_CONFIG                   LU ports for remote system "TSO/PHILLY"


2    TSO/CRT1                       3    TSO/CRT2
4    TSO/CRT3                       5    TSO/GENPRINT1
6    FREE/CRT1                      7    FREE/CRT2
8    FREE/CRT3






Options:   <port number> = Add, change, or delete port with this number
           RETURN = Finish
Selection:
```

LU Port Menu
Figure 9-11

You can continue to add, delete, or change lines, remote systems or ports defined in your configuration worksheet. When your configuration is complete, return to the Main Menu.

SAVING A CONFIGURATION ON DISK

After you have modified the Server configuration, you will most likely want to save the configuration in a disk file. Return to the Main Menu and select Option 7 (Saving configuration to disk file) to write the configuration to a disk file.

Until a save operation is successfully completed, all configuration information is stored in memory. If you attempt to terminate a session prior to saving the configuration (using QUIT or CTRL-P), the Server configurator requests confirmation of the termination request. (For details, see the section below titled TERMINATING A SESSION.)

During the save operation, the Server configurator adds the following information to the SNA configuration file:

- File format number (This is a number indicating the format in which the configuration file is stored on disk. Later versions of PRIME/SNA software may use a different format.)
- Date and time file created

- Login name of Administrator who created file
- Date and time of last edit
- Login name of Administrator who last edited the file
- Update date-time stamp

GENERATING CONFIGURATION FILE OUTPUT

At some point, you most likely will want to output a listing of the SNA configuration file to your terminal screen, a spool queue for printing, or a text file. To do so, select the appropriate option from the Main Menu as follows:

3. Display the configuration on the terminal.
4. List the configuration to a disk file.
5. Spool the configuration to a printer.

Note

You can also generate configuration output by using the -DISPLAY, -LISTING, or -SPOOL options on the command line. See the section above titled COMMAND LINE MODE for details.

Display On Terminal

Option 3 (Display configuration on the terminal) displays the contents of a SNA configuration file on your terminal in the format depicted in Figure 9-12.

```
Date and time created              :  1 Apr 85 16:21:36 Monday
By                                 : PSNAUSER
Date and time last edited          : 10 Apr 85 10:15:20 Wednesday
By                                 : PSNAUSER

LINE                               : BOS-NY

Group                              : NORTHEAST
Controller number                  : 0
Line number                        : 300
Signal encoding                    : NRZI
Communications interface           : RS232
Clocking                           : external
Point-to-point or multipoint       : point-to-point
Data set control                   : half-duplex
Line type                          : switched
Auto-answer                        : yes
Auto-disconnect idle time          : 300
--More--
```

Output of the Display On Terminal Option
Figure 9-12

List to a Disk File

Option 4 (List configuration to a disk file) writes the Server configuration to a disk file in the format depicted in Figure 9-12. This option requests that you supply a listing output pathname or accept the default, which is the current SNA configuration filename with the .LIST extension added. In the example in Figure 9-12, the current default output filename would be PRIME/SNA*>TPUBEXAMP_SERVER.LIST.

Spool to a Printer

Option 5 (Spool configuration to a printer) spools the Server configuration to a printer in the format depicted in Figure 9-12. This option requests that you supply a header for the spooled file (16 characters maximum). If you do not supply a header, an L_ is added to the beginning of the current configuration filename. In the example in Figure 9-12, the header would be L_TPUBSEXAMP.

CHANGING A CONFIGURATION TITLE

The title/comment fields displayed on the Main Menu and the Line Name Menu enable you to display additional information about a configuration file or specific line in a configuration.

To enter or modify text in the title/comment field, select Option 6, (Change configuration title) from the Main Menu. The Server configurator presents the display depicted in Figure 9-13.

```
SNA_SERVER_CONFIG                    Configuration file "tpubsexamp.config"


File created on  1 APR 85 at 16:21:36 by PSNAUSER
Last edited  on 10 APR 85 at 10:15:20 by PSNAUSER


Enter title or special information text for this configuration file.
One or two lines may be entered.  If first line is more than 80
characters it will be divided and counted as two lines.  Enter lines
of text:

Enter text for titles and information in these two lines.  Text may
consist of description of configuration and/or useful reference notes.
```

The Change Title/Comment Field Display
Figure 9-13

You can display a maximum of 80 characters in each of the two fields. If you enter fewer than 80 characters in the first field and press RETURN, you can enter a second line of text. However, if you enter 80 or more characters (causing the terminal display to wrap to the next line), the Server configurator assumes that the two fields were entered together.

TERMINATING A SESSION

Option 8 (Quit configuration session) from the Main Menu allows you to exit from the Server configurator. The Server configurator closes the configuration file and terminates. If you have created or modified the configuration during the session, the Server configurator displays a warning message (shown in Figure 9-14), indicating that changes have been made to the configuration. It requests that you verify that you wish to end the session without changing the configuration file. Enter Y if you do not want to save the changes.

If you want to save the changes, enter N. The Server configurator returns you to the Main Menu, allowing you to select the Save configuration option.

