

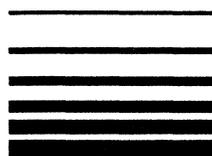
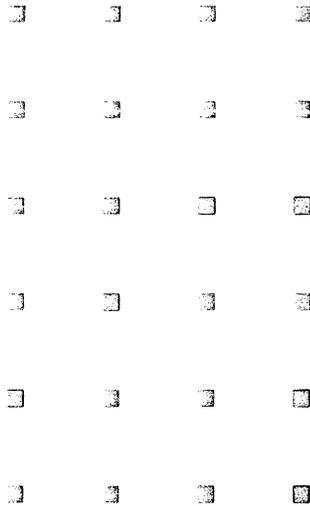


X.25 Network Control Program  
Packet Switching Interface

SC30-3470-1

**Planning and Installation**

Version 3 Releases 1 and 2



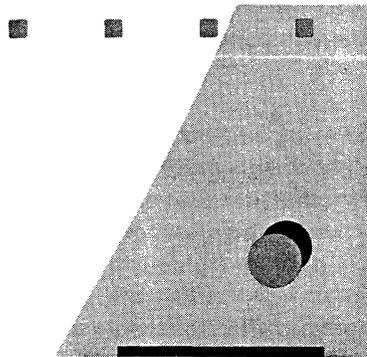


# X.25 Network Control Program Packet Switching Interface

SC30-3470-1

## **Planning and Installation**

Version 3 Releases 1 and 2



**File Number**  
S370/4300/30xx-50

**Program Number**  
5688-035

## **Second Edition (December 1988)**

This edition applies to the IBM licensed program X.25 Network Control Program Packet Switching Interface Version 3 (program number 5688-035) Releases 1 and 2.

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## About This Book

*X.25 NPSI Planning and Installation* assists system programmers in planning and installing IBM's X.25 Network Control Program Packet Switching Interface (X.25 NPSI) licensed program. X.25 NPSI provides Systems Network Architecture (SNA) users with the ability to use communication facilities that support the X.25 Interface as defined by the International Telegraph and Telephone Consultative Committee (CCITT) at Geneva in 1980 and a subset of the Recommendation as defined at Malaga-Torremolinos in 1984.

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## Who Should Use This Book

This book, *X.25 NPSI Planning and Installation*, is intended for system programmers who are responsible for planning and installing X.25 NPSI in a network.

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## How to Use This Book

This section includes information about the organization, the acronyms, and the symbols used in the book. It is important that you read this book before you begin planning and installing X.25 NPSI in your network.

## How This Book Is Organized

This book is organized into the following sections that address specific planning and installation considerations for X.25 NPSI.

Chapter 1, "Introduction," discusses the planning process for X.25 NPSI and gives a general overview of the installation process.

Chapter 2, "Planning for an X.25 NPSI Network," discusses X.25 NPSI pre-installation considerations. This chapter describes:

- X.25 PSDN subscription
- Virtual circuit types
- Hardware and software requirements
- Storage requirements
- System performance
- Access methods
- Application programming
- Network resource recovery
- Migration.

Chapter 3, “Network Definition,” describes how to define the configuration of an X.25 NPSI environment prior to generation. This chapter explains how to define:

- Physical circuits
- Virtual circuits
- Logical channels
- Virtual circuit tables
- Switched virtual circuit subarea communication (SVCSC)
- Short hold mode (SHM)
- Packet assembler/disassembler (PAD) support
- General access to X.25 transport extension (GATE)
- Dedicated access to X.25 transport extension (DATE).

Chapter 4, “Resource Definition Reference,” describes the resource naming conventions and the X.25 NPSI statements that are used to define network resources. The statements, presented alphabetically, include an illustrated format and an explanation of the keywords.

Chapter 5, “Coding NCP and VTAM Parameters for X.25 NPSI,” describes NCP considerations, VTAM considerations including SNA type 2.1 node, and SVCSC considerations including SHM and session continuation. This chapter instructs you in the use of the access method and in the coding of NCP statements that work with X.25 NPSI definitions for accessing X.25 NPSI after it is installed.

Chapter 6, “Controlling X.25 NPSI Resources,” introduces the operation of X.25 NPSI resources after the installation process is complete. This chapter distinguishes between SNA and non-SNA resources and switched and permanent virtual circuits (SVCs and PVCs). This chapter also describes the correct sequence for the activation and deactivation of X.25 NPSI resources, for calls using SVCSC, and for session continuation.

Appendix A, “Defining X.25 PSDN Facilities,” instructs you on how to define the PSDN facilities used by X.25 NPSI.

Appendix B, “Installation Examples for X.25 NPSI,” provides an example of X.25 NPSI generation that includes:

- X.25 NPSI
- NCP
- VTAM parameters
- Two switched major nodes
- A mode table for password protection and LU type 6.2.

Appendix C, “Statement and Keyword Changes,” contains a statement-by-statement listing of each X.25 NPSI statement and associated keywords. Keywords that are valid only for Version 3 Release 2 are noted.

A bibliography, glossary, and index are also included in this book.

## Acronyms Used in This Book

Throughout the book, the following acronyms apply:

CCITT	International Telegraph and Telephone Consultative Committee
DATE	Dedicated Access to X.25 Transport Extension
GATE	General Access to X.25 Transport Extension
MVS	Multiple Virtual Storage/System Product (MVS/SP) operating system or Multiple Virtual Storage/Extended Architecture (MVS/XA) operating system
NCP	Network Control Program
PCNE	Protocol Converter for Non-SNA Equipment
PSDN	Packet Switched Data Network
SNA	Systems Network Architecture
SSP	System Support Programs
VM	Virtual Machine/System Product (VM/SP) operating system or Virtual Machine/Extended Architecture (VM/XA) operating system
VSE	Disk Operating System/Virtual Storage Extended (DOS/VSE) operating system
VTAM	Virtual Telecommunications Access Method
X.25 NPSI	X.25 NCP Packet Switching Interface.

### How the Term Network Is Used

The term *network* has at least two meanings. A *public network* is established and operated by communication common carriers or telecommunication Administrations for the specific purpose of providing circuit-switched, packet-switched, and leased-circuit services to the public.

A *user application network* is a configuration of data processing products, such as processors, controllers, and terminals, established and operated by users for data processing or information exchange, which can use transport services offered by communication common carriers or telecommunication Administrations.

### How Numbers Are Written

In this book, numbers over four digits are represented in metric style. A space is used rather than a comma to separate groups of three digits. For example, the number ten thousand five hundred fifty-two is written 10 552.

### How Version and Release Are Abbreviated

The terms *version* and *release* are abbreviated as "V" and "R." For example, x.25 NPSI Version 3 Release 2 is abbreviated as X.25 NPSI V3R2.

# Symbols Used in This Book

Figure 1 illustrates the networking symbols used throughout this book.

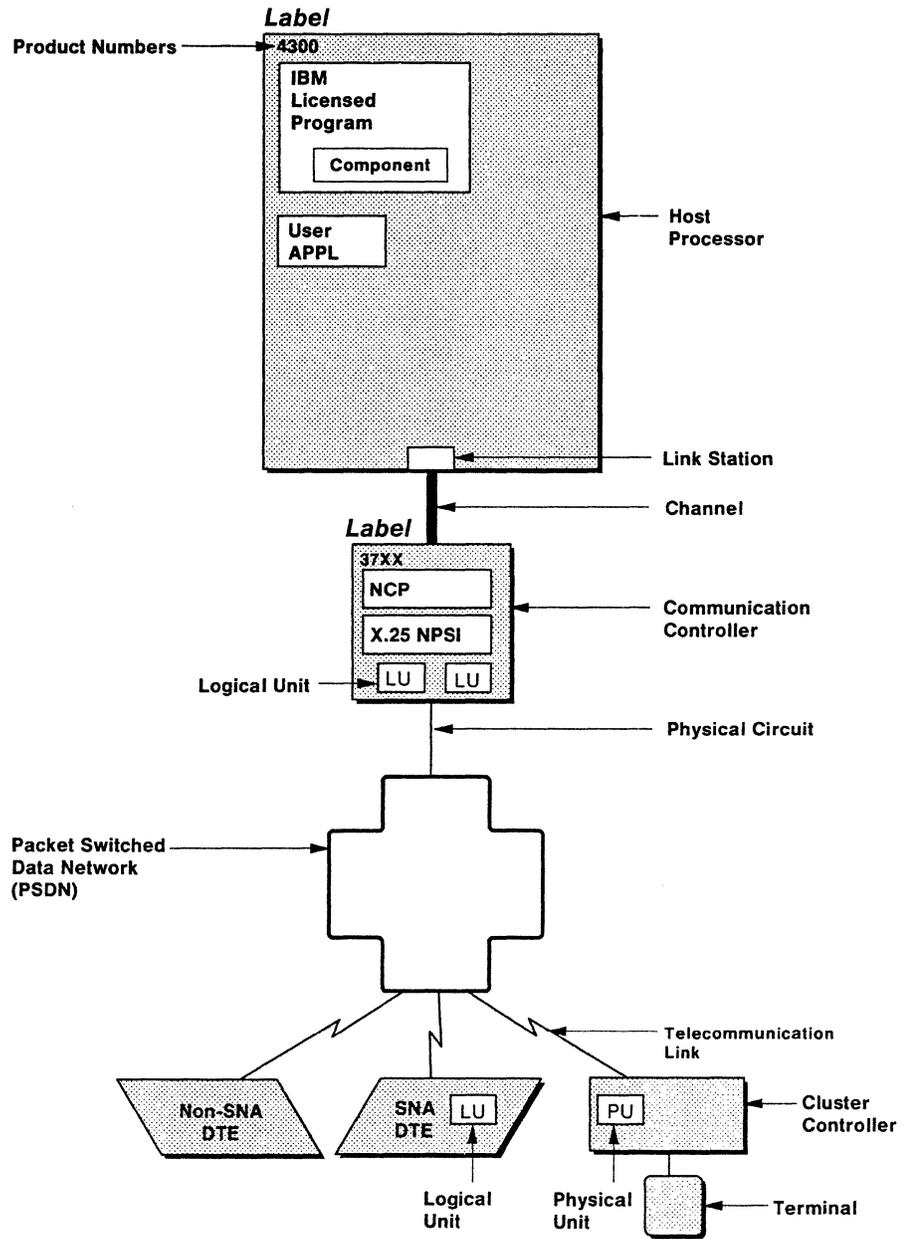


Figure 1. Networking Symbols Used in This Book

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## What Is New in This Book

This section briefly describes the enhancements to X.25 NPSI for Version 3 Releases 1 and 2.

### Version 3 Release 1

X.25 NPSI Version 3 Release 1 contains the following enhancements:

- IBM 3745 communication controller support  
The IBM 3745 communication controller allows X.25 NPSI V3R1 to use additional line addresses.
- Port swapping  
X.25 NPSI V3R1 allows swapping of the physical circuit to a controller port reserved for that support.
- Common NCP/X.25 NPSI generation  
NCP and X.25 NPSI generation are now integrated. The NCP/X.25 NPSI network can be defined and generated simultaneously in the same input stream in a single job step under the NCP/EP Definition Facility (NDF).
- Performance improvement  
The path length for packet transmission has been reduced, and the throughput in packets per second has improved at the same central control unit (CCU) utilization. This improvement applies to communication with SNA peripheral nodes, non-SNA DTES, and subarea-to-subarea communication.
- Integration of fast connect programming request for price quotation (PRPQ)  
The fast connect PRPQ (ZD9700), formerly available only in certain countries, is integrated as a part of X.25 NPSI. The interface between the fast connect function of X.25 NPSI V3R1 and the CTCP is changed from the interface of the fast connect PRPQ.
- Improved availability  
In X.25 NPSI V3R1, a switched virtual circuit is no longer tied to a specific SNA resource; instead the association is done during call setup.
- Virtual circuit trace  
The NCP can perform a line trace on a specified physical circuit that includes one or more virtual circuits. The advanced communication function trace analysis program (ACF/TAP) for SSP V3R3 can print and format the trace for one or more virtual circuits separately.
- Miscellaneous enhancements
  - CTCP/LLC selection
  - DATE message to unbound LU
  - Multiple GATE CTCPS
  - Optional inbound queuing
  - PAD selection
  - Password protection
  - Remote PU type 4 activation
  - SHUTD processing.
- Support for Network Control Program (NCP) Version 5 Release 1.

## Version 3 Release 2

X.25 NPSI Version 3 Release 2 contains the following enhancements:

- SNA type 2.1 node support  
X.25 NPSI V3R2, in conjunction with VTAM V3R2, allows SNA type 2.1 peripheral node logical units to communicate through a PSDN.
- Enhanced availability during loss of SSCP ownership  
This function ensures the continuation of active LU-LU sessions for non-SNA devices after the owning SSCP has been lost.
- Improved conformance to CCITT 84 and ISO 7776 and 8208  
The diagnostic codes that conform to the CCITT 84 Recommendation can be used by X.25 NPSI V3R2.
- Switched virtual circuit subarea communication (SVCSC)  
Switched virtual circuit subarea communication (SVCSC) allows two subarea nodes to be connected by a switched virtual circuit. This connection is used primarily for the following circumstances:
  - Connecting two subarea nodes in different PSDNS
  - Adding transfer capacity
  - Connecting to a subarea node.
- Switched virtual circuit short hold mode (SHM)  
An optional feature called short hold mode is available when SVCSC is selected. SHM applies only when X.25 NPSI communicates with another X.25 NPSI. SHM enables a virtual connection to be deactivated when no traffic is exchanged in a specified amount of time. When traffic resumes from either side, X.25 NPSI with SHM can reestablish the connection. This function provides a significant savings in network fees.
- Support for Network Control Program (NCP) Version 5 Release 2 and Version 5 Release 2.1
- User capability for defining the resource names using the X25.VC statement.

---

## Where to Find More Information

You should read *X.25 NPSI General Information* before reading this book. You should also be familiar with SNA concepts and products, as described in *Systems Network Architecture Concepts and Products*.

Publications for the X.25 NPSI library include:

- *X.25 NPSI General Information*
- *X.25 NPSI Host Programming*
- *X.25 NPSI Diagnosis, Customization, and Tuning*.

For information on related publications, see “Bibliography” on page 239 at the back of this book.

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## Chapter 1. Introduction

This chapter describes the x.25 Network Control Program Packet Switching Interface (X.25 NPSI) and explains the planning for the installation process of this IBM licensed program. For example, when planning to install X.25 NPSI, you must answer several questions, such as:

- What are the hardware and software requirements?
- What types of connections are required?
- How do you specify NCP statements?

Background information on the X.25 NPSI licensed program and packet switched data networks (PSDNs) can be found in *X.25 NPSI General Information*.

---

### Concepts

This book assumes you are familiar with the concepts and procedures needed to install IBM licensed programs, such as NCP. This knowledge will help you perform the necessary planning tasks for the X.25 NPSI installation.

#### What Is X.25 NPSI?

X.25 NPSI is an interface that allows Systems Network Architecture (SNA) users to use X.25 PSDNs in conjunction with their existing network. X.25 NPSI allows SNA host processors to communicate with both SNA and non-SNA equipment over PSDNs that use X.25 protocols.

#### How Does X.25 NPSI Fit into the Network?

Within the communication controller, X.25 NPSI operates under the control of the NCP. The NCP/EP Definition Facility (NDF) processes the NCP and X.25 NPSI statements to create tables, VTAM source statements, and the link-edit control statements. These tables, control statements, and preassembled modules are input to the linkage editor, which creates a load module containing NCP and X.25 NPSI processes.

---

## X.25 NPSI Generation under MVS

X.25 NPSI generation under MVS occurs as a two-stage, inline process in the first step of NCP generation. This inline process simplifies the generation of load modules.

X.25 NPSI is installed from tape. To select the correct tape files, refer to the instructions contained in the X.25 NPSI program directory.

For a complete explanation of the NCP installation procedure, see the *NCP, SSP, and EP Resource Definition Guide*.

### Installation

This section lists the libraries for Releases 1 and 2 of Version 3 for X.25 NPSI.

#### Installation for V3R1

After installing V3R1 X.25 NPSI under MVS, the following libraries are available.

- SYS1.NPSIOBJ

SYS1.NPSIOBJ contains the object code for the X.25 NPSI part of the NCP/EP Definition Facility (NDF). This library is used for maintenance to the X.25 NPSI part of the generation.

- SYS1.NPSILNK

SYS1.NPSILNK is created during installation of X.25 NPSI. This library is concatenated to the NCP SYS1.SSPLIB library, and used by NDF for the X.25 NPSI part of generation.

- SYS1.MAC3725X

SYS1.MAC3725X contains the X.25 NPSI macros used during NCP and X.25 NPSI combined generation. These macros are used during the table assembly of NCP generation.

- SYS1.OBJ3725X contains the preassembled X.25 NPSI load modules. This library is used during the link-edit step of the combined NCP and X.25 NPSI generation.

You must code a DD statement with a DDNAME of OBJ3725X to define this library for V3R1 at link-edit time.

#### Installation for V3R2

When installing V3R2 X.25 NPSI under MVS, restore the following libraries from the X.25 NPSI distribution tape.

- SYS1.NPSIOBJ

SYS1.NPSIOBJ contains the object code for the X.25 NPSI part of NDF. This library is used for maintenance to the X.25 NPSI part of the generation.

- SYS1.NPSILNK

SYS1.NPSILNK is created during the installation of X.25 NPSI and is used by the NCP/EP Definition Facility (NDF). This library is concatenated to the NCP SYS1.SSPLIB library.

- SYS1.SBALMAC1

SYS1.SBALMAC1 contains the X.25 NPSI macros used during NCP and X.25 NPSI combined generation. These macros are used during the table assembly of NCP generation.

- SYS1.SBALMOD1

SYS1.SBALMOD1 contains the preassembled X.25 NPSI load modules. This library is used during the link-edit step of the combined NCP and X.25 NPSI generation.

The library names change between V3R1 and V3R2 but the descriptions listed in "Installation for V3R1" on page 4 still apply. Table 1 shows the library names for V3R1 and the changed names in V3R2.

		System	Distribution
V3R1 Name	Content	V3R2 Name	V3R2 Name
NPSIOBJ	Generation modules		NPSIOBJ
NPSILNK *	Generation load module	NPSILNK	
MAC3725X	Generation macros	SBALMAC1	ABALMAC1
OBJ3725X	Executable modules	SBALMOD1	ABALMOD1
<p><b>Note:</b> X.25 NPSI has two sets of libraries:</p> <p><b>S</b> For the system (target) library name.</p> <p><b>A</b> For the distribution library name.</p> <p>* Not delivered for MVS, but created during installation and used during X.25 NPSI generation. Delivered with VM.</p>			

X.25 NPSI code is first installed in the system library, also known as the target library. When the code is successfully installed, it is copied into the distribution library at System Modification Program (SMP) ACCEPT time.

You must code a DD statement with a DDNAME of ABALMOD1 specifying the system library of SBALMOD1 for the data set name in order to define the X.25 NPSI V3R2 object module library at link-edit time. See "LKEDT Step" on page 208.

## Generation Process

The combined X.25 NPSI NCP generation procedure results in the following improvements:

- One generation set contains both X.25 NPSI and NCP statements.
- Load module creation takes less time.
- The NCP and X.25 NPSI listing is printed as one item.
- NDF diagnostic aids can be used.

To verify the input definitions without going through the entire generation process, use the FASTRUN keyword on the OPTIONS statement. When FASTRUN is selected, NDF reads the input and performs a validity check. Only the input section and error listing are generated. Control blocks and the load module are not produced.

TBL1OBJ and TBL2OBJ are small data sets. The size depends on the number of multichannel links (MCHS) and virtual circuits. A safe order of magnitude is one cylinder of 3380 to every 200 virtual circuits.

Figure 2 on page 7 and Figure 3 on page 8 describe the production of the combined NCP/X.25 NPSI load modules for V3R1 and V3R2, respectively. The X.25 NPSI statements described in Chapter 4, "Resource Definition Reference," provide the attachment to the PSDN. These statements are required for the X.25 NPSI part of the NCP generation and define the X.25 NPSI control blocks through the use of NDF.

The linkage editor uses both the X.25 NPSI library (SYS1.OBJ3725X for V3R1 and SYS1.SBALMOD1 for V3R2) and the NCP library (SYS1.OBJ3725 for V3R1 and SYS1.SNCPMOD1 for V3R2) as input. This produces the following:

- NCP/X.25 NPSI Load Module
- Resource Resolution Table.

The NCP load module contains NCP and X.25 NPSI control blocks and executable code.

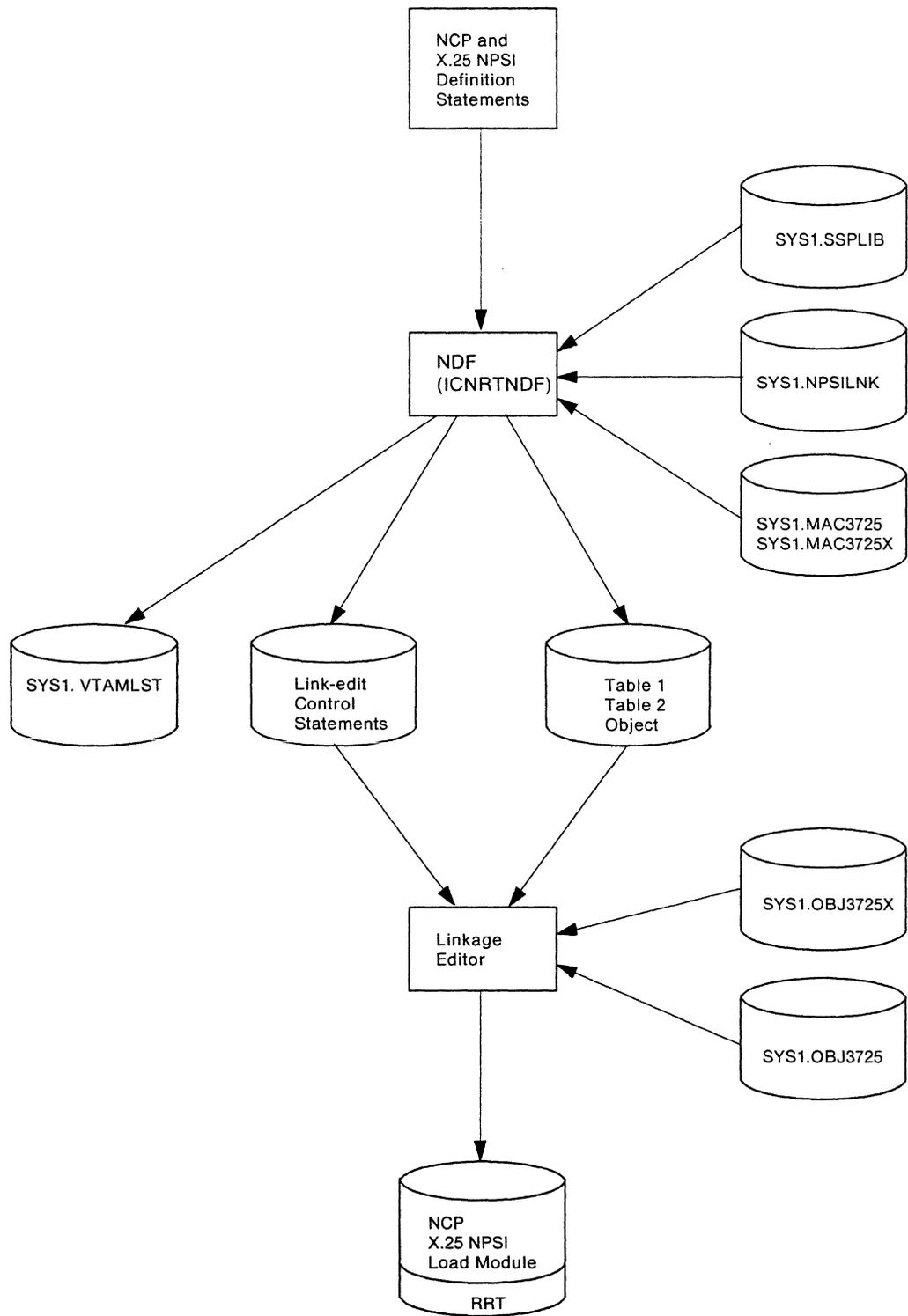


Figure 2. X.25 NPSI Generation Summary under MVS for V3R1

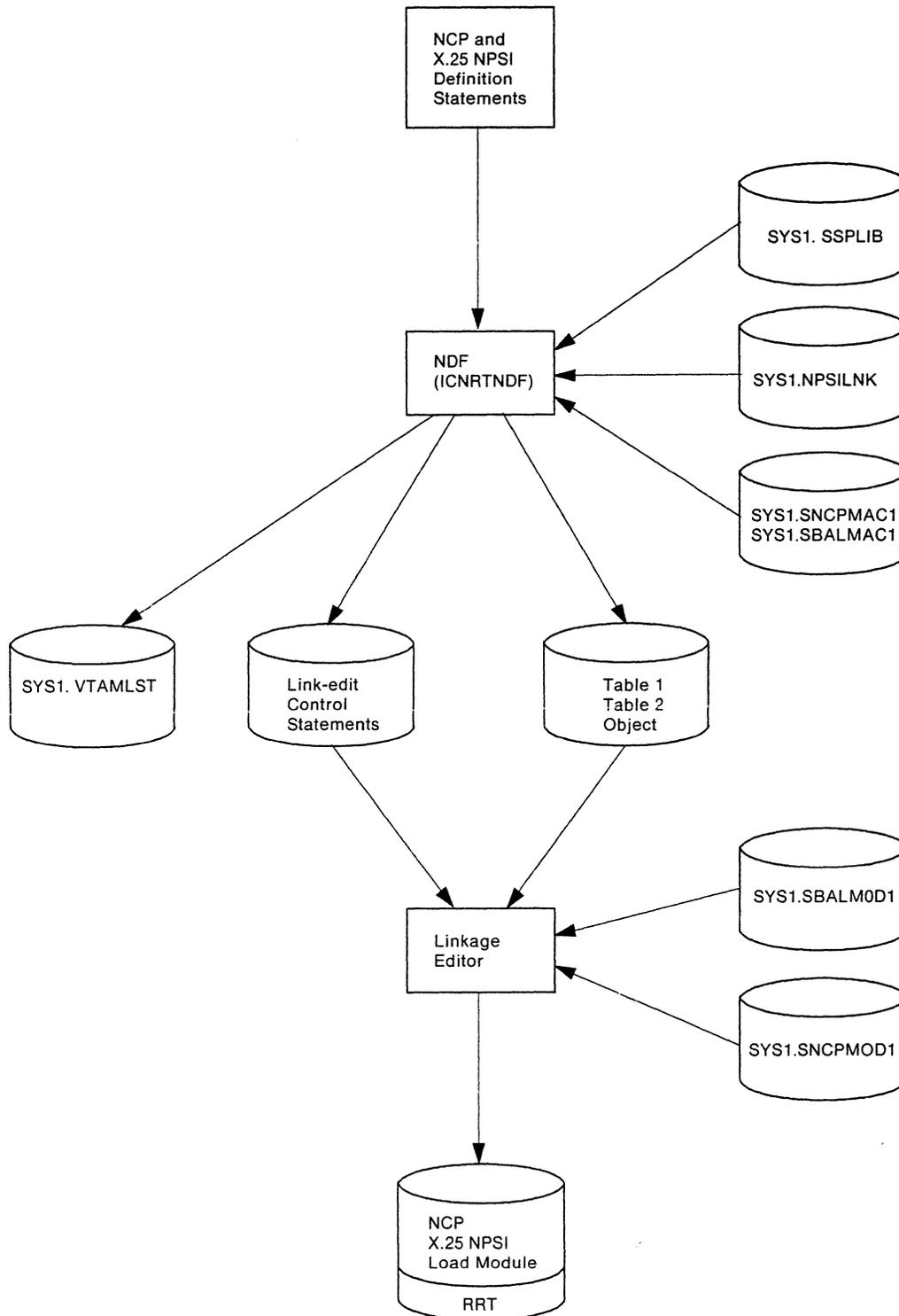


Figure 3. X.25 NPSI Generation Summary under MVS for V3R2

## Placement within the NCP Generation Definition Statements

The X.25 NPSI generation process under MVS allows you to specify the X.25 NPSI definitions within the NCP definitions by using the NDF standard attachment facility. To accomplish this, code X.25 NPSI statements in the NCP generation code after all start-stop (SS) and binary synchronous communication (BSC) definitions if any, and before all SNA network interconnection (SNI) NETWORK statements (nonnative network definitions).

Figure 4 shows the correct placement of X.25 NPSI statements.

```

NCP BUILD Statement
.
.
SS Definitions
.
.
BSC Definitions
.
.
SDLC Definitions
.
.
X.25 NPSI Definitions
  X25.NET Statement
.
.
  X25.END Statement
Channel Adapter Definitions (required for 3745)
.
.
SNI Definitions (nonnative network definitions)
.
.
GENEND Statement

```

Figure 4. Placement of X.25 NPSI Statements in NCP Generation

---

## X.25 NPSI Generation under VM (V3R2 Only)

X.25 NPSI generation under VM occurs as a two-stage, inline process in the first step of NCP generation. Because X.25 NPSI input is submitted with the NCP input, the time required to produce a load module is significantly reduced.

X.25 NPSI is installed from tape. To select the correct tape files, refer to the instructions in the X.25 NPSI program directory. No specific X.25 NPSI EXECs are provided to perform X.25 NPSI generation. X.25 NPSI uses the NDF standard attachment facility for generation.

For a complete explanation of the NCP installation procedure, see the *NCP, SSP, and EP Resource Definition Guide*.

### Installation

When installing X.25 NPSI under VM, you must restore various files from the X.25 NPSI distribution tape. Descriptions of the required files are as follows:

- NPSIOBJ TXTLIB contains the object code for the X.25 NPSI part of the NCP/EP Definition Facility (NDF). This file is used to apply maintenance to the X.25 NPSI part of the generation.
- NPSILNK LOADLIB contains the load module used to generate X.25 NPSI.
- SBALMAC1 MACLIB contains the X.25 NPSI macros used during NCP and X.25 NPSI combined generation. These macros are used during the table assembly of NCP generation.
- SBALMOD1 TXTLIB contains the preassembled X.25 NPSI load modules. This file is used during the link-edit step of the combined NCP and X.25 NPSI generation.

The DDNAME of the FILEDEF statement used to define the X.25 NPSI object modules library must be SBALMOD1.

### Generation Process

The combined NCP/X.25 NPSI generation procedure results in the following improvements:

- One generation set contains both X.25 NPSI and NCP statements.
- Load module creation takes less time.
- The NCP and X.25 NPSI listing is printed as one item.
- NDF diagnostic aids can be used.

To verify the input definitions without going through the entire generation process, use the FASTRUN keyword on the OPTIONS statement. When FASTRUN is selected, NDF reads the input and performs the validity check. Only the input section and error listing are generated. Control blocks and the load module are not produced.

The TBL1OBJ and TBL2OBJ are small data sets. The size depends on the number of MCHs and virtual circuits. A safe order of magnitude is one cylinder of 3380 to every 200 virtual circuits.

The X.25 NPSI statements described in Chapter 4, "Resource Definition Reference," provide the attachment to the PSDN. These statements are required for the X.25 NPSI

part of the NCP generation and define the X.25 NPSI control blocks through the use of NDF.

The linkage editor uses both the X.25 NPSI object module library (SBALMOD1 TXTLIB) and the NCP object module library (SNCPMOD1 TXTLIB) as input. This produces the following:

- NCP/X.25 NPSI Load Module
- Resource Resolution Table.

The NCP load module contains NCP and X.25 NPSI control blocks and executable code.

## Placement within the NCP Generation Definition Statements

The X.25 NPSI generation process under VM allows you to specify the X.25 NPSI definitions within the NCP definitions by using the NDF standard attachment facility. To accomplish this, code X.25 NPSI statements in the NCP generation code after all start-stop (SS) and binary synchronous communication (BSC) definitions if any, and before all SNA network interconnection (SNI) NETWORK statements (nonnative network definitions).

Figure 5 shows the correct placement of X.25 NPSI statements.

```

NCP BUILD Statement
.
.
SS Definitions
.
.
BSC Definitions
.
.
SDLC Definitions
.
.
X.25 NPSI Definitions
  X25.NET Statement
  .
  .
  X25.END Statement
Channel Adapter Definitions (required for 3745)
.
.
SNI Definitions (nonnative network definitions)
.
.
GENEND Statement

```

Figure 5. Placement of X.25 NPSI Statements in NCP Generation

---

## X.25 NPSI Generation under VSE (V3R2 Only)

The generation of X.25 NPSI under VSE uses the NDF standard attachment facility. The generation procedure using special IBM products such as X.25 NPSI, is described in *NCP, SSP, and EP Resource Definition Guide*. See "Bibliography" on page 239, at the back of this book.

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---

## Chapter 2. Planning for an X.25 NPSI Network

This chapter introduces you to the planning concepts needed for integrating X.25 NPSI into your network. The chapter is divided into five task sections:

- Planning for the x.25 interface
- Planning for x.25 NPSI
- Planning for x.25 NPSI in the network
- Planning for x.25 NPSI migration
- Planning for the configurator.

Because X.25 NPSI connects SNA equipment through an X.25 PSDN, you should have an understanding of the Recommendation X.25, the PSDNs that conform to X.25, and the subscription parameters for PSDNs that work with X.25 NPSI.

As you plan your generation, you also should become familiar with the following:

- Hardware and software compatibility
- Logical link control types
- Storage requirements
- Connections that do not use PSDNs
- Conformance to ISO standards.

Because X.25 NPSI communicates with many components of the network, you need to understand:

- SNA considerations
- Host application considerations
- Network recovery considerations.

If you used an earlier version of X.25 NPSI, you should also read "Planning for X.25 NPSI Migration" on page 49.

---

### Planning for the X.25 Interface

To plan for the use of X.25 NPSI in your network, you need to understand both the Recommendation X.25 and the packet switched data networks (PSDNs) that are designed to conform to the recommendation.

"Recommendation X.25" on page 16 gives you a brief introduction to the Recommendation X.25.

"PSDNs" on page 16 gives you an overview of the workings of the PSDN.

"Planning PSDN Subscription" on page 17 describes specific subscription parameters available from PSDNs.

*X.25 NPSI General Information* contains more information about X.25 and PSDNs.

## Recommendation X.25

The Recommendation x.25 was first approved by the International Telegraph and Telephone Consultative Committee (CCITT) in 1976. Since then, the recommendation has been refined and enhanced in 1980 and 1984.

The recommendation defines a standard interface for communication over three conceptual levels: physical, link, and packet.

- Physical level

The physical level specifies the electrical and physical characteristics of the interface (for example, voltage levels and circuit signals).

Recommendation x.21 from the CCITT defines the recommended physical interface. An alternate physical interface is defined in x.21 bis. x.21 bis is similar to the current v.24 (EIA RS-232-C in the U.S. and Canada) and v.35 interfaces implemented on IBM equipment.

- Link level

The link level converts the physical circuit into an error-free logical link used to transfer data between the data terminal equipment (DTE) and the data communication equipment (DCE).

Link level provides a standard protocol for the following procedures:

- Controlling the data link
- Checking the frame sequence
- Detecting the start and end of a frame
- Initializing the link
- Disconnecting the link
- Resetting the link.

The address field defines the flow and direction of the frame. For example, the address field indicates whether the frame is a command or a response. Both the DTE and the DCE use the control field information to detect out-of-sequence frames, duplicated frames, missing frames, and the types of frames. The frame check sequence is a facility for detecting transmission errors.

- Packet level

The packet level defines the structure of *data* and *control* packets. Data packets contain the information that is to be transferred. Control packets are used to establish and manage virtual circuits.

The packet level specifies how a single physical circuit can be used by multiple logical circuits that handle simultaneous virtual calls. Packet flow over the logical circuit is also managed at the packet level.

## PSDNs

Packet switched data networks (PSDNs) are networks connected by high-speed lines that carry data in small segments called *packets*. PSDNs perform the following functions:

- Route user data packets
- Respond to command packets
- Monitor and manage the status of network resources.

PSDNs allow you to control data flow over the circuits. Placing data into segments permits multiple users to share one physical circuit. Though many users can use a

PSDN at one time, each user sees it as a point-to-point connection because of the use of the *virtual circuit*.

Each physical circuit can contain up to 4096 virtual circuits. Virtual circuits are created by connecting two end points of a network. Each end of the virtual circuit accesses the PSDN through a *logical channel*.

There are two types of virtual circuit connections supported in a PSDN:

- Permanent virtual circuit (PVC)
- Switched virtual circuit (SVC).

A PVC is analogous to a leased line in that a predefined association between two logical channels is made to the PSDN. An SVC is analogous to a switched circuit. A call setup procedure must be followed to establish a virtual circuit connection between two logical channels. The PSDN uses routing tables to maintain the relationships among the physical circuits, virtual circuits, and logical channels.

**Note:** Although access to the PSDN by a physically switched connection is part of the CCITT Recommendation X.25, most networks provide access only by physically nonswitched connections. X.25 NPSI supports nonswitched connections to PSDNs only.

Packets that flow on the virtual circuit have a maximum packet length. If the data length that is sent exceeds this maximum length, the packet is arranged into segments that do not exceed the maximum packet length. The PSDN then transmits the packets to the specified destination and guarantees delivery in the proper order with no information loss.

To ensure the proper delivery of packets, the PSDN uses a *packet header* that includes the logical channel identifier, a sequence number, and other control information. In most cases, the PSDN receives the packetized data from a DTE, sends an acknowledgment to the origin, and passes the packets to their destination.

**Note:** CCITT Recommendation X.25 applies to the interface between the PSDN DCE and a user DTE. PSDNs that provide an X.25 interface do not always operate in exactly the same way. In addition, not all PSDNs provide an X.25 interface.

## Planning PSDN Subscription

The following considerations should be discussed with your PSDN vendor when you plan the attachment requirements.

### Packet Size

Packet size is defined to the PSDN as the maximum size packet that can be transmitted between the DTE and DCE.

X.25 NPSI supports packet sizes ranging from 32 through 4096 bytes, but many PSDNs have their own size restrictions. To ensure compatibility, discuss packet size with your network vendor. A larger packet size decreases central control unit (CCU) utilization by X.25 NPSI, because splitting the path information unit (PIU) into several packets is time-consuming.

Packet size can be predetermined or negotiated at call setup.

## Packet-Level Window Size

Packet-level window size defines the maximum number of packets that can be transmitted between the DTE and DCE on a particular virtual circuit before an acknowledgment must be received.

A packet window exists for each transmission direction. The packet-level window size affects end-to-end flow control for a virtual circuit and is dependent upon the:

- Type of application
- Traffic flow
- Line access speed.

Many PSDN vendors do not offer packet-level window size as a subscription parameter. Instead, they set the packet-level window size default at 2, because, as the packet-level window size increases, the buffer requirements within a PSDN increase.

Subscribing to or negotiating a packet window size of more than 2 (if the size is available from the PSDN vendor) increases the degree of piggybacking required in the X.25 NPSI packet level, and therefore decreases CCU utilization.

## Link-Level Window Size

Link-level window size defines the number of packets that can be transmitted on a physical circuit before an acknowledgment must be returned. This window size is the sum of all packets transmitted for all virtual circuits operating on a physical circuit. Link-level window size is a mechanism used to regulate information flow across the X.25 DTE/DCE interface.

For access lines with smaller error rates, you can obtain better throughput by defining larger link-level window sizes. For most PSDNs, the link-level window size is fixed at 7.

## Closed User Group

A closed user group (CUG) is a PSDN facility intended to prevent unauthorized access to a DTE. When CUG is in use, switched logical channels not subscribing to the same CUG are unable to communicate with each other. The CUG option does not affect X.25 NPSI performance.

CCITT defines the following types of CUGs within X.25:

- Outgoing access
- Incoming access
- Incoming calls barred
- Outgoing calls barred
- Outgoing access selection.

Some networks allow all types of CUGs; others allow only some types. Check with your PSDN vendor to determine which CUGs are available.

X.25 NPSI *unconditionally* accepts CUGs for incoming calls by default. If you want to control CUGs, you must use the X.25 NPSI GATE or DATE function, or specify the type of CUG to be rejected in the RFAC keyword of the X25.NET statement. See *X.25 NPSI Host Programming* to learn more about programming GATE and DATE.

## Reverse Charging

Reverse charging for an X.25 connection is the same as reverse charging in the telephone network. With reverse charging, the called party pays the connection cost.

PSDN vendors charge for connection in different ways. Charges can be determined by the number of virtual circuits and by the number of physical circuits. Many vendors allow you to specify reverse charging only by physical circuit, which will affect all virtual circuits using that physical circuit.

Some PSDN vendors determine charges using a volume-related charge that applies to a subscription account, rather than a virtual circuit. Each installation must pay a subscription charge. In this case, you can avoid multiple subscription charges by using reverse charging for one installation with a subscription account and have all packets charged to that single subscription.

Some PSDN vendors automatically charge the called party when a PSDN packet assembler/disassembler (PAD) is accessed.

You must arrange with the PSDN vendor at the time of subscription to either accept or reject reverse charge calls.

X.25 NPSI *unconditionally* accepts reversed charging of incoming calls by default. To control reverse charging, you must use the X.25 NPSI GATE or DATE function or specify that you want to reject reversed charging in the RFAC keyword of the X25.NET statement. See *X.25 NPSI Host Programming* to learn more about programming GATE and DATE.

## High-Priority Class of Traffic

This high-priority class of traffic service ensures that packets marked as high-priority are transmitted before other packets. However, this service requires the use of a smaller packet size and is done at a premium cost.

X.25 NPSI fully supports high-priority class of traffic service. X.25 NPSI checks incoming calls for high-priority service requests and internally updates the packet length to 128 for the duration of a high-priority call.

For outgoing calls, you can specify priority service using the optional facilities keyword (OPTFACL) of the X25.OUFT statement. You must also code an associated X25.VCCPT statement defining a maximum packet length of 128.

See Chapter 4, "Resource Definition Reference," for more information about the X25.OUFT and X25.VCCPT statements.

**Note:** Do not confuse high-priority class of traffic with the CCITT fast select facility.

## Line Speed

Line speed is how many bits per second (bps) a physical circuit can transmit data. A greater line speed means an increased connection cost, in addition to the increased circuit cost. A lower line speed lengthens response time. To shorten response time, the average load on a physical circuit's transmit leg or receive leg should not exceed 60 percent. Plan your line speed needs carefully, and then discuss them with your PSDN vendor.

**Note:** Configurators 3720 or 3745 compute the use of each MCH leg (transmitting and receiving) as a function of the traffic described on each virtual circuit belonging to this MCH. This information can help in determining the required line speed.

## PAD Service

A PSDN can include PAD service in its configuration. PAD service provides protocol conversion for connecting non-X.25 devices to an X.25 interface. CCITT has defined the following three PAD recommendations:

- X.3 defines a set of parameters that a PSDN PAD must have to allow attachment of start-stop ASCII devices that are TTY 33/35 compatible.
- X.28 provides a profile for the setting of the X.3 control parameters.
- X.29 specifies minimum functions that a packet-mode DTE, such as X.25 NPSI, must have to interface with the PAD over an X.25 connection.

X.25 NPSI provides two types of PAD support. The first type is called *integrated* PAD support. Integrated PAD support employs a subset of the Recommendation X.29. An ASCII terminal conforming to X.28 and communicating through an X.3 PAD can use integrated PAD support to access an SNA host.

The second type of PAD support is called *transparent* PAD support. With this type of support, the host application is responsible for those commands that allow communication with the remote PAD.

Transparent PAD support is required for any PAD that does not follow the recommendations X.3, X.28, and X.29. Transparent PAD support can also be used with a PAD that supports the CCITT recommendations X.3, X.28, and X.29 if the host application requires control of the PAD service in a different way than the support provided by integrated PAD support.

## Conformance to ISO Standards and CCITT 84 (V3R2 Only)

This section describes how X.25 NPSI V3R2 conforms to the ISO standards 7776 and 8208.

**Note:** The enhancements listed in this section are available in V3R2 only. It must also be noted that the modifications described in the packet level section *do not* apply to the DATE or GATE environment.

## System Generation

Keywords must be added to the X25.NET statement to support the optional features at the packet level. See "Packet Level" on page 21 for the keywords.

## Link Level

The link level changes bring X.25 NPSI in closer conformance to the ISO 7776 and CCITT 1984 Recommendations. The changes are as follows:

- X.25 NPSI retransmits a frame reject (FRMR) frame with the same information field that was originally transmitted in response to an I or S frame.
- X.25 NPSI transmits an FRMR response when an unknown response is received with the final bit set on.
- X.25 NPSI transmits a set asynchronous balanced mode (SABM) frame when an unexpected response frame is received with the final bit set on.

- An unnumbered acknowledgment (UA) is sent rather than an SABM/UA in response to an SABM.
- X.25 NPSI accepts a FRMR as valid, even if all of the X, Y, Z, and W bits are set off. Reinitialization of the MCH is then performed.

## Packet Level

**Note:** Modifications in the packet level section do not apply when using the DATE and GATE functions.

The X.25 NPSI enhancements, to more closely conform to ISO 8208 and CCITT 84 at the packet level, include:

- Possible use of CCITT 84 diagnostic codes
- Facility checking for Incoming Call and Call Connected packets
- Checking of nonstandard facilities for Incoming Call and Call Connected packets
- Additional validity checking of received packets
- Reset packet exchange on an SVC followed by an optional Clear packet
- Retries on Clear, Reset, and Restart packets.

**CCITT 84 Diagnostic Codes:** When X.25 NPSI sends a Restart, Clear, or Reset packet to the network, it appends cause and diagnostic codes to the created packet. X.25 NPSI selects the appropriate cause and diagnostic codes to send to the DCE, depending on the specification of the CAUSE keyword of the X25.NET statement.

During X.25 NPSI system generation, a cause and diagnostic table is built as coded in the CAUSE keyword in the X25.NET statement. One of the following three tables is built:

- CCITT
- IBM00
- IBM80

The default value is:

CAUSE=IBM00

See *X.25 NPSI Diagnosis, Customization, and Tuning* for more information on CCITT cause and diagnostic codes.

**Note:** Many IBM diagnostics do not have an equivalent CCITT diagnostic code. In such cases, even with CAUSE = CCITT specified, the IBM00 set of codes is sent.

**X.25 NPSI Facility Checking for Incoming Call and Call Connected Packets:** X.25 NPSI checks the format of the facility field in both the Incoming Call and the Call Connected packets. X.25 NPSI accepts the call if the call is specified in the NSTDFAC keyword of the X25.NET statement, or if the facility codes are any one of the following:

- Fast select
- Reverse charging
- Throughput class negotiation
- Call redirection
- Closed user group (CUG) with basic format

- CUG with outgoing access (basic)
- CUG with extended format
- CUG with outgoing access (extended)
- Bilateral cug
- Packet size negotiation
- Packet window size negotiation
- High-priority class of traffic.

If this is not the case, X.25 NPSI clears the call. A Clear Request packet is sent if a format error is found.

X.25 NPSI also scans the facility codes in both the Incoming Call and the Call Connected packets. X.25 NPSI does not check for invalid facility codes.

X.25 NPSI checks the facility field format for the following:

- A facility length greater than the remainder of the packet
- A facility length greater than 109 bytes
- A duplicated facility.

A table of up to nine predefined CCITT facilities can be built at system generation, and you decide which facilities, if any, you want to reject. Use the keyword RFAC in the X25.NET statement to code the facilities you want to reject. For example:

```
RFAC=(fac1,fac2,fac3,...)
```

where fac is the mnemonic code of the facility to reject. Nine facilities are available. Each facility is optional and can be rejected. The default value is NONE, indicating that no facility is rejected. See "X25.NET Statement" on page 114 for the list of facilities that can be rejected.

**Note:** Fast select is supported only when communicating through a GATE or DATE CTCP.

When an Incoming Call or Call Connected packet containing optional facilities is received, and one of the facilities is coded for rejection, a Clear packet is sent to the network.

**Nonstandard X.25 NPSI Facilities Process:** In addition to the standard CCITT X.25 user facilities, a table of nonstandard facilities to be accepted can be generated. Although the nonstandard user facilities are not defined in the CCITT Recommendation X.25, they must have the proper facility format.

Use the NSTDFAC keyword in the X25.NET statement to code the nonstandard facilities. The default value is NONE. For example:

```
NSTDFAC=(Nsfac1,Nsfac2,Nsfac3...)
```

A nonstandard facility can be duplicated in a Call packet. In this case, the facility must be coded as *many times* as it might be duplicated. For example:

```
NSTDFAC=(Nsfac1,Nsfac2,Nsfac2,Nsfac2,Nsfac3...)
```

**Validity Checking of Received Packets:** When a packet is received, X.25 NPSI checks for the following:

- The packet is valid in the current virtual circuit state.
- The length of the packet is valid.
- The packet has a valid format.

- The virtual circuit number allows for the received packet type.
- The packet is valid on the virtual circuit number.

**Reset Packet Handling:** The following information should be considered when a Reset packet is received by X.25 NPSI.

- For a PVC:
  - When a Reset packet is received, X.25 NPSI confirms the reset and sends an INOP message for the virtual circuit PU.
  - When a Reset packet is sent, X.25 NPSI waits for a Reset Confirmation packet and sends an INOP message for the virtual circuit PU.
- For an SVC:
  - When a Reset packet is received, X.25 NPSI confirms the reset and clears the virtual circuit if CRAFTRC = YES is coded. When X.25 NPSI receives a Clear Confirmation packet, X.25 NPSI deactivates the virtual circuit PU. If CRAFTRC = NO is coded, X.25 NPSI confirms the Reset packet, and the virtual circuit is not cleared or deactivated unless X.25 NPSI is processing a packet sequence with the M bit on for LLC2 and LLC3.
  - When X.25 NPSI detects a reset condition, it sends a Reset packet to the network and waits for a confirmation. If CRAFTRC = YES is coded, X.25 NPSI sends a Clear packet, waits to receive the Clear Confirmation packet, and then causes the virtual circuit PU to become inoperable. If CRAFTRC = NO is coded, the virtual circuit is not cleared or made inoperable unless X.25 NPSI is processing a packet sequence with the M bit on for LLC2 and LLC3.

**Note:** It is the responsibility of a communication and transmission control program (CTCP) to send a Clear Request packet when a Reset packet is sent or received on a virtual circuit using GATE or DATE.

**Retries on Clear, Reset, and Restart Packets:** Timer values and retry counts are specified in the X25.NET statement. The default value for the timers is set at 180 seconds, with the exception of T21, which has a default of 200 seconds. The retry count default value is set at 1 for all retry counters, except for R21 (Call) where no retry is attempted.

The system generation keywords specified in the X.25 NET statement are:

**Timer Values**

- T20** Restart Request response timer
- T21** Call Request response timer
- T22** Reset Request response timer
- T23** Clear Request response timer

**Retry Counters**

- R20** Restart Request retries
- R22** Reset Request retries
- R23** Clear Request retries.

---

## Planning for X.25 NPSI

This section discusses the considerations for X.25 NPSI that you should be familiar with when planning your installation:

- Software and hardware compatibility
- Storage requirements
- Connection without a PSDN
- Logical link control types.

### Software and Hardware Compatibility

Software release compatibility for X.25 NPSI can be defined as follows:

<b>Operating System</b>	For V3R2: MVS, VM, and VSE operating system. For V3R1: MVS operating system.
<b>Access Method</b>	X.25 NPSI works with the same access methods as the corequisite NCP version. See <i>Network Program Products General Information</i> for details.
<b>Host Resident Programs</b>	SNA applications are fully compatible with connection to SNA destinations. You need to take special considerations with non-SNA destinations. These programs must be able to support an LU type 1 device.

For further information on hardware compatibility with X.25 NPSI, see *X.25 NPSI General Information*.

X.25 NPSI supports the IBM 3720 and the IBM 3745 communication controllers. X.25 NPSI allows swapping of the physical circuit to controller lines reserved for backup support. Also, the NCP load module can be loaded from the disk on the communication controller.

### Storage Requirements

Because X.25 NPSI works in a communication controller under the NCP, plan your generation definitions to include X.25 NPSI storage requirements. X.25 NPSI increases the NCP storage requirements as shown in Table 2.

Component	Requirement
X.25 NPSI	60K to 100K
Each virtual circuit	0.9K + 0.3K per LU
Each physical circuit	2K

## Connection without a PSDN

X.25 NPSI generally uses a PSDN to communicate with a remote DTE, but a PSDN is *not* a requirement. X.25 NPSI can communicate with a destination node without going through a PSDN.

The destination node can be attached through a:

- Direct connection (communication controller clocks the physical circuit)
- Modem eliminator
- Regular data circuit.

Two cases must be distinguished:

**Case 1:** X.25 NPSI functions as a DCE at the link level and as a DTE at the packet level.

**Restriction:** The link level in X.25 NPSI acts as a DCE station. Primary and secondary addresses are reversed. DCE to DTE commands carry the address 03, while responses carry the address 01. If STATION = DCE is coded, X.25 NPSI does not send a Ready Receive (RR) packet with poll commands when no activity exists on the line.

The packet level in X.25 NPSI does not work as a DCE station, but instead functions in the following manner:

- For outgoing calls, svcs are assigned in decreasing order. Call collisions can occur frequently if:
  - Call and Clear frequency is high.
  - There are several svcs on the MCH, and the other end also assigns svcs in decreasing order.
- In Call packets, facilities are processed as in a DTE.
- Cause and diagnostic codes are set as in a DTE. See *X.25 NPSI Diagnosis, Customization, and Tuning* for more information on the codes.

**Note:** The last two items in this list do not apply for GATE or DATE.

**Case 2:** The remote device operates as a DCE. In this case, X.25 NPSI operates as a DTE.

**Note:** For clarity, the X.25 NPSI library is written so that X.25 NPSI appears to operate as a DTE. Be aware that the X.25 NPSI MCH can also act as a DCE with the previous restriction.

## Logical Link Control Types

X.25 NPSI supports five logical link control (LLC) types. The LLC type used depends on the type of device with which X.25 NPSI communicates, and the characteristics of the communication.

LLC types define the support functions required in X.25 NPSI. LLCs can be classified either as SNA to SNA or as SNA to non-SNA connections.

- SNA to SNA connections:
  - LLC type 2 connects to SNA DTEs through a physical services header (PSH) interface.
  - LLC type 3 connects to SNA peripheral nodes or SNA subarea nodes using qualified logical link control (QLLC).
- SNA to non-SNA connections:
  - LLC type 0 connects to X.25 non-SNA DTEs.
  - LLC type 4 connects to non-SNA DTEs that use GATE support.
  - LLC type 5 connects to non-SNA DTEs through a PAD.

**Note:** LLC type 1 is not used.

The following sections provide a detailed description of the LLC types, fast connect, and DATE.

## SNA Connections

LLC types 2 and 3, which connect to SNA destinations, are explained in this section.

**Logical Link Control Type 2:** LLC type 2 connects the host to an SNA DTE by using a physical services header (PSH). X.25 NPSI processes the SDLC commands through the PSH.

To create an LLC type 2:

- PVC—use the X25.LINE, X25.PU, and one or more X25.LU statements; do not use the X25.VC statement.
- SVC—use the X25.VC statement or the X25.LINE and X25.PU statements together.

See Chapter 4, “Resource Definition Reference,” for more information about the X25.VC, X25.LINE, X25.PU, and X25.LU statements.

The following are examples of type 2 connections:

- 3274 cluster controller connected to the PSDN through a Network Interface Adapter (NIA)<sup>1</sup>
- PU type 2 SNA host connected to the PSDN through an NIA (for example, S/3x). NIA supports only PU type 1 and 2.

See Figure 6 on page 27 for an example of an LLC type 2 connection.

---

<sup>1</sup> A Network Interface Adapter (NIA) is an example of a hardware device that uses LLC 2 to connect an SNA host or a DTE to a network.

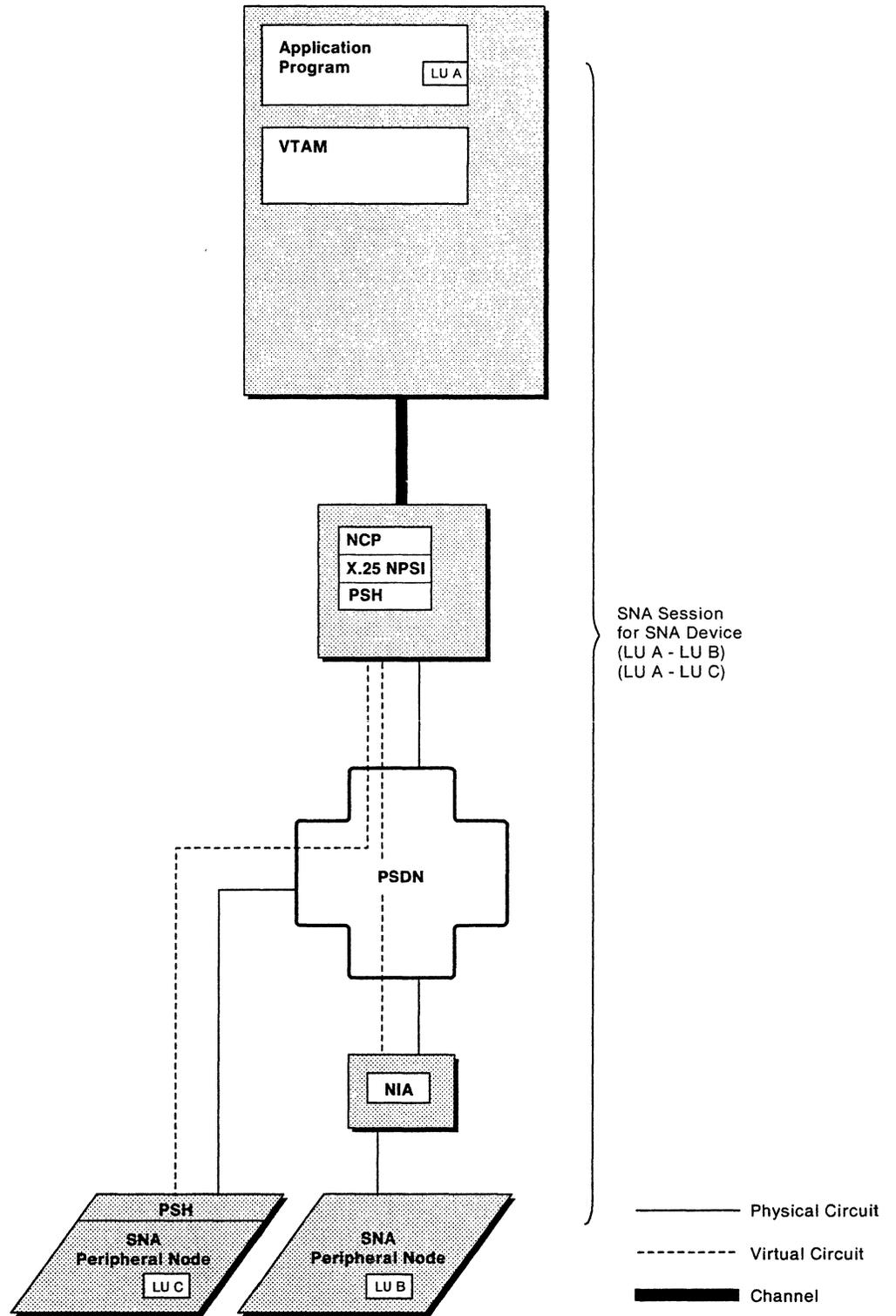


Figure 6. Logical Link Control Type 2

**Logical Link Control Type 3:** LLC type 3 connects the host with SNA DTES using qualified logical link control (QLLC). Packets with the Q bit contain SDLC commands. Packets without the Q bit contain Information frames. Peripheral node QLLC supports the SNA type 2.1 node. This type of node allows peer-to-peer sessions to be set up between peripheral nodes. Subarea node QLLC supports the switched virtual circuit subarea communication (svcsc) function and the short hold mode (SHM). svcsc allows subarea-to-subarea communication using a switched virtual circuit.

Figure 7 on page 29 shows an LLC type 3 that uses peripheral node QLLC support to attach to a peripheral node. Figure 8 on page 30 shows an LLC type 3 that uses subarea network node QLLC support to attach to a communication controller using X.25 NPSI.

To create an LLC type 3:

- Peripheral node
  - PVC—use the X25.LINE, X25.PU, and one or more X25.LU statements; do not use the X25.VC statement.
  - SVC—use the X25.VC statement or the X25.LINE and X25.PU statements together.
- Subarea node
  - PVC—use the X25.LINE and X25.PU statements together; do not use the X25.LU statement.
  - SVC—use the X25.LINE and the X25.PU statements to define the SNA resources corresponding to the NCP LINE and PU to the remote subarea. Then use the X25.VC statement to define the virtual circuit. (V3R2 only)

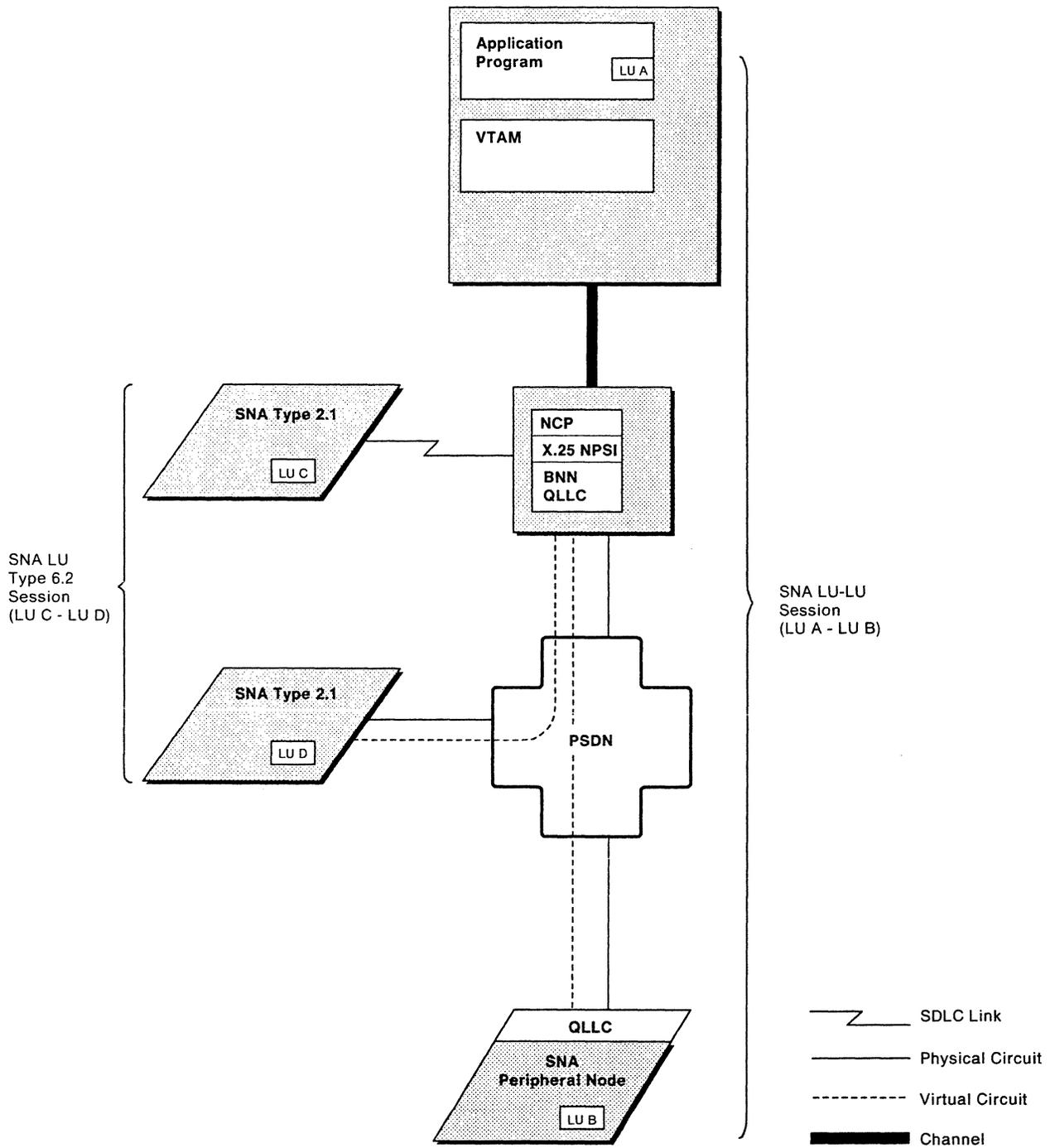


Figure 7. Logical Link Control Type 3 (Peripheral Node)

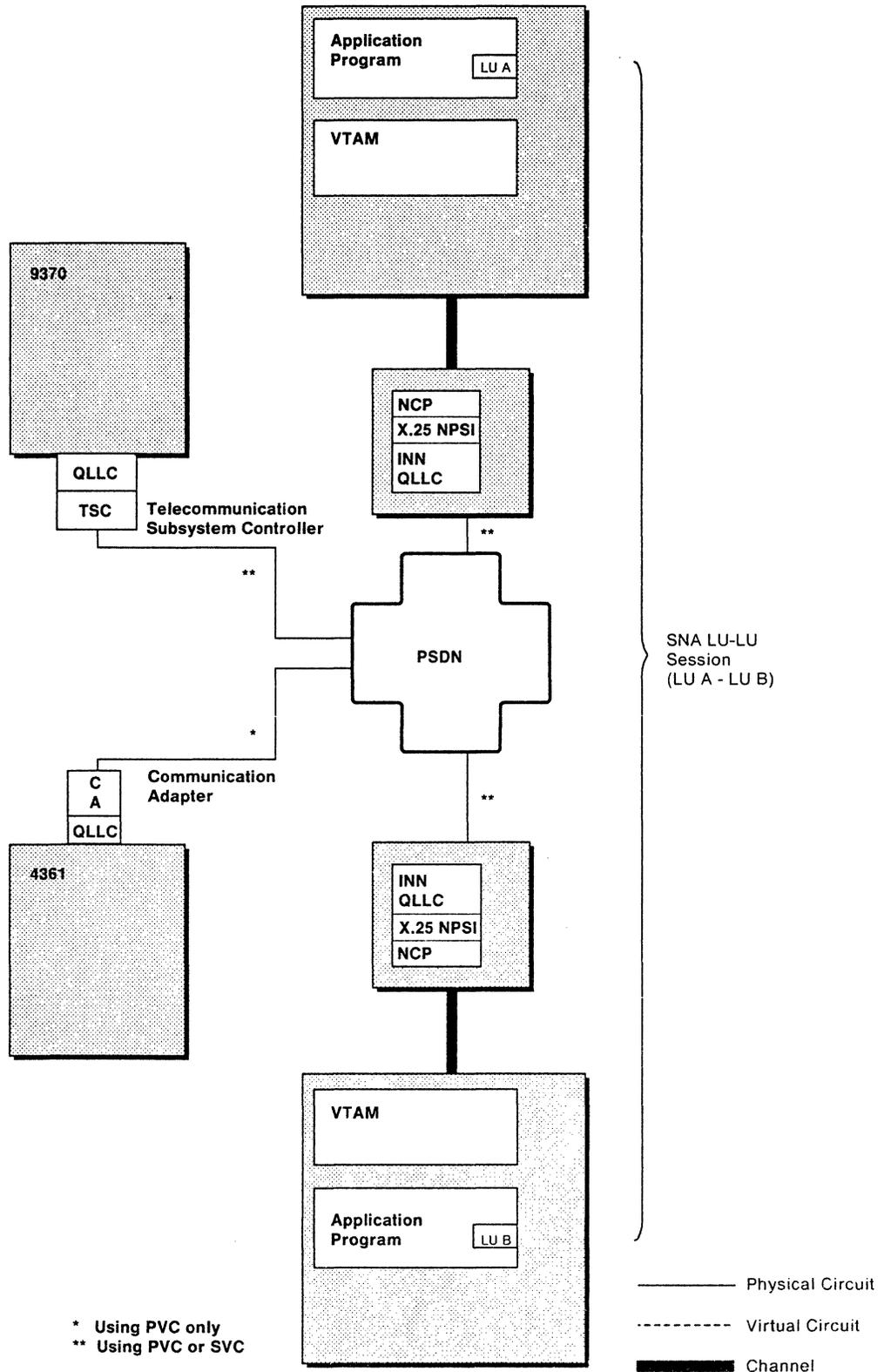


Figure 8. Logical Link Control Type 3 (Subarea Node)

It is not possible to load a remote communication controller through X.25 NPSI, but initial activation of a remote communication controller is possible when using a PVC. In this case, the NCP/X.25 NPSI load module must already be loaded from the controller's disk.

