Multi-platform APPC Configuration Guide

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1.0 Introduction

To order this document, request SV40-0089-01. This document is also available in the following places:

- OS2BBS -- the IBM bulletin board accessible through IIN.
    - MPCONFIG.ZIP -- The Postscript version, the ASCII text version, the LIST3820 version, and the sample files.
- MKTTOOLS -- the IBM-internal bulletin board with packages available for distribution to customers. Most marketing reps and SE's have access to this bulletin board.
    - MPCONFIG PACKAGE -- contains the Postscript, ASCII text, and a LIST3820 version of the document, as well as the sample files.

This booklet explains how to configure APPC and APPN on the following platforms:

- Networking Services/DOS
- OS/2 Extended Services
- Communications Manager/2 1.1
- RISC System/6000 SNA Services
- RISC System/6000 SNA Server/6000
- VM
- CICS
- MVS
- OS/400
- 3174

(See the individual chapters for details on product versions and prerequisites.)

To configure APPC on different kinds of computers you need to know multiple configuration methods. Terminology varies from one type of computer to another. There is a set of values that needs to match between two computers that want to communicate.

This guide is designed to do three things:

1. Describe the steps needed to configure APPC.
2. Explicitly state which values in one computer's configuration need to match values in a partner computer's configuration.
3. Clarify the terminology differences between computers by mapping to a set of standard terms, and confining platform-specific terms to the section that describes that platform.

This guide is not a tutorial on APPC or APPN concepts, although some APPC and APPN terms are introduced in this first section. It is also not a network design tutorial. A good introduction to APPC and APPN concepts is provided in two publications: *Networking with APPN: An Overview*, G325-0204-00 and *Communi-*

cating with APPC and CPI-C: A Technical Overview, G325-0202-00. Both are available from IBM.

To keep things simple, configuration for a token-ring Local Area Network is explicitly presented in this booklet. The information here should help you configure other types of networks, but additional information from the platform's installation guide may be necessary in those cases.

1.1 APING

This guide uses a widely available APPC program named APING in the configuration examples. APING is a small program that sends data across a network and receives data back. APING is used to test connectivity between two machines on a network, and to provide diagnostic information when APPC communications fail. APING is shipped as a sample program with Networking Services/DOS and Communications Manager/2. It is also available on several bulletin boards:

- CompuServe

  There is an APPC Info Exchange forum on CompuServe (type GO APPC to access this forum). In the Sample Programs Library section, there are several packages related to APING:

  - APING.ZIP - The OS/2 APING executables, C source code, and makefiles for many platforms.

  - APINGS.ZIP - The C source portion of the APING.ZIP package.

  - PNGFAM.ZIP - The executables from the APING.ZIP package.

  - APINGC.ZIP - the CICS COBOL source for the APINGD server.

- MKTTOOLS

  MKTTOOLS is an IBM-internal bulletin board containing packages that can be distributed to customers. IBM marketing reps and SE's have access to this bulletin board and can request packages from it. The packages related to APING are:

  - APING PACKAGE: The OS/2 APING executables, C source code, and makefiles for many platforms.

  - APINGCIC PACKAGE: the CICS COBOL source for the APINGD server.

- OS2BBS

  The OS2BBS is a bulletin board accessible through IBM Information Network. You can acquire and register for the service by calling 1-800-547-1283. The APING package is available on the OS2BBS.

  - APING.ZIP: The OS/2 APING executables, C source code, and makefiles for many platforms.

The APING package consists of a client program, APING, and a server program APINGD. We recommend that you obtain APING and use it when you configure APPC in your network.

When you finish configuring both partners, run APING on the client machine. When APING successfully exchanges information with a partner, the following information (with timing variations) is displayed.

```
APING version 2.35 APPC echo test with timings.
  by Peter J. Schwaller (pjs@ralvm6.vnet.ibm.com)

Allocate duration:                        1711 ms

Program startup and Confirm duration:      689 ms

       Duration     Data Sent    Data Rate    Data Rate
       (msec)       (bytes)      (KB/s)       (Mb/s)
       ----------   ----------   ----------   ----------
           31           200          6.3         0.050
           29           200          6.7         0.054
Totals:    60           400          6.5         0.052

Duration statistics:   Min = 29   Ave = 30   Max = 31
```
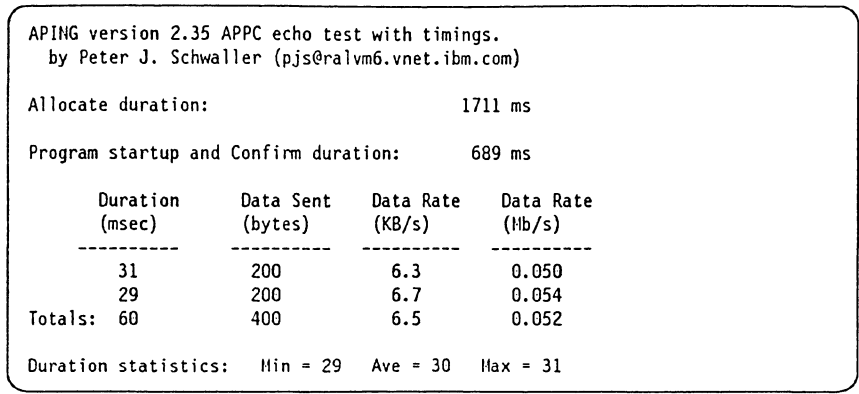
Figure 1. Results from APING

1.2 Using this guide

This guide contains a chapter for each platform. Each chapter describes that platform's configuration independent of the type of machine it will be connecting to. Within each chapter, when parameter values are needed from a partner computer, the instructions will say: "See the 'How to find...' section of the partner computer's configuration chapter." The person using that partner computer's configuration chapter should be able to read the 'How to find...' instructions and provide the proper value.

Each chapter assumes some knowledge of the operation of that platform. No APPC or APPN knowledge is required, but someone configuring Networking Services/DOS needs to know how to edit a text file in DOS, and how to copy files, for example.

If there are different people configuring different platforms, for example, when trying to connect OS/2 to an AS/400, this is what you should do:

1. Give the chapter on OS/2 to the person configuring OS/2.

2. Give the OS/400 chapter to the person configuring OS/400.

3. Each person fills in the values in the platform Configuration Worksheet at the beginning of their chapter. You need to obtain specific values from the person who is configuring the platform that you want to connect to. Instructions for finding this information are in the "How to find..." section of their chapter.

4. Each person follows the configuration directions in their chapter, filling in the appropriate values from the Configuration Worksheet.

5. If you need more details about a platform's configuration, you should refer to documents listed at the beginning of each chapter.

In this manner, the OS/2 configurerr never needs to learn the AS/400 configuration terminology (unless the same person is the configurer of both machines).

Each chapter in this booklet is not only independent of the partner computer's platform, but also independent of the network structure. This means that the connection between computers is described as a direct connection from one computer to the other. However, configuration can get complex when a computer starts con-

necting to several partner computers. This complexity is unnecessary when a special kind of node called a network node is added to the network. A network node is used to locate partners in a network. (Network nodes are discussed in more detail in 1.9, "What Is APPN?" on page 6.)

If you have an APPN network node in your network, you should define just one link to it, and avoid defining the many individual links to the other computers in the network that can be located by the network node. The chapter for each platform describes how to substitute a link to a network node for many direct links to partner machines. The way to find out if you have a network node in your network is to ask someone who set up the network. That person should be able to provide you with the necessary information about the network node for you to include it in your configuration. If you don't have a network node, or don't know if you have one, you can continue to follow the directions that assume there is no network node. The only drawback is that this may add unnecessary complexity to your network.

1.3 What Is APPC?

Advanced Program-to-Program Communication (APPC) is software that enables high-speed communications between programs on different computers, from portables and workstations to midrange and host computers. APPC software is available for many different IBM and non-IBM operating systems, either as part of the operating system or as a separate software package.

APPC serves as a translator between application programs and the network. When an application on your computer passes information to the APPC software, APPC translates the information and passes it to a network interface, such as a LAN adapter card. The information travels across the network to another computer, where the APPC software receives the information from the network interface. APPC translates the information back into its original format and passes it to the corresponding partner application.

1.4 What are Transaction Programs and Conversations?

The part of an application that initiates or responds to APPC communications is called a *transaction program* or TP. A transaction program on your workstation is not an entire, stand-alone program. Instead, it is the part of the program that handles transactions (exchanges of data) with another program.

When people talk with each other, we say that they are having a conversation. Likewise, the communication between two transaction programs is called a *conversation*.

A conversation between two programs is similar to conversation between two people. When you have a conversation with another person, you follow unwritten rules that govern how you begin and end the conversation, take turns speaking, and exchange information. Similarly, APPC is called a *protocol* because it provides the rules that govern how conversations between transaction programs start and stop, which program "speaks" first, and how data is exchanged.

A program in your computer may have several conversations active at one time, with the same transaction program or with different transaction programs.

1.5 What are Logical Units and Sessions?

When two people in different buildings want to talk to each other, they must use their telephones. Similarly, transaction programs in different computers can't talk directly to each other. Instead, they converse over sessions between two logical units.

A *logical unit* or LU is APPC software that serves as an interface or translator between a transaction program and the network. A logical unit manages the exchange of data between transaction programs..

An *LU* is located on your computer. A *partner LU* is located on a partner computer.

Before a transaction program can start a conversation with a partner transaction program, APPC must establish a *session*, the session that connects the local LU and the partner LU.

There is a one-to-one relationship between a conversation and a session. A session can support only one conversation at a time. However, as soon as that conversation ends, another conversation can use the session. So, compared to conversations, sessions are long-lived connections.

1.6 What Is a Mode?

A mode is a set of parameters that defines the characteristics of a session between two LUs. Modes have names that must match exactly. There are 4 modes predefined on most platforms that can be used by most applications. (Two more modes, SNASVCMG and CPSVCMG, are also defined, but they are not intended to be used directly by applications.) The SC suffix in the mode name means the definitions include security.

- #INTER   - for interactive jobs
- #BATCH   - for batch jobs
- #INTERSC - for interactive jobs with security
- #BATCHSC - for batch jobs with security

1.7 What Is CPI-C side information?

CPI-C, Common Programming Interface Communications, provides a consistent application programming interface for network applications.

CPI-C programming provides a mechanism, called side information, which associates a set of parameters with a specified symbolic destination name. The CPI-C program then uses the symbolic destination name to initialize a conversation. This information includes:

CPI-C Symbolic destination name
     The name used to refer to the CPI-C side information entry.

TP name
     The name used to identify which program to start on the partner computer.

LU name
> The name of the partner LU

mode name
> The characteristics associated with the session between the LUs.

1.8 What Is a Network?

Transaction programs in different computers must use a network to communicate with each other. APPC provides the interface between the programs and networking software and hardware.

In simplest terms, a network consists of components that connect computers. These components are:

Node
> A node is any computer in the network. For example, if your DOS workstation is connected to an OS/2 workstation, both computers are nodes.

Link
> A link is a physical or logical connection between two adjacent nodes.

Before data can be sent between two nodes, a link must be active between them.

1.9 What Is APPN?

Advanced Peer-to-Peer Networking (APPN) provides networking functions for APPC applications.

When configuring a node in a network, you must decide which type of node to configure. Types of nodes in an APPN network are:

Low-entry networking node (LEN)
> Low-entry networking nodes are the simplest node type and have the least function. A low-entry networking node must be an end point in the network; it cannot function as an intermediate node. A LEN is capable of peer-to-peer communication, but unable to make direct use of APPN functions. Most end-user computers should be EN's. However, some platforms can only be LEN nodes, e.g., NS/DOS.

End node (EN)
> An end node provides the functions of a low-entry networking node plus the ability to register information about itself with a network node. This ability helps reduce the amount o + network configuration required.

Network node (NN)
> NN's are used to locate partners in an APPN network. If there is a NN in the network, an end node can define one link to the network node. The EN then requires no other link definitions. Typically, there is at least one network node in a network but the addition of more requires informed network analysis.

1.9.1 What is a Control Point(CP) ?

In APPN, a control point is responsible for managing the node and its resources and, in an APPN end node, for communicating with an adjacent network node server's control point to obtain APPN network services. A control point is an LU and it might be the only LU at that node. *Whenever possible the CP should be the only LU at a node.* Platforms that are LEN only do not use the control point.

1.9.2 What is Subarea Networking?

Subarea networks existed prior to APPN. As opposed to APPN, subarea networks are hierarchical in nature. The software that implements subarea networks runs in host computers and communication controllers attached to those hosts. The host software is called VTAM (Virtual Telecommunications Access Method), and the communication controller software is called NCP (Network Control Program).

Nodes in APPN networks can have links to subarea networks and can establish sessions and conversations with LUs and TPs in those networks. From the perspective of the APPN node the entire subarea network is viewed as a LEN node. Resources in the subarea network can then be defined in the APPN node as though they all were contained in one LEN node.

1.9.3 What is a Node Identifier?

Note: Some SNA products require partner systems to code a specific value for a parameter called the *node identifier* or *node id* for short. The two systems pass this node identifier during the link activation in a message unit called exchange identification or "XID." Node identifiers for each specific platform are described in the appendix. See Appendix A, "Using Node IDs in VTAM" on page 143.

We discourage use of node identifiers, preferring the CP name because it is more generic and less confusing.

1.10 How do I Configure a Network?

This section provides an overview of the steps required to configure APPC. Configuration is described by using a standard terminology. These standard terms are used throughout the guide to discuss configuration. Each platform may use platform-specific terms in its configuration instead of the standards tems. Therefore, each chapter contains a terminology mapping chart that cross-references the terms below with platform-specific terms.

The steps to APPC configuration are:

• Define yourself to the network.

To define yourself to the network, you must define these parameters:

— Network Name

A network is a set of interconnected nodes that are grouped by a common identifier called a *network name*. The network name is a 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name.

- LU name

  1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the network name.

  The fully qualified name is represented as two concatenated names, the network name and the LU name, separated by a period (NETNAME.LUNAME). This unique name identifies the node.

- Define a link to your partner

  - You can define a direct link between the local node and the partner node if both nodes are in the same local network.

  - If there is a network node (NN) in the local network, you can define a link to the NN, and the NN can locate the partner node.

  - If the partner node is located in a VTAM subarea, you can define a link to the VTAM subarea, and the VTAM subarea can locate the partner node for you.

  To define a link, you must define these parameters:

  - Network Name

    This is the Network Name of the partner machine. To determine this value, refer to the "How to find..." section of the partner machine's configuration chapter.

  - Partner LU Name

    This is the LU name of the partner machine. To find this value, refer to the "How to find..." section of the partner machine's configuration chapter.

  - Adjacent LAN Address

    This is the address of the adjacent node or the network node you are connecting to. In a token ring, this is the address of the token ring card at the adjacent node. To find this value, refer to the "How to find..." section of the partner machine's configuration chapter.

- Define partner LU name

  If you ARE NOT using a network node in your network, you must define a partner LU name. This will allow the partner to be located.

  - Partner LU Name

    This is the Local LU name defined on the partner machine. To find this value, refer to the "How to find..." section of the target machine's configuration chapter.

  If you ARE using a network node in your network, you do not need to define an explicit partner LU name. However, you will need to know the partner LU name when running transaction programs.

  CPI-C Side Information may be used to associate a set of parameters, including the partner LU name, with a symbolic destination name. The symbolic destination name can then be used when running transaction programs to specify the partner. Each platform has directions for configuring CPI-C side information.

- Configure to run as a server

If you are configuring your computer to run as a server, a transaction program must be configured on your computer. The transaction program will be the target of a conversation started by a client.

— TP name

1 to 64 alpha-numeric characters. This is the name specified by the partner APPC application when it wants to start a conversation with a TP on your computer.

How do I Configure a Network?

2.0 AIX SNA Services/6000 Configuration

This chapter explains how to configure AIX SNA Services/6000. AIX SNA Services/6000 is IBM's implementation of APPC for AIX. Version 1.2 supports only low entry networking nodes (see 1.9, "What Is APPN?" on page 6 for a discussion of SNA node types). The machine to be configured should have AIX version 3.2 and SNA Services version 1.2 with the latest updates applied. This is necessary to get the maximum benefit of APPC, including CPI-C support, and mode definitions. To check the level of SNA Services you have installed, run the command

```
lslpp -h sna.sna.obj
```

The result should contain four numbers similar to this:

```
01.02.0000.0000
```

If the last number is "0000", you do not have the latest updates. You should apply PTF's U411903 and U411904. If the last number is "0224" (indicating the July, 1992 quality refresh) or "0244" (indicating the December, 1992 quality refresh), then your SNA Services are sufficiently updated.

This document describes all of the profiles that need to be created to configure an AIX machine to run APING to another machine. A few profiles may be left out if you don't plan to run this AIX machine as a server. These will be noted.

2.1.1 Prerequisites

- AIX V3.2

- AIX SNA Services/6000 V1.2 with PTF's U411903 and U411904

- Token-ring adapter

For more detailed configuration information, refer to the following publications:

- *Using AIX SNA Services/6000*, SC31-7002

- *AIX SNA Services/6000 Reference*, SC31-7014

2.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by SNA Services/6000.

Standard Term	AIX SNA Services/6000 Term
Link Name	Attachment profile name
Network Name	network name
LU Name	local LU name
Partner LU Name	remote LU name
LAN Address	Link Address
Adjacent LAN Address	Remote link address

2.3 SNA Services/6000 Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following the recommendations in the Worksheet, you will write #INTER in the right column on the ?MODE? line. Then in Figure 13 on page 24 you will type #INTER in the "MODE name" field to replace "?MODE?" like this:

```
CPI Communications Side Information
            PROFILE name                      = ?SYMDEST?
            PARTNER LU name                   = ?CALLCONNPRO?
            REMOTE TRANSACTION PROGRAM name   = ?TPNAME?
            SERVICE transaction program?      = no
            MODE name                         = #INTER
```

Figure 2. CPI Communications Side Information

Notes:

In the following chart and throughout this chapter, be aware that all of the values entered are case-sensitive. So if you enter a particular value in lower case in one place, remember to enter the same value in lower case when it appears again.

Symbol	How to determine the value for this symbol	Fill in value here
Values that must match with other places		
?LOCALLU?	This is the symbol that refers to the LU name of the machine you are defining to the network. It is a 1 to 8 character field consisting of upper-case alphanumeric characters which represent the LU name of the node. Choose a name that is unique within the same network. Refer to 1.10, "How do I Configure a Network?" on page 7 for information about LU names.	
?LOCALCP?	This is the symbol that refers to the Control Point name of your machine. It is same as your ?LOCALLU?. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	

Symbol	How to determine the value for this symbol	Fill in value here
?LOCALNET?	This is the symbol that refers to the network name of the machine you are defining to the network. While it can be any 1 to 8 character field consisting of upper-case alphanumeric characters, there is a structured format that can be followed to insures uniqueness of the network name around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
?PARTNERLU?	This is the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. For AIX SNA Services/6000, this value is to be entered in upper case. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?PARTNERNET?	This is the symbol for the network name of the partner computer. Use the network name from the partner computer's "How to find..." section. For AIX SNA Services/6000, this value is to be entered in upper case. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner network name.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) For AIX SNA Services/6000, this letters in this value are to be entered in upper case. Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the symbol for the Transaction Program name. This is the name of the transaction program at the partner computer. It is 1-64 bytes long, and it is case sensitive. For APING, the TP Name on the server is **APINGD**.	
?TPPATH?	This is the symbol for the fully specified path and filename of the executable code for a server transaction program located on your machine. For APINGD, this may be: **/local/sna/apingd**.	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is **#INTER**. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section. For AIX SNA Services/6000, this value must be entered in upper case.	
Local values		

Symbol	How to determine the value for this symbol	Fill in value here
?SYMDEST?	This is the symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the AIX machine to refer to a CPI-C side information entry. See 1.7, "What Is CPI-C side information?" on page 5 for more information on CPI-C Side Information. **Note:** The December 1992 quality refresh of SNA Services/6000 fixes an error that would require you to specify a symbolic destination that is exactly eight characters long when running APING. If you only have the July 1992 quality refresh (see 2.0, "AIX SNA Services/6000 Configuration" on page 11), you should specify an eight character symbolic destination name.	

The following are the names of the profiles that must be configured. The profile names must be 1 to 14 characters long (unless otherwise indicated). The profile names are referenced only on the machine you are configuring, and do not need to match any values on other machines. Some suggestions for profile names are provided.

If you are using Quick Configuration, you only need to fill in a value for the first symbol below (?QUICKPRO?). All the profile names generated for the Quick Configuration will be the same (except the Transaction Program and Mode profile names which are slightly modified).

Symbol	How to determine the value for this symbol	Fill in value here
?QUICKPRO?	The symbol for name that Quick Configuration uses to generate profile names for all the profiles it creates. You don't need this value if you are not using Quick Configuration. This value is 1-12 characters long. Suggestion: use the same value as that used for the ?PARTNERLU? symbol.	
?CPPRO?	The symbol for the name of the Control Point profile. Suggested profile name: **CPPRO**	
?LUPRO?	The symbol for the name of the Local Logical Unit 6.2 profile. Suggested profile name: **LUPRO**	
?CALLATTACHPRO?	The symbol for the name of the Outgoing (CALL) Attachment profile. Suggested profile name: **CALLATT** **Note:** The attachment profile names are only 1-8 characters long.	
?LISTATTACHPRO?	The symbol for the name of the Incoming (LISTEN) Attachment profile. Suggested profile name: **LISTATT** **Note:** The attachment profile names are only 1-8 characters long.	
?CALLCONNPRO?	The symbol for the name of the Outgoing (CALL) Connection profile. Suggested profile name: **CALLCONN**	
?LISTCONNPRO?	The symbol for the name of the Incoming (LISTEN) Connection profile. Suggested profile name: **LISTCONN**	

Symbol	How to determine the value for this symbol	Fill in value here
?MODEPRO?	The symbol for the name of the Mode Profile. To avoid defining new modes, use one of the mode profiles already supplied by SNA Services/6000: • INTER • BATCH • INTERSC • BATCHSC Note that these are the mode profile names. The actual modes defined by them are: #INTER, #BATCH, #INTERSC, and #BATCHSC. Which one to choose may depend on the requirements of your client/server application, as specified in its documentation. See 1.6, "What Is a Mode?" on page 5 for a discussion of these modes. To use the default mode that APING uses, specify **INTER**.	
?MODELISTPRO?	The symbol for the name of the Mode List profile. Suggested profile name: **MODELIST**	
?RTPNAMEPRO?	The symbol for the name of the Remote Transaction Program Name profile. This value must not be the same as any local Transaction Program Name profiles (Denoted by ?TPNAMEPRO? below.). Suggested profile name: use the ?TPNAME? value, followed by an "R". (For APING, this would be **APINGDR**.) If this machine is being configured as a server only, you do not need to create any Remote Transaction Program Name profiles.	
?RTPLISTPRO?	The symbol for the name of the Remote Transaction Program List profile. Suggested profile name: **RTPLIST** If this machine is being configured just as a server (i.e. it will not try to start transaction programs on the partner machine), you do not need to create a Remote Transaction Program List profile and can use the default profile provided by SNA Services/6000 called **RDEFAULT**.	
?TPNAMEPRO?	The symbol for the name of the local Transaction Program Name profile. Suggested profile name: If the value for ?TPNAME? is less than 12 characters long, use the value for ?TPNAME? followed by "PRO". For example: **APINGDPRO**. Otherwise, make up a profile name that is 1-14 characters long. If you will not be running this machine as a server, you do not need to configure any local Transaction Program Names, and will therefore not need this value.	

Symbol	How to determine the value for this symbol	Fill in value here
?TPNLISTPRO?	The symbol for the name of the Transaction Program List profile. Suggested profile name: **TPNLIST**. If you will not be running this machine as a server, you do not need to configure transaction programs on it. In this case, use the default Transaction Program List profile name, **TDEFAULT**. Again, if you will not be running this machine as a server, you do not need to configure a local Transaction Program List profile, and will therefore not need this value.	

2.4 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

   a. Additional LEN configuration

   b. Other link configuration

3. Configure to run as a client

   a. Define CPI-C side information

   b. Other client configuration

4. Configure to run as a server

   a. Define transaction programs

   b. Other server configuration

SNA Services stores its configuration information within encoded profiles that are accessed using the System Management Interface Tool (SMIT). SMIT presents panels on which you enter your configuration values. All of the values used in AIX SNA Services/6000 are case-sensitive, so be sure to always enter profile names and other configuration values in the same case throughout the SMIT panels.

Within SMIT, SNA Services configuration panels can be accessed by selecting the following series of panels:

```
--Communications Applications
  --SNA Services
    --Configure
      --Advanced Configuration
```

For the rest of this discussion, other panels will be specified from this base level within SMIT.

The user should have the base configuration of AIX SNA Services installed and have "system group" access to the system in order to run SMIT and start the SNA subsystem. "System group" authority is required to make the changes suggested in

this document. See the document, *Using AIX SNA Services/6000*, SC31-7002, for more information on SNA Services installation.

For this discussion, we will progress through a basic configuration that allows both an outgoing and incoming APING operation to be performed. This chapter describes how to configure a workstation that is attached to a Token Ring LAN and assumes the token ring DLC has been created by the system. Other DLC's will require Attachment Profile definitions that would replace the Token Ring Attachment Profile described below.

There are several profiles that need to be defined:

1. A Control Point Profile

2. A Local LU (6.2) Profile

3. 2 Token Ring Attachment Profiles

4. Two Logical Connections Profiles

5. A Mode List Profile

6. A Remote TP Name Profile

7. A Remote TP Name List Profile

8. A CPI-C Side Information Entry

9. A TP Name Profile

10. A TP Name List Profile

2.4.1 Quick Configuration

AIX SNA Services/6000, with the PTFs specified in 2.0, "AIX SNA Services/6000 Configuration" on page 11, provides a "Quick Configuration" utility that creates all of the above profiles based on information entered on just one or two SMIT panels. This Quick Configuration is an excellent way to configure a simple connection to a partner machine using a single mode definition and a single transaction program definition. Quick Configuration is designed for just such a scenario. Quick Configuration does not reuse profiles that have already been defined. So, if you repeatedly use Quick Configuration to define connections to partners, then multiple LU profiles, mode profiles, mode list profiles, etc. will be defined. It is recommended that if you choose to use Quick Configuration that you use it to define the first connection to a partner, but from then on to follow the explicit instructions for adding or updating the other profiles.

2.4.2 Verifying configuration

Once the profiles are created, they can be verified using either the command verifysna, or in SMIT by following this hierarchy of panels:

```
--Communications Applications and Services
  --SNA Services
    --Configure SNA Profiles
      --Advanced SNA Configuration
        --Verify SNA Configuration Profiles
```

2.4.3 Starting and stopping APPC

APPC is part of the AIX SNA Services/6000 subsystem. You can use the following command to test the status of the SNA subsystem:

```
lssrc -l -s sna
```

If the SNA subsystem is not started, it can be started with the command:

```
startsrc -s sna
```

If you want the partner computer to be able to initiate a conversation to this AIX machine, you need to start the listen attachment before your partner attempts to activate the link between the two. Do this with this command:

```
startsrc -t attachment -o ?LISTATTACHPRO?
```

Note: The "?LISTATTACHPRO?" value must match the "PROFILE name" of the Token Ring Attachment profile defined as the incoming, or "listen" attachment.

To stop the SNA subsystem, execute this command:

```
stopsrc -s sna
```

2.5 Configuration

2.5.1 Starting from Scratch

If you would like to set your SNA configuration to its default values, run this command:

```
/usr/lpp/sna/bin/peu
```

To run this command, you need "root" authority, and you should delete or move all the files in /etc/opjrepos/sna.

2.5.2 Quick Configuration

1. From within SMIT, follow these panels:

```
-- Communications Applications and Services
  --SNA Services
    --Configure SNA Profiles
      --Quickly Configure an LU 6.2 Connection
```

2. Enter a 1-12 character name (This is the value you filled in for the ?QUICKPRO? symbol in the Worksheet). All profiles created during this quick configuration will contain this name.

3. Specify "no" when asked if you wish to configure to an existing network attachment.

4. Select a default network ATTACHMENT type: **token_ring_listen** if your partner will initiate the conversation, **token_ring_call** if you will be initiating the conversation. To allow both actions, you will need to add another attachment profile after Quick Configuration, or follow the non-Quick Configuration instructions below.

   The following figure shows the Quick Configuration panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
Quick Configuration NAME            = ?QUICKPRO?
Fully qualified LOCAL LU name        = ?LOCALNET?.?LOCALLU?
Local LU ADDRESS                     = 0
MODE name                            = ?MODE?
Local Transaction Program name       = ?TPPATH?
Fully qualified REMOTE LU name       = ?PARTNERNET?.?PARTNERLU?
Remote Transaction Program  name     = ?TPNAME?
ATTACHMENT                           = ?QUICKATTACH? #see note a
Link ADDRESS                         = ?LANADDRESS? #see note b
```

Figure 3. Quick Configuration panel.

Notes:

    a. The value in this field is already fixed when this panel is displayed.

    b. This field only appears if this configuration is based on a Call attachment.

5. You should now have a connection to a partner properly configured. Skip to 2.6, "Running APING" on page 26. The following descriptions for adding profiles can be used to understand the profiles that were created by Quick Configuration, and to expand the configuration (by adding transaction program profiles, mode profiles, and more connection profiles that reference the profiles already created by Quick Configuration).

2.5.3 Define yourself to the network

2.5.3.1 Create Control Point profile

A control point must be defined to run APPC on SNA Services. This definition is done by adding a Control Point profile.

From within SMIT, the Control Point profile can be accessed by following this series of panels:

```
--Nodes
  --Control Point
```

The following figure shows the Control Point profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
PROFILE name       = ?CPPRO?
XID node.ID        = 00000000        # see note
NETWORK name       = ?LOCALNET?
CONTROL POINT name = ?LOCALCP?
```

Figure 4. Control Point profile

Note: It is not recommended that you use an XID node ID for configuration. See Appendix A, "Using Node IDs in VTAM" on page 143 for a discussion of whether you should, and if so, what value to use here.
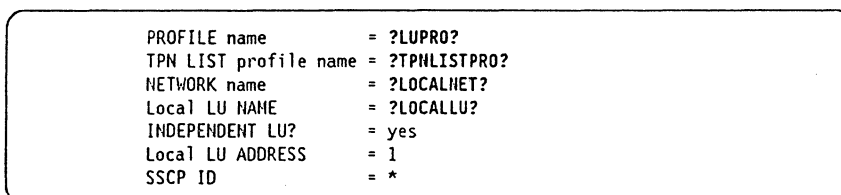
2.5.3.2 Create a local LU 6.2 Profile

The local LU 6.2 profile must also be added. Its definition follows.

