

OS390 eNetwork Communications Server



SNA Resource Definition Samples

Version 2 Release 5

OS390 eNetwork Communications Server



SNA Resource Definition Samples

Version 2 Release 5

Note: Before using this information and the product it supports, be sure to read the general information under "Appendix. Notices" on page 223.

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About This Book

This book contains sample definitions to help system programmers define resources in a VTAM network.

Attention: *Be aware that these samples are for illustrative purposes only; they are not intended to run in your network as presented here. You are responsible for making the proper modifications to the samples for your specific installation.* For example, operands that define such items as line speed and control unit addresses must be changed to match the needs of your installation.

Note: These samples **are not** all taken from the same network. Therefore, host A01N in one sample **is not** necessarily the same host as A01N in any other sample.

Who Should Use This Book

Before defining resources for a VTAM network, you should be familiar with the basic concepts of telecommunication, Systems Network Architecture (SNA), and VTAM. You should be especially well acquainted with the requirements of your own network and the directions given in the *OS/390 eNetwork Communications Server: SNA Network Implementation* for addressing those requirements.

How to Use This Book

This book is an aid to be used in conjunction with the following VTAM books:

- *OS/390 eNetwork Communications Server: SNA Network Implementation*
- *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*
- *OS/390 eNetwork Communications Server: SNA Operation.*

In each chapter you will find sample resource definitions for commonly used network configurations and networking functions. After determining, with the help of the *OS/390 eNetwork Communications Server: SNA Network Implementation*, what resources need to be defined to implement your own VTAM network configuration, you can then refer to *OS/390 eNetwork Communications Server: SNA Resource Definition Sample* to find samples of the resource definitions you need. Since these samples are for guidance only, you must then customize them to your specific networking environment.

You will notice that certain keywords are highlighted in the samples shown here. The highlighted keywords are those keywords that are referenced in the accompanying text.

This book does not explain in detail the syntax used in the sample definitions. For more information on the syntax, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

For installation and coding instructions, and for more detailed descriptions of the functions covered in these samples, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*. The *OS/390 eNetwork Communications Server: SNA Network Implementation* also contains many samples and examples in addition to those presented in this book.

For an overview of VTAM's support for APPN and the new functions in eNetwork Communications Server for OS/390 V2R5, refer to *OS/390 eNetwork Communications Server: SNA Planning and Migration Guide*.

How This Book Is Organized

This book follows the organization of the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference* very closely. It consists of the following chapters:

- “Chapter 1. Adjacent Control Point Major Node” on page 1
- “Chapter 2. Application Program Major Node” on page 5
- “Chapter 3. Channel-Attachment Major Node” on page 17
- “Chapter 4. Cross-Domain Resource Major Node” on page 27
- “Chapter 5. Cross-Domain Resource Manager Major Node” on page 33
- “Chapter 6. External Communication Adapter (XCA) Major Node” on page 49
- “Chapter 7. Local Non-SNA Major Node” on page 69
- “Chapter 8. Local SNA Major Node” on page 71
- “Chapter 9. LU Group Major Node” on page 81
- “Chapter 10. Model Major Node” on page 83
- “Chapter 11. Network Control Program (NCP) Major Node” on page 89
- “Chapter 12. Switched Major Node” on page 125
- “Chapter 13. TCP/IP Major Node” on page 157
- “Chapter 14. Transport Resource List Major Node” on page 161
- “Chapter 15. Path Definition Statements” on page 165
- “Chapter 16. VTAM Start Option Lists” on page 173
- “Chapter 17. Configuration Lists” on page 197
- “Chapter 18. Table Definitions” on page 201.

Definitions of the technical terms and abbreviations used in this book can be found at the following url: <http://www.networking.ibm.com/nsg/nsgmain.htm>

Artwork Used in This Book

Figure 1 on page xi shows the conventions used in this book to illustrate the parts of a network.

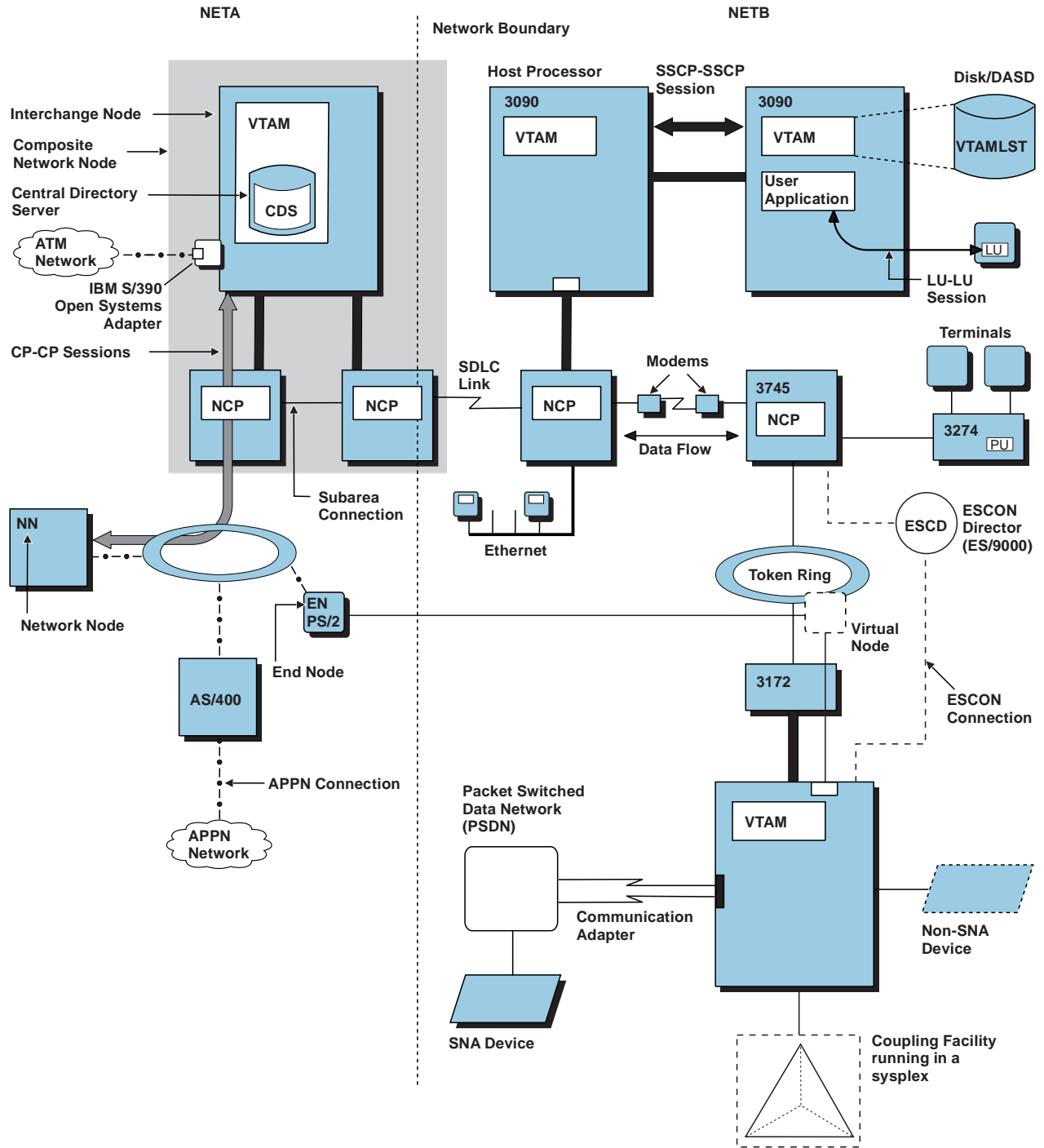


Figure 1. Conventions Used in Network Illustrations

What Is New in This Book

This book was previously published in January 1997 with the order number SC31-8378-00.

Chapter 1. Adjacent Control Point Major Node

About This Chapter

This chapter describes sample adjacent control point major node definitions.