Initial activation of a remote NCP/X.25 NPSI is not possible using an SVCSC. However, once initial activation has been done using a channel, an SDLC leased line, or a PVC, an SVCSC virtual circuit can convey ownership of the NCP/X.25 NPSI and its related line's physical unit LUS at failure or inactivation of the vehicle that allowed initial activation. Operation of the remote NCP/X.25 NPSI can continue through the SVCSC line alone.

In order for the SVCSC line to recover the ownership, recovery must be triggered by VTAM sending a command to the remote NCP. An operator can request an activate line trace of a virtual circuit located in the remote NCP. The operator command will inevitably be rejected because line trace is not supported on a virtual circuit, but not before it reaches the remote NCP.

Figure 9 on page 32 is an example of the way SVCSC could be used. The PUS are owned by the host to which they are attached through NCP and the channel. The LUS on the left can log on to host#1 in the same domain. They can also log on to host#2 using cross-domain or cross-network functions. Symmetrically, the LUS on the right should be owned by the SSCP on the right, but they should be able to log on to applications on both sides.

Multiple load module functions can be executed when activation of the remote NCP over an SVCSC connection is not required. In other words, a load module can be put on a 3720 or a 3745 disk using a SVCSC after the NCP has been activated by some other means.

Only single link transmission groups are supported by X.25 NPSI. Multiple virtual circuits cannot be combined to form a multilink transmission group.

The following examples are type 3 connections:

- SNA host connected to the PSDN through X.25 NPSI
- SNA device with integrated X.25 support connected to the PSDN
- SNA host connected to an SNA DTE through an X.25 network.

See Chapter 4, "Resource Definition Reference," for more information about the X25.VC, X25.LINE, X25.PU, and X25.LU statements.

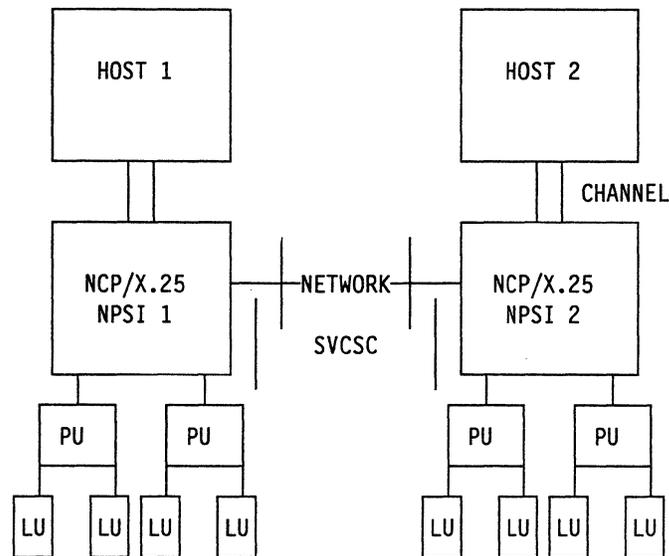


Figure 9. Example of SVCSC Use in Network

## Non-SNA Connections

Logical link control types 0, 4, and 5, which connect to non-SNA destinations, are explained in this section.

X.25 NPSI communicates with non-SNA destinations by simulating an SNA physical unit type 1 and logical unit type 1 for each non-SNA device. This simulator allows the SNA host and its associated applications to communicate with the non-SNA devices. The simulation function is called the LU simulator (LUSIM). The LU simulator converts outgoing SNA requests from the host into X.25 packets, and converts the X.25 packets returning from the non-SNA DTE into SNA requests.

LUSIM facilitates host control over the non-SNA destination. Examples of this control include clearing the virtual circuit and operating a dial-out connection.

**Logical Link Control Type 0:** LLC type 0 (PCNE) connects the host with non-SNA DTEs that use X.25.

To create an LLC type 0:

- PVC—use the X25.VC statement or the X25.LINE, X25.LU, and X25.PU statements together.
- SVC—use the X25.VC statement or the X.25 LINE and X25.PU statements together.

See Chapter 4, "Resource Definition Reference," for more details on using the X25.VC, X25.LINE, X25.LU, and X25.PU statements.

The following examples are of LLC type 0 connections:

- Non-SNA host connected to the PSDN
- Non-SNA device connected to the PSDN without PAD.

See the LLC type 0 example shown in Figure 10 on page 33.

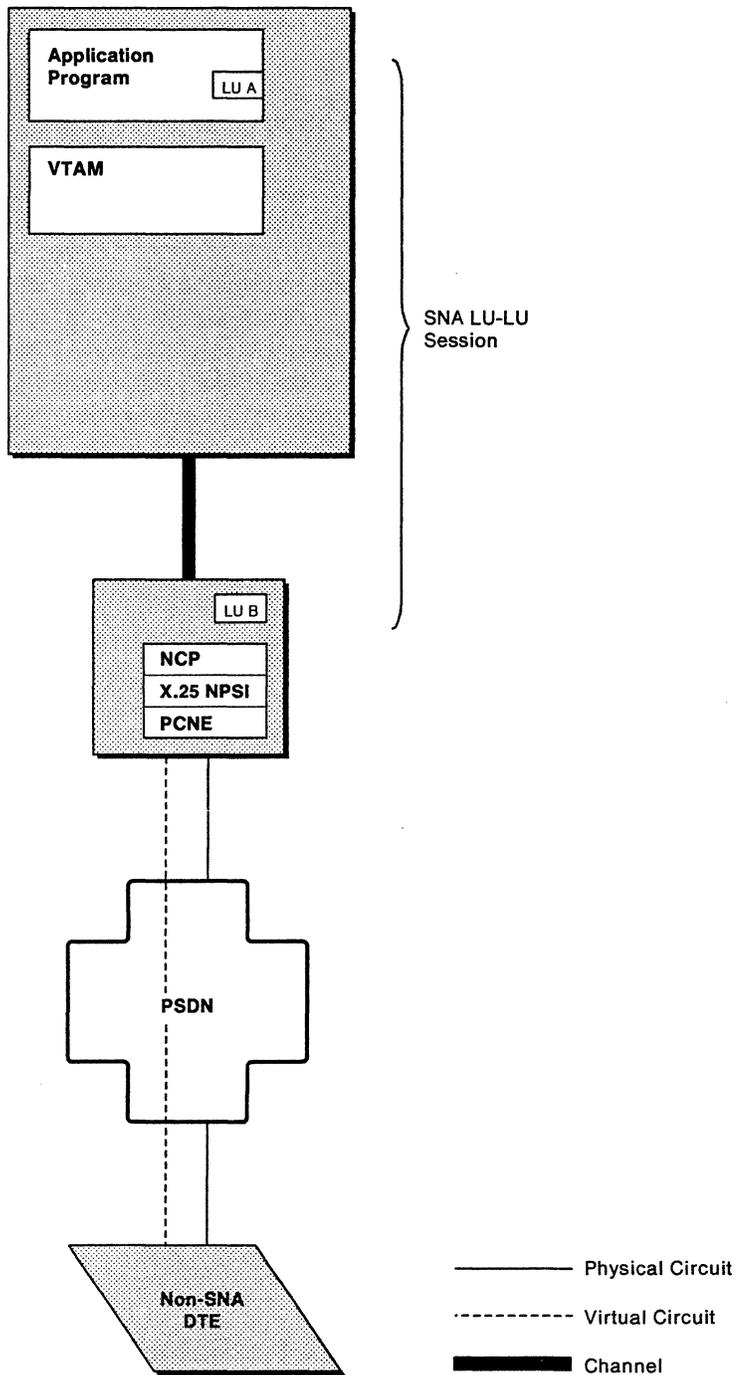


Figure 10. Logical Link Control Type 0

**Logical Link Control Type 4:** Type 4 LLCs are designed to allow users complete control over their virtual circuit connection through the use of a feature called general access to X.25 transport extension (GATE). The GATE support function is based on PCNE or LLC type 0.

The distinction between an LLC type 4 and an LLC type 0 is that, in a type 0 connection, X.25 NPSI handles all the X.25 control packets automatically. For a type 4 connection, a host application called communication and transmission control program (CTCP), must be written to control the virtual circuit.

The CTCP controls the setup and termination of the virtual circuit by exchanging commands with X.25 NPSI GATE. In addition, the CTCP processes all X.25 control and data packets. Command codes are contained in the first byte of each Request unit exchanged between the CTCP and X.25 NPSI. Because all application data passes through the CTCP, the GATE CTCP is often called a *relay* program.

GATE converts incoming packets into PIUS. Then, GATE adds the appropriate 1-byte command code to the Request unit, depending on the type of packet received, before sending the PIUS to the CTCP. Upon receipt of the Request unit, the CTCP interprets the command code and acts upon the command.

GATE converts outgoing PIUS into packets. The packet type is determined by the first byte of the outgoing Request unit or Response unit (RU).

The CTCP communicates with GATE by using one of two types of LU-LU sessions. The first type of session is between the CTCP and one of the logical units for the physical circuit used by the LLC type 4. The second type is between the CTCP logical unit and the logical unit for the virtual circuit.

To create a logical unit for the physical circuit that is used by the virtual circuit, use the X25.MCH statement. Virtual circuits of a given MCH can communicate with up to 28 CTCPs. The GATE keyword must be coded as GATE = GENERAL.

To create an LLC type 4:

- PVC—use the X25.VC statement or the X25.LINE, X25.PU, and X25.LU statements together.
- SVC—use the X25.VC statement or the X25.LINE and X25.PU statements together.

See Chapter 4, “Resource Definition Reference,” for further descriptions of the X25.MCH and X25.VC statements.

The following examples are type 4 connections:

- OSNS CTCP<sup>2</sup> connected to an OSI system through a PSDN and GATE
- GTMOSI CTCP<sup>3</sup> connected to a videotex terminal or a start-stop device through GATE and PAD.

See the example of GATE shown in Figure 11 on page 35.

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<sup>2</sup> OSNS is an acronym for Open Systems Network Support.

<sup>3</sup> GTMOSI is an acronym for General Teleprocessing Monitor for Open Systems Interconnection (OSI). In certain countries, IBM can provide these CTCPs for use with GATE.

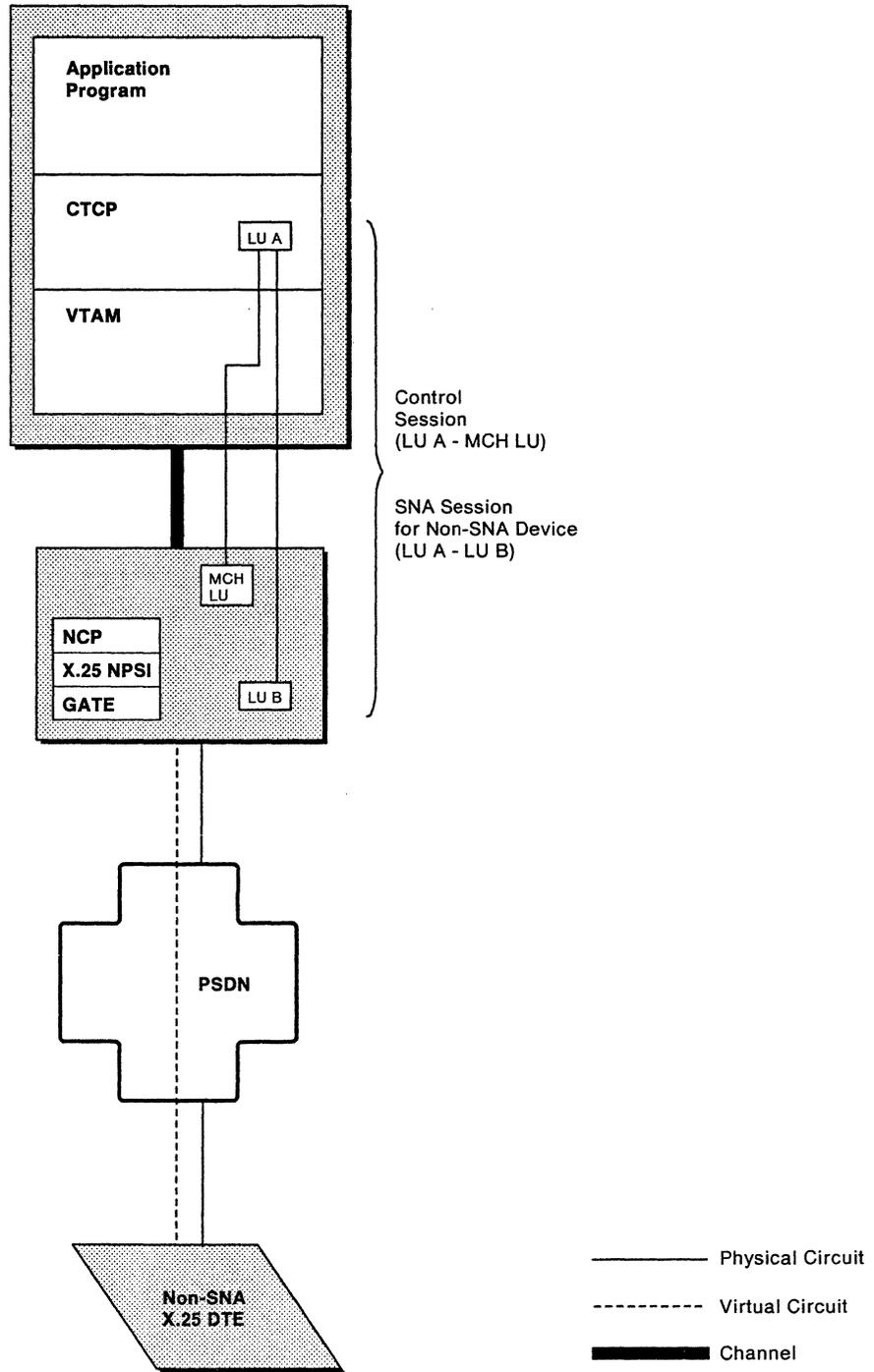


Figure 11. Logical Link Control Type 4 (GATE)

**Fast Connect Option for GATE:** X.25 NPSI includes an option for GATE virtual circuits called fast connect. Fast connect provides a quick way to connect non-SNA terminals to an SNA host processor. Rather than going through SNA session establishment for each call, fast connect saves time during call establishment by just linking X.25 resources with preestablished SNA sessions. Once SNA session establishment is complete, the sessions remain active when the X.25 virtual circuits are cleared and when the MCH fails or is deactivated.

SNA resources, used to map fast connect switched virtual circuits, are declared as nonswitched to NCP and the access method.

Figure 12 on page 37 shows how fast connect uses a dedicated SNA session to connect to a non-SNA device.

When fast connect is selected on an MCH, the entire MCH is dedicated to the fast connect operation and cannot be used for other LLC types.

At system initialization, all available SNA sessions between the CTCP and X.25 NPSI are opened by VTAM's automatic logon (LOGAPPL). X.25 NPSI fast connect then assigns each incoming call to one of the preestablished sessions, thereby eliminating all VTAM processing associated with SNA session establishment. Once the user activity is complete, the virtual circuit is cleared. However, the associated SNA session is maintained in a ready state to receive any subsequent calls on any virtual circuit.

Fast connect is useful when there is a heavy demand for quick connections of a short duration. In general, you can use fast connect as follows:

- Have a single CTCP for each MCH
- Have a single CTCP for multiple MCHS
- Have multiple CTCPS connected to the same MCH.

For example, you might use fast connect in a system that connects videotex terminals through a PAD to an SNA host processor.

If there is only one CTCP, or if the peak traffic period for each CTCP occurs at the same time, you can choose to connect only one CTCP for each physical circuit. Figure 13 on page 38 shows an example of such a configuration.

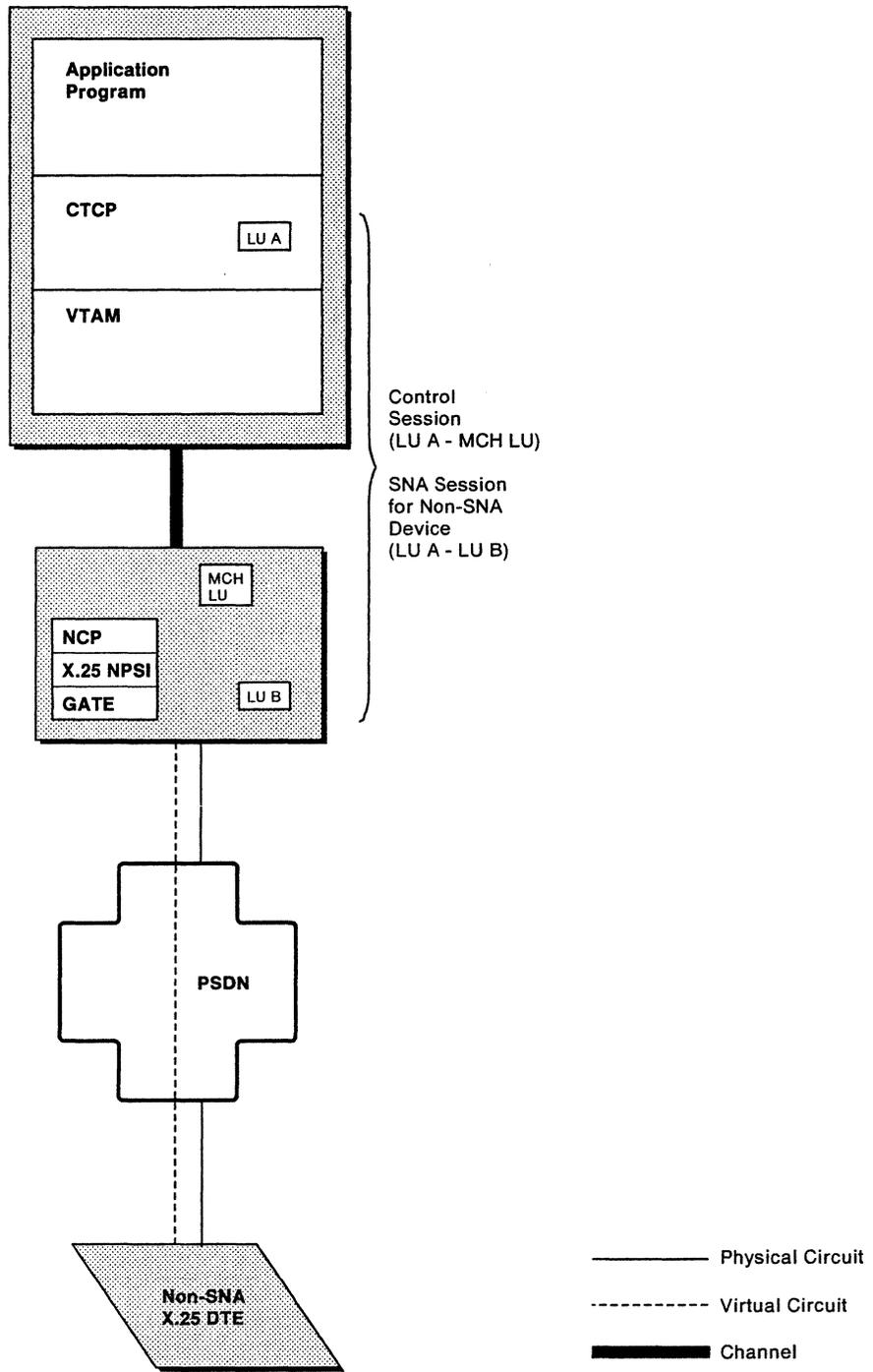


Figure 12. Logical Link Control Type 4 that Use Fast Connect

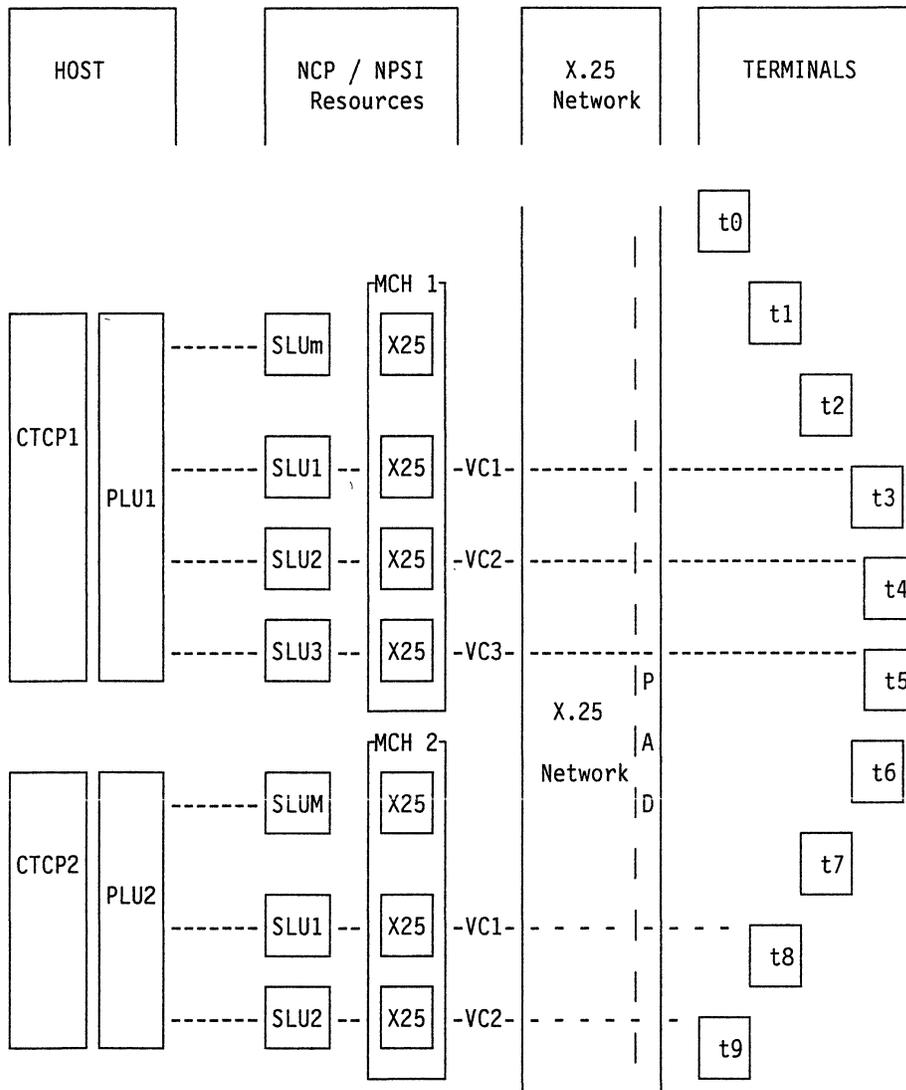


Figure 13. Fast Connect with One CTCP for One Physical Circuit

If peak traffic periods occur at different times on different CTCPs, the set of virtual circuits for one physical circuit can be shared by several CTCPs. Each virtual circuit can connect to only one CTCP at a time. In this case, more than one CTCP is defined for each physical circuit as shown in Figure 14 on page 39.

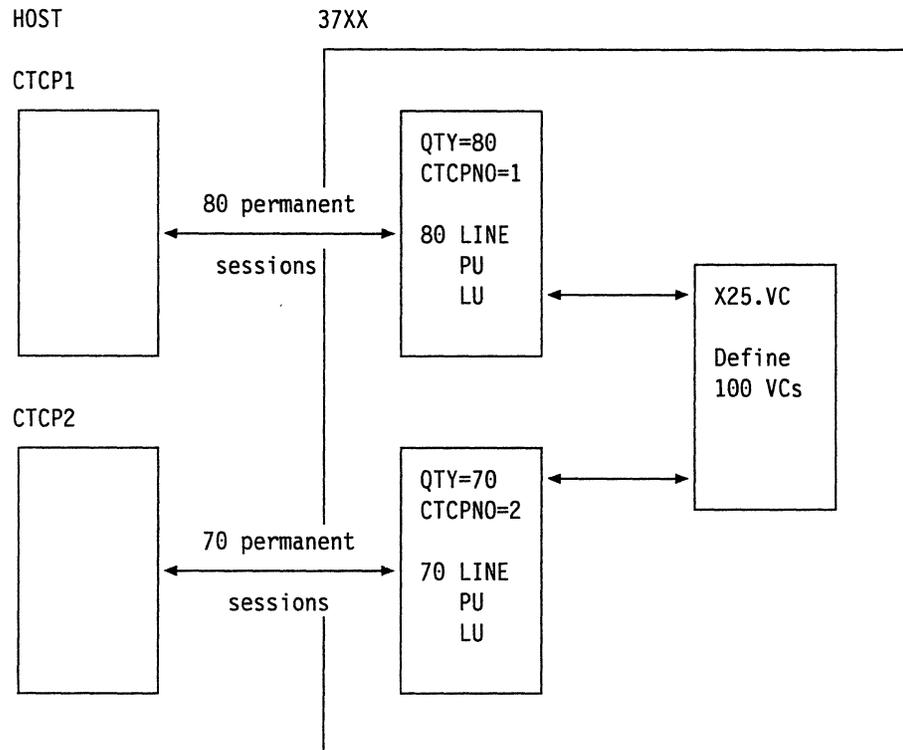


Figure 14. Fast Connect with Two CTCPs for One Physical Circuit

Using Figure 14 as an example, CTCP1 has a peak time from 4:00 p.m. to 5:00 p.m. CTCP2 has a peak time from 7:00 p.m. to 8:00 p.m. CTCP1 can communicate with 80 SNA resources. CTCP2 can communicate with 70 SNA resources. The physical circuit contains 100 virtual circuits.

During peak time for CTCP1, up to 80 virtual circuits can be used for CTCP1. Concurrent with this, CTCP2 handles the remaining 20 virtual circuits.

The reverse occurs during peak time for CTCP2. Up to 70 virtual circuits can be used by CTCP2, which enables CTCP1 to use up to 30 virtual circuits.

To generate fast connect, code `GATE = GENERAL` on the `X25.MCH` statement. You also need to use the `CONNECT` keyword with a value of either `YES`, `CUD0`, or `SUBD`. If you code `YES`, do not code the `CUD0` or the `SUBD` keywords, because there is only one CTCP per MCH. If you code `CUD0` or `SUBD`, you must code the corresponding CTCP keyword.

You can also code the following keywords of the `X25.MCH` statement:

- LUNAME
- LOGAPPL
- MODETAB
- VMODTAB
- TAXUNIT

If you are connecting the physical circuit to multiple CTCPs, code an `X25.FCG` statement for each CTCP that is in communication with the MCH. An `X25.FCG` statement creates `LINE`, `PU`, and `LU` statements for fast connect resources.

Use X25.VC to describe x.25 resources associated with fast connect virtual circuits. The CALL keyword must be coded consistently with your PSDN subscription. TYPE=S must be coded and X25.VC must be used to describe the virtual circuits. X25.LINE cannot be used. The order of the statements must be as follows:

```
X25.MCH    CONNECT=SUBD or CUD0,CTCP=  
X25.LCG  
X25.VC     LCN=(n1,n2),TYPE=S  
X25.FCG    QTY=m1,CTCPNO=x  
X25.FCG    QTY=m2,CTCPNO=y
```

See Chapter 4, "Resource Definition Reference," for further descriptions of the X25.MCH, X25.FCG, and X25.VC statements. See Appendix B, "Installation Examples for X.25 NPSI," for examples showing fast connect coding.

**Logical Link Control Type 5:** LLC type 5 connects the host with non-x.25, non-SNA DTEs that use an x.25 PAD. Type 5 connections are similar to type 0 connections. The exception is that, with type 5, the host program (transparent option) or x.25 NPSI (integrated option) can send and receive qualified packets in addition to non-qualified packets. PAD service functions are controlled by means of qualified packets. PAD support is indicated by coding the PAD keyword in the X25.MCH statement.

To create an LLC type 5 virtual circuit:

- PVC—use the X25.VC statement or the X25.LINE and X25.PU statements together. You must also code an X25.LU statement.
- SVC—use the X25.VC statement or the X25.LINE and X25.PU statements together.

See Chapter 4, "Resource Definition Reference," for details about using the X25.VC, X25.LINE, X25.PU, X25.LU, and X25.MCH statements.

The following examples are type 5 connections:

- Non-SNA, non-x.25 device connected to the PSDN using a PAD that supports CCITT recommendations x.3, x.28, and x.29.
- Non-SNA, non-x.25 device connected to the PSDN using a nonstandard PAD.

Figure 15 on page 41 shows an LLC type 5 connected through integrated PAD support. Figure 16 on page 42 shows an LLC type 5 connected through transparent PAD support.

**Note:** Transparent PAD can also be used to control non-SNA x.25 remote DTEs that do not use a PAD. In this case, the application does not send PAD parameters but has control over the Interrupt and Reset packets.

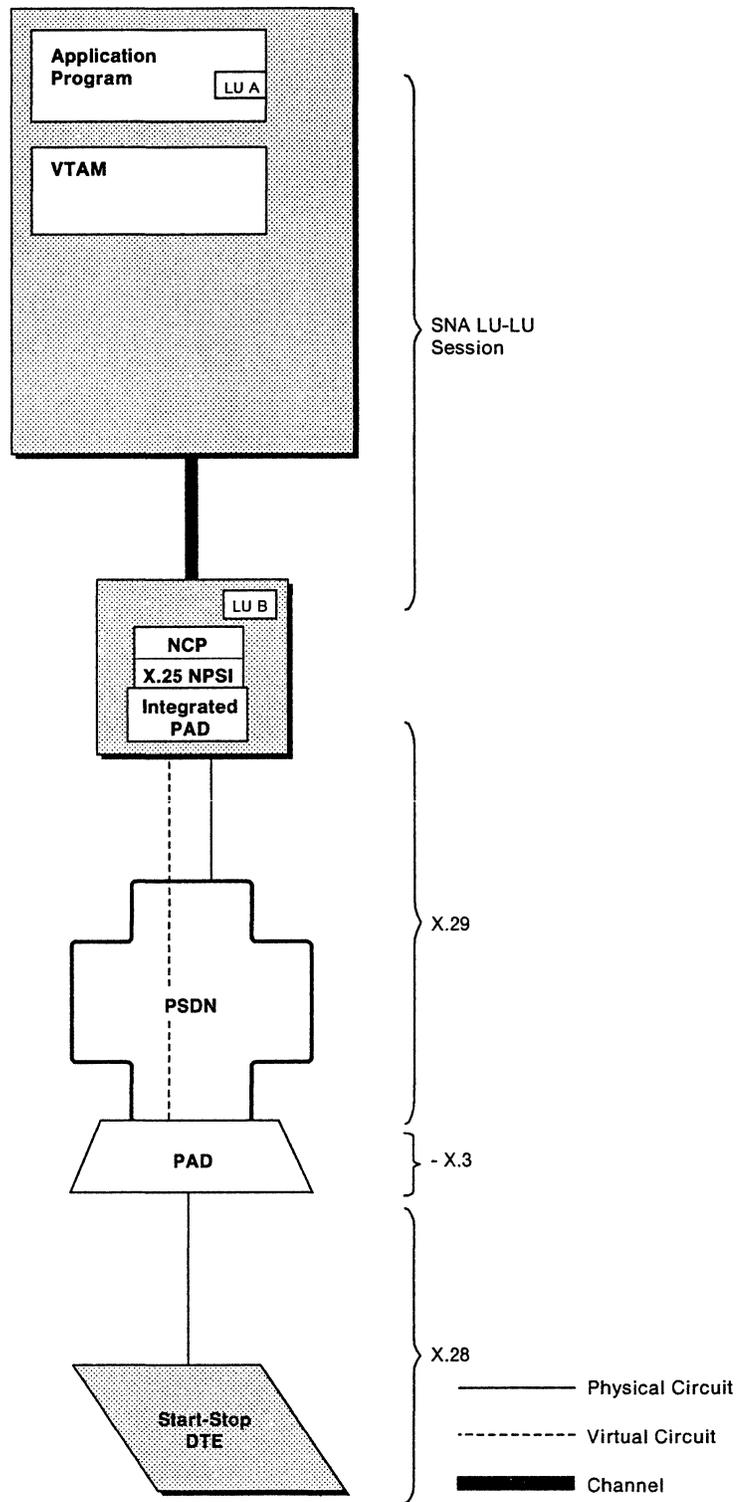


Figure 15. Logical Link Control Type 5 (Integrated PAD)

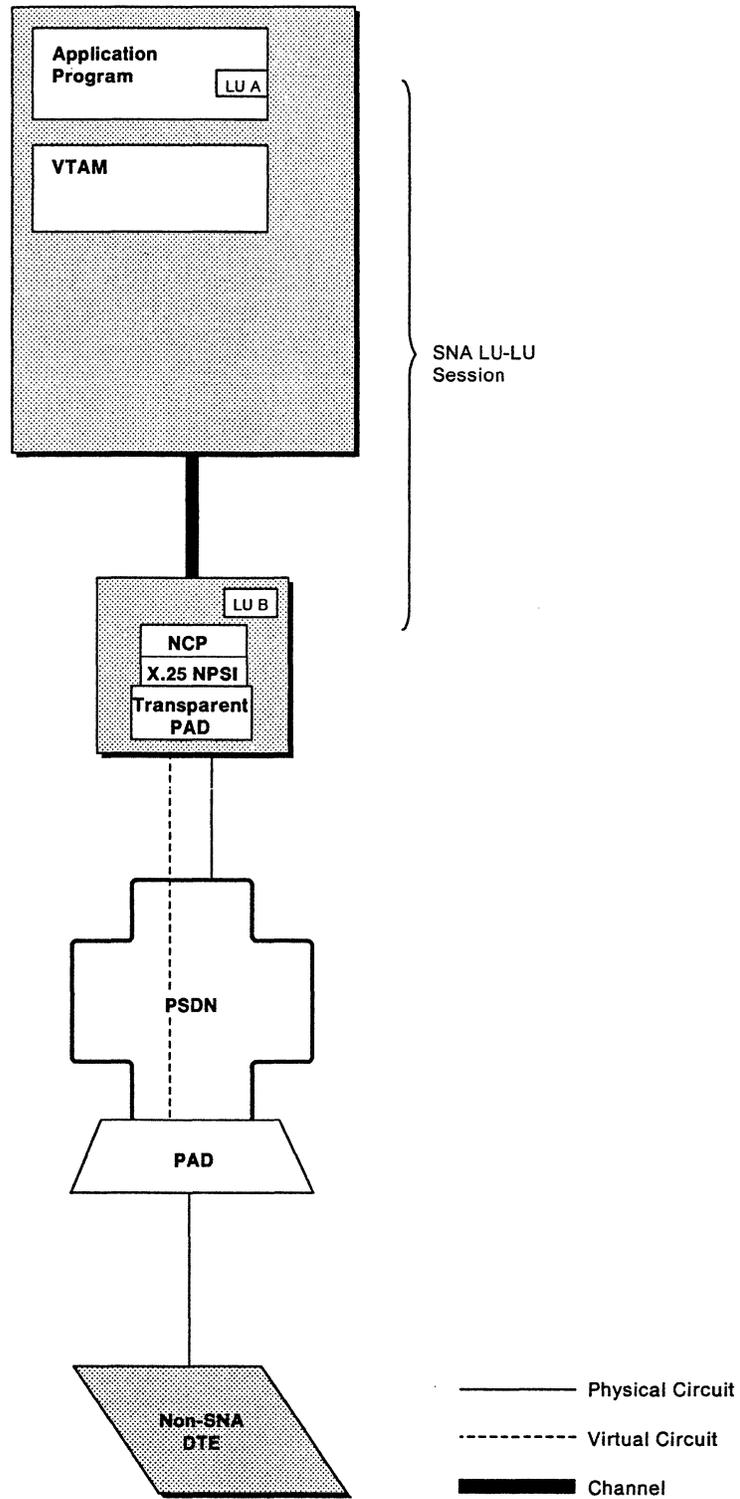


Figure 16. Logical Link Control Type 5 (Transparent PAD)

## Virtual Circuits that Use DATE

X.25 NPSI provides extended support, called dedicated access to X.25 transport extension (DATE), for LLC types 0, 2, 3, and 5. You can use DATE for security control, resource allocation, accounting, and other extended requirements.

DATE support requires the use of a CTCP. Virtual circuits that use DATE support are set up and taken down by commands passed between the CTCP and X.25 NPSI. The CTCP controls the setup and the termination of the virtual circuit, and processes all X.25 control and qualified packets, except when using LLC type 5.

DATE converts incoming control packets into PIUS. DATE adds the appropriate 1-byte command code to the Request unit, depending on the type of packet, before sending the PIU to the CTCP. Upon receipt of the Request unit, the CTCP interprets and acts upon the command code.

DATE then converts outgoing PIUS passed by the CTCP into control or qualified packets. Before the packet is sent to the remote DTE, DATE deletes the 1-byte command code, builds the control or qualified packets, and transmits the packets to the PSDN.

Communication with X.25 NPSI is performed using two types of LU-LU sessions. The first type of session is between the CTCP logical unit and the physical circuit logical unit. The second type is between the application logical unit and the virtual circuit logical unit. Once the virtual circuit is set up, the protocol depends on the type of virtual circuit. The CTCP is used during session setup and termination, and to handle control packets and qualified packets.

The application communicates directly with the terminal for data exchange. Consequently, the CTCP is not involved. For control and qualified packets, the CTCP communicates with the X.25 NPSI DATE function over the CTCP to MCH LU session. The third byte of the RU is used to indicate the packet type.

The following examples are DATE type connections:

- Non-SNA device connected to a PSDN through a nonstandard PAD
- Nonstandard network connected to an SNA host.

To generate DATE support, first code GATE = DEDICAT in the X25.MCH statements, and then for:

- PVC—use the X25.LINE or X25.VC statement. X25.PU and X25.LU statements must be coded together with the X25.LINE statement.
- SVC—code the CALL keyword consistent with your PSDN subscription in the X25.VC or X25.LINE statement. X25.PU must be coded with the X25.LINE statement.

See Chapter 4, “Resource Definition Reference,” for detailed information about the X25.MCH, X25.LINE, X25.VC, X25.PU, and X25.LU statements.

**Note:** For LLC type 5, DATE provides only transparent PAD support. GATE and DATE cannot use the same physical circuit. SVCSC is not supported on a DATE MCH

Figure 17 on page 44 shows how DATE works with the CTCP to control the virtual circuit.

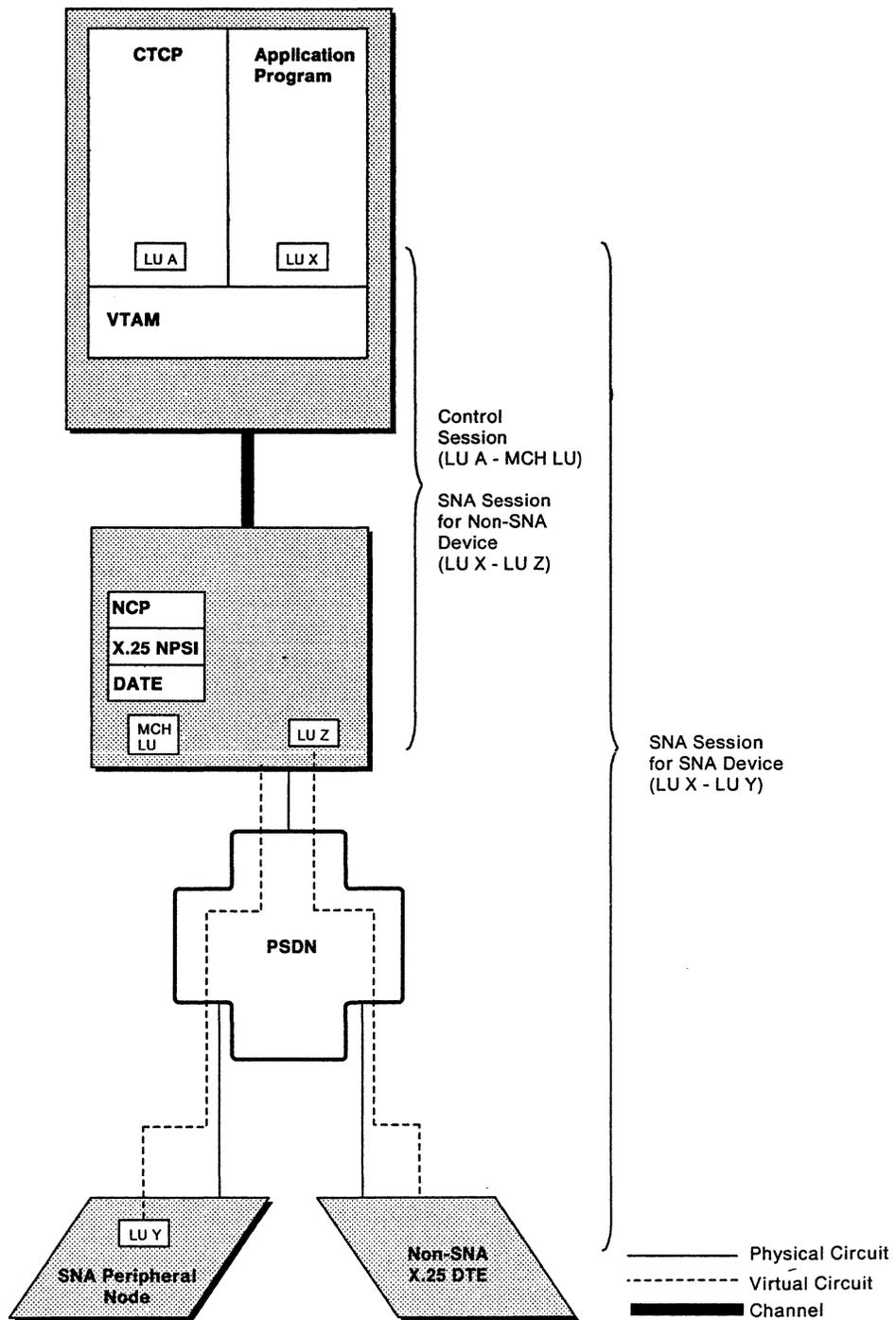


Figure 17. Virtual Circuits that Use DATE

## Logical Link Control Type Selection

The LLC type for PVCs is selected through the use of the LLC keyword in the X25.LINE statements or the X25.VC statements associated with the PVCs. The LLC type statement is defined for PVCs during the generation process.

The LLC type for SVCS is not defined at generation. During generation, the LLCLIST keyword of the X25.MCH statement specifies the virtual circuit types allowed on this MCH. The type for any given session is selected during virtual circuit setup.

During call-in, X.25 NPSI decides which LLC type to use by one of the following methods:

- Call user data byte 0 (CUD0)

An LLC can be selected using IBM-defined standard CUD0 values. If these standard values do not fit your needs, X.25 NPSI allows you to create a correspondence table to specify user-defined CUD0 fields. Through this table, devices and software that do not use the IBM-defined standard CUD0 values can select LLC types.

- Subaddressing

The last digit in the subaddressing field is used to select an LLC. The subaddressing field is located at the end of the called DTE address.

- CALL ACCEPTED command (if DATE is used)

In response to the Incoming Call packet, the CALL ACCEPTED command containing the LLC type is sent from the CTCP to the logical unit associated with the physical circuit.

During call-out, the LLC type is selected through VTAM. For virtual circuit types 0, 2, 3, and 5 that do not use DATE, code the type in the L character of the DIALNO keyword in the VTAM PATH statement. For call-outs that use DATE, the CALL REQUEST command from the CTCP to the DATE function of X.25 NPSI specifies the LLC. For GATE, LLC type 4 is automatically selected by X.25 NPSI when a GATE CTCP makes an outgoing call.

## Piggybacking Techniques

Piggybacking means a received frame or packet is acknowledged in the next outgoing frame or packet rather than in an isolated Receive Ready (RR) frame or packet. Increased piggybacking occurs if the packet or link level window size is greater than 2.

### Link Level

Version 3 increases the degree of piggybacking by delaying the RR transmission for a short period of time. This delay allows additional information frames (I frames) to arrive in the outbound queue. The acknowledgment is piggybacked on an outbound I frame that uses the same physical circuit.

The RR transmission time delay is defined by the T2 timer. X.25 NPSI calculates the T2 timer as a function of two values defined in the X25.MCH statement:

- SPEED
- T1TIMER

For the link-level piggybacking to occur, the T1TIMER must be coded on the X25.MCH statement. The SPEED keyword defines the line speed of the physical

circuit. The T1TIMER keyword defines the maximum time the DCE will wait for a frame acknowledgment.

When service is continuous (24 hours a day, 7 days a week), and the MCH speed must be altered without changing the generation, code SPEED and T1TIMER keywords that will work with both SPEEDs and T1TIMERS. By specifying the SPEED and T1TIMER keyword values that generate the smallest T2, you can benefit from link-level piggybacking in both cases. See *X.25 NPSI Diagnosis, Customization, and Tuning* for computation of T2.

## Packet Level

Unless the receive packet window is about to close, no RR packet is sent out to acknowledge a received packet. Instead, the acknowledgment is made by the next packet that is sent. Packet-level piggybacking occurs only if the packet window size is greater than 2.

---

## Planning for X.25 NPSI in the Network

This section describes x.25 NPSI planning considerations for the overall network configuration. X.25 NPSI resides in a communication controller under the control of NCP, and accesses host and network resources through an access method, such as VTAM. Statements and keywords in VTAM and NCP that specifically affect x.25 NPSI are discussed in Chapter 5, "Coding NCP and VTAM Parameters for X.25 NPSI."

Other factors that affect your network planning for x.25 NPSI include:

- SNA considerations
- Host application program considerations
- Network resource recovery considerations.

## SNA Considerations

Because X.25 NPSI is used to connect SNA equipment through an X.25 interface, the following SNA considerations affect X.25 NPSI planning:

- PIU segmentation
- Flow control parameters
- Pacing parameters.

## PIU Segmentation

Two parameters determine how the user data is segmented for outbound transmissions from the host:

- NCP buffer size (BFRS) specified in the NCP BUILD statement
- MAXDATA keyword on the PU statement.

**NCP Buffer Size:** The optimal buffer size is not the same for X.25 NPSI and NCP. If LLC type 2 is not used, an appropriate value is 124; if LLC type 2 is used, the value 120 will reduce the number of excess packets. Set the optimal buffer size to a value that avoids the creation of small packets, which require as much processing as large packets.

**MAXDATA Keyword:** This keyword specifies the maximum number of bytes in a PIU. Because segmenting is not supported for virtual circuit types 0, 4, and 5, MAXDATA must exceed the largest PIU size for these virtual circuits.

These parameters can be tuned to reduce the number of packets flowing across the DTE and DCE interface. See *X.25 NPSI Diagnosis, Customization, and Tuning* for more information.

### **SNA Flow Control Parameters**

It is preferable to use 3270 printers in SNA Character String (SCS) mode rather than in Data Stream Compatibility (DSC) mode.

### **Pacing Parameters**

Be careful when you define pacing parameters, because some devices require specific pacing counts. Consult the device component description manual to determine pacing parameters. An isolated pacing response causes as much central control unit (CCU) utilization as a full data packet.

### **Host Application Program Considerations**

When planning for X.25 NPSI, consider the following host application requirements:

- Non-SNA communication
- Transparent PAD implementation
- CICS, IMS, and TSO adjustments.

### **Non-SNA DTE Communication**

You must synchronize the two end points of the X.25 connection. Synchronization means that the end points manage data formats and application requirements in a compatible manner.

To synchronize end points, make sure that one or both ends know the configuration of the data that the partner is sending. The configuration includes:

- Character set (ASCII, EBCDIC, or other)
- Interface parity
- Data format (information layout within the data stream)
- Control characters and their associated effects
- Application control.

You can discover these details by familiarizing yourself with the end points. If the end point that you want to communicate with is not at your site, call the remote location for the necessary information.

### **Transparent PAD Implementation**

The host application program using transparent PAD support adds a control character to the Request unit in the first byte. This control byte specifies one of the following six message types:

- Data packet without Q bit
- Data packet with Q bit
- Interrupt request
- Interrupt confirmation
- Reset packet
- Reset confirmation.

See *X.25 NPSI Host Programming* for more information about the control byte.

## CICS, IMS, and TSO Adjustments

CICS, IMS, and TSO are commonly used applications. In order to communicate with the simulated LU, you must make some adjustments to these applications. The host application program must consider such items as bracketing and presentation.

You might want to design the application program to reduce the required dialogs between the host and remote user. To do this, use formatted screens or modified data fields. Applications such as those that send out automatic time of day messages (PROFS), and those that employ graphics (GDDM) should *not* be used.

**General Adjustments:** To enable CICS, IMS, and TSO applications to communicate with a logical unit simulated by X.25 NPSI, consider the following:

- Bracketing  
See *X.25 NPSI Host Programming* for more information regarding bracketing considerations.
- Presentation level  
Presentation level includes character set used, communication parity, and screen layout.
- Application level  
Application level includes application responses, nature of the application behavior, and conversation termination requirements.
- BIND parameters  
CICS and IMS do not use the session parameters from the VTAM logmode entry; for example RUSIZE and PACING. Instead, CICS and IMS create their own BIND parameters. Check the application's terminal table for specific parameter information.
- Definite or exception response  
The use of definite or exception response is defined within the BIND parameters and can be created in these subsystems. A definite response ensures message integrity, but can have a disastrous effect on performance in an X.25 interface when used on an LLC type 0 with D bit. Whenever possible, you should use exception response in these cases; however, the application requirements or hardware support can be a constraint to this specification. See *VTAM Programming* and *X.25 NPSI Host Programming* for more information.

**CICS Adjustments:** In CICS, consider the following:

- Definite response can be requested by the:
  - MSGINTEG keyword on the DFHPCT macro
  - DEFRESP parameter on the SEND or CONVERSE commands.
- The WAIT option on the SEND command can cause additional RUS to be sent just for change-of-direction or end-bracket indicators. The WAIT option can slow down response time by increasing the number of transmitted packets.

**IMS Adjustments:** In IMS, response mode can be more efficient than non-response mode. Consider IMS fast path that automatically uses response mode.

**TSO Adjustments:** In TSO, the application level requires special consideration because TSO does not include the recovery facilities available in CICS and IMS. Only line mode operation is available when LLC type 0 or 5 is used.

## Network Resource Recovery Considerations (V3R2 Only)

Session continuation allows LU-LU sessions to remain active when the owning system service control point (SSCP) fails. With the owning SSCP inoperable, an alternate SSCP can acquire ownership of the resource. When the original SSCP becomes operable, it can regain ownership. This is true for PVCs and svcs attached to either SNA or non-SNA remote DTES. When using virtual circuits that are under DATE, special considerations are needed. See *X.25 NPSI Diagnosis, Customization, and Tuning*.

In addition to session continuation, the short hold mode function facilitates connections that are usually infrequent and of short duration. The short hold mode function upholds the connection only when there is data to be transmitted. The deactivation and the activation of the connection are transparent to the application.

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## Planning for X.25 NPSI Migration

If you migrate from Version 1 of X.25 NPSI to Version 3, be aware that the generation process has been modified. All X.25 NPSI V3R2 stage 1 generation statements must be modified or incorporated into the NCP generation statements. After you modify the generation statements, use the NCP/EP Definition Facility (NDF) to complete the joint NCP and X.25 NPSI generation procedure. NDF, which is provided through the system service program (SSP), performs the entire NCP generation procedure.

### Migration from V1 to V3R1

You should verify that you have modified the current X.25 NPSI source statements to allow creation of a valid load module and access method definition. Be sure to:

- Modify all X.25 NPSI statements.

All Version 1 macros must be changed to include a period between the X25 portion and the suffix. For example, the X25MCH macro becomes the X25.MCH statement.

- Remove the X25BUILD statement.

If NDF finds an X25BUILD statement, it will be flagged as an error and a load module will not be generated until it is removed. Many keywords previously coded on X25BUILD are not required now that X.25 NPSI is generated under NDF. Others have been moved to the NCP BUILD statement.

- Modify X.25 NPSI keywords to allow NDF and VTAM processing.

Several X.25 NPSI keywords must be modified. For example, the IDNUMH keyword previously coded in X25BUILD must be coded as X25.IDNUMH and placed on the NCP BUILD statement.

Also code USERGEN = X25NPSI. The USERGEN keyword on the NCP OPTION statement indicates the name of the load module that processes X.25 NPSI generation statements in NDF.

Code NEWDEFN = YES so that NDF builds a new generation definition for input into VTAM.

- Place the X.25 NPSI statements after all start-stop (SS) and binary synchronous communication (BSC) definitions and before SNI statements that define the non-native networks (NETWORK, GWNAU, and PATH).
- Modify the LCGDEF keyword. Change LCGDEF = a(b) to LCGDEF = (a,b) to permit NDF processing. If you need to place more than one pair, use the following format:  
`LCGDEF=((a,b),(c,d),..., (y,z))`
- Be aware of the change in the DSTNODE default value.  
 The default value of the DSTNODE keyword on the X25.LINE statement is now BNN (peripheral node) for both PVCS and SVCS.
- Modify the fast connect virtual circuit definitions.  
 Fast connect virtual circuits must be declared as SVCS. Previously, they were declared as PVCS in the fast connect programming request for price quotation (PRPQ).
- Modify the fast connect CTCP.  
 Formerly, call-outs in the fast connect PRPQ were directed to the MCH LU. However, now they must be directed to the SNA resources that are used to map the SVCS.
- Code SPEED and T1TIMER on the X25.MCH statement.  
 In order to obtain maximum piggybacking, specify the SPEED and the T1TIMER keywords on the X25.MCH statement.
- Be aware of the change in the X25.VC and the X25.LINE of the CALL keyword for the DATE MCH. This is now coded according to the PSDN subscription.
- Be aware that the CUD field for LLC type 3 now only contains X'C3'. The bytes that follow can be added as needed by using the USRFILD keyword of the X25.OUFT statement.
- The ZZZZZ field of the DIALNO keyword of the PATH statement in the SMN must now be coded in all cases where X.25 NPSI is to generate a Call Request for LLC0 or LLC5.
- Be aware that the X25.USGTIER keyword must be coded on the BUILD statement.
- Eliminate X25.END statement keywords.  
 If NDF finds keywords coded on the X25.END statement, NDF creates a warning message and suppresses the creation of the load module.

## Migration from V3R1 to V3R2

To migrate from V3R1 to V3R2 consider the following:

- The names generated by the PRFLINE, PRFPU, PRFLU, and SUFFIX keywords of the X25.FCG statement are not padded to eight characters. The length of the SUFFIX specification is added to the length of the PRFLINE, PRFPU, and PRFLU keywords to determine the length of the names.
- Names can be built in decimal or hexadecimal. Use the HEXNAME keyword for specification.
- PRFLINE, PRFPU, PRFLU, and SUFFIX keywords are valid for the X25.VC statement.

See Appendix C, “Statement and Keyword Changes,” for a listing of all X.25 NPSI statement keywords that you need to modify.

---

## Planning for the Configurator

The CF3720 configurator applies to the 3720 communication controller. The CF3745 configurator applies to the 3745 communication controller.

These configurators assist in planning your configuration by:

- Calculating the ccu utilization.

You should limit the ccu utilization to a maximum of 90 percent to preserve response time and avoid slowdown due to buffer shortages.

- Calculating each physical circuit’s utilization.

IBM configurators compute the MCH load as a function of the traffic on the dependent virtual circuits. It is recommended that you limit the percentage of use of each leg (transmit and receive) to 60 percent to avoid excessive queueing on the MCH. Excessive queueing degrades response time and eventually causes slowdown due to buffer shortage.

The configurator assumes that the link level window is 7, which allows the configurator to assume full piggybacking at link level.

**Note:** Remember that link level piggybacking is achieved by coding the appropriate values for SPEED and T1TIMER on the X25.MCH statement.

The configurator takes into account the degree of piggybacking at the packet processing level by the receipt of what you coded for the number of input frames per link-level response. If the packet level processing window is less than 3, no piggybacking occurs. The coded response must be 1. If your packet level processing window is 3 or more, and if your inbound traffic is balanced by outbound traffic, full packet level processing piggybacking occurs. The coded response must be 7. The response to the number of output frames per link-level response must be 1. When answering for non-SNA DTES, the following parameters apply:

- OUT PACING must be coded as 1.
- IN PACING must be coded as 0.
- VPACING must be equal to the value coded either at generation or in the switched major node (SMN).

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## Chapter 3. Network Definition

This chapter provides information needed to define your network configuration using X.25 NPSI. Chapter 3 discusses the following areas:

- Physical circuits
- Logical channels
- Virtual circuits
- Logical link control selection
- CTCP definitions
- PAD support
- PCNE to PCNE considerations.

---

### Physical Circuits

A *physical circuit* is a hardware connection between two locations. X.25 NPSI defines physical circuits between the communication controller that contains X.25 NPSI (usually a DTE to the PSDN) and the other end of the X.25 connection (usually a DCE).

Examples of the physical-level interfaces specified in the X25.MCH statement are:

- Disable time-out value
- Enable time-out value
- Activation after a VTAM cold start.

The physical circuit must be defined to allow X.25 NPSI to operate the connection. The definition of the physical circuit includes the communication controller port address and a number of link-level parameters, such as:

- Frame size
- Frame window size
- Retry counts
- DTE or DCE distinction.

---

### Logical Channels

A *logical channel* is the path on which data travels either between its origin DTE and the PSDN or between the PSDN and its destination DTE. The PSDN creates a virtual circuit by allowing communication between logical channels connected to two DTEs. When a virtual circuit is established, the PSDN and X.25 NPSI use a logical channel group number and logical channel number to identify the virtual circuit. These two numbers comprise the *logical channel identifier* for that virtual circuit. Figure 18 on page 56 is an example of a logical channel definition.

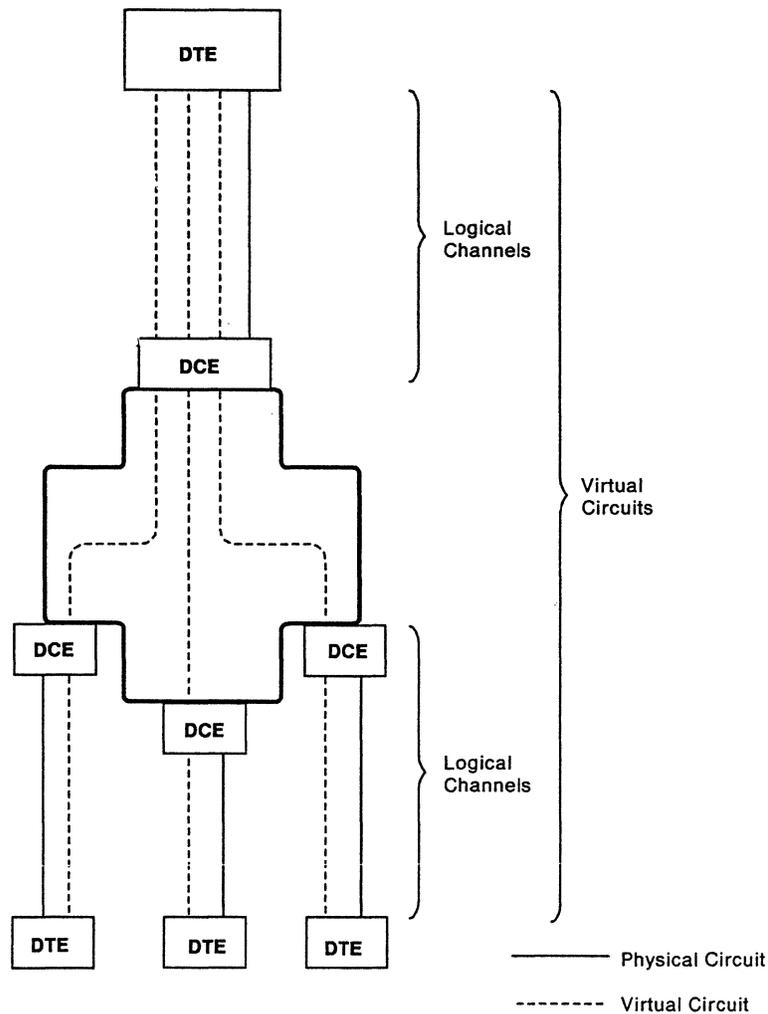


Figure 18. Logical Channel Definition

The logical channel identifier consists of three digits. Digit 1 is the logical channel group number; digits 2 and 3 are the logical channel number.

Each packet that X.25 NPSI exchanges with the PSDN contains, in its packet header, the logical channel identifier for the appropriate virtual circuit. X.25 NPSI uses the logical channel identifier to associate a packet with a particular virtual circuit and then sends the packet to the PSDN. The PSDN assigns a new logical channel identifier to route the packet through the network to its destination DTE. Also, the PSDN keeps a record of the pair of logical channel identifiers associated with each virtual circuit.