From within SMIT, this can be accessed via:

```
--Logical Units
  --LU6.2
    --LU6.2 Local Logical Unit
```

The following figure shows the Control Point profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
PROFILE name            = ?LUPRO?
TPN LIST profile name   = ?TPNLISTPRO?
NETWORK name            = ?LOCALNET?
Local LU NAME           = ?LOCALLU?
INDEPENDENT LU?         = yes
Local LU ADDRESS        = 1
SSCP ID                 = *
```

Figure 5. Local LU6.2 profile

2.5.4 Define a link to a partner or network node

Next, the partner LU and link need to be defined in order for a connection to the partner LU to be established. There are two types of links that can be defined. One type of link allows this machine to initiate a connection to the partner computer. This link is called a *"call"* attachment. The other allows the partner computer to initiate a connection with the local computer. This link is called a *"listen"* attachment. Both attachments must be defined if both partner and local computers wish to be able to initiate a connection. The listen attachment must be started before the partner attempts to activate the link. Instruction on starting the link is discussed in 2.4.3, "Starting and stopping APPC" on page 18.

2.5.4.1 Create a Token Ring Attachment profile (LISTEN or incoming)

From within SMIT, the Token Ring Attachment profile can be accessed by following this series of panels:

```
--Physical Units
  --Token Ring
    --Token Ring Attachment
```

The following figure shows the Listen (incoming) Attachment profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
PROFILE name                      = ?LISTATTACHPRO?
CONTROL POINT profile name        = ?CPPRO?
LOGICAL LINK profile name         = TDEFAULT
PHYSICAL LINK profile name        = TDEFAULT
STOP ATTACHMENT on inactivity?    = no
inactivity TIMEOUT                = 0
LU address REGISTRATION           = no
REGISTRATION PROFILE name         = LDEFAULT
CALL type                         = listen
AUTO-LISTEN?                      = yes
MINIMUM SAP address               = 04
MAXIMUM SAP address               = EC
ACCESS ROUTING                    = link_name
REMOTE LINK name                  =
Remote LINK address               = 000000000000
Remote SAP address                = 04
```

Figure 6. Token Ring Attachment Profile (LISTEN or incoming)

2.5.4.2 Create a Token Ring Attachment profile (CALL or outgoing)

The following figure shows the call (outgoing) Attachment profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
Token Ring Attachment profile (CALL)
        PROFILE_name                      = ?CALLATTACHPRO?
        CONTROL POINT profile name        = ?CPPRO?
        LOGICAL LINK profile name         = TDEFAULT
        PHYSICAL LINK profile name        = TDEFAULT
        STOP ATTACHMENT on inactivity?    = no
        inactivity TIMEOUT                = 0
        LU address REGISTRATION           = no
        REGISTRATION PROFILE name         = LDEFAULT
        CALL type                         = call
        AUTO-LISTEN?                      = no
        MINIMUM SAP address               = 04
        MAXIMUM SAP address               = EC
        ACCESS ROUTING                    = link_address
        REMOTE LINK name                  =
        Remote LINK address               = ?LANADDRESS?
        Remote SAP address                = 04
```

Figure 7. Token Ring Attachment profile (CALL or outgoing)

2.5.4.3 Define Logical Connections

The connection profile specifies the attachment profile to be used to activate the partner, the partner LU name, and the Remote Transaction Program (RTP) name list. Again, in order to act as both client and server, separate connection profiles must be defined.

From within SMIT, the Logical Connection profiles can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
     --LU6.2 Logical Connection
```

Create Logical Connection profile (CALL): The following figure shows the CALL
Logical Connection profile panel. Replace the symbols (the words beginning and
ending with question marks) with the corresponding values from the Configuration
Worksheet. You'll also need to change any other values that are highlighted.

```
PROFILE name                              = ?CALLCOHHPRO?
ATTACHHENT profile name                   = ?CALLATTACHPRO?
LOCAL LU profile name                     = ?LUPRO?
NETWORK name                              = ?PARTHERHET?
STOP CONNECTION on inactivity?            = no
TIHEOUT                                   = 0
REHOTE LU name                            = ?PARTHERLU?
SECURITY Accepted                         = conversation
CONVERSATION SECURITY ACCESS LIST profile = CONVDEFAULT
REHOTE TPN LIST profile name              = ?RTPLISTPRO?
HODE LIST profile name                    = ?HODELISTPRO?
INTERFACE type                            = extended
SESSION COHCURREHCY                       = parallel
Hode VERIFICATION?                        = no
```

Figure 8. Logical Connection profile (CALL)

2.5.4.4 Create Logical Connection profile (LISTEN)

The following figure shows the LISTEN Logical Connection profile panel. Replace
the symbols (the words beginning and ending with question marks) with the corre-
sponding values from the Configuration Worksheet. You'll also need to change any
other values that are highlighted.

```
PROFILE name                              = ?LISTCOHHPRO?
ATTACHHENT profile name                   = ?LISTATTACHPRO?
LOCAL LU profile name                     = ?LUPRO?
NETWORK name                              = ?PARTHERHET?
STOP CONNECTION on inactivity?            = no
TIHEOUT                                   = 0
REHOTE LU name                            = ?PARTHERLU?
SECURITY Accepted                         = conversation
CONVERSATION SECURITY ACCESS LIST profile = CONVDEFAULT
REHOTE TPN LIST profile name              = ?RTPLISTPRO?
HODE LIST profile name                    = ?HODELISTPRO?
INTERFACE type                            = extended
SESSION COHCURREHCY                       = parallel
Node VERIFICATION?                        = no
```

Figure 9. Logical Connection profile (LISTEN)

2.5.5 Configure to run as a client

To run as a client, the following information needs to be configured:

• the modes to be used (unless using the predefined modes already provided with
  the product), and

• the names of the Transaction Programs to run on the target machines, and

• optionally, CPI-C Side Information.

2.5.5.1 Define the Mode List

The mode list contains the names of the mode profiles that can be used by a transaction program.

From within SMIT, the mode profile list can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 Mode List
```

The following figure shows the Mode List profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You can add more than one profile to this list.

```
Mode List
            PROFILE name = ?MODELISTPRO?
            Name 1       = ?MODEPRO?
            Name 2       = ?MODEPRO2?
            Name 3       = ?MODEPRO3?
```

Figure 10. Mode List

2.5.5.2 Create the Remote TP Name profile

The remote TP profile specifies a Transaction Program that will be run on the partner machine. A Remote TP Name list is then created to collect a set of Remote TP Name profiles. Neither the Remote TP Name profiles nor the Remote TP Name list need to be created if this machine will only be running as a server.

From within SMIT, the Remote TP Name profile can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 Remote Transaction Program Name
```

The following figure shows the LISTEN Logical Connection profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
Remote TP Name profile
            PROFILE name              = ?RTPNAMEPRO?
            RTPN name is in HEXADECIMAL? = no
            RTPN name                 = ?TPNAME?
            PIP data?                 = no
            CONVERSATION type         = mapped
            RECOVERY level            = no_reconnect
            SYNC level                = confirm
```
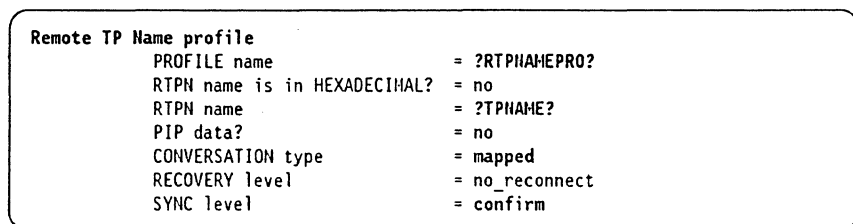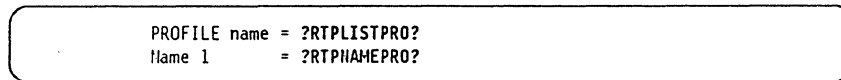
Figure 11. Remote Transaction Program Name

2.5.5.3 Create Remote TP Name List profile

From within SMIT, the Remote TP Name List profile can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 Remote Transaction Program Name List
```

The following figure shows the Remote TP Name List profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
PROFILE name = ?RTPLISTPRO?
Name 1       = ?RTPNAMEPRO?
```

Figure 12. Remote Transaction Program Name List profile

Note: More remote transaction programs can be configured by creating more Remote Transaction Name profiles and adding them to this list.
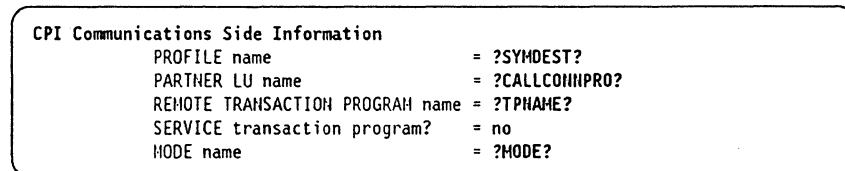
2.5.5.4 Defining CPI-C Side Information

Some applications, like APING, do not require CPI-C side information. These applications use programming calls available on a particular platform to dynamically create side information when running. SNA Services/6000 provides the programming calls that allow APING (and other applications) to do this dynamic definition, so you do not need to create this Side Information profile for APING. For those applications that require CPI-C Side Information, this is how to create a profile:

From within SMIT, CPI-C Side Information panel can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 CPI Communications Side Information
```

The following figure shows the CPIC-C Side Information panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
CPI Communications Side Information
        PROFILE name                      = ?SYMDEST?
        PARTNER LU name                   = ?CALLCONNPRO?
        REMOTE TRANSACTION PROGRAM name   = ?TPNAME?
        SERVICE transaction program?      = no
        MODE name                         = ?MODE?
```

Figure 13. CPI Communications Side Information

2.5.6 Configure to run as a server

2.5.6.1 Define local transaction programs

To run AIX as a server, you must define the transaction programs (TPs) on your machine with which a client can start a conversation. For each TP, you must define a TP profile, and then you need to create a TP Name List profile that lists the TP profiles you have defined. This TP Name List profile will then be referenced in the definition of a connection. (If you will not be running this machine as a server, you do not need to create either the Transaction Program Name profile or the Transaction Program Name List profile.)

2.5.6.2 Create Transaction Program Name

From within SMIT, the Transaction Program Name profile panel can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 Transaction Program Name
```

The following figure shows the Transaction Program Name profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
PROFILE name                   = ?TPNAMEPRO?
Transaction program name is in HEXADECIMAL? = no
TRANSACTION program name       = ?TPNAME?
PIP data?                      = no
SUBFIELDS                      = 0
CONVERSATION type              = mapped
RECOVERY level                 = no_reconnect
SYNC level                     = confirm
Full PATH to TPN executable    = ?TPPATH?
MULTIPLE INSTANCES supported?  = yes
User ID                        = 100
SERVER synonym name            = TDEFAULT
RESTART action                 = once
COMMUNICATION type             = signals
IPC queue key                  = 0
Standard INPUT file/device     = /dev/null
Standard OUTPUT file/device    = /dev/console
Standard ERROR file/device     = /dev/console
SECURITY Required              = none
communication_ipc_queue_key    = 0
RESOURCE SECURITY ACCESS LIST profile = RSRCDEFAULT
```

Figure 14. TP Name profile

2.5.6.3 Create Transaction Program Name List

From within SMIT, the TP Name List profile panel can be accessed by following this series of panels:

```
--Logical Units
  --LU6.2
    --LU6.2 Transaction Program Name List
```

The following figure shows the LISTEN Logical Connection profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.
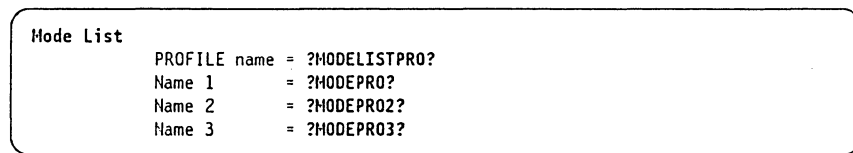
```
TP Name List
           PROFILE name = ?TPNLISTPRO?
           Name 1       = ?TPNAMEPRO?
```

Figure 15. Transaction Program Name List

Note: You can define more Transaction Programs to be run between two machines by adding more TP Name profiles and adding them to this TP Name List.

2.6 Running APING

Execute APING to contact the partner LU defined by the outgoing connection, ?CALLCONNPRO?, by typing:

aping -n ?CALLCONNPRO?

with the APING executable being located in a directory in the system's PATH (ex. /local/appctps). If you ran Quick Configuration to generate your profiles, the value to use for ?CALLCONNPRO? is the same value used to name your quick configuration, ?QUICKPRO?.

You can alternatively specify the CPI-C symbolic destination name:

aping -n ?SYMDEST?

Once an incoming session is established, the RS/6000 can communicate with this caller only on this session (and not on a new outgoing call). This problem will be fixed in a later release. Thus, if an incoming session is already established, you would not specify ?CALLCONNPRO? as the target. You would specify the listen connection, ?LISTCONNPRO?.

2.7 How to find...

- LU name

  The LU name is specified in a Local LU6.2 profile as the "Local LU NAME" parameter. To find out which Local LU6.2 profile to look at, see the listen Logical Connection profile parameter "LOCAL LU profile name". There may be many Logical Connection profiles. The one to use is the one that specifies as its "ATTACHMENT profile name" the same Token ring Attachment profile used in the **startsrc** command that starts the listen attachment.

  For example: In the configuration recommended above, the Token Ring Attachment profile specified in the **startsrc** command is LISTEN. The Logical Connection profile that specifies LISTEN as its "ATTACHMENT profile name" is called ?CALLCONNPRO?. The "LOCAL LU profile name" in the ?CALLCONNPRO? Logical Connection profile is ?LUPRO? Therefore, the LU name is the value specified as the "Local LU NAME" parameter of the ?LUPRO? Local LU6.2 profile.

- Network name

  See the discussion for how to find the local LU name. The Network name is also specified in the Local LU6.2 profile, as the "NETWORK name" parameter.

- Control Point (CP) name

The CP name is specified in the Control Point profile as the "CONTROL POINT name." The actual Control Point profile being used is specified in the Attachment profiles as the "CONTROL POINT profile name."

- LAN address

  The LAN address is hard-coded on the Token-Ring adapter in the AIX machine or is over-ridden by a value called the "locally administered LAN address. It is a 12-digit hexadecimal value. You can find the LAN address by running the command **lscfg -v**. The LAN address is specified by the Network Address parameter under the tok0 resource. This parameter will specify the locally administered address if there is one.

3.0 AIX SNA Server/6000 Configuration

This chapter explains how to configure AIX SNA Server/6000. AIX SNA Server/6000 is IBM's implementation of APPN for AIX. Version 2.1 supports APPN network nodes, end nodes, and low entry networking nodes (see 1.9, "What Is APPN?" on page 6 for a discussion of SNA node types). The machine to be configured must have AIX version 3.2 and SNA Server version 2.1 installed. To check the level of SNA Server you have installed, use the command

```
lslpp -h sna.sna.obj
```

The result should contain four numbers similar to this:

```
01.03.0000.0000
```

The first 0000 contains a number identifying the year in which this level was made available (0093 is equivalent to 1993). The last 0000 represents the week of the year (0115 is equivalent to the 11th week, 5th build of that week).

This document describes all of the profiles that need to be created to configure an AIX machine to run APING to another machine. You may leave a few profiles out if you don't plan to run this AIX machine as a server. These will be noted.

3.1.1 Prerequisites

- AIX V3.2

- AIX SNA Server/6000 V2.1

- Token-ring adapter

For more detailed configuration information, refer to the following publications:

- *AIX SNA Server/6000: User's Guide*, SC31-7002-01

- *AIX SNA Server/6000: Configuration Reference*, SC31-7014-01

3.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by SNA Server/6000.

Standard Term	AIX SNA Server/6000 Term
Link Name	Link Station profile name
Network Name	network name
LU Name	local LU name
Partner LU Name	partner LU name
LAN Address	Link Address
Adjacent LAN Address	Remote link address

3.3 SNA Server/6000 Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following the recommendations in the Worksheet, you will write #*INTER* in the right column on the ?*MODE?* line. Then in Figure 19 on page 36 you will type #INTER in the "MODE name" field to replace "?MODE?" like this:

```
Profile name                            = "?SYMDEST?"
Local LU or Control Point alias         = ""
   Partner LU alias                     = ""
   Fully qualified partner LU name      = "?PARTNERNET?.?PARTNERLU?"
Mode name                               = "?MODE?"
Remote transaction program name (RTPN)  = "?TPNAME?"
RTPN in hexadecimal                     = no
Comments                                = ""
```

Figure 16. CPI Communications Side Information

Notes:

In the following chart and throughout this chapter, all of the values entered are case-sensitive. So if you enter a particular value in lower case in one place, remember to enter the same value in lower case when it appears again.

Symbol	How to determine the value for this symbol	Fill in value here
Values that must match with other places		
?LOCALLU?	This is the symbol that refers to a LU name in the machine you are defining to the network. It is a 1 to 8 character field consisting of upper-case alphanumeric characters which represent an LU name in the node. Choose a name that is unique within the same network. Refer to 1.10, "How do I Configure a Network?" on page 7 for information about LU names. A local LU name is not necessary for communicating with other nodes in the network. The local CP name may function as the default LU name, in which case you do not need a local LU name defined.	

Symbol	How to determine the value for this symbol	Fill in value here
?LOCALCP?	This is the symbol that refers to the Control Point (CP) name of your machine. It must be unique in the network. The local CP name may be used as the local LU for establishing sessions with remote stations. If sessions with local LUs besides the local CP is desired, then a local LU name must be defined. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	
?LOCALNET?	This is the symbol that refers to the network name of the machine you are defining to the network. While it can be any 1 to 8 character field consisting of upper-case alphanumeric characters, there is a structured format that can be followed to insures uniqueness of the network name around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
?PARTNERLU?	This is the symbol for the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?PARTNERNET?	This is the symbol for the network name of the partner computer. Use the network name from the partner computer's "How to find..." section. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner network name.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the symbol for the Transaction Program name. This is the name of the transaction program at the partner computer. It is 1-64 bytes long, and it is case sensitive. For APING, the TP Name on the server is **APINGD**.	
?TPPATH?	This is the symbol for the fully specified path and filename of the executable code for a server transaction program located on your machine. For APINGD, this may be: **/local/sna/apingd**.	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is **#INTER**. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	

Symbol	How to determine the value for this symbol	Fill in value here
Local values		
?SYMDEST?	This is the symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the AIX machine to refer to a Side Information profile. See 1.7, "What Is CPI-C side information?" on page 5 for more information on Side Information.	
?LUPRO?	The symbol for the name of the Local Logical Unit 6.2 profile. Suggested profile name: **LUPRO**	
The following are the names of the profiles that must be configured. The profile names must be 1 to 14 characters long (unless otherwise indicated). The profile names are referenced only on the machine you are configuring, and do not need to match any values on other machines. Some suggestions for profile names are provided.		
?CALLLSPRO?	The symbol for the name of the Outgoing (CALL) Link Station profile. Suggested profile name: **CALLLS** **Note:** The Link Station profile names are only 1-8 characters long.	
?TPNAMEPRO?	The symbol for the name of the local Transaction Program Name profile. Suggested profile name: If the value for ?TPNAME? is less than 12 characters long, use the value for ?TPNAME? followed by "PRO". For example: **APINGDPRO**. Otherwise, make up a profile name that is 1-14 characters long. If you will not be running this machine as a server, you do not need to configure any local Transaction Program Names, and will therefore not need this value.	

3.4 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network
2. Define a link to a partner or intermediate node
   a. Additional LEN configuration
   b. Other link configuration
3. Configure to run as a client
   a. Define CPI-C side information
   b. Other client configuration
4. Configure to run as a server
   a. Define transaction programs
   b. Other server configuration

SNA Server stores its configuration information within encoded profiles that are accessed using the System Management Interface Tool (SMIT). SMIT presents panels on which you enter your configuration values. **All of the values used in AIX SNA Server/6000 are case-sensitive, so be sure to always enter profile names and other configuration values in the same case throughout the SMIT panels.**

Within SMIT, SNA Server configuration panels can be accessed by selecting the following series of panels:

```
--Communications Applications
  --SNA Server/6000
    --Configure SNA Profiles
```

All other panels referenced in this section are accessed from this base level within SMIT.

You must have the base configuration of AIX SNA Server installed and have "system group" access to the system before you can start the SNA subsystem. You need "System group" authority to make the changes described in this document. See the document, *AIX SNA Server/6000: User's Guide*, SC31-7002-01, for more information on SNA Server installation.

This chapter describes a basic configuration that allows both an outgoing and incoming APING operation to be performed and describes how to configure a workstation that is attached to a Token Ring LAN. A token ring DLC must already exist on the system. Other DLC's will require Link Station profile definitions that would replace the Token Ring Link Station profile described below.

You need to define:

1. A Control Point Profile

2. A Token Ring Link Station Profile

3. A Token Ring SNA DLC Profile

4. A TP Name Profile (if configured as the server)

These profiles are optional:

1. A Local LU (6.2) Profile

2. A Side Information Profile

3.4.1 Verifying configuration

Once the profiles are created, they must be verified using either the command **verifysna**, or in SMIT by following this hierarchy of panels:

```
--Advanced SNA Configuration
  --Verify Configuration Profiles
```

Before profiles can be used by SNA and APPC, they must be verified with the update option (either normal or dynamic, depending whether SNA is running). Verification ensures that changes are correct and that no profiles are in conflict with each other. Profile additions, changes, or deletions will not take effect until the profile database is verified and updated.

3.4.2 Starting and stopping APPC

APPC is part of the AIX SNA Server/6000 subsystem. You can use the following command to test the status of the SNA subsystem:

```
sna -display global
```

or, for short,

```
sna -d g
```

If the SNA subsystem is not started, it can be started with the command:

```
sna -start sna
```

or, for short,

```
sna -s
```

SNA Server/6000 can be configured to accept incoming link activation requests from remote stations automatically without the need for additional "listening" Link Station profiles. (These "listening" Link Station profiles were required in SNA Services/6000 V1.2). This function, known as dynamic link station support, is configured by default.

To stop the SNA subsystem, execute this command:

```
sna -stop sna
```

3.5 Configuration

3.5.1 Starting from Scratch

If you would like to set your SNA configuration to its default values, run these commands:

```
rm -fr /etc/objrepos/sna/*
/usr/lpp/sna/bin/mksnadb
```

To use these command, you need "root" authority.

3.5.2 Define yourself to the network

3.5.2.1 Initial Node Setup

SNA Server/6000 has one Control Point profile, **node_cp**, which is used to identify the local node to the network. You must complete the control point profile the control point profile before you can start SNA and use APPC. Configuration of this profile is handled through Initial Node Setup. The Initial Node Setup function also allows you to configure a single link station to provide a link to one remote station. This gives the user a single entry point to define the minimum amount of information for SNA Server/6000 to operate.

From within SMIT, Initial Node Setup can be accessed on this panel:

```
--Initial Node Setup
```

The following figures show the panels that will display using Initial Node Setup. The first panel requires you to select the primary link type you will use for this configuration. You will select **token_ring** for this example. Be sure to select the appro-

priate identifier if the link type you plan to use is not for a Token Ring network. The second panel requests the information necessary to configure the Control Point, Link Station, and SNA DLC profiles. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
Choose the DLC type you wish this configuration to     token_ring
represent.
```

Figure 17. Initial Node Setup: DLC type

```
Control Point name     = ?LOCALCP?
Control Point type     = appn_end_node        # see note
Local network name     = ?LOCALNET?
XID node ID            = *                     # see note

Optional link station information:

Link station type      = token_ring
Link station name      = ?CALLLSPRO?
Calling link station?  = yes
Link address           = ?LANADDRESS?
```

Figure 18. Initial Node Setup: Information

Note: By default, your machine is configured as an APPN End Node. Change this value only if you are certain that you are to function as an APPN Network Node.

Note: It is not recommended that you use an XID node ID for configuration. See Appendix A, "Using Node IDs in VTAM" on page 143 for a discussion of whether you should, and if so, what value to use here.

3.5.3 Configure to run as a client

To configure as a client, the following information needs to be configured:

* the modes to be used (unless using predefined modes already provided with the product), and,

* optionally, Local LU or Side Information, or both.

3.5.3.1 Defining Side Information

Some applications, like APING, do not require side information. These applications use programming calls available on a particular platform to dynamically create side information when running. SNA Server/6000 provides the programming calls that allow APING (and other applications) to do this dynamic definition, so you do not need to create a Side Information profile for APING. For those applications that require Side Information, this is how to create a profile:

From within SMIT, the Side Information panel can be accessed by following this series of panels:

```
--Advanced Configuration
  --Sessions
    --LU 6.2
      --LU 6.2 Side Information
```

The following figure shows the Side Information panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
Profile name                            = "?SYMDEST?"
Local LU or Control Point alias         = ""
   Partner LU alias                     = ""
   Fully qualified partner LU name      = "?PARTNERNET?.?PARTNERLU?"
Mode name                               = "?MODE?"
Remote transaction program name (RTPN)  = "?TPNAME?"
RTPN in hexadecimal                     = no
Comments                                = "".
```

Figure 19. Side Information

3.5.3.2 Create a Local LU 6.2 Profile

You can also add The Local LU 6.2 profile if you plan to use a local LU name that is different from the local CP name. If you create a local LU name using a LU 6.2 Local LU profile, then the local LU alias field in that profile must be specified in the "Local LU or Control Point alias" field in the Side Information profile. If no local LU alias is specified in the Side Information profile, or side information is not used with **aping**, the local CP name will be used as the local LU by default.

The local LU name definition follows.

From within SMIT, this can be accessed via:

```
--Advanced Configuration
  --Sessions
    --LU 6.2
      --LU 6.2 Local LU
```

The following figure shows the Local LU profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet.

```
Profile name                                    = ?LUPRO?
Local LU name                                   = ?LOCALLU?
Local LU alias                                  = ?LOCALLU?
Local LU is dependent?                          = no
   If yes,
      Local LU address                          = 1
      SSCP ID                                   = *
      Link Station Profile name                 = ""
Conversation Security Access List Profile name  = ""
```

Figure 20. Local LU6.2 profile

3.5.4 Configure to run as a server

3.5.4.1 Define local transaction programs

To run AIX as a server, you must define the transaction programs (TPs) on your machine with which a client can start a conversation. For each TP, you must define a TP profile. (If you will not be running this machine as a server, you do not need to create the Transaction Program Name profile.)

3.5.4.2 Create Transaction Program Name Profile

From within SMIT, the Transaction Program Name profile panel can be accessed by following this series of panels:

```
--Advanced Configuration
  --Sessions
    --LU 6.2
      --LU 6.2 Transaction Program Name
```

The following figure shows the Transaction Program Name profile panel. Replace the symbols (the words beginning and ending with question marks) with the corresponding values from the Configuration Worksheet. You'll also need to change any other values that are highlighted.

```
Profile name                    = ?TPNAMEPRO?
Transaction program name        = ?TPNAME?
Transaction program name is in hexadecimal? = no
PIP data?                       = no
  If yes, subfields             = 0
Conversation type               = mapped
Sync level                      = confirm
Resource security level         = none
  If access, Resource Security Access List Prof. =
Full PATH to TPN executable     = ?TPPATH?
Multiple instances supported?   = yes
User ID                         = 100
Server synonym name             =
Restart action                  = once
Communication type              = signals
  If IPC, Communication IPC queue key = 0
Standard input file/device      = /dev/null
Standard output file/device     = /dev/console
Standard error file/device      = /dev/console
```

Figure 21. TP Name profile

3.6 Running APING

You can specify the CPI-C side information symbolic destination name on the APING command like this:

```
aping -n ?SYMDEST?
```

or, you can supply the fully qualified LU name of the partner like this:

```
aping ?PARTNERNET?.?PARTNERLU?
```

3.7 How to find...

- LU name

  The LU name is specified in a Local LU6.2 profile as the "Local LU name" parameter.

- Network name

  The network name is specified in the Control Point profile, **node_cp** as the "Local network name" parameter.

- Control Point (CP) name

  The CP name is specified in the Control Point profile **node_cp** as the "Control Point name" parameter.

- LAN address

  The LAN address is hard-coded on the Token-Ring adapter in the AIX machine or is over-ridden by a value called the "locally administered LAN address. It is a 12-digit hexadecimal value. You can find the LAN address by running the command **lscfg -v**. The LAN address is specified by the Network Address parameter under the tok0 resource. This parameter will specify the locally administered address if there is one.

4.0 AS/400 Configuration

This chapter describes configuration for APPC on the AS/400. The chapter uses a step-by-step methodology to describe how to configure APPC communications on the AS/400 with an IBM token-ring adapter connection to the network.

4.1.1 Prerequisites

- APPC/APPN support is part of the OS/400 operating system of AS/400.

- Token ring adapter

For more information refer to the following publications:

- *AS/400 Programming Reference Summary*, SC21-8076

- *AS/400 Programming: Control Language Reference*, SC41-0030

- *AS/400 Communications APPC Programmer's Guide*, SC41-8189

- *AS/400 Communications APPN Guide*, SC41-8188

- *AS/400 System Operator's Quick Reference*, SX41-9573

4.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by the AS/400.

Standard Term	AS/400 Term
Network Name	Remote Network Identifier
LU Name	Local Location
CP Name	Local Control Point Name
Partner LU Name	Remote Location
Local LAN Address	Local Adapter Address
Adjacent LAN Address	LAN Remote Adapter Address

4.3 AS/400 APPC Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following our excellent recommendations, you will write *#INTER* in the right column on the *?MODE?* line. Then in Figure 27 on page 47 you will type #INTER on the AS/400 screen that looks like this:

```
Modename    ==> #INTER
```

Symbol	How to determine the value for this symbol	Fill in value here
Values that much match with other places		
?LOCALLU?	This is the symbol that refers to the LU name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the same network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about LU names.	
?LOCALCP?	This is the symbol that refers to the Control Point name of your machine. It should be the same as your ?LOCALLU?. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	
?LOCALNET?	This is the symbol that refers to the network name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
?PARTNERLU?	This is the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?PARTNERCP?	This is the Control Point(CP) name of your partner. Refer to the "How to find.." section of the partner computer's configuration chapter for this value.	
?PARTNERNET?	This is the symbol for the network name of the partner computer. Use the network name from the partner computer's "How to find..." section. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner network name.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the symbol for the Transaction Program name. This is the name of the transaction program at the partner computer. For APING, the TP Name on the server is **APINGD**.	

Symbol	How to determine the value for this symbol	Fill in value here
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is #INTER. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
?NODEID?	This is the symbol for the node identifier. Refer to 1.9.3, " What is a Node Identifier?" on page 7 for information on whether or not you need this value, and if so, how to define it. If you do use the node identification, the recommended/?/required IDBLOCK value (the first part of the node ID) on this platform is 056.	
Local values		
?CONTRNAME?	This is the symbol for the controller description name. 1 to 10 letters or numbers which will be used as a local name on the AS/400 machine to refer to the controller description. You can choose any name you like, but since you will use this name later to refer to this controller, choose a meaningful name (such as PARTNERCP).	
?DEVNAME?	This is the symbol for the device description name. 1 to 10 letters or numbers which will be used as a local name on the AS/400 machine to refer to the device description. You can choose any name you like, but choose a meaningful name (such as PARTNERLU). Note: These device descriptions are automatically created for APPN(*YES) controllers.	
?NODETYPE?	This is the symbol for your AS/400's APPN node type. This can be *ENDNODE to be configured as an end node, or *NETNODE to be configured as a network node.	
?LINENAME?	This is the symbol for the line description name. 1 to 10 letters or numbers which will be used as a local name on the AS/400 machine to refer to the line description. You can choose any name you like, but since you will use this name later to refer to this controller, choose a meaningful name (such as TRLANXX, where XX is the LAN adapter number)	
?RESNAME?	This is the symbol for the resource name. You can use the command "WRKHDWRSC" to find out the resource name of the adapter you are using. WRKHDWRSC TYPE(*CMN)	
?PLUALIAS?	This is the symbol for the partner LU alias. 1 to 8 characters that designates a nickname for the Partner LU. Alias names are case sensitive. (Suggestion: PARTLU0)	
?SYMDEST?	This is the symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the AS/400 machine to refer to a CPI-C side information entry. (Suggestion: PLUALIAS)	

4.4 Working with the AS/400

4.4.1 Starting/stopping APPC

Before you can start APPC, the Line Description which is being used for communications must be activated.

You can start and stop a Line Description by using the VRYCFG command. To activate or start a line between two systems type the following from the command entry (CL commands):

```
VRYCFG CFGOBJ(?LINENAME?)  CFGTYPE(*LIN) STATUS(*ON)
```

To stop a link type the following from the command entry:

```
VRYCFG CFGOBJ(?LINENAME?)  CFGTYPE(*LIN) STATUS(*OFF)
```

You can start and stop an APPC controller by several methods.

- VRYCFG command
- Following menu panels
- WRKCFGSTS command
- VRYCFG

The VRYCFG command can be used to activate and deactivate a controller, or link. To activate or start a link between two systems type the following from the command entry (CL commands):

```
VRYCFG CFGOBJ(?CONTRNAME?)  CFGTYPE(*CTL) STATUS(*ON)
```

To stop a link type the following from the command entry:

```
VRYCFG CFGOBJ(?CONTRNAME?)  CFGTYPE(*CTL) STATUS(*OFF)
```

- Menu panels

To activate or start a link between two systems using menu commands, follow this sequence:

```
-- AS/400 Main panel
    -- 7. Define or change the system
        -- 1. Configuration
            -- 1. Configure devices and communication
                -- 2. Configure communications and remote hardware
                    -- 1. Work with communications controllers
                        -- 8. next to desired ?CONTRNAME? entry.
                            -- 1. or 2. for Vary on or Vary off
```

- WRKCFGSTS

The WRKCFGSTS command can be used to activate and deactivate a controller, or link. To activate or start a link between two systems type the following from the command entry (CL commands):

```
WRKCFGSTS  (*CTL)
```

```
Type 1 to vary on and type 2 to vary off
the desired controller or device description.
```

4.4.2 Other Commands

- APING.DOC - Refer to the APING documentation for how to compile the APING and other programs on the AS/400.

4.5 Configuration

4.5.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

   a. Additional LEN configuration

   b. Other link configuration

3. Configure to run as a client

   a. Define CPI-C side information

   b. Other client configuration

4. Configure to run as a server

   a. Define transaction programs

   b. Other server configuration

When using AS/400 APPC configuration commands, you can enter the commands in one of three ways:

- Using the command prompt: Enter the command and press PF4(Prompt).

- Using direct entry: Enter the command and its parameters following the syntax described in the *CL Reference*

- Proceeding through a series of menu driven panels.

4.5.2 Define yourself to the network

1. To communicate within an APPN network you must have an LU name. During the AS/400 installation process, at least one LU name was configured. Your local LU is displayed on the Display Network Attributes panel. You can view this display either by using the DSPNETA command, or by following this sequence of panels:

```
-- AS/400 Main panel
   -- 7. Define or change the system
      -- 1. Configuration
         -- 4. Network management
            -- 1. Display network attributes

You will see a panel similar to the following:
```

```
                        Display Network Attributes
                                                      System:

Current system name  . . . . . . . . . . . . . . >
  Pending system name  . . . . . . . . . . . . . >
Local network ID . . . . . . . . . . . . . . . . > ?LOCALNET?
Local control point name . . . . . . . . . . . . > ?LOCALCP?
Default local location . . . . . . . . . . . . . > ?LOCALLU?
Default mode . . . . . . . . . . . . . . . . . . > BLANK
APPN node type . . . . . . . . . . . . . . . . . > ?NODETYPE?
Maximum number of intermediate sessions  . . . . > 200
Route addition resistance  . . . . . . . . . . . > 128
Server network ID/control point name . . . . . . >
```

Figure 22. DISPLAY NETWORK ATTRIBUTES. This screen displays the configured network attributes.

If you wish to change the network attributes, use the command CHGNETA command or follow this panel sequence:

```
-- AS/400 Main panel
   -- 7. Define or change the system
      -- 1. Configuration
         -- 4. Network management
            -- 2. Change network attributes
```

2. For APPC on the AS/400, an entry called a communications entry must be created in a subsystem to handle APPC program evoke (or allocate) requests. To check to see if the communications entry has already been defined:

   a. Type WRKSBS

   b. Type 5 in the blank next to your communications subsystem (ex. QCMN)

   c. Type 8 to view Communications Entries or Type 9 to view Remote Location Entry.

If there is not a Communications Entry for device APPC, you must add one. To add a Communications Entry, the communications subsystem must be stopped. To stop the subsystem, use the following commands.

   • Type WRKSBS

- Type 4 to end the subsystem

For further information, see the AS/400 Operators Guide. To add a Communications Entry for device APPC, type the CL command ADDCMNE:

```
            ADDCMNE
Subsystem Description ............... > QCMN
    Library     ....................... > *LIBL
Device .............................. > APPC
Remote Location ..................... >
Job Description ..................... > QDFTJOBD
    Library     ....................... >
Default User Profile ............... > QUSER
Mode ................................ > *ANY
Maximum active jobs ................ > *NOMAX
```

Figure 23. ADD COMMUNICATIONS ENTRY. This screen displays the Add Communications entry parameters.

The subsystem must be stopped and restarted for the communications entry to be added.

4.5.3 Define a link to a partner or network node

There are three 'descriptions' used for APPC communications on the AS/400. These are:

- Line Description

  The line description describes the physical line connection to be used between the AS/400 and the network.

- Controller Description

  The controller description is used to describe all the characteristics of a link to an adjacent computer.

- Device Description

  The device description is used to describe all the characteristics of the logical connection between two locations in the network.

The AS/400 has a feature called automatic configuration. APPN Controllers are auto-created if the line description is defined with Automatic configuration can be used to autocreate a device description and/or a controller description on the AS/400. The autocreate happens when a partner tries to start a conversation with the AS/400.

The below configuration directions describe how to create or change line, controller, and device descriptions. If you wish to autocreate a controller and/or device description, you can skip those respective steps.

1. Create or change line description: You must have a line description to be used with the controller description. If there is a line description already available, you should not create a new one and can skip this step. This example creates a token ring line description named TRLAN. To create or change line

descriptions for token-ring, use CRTLINTRN or CHGLINTRN (create or change T-R line).