```
SNA_SERVER_CONFIG Revision 1.0 - 19.4  Configuration file "<config-file>"

 <title/comments>


File created on <dd mmm yy at hh:mm:ss> by <user>
Last edited  on <dd mmm yy at hh:mm:ss> by <user>



         1.  Edit configuration
         2.  Create configuration
         3.  Display configuration on the terminal
         4.  List configuration on a disk file
         5.  Spool configuration to a printer
         6.  Change configuration title
         7.  Save configuration to the disk file
         8.  Quit configuration session



         Enter selection: 8

Configuration changes have not been saved; okay to quit (Y,N)?
```

Terminating from the Main Menu
Figure 9-14

If you press CTRL-P while editing a configuration file, the Server configurator verifies that you want to terminate the session, as depicted in Figure 9-15. If you enter Y, you are returned to PRIMOS command level and no changes are made to the configuration file. If you enter N, your editing session resumes.

```
SNA_SERVER_CONFIG                                 Adding line "<linename>"


Name of group containing the line, if any:
ICS2 Controller number in octal (10, 11, 36, 37)          : <n>
ICS2 line number in octal (0, 4, 20, 24, ... 364)         : <n>
NRZI signal encoding for the line                    (Y,N): <Y or N>
RS232 interface or V.35 digital interface            (R,V): <R or V>
Half duplex or Full duplex data set control          (H,F): <H of F>
Baud rate for internal clock, or "0" for external clocking : <n>
Point-to-point or Multipoint                         (P,M): <P or M>
Leased or Switched line                              (L,S): <L or S>
Auto-answer modem on the line                        (Y,N): <Y or N>
Auto-disconnect idle time in seconds, or blank            : <n>



Options:   C = Change line parameters    D = Delete line    F = Finish
           RETURN = Configure remote systems for this line
Selection:

Do you really want to quit?
```

Terminating a Session During Editing
Figure 9-15

10
Configuring the Interactive Subsystem

INTRODUCTION

The Interactive configurator is an online utility for configuring devices for the Interactive Subsystem. Using the configurator, you can create up to ten Interactive configuration entries for every Server configuration file. The configurator also enables you to edit, copy, delete, print, or display an Interactive configuration entry.

The Interactive configurator is invoked with the PRIMOS external command, SNA_3270_CONFIG. This chapter describes the format and options for SNA_3270_CONFIG, and gives instructions for operating the Interactive configurator.

Command Line Versus Menu-Driven Operation

The Interactive configurator operates in either of two modes, depending on the options you include on the command line when invoking SNA_3270_CONFIG. In command line mode the configurator performs a particular function and then terminates. This mode is used whenever you include the -DISPLAY, -LISTING, or -SPOOL option on the command line. In menu-driven mode you run the configurator interactively by making selections from a series of menus. This mode is used whenever you include no options on the command line, or you include a valid combination of the following options: -CREATE, -EDIT, -ENTRY_ID, or -TERMINAL_TYPE. Both of these modes are described in more detail in the sections that follow.

Help Facility

The Interactive configurator has a built-in help facility that you can use while working in menu-driven mode. When the cursor is located at a prompt or in a field, pressing the appropriate "Help" key, followed by the RETURN key, displays a help message relating to that prompt or field. If your terminal is a PT200 or PST 100, use the HELP key in the top row for this function. For all other terminal types, use the question mark (?) key or the tilde (~) key as the "Help" key. (If the key you wish to use is already defined as your kill or erase character, you can use the TERM command to redefine this character.)

COMMAND LINE FORMAT FOR SNA_3270_CONFIG

The format of the SNA_3270_CONFIG command is as follows:

```
SNA_3270_CONFIG [config-pathname] [options]
```

config-pathname specifies the pathname of an existing Server configuration file (segment directory).

Valid command line options and their actions are as follows:

Option	Description
{-ENTRY_ID | -EID} entry-id	Specifies the entry ID of an Interactive configuration entry in the Server configuration file.
-EDIT	Modifies an existing Interactive configuration entry. -EDIT can be used with no other options except -ENTRY_ID and -TERMINAL_TYPE.
-CREATE	Creates a new Interactive configuration entry. Can be used with no other options except -ENTRY_ID and -TERMINAL_TYPE.
{-TERMINAL_TYPE | -TTP} terminal-type	Specifies the terminal type you are using: either PT200, PST100, or PT45, or TTY (teletype) for any other type. This parameter determines the cursor addressing and clear-screen sequences applicable to your terminal. If no terminal type is specified, the configurator uses the value of TTY, or the global variable .TERMINAL_TYPE$ for terminal-type (if set up). This option is used alone, or with -ENTRY_ID, -CREATE, or EDIT.

-DISPLAY	Displays the configuration on the terminal. The display pauses every 23 lines and waits for you to indicate whether to display the next part of the configuration or terminate the display. -DISPLAY is used with no other options except -ENTRY_ID and -NO_WAIT.
{ -NO_WAIT / -NW }	Allows the display to continue without interruption. -NO_WAIT can only be used when -DISPLAY is used.
-LISTING [output-file]	Writes the configuration to the disk file specified by output-file. If you omit the output filename, the Interactive configurator deletes the .CONFIG file extension of the configuration filename (if present). Then it appends _3270.LIST to the filename if the resultant name is 32 characters or less. If the resultant file name is greater than 32 characters, the listing filename is composed of the configuration filename prefixed by L_. -LISTING can be used with -ENTRY_ID.
-SPOOL [spool-options]	Spools the configuration to a printer using the SPOOL command options you specify. Any of the following SPOOL options may be given: -AS alias, -AT destination, -COPIES n, -DEFER [time], -FORM [type], -LNUM, -NOHEAD. -SPOOL is used only with these options and with -ENTRY_ID.
-HELP	Provides online information about the SNA_3270_CONFIG command. -HELP cannot be combined with other options.

COMMAND LINE MODE

The Interactive configurator operates in command line mode when you use the following command line format and options:

```
SNA_3270_CONFIG [config-     [-ENTRY_ID    ( -DISPLAY [NO_WAIT] )
                 pathname]    entry-id]    { -LISTING           }
                                           { -SPOOL             }
                                           (  [spool-options]   )
```

If you do not specify a configuration pathname, PRIME/SNA*>SNA.CONFIG is assumed. If you do not include the -ENTRY_ID option and a valid entry ID, the default Interactive configuration entry, SNA_3270.CONFIG, is assumed. (-ENTRY_ID can precede or follow -DISPLAY, -LISTING, or -SPOOL.)

MENU-DRIVEN MODE

To invoke the Interactive configurator in menu-driven mode, use the following command line format and options:

```
                                      ┌ { -CREATE }            ┐
                                      │ { -EDIT   }            │
SNA_3270_CONFIG [config-pathname]     │ -ENTRY_ID entry-id     │
                                      │ -TERMINAL_TYPE         │
                                      └  terminal-type         ┘
```

If you do not specify a configuration pathname, the Interactive configurator requests that you supply one, as follows:

```
Server configuration pathname: PRIME/SNA*>SNA.CONFIG
```

Supply a configuration pathname or accept the default pathname, PRIME/SNA*>SNA.CONFIG. Press Return.

If you have included the -ENTRY_ID option and a valid entry ID, the Main Menu is presented, as depicted in Figure 10-2.

Note

> When you include the -EDIT option and a valid entry ID on the command line, the configurator proceeds directly to the Remote System Name Menu (Figure 10-4), skipping the Main Menu. This also occurs when you include -CREATE on the command line, if the entry ID you specify does not already exist.
>
> If you include -CREATE and an existing entry ID on the command line, the configurator asks you if you want to delete the existing configuration. If you respond with Y, the configuration is deleted and the configurator presents the Remote System Name Menu. If you respond with N, the Interactive Entry ID Menu is presented (Figure 10-1).

If you do not include the -ENTRY_ID option and a valid entry ID, the Interactive configurator searches through the configuration file for valid Interactive configuration entries. If no valid entries are found, the Interactive configurator displays the default entry ID name, as follows.

Interactive configuration entry ID: SNA_3270.CONFIG

Press Return to accept this entry ID, or enter another entry ID name and press Return.

Note

If you have included -EDIT on the command line, and if no valid configuration entries exist, the configurator displays an informative message and terminates.

If valid Interactive configuration entries are found, the Interactive configurator displays the Interactive Entry ID Menu depicted in Figure 10-1.

```
SNA_3270_CONFIG                                         Select entry ID

The following are the Interactive configuration entries:

               1.  <entry-ID1>
               2.  <entry-ID2>
               3.  <entry-ID3>
               4.  <entry-ID4>
               5.  <entry-ID5>
               6.  <entry-ID6>
               7.  <entry-ID7>
               8.  <entry-ID8>

Enter selection or new entry ID:
```

The Interactive Entry ID Menu
Figure 10-1

Select an entry by entering the appropriate number and pressing Return. (If you are creating a new configuration and do not wish to overwrite an existing entry, enter a new entry ID name.) The Interactive configurator Main Menu appears (as depicted in Figure 10-2). All selections, except 10 and 11, operate on the currently selected Interactive configuration entry.

Note

If you entered -EDIT or -CREATE on the command line, the configurator skips the Main Menu and displays the Remote System Name Menu at this point.

Notice that the initial invocation of the SNA_3270_CONFIG command and the Main Menu screen show the revision stamp.