You need an adjacent control point major node to define all the adjacent CPs with which you want your VTAM node to establish CP-CP sessions. The adjacent control point major node consists of ADJCP definition statements (the minor nodes), each of which represents an adjacent control point.

If the DYNADJCP start option is defaulted or specified as YES, an adjacent CP major node, ISTADJCP, is automatically created when VTAM is initialized. Adjacent CP minor nodes will then be created as needed to provide control and management of connections to adjacent APPN nodes. It is not necessary, in this case, to code an adjacent control point major node.

Note: Unless CDRSCs are predefined for adjacent CPs, CDRDYN=YES is also required for the dynamic creation of adjacent CP minor nodes.

If the DYNADJCP start option is defaulted or specified as YES, and you code an ADJCP major node, adjacent control points not specified in the ADJCP major node are still dynamically defined in the ISTADJCP major node.

If you define the DYNADJCP start option as NO, you need to define every potential adjacent CP within adjacent CP major and minor nodes. Connections are established with only those nodes you specify.

For more information about adjacent control point major nodes, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* or the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

Adjacent Control Point Major Nodes for a Small Network

The adjacent control point major node samples shown in this section are for a small APPN network consisting of three network nodes (SSCP1A, SSCP2A, and SSCPBA) and three end nodes (SSCP7B, SSCP9C, and SSCPAA). This network is shown in Figure 2 on page 2. Note that this graphic representation of the network is only intended to describe the overall topology of the network. The actual physical connections are not shown.

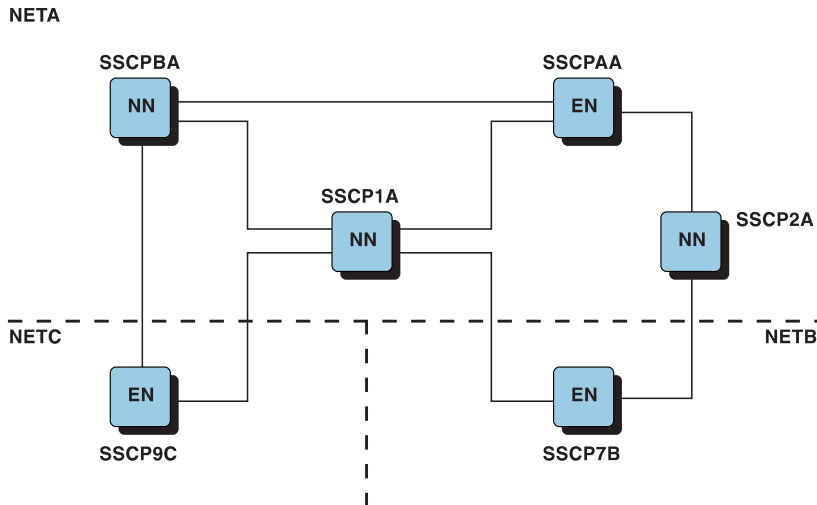


Figure 2. A Small APPN Network

Note also that not all the nodes have the same NETID.

Adjacent Control Point Major Node for SSCP1A

In the following example, there are five adjacent control point minor nodes in the adjacent control point major node ADJCPAA. SSCP2A is the name of the first minor node and the name of an adjacent CP to which connections are to be established. Although SSCPAA is known to SSCP1A, its nodetype (end node) will not be learned by SSCP1A until a connection is established between the two nodes. The following list explains the significance of the various operands specified.

Operand

Meaning

NN=YES

The adjacent node is expected to be a network node. If you do not specify a value for NN, then the APPN capabilities of the adjacent node are identified and accepted when a connection is established.

NETID=NETA

The network identifier of SSCP2A is NETA.

DYNLU

Because DYNLU is not coded, its value is the value of the DYNLU start option.

NATIVE

Because NATIVE is not coded, the two nodes negotiate their subnetwork affiliation during connection establishment: if the NETIDs match, the connection defaults to a native connection; if the NETIDs are different, the connection defaults to a nonnative connection.

VN=NO

The adjacent CP is not a virtual node.

```
* =====> BEGINNING OF DATA SET ADJCP1A
*****
* Description: Adjacent CP Major Node for SSCP1A          *
*****
*
ADJCP1A  VBUILD TYPE=ADJCP          ADJACENT CP MAJOR NODE
```



```

SSCP2A  ADJCP  NN=YES,          SSCP2A IS ADJACENT NN          X
          NETID=NETA,        NETA IS SSCP2A'S NETID        X
          VN=NO              SSCP2A IS NOT A VIRTUAL NODE
SSCPAA  ADJCP  NETID=NETA      NETA IS SSCPAA'S NETID
SSCPBA  ADJCP  NN=YES,          SSCPBA IS ADJACENT NN          X
          NETID=NETA        NETA IS SSCPBA'S NETID
SSCP7B  ADJCP  NN=NO,          SSCP7B IS ADJACENT EN          X
          NETID=NETB,        NETB IS SSCP7B'S NETID        X
          VN=NO              SSCP7B IS NOT A VIRTUAL NODE
SSCP9C  ADJCP  NN=NO,          SSCP9C IS ADJACENT EN          X
          NETID=NETC        NETC IS SSCP9C'S NETID
* =====> END OF DATA SET ADJCP1A

```

Adjacent Control Point Major Node for SSCP2A

In the adjacent control point major node below, note that, although SSCPAA is known to SSCP2A, its nodetype (end node) will not be learned by SSCP2A until a connection is established between the two nodes.

```

* =====> BEGINNING OF DATA SET ADJCP2A
*****
* Description: Adjacent CP Major Node for SSCP2A          *
*****
*
ADJCP2A  VBUILD TYPE=ADJCP
SSCP1A   ADJCP  NN=YES,NETID=NETA
SSCPAA   ADJCP  NETID=NETA
SSCPCA   ADJCP  NN=YES,NETID=NETA
SSCP7B   ADJCP  NN=NO,NETID=NETB
SSCP9C   ADJCP  NN=NO,NETID=NETC
* =====> END OF DATA SET ADJCP2A

```

Adjacent Control Point Major Node for SSCPBA

In the adjacent control point major node below, note that, although SSCPAA is known to SSCPBA, its nodetype (end node) will not be learned by SSCPBA until a connection is established between the two nodes.

```

* =====> BEGINNING OF DATA SET ADJCPBA
*****
* Description: Adjacent CP Major Node for SSCPBA          *
*****
*
ADJCPBA  VBUILD TYPE=ADJCP
SSCP1A   ADJCP  NN=YES,NETID=NETA
SSCPAA   ADJCP  NETID=NETA
SSCP9C   ADJCP  NN=NO,NETID=NETC
* =====> END OF DATA SET ADJCPBA

```

Adjacent Control Point Major Node for SSCPAA

In the adjacent control point major node shown below, note that, although SSCPBA has predefined SSCPAA as an adjacent control point (see “Adjacent Control Point Major Node for SSCPBA”), SSCPAA has not predefined SSCPBA as an adjacent control point. Therefore, SSCPAA must have the DYNADJCP start option defaulted or coded as YES to establish CP-CP sessions with SSCPBA.

```

* =====> BEGINNING OF DATA SET ADJCPAA
*****
* Description: Adjacent CP Major Node for SSCPAA          *
*****
*

```

```

ADJCPAA  VBUILD TYPE=ADJCP
SSCP1A   ADJCP  NN=YES,NETID=NETA
SSCP2A   ADJCP  NN=YES,NETID=NETA
* =====> END OF DATA SET ADJCPAA

```

Adjacent Control Point Major Node for SSCP7B

Note that this end node has defined both SSCP1A and SSCP2A as adjacent control points. These definitions are required for either SSCP1A or SSCP2A to act as SSCP7B's network node server, in the event that the DYNADJCP start option had been coded with NO as a value.

```

* =====> BEGINNING OF DATA SET ADJCP7B
*****
* Description: Adjacent CP Major Node for SSCP7B          *
*****
*
ADJCP7B  VBUILD TYPE=ADJCP
SSCP1A   ADJCP  NN=YES,NETID=NETA
SSCP2A   ADJCP  NN=YES,NETID=NETA
* =====> END OF DATA SET ADJCP7B