```
                CRTLINTRN
Line Description .................... > ?LINENAME?
Resource name ....................... > ?RESNAME?
Online at IPL ....................... > *YES
Vary on wait ........................ > *NOWAIT
Maximum contollers .................. > 40
Line speed .......................... > 4M
Maximum frame size .................. > 1994
Local adapter address ............... > *ADPT
```

Figure 24. CREATE/CHANGE LINE DESCRIPTION. This screen displays the Line Description attributes.

2. Create or change controller description (link definition): You can access controller descriptions through the CRTCTLAPPC or CHGCTLAPPC commands (Create/Change Controller Description, APPC). The following example shows only the fields of the controller description that need to be changed. You can allow the other fields to default.

```
                CRTCTLAPPC
Controller Description .............. > ?CONTRNAME?
Link type ........................... > *LAN
Online at IPL ....................... > *YES
APPN-capable ........................ > *YES
Switched line list .................. > ?LINENAME?
Remote network identifier ........... > ?PARTNERNET?
Remote control point ................ > ?PARTNERLU?
LAN remote adapter address .......... > ?LANADDRESS?
APPN CP session support ............. > *YES
APPN node type ...................... > *CALC
APPN transmission group number ...... >  CALC
```

Figure 25. CREATE/CHANGE CONTROLLER DESCRIPTION. This screen displays the Controller Description attributes.

3. OPTIONAL STEP FOR APPN(*YES) devices: Create or change device description (LU definition): You can access controller descriptions through the CRTDEVAPPC or CHGDEVAPPC commands (Create/Change Device Description, APPC). The following example shows only the fields of the device description that need to be changed. You can allow the other fields to default.

```
                CRTDEVAPPC
Device Description .................. > ?DEVNAME?
Remote Location..................... > ?PARTNERLU?
Local Location ...................... > ?LOCALLU?
Remote network identifier ........... > ?PARTNERNET?
Attached Controller ................. > ?CONTRNAME?
```

Figure 26. CREATE/CHANGE DEVICE DESCRIPTION. This screen displays the Device Description attributes.

4.5.4 Configure to run as a client

4.5.4.1 Define CPI-C side information

To use a CPI-C symbolic destination name, a CPI-C side info entry or CSI should be defined.

The following are CL commands that allow you to create, display, print, change, delete and work with the side information.

- CRTCSI - Create the *CSI

- DSPCSI - Display or print the *CSI object

- CHGCSI - Change the *CSI object

- DLTCSI - Delete the *CSI object

- WRKCSI - Provides a menu interface for the *CSI object

```
                    CRTCSI
Side Information..................... > ?SYMDEST?
  Library.............................>
Remote Location...................... > ?PARTNERLU?
Transaction Program name............. > ?TPNAME?

              Additional Parameters
Local location....................... > ?LOCALLU?
Mode................................. > ?MODE?
Remote network identifier............ > ?PARTNERNET?
```

Figure 27. CREATE CPI-C SIDE INFORMATION. This screen displays the CPI-C Side Information parameters. Press PF10 for Additional parameters.

4.5.5 Configure to run as a server

4.5.5.1 Define transaction programs

To run AS/400 as a server, you must, in addition to the configuration steps above, define a transaction program (TP) on your machine which will be started when the client establishes a conversation.

To define the TP for AS/400, the User Library List needs to list the library that contains the transaction program. If the library that contains the TP is not in the list, it should be added. To access the User Library List do the following:

- Type the WRKSYSVAL from a command line

- Page down until you find the QUSRLIBL system value.

- Select 2 for Change

- Type your server program's library name (e.g. APING) in the space next to the desired sequence number. The library should contain the server program to be started (e.g. APINGD)

- Stop and restart your communications subsystem in order to update the subsytems and User Library List. To stop your communication subsystem, use the following commands:

  - Type STRSBS

  - Type your subsystem name and press Enter

  To start your communication subsystem, use the following commands:

  - Type WRKSBS

  - Type 4 to end the subsystem

4.6 Running APING

You should now be able to APING any of the computers you configured to using the steps above.

To run APING, from the AS/400 command line, type the CL command CALL from the command entry line.

```
            Call Program (CALL)
Program............................... > APIHG
 Library.............................> APIHG
Parameter........................... > ?PARTHERLU?or?SYHDEST?
                                      or?PLUALIAS?
```

Figure 28. CALL program. This screen displays the Call program parameters.

4.7 How to find....

- LU name

  During the AS/400 installation process, at least one LU name was configured. Your LU name can be found on the Display Network Attributes panel. Use DSPNETA command or follow this panel sequence.

  ```
  -- AS/400 Main panel
     -- 7. Define or change the system
        -- 1. Configuration
           -- 4. Network management
              -- 1. Display network attributes
  ```

  On the Display network attributes panel, the LU name is the Default local location.

- CP name

  On the Display network attributes panel, the CP name is the Local control point name.

- Network Name

  On the Display network attributes panel, the Network Name is the Local network ID.

- LAN address

  the LAN address is found by accessing the line description.

    - Type "WRKLIND *TRLAN" (Work with line descriptions)

    - Page down to the Token-Ring line description entry

    - Type "5" in front of the Token-Ring line description entry to Display

    - Look in the panel entry for Local Adapter Address. This is the value that a partner will enter for its remote address when connecting.

5.0 CICS Configuration

The Customer Information and Control System (CICS) provides an environment optimized for running very short programs called *transactions* on System/370 and System/390 processors. Transactions consist of a program (that may perhaps call other programs) with an associated transaction identifier or *transaction ID*. The transaction ID is 1-4 characters long but typically is always four characters. For example, the transaction CEDA starts the program that performs on-line resource definition.

This chapter describes how to configure CICS to use the APING and APINGD sample programs.

5.1.1 Prerequisites

The following software levels are required for the definitions in this chapter:

- CICS/ESA Version 3 Release 3
- ACF/VTAM Version 3 Release 4.1 or Version 3 Release 3
- MVS/ESA Version 4 Release 3 or Version 4 Release 2
- NCP Version 5 Release 2 or later
- Token ring adapter

In most cases, you will find CICS has already been installed and an LU name has been assigned. In addition, you will almost certainly find VTAM installed and the network name has already been defined. Therefore, while we give instructions on how to set the LU name in CICS and VTAM, you probably will not need to make any changes. The information is very useful, however, because you will need it to configure other platforms that wish to communicate with CICS.

In addition, you should have the APING and APINGD sample programs for CICS.

These publications provide detailed information on the configuration process for CICS Version 3 Release 3 and VTAM Version 3 Release 4.1.

- *CICS/ESA: Resource Definition (Online)*, SC33-0666
- *CICS/ESA: System Definition Guide*, SC33-0664
- *VTAM: Resource Definition Reference*, SC31-6438
- *VTAM: Network Implementation Guide*, SC31-6434
- *NCP: Resource Definition Reference*, SC30-3448 -

5.2 Terminology

Below is a table of standard APPC terms and the equivalent CICS terms. Using standard terms makes configuring two unlike platforms easier so standard terms are used whenever possible. Some terms have no CICS equivalent but instead are set in VTAM or NCP.

Standard Term	CICS Term
Link Name	PU name (VTAM)
Network Name	Network, NETID (see note)
LU Name	APPLID, ACBNAME
Partner LU Name	Netname
LAN Address	LOCADD (NCP)
Adjacent LAN Address	DIALNO (VTAM)

Note: CICS uses network name only when defining CPI-C side information. VTAM keeps track of partner LUs and routing traffic to the partner LUs, in the same network or different networks.

5.3 CICS Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following our excellent recommendations, you will write #INTER in the right column on the ?MODE? line. Then in Figure 36 on page 64 you will type #INTER on the CICS screen that looks like this:

```
MOdename   ==> #INTER
```

Likewise, in Figure 33 on page 61 the substitution would look like this:

```
?PARTNERLU? LU  LOCADDR=0,ISTATUS=ACTIVE,                        X
                MODETAB=?MODETABLE?,DLOGMOD=#INTER
```

Variable	How to determine the value for this symbol	Fill in value here
Values that must match in other places		
?LOCALLU?	This is the LU name of the CICS region you are configuring. It can be 1-8 characters (letters or numbers) but must begin with a letter. In CICS this is called the *APPLID*; in VTAM this is called the APPLID or *ACBNAME*. Refer to 1.10, "How do I Configure a Network?" on page 7 for information on how to define this value. If CICS is installed and running, you will not be able to choose this, you will have to get this value from the CICS or VTAM system programmer.	
?LOCALNET?	This is the network name, called the *NETID* in VTAM. It can be 1-8 characters (letters or numbers) but must begin with a letter. CICS uses the value defined in VTAM. See 5.7, "How to find..." on page 71 for information on how to find this value.	

Variable	How to determine the value for this symbol	Fill in value here
?LOCALCP?	This is the Control Point name of your machine. It can be 1-8 characters (letters or numbers) but must begin with a letter. It's value is set in VTAM, where it is called the *SSCPNAME*. See 5.7, "How to find..." on page 71 for more details.	
?PARTNERCP?	This is the Control Point name of the partner computer. VTAM uses this name in the CPNAME parameter to identify partner computers. Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?PARTNERLU?	This is the partner's LU name. CICS calls this the *netname*. This is *NOT* the same as the ?LOCALNET? name described earlier. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. In many cases this value will be the same as the preceding value (?PARTNERCP?).	
?PARTNERNET?	This is the network name of the partner computer. VTAM does all processing of network name Use the network name from the partner computer's "How to find..." section. If this value is different than the value for ?LOCALNET?, special coding is required in VTAM (see Figure 34 on page 61 for an example).	
?LANADDRESS?	This is the LAN address of the network processor that connects the host to the LAN. It is 12 hexadecimal digits (for example, x'10005A25EEF0' or x'400085950001'). This chapter assumes that the network processor is an IBM 3745 running NCP V5R2 or later. VTAM's preferred method for connecting to APPN or LEN nodes requires the partner computer to initiate the connection. This relieves VTAM (and VTAM system programmers) from having to know the LAN Address of the partner computer. VTAM uses the ?PARTNERCP? name to identify the partner.	
?TPNAME?	This is the Transaction Program name. It is the name that is sent across the network to the server machine and can be 1-64 characters, including a period (.). The server machine then maps this TP Name to an executable program. The TP Name is usually specified in a client/server product's documentation. For APING, the default TP Name is APINGD but this can be changed.	APINGD
?SERVERTRAN?	A 4 character name for the CICS server transaction, that is, the transaction initiated by an APPC partner LU. This must match the first four characters of the Transaction Program name and must be in upper-case.	APIN
?MODE?	See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Sometimes a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is #INTER.	#INTER
Local values		

Variable	How to determine the value for this symbol	Fill in value here
?LINKNAME?	1 to 8 letters or numbers which will be used as a local name to refer to the link to a partner computer. You can choose any name you like, but since you will use this name later to refer to this link, choose a meaningful name. CICS relies on VTAM to handle this type of information. VTAM calls the link name the PU name and it must begin with an alphabetic character. See Figure 33 on page 61 for more information.	
?SYMDEST?	This is the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. CICS does not require you to create side information. Example: **JOE.**	
Profile names, file names - these are names of CICS resources or members of MVS datasets. Unless otherwise noted, you can choose any name you want.		
?PROCLIB?	The dataset that contains the CICS start-up procedure. This procedure library should already exist and will probably have a member for CICS. Examples: **SYS1.PROCLIB** or **IPO1.PROCLIB.**	
?CICSPROC?	The procedure name (a member in ?PROCLIB?) that starts CICS. This job must run *after* the VTAM application node (APPL) is active. Example: **CICS330.**	
?SITPARMS?	The dataset with just those CICS System Initialization Table (SIT) parameters that are set at start-up time. There are several dozen SIT parameters. If several CICS regions have the same settings for most of them, they can use the same pre-assembled table but change the ones that need to be unique (like the LU name) when starting CICS. One way to do this is with a dataset containing the parameters to be changed. Example: **CICS330.SYSIN(DFHSSIP1).**	
?SWNETNODE?	The VTAM switched major node containing the PU definition for the remote peripheral node (if the partner LU is in a DOS, OS/2, AIX, or OS/400 or other APPN platform). VTAM V3R4, the basis for the examples in this book, has a feature that dynamically creates the PU definition. This may already be defined. Example: **LANSW.**	
?APPLNODE?	The VTAM application major node with the CICS APPL statement. This must be varied active before starting CICS. This typically will already exist so contact your VTAM systems programmer for this. If you are looking on your own, it will usually have APPL in the name. Example: **CICSAPPL.**	
?GROUP?	A 1-8 character name for the collection of CICS definitions. CICS reserves for its own use names beginning with DFH. You can choose any name. Examples: **OS2** or **AIX.**	
?CON?	A 1-4 character *connection* name used as a nickname for the partner LU. The CICS connection defines the partner LU. Several other parameters are tied to the connection name. It does not have to match anything outside CICS. Example: **DWA1.**	

Variable	How to determine the value for this symbol	Fill in value here
?SESSION?	A 1-8 character name for the sessions with a given mode name.	
?CLIENTTRAN?	A 1-4 character name for the CICS client transaction, that is, a transaction started by a terminal user signed on to this CICS region. Example: APNG.	
?CLIENTPGM?	A 1-8 character name for the client program. This typically is the same as the real program name and this chapter will use that convention. Example: APING.	
?SERVERPGM?	A 1-8 character name for the server program. This typically is the same as the real program name and this chapter will use that convention. Example: APINGD.	
?PROFILE?	A 1-8 character name for the partner characteristics in CICS' CPI-C side information. See 5.5.5.1, "Define CPI-C Side Information (OPTIONAL)" on page 66.	
?APINGLIB?	The load library containing the compiled and link-edited programs for APING and APINGD. Example: CICSAPPS.LOADLIB.	
?MODETABLE?	The binary table containing mode names that VTAM searches, usually a member of SYS1.VTAMLIB. This may already exist but may not have the preferred mode names (#INTER, #BATCH, etc.) Check to make sure. Example: APPCMODE.	

5.4 Working with CICS and VTAM

This section describes commands that you (or an MVS system operator) must issue from an MVS operator console to make CICS and VTAM work. There are programs like the JES Spool Display and Search Facility (SDSF) that allow authorized users to view the system log and enter MVS commands from any 3270 session. If you have such a program then you don't have to be at the System/390 console to issue these commands.

VTAM definitions are grouped into *major nodes*, each of which is a separate member of SYS1.VTAMLST. The VBUILD TYPE= statement determines the type of major node. The two types you will use are *application* major nodes and *switched* major nodes. Application major nodes define host LUs using APPL statements, while switched major nodes define peripheral nodes using PU statements and LU statements. All of these will be described in more detail.

5.4.1 Starting/stopping APPC

APPC is part of CICS; it starts automatically when CICS is started, and stops automatically when CICS is stopped. Starting CICS consists of two steps:

1. Starting the VTAM application major node that contains the CICS APPL definition. To do this, issue the following command from the MVS operator console:

```
v net,act,id=?APPLNODE?
```

2. Running an MVS job that starts CICS. This job (called a *procedure* or *proc*) is usually in a *procedure library* such as SYS1.PROCLIB. To start CICS, issue following command from the MVS console:

```
s ?CICSPROC?
```

The procedure can be included in the MVS start-up list or a system operator can run it from the console. For more details on the start-up proc, see 5.5.2, "Defining yourself to the network" on page 57.

5.4.2 Other commands

Other MVS and CICS commands that are necessary or just useful include the following:

MVS console commands

- If the partner LU is in a computer connected to an NCP (a common case for CICS), the VTAM definition for the partner computer must be active before the computer can even connect to NCP. (There are some exceptions to this. See *VTAM: Network Implementation Guide*, Chapter 5, Section 2 for more details.) In VTAM, a *switched major node* is a set of definitions for partner computers on a LAN (in this example). The following command activates the switched major node and all the partner computer definitions in it:

```
v net,act,id=?SWNETNODE?
```

  If the major node is active the following commands deactivate and activate the link to the partner computer:

```
v net,inact,id=?LINKNAME?,f
v net,act,id=?LINKNAME?
```

- Displaying an active LU shows all the sessions and session partners of that LU. The following commands display the CICS LU and the partner LU.

```
d net,id=?LOCALLU?,e
d net,id=?PARTNERLU?,e
```

CICS Commands

- In CICS, the CEMT transaction allows you to display and modify the status of connections, netnames, and modenames (that is, all sessions with a particular mode name):

```
cemt inq conn(?CON?)
cemt inq netname(?PARTNERLU?)
cemt inq netname(?MODE?)
```

5.5 Configuration

This guide provides instructions for using CICS Resource Definition Online (RDO) to create and modify CICS definitions. To start Resource Definition Online, you must be logged on to CICS and your user-ID must be authorized to run the CEDA transaction.

5.5.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

   a. Additional LEN configuration

   b. Other link configuration

3. Configure to run as a client

   a. Define CPI-C side information

   b. Other client configuration

4. Configure to run as a server

   a. Define transaction programs

   b. Other server configuration

Since CICS' primary role is as a server, the server discussion will come before the client discussion.

5.5.2 Defining yourself to the network

Typically, the LU name for CICS has already been defined by the CICS systems programmer. If you are logged on to CICS, for example, the CICS LU name appears in the lower right corner of the 3270 screen. If this is the case for you, skip directly to 5.5.3, "Define a link to a partner or intermediate node" on page 60.

If you must start from scratch, this section describes how to create the CICS LU name. The APPLID parameter in the CICS System Initialization Table (SIT) determines the LU name for CICS. This macro statements are assembled and link-edited into a binary table that CICS loads at start-up time. The APPLID must match the ACBNAME used in the VTAM APPL statement.

The APPLID in the System Initialization Table can be over-ridden at start time by including some statements in the start-up procedure. In particular, the APPLID can be (and usually is) specified this way. Figure 29 on page 58 is a CICS start-up procedure. The dataset with the over-ride parameters must be in the SYSIN DD concatenation list.

The highlighted sections are discussed in the notes below. This is not the complete listing, just the section from the beginning down to the DFHRPL DD statement.

```
//DFHSTART PROC START='AUTO',
// INDEX1='CICS330',
// INDEX2='CICS330',
// REGNAM1=,
// REGNAM2=,
// REG='32M',
// DUMPTR='YES',
// RUNCICS='YES',
// OUTC='*',
// RDRC='A',
// SIP=1
        etc.


//*************************************************************
//****************** EXECUTE CICS ************************
//*************************************************************
//CICS    EXEC PGM=DFHSIP,REGION=&REG,TIME=1440,
// COND=(1,NE,CICSCNTL),
// PARM='START=&START,SYSIN'
//*
//*          THE CAVM DATASETS - XRF
//DFHXRMSG DD DISP=SHR,
// DSN=&INDEX1..CNTL.CICS&REGNAM1..DFHXRMSG
//DFHXRCTL DD DISP=SHR,
// DSN=&INDEX1..CNTL.CICS&REGNAM1..DFHXRCTL
//*
//* THE "FILEA" APPLICATIONS SAMPLE VSAM FILE
//* (THE FILEA DD STATEMENT BELOW WILL
//* OVERRIDE THE CSD DEFINITION IN GROUP DFHMROFD)
//FILEA     DD DISP=SHR,
// DSN=&INDEX1..CICS&REGNAM1..FILEA
//*
//SYSIN    DD DSN=?SITPARMS?,DISP=SHR                          # note 1
//DFHCMACD DD DSN=CICS330.DFHCMACD,DISP=SHR
//*        THE CICS STEPLIB CONCATENATION
//STEPLIB  DD DSN=EDC.V2R1M0.SEDCLINK,DISP=SHR
//         DD DSN=&INDEX2..SDFHAUTH,DISP=SHR
//         DD DSN=SYS1.COB2CICS,DISP=SHR
//         DD DSN=SYS1.COB2LIB,DISP=SHR
//*        DD DSN=IMS.RESLIB,DISP=SHR
//*        THE CICS LIBRARY (DFHRPL) CONCATENATION
//DFHRPL   DD DSN=EDC.V2R1M0.SEDCLINK,DISP=SHR                 # note 2
//         DD DSN=&INDEX2..SDFHLOAD,DISP=SHR
//         DD DSN=?APINGLIB?,DISP=SHR                          # note 2
//         DD DSN=SYS1.COB2CICS,DISP=SHR
//         DD DSN=SYS1.COB2LIB,DISP=SHR
        etc.
```

Figure 29. Startup Procedure for CICS - ?PROCLIB?(?CICSPROC?)

Notes:

1. The ?SITPARMS? dataset contains the overrides to the System Initialization Table. This file must be in the SYSIN DD list.

2. The DFHRPL DD concatenation list is where CICS looks for executable programs and must contain the load library containing the APING and APINGD modules. In this example, the load library is ?APINGLIB?.

Figure 30 on page 59 shows a data set with SIT over-ride parameters, in particular the APPLID. Once CICS has started, these parameters become part of the SIT for this CICS region.

```
SIT=6$,
XRF=NO,
SEC=YES,
XAPPC=YES,
XCMD=NO,
XDCT=NO,
XJCT=NO,
XPCT=NO,
XPPT=NO,
XTST=NO,
XTRAN=YES,
XFCT=NO,
XPSB=NO,
AUXTR=ON,
AUXTRSW=NEXT,
APPLID=(?LOCALLU?),     # note
ISC=YES,
GRPLIST=MNFLIST,
.END
```

Figure 30. CICS SIT Override Parameters - CICS330.SYSIN(DFHSSIP1)

Notes:

1. The APPLID must match the VTAM ACBNAME parameter.

To define the CICS LU name in VTAM, you will need to set up an application major node with a minor node for this CICS region. In VTAM, the name of a resource (LU, APPL, etc.) is the name that precedes the key word in the definition. Figure 31 shows an example of a VTAM application major node with one minor node (that is, one APPL statement).

```
?APPLNODE? VBUILD TYPE=APPL                                      # note 1
?LOCALLU? APPL   ACBNAME=?LOCALLU?,AUTH=(ACQ,PASS,VPACE),      X   # notes 2,3,4
              MODETAB=?MODETABLE?,EAS=200,PARSESS=YES,VPACING=0,  X   # notes 5,6
              SONSCIP=YES
```

Figure 31. VTAM Application Major Node - SYS1.VTAMLST(?APPLNODE?)

Notes:

1. By convention, the major node name (the label on the VBUILD statement) is also the name of the member in SYS1.VTAMLST.

2. The ACBNAME must match the APPLID parameter in the CICS System Initialization Table. If the ACBNAME is not specified, it defaults to the name directly preceding the APPL keyword (?LOCALLU? in this figure).

3. The mode table ?MODETABLE? must contain the mode names used by partner LUs that initiate connections to this CICS. VTAM only checks the name (the parameters can be anything or nothing). VTAM does not check outbound BINDs for mode names, only inbound BINDs. So you may run into a situation where you can acquire a session from CICS successfully but a CNOS from a remote system will fail.

4. The continuation character (X in this example) must be in column 72, and continuation lines (here the MODETAB = ...) must begin in column 16.

5. PARSESS = YES indicates this CICS will use parallel sessions.

6. Another parameter, APPC, is not coded here because the default, APPC = NO, is the desired value. CICS uses its own APPC implementation and does not use VTAM's APPC support.

There are two mode names that must be in the mode table (?MODETABLE?) named in Figure 31 on page 59. They are SNASVCMG and ?MODE? (the mode name from the worksheet in 5.3, "CICS Configuration Worksheet" on page 52). The assembler source code in Figure 32 provides working definitions. Add this source code to the source code for the mode table, assemble it and re-link it to SYS1.VTAMLIB.

```
          TITLE 'SNASVCMG'
***********************************************************************
*         LOGMODE TABLE ENTRY FOR RESOURCES CAPABLE OF ACTING       *
*                               AS LU 6.2 DEVICES                   *
***********************************************************************
SNASVCMG MODEENT LOGMODE=SNASVCMG,FMPROF=X'13',TSPROF=X'07',         *
                 PRIPROT=X'B0',SECPROT=X'B0',COMPROT=X'D0B1',        *
                 RUSIZES=X'8686',ENCR=B'0000',SSNDPAC=7,             *
                 PSERVIC=X'060200000000000000000300',                *
                 SRCVPAC=7,PSNDPAC=7,TYPE=0
          TITLE '#INTER'
***********************************************************************
*                                                                   *
*         LOGMODE TABLE FOR INTERACTIVE SESSIONS ON RESOURCES       *
*         CAPABLE OF ACTING AS LU 6.2 DEVICES                       *
*                                                                   *
***********************************************************************
#INTER   MODEENT LOGMODE=#INTER,                                     *
                 ENCR=B'0000',SSNDPAC=7,                             *
                 SRCVPAC=7,PSNDPAC=7
```

Figure 32. VTAM Mode Definitions - SNASVCMG and ?MODE?

5.5.3 Define a link to a partner or intermediate node

To define a link to a partner or intermediate node, create a VTAM switched major node with a physical unit (PU) definition. If the partner LU is in the same system (APPC/MVS or another CICS region, for example), skip this section and go to 5.5.4, "Configure to run as a server" on page 62.

Note: The examples here are for APPN nodes and LEN nodes. If the partner LU is in another S/390 host, subarea routing must be used and VTAM on both hosts must have proper paths defined to allow CICS to communicate with the partner LU.

Since the next node in the path to the partner LU may be just an intermediate hop, the term *adjacent link* will be used to name the link chosen to route the traffic to the partner LU.

For most APPC systems communicating with CICS, the link to the host S/390 is activated by the remote system, not by VTAM. (CICS does not know about link

definitions at all.) The examples shown here represent APPN nodes or LEN nodes that activate links to VTAM.

Below is a sample VTAM switched major node.

```
?SWNETNODE? VBUILD TYPE=SWNET,MAXGRP=6,MAXNO=6                        # note 1
?LINKNAME?  PU  ADDR=04,                                          X  # note 2
                CPNAME=?PARTNERCP?,                               X  # note 3
                PUTYPE=2,                                         X
                MAXDATA=2057,                                     X
                MAXPATH=1
?PARTNERLU? LU  LOCADDR=0,ISTATUS=ACTIVE,                         X  # note 4
                MODETAB=?MODETABLE?,DLOGMOD=?MODE?                   # note 5
```

Figure 33. VTAM Switched Major Node - SYS1.VTAMLST(?SWNETNODE?)

Notes:

1. The name of the switched node (?SWNETNODE?) is the label of the VBUILD statement.

2. VTAM thinks of PUs as links; this name is strictly internal to VTAM.

3. The CPNAME in this definition is obtained from the partner (or defined by the VTAM system programmer and given to the person setting up the partner computer). It *must* match exactly. The network name is by default the same as VTAM's (see 5.7, "How to find..." on page 71).

4. On the platforms that will use this form of VTAM definition, it is quite likely that ?PARTNERLU? and ?PARTNERCP? are one and the same. In fact, for Networking Services/DOS, this is a requirement.

5. VTAM only requires that the mode name be in the mode table. Making it the default (DLOGMOD) just makes things tidier. Note that the mode name SNASVCMG must also be in the mode table.

If the partner computer has a different network name than VTAM's, then you must have VTAM Version 3 Release 4 or later to use the following definition. The partner computer is said to be in a *non-native* network.