By keeping the logical channel pairings consistent, the PSDN ensures that data is not passed to an inappropriate destination. DTEs use the logical channel identifier from the PSDN to associate the logical channel with the virtual circuit.

Use the following statements and keywords to define logical channels to X.25 NPSI:

```
X25.MCH      LCGDEF=((1cg,1cnhi),(1cg,1cnhi),...)
X25.LCG      LCGN=number
X25.VC       LCN=(number1,number2)
X25.LINE     LCN=number
```

Several logical channels can be assigned to the same physical circuit. The X25.MCH statement is used to define a physical circuit and all the logical channel groups assigned to the physical circuit.

The LCGDEF keyword of the X25.MCH statement specifies the logical channel groups associated with the defined physical circuit. The LCGDEF keyword also defines the highest logical channel number within each logical channel group. This allows you to define a separate range of logical channel numbers for each logical channel group.

An X25.LCG statement follows each X25.MCH statement. One X25.LCG statement must be created for each logical channel group defined in the X25.MCH statement. The LCGN keyword of the X25.LCG statement defines the logical channel group number for all the virtual circuits specified by the subsequent X25.VC or X25.LINE statements.

Use the X25.VC statement or a combination of the X25.LINE, X25.PU, and X25.LU statements to define the virtual circuits that are members of the logical channel group defined by the X25.LCG statement. Code these statements following each X25.LCG statement. Use the LCN keyword of the X25.VC and X25.LINE statements to assign a logical channel number to each virtual circuit. The X25.VC and X25.LINE statements must be arranged in ascending order by logical channel number. The X25.LU statement defines logical units for the PVC DTEs that are associated with the virtual circuit for peripheral node connections.

This coding creates a hierarchical relationship of the physical circuit to the logical channel group to the logical channel number. In addition, you must define each virtual circuit for one logical channel group before defining the next logical channel group. As a result, if a physical circuit contains logical channel groups 2 and 3, *all* of the definitions for logical channel group 2 *precede* the definitions for logical channel group 3. The following is an example of the order of these statements.

```
X25.LCG  LCGN=2

X25.LINE LCN=1,...
X25.PU   ...
X25.LU   ...
X25.LU   ...
X25.VC   LCN=(2,5),...

X25.LCG  LCGN=3

X25.LINE LCN=1,...
X25.PU   ...
X25.LU   ...
X25.VC   LCN=(2,5),...
```

---

## Virtual Circuits

*Virtual circuits* are defined through the interaction of several statements. X.25 NPSI uses the interactions between these statements to generate NCP definitions. The virtual circuit definition includes designations for:

- PVC or SVC
- Logical link control (LLC)
- Call-in or call-out
- Packet window size
- Packet size.

Virtual circuits differ from physical circuits in that virtual circuit connections are logical rather than physical. The use of virtual circuits provides a multiplexing technique that increases the use of the physical circuit. This path flexibility allows any DTE to connect with any other DTE that is connected to the PSDN.

The PSDN configuration determines which physical circuits are used.

### PVC Definition

A permanent virtual circuit (PVC) does not perform any dial procedures through the PSDN. PVCs simulate the action of a dedicated line and are activated with the physical circuit. Connection definitions are located in X.25 NPSI.

Use the X25.VC statement to define PVCs connecting to non-SNA DTEs. The X25.VC statement produces one NCP LINE, PU, and LU statement per virtual circuit.

Use the X25.LINE, X25.PU, and X25.LU statement sequence to define PVCs that connect to SNA peripheral nodes. Use the X25.LINE and X25.PU statements to define PVCs that connect to SNA subarea nodes.

You can use the X25.LINE, X25.PU, and X25.LU statements to create network names that meet a customized naming standard. Use statement labels as you do for NCP generation. You can also use the X25.VC statement with PRFLINE, PRFPU, PRFLU, SUFFIX, and HEXNAME to build customized names.

After the generation process is complete, these components will have NCP LINE, PU, and LU definitions. You can activate, deactivate, and test them as you would any other NCP resource.

Arrange the statements in ascending order by logical channel numbers within the same logical channel group, as shown in the sample program in Appendix B, "Installation Examples for X.25 NPSI."

### SVC Definition

A switched virtual circuit (SVC) is established in response to an X.25 Call packet or a Connect Out request from the host. SVCs can be initiated by either the remote DTE (incoming call) or by X.25 NPSI (outgoing call).

To define SVCs, use either the X25.VC statement or the X25.LINE and X25.PU statement sequence.

**Note:** No X25.LU statement is associated with this definition.

The physical and logical unit definitions for an SVC are contained in members of the VTAMLST source library called the switched major node (SMN). There can be one or more members within the VTAMLST library. SMNS contain definitions for all switched facilities that run under VTAM, whether or not they use X.25 NPSI. The X.25 NPSI switched resource entries contain the physical and logical unit definitions that include the VTAM parameters used for session establishment.

The NCP LINE and PU statements for SVCS are generated in the reverse order specified in the X.25 NPSI source deck. This reverse order enables VTAM to use the larger SNA resource numbers for outgoing calls. X.25 NPSI uses the smaller SNA resource numbers for processing incoming calls. This reduces the chance of call collision. See Figure 20 on page 153 and Figure 21 on page 156.

The names defined for the PU in VTAM and X.25 NPSI *do not* need to match. The name used by VTAM and the NetView™ program<sup>4</sup> is the name in the SMN. The PU defined in the NCP is used to create only the control block structure. To locate the proper PU statement in the SMN, use either the IDNUM/IDBLK combination or CPNAME.

### **SVCSC and Short Hold Mode Definitions (V3R2 Only)**

Switched virtual circuit subarea communication (SVCSC) provides connectivity between two subarea nodes over switched virtual circuits. Six keywords in the X25.MCH statement are associated with the SVCSC function:

SVCINN	<p>Is the number of simultaneously active switched subarea node connections. It represents the number of switched virtual circuits allocated to subarea node traffic. SVCINN must equal the number of LINE and PU statements defined with DSTNODE = INN,TYPE = S.</p> <p>SVCINN = 0 means that no SVCSC is on the MCH. The default value is 0.</p>
SDRTCNT	<p>Is the number of retries attempted when the short hold mode (SHM) reconnection cannot be established during call setup and the switched XID exchange.</p> <p>The default value is 0 (no retry).</p>
SDRTIME	<p>Is the timer used between 2 retries.</p> <p>The default value is 10 seconds.</p>
SHM	<p>Specifies whether short hold mode is to be used by SVCSC on the MCH. SHM = NO specifies that no SVCSCs on the MCH use SHM. SHM = YES specifies that at least one SVCSC on the MCH uses SHM. The default is YES.</p> <p>The processing of the SHM parameters for switched major nodes involves both the calling and the called system service control point (SSCP).</p>

<sup>4</sup> NetView is a trademark of International Business Machines Corporation.

**ACTIVTO** Determines an inactivity timer that can be set for the MCH. The ACTIVTO keyword is coded on the X25.MCH statement. ACTIVTO can be used when operating with an Enterprise System/9370™ processor through a Telecommunication Subsystem Controller (TSC). ACTIVTO determines the maximum number of seconds of inactivity before x.25 NPSI clears the virtual circuit and sends an INOP message to the host. (The ES/9370™ does not support SHM.)

An initial connection using the V NET,DIAL command must be repeated after an ACTIVTO.

ACTIVTO is taken into account only if SHM is not in effect. SHM=NO must be coded for at least one of the following elements:

- In X25.MCH statement on one or both ends
- In SMN on one or both ends.

---

**BRKCON** ACTIVTO is also controlled by the BRKCON keyword of the PU definition statement. This keyword specifies that the NCP break a switched connection if a line remains idle (not sending or receiving I frames) for the period of time specified by ACTIVTO on the GROUP definition statement. BRKCON is valid only if DIAL = YES and PUTYPE = 4 is coded for switched subarea support lines.

It is recommended that you code XMONLNK = YES on X25.MCH statements containing subarea node PVCs or SVCs.

The required virtual circuit definitions consist of two parts. The parts are the SNA and x.25 resource sets. This requirement is similar to the coding needed for the fast connect function.

The SNA set of resources is defined with the X25.LINE and X25.PU statements. The X25.LINE statement must specify:

```
TYPE=S|SWITCHED
DSTNODE=INN
```

The LCN keyword must be omitted in the X25.LINE statement. The PU statement must specify PUTYPE = 4, defining the interface as a subarea node to VTAM.

**Note:** The specification of PUTYPE = 4 should be understood to include PU type 5, as is the case with an ES/9370™ processor<sup>5</sup> through a TSC or a 4361 through a communication adapter.

In addition, the x.25 resources must be defined using the X25.VC statement. This statement defines the virtual circuits to x.25 NPSI. The virtual circuits defined with this statement can be used for *both* subarea and peripheral node communication.

x.25 NPSI establishes the connection between the SNA and the x.25 resources. The connection of the resources is done during the establishment of the virtual circuit. For an incoming call, this connection is established *after* the prenegotiation exchange because the call must be identified as a newly established connection or a short hold mode reconnection.

**Note:** When using the svcsc function, note the following:

---

<sup>5</sup> Enterprise System/9370 and ES/9370 are trademarks of International Business Machines Corporation.

- The number of SNA resources (X25.LINE and X25.PU statement pairs) must match the specification of the SVCINN keyword on the X25.MCH statement.
- The virtual circuits, defined for svcsc, are taken into account when determining the default IDNUM *if* the LLCLIST keyword on the X25.MCH statement includes any of the following:
  - LLC0
  - LLC4
  - LLC5

Only single link transmission groups are supported by x.25 NPSI.

## Call Definitions

To perform a call-in or call-out procedure, x.25 NPSI must be operating with svcs. PVCs do not perform any type of call operation. SVCS use SMN in the VTAM statement library to complete the call operation.

## Call-In Definitions

The PUTYPE, IDBLK and IDNUM, and CPNAME keywords are used for the call-in definitions.

**PUTYPE:** The PUTYPE keyword for the PU statement in the SMN specifies the physical unit type. Code PUTYPE = 1 for LLC types 0, 4, and 5. Code the PUTYPE keyword according to the NCP rules for LLC types 2 and 3. See the *NCP, SSP, and EP Resource Definition Guide* for NCP rules.

**IDBLK and IDNUM:** When a switched resource either contacts or is contacted by NCP, NCP presents a resource identification to the host (VTAM). The type of identification presented depends on the nature of the link-level identification exchange procedure.

In the case of LLC0 without subaddressing, the IDNUM is obtained from the Incoming Call packet CUD field.

In the case of other non-SNA resources supported by x.25 NPSI, IDBLK and IDNUM are created internally by x.25 NPSI. This creation is based on the sequence of the virtual circuit definition and the specification of the X25.IDNUMH operand of the BUILD statement. The identification must match the IDNUM and IDBLK operands of a PU statement in an active SMN.

In the case of SNA switched resources, the identification is obtained from the resource, and the IDNUM and IDBLK operands must match. The exception is the SNA type 2.1 nodes.

**CPNAME:** For SNA type 2.1 node switched resources, the identification is also obtained from the resource, but two possibilities exist. The link-level identification procedure can be the same as for other SNA switched resources, or it can result in obtaining a CPNAME value rather than the IDNUM and IDBLK values. When a CPNAME value is obtained, the CPNAME value must match the CPNAME operand of a PU statement in an active SMN.

**Note:** The specification of IDNUM and CPNAME is usually part of the product customization for SNA switched resources. The value of IDBLK is fixed according to the type of product; for example, X'017' is the value for the 3174. The required value is contained in the product documentation.

At generation, X.25 NPSI generates a default IDNUM for each svc except in the following cases:

- SVCS on a fast connect MCH
- SVCS on an MCH where LLCLIST does not require LLC0, LLC4, or LLC5.

These identification numbers appear in the order in which the svcs appear in the Resource Resolution Table. This order corresponds with the resource order in the VTAMLST NCP source statements, which is the *reverse* order of the X.25 NPSI source statements.

Default IDNUM values start at X'002' and increment by X'02'. The following example shows the default identification numbers for the svcs defined in Appendix B, "Installation Examples for X.25 NPSI."

SVC	Default Identification Number
SP3002	X'002'
SP3001	X'004'
SP2002	X'006'
SP2001	X'008'
SP1100	X'00A'
SP0004	X'00C'
SP0003	X'00E'
SP0002	X'010'
SP0001	X'012'
SP7007	X'014'
SP7006	X'016'
SP7005	X'018'
SP7004	X'01A'
SP7003	X'01C'
SP7GGH	X'01E' (allocated for SVCSCs but not used)
SP7GGI	X'020' (allocated for SVCSCs but not used)

The X25.IDNUMH keyword of the BUILD statement defines the first byte of the five-digit IDNUM. The one byte IDNUMH value is appended with the three-rightmost digits of the default IDNUM. Therefore, if X25.IDNUMH=02 and the default IDNUM is X'124', the IDNUM that is created is X'02124'.

**Note:** The IDNUM creation process results in a limit of 2048 uniquely numbered values. The maximum number of svcs using a default IDNUM that can be created in one NCP/X.25 NPSI load module is 2048. The IDNUM creation process allows only 16 distinct values for the IDNUMH keyword. This means that no more than 16 communication controllers can be under the control of one host running X.25 NPSI in contact with non-SNA resources.

When an incoming call specifies a non-SNA LLC, the default IDNUM within the Request Contact (REQCONT) command is used. X.25 NPSI uses its own IDBLK specification of X'003' in the Request Contact (REQCONT) command to create the identification number for selecting the correct SMN entry.

When an incoming call specifies an SNA LLC, IDNUM and IDBLK are used. IDNUM and IDBLK are specified within the XID sent by the remote SNA device.

The NCP anonymous caller function is not supported by X.25 NPSI.

Table 3 on page 63 defines the IDNUM assignment in X.25 NPSI.

Table 3. IDNUM Assignment in X.25 NPSI			
LLC Type	Physical Circuit	Call-In	Call-Out
LLC type 0	GATE = NO	CUD field	ZZZZ field of DIALNO
	GATE = DEDICAT	Default IDNUM	Default IDNUM
	GATE = GENERAL SUBADDR = NO	CUD field	ZZZZ field of DIALNO
	GATE = GENERAL SUBADDR = YES	Default IDNUM	ZZZZ field of DIALNO
LLC type 2		PU ID from remote SNA DTE	PU ID from remote SNA DTE
LLC type 3 peripheral node		PU ID from remote SNA DTE	PU ID from remote SNA DTE
LLC type 3 subarea node		Value specified in IDNUM of remote end PATH statement	Value specified in IDNUM of remote end PATH statement
LLC type 4		Default IDNUM	Default IDNUM
LLC type 5	GATE = NO or GATE = GENERAL	Default IDNUM	ZZZZ field of DIALNO
	GATE = DEDICAT	Default IDNUM	Default IDNUM
<b>Note:</b> The NCP anonymous caller feature is not supported.			

## Call-Out Definitions

The PUTYPE, IDBLK, and IDNUM keywords are used for the call-out definitions. The PATH definition statement is also used for the call-out definitions.

**PUTYPE:** The PUTYPE keyword for the PU statement in the SMN specifies the physical unit type. Code PUTYPE = 1 for LLC types 0, 4, and 5. Code the PUTYPE keyword according to the NCP rules for LLC types 2 and 3. See the *NCP, SSP, and EP Resource Definition Guide* for NCP rules.

**IDBLK and IDNUM:** For SNA remote DTES, the parameters specified for these keywords must match the IDBLK and the IDNUM of the remote SNA DTE.

For non-SNA remote DTES, the IDBLK is 003, and the IDNUM must match the value specified in the ZZZZ field of the DIALNO keyword.

**PATH Definition Statement:** The PATH definition statement in a switched major node is used to define a dial-out path to a remote PU. Up to 256 PATH statements can be specified for each PU. The PATH statement must immediately follow the PU statement that defines the associated PU. VTAM searches the PATH statements for an available path in the order specified in the configuration deck.

The ZZZZ field of the DIALNO keyword must be coded for LLC0 and LLC5, and must match the IDNUM specified in the PU statement corresponding to the involved PATH statement.

See Chapter 5, "Coding NCP and VTAM Parameters for X.25 NPSI," for more detailed information on the required keywords and their exact coding requirements.

## SNA Type 2.1 Node Definition (V3R2 Only)

SNA type 2.1 nodes support connectivity without the need for SSCP involvement. SNA type 2.1 nodes also support LU type 6.2, which in turn can support concurrent, parallel sessions.

In a switched environment, VTAM can locate the appropriate PU/LU pair either by using the normal IDNUM/IDBLK combination or by using the CPNAME keyword on the PU statement in a switched major node source statement member of VTAM.

For call-in and call-out definitions, SNA type 2.1 uses QLLC with X'C3' in CUD0. For a call-out, LLC3 is used as in the normal peripheral node QLLC. Also, XID=YES must be coded in the X25.PU statement for PVCs of SNA type 2.1 nodes.

## SVCS Considerations (V3R2 Only)

The PU statement involved in the SVCS connection is located by VTAM using the following three keywords:

- NETID
- SUBAREA
- IDNUM

The PU/PATH involved in the connection is determined if and when the three parameters match the values received in the REQCONT.

The following mechanisms, which are based on the integrity of the network, are considered when using SVCS within switched major nodes.

- Calling DTE address

X.25 networks always provide the address of the calling DTE. The called DTE can then check this address against a list of authorized callers. This mechanism is optional.

VTAM does not support the outbound verification of the DTE address. As a result, when used with X.25 NPSI, the VERIFY keyword on the PATH statement must be coded as VERIFY=IN.

Call Redirection and Hunt Group are supported except when SHM is used on the virtual circuit. If SHM is used in either of these cases, the SHM reconnection will fail.

- Closed user group (CUG)

The access to a given CUG is controlled by the X.25 network. Calls issued to a DTE that belong to a given CUG are accepted by the network only when they originate at another DTE belonging to the same CUG.

## Associated Tables

In addition to defining LLC types, you must define parameters that are to be associated with each virtual circuit. The following are two types of virtual circuit parameters:

- Virtual circuit connection variables

The virtual circuit connection variables apply to all virtual circuits and include:

- Maximum packet length
- Packet-level window size
- Parameters to prevent NCP slowdown.

- Optional user facilities

The optional user facilities apply to x.25 facility codes and user data copied into the Call Request packet when x.25 NPSI makes an outgoing call for LLC types where a CTCP does not create the Call Request packet directly.

## X25.VCCPT Statement

Virtual circuit connection variables are defined using the X25.VCCPT statements. These statements create a table that x.25 NPSI uses to specify the virtual circuit connection parameters. Each X25.VCCPT statement is one entry in this table. See “X25.VCCPT Statement” on page 128 for the format of, and coding information about, X25.VCCPT.

**Call-In Specifications:** For call-in, to define the VCCPT entry, use the VCCINDX keyword on either the X25.VC or X25.LINE statement. This keyword corresponds to the INDEX keyword of the X25.VCCPT statement. For example, if you want to use the entry specified by INDEX=2 on the X25.VCCPT statement, code VCCINDX=2 on the statement you are using to define your virtual circuit.

When you use a GATE or DATE CTCP, the packet size and packet window size are selected through the CALL ACCEPTED command. Byte 3 of this command contains the packet window size. Bytes 4 and 5 contain the packet size. All sizes are in hexadecimal.

Values for packet size and packet window size can be specified in the Flow Control Parameter Negotiation facility in the Incoming Call packet. See Appendix A, “Defining X.25 PSDN Facilities,” for further information. This allows an SVC to work with a different set of values from those defined by the VCCINDX keyword.

X.25 NPSI slowdown parameter definitions for virtual circuits are not affected by the use of GATE or DATE. These values are taken from the applicable VCCPT entry pointed to by the VCCINDX keyword on the virtual circuit definition.

**Call-Out Specifications:** For call-out, to define the VCCPT entry, use the “XX” component of the DIALNO keyword on the VTAM PATH statement. The “XX” component value specifies which VCCPT entry to use, or designates the entry defined on the X25.VC or the X25.LINE statement. Thus, the “XX” field can be used to override the default VCCPT for the virtual circuit.

Specify the “XX” as zero (“00”) to designate the use of the VCCINDX on the X25.VC or X25.LINE statement. When you use a GATE or DATE CTCP, the packet size and packet window size are selected through the CALL REQUEST command from the CTCP to GATE or DATE. Byte 3 of this command contains the packet window size; bytes 4 and 5 contain the packet size. All sizes are in hexadecimal. With DATE and GATE, flow control parameters received in a Call Connected packet are ignored by x.25 NPSI. If they do not match the values specified by the CTCP in the call-out, the CTCP must clear the call.

X.25 NPSI slowdown parameter definitions for virtual circuits are not affected by the use of GATE or DATE. Their values are taken from the applicable VCCPT entry pointed to by the VCCINDX keyword on the virtual circuit definition.

## X25.OUFT Statement

Use the X25.OUFT statements to create a table of optional user facility fields and a CUD field for Call Request packets. X.25 NPSI uses these fields to specify the optional user facilities used on the virtual circuits. Each X25.OUFT statement defines one table entry. See “X25.OUFT Statement” on page 118 for more information on the X25.OUFT statement coding.

X25.OUFT applies only to a call-out from X.25 NPSI because the optional user facilities field and the CUD field created are placed in the Call Request packet.

**Call-Out Specifications:** When performing a call-out, X.25 NPSI obtains the OUFT entry through the use of the “YY” component of the DIALNO keyword on the VTAM PATH statement. This component specifies the OUFT entry or specifies using the OUFT entry defined on either the X25.VC or the X25.LINE statement. A “00” value indicates that the default value coded on the X25.VC or X25.LINE statement should be used. Any non-zero value specifies an OUFT table entry. You can use the DIALNO keyword to override the default OUFT entry.

When you use GATE or DATE, the CTCP creates the optional user facilities and CUD field. The CTCP sends them in the Call Request packet at the end of the CALL REQUEST command sent to X.25 NPSI.

---

## Logical Link Control Selection

X.25 NPSI connects through five logical link control (LLC) types as described in “Logical Link Control Types” on page 25. LLCs define the DTE type to which the virtual circuit connects. DTE types include SNA peripheral nodes, subarea connections, and non-SNA DTES. Each DTE type requires different data flow processing.

In addition, X.25 NPSI allows you to use a CTCP to control the virtual circuit. This support is supplied through either the GATE or the DATE function of X.25 NPSI.

For more information on GATE, see “GATE” on page 72. For more information about DATE, see “DATE” on page 71. For detailed programming information, see *X.25 NPSI Host Programming*.

When X.25 NPSI uses GATE or DATE, X.25 NPSI does not process X.25 commands. Instead, X.25 NPSI places the command in a buffer and forwards it to the CTCP. The CTCP initiates the response to the command.

X.25 NPSI processes a virtual circuit based on whether the virtual circuit is a PVC or an SVC, and whether a CTCP will be used.

## PVC Selection

To define the LLC for a PVC, use the LLC keyword of the X25.VC or X25.LINE statement. The LLC keyword specifies the LLC type of the virtual circuit. The LLC for the PVC always stays the same.

Using a CTCP with a PVC gives you better session control, because you can use the CTCP to monitor use and to provide more security.

With GATE, code the OSITYPE keyword of the X25.VC or the X25.LINE statement to specify the CTCP.

## SVC Selection

svc definitions require careful planning, because svcs are selected dynamically when calls are established. An svc can be defined as any LLC type.

### For Call-In

For an svc used for call-in, define the LLC type in one of the following:

- Byte 0 of the CALL USER DATA field (CUD0)
- The subaddressing field of the incoming Call Request packet
- The CTCP response to an Incoming Call packet (DATE only).

**Using CUD0 for LLC Type and CTCP Selection:** The following are default CUD0 values and the associated LLC types:

CUD0	LLC Type
X'01'	Type 5 (PAD)
X'41'	Type 5 (PAD)
X'51'	Type 5 (PAD)
X'81'	Type 5 (PAD)
X'C0'	Type 0 (PCNE)
X'C2'	Type 2 (PSH)
X'C3'	Type 3 (Peripheral node QLLC)
X'C4'	Type 4 (GATE)
X'E3'	Type 3 (Subarea node QLLC)

You can also use the CUD0 field to specify which CTCP to use for GATE processing. The ways to do this include:

- Omit CUD0 on the X25.MCH statement.

In this case, there can be only *one* CTCP. This CTCP is chosen if the first byte of the CUD field is:

- NULL
- X'00'
- Any value from X'02' through X'2F'
- X'C4'.

- Code CUD0=ALL.

This specification allows for two CTCPs. The first CTCP is chosen if the first byte of the CUD field is:

- X'02'
- X'C4'.

The second CTCP is chosen if the CUD field has one of the following values:

- NULL
- X'00'
- Any value from X'03' through X'2F'.

- Use the correspondence table.

If a CUD0 to CTCP correspondence table is created, the CTCP is selected as specified in the table. Any of the 28 CTCPs can be selected in this manner. Each physical circuit can use a different set of rules for CTCP selection.

**Using Subaddressing for LLC Type and CTCP Selection:** When you define subaddressing to select LLC type, X.25 NPSI uses the *last* digit of the called DTE address to select the LLC type. X.25 NPSI assumes the last digit to be a subaddress digit. CCITT Recommendation X.121 defines the format of the addresses used by the Recommendation X.25 and also specifies a maximum address length of 14 digits. X.25 NPSI allows up to 15 digits; thus, one address digit is always available. The network ignores address digits after those actually needed for addressing.

**Note:** X.25 NPSI cannot tell whether the last address digit is part of the address or is added by the calling DTE for LLC selection purposes.

The following example shows how you can define subaddressing digits to select LLC types:

```
LLC0=(1,2),LLC4=(0,3,4,7),LLC5=(6,5),LLCI=(8)
```

The coding shown above produces the following correspondence:

- Type 0 (PCNE) if 1 or 2 is the last subaddressing digit
- Type 4 (GATE) if 0, 3, 4, or 7 is the last subaddressing digit
- Type 5 (PAD) if 5 or 6 is the last subaddressing digit
- Type 3 (Subarea node QLLC) if 8 is the last subaddressing digit.

When LLC type 4 is selected through subaddressing, the virtual circuit will always be connected to the first CTCP.

Even though a GATE CTCP is not active and is not intended to become active, to use subaddressing you must code both GATE = GENERAL and SUBADDR = YES on the X25.MCH statement.

**Note:** If a subaddress digit is coded in the Call Request packet that is not defined in the generation, the CUD0 field is used to select the CTCP or the LLC.

**Using DATE for LLC Type Selection:** An SVC using DATE is defined with the GATE = DEDICAT keyword of the X25.MCH statement. Such an SVC can be a type 0, 2, 3, or 5 virtual circuit. Type selection occurs when the incoming Call Request packet is passed to the DATE CTCP. The CTCP reads information in the CALL REQUEST command, selects the type, and sends a CALL ACCEPTED command to the DATE portion of X.25 NPSI. Byte 6 of this command specifies the virtual circuit type.

## For Call-Out

Call-out is performed to a known destination. The LLC type is known before the call is actually established. For GATE and DATE, the Call Request packet for call-out is built entirely by the CTCP.

Use the VTAM PATH statement to specify the LLC type for non-GATE and non-DATE virtual circuits. The VTAM PATH statement is coded in the switched major node entry of the VTAM definition library.

X.25 NPSI uses a modified version of the DIALNO keyword of the PATH statement. The dial number contains various parameters required to perform the call-out function. This keyword format can be found in "PATH Definition Statement" on page 138.

X.25 NPSI uses the "L" field of the DIALNO to determine the LLC type. Table 4 on page 69 shows the "L" values, the LLC type created, and the beginning of the CUD field.

Table 4. DIALNO "L" Values		
"L"	LLC Type	Beginning of the CUD Field
0	LLC0	X'C0'
1	LLC3 (Subarea node)	X'E3'
2	LLC2	X'C2'
3	LLC3 (Peripheral node)	X'C3' X'C30100008dddwww0000000' for use by 3710 Controller  ddd 3-decimal digit upstream address (USA) of the terminal addressed by this outgoing call.  www 5-decimal digit ID number of the PU used to map the terminal addressed by the out- going call.
5	LLC5	X'01000000'
6	LLC5	X'51000000'
7	LLC5	First positional parameter specified in CUD0 keyword corresponding to an 85 in the CTCP keyword. See "Extended LLC Type and CTCP Selection" on page 70 for more information.
8	LLC5	X'81000000'
9	LLC5	X'41000000'
colon (:)	LLC0	First positional parameter specified in CUD0 keyword corresponding to an 80 in the CTCP keyword, followed by ZZZZ. See "Extended LLC Type and CTCP Selection" on page 70 for more information.
period (.)	LLC0	First positional parameter specified in CUD0 keyword corresponding to an 80 in the CTCP keyword. See "Extended LLC Type and CTCP Selection" on page 70 for more information.

**Note:** When the call-out is initiated by a CTCP using GATE, X.25 NPSI automatically uses LLC type 4.

Call initiation from a DATE CTCP allows you to specify the LLC type within the CALL REQUEST command. The physical circuit is defined to X.25 NPSI as being controlled by a DATE CTCP. The DATE CTCP must:

1. Acquire an MCH LU.
2. Select an LLC type.

3. Establish the session to the virtual circuit LU. This is done by any one of the following:

- X.25 NPSI generates a logon request.
- A user performs LOGON from a remote device.
- A LOGAPPL keyword is coded on the LU statement in the SMN.

### Extended LLC Type and CTCP Selection

If GATE = GENERAL is defined on the MCH, you can create a user-defined table for selecting LLC types by using the CUD0 and CTCP keywords of the X25.MCH statement.

Use the CUD0 and CTCP keyword correspondence to create a one-for-one correspondence between LLC type and CUD0 codes.

To code a one-for-one correspondence, code the CTCP keyword of the X25.MCH statement with the number of subkeywords equal to the number of CUD0 codes in the CUD0 keyword. The *position* of each code determines the LLC type or CTCP number to which it corresponds. You must code the LLC type numbers as the LLC type plus 80, as shown in Table 5.

LLC#	Code	Type
LLC0	80	PCNE—non-SNA, X.25
LLC2	82	PSH—SNA using NIA
LLC3	83	Peripheral node/QLLC—SNA/QLLC (Peripheral node)
LLC5	85	PAD – non-SNA using PAD

Because the CUD0 and CTCP keywords are coded on the X25.MCH statement, you can use them to create a different table for each physical circuit. For call-outs, the value placed in CUD0 can also be user-specified for LLC0 and LLC5.

The following is an example for coding a user-defined table. Any CUD0 value can be specified, including a NULL value.

```
CUD0=(00,01,C1,C5,02,FF,03,04,E3,73,61,NULL)
CTCP=(00,01,80,85,85,80,01,02,83,02,85,80)
```

The result is in the following user-defined table (Table 6).

CUD0	CTCP Keyword	Result
00	CTCP 00	
01	CTCP 01	
C1	LLC 0	C1 will go in CUD0 for L = . or : on call-out *
C5	LLC 5	C5 will go in CUD0 for L = 7 on call-out *
02	LLC 5	

Table 6 (Page 2 of 2). Coding Example of CUD0 Value		
CUD0	CTCP Keyword	Result
FF	LLC 0	
03	CTCP 01	
04	CTCP 02	
E3	LLC 3	
73	CTCP 02	
61	LLC 5	
NULL	LLC 0	
<b>Note:</b> * Is the first value facing an 80 (for C1) or an 85 (for C5) in the CUD0 keyword.		

In addition, default LLC type selection is made *except* for X'00', X'01', X'02', X'03', and X'04', which were overridden within the table.

---

## CTCP Definition

GATE and DATE programming facilities use the CTCP for virtual circuit setup, termination, and control. The following sections outline the network requirements for GATE and DATE and define special requirements for using the GATE fast connect option.

## DATE

DATE is used with all virtual circuits that reside on a physical circuit defined as GATE = DEDICAT; consequently, you are unable to:

- Have a physical circuit where *both* DATE and GATE virtual circuits reside
- Bypass the CTCP when performing any CALL REQUEST
- Use integrated PAD support.

To generate DATE support, code GATE = DEDICAT in the X25.MCH statement as shown in the following example:

```
X25.MCH  ADDRESS=xxx,
        .
        .
        GATE=DEDICAT
        .
        .
```

When you use DATE, you must code the CALL keyword of the X25.LINE or X25.VC statements in accordance with your PSDN subscription. This allows x.25 NPSI to verify that the CTCP is functioning in accordance with the PSDN subscription.

A call-out made by the CTCP is simulated by a call-in to NCP and the access method. Therefore, x.25 NPSI forces CALL = IN on all NCP LINE statements created during x.25 NPSI generation.

## GATE

Because GATE defines its own LLC type (type 4), GATE cannot reside on the same physical circuit as DATE.

To generate GATE support, code GATE = GENERAL in the X25.MCH statement as shown in the following example:

```
X25.MCH  ADDRESS=xxx,  
        .  
        .  
        GATE=GENERAL  
        .  
        .
```

In addition to the X25.MCH statement, you must define the following if you want to use them:

- PVC or SVC
- CUD0 or subaddressing fields.

### PVC Specifications

PVCs that use GATE can be defined for virtual circuits in the following ways:

- Code GATE = GENERAL on the X25.MCH statement.
- Code LLC = LLC4 on the X25.VC or the X25.LINE statement.
- Code TYPE = PERMANENT on the X25.VC or the X25.LINE statement.

**Note:** If you use the X25.LINE statement, you must also define the X25.LU and the X25.PU statements.

### SVC Specifications

Specifying GATE on an SVC differs for call-in and call-out. For either operation, you must code the GATE = GENERAL keyword on the X25.MCH statement.

**Call-In:** In order to perform call-in on a virtual circuit, code the CALL keyword as either CALL = IN (the default value), or CALL = INOUT.

You can determine the LLC type through the use of the CUD0 field or the subaddressing field. If you want to control the virtual circuits, select the CTCP by using one of the following:

- Omit CUD0 on the X25.MCH statement

In this case, there can be only *one* CTCP. This CTCP is chosen if the first byte of the CUD field is:

- NULL
- X'00'
- Any value from X'02' through X'2F'
- X'C4'.

- Code CUD0 = ALL

This specification allows for two CTCPs. The first CTCP is chosen if the first byte of the CUD field is:

- X'02'
- X'C4'.

The second CTCP is chosen if the CUD field has one of the following values:

- NULL
- X'00'
- Any value from X'03' through X'2F'.

- Use the correspondence table.

If a CUD0 to CTCP correspondence table is created, the CTCP is selected as specified in the table. Any of the 28 CTCPS can be selected in this manner. Each physical circuit can use a different set of rules for CTCP selection.

In addition to the X.25 NPSI generation specifications, the CTCPS must be numbered sequentially according to the logical unit associated with the physical circuit. The CTCP numbers range from 00–27.

When you use a table, you can define specific CTCPS to establish sessions with the appropriate physical circuit logical unit. All LU-LU sessions between the CTCPS and logical units do not have to be continuously active. Additional LU-LU sessions can be established as network traffic requires.

When subaddressing is used to select the LLC, the first CTCP is selected if the subaddressing digit of the call packets matches one of the values specified for the LLC4 keyword of the X25.MCH statement. If it does not match any of these values, X.25 NPSI uses the CUD0 of the Incoming Call packet to select the CTCP.

**Call-Out:** When GATE is used and a call-out is requested by the CTCP, X.25 NPSI simulates a call-in to the NCP and VTAM. Therefore, all the virtual circuits that can be used for GATE call-out must be declared as CALL = IN or CALL = INOUT at generation. Because all virtual circuits on an MCH are not dedicated to operating through GATE, NDF passes the coded CALL keyword (without change) to the NCP and VTAM.

When you want to reserve a certain number of virtual circuits for non-GATE call-outs, code CALL = OUT for this number of virtual circuits.

When the CTCP requests call-out on a physical circuit coded as using GATE, the call must use a type 4 virtual circuit and must meet the following two specifications in order to be successful:

- Include LLC4 in the LLCLIST keyword of the X25.MCH statement.
- Code CALL = IN or CALL = INOUT on the X25.LINE or X25.VC statement to ensure the availability of a virtual circuit.

## Fast Connect Option

*MCH Keywords:* Fast connect support requires that you add the CONNECT keyword on the X25.MCH statement at the time of generation. To select the CTCP, use one of the four CONNECT options:

- CONNECT = NO  
CONNECT = NO is the default and results in a non-fast connect MCH.
- CONNECT = YES

When CONNECT = YES is specified, *neither* the CUD0 nor SUBD keywords can be used. Only a single CTCP can be used with CONNECT = YES.

- CONNECT=CUD0

When CONNECT=CUD0 is specified, the first byte of the CUD field (CUD0) is used to select the CTCP. This keyword is paired with the CTCP keyword to create a correspondence table between the positional parameters specified within the CUD0 and CTCP keywords. This specification allows you to define up to 28 different CTCP destinations.

- CONNECT=SUBD

When CONNECT=SUBD is specified, the subaddressing digit is used as the selection method for CTCP destination. In the case of fast connect, the *last* subaddressing digit determines the correct CTCP destination. Like CUD0, this keyword is paired with the CTCP keyword to create a correspondence table. Unlike CUD0, only 10 different destinations can be defined.

**Note:** When subaddressing is used for CTCP selection with fast connect, but a subaddressing digit is not found in the correspondence table, the CUD0 field *cannot* be used as an alternative connection method, as it is in GATE. In this case, the call will be cleared.

For each different CTCP specified in the CTCP keyword, a set of additional keywords can be specified in relation to the CTCP number. Thus, CTCP-0 is specified as the first positional parameter on each of these keywords, CTCP-1 is the next positional parameter and so on through CTCP-27. A maximum of 28 parameters can be specified on the following keywords:

- LUNAME

LUNAME specifies the MCH\_LU names corresponding to each CTCP. These secondary logical units (SLUs) are in session with the appropriate CTCP.

- LOGAPPL

LOGAPPL specifies the application name to which the LU is attached once the LU is successfully activated. This keyword places the VTAM-only keyword on the LU statements created by the X25.MCH statement and on the LUS created for the SNA resources used to map the SVCS related to the CTCP.

- MODETAB

MODETAB defines the logmode entry table used between the MCH\_LUS defined in the LUNAME keyword and the CTCPS defined in the LOGAPPL keyword.

- TAXUNIT

TAXUNIT specifies the number of characters that define a network tax unit that can be used for billing purposes. Valid values for this keyword are 32, 64, or 128. When this keyword is specified and either a CLEAR command, CLEAR CONFIRMATION command, or information/error report is sent to the CTCP, X.25 NPSI appends the billing information to the specified command.

- VMODTAB

VMODTAB defines the logmode table entry used for the sessions between the virtual circuits and the CTCPS. These virtual circuits are defined in the X25.FCG statement and the X25.VC statement.

*FCG Keywords:* Fast connect also requires that specific keywords be used in the X25.FCG statement. If more than one destination CTCP is attached to a particular MCH, an X25.FCG statement must be coded for each CTCP. This statement also defines the number of SNA sessions that will be allocated for fast connect use. Use the following keywords to achieve this:

- CTCPNO

CTCPNO specifies which CTCP is being defined by the statement. Valid values range from 0–27.

- QTY

QTY defines the number of SNA sessions created by this statement. The maximum value of this keyword is 4096.

The X25.FCG statement also defines the fast connect LINE, PU, and LU names with the following five keywords:

- PRFLINE—defines the prefix used for all LINES
- PRFPU—defines the prefix used for all PUs
- PRFLU—defines the prefix used for all LUs
- SUFFIX—defines the lower limit of the resource numbers
- HEXNAME—defines whether the suffix incrementation is in hex or decimal; the default is YES.

The resource name is created by appending the suffix to the appropriate prefix. The length of the names is constant and is defined by the sum of the length of PRFLINE, PRFPU, or PRFLU, added to the length of the SUFFIX parameter.

**Note:** Because there is an 8-character limitation on labels, as the prefix increases, the suffix size decreases, reducing the number of resources that can be defined.

PRFLINE, PRFPU, PRFLU, and SUFFIX have no default. Choose either the X.25 NPSI default naming convention or specify the names using the PRFLINE, PRFPU, PRFLU, and SUFFIX keywords. The specifications cannot be mixed. X25.FCG also creates a GROUP statement for each instance of X25.FCG.

The following X25.FCG keywords are used to define specifications that sift down to the LINE, PU, and LU statement levels:

- MAXDATA
- ISTATUS
- NCPGRP
- OWNER
- SPAN
- ANS

Figure 19 on page 77 shows an example of a fast connect configuration. To create this environment, you can use the following x.25 NPSI keywords as an example:

```
X25.MCH      ADDRESS=XXX,
             CONNECT=CUD0,
             LOGAPPL=(CTCP1,CTCP2),
             CUD0=(00,09,01),
             CTCP=(00,01,00)

X25.LCG      LCGN=4

X25.VC       LCN=(1,100),
             VCCINDX=01,
             TYPE=S,
             CALL=IN

X25.FCG      QTY=80,
             CTCPNO=0,
             MAXDATA=2580,
             PRFLINE=XL12,
             PRFPU=XP12,
             PRFLU=XL12,
             SUFFIX=01

X25.FCG      QTY=70,
             CTCPNO=01,
             MAXDATA=2580,
             PRFLINE=XL13,
             PRFPU=XP13,
             PRFLU=XL13,
             SUFFIX=01
```

**Note:** SNA resources are defined using the X.25 FCG statement. Virtual circuits are defined using the X25.VC statement.

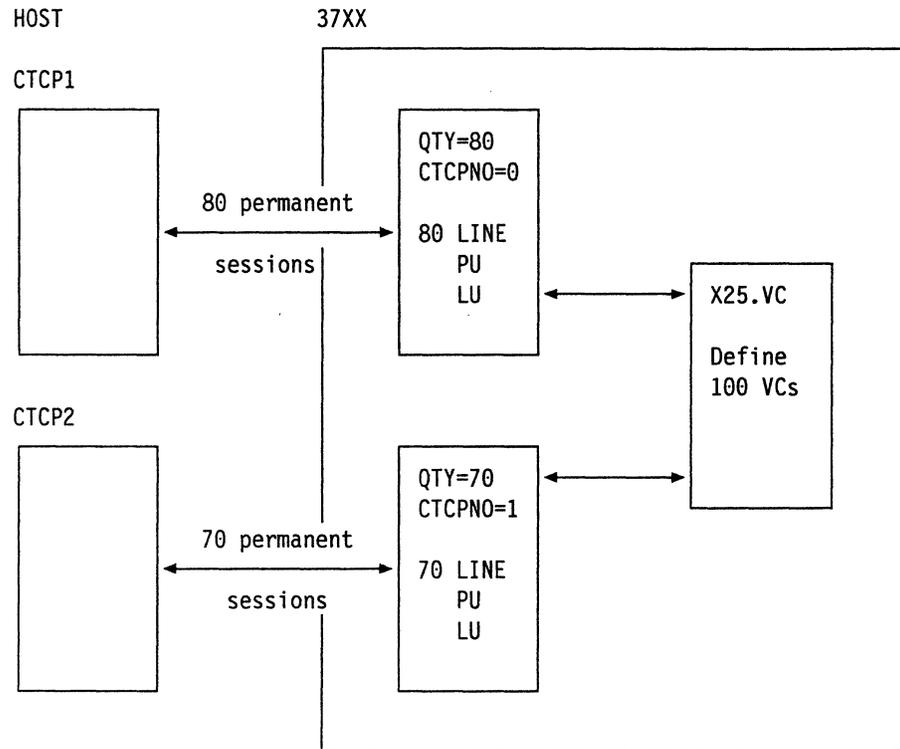


Figure 19. Fast Connect with Two CTCPs for One Physical Circuit

## PAD Support

PAD support is defined on the X25.MCH statement using the PAD keyword. x.25 NPSI provides two types of PAD support:

- Integrated PAD
- Transparent PAD.

Integrated PAD support is used to define a PAD that conforms to CCITT Recommendation x.28. To define integrated PAD support, you must code the PAD keyword as PAD=INTEG.

Integrated PAD support also allows applications to take advantage of X.25 NPSI password protection. To do this, the application must use the inhibit presentation (INP) or the enable (ENP) presentation characters. Hexadecimal codes for these are:

INP=24  
ENP=14

Use transparent PAD support for all other types of PADS, except for the SDLC PAD. You should use transparent PAD support if you require more PAD control than is provided with the integrated PAD. To define transparent PAD, you must code the PAD keyword as PAD=TRANSP.

The default on the PAD keyword is PAD=NO. If you code NO or leave the PAD keyword off, PAD support is not available for virtual circuits on the physical circuit.

**Note:** LLC5 must be included in the LLCLIST to use PAD SVCS.

---

## PCNE to PCNE Considerations

If you specify a PU associated with a type 0 virtual circuit, remember that the remote identification number generated in the Call Request packet is in CUD field bytes 1—3. This remote identification number, received from an Incoming Call packet by the remote DTE, will equal the ZZZZZ field plus 1.

The only relationship between two SNA domains is made by the remote identification number specified in the Call Request and Incoming Call packets.

The IDNUM keywords coded in the two domains need to be correlated so that it is clear which PU of one domain calls which PU of the other domain. Code your PU and PATH statements as illustrated in the following example:

SNA Domain 1		SNA Domain 2	
PU11	PU IDBLK=003, IDNUM=90001, . . .	PU22	PU IDBLK=003, IDNUM=90002, . . .
PA11	PATH DIALNO...*90001,	* No PATH (PU is used for call-in)	
	. . .		

The ZZZZZ field of PU11 is used as IDNUM for PU11 and is incremented by 1 to be used as IDNUM for calling in PU22.

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## Chapter 4. Resource Definition Reference

This chapter presents the resource naming conventions and resource definition statement formats in alphabetical order, uses tables to illustrate the statement format, and describes the keywords for each statement. For purposes of clarity, each statement section starts on a new page.

Read “Planning for X.25 NPSI Migration” on page 49 to learn about x.25 NPSI changes in the generation process.

---

### Resource Naming Conventions

X.25 NPSI resource names are used by VTAM, the NetView program, and teleprocessing subsystems such as CICS or IMS, during the operation of the network system.

X.25 NPSI resource names can be created in two ways:

- NDF creates default resource names during the generation process if you do not specify a label on the resource statement.
- You can override the default and code your own user-specified names on the X25.LINE, X25.MCH, X25.PU, X25.LU, X25.FCG, and X25.VC definition statements.

All resource names built by default during x.25 NPSI generation use the letter specified by the value of the X25.PREFIX keyword on the NCP BUILD statement. This is by default, an X. See “BUILD Definition Statement” on page 85 for information on replacing X with a user-specified letter.

NDF builds the resource names for the following:

- Physical circuit

pLxxx LINE  
pPxxx PU  
pUxxx LU or  
pUxxxLnn (for any LU other than the first, if more than one LU  
is defined for the MCH GATE)

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default=X).
- xxx Is the physical circuit line address specified by the ADDRESS keyword on the X25.MCH statement.
- nn Is the number of the LU (for example 01 for LU1, 02 for LU2 and so on, up to 27). The first LU (LU number 00) is named pUxxx.

- GROUP statement created by X25.MCH

Each X25.MCH statement creates a unique GROUP statement.

pNETnm

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X).
- n Is the position of the previous X25.NET statement within the x.25 NPSI generation source statements.
- m Is the rank of this MCH within the previous X25.NET statement.

- Virtual circuit

pLxxxlcn LINE

pPxxxlcn PU

pUxxxlcn LU

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X).
- xxx Is the physical circuit line address specified by the ADDRESS keyword on the X25.MCH statement.
- lcn Is the logical channel number (in hexadecimal) of the current virtual circuit.

**Note:** The same defaults are generated for LINE, PU, and LU. There is no distinction between the X25.VC, X25.LINE, X25.PU, or X25.LU statements relative to the generation of these defaults.

- GROUP statement created by X25.LINE or X25.VC statement

p25Pxxxy for PVCs

p25Sxxxy for SVCs

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X).
- xxx Is the physical circuit line address as coded in the X25.MCH ADDRESS keyword (1–3 digits).
- y Is the letter specifying the group sequence on the physical circuit. The first group will be assigned an A, the second group a B, and so on.

- SVCSC

pLxxxvvv LINE

pPxxxvvv PU

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X).
- xxx Is the address of the MCH.
- vvv Is the number of the SVCSC line or PU within the MCH expressed in base 20, with letters G–Z used to represent the numbers 0–19, respectively. For example, the first name is pLxxxGGH; the second name is pLxxxGGI, and so on.

- X25.FCG statement

```
pLGmnggg  LINE
pPGmnggg  PU
pUGmnggg  LU
```

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X).
- m Is the number of the X25.MCH with CONNECT = CUD0 or CONNECT = SUBD. This single alphanumeric number ranges from 0–9 and A–Z. The number of MCHs with fast connect is limited to 36.
- n Is the number of the CTCP defined within the MCH. This number is then converted into a single alphanumeric in the range 0–9 and A–R.
- ggg Is the SNA resource number in hexadecimal.

- GROUP statement created by X25.FCG statement

Each X25.FCG statement creates a unique GROUP statement.

```
p25PGmnj  GROUP
```

where:

- p Is the X25.PREFIX keyword of the BUILD statement (default = X)
- m Is the number of the X25.MCH with CONNECT = CUD0 or CONNECT = SUBD. This single alphanumeric number ranges from 0–9 and A–Z. The number of MCHs with fast connect is limited to 36.
- n Is the number of the CTCP defined within the MCH. This single alphanumeric number ranges from 0–9 and A–R.
- j Is an alpha character in the sequence A–Z.

In addition to NDF-generated names, you can specify unique rules for name creation using the following keywords:

- PRFLINE
- PRFPU
- PRFLU
- SUFFIX
- HEXNAME

The following examples show coding for the keywords PRFLINE, PRFPU, PRFLU, and SUFFIX, and the names that are generated. The first example is:

```
X25.VC LCN=(1,100),TYPE=S,OUFINDX=1,VCCINDX=1,
        PRFLINE=AL1,PRFPU=AP1,SUFFIX=001,HEXNAME=NO
```

The names generated are as follows:

```
AL1001 to AL1100 for the LINEs
AP1001 to AP1100 for the PUs
the SUFFIX goes from 001 to 100 in decimal.
```

The second example is:

```
X25.VC LCN=(1,100),TYPE=P,VCCINDX=1
        PRFLINE=AL1,PRFPU=AP1,PRFLU=AU1,SUFFIX=001
```

The names generated are as follows:

```
AL1001 to AL1064 for the LINES
AP1001 to AP1064 for the PUs
AU1001 to AU1064 for the LUs
the SUFFIX goes from 001 to 064 in hexadecimal.
```

**Note:** To simplify X.25 NPSI resource identification in the host processor, use the NDF default naming convention.

X.25 NPSI uses macros to describe its control blocks during NCP stage 2 generation. Because these macros are prefixed with BAK, you cannot use BAK to define other macros.

Also, because the entry points within the X.25 NPSI load module begin with the prefix BAL, you cannot use BAL to define other entry points in any customized X.25 NPSI code.

---

## Conventions Used in This Chapter

The following conventions are used throughout this chapter:

- Capital letters represent values you code directly, without changing.
- Small letters represent variables for which you must supply values.
- Commas separate keywords and the keyword values.
- Brackets [ ] enclose *optional* or *conditional* keywords and symbols.

An *optional* keyword can be coded or omitted, independent of other keywords. If certain keywords are omitted, default values will be used. A keyword's default value is always given as one of the choices.

A *conditional* keyword can be coded or omitted, depending on how you code (or omit) other keywords in the same or other definition statements.

Within the definition statement description, required keywords appear first in alphabetical order. Then, the conditional or optional keywords follow in alphabetical order.

- Braces { } indicate that you must choose from the enclosed values.
- OR symbol | indicates that you must choose from the values on either side of the symbol.
- An underlined value represents the default value of the keyword. X.25 NPSI generation uses that value if you omit the keyword.
- Parentheses ( ) must enclose a sequence of values coded for one keyword.
- Single quotation marks must enclose a character string if that character string can be confused with a value for a keyword. Enclosing the character string in quotation marks lets you use certain names as symbols that you would be prevented from using otherwise.
- Numbers have a period between the whole and fractional portions of the numeral. For example, 1.5 denotes one and a half.

In the syntax lists at the beginning of each definition statement, each required keyword, except the last, is followed by a comma. Similarly, each optional keyword, after the last required keyword, is preceded by a comma. However, if the lists consist of optional keywords only, each optional keyword, except the first keyword, is preceded by a comma. These commas are shown to emphasize that you must code a comma between each keyword, but not after the last keyword or before the first keyword of each definition statement.

The X.25 NPSI generation procedure does not check NCP, NetView, or VTAM keywords for proper syntax. The generation process also does not verify that any related keywords are absent or present. For the meaning of the keywords, see the appropriate NCP, NetView program, or VTAM installation manuals.

---

## BUILD Definition Statement

The X25BUILD statement is no longer a valid X.25 NPSI definition statement. Information provided by this macro must now be specified on the NCP BUILD statement. If you code an X25BUILD statement, it is flagged with a severity 4 warning message. No keyword processing occurs for the statement found in error.

Several keywords previously coded on the X25BUILD statement are now coded by using equivalent keywords on the NCP BUILD statement. However, some keywords do not have a corresponding NCP keyword. See Appendix C, "Statement and Keyword Changes," for a complete list of X25BUILD keywords.

Former keywords must be modified before they are added to the NCP BUILD statement. To do this, add the prefix 'X25.' to each keyword to designate it as a unique X.25 NPSI keyword. For example, IDNUMH is now coded as X25.IDNUMH.

Seven keywords have been added to the NCP BUILD statement. These are:

**X25.IDNUMH:** X25.IDNUMH specifies the first 2 digits of the IDNUM for PUS used to map non-SNA resources. Code the IDNUMH value in hexadecimal. The default value is 00; valid values range from 00–0F.

**X25.MAXPIU:** X25.MAXPIU specifies the maximum length for inbound PIUS. Code the length in kilobytes or in bytes. The default value is 64K. The X25.MAXPIU value ranges from 2K–64K for kilobytes and 1296–65535 for bytes.

**X25.MCHCNT:** X25.MCHCNT specifies the number of physical circuits defined in the X.25 NPSI generation statements. Code X25.MCHCNT in decimal. The default value is 1; valid values range from 1–4095.

**X25.MWINDOW:** X25.MWINDOW specifies the frame window size used by link access procedure balanced (LAPB). Valid values range from 1–7.

**Note:** MWINDOW applies to all X25.MCH statements that follow unless the X25.MCH statement overrides the X25.MWINDOW.

**X25.PREFIX:** X25.PREFIX specifies the first letter for X.25 NPSI default resource names. Code the X25.PREFIX value as an alphabetic character that ranges from A–Z. The default value is X.

See "Resource Naming Conventions" on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI.

**X25.SNAP:** X25.SNAP sets the SNAP trace facility on during generation. Code YES when you want the SNAP trace facility. The default value is NO. See *X.25 NPSI Diagnosis, Customization, and Tuning* for instructions on how to use the SNAP trace facility with X.25 NPSI.

**X25.USGTIER:** X25.USGTIER specifies the usage tier where this X.25 NPSI Version 3 load module will operate. The value must be less than or equal to the usage tier installed with this X.25 NPSI. To determine the ordered usage tier, look at your IBM licensing agreement. The default value is 1; valid X25.USGTIER values range from 1–5. If you specify a value that exceeds the installed feature level, the X.25 NPSI generation will fail.

The X25.USGTIER value specified for X.25 NPSI generation must *not* be less than the usage tier value specified by the USGTIER keyword of the NCP BUILD statement for the associated NCP Version 5. If you specify an X25.USGTIER value that is less than the USGTIER value specified for the associated NCP, the X.25 NPSI generation will fail. The MCHs that can be generated for X.25 NPSI depend on the NCP USGTIER. The MCH addresses cannot exceed the USGTIER coded for the NCP.

An example of how to code the usage tier parameters is as follows:

```
BUILD USGTIER=3,          NCP Version 5 usage tier
      X25.USGTIER=3,     X.25 NPSI Version 3 usage tier
      .                  Other parameters
      .
      .
```

NCP V5R1 requires that at least one NCP LINE, PU, and LU statement be defined in an X.25 NPSI generation before any user LINE statement is defined. A dummy LINE can be defined if ISTATUS=INACTIVE is specified.

See Appendix B, “Installation Examples for X.25 NPSI,” for an example of coding NCP GROUP, LINE, PU, and LU statements.

---

## X25.END Statement

**USAGE:** Required.

**POSITION:** Last in x.25 NPSI definition statements.

**FORMAT AND KEYWORDS:** The format of the X25.END definition statement is:

symbol X25.END

Use the X25.END statement to end x.25 NPSI generation. Do not include any keywords with this statement.

---

### Keywords

---

This definition statement has no keywords.

---

*symbol*

Is an optional label for the X25.END statement.

**Note:** If this statement is not included with your x.25 NPSI source statements, NDF will produce a severity 8 warning message. NDF will also flag the following keywords with a severity 4 warning message:

- INCHI
- INCINIT
- INCL2HI
- INCL2LO
- INCPRFX
- LSTUACB
- NCPSTG1
- ORDHI
- ORDINIT
- ORDL2HI
- ORDL2LO
- SRCHI
- SRCLO
- X25VTAM

---

## X25.FCG Statement

**USAGE:** Defines the SNA resources used with fast connect. Use the X25.FCG statement to define SNA resources (LINE, PU, and LU) that will map to SVCs connected to more than one CTCP.

**POSITION:** X25.FCG statements follow the corresponding X25.MCH statement in the source statements and follow the X25.VC statements related to that MCH.

The mandatory order of the statements is as follows:

- X25.MCH
- X25.LCG
- X25.VC
- X25.FCG

When you connect several fast connect CTCPS through one physical circuit, you must have one X25.FCG statement for each CTCP. Do *not* code an X25.FCG statement if you use only one CTCP. Code CONNECT= YES on the X25.MCH statement instead. The sample generation in Appendix B, "Installation Examples for X.25 NPSI," contains sample X25.FCG statements and shows their position within a generation deck.

**FORMAT AND KEYWORDS:** The format of the X25.FCG definition statement is:

```
symbol      X25.FCG      keywords
```

**VTAM Users:** Appearing after the keyword list are VTAM keywords that can be coded on this definition statement. These keywords provide information only to the VTAM initialization process and are not required in the generation definition used as input to NCP generation. See the appropriate VTAM installation manual for descriptions of these keywords and for information on the VTAM initialization process.

---

### Keywords

```
CTCPNO=number,
QTY=number
[,ANS={CONTINUE|CONT}]
      {STOP      }
[,HEXNAME={NO }] (V3R2 only)
      {YES}
[,ISTATUS={ACTIVE  }]
      {INACTIVE}
[,MAXDATA={number}]
      {261  }
[,NCPGRP={NEW      }]
      {identifier}
[,PRFLINE=x]
[,PRFLU=z]
```

---

---

**Keywords**

---

[,PRFPU=y]  
[,SPAN=name]  
[,STATOPT=text string]  
[,SUFFIX=number]

---

**VTAM Keywords**

---

[,DISCNT=...]  
[,DLOGMOD=...]  
[,ENCR=...]  
[,FEATUR2=...]  
[,LOGTAB=...]  
[,OWNER=...]  
[,SSCPFM=...]  
[,TERM=...]  
[,USSTAB=...]  
[,VPACING=...] (V3R2 only)

---

## X25.FCG

*symbol*

Is an optional name for the X25.FCG statement. It is not used by VTAM or NCP.

**CTCPNO=number**

Is the number of the CTCP defined by the X25.FCG statement. Refer to the X25.MCH statement for the CTCP keyword. The range, written in decimal from 0–27, cannot exceed the maximum CTCP number for the physical circuit.

**QTY=number**

Is the number of simultaneous SNA sessions authorized for the specified CTCP. The number can range from 1–4096, but it must be less than or equal to the number of virtual circuits defined for the physical circuit.

**[ANS={CONTINUE|CONT}]**  
**{STOP }**

Specifies the ANS keyword that is copied in the NCP PU statement for the SNA resources that are defined. CONTINUE can be abbreviated as CONT. Code ANS=CONT if session continuation is desired for the dependent virtual circuits. X.25 NPSI provides no default.

**[HEXNAME={NO }] (V3R2 only)**  
**{YES}**

Specifies whether the suffix of the LINE name, PU name, and LU name for the NCP builds in hexadecimal or decimal when the SUFFIX keyword is used. Coding HEXNAME=NO requires the coding of PRFLINE, PRFPU, PRFLU, and SUFFIX. The default value is YES.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

**[ISTATUS={ACTIVE }]**  
**{INACTIVE}**

Specifies whether the lines, physical units, and logical units are activated following a VTAM first start or cold restart. X.25 NPSI provides no default. This keyword and parameter is reported on the generated NCP LINE statements.

**[MAXDATA={number}]**  
**{261 }**

Specifies the maximum number of bytes in a PIU. Valid values range from the NCP buffer size (BFRS keyword of the NCP BUILD statement) to 65535. Because X.25 NPSI does not support SNA segmenting for non-SNA DTES, the value specified for MAXDATA should be greater than the maximum PIU size sent by the application. If this size is not known, specify 65535 for MAXDATA. See *NCP, SSP, and EP Resource Definition Reference* for more information about MAXDATA.

**[NCPGRP={NEW }]**  
**{identifier}**

Is a label applied to the NCP group. If you code NEW or omit this keyword, the default name for the NCP group will be:

p25PGmnj

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

**[PRFLINE=x]**

Specifies a user-defined prefix for the name of the LINE statement used for fast connect. The default prefix generated by X.25 NPSI is:

pLGmnggg

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

**[PRFLU=z]**

Specifies a user-defined prefix for the name of the LU used for fast connect. The default prefix generated by X.25 NPSI is:

pUGmnggg

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

**[PRFPU=y]**

Specifies a user-defined prefix for the name of the PU used for fast connect. The default prefix generated by X.25 NPSI is:

pPGmnggg

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

**[SPAN=name]**

Specifies that the NetView program operator’s access to the virtual circuit line is restricted. This specification is copied to the LINE, PU, and LU statements generated by the X25.FCG statement.

**[STATOPT=text string]**

The STATOPT keyword and its text string operand are copied as specified into a comment statement following the LINE statement generated by NDF.

**[SUFFIX=number]**

Specifies a number that is the lower limit for each set of names built. There is no default. This keyword must be coded together with PRFLINE, PRFPU, and PRFLU if user-defined names are to be generated. The length of the names is equal to the length of PRFLINE, or PRFPU, or PRFLU, added to the length of the SUFFIX parameter. Values range from 0—X'FFF' if HEXNAME = YES, and from 0—4095 if HEXNAME = NO.

PRFLINE, PRFPU, PRFLU, and SUFFIX must be coded together.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to code the related statement keywords.

---

## X25.LCG Statement

**USAGE:** Use this statement to describe the logical channel group (LCG). You must code an X25.LCG statement for each LCG defined on a physical circuit.

**POSITION:** This statement follows the X25.MCH statement and precedes the virtual circuit definition for this group.

**FORMAT AND KEYWORDS:** The format of the X25.LCG statement is:

X25.LCG      keywords

---

### Keywords

---

LCGN=*number*

---

LCGN=*number*

Specifies the logical channel group number (LCGN) for all virtual circuits specified by the subsequent X25.VC or X25.LINE statements. Valid values range from 0—15. You must define the number in the LCGDEF keyword of the preceding X25.MCH statement.

**Note:** If you use more than one LCG, code the LCG numbers in the X25.LCG statements in ascending order.

---

## X25.LINE Statement

**USAGE:** Use the X25.LINE statement to define the characteristics of a virtual circuit. This statement is similar to the X25.VC statement. The X25.LINE statement generates an NCP LINE statement and allows you to control the LINE name and some parameters of the NCP LINE statement.

**POSITION:** Arrange X25.LINE statements that define virtual circuits associated with the same logical channel group in ascending order by logical channel number. Each X25.LINE statement must be followed by one X25.PU statement. If you are defining a non-subarea node PVC, it also must be followed by at least one X25.LU statement.

**FORMAT AND KEYWORDS:** The format of the X25.LINE statement is:

```
symbol      X25.LINE      keywords
```

**VTAM Users:** Appearing after the keyword list are VTAM keywords that can be coded on this definition statement. These keywords provide information only to the VTAM initialization process and are not required in the generation definition used as input to NCP generation. See the appropriate VTAM installation manual for descriptions of these keywords and for information on the VTAM initialization process.