```

Adjacent Control Point Major Node for SSCP9C

Note that this end node has defined both SSCP1A and SSCPBA as adjacent control points. These definitions are required for either SSCP1A or SSCPBA to act as SSCP7B's network node server, in the event that the DYNADJCP start option had been coded with NO as a value.

```

* =====> BEGINNING OF DATA SET ADJCP9C
*****
* Description: Adjacent CP Major Node for SSCP9C          *
*****
*
ADJCP9C  VBUILD TYPE=ADJCP
SSCP1A   ADJCP  NN=YES,NETID=NETA
SSCPBA   ADJCP  NN=YES,NETID=NETA
* =====> END OF DATA SET ADJCP9C

```

Adjacent Control Point Minor Node with DYNLU=NO

In the following example, SSCP2A is defined as an adjacent control point with DYNLU=NO, specifying that dynamic definition of logical units is not allowed for SSCP2A. Unless you predefine the logical units that use adjacent link stations attached to this adjacent CP, the session request will fail. DYNLU=NO overrides the value coded on the DYNLU start option and also overrides the values coded on definition statements for resources attached to this adjacent CP.

```

* =====> BEGINNING OF DATA SET CMAD0901
*****
* Description: Adjacent CP Major Node for SSCP1A          *
*****
*
ADJCP1A  VBUILD TYPE=ADJCP
SSCP2A   ADJCP  NN=YES,NETID=NETA,DYNLU=NO
SSCPAA   ADJCP  NETID=NETA
* =====> END OF DATA SET CMAD0901

```

Chapter 2. Application Program Major Node

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About This Chapter

This chapter contains sample application definitions used by hosts in the VTAM network.

Application programs must be defined within an application program major node. Each application program represents a minor node.

LU 6.2 Conversation-Level Security

VTAM's LU 6.2 support provides five levels of conversation-level security for user ID verification, specified on the SECACPT operand of the APPL definition statement.

- NONE means the logical unit does not support conversation requests containing access security subfields.
- CONV means the logical unit supports conversation requests containing access security subfields.
- ALREADYV means the logical unit supports conversation requests containing access security subfields and it also accepts already-verified indications that it receives in conversation requests from partner logical units.
- PERSISTV means the logical unit supports conversation requests containing access security subfields and it also accepts persistent verification indications that it receives in conversation requests.
- AVPV means the logical unit supports conversation requests containing access security subfields, and it also accepts the already-verified indications and persistent verification indications that it receives in conversation requests.

APPC=YES is required for LU 6.2 conversation-level security.

Persistent verification during an LU 6.2 session means that, after a successful initial sign-on (in which a password is required), the user's ID and other relevant information are saved by the local and remote logical units. The user can then request access to secure resources at the remote logical unit without providing the user's password. The remote logical unit considers the user's authorization to be already verified.

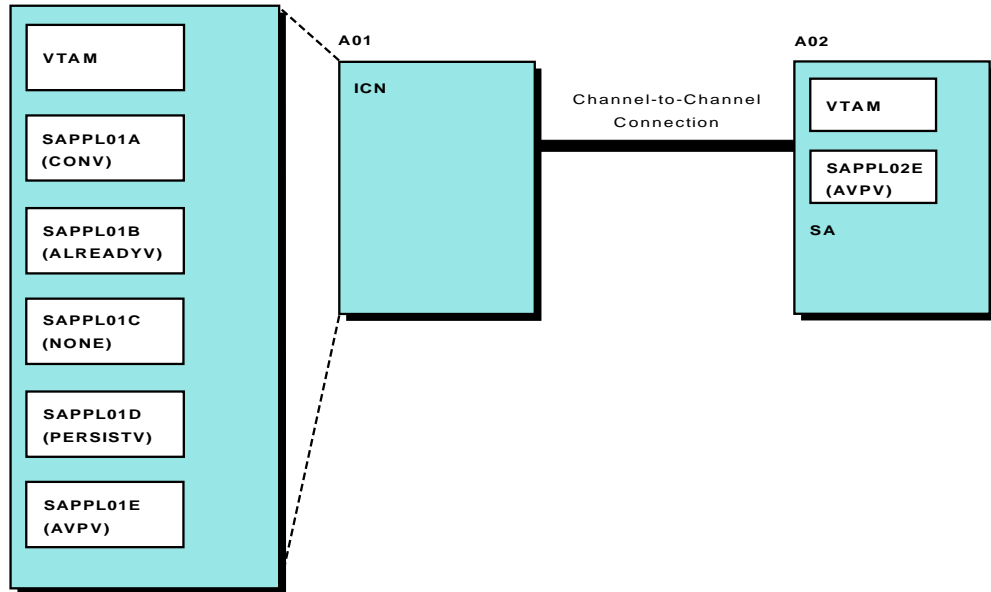


Figure 3. LU 6.2 Persistent Verification. Host A01 is an interchange node (ICN). Host A02 is a subarea node (SA).

For a more detailed description of LU 6.2 conversation-level verification, refer to the *OS/390 eNetwork Communications Server: SNA Programmers LU 6.2 Guide*.

For more information on PERSISTV, AVPV, and the other SECACPT options, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The next sample illustrates the use of the SECACPT operand.

```
*****
* A01APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - ICN A01          *
*****
* APPLS WITH LU6.2 CONVERSATION SECURITY                            *
*****
      VBUILD TYPE=APPL
SAPPL01A APPL  AUTH=(ACQ,PASS),                                     X
                APPC=YES,          ** REQUIRED FOR SECACPT KEYWORD **X
                MODETAB=AMODETAB,  ** CONVERSATION ACCESS SUBFIELDS **
                SECACPT=CONV
SAPPL01B APPL  AUTH=(ACQ,PASS),                                     X
                APPC=YES,          ** REQUIRED FOR SECACPT KEYWORD **X
                MODETAB=AMODETAB,  ** ALREADY VERIFIED INDICATIONS **
                SECACPT=ALREADYV
SAPPL01C APPL  AUTH=(ACQ,PASS),                                     X
                APPC=YES,          ** REQUIRED FOR SECACPT KEYWORD **X
                MODETAB=AMODETAB,  ** NO CONVERSATION SECURITY **
                SECACPT=NONE
SAPPL01D APPL  AUTH=(ACQ,PASS),                                     X
                APPC=YES,          ** REQUIRED FOR SECACPT KEYWORD **X
                MODETAB=AMODETAB,  ** PERSISTENT VERIFY INDICATIONS **
                SECACPT=PERSISTV
SAPPL01E APPL  AUTH=(ACQ,PASS),                                     X
                APPC=YES,          ** REQUIRED FOR SECACPT KEYWORD **X
                MODETAB=AMODETAB,  ** ACCEPTS ALL INDICATIONS **
                SECACPT=AVPV
*****
```

In the next sample, SAPPL02E is defined with SECACPT=AVPV. This application supports conversation requests containing access security subfields,

already-verified indications, and persistent verification indications when communicating with SAPPL01E from the previous sample from A01.

```
*****
* A02APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - SUBAREA A02      *
*****
* APPL WITH LU6.2 CONVERSATION                                       *
*****
          VBUILD TYPE=APPL
SAPPL02E APPL AUTH=(ACQ,PASS),                                         X
          APPC=YES,             ** REQUIRED FOR SECACPT KEYWORD**X
          MODETAB=AMODETAB,     X
          VERIFY=OPTIONAL,      ** IDENTITY VERIFICATION      **X
          SECACPT=AVPV          ** ACCEPTS ALL INDICATORS
*****
```

LU 6.2 Session-Level Security

This function provides an optional security protocol for verifying the identity of a partner LU when LU-LU sessions are established.

APPC=YES is required for LU 6.2 session-level security.

During activation of LU 6.2 sessions involving control points, the VERIFYCP start option specifies whether VTAM performs session-level LU-LU verification. See page 182.

Using the VERIFY Operand

The VERIFY operand specifies whether the VTAM program performs session-level LU-LU verification during activation of LU-LU 6.2 sessions.