```
?SWNETNODE? VBUILD TYPE=SWNET,MAXGRP=6,MAXNO=6
?LINKNAME?  PU  ADDR=04,                                          X
                CPNAME=?PARTNERCP?,                               X
                PUTYPE=2,                                         X
                MAXDATA=2057,                                     X
                MAXPATH=1,                                        X
                XNETALS=YES,                                      X  # note 1
                NETID=?PARTNERNET?                                   # note 2
?PARTNERLU? LU  LOCADDR=0,ISTATUS=ACTIVE,                         X
                MODETAB=?MODETABLE?,DLOGMOD=?MODE?
```

Figure 34. VTAM Switched Major Node, Non-Native Network -
SYS1.VTAMLST(?SWNETNODE?)

Notes:

1. You must code XNETALS = YES here and int the VTAM start options. It is only valid with VTAM V3R4 or later.

2. The NETID is the partner network name from the worksheet in 5.3, "CICS Configuration Worksheet" on page 52.

5.5.4 Configure to run as a server

To configure CICS as a server you must define the following:

- a CONNECTION object (with the partner LU name)

- a SESSIONS object (with the mode name for the session)

- a TRANSACTION object (with the TP Name to be started)

- a PROGRAM object (used by the TRANSACTION object)

In CICS, *objects* have properties such as authorization lists (what user-ids can use the object), resources required (memory, buffers), etc. CICS manages all these to provide low response time.

Note: To distinguish CICS objects, such as a CONNECTION, from more generic usages, the CICS object names will be in upper case. For example, a PROGRAM refers to the CICS definition for a program object, while a program can be any executable file or load module.

To create and modify definitions in CICS start the CEDA transaction. All definitions in CICS are kept in *groups*. Most object identifiers must be globally unique, that is, cannot be used in any other group. SESSIONS objects are an exception to this rule. In the following sections all the definitions are in the same group.

5.5.4.1 Defining a CONNECTION

To define a connection in CICS, type the following at a clear screen:

```
ceda define group(?GROUP?) connection(?CON?)
```

CICS folds all characters to upper-case, so you don't have to worry about typing lower-case characters. If the group does not exist, CICS will create it for you automatically. Figure 35 on page 63 shows the 3270 screen that results from this command. CICS fills in the group name and the CONNECTION identifier from the values you typed. On this screen and all other CICS screens, if a value must be selected from a list, then the part of the list value that is upper-case serves as a short-name. For example, the ACcessmethod parameter has options of Vtam, IRc, INdirect, and Xm. To select Vtam, typing "V" is the same as typing "VTAM."

```
OVERTYPE TO MODIFY                                          CICS RELEASE = 0330
  CEDA DEFine
    Connection      : ?CON?                                                      # note 1
    Group           : ?GROUP?
    DEscription  ==> PARTNER LU
  CONNECTION IDENTIFIERS
    Netname      ==> ?PARTNERLU?                                                  # note 2
    INDsys       ==>
  REMOTE ATTRIBUTES
    REMOTESystem ==>
    REMOTEName   ==>
  CONNECTION PROPERTIES
    ACcessmethod ==> Vtam           Vtam | IRc | INdirect | Xm
    Protocol     ==> Appc           Appc | Lu61                                  # note 3
    SInglesess   ==> No             No | Yes                                     # note 4
    DAtastream   ==> User           User | 3270 | SCs | STrfield | Lms
    RECordformat ==> U              U | Vb
  OPERATIONAL PROPERTIES
+   AUtoconnect  ==> No             No | Yes | All                               # note 5
    INService    ==> Yes            Yes | No
  SECURITY
    SEcurityname ==>
    ATtachsec    ==> Local          Local | Identify | Verify | Persistent       # note 6
                                    | Mixidpe
    BINDPassword ==>                PASSWORD NOT SPECIFIED
    BINDSecurity ==> No             No | Yes


                                                            APPLID=TOCICS3
```

Figure 35. CEDA DEFINE GROUP(?GROUP?) CONNECTION

Required parameters:

1. *Connection* is a 1-4 character nickname for this partner LU.

2. *Netname* is the partner LU name. The netname must match a VTAM definition, either from a dynamically-defined cross-domain resource (CDRSC) or from a static definition in a VTAMLST member. (See Figure 33 on page 61.) CICS uses netname to refer to ?PARTNERLU? and doesn't allow you to set the partner network name. Remember, the fully-qualified partner name is ?LOCALNET?.?PARTNERLU? (for example, USNET1.PARTNER).

3. *Protocol* must be entered and must be APPC.

4. *SInglesess* must be set to NO. The example definitions in this guide all require parallel sessions.

5. The " + " sign indicates the bottom of the first screen displayed by CEDA. The function key settings are displayed at the bottom of the screen (but not shown here).

6. *Attachsec* specifies the type of security that can be used. Persistent means that this partner sends a user-ID and password the first time it tries to start a transaction; subsequent transactions are sent with just the user-ID and some bits that say "persistent verification - already signed on." CICS V3R3 will keep a table of logged-on users. The partner system can still try to start a program with no security and if the transaction does not require security, it will run. However, transactions that require RACF user-ID authorization would fail in such cases.

   Here the default, "Local," means that any transaction that can be run by the default user-ID, CICSUSER, can be run by this partner LU.

5.5.4.2 Defining SESSIONS

To define the mode name and session characteristics for the partner LU a SES-
SIONS definition must be created. The following command builds a 3270 screen
that allows you to do so.

```
ceda define group(?GROUP?) sessions(?SESSION?)
```

Figure 36 shows the 3270 screen that you should as a result.

```
OVERTYPE TO MODIFY                              CICS RELEASE = 0330
 CEDA  DEFine
  Sessions       : ?SESSION?                                          # note 1
  Group          : ?GROUP?
  DEscription  ==> ?MODE? SESSIONS FOR PARTNER LU
 SESSION IDENTIFIERS
  Connection   ==> ?CON?                                              # note 2
  SESSName     ==>
  NETnameq     ==>
  MOdename     ==> ?MODE?                                             # note 3
 SESSION PROPERTIES
  Protocol     ==> Appc            Appc | Lu61
  MAximum      ==> 008 , 004       0-999                              # note 4
  RECEIVEPfx   ==>
  RECEIVECount ==>                 1-999
  SENDPfx      ==>
  SENDCount    ==>                 1-999
  SENDSize     ==> 04096           1-30720
 + RECEIVESize ==> 04096           1-30720

                                                 APPLID=TOCICS3
```

Figure 36. CEDA DEFINE GROUP(?GROUP?) SESSIONS

Required parameters:

1. *Sessions* is the CICS name for this session set. The name must be unique
   within this group.

2. *Connection* identifies the CICS connection in this group (in other words, the
   partner LU) associated with this mode name.

3. *Modename* specifies the mode for this group of sessions.

4. *Maximum* specifies the number of sessions for this mode name. The values
   shown here match the default values for the mode names #INTER and
   #BATCH as defined in APPN end nodes and network nodes.

5.5.4.3 Define transaction program - server

To define a transaction program in CICS requires two things, a TRANSACTION
and a PROGRAM. The TRANSACTION definition assigns the unique four-
character transaction identifier for this CICS region, while the PROGRAM estab-
lishes characteristics of the executable code. The examples here show the server side
of APING, namely APINGD.

To define the APINGD program, type the following command:

```
ceda define group(?GROUP?) program
```

```
OVERTYPE TO MODIFY                                        CICS RELEASE = 0330
 CEDA DEFine
  PROGram        : ?SERVERPGM?                                              # note 1
  Group          : ?GROUP?
  DEscription   ==> TEST PROGRAM TO ALLOCATE AND DEALLOCATE
  Language      ==> C                    CObol | Assembler | Le370 | C | Pli  # note 2
                                         | Rpg
  RELoad        ==> No                   No | Yes
  RESident      ==> No                   No | Yes
  USAge         ==> Normal               Normal | Transient
  USElpacopy    ==> No                   No | Yes
  Status        ==> Enabled              Enabled | Disabled
  RSl            : 00                    0-24 | Public
  Cedf          ==> Yes                  Yes | No
  DAtalocation  ==> Below                Below | Any
  EXECKey       ==> User                 User | Cics
 REMOTE ATTRIBUTES
  REMOTESystem  ==>
+ REMOTEName    ==>

                                                          APPLID=TOCICS3
```

Figure 37. CEDA DEFINE GROUP(?GROUP?) PROGRAM

Required parameters:

1. *Program* is the name of the member of ?APINGLIB? that contains the
   APINGD executable code. (See Figure 29 on page 58 for the JCL to include
   this load library in CICS' search list.)

2. *Language* specifies the source language of the program. The APINGD sample
   program is written in C, so the default, Cobol, must be changed. There is a
   Cobol version of APINGD that will run on CICS systems that do not have
   CPI-C support (such as CICS Version 2 Release 1.2) or that do not have the C
   run-time libraries. The Cobol source code is available on CompuServe, the
   IBM BBS, and MKTTOOLS.

To define the transaction, type the following command:

```
ceda define group(?GROUP?) transaction
```

The resulting screen should resemble that shown in Figure 38.

```
OVERTYPE TO MODIFY                                        CICS RELEASE = 0330
 CEDA DEFine
  TRansaction    : ?SERVERTRAN?                                           # note 1
  Group          : ?GROUP?
  DEscription   ==> APING SERVER TRANSACTION
  PROGram       ==> ?SERVERPGM?                                           # note 2
  TWasize       ==> 00000              0-32767
  PROFile       ==> DFHCICST
  PArtitionset  ==>
                  .
                  .
                  .
 ALIASES
  Alias          :
  TASKReq        :
  XTRanid        :
+ TPName         : APINGD                                                 # note 3

                                                          APPLID=TOCICS3
```

Figure 38. CEDA DEFINE GROUP(?GROUP?) TRANSACTION

Required parameters:

1. *Transaction* is the one-to-four character transaction id. The APING client specifies a remote TP name of APINGD (as a default). When CICS receives a request to start a transaction, it only looks at the first four characters of the TP name. Therefore APING must be the transaction id used by this program.

2. *Program* is a pointer to the PROGRAM definition. In this case the PROGRAM definition has the same name as the program.

3. The TPName parameter is not supported in CICS/MVS Version 2,

The other values shown in this example are local system defaults.

5.5.4.4 INSTALLing the Definitions

Before any definitions can be used they must be added to the running CICS System Definition (CSD) using the INSTALL command. This is accomplished by typing

```
CEDA INSTALL GROUP(?GROUP?)
```

This command will install all the objects in the group - CONNECTIONs, SESSIONS, PROGRAMS, etc. Some objects can be installed individually, too. Here is an example of installing a change to the program APING:

```
CEDA INSTALL GROUP(?GROUP?) PROGRAM(APING)
```

If a resource is in use, or *In Service* in CICS terms, the installation will fail. If you get the INSTALLATION FAILED message, you can display the messages by pressing the PF9 key. This shouldn't happen the first time, though.

If you need to take a CONNECTION out of service, or disable a TRANSACTION or PROGRAM, use the CEMT transaction (see 5.4, "Working with CICS and VTAM" on page 55).

5.5.5 Configure to run as a client

Only the client has to deal with CPI-C side information and CICS provides a default entry that allows programs to use CPI-C with no predefined side information. APING will accept a fully-qualified partner LU name (?LOCALNET?.?PARTNERLU?) as the partner LU parameter. Therefore, the following two definitions are not necessary if the connection and sessions definitions follow the guidelines stated above.

The PARTNER definition contains most of the details, but the default profile uses a blank mode name. The PROFILE definition uses the #INTER mode name.

5.5.5.1 Define CPI-C Side Information (OPTIONAL)

To define CPI-C side information in CICS you must create a PARTNER definition and a PROFILE definition. Both are optional. You can invoke APING with either the CICS netname (?PARTNERLU?) or a fully-qualified partner LU name (?LOCALNET?.?PARTNERLU?) and APING will work properly.

To create a PARTNER definition, type the following command in CICS:

```
ceda define group(?GROUP?) partner
```

The 3270 screen shown in Figure 39 on page 67 should appear. Type in the values for Partner, Netname, Network, and TP name from the worksheet in 5.3, "CICS Configuration Worksheet" on page 52.

```
OVERTYPE TO MODIFY                                    CICS RELEASE = 0330
  CEDA  DEFine
   PARTNer        : ?SYMDEST?                                                   # note 1
   Group          : ?GROUP?
   Description  ==> CPI-C SIDE INFO
  REMOTE LU NAME
   NETName      ==> ?PARTNERLU?                                                 # note 2
   NETWork      ==> ?PARTNERNET?                                                # note 2
  SESSION PROPERTIES
   Profile      ==> DFHCICSA                                                    # note 3
  REMOTE TP NAME
   Tpname       ==> ?TPNAME?                                                    # note 4
                ==>
   Xtpname      ==>
                ==>
                ==>


                                                       APPLID=TOCICS3
```

Figure 39. CEDA DEFINE GROUP(?GROUP?) PARTNER. The CPI-C side informa-
tion.

Required parameters:

1. *Partner* is the name for this resource in CICS.

2. *Netname* is the partner's LU name. *Network* is the partner's network name.

3. *Profile* is the set of characteristics this partner has. The most important of these
   is the modename. The default profile, DFIICICA, works if the program sets
   the mode name explicitly. APING does set the mode name to #INTER as the
   default.

4. *Tpname* is the initial setting for the remote TP name. This can be overridden in
   the program using Set_TP_Name (CMSTPN). The TP name must match a
   corresponding TP definition at the remote system.

To define a PROFILE to explicitly set the mode name for the CPI-C side informa-
tion, type the following command:

```
ceda define group(?GROUP?) profile
```

The screen shown in Figure 40 on page 68 should appear. Type in the values for
?PROFILE? and ?MODE? from the worksheet in 5.3, "CICS Configuration
Worksheet" on page 52.

```
OVERTYPE TO MODIFY                                      CICS RELEASE = 0330
  CEDA DEFine
   PROFile       : ?PROFILE?                                                    # note 1
   Group         : ?GROUP?
   DEscription  ==> CPI-C PROFILE TO CHANGE MODE NAME
   Scrnsize     ==> Default            Default | Alternate
   Uctran       ==> No                 No | Yes
   MOdename     ==> ?MODE?                                                      # note 2
   PRIntercomp  ==> No                 No | Yes
   JOURNALLING
   Journal      ==> No                 No | 1-99
   MSGJrnl      ==> No                 No | INPut | Output | INOut
   PROTECTION
   MSGInteg     ==> No                 No | Yes
   Onewte       ==> No                 No | Yes
   PROtect      ==> No                 No | Yes
   Chaincontrol ==> No                 No | Yes
   PROTOCOLS
 + DVsuprt      ==> All                All | Nonvtam | Vtam

                                                        APPLID=TOCICS3
```

Figure 40. CEDA DEFINE GROUP(?GROUP?) PROFILE

Required parameters:

1. *Profile* is the name for this resource. This name must match the Profile parameter in the PARTNER definition.

2. *Mode name* identifies the mode for this side info entry. There must be a SESSIONS definition with the same modename. (Remember, this profile entry is optional if the application uses a default mode name, as APING does.) We recommend that ?MODE? be #INTER or one of the other mode names that ship with APPN products - #BATCH, #INTERSC, or #BATCHSC.

5.5.5.2 Define transaction program - client

Defining the client TRANSACTION and PROGRAM is just like defining the server as described in 5.5.4.3, "Define transaction program - server" on page 64. To define the PROGRAM, type the following in CICS:

```
ceda define group(?GROUP?) program
```

You should get the screen shown in Figure 41 on page 69.

```
OVERTYPE TO MODIFY                                    CICS RELEASE = 0330
 CEDA DEFine
  PROGram        : ?CLIENTPGM?                                              # note 1
  Group          : ?GROUP?
  DEscription   ==> APING CLIENT PROGRAM
  Language      ==> C                    CObol | Assembler | Le370 | C | Pli  # note 2
                                         | Rpg
  RELoad        ==> No                   No | Yes
  RESident      ==> No                   No | Yes
  USAge         ==> Normal               Normal | Transient
  USElpacopy    ==> No                   No | Yes
  Status        ==> Enabled              Enabled | Disabled
  RS1            : 00                    0-24 | Public
  Cedf          ==> Yes                  Yes | No
  DAtalocation  ==> Below                Below | Any
  EXECKey       ==> User                 User | Cics
 REMOTE ATTRIBUTES
  REMOTESystem  ==>
  REMOTEName    ==>
  Transid       ==>
  EXECUtionset  ==> Fullapi              Fullapi | Dplsubset

                                                      APPLID=TOCICS3
```

Figure 41. CEDA DEFINE GROUP(?GROUP?) PROGRAM. Here you tell CICS about
the executable program.

Required parameters:

1. *Program* is a member of the MVS load library ?APINGLIB? included in the
   DFHRPL DD concatenation list in the CICS start-up procedure. (See
   Figure 29 on page 58.)

2. *Language* must be set to C.

To define the TRANSACTION, type the following in CICS:

```
ceda define group(?GROUP?) transaction
```

You should get the screen shown in Figure 42. Modify the Transaction and
Program fields as described in the notes.

```
OVERTYPE TO MODIFY                                    CICS RELEASE = 0330
 CEDA DEFine
  TRansaction    : ?CLIENTTRAN?                                            # note 1
  Group          : ?GROUP?
  DEscription   ==> APING CLIENT TRANSACTION
  PROGram       ==> ?CLIENTPROG?                                           # note 2
  TWasize       ==> 00000               0-32767
  PROFile       ==> DFHCICST
  PArtitionset  ==>
  STatus        ==> Enabled             Enabled | Disabled
  PRIMedsize     : 00000                0-65520
  TASKDATALoc   ==> Below               Below | Any
  TASKDATAKey   ==> User                User | Cics
 REMOTE ATTRIBUTES
  DYnamic       ==> No                  No | Yes
  REMOTESystem  ==>
  REMOTEName    ==>
  TRProf        ==>
+ Localq        ==>                     No | Yes

                                                      APPLID=TOCICS3
```

Figure 42. CEDA DEFINE GROUP(?GROUP?) TRANSACTION

Required parameters:

1. *Transaction* is the four-character transaction id. This must be unique in this CICS region. As this transaction is started by a local terminal user, it does not need to match anything specified at the remote system.

2. *Program* is a pointer to the PROGRAM object defined in Figure 41

Remember to CEDA INSTALL your new definitions! (See 5.5.4.4, "INSTALLing the Definitions" on page 66.)

5.6 Running APING

To run APING, type any of the following commands at a clear CICS screen (don't forget the period if you use the first format):

```
?CLIENTTRAN? -n ?PARTNERNET?.?PARTNERLU?
?CLIENTTRAN? -n ?PARTNERLU?
?CLIENTTRAN? -n ?SYMDEST?
```

You should see the APING logo and output. The "-n" switch tries to start the APINGD transaction on the remote computer without any security information (user-ID and password).

Note: If you are running with RACF, your transaction must be authorized and your user-ID must be authorized to use it. If you get an error message like "DFHAC2033 ... Your are not authorized to use transaction XXXX." you will need to contact your RACF administrator.

You may need to manually start a session between CICS and the partner LU, since CICS does not do this automatically. To start a session with the partner session, at a CICS screen type this command:

```
cemt inq con(?CON?)
```

You will get the screen shown in Figure 43. By the connection and netname for the partner LU you should see "Ins Acq." This is CICS short-hand for "In-service, acquired." If the status is "Ins Rel," overtype the "Rel" with "Acq" and press the enter key. The resulting screen should now have "Ins Acq" as the status. If not, contact your VTAM systems programmer and make sure that the partner LU is active. You can also use the commands described in 5.4.2, "Other commands" on page 56 to display or activate the partner LU or switched major node.

```
INQ CON(?CON?)
STATUS: RESULTS - OVERTYPE TO MODIFY
Con(?CON?) Net(PARTNERLU?)     Ins Rel                    NORMAL
```

Figure 43. CICS Status for Connection ?CON?

5.7 How to find...

- LU Name

    If you can logon to the CICS region to begin defining partners, the CICS LU name appears on the bottom right of the screen as **APPLID = ?LOCALLU?**. Here that's TOCICS3.

- Control Point (CP) Name

    In MVS systems, the CP name is equivalent to the name of the VTAM System Services Control Point (SSCP). It takes its value from the SSCPNAME parameter in ATCSTRxx (see Figure 44).

- Network Name

    The network name can be found in the VTAM start list member of SYS1.VTAMLST. Look for a member named ATCSTRxx, where xx is 00 or TS or something. It should look like this:

```
HOSTSA=1,                                                     X
SSCPID=01,                                                    X
SSCPNAME=?LOCALCP?,                                            X
DYNASSCP=NO,                                                   X
NETID=?LOCALNET?,                                              X
MAXSUBA=63,                                                   X
CONFIG=00,                                                    X
NOPROMPT,                                                     X
    etc.
```

Figure 44. The VTAM Start Parameter List - SYS1.VTAMLST(ATCSTR00)

- LAN Address

    The LAN address for a CICS host connected to a token ring through a 3745, 3720, or 3725 is in the NCP gen in SYS1.VTAMLST. Look for a GROUP macro statement with ECLTYPE = PHYSICAL and immediately after that should be a LINE macro with a LOCADD parameter. That is the LAN address. Here is an example:

```
*    BUILDING RING DEFINITIONS (PHYSICAL)
TO30T2PG GROUP ECLTYPE=(PHYSICAL,ANY),                        *
               TYPE=NCP,                                      *

               etc.

TO30T2PL LINE ADDRESS=(1089,FULL),LOCADD=?LANADDRESS?,PORTADD=2,   *
               RCVBUFC=4095,MAXTSL=692,ADAPTER=TIC2,TRSPEED=4,      *
               UACB=(X$P2AX,X$P2AR)
```

Figure 45. Portion of NCP Gen with LAN Address

6.0 Networking Services/DOS Configuration

Networking Services/DOS is a software product that supports the CPI-C interface APPC in the DOS and Microsoft Windows 3.0 and 3.1 environments. Networking Services/DOS allows a DOS machine to participate as a low entry networking node (see 1.9, "What Is APPN?" on page 6 for a discussion of node types). This chapter describes how to configure Networking Services/DOS running on DOS 3.3 or later on a workstation with a token-ring adapter connecting it to a token ring local area network.

6.1.1 Prerequisites

- Networking Services/DOS, Version 1.0, Part number 20G0437

- DOS, Version 3.3 or greater

- Local Area Network Support Program, Version 1.3 (Supplied with Networking Services/DOS)

- Token ring adapter

For additional configuration information, refer to the *Networking Services/DOS User's Guide and Reference*, S20G-0438-00

6.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by Networking Services/DOS.

Standard Term	Networking Services/DOS Term
Link Name	link name
Network Name	network ID or NETID
LU Name	local LU name
Partner LU Name	partner LU name
Local LAN Address	adapter address
Adjacent LAN Address	remote computer LAN address

6.3 Networking Services/DOS Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following the recommendations in the Worksheet, you will write #INTER in the right column on the ?MODE? line. Then in Figure 48 on page 78 you will type #INTER on the line to replace "?MODE?" like this:

```
?SYMDEST? ?PARTNERNET?.?PARTNERLU? #INTER ?TPNAME?
```

Likewise, the other symbols on the line above will be replaced with the appropriate values from the right column of the Configuration Worksheet.

Symbol	How to determine the value for this symbol	Fill in value here
Values that must match with other places		
?LOCALLU?	This is the LU name of the machine you are defining to the network. Refer to 1.10, "How do I Configure a Network?" on page 7 for information on how to define this value.	
?LOCALNET?	This is the network name of the machine you are defining to the network. Refer to 1.10, "How do I Configure a Network?" on page 7 for information on how to define this value.	
?PARTNERLU?	This is the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?PARTNERNET?	This is the network name of the partner computer. Use the network name from the partner computer's "How to find..." section.	
?LANADDRESS?	This is the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the name of the transaction program at the partner computer. It is a name that is sent across the network to the server machine. The server machine then maps this TP Name to an executable program. The TP Name is usually specified in a client/server product's documentation. For APING, the TP Name on the server is **APINGD**.	
?MODE?	See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is #INTER. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
Local values		
?LINKNAME?	1 to 8 letters or numbers which will be used as a local name on the Networking Services/DOS machine to refer to the link to a partner computer. Suggestion: **LINK0001**	

Symbol	How to determine the value for this symbol	Fill in value here
?SYMDEST?	This is the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the Networking Services/DOS machine to refer to a CPI-C side information entry. Suggestion: use the same value as ?LOCALLU?.	
?TPPATH?	This is the fully-specified path and filename of the executable code for a server transaction program located on your machine. For example, if Networking Services/DOS is installed on the C:\ drive, this value could be: C:\NSD\SAMPLES\APING\APINGD.EXE	

6.4 Working with Networking Services/DOS

6.4.1 Starting/stopping APPC

Once your Networking Services/DOS configuration files are set up, you start Networking Services/DOS by issuing this command:

```
NSD START CONFIG.NSD
```

You can stop Networking Services/DOS and unload it from memory by issuing the command

```
NSD STOP /U
```

6.4.2 Displaying active sessions

You can display active APPC sessions by issuing the command:

```
NSD LIST /SESSION
```

This command may be useful in determining where an error may be occurring if APING does not run successfully.

6.4.3 Other commands

The other NS/DOS commands are documented in the *Networking Services/DOS User's Guide and Reference.*

6.5 Configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

    a. Additional LEN configuration

    b. Other link configuration

3. Configure to run as a client

    a. Define CPI-C side information

    b. Other client configuration

4. Configure to run as a server

    a. Define transaction programs

    b. Other server configuration

6.5.1 Working with APPC configuration

Networking Services/DOS configuration is done through configuration files that are loaded and interpreted when an NSD START command is issued. These files are:

- CONFIG.NSD

- SIDEINFO.NSD

- DEFINETP.NSD

- MODE.NSD

All these files need to be in the same directory. When Networking Services/DOS is started, it searches for these files in the current directory. To get Networking Services/DOS up and running from the .NSD files supplied with NS/DOS (in the \NSD\EXAMPLES subdirectory), you only need to alter the CONFIG.NSD and DEFINETP.NSD files.

6.5.2 Define yourself to the network

Before an Networking Services/DOS machine can communicate on a network, it must define itself to the network. This is done with an NSDN statement in the Networking Services/DOS's CONFIG.NSD file. The NSDN statement specifies the fully-qualified LU name of the DOS machine.

Networking Services/DOS provides many sample configuration files in the \NSD\EXAMPLES directory. To use the token-ring example as your base configuration file, copy TKRING.NSD from the \NSD\EXAMPLES directory to \NSD\CONFIG.NSD. Then, throughout this chapter, make changes to this CONFIG.NSD as indicated in the examples.

```
NSDN ?LOCALNET?.?LOCALLU?
```

Figure 46. Define yourself to the network - (in CONFIG.NSD)

6.5.3 Additional common configuration

There are several more statements that can be added to your CONFIG.NSD to improve performance or to specify more detailed information about how Networking Services/DOS runs in your machine. See the *Networking Services/DOS User's Guide and Reference* to learn more about them. Here we will discuss just two of these statements that you may have to configure to get Networking Services/DOS to run. These statements control access to resources within your machine that may already be used by something else.

The NSDI statement controls which DOS interrupt Networking Services/DOS will claim. You only need to use this statement if there are problems running the NSD START command. The default interrupt is 0x68. If you receive an error message

when running the NSD START command that indicates that an interrupt is already in use, change (or add) the following line in your CONFIG.NSD, specifying a different interrupt number:

```
NSDI 68     /* valid values are 60 through 68 */
```

Another problem you may encounter, due to possible conflicts with other software running on your machine, is a conflict in which SAP (service access point) Networking Services/DOS uses when it opens the LAN adapter. The default value is 04. If you receive an error message when running the NSD START command that indicates there is a SAP conflict, add the following line to your CONFIG.NSD, specifying a different SAP:

```
TRSS 04   /* valid values are X'04' through X'FC' and must be */
          /* divisible by 4.  X'08' is recommended as a        */
          /* second choice.  Then try '0C', '10', '14', '18'...*/
```

Note: The SAP you use must also be within the partner computer's valid range, so try to use as small a value as possible, such as 08 or 0C.

6.5.4 Define a link to a partner or network node

In order to start a conversation with another node, you must define a link to that node, or a link to a network node.

If you choose to define multiple links, you may also need to execute a command that tells Networking Services/DOS which link to use to find a particular partner LU.

6.5.4.1 Defining a link

A link is defined with the TRLD statement:

```
TRLD ?LINKNAME?, ?LANADDRESS?
```

Figure 47. Define a link - (in CONFIG.NSD).

6.5.4.2 Other link configuration

You can define more than one link by including more than one TRLD statement in your CONFIG.NSD file. When an APPC program attempts to establish a conversation with another node, Networking Services/DOS has to determine which link to route APPC traffic on. Networking Services/DOS will first search to see if a link has been assigned to the partner LU by a previous session activation. If so, that link is used; if not, Networking Services/DOS will send the request to find the partner LU to the first link specified in your CONFIG.NSD. If the partner LU is to be located through a different link, you must, in addition to defining the link with a TRLD statement, specify through which link the LU should be found. To do this, you must run the NSD ACTIVATE command after starting Networking Services/DOS with NSD START. The NSD ACTIVATE command looks like this:

```
NSD ACTIVATE LU=?PARTNERNET?.?PARTNERLU? LINK=?LINKNAME?
```

6.5.5 Configure to run as a client

6.5.5.1 Define CPI-C side information

Some applications, like APING, do not require CPI-C side information to run. These applications use programming calls available on a particular platform to dynamically create side information when running. Networking Services/DOS provides the programming calls that allow APING (and other applications) to do this, so for APING, you do not need to create this Side Information profile. For those applications that require CPI-C Side Information, this is how to create a profile:

CPI-C side information is defined in the SIDEINFO.NSD file. To add a CPI-C side information entry, edit this file and add a line specifying the Symbolic Destination Name, Partner LU Name, Mode Name, and Transaction Program Name as follows:

```
?SYMDEST? ?PARTNERNET?.?PARTNERLU?  ?MODE? ?TPNAME?
```

Figure 48. Define CPI-C side information - (in SIDEINFO.NSD)

6.5.6 Configuring to run as a server

6.5.6.1 Define transaction programs

To run Networking Services/DOS as a server, you must, in addition to the common configuration steps above, define a transaction program (TP) on your machine that will be started when the client establishes the conversation. The TP is defined in the DEFINETP.NSD configuration file. Here is the syntax of this statement in DEFINETP.NSD:

```
?TPNAME?   ?TPPATH?   *   *   OPERATOR_STARTED
```

Figure 49. Define a transaction program - (in DEFINETP.NSD). The asterisks indicate that you want to accept the default timeout values when starting the transaction program.

The last value on the line specifies the "TP program operation". This parameter indicates how the TP is started. It can be one of the following:

AM_STARTED
> the Program Launcher starts the program. The Program Launcher operates only in the Microsoft(TM) Windows environment.

OPERATOR_STARTED
> the Networking Services/DOS user starts the program. If you are not running in the Microsoft Windows environment, this is your only option. (Actually, if you're not running in the Microsoft Windows environment, the TP program operation parameter is ignored because OPERATOR_STARTED is the only valid operation).

6.5.7 Running APINGD

After running NSD START with the updated information in DEFINETP.NSD, you should be able to APING the Networking Services/DOS machine from another machine. If you are using the Program Launcher in the Microsoft Windows einvironment, you must start the Program Launcher before starting APING on the partner machine. To start the Program Launcher, double-click an icon created from

the \NSD\NSDPLW.EXE file, or place this icon in the startup folder to have the program launcher started whenever Windows is started.

If you are not using the Program Launcher, you will have to manually start APINGD.EXE on the Networking Services/DOS machine. This can be done before or after you start APING on the partner machine.

6.6 Running APING

You should now be able to APING any of the computers you configured to using the steps above.

To run APING, issue this command:

```
APING -n ?SYMDEST?
```

or you can specify the fully-qualified LU name of your partner:

```
APING -n ?PARTNERNET?.?PARTNERLU?
```

If Networking Services/DOS should try to locate the partner machine on a link other than the first one specified in your CONFIG.NSD, you need to run the "NSD ACTIVATE" command after starting Networking Services/DOS, and before APINGing that partner machine. For example:

```
NSD ACTIVATE LU=?PARTNERLU?.?PARTNERNET? LINK=?LINKNAME?
```

6.7 How to find...

- LU name

  The LU name is specified in the CONFIG.NSD file on the NSDN line. The LU name consists of the entire string following the period.

- Network Name

  The network name is specified in CONFIG.NSD on the NSDN line. The network name is the 1-8 characters preceding the period. See 6.5.2, "Define yourself to the network" on page 76 for details on the syntax of the NSDN statement.

- Control Point (CP) name

  The CP name is the same as the LU name.

- LAN address

  The LAN address is a 12-digit hexadecimal value that identifies your token-ring adapter to the network. There is a LAN address hard-coded on the Token-Ring adapter in the Networking Services/DOS machine. This hard-coded value is sometimes be over-ridden with something called a "locally administered address." You can find the LAN address on your Token-Ring card by running the program LANADDR, which is supplied with Networking Services/DOS. When you run LANADDR, the LAN address of your machine will be displayed as the "Adapter 0 in-use address". Use the 12 hexadecimal digits displayed. (If you have a secondary adapter installed and are accessing it with the Networking Services/DOS optional keyword TRAN, you would use the "Adapter 1 in-use address".) The "in-use address" displays the "locally administered address" if there is one being used.

7.0 APPC/MVS Configuration

This chapter describes how to configure APPC/MVS. The configuration is spread among the APPC/MVS subsystem, VTAM, and NCP. Examples of configuration of each are shown. The filenames shown are sample files created for VTAM, NCP, and APPC/MVS.

7.1.1 Prerequisites

Software and hardware prerequisites for APPC/MVS include:

- MVS/ESA V4.2 or later
- VTAM V3.3 or later
- NCP V5.2 or later
- 3745 with Token-ring attachment
- Using the transaction program(TP) APING as a sample TP
- Single SNA domain.

While the 3745 is not a strict prerequisite (a 3172, for example, can be used instead) this document only describes configuration with a 3745 as gateway.

7.1.2 Prerequisites

For more detailed information on APPC/MVS configuration and operation refer to:

- *MVS/ESA Planning: APPC Management*, GC28-1110
- *VTAM Resource Definition Reference*, SC31-6438
- *NCP Resource Definition Reference*, SC30-3448
- *APPC/MVS Handbook for OS/2 System Administrator*, GC28-1133
- *APPC Sys Defs in MVS/ESA and OS/2*, GG66-3224

7.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by APPC/MVS.

Standard Term	APPC/MVS Term
Network Name	NETID
LU Name	name supplied for APPL definition in APPL major node
Partner LU Name	name supplied for LU definition in major nodes other than APPL
Local LAN Address	LOCADD (in NCP gen)
Adjacent LAN Address	DIALNO (on PATH definition in switched major node)

7.3 APPC/MVS Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

Symbol	How to determine this value	Fill in value here
Values that much match with other places		
?LOCALLU?	This is the symbol that refers to the LU name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the same network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about LU names. The value specified for the ACBNAME on the LUADD statement in the PARMLIB member APPCPMxx defines an APPC/MVS LU. Look in this PARMLIB member to see if one has already been created.	
?LOCALCP?	This is the symbol that refers to the Control Point name of your machine. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points. VTAM, being a LEN node, does not have a CP (Control Point) name for APPN use. It does, however, have an SSCPNAME (System Services Control Point Name). Use the SSCPNAME in lieu of a CP name. It is the value specified for SSCPNAME in the VTAM start options member (ATCSTRxx is the start options member of the VTAMLST dataset).	
?LOCALNET?	This is the symbol that refers to the network name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names. For systems with VTAM already configured, this value is found in the VTAMLST start options (ATCSTRxx) member. The option name is NETID.	
?PARTNERLU?	This is the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	

Symbol	How to determine this value	Fill in value here
?LANADDRESS?	This is the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner network name.	
?TPNAME?	This is the symbol for the Transaction Program name. This is the name of the transaction program at the partner computer. For APING, the TP Name on the server is **APINGD**.	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is #**INTER**. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
Local values		
?NCPLANADDR?	This is the local LAN address coded in NCP on a LINE macro using the LOCADD parameter.	
?MODETAB?	Name of a logon mode table in VTAM. It is assembled and link-edited into a VTAM LOADLIB dataset. The systems programmer should know the names of the logon mode tables defined on the system. This should be the name of the table where the APPC modes are included.	
?SYMDEST?	This is symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It is included when creating a side information entry. Its value matches that provided on the DESTNAME parameter of the side information entry. parameter.	
?VOL?	This is the symbol for the name of a volume on which VSAM datasets for APPC/MVS will be created. It is a maximum of six characters.	
?JES?	The actual JES subsystem type (JES2 or JES3) should be substituted for this.	
?CLIST.DATASET?	The CLIST dataset in which you put the transaction program(APINGD) CLIST .	
?APPC.LOADLIB?	The load library dataset in which you put the transaction program(APING).	
?SIFILE?	This is the symbol for the VSAM dataset where CPI-C Side Information profiles will be permanently located. This value is normally SYS1.APPCSI	
?TPFILE?	This is the symbol for the VSAM dataset where TP profiles will be permanently located. This value is normally SYS1.APPCTP	

Symbol	How to determine this value	Fill in value here
?TPLEVEL?	This is the symbol for specification of where to begin searching for TP profiles. USER provides the search order: USER provides the search order. You may also specify GROUP (USER profiles ignored) or SSYTEM (USER and GROUP profiles ignored)	

7.4 Working with APPC/MVS

7.4.1 Starting/stopping APPC

The commands to start APPC/MVS are:

```
START APPC,SUB=MSTR,APPC=xx
START ASCH,SUB=MSTR,ASCH=xx
```

The xx is the identifier of the parmlib member. The default is 00.

APPC/MVS is ended by issuing:

```
C APPC
C ASCH
```

7.4.2 Other commands

Once APPC/MVS is activated, there are several commands that can be used to monitor APPC/MVS operation. A subset of these commands is shown below:

```
DISPLAY APPC,TP,ALL
DISPLAY APPC,LU,ALL
DISPLAY ASCH,ALL
```

These commands provide information on APPC/MVS TPs, LUs, and scheduler operations, respectively.

7.5 Configuration

7.5.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network
2. Define a link to a partner or intermediate node
   a. Additional LEN configuration
   b. Other link configuration
3. Configure to run as a client
   a. Define CPI-C side information
   b. Other client configuration
4. Configure to run as a server
   a. Define transaction programs
   b. Other server configuration

For APPC/MVS, configuration is done in the following places:

- SYS1.PARMLIB - Two parmlib members are added with parameters for the APPC and ASCH subsystems, respectively.

- VSAM - Datasets are needed for TP definitions and CPI-C side information.

- VTAM - Definitions are required in an application major node for the APPC/MVS LU or LUs, as well as partner definitions in a switched major node for LAN attached nodes, such as workstations. Additions are also need in logon mode tables for APPC modes.

- NCP - The token-ring adapter must be configured, and a parameter added to the NCP definition to support reserve storage for APPC LUs.

7.5.2 Define yourself to the network
1. Create Parmlib members

   The samples below show placement of two members (ASCHPM00 and APPCPM00) in SYS1.PARMLIB. These two members have startup parameters for the two applications that make up APPC/MVS; APPC, the base APPC support, and ASCH, the job scheduler that handles starting applications when incoming requests are received.

   ASCHPMXX members define classes of APPC/MVS transaction scheduler initiators and provides default scheduling information when it is missing from a TP profile.

```
CLASSADD CLASSNAME(FAST)    /* Specify the name of the class to be    */
                           /* added                                   */
         MAX(10)           /* Specify that the maximum number         */
                           /* of transaction initiators allowed       */
                           /* for this class is 10                    */
         MIN(2)            /* Specify that the minimum number         */
                           /* of transaction initiators to be         */
                           /* brought up for this class is 2          */
         RESPGOAL(.02)     /* Specify that the response time          */
                           /* goal for transaction programs           */
                           /* executing within this class is 0.02     */
                           /* seconds                                 */
         MSGLIMIT(500)     /* Specify that the maximum size of        */
                           /* the job logs for TPs is 500             */
                           /* messages                                */
OPTIONS DEFAULT(FAST)      /* Specify the default class - Note #1     */
        SUBSYS(?JES?) /* name of subsystem under which     */
                           /* all newly created APPC/MVS         */
                           /* transaction initiators are stored*/
TPDEFAULT REGION(4M)       /* Note #2                              */
          OUTCLASS(A)      /* Note #3                              */
```

Figure 50. SYS1.PARMLIB(ASCHPM00) - ASCHPM00.LIB

Notes:

a. The DEFAULT(classname) is an optional parameter that specifies the default class of transaction initiators in which to run a TP when a class name is not specified in a TP profile. If the TP profile does not specify a class name, and there is no default defined by this parameter, then the request to run the TP is denied. If the DEFAULT parameter names a class that does not exist, an error message is displayed on the console.

b. Region size - The region size assigned to TPs that do not specify a region size in their TP profile is 2M.

c. Output class - A is the class used as a default MSGCLASS for TPs whose profiles do not specify the MSGCLASS keyword in their JOB statements. When the SYSOUT keyword does not include a specific output class, the value of MSGCLASS can be used as a default.

APPCPMXX members control the communication functions. The sample below defines a local LU for the APPC/MVS configuration.

```
/*                              APPCPM00                                    */
    LUADD ACBNAME(?LOCALLU?)        /* Add LU MVSLU01 to the                 */
                                    /* APPC/MVS configuration                */
          SCHED(ASCH)               /* Specify that the APPC/MVS             */
                                    /* transaction scheduler is associated   */
                                    /* with this LU name                     */
          BASE                      /* Designate this LU as the base LU      */
          TPDATA(?TPFILE?)/* Specify the VSAM data set for */
                                    /* (Suggestion SYS1.APPCTP)              */
                                    /* the permanent repository for          */
                                    /* TP profiles for this LU               */
          TPLEVEL(USER)             /* Specify the search order for TP       */
                                    /* profiles as                           */
                                    /* 1. TP profiles associated with        */
                                    /*    a specific user - USER             */
                                    /* 2. TP profiles associated with        */
                                    /*    a group of users - GROUP           */
                                    /* 3. TP profiles associated with        */
                                    /*    all users of the LU name - SYSTEM*/
    SIDEINFO DATASET(?SIFILE?)  /* Specify the VSAM data set */
                                    /* (Suggestion SYS1.APPCSI)              */
                                    /* for the permanent                     */
                                    /* repository for the side               */
                                    /* information                           */
```

Figure 51. SYS1.PARMLIB(APPCPM00) - APPCPM00.LIB

2. Create VTAM Application Major Node

Place the following sample in a VTAMLST library (usually SYS1.VTAMLST):

```
APPCAPP VBUILD TYPE=APPL
?LOCALLU? APPL ACBNAME=?LOCALLU?,APPC=YES,AUTOSES=1,DDRAINL=NALLOW,      *
               DMINWNL=1,DMINWNR=1,DRESPL=NALLOW,DSESLIM=2,EAS=509,      *
               MODETAB=?MODETAB?,SECACPT=CONV,VPACING=0,VERIFY=NONE,     *
               SRBEXIT=YES,DLOGMOD=?MODE?
```

Figure 52. VTAM definition of APPC LU - APPLMVS.VTM

This definition will define the APPC/MVS local LU to VTAM. Multiple APPC/MVS LUs may be defined. For simplicity of administration, the recommendation would be to define the smallest number of LUs needed.

3. Add APPC Modes to the Logmode Table

APPC modes are shown in Figure 53 on page 88. Add them to your logmode table, compile, and then link-edit the member into a VTAM library. Also include them in the default logmode table (ISTINCLM) so that dynamically created LUs can use them.

```
***********************************************************************
*          LOGMODE TABLE ENTRY FOR RESOURCES CAPABLE OF ACTING       *
*                      AS LU 6.2 DEVICES                             *
***********************************************************************
SNASVCMG HODEENT LOGMODE=SNASVCMG,FMPROF=X'13',TSPROF=X'07',          *
                 PRIPROT=X'B0',SECPROT=X'B0',COMPROT=X'D0B1',         *
                 RUSIZES=X'8686',ENCR=B'0000',SSNDPAC=7,              *
                 PSERVIC=X'0602000000000000000000300',                *
                 SRCVPAC=7,PSNDPAC=7,TYPE=0
         TITLE '#BATCH'
***********************************************************************
*                                                                    *
*          LOGMODE TABLE FOR BATCH SESSIONS ON RESOURCES CAPABLE     *
*          OF ACTING AS LU 6.2 DEVICES                               *
*                                                                    *
***********************************************************************
#BATCH   HODEENT LOGMODE=#BATCH,                                      *
                 ENCR=B'0000',SSNDPAC=3,                              *
                 SRCVPAC=3,PSNDPAC=3,RUSIZES=X'F7F7'
         TITLE '#INTER'
***********************************************************************
*                                                                    *
*          LOGMODE TABLE FOR INTERACTIVE SESSIONS ON RESOURCES       *
*          CAPABLE OF ACTING AS LU 6.2 DEVICES                       *
*                                                                    *
***********************************************************************
#INTER   HODEENT LOGMODE=#INTER,                                      *
                 ENCR=B'0000',SSNDPAC=7,                              *
                 SRCVPAC=7,PSNDPAC=7,RUSIZES=X'F7F7'
         TITLE '#BATCHSC'
***********************************************************************
*                                                                    *
*          LOGMODE TABLE FOR BATCH SESSIONS REQUIRING SECURE         *
*          TRANSPORT ON RESOURCES CAPABLE OF ACTING AS LU 6.2        *
*          DEVICES                                                   *
*                                                                    *
***********************************************************************
#BATCHSC HODEENT LOGMODE=#BATCHSC,                                    *
                 ENCR=B'0000',SSNDPAC=3,                              *
                 SRCVPAC=3,PSNDPAC=3,RUSIZES=X'F7F7'
         TITLE '#INTERSC'
***********************************************************************
*                                                                    *
*          LOGMODE TABLE FOR INTERACTIVE SESSIONS REQUIRING          *
*          SECURE TRANSPORT ON RESOURCES CAPABLE OF ACTING AS        *
*          LU 6.2 DEVICES                                            *
*                                                                    *
***********************************************************************
#INTERSC HODEENT LOGMODE=#INTERSC,                                    *
                 ENCR=B'0000',SSNDPAC=7,                              *
                 SRCVPAC=7,PSNDPAC=7,RUSIZES=X'F7F7'
         TITLE 'CPSVCMG'
***********************************************************************
*                                                                    *
*          LOGMODE TABLE FOR CP-CP SESSIONS ON RESOURCES CAPABLE     *
*          OF ACTING AS LU 6.2 DEVICES                               *
*                                                                    *
***********************************************************************
CPSVCMG  HODEENT LOGMODE=CPSCVMG,                                     *
                 RUSIZES=X'8686',ENCR=B'0000',                        *
                 SSNDPAC=7,SRCVPAC=7,PSNDPAC=7
```

Figure 53. APPC Logon Mode Entries - APPCMODE.ASM

7.5.3 Define a link to a partner or intermediate node

1. Define the Token-ring adapter in NCP

The following is a sample token-ring connection from NCP:

```
T030T2PG GROUP ECLTYPE=(PHYSICAL,ANY)
T030T2PL LINE  ADDRESS=(1089,FULL),LOCADD=?NCPLANADDR?,PORTADD=2,      X
                RCVBUFC=4095,MAXTSL=2044,ADAPTER=TIC2,TRSPEED=4
*
T030TRLO GROUP ECLTYPE=LOGICAL,AUTOGEN=10,PHYPORT=2,CALL=INOUT
```

Figure 54. LAN definitions on NCP

2. Provide for use of independent LUs on the token-ring connection

   Once the token-ring is defined in the NCP, the only additional parameter that is
   required is NUMILU on the LUDRPOOL macro. An example is:

   ```
   POOL1   LUDRPOOL NUMILU=100,NUMTYP1=20,NUMTYP2=20
   ```

   In this example the NCP will be able to support up to 100 independent LUs
   that are using dial connections (token-ring or switched lines).

7.5.3.1 Additional LEN configuration

Place the following in a VTAM switched major node definition. It assumes that the
partner is not another VTAM. If the partner LU is on another VTAM system, then
the link definitions for the token-ring shown above need to be for a subarea link, or
the cross-domain links need to be defined so that normal LU routing within the
subarea network will resolve the locations of the session partners.

```
WSN       VBUILD TYPE=SWNET,MAXGRP=2,MAXNO=2
PARTPU    PU     ADDR=04,                                             X
                 CPNAME=?PARTNERLU?,                                  X
                 PUTYPE=2,                                            X
                 MAXDATA=2012,                                        X
                 MAXPATH=1,                                           X
?PARTNERLU?  LU   LOCADDR=0,MODETAB=?MODETAB?,DLOGMOD=?MODE?
```

Figure 55. SYS1.VTAMLST(WSN) - WSN.VTM

7.5.4 Configure to run as a client

7.5.4.1 Define CPI-C side information

1. Create VSAM Dataset for CPI-C Side Information

   The following example job creates the VSAM dataset for Common Program-
   ming Interface-Communications(CPI-C) Side Information. It is needed for
   APPC/MVS to be able to initiate TPs that use side information. While it is
   used exclusively when APPC/MVS is acting as a client, it is included here so
   that the side information entry in SYS1.PARMLIB(APPCPM00) will reference
   an existing dataset. Later, new side information entries may be added to the
   dataset.

```
//APPC002  JOB CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
/*JOBPARM LINES=9999,TIME=1440
//SISAMPLE EXEC PGM=IDCAMS
//TSSC01   DD   DISP=OLD,UNIT=3380,VOL=SER=?VOL?
//SYSPRINT DD   SYSOUT=*
//SYSABEND DD   SYSOUT=*
//AMSDUMP  DD   SYSOUT=*
//SYSIN    DD   *
       DEFINE CLUSTER (NAME(?SIFILE?) - /* side info data set name = SYS1.APPCSI */
            VOLUME(?VOL?) -   /* the volume where the VSAM datasets are defined */
            INDEXED REUSE -
            SHAREOPTIONS(3 3) -
            RECORDSIZE(248 248) -
            KEYS(112 0) -
            RECORDS(50 25)) -
       DATA -
            (NAME(?SIFILE?.DATA)) -   /* side info data set name = SYS1.APPCSI */
       INDEX -
            (NAME(?SIFILE?.INDEX))    /* side info data set name = SYS1.APPCSI */
```

Figure 56. Sample JCL for Side Information VSAM dataset - ATBSIVSM.JCL

CPI-C side information is saved in the VSAM dataset created by the sample JCL file ATBSIVSM.JCL.

```
//SIADD0    JOB CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
//*************************************************************
//STEP      EXEC PGM=ATBSDFMU
//SYSPRINT DD   SYSOUT=*
//SYSSDLIB DD   DSN=SYS1.APPCSI,DISP=SHR
//SYSSDOUT DD   SYSOUT=*
//SYSIN    DD   *
     SIADD
         DESTNAME(?SYMDEST?)
         TPNAME(?TPNAME?)
         MODENAME(?MODE?)        /* see Note #1 */
         PARTNER_LU(?PARTNERLU?) /* see Note #2 */
/*
```

Figure 57. Sample JCL CPI-C Side Information Job - SIADD.JCL

2. Add new CPI-C side information entries

The above example SIADD.JCL shows the JCL to add new CPI-C Side Information entries to the CPI-C Side Information dataset.

Notes:

1. If no mode name is specified, a default mode name might be available

2. If no partner LU name is specified, APPC/MVS assumes the TP resides in the local LU.

7.5.4.2 Other client configuration

It will not usually be necessary to connect from VTAM out to other nodes. However, if it becomes necessary to do so, a line must be added to the switched major node defined above (WSN.VTM). The following line can be added just before the LU definition:

```
PATH1    PATH  GRPNM=T030TRL0,DIALNO=?LANADDRESS?,PID=1
```

The GRPNM parameter references a group of logical LAN lines defined in the NCP. See Figure 54 on page 89 for an example of defining logical LAN lines in the NCP.

7.5.5 Configure to run as a server

7.5.5.1 Define transaction programs (TPs)

A VSAM Dataset must first be created in order for APPC/MVS to be able to associate TP names with particular job streams when an incoming request to start a TP is received. Once the dataset is created, new TP's may be added by following step 2 and step 3 below.

When adding new transaction programs, you may have a server transaction program CLIST or REXX EXEC, or a compiled program. Regardless of how your TP is written, it needs to be defined to APPC/MVS by creating a TP profile for the program, and by adding the TP profile to the TP VSAM dataset.

1. Create VSAM Dataset for Transaction Program (TP) Profiles

   The following job creates the VSAM dataset for TP profiles.

```
//APPC001  JOB CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
/*JOBPARM LINES=9999,TIME=1440
//TPSAMPLE EXEC PGM=IDCAMS
//VOL1     DD  DISP=OLD,UNIT=3380,VOL=SER=?VOL? /* The volume for the VSAM datasets *
//SYSPRINT DD  SYSOUT=*
//SYSABEND DD  SYSOUT=*
//AMSDUMP  DD  SYSOUT=*
//SYSIN    DD  *
         DEFINE CLUSTER (NAME(?TPFILE?) - /* TP profile data set name=SYS1.APPCTP*/
             VOLUMES(?VOL?) - /* The volume where the VSAM datasets are defined */
             INDEXED REUSE -
             SHAREOPTIONS(3 3) -
             RECORDSIZE(3824 7024) -
             KEYS(112 0) -
             RECORDS(300 150)) -
         DATA -
             (NAME(?TPFILE?.DATA)) - /* TP profile data set name = SYS1.APPCTP */
         INDEX -
             (NAME(?TPFILE?.INDEX))  /* TP profile data set name = SYS1.APPCTP */
/*
```

Figure 58. JCL for TP profile VSAM dataset - ATBTPVSM.VTM

2. id = clist.Add transaction program to library

   - REXX EXEC - If you have the transaction program(APINGD) REXX CLIST, add it to a public CLIST dataset(?CLIST.DATASET?). The TP profile for the REXX example below assumes it has been added to dataset APPC.CLIST.

- Compiled program - If you have the transaction program(APINGD) compiled program, add the program to the ?APPC.LOADLIB?.

3. Create TP profile for transaction program(APINGD)

- REXX EXEC - The following job runs the APPC/MVS administrative utility to add a TP profile for the transaction program(APINGD). It starts the TSO Terminal Monitor Program IKJEFT01, which in turn calls the REXX CLIST located in the APPC.CLIST dataset.

```
//TPADD0    JOB   CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
//STEP      EXEC  PGM=ATBSDFMU
//SYSPRINT  DD    SYSOUT=*
//SYSSDLIB  DD    DSN=?TPFILE?,DISP=SHR
//SYSSDOUT  DD    SYSOUT=*
//SYSIN     DD    DATA,DLM=XX
     TPADD
          TPNAME(?TPNAME?)
          ACTIVE(YES)
          TPSCHED_DELIMITER(##)
              TAILOR_SYSOUT(NO)
              TAILOR_ACCOUNT(NO)
              CLASS(FAST)
              TPSCHED_TYPE(STANDARD)
              JCL_DELIMITER(END_OF_JCL)
//APPC04    JOB   MSGLEVEL=(1,1),MSGCLASS=A
//IKJACCNT  EXEC  PGM=IKJEFT01,
//          PARM='EXEC ''?CLIST.DATASET?(APINGD)'''
//SYSUADS   DD    DISP=SHR,DSN=SYS1.UADS
//SYSLBC    DD    DISP=SHR,DSN=SYS1.BRODCAST
//STEPLIB   DD    DSN=ISP.V3R2M0.ISPLOAD,DISP=SHR
//SYSTSPRT  DD    SYSOUT=*,FREE=CLOSE
//SYSTSIN   DD    DUMMY
//SYSPRINT  DD    SYSOUT=*,FREE=CLOSE
END_OF_JCL
   KEEP_MESSAGE_LOG(NEVER)                    /* Note # */
##
XX
/*
```

Figure 59. JCL to add a TP profile to the VSAM dataset - TPADD.JCL

Notes:

a. To log messages, specify KEEP_MESSAGE_LOG(ALWAYS) or KEEP_MESSAGE_LOG(ERROR) along with MESSAGE_DATA_SET(name).

- Compiled program - The following job runs the APPC/MVS administrative utility to add a TP profile for the transaction program(APINGD). It starts the TSO Terminal Monitor Program IKJEFT01, which in turn calls the REXX CLIST located in the APPC.CLIST dataset.

```
//TPADD0    JOB  CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
//STEP      EXEC PGM=ATBSDFMU
//SYSPRINT  DD   SYSOUT=*
//SYSSDLIB  DD   DSN=SYS1.APPCTP,DISP=SHR
//SYSSDOUT  DD   SYSOUT=*
//SYSIN     DD   DATA,DLM=XX
     TPADD
         TPNAME(?TPNAME?)
         ACTIVE(YES)
         TPSCHED_DELIMITER(##)
            TAILOR_SYSOUT(NO)
            TAILOR_ACCOUNT(NO)
            CLASS(FAST)
            TPSCHED_TYPE(STANDARD)
            JCL_DELIMITER(END_OF_JCL)
//APPC04    JOB  MSGLEVEL=(1,1),MSGCLASS=A
//IKJACCNT  EXEC PGM=?TPNAME?,
//SYSUADS   DD   DISP=SHR,DSN=SYS1.UADS
//SYSLBC    DD   DISP=SHR,DSN=SYS1.BRODCAST
//STEPLIB   DD DSN=?APPC.LOADLIB?,DISP=SHR
//SYSTSPRT  DD SYSOUT=*,FREE=CLOSE
//SYSTSIN   DD DUMMY
//SYSPRINT  DD SYSOUT=*,FREE=CLOSE
END_OF_JCL
  KEEP_MESSAGE_LOG(NEVER)                           /* Note # */
##
XX
/*
```

Figure 60. JCL to add a TP profile to the VSAM dataset - TPADD.JCL

Notes:

a. To log messages, specify KEEP_MESSAGE_LOG(ALWAYS) or
   KEEP_MESSAGE_LOG(ERROR) along with
   MESSAGE_DATA_SET(name).

7.6 Running APING

To run APING from TSO enter:

```
CALL '?APPC.LOADLIB?(APING)' '?SYMDEST?'
```

It can also be run from a batch program. Below is a sample job:

```
//APING0    JOB CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),NOTIFY=NEALS
//****************************************************************
//STEP      EXEC PGM=APING,PARM='?SYMDEST?'
//STEPLIB   DD   DSN=?APPC.LOADLIB?,DISP=SHR
//          DD   DSN=PLI.V2R3M0.SIBMLINK,DISP=SHR
//          DD   DSN=EDC.V2R1M0.SEDCLINK,DISP=SHR
//SYSPRINT  DD   SYSOUT=*
/*
```

Figure 61. JCL to run APING - APING.JCL

Note: It may be necessary to change the PLI.V2R3M0.SIBMLINK and the
EDC.V2R1M0.SEDCLINK DD statements to match levels of C and PL/1 on your
system.

7.7 How to find ...

- LU name

  For APPC/MVS, this is configured in SYS1.PARMLIB(APPCPMxx). The LUADD parameter includes an ACBNAME. The ACBNAME defines an APPC/MVS LU Name. This name is also included on an APPL definition statement in an APPL major node of VTAM.

- Control Point (CP) name

  VTAM, being a LEN node, does not have a CP (Control Point) name for APPN use. It does, however, have an SSCPNAME (System Services Control Point Name). If in configuring a partner platform a CP name is needed, use the SSCPNAME instead. It is also set in the ATCSTRxx member of the VTAMLST dataset.

- Network Name

  It is defined in a member named ATCSTRxx of a dataset with the DDNAME of VTAMLST in the VTAM start procedure. The "xx" is two digits, and the default is 00. ATCSTRxx is the VTAM start options. The NETID parameter defines the network name.

- LAN address

  The LAN address is coded in NCP on a LINE macro using the LOCADD parameter.

8.0 OS/2 Extended Services and Networking Services/2 Configuration

This chapter describes how to configure APPC on an OS/2 workstation that is connected to a token ring local area network. It is directed at the following software configuration:

8.1.1 Prerequisites

- OS/2 EE 1.3 with Networking Services/2 or OS/2 2.0 Extended Services

- Token-ring adapter

This chapter describes how to configure OS/2 on a workstation connected to a LAN. For more information:

- *SAA Networking Services/2 Administrator's Guide*, SC52-1110-00

- *ES OS/2 APPC Programming Referece*, S04G-1025-00

- *ES OS/2 APPN/LU6.2 Connection and Management*, SG22-1052-00

8.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by OS/2.

Standard Term	OS/2 Panel Config Term	OS/2 NDF Term
Network Name	Network Name	Network Name
LU Name	Local Node Name	Local LU Name
CP Name	CP Name	
Partner LU Name	Partner Node Name	Partner LU Name
Local LAN Address	Local MAC Address	N/A
Adjacent LAN Address	LAN Destination Address	Destination Address

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following our excellent recommendations, you will write #INTER in the right column on the ?MODE? line. Then in Figure 69 on page 104 you will type #INTER on the OS/2 screen that looks like this:

```
MOdename   ==> #INTER
```

Symbol	How to determine the value for this symbol	Fill in value here
Values that much match with other places		
?LUNAME?	This is the symbol that refers to the LU name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the same network name. An LU name is defined by defining a CPNAME in OS/2. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about LU names.	
?CPNAME?	This is the symbol that refers to the Control Point name of your machine. It should be the same as your ?LUNAME?. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	
?NETWORK?	This is the symbol that refers to the network name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
?PARTNERLU?	This is the symbol for the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?PARTNERCP?	This is the symbol for the Control Point(CP) name of your partner. Refer to the "How to find.." section of the partner computer's configuration chapter for this value.	
?PARTNERNET?	This is the symbol for the network name of the partner computer. Use the network name from the partner computer's "How to find..." section.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the Transaction Program name. It is a name that is sent across the network to the server machine. The server machine then maps this TP Name to an executable program. The TP Name is usually specified in a client/server product's documentation. For APING, the TP Name on the server is **APINGD**.	

Symbol	How to determine the value for this symbol	Fill in value here
?TPPATH?	This is the fully-specified path and filename of the transaction program's executable code. For example, if OS/2 is installed on the C:\ drive, this value could be: **C:\OS2\SAMPLES\APING\APINGD.EXE**	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is **#INTER**. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
Local values		
?NODETYPE?	This is the symbol for the APPN node type. This should be EN to be configured as an end node, or NN to be configured as a network node. In most cases, you will configure as a EN.	
?PLUALIAS?	This is the symbol for the Partner LU Alias. 1 to 8 characters that designates a nickname for the Partner LU. Alias names are case sensitive.	
?LINKNAME?	This it the symbol for the link name of a logical link. 1 to 8 letters or numbers which will be used as a local name on the OS/2 machine to refer to the link to a partner computer. You can choose any name you like, but since you will use this name later to refer to this link, choose a meaningful name. (suggestion:**LINK001**)	
?SYMDEST?	This is the symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the OS/2 machine to refer to a CPI-C side information entry.	

8.3 Working with OS/2 Configuration

8.3.1 Starting/stopping APPC

APPC is started and ended by starting and stopping Communications Manager.

- Starting: Type "STARTCM" from the OS/2 command prompt or mouse click on "Communications Manager".

- Stopping: In Communications Manager, choose 'Exit' from the Action Bar.

8.3.2 Other commands

- Displaying link information: To display link information, choose "Manage SNA Logical Links" from the Communications Manager Folder or type "APPNLINK" from an OS/2 command prompt. You can also use APPNLINK to activate and deactivate links. This command is only available in ES OS/2 2.0.

- Displaying active SNA Config Info: To display active configuration information, choose "Display active SNA Configuration' from the Communications Manager Folder or type "PMDSPLAY" from an OS/2 command prompt to display active configuration information.

- APPNV.CTL: This file serves two purposes. It gives a description of the node definitions file and the format of the commands that can be placed in this file. This file also defines the command, parameter, and value names that are allowed in the node definitions file.

8.4 Configuration

8.4.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

   a. Additional LEN configuration

   b. Other link configuration

3. Configure to run as a client

   a. Define CPI-C side information

   b. Other client configuration

4. Configure to run as a server

   a. Define transaction programs

   b. Other server configuration

OS/2 configuration for APPC/APPN can be accomplished via several methods:

- Panel Configuration for OS/2 2.0

- Text editing a Node Definitions File (NDF) for OS/2 1.3 or OS/2 2.0

- Panel Configuration for OS/2 1.3 + NS/2.

The Panel Configuration facility accomplishes the same function as text editing the NDF file and adding the configuration statements. This chapter will discuss both Panel Configuration for OS/2 2.0 and NDF file editing for OS/2 1.3 + NS/2 and OS/2 2.0. It will not discuss Panel Configuration for NS/2.

Your NDF file is located in the \CMLIB\APPN directory. It has the same filename as your Communication Manager configuration file whose file extension is ".CFG". However, the NDF file has the file extension ".NDF".

There are example NDF and CFG files provided with this guide called BASE.NDF and BASE.CFG. If you wish to configure a machine from with no current configuration, copy the BASE.NDF file into the \CMLIB\APPN directory and the BASE.CFG file into the \CMLIB directory. If you do not want to lose a current configuration, do not copy the BASE files. You can, however, cut and paste the commands needed from the BASE.NDF file to your own NDF file. The NDF File Configuration instructions show what commands and parameters should be in the NDF file.

If you wish to use the Panel Configuration for OS/2 2.0, follow the Panel Configuration instructions in this chapter. This method also will place the correct commands in your NDF file.

8.4.2 Define yourself to the network

Before an OS/2 machine can communicate on a network, it must define itself to the network. This configuration is usually done when OS/2 is installed.

8.4.2.1 Panel configuration:

1. Define LU name

   You can define (or find if it is already configured) your LU name in the Local Node Characteristics panel.

   Follow this sequence of panels:

```
-- Select Communications Manager from the OS/2 Window List
  -- Advanced
    -- Configuration, (type Config file name and press ENTER)
      -- SNA feature profiles
        -- SNA Network Definitions
          -- Create/Change
            -- Local Node Characteristics
```

```
Required Features:

Network ID:      ?NETWORK?