You cannot modify the x.25 level 3 DTE timer with X25.LINE. These values, set according to the CCITT 84 Recommendations, are as follows:

Timer and Seconds	Packet
T20 = 180 seconds	Restart Request
T21 = 200 seconds	Call Request
T22 = 180 seconds	Reset Request
T23 = 180 seconds	Clear Request

If these values do not meet your specific requirements, use the DATE function to select appropriate values or select the values using the T20, T21, T22, or T23 keywords of the X25.NET statement.

---

### Keywords

```
LCN=number,
TYPE={SWITCHED|S },
      {PERMANENT|P},
VCCINDX=index
[,CALL={OUT  }
        {IN  }
        {INOUT}
[,COMMITO={1}
           {2}
           {4}
           {8}
```

---

---

**Keywords**

---

[,DSTNODE={BNN}]  
    {INN}

[,ISTATUS={ACTIVE }]  
    {INACTIVE}

[,LLC={LLC0}]  
    {LLC2}  
    {LLC3}  
    {LLC4}  
    {LLC5}

[,MONLINK={YES}]  
    {NO }

[,NCPGRP={label}]  
    {NEW }

[,OSITYPE={number}]  
    {0 }

[,OUFINDX=index]

[,RETVCT={count}]  
    {3 }

[,RETVCTO={timeout}]  
    {30 }

[,SPAN=name]

[,STATOPT=text string]

[,TRANSFR=count]

---

---

**VTAM Keywords**


---



---

[ ,OWNER=... ]

---

*symbol*

Is an optional name that labels the corresponding LINE statement in the NCP source statements, and serves as the symbolic name for the virtual circuit that you define. The default name generated by X.25 NPSI is:

pLxxxggg

See "Resource Naming Conventions" on page 81 for X.25 NPSI default name resources.

*LCN=number*

Specifies the logical channel number (LCN) of the defined virtual circuit. Code this value in decimal notation. Valid values range from 0–255.

**Note:** Some networks do not use the value 0 within logical channel group 0.

TYPE={SWITCHED|S }  
 {PERMANENT|P}

Specifies the virtual circuit type. This keyword is required and has no default value. To define an SVC, code TYPE=SWITCHED or TYPE=S. To select a PVC, code TYPE=PERMANENT or TYPE=P. If the MCH is dedicated to fast connect, code TYPE=S.

*VCCINDX=index*

Specifies the entry in the connection parameter table that contains the operational characteristics of the virtual circuit defined by this X25.LINE statement.

This keyword is mandatory for all virtual circuits. Valid values range from 1–99. The index serves as a default for call-outs if you code xx=00 in the DIALNO keyword.

Packet and window sizes defined in the corresponding entry of the VCCPT must be the same as the values assigned by the PSDN.

[CALL={OUT }]  
 {IN }  
 {INOUT }

Specifies the way an SVC is established. You can use this keyword only if TYPE=SWITCHED or TYPE=S is coded.

Use CALL=IN if the virtual circuit that you define will be established at the request of a remote DTE rather than X.25 NPSI.

Use CALL=OUT if the virtual circuit that you define will be established at the request of the local host access method through X.25 NPSI.

CALL=INOUT means that a virtual circuit can be established in either way.

For a DATE physical circuit, you must code the CALL keyword to match your PSDN subscription.

For a GATE MCH, if you want to reserve a certain number of virtual circuits for non-GATE call-outs, code CALL=OUT for the required number of virtual circuits. The number of virtual circuits used to call out by the CTCP should be declared as CALL=INOUT or CALL=IN.

## X25.LINE

[COMMITO={1}]  
    {2}  
    {4}  
    {8}

Specifies in seconds the idle virtual circuit commit time-out. When this time elapses, buffers that were committed for this virtual circuit are decommitted. The default value is 4.

[DSTNODE={BNN}]  
    {INN}

Specifies the type of destination node. The DSTNODE keyword is meaningful only for virtual circuit type 3. DSTNODE = BNN means that the virtual circuit is connected to a peripheral node, such as a cluster or a terminal. DSTNODE = INN means that the virtual circuit is connected to a subarea node, such as another communication controller. The default value is BNN. With V3R2, you can specify DSTNODE = INN together with TYPE = SWITCHED or TYPE = S.

[ISTATUS={ACTIVE }]  
    {INACTIVE}

Specifies whether the line is activated following a VTAM first start or cold restart. X.25 NPSI provides no default. This keyword and parameter is reported on the generated NCP LINE.

[LLC={LLC0}]  
    {LLC2}  
    {LLC3}  
    {LLC4}  
    {LLC5}

Specifies the type of PVC defined by this statement. This keyword is used only for PVCs, because X.25 NPSI defines the LLC type for SVCS at call setup. This keyword is mandatory when you code TYPE = PERMANENT or TYPE = P.

- Code LLC0 if the virtual circuit goes to a non-SNA DTE and does not require GATE or PAD support (type 0 virtual circuit).
- Code LLC2 if the virtual circuit goes to an SNA peripheral node (type 2 virtual circuit) attached with PSH protocol.
- Code LLC3 if the virtual circuit goes to an SNA peripheral node attached with QLLC protocol or to another subarea node (type 3 virtual circuit).
- Code LLC4 if the virtual circuit requires GATE support (type 4 virtual circuit).
- Code LLC5 if the virtual circuit connects to a terminal requiring PAD support (type 5 virtual circuit). Specify the type of PAD support (integrated or transparent) using the PAD keyword of the X25.MCH statement.

[MONLINK={YES}]  
    {NO }

Specifies the value given to this keyword in the corresponding NCP LINE statement. There is no default value. Code YES if this is a remote NCP to be activated over the subarea node PVC. See *NCP, SSP, and EP Resource Definition Reference* for details.

[NCPGRP={label}]  
    {NEW }

Specifies the label of the NCP GROUP statement that includes the virtual circuit. If you do not specify this value, the name is generated by NDF. You can code this keyword if you want to modify the group name to which this LINE belongs.

If you specify a *label*, a new NCP GROUP statement is created that uses this label as its name.

If you specify NEW, a new NCP GROUP statement is automatically created at X.25 NPSI generation.

X.25 NPSI creates one group of PVCs and one group of SVCs for each MCH by default. If you omit the NCPGRP keyword, the virtual circuit will belong to the group with the most recently created name. The default name is generated as follows:

p25Pxxxxy for PVCs  
p25Sxxxxy for SVCs

See "Resource Naming Conventions" on page 81 for X.25 NPSI default naming resources.

**Note:** This keyword can no longer be used to make a call-out on a virtual circuit belonging to a given set of virtual circuits within an MCH. If a virtual circuit is within an MCH, X.25 NPSI allocates the virtual circuits for call-outs starting from the largest virtual circuit number available for call-out.

[OSITYPE={*number*}]  
{0 }

Specifies in decimal the GATE CTCP with which this virtual circuit must communicate. This parameter applies to PVCs only, and must be used when the MCH is capable of communicating with several GATE CTCPs. If the MCH is not capable of communicating with more than one GATE CTCP, this keyword must be omitted. Valid values range from 0–27. The default value is 0.

[OUFINDX=*index*]

Specifies the default index value in the X25.OUFT table. The index value points to the table entry that builds the facility field and the end of the CUD field in a Call Request packet. OUFINDX serves as a default for call-outs if you code yy = 00 in the DIALNO keyword. Valid values range from 1–99. This keyword is required when you code TYPE = SWITCHED or TYPE = S.

[RETVCCCT={*count*}]  
{3 }

Specifies the number of retransmissions of a physical services command. RETVCCCT is used only when the virtual circuit goes to an SNA DTE. Valid values range from 0–255; the default value is 3.

[RETVCTO={*timeout*}]  
{30 }

Specifies the time between retransmissions of physical services commands when the virtual circuit is connected to an SNA DTE. Valid values range from 0–255 seconds; the default value is 30 seconds.

For the 3710, specify a value greater than the time needed to perform recovery for a downstream device.

[SPAN=*name*]

Restricts the NetView program operator's access to the virtual circuit line. This specification is copied to the LINE, PU, and LU statements generated by the X25.LINE statement.

[STATOPT=*text string*]

The STATOPT keyword and its text string operand are copied as specified into a comment statement following the LINE statement generated by NDF.

[TRANSFR=*count*]

Specifies the number of NCP buffers corresponding to the maximum amount of data that can be received from the line during a single data transfer operation. This keyword applies only to subarea node virtual circuits.

---

## X25.LU Statement

**USAGE:** Use this statement to define an LU associated with the DTE. The keywords are the same as those for the NCP LU statement.

**POSITION:** This statement follows the X25.PU statement for PVC definitions.

**FORMAT AND KEYWORDS:** The format of the X25.LU statement is:

```
symbol X25.LU keywords
```

Code one X25.LU statement for each logical unit associated with a virtual circuit. For more information on the LU statement and its keywords, see *NCP, SSP, and EP Resource Definition Reference*.

---

### Keywords

---

[LOCADDR=number]

[,LUDR=NO]

[,NPACOLL=NO]

---

*symbol*

Is an optional field that provides a resource name for the logical unit. The default name is:

pUxxxggg

See "Resource Naming Conventions" on page 81 for X.25 NPSI default name resources.

[LOCADDR=number]

Specifies the local address of the logical unit in decimal with no leading zeros. For LLC types 0, 4, and 5 you must code LOCADDR=0.

[LUDR=NO]

Specifies whether the logical unit can be deleted by dynamic reconfiguration. Because X.25 NPSI does not support dynamic reconfiguration, X.25 NPSI places LUDR=NO in the statement.

[NPACOLL=NO]

Specifies whether data transmitted and received by this logical unit is eligible for collection by the NetView performance monitor (NPM). Because X.25 NPSI does not support NPM, X.25 NPSI places NPACOLL=NO in the statement.

The sample program in Appendix B, "Installation Examples for X.25 NPSI," contains sample X25.LU statements for several types of virtual circuits.

---

## X25.MCH Statement

**USAGE:** Use this statement to describe a physical circuit to X.25 NPSI. It generates an NCP LINE statement, an NCP PU statement, and one or more NCP LU statements.

**POSITION:** This statement follows the X25.NET statement. The X25.MCH statement is then followed by the X25.LCG statement and other statements that define the virtual circuits.

**FORMAT AND KEYWORDS:** The format of the X25.MCH statement is:

```
symbol      X25.MCH      keywords
```

**VTAM Users:** Appearing after the keyword list are VTAM keywords that can be coded on this definition statement. These keywords provide information only to the VTAM initialization process and are not required in the generation definition used as input to NCP generation. See the appropriate VTAM installation manual for descriptions of these keywords and for information on the VTAM initialization process.

---

### Keywords

```
ADDRESS=xxx,
FRMLGTH=length,
LCGDEF=(lcg,lcghi),    or
        ((lcg,lcghi),(lcg,lcghi),...),
MWINDOW=window
[,ACTIVTO=timer]      (V3R2 only)
[,ANS={CONTINUE|CONT}]
        {STOP        }
[,BRKCON={CONNECTO}] (V3R2 only)
        {NOWNERTO}
        {NONE      }
[,CONNECT={NO  }]
        {YES  }
        {CUD0}
        {SUBD}
[,CTCP=(m1,m2,m3,...,mn)]
[,CUD0=(n1,n2,n3,...,nn)]
[,DBIT={YES}]
        {NO  }
[,DIRECT={YES}]
        {NO  }
[,DSABLTO=timer]
[,ENABLTO=timer]
```

---

---

**Keywords**


---

```
[,GATE={DEDICAT}]
    {GENERAL}
    {NO }

[,ISTATUS={ACTIVE }]
    {INACTIVE}

[,ITRACE={YES}]
    {NO }

[,LCNO={NOTUSED}]
    {USED }
```

```
[,LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5)]
[,{LLC0=(m1,m2...)},...]
    {LLC2=(m1,m2...)}
    {LLC3=(m1,m2...)}
    {LLC4=(m1,m2...)}
    {LLC5=(m1,m2...)}
    {LLCI=(m1,m2...)}

[,LOGAPPL=(app10,app11,...,app1m)]

[,LUNAME=(luname0,luname1,...,lunamem)]

[,MACB=(labelx,labelr)]

[,MODETAB=(table0,table1,...,tablem)]

[,NCPGRP={label}]
    {NEW }
```

```
[,NDRETRY={count}]
    {1 }
```

```
[,NETID=(name,ANY)] (V3R2 only)
```

```
[,NPRETRY={count}]
    {Z }
```

```
[,PAD={INTEG }]
    {TRANSP}
    {NO }
```

```
[,PKTMODL={128}]
    {8 }
```

```
[,PUNAME=puname]

[,PWPROT={YES}]
    {NO }
```

```
[,SDRTCNT=number] (V3R2 only)

[,SDRTIME=time] (V3R2 only)

[,SHM={YES}] (V3R2 only)
    {NO }
```

```
[,SHUTD={INVCLR }]
    {NOINVCLR}
```

```
[,SPAN=name]
```

---

---

**Keywords**


---

```
[,SPEED={rate}]
    {9600}

[,SPNQLLC={YES}]
    {NO }

[,STATION={DCE}]
    {DTE}

[,STATOPT=text string]

[,SUBADDR={YES}]
    {NO }

[,SUBD=(n1,n2,n3,...nn)]

[,SVCINN={number}] (V3R2 only)
    {0 }

[,T1TIMER={time}]
    {0 }

[,TAXUNIT={32 }]
    {64 }
    {128}

[,TDTIMER=timer]

[,TPTIMER=timer]

[,TRAN={ODD }]
    {EVEN}
    {NO }

[,VMODTAB=(v0,v1,v2,...vm)]

[,XMONLNK={YES}] (V3R2 only)
    {NO }

[,X21INTWK={NO }]
    {OLD }
    {1984}
```

---



---

**VTAM Keywords**


---

```
[,OWNER=...]
```

---

*symbol*

Is an optional label. When coded, it overrides the automatic resource name generation for the corresponding NCP line. The automatic name generation creates:

pLxxx

See "Resource Naming Conventions" on page 81 for X.25 NPSI default naming resources.

**ADDRESS=xxx,**

Specifies the duplex line interface address in 1–3 decimal digits. Valid values range from 0–63 for the 3720 and 0–511 for the 3745. The value specified must be in the range allowed by the NCP USGTIER value specified on the BUILD statement. For example, line addresses 32–63 are not allowed on a 3720 with a USGTIER of 1.

See *NCP, SSP, and EP Resource Definition Reference* for the ranges of addresses corresponding to NCP USGTIER values.

**FRMLGTH**=*length*,

Specifies the maximum frame length in bytes that flow over the physical circuit. *length* is the x.25 N1 parameter divided by 8; it is also equal to the data packet maximum length added to the packet header length. Valid values range from 35–4100. Packet header length is:

- 3 bytes for packet modulo 8
- 4 bytes for packet modulo 128.

**Note:** The minimum value for an MCH that supports subarea node virtual circuits is 131.

**LCGDEF**=(*lcg, lcnhi*)  
 ((*lcg, lcnhi*), (*lcg, lcnhi*), ...)

Specifies the highest logical channel number in decimal (*lcnhi*) for each logical channel group (LCG). The *lcg* must be in decimal also.

You must define at least one pair of values; however, you can define up to 16 pairs in any order. Define only LCGs that will actually be used.

**MWINDOW**=*window*

Specifies the frame window size to be used by the x.25 Link Access Protocol (LAP) level 2. Valid values range from 1–7. This parameter is mandatory unless it has been specified in the BUILD statement. If it is specified in the X25.MCH and in the BUILD statement, the value specified in the X25.MCH overrides the value specified in the BUILD statement.

[**ACTIVTO**=*timer*] (**V3R2 only**)

Specifies the value of the inactivity time-out in seconds. An svcsc is cleared and the PU is made inoperable after ACTIVTO seconds if BRKCON=CONNECTO or if BRKCON=NOWNERTO is specified, and if SHM is not in effect. The connection must be reestablished using a VARY NET,DIAL command after such an inactivity time-out. Range is from 1–5400 seconds. This keyword applies to svcsc only.

[**ANS**={**CONTINUE** | **CONT**}]  
 {**STOP** }

Specifies the ANS keyword that is copied in the NCP PU statement for the defined physical circuit. CONTINUE can be abbreviated as CONT. Code ANS=CONT if CONT is coded in any of the X25.VC, X25.FCG, or X25.PU statements associated with the dependent virtual circuits.

[**BRKCON**={**CONNECTO**}] (**V3R2 only**)

{**NOWNERTO**}  
 {**NONE** }

Specifies that x.25 NPSI breaks a switched connection if a line is idle (not sending or receiving data) for a period of time specified by ACTIVTO on the GROUP statement. BRKCON is valid only if you code DIAL=YES and PUTYPE=4.

If you code BRKCON=CONNECTO or BRKCON=NOWNERTO, x.25 NPSI starts the inactivity timer after each data sent or received, and breaks the connection after ACTIVTO time-out. The default is BRKCON=NONE.

[CONNECT={NO }]  
 {YES }  
 {CUD0}  
 {SUBD}

Specifies whether the fast connect function of X.25 NPSI is used on this physical circuit.

**NO** Specifies that fast connect is not used on this physical circuit. It is the default value.

**YES** Specifies that fast connect is used on this physical circuit. CONNECT=YES is used when only one CTCP is used on this fast connect MCH.

**CUD0** Specifies that fast connect with multiple CTCPs is used on this physical circuit, and that the CTCP is selected through CUD0. When CONNECT=CUD0 is specified, the CUD0 and CTCP keywords must be coded on the X25.MCH statement. Then the following optional keywords can be specified on the X25.MCH statement:

- LUNAME
- LOGAPPL
- MODETAB
- VMODTAB

A value is specified for each *unique* CTCP value. Thus, if 10 parameters were specified on the CTCP keyword, but there were only two unique values (00 and 01), these keywords should contain only two corresponding values.

The parameters are specified in a position corresponding to the CTCP number. The parameter in the first position corresponds with CTCP 0, the second with CTCP 01, and so on.

**SUBD** Specifies that fast connect with multiple CTCPs is used on this physical circuit and the CTCP is selected through subaddressing. When CONNECT=SUBD is specified, the SUBD and CTCP keywords must be coded on the X25.MCH statement. Then the following optional keywords can be specified on the X25.MCH statement.

- LUNAME
- LOGAPPL
- MODETAB
- VMODTAB

A value is specified for each *unique* CTCP value. Thus, if 10 parameters are specified on the CTCP keyword, but there are only two unique values (00 and 01), these keywords should only contain two corresponding values.

The parameters are specified in a position corresponding to the CTCP number. The parameter in the first position corresponds with CTCP 0, the second with CTCP 01, and so on.

**[CTCP=(m1,m2,m3,...,mn)]**

The CTCP keyword works in conjunction with the CUD0 or SUBD keyword if GATE=GENERAL is coded. Valid values (in decimal) range from 0—27. You can code CTCP depending on the CUD0 keyword as follows:

- Omit the CUD0 keyword. Do not code the CTCP keyword.
- Code CUD0=ALL. This provides a set of default values. Do not code the CTCP keyword.
- Code CUD0=(set of numbers). CTCP numbers or LLC numbers must correspond to the values coded in the CUD0 or SUBD keywords.

Values 00—27 select the CTCP. Values 80—85 select LLC types 0—5, respectively. In the case of fast connect, you must code the CTCP keyword if the SUBD keyword is coded.

**[CUD0=(n1,n2,n3,...,nn)]**

The CUD0 keyword works in conjunction with the CTCP keyword if GATE=GENERAL is coded. You can code these keywords in three ways:

- Omit the CUD0 keyword. The GATE CTCP is selected if there is no CUD (NULL CUD), or if CUD0 contains X'00', or any value from X'02'—X'2F'. Do not code the CTCP keyword.
- Code CUD0=ALL. This provides a set of default values.
  - The first GATE CTCP (0) is selected when CUD0 is equal to X'02' and X'C4'.
  - The second CTCP is selected when there is no CUD (NULL CUD), or if CUD0 contains X'00', or any value from X'02'—X'2F'.
- Code CUD0=(set of numbers). This provides maximum flexibility for selecting the CTCP or the LLC.

Specified values override the default values defined in CUD0=ALL. Unspecified values take the default values shown with CUD0=ALL. Hexadecimal values should be coded as one or two digits.

Values range from X'00'—X'FF' plus NULL, with NULL designating an empty CUD field. If one of the default values is to be rejected, the CTCP will issue the CLEAR command at reception of the invalid call-in.

Examples of CUD0 and CTCP coding are:

CUD0=(00,01,02,03,04,C1,CC,71,61,NULL)

CTCP=(00,00,01,00,01,80,80,85,85,01)

The result of this coding is:

- The first CTCP is selected when CUD0 is coded with X'00', X'01', and X'03', including the non-overridden default value X'C4'.
- The second CTCP is selected when CUD0 is coded with X'02', X'04', and NULL, including the non-overridden default values X'05' to X'2F'.
- LLC0 is selected by X'C1' and X'CC'.
- LLC5 is selected by X'71' and X'61' in addition to the non-overridden values X'41', X'51', and X'81'.

Specify or omit the leading zero in the CTCP keyword and CUD0 keywords. This allows you to align the corresponding subkeywords by coding them one above the other.

[DBIT={YES}]  
 {NO }

Specifies whether the delivery confirmation bit (D bit) is to be used. The D bit is an indicator in the packet header of data packets flowing to and from non-SNA DTEs supported by type 0 virtual circuits. It confirms that a packet was received at its destination. The default value is NO. If you code DBIT = YES, the following events occur:

- The D bit is set in the last packet of a packet sequence built from an outgoing PIU carrying any of the definite response bits.
- The definite response bit is set on in an incoming only-in-chain PIU when the corresponding incoming packet (or the last packet of a packet sequence) has the D bit on, and, if at BIND time, the definite response was requested on the secondary-to-primary flow.

[DIRECT={YES}]  
 {NO }

Specifies whether the physical circuit is directly attached to a communication controller or to a peripheral node. The default value NO specifies modem attachment.

[DSABLTO=*timer*]

Specifies the value of the disable time-out in seconds. This timer value is set by the modem and represents the maximum delay during which the DTE expects the Data Set Ready (DSR) signal to end, once the DISABLE command has been issued. The range is 0.1 second—1632.0 seconds in increments of 0.1 second; the default is 3.0 seconds.

[ENABLTO=*timer*]

Specifies the value of the enable time-out in seconds. This timer value is set by the modem, and represents the maximum delay during which the DTE expects the Data Set Ready (DSR) signal to begin after the ENABLE command has been issued. The range of values is 0.1 second—1632.0 seconds in increments of 0.1 second; the default is 3.0 seconds.

The timer is also used for modem retrain and DSR recovery. You should specify a large enough value for this keyword so that the time during which Data Set Ready (DSR) or Clear To Send (CTS) are down is exceeded. The DSR or the CTS might be down temporarily for tests or malfunctions.

This procedure keeps the physical circuit and all its virtual circuits up despite temporary CTS or DSR down conditions induced by the network.

[GATE={DEDICAT}]  
 {GENERAL}  
 {NO }

Specifies whether the GATE or the DATE function is supported on this physical circuit. Code:

- GATE = DEDICAT for the DATE function.
- GATE = NO if neither the GATE nor the DATE function is used.
- GATE = GENERAL for the GATE function (with or without fast connect).

If you code GATE = GENERAL, you can also code the SUBADDR, CTCP, CUD0, and SUBD keywords. The default value is NO.

## X25.MCH

[**ISTATUS**={**ACTIVE** }]  
{**INACTIVE**}

Specifies whether the line, physical units, and logical units are activated following a VTAM first start or cold restart. X.25 NPSI does not generate a default value for this keyword. This keyword and parameter are put on the LINE statement generated for this MCH.

For DATE or GATE, ISTATUS = ACTIVE is forced by x.25 NPSI generation on the LUS generated for this MCH. In any other case, ISTATUS = INACTIVE is forced on the LU generated by this X25.MCH statement.

[**ITRACE**={**YES**}]  
{**NO** }

Specifies whether LAP internal trace is performed on this physical circuit. The default is YES.

[**LCN0**={**NOTUSED**}]  
{**USED** }

Specifies if logical channel number 0 of the logical channel group 0 designates a virtual circuit. The default value is USED.

**Note:** If you specify USED, LCN=0 must be defined in a subsequent X25.LINE or X25.VC statement.

[**LLCLIST**=(**LLC0**,**LLC2**,**LLC3**,**LLC4**,**LLC5**)]

Specifies the types of svcs that are supported on this physical circuit. LLCLIST is mandatory if you want to associate any svcs with this physical circuit; however, it is not required if only pvcs are associated with this physical circuit. These keyword values are not positional. Code one value for each svc type as follows:

- Code LLC0 if one or more svcs can connect to a non-SNA DTE, and these circuits do not require GATE or PAD support (type 0 virtual circuits).
- Code LLC2 if one or more svcs can connect to an SNA peripheral node with PSH protocol (type 2 virtual circuits).
- Code LLC3 if one or more svcs can connect to an SNA peripheral or subarea node with protocol QLLC (type 3 peripheral or subarea node virtual circuit).
- Code LLC4 if one or more svcs can require GATE support (type 4 virtual circuits).
- Code LLC5 if one or more svcs can require transparent or integrated PAD support (type 5 virtual circuits).

[, {**LLC0**=(**m1**,**m2**...)}, ...]  
{**LLC2**=(**m1**,**m2**...)}  
{**LLC3**=(**m1**,**m2**...)}  
{**LLC4**=(**m1**,**m2**...)}  
{**LLC5**=(**m1**,**m2**...)}  
{**LLCI**=(**m1**,**m2**...)}

**LLC0** = (*m1*,*m2*,...)

Specifies the values in the subaddress field of Incoming Call packets, which indicates that the calling DTE is a non-SNA DTE not requiring GATE or PAD support. *m* is any decimal digit from 0— 9. This keyword is valid only when you code SUBADDR = YES.

**LLC2** = (*m1*,*m2*,...)

Specifies the values in the subaddress field of Incoming Call packets, which indicates that the calling DTE is an SNA peripheral node attached with PSH protocol. *m* is any decimal digit from 0—9. This keyword is valid only when you code SUBADDR = YES.

**LLC3 = (m1,m2,...)**

Specifies the values in the subaddress field of the Incoming Call packets, which indicates that the calling DTE is an SNA peripheral node attached with the peripheral node QLLC protocol. *m* is any decimal digit from 0–9. This keyword is valid only when you code SUBADDR=YES.

**LLC4 = (m1,m2,...)**

Specifies the values in the subaddress field of Incoming Call packets, which indicates that the calling DTE requires GATE support. *m* is any decimal digit from 0–9. This keyword is valid and mandatory when you code SUBADDR=YES.

**LLC5 = (m1,m2...)**

Specifies the values in the subaddress field of Incoming Call packets, which indicate that the calling DTE requires integrated or transparent PAD support. *m* is any decimal digit from 0–9. This keyword is valid only when you code SUBADDR=YES.

**LLCI = (m1,m2...)**

Specifies the values in the subaddress field of the Incoming Call packets, which indicate that the calling DTE requires switched subarea node. *m* is any decimal digit from 0–9. This keyword is valid only when you code SUBADDR=YES on the X25.MCH statement. If this feature is used, the caller must insert at least an extra digit at the end of the called DTE address in the DIALNO (NN field in DIALNO) of the PATH statement in the remote SMN.

**Note:** You must code different values for *m* in each of the LLC0, LLC2, LLC3, LLC4, LLC5, and LLCI keywords. This allows you to select a given LLC based on the subaddressing digit values.

**[LOGAPPL=(appl0,appl1,...,applm)]**

Specifies the application names corresponding to the CTCP numbers specified in the CTCP keyword. This causes VTAM to automatically generate a logon request to the specified application on behalf of the associated physical circuit LU when the LU is activated by VTAM. There is one unique subvalue for each of the subvalues of the CTCP keyword. X.25 NPSI provides no default for this keyword.

**[LUNAME=(luname0,luname1,...,lunamem)]**

Specifies the names of the logical units associated with this MCH. There is one unique subvalue for each of the subvalues of the CTCP keyword.

**[MACB=(labelx,labelr)]**

Specifies the labels of control blocks (UACBS). Control block labels are usually created by X.25 NPSI during generation. Code MACB to prevent label duplication with other resource names in the same generation. If you do not code this keyword, X.25 NPSI will create the UACB labels in the following formats:

X25AxxxX  
X25AxxxR

where xxx is equal to the ADDRESS keyword.

**[MODETAB=(table0,table1,...,tablem)]**

Specifies the mode table (MODETAB) for the physical circuit LUS defined in this X25.MCH statement. There is one unique subvalue for each of the subvalues of the CTCP keyword. X.25 NPSI provides no default for this keyword.

[NCPGRP={*label*}]  
 {NEW }

Specifies the label of the NCP GROUP statement that includes the physical circuit in the NCP. If you do not specify this value, the name is created by x.25 NPSI generation. The default for this keyword is dependent on the network.

If you omit this keyword, the built-in label is:

pNETnm

If you specify NEW, a new NCP GROUP statement is created and named using the automatic naming convention. If you specify *label*, a new NCP GROUP statement is created that has the specified name.

**Notes:**

1. In order to print the SNAP trace only once in a formatted dump, x.25 NPSI generation automatically forces a new GROUP for the second MCH. The first MCH is in a group by itself; the second and subsequent MCHs will be part of the second GROUP unless this keyword is coded.
2. If you want to have all the MCHs of a given generation in the same NCP GROUP, you must code the same name for NCPGRP on all the MCHs.

See "Resource Naming Conventions" on page 81 for x.25 NPSI default naming resources.

[NDRETRY={*count*}]  
 {1 }

Specifies the number of times that the Np/Tp sequence will be executed. Valid values range from 1–3; the default is 1. See the description of the TPTIMER keyword for more information.

[NETID=*name*,ANY] (V3R2 only)

Specifies the association of a switched subarea support group (DIAL = YES and PUTYPE = 4) to a network. This keyword is copied in the GROUP statements generated by x.25 NPSI for SVCSC lines. It is used with SNI.

*name* corresponds to either NETID on the BUILD definition statement (native network), or NETID on the NETWORK definition statement (non-native network).

If you code NETID = (*name*,ANY), the values specified for NETID on the virtual circuit PU statements related to this MCH are not required to be the same.

[NPRETRY={*count*}]  
 {7 }

Specifies the total number of transmissions of an I or U frame in a Tp time-out recovery. Valid values range from 3–31; the default is 7. See the description of the TPTIMER keyword for more information.

[PAD={INTEG }]  
 {TRANSP}  
 {NO }

Specifies whether the terminals supported by PAD can be attached through virtual circuits associated with this physical circuit. If PAD support is provided, this keyword also specifies the type of support as follows:

- INTEG** Specifies that x.25 NPSI provides integrated PAD support. This value cannot be specified if GATE = DEDICAT is specified.
- TRANSP** Specifies that x.25 NPSI provides transparent PAD support.

**NO** Specifies that x.25 NPSI does not provide PAD support. If NO is coded, LLC5 cannot be coded in the LLCLIST keyword, the LLC5 keyword cannot be coded in the X25.MCH statement, and LLC=LLC5 keyword cannot be coded in an X25.VC or X25.LINE statement for a PVC associated with this physical circuit.

[PKTMODL={128}]  
{8 }

Specifies the modulo used by packet protocol. Valid values are 8 or 128; the default value is 8. You must specify a modulo greater than all the values specified in the VWINDOW keywords of the X25.VCCPT statements related to this MCH.

[PUNAME=*puname*]

Specifies the name of the physical unit associated with this MCH.

[PWPROT={YES}]  
{NO }

Specifies whether password protection will be performed on the virtual circuits related to this MCH using integrated PAD. YES is valid only if PAD=INTEG is defined on this physical circuit. The default is NO.

[SDRTCNT=*n*] (V3R2 only)

Specifies the number of retries made when the SHM reconnection cannot be established. The default value is 0 (no retry).

[SDRTIME=*time*] (V3R2 only)

Specifies the number of seconds between two retries of SHM reconnection. The default value is 10 seconds.

[SHM={YES}] (V3R2 only)  
{NO }

Specifies whether SHM is used on the SVCSC lines dependent on this MCH. When SHM=NO is coded, no lines will use SHM. When SHM=YES is coded, SVCSC lines may use SHM on this MCH.

[SHUTD={INVCLR }]  
{NOINVCLR}

Specifies whether a shutdown request, sent to the LU that represents an integrated PAD virtual circuit, causes any action (INVCLR) or not (NOINVCLR). This action, for SVCS, is the sending of an Invitation to Clear PAD message, or for PVCs, the sending of a Reset packet. This keyword is valid only when PAD=INTEG is coded. The default is INVCLR (Invitation to Clear).

[SPAN=*name*]

Specifies that the NetView program operator's access to the virtual circuit line is restricted. This specification is copied to the LINE, PU, and LU statements generated by the X25.MCH statement.

[SPEED={rate}]  
{9600}

Specifies the data rate for the physical circuit in bits per second (bps). The default value is 9600. The range is from 1200—128K. See *NCP, SSP, and EP Resource Definition Guide* for details when DIRECT is used.

**Note:** The SPEED and T1TIMER keywords are used to cause piggybacking of acknowledgments at the link level.

[SPNQLLC={YES}]  
{NO }

Specifies whether this MCH is connected to a network that supports an SDLC PAD that does not provide the standard QLLC interface. The effect of this keyword is to set X'42000000' in the CUD field rather than X'C3' for QLLC outgoing calls. SPNQLLC also accepts X'62' as the first byte of the CUD for incoming calls instead of X'C3'. The address portion of the Q commands will be set to X'EF' rather than X'FF'. The default value is NO.

[STATION={DCE}]  
{DTE}

Specifies whether the MCH is to operate as a DTE or a DCE. DTE is the default value and must be used for a normal connection to a network node (usually a DCE). Full DCE support is not provided by X.25 NPSI.

When STATION = DCE is coded, NDRETRY = 1 should be coded so that:

- TPTIMER corresponds to CCITT T1.
- NPRETRY corresponds to N2.

[STATOPT=*text string*]

The STATOPT keyword and its text string operand are copied as specified into a comment statement following the LINE statement generated by NDF.

[SUBADDR={YES}]  
{NO }

Specifies whether subaddressing is used within the Incoming Call packets on this MCH to select LLC types. The SUBADDR keyword is valid only when GATE = GENERAL is coded. Subaddressing applies only to svcs and is specified in the rightmost digit of the called DTE address within the Incoming Call packet.

[SUBD=(*n1,n2,n3,...nn*)]

Specifies that fast connect is used on this physical circuit and that the CTCP is selected through subaddressing. When SUBD is coded, the CTCP keyword must be coded on the X25.MCH statement. Then, the following optional keywords can be coded:

- LUNAME
- LOGAPPL
- MODETAB
- VMODTAB

There is one unique subvalue for each of the subvalues of the CTCP keyword.

[SVCINN=*n*] (V3R2 only)

Specifies the number of simultaneously switched subarea node connections. It is representative of the number of switched virtual circuits allocated to subarea node traffic. SVCINN specification must equal the number of LINE and PU statements defined with DSTNODE = INN and TYPE = S.

The default value is SVCINN = 0, specifying that no svcsc is available.

[T1TIMER={*time*}]  
{0 }

Specifies the time, in seconds, that the DCE will wait for frame acknowledgment. Tenths of seconds can be entered. The default value of 0 does not allow for link-level piggybacking.

**Note:** This keyword corresponds to the T1 that is provided by the network vendor at subscription time. The T1TIMER keyword is used with the SPEED keyword to cause piggybacking of acknowledgments at the link level.

[TAXUNIT={32 }]  
 {64 }  
 {128}

Specifies the number of characters for a network tax unit. The value is used by x.25 NPSI fast connect to build billing information reports and to send the reports to the CTCP. The default value is 64.

[TDTIMER=*timer*]

Specifies the value of the x.25 NPSI internal delay timer between Nd transmissions. Valid values are 1, 2, and 3 seconds; the default value is 1 second. See the description of the TPTIMER keyword for more information.

[TPTIMER=*timer*]

Specifies the value of the x.25 T1 timer in seconds. The valid range is from 0.5–25.5 seconds in increments of 0.1 second; the default value is 1.0 second. The x.25 T1 timer represents the maximum delay during which the DTE expects the acknowledgment of a transmitted I or U frame with or without the poll bit set, or of a transmitted S frame with the poll bit set.

**Note:** Once flags are transmitted and monitored on the first transmit operation issued to the scanner, the  $Nd \times (Td + (Np \times Tp))$  value must exceed the time needed by the PSDN to return the flags at contact time. This time can exceed 16 seconds.

[TRAN={ODD }]  
 {EVEN}  
 {NO }

Specifies whether data incoming from a PAD-supported DTE or LLC0-supported DTE under DATE will be translated from ASCII to EBCDIC. In addition, it specifies whether data going to a PAD-supported DTE or to a LLC0-supported DTE under DATE will be translated from EBCDIC to ASCII.

**ODD** Specifies that odd parity is used for translation.

**EVEN** Specifies that even parity is used for translation.

**NO** Specifies that no translation is performed.

**Notes:**

1. This keyword is valid only if PAD = INTEG, PAD = TRANSP, or GATE = DEDICATED are coded. For more information, see *X.25 NPSI Diagnosis, Customization, and Tuning*.
2. Only data packets are translated.

[VMODTAB=(*v0,v1,v2,...vm*)]

Specifies the mode table (MODETAB) for the virtual circuit LUS defined in the X25.FCG or X25.VC statements corresponding to this X25.MCH statement. There is one unique subvalue for each of the subvalues of the CTCP keyword. x.25 NPSI generates no default for this keyword.

[XMONLNK={YES}] (V3R2 only)  
 {NO }

Specifies whether the MCH will be automatically activated after the initial loading or after ANS. This allows NCP/X.25 NPSI to be activated using a subarea node PVC.

XMONLNK = YES must be coded when this MCH contains a subarea node PVC that can be used to activate NCP/X.25 NPSI. When ownership is lost over a channel, an x.25 PVC, or an SDLC line, XMONLNK = YES must be coded if a subarea node SVC of this MCH is to convey ownership of the NCP after ANS.

## X25.MCH

It is recommended that you specify XMONLNK = YES if the MCH contains a subarea PVC or SVC. This allows ownership recovery to occur over one of the subarea node PVCs or SVCS at ANS. It also allows the MCH to stay up when a VARY NET,INACT,F command for the NCP is issued enabling subarea node traffic to continue over subarea node virtual circuits of this MCH.

This keyword is equivalent to the X25.MNLNK statement. See *NCP, SSP, and EP Resource Definition Reference* for more details on XMONLNK.

[X21INTWK={NO }]  
{OLD }  
{1984}

Specifies whether this MCH is connected to an x.25 network offering an x.21 leased interface. Coding X21INTWK = OLD or X21INTWK = 1984 indicates to x.25 NPSI that it is an x.21 leased connection. The default is NO.

The X21INTWK keyword must be coded for a 3745. For a 3720, this keyword is not required, even if the x.25 network offers an x.21 leased interface.

---

## X25.MNLNK Statement

**USAGE:** Use this statement to allow the MCH to be automatically activated within the NCP. This statement allows activation of a remote NCP/X.25 NPSI loaded from the 3720 or the 3745 disk through a subarea node PVC. This statement must be coded if, after ANS, a subarea node SVC of this MCH is to convey ownership of the NCP due to loss of ownership using a channel, an X.25 PVC, or an SDLC line.

**POSITION:** This statement must follow the X25.MCH statement to which it applies.

**FORMAT AND KEYWORDS:** The format for the X25.MNLNK statement is:

symbol      X25.MNLNK

See the MONLINK keyword of the PU statement in the *NCP, SSP, and EP Resource Definition Guide* for further details.

---

### Keywords

---

This definition statement has no keywords.

---

**Note:** Applies to V3R1 only.

It is recommended to code this statement if the MCH contains subarea node PVCs. This allows ownership recovery to occur over one of the subarea node PVCs at ANS. It also allows the MCH to stay up when a VARY NET,INACT,F command for the NCP is issued enabling subarea node traffic to continue over subarea node virtual circuits of this MCH.

---

## X25.NET Statement

**USAGE:** Use this statement to specify and start the description of a PSDN. One X25.NET statement is required for each PSDN. You can specify a maximum of nine X25.NET statements during a generation.

**POSITION:** This is the first statement in X.25 NPSI's definition list. Additional X25.NET statements can be used to define additional networks.

**FORMAT AND KEYWORDS:** The format of the X25.NET statement is:

symbol	X25.NET	keywords
--------	---------	----------

---

### Keywords

---

```

DM={YES}
  {NO }

[,CAUSE={CCITT}] (V3R2 only)
  {IBM00}
  {IBM80}

[,CPHINDX={index}]
  {1 }

[,CRAFTRC={YES}] (V3R2 only)
  {NO }

[,NETTYPE={1}]
  {3}

[,NSTDFAC={Nsfac1,Nsfac2,Nsfac3,Nsfac3,Nsfac3,Nsfac4,...,Nsfacn}] (V3R2 only)
  {NONE }

[,OUHINDX={index}]
  {1 }

[,RFAC={fac1,fac2,.....}] (V3R2 only)
  {NONE }

[,R20={count}] (V3R2 only)
  {1 }

[,R22={count}] (V3R2 only)
  {1 }

[,R23={count}] (V3R2 only)
  {1 }

[,T20={timer}] (V3R2 only)
  {180 }

[,T21={timer}] (V3R2 only)
  {200 }

[,T22={timer}] (V3R2 only)
  {180 }

[,T23={timer}] (V3R2 only)
  {180 }

```

---

*symbol*

Specifies an optional name for this X25.NET statement.

DM={YES}  
{NO }

Specifies whether the LAPB DM command is received or sent by the PSDN. This command, included in the CCITT Recommendation, is not supported by all PSDNs.

[CAUSE={CCITT}] (V3R2 only)  
{IBM00}  
{IBM80}

Determines the type of cause and diagnostic byte x25.NPSI sends to the network in Clear, Reset, and Restart Request packets. The cause and diagnostic code specified in the CAUSE keyword references one of three cause and diagnostic tables. See *X.25 NPSI Diagnosis, Customization, and Tuning* for table specifications.

**CCITT** Is cause 00 with CCITT 84 diagnostics.

**IBM00** Is cause 00 with SNA diagnostics (for IBM migration).

**IBM80** Is cause 80 with SNA diagnostics (same diagnostics as IBM00).

[CPHINDX={*index*}]  
{1 }

Specifies the greatest index value coded in the INDEX keyword of an X25.VCCPT statement within this network. Valid values range from 1–99; the default is 1.

[CRAFTRC={YES}] (V3R2 only)  
{NO }

Specifies whether a switched connection is maintained after a Reset packet is received or sent. If CRAFTRC=NO, the svc is not cleared after the Reset Confirmation packet is received or sent, and the virtual circuit is not made inoperable. If CRAFTRC=YES, the svc is cleared and the virtual circuit is made inoperable after the receiving or sending of a Reset Confirmation packet. The default value is YES.

This keyword is not taken into account for PVCs. The virtual circuit PU is always made inoperable after sending or receiving a Reset packet.

**Note:** Because packet sequencing is reset when a reset exchange occurs, X.25 NPSI cannot guarantee data integrity when CRAFTRC=NO is coded.

[NETTYPE={1}]  
{3}

Specifies the network type. Possible values are 1 and 3; the default is 1.

For NETTYPE = 1, when x.25 NPSI receives a RESET 07, it stops sending physical services commands to the remote DTE until it receives a RESET 00, 09, or 0F. For NETTYPE = 3, when x.25 NPSI receives a RESET 07, it continues sending physical services commands to the remote DTE because a network defined as type 3 (DDX-P) does not compensate a RESET 07 by a RESET 09.

**[NSTDFAC={*Nsfac1,Nsfac2,Nsfac3,Nsfac3,Nsfac3,Nsfac4,...,Nsfacn*}] (V3R2 only)**  
**{NONE }**

Specifies the nonstandard facilities accepted by X.25 NPSI. A table of nonstandard user facilities is built at system generation. Nonstandard facilities must be in accordance with X.25 facility format.

A nonstandard facility can be duplicated in a call packet. Therefore, the nonstandard facility must be coded as *many times* as it might be duplicated. The default value is NONE.

The nonstandard facilities are coded in hexadecimal. You must use two hexadecimal digits to code a facility in the NSTDFAC keyword. If several facilities are to cause call rejection, they must be enclosed in parentheses. For example, you can code:

NSTDFAC=(05,1f,ff,fe,18)

This causes the calls that include these nonstandard facilities to be accepted.

**[OUHINDX={*index*}]**  
**{1 }**

Specifies the greatest index value coded in the INDEX keyword of an X25.OUFT statement within this network. Valid values range from 1–99; the default is 1.

**[RFAC={*fac1,fac2,...*}] (V3R2 only)**  
**{NONE }**

Specifies the facilities to be rejected. When an Incoming Call or Call Connected arrives carrying a facility coded in the RFAC keyword, that call is cleared. Nine optional facilities are available and each can be rejected. The default is NONE (no facility is rejected). If several facilities are to cause call rejection, they must be enclosed in parentheses. Use the RFAC keyword, where *fac* is the mnemonic code of the facility to be rejected.

The facilities that can cause a call to be cleared due to rejected facilities are:

- FASTSEL**      Fast select
- REVCHG**      Reverse charging
- THRUPUTCL**    Throughput class negotiation
- CALLREDIR**    Call redirection
- CUGB**          Closed user group with basic format
- CUGOAB**        Closed user group with outgoing access (basic)
- CUGE**          Closed user group with extended format
- CUGOAE**        Closed user group with outgoing access (extension)
- BLCUG**         Bilateral closed user group.

- [R20={count}] (V3R2 only)  
{1 }  
Specifies the maximum number of Restart Request retransmissions. The default value is 1.
- [R22={count}] (V3R2 only)  
{1 }  
Specifies the maximum number of Reset Request retransmissions. The default value is 1.
- [R23={count}] (V3R2 only)  
{1 }  
Specifies the maximum number of Clear Request retransmissions. The default value is 1.
- [T20={timer}] (V3R2 only)  
{180 }  
Specifies a value for the Restart Request timer. The default value is 180 seconds.
- [T21={timer}] (V3R2 only)  
{200 }  
Specifies a value for the Call Request response timer. The default value is 200 seconds.
- [T22={timer}] (V3R2 only)  
{180 }  
Specifies a value for the Reset Request response timer. The default value is 180 seconds.
- [T23={timer}] (V3R2 only)  
{180 }  
Specifies a value for the Clear Request response timer. The default value is 180 seconds.

---

## X25.OUFT Statement

**USAGE:** Use this statement to specify the user facilities and call user data that will be copied into the Call Request packet for an outgoing call.

One X25.OUFT statement is required for each entry in the optional user facilities table. The table length is specified by the OUHINDX keyword of the X25.NET statement. Consecutive entries need not be used.

**POSITION:** This statement must be placed between the X25.NET and the X25.MCH statements to which it applies.

**FORMAT AND KEYWORDS:** The format of the X25.OUFT statement is:

symbol      X25.OUFT      keywords

You can code as many as 99 X25.OUFT statements for each PSDN. At least one X25.OUFT statement is required for each PSDN using SVCS. No X25.OUFT statement is required for a PSDN using only PVCs.

For logical channels used exclusively by type 4 virtual circuits or logical channels under the control of a DATE CTCP, X25.OUFT statements are not used. However, it is necessary to reference an X25.OUFT statement in the associated X25.LINE or X25.VC statements. If there is no other requirement for X25.OUFT statements, a dummy entry for these virtual circuits can be created as follows:

```
X25.OUFT INDEX=1
```

See "PATH Definition Statement" on page 138 for more details.

---

### Keywords

INDEX=index

[,OPTFACL=hexvalue]

[,USRFILD=hexvalue]

[,USRFIL2=hexvalue]

---

**INDEX=index**

Specifies the entry in the optional user facilities table. Valid values range from 01–99.

**[OPTFACL=hexvalue]**

Specifies the hexadecimal configuration to be copied into the optional facility field of a Call Request packet. The *hexvalue* must contain an even number of digits less than or equal to 218. Use the optional facility fields for flow control negotiation. See Appendix A, "Defining X.25 PSDN Facilities," for a description of flow control negotiation.

[USRFILD=*hexvalue*]

Specifies the correct bit configuration to be copied after the virtual circuit type in the CUD field of the Call Request packet. Set the *hexvalue* to an even number of digits less than or equal to 254. X.25 NPSI sets the virtual circuit type to one of the following values:

X' C0dddd0'	Virtual circuit type 0
X' C2'	Virtual circuit type 2
X' C3'	Virtual circuit type 3 peripheral node
X' E3'	Virtual circuit type 3 subarea node
X' pp000000'	Virtual circuit type 5.

where:

pp           Is equal to 01, 41, 51, or 81. If L=7 is coded (user-defined CUD0), pp is user-defined and bytes 1, 2, and 3, of the CUD are not filled with 000000.

dddd0       Is the remote DTE IDNUM. (It is not added in the CUD if L = .).

[USRFIL2=*hexvalue*]

Specifies the correct bit configuration to be copied to the last part of the CUD field of the Call Request packet. Set the *hexvalue* with an even number of digits less than or equal to 254.

**Note:** The sum of the lengths of the values specified in USRFILD and USRFIL2 must not exceed 256 digits. The maximum length of the CUD field in a call packet for fast select is 256 digits. A normal Call Request packet has a CUD field less than 32 digits (16 bytes).

The following is an example of an X25.OUFT statement:

```
X25.OUFT
INDEX=1,
OPTFACL=0302430707,
USRFILD=123456789ABC,
USRFIL2=4455
```

Assuming this is a type 2 virtual circuit; the logical channel number is 4, the packet modulo is 8, and the corresponding Call Request packet is:

```
X' 10040B091234567890050302430707C2123456789ABC4455'
```

where:

1	Is the GFID.
0	Is the logical channel group number.
04	Is the logical channel number.
0B	Is the call request.
09	Is the address length.
123456789	Is the DTE address.
0	Is the padding to create an even number of digits.
05	Is the facility length.
0302430707	Is the facility field.
C2	Is the LLC2.
123456789ABC4455	Is the CUD field.

---

## X25.PU Statement

**USAGE:** Use this statement to define the physical unit associated with either an SNA DTE connected to a corresponding virtual circuit or a non-SNA DTE connected to a corresponding virtual circuit.

**POSITION:** You must code one X25.PU statement instruction for each X25.LINE statement. If necessary, an NCP SERVICE statement is generated by X.25 NPSI.

**FORMAT AND KEYWORDS:** The format of the X25.PU statement is:

symbol X25.PU keywords

X25.PU keywords are the same as the NCP PU keywords. Appendix B, "Installation Examples for X.25 NPSI," contains sample X25.PU statements for several virtual circuit types. For more information on these statement keywords, see *NCP, SSP, and EP Resource Definition Reference*.

---

### Keywords

[PUTYPE=type]  
 [,MAXDATA=size]  
 [,MAXOUT=number]  
 [,NPACOLL=NO]  
 [,PUDR=NO]  
 [,XID={YES}] (V3R2 only)  
 {NO }

---

*symbol*

Specifies an optional resource name for the physical unit. The default name is built as follows:

pPxxxggg

See "Resource Naming Conventions" on page 81 for X.25 NPSI default naming resources.

[PUTYPE=type]

Specifies the physical unit type associated with the remote DTE. Specify 1 for LLC0, LLC4, and LLC5.

[MAXDATA=size]

Specifies the maximum bytes in a PIU. Because no segmenting is supported for virtual circuit types 0, 4, and 5, MAXDATA must exceed the largest PIU size for these virtual circuit types. If this maximum size is not known, specify 65535 for MAXDATA. The default for PU type 1 is 261; the default for PU type 2 is 265. The range goes from NCP buffer size (BFRS of BUILD) to 65535. This keyword does not need to be coded for SNA type 2.1 because its value is determined during XID 3 negotiation.

[MAXOUT=*number*]

Code MAXOUT=6 to queue data arriving before start data traffic (SDT) in X.25 NPSI for LLC0 and LLC5.

[NPACOLL=NO]

Specifies whether data transmitted and received by this physical unit is eligible for collection by the NetView performance monitor (NPM). However, X.25 NPSI does not support NPM, so the value is forced to NO.

[PUDR=NO]

Specifies whether dynamic reconfiguration is supported on this PU. However, X.25 NPSI does not support dynamic reconfiguration, so the value is forced to NO.

[XID={YES}] (V3R2 only)

{NO }

Specifies whether an XID exchange will occur with the remote DTE PVC. X.25 NPSI forces a NO for LLC types 0, 2, 4, and 5, because the remote device is unable to support an XID exchange on a PVC. For LLC3, the user specifies YES or NO; if the specification is omitted, the NCP defaults to YES. For SNA type 2.1 nodes, YES must be coded. See *NCP, SSP, and EP Resource Definition Reference* for more information.

---

## X25.VC Statement

**USAGE:** Use this statement to describe one or more virtual circuits with the same characteristics.

**POSITION:** The X25.VC statement follows the X25.MCH and X25.LCG statements, and precedes the X25.FCG statement when a fast connect MCH is defined.

**FORMAT AND KEYWORDS:** The format of the X25.VC statement is:

```
symbol      X25.VC      keywords
```

**VTAM Users:** The VTAM keywords that can be coded on this definition statement appear after the keyword list. These keywords only provide information to the VTAM initialization process and are not required in the generation definition used as input to NCP generation. See the appropriate VTAM installation manual for these keyword descriptions and for information on the VTAM initialization process.

---

### Keywords

---

```
LCN=(number1,number2),
TYPE={SWITCHED|S },
      {PERMANENT|P },
VCCINDX=index
[,ANS={CONTINUE|CONT}]
      {STOP      }
[,CALL={IN  }
        {OUT  }
        {INOUT}
[,COMMITO={1}]
           {2}
           {4}
           {8}
[,HEXNAME={YES}] (V3R2 only)
           {NO }
[,ISTATUS={ACTIVE }]
           {INACTIVE}
[,LLC={LLC0}]
        {LLC4}
        {LLC5}
[,MAXDATA={number}]
           {261 }
[,MAXOUT=number]
[,NCPGRP={symbol}]
           {NEW  }
[,OSITYPE={number}]
           {0   }
```

---

---

**Keywords**


---

[,OUFINDX=*index*]  
 [,PRFLINE=*x*] (V3R2 only)  
 [,PRFLU=*z*] (V3R2 only)  
 [,PRFPU=*y*] (V3R2 only)  
 [,RETVCCCT={*count*}]  
     {3 }  
 [,RETVCTO={*timeout*}]  
     {30 }  
 [,SPAN=*name*]  
 [,STATOPT=*text string*]  
 [,SUFFIX=*w*] (V3R2 only)

---



---

**VTAM Keywords**


---

[,DISCNT=...]  
 [,DLOGMOD=...]  
 [,ENCR=...]  
 [,FEATUR2=...]  
 [,LOGAPPL=...]  
 [,LOGTAB=...]  
 [,MODETAB=...]  
 [,OWNER=...]  
 [,SSCPFM=...]  
 [,TERM=...]  
 [,USSTAB=...]  
 [,VPACING=...] (V3R2 only)

---

*symbol*

Specifies an optional label for this X25.VC statement.

**LCN**=(*number1,number2*)

Specifies that the virtual circuits defined by this X25.VC statement have sequential logical channel numbers, beginning with *number1* and ending with *number2*. These two numbers are in decimal notation. Valid values range from 0–255; however, some PSDNs do not use the value 0. Specify only one value (LCN=*number1*) when you define only one logical channel at a time.

**TYPE**={**SWITCHED**|**S** }  
       {**PERMANENT**|**P**}

Specifies the type of virtual circuits being defined. You can abbreviate SWITCHED with an S and PERMANENT with a P. This keyword is required and has no default.

**VCCINDX**=*index*

Specifies the entry in the virtual circuit connection parameter table (VCCPT) that contains operational characteristics of the defined PVC.

For svcs, this keyword specifies:

- Incoming call—the entry in the VCCPT that contains the operational characteristics of the defined virtual circuit.
- Outgoing call (Call Request)—the default value of the entry in the VCCPT that contains the operational characteristics of the defined virtual circuit. The default value is used when the XX field of the DIALNO keyword of the VTAM PATH statement equals 00.

These values can be overridden during flow control negotiation.

The specified table entry must be defined in an X25.VCCPT statement. Valid values range from 1—99.

Packet and window sizes defined in the corresponding VCCPT entry must correspond to the PSDN-assigned values.

[ANS={CONTINUE|CONT}]  
{STOP }

Specifies whether the PU connected to this virtual circuit continues or stops if NCP enters ANS. The value is passed to the NCP PU statement. X.25 NPSI supports session continuation on virtual circuits for SNA devices and, starting with V3R2, for non-SNA devices also. Refer to *NCP, SSP, EP Resource Definition Guide* for the meaning and details of the ANS keyword. No default is defined by X.25 NPSI for this keyword.

[CALL={IN }]  
{OUT }  
{INOUT}

Specifies the way an SVC is established. You can use this keyword only if TYPE=S is coded.

Use CALL=IN if the virtual circuit you are defining will be established at the request of a remote DTE rather than at the request of X.25 NPSI.

Use CALL=OUT if the virtual circuit you are defining will be established at the request of the local host access method through X.25 NPSI.

For a DATE physical circuit, you must code the CALL keyword to match your PSDN subscription.

For a GATE physical circuit, you must code CALL=IN or CALL=INOUT. However, if you want to reserve a certain number of virtual circuits for non-LLC4 call-outs, code CALL=OUT for the number of virtual circuits to be reserved.

CALL=INOUT means that a virtual circuit can be established in either way.

[COMMITO={1}]  
{2}  
{4}  
{8}

Specifies the value in seconds of the commit time-out for idle virtual circuits. When this timer elapses, buffers committed to this virtual circuit are decommitted. The default value is 4 seconds.

[HEXNAME={YES}] (V3R2 only)  
{NO }

Specifies whether the suffix of the LINE name, PU name, and LU name builds in hexadecimal (YES) or decimal (NO). The default value is YES. Specifying NO requires the coding of PRFLINE, PRFPU, PRFLU, and SUFFIX.

See "Resource Naming Conventions" on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to specify the related statement operands.

[**ISTATUS**={**ACTIVE** }]  
{**INACTIVE**}

Specifies whether the lines, physical units, and logical units are activated following a VTAM first start or cold restart. X.25 NPSI provides no default for this keyword. This keyword and parameter are reported on the generated NCP LINE statements.

[**LLC**={**LLC0**}]  
{**LLC4**}  
{**LLC5**}

Specifies the PVC type defined by this statement. This LLC keyword is mandatory for PVCs and should be coded as follows:

- Code LLC0 if the virtual circuit connects to a non-SNA DTE and does not require GATE or PAD support (type 0 virtual circuit).
- Code LLC4 if the virtual circuit requires GATE support (type 4 virtual circuit).
- Code LLC5 if the virtual circuit connects to a terminal that requires PAD support (type 5 virtual circuit). The type of PAD support (integrated or transparent) is specified on the PAD keyword of the X25.MCH statement.

[**MAXDATA**={*number*}]  
{**261** }

Specifies the maximum number of bytes in an SNA segment. Because SNA segmenting is not supported for non-SNA LLCs, you need to specify a MAXDATA value greater than the maximum PIU size. If this maximum size is not known, specify 65535 for MAXDATA. The range is from the NCP buffer size (BFRR of BUILD) to 65535. See *NCP, SSP, and EP Resource Definition Reference* for more information.

[**MAXOUT**=*number*]

MAXOUT=6 is specified to queue data arriving before start data traffic (SDT) in X.25 NPSI for LLC0 and LLC5. At SDT, this data is passed to the application.

[**NCPGRP**={*label*}]  
{**NEW** }

Specifies the symbol of the NCP GROUP statement that defines the virtual circuit. If you do not specify this value, the name is generated by NDF. Code this keyword to modify the group name to which this line belongs.

If you specify *label*, a new NCP GROUP is created using this label as the GROUP statement name.

If you specify **NEW**, a new NCP group is automatically created at X.25 NPSI generation.

X.25 NPSI creates one group of PVCs and one group of SVCs for each MCH by default. If you omit the NCPGRP keyword, the virtual circuit belongs to the most recently created group name. The default name is generated as follows:

p25Pxxxy for PVCs  
p25Sxxxy for SVCs

See "Resource Naming Conventions" on page 81 for X.25 NPSI default naming resources.

**Note:** This keyword can no longer be used to make a call-out on a virtual circuit belonging to a given set of virtual circuits within an MCH. When the virtual circuit is within an MCH, X.25 NPSI allocates the virtual circuits for call-out starting from the largest virtual circuit number that is available for call-out.

## X25.VC

[OSITYPE={*number*}]  
    {0 } }

Specifies in decimal the GATE CTCP with which this virtual circuit must communicate. This parameter applies to PVCs only, and must be used when the MCH is capable of communicating with several GATE CTCPS. If the MCH is not capable of communicating with more than one GATE CTCP, this keyword must be omitted. Valid values range from 0–27. The default value is 0.

[OUFINDX=*index*]

Specifies the default OUFT index value used to build the facility field and the end of the CUD field in a Call Request packet. The specified index must be defined in a previous X25.OUFT statement.

[PRFLINE=*x*] (V3R2 only)

Specifies a user-defined prefix for the name of the NCP LINE statements generated for this X25.VC statement. This keyword can be a character string of 1–7 characters.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to specify the related statement keywords.

[PRFLU=*z*] (V3R2 only)

Specifies a user-defined prefix for the name of the NCP LU statements generated for this X25.VC statement. This keyword can be a character string of 1–7 characters.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to specify the related statement keywords.

[PRFPU=*y*] (V3R2 only)

Specifies a user-defined prefix for the name of the NCP PU statements generated for this X25.VC statement. This keyword can be a character string of 1–7 characters.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to specify the related statement keywords.

[RETVCCCT={*count*}]  
    {3 } }

Specifies the number of retransmissions of the physical services command on virtual circuits connected to an SNA subarea or peripheral node. Valid values range from 0–255; the default value is 3.

[RETVCTO={*timeout*}]  
    {30 } }

Specifies the timer used between retransmissions of a physical services command on virtual circuits connected to an SNA subarea or peripheral node. Valid values range from 0–255 seconds; the default value is 30 seconds.

[SPAN=*name*]

Restricts the NetView program operator’s access to the virtual circuit. This keyword is copied as coded on the LINE, PU, and LU statements generated by X.25 NPSI for the X25.VC statement.

[STATOPT=*text string*]

The STATOPT keyword and its text string operand are copied as specified into a comment statement following the LINE statement generated by NDF.

[SUFFIX=*w*] (V3R2 only)

Specifies a number that is the lower limit for each set of names built. There is no default. This parameter must be specified together with PRFLINE, PRFPU, and PRFLU if user-defined names are generated. The length of the name is equal to the length of PRFLINE, or PRFPU, or PRFLU, added to the length of the SUFFIX

parameter. Values range from 0—X'FFF' when HEXNAME = YES, and from 0—4095 when HEXNAME = NO.

PRFLINE, PRFPU, PRFLU, and SUFFIX must be coded together.

See “Resource Naming Conventions” on page 81 for a description of the options available for the automatic creation of resource names in X.25 NPSI, and how to specify the related statement keywords.

---

## X25.VCCPT Statement

**USAGE:** Use this statement to describe the connection parameters for one or more virtual circuits. At least one X25.VCCPT statement is required; however, up to 99 statements can be coded. One statement is required for each entry on the virtual circuit connection parameter table. Entries need not be consecutive. Table length is specified by the CPHINDX keyword of the previous X25.NET statement.

**POSITION:** This statement is positioned after the X25.NET statement and before the X25.MCH statement. Each virtual circuit must use an entry in the virtual circuit connection parameter table.

**FORMAT AND KEYWORDS:** The format of the X25.VCCPT statement is:

```
symbol      X25.VCCPT      keywords
```

For virtual circuits used exclusively by LLC type 4 or those under the control of a DATE CTCP, the MAXPKTL and VWINDOW keywords of the X25.VCCPT statements are not used because these parameters are defined by the CTCP. However, the INSLOW keyword is used in the X25.VCCPT statement referenced by associated virtual circuits.

---

### Keywords

```
INDEX=index,
MAXPKTL=size
[,INSLOW={{(percent1,percent2)}}
           {(50,12)      }
]
[,VWINDOW={value}]
           {2      }
```

---

**INDEX=***index*

Specifies the entry of the vccpt that is initialized by the X25.VCCPT statement. For example, INDEX=3 initializes the third entry in the vccpt. Valid values range from 1–99.

**MAXPKTL=***size*

Specifies (in bytes) the maximum length of the packets to be sent or received over the virtual circuits. This length is the maximum length of data in a packet, excluding the length of the packet header. Valid values range from 32–4096; there is no default value. For a subarea node virtual circuit, the MAXPKTL value must be at least 128.