- VERIFY=NONE specifies that no verification of the partner LU's identity takes place during session activation.
- VERIFY=OPTIONAL specifies that identity verification is performed for certain partner LUs during session activation. Determination for which partner LUs the LU-LU verification is performed depends on whether there is a password defined for the LU-LU pair in the installed security manager product.
- VERIFY=REQUIRED specifies that VTAM verifies the identity of all partner LUs during activation of sessions between LU 6.2 applications. Every partner LU must have an LU-LU password defined. Any partner LUs that do not have an LU-LU password defined cannot establish LU 6.2 sessions with this application program.

The example below illustrates the use of the VERIFY operand.

```
*****
* A02APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - SUBAREA A02      *
*****
* APPL WITH LU6.2 CONVERSATION                                       *
*****
          VBUILD TYPE=APPL
SAPPL02E APPL AUTH=(ACQ,PASS),                                         X
          APPC=YES,             ** REQUIRED FOR SECACPT KEYWORD**X
          MODETAB=AMODETAB,     X
          VERIFY=OPTIONAL      ** IDENTITY VERIFICATION      **X
          SECACPT=AVPV          ** ACCEPTS ALL INDICATORS
*****
```

Using the SECLVL Operand

The SECLVL operand specifies whether enhanced security verification is used during session-level LU-LU verification.

- SECLVL=ADAPT specifies that either the enhanced or the basic protocol for identity verification will be performed on sessions that use session-level LU-LU verification. VTAM attempts to use the enhanced protocol but accepts the use of the basic protocol if the partner LU does not support the enhanced protocol.
- SECLVL=LEVEL1 specifies that the basic protocol is used for sessions that use session-level LU-LU verification.
- SECLVL=LEVEL2 specifies that VTAM uses only the enhanced protocol for identity verification. If the partner LU does not support the enhanced protocol, VTAM rejects the session and issues a sense code.

The following example illustrates the use of SECLVL:

```
VBUILD TYPE=APPL
. . .
APPCAP05 APPL AUTH=(ACQ,PASS),APPC=YES,SYNCLVL=SYNCPT,ATNLOSS=ALL,      *
          OPERCNOS=ALLOW,VERIFY=REQUIRED,SECLVL=ADAPT
APPCAP06 APPL AUTH=(ACQ,PASS),APPC=YES,SYNCLVL=SYNCPT,ATNLOSS=ALL,      *
          OPERCNOS=ALLOW,VERIFY=REQUIRED,SECLVL=LEVEL1
APPCAP07 APPL AUTH=(ACQ,PASS),APPC=YES,SYNCLVL=SYNCPT,ATNLOSS=ALL,      *
          OPERCNOS=ALLOW,VERIFY=REQUIRED,SECLVL=LEVEL2
. . .
```

LU 6.2 Selective Deactivation of Idle Sessions

You can limit the use of some network connections, such as lines, groups of lines, and physical units. When a network connection is limited, a session on the connection can be deactivated if no conversation is detected for a set period of time. If all sessions are deactivated, the connection itself is deactivated.

Note: Only LU 6.2 sessions are affected by limited resource definition. Non-LU 6.2 sessions are unaffected and cannot be limited. In addition, defining a network connection as limited does not affect VTAM CP LU 6.2 sessions.

To use this function, you must:

1. Choose which network connections you want to define as limited. The best connections to choose are lines and physical units whose cost is determined by the length of time a connection exists. Defining these as limited can help reduce switched line connect charges.

You can define a line, a group of lines, or a physical unit as a limited resource for the following major nodes:

- NCP
 - External communication adapter (line only)
 - Switched (physical unit only)
 - Local SNA (physical unit only)
 - Model (physical unit only).
2. Define the connections as limited resources by coding LIMRES=YES on the major node's GROUP, LINE, or PU definition statement.
 3. Use the following steps to determine how long you want an inactive session to remain on the queue before it is deactivated:
 - a. Determine the shortest line time cost interval for the connection.
 - b. Divide that interval in half.

- c. Subtract 1 second.
4. Code the result, in seconds, on the LIMQSINT operand on the APPL definition statement.

For example, in Figure 4, S28APPLA is an APPC application program and B28CCNPU, a channel-attached type 2.1 node, has been defined for the channel between B128 and NCP B75NCP. The value for LIMQSINT is determined as follows:

1. The line time cost interval for S28APPLA is 4 minutes 2 seconds, or 242 seconds.
2. Divide that in half: $242 \div 2 = 121$.
3. Subtract 1: $121 - 1 = 120$.
4. Code LIMQSINT=120 on the APPL definition statement (See “Defining LIMQSINT” on page 10.)

In the local SNA major node, code LIMRES=YES on the PU definition statement for B28CCNPU to define B28CCNPU as a limited resource. (See “Selective Deactivation of Idle LU 6.2 Sessions” on page 73.)

The above definitions will cause any any LU 6.2 sessions in which S28APPLA is participating (except for LU 6.2 sessions that the VTAM CP is using) and which traverse B28CCNPU to be deactivated if no conversations are detected for a period of 120 seconds on B28CCNPU.

For more information on selective deactivation, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

For more information on the LIMRES and LIMQSINT operands, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

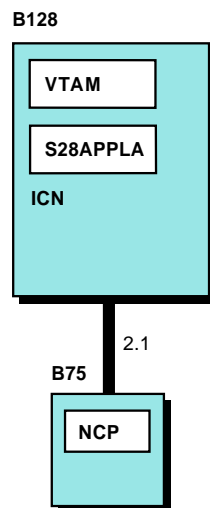


Figure 4. LU 6.2 Selective Deactivation. Host B128 is an interchange node (ICN).

Defining LIMRES

For an example of a major node that defines a limited resource, see “Selective Deactivation of Idle LU 6.2 Sessions” on page 73.

Defining LIMQSINT

In the following definition, any LU 6.2 sessions in which S28APPLA is participating and which traverse a limited resource will be deactivated if no conversations are detected for a period of 120 seconds over that limited resource.

```
*****
* B28APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - ICN B1028      *
*****
* LIMITED RESOURCE APPL                                           *
*****
          VBUILD TYPE=APPL
S28APPLA APPL  APPC=YES,                                           X
          AUTH=(ACQ,PASS),                                         X
          LIMQSINT=(120)      ** LIMITED RESOURCE EXPIRATION **
*****
```

Application-Supplied Information for Switched Connections

A VTAM application program can supply dial number digits and other dial-out switched connection information during session initiation. This application-supplied information, which you provide in the ASDP control block, temporarily overrides the information defined for the contacted device in a switched major node.

Note: This function also authorizes the application to override XID checking for the contacted device. This can cause a security exposure.

This function can be used with a type 1 or 2 physical unit or a type 2.1 node.

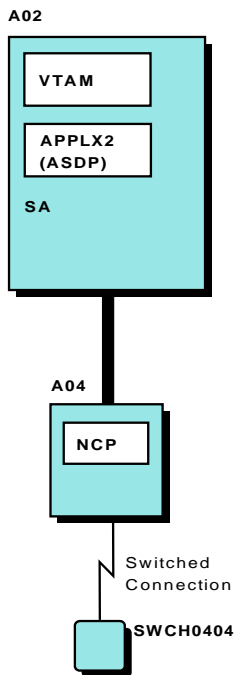


Figure 5. Application-Supplied Operands for Switched Connections. Host A02 is a subarea node (SA).

For more information on this function, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

For a sample switched major node that authorizes a physical unit to accept application-supplied dial-out information, see “Application-Supplied Operands for Switched Connections” on page 147.

For more information on the ASDP control block, refer to *OS/390 eNetwork Communications Server: SNA Programming*.