Local node name: ?LUNAME?

Node type:

     o  End Node to Network Node Server
     o  End Node - No Network Node Server
     o  Network Node

Your network node server address:     ?LANADDRESS?

Optional Features

     Local Node ID          05D ____
     Local Node Alias Name      _____
     Comment                Configuration is Fun!_____

 _   Activate Attach Manager at start up
```

Figure 62. Local Node Characteristics. This screen displays the Local Node characteristics The LU name is the Local node name on this screen.

Notes:

a. Check the "Activate Attach Manager at start up" box so that programs can be Attach Manager started.

2. Define your node type

OS/2 can be either an end node or network node. If you choose the End Node to Network Node Server and fill in the network node address, a connection will automatically be configured to your network node and you can skip the "Define a link to a partner or intermediate node" configuration step.

8.4.2.2 NDF file Configuration:

1. Define LU name

You can define (or find if it is already configured) your LU name in the DEFINE_LOCAL_CP command in the following Node Definitions File (NDF) excerpt:

```
define_local_cp
fq_cp_name(?NETWORK?.?LUNAME)
cp_alias(mylu)
node_id(x'00000')
node_type(?NODETYPE?);
```

Figure 63. NDF file excerpt from BASE.NDF for DEFINE_LOCAL_CP.

2. Define Node Type

OS/2 can be either an end node or a network node.

- end node -   ?NODETYPE?= EN

- network node -?NODETYPE?= NN

8.4.3 Define a link to a partner or intermediate node

A link is configured by defining a connection on the panels or a logical link in the NDF file.

8.4.3.1 Panel configuration:

1. To define a link, follow this sequence of panels:

```
-- Communications Manager from the OS/2 Window List
  -- Advanced
    -- Configuration. type configuration file name and press ENTER
      -- SNA feature profiles
        -- SNA Network Definitions
          -- Connections
```

2. A list of nodes will be display. Select the type of node you are connecting to:

- Network Node - choose Network Node

- Partner Node - choose Peer Node

- Host Node - choose Primary Host

3. Select the type of connection you desire (e.g. IBMTRNET for token-ring)

4. The screen, "Creating a Connection to a Peer Node" will be shown. Fill in the appropriate values from the Required Values Table

```
Creating a Connection to a Peer Node - ESBASE

Link Name:              ?LINKNAME?
Partner network ID:     ?PARTNERNET?
Partner node name:      ?PARTNERLU?
LAN destination address: ?LANADDRESS?
Comment: _____
```

Figure 64. Creating a Connection. This screen displays the parameters for defining a connection to a peer node.

8.4.3.2 NDF file Configuration

Define a link to the network node: To define a link to your network node, your Node Definitions File should contain a "define_logical_link" command,

```
define_logical_link
    link_name(?LINKNAME?)
    adjacent_node_type(learn)
    preferred_nn_server(yes)
    dlc_name(ibmtrnet)
    adapter_number(0)
    destination_address(x'?LANADDRESS?')
    cp_cp_session_support(yes)
    activate_at_startup(yes);
```

Figure 65. NDF file excerpt from BASE.NDF for DEFINE_LOGICAL LINK for network node link.

Define a link directly to your partner or to a LEN node.: To define a link directly to your partner, your Node Definitions File should contain a "define_logical_link" command like this:

```
define_logical_link
    link_name(?LINKNAME?)
    fq_adjacent_cp_name(?PARTNERNET?.?PARTNERCP?)
    adjacent_node_type(learn)
    dlc_name(ibmtrnet)
    adapter_number(0)
    destination_address(x'?LANADDRESS?')
    cp_cp_session_support(no)
    activate_at_startup(no);
    solicit_sscp_session(no);
```

Figure 66. NDF file excerpt from BASE.NDF for DEFINE_LOGICAL LINK for partner link.

For a link to a host LEN node that requires 3270, the following define_logical_link parameter should be changed to yes.

```
solicit_sscp_session(yes);
```

Also, to configure 3270 sessions the ?LANADDRESS? should match the Destination Address in 3270 Feature Profile Connections.

8.4.3.3 Additional configuration

Define partner LU's: When the partner LU is NOT accessible through a NN, as in a LEN node connection or a direct link to your partner, you must define the path to the partner LU.

For your machine to be able to locate the partner LU, a correlation between your link definition and the partner LU must be established. This is done by associating the partner LU to a particular link.

Panel configuration: Follow this sequence of panels:

```
-- Communications Manager from the OS/2 Window List
  -- Advanced
    -- Configuration, type config file name and press ENTER
      -- SNA feature profiles
        -- SNA Network Definitions
          -- Connections
            -- Link Name defined above for the host or partner connection
              -- Define Partner LU's
```

```
To add a Partner LU, enter the LU name, alias, and comment.  Then select
Add button.

To change a Partner LU, select and LU from the list, change the LU name,
and/or Comment fields and select the Change button.

To Delete a Partner LU, select an LU from the list and select the Delete

                                 LU name             Alias
          LU name:   ?PARTNERLU?   ?PARTNERLU?        ?PLUALIAS?
          Alias:     ?PLUALIAS?
          Comment:   UNC #1_____
```

Figure 67. Partner LU. This screen displays the Partner LU parameters.

NDF file Configuration:

```
define_partner_lu
    fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
    description(partner lu for appc on the host)
    partner_lu_alias(?PLUALIAS?)
    partner_lu_uninterpretred_name(?PARTNERLU?)
    max_mc_ll_send_size(32767)
    conv_security_verification(NO)
    parallel_session_support(YES);

define_partner_lu_location
    fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
    wildcard_entry(NO)
    fq_owning_cp_name(?PARTNERNET?.?PARTNERCP?)
    local_node_nn_server(NO);
```

Figure 68. NDF file excerpt for define_partner_lu and define_partner_lu_location.

8.4.4 Configure to run as a client

8.4.4.1 Define CPI-C side info entry

APING and many other applications do not require CPI-C side information. Refer to 1.7, "What Is CPI-C side information?" on page 5 for a discussion fo CPI-C side info entries. If you wish to use a symbolic destination name as the target of a conversation, you must define a CPI-C side info entry.

Panel Configuration: Follow this sequence of panels:

```
-- Communications Manager from the OS/2 Window List
  -- Advanced
     -- Configuration, type config file name and press ENTER
        -- SNA feature profiles
           -- SNA Network Definitions
              -- Additional SNA Features
                 -- CPI-C Communications Side Info
```

```
Creating a Side Information -

Partner LU

o  Fully qualified name    ?PARTHERNET?.?PARTHERLU?
o  Alias                   ?PLUALIAS?

Partner TP

  _ Service TP
   TP name:     ?TPNAME?

Security Type

o Same      o None      o Program

Mode Name:    ?MODE?

Comment:  _____
```

Figure 69. CPI-C Side Info. This screen displays the CPI-C Side Information parameters.

NDF File Configuration: To define a CPI-C side info entry, your Node Definitions File should contain a "define_cpic_side_info" command,

```
define_cpic_side_info  symbolic_destination_name(?SYMDEST?)
               fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
               mode_name(?MODE?)
               tp_name(?TPNAME?);
```

Figure 70. NDF file excerpt for defining a CPI-C side info entry.
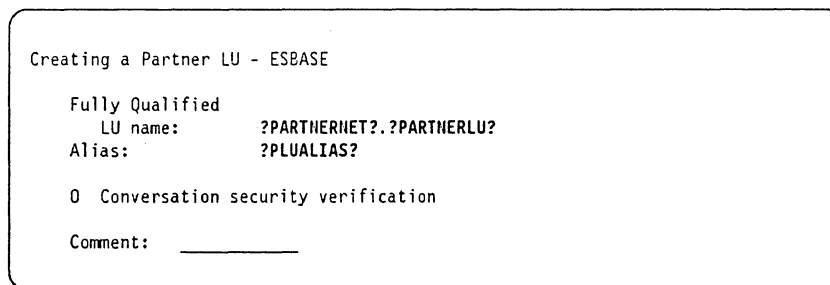
8.4.4.2 Other Client Configuration

Define Partner LU Alias: An additional feature of defining partner LUs is that you can provide an alias for the actual partner LU name. For example, you could define SERVER to be an alias for PARTNERNET.PARTNERLU. Alias's are case sensitive; SERVER is a different alias than "server."

If you choose to define partner LUs, either to provide an alias for use when running a client program, or to restrict the names of partner clients that can contact you, use a "define_partner_lu" command as follows in the NDF:

Panel configuration:: Follow the below sequence of panels:

```
-- Communications Manager from the OS/2 Window List
   -- Advanced
      -- Configuration, type config file name and press ENTER
         -- SNA feature profiles
            -- SNA Network Definitions
               -- Connections
                  -- Link Name defined above for the host connection
                     -- Define Partner LU's
```

```
Creating a Partner LU - ESBASE

    Fully Qualified
       LU name:      ?PARTNERNET?.?PARTNERLU?
    Alias:           ?PLUALIAS?

    0  Conversation security verification

    Comment:      _____
```

Figure 71. Partner LU. This screen displays the Partner LU parameters.

NDF File Configuration:

```
define_partner_lu
   fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
   partner_lu_alias(?PLUALIAS?,?plualias?);
```

Note: Because the alias is case sensitive, is recommended that you define the alias (PLUALIAS) in both upper and lowercase. This can only be done in the NDF file as in the example above.

Figure 72. NDF file excerpt for Partner LU..

8.4.5 Configure to run as a server

8.4.5.1 Define transaction programs

To run OS/2 as the target of a conversation, you must, in addition to the common configuration steps above, define a TP on your machine that will be the target program of the conversation.

Panel configuration: Follow this sequence of panels:

```
-- Communications Manager from the OS/2 Window List
  -- Advanced
    -- Configuration, type config file name and press ENTER
      -- SNA feature profiles
        -- SNA Network Definitions
          -- Additional SNA Features
            -- Transaction Program Definitions
```

```
Creating a Transaction Program

Options:

_ Conversation security required          _ Service TP

Transaction Program (TP) name  :   ?TPNAME?

OS/2 program path and file name:   ?TPPATH?

Program parameter string       :   see note 1 below

Icon path and file name        :

Comment                        :
```

Figure 73. TP definition. This screen displays the TP definition parameters.

Click on the 'Continue' button and see see note 2 below for TP program operation parameter.

NDF File Configuration: To define a transaction program to your network node, your Node Definitions File should contain a "define_tp" command,

```
define_tp
    tp_name(?TPNAME?)
    filespec(?TPPATH?)
    parm_string()                          see note 1 below
    tp_operation(nonqueued_am_started)     see note 2 below
    program_type(vio_windowable);
```

Figure 74. NDF file excerpt from BASE.NDF for DEFINE_TP.

Notes:

1. Parameter string

   Any command line parameters that need to be run with the program are entered here.

2. TP program operation

   This parameter indicates how the local TP is started as a server. It can be one of the following:

   - QUEUED_OPERATOR_STARTED
   - QUEUED_OPERATOR_PRELOADED
   - QUEUED_AM_STARTED
   - NONQUEUED_AM_STARTED

8.4.5.2 Other Server Configuration

Since both Extended Services and Networking Services/2 support APPN, you do not need to define partner LU names. The partner LU can be located through APPN services.

When inbound implicit partner LU support is enabled, the computer has the capability to accept an incoming BIND request that contains a partner LU name that is not defined at the local node. To enable any partner to call you when your computer is a server, make sure your Node Definitions File contains the following:

```
define_defaults
     implicit_inbound_plu_support(yes);
```

Figure 75. NDF file excerpt for implicit_inbound_plu_support.

Note: The implicit_inbound_plu_support cannot be changed from the panel configuration.

8.4.6 Verifying configuration

You must verify the changes you make to the configuration by using one of the following methods.

- Panel configuration: Choose Verify from the action bar to verify and update your configuration. Answer "Yes" to "Do you want to update active configuration?"

- Panel Configuration: Choose the Verify icon from the Communications Manager Folder

- NDF Configuration - Run the following 'appnv' command from the OS/2 Command prompt with the /e option to verify and update your configuration. Type APPNV, then your NDF file name.
       'appnv < NDF file name > .NDF'

You must stop and restart Communications Manager to make changes active.

8.5 Running APING

Run the APING executable from the OS/2 Command prompt with the following parameters:

- Parameter = ?PARTNERNET?.?PARTNERLU? or ?PLUALIAS? or ?SYMDEST?

- Options = Any options flags you wish to run with APING. Type 'APING ?' for list.

APING ?PARTNERNET?.?PARTNERLU?

8.6 How to find...

8.6.1 Panel Configuration

- LU name

  You can find your local LU in the Local Node Characteristics panel.

  ```
  -- Communications Manager from the OS/2 Window List
     -- Advanced
        -- Configuration, type Config file name and press ENTER
           -- SNA feature profiles
              -- SNA Network Definitions
                 -- Local Node Characteristics
  ```

  The LU name is the Local Node Name on the panel.

- CP name

  The CP name is the same as the LU name found above (Local Node Name).

- Network Name

  The Network Name is the Network ID in the above panel.

- local LAN address - cannot be found in the panels

8.6.2 NDF File

- LU name

  You can find your LU name in the DEFINE_LOCAL_CP command in the following Node Definitions File excerpt:

```
define_local_cp
    fq_cp_name(?NETWORK?.?LUNAME?)
    cp_alias(mylu)
    node_id(x'?NODEID?')
    node_type(en);
```

Figure 76. NDF file excerpt from BASE.NDF for DEFINE_LOCAL_CP.

The LU name is LUNAME.

- CP name

  The CP name is the same as the LU name found above.

- Network Name

  The Network Name is the NETWORK variable in the excerpt of the
  DEFINE_LOCAL_CP command.

- local LAN address

  The LAN address is a 12-digit hexadecimal value that identifies your token-ring
  adapter to the network. There is a LAN address hard-coded on the Token-
  Ring adapter in the NS/DOS machine. This hard-coded value is sometimes be
  over-ridden with something called a "locally administered address." You can
  find your LAN address in the following ways.

  - Check the computer's \IBMCOM\LANTRAN.LOG file if you are using
    OS/2 2.0. or in the \CMLIB\ACSLAN.LOG file if you are using OS/2 1.3
    + NS/2. You will see a line that says:

    Adapter X has node address 'LANADDRESS' The value in
    LANADDRESS is your local LAN address.

  - Run diagnostics on the computer's reference diskette:

    1. Boot the machine on its reference diskette

    2. Press Enter to clear the main panel

    3. Press Ctrl + A to start advanced diagnostics

    4. Select "System checkout"

    5. Press "Y" to indicate the list is correct

    6. Select "Run tests one time"

    7. Cursor down to the "Primary Token-Ring Adapter and press Enter

    8. Select the proper cable type

    9. Press enter on the panel asking you to disconnect your cable (you don't
       actually need to disconnect it for this exercise)

    10. Press enter when told the next screen will contain important informa-
        tion

    11. On the information screen, the value after Adapter Address is you LAN
        address (you may need to Page Down to see this value).

12. After making note of the Adapter Address, remove the reference diskette, reconnect your cable if you disconnected it, and press Ctrl-Alt-Delete to reboot your machine.

9.0 OS/2 CM/2 Configuration

This chapter describes how to configure APPC for a Communications Manager/2 (CM/2) workstation that is connected to a token ring local area network. It is directed at the following software configuration:

9.1.1 Prerequisites

- OS/2 2.0 or later

- Communications Manager/2 1.0

- Token-ring adapter

For additional information about configuring CM/2, see:

- *CM/2 Installation, Configuration and Administration*, SBOF-4386-00

- *CM/2 Configuration Guide*, SC31-6171-00

- *CM/2 APPC Programming Guide and Reference*, SC31-6160-00

9.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by CM/2.

Standard Term	*CM/2 Panel Term*	*CM/2 NDF Term*
Network Name	Network Name	Network Name
LU Name	Local Node Name	Local LU Name
Partner LU Name	Partner Node Name	Partner LU Name
Local LAN Address	Local MAC Address	N/A
Adjacent LAN Address	LAN Destination Address	Destination Address

9.3 Communications Manager/2 APPC Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

For example, if you are following our excellent recommendations, you will write *APING* in the right column on the *?TPNAME?* line. Then in Figure 87 on page 122, you will type APING on the CM/2 screen that looks like this:

```
TP name:    ?TPNAME?
```

Also, in Figure 91 on page 124,. you will type APING on the CM/2 screen that looks like this:

```
Transaction Program (TP) name :    ?TPNAME?
```

Symbol	How to determine the value for this symbol	Fill in value here
Values that must match with other places		
?LUNAME?	This is the symbol that refers to the LU name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the same network name. An LU name is defined by defining a CPNAME in OS/2. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about LU names.	
?CPNAME?	This is the symbol that refers to the Control Point name of your machine. It should be the same as your ?LUNAME?. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	
?NETWORK?	This is the symbol that refers to the network name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
?PARTNERLU?	This is the symbol for the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?PARTNERCP?	This is the symbol for the Control Point(CP) name of your partner. Refer to the "How to find.." section of the partner computer's configuration chapter for this value.	
?PARTNERNET?	This is the symbol for the network name of the partner computer. Use the network name from the partner computer's "How to find..." section.	
?LOCALPU?	This is the symbol for VTAM's PU name. See your host platform's instructions to determine your PU name.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	

Symbol	How to determine the value for this symbol	Fill in value here
?TPNAME?	This is the Transaction Program name. It is a name that is sent across the network to the server machine. The server machine then maps this TP Name to an executable program. The TP Name is usually specified in a client/server product's documentation. For APING, the TP Name on the server is **APINGD**.	
?TPPATH?	This is the fully-specified path and filename of the transaction program's executable code. For example, if OS/2 is installed on the C:\ drive, this value could be: **C:\OS2\SAMPLES\APING\APINGD.EXE**	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is **#INTER**. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
Local values		
?NODETYPE?	This is the symbol for the APPN node type. This should be **EN** to be configured as an end node, or **NN** to be configured as a network node. In most cases, you will configure as a EN.	
?LUALIAS?	This is the symbol for the Local LU Alias. 1 to 8 characters that designates a nickname for the Local LU. Alias names are case sensitive.	
?PLUALIAS?	This is the symbol for the Partner LU Alias. 1 to 8 characters that designates a nickname for the Partner LU. Alias names are case sensitive.	
?LINKNAME?	This it the symbol for the link name of a logical link. 1 to 8 letters or numbers which will be used as a local name on the OS/2 machine to refer to the link to a partner computer. You can choose any name you like, but since you will use this name later to refer to this link, choose a meaningful name. (suggestion:**LINK001**)	
?SYMDEST?	This is the symbol for the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It will be used locally on the OS/2 machine to refer to a CPI-C side information entry.	

9.4 Working with CM/2

The terms used to maneuver through CM/2 screens are described below

- Select - place mouse pointer on desired item and click with left mouse button. The screen will not change when clicked as this is simply a selection pointer.

- Mouse click - place mouse pointer on desired item and click with left mouse button. Screen data will be processed when clicked.

- Double-mouse-click - place mouse pointer on desired item and double-click the left mouse button. Screen data will be processed.

9.4.1 Starting/stopping APPC

APPC can be started and ended by starting and stopping CM/2. To start or stop CM/2, double-mouse-click on the 'Start CM/2' icon. To stop CM/2, double-mouse-click on the 'Stop CM/2' icon. icons respectively.

9.4.2 Other commands

- Displaying logical links: double-mouse-click on "CM/2 Subsystems", then click on "SNA Subsystems", then double-mouse-click on "Logical links" to display the logical links. You can also use this screen to activate and deactivate links by mouse-click on "Link" on the action bar and mouse-click on the "Activate" or "Deactivate" action item.

- Displaying active configuration: Double-mouse-click on "CM/2 Subsystems", then double-mouse-click on "SNA Subsystems", then double-mouse-click on "Display active configuration" to display active configuration information. You can instead type "PMDSPLAY" from an OS/2 command prompt.

- APPNV.CTL: This file serves two purposes. It gives a description of the node definitions file and the format of the configuration verbs that can be placed in this file. This file also defines the command, parameter, and value names that are allowed in the node definitions file.

9.5 Configuration

9.5.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

   a. Additional LEN configuration

   b. Other link configuration

3. Configure to run as a client

   a. Define CPI-C side information

   b. Other client configuration

4. Configure to run as a server

   a. Define transaction programs

   b. Other server configuration

There are two ways to configure APPC/APPN:

- CM/2 Panel Configuration

- Text editing a CM/2 Node Definitions File (NDF)

The Panel Configuration facility accomplishes the same function as text editing the NDF file and adding the configuration statements. This chapter will discuss both CM/2 Panel Configuration and CM/2 NDF file editing.

Your NDF file is located in the \CMLIB directory. It has the same filename as your Communication Manager configuration file which has a file extension of ".CFG". The NDF file has the file extension ".NDF".

There are example NDF and CFG files. These files are provided with the CM/2 Configuration Guide files. If you want to configure a machine from scratch, copy the BASE2.NDF and BASE2.CFG files into the \CMLIB directory. If you want to modify an existing configuration, do not copy the BASE2 files. You can, however, cut and paste the verbs needed from the BASE2.NDF file to your own NDF file. The NDF File Configuration instructions in this chapter show what commands and parameters should be in the NDF file.

If you want to use CM/2 Panel Configuration, follow the Panel Configuration instructions. This method will place the correct commands in your NDF file. Follow this panel sequence to enter the CM/2 Configuration Setup.

1. Double-mouse-click the 'CM/2 Setup' icon in the Communications Manager/2 folder.

2. Mouse-click on 'OK'

3. Mouse-click on 'Setup'

4. Type desired configuration file name and mouse-click on OK. This configuration file name will be 'BASE2' if you are using the configuration files provided with the CM/2 Configuration Guide files.

5. Select 'Token-ring or other LAN types' from Workstation Connection Type column. Select 'APPC APIs' from Feature or Application type column. Mouse-click on 'Configure'

You now have a list of the profiles that need to be configured for APPC.

9.5.2 Define yourself to the network

Before a CM/2 can communicate in a network, it must define itself to the network. This is usually done during installation.

9.5.2.1 Panel configuration:

You can define (or find if it is already configured) your LU name in the Local Node Characteristics panel.

To define or view your local LU name, follow this sequence of panels:

```
-- Select "SNA local node characteristics"
   -- Mouse click on "Configure" to view the "Local Node Characteristics" panel
```

```
Local Node Characteristics

  Network ID        ?NETWORK?

  Local node name   ?LUNAME?

  Node type

        o  End Node to Network Node Server
        o  End Node - No Network Node Server
        o  Network Node

  Your network node server address:    ?LANADDRESS?

  Local Node ID          05D _____


    -----     -------------    ----------    -------    ------
   | OK |    | Options...|    |NetWare(R)|    |Cancel|    | Help |
    -----     -------------    ----------    -------    ------
```

Figure 77. Local Node Characteristics. This screen displays the Local Node character-istics. The LU name is the Local node name on this screen. The Node Id is the Local Node ID.

Fill in the highlighted parameters as determined for the CM/2 Configuration Work-sheet at the beginning of the chapter.

Mouse-Click on "Options..." to proceed to Local Node Options panel and fill in the ?LUALIAS? from the CM/2 Configuration Worksheet.

```
Optional Features

      Local Node Alias Name       ?LUALIAS?
      Maximum Compression Level   -------
      Maximum Compression Tokens  _____
      Optional Comment            Configuration is Fun!_____

  _  Activate Attach Manager at start up


    -----     -------    ------
   | OK |    |Cancel|    | Help |
    -----     -------    ------
```

Figure 78. Local Node Options. This screen displays the Local Node Options. The local LU alias is the Local Node Alias Name on this screen.

Mouse-Click on "OK" to go back to Local Node Characteristics panel.

Mouse-Click on "OK" to go process data.

Notes:

1. If you choose the End Node to Network Node Server and fill in the network node address, a connection will automatically be configured to your network node and you can skip the "Define a link to a partner or intermediate node" step.

9.5.2.2 NDF file Configuration:

1. Define LU name

   You can define (or find if it is already configured) your LU name using the DEFINE_LOCAL_CP command in the Node Definitions File excerpt. A portion of the BASE2.NDF file is shown in the figure below.

```
define_local_cp
  fq_cp_name(?NETWORK?.?LUNAME)
  cp_alias(mylu)
  node_id(x'00000')
  node_type(?NODETYPE?);
```

Figure 79. NDF file excerpt from BASE2.NDF for DEFINE_LOCAL_CP.

2. Define Node Type

   OS/2 can be either an end node or a network node.

   • end node - Fill in "EN" for ?NODETYPE?

   • network node - Fill in "NN" for ?NODETYPE?

9.5.3 Define a link to a partner or intermediate node

A link is configured by defining a 'connection' via the panels or a 'logical link' in the NDF file.

9.5.3.1 Panel configuration:

1. To define a link to a partner, or to an intermediate node, follow this sequence of panels:

```
-- Select "SNA Connections"
   -- Mouse-Click on "Configure" to view the "Connections List" panel
```

2. Select the type of node you are connecting to:

   • network node - choose "to network node"

   • end node or if you are unsure of partner node type - choose "to peer node"

   • host node - choose "to host"

3. Mouse-Click on "Create" to view the "Adapter List" panel

4. Select the type of data link connection you desire (e.g. Token-ring or other LAN types)

5. Mouse-Click on 'Continue' to view the creating connection panels:

6. Substitute the highlighted parameters with the appropriate values from the CM/2 APPC Configuration Worksheet at the beginning of this chapter.

```
Connection to a Network Node

Link Name  ?LINKNAME?        0  Activate at Startup

LAN destination address(hex)     Address Format          Remote SAP
?LANADDRESS?                     Token Ring              _

Adjacent Node ID(hex)            _____

0 Use this network node connection as your preferred network node server
0 Solicit SSCP-PU Session

Optional comment
_____


        -----      ------      ------
       | OK  |    |Cancel|    | Help |
        -----      ------      ------
```

Figure 80. Create a Connection to a Network Node. This screen displays the parameters
that need to be defined for connecting to a network node.

Notes:

1. The 'Solicit SSCP-PU Session" is checked when your network node is the
   gateway to a host.

```
Connection to a peer node

Link Name  ?LINKNAME?        0  Activate at Startup

LAN destination address(hex)     Address Format          Remote SAP
?LANADDRESS?                     Token Ring              _

Adjacent Node ID(hex)            _____

Partner network ID        ?PARTNERNET?
Partner node name         ?PARTNERLU?

Optional comment
_____


    -----      -----------------------     ------     ------
   | OK  |    | Define Partner LUs...|    |Cancel|   | Help |
    -----      -----------------------     ------     ------
```

Figure 81. Create a Connection to a LEN. This screen displays the parameters that need
to be defined for connecting to a peer node.

```
Connection to a Host

Link Name        ?LINKNAME?                    0  Activate at Startup
Local PU name    ?LOCALPU? (see Note #1)  0  APPN support    (see note #4)
Node ID (hex)    ?NODEID?  (see note #2)

LAN destination address(hex)    Address Format        Remote SAP
?LANADDRESS?                     Token Ring            _

Adjacent Node ID(hex)           _____

Partner network ID  ?PARTNERNET?


Partner node name   ?PARTNERCP?  (Required for partner
                                                    LU definitions)

0 Use this host connection as your focal point support  (see note #3)

Optional comment

_____

 _____    _____   _____    _____
| OK |   | Define Partner LUs...|  |Cancel|  | Help |
 _____    _____   _____    _____
```

Notes:

1. The ?LOCALPU? name should match the PU name in VTAM but this parameter **should not** be the same as the ?PARTNERCP? (or ?PARTNERLU?) name.

2. See Appendix A, "Using Node IDs in VTAM" on page 143 for information on when to use the ?NODEID? parameter.

3. Check this box when you want this host connection to be the focal point.

4. Check this box when the host you will be connecting to supports CP-CP sessions.

Figure 82. Create a Connection to a Host. This screen displays the parameters that need to be defined for connecting to a host node.

9.5.3.2 NDF file Configuration

Define a link to the network node: To define a link to your network node, your Node Definitions File must contain a "define_logical_link" command, as shown in the example below.

```
define_logical_link
    link_name(?LINKNAME?)
    adjacent_node_type(learn)
    preferred_nn_server(yes)
    dlc_name(ibmtrnet)
    adapter_number(0)
    destination_address(?LANADDRESS?)
    cp_cp_session_support(yes)
    activate_at_startup(yes);
```

Figure 83. NDF file excerpt from BASE2.NDF for DEFINE_LOGICAL LINK for network node link..

Define a link directly to your partner or to a LEN node.: To define a link directly to your partner, your Node Definitions File should contain a "define_logical_link" command, as shown in the example below.

```
define_logical_link
    link_name(?LINKNAME?)
    fq_adjacent_cp_name(?PARTNERNET?.?PARTNERLU?)
    adjacent_node_type(learn)
    dlc_name(ibmtrnet)
    adapter_number(0)
    destination_address(?LANADDRESS?)
    cp_cp_session_support(no)
    activate_at_startup(no);
    solicit_sscp_session(no);
```

Figure 84. NDF file excerpt from BASE2.NDF for DEFINE_LOGICAL LINK for partner link.

When defining a link to a host LEN node that requires 3270 sessions, the following define_logical_link parameter must be changed to yes.

```
solicit_sscp_session(yes);
```

Also, to configure 3270 sessions the ?LANADDRESS? must match the Destination Address in 3270 Feature Profile Connections.

9.5.3.3 Additional configuration for LEN nodes.

When the partner LU is not accessible through a NN, as in a LEN node connection or a direct link to your partner, the following additional configuration must be done.

For your machine to be able to locate the partner LU, a correlation between your link definition and the partner LU must be established. This is done by associating the partner LU to a particular link.

Panel configuration: To add partner LU definitions for LEN nodes, follow this sequence of panels:

```
-- SNA Connections
   -- Select Link Name defined above for the host or LEN connection
      -- Mouse click on "Change" to view "Adapter List" panel
         -- Select DLC type defined above for the host or LEN connection
            -- Mouse click on 'Continue' to view "Change a connection to a Host" pan
               -- Mouse click on Define Partner LU's to view "Partner LU" panel
```

```
To add a Partner LU, enter the LU name, alias, and comment.  Then select Add.

To change a Partner LU, select an LU from the list, change the LU name,
and/or comment fields, and select the Change button.

To delete a Partner LU, select an LU from the list and select Delete.