```
SNA_3270_CONFIG Revision 1.0 - 19.4             Entry ID:  "<entry-ID>"



File created on dd mmm yy at hh:mm:ss by <user>
Last edited  on dd mmm yy at hh:mm:ss by <user>

         1.  Edit configuration
         2.  Create configuration
         3.  Display configuration on the terminal
         4.  List configuration on a disk file
         5.  Spool configuration to a printer
         6.  Change configuration title
         7.  Save configuration to the disk file
         8.  Copy configuration
         9.  Delete configuration
         10. Select another configuration
         11. Quit configuration session


         Enter selection:
```

The Interactive Configurator Main Menu
Figure 10-2

The functions of the Interactive configurator Main Menu selections are as follows:

Menu Selection	Function
1. Edit configuration	Change the existing configuration.
2. Create configuration	Create a new configuration.
3. Display configuration on the terminal	Display the configuration on the terminal screen.
4. List configuration on a disk file	List the configuration to a specified text file.

5.	Spool configuration to a printer	Direct listing of the configuration to a spool queue for printing.
6.	Change configuration title	Change title/comment field.
7.	Save configuration to the disk file	Write out the configuration to disk file.
8.	Copy configuration	Copy an Interactive configuration entry to another entry within the same Server configuration file (PRIME/SNA segment directory).
9.	Delete configuration	Delete an Interactive configuration.
10.	Select another configuration	Select another Interactive configuration.
11.	Quit configuration session	Exit from the Interactive configurator.

CREATING AN INTERACTIVE CONFIGURATION — GENERAL STEPS

You can either invoke the Interactive configurator with an existing Server configuration pathname, or you can accept the default pathname. The Interactive Entry ID Menu is displayed, listing all the existing entry IDs (Interactive configuration entries associated with the Server configuration file).

From the Interactive Entry ID Menu, the Interactive configurator presents a series of menus that allow you to define or modify the components of an Interactive configuration entry. Figure 10-3 shows the hierarchy of menus in the Interactive configurator.

To demonstrate how to create a simple Interactive configuration, this section uses Figure 10-3 in conjunction with a list of general steps. The next section presents all the Interactive configurator menus and describes the available options for each menu.

The Interactive configuration demonstrated here is a continuation of the simple Server configuration presented in the previous chapter. If you recall, the simple configuration consisted of the following line, remote system, and LU ports.

LINE: LINE1

REMOTE SYSTEM: REMOTESYS1

LU PORT 1: CRT1

LU PORT 2: PRINTER1

You use the Interactive configurator to define the device types and device characteristics for the LU ports.

The numbered steps below correspond to the circled numbers in Figure 10-3. Use these steps, along with the accompanying diagram, to familiarize yourself with the layout and operation of the Interactive configurator. You also can use this diagram as a reference when you run the Interactive configurator.

1. Enter the entry ID of the Interactive configuration you are going to create.

2. On the Remote System Menu, select REMOTESYS1.

3. On the Port Name Menu, select CRT1.

4. On the Device Type Menu, choose CRT as the device type.

5. On the CRT Characteristics Menu, define the characteristics of the CRT1.

6. Return to the Port Name Menu.

7. Select PRINTER1.

8. On the Device Type Menu, choose PRINTER as the device type.

9. On the Printer Characteristics Menu, define the characteristics of PRINTER1.

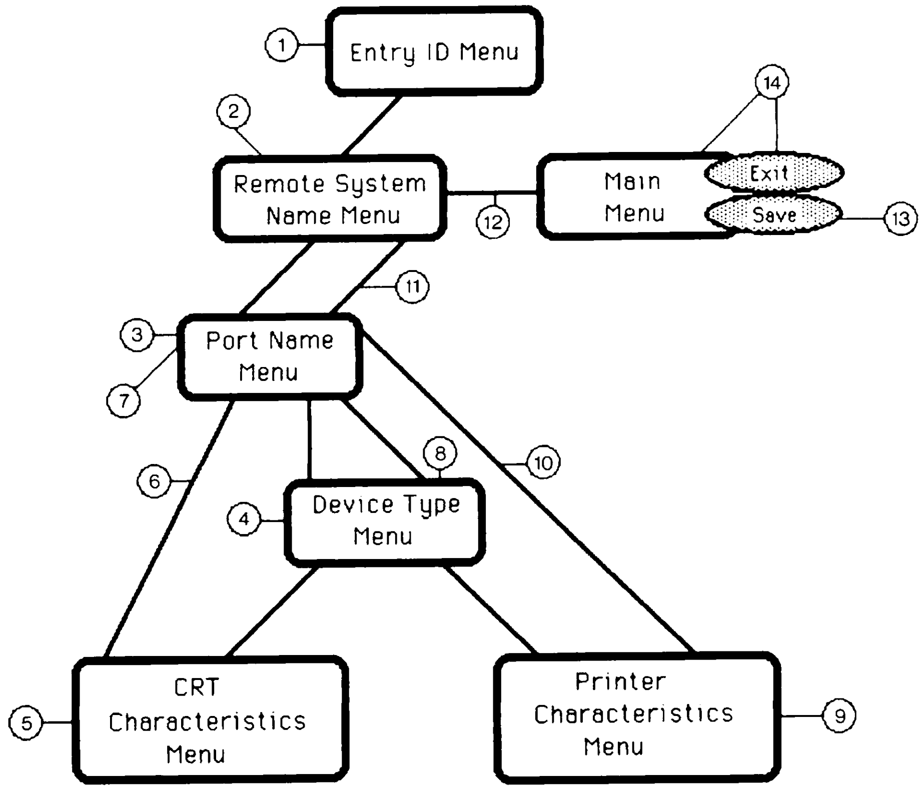
10. Return to the Port Name Menu.

11. Return to the Remote System Name Menu.

12. Return to the Main Menu.

13. Save the Interactive configuration.

14. Exit from the Interactive configurator or invoke other Main Menu options.



Hierarchy of Menus for an Interactive Configuration
Figure 10-3

INTERACTIVE CONFIGURATOR MENUS AND OPTIONS

In this section, all Interactive configurator menus are displayed and each menu option is described.