An application is authorized to supply dial-out information using the ASDP option on the AUTH operand on the APPL definition statement in an application program major node. Here, application APPLX2 is authorized to supply dial-out information (AUTH=ASDP).

```
*****
*   A02APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - SUBAREA A02   *
*****
          VBUILD TYPE=APPL
APPLX2  APPL  AUTH=(ACQ,PASS,ASDP), X
          MODETAB=AMODETAB,                                     X
          PARSESS=YES
*****
```

Extended Wildcard Enhancement

Wildcard values enable an operator or program operator application to expand a display by substituting special symbols (for example, * and ?) to represent unspecified characters in the name of a resource. In the application program major node named A01APPLS (see below), the application program minor node A01NVPPT specifies the operand DSPLYWLD=YES. DSPLYWLD=YES indicates that A01NVPPT—the program operator interface—is permitted to issue DISPLAY commands containing wildcards when the DSPLYWLD start option is FULLWILD or POAONLY. In addition, the application program must specify either AUTHLEN=PPO or AUTHLEN=SPO for DSPLYWLD=YES to take effect. Therefore, DSPLYWLD=YES is in effect for A01NVPPT (which specifies AUTH=(NVPACE,PPO)) and DSIAMLUT (which specifies AUTH=(SPO,ACQ)) but not for A01NVLUC (which only specifies AUTH=ACQ).

```
*****
*   A01APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - ICN A01   *
*****
          VBUILD TYPE=APPL
          .
          .
          .
A01NVPPT APPL  AUTH=(NVPACE,PPO),                               X
                DSPLYWLD=YES,                                   X
                DLOGMOD=DSILGMOD,                               X
                EAS=1,                                          X
                MODETAB=AMODETAB,                               X
                PRTCT=A01NV
DSIAMLUT APPL  AUTH=(SPO,ACQ),                                   X
                DSPLYWLD=YES,                                   X
                EAS=2,                                          X
                PARSESS=YES,                                    X
                PRTCT=A01NV,                                    X
                VPACING=1
*****
*   NETVIEW-NETVIEW COMMUNICATION                               *
*****
A01NVLUC APPL  AUTH=ACQ,                                       X
```

DLOGMOD=DSINLDM,	X
MODETAB=AMODETAB,	X
PARSESS=YES,	X
PRTCT=A01NV	

Data Compression

VTAM's data compression facility enables VTAM to compress the data on selected LU-LU sessions when you are using application programs in a multiple-domain network. The value specified on the COMPRES operand of the MODEENT macroinstruction determines whether data compression is allowed. If your application is the SLU and you want to use compression, code COMPRES=REQD on the MODEENT macroinstruction in the logon mode table.

If data compression is allowed, VTAM supports the following levels:

- 0 No compression
- 1 Run-length encoding (RLE) compression
- 2 Small table compression
- 3 Medium table compression
- 4 Large table compression.

The CMPVTAM start option specifies the maximum compression level allowed for sessions involving the host's application programs. A VTAM host performs data compression only if the CMPVTAM start option has been specified with a value in the range 1-4. This level can be changed by the MODIFY COMPRESS command, and displayed by the DISPLAY VTAMOPTS command.

If CMPVTAM has been specified with a value greater than 1, the CMPMIPS start option can be used to balance the number of machine cycles needed with the effectiveness of compression for outbound messages. Higher values for CMPMIPS will likely increase both compression effectiveness and cycle usage, while lower CMPMIPS values will likely lower both compression effectiveness and cycle usage.

Input and output compression levels for a specific application program are specified on the CMPAPPLI and CMPAPPLO operands on the APPL definition statement. The CMPAPPLI and CMPAPPLO operands specify the maximum compression levels for an application's input data (the data the PLU receives) and output data (the data the PLU sends), respectively. An application program's compression level can be modified by the MODIFY COMPRESS command and displayed by the DISPLAY ID command.

For more information on data compression, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

Defining Compression Limits for Application ECHO01

In the application program major node for ECHO01 shown below, CMPAPPLI=4 means that large table data compression is used for ECHO01'S input data when VTAM is the PLU for the session, unless the value set on A01's CMPVTAM start option is lower.

CMPAPPLO=1 means that RLE data compression is used for ECHO01's output data when VTAM is the PLU for the session, unless the value set on A01's CMPVTAM start option is lower.

```

*****
*   A01APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - ICN A01   *
*****
      VBUILD TYPE=APPL
ECHO01  APPL  APPC=YES,           ** APPCCMD MACRO CAPABILITY      **X
          AUTH=(ACQ,PASS),       ** APPL AUTHORIZE VTAM FUNCTION **X
          AUTOSES=2,             ** APPC - AUTO CONT WINNER SESS **X
          CMPAPPLI=4,           ** INPUT DATA COMPRESSION LEVEL **X
          CMPAPPLO=1,         ** OUTPUT DATA COMPRESSION LEVEL**X
          DMINWNL=1,             ** APPC - CONTENTION LOSER MIN  **X
          DMINWNR=1,             ** APPC - CONTENTION WINNER MIN  **X
          DSESLIM=4,             ** APPC - MODE SESSION LIMIT    **X
          MODETAB=AMODETAB,      ** LOGON MODE TABLE NAME      **X
          PARSESS=YES            ** PARALLEL SESSION CAPABILITY **

```

Defining Compression Limits for Application ECHO02

In the application program major node for ECHO02 shown below, CMPAPPLI=4 means that large table data compression is used for ECHO02'S input data when VTAM is the PLU for the session, unless the value set on A02's CMPVTAM start option is lower.

CMPAPPLO=2 means that small data compression is used for ECHO02's output data when VTAM is the PLU for the session, unless the value set on a A02's CMPVTAM start option is lower.

```

*****
*   A02APPLS - VTAM APPLICATION PROGRAM MAJOR NODE - SUBAREA A02 *
*****
      VBUILD TYPE=APPL
ECHO02  APPL  APPC=YES,           ** APPCCMD MACRO CAPABILITY      **X
          AUTH=(ACQ,PASS),       ** APPL AUTHORIZE VTAM FUNCTION **X
          AUTOSES=2,             ** APPC - AUTO CONT WINNER SESS **X
          CMPAPPLI=4,           ** INPUT DATA COMPRESSION LEVEL **X
          CMPAPPLO=2,         ** OUTPUT DATA COMPRESSION LEVEL**X
          DMINWNL=1,             ** APPC - CONTENTION LOSER MIN  **X
          DMINWNR=1,             ** APPC - CONTENTION WINNER MIN  **X
          DSESLIM=4,             ** APPC - MODE SESSION LIMIT    **X
          MODETAB=AMODETAB,      ** LOGON MODE TABLE NAME      **X
          PARSESS=YES            ** PARALLEL SESSION CAPABILITY **

```

Resource Registration in an APPN Network

Resource registration places information about the location of resources in a directory services database. This registration reduces broadcast searches by ensuring that a resource will be found in the directory services database. Resources can be registered to a directory database on a network node server and/or to a central directory server.

For an application in an APPN network, the REGISTER operand on the GROUP or APPL statement specifies how it should be registered.

REGISTER=CDSERVR

An end node resource should be registered to its network node server and central directory resource registration is requested for it. A network node resource is registered at the central directory server. This is the default for non-TSO applications, because they are likely to be the object of a search.

REGISTER=NETSRVR

An end node resource should be registered to its network node server, but central directory registration should not be requested for it.

REGISTER=NO

The resource should not be registered.

For more information on how applications are registered, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

The sample application program major node below illustrates the specification of resource registration.

```
*****
**
** APPL1A - APPL DECK FOR SSCP1A
**
*****
REGAPPL1 APPL AUTH=(PASS,ACQ),
              REGISTER=NETSRVR      NETWORK NODE SERVER REGISTRATION      X
REGAPPL2 APPL AUTH=(PASS,ACQ),
              REGISTER=CDSERVR     CENTRAL DIRECTORY REGISTRATION      X
REGAPPL3 APPL AUTH=(PASS,ACQ),
              REGISTER=NO          NO REGISTRATION
REGAPPL4 APPL AUTH=(PASS,ACQ)
```

While VTAM is running, you can change the registration of VTAM applications in an APPN network by using the MODIFY RESOURCE command. For more information, see the *OS/390 eNetwork Communications Server: SNA Operation*.