                                              LU name           Alias

          Network ID:?NETWORK?
          LU name:    ?PARTNERLU?
          Alias:      ?PLUALIAS?
                                                            ------
                                                            |Delete|
                                                            ------

          Dependent partner LU
              O Partner LU is dependent
              Uninterpreted name _____

          Optional Comment      _____

          -----    ------
          | Add |  |Change|
          -----    ------

          -----    ------   ------
          | OK  |  |Cancel|  | Help |
          -----    ------   ------
```

Figure 85. Partner LU. This screen displays the parameters that need to be defined for a
            partner LU.

Mouse-click on "Add" to add the Partner LU definition.

NDF file Configuration:

```
define_partner_lu
      fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
      description(partner lu for appc on the host)
      partner_lu_alias(?PLUALIAS?)
      partner_lu_uninterpretred_name(?PARTNERLU?)
      max_mc_ll_send_size(32767)
      conv_security_verification(NO)
      parallel_session_support(YES);

define_partner_lu_location
      fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
      wildcard_entry(NO)
      fq_owning_cp_name(?PARTNERNET?.?PARTNERCP?)
      local_node_nn_server(NO);
```

Figure 86. NDF file excerpt for DEFINE_PARTNER_LU and
            DEFINE_PARTNER_LU_LOCATION..

9.5.4 Configure to run as a client

9.5.4.1 Define CPI-C side info entry

APING and many other applications do not require CPI-C side information.

If you wish to use a symbolic destination name as the target of a conversation, define a CPI-C side info entry.

Panel Configuration: To define CPI-C side information, follow this sequence of panels:

```
-- SNA Features
    -- Mouse-Click on "Configure" to view "SNA Features" panel
        -- Select CPI-C Communications Side Info
            -- Mouse-Click on "Create" to view "Create CPI-C" panel
```

```
CPI Communications Side Information

Symbolic destination name   ?SYMDEST?.

Partner LU
----------
o  Fully qualified name      ?PARTNERNET?.?PARTNERLU?
o  Alias                     ?PLUALIAS?

Partner TP
-----------
  _ Service TP
  TP name        ?TPNAME?

Security Type                        Mode name
-------------                        ---------
o Same      o None      o Program    ?MODE?


Optional Comment   _____

   -----      ------    ------
   | OK |    |Cancel|   | Help |
   -----      ------    ------
```

Figure 87. CPI-C Side Info. This screen displays the parameters that need to be defined for a CPI-C Side Information entry.

NDF File Configuration: To define a CPI-C side info entry, your Node Definitions File must contain a "define_cpic_side_info" command,

```
define_cpic_side_info  symbolic_destination_name(?SYMDEST?)
            fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
            mode_name(?MODE?)
            tp_name(?TPNAME?);
```

Figure 88. NDF file excerpt for defining a CPI-C side info entry..

9.5.4.2 Other Client Configuration

Define Partner LU Alias: An additional feature of defining partner LUs is that you can provide an alias for the actual partner LU name. For example, you could define "SERVER" to be an alias for ?PARTNERNET.PARTNERLU?. Aliases are case sensitive; "SERVER" is a different alias from "server."

You may choose to define partner LUs, either

1. to provide an alias for use when running a client program or

2. to restrict the names of partner clients that can contact you.

Panel configuration: To define a partner LU alias, follow the below sequence of panels:

```
-- SNA Connections
   -- Select Link Name defined above for the host or LEN connection
      -- Mouse click on 'Change'
         -- Select DLC type defined above for the host or LEN connection
            -- Mouse click on 'Continue'
               -- Mouse click on Define Partner LUs
```

```
Partner LU

     Fully Qualified
        LU name          ?PARTNERNET?.?PARTNERLU?
     Alias               ?PLUALIAS?

     O  Conversation security verification

     Dependent partner LU
     O Partner LU is dependent
     Uninterpreted name  _____

     Optional comment

     _____

     _____      _____     _____
    | OK  |    |Cancel|   | Help |        .
     _____      _____     _____
```

Figure 89. Partner LU. This screen displays the parameters that need to be defined for a partner LU and partner LU alias.

NDF File Configuration:

```
define_partner_lu
    fq_partner_lu_name(?PARTNERNET?.?PARTNERLU?)
    partner_lu_alias(?PLUALIAS?,?plualias?);
```

Note: Because the PLU Alias is case sensitive, you should
define the PLUALIAS both in upper and lower
case. This can only be done in the NDF file as shown in the example above.

Figure 90. NDF file excerpt for Partner LU..

9.5.5 Configure to run as a server

9.5.5.1 Define transaction programs

To run CM/2 as the server, you must, in addition to the common configuration steps above, define a transaction program on your machine that will be the target program of conversations that will be started by client programs.

Panel configuration:: To define a transaction program, follow this sequence of panels:

```
-- SNA Features
     -- Mouse-click on "Configure" to view "SNA Features" panel
          -- Select "Transaction program definitions"
               -- Mouse-click on "Create" to view "Create a TP" panel
```

```
Transaction program definition

0 Service TP
Transaction Program (TP) name          ?TPNAME?

OS/2 program path and file name        ?TPPATH?

Optional comment
_____


Optional values:

0 Conversation security required

Program parameter string               see note 1 below

Icon path and file name                _____


    --------------      ------      ------
    | Continue... |     | Cancel |   | Help |
    --------------      ------      ------
```

Figure 91. TP definition. This screen displays the parameters that need to be defined for a transaction program definition.

NDF File Configuration: To define a transaction program to your network node, your Node Definitions File must contain a "DEFINE_TP" command, as shown in the example below.

```
define_tp
    tp_name(?TPNAME?)
    filespec(?TPPATH?)
    parm_string()
    tp_operation(nonqueued_am_started)
    program_type(vio_windowable);
```

Figure 92. NDF file excerpt from BASE2.NDF for DEFINE_TP..

Notes:

1. Parameter string

   Enter any command line parameters that need to be run with the program.

2. TP program operation

   This parameter indicates how the TP is started. It can be one of the following:

   - QUEUED_OPERATOR_STARTED
   - QUEUED_OPERATOR_PRELOADED
   - QUEUED_AM_STARTED
   - NONQUEUED_AM_STARTED

9.5.5.2 Other Server Configuration

Because CM/2 supports APPN, you do not need to define partner LU names.

When your computer is the client, you will simply need to specify the fully qualified name of your partner LU. This fully qualified name includes the network name and LU name concatenated with a period. To enable any partner to call you when your computer is a server, make sure your Node Definitions File contains the following:

```
define_defaults
    implicit_inbound_plu_support(yes);
```

Figure 93. NDF file excerpt for implicit_inbound_plu_support..

Note: The implicit_inbound_plu_support cannot be changed from the panel configuration.

9.6 Verifying configuration

You must verify the changes you make to the configuration by using one of the following methods.

- Panel configuration: When you click on Close from the CM Setup screens the program will check your configuration. Answer "Yes" to "Do you want to update active configuration?"

- Panel Configuration: Choose the Verify icon from the Communications Manager Folder

- NDF Configuration - Run the following 'appnv' command from the OS/2 Command prompt with the /e option to verify and update your configuration. Type APPNV, then your NDF file name.
      'cmverify < NDF file name > .NDF'

You should stop and restart Communications Manager to make changes active.

9.7 Running APING

To verify configuration between two computers, run APING from the OS/2 Command prompt with the following parameters:

- Parameter = ?PARTNERNET?.?PARTNERLU? or ?PLUALIAS? or ?SYMDEST?

- Options = Any options flags you wish to run with APING. Type 'APING ?' for list.

```
APING ?PARTNERNET?.?PARTNERLU?
```

9.8 How to find...

9.8.1 Panel Configuration

- LU name

  You can find your local LU name in the Local Node Characteristics by following the following sequence of panels:

```
-- Select "SNA local node characteristics"
  -- Mouse click on "Configure" to view the "Local Node Characteristics" panel
```

  The LU name is the Local Node Name on the panel.

- CP name

  The CP name is the same as the LU name found above (Local Node Name).

- Network Name

  The Network Name is the Network ID in the Local Node Characteristics panel.

- local LAN address - the local LAN address cannot be found by the CM/2 panels.

9.8.2 NDF File

- LU name

  You can find your LU name in the DEFINE_LOCAL_CP command in the following Node Definitions File excerpt:

```
define_local_cp
  fq_cp_name(?NETWORK?.?LUNAME?)
  cp_alias(mylu)
  node_id(?NODEID?)
  node_type(?NODETYPE?);
```

Figure 94. NDF file excerpt from BASE2.NDF for DEFINE_LOCAL_CP..

The LU name is LUNAME.

- CP name

The CP name is the same as the LU name found above.

- Network Name

The Network Name is the ?PARTNERNET? in the excerpt of the DEFINE_LOCAL_CP command.

- local LAN address

The LAN address is a 12-digit hexadecimal value that identifies your token-ring adapter to the network. There is a LAN address hard-coded on the Token-Ring adapter in the CM/2 machine. This hard-coded value is sometimes be over-ridden with something called a "locally administered address." You can find your LAN address in the following ways.

- Check the computer's \IBMCOM\LANTRAN.LOG file. You will see a line that says:

  Adapter X has node address 'LANADDRESS'. The value in LANADDRESS is your local LAN address.

- Run diagnostics on the computer's reference diskette:

  1. Boot the machine on its reference diskette

  2. Press Enter to clear the main panel

  3. Press Ctrl + A to start advanced diagnostics

  4. Select "System checkout"

  5. Press "Y" to indicate the list is correct

  6. Select "Run tests one time"

  7. Cursor down to the "Primary Token-Ring Adapter" and press Enter

  8. Select the proper cable type

  9. Press enter on the panel asking you to disconnect your cable (you don't actually need to disconnect it for this exercise)

  10. Press enter when told the next screen will contain important information

  11. On the information screen, the value after Adapter Address is your LAN address (you may need to Page Down to see this value).

12. After making note of the Adapter Address, remove the reference diskette, reconnect your cable if you disconnected it, and press Ctrl-Alt-Delete to reboot your machine.

10.0 APPC/VM Configuration

This chapter describes how to configure APPC/VM. The configuration is spread among the APPC/VM VTAM Support service machine (AVS), VTAM, and NCP. Examples of configuration of each are shown.

10.1.1 Prerequisites

Software and hardware prerequisites for our chapter examples of APPC/VM include:

- VM/ESA V1.0 or later
- VTAM V3.3 or later
- NCP V5.2 or later
- 3745 with Token-ring attachment
- Single SNA domain.

It also assumes that the software listed above has already been installed on the appropriate hardware platforms.

For more detailed information on APPC/VM configuration and operation refer to:

- *VM/ESA Connectivity Planning, Administration, and Operation*, SC24-5448
- *VTAM Resource Definition Reference*, SC31-6438
- *NCP Resource Definition Reference*, SC30-3448

10.2 Terminology

The terminology table maps the standard networking terms defined in 1.10, "How do I Configure a Network?" on page 7 to the terms used by APPC/VM.

Standard Term	*APPC/VM Term*
Network Name	NETID
LU Name	name supplied for APPL definition in APPL major node
Partner LU Name	name supplied for LU definition in major nodes other than APPL
Local LAN Address	LOCADD (in NCP gen)
Adjacent LAN Address	DIALNO (on PATH definition in switched major node)

10.3 APPC/VM Configuration Worksheet

Use the following worksheet to determine all the values you will need to configure this platform. The worksheet is split into two parts: values determined by referring to the Guide introduction or other platform chapters, and values that are local to this platform which you create. There are three columns. The left-most column has a variable name that starts and ends with a question mark (?), the middle column describes what the variable is used for and how to determine its value, and the right-most column is left blank so you can fill in a value. Whenever there is a reference in this chapter to a value in the left column, substitute the value you have written in the right column.

Symbol	How to determine this value	Fill in value here
Values that much match with other places		
?LOCALLU?	This is the symbol that refers to the LU name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters which is the LU name of the node. Choose a name that is unique within the same network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about LU names.	
	You may already have an LU name defined. If so, it is the value specified in an "AGW ACTIVATE GATEWAY" command. This command can be included in the AGWPROF GCS exec of the AVS service machine, or it can be issued from the AVS console.	
	You may also have more than one LU. There are two major types of gateways in APPC/VM; global and private. If you want to use both you will need a minimum of one LU for each type. See 10.6.5, "Configure to run as a server" on page 138 for more information on gateways. A private gateway will be referred to by ?LOCALLU_P?, while a global gateway will be called ?LOCALLU_G?.	
?LOCALCP?	VTAM prior to V4 does not have a control point. Refer to 1.9, "What Is APPN?" on page 6 for more information about control points.	
?LOCALNET?	This is the symbol that refers to the network name of the machine you are defining to the network. 1 to 8 character field consisting of alphanumeric characters. There is a structured format for the network name which includes the country code, enterprise code and network suffix code. This format insures uniqueness around the world. Call your local IBM branch office for the format information and to register your network name. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about network names.	
	For systems with VTAM already configured, this value is found in the VTAMLST start options (ATCSTRxx) member. The option name is NETID.	

Symbol	How to determine this value	Fill in value here
?PARTNERLU?	This is the partner's LU name. Refer to the "How to find..." section of the partner computer's configuration chapter for this value. Refer to 1.10, "How do I Configure a Network?" on page 7 for more information about the partner LU name.	
?LANADDRESS?	This is the symbol for the LAN Address of the partner computer. (Or the LAN Address of a network node, if the link is being made to a network node.) Refer to the "How to find..." section of the partner computer's configuration chapter for this value.	
?TPNAME?	This is the symbol for the Transaction Program name. This is the name of the transaction program at the partner computer. For APING, the TP Name on the server is APINGD. When using private gateways, an entry is made in the $SERVER$ NAMES file that maps the TP name to an EXEC or module. The actual TP name follows a ":nick." parameter in the file.	
?MODE?	This is the symbol for the mode name. See 1.6, "What Is a Mode?" on page 5 for a discussion of modes. Often, a client/server product's documentation specifies what mode must be used by that product. APING can use any mode (this can be specified on the APING command line), but the default is #INTER. It is recommended that you use one of the architected modes discussed in the "What Is a Mode?" section.	
Local values		
?NCPLANADDR?	This is the local LAN address coded in NCP on a LINE macro using the LOCADD parameter.	
?MODETAB?	Name of a logon mode table in VTAM. It is assembled and link-edited into a VTAM LOADLIB dataset. The systems programmer should know the names of the logon mode tables defined on the system. This should be the name of the table where the APPC modes are included.	
?SYMDEST?	This is the CPI-C side information symbolic destination name. It is any 1-8 character name you choose. It is included when creating a side information entry. The side information is stored in communications directory files which are similar to NAMES files.	

10.4 Working with APPC/VM

10.4.1 Starting/stopping APPC

APPC/VM is usually started by autologging the AVS/VM virtual machine. It can also be started by issuing AGW START once GCS is ipled in the AVSVM machine. Stopping APPC/VM is accomplished via the AGW STOP command.

10.5 Other commands

APPC/VM is a VTAM application that runs in its own disconnected virtual machine (typically AVSVM) under GCS. Once APPC/VM is logged on there are several commands that can be used to monitor its operation. A subset of these commands is shown below:

```
AGW QUERY ALL
AGW CNOS
AGW ACTIVATE GATEWAY
```

The QUERY ALL command provides a listing of all resources in use by APPC/VM. AGW CNOS will negotiate session limits with partner LUs. ACTIVATE GATEWAY makes an LU available to APPC/VM for its own use.

10.6 Configuration

10.6.1 Working with APPC configuration

The following configuration steps will be discussed:

1. Define yourself to the network

2. Define a link to a partner or intermediate node

    a. Additional LEN configuration

    b. Other link configuration

3. Configure to run as a client

    a. Define CPI-C side information

    b. Other client configuration

4. Configure to run as a server

    a. Define transaction programs

    b. Other server configuration

For APPC/VM, configuration is done in the following places:

- AVSVM DIRECT - The directory entry for APPC/VM.

- AGWPROF GCS - This exec is called by AVSVM during startup. It starts resources for AVS/VM.

- Server commands - Certain commands are issued in any virtual machine that will be used as a server.

- COMDIR - For client virtual machines, the communications directory must be established for CPI-C applications with the SET COMDIR command.

- $SERVER$ NAMES - For server virtual machines, this file contains the mapping of transaction program names to executables. It is used only with private gateways.

- VTAM - Definitions are required in an application major node for the APPC/VM LU or LUs, as well as partner definitions in a switched major node for LAN attached T2.1 nodes, such as workstations. Additions are also need in logon mode tables for APPC modes.

- NCP - The token-ring adapter must be configured, and a parameter added to the NCP definition to support independent LUs.

10.6.2 Define yourself to the network

1. Create CP Directory Entry for the APPC/VM VTAM Service Machine

APPC services in VM access an SNA network through the APPC/VM VTAM Service Machine (AVSVM). AVSVM's directory entry should look similar to the one shown below:

```
USER AVSVM AVSVM 32M 64M G 64
 ACCOUNT  1   AVSVM
 MACH XA
 IUCV ANY
 IUCV *IDENT GATEANY ?LOCALLU? REVOKE
 IUCV ALLOW
 OPTION COMSRV MAXCONN 20 ACCT
 NAMESAVE GCS
  IPL   GCS PARM AUTOLOG
 CONSOLE 01F 3215
 SPOOL    00C 2540 READER A
 SPOOL    00D 2540 PUNCH A
 SPOOL    00E 1403
 LINK    MAINT  190 190 RR
 LINK    MAINT  19D 19D RR
 LINK    MAINT  19E 19E RR
 LINK    MAINT  193 193 RR
 MDISK 191 3380 2209 003 SSKN05 MR RAVSOBJ  WAVSOBJ  MAVSOBJ
*
```

Figure 95. CP Directory Entry for AVSVM - AVSVM.DIR

2. Load AVS from the Product Tape

This step is described in the *VM/ESA Installation Guide*, SC24-5526. It is done by issuing the command:

```
vmfins install ppf esains avs (nomemo nolink
```

It is strongly recommended in the VM/ESA Installation Guide that none of the disk addresses in the user directory be modified. The directory entry shown above is the entry shipped with VM/ESA.

The example above is for installation on mini-disks. It may be advantageous to install AVS in the shared file system (SFS). For more information on this, see both the VM/ESA Installation Guide and *VM/ESA: CMS Planning and Administration Guide*, SC24-5445.

3. Create the AVS Virtual Machine Profile and AGWPROF GCS.

The PROFILE GCS contains commands to start AVS when the virtual machine is started. It is stored on the AVS 191 disk. AGWPROF GCS is

called after AVS initialization, and contains commands to execute as soon as
AVS is available. Samples of each are shown below.

```
/*******************************************************************/
/*                                                                 */
/*  SAMPLE PROFILE GCS FOR AVS                                     */
/*                                                                 */
/*******************************************************************/
Trace 0
'CP SET IMSG ON'
'CP SET EMSG ON'
'CP SET RUN ON'
'CP SET PF01 IMMED AGW QUERY ALL'
'CP SET PF02 IMMED AGW QUERY GATEWAY ALL'
'CP SET PF03 IMMED AGW QUERY CNOS ALL'
'CP SET PF04 IMMED AGW QUERY USERID ALL'
'CP SET PF05 IMMED AGW QUERY CONV ALL'
'CP SET PF12 RETRIEVE'
/*******************************************************************/
/*                                                                 */
/*  Determine mode of operation.   Load AGW370 loadlib if running  */
/*  in 370 mode.   Load AGW LOADLIB if running in XA mode.         */
/*******************************************************************/
'GLOBAL LOADLIB AGWUTIL'    /* Contains AGWGMD                      */
'OSRUN AGWGMD'              /* AGWGMD returns 0 if running in XA mode,
                               and 4 if running in 370 mode         */

IF RC=0 THEN               /* Virtual machine is in XA mode        */
    'GLOBAL LOADLIB AGW'
ELSE
    'GLOBAL LOADLIB AGW370' /* Virtual machine is in 370 mode       */

'LOADCMD AGW AGW'
'Q LOADLIB'
'Q LOADCMD'
'AGW START'                 /* Start AVS                            */
exit rc
```

Figure 96. PROFILE GCS - PROFILE.GCS


```
/**********************/
/* AGWPROF GCS FOR AVS */
/**********************/

'AGW ACTIVATE GATEWAY ?LOCALLU_P? PRIVATE'
'AGW ACTIVATE GATEWAY ?LOCALLU_G? GLOBAL'
```

Figure 97. AGWPROF GCS - AGWPROF.GCS

Notes:

   a. The names substituted for ?LOCALLU? should be different. ?LOCALLU?
      was used to designate both since they are both local LUs.

   Gateways define paths (Logical Units or LUs) into the SNA network. As such
   these names must match names of LUs defined in a VTAM application major
   node described below.

4. Create VTAM Application Major Node

Place the following in a VTAMLST library (usually SYS1.VTAMLST):

```
*
APLAVS   VBUILD  TYPE=APPL
?LOCALLU_G? APPL APPC=YES,                                              X
                 AUTHEXIT=YES,                                         X
                 AUTOSES=1,                                            X
                 DSESLIM=8,                                            X
                 DMINWNL=4,                                            X
                 DMINWNR=4,                                            X
                 PARSESS=YES,                                          X
                 SYNCLVL=CONFIRM,                                      X
                 SECACPT=ALREADYV
?LOCALLU_P? APPL APPC=YES,                                             X
                 AUTHEXIT=YES,                                         X
                 AUTOSES=1,                                            X
                 DSESLIM=8,                                            X
                 DMINWNL=4,                                            X
                 DMINWNR=4,                                            X
                 PARSESS=YES,                                          X
                 SYNCLVL=CONFIRM,                                      X
                 SECACPT=ALREADYV
```

Figure 98. VTAM definition of APPC LU - APPLVM.VTM

Notes:

a. The names substituted for ?LOCALLU? should be different. ?LOCALLU? was used to designate both since they are both local

b. If a logon mode table other than the default table (ISTINCLM) will contain the APPC mode entries, a **MODETAB** parameter should be added to the entries above. LUs.

c. Depending on security requirements on the VM system, the **SECACPT** parameter may also need to be changed.

5. Add APPC Modes to the Logmode Table

APPC modes are shown in Figure 99 on page 136. Add them to your logmode table, compile, and then link-edit the member into a VTAM library. Also include them in the default logmode table (ISTINCLM) so that dynamically created LUs can use them.

```
******************************************************************
*        LOGMODE TABLE ENTRY FOR RESOURCES CAPABLE OF ACTING     *
*                       AS LU 6.2 DEVICES                         *
******************************************************************
SNASVCMG MODEENT LOGMODE=SNASVCMG,FMPROF=X'13',TSPROF=X'07',      *
              PRIPROT=X'B0',SECPROT=X'B0',COMPROT=X'D0B1',        *
              RUSIZES=X'8686',ENCR=B'0000',SSNDPAC=7,             *
              PSERVIC=X'060200000000000000000300',                *
              SRCVPAC=7,PSNDPAC=7,TYPE=0
         TITLE '#BATCH'
******************************************************************
*                                                                *
*        LOGMODE TABLE FOR BATCH SESSIONS ON RESOURCES CAPABLE    *
*        OF ACTING AS LU 6.2 DEVICES                              *
*                                                                *
******************************************************************
#BATCH   MODEENT LOGMODE=#BATCH,                                  *
              ENCR=B'0000',SSNDPAC=3,                             *
              SRCVPAC=3,PSNDPAC=3,RUSIZES=X'F7F7'
         TITLE '#INTER'
******************************************************************
*                                                                *
*        LOGMODE TABLE FOR INTERACTIVE SESSIONS ON RESOURCES      *
*        CAPABLE OF ACTING AS LU 6.2 DEVICES                      *
*                                                                *
******************************************************************
#INTER   MODEENT LOGMODE=#INTER,                                  *
              ENCR=B'0000',SSNDPAC=7,                             *
              SRCVPAC=7,PSNDPAC=7,RUSIZES=X'F7F7'
         TITLE '#BATCHSC'
******************************************************************
*                                                                *
*        LOGMODE TABLE FOR BATCH SESSIONS REQUIRING SECURE        *
*        TRANSPORT ON RESOURCES CAPABLE OF ACTING AS LU 6.2       *
*        DEVICES                                                  *
*                                                                *
******************************************************************
#BATCHSC MODEENT LOGMODE=#BATCHSC,                                *
              ENCR=B'0000',SSNDPAC=3,                             *
              SRCVPAC=3,PSNDPAC=3,RUSIZES=X'F7F7'
         TITLE '#INTERSC'
******************************************************************
*                                                                *
*        LOGMODE TABLE FOR INTERACTIVE SESSIONS REQUIRING         *
*        SECURE TRANSPORT ON RESOURCES CAPABLE OF ACTING AS       *
*        LU 6.2 DEVICES                                           *
*                                                                *
******************************************************************
#INTERSC MODEENT LOGMODE=#INTERSC,                                *
              ENCR=B'0000',SSNDPAC=7,                             *
              SRCVPAC=7,PSNDPAC=7,RUSIZES=X'F7F7'
         TITLE 'CPSVCMG'
******************************************************************
*                                                                *
*        LOGMODE TABLE FOR CP-CP SESSIONS ON                      *
*        RESOURCES CAPABLE                                        *
*        OF ACTING AS LU 6.2 DEVICES                              *
*                                                                *
******************************************************************
CPSVCMG  MODEENT LOGMODE=CPSCVMG,                                 *
              RUSIZES=X'8686',ENCR=B'0000',                       *
              SSNDPAC=7,SRCVPAC=7,PSNDPAC=7
```

Figure 99. APPC Logon Mode Entries - APPCMODE.ASM

10.6.3 Define a link to a partner or intermediate node

1. Define the Token-ring adapter in NCP

The following is a sample token-ring connection from NCP:

```
T030T2PG GROUP ECLTYPE=(PHYSICAL,ANY)
T030T2PL LINE  ADDRESS=(1089,FULL),LOCADD=?NCPLANADDR?,PORTADD=2,      X
               RCVBUFC=4095,MAXTSL=2044,ADAPTER=TIC2,TRSPEED=4
*
T030TRL0 GROUP ECLTYPE=LOGICAL,AUTOGEN=10,PHYPORT=2,CALL=INOUT
```

Figure 100. LAN definitions on NCP

2. Provide for use of independent LUs on the token-ring connection

Once the token-ring is defined in the NCP, the only additional parameter that is required is NUMILU on the LUDRPOOL macro. For example:

```
POOL1   LUDRPOOL NUMILU=100,NUMTYP1=20,NUMTYP2=20
```

In this example the NCP will be able to support up to 100 independent LUs that are being connected via dial connections (token-ring or switched lines).

10.6.3.1 Additional LEN configuration

Place the following in a VTAM switched major node definition. It assumes that the partner node is not another VTAM. If the partner LU is on another VTAM system, then the link definitions for the token-ring shown above need to be for a subarea link, or the cross-domain links need to be defined so that normal LU routing within the subarea network will resolve the locations of the session partners.

```
WSN      VBUILD TYPE=SWNET,MAXGRP=2,MAXNO=2
PARTPU   PU     ADDR=04,                                          X
                CPNAME=?PARTNERLU?,                               X
                PUTYPE=2,                                         X
                MAXDATA=2012,                                     X
                MAXPATH=1
?PARTNERLU? LU   LOCADDR=0,MODETAB=?MODETAB?,DLOGMOD=?MODE?
```

Figure 101. WSN.VTM

PARTNERLU should be changed to match the partner LU name. See the "How to find..." section of the partner computer's configuration chapter for this value.

10.6.4 Configure to run as a client

Place the APING MODULE and APINGD MODULE on a minidisk to which you have access. It is recommended to use a shared minidisk.

10.6.4.1 Define CPI-C Side Information

In APPC/VM side information is stored in what is called a *communications directory*. It is a VM file similar in definition and use to VM NAMES files. Defining CPI-C Side Information is optional. Below is a sample entry:

```
:nick.?SYMDEST?   :APINGD
                  :luname.?LOCALLU? ?PARTNERLU?
                  :modename.?MODE?
                  :security.NONE
```

Figure 102. Sample Communications Directory Entry - COMDIR.SMP

If this entry is included in a VM file called SAMPLE COMDIR then it can be activated in the client virtual machine by issuing:

```
SET COMDIR FILE USER SAMPLE COMDIR
```

More information on this command can be found by looking at the online help text for SET COMDIR.

10.6.5 Configure to run as a server

Place the APING MODULE and APINGD MODULE on a minidisk to which you have access. It is recommended to use a shared minidisk.

1. Configure the Virtual Machine to run APINGD

There are two principle methods of execution for transaction programs in APPC/VM; as global resources or as private resources. A global resource can be thought of as a resource or program available to a number of users, while a private resource or program is run within a particular users virtual machine. Which type is used by APPC/VM on incoming requests is determined by the type of gateway; if a global gateway is used, the transaction program is scheduled as a global resource, while if a private gateway is used the transaction program is assumed to be private. Gateways are APPC/VM LUs.

Configuring a Global Gateway: A global resource must be registered as such with VM. There are two ways to do this. First, an entry can be added to the directory of the virtual machine owning the resource, as is shown below:

```
IUCV *IDENT resrc1 GLOBAL
```

This will identify resrc1 as a resource managed by the virtual machine in which it is included.

The other way is to use the Identify_Resource_Manager (XCIDRM) call. This call can be used from within a program or EXEC to register the resource with VM. This still requires an additional directory entry similar to the one below:

```
IUCV *IDENT RESANY GLOBAL
```

The "RESANY" parameter allows the resource manager virtual machine to register any resource name using the XCIDRM call. Below is a sample EXEC called RESAPING which registers a resource called APINGD as a global resource, and then waits for events (such as an incoming attach) to schedule the transaction program.

```
/**/
/* ARG resid */
'set ldrtbls 20'
'rtnload * (FROM VMLIB SYSTEM GROUP VMLIB)'
'global loadlib edclink'
'GLOBAL TXTLIB EDCBASE IBMLIB CMSLIB CMSSAA'
resid = word(resid userid(), 1)
original_resid = resid
'EXECIO * DISKR CMREXX COPY * (FINIS STEM CPICONST.'
if rc<>0 then exit rc
do i=1 to cpiconst.0
  interpret cpiconst.i
  end
/* TRACE 'I' */
server_scope=XC_GLOBAL
service_mode=XC_SEQUENTIAL
secnone=XC_ACCEPT_SECURITY_NONE
address cpicomm
RESID='APINGD '
'XCIDRM RESID SERVER_SCOPE SERVICE_MODE SECNONE IDSRV_RC'
IF IDSRV_RC <> 0 & IDSRV_RC <>24 THEN DO
  SAY 'Unable to start resource' RESID
  exit idsrv_RC
  end
do forever
 say 'Waiting for ALLOCATION event, TERMINATE, STOP or CMS command'
 'XCWOE resid conversation_id event length buffer WOE_rc'
 select
  WHEN event=XC_ALLOCATION_REQUEST then do
    address cms 'VMFCLEAR'
    say 'Allocation request received for' resid
    CALL Process_Request
    end
  WHEN event=XC_CONSOLE_INPUT then
    CALL user_input left(buffer,length)
  WHEN event=XC_REVOKE_RESOURCE then do
    say 'Resource management for' resid 'has been revoked'
    SIGNAL Terminate_Server
    end
  OTHERWISE
    say 'Wait_On_Event returned event XC_INFORMATION_INPUT'
    SIGNAL Terminate_Server
  end
end
Process_Request:
ADDRESS COMMAND
RESID
RETURN
User_Input:
arg user_buffer
select
  WHEN USER_BUFFER = 'STOP' THEN DO
    say 'Terminating because of stop'
    exit
    end
  OTHERWISE DO
    ADDRESS CMS USER_BUFFER
    END
end
return
```

Figure 103. EXEC to Schedule a Global Resource - RESAPING.EXC

Configuring a Private Gateway: A private gateway runs in a user's "private" virtual machine. Within that virtual machine the appropriate TXTLIB and LOADLIB members must be globalled to run a program such as APING that is written in C. The following EXEC gives an example of an EXEC that can be called from a user's PROFILE EXEC to set up the virtual machine to act as a server:

```
/* This exec sets parameters for APPC/VM server operation */
PARSE ARG HELP1
IF HELP1 = '?' THEN DO
   say 'This EXEC sets a user virtual machine for use as an APPC server.'
   say 'It:'
   say '  1. Performs SET SERVER ON'
   say '  2. Performs SET FULLSCREEN OFF'
   say '  3. Performs SET AUTOREAD OFF'
   say '  4. GLOBALs loadlib and txtlibs needed for C/370.'
   say
   say 'It can be called from the PROFILE EXEC to automatically enable'
   say 'APPC server function.'
   exit 0
end
TRACE 0
SET CMSTYPE HT
/* Test for existing LOADLIB defs. Add EDCLINK (C runtime) if not   */
/* configured.                                                      */
'QUERY LOADLIB (STACK LIFO)'
PARSE UPPER PULL LLIBS
I = WORDS(LLIBS)
EDCADD='YES'
LOADCMD = 'GLOBAL LOADLIB '
DO J=3 TO I
   IF WORD(LLIBS,J)<>'NONE' THEN LOADCMD=LOADCMD || ' ' || WORD(LLIBS,J)
   IF WORD(LLIBS,J)='EDCLINK' THEN EDCADD='NO'
END
IF EDCADD='YES' THEN LOADCMD=LOADCMD || ' EDCLINK'
INTERPRET LOADCMD
/* Test for existing TXTLIB defs. Add EDCBASE (C libraries) and     */
/* and CMSSAA (contains CPI-C routines), if necessary.              */
'QUERY TXTLIB (STACK LIFO)'
PARSE UPPER PULL TLIBS
I = WORDS(TLIBS)
EDCADD='YES'
IBMADD='YES'
SAAADD='YES'
LIBCMD = 'GLOBAL TXTLIB '
DO J=3 TO I
   IF WORD(TLIBS,J)<>'NONE' THEN LIBCMD=LIBCMD || ' ' || WORD(TLIBS,J)
   IF WORD(TLIBS,J)='EDCBASE' THEN EDCADD='NO'
   IF WORD(TLIBS,J)='CMSSAA' THEN SAAADD='NO'
   IF WORD(TLIBS,J)='IBMLIB' THEN IBMADD='NO'
END
IF EDCADD='YES' THEN LIBCMD=LIBCMD || ' EDCBASE'
IF SAAADD='YES' THEN LIBCMD=LIBCMD || ' CMSSAA'
IF IBMADD='YES' THEN LIBCMD=LIBCMD || ' IBMLIB'
INTERPRET LIBCMD
'SET SERVER ON'
'SET FULLSCREEN OFF'
'SET AUTOREAD OFF'
```

Figure 104. EXEC to Enable Server Operation - RESAPING.EXC

Notes:

1. The last three lines (SET commands) are required for private server operation.

10.6.5.1 Define transaction programs (TPs)

When a private gateway is used, APPC/VM converts TP names received on ATTACHes to executable program names by mapping the TP names to entries in a file called $SERVER$ NAMES.

To add new transaction programs, edit the $SERVER$ NAMES file and add the following entry.