For incoming packets, make sure that the accumulated PIU length does not exceed the maximum data length defined in the NCP HOST statement. See *NCP, SSP, and EP Resource Definition Guide* for more information on the HOST statement.

For outgoing packets, X.25 NPSI will split the PIU data into packets using the M bit, except for type 2 virtual circuits. For type 2 virtual circuits, X.25 NPSI splits the PIU data using segment indication. The maximum packet length equals the packet length defined for the remote DTE.

```
[INSLOW={ (percent1,percent2)}]
  { (50,12) }
```

Specifies the percentage of free buffers that can be reached before the virtual circuits using this number enter an unsafe or danger situation. Unsafe and danger thresholds are mechanisms used by X.25 NPSI to avoid NCP slowdown. *percent1* and *percent2* values are specified in relation to the values in the SLOWDOWN keyword of the NCP BUILD statement.

*percent1* Defines the UNSAFE threshold.  
*percent2* Defines the DANGER threshold.

Valid values are 0, 6, 12, 25, 50, and 100. When this keyword is coded, both values must be specified, and *percent1* must be greater than *percent2*. Default values of 50 for *percent1*, and 12 for *percent2*, mean that the UNSAFE limit is 50 percent higher while the DANGER limit is 12 percent higher than the NCP SLOWDOWN value.

**Note:** These keywords are not taken into account for subarea node virtual circuits.

```
[VWINDOW={value}]
  { 2 }
```

Specifies the value of the transmit or receive window used by the packet protocol for the virtual circuits that use the entry. This value must be less than the packet modulo value defined in the X25.MCH statement. Valid values range from 1–127; the default is 2.

**Note:** GATE and DATE do not use the VCCPT to define the packet size and the packet window. Packet size and packet window are defined by the CTCP. Because other keywords are used, at least one X25.VCCPT statement must be coded for compatibility.

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---

## Chapter 5. Coding NCP and VTAM Parameters for X.25 NPSI

This chapter explains the following considerations that are specific to X.25 NPSI:

- NCP
- VTAM
- SVCSC
- Session continuation
- Virtual route pacing for subarea-to-subarea communication.

---

### NCP Considerations

When you code NCP statements to work with X.25 NPSI, consider the following:

- NCP statements changed for X.25 NPSI
- NCP statements created by X.25 NPSI generation.

### NCP Statements Changed for X.25 NPSI

This section provides information about NCP statements that must be coded differently for X.25 NPSI.

#### OPTIONS Definition Statement

You must code the **OPTIONS** definition statement as the first statement in your NCP generation statement list. The two required keywords are **USERGEN** and **NEWDEFN**.

The **USERGEN** keyword indicates the name of the NDF load module that contains X.25 NPSI generation modules. Code it as:

```
USERGEN=X25NPSI
```

If you omit **USERGEN**, X.25 NPSI statements will not be processed. Any X.25 NPSI statements found during the NCP generation will be flagged as errors.

You must code **NEWDEFN=YES** on the **OPTIONS** statement so that NDF creates a new generation definition for input to VTAM. This new definition consists of the NCP generation definition and keywords passed from the generation load modules specified on **USERGEN**.

Externally, the X.25 NPSI statements appear in the definitions passed to VTAM; however, VTAM ignores these statements because of the "X25." prefix. By coding **YES**, these statements are put into a format that VTAM can use.

It is suggested that you code **NEWDEFN=(YES,,SUPP)** to avoid the message, **GENERATED BY X.25 NPSI**, before each **LINE**, **PU**, and **LU** statement generated by the NDF part of X.25 NPSI.

#### LUDRPOOL Definition Statement

The **LUDRPOOL** definition statement must be specified in the NCP when switched virtual circuits are used. The statement keywords **NUMTYP1**, **NUMTYP2**, and **NUMILU** must be coded. **NUMTYP1** and **NUMTYP2** specify the number of logical units included in the logical unit pools for type 1 and type 2, respectively. **NUMILU** specifies the number of independent LUS for dynamic reconfiguration. The ses-

sions supported in the value coded for NUMILU can exist between SNA type 2.1 nodes and other SNA type 2.1 nodes.

## NCP Statements Created by X.25 NPSI Generation

The NCP LINE, PU, and LU definition statements are generated for the X25.MCH, X25.VC, and the X25.FCG statements. Examples are provided to help you decide which types of circuits best fit your site's requirements.

### PU Definition Statement

The following examples show the PU definitions normally generated by X.25 NPSI for physical circuits, PVCs, and SVCs, respectively:

- Table 7 illustrates the PU statement generated for a physical circuit.
- Table 8 illustrates the PU statement generated for a PVC.
- Table 9 on page 135 illustrates the PU statement generated for an SVC.

Table 7. PU Statement for a Physical Circuit		
Name	Operation	Keywords
name	PU	ADDR = 01, ANS = ....., MAXDATA = 261, PUTYPE = 1

<b>name</b>	X.25 NPSI assigns a physical unit name during the generation process or takes one from the PUNAME keyword of the X25.MCH statement.
<b>ADDR = 01</b>	Specifies the hexadecimal representation of the 8-bit address of the physical unit represented by this PU statement. The address code is 01.
<b>ANS = .....,</b>	Copied from the X25.MCH statement.
<b>MAXDATA = 261</b>	Specifies the maximum length of a PIU sent to a type 1 PU.
<b>PUTYPE = 1</b>	Specifies the type of physical unit of the SDLC station represented by this PU statement instruction. The PU type is 1.

When a PVC is defined by an X25.VC statement, the PU generated will be for type 0, 4, or 5 virtual circuits.

Table 8. PU Statement for a Permanent Virtual Circuit		
Name	Operation	Keywords
name	PU	ADDR = 01, PACING = 1, PUTYPE = 1

You can code MAXDATA and VPACING in the X25.VC statement in your X.25 NPSI generation statements.

For type 2 or 3 virtual circuits use the X25.PU statement.

When an svc is defined by an X25.VC statement, the PU generated will be:

Table 9. PU Statement for a Switched Virtual Circuit		
Name	Operation	Keywords
name	PU	PUTYPE = (1,2)

X.25 NPSI does not support the SRT keyword of the PU statement. Default values for the SRT thresholds are 32768 for counters contained in 2 bytes, and 128 for counters contained in 1 byte. See the *X.25 NPSI Diagnosis, Customization, and Tuning* for the format of these counters within RECFMS.

## LU Definition Statement

Several LU statements are generated for the physical circuit if you code GATE=GENERAL and if virtual circuits of the MCH need to communicate with several CTCPS. You can specify up to 28 CTCPS.

The following examples show the LU definitions normally generated by X.25 NPSI.

- Table 10 illustrates the first LU statement generated for a physical circuit with GATE=NO.
- Table 11 illustrates how subsequent LU statements are generated for a physical circuit.

Table 10. First LU Statement for a Physical Circuit		
Name	Operation	Keywords
name	LU	LOCADDR=0, ISTATUS=INACTIVE

**LOCADDR = 0** Specifies the local address of the logical unit in decimal notation without leading zeros. Code it as 0.

**ISTATUS = INACTIVE** Informs VTAM that this logical unit should not be activated after initial program load (IPL) if GATE=NO is coded in the X25.MCH statement.

Table 11. Subsequent LU Statement for a Physical Circuit		
Name	Operation	Keywords
symbol	LU	LOCADDR = n, ISTATUS = ACTIVE

For type 0, 4, or 5 virtual circuits, NDF generates one LU statement for each virtual circuit defined with an X25.VC statement that is coded TYPE=PERMANENT. Table 12 on page 136 illustrates the LU generated for a PVC.

Table 12. LU Statement for a Permanent Virtual Circuit		
Name	Operation	Keywords
symbol	LU	LOCADDR=0

For type 2 and 3 virtual circuits that are connected to SNA peripheral nodes, use the X25.LU statement. However, you cannot specify the X25.LU statement for virtual circuits connected to the subarea node.

For logical units on svcs, define the logical unit in a switched major node of the host access method.

---

## VTAM Considerations for Switched Major Node

Use the following guidelines when coding the parameters required for defining an SNA switched major node.

### PU Definition Statement

Code the following parameters on the PU definition statement:

- ADDR

Code the ADDR keyword, even though it is not used by X.25 NPSI. All values less than 255 are valid.

- DISCNT

Code DISCNT=YES if the svc is to be cleared when the last LU-LU session, which involves the PU, terminates.

DISCNT=YES must be coded for virtual circuits using GATE or DATE.

Code DISCNT=NO if you define the control PU for a 3710. Because the PU does not have an LU, the ACTLU command fails, but the PU remains connected and available for communication with the NetView program.

- MAXDATA

Code the MAXDATA keyword appropriately if you specify a PU associated with a type 2 or a peripheral node type 3 virtual circuit.

Code the MAXDATA keyword with a value of 65535 for a PU associated with a value greater than the maximum PIU size if you specify type 0, 4, or 5 virtual circuit.

**Note:** If you do not know the maximum PIU size for non-SNA virtual circuits, code 65535 for MAXDATA.

- MAXOUT

Code MAXOUT=6 when using LLC type 0 and LLC type 5 to cause X.25 NPSI to queue all data received before SDT. At SDT, this data is passed to the application.

- PUTYPE

Code the PUTYPE keyword as required by the remote PU when connected using LLC type 2 and 3.

Code PUTYPE=1 for LLC types 0, 4, or 5.

- IDBLK

Code the IDBLK keyword as required by the remote PU when using LLC types 2 or 3.

Code this keyword as IDBLK=003 when using LLC types 0, 4, or 5.

- IDNUM

Code the IDNUM keyword as required by the remote PU when using LLC type 2 or 3. For non-SNA, the IDNUM sent in the REQUEST CONTACT has the following format:

XXYYY

where:

XX Is the X25.IDNUMH keyword value of the NCP BUILD statement (default=X'00').

YYY Is the default identification number.

Default identification numbers are assigned for each svc at generation in the order in which the svcs appear in the Resource Resolution Table (the reverse order occurs in the generation deck). The default identification number is a value beginning at X'002' with increments of X'02'. Default IDNUMs are used for PCNE with subaddressing, PAD, and GATE.

In the generation example noted in Appendix B, the following IDNUM values are assigned:

SVC	Default ID Number
SP3002	X'002'
SP3001	X'004'
SP2002	X'006'
SP2001	X'008'
SP1100	X'00A'
SP0004	X'00C'
SP0003	X'00E'
SP0002	X'010'
SP0001	X'012'
SP7007	X'014'
SP7006	X'016'
SP7005	X'018'
SP7004	X'01A'
SP7003	X'01C'
SP7GGH	X'01E' (generated for subarea node lines but not used)
SP7GGI	X'020' (generated for subarea node lines but not used)

See Chapter 3, "Network Definition," for more programming details regarding X25.IDNUMH.

- CPNAME (SNA type 2.1)

CPNAME specifies the control point (CP) name of an SNA type 2.1 peripheral node. CPNAME is valid only for type 2.1 nodes that have a CP name. In a switched environment, VTAM can locate the appropriate PU/LU pair by using either the normal IDNUM/IDBLK combination or through the use of the CPNAME keyword on the PU statement in a switched major node source statement member of VTAM.

## PATH Definition Statement

This section describes the PATH statement that is required when using X.25 NPSI.

Code the DIALNO keyword on the PATH definition statement as either one of the following:

```
DIALNO=NNN...N[*MMM...M]LXXYY[*ZZZZZ]
```

```
DIALNO=NNN...N[*MMM...M]LXXYY*DDD[WWWWW] (3710 only)
```

DIALNO is used to establish an outgoing call connection for virtual circuit types 0, 2, 3, or 5 without DATE.

The maximum length of the DIALNO parameter is 32 characters, including asterisks.

- **NNN...N**  
Is the network address of the called DTE. Up to 15 characters can be used.
- **MMM...M**  
Is the network address of the calling DTE. Up to 15 characters can be used. This is an optional field that is required only if the address of the calling DTE must be specified.
- **L**  
Specifies (in 1 byte) the virtual circuit type that is used by the current connection. See Table 4 on page 69 for more information.
- **XX**  
Is the 2-byte VCCPT index that has valid values ranging from 00–99.  
  
XX=00 commands X.25 NPSI to use the values defined in the VCCPT entry that are coded in the VCCINDX keyword of the X25.VC or X25.LINE statement.  
  
XX=xx commands the packet procedure to use the values defined in the VCCPT entry with INDEX=xx. You must define this entry during X.25 NPSI generation.
- **YY**  
Is the 2-byte OUFT index that can have values ranging from 00–99.  
  
YY=00 commands the Call Request packet to be built with the facility field and the user data that is specified using the OUFINDX keyword of the X25.VC or X25.LINE statement.  
  
YY=yy commands the Call Request packet to be built with the facility field and the user data that is defined using the OUFT entry with INDEX=yy. You must define this entry during X.25 NPSI generation.
- **ZZZZZ**  
Is the 5-character identification number specified in the IDNUM keyword for the PU statement. This field must be preceded by an asterisk and is valid and required only when you specify a type 0 or 5 virtual circuit.  
  
If you use this field to specify a default IDNUM, enter special characters for the hexadecimal digits A–F as shown below:  
  
– : for A  
– . for B

- % for C
- \_ for D
- ; for E
- ? for F

- DDD

Is the 3-digit decimal upstream address (USA) of the terminal addressed by the outgoing call. Valid DDD values are 000–255.

This field is used only by the 3710 network controller and applies only to virtual circuit type 3 (L=3). The 3710 network controller, which has an internal table that converts the USA into the actual terminal address, uses this field to determine the specific terminal that the call addresses.

- WWWWW

Is the 5-digit decimal identifier number of the physical unit used to map the terminal addressed by the outgoing call. This field only applies to the 3710 network controller and is used to return the IDNUM to the host when the host requests the PU XID. The IDNUM keyword of the PU statement in the SMN must equal this value. The identifier block is 044 and is automatically generated by the 3710.

**Note:** WWWWW does not apply to the 3710 when it is attached to a real type 2 physical unit. In this instance, it should be omitted because the physical unit provides type 2 XID. The WWWWW digits are replaced by five 0 digits in the CUD part of the call packet. The CUD length taken by the 3710 is constant.

A coding example of the DIALNO parameter for a virtual circuit using LLC type 3 for a 3710 is:

```
DIALNO=17500023530202*00425184
```

In this example, the network address of the called DTE is 175000235, the VCCPT and OUTFT entries are 2, and the called cluster is a 3710 network controller with an upstream address of 004 and an IDNUM of 25184. If the OUFT entry for INDEX=2 has OPTFACL=420707 and USRFILD=1234, and the virtual circuit number is 005, the corresponding Call Request packet is built as follows:

```
X'10050B09175000235003420707C301000080042518400000001234'
```

where:

1	Is the general format identifier.
0	Is the logical channel group number.
05	Is the logical channel number.
0B	Is the packet type identifier (Call Request).
0	Is the length of calling DTE address.
9	Is the length of called DTE address.
175000235	Is the called DTE address.
0	Is the padding for even number of bytes.
03	Is the facility length.
420707	Is the facility.
C3010000	Is the virtual circuit type 3.
8	Is the length of USA and IDNUM.
004	Is the USA.
251840000000	Is the IDNUM to be returned by the 3710, plus 7 reserved digits.
1234	Is the end of CUD.

The called and calling DTE addresses are concatenated by filling 1 digit per halfbyte. If the total number of digits is odd, then the concatenated addresses are padded on the right with a 0. No padding is done between the called DTE address and the calling DTE address.

The REDIAL keyword of the PATH statement is not recognized by X.25 NPSI. Even if you code REDIAL=n, no redialing is performed.

## LU Definition Statement

For type 0, 4, or 5 virtual circuits, you must code PACING=1 (the default value) and LOCADDR=0. If you are using a TWX terminal, you might, depending on the application, have to code TERM=TWX in the LU statement to obtain the correct formatting.

The default IDNUM scheme is identical for virtual circuits whether they are defined as GATE, PAD, or PCNE using subaddressing; therefore, you cannot tell which SNA virtual circuit type corresponds to a PU or LU definition. Do not specify parameters in your PU and LU definitions that will prevent virtual circuit types using an SMN entry from working. For example, USSTAB is often used for PAD definitions, but USSTAB prevents a GATE virtual circuit from working. If USSTAB is required for PAD support or subaddressed PCNE virtual circuits, do not use GATE on the same physical circuit.

## SNA Type 2.1 Node (V3R2 Only)

An SNA type 2.1 node supports connectivity between independent LUS without the need for SSCP involvement. An LU type 6.2 operating in this type of SNA node supports concurrent, parallel sessions.

In a switched environment, VTAM can locate the appropriate PU/LU pair either by using the normal IDNUM/IDBLK combination or the CPNAME on the PU statement in a switched major node source statement member of VTAM.

---

## SVCSC Considerations (V3R2 Only)

This section lists the keywords that must be coded on various statements in the SMNS for the SVCSC function.

### PU Statement for SVCSC

The following are the keywords that must be coded on the PU statement in the SMN for the SVCSC function.

SUBAREA	Specifies the subarea number of the other end.
TGN	Defines the transmission group number that is used when communicating between subareas. The value can be specified either as an integer or as ANY. At least one of the subareas must specify a specific TGN.  If TGN=ANY is coded, the connection uses the same TGN as the other side's subarea.

IDNUM	Is the identification number between the calling and the called DTEs. The <i>same</i> IDNUM must be specified on the PU definitions in the two SSCPs that own each end of the switched line.
PUTYPE	Specifies the PU type. PUTYPE = 4 or PUTYPE = 5 (for ES/9370) must be coded.
NETID	<p>Specifies the network identifier of the remote DTE. NETID must be the same as the current network identifier if SNI is not used. NETID must be the same as the network identifier of the other network if SNI is used.</p> <p>In the NCP statement, NETID specifies the SNI network of the potential caller. With SVCSC and a gateway, the same NCP_PU is used for connections to different adjacent link stations in different SNI networks. When NETID = ANY is coded, the NCP checks that the received NETID, from either the other DTE or the SSCP, is in the list of defined SNI networks. Otherwise, the NETID is checked against a unique generated value.</p>

**Notes:**

1. IDBLK is not used and does not need to be specified on the PU statement.
2. If takeover of ownership is to be done using an SVCSC, ANS = CONT must be coded in the PU statement in the SMN.

## PATH Statement Definition for SVCSC

When using SVCSC, with or without the SHM function, special considerations are required for the PATH statement. The PU statement can be defined as CALL = IN, CALL = OUT, or CALL = INOUT using the CALL keyword to prevent call-ins or call-outs for security reasons.

A key parameter of the PATH statement is specified in the GRPNM keyword. It is used to correlate the SMN entry with the X.25 NPSI generation for incoming calls as well as call requests. X.25 NPSI generates a GROUP of SVCSC LINE/PUs for each MCH by default. You can choose to create several GROUPs of SVCSC for each MCH by coding the NCPGRP keyword in the X25.LINE statements. This will complicate the coding of the SMN because several PATH statements will be required for each PU in the cases of incoming and outgoing calls.

## Call-Out

To perform a call-out using SVCSC, consider the following:

- The GRPNM keyword must be coded in order to locate the correct NCP GROUP of the X25.MCH statement where the call will be made.
- If the SNA resource is restricted to call-out only, the PATH statement should be coded as CALL = OUT.
- If SHM is used for this resource, the SHM, SHMTIM, and GRPNM keywords must be coded.

- If the PATH statement is coded with SHM = YES, the corresponding X25.MCH statement must be coded the same to permit SHM implementation. If the coding does not match, VTAM does not perform the call-out.
- In the DIALNO parameter, L specifies the virtual circuit type used by the current connection and it must be coded as L = 1. The XX and YY parameters must be coded in order to designate the VCCPT and OUFT entries.

The DIALNO keyword is required when SHM = YES is coded on the PATH statement.

## Call-In

To perform a call-in using svcsc, consider the following:

- The PATH statement, if required, is selected as a function of the GRPNM that specifies the NCP LINE over which the call came in. PATH statements are required if SHM, security checking, or CALL = IN is specified for this PU.
- If the SNA resource is restricted to call-in only, the PATH statement should be coded as CALL = IN.
- GRPNM must be coded if CALL, VERIFY, or SHM are coded.

If the call-in can come in through one or more virtual circuit lines associated with NCP GROUP statements, all the GROUP names must be coded in the PATH statements that follow the called PU statement. One PATH statement must be coded for each GROUP of svcsc over which an incoming call can be made.

- If the SHM function is to be used, the DIALNO, SHM, and SHMTIM keywords must be coded.

The SHMTIM keyword value does not have to be equal on both sides in the PATH statements. X.25 NPSI uses the largest value coded for the disconnection. The SHMTIM keyword value is expressed in seconds, and the range is from 0–5400 seconds. The default value is 30 seconds. The SHM disconnection is initiated from the primary side only (the primary side having the highest subarea number). Reconnection can be triggered from either side.

The GRPNM keyword must also be coded if SHM is used. VTAM verifies that the call came on a GROUP that has coded SHM. If SHM = NO is coded, no SHM occurs during the call. To have SHM, SHM = YES must be coded in the following four statements:

- PATH of the calling out side
- GROUP of the NCP calling out side
- GROUP of the NCP called side
- PATH of the called side.

This requirement is valid even when the virtual circuit is incoming to the local DTE to be able to construct the Call Request at SHM reconnection.

- If VTAM is to perform security checking for the SNA resource, the following must be coded:
  - VERIFY = IN must be coded.
  - GRPNM must be coded to check if the correct remote DTE identifier is specified in the PATH statement designated by the GRPNM through which the call-in came.
  - One or more DTE addresses must be placed on the VERID keyword. The VERID keyword is valid on call-in requests only.

## Call-Inout

When a PATH statement supports both call-in and call-out and svcsc is used, the following must be coded:

- The CALL keyword should be coded as CALL = INOUT. The default is CALL = INOUT.
- The GRPNM keyword must be coded to be able to select an NCP group of lines for making the call-out, and for use in SHM definition and security checking for incoming calls.
- If SHM is used, the DIALNO, SHM, and SHMTIM keywords must be coded.
- If VTAM is to perform security checking for the SNA resource, the following must be coded:
  - VERIFY = IN must be coded.
  - One or more DTE addresses must be placed on the VERID keyword.
  - GRPNM must be coded to check if the correct remote DTE identifier is specified in the PATH statement designated by the GRPNM through which the call-in came.

## Correlation of PATH Statements

Several PATH statements can be specified for a given svcsc PU statement. If several are specified, there must be some consistency between them. A PATH statement must be defined for each NCP GROUP used if one of the PATH statements has the following keywords coded:

- CALL =

If the CALL keyword is coded in any of the PATH statements, the call is accepted or performed only if the specification on the PATH designated by the GRPNM corresponds to the attempted operation.

- VERIFY =

If VERIFY is coded in any of the PATH statements, and if VERIFY = IN or VERIFY = INOUT is coded in the PATH designated by the GRPNM, the call is accepted only if the VERID contains the caller's address.

See Appendix B, "Installation Examples for X.25 NPSI," for coding examples.

See the following chapters in *X.25 NPSI Diagnosis, Customization, and Tuning*:

- "Error Determination and Recovery" for more details on the svcsc function
- "Problem Resolution Examples" if a problem occurs
- "X.25 NPSI Flow Sequences" for data flows.

---

## Session Continuation (V3R2 Only)

Session continuation allows LU-LU sessions to remain active when the owning SSCP is lost. When the resource that served to establish ownership of the NCP fails, the NCP enters ANS. The NCP is then no longer owned. Ownership cannot be established on NCP initiative; therefore, the initiative must come from an eventual owner, for example an SSCP.

By coding ANS = CONT at system generation (for PVCs) or in the SMN (for SVCs), a connection is provided with session continuation.

Line, PU, and LU ownership can be taken over by another SSCP at ANS time, and given back to the original SSCP without disruption of the LU-LU sessions, if the partners remain reachable. This applies to SNA PVCs and SVCS and to non-SNA PVCs and SVCS.

ANS=CONT must be coded on the X25.MCH statement to allow CONT to work on the dependent virtual circuits. When ANS occurs, the NCP does not disconnect the PU coded with ANS=CONT. The NCP allows the LINE and PU to remain active so that the LU-LU sessions belonging to the PU are not disturbed. Thus, when the owning SSCP is lost, but the application and remote DTE are not, the data exchange can continue without any disruption.

**Note:** Session continuation is supported for SNA DTES (PVC and SVC) in V3R1. In V3R2, session continuation is also supported for non-SNA remote DTES (PVC and SVC).

---

## Virtual Route Pacing for Subarea to Subarea Communication

Virtual route pacing window size (VRPWS) must be considered when subarea node virtual circuits are used. For example, the VRPWS value must be larger than the default values in order to avoid frequent:

- Isolated virtual routed pacing responses. These responses use as much x.25 NPSI processing time as a normal data packet. Too many of these can increase central control unit (CCU) utilization.
- Entering and exiting virtual route hold. This activity degrades response time on the virtual route. If the CCU is fully loaded, the execution of some background tasks can be delayed because x.25 NPSI subarea node tasks have a higher priority.

The INSLOW keywords of the X25.VCCPT statement are not taken into account for subarea node virtual circuits. Instead, global flow control between subarea nodes controls buffer levels by way of the virtual route pacing mechanism. Therefore, the VRPWS must be adjusted as a function of both the buffer pool size and the SLODOWN threshold.

Consult *NCP, SSP, and EP Diagnosis* under the heading "Network Flow Control Problems" for assistance in calculating the appropriate virtual route window size.

**Note:** If the buffer pools on the virtual route are large enough, the VRPWS keyword can be as high as 256 minus 16n with n representing the number of hops between subarea nodes.

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## Chapter 6. Controlling X.25 NPSI Resources

This chapter describes the method of controlling the following resources for X.25 NPSI:

- SNA resources
- Non-SNA X.25 NPSI resources.

---

### SNA Resources

This section describes the operation of permanent virtual circuits (PVCs) and switched virtual circuits (SVCs). It also includes the required keywords, definitions, and activation and deactivation sequences, to permit safe and effective management of these resources.

#### Permanent Virtual Circuits

PVCs are defined to the network as SNA dedicated resources. SNA resources, which operate on PVCs, are defined to VTAM and NCP in the same way they are defined to non-X.25 dedicated resources.

#### Activation

PVC activation for SNA resources starts when the MCH is activated. Once this occurs, the normal SNA activation sequence flows as though X.25 NPSI does not exist. Normal SNA flow includes ACTLINK, ACTPU, and ACTLU commands. SDLC commands are mapped to qualified logical link control (QLLC) packets for LLC type 3 and to physical services headers (PSH) for LLC type 2.

To activate an SNA resource on a PVC, complete each activation step in the following order. To successfully complete the connection, this sequence must be followed carefully.

1. Activate the physical circuit line.

Activate the physical circuit line that is used by the virtual circuit to connect to the PSDN. The SNA activation sequence procedure requires that you activate the line first.

Physical circuit activation causes the voltage level in the data terminal ready (DTR) to raise. In response, the modem raises the data set ready (DSR) level, enabling the physical line to transmit and receive data.

2. Activate the physical circuit PU.

Activate the physical circuit PU to initiate the link access procedure balanced (LAPB) process. This activation causes the acknowledgments to flow and the physical circuit to reinitialize. An ACTPU command is transmitted to the MCH PU, completing this part of the activation sequence.

3. Activate the PVC line.

Activate the PVC (defined in the X25.LINE statement or the X25.VC statement) before or after MCH activation. No traffic occurs on the real line for this command. Though no traffic is actually transmitted in response to this command, you must adhere to the NCP hierarchy and activation sequence.

#### 4. Activate the PVC PU.

Activate the physical unit associated with the PVC. The SNA request that activates the PVC also initiates the contact procedure. As a result, X.25 NPSI transmits a PSCONT, QXID, or QSM command to the remote DTE. A positive acknowledgment permits the contact procedure to be completed by a CONTACTED message returned to the initiator. An ACTPU command is transmitted to the PVC PU to complete the sequence.

#### 5. Activate the PVC LUS.

The last part of this sequence is the activation of the LUS associated with the PVC. This sequence consists of an ACTLU command that is transmitted to the PVC LU. If the LU is successfully activated, a positive response is returned.

## Deactivation

VTAM and NCP definitions for SNA resources that operate on PVCs are similar to definitions related to normal NCP resources, and do not depend on whether you are using X.25 NPSI. Like the activation sequence, the deactivation sequence closely resembles the SDLC resource sequence.

If the physical circuit is deactivated or has never been activated, the PVC will be unavailable for communication. If any of the PVC components (physical circuit, logical units, or physical units) are inactive, the subsequent components in the activation sequence will be unavailable. For example, if a physical circuit's physical unit is inactive, the PVC physical unit and logical unit cannot be activated.

The best method of deactivating the PVC is to reverse the order of the activation sequence. Reversing the order guarantees that all resources are returned to the correct state, and ensures that the network is synchronized and available for future communication. However, a PU can be deactivated if a RESET command is received from or sent to the network.

If for some reason a resource hangs in PENDING status, the network operator should issue a V NET,INACT,F command for the line related to the hung resource. In this case, every resource dependent on that line is deactivated.

## Connectability Status

When the PVC is available for communication, all resources associated with the SNA PVC indicate a status of ACTIVE. Check for the ACTIVE status to ensure that the PVC is ready for communication. The PVC is defined to NCP and VTAM as a dedicated SNA resource. As a result, the VTAM and NCP status for a PVC resource is displayed in the same way as any other dedicated SNA resource.

## Switched Virtual Circuits

SVCs are defined to VTAM and NCP as SNA switched resources. As a result, VTAM requires the creation of a switched major node (SMN) for SVCs.

## Activation

To activate an SNA resource on an SVC, complete each activation step in the following order. To successfully complete the connection, this sequence must be followed carefully.

1. Activate the physical circuit line.
2. Activate the physical circuit PU.

3. Activate the svc line.

This can be done before MCH activation.

4. Activate the switched major node.

Activation of an SVC PU in an SMN results in the PU being ready to send or accept calls. The SMN physical unit completes the activation sequence with a connectable (CONCT) status.

Call-out is triggered by the application through the use of OPNDST OPTCD=ACQUIRE macro, or using an OPNDST OPTCD=ACCEPT combined with a SIMLOGON macro or VARY NET,LOGON= command.

There is no logical unit activation with an svc until the call is completed. In addition, the physical unit is not active until the call is completed.

Besides the normal activation sequence, the following SNA requests are also needed to activate svcs:

- CONNOUT or ACTCONNIN
- REQCONT
- Multiple SETCVs
- RNAA

The activation process differs for call-in and call-out. See *X.25 NPSI Diagnosis, Customization, and Tuning* for data flow diagrams.

### Activating Calls that Use SVCSC (V3R2 Only)

For calls using SVCSC, the command V NET,DIAL,ID = puname of the SVCSC PU causes the call-out to be made. This PU in the SMN must have a PATH statement that contains the DIALNO keyword. The call can be made from either side when the calling PU has an associated PATH statement. There are no requirements on the called side for establishing the PU type 4 or 5 to PU type 4 or 5 session, besides activating the SMN.

If one of the NCPs fails during SHM disconnection but becomes active before reconnection, an initial call using V NET,DIAL must still be retransmitted. In this case, a normal SHM reconnection would fail and both sides would become inoperable. Before retransmitting the V NET,DIAL command, the side that remained active must be deactivated.

After ANS and takeover of an NCP, the SVCSCs that were active must be reactivated from the new SSCP as all other resources. For example, this can be done using the V NET,ACT,ID = ncpname,SCOPE = ALL command. This allows the SSCP taking over to update its internal tables. Issuing a V NET,DIAL command prior to the activation previously noted for an SVCSC resource would desynchronize SSCP and X.25 NPSI statuses.

### Considerations

X.25 does not create a link between the X.25 NPSI resource and SNA resources until the call is established. This structure eliminates MCH lockups that can occur because of a loss of synchronization between the SNA and the X.25 resources.

X.25 NPSI uses the SNA resources of a physical circuit as a pool of available resources. After obtaining the first available resource, X.25 NPSI creates a correspondence between the two sets of resources.

## Deactivation

The svc deactivation sequence is a reversal of the activation sequence. svc deactivation involves messages that flow between the PSDN, X.25 NPSI, NCP, and VTAM. Message traffic results from the higher SNA levels that pass information to synchronize end points.

If the deactivation is initiated by a local or a remote DTE, the sequence can vary. The following three deactivation methods are used for svc:

- Operator
- CLSDST command from application
- Clear packet to or from the network.

The link between SNA and X.25 resources is broken at this point.

### Deactivating Calls that Use SVCSC (V3R2 Only)

For calls using SVCSC, the command `V NET,HANGUP,ID=puname of the SVCSC PU` causes the call to be cleared. The call can be cleared from either side. Other possibilities, such as a CLEAR command from the network for usual error cases, can cause the call to be cleared. No SHM retries are executed then.

## Connectability Status

To allow for connection to a switched facility, every component must be in the correct state. The PU and LU in the SMN must be in a connectable (CONCT) state. The MCH line, MCH PU, and virtual circuit line must indicate an ACTIVE status.

The CONCT state is entered when the resource is available for connection. In this state, the VTAM resource is pending an activation sequence. Then the connection request is passed to the access method for final resolution of network address and resource pairings. The access method locates the appropriate physical unit in the SMN definition, and then determines the physical unit and link pairing.

After the activation sequence starts, the resource status changes to ACTIVE. This continues until the svc logical unit is active with an LU-LU session setup. At this stage, the entire communications path is active, and the application session is established.

## Application Attachment

The application residing in the SNA host is attached to the SNA resource as if the PSDN did not exist. A normal BIND flows between the two logical units.

Determine the application considerations when using switched virtual circuits. For more information on the application requirements, see *X.25 NPSI Host Programming*.

---

## Non-SNA Resources

Non-SNA resources operate similarly to SNA resources, except that:

- Non-SNA resources are defined and controlled by X.25 NPSI. X.25 NPSI takes the non-SNA resource and simulates it as an SNA resource to the host. Conversely, SNA requests sent from the host to non-SNA resources are handled by X.25 NPSI, rather than being sent directly to the non-SNA resources.

- Non-SNA resources, emulated as SNA resources by X.25 NPSI, are viewed as SNA LU type 1 devices. LU type 1 devices use an FID3 transmission header that is 2-bytes long and contains no sequence number. Consequently, no outstanding PIUs are allowed in the network because all PIUs must be acknowledged. Each PIU sent to a non-SNA resource is paced.

## Permanent Virtual Circuits

This section describes activation, deactivation, and connectability states for non-SNA PVCs.

### Activation

PVC activation for non-SNA resources is similar to the activation sequence for SNA PVCs. The difference is that for non-SNA resources, X.25 NPSI, rather than the remote device, defines and controls the simulated SNA resources. A CONTACT command is sent to the PVC and a response is returned; however, no DTE data (such as PSCONT or QSM) is forwarded to the PSDN.

### Deactivation

PVC deactivation for non-SNA resources is also similar to the PVC deactivation sequence for SNA resources. Again, the difference is that X.25 NPSI defines and controls the simulated SNA resources rather than the remote device. A DISCONTACT command is sent to the PVC and a response is returned; however, no DTE data (such as PSDISC or QDISC) is forwarded to the PSDN.

### Connectability Status

VTAM displays the resource status as ACTIVE just as it does for an SNA PVC. However, this display only reflects the status as recorded by VTAM. SNA and non-SNA PVC resources appear the same to VTAM even though the non-SNA remote device might not be ready.

## Switched Virtual Circuit

This section describes activation, deactivation, and connectability states for non-SNA SVCS.

### Activation

SVC activation for both non-SNA and SNA resources is similar except that the SNA requests are not sent to the remote DTE. Instead, all SNA requests are processed by X.25 NPSI and the LU simulator. Synchronization between VTAM statuses and the remote DTE is ensured by the calling sequence.

### Dial-In

The activation process for dial-in from a non-SNA resource is less complicated than for SNA resources because only the Call Request and Call Accepted packets are transmitted across the network. Resource activation and session setup is performed between the NCP, X.25 NPSI, and VTAM.

### Dial-Out

Dial-out to non-SNA resources follows the same process as that described for SNA resources. The difference is that fewer commands are processed across the network. Once the calling sequence is complete, PU and LU activation occurs as a series of command exchanges between the access method and the X.25 NPSI LU simulator.

## Connectability Status

Connectability status for svcs, whether they are non-SNA resources or SNA resources, is the same.

## Session Continuation (V3R2 Only)

For switched connections, the NCP allows a switched line and PU to remain active when the owning SSCP fails. With the owning SSCP inoperable, an alternate SSCP can acquire ownership of the resource. When the original SSCP becomes operable, it can regain ownership. Thus, when the session partners can still be accessed, the active LU-LU sessions belonging to that PU are not disturbed.

By coding ANS=CONT for a PU in the VTAM switched major node, the NCP allows session continuation.

## Application Attachment

To a host application, non-SNA resources appear to be defined as SNA resources. Actually, the host application is in session with the X.25 NPSI-simulated SNA resource. This resource is defined to the host application program as an SNA LU type 1 device.

X.25 NPSI takes the information transmitted to the simulated LU, prepares it for the PSDN, and transmits it. Therefore, the burden of support is transferred from the host application program to X.25 NPSI; however, the application must support the LU1 session.

## GATE Considerations

GATE processing requires that a session be established between the CTCP and the physical circuit LU before connection to the network resources requiring LLC type 4 can be completed. The MCH line, PU, and LU must be activated first; afterwards, the CTCP can establish a session with the MCH LU.

The following processes are unique to GATE:

- All data for GATE processing passes between the CTCP and the virtual circuit LU. Consequently, the CTCP must either process the request or forward it to the appropriate application program.
- GATE usage is determined on a virtual circuit-by-virtual circuit basis. Therefore, a single physical circuit can support LLC type 4 and other types of LLCs.
- The MCH LU does not have to be active or in session for calls that do not require LLC type 4. The MCH LU to CTCP session is required only for LLC type 4 virtual circuits.
- GATE call-out requires no PATH statement in the switched major node because X.25 NPSI handles this call-out as a simulated call-in request.
- The CTCP must issue CLSDST to deactivate the virtual circuit because X.25 NPSI does not generate an INOP RU at clear time.

**Note:** If the CTCP is canceled or abends, or if the CTCP access method control block (ACB) is deactivated, the resources controlling the virtual circuits connected to this CTCP must be deactivated and then reactivated to avoid difficulties. In effect, the LUs that are undergoing logon processing at the time the CTCP fails stay active and are not reusable until the resources are deactivated or reactivated. If deactivating and reactivating the resources fails, the line resources associated with the hung virtual circuits must be deactivated with the VARY INACT,F form of the deactivate command, followed by activation.

## Fast Connect Considerations

If you plan to use fast connect, consider these additional points:

- Sessions between the CTCP and the virtual circuit LUS must be pre-established.
- NCP and VTAM operate as though they are communicating with nonswitched resources, while X.25 NPSI is controlling the SVCS. X.25 NPSI maps the SVCS to the nonswitched lines.
- Sessions remain active even though clear messages are exchanged. The CTCP must provide the ability to display the status of the svc if it is required for operation.

Activate the virtual circuits and SNA resources before activating the MCH. This permits the sessions to be established prior to any call-in requests.

Figure 20 shows how resources are allocated to avoid assignment collisions. This assignment process only applies to fast connect.

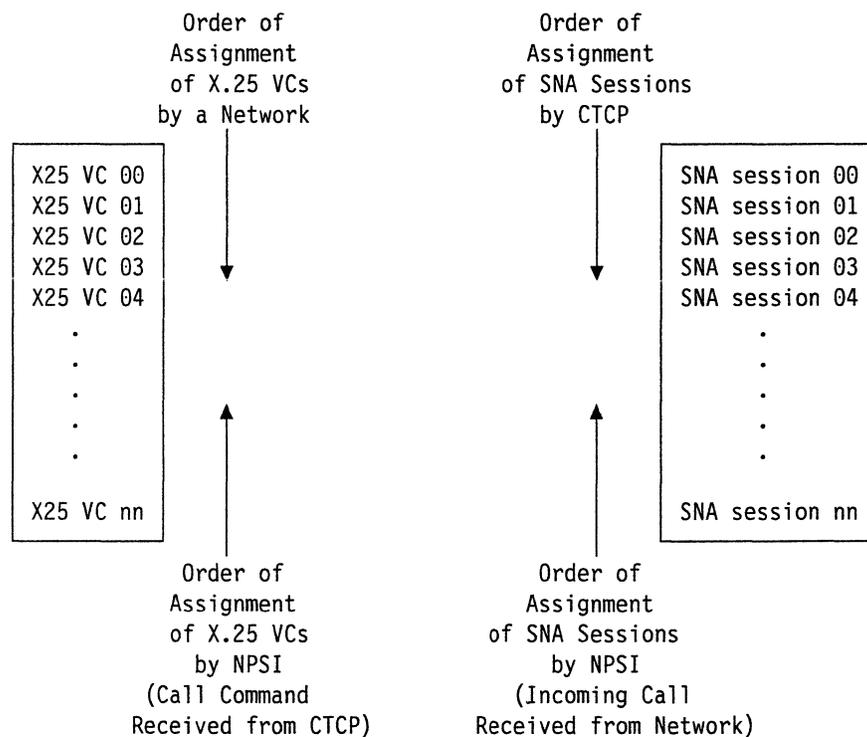


Figure 20. VC and SNA Resource Assignment Order (Fast Connect Only)

## DATE Considerations

If DATE is used, the order and method of activation for virtual circuits is slightly modified. In general, DATE (and the associated CTCP) is used only for call setup and termination. During the application session, DATE is entirely out of the data flow. Unlike GATE, DATE is used for all virtual circuits on a physical circuit.

## Activation

To activate a virtual circuit for DATE, follow each of these steps in the correct order. To successfully complete the connection, follow this sequence carefully.

1. Activate the physical circuit.

Activate the physical circuit used by the virtual circuit that connects to the PSDN. Remember that the SNA activation sequence requires you to activate the physical line first.

Physical circuit activation causes the voltage level in the data terminal ready (DTR) to raise. In response, the modem raises the data set ready (DSR) level, enabling the physical line to transmit and receive data. You must reactivate the MCH line after CTCP deactivation or failure because the MCH line is then inactive.

2. Activate the physical circuit PU.

During this step, nothing is sent to the network. The ACTPU is immediately completed.

3. Activate the MCH LU.

The LU is automatically activated because ISTATUS = ACTIVE is generated for the DATE MCH LU.

4. Verify that the CTCP has established a type 1 session with the MCH LU.

5. Verify that the CTCP has sent the RESTART command to initiate the link access procedure balanced (LAPB) process. After the CTCP starts the line setup, it can monitor the link.

**Note:** If the CTCP is canceled or abends, or if the CTCP ACB is deactivated, the switched major node controlling the virtual circuits connected to this CTCP must be deactivated and then reactivated to avoid hung resources.

**PVC Setup:** DATE has very little effect on PVC activation. DATE is only involved when the Reset, Interrupt, and qualified packets are exchanged between the CTCP and X.25 NPSI. In this situation, DATE takes the appropriate packet information and passes it on to the CTCP.

**SVC Setup:** DATE has an effect on SVC activation. For example, the CTCP must determine when a user application program is ready to be called or is waiting to call out. Virtual circuit type, packet size, and window size must all be defined to the CTCP before it can pass that information on to X.25 NPSI.

For call-in, DATE processes the Call Request packet and forwards it to the CTCP. The CTCP then sends a CALL ACCEPTED command to X.25 NPSI that determines LLC type, window size, and packet size. Request Contact (REQCONT) is provided at this time.

For call-out, an operator command or an application-initiated message must be sent to the CTCP. Call-in is simulated to VTAM even though the CTCP can perform call-out. Therefore, the PATH statement is not needed in DATE's switched major node.

X.25 NPSI can build a logon for LLC types 0 and 5, if requested by the CTCP. For more details on DATE CTCP, see *X.25 NPSI Host Programming*.

## Deactivation

DATE session deactivation can occur in the following ways:

- X.25 NPSI receives a Clear Indication packet from the PSDN. Upon receipt of this packet, X.25 NPSI sends a CLEAR command to the CTCP. The CTCP sends a CLEAR CONFIRMATION command to X.25 NPSI, which in turn forwards the command to the network and generates an INOP to the virtual circuit for the host. This causes the application's LOSTERM exit to be invoked, permitting the session to be cleared when the CLSDST command is executed.
- The application issues a CLSDST command. Upon receipt of the resulting ABCONN request, X.25 NPSI sends an information report to the CTCP that sends a CLEAR command back to X.25 NPSI. Afterwards, X.25 NPSI forwards a Clear packet to the PSDN. Upon receipt of the Clear Confirmation packet from the PSDN, deactivation is complete.
- The CTCP can be deactivated normally by operator intervention, or abnormally by an abend. Once the CTCP is reactivated, the MCH link must also be reactivated and the session to the MCH LU re-established.
- The application requests the CTCP to clear the session by having the CTCP send a CLEAR command to X.25 NPSI. DATE translates this command into a Clear Request packet and forwards this information to the PSDN. A Clear Confirmation packet is returned to X.25 NPSI, triggering an INOP to the host. This causes the application's LOSTERM exit to be invoked. Session termination occurs when the CLSDST command is executed.
- The CTCP fails for some reason and the MCH line is made inoperable. As a result, all dependent virtual circuits are cleared (SVCS) or reset (PVCS) either by the network, after a time-out of approximately two minutes, or by X.25 NPSI when the CTCP is restarted.

### X.25 and SNA Resource Assignment Process

Due to the X.25 NPSI control block structure that has been modified, the X.25 and the SNA resource assignment has been modified from Version 1. This modification should be transparent to VTAM and the CTCP. Figure 21 on page 156 shows the direction in which the resources are allocated and lists which program allocates each type of resource. Assignments are made in this order to avoid assignment collisions.



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## Appendix A. Defining X.25 PSDN Facilities

This appendix describes how X.25 NPSI supports various optional user facilities defined in the X.25 Recommendation. In addition to describing the differences between virtual circuits with and without CTCPS, the following optional facilities are discussed:

- Flow control parameter negotiation
- Closed user group
- Fast select
- High-priority class of traffic
- One-way logical channel
- Reverse charging
- Throughput class negotiation.

---

### Optional Facilities Using X.25 NPSI Statements

The following section describes:

- Virtual circuits without a CTCP
- Virtual circuits with a CTCP.

#### Virtual Circuits without a CTCP

For virtual circuits without a CTCP, X.25 NPSI selects the flow control parameter values according to the following hierarchy:

- In the facility fields of the Incoming Call or Call Connected packets
- In the X25.VCCPT statement.

**Note:** Facilities defined in the X25.OUFT statement are not taken into account by X.25 NPSI. However, you must code the VCCPT facility entries to match the OUFT facility entries. In the PATH macro, xx and yy indexes must point to compatible entries.

#### Virtual Circuits with a CTCP

For virtual circuits with a CTCP, the CTCP defines the flow control parameter values to X.25 NPSI in the CALL REQUEST or CALL ACCEPTED command. The values specified in the commands from the CTCP *should* correspond to either the values specified in the facility fields of the corresponding packet or the values that the network will use by default.

X.25 NPSI passes these facilities to the CTCP or to the PSDN without any processing. Negotiation occurs directly between the CTCP and the PSDN. If the facilities are not accepted by the CTCP or the PSDN, the call must be cleared by the CTCP or the PSDN.

X.25 NPSI does not check whether the packet and window sizes are the same in both directions. X.25 NPSI is transparent to all these negotiations.

If the packet size and window size passed to the CTCP in the CALL CONNECTED command are different from the sizes specified to X.25 NPSI in the CALL REQUEST, the CTCP must clear the call.

---

## Flow Control Parameter Negotiation

X.25 NPSI supports flow control parameter negotiation. This optional facility allows packet and window size negotiation on a per call basis. When the calling DTE subscribes to flow control parameter negotiation, the DTE can request specific packet and window sizes for each direction of traffic flow. If a size is not specified, the default value is used.

### Coding Requirements

To code flow control parameter negotiation, use:

- Packet length

Facility code field = X'42'

Facility field parameter = '0x0y'

where:

x Is the packet size for transmission from the called DTE.

y Is the packet size for transmission from the calling DTE.

PACKET SIZE CODE	PACKET LENGTH
4	16
5	32
6	64
7	128
8	256
9	512
A	1024
B	2048
C	4096

- Window size

Facility code field = X'43'

Facility field parameter = 'wwzz'

where:

ww Is the window size for transmission from the called DTE.

zz Is the window size for transmission from the calling DTE.

An example of a facility field is:

420909430404

where:

42 Is the flow control packet size negotiation facility.

0909 Is the packet size.

43 Is the flow control window size negotiation facility.

0404 Is the window size for each direction.

This specification results in a packet size of 512 and a window size of 4 for each direction of traffic.

## Operation

X.25 NPSI checks the facility values in all the Incoming Call and Call Connected packets, and will accept the call only if *all* of the following five conditions are met:

1. x must be defined between X'4' and X'C'.
2. x must equal y.
3. Negotiated packet size must be less than the maximum frame length.
4. ww must equal zz.
5. ww must be less than or equal to 7 for modulo 8, or less than or equal to 127 for modulo 128.

---

## Closed User Group

This option restricts a set of DTEs from access to another DTE set. DTEs belonging to one CUG can communicate with each other, but are denied communication with DTEs outside their group.

### Coding Requirements

To code CUG in the Call Request packet use:

Facility code field = X'03'

Closed user group (CUG) number as defined to the PSDN.

The index to the closed user group is in the form of two decimal digits. Each digit is binary coded. Bit 5 is the low-order bit of the first digit and bit 1 is the low-order bit of the second digit.

**Note:** Indexes to the same closed user group at different DTE to DCE interfaces, can differ.

The following example shows a request for closed user group 14:

0314

### Operation

X.25 NPSI accepts the call; however, it performs no analysis.

X.25 NPSI performs no analysis on the content of the facility field, and accepts the call as long as none of the CUG keywords are specified in the RFAC keyword of the X25.NET statement of the corresponding network.

---

## Fast Select

The fast select option allows data to be transferred to or from the CTCP in a Call Request, Incoming Call, Call Accepted, Call Connected, Clear Request, or Clear Indication packet on an svc within the CALL USER DATA and CLEAR USER DATA fields.

## Coding Requirements

To code the fast select option, use:

Facility code field = X'01'

Facility parameter field = X'80' (no restriction on response)

Facility parameter field = X'C0' (restriction on response); Call Accepted packets cannot be used.

The following example shows the facility field requesting fast select:

```
01C0
```

## Operation

Communication between DTEs occurs through the use of:

- Incoming Call or Call Request packet
- Call Accepted or Call Connected packet
- Clear Request or Clear Indication packet.

This contrasts to the normal mode of using Information packets as a communication method. The control packet's user data field is restricted in size to 128 bytes. This facility is only supported through DATE or GATE.

Fast select is an optional facility that can be rejected through the RFAC keyword in the X25.NET statement.

---

## High-Priority Class of Traffic

The high-priority class of traffic facility allows data to be transferred between the DTE and the DCE on an SVC with high-priority. This option restricts the requests and responses to 128 bytes in length with no support for the M bit (more data bit).

### Coding Requirements

To code the high-priority class of traffic facility, use:

Facility code field = X'01'

Facility parameter field = X'00' (high-priority class of traffic not requested)

Facility parameter field = X'02' (high-priority class of traffic requested).

The following example shows the facility field requesting high-priority class of traffic:

0102

### Operation

High-priority class of traffic is supported for outgoing and incoming calls. Packets must be 128 bytes long. For incoming calls, X.25 NPSI checks for high-priority service requests in the facility fields and internally updates the maximum packet size during the call. For outgoing calls, X.25 NPSI supports this facility by using the OPTFACL keyword of the X25.OUFT statement associated with a VCCPT entry containing a MAXPKTL parameter of 128.

---

## One-Way Logical Channel

The one-way logical channel facility limits the use of a logical channel to either incoming or outgoing calls.

### Incoming Coding Requirements

The logical channel number of an incoming one-way logical channel must be *greater* than the greatest value for a permanent virtual circuit and *less* than the smallest value for a two-way virtual circuit. Thus, if LCNS 1–5 are used for PVCs and you want five logical channels for one-way incoming calls, these LCNS must start at a value greater than 5, but a lesser value than 4095.

### Outgoing Coding Requirements

The logical channel number of an outgoing one-way logical channel must be *greater* than the greatest value for a two-way virtual circuit but *less* than 4095. Thus, if LCNS 1–5 are used for two-way virtual circuits and you want five logical channels for one-way outgoing calls, you must assign LCNS greater than 5, but less than 4095, to these logical channels.

Restricted virtual circuits are defined through the use of the CALL keyword of the X25.LINE or X25.VC statement. The CALL keyword, which defines how an SVC is to be established, has the following options:

- CALL = IN (one-way in)
- CALL = OUT (one-way out).

---

## Reverse Charging

The reverse charging facility causes the PSDN to charge the called DTE rather than the calling DTE. If this facility is not specified, the calling DTE is assessed all connection charges.

### Coding Requirements

To code reverse charging in the Call Request packet, use:

Facility code field = X'01'

Facility parameter field = X'00' (reverse charging not requested)

Facility parameter field = X'01' (reverse charging requested).

The following example shows the facility field requesting reverse charging:

0101

### Operation

X.25 NPSI accepts the presence of the reverse charging facility field in an Incoming Call packet without analysis of the content unless REVCHG is specified with the RFAC keyword of the X25.NET statement. If REVCHG is specified, the call is cleared. Reverse charging can be requested by X.25 NPSI in an outgoing call using the OUFY index in the PATH statement. Otherwise, reverse charging acceptance can be controlled through the use of DATE and GATE CTCPS.

---

## Throughput Class Negotiation

The throughput class of a virtual call defines the effective rate in which data can be transferred. Both packet size and window size affect this rate, but other factors such as the line speed also contribute.

Throughput class can only be negotiated *downward*. Downward negotiation reduces the effective data exchange rate and the associated transmission cost. This resulting data exchange rate effectively reduces the priority of a virtual circuit, which in turn reduces the use of the connecting physical circuit.

The PSDN forces the smallest throughput class value for each flow if there is a conflict between the throughput classes for transmission and the default for reception. This case applies only to switched virtual circuits.

## Coding Requirements

To code the throughput class negotiation facility use:

Facility code field = X'02'

Facility parameter field = bits 0–3

Facility parameter field = bits 4–7.

The throughput class for transmission from the calling DTE is indicated in bits 4, 5, 6, and 7. The throughput class for transmission from the called DTE is indicated in bits 0, 1, 2, and 3. Bits 3 and 7 are the low-order bits of each throughput class indicator.

The following example shows the facility field requesting throughput class negotiation with 2400 bits per second for both the called and calling DTEs:

0277

## Operation

X.25 NPSI accepts the presence of the throughput class negotiation facility field in an Incoming Call packet without analysis of the content unless THRUPUTCL is specified with the RFAC keyword of the X25.NET statement. If THRUPUTCL is specified, the call is cleared.

## Optional Facilities Table

CCITT defines optional user facilities. If DATE or GATE is used, X.25 NPSI allows all facilities to be supported by the CTCP. However, if DATE or GATE is *not* used, X.25 NPSI supports the following facilities. Table 13 and Table 14 show X.25 NPSI support of CCITT facilities.

Optional User Facility	GATE/DATE	Other Option
Bilateral CUG Related Facilities	S	S (out+GR)
Call Redirection Notification	S (by DCE)	S (by DCE)
Called Address Extension	S	S (out)
Called Line Address Modified Notification	S	N/S
Called Redirection Notification	S (by DCE)	S (by DCE)
Calling Address Extension	S	S (out)
Charging Information	S	N/S
Closed User Group (CUG)	S	S (out+GR)
CUG Selection	S	S (out+GR)
CUG with Incoming Access	S	S (out+GR)
CUG with Outgoing Access	S	S (out+GR)
CUG with Outgoing Access Selection	S	S (out+GR)
D Bit Modification	N/S	N/S
Default Throughput Class Assignment	S	S
End-to-End Transit Delay Negotiation	S	S (out)
Extended Packet Sequence Numbering	S	S
Fast Select	S	N/S
Fast Select Acceptance	S	N/S
Flow Control Parameter Negotiation	S	S
Hunt Group	S (by DCE)	S (by DCE)
Incoming Calls Barred	S (by DCE)	S (by DCE)
Incoming Calls Barred within CUG	S	S (out)
Local Charging Prevention	S (by DCE)	S (by DCE)
Minimum Throughput Class Negotiation	S	S (out)
Network User Identification	S	S (out)
Nonstandard Default Packet Sizes	S	S
Nonstandard Default Window Sizes	S	S
One-way Logical Channel Incoming	S	S
One-way Logical Channel Outgoing	S	S

Table 13 (Page 2 of 2). X.25 NPSI Support		
Optional User Facility	GATE/DATE	Other Option
Online Facility Registration	N/S	N/S
Outgoing Calls Barred	S (by DCE)	S (by DCE)
Outgoing Calls Barred within CUG	S	S (out)
Packet Retransmission	N/S	N/S
Reverse Charging	S	S (out)
Reverse Charging Acceptance	S	S
RPOA Selection	S	S (out)
Throughput Class Negotiation	S	S
Transit Delay Selection and Indication	S	S (out)
<b>Note:</b>		
<b>S</b>	Supported by DTE, or usage on a per-call basis depends on operational requirements.	
<b>N/S</b>	Not supported.	
<b>By DCE</b>	The DTE is not involved in the processing of this facility.	
<b>Out</b>	X.25 NPSI can set some facilities in the outgoing Call Request packets without processing or checking these facilities when they are received in an Incoming Call or Call Connected packet.	
<b>GR</b>	Incoming call is rejected if the facility is included in the call-in, is not associated with the facility parameter, and is specified to be rejected in the RFAC keyword of the X25.NET statement.	

Table 14. Supported for Implementation Requirements	
Implementation Requirement	Support
Call User Data Field	S
Concurrent sharing with SNA	S (subaddressing, CUD)
Extended Addressing	S (with GATE/DATE only)
Extended Facilities and Length	S
Fast Select	S (with GATE/DATE only)
Interrupt Packet Control	S
Reset Packet Control	S
Use of D bit	S
Use of M bit	S (no mapping on SNA chaining)
<b>Note:</b>	
<b>S</b>	Supported

## Appendix B. Installation Examples for X.25 NPSI

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---

## Appendix B. Installation Examples for X.25 NPSI

This appendix contains examples of the coding you need to install X.25 NPSI in the NCP. Use this appendix as an aid when planning your installation process, but remember all network configurations differ.

The appendix is divided into two parts:

- Example A for Version 3 Release 1
- Example B for Version 3 Release 2.

Each part contains an example of coding that is particular to that version.

---

## Version 3 Release 1 (Example A)

This example consists of four sections:

- NCP and x.25 NPSI generation input including JCL

This section contains examples of x.25 NPSI features, such as different types of MCHS and virtual circuits.

- LKEDT step

This section contains an example illustrating how the LKEDT step makes for easier maintenance of x.25 NPSI if relinking of modules is all that is required.

- NCP input produced by NDF (x.25 NPSI)

This section contains examples of NCP statements produced by the x.25 NPSI part of generation for input to VTAM. Also, examples are included of the default x.25 NPSI naming conventions and of the order of the statements generated for SVCS.

- Main switched major node

This example illustrates some of the IDNUM usages that go with the x.25 NPSI generation.