Dynamic Definition of VTAM Application Programs

In VTAM, you can code a dynamically defined application program, which can be used as the definition for one or more application programs. You code a dynamic application program definition by placing wildcard characters (* and ?) in the name of the APPL definition statement that defines characteristics for one or more application programs.

Dynamic application program definitions enable you to reduce the number of application program definitions in VTAMLST.

To code a dynamic application program definition, code an APPL definition statement to define application program characteristics that you expect to be used by one or more VTAM application programs. Use wildcard characters in the name of the APPL definition statement. You can use the following characters:

Asterisk (*)

Represents 0 or more unspecified characters

Question Mark (?)

Represents a single unspecified character

An asterisk (*) can be used in the second to eighth characters of the application program name. A question mark (?) can be used anywhere in the application program name.

For example, in the sample application program major node CLONEALP the name C? represents any two-character name that begins with C and ends with any one additional valid character. The name C* represents any name that begins with C and ends with zero to 7 additional valid characters. The name C?C represents any three-character name that begins with C, ends with C, and has any one additional valid character as its second character.

```

CLONEALP      VBUILD TYPE=APPL
.
.
.
?C           APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C           APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?          APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C*C         APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C        APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C?       APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C*C      APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C?C     APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C?C?    APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C?C?C   APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C?C?C?C*  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C*C*C*C*  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C*C       APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C*C*C*    APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
C*C*C*CC  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES

```

In the sample application program major node ASTQUEST, both ?* and ?***** match any application program major name one to eight characters in length. However, since ?***** is the more specific of the two, that will be the one chosen.

```

ASTQUEST VBUILD TYPE=APPL
?*       APPL AUTH=(PASS,ACQ,PPO),EAS=500,PARSESS=YES
?**      APPL AUTH=(PASS,ACQ,SPO),EAS=500,PARSESS=YES
?***     APPL AUTH=(PASS,ACQ,PPO),EAS=500,PARSESS=YES
?****    APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
?*****  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
?*****  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES
?*****  APPL AUTH=(PASS,ACQ),EAS=500,PARSESS=YES

```

Chapter 3. Channel-Attachment Major Node

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VTAM-to-NCP Channel Connection	21	Using MVS System Symbols	25

About This Chapter

This chapter describes sample channel-attachment major node definitions.

A channel-attachment major node is used to define the following types of support:

- Channel-to-channel adapter
- Channel-attached NCP
- Multipath channel.

VTAM-to-VTAM Channel Connection

A channel-attachment major node is used to define a channel-to-channel adapter connection between two host processors. This connection can be provided by a 3088 or 3737 unit, or by multiple channel adapters on a communication controller.

To define channel-to-channel adapter support you must define two channel-attachment major nodes for each connection, one on each host. It must include the following definition statements:

- VBUILD TYPE=CA
- GROUP LNCTL=CTCA
- LINE
- PU.

For more information on this type of connection, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

Single Transmission Group

Figure 6 on page 18 shows a channel-to-channel connection between two host processors, A01 and A02. Only one transmission group connects the two processors. The connection is defined using one channel-attachment major node for each host.

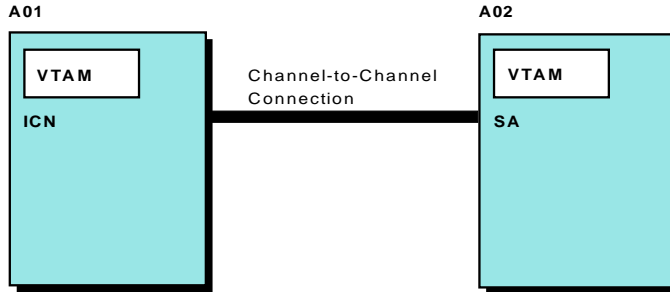


Figure 6. A VTAM-to-VTAM Channel Connection. Host A01 is an interchange node (ICN). Host A02 is a subarea node (SA).

The first channel-attachment major node shown below represents the view of the connection from host A01 in Figure 6.

The VBUILD definition statement defines the beginning of this channel-attachment major node (TYPE=CA).

The GROUP definition statement indicates that the attachment between hosts A01 and A02 is a channel-to-channel attachment (LNCTL=CTCA).

MAXBFRU defines the number of 4K-byte pages of storage that are used to buffer PIUs for transmission over the channel link. DELAY slows down the data transfer so that more PIUs can be buffered and transferred in a single I/O channel operation. In this sample, MAXBFRU=10 and DELAY=.001.

The MIH operand is coded with a value of YES so that the channel link becomes inoperative after the time period (3 seconds) specified on the REPLYTO operand. Otherwise, the channel link appears operative, but VTAM cannot use it.

You must code one LINE definition statement for each channel adapter. Here, BC2 is the address of the channel.

You must code one PU definition statement for each LINE definition statement.

```
* =====> BEGINNING OF DATA SET A01CTC
*****
* A01CTC - VTAM CHANNEL-ATTACHMENT MAJOR NODE (CTCA) - ICN A01 *
*****
          VBUILD TYPE=CA          ** CTCA MAJOR NODE          **
CTCGRP  GROUP DELAY=.001,        ** LOW-PRIORITY DATA TRANS DELAY ** X
          ISTATUS=ACTIVE,        ** INITIAL ACTIVATION STATE   ** X
          LNCTL=CTCA,            ** CTCA LINKS                 ** X
          MAXBFRU=10,           ** RECEIVE DATA BUFFER PAGE SIZE ** X
          MIH=YES,              ** MISSING INTERRUPT HANDLING  ** X
          REPLYTO=3.0           ** CHANNEL PROG COMPLETE TIME OUT **
*****
* CTC CONNECTION FROM A01 TO A02 *
*****
CTCLINE3 LINE ADDRESS=BC2        ** CHANNEL UNIT ADDRESS      **
CTCPU3  PU  PUTYPE=4,           ** PHYSICAL UNIT TYPE        ** X
          TGN=1                  ** TRANSMISSION GROUP NUMBER **
.
.
.
* =====> END OF DATA SET A01CTC
```

The next channel-attachment major node shown below represents the view of the connection from host A02 in Figure 6.

The VBUILD definition statement defines the beginning of this channel-attachment major node (TYPE=CA).

The GROUP definition statement indicates that the attachment between hosts A01 and A02 is a channel-to-channel attachment (LNCTL=CTCA), with DELAY=.001, MAXBFRU=10, MIH=YES, and REPLYTO=3.0.

The LINE definition statement shows that BC2 is the address of the channel.

You must code one PU definition statement for each LINE definition statement.

```
* =====> BEGINNING OF DATA SET A02CTC
*****
* A02CTC - VTAM CHANNEL-ATTACHMENT MAJOR NODE (CTCA) - SUBAREA A02 *
*****
          VBUILD TYPE=CA          ** CTCA MAJOR NODE          **
CTCGRP  GROUP DELAY=.001,        ** LOW-PRIORITY DATA TRANS DELAY ** X
          ISTATUS=ACTIVE,        ** INITIAL ACTIVATION STATE   ** X
          LNCTL=CTCA,           ** CTCA LINKS                 ** X
          MAXBFRU=10,          ** RECEIVE DATA BUFFER PAGE SIZE ** X
          MIH=YES,             ** MISSING INTERRUPT HANDLING  ** X
          REPLYTO=3.0          ** CHANNEL PROG COMPLETE TIME OUT **
*****
* CTC CONNECTION FROM A02 TO A01 *
*****
CTCLINE3 LINE ADDRESS=BC2        ** CHANNEL UNIT ADDRESS      **
CTCPU3  PU  PUTYPE=4,           ** PHYSICAL UNIT TYPE        ** X
          TGN=1                 ** TRANSMISSION GROUP NUMBER **
.
.
.
* =====> END OF DATA SET A02CTC
```

Parallel Transmission Groups

A transmission group is one or more physical links connecting two subareas. In a VTAM-to-VTAM configuration, each transmission group is single-link-capable only. Although you can have as many as 255 transmission groups, only 16 of these can be defined between two adjacent VTAMs, because the maximum number of explicit routes that can be defined is 16.