```
* This file is used by APPC server to determine what module or exec
* to call based on the TP name received in an ATTACH.
:nick.APINGD     :list.*
                 :module.APINGD
```

Figure 105. $SERVER$ NAMES - TP To Executable Mapping - $SERVER$.NAM

In the above example, the TP name APINGD specified in the ":nick" field is mapped to the executable. The ":list" field specifies a list of userids authorized to run this TP. The asterick implies that any userid may run the TP.

If the userid on the ATTACH matches the userid of the virtual machine where the TP is to run, then the ":list" entry is not needed. Similarly, if the TP name received in the ATTACH matches the executable name then the ":module" entry is not required. If both of these conditions are true then the entire entry in the file can be omitted.

To add other transaction programs, edit the $SERVER$ NAMES file and add the following entry: :nick.?TPNAME?   :list.*
                 :module.?TPNAME?

10.7 How to find....

- LU Name

  For APPC/VM, this is configured in AGWPROF GCS. The command:

  `AGW ACTIVATE GATEWAY ?LOCALLU? GLOBAL`

  defines a global resource manager with name ?LOCALLU?.

- Control Point (CP) Name

  VTAM, being a LEN node, does not have a CP (Control Point) name for APPN use. It does, however, have a SSCPNAME (System Services Control Point Name). If in configuring a partner platform a CP name is needed, use the SSCPNAME instead. . It is also set in the ATCSTRxx file on the VTAM 191 disk.

- Network Name

  It is defined in a file named ATCSTRxx on VTAM's 191 disk. The "xx" is two digits, and the default is 00. ATCSTRxx is the VTAM start options. The NETID parameter defines the network name.

- LAN address

  The LAN address is coded in NCP on a LINE macro using the LOCADD parameter.

Appendix A. Using Node IDs in VTAM

Prior to VTAM Version 3 Release 2, the only mechanism VTAM had for resolving dynamic connections like dial-in was the node ID. The examples in this guide all use a LAN connection which to VTAM is just like dial-in. The node ID is set in the computer dialing in and must match the value in VTAM for that physical unit.

The node ID itself was intended to have two parts: a *block number* that was to be unique for each product type and an *ID number* that was to be unique within each product type. These two parts correspond respectively to the *IDBLK* and *IDNUM* parameters in VTAM.

The examples below show for each of the pertinent platforms (LEN peripheral nodes and APPN nodes) how to code the node ID in the platform and the corresponding VTAM definition.

Note: Some platforms allow you to set the block number; in others it is fixed. If the block number is settable you can use any matching value for IDBLK in VTAM. If the block number is fixed and VTAM does not use the CPNAME parameter as recommended, then the VTAM IDBLK MUST MATCH the block number in the product. This will be indicated in the examples.

Note: Although the information regarding nodeids applies to VTAM releases earlier than Version 3 Release 2, the configurations in this guide require function that is only supported in Version 3 Release 2 and later.

A.1 Node ID for SNA Services/6000 or SNA Server/6000

SNA Services/6000 and SNA Server/6000 allow you to set the block number; the default is 071. In the example below, the "bbb" values must match in VTAM and SNA Services/6000 or SNA Server/6000.

```
PROFILE name       = ?CPPRO?
XID node ID        = bbbnnnnn
NETWORK name       = ?NETNAME?
CONTROL POINT name = ?SSCPNAME?
```

Figure 106. SNA Services/6000: Control Point profile

```
Control Point name   = ?LOCALCP?
Control Point type   = appn_end_node      # see note
Local network name   = ?LOCALNET?
XID node ID          = *                   # see note
```

Figure 107. SNA Server/6000: Initial Node Setup: Information

The corresponding VTAM definition is as follows:

A.3 Node ID for Networking Services/DOS

Networking Services/DOS calls the block number the *block_ID* and the ID number the *ID*. The block_ID is **settable** but defaults to 075. In the example below, the "bbb" values must match in VTAM and Networking Services/DOS.

```
NSDN ?NETWORK?.?LUNAME?,bbbnnnnn
```

The corresponding VTAM definition is as follows:

```
?LINKNAME? PU ADDR=04,                                              X
              CPNAME=?LUNAME?,                                      X
              IDBLK=bbb,              * DEFAULTS TO 075        *    X
              IDNUM=nnnnn,            * ANY 5 HEX DIGITS       *    X
              MODETAB=?MODETAB?
?LUNAME?   LU LOCADDR=0,DLOGMOD=#INTER
```

Note: For Networking Services/DOS, the LU name and CP name are the same. The modetable must include the name #INTER.

A.4 Node ID in OS/2 Extended Services

OS/2 Extended Services calls the ID number the nodeid and the block number is FIXED at 05D. You MUST tell the VTAM system programmer to set the IDBLK to 05D. Below is the example Local Node Characteristics window and NDF excerpt.

```
Required Features:

  Network ID:          _____

  Local node name: _____

  Node type:

        o  End Node to Network Node Server
        o  End Node - No Network Node Server
        o  Network Node

  Your network node server address:     ?LANADDRESS?

  Optional Features

     Local Node ID          05D nnnnn
     Local Node Alias Name  _____
     Comment                Configuration is Fun!_____

  _  Activate Attach Manager at start up
```

Figure 109. Local Node Characteristics for Extended Services

```
define_local_cp fq_cp_name(?NETWORK?.?LUNAME?)
                cp_alias(mylu)
                node_id(x'nnnnn')
                node_type(?NODETYPE?);
```

Figure 110. NDF file excerpt DEFINE_LOCAL_CP with nodeid

The corresponding VTAM definition is as follows:

```
?LINKNAME? PU ADDR=04,                                         X
              CPNAME=?LUNAME?,                                 X
              IDBLK=05D,        * MUST BE 05D FOR EXT. SVCS.*  X
              IDNUM=nnnnn,      * ANY 5 HEX DIGITS         *   X
              MODETAB=?MODETAB?
?LUNAME?   LU LOCADDR=0,DLOGMOD=#INTER
```

Appendix B. The 3174 Establishment Controller and the 3172 Interconnect Controller

The purpose of this appendix is to direct the reader that is interested in using 317x controllers to connect APPC partners.

In the APPC/MVS, APPC/VM and CICS sections of this configuration guide, the 3745 Communications Controller provides access from the LAN to the IBM mainframe. A 3174 Establishment Controller or a 3172 Interconnect Controller can also provide gateway function. Here we refer you to other publications for config-uration information about these controllers.

In the case of the 3174, where you go will depend on the level of microcode oper-ating in the 3174 (i.e. the configuration support level).

If using 3174 Configuration Support C, then the *3174 APPN Implementation Guide*, publication number GG24-3702, is recommended. It details APPN support in the 3174 and features twelve example scenarios. Each scenario includes configuration definitions at all levels (LAN attached node, 3174 and the mainframe) and display commands examples.

When the 3174 is loaded with earlier versions of microcode (Config A and Config B), the reader should obtain *Experiences of Connecting APPC/PC with CICS/VS via the 3174 Token Ring Gateway* for end-to-end definition examples as well as opera-tion, and problem determination information. The publication number is GG66-0287.

End-to-end configuration definitions are provided and installation considerations are discussed in *Using the 3172 for LAN to Host Connectivity*, publication number SG22-1053.

Appendix C. Working with Dependent LUs in OS/2

There are some situations where independent LUs just won't work. Take as an example a 3174 serving as a token-ring gateway for an MVS host. VTAM Version 3.3 for MVS will reject a Bind from the 3174 or any of it's downstream PUs, which means you can't use independent LUs. So. how can you get APPC function? **Use dependent LUs, of course!**

This appendix describes how to set up VTAM and OS/2 Communications Manager (Extended Services or CM/2) to run APING to a host application (CICS, IMS, or APPC/MVS) using dependent LUs. We'll wrap up with some networking considerations and tips.

Keep in mind the differences between independent and dependent LUs:

- An independent LU

  - requires no VTAM services unless the partner LU is somewhere on the other side of the VTAM-NCP network, say on another LAN
  - can send a BIND to start a session with any partner LU
  - can have "parallel" sessions to the same partner LU
  - can have sessions with multiple partners at the same time
  - when defined in VTAM has local address (LOCADDR) of 0

- A dependent LU

  - requires VTAM services and an SSCP-LU session to get them
  - cannot start a session by itself
  - can only have one session to one partner at a time
  - when defined in VTAM has local address greater than 0

C.1 Configuring VTAM

Dependent LUs require defining two pieces of information to VTAM: an LU definition and a mode entry in a mode table.

C.1.1 VTAM PU Definition for Workstation Dependent LU

```
?LINKNAME? PU ADDR=?PUADDR?,MODETAB=LU2TABLE,DLOGMOD=LU2MODE,        X
                MAXDATA=1927,...
TERMLU1  LU LOCADDR=02
TERMLU2  LU LOCADDR=03
?OS2DLU? LU LOCADDR=?LOCADDR?,MODETAB=?MODETABLE?,DLOGMOD=?MODE?
```

Figure 111. VTAM PU Definition with Dependent LU for SDLC Device

```
?LINKNAME? PU CUADDR=?PUADDR?,MODETAB=LU2TABLE,DLOGMOD=LU2MODE,      X
                MAXDATA=1927,...
TERMLU1  LU LOCADDR=02
TERMLU2  LU LOCADDR=03
?OS2DLU? LU LOCADDR=?LOCADDR?,MODETAB=?MODETABLE?,DLOGMOD=?MODE?
```

Figure 112. VTAM PU Definition with Dependent LU for Channel-Attached Device

Notes:

1. The ADDR parameter for switched nodes is irrelevant. For SDLC devices (ADDR) and channel-attached devices (CUADDR) this parameter must be defined in the device itself to match the VTAM parameter.

2. If this PU is downstream from a 3174 token-ring gateway, the ?PUADDR? must match the "S" column in question 941 of the 3174 customization..

3. This example shows the VTAM sift-down rule in effect. That is, the terminal LUs use the modetable and default log mode from the PU statement. You could put the APPC mode in the LU2TABLE rather than using a separate mode table.

4. ?OS2DLU?,?LOCADDR?, and ?MODE? will all be used in the OS/2 definition.

C.1.2 VTAM Mode Table Entry for Single-Session Mode

```
?MODE?   MODEENT LOGMODE=?MODE?,FMPROF=X'13',TSPROF=X'07',            X
                 PRIPROT=X'B0',SECPROT=X'B0',COMPROT=X'50B5',TYPE=X'00',  X
                 RUSIZES=X'F7F7',PSERVIC=X'060200000000000000002C00'
```

Figure 113. VTAM Mode Entry for Single-Session Mode

Notes:

1. This mode entry specifies that the primary LU is contention-winner (COMPROT = x'xxBx'), a requirement for CICS autoinstall.

2. The PSERVIC is required. The x'2C' specifies that the session supports synclevel confirm and single-session only.

3. This mode entry must be assembled and link-edited with the ?MODETABLE? member of SYS1.VTAMLIB (MVS), the ?MODETABLE? VTAMLST file (VM), or the equivalent file in VSE.

C.1.3 VTAM Network Identifier (NETID)

When working with 3174 LIC B as a token-ring gateway, the 3174 does not send XIDs from the downstream PUs to VTAM. In particular, VTAM assumes that the downstream PUs are in the same network, that is, the downstream PUs have the same NETID as VTAM. *If the downstream PU and VTAM have different NETIDs, communication cannot take place.*

The VTAM NETID is found in ATCSTRxx, the VTAM start options list.

C.2 Configuring the Dependent LU in Communications Manager

Configuring dependent LUs in Communications Manager involves not only the local LU but also the partner LU and the logical link. Below are definitions from a Communications Manager .NDF file.

C.2.1 Defining the Dependent LU in OS/2

```
DEFINE_LOCAL_LU  LU_NAME(?OS2DLU?)
                 DESCRIPTION(Dependent LU for PU 2.0 host gateways)
                 LU_ALIAS(?LUALIAS?)
                 NAU_ADDRESS(?LOCADDR?);
```

Figure 114. OS/2 Local Dependent LU Definition

Notes:

1. ?LOCADDR? must match that in VTAM and must be greater than zero.

2. The alias of the local LU, ?LUALIAS?, can be mixed-case.

C.2.2 Defining the Host LU to OS/2

```
DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(?HOSTNET?.?HOSTLU?)
                   PARTNER_LU_ALIAS(?PLUALIAS?,?PLUalias?)
                   PARTNER_LU_UNINTERPRETED_NAME(?HOSTLU?)
                   MAX_MC_LL_SEND_SIZE(32767)
                   CONV_SECURITY_VERIFICATION(NO)
                   PARALLEL_SESSION_SUPPORT(NO);
```

Figure 115. OS/2 Partner LU Definition

Notes:

1. If ?HOSTNET? is different from the local NETID, you must code a cross-domain resource (CDRSC) definition in VTAM and name it ?HOSTLU?.

2. OS/2 allows you to specify several different aliases for partner LUs. Here we show one alias in all upper-case and one in mixed-case.

3. CM sends the partner LU uninterpreted name to VTAM to start the BIND process. This parameter is required.

4. The parallel session support MUST be NO for dependent LUs.

C.2.3 Defining the OS/2 Link and PLU Location

You must tell Communications Manager where to find the partner LU. This involves the link definition to (in our example) the 3174 gateway.

```
DEFINE_LOGICAL_LINK  LINK_NAME(?GWLINK?)
                     DESCRIPTION(Host gateway)
                     FQ_ADJACENT_CP_NAME(?NETWORK?.?GWCP?)
                     ADJACENT_NODE_TYPE(LEN)
                     DLC_NAME(IBMTRNET)
                     ADAPTER_NUMBER(0)
                     DESTINATION_ADDRESS(?LANADDRESS?)
                     CP_CP_SESSION_SUPPORT(NO)
                     ACTIVATE_AT_STARTUP(YES)
                     SOLICIT_SSCP_SESSION(YES);

DEFINE_PARTNER_LU_LOCATION  FQ_PARTNER_LU_NAME(?HOSTNET?.?HOSTLU?)
                            WILDCARD_ENTRY(NO)
                            FQ_OWNING_CP_NAME(?NETWORK?.?GWCP?)
                            LOCAL_NODE_NN_SERVER(NO);
```

Figure 116. OS/2 Link and PLU Location Definitions

Notes:

1. Communications Manager uses the adjacent node's CP name, ?GWCP?, as a dummy name when the adjacent node type is LEN. However, for smoother migration to APPN use the rules in C.4, "Additional Tips and Details" on page 153.

2. You must set SOLICIT_SSCP_SESSION(YES) because the dependent LU requires one.

3. If this workstation communicates with several host LUs, you may wish to set WILDCARD_ENTRY(PARTIAL). See C.4, "Additional Tips and Details" on page 153 for an example.

C.2.4 Defining the OS/2 Single-Session Mode

```
DEFINE_MODE  MODE_NAME(?MODE?)
             DESCRIPTION(Single-session mode)
             COS_NAME(#INTER  )
             DEFAULT_RU_SIZE(YES)
             RECEIVE_PACING_WINDOW(4)
             MAX_NEGOTIABLE_SESSION_LIMIT(1)
             PLU_MODE_SESSION_LIMIT(1)
             MIN_CONWINNERS_SOURCE(1);
```

Figure 117. OS/2 Single-Session Mode Definition

Notes:

1. The mode name ?MODE? must match that in VTAM.

2. Set MIN_CONWINNERS_SOURCE(1) if programs on the workstation will start most of the APPC conversations. Set this to (0) if the host application starts most of the conversations (for example, ImagePlus/ESA or NetView Distribution Manager).

C.3 Running APING

Finally, to run APING, issue the following two commands from an OS/2 command prompt:

```
ffIC:\" set appcllu=?LUALIAS?
ffIC:\" aping -n -m ?MODE? ?PLUalias?
```

The environment variable APPCLLU tells CPI-C which local LU to use for the session. If you don't set this variable, CPI-C uses the default LU. The default LU is the control point LU. (You can change this; see the tips in C.4, "Additional Tips and Details" on page 153.)

Remember when setting APPCLLU and when running APING that *aliases are case-sensitive*. You must specify the mode here because APING will try to use #INTER, which will in turn try (and fail) to set up parallel sessions.

C.4 Additional Tips and Details

C.4.1 Tips

Here are some other tricks:

- Choosing the CP names on DEFINE_LOGICAL_LINK

  - If your gateway is a 3745, use the VTAM SSCP name. When you migrate to APPN, the SSCP name becomes the CP name of the VTAM-NCP "composite network node".
  - If your gateway is anything else, use the CP name of the gateway node (3174, 3172, CM/2,...). When you migrate to APPN, the gateway itself becomes the APPN network node. (The 3172 network node function is a statement of direction as of 2/94.)

- Using wildcards to reduce PLU location definitions

  If your workstation communicates with many host LUs, you can get by with one statement coded like this:

  ```
  DEFINE_PARTNER_LU_LOCATION  FQ_PARTNER_LU_NAME(?PARTNERNET?.)
                              WILDCARD_ENTRY(PARTIAL)
                              FQ_OWNING_CP_NAME(?NETWORK?.?GWCP?)
                              LOCAL_NODE_NN_SERVER(NO);
  ```

  Communications Manager will route requests for all LUs in the ?PARTNERNET? network to the gateway link.

- Changing the default LU

  If you never use the parallel session capability of the CP LU, then you can change the default LU (and eliminate the "set APPCLLU" step) by coding this line in the DEFINE_DEFAULTS stanza:

  ```
  DEFINE_DEFAULTS  DEFAULT_LOCAL_LU_ALIAS(?LUALIAS?)
                   ...
  ```

- Defining VTAM cross-domain resources

  ```
  **********************************************************
  * THE LOCAL NETWORK ID IS NET1, LOCAL VTAM IS N1CDRM1   *
  **********************************************************
  ?CDRSCMAJ? VBUILD   TYPE=CDRSC
  ?HOSTLU1?  CDRSC    CDRM=N1CDRM1      * Host LU1 on some other NET1 VTAM
  ?HOSTNET?  NETWORK  NETID=?HOSTNET?
  ?HOSTLU?   CDRSC    ISTATUS=ACTIVE    * Host LU in HOSTNET network
  ```

  To connect two VTAMs with different network IDs requires the SNA Network Interconnect (SNI) product with one VTAM in each network connected to a "gateway" NCP. VTAMs are known in the network by their Cross-Domain Resource Manager (CDRM) names. VTAM Version 3.4 and later treat ALL independent LUs as cross-domain resources.

C.4.2 Minutiae

One of the limitations of dependent LUs is that you can't start a session from your dependent LU to an LU in another OS/2 system. The partner system MAY be able to start a session to the dependent LU if it has an independent LU. In fact, from a dependent LU you can only initiate sessions to host LUs or LUs in nodes (like the AS/400) that respond to the VTAM message CDCINIT. The node

responds to the CDCINIT with a BIND to the originating LU (in OS/2 in our example).

If all you want to do is APPC to one host application at a time, dependent LU support is adequate. If you want to do a lot of APPC with multiple host applications, then you will need several LUs per workstation. This makes working with CPI-C somewhat tedious, since CPI-C uses the "default" LU. This is nice because the application doesn't have to know anything about the local configuration. However, with lots of dependent LUs, your applications will need to use different local LUs. This is just one more reason to use one independent LU that can have multiple sessions with multiple partners.

Appendix D. CICS: Autoinstalling Parallel Sessions

Note: CICS/ESA Version 4, announced February 1, 1994, supports autoinstalling parallel sessions. See Announcement Letter 294-026 for more details.

Customers use CICS autoinstall to conserve CICS resources for applications like Image+/ESA. Some CICS system programmers (and many IBMers as well) believe that autoinstall only works for dependent LUs. However, there are many dynamic definition features in VTAM and APPN that only work with independent LUs and cannot be used by dependent LUs. It would be very nice to get the benefits of both autoinstall and independent LUs. Well, YOU CAN! Really, it was possible all along; it just wasn't easy to figure out. Here's how. If you know all about CICS autoinstall just skip to D.1.2, "VTAM Mode Table Entry" on page 156. Otherwise, the next few paragraphs serve as an introduction.

Many APPC platforms can build partner definitions automatically whenever an unknown partner tries to connect. Automatic definition means less administrative work, fewer mistakes, and happier users. CICS calls this function "autoinstall" and CICS has had it for a long time. That's the good news. The bad news is that CICS can autoinstall only single-session "terminals" and VTAM must start the process.

In SNA terms a CICS terminal is typically a dependent LU and SNA (VTAM in particular) works very well with dependent LUs. However, SNA with Advanced Peer-to-Peer Networking (APPN) works better with independent LUs that send BINDs directly and don't need VTAM. A typical workstation cannot just send a BIND to CICS; there must be a CINIT message (pronounced "see-init") from VTAM in order to start the autoinstall process.

So, the task boils down to two steps

1. Setting up Communications Manager or Networking Services/DOS to properly respond to CICS

2. Starting the process in VTAM, either through system definition or operator command.

For complete details on what happens between dependent LUs, VTAM, and CICS, see D.5, "Autoinstall Details" on page 159. If you just want the configuration and operation information, read on.

D.1 Setting up CICS and VTAM for Autoinstall

There are three events that will cause VTAM to send a CINIT to CICS (starting the autoinstall process):

1. An LU statement is coded with the LOGAPPL(?CICSLU?) parameter and the LU becomes active (CICSLU is the CICS applid or region name).

2. A VTAM operator issues a

   ```
   VARY NET,LOGON=?CICSLU?,ID=?ILU?,LOGMODE=?MODE?
   ```

   command (?ILU? is the independent LU name, ?MODE? is a mode with parameters that match the CICS defaults for the LU62 terminal).

3. A dependent LU sends an INIT_SELF to VTAM naming ?CICSLU? as the "partner uninterpreted name."

Note that only item 3 explicitly excludes independent LUs. So, to bring CICS into the dynamic world of APPN, all we have to do is implement method 1 or 2.

D.1.1 CICS Model Definitions

The following example shows what happens with the CICS/ESA V3R3 default definitions. The two pertinent CICS resource definitions are LU62 TERMINAL in group DHFTERM and DFHLU62T TYPETERM in group DFHTYPE. You can't change the CICS defaults; these screens are shown for information only.

```
TERMINAL        : LU62
GROUP           : DFHTERM
DESCRIPTION     :
AUTINSTMODEL    : ONLY  NO | YES | ONLY
AUTINSTNAME     : DFHLU62T
TERMINAL IDENTIFIERS
  TYPETERM      : DFHLU62T
  NETNAME       : LU62
SESSION SECURITY
  SECURITYNAME  :
  ATTACHSEC     : LOCAL        LOCAL | IDENTIFY | VERIFY | PERSISTENT | MIXIDPE
  BINDPASSWORD  :                     PASSWORD NOT SPECIFIED
  BINDSECURITY  : NO    NO | YES
```

Figure 118. LU62 TERMINAL Definition in Group DFHTERM

You may wish to change the ATTACH security to VERIFY (for password checking on all transactions) or PERSISTENT (for OS/2). To do so, you must create a new model TERMINAL definition and a new model TYPETERM definition.

Figure 119 shows the important lines in the TYPETERM definition used for APPC autoinstall.

```
TYPETERM        : DFHLU62T
GROUP           : DFHTYPE
DESCRIPTION     :
RESOURCE TYPE
  DEVICE        : APPC
SESSION PROPERTIES
  ASCII         : NO   NO | 7 | 8
  SENDSIZE      : 02048  0-30720
  RECEIVESIZE   : 02048  0-30720
  BRACKET       : YES  YES | NO
  LOGMODE       :
```

Figure 119. DFHLU62T TYPETERM Definition in Group DFHTYPE

D.1.2 VTAM Mode Table Entry

The key VTAM definition is the mode name in the LU's default mode table. You must create this mode entry or one like it. Below is the assembler source for the ?MODE? mode. Add this entry to your mode table source file, assemble it, and link-edit the result with SYS1.VTAMLIB.

```
?MODE?   MODEENT LOGMODE=?MODE?,FMPROF=X'13',TSPROF=X'07',              X
              PRIPROT=X'B0',SECPROT=X'B0',COMPROT=X'50B5',TYPE=X'00', X
              RUSIZES=X'8888',PSERVIC=X'060200000000000000002C00'
```

Figure 120. Sample Mode Entry for Single-Session, PLU Contention-Winner Mode

Notes:

1. The common Function Management protocols (COMPROT) is x'50B5'. The third character must be x'B' to indicate "bind-sender (CICS) is contention-winner."

2. CICS **always** tries to be the contention-winner for the session but accepts whatever the partner LU sets in the BIND response.

Once you have successfully link-edited the mode table, update the working mode table with the command

```
modify net,table,option=load,newtab=?MODETABLE?
```

D.2 Autoinstalling OS/2 Communications Manager ILUs

OS/2 Communications Manager can accept being contention-loser when the session-limit is 1. If an OS/2 application tries to allocate a conversation on the session and the session is not in use, Communications Manager will send a no-op message to CICS with bits in the header that say (in effect) "I want to use this session, is it okay?" and CICS will respond, "It's okay." Then Communications Manager will return control to the program and the transaction program will proceed.

D.2.1 Starting the Autoinstall

To autoinstall the OS/2 LU, do one of the following:

- code the VTAM LU statement with a LOGAPPL parameter. For example,

```
?OS2LU? LU LOCADDR=0,ISTATUS=ACTIVE,DLOGMOD=?MODE?,LOGAPPL=?CICSLU?
```

- issue the VTAM operator command

```
v net,logon=?CICSLU?,id=?OS2LU?,logmode=?MODE?
```

D.3 Setting Up OS/2 CM for Autoinstall

There are two cases to consider for OS/2 system definition.

1. CICS always starts the APPC conversation; this happens with Image + /ESA, for example. You need no additional definitions in Communications Manager.

2. OS/2 applications will start conversations with CICS transactions. This will require a partner LU definition that specifies a session limit of 1 and the mode definition.

D.3.1 Defining the Mode Name

To make OS/2 the contention-winner on the single session, you must create a mode definition (see below). The session limits must be coded exactly as shown; the RU sizes and pacing values can be changed.

```
DEFINE_MODE  MODE_NAME(?MODE?)
             DESCRIPTION(For CICS autoinstall test)
             COS_NAME(#INTER )
             DEFAULT_RU_SIZE(YES)
             RECEIVE_PACING_WINDOW(4)
             MAX_NEGOTIABLE_SESSION_LIMIT(1)
             PLU_MODE_SESSION_LIMIT(1)
             MIN_CONWINNERS_SOURCE(1);
```

Figure 121. Contention-Winner Mode Definition for Communications Manager

D.3.2 Defining the Partner LU (CICS)

```
DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(?CICSNET?.?CICSLU?)
                   PARTNER_LU_ALIAS(?PLUALIAS?,?plualias?)
                   MAX_MC_LL_SEND_SIZE(32767)
                   CONV_SECURITY_VERIFICATION(NO)
                   PARALLEL_SESSION_SUPPORT(NO);
```

Figure 122. Communications Manager Partner LU Definition

Notes:

1. If ?CICSNET? is different from the local NETID, you must code a cross-domain resource (CDRSC) definition in VTAM and name it ?CICSLU?.

2. Communications Manager allows you to specify several different aliases for partner LUs. Here we show all upper-case and all lower-case aliases.

3. The parallel session support MUST be NO for CICS autoinstall.

D.4 Autoinstalling Networking Services/DOS ILUs

This requires Networking Services/DOS at CSD level IP00898 or later. Networking Services/DOS (version 1.0 with CSD and version 1.1) will always try to be the contention winner. Figure 123 shows a sample MODE.NSD containing a proper single-session mode definition.

```
//                   Rcv      Maximum     Minimum
//         Maximum   Pacing   Negotiable  Negotiable
// Mode Name RU Size Window   Sessions    Conwinners
// --------- ------- ------   ----------  ----------
   SNASVCMG    256     1          2           1
   BLANK       *       2          8           4
   #BATCH      *       3          8           4
   #INTER      *       7          8           4
//   ?MODE? is for single-session CICS autoinstall
   ?MODE?     1024     3          1           1
```

Figure 123. Contention-Winner Mode Definition for Networking Services,DOS

As with OS/2, the RU size and pacing windows are tunable, the session limits are not. Autoinstall will not work if the mode name is omitted from the MODE.NSD file.

D.4.1 Starting the Autoinstall

To autoinstall the Networking Services/DOS LU, do one of the following:

* code the VTAM LU statement with a LOGAPPL parameter. For example,

  `?NSDLU? LU LOCADDR=0,ISTATUS=ACTIVE,DLOGMOD=?MODE?,LOGAPPL=?CICSLU?`

* issue the VTAM operator command

  `v net,logon=?CICSLU?,id=?NSDLU?,logmode=?MODE?`

Here, ?NSDLU? must match the Networking Services/DOS LU definition in the NSDN statement in the CONFIG.NSD file.

`NSDN ?NETWORK?.?NSDLU?`

D.5 Autoinstall Details

APPC sessions start with one LU sending a BIND to the partner LU. The partner LU can use information in the BIND to completely identify the origin LU. Therefore most platforms use the BIND to start the automatic definition process. This approach does not work for dependent LUs because dependent LUs can't send BINDs.

CICS needed a solution that worked for dependent LUs. Fortunately, whenever someone at a 3270 terminal (a dependent LU to VTAM and CICS),needs to connect to CICS, VTAM sends to CICS a message called a "control initiate" (CINIT). The CINIT contains the terminal's LU name and all the other parameters that go in a BIND. If all those parameters match what CICS wants to send, then CICS will build a BIND to the target LU and send it.

In APPC, dependent LUs automatically send a message called INIT_SELF to VTAM, which in turn causes VTAM to send a CINIT to CICS. Independent LUs will try to send a BIND to start a session and CICS will reject BINDs from LUs for which it does not have an existing CONNECTION or TERMINAL definition.

So, our problem becomes "How can I get VTAM to generate a CINIT for an independent LU?" or, to use VTAM terminology, "How can I logon an independent LU to CICS?" There are only two ways to do this: issue the VTAM operator command "v net,logon = ..." or code the LOGAPPL parameter on the LU definition statement. D.1, "Setting up CICS and VTAM for Autoinstall" on page 155 describes the operational steps to make this work.

D.6 References

VTAM Operation VTAM Resource Definition Reference