```
SNA_3270_CONFIG                                          Entry ID: "<entry-ID>"



-> 1.  <rsname1>                               3.  <rsname3>
   2.  <rsname2>










Options:   <item number> = Configure devices for remote system of this number
           F = Finish    RETURN = Configure devices for the -> remote system
Selection:
```

Remote System Name menu
Figure 10-4

Option	Result
Enter item number and press RETURN	Moves the arrow-pointer to the remote system you select and displays the Port Name Menu. This allows you to configure devices for the ports of that remote system.
Enter F and press RETURN	Returns you to the Main Menu.
Press RETURN	Selects the remote system positioned at the arrow-pointer and displays the Port Name Menu. This allows you to configure devices for that remote system.

```
SNA_3270_CONFIG                                       Remote system "<rsname>"



 2    <portname2>                        3    <portname3>
 4    <portname4>                        5    <portname5>
 6    <portname6>









Options:   <port number> = Add, change, or delete device for port with number
           D = Delete all devices for these ports     F or RETURN = Finish
Selection:
```

Port Name Menu
Figure 10-5

Option	Result
Enter port number and press RETURN	Selects the specified port for editing. The arrow-pointer is displayed at the specified port. Add (or modify) the port name by pressing RETURN and entering a new port name. The Interactive configurator asks if this new device is a CRT. Responding with Y displays the CRT Characteristics Menu (Figure 10-6). Responding with N displays the Printer Characteristics Menu (Figure 10-7). The Printer and CRT Characteristics Menus allow you to define or modify characteristics of the selected port.
Enter D and press RETURN	Requests verification to delete all devices configured for a port. Responding with Y deletes all devices configured for that port and returns the cursor to the main prompt. Responding with N returns the cursor to the main prompt. This option is only applicable if you are editing an existing Interactive configuration.

Enter F and press RETURN	Returns you to the Remote System Name Menu.

The following option appears if more ports are configured than can be displayed on one screen of text:

Enter M and/or press RETURN	Displays the next set of ports that will fit on one screen.

```
SNA_3270_CONFIG                                          Port "<portname>"

Device name                              : <portname>

Device group name, if any                : <device group name>
Remote system group name, if any         : <rsgroup name>

Device type                              : CRT

Default screen size                      : <screen size>
Alternate screen size                    : <screen size>

Local copy to printer allowed            : <Y or N>
Local copy print options, if any         : <spool options>

Local copy to file allowed               : <Y or N>
Local copy file destination, if any      : <pathname>

Options:   C = Change device parameters    D = Delete device
           F or RETURN = Finish
Selection:
```

CRT Characteristics Menu
Figure 10-6

Option	Result
Enter C and press RETURN	Positions the cursor adjacent to the colon (:) prompt in the first field on the screen. Modify the data and/or press RETURN to move to the next field. The cursor returns to the main prompt after the last field is entered. If you define the "Local copy to printer allowed" field as N, the cursor skips over the next field ("Local copy print options, if any"). The same type of skip occurs if you enter N for the "Local copy to file allowed" field.

Enter D and press RETURN	Requests verification to delete the device. Entering Y deletes the device and returns you to the Port Name Menu. Entering N returns you to the main prompt.
Enter F and press RETURN	Returns you to the Port Name Menu.

```
SNA_3270_CONFIG                                              Port "<portname>"
Device name                              : <portname>
Device group name, if any                : <device group name>
Remote system group name, if any         : <rsname>
Device type                              : PRINTER
3270DS, SCS, or BOTH                     : <print stream support type>
Default buffer size                      : <standard or extended>
Alternate buffer size                    : <standard or extended>
Options:   C = Change device parameters    D = Delete device
           F or RETURN = Finish
Selection:
```

Printer Characteristics Menu
Figure 10-7

Option	Result
Enter C and press RETURN	Positions cursor adjacent to the colon (:) prompt in the first field on the display screen. Modify the data and/or press RETURN to move to the next field. The cursor returns to the main prompt after the last field is entered.
Enter D and press RETURN	Requests verification to delete the device. Responding with Y deletes the device and returns you to the Port Name Menu. Responding with N returns you to the main prompt.
Enter F and press RETURN	Returns you to the Port Name Menu.

CREATING OR EDITING A CONFIGURATION -- AN EXAMPLE

This section demonstrates a sample Interactive configuration session.

The following information has been summarized from a sample configuration worksheet. Data relating to remote system TSO/PHILLY is used in the sample menus.