For more information on parallel transmission groups, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

Figure 7 on page 20 shows parallel transmission groups TGN2 and TGN3 in a multiple-domain network.

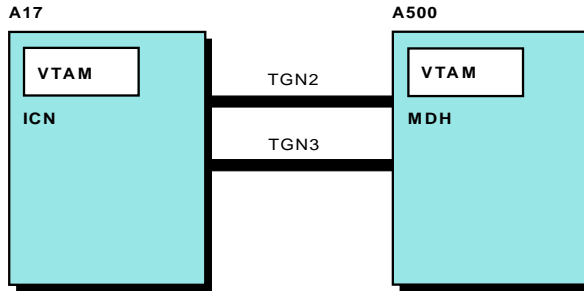


Figure 7. Parallel Transmission Groups in a Multiple-Domain Network. Host A17 is an interchange node (ICN). Host A500 is a migration data host (MDH).

The first channel-attachment major node below represents the view of the connection from host A17 in Figure 7.

The VBUILD definition statement defines the beginning of this channel-attachment major node (TYPE=CA).

The GROUP definition statement indicates that the attachments between hosts A17 and A500 are channel-to-channel attachments (LNCTL=CTCA).

You must code one LINE definition statement for each channel adapter. The address specified by the ADDRESS operand is a 3- or 4-digit hexadecimal device address, which must match the value assigned to the device during operating system I/O definition. With 4-digit device addressing you can specify as many as 65536 channel-attached devices.

You must code one PU definition statement for each LINE definition statement. The TGN operands specify transmission group numbers for the channel link transmission groups (TGN=2, TGN=3).

```
* =====> BEGINNING OF DATA SET A17CTC2
*****
* A17CTC2 - VTAM CHANNEL-ATTACHMENT MAJOR NODE (CTCA) - ICN A17      *
*          - CONNECTS A17 TO A500                                     *
*****
          VBUILD TYPE=CA          ** CTCA MAJOR NODE          **
CTCGRP2  GROUP DELAY=.001,        ** LOW-PRIORITY DATA TRANS DELAY ** X
          LNCTL=CTCA,             ** CTCA LINKS              ** X
          ISTATUS=ACTIVE,         ** INITIAL ACTIVATION STATE   ** X
          MAXBFRU=10,             ** RECEIVE DATA BUFFER PAGE SIZE ** X
          MIH=YES,                 ** MISSING INTERRUPT HANDLING  ** X
          REPLYTO=3.0             ** CHANNEL PROG COMPLETE TIME OUT **
*****
* CTC CONNECTION FROM A17 TO A500                                     *
*****
CTCLINE4 LINE ADDRESS=0BC4        ** CHANNEL UNIT ADDRESS      **
CTCPU4   PU   PUTYPE=4,           ** PHYSICAL UNIT TYPE        ** X
          TGN=2                    ** TRANSMISSION GROUP NUMBER   **
*****
* CTC CONNECTION FROM A17 TO A500                                     *
*****
CTCLINE5 LINE ADDRESS=0BC5        ** CHANNEL UNIT ADDRESS      **
CTCPU5   PU   PUTYPE=4,           ** PHYSICAL UNIT TYPE        ** X
          TGN=3                    ** TRANSMISSION GROUP NUMBER   **
* =====> END OF DATA SET A17CTC2
```

The next channel-attachment major node shown below represents the view of the connection from host A500 in Figure 7.

The VBUILD definition statement defines the beginning of this channel-attachment major node (TYPE=CA).

The GROUP definition statement indicates that the attachments between hosts A17 and A500 are channel-to-channel attachments (LNCTL=CTCA).

You must code one LINE definition statement for each channel adapter.

You must code one PU definition statement for each LINE definition statement. The TGN operands specify transmission group numbers for the channel link transmission groups (TGN=2, TGN=3).

```

* =====> BEGINNING OF DATA SET A50CTC2
*****
* A50CTC2 - VTAM CHANNEL-ATTACHMENT MAJOR NODE (CTCA) - MDH A500 *
*          CONNECTS SA 500 TO SA 17 - *
*****
          VBUILD TYPE=CA          ** CTCA MAJOR NODE          **
CTCGRP2  GROUP DELAY=.001,        ** LOW-PRIORITY DATA TRANS DELAY ** X
          LNCTL=CTCA,             ** CTCA LINKS          ** X
          ISTATUS=ACTIVE,         ** INITIAL ACTIVATION STATE ** X
          MAXBFRU=10,            ** RECEIVE DATA BUFFER PAGE SIZE ** X
          MIH=YES,               ** MISSING INTERRUPT HANDLING ** X
          REPLYTO=3.0            ** CHANNEL PROG COMPLETE TIME OUT **
*****
* CTC CONNECTION FROM A500 TO A17 *
*****
CTCLINE4 LINE ADDRESS=BC4          ** CHANNEL UNIT ADDRESS          **
CTCPU4  PU  PUTYPE=4,             ** PHYSICAL UNIT TYPE            ** X
          TGN=2                    ** TRANSMISSION GROUP NUMBER     **
*****
* CTC CONNECTION FROM A500 TO A17 *
*****
CTCLINE5 LINE ADDRESS=BC5          ** CHANNEL UNIT ADDRESS          **
CTCPU5  PU  PUTYPE=4,             ** PHYSICAL UNIT TYPE            ** X
          TGN=3                    ** TRANSMISSION GROUP NUMBER     **
* =====> END OF DATA SET A50CTC2

```

VTAM-to-NCP Channel Connection

Figure 8 on page 22 shows a channel attachment between a VTAM host and 3720 Communication Controller running the Network Control Program.

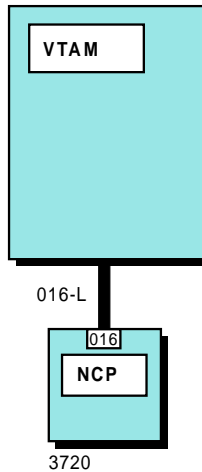


Figure 8. Channel-Attached 3720 Communication Controller

You can define a channel attachment between a host and an NCP in a channel-attachment major node. This data host attachment eliminates the requirement that the host have ownership (control) of network resources. With this channel-attachment defined, VTAM can contact a channel-attached NCP without activating the NCP.

By using this definition process, a VTAM data host is not required to establish an SSCP-PU session for data transfer to occur over the channel link to the communication controller.

The only definition required in the VTAM data host is a channel-attachment major node definition; no NCP major node definition is required. However, the NCP must be loaded and active if VTAM is to contact the NCP and not establish an SSCP-PU session.

To define a channel-attached NCP, you must code the following definition statements:

- VBUILD TYPE=CA
- GROUP LNCTL=NCP
- LINE
- PU.

When you code LNCTL=NCP, VTAM does not have to have knowledge of the resources attached to the NCP.

Code one LINE definition statement for each channel-to-NCP link.

Code one PU definition for each LINE definition statement.

For more information on using channel-attachment major nodes to define VTAM-to-NCP channel connections, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

The following sample defines a channel-attached NCP (A03) for host A500. The LINE definition statement defines 013 as the channel unit address for the channel link to the communication controller. The MAXBFRU operand specifies 100 as the maximum number of I/O buffers that are used by the VTAM host to receive data from the NCP. The default value for MAXBFRU is 3.

CHANCON=COND (the default value) indicates that VTAM allows the NCP to reject the host's CONTACT request if the host's subarea number is already in use by another host (attached to another of the NCP's channels).

DELAY=0.200 (the default value) specifies 0.200 seconds as the maximum amount of time that VTAM waits before transmitting low-priority data to the physical unit.

MAXDATA=65535 (the default value) specifies 65535 as the maximum number of bytes that the NCP can receive from VTAM in a single-segment PIU.