**Note:** This is not meant to be a production example.

## NCP and X.25 NPSI Generation Input Including JCL

```

//S1 EXEC PGM=IEHPRGM
//* CLEAN UP PREALLOCATED PDS USED TO SAVE CONTROL BLOCK OBJECT CODE
//SYSPRINT DD SYSOUT=A
//DD1 DD VOL=SER=NCPX25,UNIT=3380,DISP=SHR
//SYSIN DD *
    SCRATCH DSNAME=X25.NCPV31.SA314G,VOL=3380=NCPX25,MEMBER=ICNTABL1
    SCRATCH DSNAME=X25.NCPV31.SA314G,VOL=3380=NCPX25,MEMBER=ICNTABL2
    SCRATCH DSNAME=X25.NCPV31.SA314G,VOL=3380=NCPX25,MEMBER=SA314LE
/*
//S2 EXEC PGM=IEBCOPY,ADDRSPC=REAL,REGION=128K
//* COMPRESS THE PREALLOCATED PDS
//SYSPRINT DD SYSOUT=A
//DISK DD DISP=SHR,DSN=X25.NCPV31.SA314G
//SYSUT3 DD UNIT=SYSDA,SPACE=(CYL,(10,1),,CONTIG)
//SYSUT4 DD UNIT=SYSDA,SPACE=(CYL,(10,1),,CONTIG)
//SYSIN DD *
    COPY OUTDD=DISK,INDD=DISK
/*
//STEP1 EXEC PGM=ICNRTNDF,REGION=6000K,PARM='LINECNT=45'
//STEPLIB DD DSN=NCP.NCPV51.SSPLIB,DISP=SHR
// DD DSN=SYS1.NPSILNK,DISP=SHR
//GENDECK DD *

```

\*\*\*\*\*

```

*
*          EXAMPLE OF GENERATION OF NPSI WITHIN NCP
*
* - MCH0 (SL0)      PVC 0 FOR PSH
*                   SVC1,2,3,4 FOR PCNE,PSH,PADX,BNNQLLC
*                   1/IN 2,3/INOUT 4/OUT
*
* - MCH1 (SL1)      PVC 0 FOR PCNE
*                   PVC 1 FOR INN (WE ARE SECONDARY)
*                   PVC 2 FOR INN (WE ARE PRIMARY)
*                   PVC 3 FOR BNN QLLC
*                   SVC 100 FOR GATE SUBADDRESSING(ANY LLC SELECTED)
*
* - MCH2 (SL2)      PVC 0 FOR PCNE
*                   SVC 1,2 FOR PCNE,PSH,PADI,BNNQLLC,GATE
*                   1/2 INOUT NULL CUD0 WILL SELECT PAD
*
* - MCH3 (SL3)      SVC 1,2 FOR PCNE,PSH,PADX,BNNQLLC (DATE)
*
*
* - MCH4 (SL4)      SVC 1,2,3,4,5,6,7 FOR FAST CONNECT
*                   CONNECT=SUBD: CTCP SELECTED VIA SUBADDRESSING*
*

```

\*\*\*\*\*

```

*
**
***  STAGE 1 INPUT
**
        OPTIONS USERGEN=X25NPSI,          *INDICATE NEO NAME          X
        NEWDEFN=YES                       *INCLUDE NPSI STMTS IN VTAMLST
BAKLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=1
*
BAKBUILD BUILD NPA=YES,                   X
        VERSION=V5R1,                     * NCP VERSION                    X

```

```

LOADLIB=LNCPI0, X
TYPGEN=NCP, X
MODEL=3720, X
NETID=LGMEMV5, * HOST ID X
MAXSUBA=15, X
SUBAREA=4, X
BFRS=124, * BEST FOR NPSI PERFORMANCE X
CA=TYPE5, X
LTRACE=4, * ALLOWS LINE TRACE ON TWO MCH'S X
OLT=YES, X
DR3270=NO, X
BRANCH=8000, X
TRACE=(YES,100), * 100 ENTRIES IN ADDRESS TRACE TBL X
NEWNAME=SA314G, X
X25.PREFIX=S, * ALL NAMES START WITH S X
X25.IDNUMH=02, * X25.IDNUMH MUST MATCH WITH SWITCHX X
TYP SYS=OS, * MAJOR NODE IDS.(2FIRST DIGITS) X
X25.SNAP=YES, * OPTIONAL DIAGNOSIS SNAP INCLUDED X
X25.MCHCNT=5, * NUMBER OF PHYSICAL LINKS X
X25.MAXPIU=64K
BAKSYSC SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCOND,RECMD, X
RIMM,NAKLIM,SESSION,SSPAUSE,XMTLMT) X
BAKHOST HOST INBFRS=7,MAXBFU=10,UNITSZ=196,BFRPAD=0,SUBAREA=1, X
DELAY=0.1,STATMOD=YES,TIMEOUT=30 X
PATH41 PATH DESTSA=(1),ER0=(1,1),ER1=(1,1),ER2=(1,1) TO HOST X
PATH42 PATH DESTSA=(5,2,3),ER0=(5,2),ER1=(5,3),ER2=(3,4) X
LUDRPOOL NUMTYP1=10, * FOR NON SNA CALLS X
NUMTYP2=10 * FOR QLLC OR PSH CALLS X
*****
EJECT * AT LEAST ONE SDLC LINE
SDLC6 GROUP LNCTL=SDLC, * MUST BE DEFINED X
TYPE=NCP, X
DIAL=YES, X
REPLYTO=20
*****
SL6 LINE ADDRESS=6, * SDLC LINE FOR NIA FRONTAL X
CLOCKNG=EXT, * X
NEWSYNC=NO, X
DUPLEX=HALF, X
NRZI=NO, X
CALL=INOUT, X
RETRIES=(7,0,0)
SP6 PU ISTATUS=INACTIVE, X
PUTYPE=2
*****
EJECT
SDLC5 GROUP LNCTL=SDLC, X
TYPE=NCP, X
DIAL=NO, X
REPLYTO=3, X
DISCNT=NO, X
ISTATUS=INACTIVE
*****
SL5 LINE ADDRESS=5, * LEASED SDLC MULTIPOINT LINE X
CLOCKNG=EXT, X
NEWSYNC=NO, X
DUPLEX=HALF, X
NRZI=NO,NPACOLL=YES, X

```

```

      RETRIES=(3)
      SERVICE ORDER=(SP5)
SP5   PU   ADDR=C2,          * ADDRESS 3274          X
      MAXDATA=261,          X
      MAXOUT=3,              X
      PUTYPE=2,NPACOLL=YES,  X
      VPACING=2,             X
      PACING=1
SU5   LU   LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,NPACOLL=YES
      EJECT
*****
GRNPA GROUP LNCTL=SDLC,      * FOR NPM RECORDING    X
      TYPE=NCP,              X
      DIAL=NO,                X
      DISCNT=NO,              X
      VIRTUAL=YES,            X
      NPARSC=YES,             X
      ISTATUS=INACTIVE
LNNPA LINE LINEFVT=NPAVFVT
PUNPA PU   PUTYPE=2,PUFVT=NPAPFVT
LUNPA LU   MAXCOLL=7,LUFVT=(NPALFVT,NPALFVT), X
      VPACING=0,LOCADDR=1
*****
      EJECT
***** X25 NPSI INPUT
*     ALLOW 3 VCCPT AND OUFT ENTRIES
TRANSPAC X25.NET CPHINDX=3,OUHINDX=3,DM=YES
*
      X25.VCCPT INDEX=1,      X
      MAXPKTL=128,           X
      VWINDOW=1,             * PACKET LEVEL WINDOW    X
      INSLOW=(100,50)        * TO PREVENT SLOWDOWN
*
      X25.VCCPT INDEX=2,      X
      MAXPKTL=128,           X
      VWINDOW=2,             * TO PREVENT SLOWDOWN    X
      INSLOW=(100,50)
*
      X25.VCCPT INDEX=3,      X
      MAXPKTL=128,           X
      VWINDOW=3,             * TO PREVENT SLOWDOWN    X
      INSLOW=(100,50)
*
      X25.OUFT INDEX=1
*
      X25.OUFT INDEX=2,        * PKT SIZE=128,VWINDOW=2  X
      OPTFACL=420707430202
*
      X25.OUFT INDEX=3,        * PKT SIZE=128,VWINDOW=3, AND  X
      OPTFACL=03430102420707430303, * REVERSECHARGING REQUEST X
      USRFILD=1234567890
*****
*
      EJECT
*****
* FIRST MCH SLO: NO DATE/GATE BUT TRANSPARENT PAD
*****
      X25.MCH ADDRESS=0,      *CONTROLLER LINE ADDR    X

```

```

ANS=CONT, X
LCGDEF=(0,4), *MAX LCN IS 4 ON LCGN 0 X
FRMLGTH=131, X
MWINDOW=2, *LAP WINDOW X
STATION=DTE, X
TPTIMER=3, *LAPB RECOVERY PARAMETERS X
TDTIMER=1, * X
NPRETRY=7, * X
NDRETRY=1, * X
LLCLIST=(LLC0,LLC2,LLC3,LLC5), X
LCNO=USED, X
SPAN=X2501, *FOR NETVIEW X
DBIT=NO, *NO DBIT SUPPORT ON THIS MCH X
PAD=TRANSP,TRAN=EVEN, *ALLOW TRANSPARENT PAD X
ITRACE=YES, * LAP INTERNAL TRACE ACTIVE X
SPEED=9600, *REAL MCH SPEED X
T1TIMER=1 *REAL T1 OF THE DCE X
*
X25.LCG LCGN=0
*
*** X25 LINE FOR PSH (PVC) LINE NAME=SL0000 PU=SP0000 LU=SU0000
*
X25.LINE LCN=0,VCCINDX=3,LLC=LLC2,TYPE=P,SPAN=X2501
*
X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2, X
PACING=2,ISTATUS=INACTIVE
X25.LU LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*
* 4 SVC'S: 1 IN, 2 IN/OUT, 1 OUT
*
X25.VC LCN=1,VCCINDX=2,TYPE=S,CALL=IN,OUFINDX=2,SPAN=X2501
X25.VC LCN=(2,3),VCCINDX=3,TYPE=S,CALL=INOUT,OUFINDX=3, X
SPAN=X2501
X25.VC LCN=4,VCCINDX=3,TYPE=S,CALL=OUT,OUFINDX=1,SPAN=X2501
*
*****
* SECOND MCH SL1: GATE WITH SUBADDRESSING
*****
X25.MCH ADDRESS=1, X
ANS=CONT, *MAX LCN IS 3 ON LCGN 0 X
LCGDEF=((0,3),(1,0)), *MAX LCN IS 0 ON LCGN 1 X
FRMLGTH=131, X
MWINDOW=3, LAP WINDOW X
STATION=DTE, X
TPTIMER=2, *LAPB RECOVERY PARAMETERS X
TDTIMER=3, X
NPRETRY=3, X
NDRETRY=3, X
LCNO=USED, X
PAD=INTEG,TRAN=EVEN, *ALLOW INTEGRATED PAD ON MCH X
GATE=GENERAL,SUBADDR=YES, X
LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5), X
LLC0=(0,2),LLC2=8,LLC3=9, *SUBADDRESSING DIGITS USED TOX
LLC4=(1,4,3,7),LLC5=(6,5), *SELECT THE 5 LLC'S X
SPAN=X2501, *USE DEFAULT T1TIMER= 1SEC X
DBIT=NO *USE DEFAULT SPEED=9600BPS
*
*

```

```

X25.LCG LCGN=0                *FIRST LOGICAL CHANNEL GROUP
*
* PVC FOR PCNE: LINK NAME=SL1000  PU=SP1000  LU=SU1000
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC0,SPAN=X2501,          *
MAXDATA=2000                *SEGMENTING NOT SUPPORTED FOR PCNE
*
***** X25 LINE FOR INN ***THIS SIDE IS SECONDARY****
*
SL1001  X25.LINE  LCN=1,                      X
        VCCINDX=3,                          X
        MONLINK=YES,                         X
        DSTNODE=INN,                         *MANDATORY FOR INN X
        LLC=LLC3,                            X
        SPAN=X2501,                          X
        TYPE=P
SP1001  X25.PU  PUTYPE=4,TGN=2,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE, X
        SPAN=2501,
*
***** X25 LINE FOR INN ****THIS SIDE IS PRIMARY****
*
SL1002  X25.LINE  LCN=2,                      X
        VCCINDX=3,                          X
        MONLINK=YES,                         X
        DSTNODE=INN,                         *MANDATORY FOR INN X
        LLC=LLC3,                            X
        SPAN=X2501,                          X
        TYPE=P
SP1002  X25.PU  PUTYPE=4,TGN=4,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE, X
        SPAN=2501,
*
***** X25 LINE FOR BNN QLLC *****
*
SL1003  X25.LINE  LCN=3,                      X
        VCCINDX=3,                          X
        LLC=LLC3,                            *DSTNODE=BNN DEFAULTED X
        SPAN=X2501,                          X
        TYPE=P
SP1003  X25.PU  PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2,      X
        PACING=1,SPAN=X2501,ISTATUS=INACTIVE
SU1003  X25.LU  LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*
** VC USING SUBADDRESSING TO SELECT THE LLC TYPE *****
*
X25.LCG LCGN=1                *SECOND LOGICAL CHANNEL GROUP
**
X25.VC  LCN=0,                    *SVC FOR SUBADDRESSING      X
        VCCINDX=3,                X
        OUFINDX=1,                X
        CALL=IN,                  *USED FOR CALLIN ONLY   X
        SPAN=X2501,                X
        TYPE=SWITCHED
*****
*   THIRD MCH  SL2 : GATE WITH USER DEFINED RELATION BETWEEN
*   FIRST CUD BYTE AND CTCP/LLC
*****
X25.MCH ADDRESS=2,              X
        ANS=CONT,                  X

```

```

LCGDEF=(0,2), X
FRMLGTH=131, X
MWINDOW=3, LAP WINDOW X
STATION=DTE, X
TPTIMER=3.1, X
TDTIMER=2, X
NPRETRY=7, X
NDRETRY=1, X
LCN0=USED, X
PAD=INTEG,TRAN=EVEN, X
GATE=GENERAL, X
SPAN=X2501, X
LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5), X
CUD0=(00,02,21,22,NULL,03,B0,C1,C5,CC,FF), X
CTCP=(00,80,01,02,85,85,85,80,85,80,85) X
*****
*
* 3 CTCP'S FOR GATE.CUD0 SELECTIONS: CTCP0=00,CTCP1=21,CTCP2=22
* PCNE WILL BE SELECTED BY CUD0=02,C1,CC
* PAD WILL BE SELECTED BY CUD0=NULL,03,B0,C5,FF
*
* FOR CALLOUT IF L=7(PAD) THE CALL OUT PKT WILL HAVE A NULL CUD
* FOR CALLOUT IF L=.(PCNE) THE CALL OUT PKT WILL HAVE 02 IN CUD0
*****
X25.LCG LCGN=0
*
*** PVC FOR PCNE *****
*
SL3000 X25.VC LCN=0, X
VCCINDX=2, X
LLC=LLC0, X
MAXDATA=2000, * SEGMENTING NOT SUPPORTED X
TYPE=P
*
** 2 SVC'S *****
*
X25.VC LCN=(1,2), X
VCCINDX=3, X
OUFINDX=1, X
CALL=INOUT, X
TYPE=SWITCHED
*****
* FOURTH MCH SL3: DATE MCH
*****
*
X25.MCH ADDRESS=3, X
ANS=CONT, X
GATE=DEDICAT, X
LCGDEF=(0,2), *MAX LCN IS 2 ON LCGN 0 X
FRMLGTH=131, X
MWINDOW=7, LAP WINDOW X
STATION=DTE, X
TPTIMER=3, X
TDTIMER=1, X
NPRETRY=7, X
NDRETRY=1, X
LLCLIST=(LLC0,LLC2,LLC3,LLC5), X
LCN0=NOTUSED, X

```

```

          DBIT=NO, X
          SPEED=9600, X
          T1TIMER=1, X
          PAD=TRANSP,TRAN=EVEN *PADI NOT ALLOWED ON DATE MCH
*
      X25.LCG LCGN=0
***
*
      X25.VC LCN=(1,2),VCCINDX=2,TYPE=S,CALL=INOUT,OUFINDX=2
      EJECT
*
*****
* FIFTH MCH XL11: 7 VC'S FOR FAST CONNECT WITH 2 CTCP'S
*****
*
***
XL11      X25.MCH ADDRESS=4,PUNAME=XP11,LUNAME=(XU11,XU12), X
          ANS=CONT, X
          LCGDEF=(0,7), X
          FRMLGTH=131, X
          MWINDOW=7, LAP WINDOW X
          STATION=DTE, X
          TPTIMER=3, X
          TDTIMER=1, X
          SPAN=X2501, X
          NPRETRY=7, X
          NDRETRY=3, X
          GATE=GENERAL, * NEEDED FOR FASTCONNECT X
          LLCLIST=LLC4, X
          LCN0=NOTUSED, X
          ITRACE=YES, X
          LOGAPPL=(GBGTPLS,GBGTPLT), *CTCP'S PLU NAMES X
          CONNECT=SUBD, * 2 CTCP'S SELECTABLE VIA THE X
          SUBD=(0,9,1), * LAST SUBADDRESSING DIGIT X
          CTCP=(0,1,1) *0 FOR CTCP 0, 9 AND 1 FOR CTCP 1
*
      X25.LCG LCGN=0 * DEFINE THE NETWORK'S VC'S
*
      X25.VC LCN=(1,7),VCCINDX=3,TYPE=S,CALL=INOUT
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCP0
*
      X25.FCG QTY=(5),CTCPNO=(0),SPAN=X2501,MAXDATA=2500, X
          PRFLINE=XL12,PRFPU=XP12,PRFLU=XU12,SUFFIX=1
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCP1
*
      X25.FCG QTY=(5),CTCPNO=(1),SPAN=X2501,MAXDATA=2500, X
          PRFLINE=XL22,PRFPU=XP22,PRFLU=XU22,SUFFIX=1
*
*****
      X25.END
*****
*****
      GENEND
      END
*****
//DBWORKFL DD UNIT=SYSDA,SPACE=(TRK,10)

```

```
//SYSPRINT DD SYSOUT=A
//PRINTER DD SYSOUT=A
//TBL1SRCE DD DSN=&&SRCE1,DISP=(,DELETE),
// UNIT=SYSDA,SPACE=(CYL,(10,10)),DCB=BLKSIZE=3200
//TBL1LIST DD SYSOUT=Z
//*TBL1OBJ DD DUMMY TABLE 1 OBJECT FILE
//TBL1OBJ DD DSN=X25.NCPV31.SA314G(ICNTABL1),DISP=OLD,
// VOL=SER=NCPX25,UNIT=3380
//TBL2SRCE DD DSN=&&SRCE2,DISP=(,DELETE),
// UNIT=SYSDA,SPACE=(CYL,(10,10)),DCB=BLKSIZE=3200
//TBL2LIST DD SYSOUT=Z
//*TBL2OBJ DD DUMMY TABLE 2 OBJECT FILE
//TBL2OBJ DD DSN=X25.NCPV31.SA314G(ICNTABL2),DISP=OLD,
// VOL=SER=NCPX25,UNIT=3380
//NEWDEFN DD DISP=SHR,DSN=SYS1.VTAMLST(SA314G)
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(10,10)),DISP=(,DELETE)
//SYSLIB DD DSN=NCP.NCPV51.MAC3725,DISP=SHR
// DD DSN=X25.NCPV31.MAC3725X,DISP=SHR
//LNKSTMT DD DSN=X25.NCPV31.SA314G(SA314LE),DISP=OLD
/*
```

**LKEDT Step**

```
//LKEDT EXEC PGM=IEWL,REGION=400K,  
// PARM='LIST,NCAL,NOXREF,SIZE=(374K,48K),MAP'  
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1)),DISP=(,DELETE)  
//SYSLIN DD DSN=X25.NCPV31.SA314G(SA314LE),DISP=OLD  
//SYSPUNCH DD DSN=X25.NCPV31.SA314G,DISP=OLD,UNIT=3380,VOL=SER=NCPX25  
//SYSPRINT DD SYSOUT=A  
//SYSLOAD DD DSN=CTI.NCPV31.NCPLOAD,DISP=SHR  
//OBJ3725 DD DSN=NCP.NCPV51.OBJ3725,DISP=SHR  
//OBJ3725X DD DSN=NCP.NCPV31.OBJ3725X,DISP=SHR  
/*
```

**NCP Input Produced by NDF (X.25 NPSI)**

```

OPTIONS USERGEN=X25NPSI,NEWDEFN=YES
BAKLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=1
*
BAKBUILD BUILD NPA=YES,VERSION=V5R1,LOADLIB=LNCP10,TYPGEN=NCP,MODEL=372*
          0,NETID=LGMEMV5,MAXSUBA=15,SUBAREA=4,BFRS=124,CA=TYPE5,L*
          TRACE=4,OLT=YES,DR3270=NO,BRANCH=8000,TRACE=(YES,100),NE*
          WNAME=SA514G,X25.PREFIX=S,X25.IDNUMH=02,TYPSYS=OS,X25.SN*
          AP=YES,X25.MCHCNT=5,X25.MAXPIU=64K
BAKSYSC  SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCOND,RECMD,RIMM,NAKLIM*
          ,SESSION,SSPAUSE,XMTLMT)
BAKHOST  HOST INBFRS=7,MAXBFRTU=10,UNITSZ=196,BFRPAD=0,SUBAREA=1,DELAY=0*
          .1,STATMOD=YES,TIMEOUT=30
PATH41   PATH DESTSA=(1),ER0=(1,1),ER1=(1,1),ER2=(1,1)
PATH42   PATH DESTSA=(5,2,3),ER0=(5,2),ER1=(5,3),ER2=(3,4)
          LUDRPOOL NUMTYP1=10
*****
SDLC6    GROUP LNCTL=SDLC,TYPE=NCP,DIAL=YES,REPLYTO=20
*****
SL6      LINE ADDRESS=6,CLOCKNG=EXT,NEWSYNC=NO,DUPLEX=HALF,NRZI=NO,CALL*
          =INOUT,RETRIES=(7,0,0)
SP6      PU ISTATUS=INACTIVE,PUTYPE=2
*****
SDLC5    GROUP LNCTL=SDLC,TYPE=NCP,DIAL=NO,REPLYTO=3,DISCNT=NO,ISTATUS=*
          INACTIVE
*****
SL5      LINE ADDRESS=5,CLOCKNG=EXT,NEWSYNC=NO,DUPLEX=HALF,NRZI=NO,NPAC*
          OLL=YES,RETRIES=(3)
          SERVICE ORDER=(SP5)
SP5      PU ADDR=C2,MAXDATA=261,MAXOUT=3,PUTYPE=2,NPACOLL=YES,VPACING=2*
          ,PACING=1
SU5      LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,NPACOLL=YES
*****
GRNPA    GROUP LNCTL=SDLC,TYPE=NCP,DIAL=NO,DISCNT=NO,VIRTUAL=YES,NPARSC*
          =YES,ISTATUS=INACTIVE
LNNPA    LINE LINEFVT=NPAVFVT
PUNPA    PU PUTYPE=2,PUFVT=NPAPFVT
LUNPA    LU MAXCOLL=7,LUFVT=(NPALFVT,NPALFVT),VPACING=0,LOCADDR=1
*****
***** X25 NPSI INPUT
*        ALLOW 3 VCCPT AND OUFT ENTRIES
TRANSPAC X25.NET CPHINDX=3,OUHINDX=3,DM=YES
*
          X25.VCCPT INDEX=1,MAXPKTL=128,VWINDOW=1,INSLOW=(100,50)
*
          X25.VCCPT INDEX=2,MAXPKTL=128,VWINDOW=2,INSLOW=(100,50)
*
          X25.VCCPT INDEX=3,MAXPKTL=128,VWINDOW=3,INSLOW=(100,50)
*
          X25.OUFT INDEX=1
*
          X25.OUFT INDEX=2,OPTFACL=420707430202
*
          X25.OUFT INDEX=3,OPTFACL=03430102420707430303,USRFILED=12345678*
          90
*****
*
*****

```

```

* FIRST MCH SL0: NO DATE/GATE BUT TRANSPARENT PAD
*****
X25.MCH ADDRESS=0,ANS=CONT,LCGDEF=(0,4),FRMLGTH=131,MWINDOW=2,*
STATION=DTE,TPTIMER=3,TDTIMER=1,NPRETRY=7,NDRTRY=1,LLCL*
IST=(LLC0,LLC2,LLC3,LLC5),LCN0=USED,SPAN=X2501,DBIT=NO,P*
AD=TRANSP,TRAN=EVEN,ITRACE=YES,SPEED=9600,T1TIMER=1
*
X25.LCG LCGN=0
*
*** X25 LINE FOR PSH (PVC) LINE NAME=SL0000 PU=SP0000 LU=SU0000
*
X25.LINE LCN=0,VCCINDX=3,LLC=LLC2,TYPE=P,SPAN=X2501
*
X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2,PACING=2,ISTATUS*
=INACTIVE
X25.LU LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*
* 4 SVC'S: 1 IN, 2 IN/OUT, 1 OUT
*
X25.VC LCN=1,VCCINDX=2,TYPE=S,CALL=IN,OUFINDX=2,SPAN=X2501
X25.VC LCN=(2,3),VCCINDX=3,TYPE=S,CALL=INOUT,OUFINDX=3,SPAN=X2*
501
X25.VC LCN=4,VCCINDX=3,TYPE=S,CALL=IN,OUFINDX=1,SPAN=X2501
*
*****
* SECOND MCH SL1: GATE WITH SUBADDRESSING
*****
X25.MCH ADDRESS=1,ANS=CONT,LCGDEF=((0,3),(1,0)),FRMLGTH=131,MW*
INDOW=3,STATION=DTE,TPTIMER=2,TDTIMER=3,NPRETRY=3,NDRTR*
Y=3,LCN0=USED,PAD=INTEG,TRAN=EVEN,GATE=GENERAL,SUBADDR=Y*
ES,LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5),LLC0=(0,2),LLC2=8,*
LLC3=9,LLC4=(1,4,3,7),LLC5=(6,5),SPAN=X2501,DBIT=NO
*
*
X25.LCG LCGN=0
*
* PVC FOR PCNE: LINK NAME=SL1000 PU=SP1000 LU=SU1000
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC0,SPAN=X2501,MAXDATA=2000
*
***** X25 LINE FOR INN ***THIS SIDE IS SECONDARY****
*
SL1001 X25.LINE LCN=1,VCCINDX=3,MONLINK=YES,DSTNODE=INN,LLC=LLC3,SPAN*
=X2501,TYPE=P
SP1001 X25.PU PUTYPE=4,TGN=2,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE,SPAN=2*
501
*
***** X25 LINE FOR INN ****THIS SIDE IS PRIMARY****
*
SL1002 X25.LINE LCN=2,VCCINDX=3,MONLINK=YES,DSTNODE=INN,LLC=LLC3,SPAN*
=X2501,TYPE=P
SP1002 X25.PU PUTYPE=4,TGN=4,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE,SPAN=2*
501
*
***** X25 LINE FOR BNN QLLC *****
*
SL1003 X25.LINE LCN=3,VCCINDX=3,LLC=LLC3,SPAN=X2501,TYPE=P
SP1003 X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2,PACING=1,SPAN=X2*

```

```

                    501, ISTATUS=INACTIVE
SU1003  X25.LU LOCADDR=2, USSTAB=USSTD3, MODETAB=MODTD3
*
** VC USING SUBADDRESSING TO SELECT THE LLC TYPE *****
*
        X25.LCG LCGN=1
**
        X25.VC LCN=0, VCCINDX=3, OUFINDX=1, CALL=IN, SPAN=X2501, TYPE=SWITC*
        HED
*****
*   THIRD MCH  SL2 : GATE WITH USER DEFINED RELATION BETWEEN
*               FIRST CUD BYTE AND CTCP/LLC
*****
        X25.MCH ADDRESS=2, ANS=CONT, LCGDEF=(0,2), FRMLGTH=131, MWINDOW=3, *
        STATION=DTE, TPTIMER=3.1, TDTIMER=2, NPRETRY=7, NDRETRY=1, LC*
        N0=USED, PAD=INTEG, TRAN=EVEN, GATE=GENERAL, SPAN=X2501, LLCL*
        IST=(LLC0, LLC2, LLC3, LLC4, LLC5), CUD0=(00,02,21,22, NULL,03*
        ,B0,C1,C5,CC,FF), CTCP=(00,80,01,02,85,85,85,80,85,80,85)
*****
*
*   3 CTCP'S FOR GATE.CUD0 SELECTIONS: CTCP0=00, CTCP1=21, CTCP2=22
*               PCNE WILL BE SELECTED BY CUD0=02,C1,CC
*               PAD WILL BE SELECTED BY CUD0=NULL,03,B0,C5,FF
*
*   FOR CALLOUT IF L=7(PAD) THE CALL OUT PKT WILL HAVE A NULL CUD
*   FOR CALLOUT IF L=(PCNE) THE CALL OUT PKT WILL HAVE 02 IN CUD0
*****
        X25.LCG LCGN=0
*
*** PVC FOR PCNE *****
*
SL3000  X25.VC LCN=0, VCCINDX=2, LLC=LLC0, MAXDATA=2000, TYPE=P
*
**      2 SVC'S          *****
*
        X25.VC LCN=(1,2), VCCINDX=3, OUFINDX=1, CALL=INOUT, TYPE=SWITCHED
*****
*   FOURTH MCH  SL3: DATE MCH
*****
*
        X25.MCH ADDRESS=3, ANS=CONT, GATE=DEDICAT, LCGDEF=(0,2), FRMLGTH=1*
        31, MWINDOW=7, STATION=DTE, TPTIMER=3, TDTIMER=1, NPRETRY=7, N*
        DRETRY=1, LLCLIST=(LLC0, LLC2, LLC3, LLC5), LCNO=NOTUSED, DBIT*
        =NO, SPEED=9600, T1TIMER=1, PAD=TRANSP, TRAN=EVEN
*
        X25.LCG LCGN=0
***
*
        X25.VC LCN=(1,2), VCCINDX=2, TYPE=S, CALL=INOUT, OUFINDX=2
*
*****
*   FIFTH MCH  XL11: 7 VC'S FOR FAST CONNECT WITH 2 CTCP'S
*****
*
***
XL11    X25.MCH ADDRESS=4, PUNAME=XP11, LUNAME=(XU11, XU12), ANS=CONT, LCGD*
        EF=(0,7), FRMLGTH=131, MWINDOW=7, STATION=DTE, TPTIMER=3, TDT*
        IMER=1, SPAN=X2501, NPRETRY=7, NDRETRY=3, GATE=GENERAL, LLCLI*

```

```

ST=LLC4,LCN0=NOTUSED,ITRACE=YES,LOGAPPL=(GBGTPLS,GBGTPLT*
),CONNECT=SUBD,SUBD=(0,9,1),CTCP=(0,1,1)
*
X25.LCG LCGN=0
*
X25.VC LCN=(1,7),VCCINDX=3,TYPE=S,CALL=INOUT
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCPO
*
X25.FCG QTY=(5),CTCPNO=(0),SPAN=X2501,MAXDATA=2500,PRFLINE=XL1*
2,PRFPU=XP12,PRFLU=XU12,SUFFIX=1
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCPI
*
X25.FCG QTY=(5),CTCPNO=(1),SPAN=X2501,MAXDATA=2500,PRFLINE=XL2*
2,PRFPU=XP22,PRFLU=XU22,SUFFIX=1
*
*****
X25.END
* GENERATED BY X25NPSI
S25P0A GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
DD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSPW=NO,LNCTL=SDLC,TIME*
R=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,USERID=(5668981*
,BALPBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAV*
XK)
* GENERATED BY X25NPSI
SLO000 LINE SPAN=X2501,IPL=NO,UACB=XA0000
* GENERATED BY X25NPSI
XC0000 SERVICE
* GENERATED BY X25NPSI
SPO000 PU ADDR=01,MAXDATA=265,PACING=2,ISTATUS=INACTIVE,VPACING=2,PUT*
YPE=2,PUDR=NO
* GENERATED BY X25NPSI
SU0000 LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,LUDR=NO
* GENERATED BY X25NPSI
S25P1A GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
DD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSPW=NO,LNCTL=SDLC,TIME*
R=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,USERID=(5668981*
,BALPBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAV*
XK)
* GENERATED BY X25NPSI
SL1000 LINE IPL=NO,SPAN=X2501,UACB=XA1000
* GENERATED BY X25NPSI
XC1000 SERVICE
* GENERATED BY X25NPSI
SP1000 PU ADDR=01,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,MAXDATA=2000,V*
PACING=(2,1)
* GENERATED BY X25NPSI
SU1000 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
SL1001 LINE SPAN=X2501,IPL=NO,MONLINK=YES,UACB=XA1001
* GENERATED BY X25NPSI
XC1001 SERVICE
* GENERATED BY X25NPSI
SP1001 PU ANS=CONT,TGN=2,ISTATUS=INACTIVE,SPAN=2501,PUTYPE=4,PUDR=NO
* GENERATED BY X25NPSI
SL1002 LINE SPAN=X2501,IPL=NO,MONLINK=YES,UACB=XA1002
* GENERATED BY X25NPSI

```

```

XC1002 SERVICE
* GENERATED BY X25NPSI
SP1002 PU ANS=CONT,TGN=4,ISTATUS=INACTIVE,SPAN=2501,PUTYPE=4,PUDR=NO
* GENERATED BY X25NPSI
SL1003 LINE SPAN=X2501,IPL=NO,UACB=XA1003
* GENERATED BY X25NPSI
XC1003 SERVICE
* GENERATED BY X25NPSI
SP1003 PU ADDR=01,MAXDATA=265,PACING=1,ISTATUS=INACTIVE,SPAN=X2501,VP*
ACING=2,PUTYPE=2,PUDR=NO
* GENERATED BY X25NPSI
SU1003 LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,LUDR=NO
* GENERATED BY X25NPSI
S25P2A GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
DD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LNCTL=SDLC,TIME*
R=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,USERID=(5668981*
,BALPBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAV*
XK)
* GENERATED BY X25NPSI
SL2000 LINE IPL=NO,UACB=XA2000
* GENERATED BY X25NPSI
XC2000 SERVICE
* GENERATED BY X25NPSI
SP2000 PU ADDR=01,PACING=1,PUDR=NO,PUTYPE=1,MAXDATA=2000,VPACING=(2,1*
)
* GENERATED BY X25NPSI
SU2000 LU LOCADDR=0,LUDR=NO
* GENERATED BY X25NPSI
S25PG40B GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
DD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LNCTL=SDLC,TIME*
R=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,USERID=(5668981*
,BALFBDT,NORECMS),LOGAPPL=GBGTPLS,XIO=(BALNAVXL,BALNAVXS*
,BALNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
XL120001 LINE IPL=NO,SPAN=X2501,UACB=XAG40000
* GENERATED BY X25NPSI
XCG40000 SERVICE
* GENERATED BY X25NPSI
XP120001 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
PACING=(2,1)
* GENERATED BY X25NPSI
XU120001 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL120002 LINE IPL=NO,SPAN=X2501,UACB=XAG40001
* GENERATED BY X25NPSI
XCG40001 SERVICE
* GENERATED BY X25NPSI
XP120002 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
PACING=(2,1)
* GENERATED BY X25NPSI
XU120002 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL120003 LINE IPL=NO,SPAN=X2501,UACB=XAG40002
* GENERATED BY X25NPSI
XCG40002 SERVICE
* GENERATED BY X25NPSI
XP120003 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*

```

```

                PACING=(2,1)
* GENERATED BY X25NPSI
XU120003 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL120004 LINE IPL=NO,SPAN=X2501,UACB=XAG40003
* GENERATED BY X25NPSI
XCG40003 SERVICE
* GENERATED BY X25NPSI
XP120004 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
                PACING=(2,1)
* GENERATED BY X25NPSI
XU120004 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL120005 LINE IPL=NO,SPAN=X2501,UACB=XAG40004
* GENERATED BY X25NPSI
XCG40004 SERVICE
* GENERATED BY X25NPSI
XP120005 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
                PACING=(2,1)
* GENERATED BY X25NPSI
XU120005 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
S25PG41C GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
                DD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LNCTL=SDLC,TIME*
                R=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,USERID=(5668981*
                ,BALFBDT,NORECMS),LOGAPPL=GBGTPLT,XIO=(BALNAVXL,BALNAVXS*
                ,BALNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
XL220001 LINE IPL=NO,SPAN=X2501,UACB=XAG41000
* GENERATED BY X25NPSI
XCG41000 SERVICE
* GENERATED BY X25NPSI
XP220001 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
                PACING=(2,1)
* GENERATED BY X25NPSI
XU220001 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL220002 LINE IPL=NO,SPAN=X2501,UACB=XAG41001
* GENERATED BY X25NPSI
XCG41001 SERVICE
* GENERATED BY X25NPSI
XP220002 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
                PACING=(2,1)
* GENERATED BY X25NPSI
XU220002 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL220003 LINE IPL=NO,SPAN=X2501,UACB=XAG41002
* GENERATED BY X25NPSI
XCG41002 SERVICE
* GENERATED BY X25NPSI
XP220003 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
                PACING=(2,1)
* GENERATED BY X25NPSI
XU220003 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL220004 LINE IPL=NO,SPAN=X2501,UACB=XAG41003
* GENERATED BY X25NPSI
XCG41003 SERVICE

```

```

* GENERATED BY X25NPSI
XP220004 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
    PACING=(2,1)
* GENERATED BY X25NPSI
XU220004 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
XL220005 LINE IPL=NO,SPAN=X2501,UACB=XAG41004
* GENERATED BY X25NPSI
XCG41004 SERVICE
* GENERATED BY X25NPSI
XP220005 PU ADDR=01,MAXDATA=2500,PACING=1,PUDR=NO,PUTYPE=1,SPAN=X2501,V*
    PACING=(2,1)
* GENERATED BY X25NPSI
XU220005 LU LOCADDR=0,SPAN=X2501,LUDR=NO
* GENERATED BY X25NPSI
S25S3A GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
    ADD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LINEAUT=YES,LN*
    CTL=SDLC,TIMER=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,US*
    ERID=(5668981,BALSBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BA*
    LNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
SL3002 LINE CALL=IN,UACB=XA3002
* GENERATED BY X25NPSI
SP3002 PU PUTYPE=(1,2)
* GENERATED BY X25NPSI
SL3001 LINE CALL=IN,UACB=XA3001
* GENERATED BY X25NPSI
SP3001 PU PUTYPE=(1,2)
* GENERATED BY X25NPSI
S25S2B GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
    ADD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LINEAUT=YES,LN*
    CTL=SDLC,TIMER=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,US*
    ERID=(5668981,BALSBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BA*
    LNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
SL2002 LINE CALL=INOUT,UACB=XA2002
* GENERATED BY X25NPSI
SP2002 PU PUTYPE=(1,2)
* GENERATED BY X25NPSI
SL2001 LINE CALL=INOUT,UACB=XA2001
* GENERATED BY X25NPSI
SP2001 PU PUTYPE=(1,2)
* GENERATED BY X25NPSI
S25S1B GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
    ADD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LINEAUT=YES,LN*
    CTL=SDLC,TIMER=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,US*
    ERID=(5668981,BALSBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BA*
    LNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
SL1100 LINE CALL=IN,SPAN=X2501,UACB=XA1100
* GENERATED BY X25NPSI
SP1100 PU SPAN=X2501,PUTYPE=(1,2)
* GENERATED BY X25NPSI
S25S0B GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
    ADD=NONE,COMPTAD=NO,COMPOWN=NO,COMPSWP=NO,LINEAUT=YES,LN*
    CTL=SDLC,TIMER=(BALNATER,,BALNATST,BALNATLS),TYPE=NCP,US*
    ERID=(5668981,BALSBDT,NORECMS),XIO=(BALNAVXL,BALNAVXS,BA*

```

```

                                LNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
SL0004  LINE CALL=IN,SPAN=X2501,UACB=XA0004
* GENERATED BY X25NPSI
SP0004  PU SPAN=X2501,PUTYPE=(1,2)
* GENERATED BY X25NPSI
SL0003  LINE CALL=INOUT,SPAN=X2501,UACB=XA0003
* GENERATED BY X25NPSI
SP0003  PU SPAN=X2501,PUTYPE=(1,2)
* GENERATED BY X25NPSI
SL0002  LINE CALL=INOUT,SPAN=X2501,UACB=XA0002
* GENERATED BY X25NPSI
SP0002  PU SPAN=X2501,PUTYPE=(1,2)
* GENERATED BY X25NPSI
SL0001  LINE CALL=IN,SPAN=X2501,UACB=XA0001
* GENERATED BY X25NPSI
SP0001  PU SPAN=X2501,PUTYPE=(1,2)
* GENERATED BY X25NPSI
SNET11  GROUP DIAL=NO,BERPROC=BALNUMBER,COMPACB=YES,COMPTAD=YES,COMPOWN*
          =YES,COMPSWP=YES,LEVEL2=BALNAML2,LEVEL3=BALNAML3,LEVEL5=*
          NCP,LNCTL=SDLC,TIMER=(BALLAP4,,BALLAP4,BALLAP4),TYPE=NCP*
          ,USERID=(5668981,BALMBDT,NORECMS,P),XIO=(BALNAMXL,BALNAM*
          XS,BALNAMXI,BALNAMXK)
* GENERATED BY X25NPSI
SL0      LINE ADDRESS=(0,FULL),SPAN=X2501,UACB=(X25A0X,X25A0R)
* GENERATED BY X25NPSI
XC0      SERVICE
* GENERATED BY X25NPSI
SP0      PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,PUTYPE=1
* GENERATED BY X25NPSI
SU0      LU LOCADDR=0,SPAN=X2501,ISTATUS=INACTIVE
* GENERATED BY X25NPSI
SNET12  GROUP DIAL=NO,BERPROC=BALNUMBER,COMPACB=YES,COMPTAD=YES,COMPOWN*
          =YES,COMPSWP=YES,LEVEL2=BALNAML2,LEVEL3=BALNAML3,LEVEL5=*
          NCP,LNCTL=SDLC,TIMER=(BALLAP4,,BALLAP4,BALLAP4),TYPE=NCP*
          ,USERID=(5668981,BALNBDT,NORECMS,P),XIO=(BALNAMXL,BALNAM*
          XS,BALNAMXI,BALNAMXK)
* GENERATED BY X25NPSI
SL1      LINE ADDRESS=(1,FULL),SPAN=X2501,UACB=(X25A1X,X25A1R)
* GENERATED BY X25NPSI
XC1      SERVICE
* GENERATED BY X25NPSI
SP1      PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,PUTYPE=1
* GENERATED BY X25NPSI
SU1      LU LOCADDR=0,SPAN=X2501,ISTATUS=ACTIVE
* GENERATED BY X25NPSI
SL2      LINE ADDRESS=(2,FULL),SPAN=X2501,UACB=(X25A2X,X25A2R)
* GENERATED BY X25NPSI
XC2      SERVICE
* GENERATED BY X25NPSI
SP2      PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,PUTYPE=1
* GENERATED BY X25NPSI
SU2      LU LOCADDR=0,SPAN=X2501,ISTATUS=ACTIVE
* GENERATED BY X25NPSI
SU2L1    LU LOCADDR=1,SPAN=X2501,ISTATUS=ACTIVE
* GENERATED BY X25NPSI
SU2L2    LU LOCADDR=2,SPAN=X2501,ISTATUS=ACTIVE
* GENERATED BY X25NPSI

```

```
SL3      LINE ADDRESS=(3,FULL),UACB=(X25A3X,X25A3R)
* GENERATED BY X25NPSI
XC3      SERVICE
* GENERATED BY X25NPSI
SP3      PU ADDR=01,ANS=CONT,MAXDATA=261,PUTYPE=1
* GENERATED BY X25NPSI
SU3      LU LOCADDR=0,ISTATUS=ACTIVE
* GENERATED BY X25NPSI
XL11     LINE ADDRESS=(4,FULL),SPAN=X2501,UACB=(X25A4X,X25A4R)
* GENERATED BY X25NPSI
XC4      SERVICE
* GENERATED BY X25NPSI
XP11     PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,PUTYPE=1
* GENERATED BY X25NPSI
XU11     LU LOCADDR=0,LOGAPPL=GBGTPLS,SPAN=X2501,ISTATUS=ACTIVE
* GENERATED BY X25NPSI
XU12     LU LOCADDR=1,LOGAPPL=GBGTPLT,SPAN=X2501,ISTATUS=ACTIVE
*****
*****
GENEND INIT=BALINIMD,TMRTICK=BALTICK,UGLOBAL=BALNMGOP
```

## Main Switched Major Node

```

*****
*
* SWITCHED MAJOR NODE TO BE USED IN CORRELATION WITH SA314G GENERATION
*
*****
**
SWS25   VBUILD MAXGRP=20,
          MAXNO=20,
          TYPE=SWNET
**
*****
*   ENTRIES FOR PCNE TO PCNE COMMUNICATION
*   (BACK TO BACK)
*
*****
*
PCNEPI  PU   ADDR=01,      PCNE TO PCNE INBOUND
          IDBLK=003,
          IDNUM=22223,    ZZZZ OF OUT CALLER +1
          DISCNT=YES,    DISCONTACT/ABCONN ON LAST DACTLU
          MAXOUT=1,      TO LET LOGON MSG IN AFTER ACTLU
          MAXDATA=1024,  SEGMENTING NOT SUPPORTED
          PACING=1,      PACING=1 IS REQUIRED
          VPACING=2,
          PUTYPE=1,
          SSCPFM=USSSCS
PCNELI  LU   LOCADDR=0    0 IS REQUIRED FOR NON SNA X25 DEVICES
**
PCNEPO  PU   ADDR=01,      PCNE TO PCNE OUTBOUND
          IDBLK=003,
          IDNUM=22222,    EQUAL ZZZZ
          MAXPATH=6,
          DISCNT=YES,    DISCONTACT/ABCONN ON LAST DACTLU
          MAXDATA=1024,  SEGMENTING NOT SUPPORTED
          PACING=1,      PACING=1 IS REQUIRED
          VPACING=2,
          PUTYPE=1,
          SSCPFM=USSSCS
PCNEP1  PATH DIALNO=10604016500201*22222,  ZZZZ=22222=IDNUM
          GRPNM=S25S0B,GID=2,PID=20        S25S0B=GROUP OF SWITCHED
*                                           VC'S ON INVOLVED MCH IN GENERATION
PCNEP3  PATH DIALNO=10604016400201*22222,
          GRPNM=S25S0B,GID=2,PID=22
PCNELO  LU   LOCADDR=0    0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*
* ENTRY FOR INCOMING AND OUTGOING CALLS FOR PADX ON MCH0
*
*****
*
*****
*
*   DEFAULT IDNUM VALUES FOR INCOMING CALLS ARE BUILT AS FOLLOW:
*   IDNUM=02012
*   ..012 FOR 9TH SVC FROM LAST SVC (9*2)=12(HEX)
*   02... COME FROM X25.IDNUMH IN NPSI BUILD MACRO
*

```

```

*****
PADXPO  PU  ADDR=01,
          IDBLK=003,
          IDNUM=02012,  FOR 9TH SVC FROM LAST SVC (9*2)=12
          MAXPATH=6,
          DISCNT=YES,   DISCONTACT/ABCONN ON LAST DACTLU
          MAXDATA=1024, SEGMENTING NOT SUPPORTED
          PACING=1,     PACING=1 IS REQUIRED
          VPACING=2,
          00000180
          PUTYPE=1,
          SSCPFM=USSSCS
PADP1   PATH DIALNO=10605023650101*02012, ZZZZ=02012=IDNUM
          GRPNM=S25S0B,GID=2,PID=50
PADXLO  LU  LOCADDR=0      0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*
* ENTRY FOR INCOMING AND OUTGOING CALLS FOR BNN QLLC/PSH *
*
*****
*
PSHPI   PU  ADDR=01,
          IDBLK=017,
          IDNUM=41264,  IDNUM OF REMOTE PU
          MAXPATH=6,
          DISCNT=YES,   DISCONTACT/ABCONN ON LAST DACTLU
          MAXDATA=265,  SEGMENTING SUPPORTED
          PACING=3,
          VPACING=3,
          PUTYPE=2,
          SSCPFM=USSSCS
          OUTGOING CALL FOR PSH
PSHP1   PATH DIALNO=10604016420201,  L=2 FOR PSH
          GRPNM=S25S0B,GID=2,PID=30  S25S0B=GROUP OF SWITCHED
*
          VC'S ON INVOLVED MCH IN GENERATION
PSHP2   PATH DIALNO=10604016430201,  L=3 FOR BNN QLLC
          GRPNM=S25S0B,GID=2,PID=31
PSHLI   LU  LOCADDR=2,MODETAB=MODTD3
*
*****
*
* ENTRY FOR SUBADDRESSING ON MCH1 FOR NON SNA VIRTUAL CIRCUITS *
*
*****
*
SAPI    PU  ADDR=01,      GATE INBOUND
          IDBLK=003,
          IDNUM=0200A,  FOR 5TH SVC FROM LAST SVC (5*2)=A
          DISCNT=YES,   DISCONTACT/ABCONN ON LAST DACTLU
          MAXDATA=2000, SEGMENTING NOT SUPPORTED
          PACING=1,     PACING=1 IS REQUIRED
          VPACING=2,
          PUTYPE=1,MAXOUT=6, TO QUEUE DATA UNTIL SDT
          SSCPFM=USSSCS
SALI    LU  LOCADDR=0      0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*

```

```

* ENTRIES FOR GATE AND PADI *
* FOR GATE,CALLIN IS ALWAYS SIMULATED TO VTAM. PATH NOT NEEDED *
* *
*****
*
GATEPI  PU  ADDR=01,          PADI INCALL OR 1ST GATE VC USED *
          IDBLK=003,          (IN OR OUT CALL) *
          IDNUM=02008,        FOR 4TH SVC FROM LAST SVC (4*2)=8 *
          MAXOUT=6,          TO QUEUE INBOUND MSG COMING BEFORE SDT *
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU *
          MAXDATA=2000,      SEGMENTING NOT SUPPORTED *
          PACING=1,          PACING=1 IS REQUIRED *
          VPACING=2, *
          PUTYPE=1, *
          SSCPFM=USSSCS *
PADILI  LU  LOCADDR=0      0 IS REQUIRED FOR NON SNA X25 DEVICES *
*
**
*
GATEPO  PU  ADDR=01,          2ND GATE VC USED(IN OR OUT CALL) *
          IDBLK=003, *
          IDNUM=02006,        FOR 3RD SVC FROM LAST SVC (3*2)=6 *
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU *
          MAXDATA=2000,      SEGMENTING NOT SUPPORTED *
          PACING=1,          PACING=1 IS REQUIRED *
          VPACING=2, *
          PUTYPE=1, *
          SSCPFM=USSSCS *
GATELO  LU  LOCADDR=0      0 IS REQUIRED FOR NON SNA X25 DEVICES *
*
*****
* *
* ENTRIES FOR USER DEFINED CUDO (CALLOUT) *
* *
*****
*
UDCUDP1 PU  ADDR=01,          TO BE USED FOR PCNE *
          IDBLK=003, *
          MAXPATH=4, *
          IDNUM=55544, *
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU *
          MAXDATA=1024,      SEGMENTING NOT SUPPORTED *
          PACING=1,          PACING=1 IS REQUIRED *
          VPACING=2, *
          PUTYPE=1, *
          SSCPFM=USSSCS USSTAB=USSTABZ *
UDCUDH1 PATH DIALNO=106050236.0101*55544, . MEANS USER DEFINED CUDO *
          GRPNM=$25S2B,GID=2,PID=96 *
UDCUDU1 LU  LOCADDR=0      0 IS REQUIRED FOR NON SNA X25 DEVICES *
*
UDCUDP2 PU  ADDR=01,          TO BE USED FOR PCNE *
          IDBLK=003, *
          MAXPATH=4, *
          IDNUM=55555, *
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU *
          MAXDATA=1024,      SEGMENTING NOT SUPPORTED *
          PACING=1,          PACING=1 IS REQUIRED *
          VPACING=2, *

```

```

                PUTYPE=1,
                SSCPFM=USSSCS USSTAB=USSTABZ
UDCUDH2 PATH DIALNO=106050236:0101*55555, : MEANS USER DEFINED CUD0 *
                GRPNM=S25S2B,GID=2,PID=97 AND ZZZZ+1 IN CUD1,2,3.
UDCUDU2 LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*
* ENTRIES FOR OUTGOING CALLS FOR PADI ON MCH2
*
*****
*
*
PADIPO PU ADDR=01,
                IDBLK=003,
                IDNUM=02005, FOR 3RD SVC FROM LAST (3*2)-1
                MAXPATH=6,
                DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU
                MAXDATA=1024, SEGMENTING NOT SUPPORTED
                PACING=1, PACING=1 IS REQUIRED
                VPACING=2,
                PUTYPE=1,
                SSCPFM=USSSCS
* ZZZZ REQUIRED FOR OUT CALLS
PADP2 PATH DIALNO=10605023650201*02005,
                GRPNM=S25S2B,GID=2,PID=60
PADILO LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*
* ENTRIES FOR DATE VC'S, TO BE USED FOR PCNE OR PADX
* FOR DATE, CALLIN IS ALWAYS SIMULATED TO VTAM. PATH NOT NEEDED
*****
*
DATEPI PU ADDR=01, 1ST DATE VC USED (IN OR OUT CALL)
                IDBLK=003,
                IDNUM=02004, FOR 2ND SVC FROM LAST SVC (2*2)=4
                DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU
                MAXDATA=1024, SEGMENTING NOT SUPPORTED
                PACING=1, PACING=1 IS REQUIRED
                VPACING=2,
                PUTYPE=1,
                SSCPFM=USSSCS
DATELI LU LOCADDR=0
*
DATEPO PU ADDR=01, 2ND DATE VC USED (IN OR OUT CALL)
                IDBLK=003,
                IDNUM=02002, FOR 1ST SVC FROM LAST SVC (1*2)=2
                DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU
                MAXDATA=1024, SEGMENTING NOT SUPPORTED
                PACING=1, PACING=1 IS REQUIRED
                VPACING=2,
                PUTYPE=1,
                SSCPFM=USSSCS
DATELO LU LOCADDR=0

```

---

## Version 3 Release 2 (Example B)

This example consists of six sections:

- NCP and X.25 NPSI generation input including JCL

This section contains examples of X.25 NPSI features, such as different types of MCHS and virtual circuits.

- LKEDT step

This section contains an example illustrating how the LKEDT step makes for easier maintenance of X.25 NPSI if relinking of modules is all that is required.

- NCP input produced by NDF (X.25 NPSI)

This section contains examples of NCP statements produced by the X.25 NPSI part of generation for input to VTAM. Also, examples are included of the default X.25 NPSI naming conventions and of the order of the statements generated for SVCs.

- Main switched major node

This example illustrates some of the IDNUM usages that go with the X.25 NPSI generation.

- Switched major node for SNA type 2.1 and SVCSC

This section contains examples of SMN entries to be used for SNA type 2.1 and SVCSC.

- MODETAB for password protection and LU type 6.2

This section contains examples of mode tables for password protection and LU type 6.2.

**Note:** This is not meant to be a production example.

## NCP and X.25 NPSI Generation Input Including JCL

```

//S1 EXEC PGM=IEHPRGM
//* CLEAN UP PREALLOCATED PDS USED TO SAVE CONTROL BLOCK OBJECT CODE
//SYSPRINT DD SYSOUT=A
//DD1 DD VOL=SER=MVSWK1,UNIT=3350,DISP=SHR
//SYSIN DD *
    SCRATCH DSN=X25.NCPV32.SA324GN,VOL=3350=MVSWK1,MEMBER=ICNTABL1
    SCRATCH DSN=X25.NCPV32.SA324GN,VOL=3350=MVSWK1,MEMBER=ICNTABL2
    SCRATCH DSN=X25.NCPV32.SA324GN,VOL=3350=MVSWK1,MEMBER=SA324LE
/*
//S2 EXEC PGM=IEBCOPY,ADDRSPC=REAL,REGION=128K
//* COMPRESS THE PREALLOCATED PDS
//SYSPRINT DD SYSOUT=A
//DISK DD DISP=SHR,DSN=X25.NCPV32.SA324GN
//SYSUT3 DD UNIT=SYSDA,SPACE=(CYL,(10,1),,CONTIG)
//SYSUT4 DD UNIT=SYSDA,SPACE=(CYL,(10,1),,CONTIG)
//SYSIN DD *
    COPY OUTDD=DISK,INDD=DISK
/*
//STEP1 EXEC PGM=ICNRTNDF,REGION=6000K,PARM='LINECNT=45'
//STEPLIB DD DSN=SYS1.SSPLIB,DISP=SHR
// DD DSN=SYS1.NPSILNK,DISP=SHR
//GENDECK DD *
*****
*
*          EXAMPLE OF GENERATION OF NPSI WITHIN NCP
*
* - MCH7 (SL7)          PVC 0 FOR PAD FOR USE WITH TSO
*                      SVC 1 TO 7 FOR PCNE,PSH,PADI,BNNQLLC,INNQLLC
*                      2 SVC RESERVED FOR INN SVC(WITH 2 INN STATIONS)*
* - MCH0 (SL0)          PVC 0 FOR PSH
*                      SVC1,2,3,4 FOR PCNE,PSH,PADX,BNNQLLC
*                      1/IN 2,3/INOUT 4/OUT
*
* - MCH1 (SL1)          PVC 0 FOR PCNE
*                      PVC 1 FOR INN (WE ARE SECONDARY)
*                      PVC 2 FOR INN (WE ARE PRIMARY)
*                      PVC 3 FOR BNN QLLC
*                      PVC 4 FOR BNN QLLC PU T2.1
*                      PVC 5 FOR BNN QLLC PU T2.1 & LU6.2
*                      SVC 100 FOR GATE SUBADDRESSING(ANY LLC SELECTED)
*
* - MCH2 (SL2)          PVC 0 FOR PCNE
*                      SVC 1,2 FOR PCNE,PSH,PADI,BNNQLLC,GATE
*                      1/2 INOUT NULL CUD0 WILL SELECT PAD
*
* - MCH3 (SL3)          SVC 1,2 FOR PCNE,PSH,PADX,BNNQLLC (DATE)
*
* - MCH4 (SL4)          SVC 1,2,3,4,5,6,7 FOR FAST CONNECT
*                      CONNECT=SUBD: CTCP SELECTED VIA SUBADDRESSING*
*****
*
**
***  STAGE 1 INPUT
**
          OPTIONS USERGEN=X25NPSI,          *INDICATE NEO NAME          X

```

```

NEWDEFN=(YES,,SUPP)      *INCLUDE NPSI STMTS IN VTAMLST
BAKLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=1
OTHLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=16
REMTAM PCCU DUMPDS=DUMPX25,SUBAREA=2
*
BAKBUILD BUILD NPA=YES, X
VERSION=V5R2, * NCP VERSION X
LOADLIB=LNCP11, X
TYPGEN=NCP, X
MODEL=3745, X
USGTIER=3, * NCP USGTIER X
X25.USGTIER=3, * NPSI USGTIER X
NETID=NETID1, * NETWORK ID X
MAXSUBA=63, X
SUBAREA=4, X
BFRS=124, * BEST FOR NPSI PERFORMANCE X
LTRACE=4, * ALLOWS LINE TRACE ON TWO MCH'S X
OLT=YES, X
DR3270=NO, X
BRANCH=8000, X
TRACE=(YES,100), * 100 ENTRIES IN ADDRESS TRACE TBL X
NEWNAME=SA324GN, XX
X25.PREFIX=S, * ALL NAMES START WITH S X
X25.IDNUMH=02, * X25.IDNUMH MUST MATCH WITH SWITCHX
TYPYS=0S, * MAJOR NODE IDS.(2FIRST DIGITS) X
X25.SNAP=YES, * OPTIONAL DIAGNOSIS SNAP INCLUDED X
X25.MCHCNT=6, * NUMBER OF PHYSICAL LINKS X
X25.MAXPIU=64K
BAKSYSC SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCOND,RECMD, X
RIMM,NAKLIM,SESSION,SSPAUSE,XMTLMT)
BAKHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=1, X
DELAY=0.1,TIMEOUT=30
OTHHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=16, X
DELAY=0.1,TIMEOUT=30
REMHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=2, X
DELAY=0.1,TIMEOUT=30
PATH14 PATH DESTSA=(1),ER0=(1,1),ER1=(1,1),ER2=(1,1) TO LOCAL
PATH116 PATH DESTSA=(16),ER0=(16,1),ER1=(16,1),ER2=(16,1) TO OTHLOCAL
PATH42 PATH DESTSA=(5,2,3),ER0=(5,2),ER1=(5,3),ER2=(3,4)
LUDRPOOL NUMTYP1=10, * FOR NON SNA CALLS X
NUMTYP2=10, *FOR QLLC OR PSH CALLS X
NUMILU=2 *FOR LU6.2 SVC'S
*****
EJECT * AT LEAST ONE SDLC LINE
SDLC6 GROUP LNCTL=SDLC, * MUST BE DEFINED X
TYPE=NCP, X
DIAL=YES, X
REPLYTO=20
*****
SL6 LINE ADDRESS=6, * SDLC LINE FOR NIA FRONTAL X
CLOCKNG=EXT, * X
NEWSYNC=NO, X
DUPLEX=HALF, X
NRZI=NO, X
CALL=INOUT, X
RETRIES=(7,0,0)
SP6 PU ISTATUS=INACTIVE, X

```

```

PUTYPE=2
*****
EJECT
SDLC5  GROUP LNCTL=SDLC,           X
        TYPE=NCP,                 X
        DIAL=NO,                  X
        REPLYTO=3,                X
        DISCNT=NO,                X
        ISTATUS=INACTIVE
*****
SL5    LINE ADDRESS=5,             * LEASED SDLC MULTIPOINT LINE X
        CLOCKNG=EXT,              X
        NEWSYNC=NO,               X
        DUPLEX=HALF,              X
        NRZI=NO,NPACOLL=YES,      X
        RETRIES=(3)
        SERVICE ORDER=(SP5)
SP5    PU  ADDR=C2,               * ADDRESS 3274           X
        MAXDATA=261,              X
        MAXOUT=3,                 X
        PUTYPE=2,NPACOLL=YES,     X
        VPACING=2,                X
        PACING=1
SU5    LU  LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,NPACOLL=YES
EJECT
*****
GRNPA  GROUP LNCTL=SDLC,           * FOR NPM RECORDING    X
        TYPE=NCP,                 X
        DIAL=NO,                  X
        DISCNT=NO,                X
        VIRTUAL=YES,              X
        NPARSC=YES,               X
        ISTATUS=INACTIVE
LNNPA  LINE LINEFVT=NPAVFVT
PUNPA  PU  PUTYPE=2,PUFVT=NPAPFVT
LUNPA  LU  MAXCOLL=7,LUFVT=(NPALFVT,NPALFVT), X
        VPACING=0,LOCADDR=1
*****
EJECT
***** X25 NPSI INPUT
* ALLOW 3 VCCPT AND OUFU ENTRIES
TRANSPAC X25.NET CPHINDX=3,OUHINDX=3,DM=YES
*
      X25.VCCPT INDEX=1,           X
        MAXPKTL=128,              X
        VWINDOW=1,                * PACKET LEVEL WINDOW  X
        INSLOW=(100,50)           * TO PREVENT SLOWDOWN
*
      X25.VCCPT INDEX=2,           X
        MAXPKTL=128,              X
        VWINDOW=2,                X
        INSLOW=(100,50)           * TO PREVENT SLOWDOWN
*
      X25.VCCPT INDEX=3,           X
        MAXPKTL=128,              X
        VWINDOW=3,                X
        INSLOW=(100,50)           * TO PREVENT SLOWDOWN
*

```

```

X25.OUFT INDEX=1
*
X25.OUFT INDEX=2,          * PKT SIZE=128,VWINDOW=2          X
OPTFACL=420707430202
*
X25.OUFT INDEX=3,          * PKT SIZE=128,VWINDOW=3, AND          X
OPTFACL=03430102420707430303, * REVERSECHARGING REQUEST X
USRFILD=1234567890
*****
*
EJECT
*****
* MCH SL7: NO DATE/GATE BUT SVC INN
*****
X25.MCH ADDRESS=7,          *CONTROLLER LINE ADDR          X
ANS=CONT,                  X
LCGDEF=(0,7),              *MAX LCN IS 7 ON LCGN 0      X
FRMLGTH=131,              X
MWINDOW=7,                *LAP WINDOW                   X
STATION=DTE,              X
TPTIMER=3,                *LAPB RECOVERY PARAMETERS    X
TDTIMER=1,                *                               X
NPRETRY=7,                *                               X
NDRETRY=1,                *                               X
LLCLIST=(LLC0,LLC2,LLC3,LLC5), X
LCN0=USED,                X
SPAN=X2501,               *FOR NETVIEW                 X
DBIT=NO,                  *NO DBIT SUPPORT ON THIS MCH X
PAD=INTEG,TRAN=EVEN,      *ALLOW INTEGRATED PAD       X
PWPROT=YES,               *PASSWORD PROTECTION ON IPAD X
ITRACE=NO,                * LAP INTERNAL TRACE INACTIVE X
SPEED=9600,               *REAL MCH SPEED              X
TITIMER=1,                *REAL T1 OF THE DCE          X
SVCINN=2,                 *NB OF SIMULT.SVC INN CONNECTIONX
SHM=YES,                  *SHORT HOLD MODE ON SVCSC'S  X
SDRTCNT=3,                *NB OF RETRIES               X
SDRTIME=10                *TIMER BETWEEN CALL RETRIES
*
X25.LCG LCGN=0            LOGICAL CHANNEL GROUP
*
* PVC FOR INTEGRATED PAD FOR USE WITH TSO AND WITH PASSWORD PROTECTION
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC5,SPAN=X2501,          *
MAXDATA=2000,          *SEGMENTING NOT SUPPORTED FOR PAD *
SSCPFM=USSNTO,        *LOGON ENDS WITH CRLF          X
MODETAB=MODTWX,       *MODETAB FOR LU1 3767/TWX      X
DLOGMOD=TWXCONT,     *FLIPFLOP OR CONTENTION PROT   X
TERM=TWX,             *MUST BE DEFINED FOR TWX/3101  X
USSTAB=USSTWX        *SPECIAL USSTAB FOR TWX/3101
*
*** 2 LINE'S FOR SUBAREA DIAL(2 SVC'S RESERVED FOR SVC INN)
*
X25.LINE DSTNODE=INN,          *DEFINE A SWITCHED INN VC      X
TYPE=S
X25.PU PUTYPE=4,ISTATUS=INACTIVE
*
X25.LINE DSTNODE=INN,          *DEFINE A SWITCHED INN VC      X

```

```

TYPE=S
X25.PU PUTYPE=4, ISTATUS=INACTIVE
*
*
* DEFINE 7 SVC TO BE SHARED BETWEEN INN SVC'S (MAX OF 2 AT A TIME)
* AND BNN SVC (MAX OF 5 AT A TIME)
*
X25.VC LCN=(1,7), VCCINDX=3, TYPE=S, CALL=INOUT, OUFINDX=1, X
SPAN=X2501
*
EJECT
*****
* MCH SLO: NO DATE/GATE BUT TRANSPARENT PAD
*****
X25.MCH ADDRESS=0, *CONTROLLER LINE ADDR X
ANS=CONT, X
LCGDEF=(0,4), *MAX LCN IS 4 ON LCGN 0 X
FRMLGTH=131, X
MWINDOW=2, *LAP WINDOW X
STATION=DTE, *FOR OWNERSHIP RECOVERY VIA X
XMONLNK=YES, *INN SVC (INITIAL ACT IMPOSSIBLE) X
TPTIMER=3, *LAPB RECOVERY PARAMETERS X
TDTIMER=1, * X
NPRETRY=7, * X
NDRETRY=1, * X
LLCLIST=(LLC0, LLC2, LLC3, LLC5), X
LCN0=USED, X
SPAN=X2501, *FOR NETVIEW X
DBIT=NO, *NO DBIT SUPPORT ON THIS MCH X
PAD=TRANSP, TRAN=EVEN, *ALLOW TRANSPARENT PAD X
ITRACE=YES, *LAP INTERNAL TRACE ACTIVE X
SPEED=9600, *REAL MCH SPEED X
TITIMER=1 *REAL T1 OF THE DCE X
*
X25.LCG LCGN=0
*
*** X25 LINE FOR PSH (PVC) LINE NAME=SLO000 PU=SP0000 LU=SU0000
*
X25.LINE LCN=0, VCCINDX=3, LLC=LLC2, TYPE=P, SPAN=X2501
*
X25.PU PUTYPE=2, ADDR=01, MAXDATA=265, VPACING=2, X
PACING=2, ISTATUS=INACTIVE
X25.LU LOCADDR=2, USSTAB=USSTD3, MODETAB=MODTD3
*
* 4 SVC'S: 1 IN, 2 IN/OUT, 1 OUT
*
X25.VC LCN=1, VCCINDX=2, TYPE=S, CALL=IN, OUFINDX=2, SPAN=X2501
X25.VC LCN=(2,3), VCCINDX=3, TYPE=S, CALL=INOUT, OUFINDX=3, X
SPAN=X2501
X25.VC LCN=4, VCCINDX=3, TYPE=S, CALL=OUT, OUFINDX=1, SPAN=X2501
*
*****
* MCH SL1: GATE WITH SUBADDRESSING & PU T2.1
*****
X25.MCH ADDRESS=1, X
ANS=CONT, *MAX LCN IS 5 ON LCGN 0 X
LCGDEF=((0,5), (1,0)), *MAX LCN IS 0 ON LCGN 1 X
FRMLGTH=131, X