```
Remote System                      : TSO/PHILLY
Remote System Group                : 8AM/START

  Port name                        : TSO/CRT1
  Port number                      : 2
  Device name                      : TSO/CRT1
  Device group name                : TSO/GUARANTEED
  Device type                      : CRT
  Default screen size              : 27x132
  Alternate screen size            : 24x80
  Local copy to printer allowed    : no
  Local copy to file allowed       : no

  Port name                        : TSO/CRT2
  Port number                      : 3
  Device name                      : TSO/CRT2
  Device group name                : TSO/GUARANTEED
  Device type                      : CRT
  Default screen size              : 27x132
  Alternate screen size            : 24x80
  Local copy to printer allowed    : no
  Local copy to file allowed       : no

  Port name                        : TSO/CRT3
  Port number                      : 4
  Device name                      : TSO/CRT3
  Device group name                : TSO/GUARANTEED
  Device type                      : CRT
  Default screen size              : 27x132
  Alternate screen size            : 24x80
  Local copy to printer allowed    : no
  Local copy to file allowed       : no

  Port name                        : TSO/GENPRINT1
  Port number                      : 5
  Device name                      : TSO/GENPRINT1
  Device group name                : TSO/GUARANTEED
  Device type                      : PRINTER
  3270DS, SCS, or BOTH             : SCS
  Default buffer size              :
  Alternate buffer size            :

  Port name                        : FREE/CRT1
  Port number                      : 6
  Device name                      : FREE/CRT1
```

Device group name	: TSO/FREE
Device type	: CRT
Default screen size	: 27x132
Alternate screen size	: 24x80
Local copy to printer allowed	: no
Local copy to file allowed	: no
Port name	: FREE/CRT2
Port number	: 7
Device name	: FREE/CRT2
Device group name	: TSO/FREE
Device type	: CRT
Default screen size	: 27x132
Alternate screen size	: 24x80
Local copy to printer allowed	: no
Local copy to file allowed	: no
Port name	: FREE/CRT3
Port number	: 8
Device name	: FREE/CRT3
Device group name	: TSO/FREE
Device type	: CRT
Default screen size	: 27x132
Alternate screen size	: 24x80
Local copy to printer allowed	: no
Local copy to file allowed	: no

The sample menus presented in the following section demonstrate how to create a portion of the Interactive configuration entry. Only the screens related to line BOS-PHILLY, remote system TSO/PHILLY, and the LU ports associated with TSO/PHILLY are presented.

Actual messages and options may differ slightly from those presented in the sample screen displays.

Note that default values of most fields are displayed automatically when the characteristics of an LU port are being defined initially. The following examples demonstrate what the screens would look like after the data values have been changed to conform to the new configuration.

When you invoke the Interactive configurator, the Entry ID Menu is displayed. This menu lists the existing Interactive configuration entries and requests the name of an entry that you want to create or edit. In this example, the default, SNA_3270_CONFIG, is assumed. When you enter this entry ID, the Remote System Name Menu appears (as shown in Figure 10-8). This menu displays a list of the remote systems that were previously defined in the Server configuration file.

```
SNA_3270_CONFIG                                          Entry ID: "SNA_3270.CONFIG"


     1.  CICS/NYC                               3.  CMS/PHILLY
->   2.  TSO/PHILLY










Options:    <item number> = Configure devices for remote system of this number
            F = Finish    RETURN = Configure devices for the -> remote system
Selection: 2
```

Remote System Name Menu
Figure 10-8

Enter item number 2 and press RETURN to configure devices for remote system TSO/PHILLY. The Port Name Menu appears with LU ports defined in the Server configuration file for remote system TSO/PHILLY (as shown in Figure 10-9).

```
SNA_3270_CONFIG                                        Remote system "TSO/PHILLY"



 2     TSO/CRT1                        3     TSO/CRT2
 4     TSO/CRT3                        5     TSO/GENPRINT1
 6     FREE/CRT1                       7     FREE/CRT2
 8     FREE/CRT3







Options:   <port number> = Add, change, or delete device for port with number
           D = Delete all devices for these ports    F or RETURN = Finish
Selection: 2
```

Port Name Menu
Figure 10-9

Enter item number 2 and press RETURN to assign device characteristics for LU port 2 (TSO/CRT1). The next screen requests that you specify whether the LU port will be defined as a CRT (as shown in Figure 10-10).

```
SNA_3270_CONFIG                                                    Port "TSO/CRT1"













Is this new device a CRT type device (Y,N)? y
```

Device Type Prompt
Figure 10-10

If you respond with Y, the CRT Characteristics Menu is displayed. If you respond with N, the Printer Characteristics Menu is displayed.

Because TSO/CRT is a CRT, enter Y and press RETURN. The CRT Characteristics Menu is displayed, allowing you to define device characteristics for TSO/CRT1. Enter C and press RETURN so that you can modify the appropriate fields. Figure 10-11 shows the modified screen.