```

```

MWINDOW=3,          LAP WINDOW          X
STATION=DTE,          X
XMONLNK=YES,          *FOR EVENTUAL ACT VIA INN PVC  X
SHUTD=NOINVCLR,      *FOR IPAD CLSDST PASS          X
TPTIMER=2,           *LAPB RECOVERY PARAMETERS      X
TDTIMER=3,           X
NPRETRY=3,           X
NDRETRY=3,           X
LCN0=USED,           X
PAD=INTEG,TRAN=EVEN, *ALLOW INTEGRATED PAD ON MCH  X
GATE=GENERAL,SUBADDR=YES, X
LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5), X
LLC0=(0,2),LLC2=8,LLC3=9, *SUBADDRESSING DIGITS USED TOX
LLC4=(1,4,3,7),LLC5=(6,5), *SELECT THE 5 LLC'S          X
SPAN=X2501,          *USE DEFAULT TITIMER= 1SEC     X
DBIT=NO              *USE DEFAULT SPEED=9600BPS
*
*
X25.LCG LCGN=0          *FIRST LOGICAL CHANNEL GROUP
*
* PVC FOR PCNE: LINK NAME=SL1000 PU=SP1000 LU=SU1000
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC0,SPAN=X2501, *
MAXDATA=2000          *SEGMENTING NOT SUPPORTED FOR PCNE
*
***** X25 LINE FOR INN ***THIS SIDE IS SECONDARY****
*
SL1001 X25.LINE LCN=1,          X
VCCINDX=3,           X
MONLINK=YES,         X
DSTNODE=INN,         *MANDATORY FOR INN          X
LLC=LLC3,            X
SPAN=X2501,          X
TYPE=P
SP1001 X25.PU PUTYPE=4,TGN=2,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE, X
SPAN=2501,
*
***** X25 LINE FOR INN ***THIS SIDE IS PRIMARY****
*
SL1002 X25.LINE LCN=2,          X
VCCINDX=3,           X
MONLINK=YES,         X
DSTNODE=INN,         *MANDATORY FOR INN          X
LLC=LLC3,            X
SPAN=X2501,          X
TYPE=P
SP1002 X25.PU PUTYPE=4,TGN=4,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE, X
SPAN=2501,
*
***** X25 LINE FOR BNN QLLC *****
*
SL1003 X25.LINE LCN=3,          X
VCCINDX=3,           X
LLC=LLC3,            *DSTNODE=BNN DEFAULTED      X
SPAN=X2501,          X
TYPE=P
SP1003 X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2, X

```

```

PACING=1,SPAN=X2501,ISTATUS=INACTIVE
SU1003 X25.LU LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*
*      *** PVC 4 FOR PU2.1 ON BNN QLLC ***
*      ***           WITH DEPENDENT LU'S ***
*
X25.LINE LCN=4, X
VCCINDX=3, X
LLC=LLC3, * DSTNODE=BNN DEFAULTED X
SPAN=X2501, X
TYPE=P
*
X25.PU PUTYPE=2,ADDR=01,VPACING=2,XID=YES,DATMODE=HALF, X
PACING=1,SPAN=X2501,ISTATUS=INACTIVE,ANS=CONT
*
X25.LU LOCADDR=2
*
*****
*
*      *** PVC 5 FOR PU2.1 ON BNN QLLC ***
*      ***           WITH INDEPENDENT LU'S ***
*
X25.LINE LCN=5, X
VCCINDX=3, X
LLC=LLC3, * DSTNODE=BNN DEFAULTED X
SPAN=X2501, X
TYPE=P
*
X25.PU PUTYPE=2,ADDR=01,VPACING=2,XID=YES,DATMODE=HALF, X
PACING=1,SPAN=X2501,ISTATUS=INACTIVE,ANS=CONT
*
X25.LU LOCADDR=0, * FOR INDEPENDENT LU'S X
MODETAB=LENMODE
*
*
** VC USING SUBADDRESSING TO SELECT THE LLC TYPE *****
*
X25.LCG LCGN=1 *SECOND LOGICAL CHANNEL GROUP
**
X25.VC LCN=0, *SVC FOR SUBADDRESSING X
VCCINDX=3, X
OUFINDX=1, X
CALL=IN, *USED FOR CALLIN ONLY X
SPAN=X2501, X
TYPE=SWITCHED
*****
* MCH SL2 : GATE WITH USER DEFINED RELATION BETWEEN
* FIRST CUD BYTE AND CTCP/LLC
*****
X25.MCH ADDRESS=2, X
ANS=CONT, X
LCGDEF=(0,2), X
FRMLGTH=131, X
MWINDOW=3, LAP WINDOW X
STATION=DTE, X
TPTIMER=3.1, X
TDTIMER=2, X

```

```

      NPRETRY=7, X
      NDRETRY=1, X
      LCN0=USED, X
      PAD=INTEG,TRAN=EVEN, X
      GATE=GENERAL, X
      SPAN=X2501, X
      LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5), X
      CUD0=(00,02,21,22,NULL,03,B0,C1,C5,CC,FF), X
      CTCP=(00,80,01,02,85,85,85,80,85,80,85)
*****
*
* 3 CTCP'S FOR GATE.CUD0 SELECTIONS:CTCP0=00,CTCP1=21,CTCP2=22
* PCNE WILL BE SELECTED BY CUD0=02,C1,CC
* PAD WILL BE SELECTED BY CUD0=NULL,03,B0,C5,FF
*
* FOR CALLOUT IF L=7(PAD) THE CALL OUT PKT WILL HAVE A NULL CUD
* FOR CALLOUT IF L=. (PCNE) THE CALL OUT PKT WILL HAVE 02 IN CUD0
*****
      X25.LCG LCGN=0
*
*** PVC FOR PCNE *****
*
      X25.VC LCN=0, X
      VCCINDX=2, X
      LLC=LLC0, X
      MAXDATA=2000, * SEGMENTING NOT SUPPORTED X
      TYPE=P
*
** 2 SVC'S *****
*
      X25.VC LCN=(1,2), X
      VCCINDX=3, X
      OUFINDX=1, X
      CALL=INOUT, X
      TYPE=SWITCHED
*****
* MCH SL3: DATE MCH
*****
*
      X25.MCH ADDRESS=3, X
      ANS=CONT, X
      GATE=DEDICAT, X
      LCGDEF=(0,2), *MAX LCN IS 2 ON LCGN 0 X
      FRMLGTH=131, X
      MWINDOW=7, LAP WINDOW X
      STATION=DTE, X
      TPTIMER=3, X
      TDTIMER=1, X
      NPRETRY=7, X
      NDRETRY=1, X
      LLCLIST=(LLC0,LLC2,LLC3,LLC5), X
      LCN0=NOTUSED, X
      DBIT=NO, X
      SPEED=9600, X
      TITIMER=1, X
      PAD=TRANSP,TRAN=EVEN *PADI NOT ALLOWED ON DATE MCH
*

```

```

X25.LCG LCGN=0
***
*
X25.VC LCN=(1,2),VCCINDX=2,TYPE=S,CALL=INOUT,OUFINDX=2
EJECT
*
*****
MCH XL11: 7 VC'S FOR FAST CONNECT WITH 2 CTCP'S
*****
*
***
XL12 X25.MCH ADDRESS=4,PUNAME=XP12,LUNAME=(XU12,XU22), X
ANS=CONT, X
LCGDEF=(0,7), X
FRMLGTH=131, X
MWINDOW=7, LAP WINDOW X
STATION=DTE, X
TPTIMER=3, X
TDTIMER=1, X
SPAN=X2501, X
NPRETRY=7, X
NDRETRY=3, X
GATE=GENERAL, * NEEDED FOR FASTCONNECT X
LLCLIST=LLC4, X
LCN0=NOTUSED, X
ITRACE=NO, *TO REDUCE PATH LENGTH X
LOGAPPL=(GBGTPLS,GBGTPLT), *CTCP'S PLU NAMES X
CONNECT=SUBD, * 2 CTCP'S SELECTABLE VIA THE X
SUBD=(0,9,1), * LAST SUBADDRESSING DIGIT X
CTCP=(0,1,1) *0 FOR CTCP 0, 9 AND 1 FOR CTCP 1 X
*
X25.LCG LCGN=0 * DEFINE THE NETWORK'S VC'S
*
X25.VC LCN=(1,7),VCCINDX=3,TYPE=S,CALL=INOUT
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCP0
*
X25.FCG QTY=(5),CTCPNO=(0),SPAN=X2501,MAXDATA=2500, X
PRFLINE=XL12,PRFPU=XP12,PRFLU=XU21,SUFFIX=0001
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCP1
*
X25.FCG QTY=(5),CTCPNO=(1),SPAN=X2501,MAXDATA=2500, X
PRFLINE=XL22,PRFPU=XP22,PRFLU=XU22,SUFFIX=0001
*
*****
X25.END
*****
CAGROUP GROUP LNCTL=CA, X
CA=TYPE6, X
DELAY=0.0, X
NCPCA=ACTIVE
CALINE1 LINE ADDRESS=08 TO LOAD ON 540=CCUA
CA1PU PU PUTYPE=5
EJECT
GENEND
END
*****

```

```
//DBWORKFL DD UNIT=SYSDA,SPACE=(TRK,10)
//SYSPRINT DD SYSOUT=A
//PRINTER DD SYSOUT=A
//TBL1SRCE DD DSN=&&SRCE1,DISP=(,DELETE),
// UNIT=SYSDA,SPACE=(CYL,(10,10)),DCB=BLKSIZE=3200
//TBL1LIST DD SYSOUT=Z
//*TBL1OBJ DD DUMMY TABLE 1 OBJECT FILE
//TBL1OBJ DD DSN=X25.NCPV32.SA324GN(ICNTABL1),DISP=OLD,
// VOL=SER=MVSWK1,UNIT=3350
//TBL2SRCE DD DSN=&&SRCE2,DISP=(,DELETE),
// UNIT=SYSDA,SPACE=(CYL,(10,10)),DCB=BLKSIZE=3200
//TBL2LIST DD SYSOUT=Z
//*TBL2OBJ DD DUMMY TABLE 2 OBJECT FILE
//TBL2OBJ DD DSN=X25.NCPV32.SA324GN(ICNTABL2),DISP=OLD,
// VOL=SER=MVSWK1,UNIT=3350
//NEWDEFN DD DISP=SHR,DSN=SYS1.VTAMLST(SA324GN)
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(10,10)),DISP=(,DELETE)
//SYSLIB DD DSN=SYS1.SNCPMAC1,DISP=SHR
// DD DSN=SYS1.SBALMAC1,DISP=SHR
//LNKSTMT DD DSN=X25.NCPV32.SA324GN(SA324LE),DISP=OLD
/*
```

## LKEDT Step

```
//LKEDT EXEC PGM=IEWL,REGION=400K,  
// PARM='LIST,NCAL,NOXREF,SIZE=(374K,48K),MAP'  
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1)),DISP=(,DELETE)  
//SYSLIN DD DSN=X25.NCPV32.SA324GN(SA324LE),DISP=OLD  
//SYSPUNCH DD DSN=X25.NCPV32.SA324GN,DISP=OLD,UNIT=3350,VOL=SER=MVSWK1  
//SYSPRINT DD SYSOUT=A  
//SYSLOAD DD DSN=SYS1.NCPLOAD,DISP=SHR  
//ANCPMOD1 DD DSN=SYS1.SNCPMOD1,DISP=SHR  
//ABALMOD1 DD DSN=SYS1.SBALMOD1,DISP=SHR  
/*
```

## NCP Input Produced by NDF (X.25 NPSI)

```

OPTIONS USERGEN=X25NPSI,NEWDEFN=(YES,,SUPP)
BAKLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=1
OTHLOCAL PCCU DUMPDS=DUMPX25,SUBAREA=16
REMTAM PCCU DUMPDS=DUMPX25,SUBAREA=2
*
BAKBUILD BUILD NPA=YES,VERSION=V5R2,LOADLIB=LNCP11,TYPGEN=NCP,MODEL=374*
          5,USGTIER=3,X25.USGTIER=3,NETID=NETID1,MAXSUBA=63,SUBARE*
          A=4,BFRS=124,LTRACE=4,OLT=YES,DR3270=NO,BRANCH=8000,TRAC*
          E=(YES,100),NEWNAME=SA324GN,X25.PREFIX=S,X25.IDNUMH=02,T*
          YPSYS=0S,X25.SNAP=YES,X25.MCHCNT=6,X25.MAXPIU=64K
BAKSYSC SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCOND,RECMD,RIMM,NAKLIM*
          ,SESSION,SSPAUSE,XMTLMT)
BAKHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=1,DELAY=0*
          .1,TIMEOUT=30
OTHHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=16,DELAY=*
          0.1,TIMEOUT=30
REMHOST HOST INBFRS=7,MAXBFRU=10,UNITSZ=196,BFRPAD=0,SUBAREA=2,DELAY=0*
          .1,TIMEOUT=30
PATH14 PATH DESTSA=(1),ER0=(1,1),ER1=(1,1),ER2=(1,1)
PATH16 PATH DESTSA=(16),ER0=(16,1),ER1=(16,1),ER2=(16,1)
PATH42 PATH DESTSA=(5,2,3),ER0=(5,2),ER1=(5,3),ER2=(3,4)
          LUDRPOOL NUMTYP1=10,NUMTYP2=10,NUMILU=2
*****
SDLC6 GROUP LNCTL=SDLC,TYPE=NCP,DIAL=YES,REPLYTO=20
*****
SL6 LINE ADDRESS=6,CLOCKNG=EXT,NEWSYNC=NO,DUPLEX=HALF,NRZI=NO,CALL*
      =INOUT,RETRIES=(7,0,0)
SP6 PU ISTATUS=INACTIVE,PUTYPE=2
*****
SDLC5 GROUP LNCTL=SDLC,TYPE=NCP,DIAL=NO,REPLYTO=3,DISCNT=NO,ISTATUS=*
      INACTIVE
*****
SL5 LINE ADDRESS=5,CLOCKNG=EXT,NEWSYNC=NO,DUPLEX=HALF,NRZI=NO,NPAC*
      OLL=YES,RETRIES=(3)
      SERVICE ORDER=(SP5)
SP5 PU ADDR=C2,MAXDATA=261,MAXOUT=3,PUTYPE=2,NPACOLL=YES,VPACING=2*
      ,PACING=1
SU5 LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,NPACOLL=YES
*****
GRNPA GROUP LNCTL=SDLC,TYPE=NCP,DIAL=NO,DISCNT=NO,VIRTUAL=YES,NPARSC*
      =YES,ISTATUS=INACTIVE
LNNPA LINE LINEFVT=NPAFVT
PUNPA PU PUTYPE=2,PUFVT=NPAPFVT
LUNPA LU MAXCOLL=7,LUFVT=(NPALFVT,NPALFVT),VPACING=0,LOCADDR=1
*****
***** X25 NPSI INPUT
* ALLOW 3 VCCPT AND OUFT ENTRIES
TRANSPAC X25.NET CPHINDX=3,OUHINDX=3,DM=YES
*
          X25.VCCPT INDEX=1,MAXPKTL=128,VWINDOW=1,INSLOW=(100,50)
*
          X25.VCCPT INDEX=2,MAXPKTL=128,VWINDOW=2,INSLOW=(100,50)
*
          X25.VCCPT INDEX=3,MAXPKTL=128,VWINDOW=3,INSLOW=(100,50)
*
          X25.OUFT INDEX=1
*

```

```

X25.OUFT INDEX=2,OPTFACL=420707430202
*
X25.OUFT INDEX=3,OPTFACL=03430102420707430303,USRFILD=12345678*
90
*****
*
*****
*
MCH SL7: NO DATE/GATE BUT SVC INN
*****
X25.MCH ADDRESS=7,ANS=CONT,LCGDEF=(0,7),FRMLGTH=131,MWINDOW=7,*
STATION=DTE,TPTIMER=3,TDTIMER=1,NPRETRY=7,NDRETRY=1,LLCL*
IST=(LLC0,LLC2,LLC3,LLC5),LCN0=USED,SPAN=X2501,DBIT=NO,P*
AD=INTEG,TRAN=EVEN,PWPROT=YES,ITRACE=NO,SPEED=9600,T1TIM*
ER=1,SVCINN=2,SHM=YES,SDRTCNT=3,SDRTIME=10
*
X25.LCG LCGN=0
*
*
* PVC FOR INTEGRATED PAD FOR USE WITH TSO AND WITH PASSWORD PROTECTION
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC5,SPAN=X2501,MAXDATA=2000*
,SSCPFM=USSNTO,MODETAB=MODTDX,DLOGMOD=TWXCONT,TERM=TWX,U*
SSTAB=USSTWX
*
*** 2 LINE'S FOR SUBAREA DIAL(2 SVC'S RESERVED FOR SVC INN)
*
X25.LINE DSTNODE=INN,TYPE=S
X25.PU PUTYPE=4,ISTATUS=INACTIVE
*
X25.LINE DSTNODE=INN,TYPE=S
X25.PU PUTYPE=4,ISTATUS=INACTIVE
*
*
* DEFINE 7 SVC TO BE SHARED BETWEEN INN SVC'S(MAX OF 2 AT A TIME)
* AND BNN SVC (MAX OF 5 AT A TIME)
*
X25.VC LCN=(1,7),VCCINDX=3,TYPE=S,CALL=INOUT,OUFINDX=1,SPAN=X2*
501
*
*****
*
MCH SL0: NO DATE/GATE BUT TRANSPARENT PAD
*****
X25.MCH ADDRESS=0,ANS=CONT,LCGDEF=(0,4),FRMLGTH=131,MWINDOW=2,*
STATION=DTE,XMONLNK=YES,TPTIMER=3,TDTIMER=1,NPRETRY=7,ND*
RETRY=1,LLCLIST=(LLC0,LLC2,LLC3,LLC5),LCN0=USED,SPAN=X25*
01,DBIT=NO,PAD=TRANSP,TRAN=EVEN,ITRACE=YES,SPEED=9600,T1*
TIMER=1
*
X25.LCG LCGN=0
*
*** X25 LINE FOR PSH (PVC) LINE NAME=SL0000 PU=SP0000 LU=SU0000
*
X25.LINE LCN=0,VCCINDX=3,LLC=LLC2,TYPE=P,SPAN=X2501
*
X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2,PACING=2,ISTATUS*
=INACTIVE
X25.LU LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*

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```

* 4 SVC'S: 1 IN, 2 IN/OUT, 1 OUT
*
X25.VC LCN=1,VCCINDX=2,TYPE=S,CALL=IN,OUFINDX=2,SPAN=X2501
X25.VC LCN=(2,3),VCCINDX=3,TYPE=S,CALL=INOUT,OUFINDX=3,SPAN=X2*
501
X25.VC LCN=4,VCCINDX=3,TYPE=S,CALL=OUT,OUFINDX=1,SPAN=X2501
*
*****
* MCH SL1: GATE WITH SUBADDRESSING & PU T2.1
*****
X25.MCH ADDRESS=1,ANS=CONT,LCGDEF=((0,5),(1,0)),FRMLGTH=131,MW*
INDOW=3,STATION=DTE,XMONLNK=YES,SHUTD=NOINVCLR,TPTIMER=2*
,TDTIMER=3,NPRETRY=3,NDRETRY=3,LCNO=USED,PAD=INTEG,TRAN=*
EVEN,GATE=GENERAL,SUBADDR=YES,LLCLIST=(LLC0,LLC2,LLC3,LL*
C4,LLC5),LLC0=(0,2),LLC2=8,LLC3=9,LLC4=(1,4,3,7),LLC5=(6*
,5),SPAN=X2501,DBIT=NO
*
*
X25.LCG LCGN=0
*
* PVC FOR PCNE: LINK NAME=SL1000 PU=SP1000 LU=SU1000
*
X25.VC LCN=0,VCCINDX=3,TYPE=P,LLC=LLC0,SPAN=X2501,MAXDATA=2000
*
***** X25 LINE FOR INN ***THIS SIDE IS SECONDARY****
*
SL1001 X25.LINE LCN=1,VCCINDX=3,MONLINK=YES,DSTNODE=INN,LLC=LLC3,SPAN*
=X2501,TYPE=P
SP1001 X25.PU PUTYPE=4,TGN=2,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE,SPAN=2*
501
*
***** X25 LINE FOR INN ****THIS SIDE IS PRIMARY****
*
SL1002 X25.LINE LCN=2,VCCINDX=3,MONLINK=YES,DSTNODE=INN,LLC=LLC3,SPAN*
=X2501,TYPE=P
SP1002 X25.PU PUTYPE=4,TGN=4,ANS=CONT,PUDR=NO,ISTATUS=INACTIVE,SPAN=2*
501
*
***** X25 LINE FOR BNN QLLC *****
*
SL1003 X25.LINE LCN=3,VCCINDX=3,LLC=LLC3,SPAN=X2501,TYPE=P
SP1003 X25.PU PUTYPE=2,ADDR=01,MAXDATA=265,VPACING=2,PACING=1,SPAN=X2*
501,ISTATUS=INACTIVE
SU1003 X25.LU LOCADDR=2,USSTAB=USSTD3,MODETAB=MODTD3
*
* *** PVC 4 FOR PU2.1 ON BNN QLLC ***
* *** WITH DEPENDENT LU'S ***
*
X25.LINE LCN=4,VCCINDX=3,LLC=LLC3,SPAN=X2501,TYPE=P
*
X25.PU PUTYPE=2,ADDR=01,VPACING=2,XID=YES,DATMODE=HALF,PACING=*
1,SPAN=X2501,ISTATUS=INACTIVE,ANS=CONT
*
X25.LU LOCADDR=2
*
*****
*
*

```

```

*          *** PVC 5 FOR PU2.1 ON BNN QLLC          ***
*          ***          WITH INDEPENDENT LU'S          ***
*
X25.LINE LCN=5,VCCINDX=3,LLC=LLC3,SPAN=X2501,TYPE=P
*
X25.PU PUTYPE=2,ADDR=01,VPACING=2,XID=YES,DATMODE=HALF,PACING=
1,SPAN=X2501,ISTATUS=INACTIVE,ANS=CONT
*
X25.LU LOCADDR=0,MODETAB=LENMODE
*
*
** VC USING SUBADDRESSING TO SELECT THE LLC TYPE *****
*
X25.LCG LCGN=1
**
X25.VC LCN=0,VCCINDX=3,OUFINDX=1,CALL=IN,SPAN=X2501,TYPE=SWITC
HED
*****
*          MCH SL2 : GATE WITH USER DEFINED RELATION BETWEEN
*          FIRST CUD BYTE AND CTCP/LLC
*****
X25.MCH ADDRESS=2,ANS=CONT,LCGDEF=(0,2),FRMLGTH=131,MWINDOW=3,*
STATION=DTE,TPTIMER=3.1,TDTIMER=2,NPRETRY=7,NDRETRY=1,LC*
NO=USED,PAD=INTEG,TRAN=EVEN,GATE=GENERAL,SPAN=X2501,LLCL*
IST=(LLC0,LLC2,LLC3,LLC4,LLC5),CUD0=(00,02,21,22,NULL,03*
,B0,C1,C5,CC,FF),CTCP=(00,80,01,02,85,85,85,80,85,80,85)
*****
*
*          3 CTCP'S FOR GATE.CUD0 SELECTIONS:CTCP0=00,CTCP1=21,CTCP2=22
*          PCNE WILL BE SELECTED BY CUD0=02,C1,CC
*          PAD WILL BE SELECTED BY CUD0=NULL,03,B0,C5,FF
*
*          FOR CALLOUT IF L=7(PAD) THE CALL OUT PKT WILL HAVE A NULL CUD
*          FOR CALLOUT IF L=. (PCNE) THE CALL OUT PKT WILL HAVE 02 IN CUD0
*****
X25.LCG LCGN=0
*
*** PVC FOR PCNE *****
*
X25.VC LCN=0,VCCINDX=2,LLC=LLC0,MAXDATA=2000,TYPE=P
*
**          2 SVC'S          *****
*
X25.VC LCN=(1,2),VCCINDX=3,OUFINDX=1,CALL=INOUT,TYPE=SWITCHED
*****
*          MCH SL3: DATE MCH
*****
*
X25.MCH ADDRESS=3,ANS=CONT,GATE=DEDICAT,LCGDEF=(0,2),FRMLGTH=1*
31,MWINDOW=7,STATION=DTE,TPTIMER=3,TDTIMER=1,NPRETRY=7,N*
DRETRY=1,LLCLIST=(LLC0,LLC2,LLC3,LLC5),LCN0=NOTUSED,DBIT*
=NO,SPEED=9600,T1TIMER=1,PAD=TRANSP,TRAN=EVEN
*
X25.LCG LCGN=0
***
*
X25.VC LCN=(1,2),VCCINDX=2,TYPE=S,CALL=INOUT,OUFINDX=2
*

```

```

*****
*           MCH XL11: 7 VC'S FOR FAST CONNECT WITH 2 CTCP'S
*****
*
***
XL12      X25.MCH ADDRESS=4,PUNAME=XP12,LUNAME=(XU12,XU22),ANS=CONT,LCGD*
          EF=(0,7),FRMLGTH=131,MWINDOW=7,STATION=DTE,TPTIMER=3,TDI*
          IMER=1,SPAN=X2501,NPRETRY=7,NDRETRY=3,GATE=GENERAL,LLCLI*
          ST=LLC4,LCN0=NOTUSED,ITRACE=NO,LOGAPPL=(GBGTPLS,GBGTPLT)*
          ,CONNECT=SUBD,SUBD=(0,9,1),CTCP=(0,1,1)
*
          X25.LCG LCGN=0
*
          X25.VC LCN=(1,7),VCCINDX=3,TYPE=S,CALL=INOUT
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCPO
*
          X25.FCG QTY=(5),CTCPNO=(0),SPAN=X2501,MAXDATA=2500,PRFLINE=XL1*
          2,PRFPU=XP12,PRFLU=XU21,SUFFIX=0001
*
* DEFINE THE MAX NB OF LU'S USABLE AT THE SAME TIME ON CTCPI
*
          X25.FCG QTY=(5),CTCPNO=(1),SPAN=X2501,MAXDATA=2500,PRFLINE=XL2*
          2,PRFPU=XP22,PRFLU=XU22,SUFFIX=0001
*
*****
          X25.END
S25P7A   GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
          DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSPW=NO,COMPACB=NO,LNC*
          TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
          YPE=NCP,USERID=(5688035,BALPBDT,NORECMS),XIO=(BALNAVXL,B*
          ALNAVXS,BALNAVXI,BALNAVXK)
SL7000   LINE IPL=NO,SPAN=X2501,UACB=XA7000
SC7000   SERVICE
SP7000   PU ADDR=01,PACING=1,PUDR=NO,PUTYPE=1,XID=NO,SPAN=X2501,MAXDATA*
          =2000
SU7000   LU LOCADDR=0,SPAN=X2501,TERM=TWX,DLOGMOD=TWXCONT,SSCPFM=USSNTO*
          ,USSTAB=USSTWX,MODETAB=MODTWX,VPACING=(2,1),LUDR=NO
S25P0A   GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
          DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSPW=NO,COMPACB=NO,LNC*
          TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
          YPE=NCP,USERID=(5688035,BALPBDT,NORECMS),XIO=(BALNAVXL,B*
          ALNAVXS,BALNAVXI,BALNAVXK)
SL0000   LINE SPAN=X2501,IPL=NO,UACB=XA0000
SC0000   SERVICE
SP0000   PU ADDR=01,MAXDATA=265,PACING=2,ISTATUS=INACTIVE,VPACING=2,PUT*
          YPE=2,XID=NO,PUDR=NO
SU0000   LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,LUDR=NO
S25P1A   GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
          DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSPW=NO,COMPACB=NO,LNC*
          TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
          YPE=NCP,USERID=(5688035,BALPBDT,NORECMS),XIO=(BALNAVXL,B*
          ALNAVXS,BALNAVXI,BALNAVXK)
SL1000   LINE IPL=NO,SPAN=X2501,UACB=XA1000
SC1000   SERVICE
SP1000   PU ADDR=01,PACING=1,PUDR=NO,PUTYPE=1,XID=NO,SPAN=X2501,MAXDATA*
          =2000
SU1000   LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO

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SL1001 LINE SPAN=X2501,IPL=NO,MONLINK=YES,UACB=XA1001
SC1001 SERVICE
SP1001 PU ANS=CONT,TGN=2,ISTATUS=INACTIVE,SPAN=2501,PUTYPE=4,PUDR=NO
SL1002 LINE SPAN=X2501,IPL=NO,MONLINK=YES,UACB=XA1002
SC1002 SERVICE
SP1002 PU ANS=CONT,TGN=4,ISTATUS=INACTIVE,SPAN=2501,PUTYPE=4,PUDR=NO
SL1003 LINE SPAN=X2501,IPL=NO,UACB=XA1003
SC1003 SERVICE
SP1003 PU ADDR=01,MAXDATA=265,PACING=1,ISTATUS=INACTIVE,SPAN=X2501,VP*
        ACING=2,PUTYPE=2,PUDR=NO
SU1003 LU LOCADDR=2,MODETAB=MODTD3,USSTAB=USSTD3,LUDR=NO
SL1004 LINE SPAN=X2501,IPL=NO,UACB=XA1004
SC1004 SERVICE
SP1004 PU ADDR=01,ANS=CONT,DATMODE=HALF,PACING=1,ISTATUS=INACTIVE,SPA*
        N=X2501,VPACING=2,PUTYPE=2,XID=YES,PUDR=NO
SU1004 LU LOCADDR=2,LUDR=NO
SL1005 LINE SPAN=X2501,IPL=NO,UACB=XA1005
SC1005 SERVICE
SP1005 PU ADDR=01,ANS=CONT,DATMODE=HALF,PACING=1,ISTATUS=INACTIVE,SPA*
        N=X2501,VPACING=2,PUTYPE=2,XID=YES,PUDR=NO
SU1005 LU LOCADDR=0,MODETAB=LENMODE,LUDR=NO
S25P2A GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
        DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSPW=NO,COMPACB=NO,LNC*
        TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
        YPE=NCP,USERID=(5688035,BALPBDT,NORECMS),XIO=(BALNAVXL,B*
        ALNAVXS,BALNAVXI,BALNAVXK)
SL2000 LINE IPL=NO,UACB=XA2000
SC2000 SERVICE
SP2000 PU ADDR=01,PACING=1,PUDR=NO,PUTYPE=1,XID=NO,MAXDATA=2000
SU2000 LU LOCADDR=0,VPACING=(2,1),LUDR=NO
S25PG50B GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINEA*
        DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSPW=NO,COMPACB=NO,LNC*
        TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
        YPE=NCP,USERID=(5688035,BALFBDT,NORECMS),LOGAPPL=GBGTPLS*
        ,XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
XL120001 LINE IPL=NO,SPAN=X2501,UACB=XAG50000
SCG50000 SERVICE
XP120001 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
        YPE=1
XU210001 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL120002 LINE IPL=NO,SPAN=X2501,UACB=XAG50001
SCG50001 SERVICE
XP120002 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
        YPE=1
XU210002 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL120003 LINE IPL=NO,SPAN=X2501,UACB=XAG50002
SCG50002 SERVICE
XP120003 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
        YPE=1
XU210003 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL120004 LINE IPL=NO,SPAN=X2501,UACB=XAG50003
SCG50003 SERVICE
XP120004 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
        YPE=1
XU210004 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL120005 LINE IPL=NO,SPAN=X2501,UACB=XAG50004
SCG50004 SERVICE
XP120005 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*

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```

YPE=1
XU210005 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
S25PG51C GROUP DIAL=NO,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
          DD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LNC*
          TL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),T*
          YPE=NCP,USERID=(5688035,BALFBDT,NORECMS),LOGAPPL=GBGTPLT*
          ,XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
XL220001 LINE IPL=NO,SPAN=X2501,UACB=XAG51000
SCG51000 SERVICE
XP220001 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
          YPE=1
XU220001 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL220002 LINE IPL=NO,SPAN=X2501,UACB=XAG51001
SCG51001 SERVICE
XP220002 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
          YPE=1
XU220002 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL220003 LINE IPL=NO,SPAN=X2501,UACB=XAG51002
SCG51002 SERVICE
XP220003 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
          YPE=1
XU220003 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL220004 LINE IPL=NO,SPAN=X2501,UACB=XAG51003
SCG51003 SERVICE
XP220004 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
          YPE=1
XU220004 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
XL220005 LINE IPL=NO,SPAN=X2501,UACB=XAG51004
SCG51004 SERVICE
XP220005 PU ADDR=01,MAXDATA=2500,XID=NO,PACING=1,PUDR=NO,SPAN=X2501,PUT*
          YPE=1
XU220005 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),LUDR=NO
S25S3A  GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
          ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LI*
          NEAUT=YES,LNCTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATS*
          T,BALNATLS),TYPE=NCP,USERID=(5688035,BALSBDT,NORECMS),XI*
          O=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
SL3002  LINE CALL=IN,UACB=XA3002
SP3002  PU PUTYPE=(1,2)
SL3001  LINE CALL=IN,UACB=XA3001
SP3001  PU PUTYPE=(1,2)
S25S2B  GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
          ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LI*
          NEAUT=YES,LNCTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATS*
          T,BALNATLS),TYPE=NCP,USERID=(5688035,BALSBDT,NORECMS),XI*
          O=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
SL2002  LINE CALL=INOUT,UACB=XA2002
SP2002  PU PUTYPE=(1,2)
SL2001  LINE CALL=INOUT,UACB=XA2001
SP2001  PU PUTYPE=(1,2)
S25S1B  GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
          ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LI*
          NEAUT=YES,LNCTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATS*
          T,BALNATLS),TYPE=NCP,USERID=(5688035,BALSBDT,NORECMS),XI*
          O=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
SL1100  LINE CALL=IN,SPAN=X2501,UACB=XA1100
SP1100  PU SPAN=X2501,PUTYPE=(1,2)
S25S0B  GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*

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ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LI*
NEAUT=YES, LNCTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATS*
T,BALNATLS),TYPE=NCP,USERID=(5688035,BALSBDT,NORECMS),XI*
O=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
SL0004 LINE CALL=OUT,SPAN=X2501,UACB=XA0004
SP0004 PU SPAN=X2501,PUTYPE=(1,2)
SL0003 LINE CALL=INOUT,SPAN=X2501,UACB=XA0003
SP0003 PU SPAN=X2501,PUTYPE=(1,2)
SL0002 LINE CALL=INOUT,SPAN=X2501,UACB=XA0002
SP0002 PU SPAN=X2501,PUTYPE=(1,2)
SL0001 LINE CALL=IN,SPAN=X2501,UACB=XA0001
SP0001 PU SPAN=X2501,PUTYPE=(1,2)
S25S7C GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LI*
NEAUT=YES, LNCTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATS*
T,BALNATLS),TYPE=NCP,USERID=(5688035,BALSBDT,NORECMS),XI*
O=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
SL7007 LINE CALL=INOUT,SPAN=X2501,UACB=XA7007
SP7007 PU SPAN=X2501,PUTYPE=(1,2)
SL7006 LINE CALL=INOUT,SPAN=X2501,UACB=XA7006
SP7006 PU SPAN=X2501,PUTYPE=(1,2)
SL7005 LINE CALL=INOUT,SPAN=X2501,UACB=XA7005
SP7005 PU SPAN=X2501,PUTYPE=(1,2)
SL7004 LINE CALL=INOUT,SPAN=X2501,UACB=XA7004
SP7004 PU SPAN=X2501,PUTYPE=(1,2)
SL7003 LINE CALL=INOUT,SPAN=X2501,UACB=XA7003
SP7003 PU SPAN=X2501,PUTYPE=(1,2)
S25S7B GROUP DIAL=YES,LEVEL2=BALNAVL2,LEVEL3=BALNAVL3,LEVEL5=NCP,LINE*
ADD=NONE,COMPTAD=NO,COMPOWN=YES,COMPSWP=NO,COMPACB=NO,LN*
CTL=SDLC,NPACOLL=NO,TIMER=(BALNATER,,BALNATST,BALNATLS),*
TYPE=NCP,USERID=(5688035,BALIBDT,NORECMS),PUTYPE=4,SHM=Y*
ES,ACTIVTO=0.0,BRKCON=NONE,XIO=(BALNAVXL,BALNAVXS,BALNAV*
XI,BALNAVXK)
SL7GGI LINE CALL=INOUT,UACB=XA7GGI
SP7GGI PU ISTATUS=INACTIVE,PUTYPE=4
SL7GGH LINE CALL=INOUT,UACB=XA7GGH
SP7GGH PU ISTATUS=INACTIVE,PUTYPE=4
SNET11 GROUP DIAL=NO,BERPROC=BALNUMBER,COMPACB=YES,COMPTAD=YES,COMPOWN*
=YES,COMPSWP=YES,LEVEL2=BALNAML2,LEVEL3=BALNAML3,LEVEL5=*
NCP,LNCTL=SDLC,NPACOLL=NO,TIMER=(BALLAP4,,BALLAP4,BALLAP*
4),TYPE=NCP,USERID=(5688035,BALMBDT,NORECMS,P),XIO=(BALN*
AMXL,BALNAMXS,BALNAMXI,BALNAMXK)
SL7 LINE ADDRESS=(7,FULL),SPAN=X2501,XMONLNK=NO,UACB=(X25A7X,X25A7*
R)
SC7 SERVICE
SP7 PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,XID=NO,PUTYPE=1
SU7 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),ISTATUS=INACTIVE
SNET12 GROUP DIAL=NO,BERPROC=BALNUMBER,COMPACB=YES,COMPTAD=YES,COMPOWN*
=YES,COMPSWP=YES,LEVEL2=BALNAML2,LEVEL3=BALNAML3,LEVEL5=*
NCP,LNCTL=SDLC,NPACOLL=NO,TIMER=(BALLAP4,,BALLAP4,BALLAP*
4),TYPE=NCP,USERID=(5688035,BALNBDT,NORECMS,P),XIO=(BALN*
AMXL,BALNAMXS,BALNAMXI,BALNAMXK)
SL0 LINE ADDRESS=(0,FULL),SPAN=X2501,XMONLNK=YES,UACB=(X25A0X,X25A*
0R)
SC0 SERVICE
SP0 PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,XID=NO,PUTYPE=1
SU0 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),ISTATUS=INACTIVE
SL1 LINE ADDRESS=(1,FULL),SPAN=X2501,XMONLNK=YES,UACB=(X25A1X,X25A*

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1R)
SC1 SERVICE
SP1 PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,XID=NO,PUTYPE=1
SU1 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),ISTATUS=ACTIVE
SL2 LINE ADDRESS=(2,FULL),SPAN=X2501,XMONLNK=NO,UACB=(X25A2X,X25A2*
R)
SC2 SERVICE
SP2 PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,XID=NO,PUTYPE=1
SU2 LU LOCADDR=0,SPAN=X2501,VPACING=(2,1),ISTATUS=ACTIVE
SU2L1 LU LOCADDR=1,SPAN=X2501,VPACING=(2,1),ISTATUS=ACTIVE
SU2L2 LU LOCADDR=2,SPAN=X2501,VPACING=(2,1),ISTATUS=ACTIVE
SL3 LINE ADDRESS=(3,FULL),XMONLNK=NO,UACB=(X25A3X,X25A3R)
SC3 SERVICE
SP3 PU ADDR=01,ANS=CONT,MAXDATA=261,XID=NO,PUTYPE=1
SU3 LU LOCADDR=0,VPACING=(2,1),ISTATUS=ACTIVE
XL12 LINE ADDRESS=(4,FULL),SPAN=X2501,XMONLNK=NO,UACB=(X25A4X,X25A4*
R)
SC4 SERVICE
XP12 PU ADDR=01,ANS=CONT,SPAN=X2501,MAXDATA=261,XID=NO,PUTYPE=1
XU12 LU LOCADDR=0,LOGAPPL=GBGTPLS,SPAN=X2501,VPACING=(2,1),ISTATUS=*
ACTIVE
XU22 LU LOCADDR=1,LOGAPPL=GBGTPLT,SPAN=X2501,VPACING=(2,1),ISTATUS=*
ACTIVE
*****
CAGROUP GROUP LNCTL=CA,CA=TYPE6,DELAY=0.0,NCPCA=ACTIVE
CALINE1 LINE ADDRESS=08
CA1PU PU PUTYPE=5
GENEND INIT=BALINIMD,LINOPT=BSC, TMRTICK=BALTICK,UGLOBAL=BALNMG*
OP
*****

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Main Switched Major Node

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***** 00000010
* SWITCHED MAJOR NODE TO BE USED IN CORRELATION WITH SA324GN GEN 00000020
***** 00000030
** 00000090
SWS25 VBUILD MAXGRP=20, *00000040
      MAXNO=20, *00000050
      TYPE=SWNET 00000060
** 00000090
***** 00000010
* ENTRY FOR PCNE THAT RECEIVES DATA BEFORE SDT * 00000020
***** 00000030
*
PCNEPBK PU ADDR=01, PCNE FOR TEST WITH DXPCNEBK *00000100
          IDBLK=003, AND PCNEBK APPL. DATA IS *00000110
          IDNUM=22225, QUEUED IN NPSI UNTIL SDT, BE THE *00000120
          DISCNT=NO,MAXOUT=6, SDT AFTER ACTLU OR UNBIND W/O *00000140
          MAXDATA=1024, ACTLU. NOTICE THE DISCNT=NO... *00000150
          PACING=1, *00000170
          VPACING=2, *00000180
          PUTYPE=1, *00000190
          SSCPFM=USSSCS 00000200
PCNELBK LU LOCADDR=0,LOGAPPL=TD5SR MAXOUT=6 GOES W LOGAPPL 00000210
** 00000090
***** 00000010
* ENTRIES FOR PCNE TO PCNE COMMUNICATION * 00000020
* (BACK TO BACK) * 00000020
***** 00000030
*
PCNEPI PU ADDR=01, PCNE TO PCNE INBOUND *00000100
          IDBLK=003, *00000110
          IDNUM=22223, ZZZZ OF OUT CALLER +1 *00000120
          DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
          MAXOUT=1, TO LET LOGON MSG IN AFTER ACTLU *00000140
          MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000150
          PACING=1, PACING=1 IS REQUIRED *00000170
          VPACING=2, *00000180
          ANS=CONT, FOR SW SESSION CONTINUATION *00000180
          PUTYPE=1, *00000190
          SSCPFM=USSSCS 00000200
PCNELI LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
** 00000240
PCNEPO PU ADDR=01, PCNE TO PCNE OUTBOUND *00000250
          IDBLK=003, *00000260
          IDNUM=22222, EQUAL ZZZZ *00000270
          MAXPATH=6, *00000310
          DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
          MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000300
          PACING=1, PACING=1 IS REQUIRED *00000320
          VPACING=2, *00000330
          ANS=CONT, FOR SW SESSION CONTINUATION *00000180
          PUTYPE=1, *00000340
          SSCPFM=USSSCS 00000350
PCNEP1 PATH DIALNO=10604016500201*22222, ZZZZ=22222=IDNUM *00000360
          GRPNM=S25S0B,GID=2,PID=20 S25S0B=GROUP OF SWITCHED 00000370
* VC'S ON INVOLVED MCH IN GENERATION
PCNEP3 PATH DIALNO=10604016900201*22222, *00000400

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GRPNM=S25S0B,GID=2,PID=22
PCNELO LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES
*
*****
*
* ENTRY FOR INCOMING AND OUTGOING CALLS FOR PADX ON MCH0 *
*
*****
*
*****
*
*   DEFAULT IDNUM VALUES FOR INCOMING CALLS ARE BUILT AS FOLLOW:
*   IDNUM=02012
*   .012   FOR 9TH SVC FROM LAST SVC (9*2)=12(HEX)
*   02...  COME FROM X25.IDNUMH IN NPSI BUILD MACRO
*****
*
PADXPO PU ADDR=01, ENTRY USED FOR IN AND OUTCALL *00000250
        IDBLK=003, *00000260
        IDNUM=02012, FOR 9TH SVC FROM END OF GEN(9*2)=12 *00000270
        MAXPATH=6, *00000310
        DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
        MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000150
        PACING=1, PACING=1 IS REQUIRED *00000170
        VPACING=2, *00000180
        ANS=CONT, FOR SW SESSION CONTINUATION *00000180
        PUTYPE=1, *00000340
        SSCPFM=USSSCS 00000350
PADP1 PATH DIALNO=10605023650101*02012, ZZZZ=02012=IDNUM *00000750
        GRPNM=S25S0B,GID=2,PID=50 00000760
PADXLO LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
*
*****
*
* ENTRY FOR INCOMING AND OUTGOING CALLS FOR BNN QLLC/PSH *
*
*****
*
PSHPI PU ADDR=01, *00018000
        IDBLK=017, *00019000
        IDNUM=41264, IDNUM OF REMOTE PU *00020000
        MAXPATH=6, *00024000
        DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
        MAXDATA=265, SEGMENTING SUPPORTED *00023000
        PACING=3, *00025000
        ANS=CONT, FOR SW SESSION CONTINUATION *00000180
        VPACING=3, *00026000
        PUTYPE=2, *00027000
        SSCPFM=USSSCS OUTGOING CALL FOR PSH 00028000
PSHP1 PATH DIALNO=10604016420201, L=2 FOR PSH *00000750
        GRPNM=S25S0B,GID=2,PID=30 S25S0B=GROUP OF SWITCHED 00000370
*
* VC'S ON INVOLVED MCH IN GENERATION
PSHP2 PATH DIALNO=10604016430201, L=3 FOR BNN QLLC *00000750
        GRPNM=S25S0B,GID=2,PID=31 00000760
PSHLI LU LOCADDR=2,MODETAB=MODTD03 00030000
*
*****
*
*****
*

```

```

* ENTRY FOR SUBADDRESSING ON MCH1 FOR NON SNA VIRTUAL CIRCUITS *      00000020
*                                                                    *      00000020
*****                                                                    *      00000030
*                                                                    *      00000090
SAPI    PU    ADDR=01,          GATE OR PCNE OR PAD CALL IN      *00000100
          IDBLK=003,          *00000110
          IDNUM=0200A,        FOR 5TH SVC FROM LAST SVC (5*2)=A *00000120
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU  *00022000
          MAXDATA=2000,      SEGMENTING NOT SUPPORTED      *00000150
          PACING=1,          PACING=1 IS REQUIRED                *00000170
          VPACING=2,        *00000180
          PUTYPE=1,MAXOUT=6,  TO QUEUE DATA UNTIL SDT          *00000190
          SSCPFM=USSSCS      00000200
SALI    LU    LOCADDR=0        0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
*
*****                                                                    00000010
*                                                                    *      00000020
* ENTRIES FOR GATE AND PADI * *      00000020
* FOR GATE, CALLIN IS ALWAYS SIMULATED TO VTAM. PATH NOT NEEDED * *      00000020
*                                                                    *      00000020
*****                                                                    00000030
*                                                                    *      00000090
GATEPI  PU    ADDR=01,          PADI INCALL OR 1ST GATE VC USED *00000100
          IDBLK=003,          (IN OR OUT CALL) *00000110
          IDNUM=02008,        FOR 4TH SVC FROM LAST SVC (4*2)=8 *00000120
          MAXOUT=6,          TO QUEUE INBOUND MSG COMING BEFORE SDT *00000140
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU  *00022000
          MAXDATA=2000,      SEGMENTING NOT SUPPORTED      *00000150
          PACING=1,          PACING=1 IS REQUIRED                *00000170
          VPACING=2,        *00000180
          ANS=CONT,          FOR SW SESSION CONTINUATION *00000180
          PUTYPE=1,          *00000190
          SSCPFM=USSSCS      00000200
PADILI  LU    LOCADDR=0        0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
*                                                                    00000240
**                                                                    00000010
*                                                                    *      00000240
GATEPO  PU    ADDR=01,          2ND GATE VC USED(IN OR OUT CALL) *00000250
          IDBLK=003,          *00000260
          IDNUM=02006,        FOR 3RD SVC FROM LAST SVC (3*2)=6 *00000120
          DISCNT=YES,        DISCONTACT/ABCONN ON LAST DACTLU  *00022000
          MAXDATA=2000,      SEGMENTING NOT SUPPORTED      *00000150
          PACING=1,          PACING=1 IS REQUIRED                *00000170
          VPACING=2,        *00000180
          ANS=CONT,          FOR SW SESSION CONTINUATION *00000180
          PUTYPE=1,          *00000340
          SSCPFM=USSSCS      00000350
GATELO  LU    LOCADDR=0        0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
*
*****                                                                    00000010
*                                                                    *
* ENTRIES FOR USER DEFINED CUD0 (CALLOUT) * *      00000020
*                                                                    *      00000020
*****                                                                    00000030
*
UDCUDP1 PU    ADDR=01,          TO BE USED FOR PCNE *0001800
          IDBLK=003,          **0001900
          MAXPATH=4,          **0002300

```

```

IDNUM=55544, CUD123 FOR CALLIN,EQ ZZZZ FOR CALL OUT *00000120
DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000150
PACING=1, PACING=1 IS REQUIRED *00000170
VPACING=2, *00000180
PUTYPE=1, **0002700
SSCPFM=USSSCS USSTAB=USSTABZ 0002800
UDCUDH1 PATH DIALNO=106050236.0101*55544, .MEANS USER DEFINED CUDO *00000750
GRPNM=S25S2B,GID=2,PID=96 AND NOTHING IN CUD1 2 3 00000760
UDCUDU1 LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
*
UDCUDP2 PU ADDR=01, TO BE USED FOR PCNE **0001800
IDBLK=003, **0001900
MAXPATH=4, **0002300
IDNUM=55555, CUD123 FOR CALLIN, EQ ZZZZ FOR CALLOUT **0002000
DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000150
PACING=1, PACING=1 IS REQUIRED *00000170
VPACING=2, *00000180
PUTYPE=1, **0002700
SSCPFM=USSSCS USSTAB=USSTABZ 0002800
UDCUDH2 PATH DIALNO=106050236:0101*55555, MEANS USER DEFINED CUDO *00000750
GRPNM=S25S2B,GID=2,PID=97 AND ZZZZ+1 IN CUD1,2,3. 00000760
UDCUDU2 LU LOCADDR=0 0 IS REQUIRED FOR NON SNA X25 DEVICES 00000210
* 0001700
***** 00000010
* *
* ENTRIES FOR OUTGOING CALLS FOR PADI ON MCH2 *
* *
***** 0001700
*
*****
*
* DEFAULT IDNUM-1 VALUES FOR OUTCALLS ARE NO LONGER USED
* ZZZZ MUST BE SPECIFIED IN THE DIALNO
*****
* 0001700
PADIPO PU ADDR=01, *00000250
IDBLK=003, *00000260
IDNUM=02005, EQUAL ZZZZ BELOW(ODD NO TO AVOID *00000270
MAXPATH=6, INTERFERENCE W CALL IN) *00000310
DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
MAXDATA=1024, SEGMENTING NOT SUPPORTED *00000150
PACING=1, PACING=1 IS REQUIRED *00000170
VPACING=2, *00000180
ANS=CONT, FOR SW SESSION CONTINUATION *00000180
PUTYPE=1, *00000340
SSCPFM=USSSCS 00000350
PADP2 PATH DIALNO=10605023650201*02005, L=5(PAD) *00000750
GRPNM=S25S2B,GID=2,PID=60 00000760
PADILO LU LOCADDR=0,TERM=TWX REQUIRED FOR NON SNA X25 DEVICES 00000210
*
***** 00000010
* *
* ENTRIES FOR DATE VC'S, TO BE USED FOR PCNE OR PADX *
* FOR DATE, CALLIN IS ALWAYS SIMULATED TO VTAM. PATH NOT NEEDED *
***** 00000030

```

```

*
DATEPI  PU  ADDR=01,      1ST DATE VC USED (IN OR OUT CALL)  **0001800
          IDBLK=003,  **0001900
          IDNUM=02004,  FOR 2ND SVC FROM LAST SVC (2*2)=4  *00000120
          DISCNT=YES,  DISCONTACT/ABCONN ON LAST DACTLU  *00022000
          MAXDATA=1024,  SEGMENTING NOT SUPPORTED          *00000150
          PACING=1,    PACING=1 IS REQUIRED                *00000170
          VPACING=2,  **0000180
          ANS=CONT,   FOR SW SESSION CONTINUATION  *00000180
          PUTYPE=1,   **0002700
          SSCPFM=USSSCS  0002800
DATELI  LU  LOCADDR=0  0003000
*
DATEPO  PU  ADDR=01,      2ND DATE VC USED (IN OR OUT CALL)  **0001800
          IDBLK=003,  **0001900
          IDNUM=02002,  FOR 1ST SVC FROM LAST SVC (1*2)=2  *00000120
          DISCNT=YES,  DISCONTACT/ABCONN ON LAST DACTLU  *00022000
          MAXDATA=1024,  SEGMENTING NOT SUPPORTED          *00000150
          PACING=1,    PACING=1 IS REQUIRED                *00000170
          VPACING=2,  **0000180
          ANS=CONT,   FOR SW SESSION CONTINUATION  *00000180
          PUTYPE=1,   **0002700
          SSCPFM=USSSCS  0002800
DATELO  LU  LOCADDR=0  0003000
*

```

## Switched Major Node for SNA Type 2.1 and SVCSC

```

***** 00000010
*
* SWITCHED MAJOR NODE TO BE USED TO TEST NPSI SWITCHED SESSION CONT. * 00000020
* AND LEN FUNCTIONS. *
* NCP/NPSI GENERATION: SA324GN *
*
***** 00000030
* 00000090
SWLENSAD VBUILD MAXGRP=20, *00000040
MAXNO=20, *00000050
TYPE=SWNET 00000060
* 00000090
*
***** 00000030
* 00000090
* THE FOLLOWING SWITCH MAJOR NODE IS USED: * 00000090
* - MP1006 IS A PU2.1 WITH LU6.2 * 00000090
* - MP2004 IS A PU2.1 WITH LU2 * 00000090
* - MP2006 IS A PU2.1 WITH LU6.2 * 00000090
* 00000090
***** 00000030
*
SMP0006 PU ADDR=01, *00018000
CPNAME=NODE16, EQUIVALENT TO IDBLK/IDNUM *00019000
MAXPATH=1, *00024000
DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
PACING=1, *00025000
VPACING=2, *00026000
PUTYPE=2, *00027000
ANS=CONT, *00027000
SSCPFM=USSSCS 00028000
*
LENP2 PATH DIALNO=10604016430201, COMMUNICATES WITH SMP4006 VIA *00000750
GRPNM=S25S0B, SAME MCH(APPL NEEDED IF CALLOUT *00000370
GID=2, IS DONE) *00000370
PID=47 00000370
*
SMU0006 LU LOCADDR=0, *00030000
MODETAB=LENMODE 00031000
* 00031000
***** 00000030
*
SMP4004 PU ADDR=01, *00018000
CPNAME=NODE24, REPLACES IDNUM/IDBLK FOR PUT2.1 *00019000
PUTYPE=2, *00027000
ANS=CONT, *00025000
VPACING=2, *00026000
PACING=1, *00023000
MAXPATH=1, *00024000
DISCNT=YES, DISCONTACT/ABCONN ON LAST DACTLU *00022000
SSCPFM=USSSCS 00028000
*
LENP1 PATH DIALNO=10604016430201, L=3 FOR QLLC BNN *00000750
GRPNM=S25S0B, GENERATED GROUP OF SWITCHED *00000370

```

```

                GID=2,                VC'S                VCS *00000370
                PID=47                00000370
*
SMU4004 LU    LOCADDR=1                00030000
*
*****                00031000
*****                00000030
*
SMP4006 PU    ADDR=01,                *00018000
                CPNAME=NODE26,        *00019000
                MAXPATH=1,            *00024000
                DISCNT=YES,           DISCONTACT/ABCONN ON LAST DACTLU *00022000
                PACING=1,              *00025000
                VPACING=2,            *00026000
                PUTYPE=2,              *00027000
                ANS=CONT,              *00027000
                SSCPFM=USSSCS         00028000
*
LENP3  PATH  DIALNO=10604016430201,  COMMUNICATES WITH SMP0006 VIA *00000750
                GRPNM=S25S0B,        SAME MCH (APPL NEEDED IF CALLOUT*00000370
                GID=2,                TO BE DONE)                *00000370
                PID=47                00000370
*
SMU4006 LU    LOCADDR=0,                *00030000
                MODETAB=LENMODE       00031000
*
*****                00031000
*****                00000010
*****                00000010
*
*
*           X25 SVC SUBAREA COMMUNICATION(SVCSC) *
*
*   SWITCHED MAJOR NODE FOR X25  FOR BOTH NCP'S *
*
*   SHM SUPPORTED ON BOTH SIDES, EITHER SIDE CAN CALL *
*
*   CONFIG = VTAM1(SA16)- NCP SA4---'X25NW'----NCP SA5---VTAM2(SA2)*
*
*****                *
*****                00000020
*****                00000020
*****                00000020
*****                00000020
*****                00000020
*****                00000020
*****                00000020
*****                00000030
*
**
**   FOR OUTGOING CALL ISSUED FROM VTAM1 OR INCOMING CALL FROM VTAM2 00000240
SVCSCPU5 PU  PUTYPE=4,                00000090
                ADDR=05,              SA 5 IS PRIMARY            *00000100
                TGN=ANY,               *
                SUBAREA=5,             SA NO OF OTHER SIDE       *00000100
                IDNUM=AAAAA,          MUST BE SAME ON BOTH SIDES *00000120
                NETID=NETID1,         OTHER SIDE'S NETID (VTAM2) *00000120
                ANS=CONT,              *00000120
                MAXDATA=1024,         *00000120
                MAXPATH=1
*
SVCSCPA5 PATH DIALNO=10604016410201,GID=51,PID=30, *L=1 FOR SVCSC *00000360
                GRPNM=S25S7B,        SVCSC LINES GROUP NAME    *00000370
                VERIFY=IN,           VERIFY INCOMING CALL ADDR *00000370
                VERID=106040164,     CALLER ADDR                *00000370
                SHM=YES,              *00000370
                SHMTIM=45             CLEAR AFTER 45 SEC OF INACTIVITY 00000370
*
*

```

```

** THIS PART IS IN VTAM2 SWITCH MAJ NODE BUT IS COPIED HERE FOR INFO 00000240
*
** FOR INCOMING CALL RECEIVED BY VTAM2 SIDE OR OUTCALL BY VTAM2 00000240
SVCSCPU4 PU PUTYPE=4, *00000190
            ADDR=04, SA 4 IS SECONDARY *00000120
            TGN=2, TG 2 ALSO USED IN PATH IN NCP *
            SUBAREA=4, SA NO OF OTHER SIDE *00000100
            IDNUM=AAAAA, MUST BE SAME ON BOTH SIDES *00000120
            NETID=NETID1, VTAM1 NETID(SAME NW AS VTAM1) *00000120
            ANS=CONT, *00000120
            MAXDATA=1024, *00000120
            MAXPATH=1
*
SVCSCPA4 PATH DIALNO=10604016910201,GID=52,PID=30, *L=1 00000240
            GRPNM=C25S0A, SVCSC LINES GROUP NAME *00000360
            SHM=YES, *00000370
            SHMTIM=33 CLEAR AFTER 33 SEC(IGNORED(LOWEST)) *00000370
***** 00000010
* 00000020
* X25 SVC SUBAREA COMMUNICATION(SVCSC) * 00000020
* 00000020
* SWITCHED MAJOR NODE FOR X25 FOR BOTH NCP'S * 00000020
* 00000020
* SHM NOT SUPPORTED AT ALL. CALLING ALLOWED FROM SA3 ONLY *
* 00000020
* CONFIG = VTAM1(SA16)- NCP SA4---'X25NW'----NCP SA3---VTAM2(SA2)*
* 00000020
***** 00000030
*
** 00000240
** FOR OUTGOING CALL ISSUED FROM VTAM1 OR INCOMING CALL FROM VTAM2 00000090
SVCSCPU3 PU PUTYPE=4, *00000100
            ADDR=03, SA 3 IS SECONDARY *00000120
            TGN=ANY, *
            SUBAREA=3, SA NO OF OTHER SIDE *00000100
            IDNUM=AAAA3, MUST BE SAME ON BOTH SIDES *00000120
            NETID=NETID1, OTHER SIDE'S NETID (VTAM2) *00000120
            ANS=CONT, *00000120
            MAXDATA=1024, *00000120
            MAXPATH=1
*
SVCSCPA3 PATH CALL=IN,GID=31,PID=30, *TO SA5 00000240
            GRPNM=S25S7B, SVCSC LINES GROUP NAME *00000360
            VERIFY=NONE NO CALLER ID VERIFICATION 00000370
*
*
** THIS PART IS IN VTAM2 SWITCH MAJ NODE BUT IS COPIED HERE FOR INFO 00000240
*
** FOR INCOMING CALL RECEIVED BY VTAM2 SIDE OR OUTCALL BY VTAM2 00000240
SVCSCPUD PU PUTYPE=4, *00000190
            ADDR=04, *00000120
            TGN=4, TG 4 ALSO USED IN PATH IN NCP *
            SUBAREA=4, SA NO OF OTHER SIDE *00000100
            IDNUM=AAAA3, MUST BE SAME ON BOTH SIDES *00000120
            NETID=NETID1, VTAM1 NETID *00000120
            ANS=CONT, *00000120
            MAXDATA=1024, *00000120

```

```
MAXPATH=1
*
SVCSCPAD PATH . DIALNO=10604016910201,GID=32,PID=30, *TO SA4 00000240
GRPNM=T25S0A, SVCSC GROUP NAME *00000360
CALL=OUT ALLOW OUT CALL ONLY *00000370
00 0370
```

## MODETAB for Password Protection and LU 6.2

```

MTTWX TITLE 'MODE TABLE ENTRIES FOR TWX 3101 TERMINAL THROUGH X.25'
      PRINT NOGEN
      EJECT
MODTwx MODETAB
TWXFLIP MODEENT LOGMODE=TWXFLIP,      FOR PAD PASSWORD PROTECTION      X
      FMPROF=X'03',                    OF NPSI V3R1 AND UP                X
      TSPROF=X'03',                    X
      PRIPROT=X'B1',                   X
      SECPROT=X'A0',                   X
      COMPROT=X'3080',                 X
      RUSIZES=X'8585',                 X
      DCODE=X'80',                     FOR DEVICES WHICH SUPPORT INP/ENP  X
      PSERVIC=X'0100000000000000000000'
*
      0 1 2 3 4 5 6 7 8 9 1011
TWXCONT MODEENT LOGMODE=TWXCONT,      FOR PAD PASSWORD PROTECTION      X
      FMPROF=X'03',                    OF NPSI V3R1 AND UP                X
      TSPROF=X'03',                    X
      PRIPROT=X'B1',                   X
      SECPROT=X'A0',                   X
      COMPROT=X'3040',                 X
      RUSIZES=X'8585',                 X
      DCODE=X'80',                     FOR DEVICES WHICH SUPPORT INP/ENP  X
      PSERVIC=X'0100000000000000000000'
*
      0 1 2 3 4 5 6 7 8 9 1011
TWXFLIPP MODEENT LOGMODE=TWXFLIPP,      X
      FMPROF=X'03',                    X
      TSPROF=X'03',                    X
      PRIPROT=X'B1',                   X
      SECPROT=X'A0',                   X
      COMPROT=X'3080',                 X
      RUSIZES=X'8585',                 X
      DCODE=X'00',                     X
      PSERVIC=X'0100000000000000000000'
*
      0 1 2 3 4 5 6 7 8 9 1011
TWXCONTP MODEENT LOGMODE=TWXCONTP,      X
      FMPROF=X'03',                    X
      TSPROF=X'03',                    X
      PRIPROT=X'B1',                   X
      SECPROT=X'A0',                   X
      COMPROT=X'3040',                 X
      RUSIZES=X'8585',                 X
      DCODE=X'00',                     X
      PSERVIC=X'0100000000000000000000'
*
      0 1 2 3 4 5 6 7 8 9 1011
MODEEND

```

00170000

```

TITLE 'MODE TABLE ENTRIES FOR LU 6.2 THROUGH X.25'
LENMODE MODETAB
LU62MODE MODEENT LOGMODE=LU62MODE,      ENTRY NAME                        X
      COMPROT=X'51B1',                 COMMON PROTOCOL                   X
      ENCR=0,                           ENCRYPTION                         X
      FMPROF=19,                        FM PROFILE 19                      X
      PRIPROT=X'B0',                   PRIMARY PROTOCOL                   X
      PSERVIC=X'060200000000000000002300', X

```

```

PSNDPAC=9,          PRIMARY SEND PACING      X
RUSIZES=X'C3C3',   RU SIZES                  X
SECPROT=X'B0',     SECONDARY PROTOCOLS      X
SRCVPAC=5,         SECONDARY RECEIVE PACING COUX
SSNDPAC=5,         SECONDARY SEND PACING COUNT X
TSPROF=7,         TS PROFILE                 X
TYPE=0            NEGOCIABLE BIND

*
SNASVCMG MODEENT LOGMODE=SNASVCMG,  ENTRY NAME                X
COMPROT=X'50A5',  COMMON PROTOCOL          X
ENCR=0,           ENCRYPTION               X
FMPROF=19,       FM PROFILE 19            X
PRIPROT=X'B0',   PRIMARY PROTOCOL        X
PSERVIC=X'060200000000000000002380',
PSNDPAC=35,      PRIMARY SEND PACING      X
RUSIZES=X'8585', RU SIZES                  X
SECPROT=X'B0',   SECONDARY PROTOCOLS      X
SRCVPAC=7,       SECONDARY RECEIVE PACING COUX
SSNDPAC=7,       SECONDARY SEND PACING COUNT X
TSPROF=7,       TS PROFILE                 X
TYPE=0            NEGOCIABLE BIND

*
MODEEND
END
00180000

```

## Appendix C. Statement and Keyword Changes

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## Appendix C. Statement and Keyword Changes

This appendix is comprised of tables that list X.25 NPSI statements and statement keywords.

All of the keywords for each statement are listed in alphabetical order. The values specified for several of the higher-level definition statements will sift down to the lower-level definition statements if they are not explicitly overridden.

This sifting is indicated in the following tables by placing in parenthesis, the lower-level statement name. For example, (MCH) is mentioned for MWINDOW in the BUILD statement. This indicates that you can code MWINDOW in the BUILD statement, and that it will sift down to the X25.MCH statement.

### X25BUILD

Keyword	Disposition
-----	Use NCP BUILD
DDNAME	No longer valid
IDNUMH	Code on NCP BUILD with prefix
JOBCARD	No longer valid
MACLIB	No longer valid
MAXPIU	Code on NCP BUILD with prefix
MCHCNT	Code on NCP BUILD with prefix
MODEL	Code on NCP BUILD
MWINDOW	Code on NCP BUILD with prefix (MCH)
OUTPUT	No longer valid
PREFIX	Code on NCP BUILD with prefix
QUALIFY	No longer valid
SNAP	Code on NCP BUILD with prefix
SRCHI	No longer valid
SRCLO	No longer valid
SRCPRFX	No longer valid
SSPV2	No longer valid
TYP SYS	Code on NCP BUILD
USGTIER	Code on NCP BUILD with prefix
VERSION	Code on NCP BUILD

## X25.END

Table 16. X25.END Changes	
Keyword	Disposition
-----	Code as X25.END
symbol	Optional
INCHI	No longer valid
INCINIT	No longer valid
INCL2HI	No longer valid
INCL2LO	No longer valid
INCPRFX	No longer valid
LSTUACB	No longer valid
NCPSTAG1	No longer valid
ORDHI	No longer valid
ORDINIT	No longer valid
ORDL2HI	No longer valid
ORDL2LO	No longer valid
SRCHI	No longer valid
SRCLO	No longer valid
X25VTAM	No longer valid

## X25.FCG

Table 17. X25.FCG Changes	
Keyword	Disposition
-----	Code as X25.FCG
symbol	Optional
ANS	Passed to NCP as is
CTCPNO	Required
DISCNT	Passed to VTAM as is
DLOGMOD	Passed to VTAM as is
ENCR	Passed to VTAM as is
FEATUR2	Passed to VTAM as is
HEXNAME	Optional (V3R2 only)
ISTATUS	Passed to VTAM as is
LOGTAB	Passed to VTAM as is
MAXDATA	Passed to NCP as is
NCPGRP	Optional
OWNER	Passed to VTAM as is
PRFLINE	Optional
PRFLU	Optional
PRFPU	Optional
QTY	Required
SPAN	Passed to NetView as is
SSCPFM	Passed to VTAM as is
STATOPT	Passed to NetView as is
SUFFIX	Optional
TERM	Passed to VTAM as is
USSTAB	Passed to VTAM as is
VPACING	Optional (V3R2 only)

## X25.LCG

Table 18. X25.LCG Changes

Keyword	Disposition
-----	Code as X25.LCG
symbol	Optional
LCGN	Required

## X25.LINE

Table 19. X25.LINE Changes

Keyword	Disposition
-----	Code as X25.LINE
symbol	Optional
CALL	Optional
COMMITO	Optional
DSTNODE	Optional
ISTATUS	Passed to VTAM as is
LCN	Required
LLC	Required if TYPE = PERMANENT; otherwise it is invalid
MONLINK	Passed to NCP as is
NCPGRP	Optional
OSITYPE	Optional
OUFINDX	Required if TYPE = SWITCHED; otherwise it is invalid
OWNER	Passed to VTAM as is
RETVCCCT	Optional
RETVCTO	Optional
SPAN	Passed to NetView as is
STATOPT	Passed to NetView as is
TRANSFR	Passed to NCP as is
TYPE	Required
VCCINDX	Required

## X25.LU

Table 20. X25.LU Changes	
Keyword	Disposition
-----	Code as X25.LU
symbol	Optional
BATCH	Not valid
BUFLIM	Not valid
DATASW	Not valid
DLOGMOD	Passed to VTAM as is
ENCR	Passed to VTAM as is
FEATUR2	Passed to VTAM as is
ISTATUS	Passed to VTAM as is
LOCADDR	Passed to NCP as is
LOGAPPL	Passed to VTAM as is
LOGTAB	Passed to VTAM as is
LUCB	Not valid
LUDR	Forced to a value of NO
LUFVT	Not valid
LUNTFY	Not valid
LUTYPE	Not valid
MAXCOLL	Not valid
MODETAB	Passed to VTAM as is
NPACOLL	Forced to a value of NO
NUMESS	Not valid
PACING	Passed to NCP as is
SPAN	Passed to NetView as is
SSCPFM	Passed to VTAM as is
TERM	Passed to VTAM as is
UCCB	Not valid
USSTAB	Passed to VTAM as is
VPACING	Passed to VTAM as is

## X25.MCH

Table 21 (Page 1 of 2). X25.MCH Changes	
Keyword	Disposition
-----	Code as X25.MCH
symbol	Optional
ACTIVTO	Optional (V3R2 only)
ADDRESS	Required
ANS	Passed to NCP as is
BRKCON	Optional (V3R2 only)
CONNECT	Optional
CTCP	Optional
CUD0	Optional
DBIT	Optional
DIRECT	Optional
DSABLTO	Optional
DSTNODE	Optional (LINE)
ENABLTO	Optional

Table 21 (Page 2 of 2). X25.MCH Changes

<b>Keyword</b>	<b>Disposition</b>
FRMLGTH	Required
GATE	Optional
ISTATUS	Passed to VTAM as is
ITRACE	Optional
LCGDEF	Required
LCN0	Optional
LLC	Optional (LINE)
LLC0	Optional
LLC2	Optional
LLC3	Optional
LLC4	Optional
LLC5	Optional
LLCI	Optional (V3R2 only)
LLCLIST	Optional
LOGAPPL	Passed to VTAM as is
LUNAME	Optional
MACB	Optional
MODETAB	Passed to VTAM as is
MWINDOW	Required
NCPGRP	Optional
NDRETRY	Optional
NETID	Optional (V3R2 only)
NPRETRY	Optional
OUFINDX	Optional (LINE)
OWNER	Passed to VTAM as is
PAD	Optional
PKTMODL	Optional
PWPROT	Optional
PUNAME	Optional
SDRTCNT	Optional (V3R2 only)
SDRTIME	Optional (V3R2 only)
SHM	Optional (V3R2 only)
SHUTD	Optional
SPAN	Passed to NetView as is
SPEED	Optional
SPNQLLC	Optional
STATION	Optional
STATOPT	Passed to NetView as is
SUBADDR	Optional
SUBD	Optional
SVCINN	Optional (V3R2 only)
TAXUNIT	Optional
TDTIMER	Optional
TPTIMER	Optional
T1TIMER	Optional
TRAN	Optional
VCCINDX	Optional (LINE)
VMODTAB	Optional
XMONLNK	Optional (V3R2 only)

## X25.NET

Keyword	Disposition
-----	Code as X25.NET
symbol	Optional
CAUSE	Optional (V3R2 only)
CPHINDX	Optional
CRAFTRC	Optional (V3R2 only)
DDXP	No longer valid
DM	Required
DSTNODE	Optional (LINE)
FRMLGTH	Optional (MCH)
LLC	Optional (LINE)
LLCLIST	Optional (MCH)
MWINDOW	Optional (MCH)
NETTYPE	Optional
NSTDFAC	Optional (V3R2 only)
OUHINDX	Optional
PKTMODL	Optional (MCH)
RFAC	Optional (V3R2 only)
R20	Optional (V3R2 only)
R22	Optional (V3R2 only)
R23	Optional (V3R2 only)
STATION	Optional (MCH)
T20	Optional (V3R2 only)
T21	Optional (V3R2 only)
T22	Optional (V3R2 only)
T23	Optional (V3R2 only)

## X25.OUFT

Keyword	Disposition
-----	Code as X25.OUFT
symbol	Optional
INDEX	Required
OPTFACL	Optional
USRFILD	Optional
USRFIL2	Optional

## X25.PU

Table 24. X25.PU Changes	
Keyword	Disposition
-----	Code as X25.PU
symbol	Optional
ADDR	Passed to NCP as is
ANS	Passed to NCP as is
AVGPB	Passed to NCP as is
BATCH	No longer valid
BUFLIM	Not valid
BNNSUP	Passed to NCP as is
DATMODE	Passed to NCP as is
DISCNT	Passed to VTAM as is
DLOGMOD	Passed to VTAM as is
ENCR	Passed to VTAM as is
FEATUR2	Passed to VTAM as is
IRETRY	Passed to NCP as is
ISTATUS	Passed to VTAM as is
LOGAPPL	Passed to VTAM as is
LOGTAB	Passed to VTAM as is
LPDA	Not valid
LUCB	Not valid
LUFVT	Not valid
LUNTFY	Not valid
LUTYPE	Not valid
MAXDATA	Passed to NCP as is
MAXLU	Passed to NCP as is
MAXOUT	Passed to NCP as is
MODETAB	Passed to VTAM as is (LU)
NETID	Passed to NCP as is
NPACOLL	Forced to a value of NO
PACING	Passed to NCP as is
PASSLIM	Passed to NCP as is
PUCB	Not valid
PUDR	Forced to a value of NO
PUFVT	Not valid
PUNTFY	Not valid
PUTYPE	Passed to NCP as is
RETRIES	Passed to NCP as is
SECNET	Passed to VTAM as is
SPAN	Passed to NetView as is
SRT	Not valid
SSCPFM	Passed to VTAM as is
SUBAREA	Passed to NCP as is
TERM	Passed to VTAM as is
TGN	Passed to NCP as is
USSTAB	Passed to VTAM as is
VPACING	Passed to VTAM as is
XID	Passed to NCP as is (V3R2 only)

## X25.VC

Table 25. X25.VC Changes	
Keyword	Disposition
-----	Code as X25.VC
symbol	Optional
ANS	Passed to NCP as is
CALL	Optional
COMMITO	Optional
DISCNT	Passed to VTAM as is
DLOGMOD	Passed to VTAM as is
ENCR	Passed to VTAM as is
FEATUR2	Passed to VTAM as is
HEXNAME	Optional (V3R2 only)
ISTATUS	Passed to VTAM as is
LLC	Required if TYPE = PERMANENT; otherwise it is invalid
LCN	Required
LOGAPPL	Passed to VTAM as is
LOGTAB	Passed to VTAM as is
MAXDATA	Passed to NCP as is
MODETAB	Passed to VTAM as is
NCPGRP	Optional
OSITYPE	Optional
OUFINDX	Required if TYPE = SWITCHED; otherwise it is invalid
OWNER	Passed to VTAM as is
PRFLINE	Optional (V3R2 only)
PRFLU	Optional (V3R2 only)
PRFPU	Optional (V3R2 only)
RETVCCCT	Optional
RETVCTO	Optional
SPAN	Passed to NetView as is
SSCPFM	Passed to VTAM as is
STATOPT	Passed to NetView as is
SUFFIX	Optional (V3R2 only)
TERM	Passed to VTAM as is
TYPE	Required
USSTAB	Passed to VTAM as is
VCCINDX	Required
VPACING	Passed to VTAM as is

## X25.VCCPT

Table 26. X25.VCCPT Changes	
Keyword	Disposition
-----	Code as X25.VCCPT
symbol	Optional
INDEX	Required
INSLOW	Optional
MAXPKTL	Required
VWINDOW	Optional

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## Bibliography

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### X.25 Network Control Program Packet Switching Interface Publications

The following paragraphs briefly describe the library of books associated with the X.25 NCP Packet Switching Interface Version 3.

*X.25 NCP Packet Switching Interface Version 3 General Information* (GC30-3469)

This book introduces managers, system designers, programmers, and other data processing personnel to the basic concepts of packet-switching, X.25, and IBM's X.25 NCP Packet Switching Interface licensed program.

*X.25 NCP Packet Switching Interface Version 3 Planning and Installation* (SC30-3470)

This book provides system programmers and analysts with the information required to plan and implement the installation of X.25 NPSI. The topics include hardware and software requirements, pre-installation system performance considerations, instructions for defining and generating X.25 NPSI, and installation examples.

*X.25 NCP Packet Switching Interface Version 3 Host Programming* (SC30-3502)

This book is written for application and system programmers to assist them in writing application programs that use the X.25 NCP Packet Switching Interface. Application programmers should have some knowledge of DATE and GATE functions and the operating systems that support them. System programmers should be knowledgeable in SNA concepts.

*X.25 NCP Packet Switching Interface Version 3 Diagnosis, Customization, and Tuning* (LY30-5610)

This book is written for system programmers to assist them in trouble-shooting and diagnosing problems with the X.25 NCP Packet Switching Interface. It helps programmers to diagnose problems, resolve common errors, and describe problems to and interface with the IBM Support Center.

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### Other Network Program Products Publications

*Network Program Products General Information* (GC30-3350)

*Network Program Products Planning* (SC30-3351)

*Network Program Products Samples* (SC30-3352)

*Network Program Products Storage Estimates* (SC30-3403)

*Network Program Products Bibliography and Master Index* (GC30-3353)

### NCP Publications

The following publications apply to the NCP and SSP libraries.

*NCP, SSP, and EP Generation and Loading Guide* (SC30-3348)

*NCP Migration Guide* (SC30-3440 for NCP V5)

*NCP, SSP, and EP Resource Definition Guide* (SC30-3447 for NCP V5)

*NCP, SSP, and EP Resource Definition Reference* (SC30-3448 for NCP V5)

*NCP and EP Reference Summary and Data Areas* (LY30-5603 for NCP V5)

*NCP Customization Guide* (LY30-5606 for NCP V5)

*NCP Customization Reference* (LY30-5607 for NCP V5)

*SSP Customization* (LY43-0021)

*NCP, SSP, and EP Messages and Codes* (SC30-3169)

*NCP, SSP, and EP Diagnosis Guide* (LY30-5591)

*NCP and EP Reference* (LY30-5605 for NCP V5)

## VTAM Publications

*VTAM Installation and Resource Definition* (SC23-0111)

*VTAM Customization* (LY30-5614)

*VTAM Directory of Programming Interfaces for Customers* (GC31-6403)

*VTAM Operation* (SC23-0113)

*VTAM Messages and Codes* (SC23-0114)

*VTAM Programming* (SC23-0115)

*VTAM Programming for LU 6.2* (SC30-3400)

*VTAM Diagnosis* (LY30-5601)

*VTAM Data Areas for MVS* (LY30-5592)

*VTAM Data Areas for VM* (LY30-5593)

*VTAM Data Areas for VSE* (LY30-5594)

*VTAM Reference Summary* (LY30-5600)

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## Other Related Publications

The following are other related publications.

### 3720 Publications

The following list shows selected publications for the 3720.

*3720/3721 Communication Controller Introduction* (GA33-0060)

*3720/3721 Communication Controller Configuration Guide* (GA33-0063)

### 3745 Publications

The following list shows the publications for the 3745.

*IBM 3745 Communication Controller Introduction* (GA33-0092)

*IBM 3745 Communication Controller Configuration Guide* (GA33-0093)

*IBM 3745 Principles of Operation* (GA33-0102)

### SNA Publications

The following publications contain detailed information on SNA.

*Systems Network Architecture Format and Protocol Reference Manual: Management Services* (SC30-3346)

*Systems Network Architecture Formats* (GA27-3136)

*X.25 Interface for Attaching SNA Nodes to Packet-Switched Data Networks: General Information Manual* (GA27-3345)

*X.25 1984 Interface for Attaching SNA Nodes to Packet-Switched Data Networks: General Information Manual* (GA27-3761)

*X.25 1984 Interface for Attaching SNA Nodes to Packet-Switched Data Networks: Architecture Reference* (SC30-3409)

*Systems Network Architecture Technical Overview* (GC30-3073)

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# Glossary

This glossary contains terms and abbreviations related to X.25, X.25 NPSI, SNA, and telecommunications. It includes information from:

- The *American National Dictionary of Information Processing Systems*, copyright 1982 by the Computer and Business Equipment Manufacturers Association (CBEMA). Copies can be purchased from the American National Standards Institute at 1430 Broadway, New York, New York 10018. These definitions are identified by an asterisk (\*).
- The *ISO Vocabulary – Information Processing*, developed by the International Organization for Standardization, Technical Committee 97, Subcommittee 1. Definitions from published sections of this vocabulary are identified by the symbol "(ISO)" following the definition. Definitions from draft international standards, draft proposals, and working papers in development by the ISO/TC97/SC1 vocabulary subcommittee are identified by the symbol "(TC97)," indicating that final agreement has not yet been reached among participating members.
- The *CCITT Eighth Plenary Assembly Red Book, Terms and Definitions*, and working documents published by the International Telegraph and Telephone Consultative Committee of the International Telecommunication Union, Geneva, 1985. These are identified by the symbol "(CCITT/ITU)" following the definition.

For abbreviations, the definition usually consists only of the words represented by the letters; for complete definitions, see the entries for the words.

## A

**ABM.** Asynchronous balanced mode.

**access barred.** In data communication, a condition in which a data terminal equipment (DTE) cannot call the DTE identified by the selection signals.

**adapter control block (ACB).** In NCP, a control block that contains line control information and the states of I/O operations for BSC lines, SS lines, or SDLC links.

**alert.** (1) In SNA, a record sent to a system problem management focal point to communicate the existence of an alert condition. (2) In the NetView program, a high priority event that warrants immediate attention. This data base record is generated for certain event types that are defined by user-constructed filters.

**ASCII.** American National Standard Code for Information Interchange.

**asynchronous balanced mode (ABM).** An operational mode of a balanced data link in which either combined station can send commands at any time and can initiate transmission of response frames without explicit permission from the other combined station. See also *normal response mode (NRM)*, *asynchronous response mode (ARM)*.

**asynchronous response mode (ARM).** An operational mode of an unbalanced data link in which a secondary station may initiate transmission without explicit permission from the primary station. See also *asynchronous balanced mode (ABM)*, *normal response mode (NRM)*.

## B

**balanced data link.** In data communication, a data link between two participating combined stations; for transmissions it originates, each station can transmit both command frames and response frames, organize its data flow, and perform error recovery operations at the data link level. Contrast with *unbalanced data link*.

**balanced station.** Synonym for *combined station*.

**begin bracket.** In SNA, the value (binary 1) of the begin-bracket indicator in the request header (RH) of the first request in the first chain of a bracket; the value denotes the start of a bracket. Contrast with *end bracket*. See also *bracket*.

**bidder.** In SNA, the LU-LU half-session defined at session activation as having to request and receive permission from the other LU-LU half-session to begin a bracket. Contrast with *first speaker*. See also *bracket protocol*.

**billing function.** An optional function of X.25 NPSI GATE Fast Connect that provides the CTCP with billing information.

**binary synchronous communication (BSC).** (1) Communication using binary synchronous line discipline. (2) A uniform procedure, using a standardized set of control characters and control character sequences, for synchronous transmission of binary-coded data between stations.

**boundary function.** (1) A capability of a subarea node to provide protocol support for attached peripheral nodes, such as: (a) interconnecting subarea path control and peripheral path control elements, (b) performing session sequence numbering for low-function peripheral nodes, and (c) providing session-level pacing support. (2) The component that provides these

capabilities. See also *boundary node*, *intermediate routing function*, *subarea node*.

**boundary node.** (1) A subarea node with boundary function. See also *boundary function*. (2) The programming component that performs FID2 (format identification type 2) conversion, channel data link control, pacing, and channel or device error recovery procedures for a locally attached station. These functions are similar to those performed by a network control program for an NCP-attached station.

**bracket.** In SNA, one or more chains of request units (RUs) and their responses that are exchanged between the two LU-LU half-sessions and that represent a transaction between them. A bracket must be completed before another bracket can be started. Examples of brackets are data base inquiries/replies, update transactions, and remote job entry output sequences to work stations. See also *begin bracket*, *end bracket*.

**bracket protocol.** In SNA, a data flow control protocol in which exchanges between the two LU-LU half-sessions are achieved through the use of brackets, with one LU designated at session activation as the first speaker and the other as the bidder. The bracket protocol involves bracket initiation and termination rules. See also *bidder*, *first speaker*.

**BSC.** Binary synchronous communication.

## C

**call.** (1) A transmission for the purpose of identifying the transmitting station for which the transmission is intended. (2) An attempt to reach a user, whether or not successful. (CCITT/ITU)

**call accepted packet.** A call supervision packet transmitted by a called data terminal equipment (DTE) to inform the data circuit-terminating equipment (DCE) of the acceptance of the call. (CCITT/ITU)

**call accepted signal.** A call control signal that is sent by the called data terminal equipment (DTE) to indicate that it accepts the incoming call. (TC97)

**call collision.** A condition that occurs when a data terminal equipment (DTE) transmits a call request signal and a data circuit-terminating equipment (DCE) simultaneously transmits an incoming call signal; neither the DTE nor the DCE receives the expected response. See also *clear collision*, *reset collision*.

**call connected packet.** A call supervision packet transmitted by a data circuit-terminating equipment (DCE) to inform a calling data terminal equipment (DTE) of the complete establishment of a call. (CCITT/ITU)

**called party.** On a switched line, the location to which a connection is established.

**call establishment.** The sequence of events for the establishment of a data connection. (CCITT/ITU)

**calling.** The process of transmitting selection signals in order to establish a connection between data stations. (TC97)

**calling party.** On a switched line the location that originates a connection.

**call-not-accepted signal.** A call control signal sent by the called data terminal equipment (DTE) to indicate that it does not accept the incoming call. (TC97)

**call request packet.** A call supervision packet transmitted by a data terminal equipment (DTE) to ask for a call establishment through the network. (CCITT/ITU)

**call request signal.** A signal in the call establishment phase which alerts the data circuit-terminating equipment (DCE) that the data terminal equipment (DTE) wishes to make a call. (CCITT/ITU)

**call supervision packet.** A packet used for the establishment or the clearing of a call at the DTE/DCE interface. (CCITT/ITU)

**CCITT.** International Telegraph and Telephone Consultative Committee.

**channel.** See *data communication channel*.

**CICS.** Customer Information Control System.

**circuit.** See *data circuit*.

**circuit switched data transmission service.** A service using circuit switching to establish and maintain a connection before data can be transferred between data terminal equipments (DTEs). (TC97) See also *packet switched data transmission service*.

**circuit switching.** A process that, on demand, connects two or more data terminal equipments (DTEs) and permits the exclusive use of a data circuit between them until the connection is released. \* (ISO) Synonymous with *line switching*. See also *message switching*, *packet switching*.

**class of service (COS).** In SNA, a designation of the path control network characteristics, such as path security, transmission priority, and bandwidth, that apply to a particular session. The end user designates class of service at session initiation by using a symbolic name that is mapped into a list of virtual routes, any one of which can be selected for the session to provide the requested level of service. See also *user class of service*.

**clear collision.** A condition that occurs when a data terminal equipment (DTE) and a data circuit-

terminating equipment (DCE) simultaneously transmit a clear request packet and a clear indication packet over the same logical channel. See also *call collision*, *reset collision*.

**clear indication packet.** A call supervision packet transmitted by a data circuit-terminating equipment (DCE) to inform a data terminal equipment (DTE) of the clearing of a call. (CCITT/ITU)

**clear request packet.** A call supervision packet transmitted by a data terminal equipment (DTE) to ask for clearing a call. (CCITT/ITU)

**CLIST.** Command list.

**closed user group.** In a group of users, a subgroup that is assigned a facility that enables a member of one subgroup to communicate only with other members of the subgroup. (TC97) A data terminal equipment (DTE) can belong to more than one closed user group.

**closed user group with outgoing access.** A closed user group that has a user assigned facility which enables that user to communicate with other users of a public data network transmission service, where appropriate, or with users having a data terminal equipment (DTE) connected to any other public switched network to which interworking facilities are available. (CCITT/ITU)

**combined station.** (1) In high-level data link control (HDLC), the part of a data station that supports the combined control functions of the data link, generates commands and responses for transmission, and interprets received commands and responses. (ISO)

**Note:** Specific responsibilities assigned to a combined station include initialization of control signal interchange, organization of data flow, interpretation of received commands, and generation of appropriate responses and actions regarding error control and error recovery functions at the data link level. (2) A data station that generates commands and responses for transmission over a data link and interprets received commands and responses. (3) Synonymous with *balanced station*. See also *primary station*, *secondary station*.

**command frame.** A frame transmitted by a primary station or a frame transmitted by a combined station that contains the address of the other combined stations. (TC97)

**command list (CLIST).** A sequential list of commands, control statements, or both, that is assigned a name; when the name is invoked the commands in the list are executed.

**communication and transmission control program (CTCP).** A user-written or IBM-supplied program used in conjunction with the DATE or GATE function of X.25 NPSI to manage virtual circuits. It executes in the host

processor. See also *DATE CTCP*, *fast connect GATE CTCP*, *GATE CTCP*.

**communication common carrier.** In the USA and Canada, a public data transmission service that provides the general public with transmission service facilities; for example, a telephone or telegraph company. See also *Post Telephone and Telegraph Administration*, *public network*.

**communication line.** Deprecated term for *telecommunication line*.

**contention mode.** In data communication, a mode of transmission in which any station may transmit whenever the line is available. If stations transmit simultaneously, protocols determine who wins the contention.

**CSDN.** Circuit-switched data network.

**CTCP.** Communication and transmission control program.

**CUD.** Call user data field.

**CUG.** Closed user group.

**Customer Information Control System (CICS).** An IBM licensed program that enables transactions entered at remote terminals to be processed concurrently by user-written application programs. It also includes facilities for building, using, and maintaining data bases.

**CV.** Control vector.

**CWALL.** An NCP threshold of buffer availability, below which the NCP will accept only high-priority path information units (PIUs).

## D

**data channel.** A device that connects a processor and main storage with I/O control units. Synonymous with *input/output channel*. Contrast with *data communication channel*.

**data circuit.** (1) Associated transmit and receive channels that provide a means of two-way data communication. (ISO) (2) See also *physical circuit*, *virtual circuit*.

### Notes:

1. Between data switching exchanges (DSEs), the data circuit may or may not include data circuit-terminating equipment (DCE), depending on the type of interface used at the data switching exchange.
2. Between a data station and a data switching exchange or data concentrator, the data circuit

includes the data circuit-terminating equipment at the data station end, and may also include equipment similar to a DCE at the data switching exchange or data concentrator location.

**data circuit-terminating equipment (DCE).** The equipment installed at the user's premises that provides all the functions required to establish, maintain, and terminate a connection, and the signal conversion and coding between the data terminal equipment (DTE) and the line. (TC97) The DCE may be separate equipment or an integral part of other equipment.

**data communication channel.** (1) A means of one-way transmission. \* (ISO) (2) Contrast with *data channel*. A channel may be provided by frequency- or time-division multiplexing. In CCITT terminology, a channel (data communication channel) provides one-way (simplex) transmission; data circuits and "logical channels" provide two-way (duplex) transmission. In data processing terminology, a channel (an I/O channel or data channel), provides two-way transfers of data. This distinction must be kept in mind when documenting the interface.

**datagram.** A self-contained, independent entity of data carrying sufficient information to be routed from the source data terminal equipment (DTE) to the destination DTE without relying on earlier exchanges between the source or destination DTE and the transporting network. (CCITT/ITU)

**data link.** (1) The assembly of parts of two data terminal equipments that are controlled by a link protocol, and the interconnecting data circuit, that enable data to be transferred from a data source to a data sink. (ISO) (2) The interconnecting data circuit and the link protocol between two or more equipments; it does not include the data source or the data sink. (3) In SNA, synonym for *link*. (4) Contrast with *telecommunication line*.

**data link level.** The conceptual level of control or processing logic existing in the hierarchical structure of a data station (primary, secondary, or combined station) that is responsible for maintaining control of the data link. The data link level functions provide an interface between the data station high level logic and the data link. These functions include transmit bit insertion and receive bit deletion; address/control field interpretation; command/response generation, transmission, and interpretation; and frame check sequence computation and interpretation. See also *packet level* and *physical level*. (TC97)

**data packet.** A packet used for the transmission of user data on a virtual circuit at the DTE/DCE interface. (CCITT/ITU)

**data station.** The data terminal equipment (DTE), the data circuit-terminating equipment (DCE), and any

intermediate equipment. \* (ISO) Synonymous with *data terminal installation*.

**data switching exchange (DSE).** The equipment installed at a single location to provide switching functions, such as circuit switching, message switching, and packet switching. (ISO)

**data terminal equipment (DTE).** That part of a data station that serves as a data source, data sink, or both, and provides for the data communication control function according to protocols. (TC97)

**data terminal installation.** Synonym for *data station*.

**data transfer.** The movement, or copying, of data from one location and the storage of the data at another location.

**data transfer phase.** The phase of a data call during which data signals can be transferred between data terminal equipments (DTEs) connected through the network. See also *network control phase*.

**data transfer rate.** The average number of bits, characters, or blocks per unit time passing between corresponding equipment in a data transmission system.

**data transmission line.** Synonym for *telecommunication line*.

**DATE.** Dedicated access to X.25 transport extension.

**DATE CTCP.** A CTCP that is used in conjunction with the DATE function of X.25 NPSI to manage virtual circuits.

**D bit.** Delivery confirmation bit.

**DCE.** Data circuit-terminating equipment.

**DCE clear confirmation packet.** A call supervision packet transmitted by a data circuit-terminating equipment (DCE) to confirm the clearing of a call. (CCITT/ITU)

**DCE/DTE interface.** See *DTE/DCE interface*.

**deadlock.** (1) Unresolved contention for use of a resource. (2) An error condition in which processing cannot continue because each of two elements of the process is waiting for an action by or a response from the other. (3) An impasse that occurs when multiple processes are waiting for the availability of a resource that will not become available because it is being held by another process that is in a similar wait state.

**dedicated access to X.25 transport extension (DATE).** A function of X.25 NPSI that allows a communication and transmission control program (CTCP) to manage virtual circuits to SNA and non-SNA DTEs by processing qualified data, Interrupt, Call, Clear, and Reset

packets. The contents of non-qualified data packets are transferred on the LU-LU session between the application program LU and the virtual circuit LU. Control and qualified data packets are transferred on the LU-LU session between the CTCP LU that manages virtual circuits and the multichannel link (MCH) LU.

**dedicated channel.** A channel that is not switched.

**dedicated circuit.** A circuit that is not switched.

**definite response (DR).** In SNA, a value in the form-of-response-requested field of the request header. The value directs the receiver of the request to return a response unconditionally, whether positive or negative, to that request. Contrast with *exception response, no response*.

**definite response mode.** A mode of operation in which an LU requires a response to its request.

**definition statement.** (1) In VTAM, the statement that describes an element of the network. (2) In NCP, a type of instruction that defines a resource to the NCP.

**DFC.** Data flow control.

**dial-in.** Refers to the direction in which a switched connection is requested by any node or terminal other than the receiving host or an NCP.

**dial-out.** Refers to the direction in which a switched connection is requested by a host or an NCP.

**direct call.** A facility which enables the establishment of a call without the need to convey address signals to the network. (CCITT/ITU)

**discarded packet.** A packet which is destroyed intentionally or by default while being transmitted through the network. (CCITT/ITU)

**disconnected mode.** Synonym for *disconnected phase*.

**disconnected phase.** A phase entered by a data circuit-terminating equipment (DCE) when it detects error conditions, recovers from a temporary internal malfunction, or receives a DISC command from a data terminal equipment (DTE). In the disconnected phase, the DCE can initiate link setup but can transmit only DM responses to received frames. See also *information transfer phase*.

**DSC.** Disconnect, disconnected.

**DSE.** Data switching exchange.

**DTE.** Data terminal equipment.

**DTE busy.** Status of a DTE which is unavailable because it cannot accept an additional call. (ISO)

**DTE clear confirmation packet.** A call supervision packet transmitted by data terminal equipment (DTE) to confirm the clearing of a call. (CCITT/ITU)

**DTE/DCE interface.** The physical interface elements and the link access procedures between data terminal equipment (DTE) and data circuit-terminating equipment (DCE). (CCITT/ITU)

**duplex.** In data communication, pertaining to a simultaneous two-way independent transmission in both directions. \* Synonymous with *full-duplex*.

## E

**EBCDIC.** Extended binary-coded decimal interchange code.

**echoplex mode.** In data communication, a mode in which characters are automatically returned to the transmitting data terminal equipment (DTE).

**ENA.** Extended network addressing.

**enable presentation (ENP) character.** A control character that enables presentation of the following characters to resume after having been stopped by an inhibit presentation (INP) character.

**end bracket.** In SNA, the value (binary 1) of the end bracket indicator in the request header (RH) of the first request of the last chain of a bracket; the value denotes the end of the bracket. Contrast with *begin bracket*. See also *bracket*.

**end-to-end control.** A means whereby during the data phase of a call, interconnected data terminal equipment (DTE) may exchange control signals without loss of data bit sequence independence. (CCITT/ITU)

**exception request (EXR).** In SNA, a request that replaces another message unit in which an error has been detected.

**exception response (ER).** In SNA, a value in the form-of-response-requested field of a request header (RH). An exception response is sent only if a request is unacceptable as received or cannot be processed. Contrast with *definite response (DR), no response*.

**extended binary-coded decimal interchange code (EBCDIC).** A set of 256 characters, each represented by eight bits.

**extended network addressing.** The network addressing system that splits the address into an 8-bit subarea and a 15-bit element portion. The subarea portion of the address is used to address host processors or communication controllers. The element portion is used to permit processors or controllers to address resources.

## F

**fallback.** On an IBM 3745 with twin CCUs, the action of switching the lines attached to one CCU to the other CCU.

**fast connect.** An optional extension of the X.25 NPSI GATE function that pre-establishes the SNA sessions between the host logical unit (LU) and the simulated LUs in X.25 NPSI.

**fast connect GATE CTCP.** A CTCP that is used in conjunction with the fast connect GATE function of X.25 NPSI to manage virtual circuits. See also *GATE CTCP*.

**fast select.** An option of a virtual call facility that allows inclusion of data in call-setup and call-clearing packets. (ISO)

**FCS.** Frame check sequence.

**first speaker.** In SNA, the LU-LU half-session defined at session activation as: (1) able to begin a bracket without requesting permission from the other LU-LU half-session to do so, and (2) winning contention if both half-sessions attempt to begin a bracket simultaneously. Contrast with *bidder*. See also *bracket protocol*.

**flag (F) sequence.** The unique sequence of eight bits (01111110) employed to delimit the opening and closing of a frame. (TC97)

**flow control.** (1) The procedure for controlling the data transfer rate. (TC97) (2) In SNA, the process of managing the rate at which data traffic passes between components of the network. The purpose of flow control is to optimize the rate of flow of message units with minimum congestion in the network; that is, to neither overflow the buffers at the receiver or at intermediate routing nodes, nor leave the receiver waiting for more message units.

**FMD.** Function management data

**formatted system services (FSS).** A facility that provides certain system services as a result of receiving a field-formatted command, such as an INITIATE or TERMINATE command. Contrast with *unformatted system services (USS)*.

**frame.** (1) In high-level data link control (HDLC), the sequence of contiguous bits bracketed by and including opening and closing flag (01111110) sequences. (2) A set of consecutive digit time slots in which the position of each digit time slot can be identified by reference to a frame alignment signal. (CCITT/ITU)

**frame check sequence (FCS).** (1) A field immediately preceding the closing flag sequence of a frame that

contains a bit sequence checked by the receiver to detect transmission errors. (2) In SDLC, 16 bits in a frame that contain transmission-checking information.

**frame-level interface.** The level of the DTE/DCE interface in packet mode operation relating to the exchange of packets with local error control, where packets are contained in frames. (CCITT/ITU) See also *packet level interface*.

**full-duplex.** Synonym for *duplex*.

## G

**GATE.** General access to X.25 transport extension.

**GATE CTCP.** A CTCP that is used in conjunction with the GATE function of X.25 NPSI to manage virtual circuits. In addition to managing virtual circuits, a GATE CTCP can be used to relay user data to and from subsystems such as CICS, IMS, and TSO.

**general access to X.25 transport extension (GATE).** A function of X.25 NPSI that allows a communication and transmission control program (CTCP) to manage virtual circuits to non-SNA DTEs by processing data, qualified data, Interrupt, Call, Clear, and Reset packets.

## H

**HDLC.** High-level data link control.

**high-level data link control (HDLC).** Control of data links by use of a specified series of bits rather than by the control characters of the ISO Standard 7-bit character set for information processing interchange. (CCITT/ITU)

**host node.** A node providing an application program interface (API) and a common application interface. See *boundary node*, *node*, *peripheral node*, *subarea node*. See also *boundary function*, *node type*.

## I

**I format.** Information format.

**I frame.** Information frame.

**IMS.** Information Management System.

**incoming call packet.** A call supervision packet transmitted by a data circuit-terminating equipment (DCE) to inform a called data terminal equipment (DTE) of a call requested by another DTE. (CCITT/ITU)

**information (I) format.** A format used for information transfer.

**information (I) frame.** A frame in I format used for numbered information transfer. See also *supervisory frame, unnumbered frame*.

**Information Management System (IMS).** A general purpose system whose full name is Information Management System/Virtual Storage (IMS/VS). It enhances the capabilities of OS/VS for batch processing and telecommunication and allows users to access a computer-maintained data base through remote terminals.

**information transfer phase.** A phase in which a data circuit-terminating equipment (DCE) can accept and transmit information (I) frames and supervisory (S) frames. See also *disconnected phase*.

**inhibit presentation (INP) character.** A control character that causes presentation of the following characters to be stopped.

**INOP.** Inoperative.

**input/output channel.** Synonymous with *data channel*.

**intermediate routing function.** In SNA, a path control capability in a subarea node that receives and routes path information units (PIUs) that neither originate in nor are destined for network addressable units (NAUs) in that subarea node. See also *boundary function*.

**intermediate routing node.** In SNA, a subarea node with an intermediate routing function. A subarea node may be a boundary node, intermediate routing node, both, or neither, depending on how it is used in a network.

**ITU.** International Telecommunication Union.

## L

**LAC.** Link access control (X.25 Level 2 in X.25 NPSI)

**LAP.** Link access procedure.

**LAPB.** Link access procedure balanced. See *link access procedures (LAP, LAPB)*.

**leased line.** Synonym for *nonswitched line*.

**line speed.** The number of binary digits that can be sent over a telecommunication line in one second, expressed in bits per second (bps).

**line switching.** Synonym for *circuit switching*.

**link access procedures (LAP, LAPB).** The link level elements used for data interchange between a data circuit-terminating equipment (DCE) and a data terminal equipment (DTE) operating in user classes of

service 8 to 11, as specified in CCITT Recommendation X.1.

**link level.** See *data link level*.

**link station.** (1) In SNA, the combination of hardware and software that allows a node to attach to and provide control for a link. (2) In VTAM, a named resource within a subarea node that represents another subarea node that is attached by a subarea link. In the resource hierarchy, the link station is subordinate to the subarea link.

**LIQ.** Link input queue.

**LLC.** Logical link control.

**load module.** A program unit that is suitable for loading into main storage for execution; it is usually the output of a linkage editor. (ISO)

**logical channel.** In packet mode operation, a means of two-way simultaneous transmission across a data link, comprising associated send and receive channels. A logical channel can represent the path that data travels from its origin to the network or from the network to its destination. (CCITT/ITU)

**logical circuits.** In packet mode operation, a means of duplex transmission across a data link comprising associated send and receive channels. A number of logical circuits can be derived from a data link by packet interleaving. Several logical circuits can exist on the same data link.

**logical unit (LU).** In SNA, a port through which an end user accesses the SNA network and the functions provided by system services control points (SSCPs). An LU can support at least two sessions—one with an SSCP and one with another LU—and may be capable of supporting many sessions with other LUs. See also *peripheral LU, physical unit (PU), primary logical unit (PLU), secondary logical unit (SLU), system services control point (SSCP)*.

**lower window edge.** The lowest sequence number in a window. (CCITT/ITU)

**LU.** Logical unit.

**LUSIM.** LU simulator.

**LU simulator (LUSIM).** A function of X.25 NPSI that simulates a logical unit (LU) for a non-SNA DTE so that the application LU or CTCP LU acts as though it is in session with an SNA DTE rather than with a non-SNA DTE. The LU-LU session between the application or CTCP LU and the simulated LU uses LU type 1 protocols.

## M

**maintenance and operator subsystem (MOSS).** A subsystem of an IBM communication controller, such as the 3725 or the 3720, that contains a processor and operates independently of the rest of the controller. It loads and supervises the controller, runs problem determination procedures, and assists in maintaining both hardware and software.

**MCH.** Multichannel link.

**message switching.** (1) In a data network, the process of routing messages by receiving, storing, and forwarding complete messages. (2) The technique of receiving a complete message, storing, and then forwarding it to its destination unaltered. (TC97)

**migration.** Installing a new version or release of a program when an earlier version or release is already in place.

**MOSS.** Maintenance and operator subsystem.

**multichannel link (MCH).** A means of enabling a data terminal equipment (DTE) to have several access channels to the data network over a single circuit. Three likely methods have been identified: packet interleaving, byte interleaving, and bit interleaving. (CCITT/ITU)

**multilink procedure.** A procedure for controlling the operation of an MCH that consists of several physical links running in parallel.

**Multiple Virtual Storage (MVS).** An IBM licensed program whose full name is the Operating System/Virtual Storage (OS/VS) with Multiple Virtual Storage/System Product for System/370. It is a software operating system controlling the execution of programs.

## N

**NCP.** Network Control Program.

**NCP/EP definition facility (NDF).** A program that is part of System Support Programs (SSP) and is used to generate a partitioned emulation program (PEP) load module or a load module for a Network Control Program (NCP) or for an Emulation Program (EP).

**NDF.** NCP/EP definition facility.

**NDM.** Normal disconnected mode.

**NEO.** Network expansion option.

**NetView program.** A System/370-based IBM licensed program used to monitor a network, manage it, and diagnose its problems.

**network addressable unit (NAU).** In SNA, a logical unit, a physical unit, or a system services control point. The NAU is the origin or the destination of information transmitted by the path control network. See also *logical unit (LU)*, *path control (PC) network*, *physical unit (PU)*, *system services control point (SSCP)*.

**network control phase.** That phase of a data call during which network control signals are exchanged between a DTE and the network for the purpose of call establishment, call disconnection, or for control signaling during the data phase. (ISO)

**Network Control Program (NCP).** An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability. Its full name is Advanced Communications Function for the Network Control Program.

**network failure.** In a network, any condition that makes a service unavailable because the network or one of its essential components is not functioning correctly.

**Network Routing Facility (NRF).** An IBM licensed program that resides in the NCP, which provides a path for messages between terminals, and routes messages over this path without going through the host processor.

**Network Terminal Option (NTO).** An IBM licensed program used in conjunction with NCP that allows certain non-SNA devices to participate in sessions with SNA application programs in the host processor. NTO converts non-SNA protocol to SNA protocol when data is sent to the host from a non-SNA device and reconverts SNA protocol to non-SNA protocol when data is sent back to the device.

**NIA.** IBM 5973-LO2 Network Interface Adapter.

**node.** (1) In a network, a point at which one or more functional units connect channels or data circuits. (ISO) (2) In SNA, an endpoint of a link or a junction common to two or more links in a network. Nodes can be distributed to host processors, communication controllers, cluster controllers, or terminals. Nodes can vary in routing and other functional capabilities. (3) In ACF/VTAM, a point in a network defined by a symbolic name.

**node type.** In SNA, a designation of a node according to the protocols it supports and the network addressable units (NAUs) that it can contain. Five types are defined: 1, 2.0, 2.1, 4, and 5. Type 1, type 2.0, and type 2.1 nodes are peripheral nodes; type 4 and type 5 nodes are subarea nodes.

**non-qualified data packet.** A data packet in which the Q-bit is set off.

**nonswitched connection.** A connection that does not have to be established by dialing. Contrast with *switched connection*.

**nonswitched line.** A telecommunication line on which connections do not have to be established by dialing. Contrast with *switched line*. Synonymous with *leased line*.

**no response.** In SNA, a value in the form-of-response-requested field of the request header (RH) indicating that no response is to be returned to the request, whether or not the request is received and processed successfully. Contrast with *definite response (DR)*, *exception response (ER)*.

**normal response mode (NRM).** An operational mode of an unbalanced data link in which the secondary station initiates transmission only as the result of receiving explicit permission from the primary station. See also *asynchronous balanced mode (ABM)*, *asynchronous response mode (ARM)*.

**NRF.** Network routing facility.

**NRM.** normal response mode.

**NTO.** Network terminal option.

## O

**octet.** A byte composed of eight binary elements.

**OLT.** Online test

**Open Systems Interconnection (OSI).** (1) The interconnection of open systems in accordance with specific ISO standards. (2) The use of standardized procedures to enable the interconnection of data processing systems.

**OSI.** Open Systems Interconnection.

**OUFT.** Optional user facility table.

## P

**padding.** In SNA, a technique by which a receiving component controls the rate of transmission of a sending component to prevent overrun or congestion. See also *session-level pacing*, *virtual route (VR) pacing*.

**packet.** A sequence of binary digits, including data and call control signals, that is transmitted and switched as a composite whole. (ISO) The data, call control signals, and error control information are

arranged in a specific format. See also *call accepted packet*, *call connected packet*, *call request packet*, *call supervision packet*, *clear indication packet*, *clear request packet*, *data packet*, *DCE clear confirmation packet*, *discarded packet*, *DTE clear confirmation packet*, *incoming call packet*, *non-qualified data packet*, *permit packet*, *qualified data packet*, *reset packet*, *RNR packet*, *RR packet*.

**packet assembler/disassembler (PAD).** A user facility which permits non-packet mode terminals to exchange data in the packet mode. (CCITT/ITU)

**packet level.** The packet format and control procedures for the exchange of packets containing control information and user data between the data terminal equipment (DTE) and the data circuit-terminating equipment (DCE). See also *data link level*, *physical level*.

**packet level interface.** The level of the DTE/DCE interface in packet mode operation relating to the exchange of data and signaling, where this information is contained in packets. (CCITT/ITU) See also *frame-level interface*.

**packet level processor.** The part of X.25 NPSI that handles X.25 level 3.

**packet mode operation.** Synonym for *packet switching*.

**packet mode terminal.** Data terminal equipment that can control, format, transmit, and receive packets. (TC97)

**packet sequencing.** A process of ensuring that packets are delivered to the receiving data terminal equipment (DTE) in the same sequence as they were transmitted by the sending DTE. (TC97)

**packet switched data network (PSDN).** A network that uses packet switching as a means of transmitting data.

**packet switched data transmission service.** A user service involving the transmission and, if necessary, the assembly and disassembly of data in the form of packets. (CCITT/ITU)

**packet switching.** (1) The process of routing and transferring data by means of addressed packets so that a channel is occupied only during the transmission of a packet. On completion of the transmission, the channel is made available for transfer of other packets. (ISO) (2) Synonymous with *packet mode operation*. Contrast with *circuit switching*.

**PAD.** Packet assembler/disassembler.

**path control (PC) network.** In SNA, the part of the SNA network that includes the data link control and path control layers. See *SNA network*, *user-application network*. See also *boundary function*.

**path information unit (PIU).** In SNA, a message unit consisting of a transmission header (TH) alone, or of a TH followed by a basic information unit (BIU) or a BIU segment. See also *transmission header*.

**PCNE.** Protocol converter for non-SNA equipment.

**PDN.** Public data network.

**peripheral link.** In SNA, a link that connects a peripheral node to a subarea node. See also *subarea link*.

**peripheral LU.** In SNA, a logical unit representing a peripheral node.

**peripheral node.** In SNA, a node that uses local addresses for routing and therefore is not affected by changes in network addresses. A peripheral node requires boundary function assistance from an adjacent subarea node. See also *intermediate routing node*, *node type*, *peripheral link*, *subarea node*.

**permanent virtual circuit (PVC).** A virtual circuit that has a logical channel permanently assigned to it at each data terminal equipment (DTE). A call establishment protocol is not required.

**permit packet.** A packet used for the transmission of permits for a virtual circuit at the DTE/DCE interface. (CCITT/ITU)

**physical circuit.** A circuit created with hardware rather than by multiplexing. See also *data circuit*. Contrast with *virtual circuit*.

**physical level.** The mechanical, electrical, functional, and procedural media used to activate, maintain, and deactivate the physical link between the data terminal equipment (DTE) and the data circuit-terminating equipment (DCE). See also *data link level*, *packet level*.

**physical unit (PU).** In SNA, a type of network addressable unit (NAU). A physical unit (PU) manages and monitors the resources (such as attached links) of a node, as requested by a system services control point (SSCP) through an SSCP-PU session. An SSCP activates a session with the physical unit in order to indirectly manage, through the PU, resources of the node such as attached links.

**piggybacking.** Act of acknowledging a received frame or packet within the next transmittal.

**PIU.** Path information unit.

**PLP.** Packet level processor.

**port.** An access point for data entry or exit.

**port swap.** A function of NCP/X.25 NPSI that allows you to install spare ports to be used as backup in case of failure of the original port.

**Post Telephone and Telegraph Administration (PTT).** A generic term for the government-operated common carriers in countries other than the USA and Canada. Examples of the PTT are the Post Office in the United Kingdom, the Bundespost in Germany, and the Nippon Telephone and Telegraph Public Corporation in Japan.

**primary logical unit (PLU).** In SNA, the logical unit (LU) that contains the primary half-session for a particular LU-LU session. Each session must have a PLU and secondary logical unit (SLU). The PLU is the unit responsible for the bind and is the controlling LU for the session. A particular LU can contain both primary and secondary half-sessions for different active LU-LU sessions. Contrast with *secondary logical unit (SLU)*.

**primary station.** (1) In high-level data link control (HDLC), the part of a data station that supports the primary control functions of the data link, generates commands for transmission, and interprets received responses. (ISO) (2) In SNA, the station on an SDLC data link that is responsible for the control of the data link. There must be only one primary station on a data link. All traffic over the data link is between a primary station and a secondary station. (3) Contrast with *secondary station*. See also *combined station*.

**Note:** Specific responsibilities assigned to the primary station include initialization of control signal interchange, organization of data flow, and actions regarding error control and error recovery functions at the data link level.

**problem determination.** The process of identifying the source of a problem; for example, a program component, a machine failure, telecommunication facilities, user or contractor-installed programs or equipment, an environment failure such as a power loss, or a user error.

**program temporary fix (PTF).** A temporary solution or bypass of a problem diagnosed by IBM as resulting from a defect in a current unaltered release of the program.

**protocol.** (1) A specification for the format and relative timing of information exchanged between communicating parties. (CCITT/ITU) (2) The set of rules governing the operation of functional units of a communication system that must be followed if communication is to be achieved. (TC97) (3) In SNA, the meanings of, and the sequencing rules for, requests and responses used for managing the network, transferring data, and synchronizing the states of network components. See also *bracket protocol*.

**protocol converter for non-SNA equipment (PCNE).** A function of X.25 NPSI that allows attachment of non-SNA X.25 DTEs without the use of a packet assembler/disassembler (PAD). PCNE replaces the packet headers used to receive data from non-SNA

**X.25 DTEs with the SNA headers used to pass the data to an application LU, and vice versa. The PCNE function uses an LU simulator.**

**PSDN.** Packet switched data network.

**PSH.** Physical services header (X.25 Level 4 for SNA terminals)

**PTF.** Program temporary fix.

**PTT.** Post Telephone and Telegraph Administration.

**PU.** Physical unit.

**public data network (PDN).** See *public network*.

**public network.** A network established and operated by an administration for the specific purpose of providing data transmission services to the public. Circuit switched, packet switched, and leased-circuit services are feasible. Contrast with *user-application network*.

**PVC.** Permanent virtual circuit.

## Q

**Q bit.** Qualified data bit.

**qualified data packet.** A data packet in which the Q bit is set on.

**QLLC.** Qualified logical link control.

## R

**receive leg.** The side of a duplex line that is receiving. Contrast with *transmit leg*.

**receive not ready packet.** See *RNR packet*.

**receive ready packet.** See *RR packet*.

**RECFMS.** Record formatted maintenance statistics.

**REJ.** Rejected message.

**request header (RH).** In SNA, control information preceding a request unit (RU). See also *request/response header (RH)*.

**request/response header (RH).** In SNA, control information, preceding a request/response unit (RU), that specifies the type of RU (request unit or response unit) and contains control information associated with that RU.

**request/response unit (RU).** In SNA, a generic term for a request unit or a response unit. See also *request unit (RU)*, *response unit (RU)*.

**request unit (RU).** In SNA, a message unit that contains control information, end-user data, or both.

**reset collision.** A condition that occurs when a data terminal equipment (DTE) and a data circuit-terminating equipment (DCE) simultaneously transmit a reset request packet and a reset indication packet over the same logical channel. See also *call collision*, *clear collision*.

**reset (of a virtual circuit).** Reinitializing of flow control on a virtual circuit, which eliminates all data that may be in transit for the virtual circuit at the time of resetting. (CCITT/ITU)

**reset packet.** A packet used for the resetting of a virtual circuit at the DTE/DCE interface. (CCITT/ITU)

**response.** In data communication, a reply represented in the control field of a response frame. It advises the primary/combined station with respect to the action taken by the secondary/combined station to one or more commands. (TC97)

**response frame.** A frame transmitted by a secondary station or a frame transmitted by a combined station that contains the address of the transmitting combined station. (TC97)

**response unit (RU).** In SNA, a message unit that acknowledges a request unit; it may contain prefix information received in a request unit. If positive, the response unit may contain additional information (such as session parameters in response to Bind Session), or if negative, contains sense data defining the exception condition.

**reverse charging acceptance.** A facility that enables a data terminal equipment (DTE) to receive incoming packets that request reverse charging.

**RNAA.** Request network address assignment.

**RNR.** Receive not ready.

**RNR packet.** A packet used by a data terminal equipment (DTE) or by a data circuit-terminating equipment (DCE) to indicate a temporary inability to accept additional packets for a given virtual call or permanent virtual circuit.

**RPOA.** Recognized private operating authority.

**RR.** Receive ready.

**RR packet.** A packet used by a data terminal equipment (DTE) or by a data circuit-terminating equipment (DCE) to indicate that it is ready to receive data packets within the window.

**RU.** Request/response unit.

## S

**SDLC.** Synchronous Data Link Control.

**SDT.** Start data traffic.

**secondary logical unit (SLU).** In SNA, the logical unit (LU) that contains the secondary half-session for a particular LU-LU session. Contrast with *primary logical unit (PLU)*.

**secondary station.** (1) In high-level data link control (HDLC), the part of a data station that executes data link control functions as instructed by the primary station and that interprets received commands and generates responses for transmission. (ISO) (2) A data station that executes data link control functions as instructed by the primary station. A secondary station interprets received commands and generates responses for transmission. Contrast with *primary station*. See also *combined station*.

**sequence number.** A number assigned to a particular frame or packet to control the transmission flow and receipt of data.

**session-level pacing.** In SNA, a flow control technique that permits a receiving session to control the data transfer rate (the rate which it receives request units) on the normal flow. It is used to prevent overloading a receiver with unprocessed requests when the sender can generate requests faster than the receiver can process them. See also *pacing, virtual route (VR) pacing*.

**S frame.** Supervisory frame

**SHM.** Short hold mode.

**short hold mode (SHM).** A function of X.25 NPSI that allows a virtual connection to be cleared if no traffic is present on the connection for a time interval specified by the user. When traffic resumes, the connection is automatically re-established.

**SMN.** Switched major node.

**SNA.** Systems Network Architecture.

**SNA network.** The part of a user-application network that conforms to the formats and protocols of Systems Network Architecture. It enables reliable transfer of data among end users and provides protocols for controlling the resources of various network configurations. The SNA network consists of network addressable units (NAUs), boundary function components, and the path control network.

**SNA network interconnect (SNI).** A facility that allows users to connect an SNA network with other SNA or non-SNA networks.

**SNI.** SNA network interconnect.

**SSCP.** System services control point.

**subaddressing.** The mechanism by which the X.25 NPSI logical link control (LLC) or the communication and transmission control program (CTCP) is selected by the value of the last digit of the called DTE address in the incoming call packet.

**subarea.** A portion of the SNA network consisting of a subarea node, any attached peripheral nodes, and their associated resources. Within a subarea node, all network addressable units, links, and adjacent link stations (in attached peripheral or subarea nodes) that are addressable within the subarea share a common subarea address and have distinct element addresses.

**subarea link.** In SNA, a link that connects two subarea nodes. See also *peripheral link*.

**subarea node.** In SNA, a node that uses network addresses for routing and whose routing tables are therefore affected by changes in the configuration of the network. Subarea nodes can provide gateway function, and boundary function support for peripheral nodes. Type 4 and type 5 nodes are subarea nodes. See *boundary node, host node, node, peripheral node*. See also *boundary function, node type*.

**supervisory (S) format.** A format used to perform data link supervisory control functions, such as acknowledge I frames, request retransmission of I frames, and request temporary suspension of transmission of I frames. See also *information format, unnumbered format*.

**supervisory (S) frame.** A frame in supervisory format used to transmit supervisory control functions.

**SVC.** Switched virtual circuit.

**SVCS.** Switched virtual circuit subarea communication

**switchback.** On an IBM 3745 with twin CCUs, the action of switching the lines currently attached to a CCU, as the result of a fallback, back to the original CCU.

**switched connection.** (1) A mode of operating a data link in which a circuit or channel is established to switching facilities as, for example, in a public switched network. (ISO) (2) A connection established by dialing. (3) Contrast with *nonswitched connection*.

**switched line.** A telecommunication line in which the connection is established by dialing. Contrast with *nonswitched line*.

**switched major node.** In VTAM, a major node whose minor nodes are physical units and logical units attached by switched SDLC links.

**switched network.** Any network in which connections are established by closing switches, for example, by dialing.

**switched virtual circuit subarea communication (SVCSC).** A function of X.25 NPSI that, together with appropriate VTAM functions, allows communication over a switched virtual circuit (SVC) between (1) two communication controllers or (2) a communication controller and certain host processors equipped with appropriate hardware and software.

**switched virtual circuit (SVC).** A virtual circuit that is requested by a virtual call. It is released when the virtual circuit is cleared.

**switched virtual circuit (SVC) short hold mode.** See *short hold mode (SHM)*.

**system services control point (SSCP).** In SNA, the focal point within an SNA network for managing the configuration, coordinating network operator and problem determination requests, and providing directory support and other session services for end users of the network. Multiple SSCPs, cooperating as peers, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its domain.

**Systems Network Architecture (SNA).** The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through and controlling the configuration and operation of networks.

**System Support Programs (SSP).** An IBM licensed program, made up of a collection of utilities and small programs, that supports the operation of the NCP.

## T

**telecommunication line.** (1) The portion of a data circuit external to a data-circuit terminating equipment (DCE) that connects the DCE to a data switching exchange (DSE), that connects a DCE to one or more other DCEs, or that connects a DSE to another DSE. (TC97) (2) Any physical medium, such as a wire or microwave beam, that is used to transmit data. (3) Synonymous with *data transmission line, transmission line*. (4) Contrast with *data link*.

**Note:** A telecommunication line is the physical medium; for example, a telephone wire or a microwave beam. A data link includes the physical medium of transmission, the protocol, and associated devices and programs—it is both logical and physical.

**time-out.** (1) An event that occurs at the end of a pre-determined period of time that began at the occurrence of another specified event. (ISO) (2) A time interval allotted for certain operations to occur; for example, response to polling or addressing before system operation is interrupted and must be restarted.

**Time Sharing Option (TSO).** An optional configuration of the operating system that provides conversational time sharing from remote stations.

**trace analysis program (TAP).** An SSP program service aid that assists in analyzing trace data produced by VTAM, TCAM, and NCP and provides network data traffic and network error reports.

**transmission header (TH).** In SNA, control information, optionally followed by a basic information unit (BIU) or a BIU segment, that is created and used by path control to route message units and to control their flow within the network. See also *path information unit (PIU)*.

**transmission line.** Synonym for *telecommunication line*.

**transmit leg.** The side of a duplex line that is transmitting. Contrast with *receive leg*.

**TSO.** Time Sharing Option.

## U

**UACB.** User adapter control block

**U frame.** Unnumbered frame.

**unbalanced data link.** A data link between a primary station and one or more participating secondary stations. The primary station assumes responsibility for the organization of data flow and for data link level error recovery operations and transmits command frames to the secondary stations. The secondary stations transmit response frames. Contrast with *balanced data link*. (TC97)

**unformatted system services (USS).** In SNA products, a system services control point (SSCP) facility that translates a character-coded request, such as a logon or logoff request into a field-formatted request for processing by formatted system services and translates field-formatted replies and responses into character-coded requests for processing by a logical unit. Contrast with *formatted system services*.

**unnumbered (U) format.** A format used to provide additional data link control functions and unnumbered information transfer. See also *information format, supervisory format*.

**unnumbered (U) frame.** A frame in unnumbered format, used to transfer unnumbered control functions. See also *information frame*, *supervisory frame*.

**USA.** Upstream address.

**user-application network.** A configuration of data processing products, such as processors, controllers, and terminals, established and operated by users for the purpose of data processing or information exchange, which may use services offered by communication common carriers or telecommunication administrations. Contrast with *public network*.

**user class of service.** A category of data transmission service provided by a data network in which the data signaling rate, the data terminal equipment operating mode, and the code structure, if any, are standardized. (TC97) See also *class of service (COS)*.

## V

**VC.** Virtual circuit.

**VCCPT.** Virtual circuit control parameter table.

**VCM.** Virtual circuit manager.

**virtual call.** See *virtual call facility*.

**virtual call facility.** A user facility in which a call setup procedure and a call clearing procedure will determine a period of communication between two data terminal equipments (DTEs) in which user's data will be transferred in the network in the packet mode of operation. All the user's data is delivered from the network in the same order in which it is received by the network. (CCITT/ITU)

**virtual circuit.** In packet switching, those facilities provided by a network that give the appearance to the user of an actual connection. (TC97) See also *data circuit*. Contrast with *physical circuit*.

**virtual circuit LU.** An LU that controls the flow of data over a virtual circuit between X.25 NPSI and a remote DTE. If the DTE is an SNA DTE, the virtual circuit LU is in that DTE. If the DTE is a non-SNA DTE, the virtual circuit LU is in the communication controller that runs X.25 NPSI; it is a simulated LU. See also *LU simulator (LUSIM)*.

**virtual route (VR) pacing.** In SNA, a flow control technique used by the virtual route control component of path control at each end of a virtual route to control the rate at which path information units (PIUs) flow over the virtual route. VR pacing can be adjusted according to traffic congestion in any of the nodes along the route. See also *pacing*, *session-level pacing*.

**Virtual Telecommunications Access Method (VTAM).** An IBM licensed program that controls communication and the flow of data in an SNA network. It provides single-domain, multiple-domain, and interconnected network capability.

## W

**window.** An ordered set of consecutive packet send sequence numbers of the data packets authorized to cross a DTE/DCE interface on a logical channel used for a virtual call or as a permanent virtual circuit.

**window edge.** The lowest sequence number in a window.

**window size.** The specified number of frames of information that can be sent before receiving an acknowledgment response.

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Planning and Installation  
Version 3 Releases 1 and 2**

**Publication No. SC30-3470-1**

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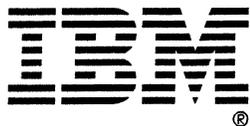
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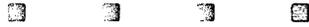


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