```
SNA_3270_CONFIG                                              Port "TSO/CRT1"

Device name                              : TSO/CRT1

Device group name, if any                : TSO/GUARANTEED
Remote system group name, if any         : 8AM/START

Device type                              : CRT

Default screen size                      : 27x132
Alternate screen size                    : 24x80

Local copy to printer allowed            : NO
Local copy print options, if any         :

Local copy to file allowed               : NO
Local copy file destination, if any      :

Options:  C = Change device parameters    D = Delete device
          F or RETURN = Finish
Selection: F
```

CRT Characteristics Menu
Figure 10-11

When you are finished defining the device characteristics for TSO/CRT1, press RETURN. You are returned to the Port Name Menu, from which point you can define the characteristics of the remaining LU ports for remote system TSO/PHILLY. Note that LU Port 2 now has an asterisk (*) preceeding it, as shown in Figure 10-12. This indicates that a logical device has been configured for LU Port 2.

```
SNA_3270_CONFIG                                   Remote system "TSO/PHILLY"


*2     TSO/CRT1                          3     TSO/CRT2
 4     TSO/CRT3                          5     TSO/GENPRINT1
 6     FREE/CRT1                         7     FREE/CRT2
 8     FREE/CRT3









Options:   <port number> = Add, change, or delete device for port with number
           D = Delete all devices for these ports    F or RETURN = Finish
Selection: F
```

Port Name Menu
Figure 10-12

SAVING A CONFIGURATION ON DISK

After you have modified the Interactive configuration, you most likely will want to save the configuration in a disk file. Return to the Main Menu and select Option 7 (Saving configuration to disk file) to write the configuration to a disk file.

Until a save operation is successfully completed, all configuration information is stored in memory. If you attempt to terminate a session prior to saving the configuration (using QUIT or CTRL-P), the Interactive configurator requests confirmation of the termination request. (For further details, see the section below titled TERMINATING A SESSION.)

Note that an Interactive configuration must have at least one device configured to be considered valid. If you attempt to save an invalid configuration, the following message is displayed at the bottom of the Main Menu:

    The configuration has no devices and can't be saved.

GENERATING CONFIGURATION FILE OUTPUT

At some point, you probably will want to output a listing of the Interactive configuration to your terminal screen, a spool queue for printing, or a text file. To do so, select the appropriate option from the Main Menu, as follows:

3. Display configuration on the terminal

4. List configuration on a disk file

5. Spool configuration to a printer

Note

You can also generate configuration output by using the -DISPLAY, -LISTING, or -SPOOL options on the command line. See the section above titled COMMAND LINE MODE for details.

Display Configuration on Terminal

Option 3 (Display configuration on the terminal) displays the contents of an Interactive configuration on your terminal in the format shown in Figure 10-13.

```
Configuration file: TPUBSEXAMP.CONFIG
Entry ID          : SNA_3270.CONFIG


Date and time created                  : 1 Apr 85 16:21:36 Monday
By                                     : PSNAUSER


Remote System                          : CICS/NYC
Remote System Group                    : 8AM/START

  Port name                            : CICS/CRT1
  Port number                          : 2
  Device name                          : CICS/CRT1
  Device group name                    : CICS/GUARANTEED
  Device type                          : CRT
  Default screen size                  : 24x80
  Alternate screen size                : 24x80
  Local copy to printer allowed        : yes
  Local copy print options             : -FORM WHITE -AT BLDG8
--More--
```

Displaying a Configuration on the Terminal
Figure 10-13

List Configuration on a Disk File

Option 4 (List configuration to a disk file) writes the Interactive configuration to a disk file in the format depicted in Figure 10-13. This option requests that you supply a listing output pathname or accept the default, PRIME/SNA*>SNA_3270.LIST.

Spool Configuration to a Printer

Option 5 (Spool configuration to a printer) spools the Interactive configuration to a printer in the format depicted in Figure 10-13. This option requests that you supply a header for the spooled file (16 characters maximum) or accept the default, PRIME/SNA*>SNA_3270.LIST.

CHANGING A CONFIGURATION TITLE

The title/comment fields displayed on the Main Menu and the Line Name Menu enable you to display additional information about a configuration or specific line in a configuration.

To enter or modify text in the title/comment field, enter Option 6 (Change configuration title) from the Main Menu. The Interactive configurator presents the display depicted in Figure 10-14.

```
SNA_3270_CONFIG                                   Entry ID: "SNA_3270.CONFIG"


File created on  1 APR 85 at 16:21:36 by PSNAUSER
Last edited  on 10 APR 85 at 10:15:20 by PSNAUSER


Enter title or special information text for this configuration file.
One or two lines may be entered.  If first line is more than 80
characters it will be divided and counted as two lines.  Enter lines
of text:

Enter text for titles and information in these two lines.  Text may
consist of description of configuration and/or useful reference notes.
```

The Change Title/Comment Field Display
Figure 10-14

You can display a maximum of 80 characters in each of the two fields. If you enter less than 80 characters in the first field and press RETURN, you can enter a second line of text. However, if you enter 80 or more characters (causing the terminal display to wrap to the next line), the Interactive configurator assumes that the two fields have been entered together.

COPYING A CONFIGURATION FILE

Option 8 (Copy configuration) on the Main Menu allows you to copy an Interactive configuration in order to create another Interactive configuration entry. This option is provided so that you can have multiple Interactive configurations for one Server configuration file (PRIME/SNA segment directory). The Interactive configurator requests that you specify the name of the new Interactive configuration entry as follows:

```
Enter the new entry ID to be created: _
```

A maximum of 10 interactive configuration entries is permitted for each Server configuration file. When that limit is reached, and you attempt to copy another entry, the Interactive configurator displays the following message:

```
The maximum number of Interactive configuration entries already
exist.
```

You must delete an existing Interactive configuration entry to make room for the new entry.

You can also overwrite an existing Interactive configuration entry by copying an entry to it. The Interactive configurator requires you verify the request as follows:

```
Okay to overwrite exisiting interactive configuration entry (Y,N): _
```

DELETING A CONFIGURATION

Option 9 (Delete configuration) allows you to delete an Interactive configuration. The Interactive configurator requests that you verify the deletion.

SELECTING ANOTHER CONFIGURATION

Option 10 (Select another configuration) allows you to dynamically change the current Interactive entry without exiting and reinvoking the Interactive configurator. When you select this option, the Interactive Configuration Entry ID Menu is displayed (as shown in Figure 10-1).

You can either select an existing Interactive configuration entry or create a new entry (if no more than 10 already are defined).

Note that the prompt at the bottom of the display depicted in Figure 10-1 changes slightly when you have defined the maximum of 10 interactive configuration entries. The new prompt is as follows:

```
Enter selection: _
```

TERMINATING A SESSION

Option 11 (Quit configuration session) allows you to exit from the Interactive configurator. The Interactive configurator closes the configuration file and terminates. If you have created or modified the configuration during the session, the Interactive configurator displays a warning message (depicted in Figure 10-15), indicating that changes have been made to the configuration. It requests you to verify that wish to end the session without changing the configuration. Enter Y if you do not want to save the changes.

If you want to save the changes, enter N. The Interactive configurator returns you to the Main Menu, allowing you to select the Save configuration option.

If you press CTRL-P while editing a configuration entry, the Interactive configurator verifies that you want to terminate the session, as depicted in Figure 10-16. If you enter Y, you are returned to PRIMOS command level and no changes are made to the configuration. If you enter N, your editing session resumes.

```
SNA_3270_CONFIG Revision 1.0 - 19.4             Entry ID:  "SNA_3270.CONFIG"

<text and comments>
<text and comments>

File created on  1 Apr 85 at 16:21:36 by PSNAUSER
Last edited  on 10 Apr 85 at 10:15:20 by PSNAUSER

         1.  Edit configuration
         2.  Create configuration
         3.  Display configuration on the terminal
         4.  List configuration on a disk file
         5.  Spool configuration to a printer
         6.  Change configuration title
         7.  Save configuration to the disk file
         8.  Copy configuration
         9.  Delete configuration
         10. Select another configuration
         11. Quit configuration session


         Enter selection: 11

Configuration changes have not been saved; okay to quit (Y,N)?
```

Terminating from the Interactive Main Menu
Figure 10-15

```
SNA_3270_CONFIG                                  Remote system "TSO/PHILLY"


*2      TSO/CRT1                        3      TSO/CRT2
 4      TSO/CRT3                        5      TSO/GENPRINT1
 6      FREE/CRT1                       7      FREE/CRT2
 8      FREE/CRT3







Options:   <port number> = Add, change, or delete device for port with number
           D = Delete all devices for these ports     F or RETURN = Finish
Selection:
Do you really want to quit?
```

Terminating a Session During Editing
Figure 10-16

INDEX

Index

L

T

U

SURVEY

READER RESPONSE FORM

DOC8908-1LA PRIME/SNA Administrator's Guide First Edition

Your feedback will help us continue to improve the quality, accuracy, and organization of our user publications.

1. How do you rate the document for overall usefulness?

___excellent ___very good ___good ___fair ___poor

2. Please rate the document in the following areas:

Readability: ___hard to understand ___average ___very clear

Technical level: ___too simple ___about right ___too technical

Technical accuracy: ___poor ___average ___very good

Examples: ___too many ___about right ___too few

Illustrations: ___too many ___about right ___too few

3. What features did you find most useful? ______________________________

____

____

____

4. What faults or errors gave you problems? ______________________________

____

____

____

Would you like to be on a mailing list for Prime's current documentation catalog and ordering information? ___yes ___no

Name: ______________________________ Position: ______________________

Company: ____

Address: ____

____Zip: ____________

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

First Class Permit #531 Natick, Massachusetts 01760

BUSINESS REPLY MAIL

Postage will be paid by:

PRIME

Attention: Technical Publications
Bldg 10B
Prime Park, Natick, Ma. 01760