TGN=1 (the default value) identifies 1 as the unique transmission group number associated with this channel link connection.

```

* =====> BEGINNING OF DATA SET A50CHN
*****
*   A50CHN - VTAM CHANNEL-ATTACHMENT MAJOR NODE (NCP) - MDH A500   *
*****
*   SUBAREA CHANNEL CONNECTION FROM A500 TO A03                     *
*****
CH013  VBUILD TYPE=CA          ** CHANNEL ATTACHMENT MAJOR NODE **
CH013G GROUP LNCTL=NCP        ** NCP CHANNEL LINK             **
CH013L LINE ADDRESS=013,      ** CHANNEL UNIT ADDRESS         ** X
                                ** RECEIVE NCP DATA BUFFER SIZE **
                                ** MAXBFRU=100                      **
CH013P PU  PUTYPE=4,          ** PHYSICAL UNIT TYPE             ** X
                                ** CHANCON=COND,                    ** X
                                ** DELAY=0.100,                      ** X
                                ** MAXDATA=65535,                    ** X
                                ** TGN=1                              ** X
*****
* =====> END OF DATA SET A50CHN

```

Multipath Channel Connection

Multipath Channel (MPC) allows you to code a single transmission group for host-to-host communication that uses multiple write-direction, read-direction subchannels, as shown in Figure 9.

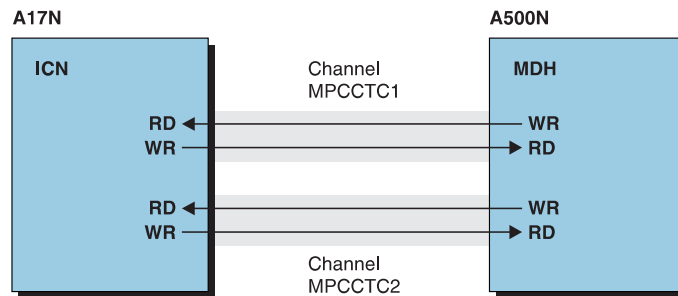


Figure 9. Two Multipath Channel Connections

There are multiple advantages to using MPC:

- Because each subchannel operates in only one direction, the half-duplex turnaround time that occurs with other channel-to-channel connections is reduced.
- If you code a transmission group in which the subchannels are divided between two physical channels, you can increase availability because the transmission group will have a path to use even if one physical channel is down.
- Because each transmission group can use more than one channel, and because the turnaround time required for half-duplex is reduced, throughput is increased.

APPN host-to-host channel connections enable two VTAMs to communicate using APPN protocols over MPC connections. APPN host-to-host channel connection support requires the definition of transport resource list major nodes and local SNA major nodes, rather than channel-attachment major nodes. For more information on APPN host-to-host channel connection see “Chapter 14. Transport Resource List Major Node” on page 161 and “APPN Host-to-Host Channel Connection” on page 72.

To define MPC support, code the following definition statements:

- VBUILD TYPE=CA
- GROUP LNCTL=MPC
- LINE
- PU.

Code only one LINE definition statement for multipath channel support. The subchannels on the physical channel are represented by the subchannel addresses coded on the READ and WRITE operands on this statement. One READ subchannel in one host and the corresponding WRITE subchannel in the other host form a complete path. In the two sample definitions below, note that the subchannel read addresses in one definition deck match the subchannel write addresses in the other.

Code one PU definition statement for the LINE definition statement.

Multipath Channel Connection for Host A17N

The following sample channel-attachment major node defines two multipath channel connections for host A17N, as shown in Figure 9 on page 23.

The VBUILD definition statement defines the beginning of this channel-attachment major node (TYPE=CA).

The first GROUP definition statement defines the transmission group MPCG1 between hosts A17N and A500N as a multipath channel connection (LNCTL=MPC). The LINE definition statement that follows defines the read and write subchannel addresses for the transmission group. READ=(BC1) defines BC1 as the read subchannel address for that transmission group. This address corresponds to the WRITE subchannel address shown for transmission group MPCG1 in the channel-attachment major node for host A500N.. WRITE=(BC2) defines BC2 as the write subchannel address for that transmission group. This address corresponds to the READ subchannel address shown for transmission group MPCG1 in the channel-attachment major node for host A500N. The READ subchannel address and the corresponding WRITE subchannel address must reference the same physical connection between the two nodes; the two addresses do not need to be identical.

```
* ===== BEGINNING OF DATA SET MPCCTC17
*****
* CHANNEL-ATTACHMENT MAJOR NODE FOR MPC          *
*****
MPCCTC  VBUILD TYPE=CA,                ** CHANNEL ATTACHMENT MAJOR NODE ** X
          CONFIGDS=CTC1CKP            ** CONFIGURATION RESTART DATASET **
MPCG1   GROUP LNCTL=MPC,              ** MULTIPATH CHANNEL CONNECTION ** X
          MAXBFRTU=16,                 ** READ SUBCHANNEL BUFFER SIZE ** X
          ISTATUS=ACTIVE,              ** BECOMES ACTIVE WITH MAJOR NODE** X
          REPLYTO=3.0                  ** TIMEOUT VALUE FOR MPC XID I/O **
MPCCTC1 LINE READ=(BC1),              ** SUBCHANNEL ADDRESS FOR READ ** X
          WRITE=(BC2)                  ** SUBCHANNEL ADDRESS FOR WRITE **
```

```

MPCPU1 PU      PUTYPE=4,TGN=1      ** LINK STATION FOR ADJACENT HOST**
*
MPCG2  GROUP  LNCTL=MPC,           ** MULTIPATH CHANNEL CONNECTION ** X
                MAXBFRU=16,       ** READ SUBCHANNEL BUFFER SIZE ** X
                ISTATUS=ACTIVE,    ** BECOMES ACTIVE WITH MAJOR NODE** X
                REPLYTO=3.0        ** TIMEOUT VALUE FOR MPC XID I/O **
MPCCTC2 LINE  READ=(BC4),          ** SUBCHANNEL ADDRESS FOR READ ** X
                WRITE=(BC5)       ** SUBCHANNEL ADDRESS FOR WRITE **
MPCPU2 PU      PUTYPE=4,TGN=2      ** LINK STATION FOR ADJACENT HOST**
*
* =====> END OF DATA SET MPCCTC17

```

Multipath Channel Connection for Host A500N

The following sample defines two multipath channel connections for host A500N.

```

* =====> BEGINNING OF DATA SET MPCCTC50
*****
* CHANNEL-ATTACHMENT MAJOR NODE FOR MPC      *
*****
MPCCTC  VBUILD TYPE=CA,           ** CHANNEL ATTACHMENT MAJOR NODE ** X
                CONFIGDS=CTC1CKP  ** CONFIGURATION RESTART DATASET **
MPCG1   GROUP  LNCTL=MPC,           ** MULTIPATH CHANNEL CONNECTION ** X
                MAXBFRU=16,       ** READ SUBCHANNEL BUFFER SIZE ** X
                ISTATUS=ACTIVE,    ** BECOMES ACTIVE WITH MAJOR NODE** X
                REPLYTO=3.0        ** TIMEOUT VALUE FOR MPC XID I/O **
MPCCTC1 LINE  READ=(BC2),          ** SUBCHANNEL ADDRESS FOR READ ** X
                WRITE=(BC1)       ** SUBCHANNEL ADDRESS FOR WRITE **
MPCPU1  PU      PUTYPE=4,TGN=1      ** LINK STATION FOR ADJACENT HOST**
*
MPCG2   GROUP  LNCTL=MPC,           ** MULTIPATH CHANNEL CONNECTION ** X
                MAXBFRU=16,       ** READ SUBCHANNEL BUFFER SIZE ** X
                ISTATUS=ACTIVE,    ** BECOMES ACTIVE WITH MAJOR NODE** X
                REPLYTO=3.0        ** TIMEOUT VALUE FOR MPC XID I/O **
MPCCTC2 LINE  READ=(BC5),          ** SUBCHANNEL ADDRESS FOR READ ** X
                WRITE=(BC4)       ** SUBCHANNEL ADDRESS FOR WRITE **
MPCPU2  PU      PUTYPE=4,TGN=2      ** LINK STATION FOR ADJACENT HOST**
*
* =====> END OF DATA SET MPCCTC50

```

Defining a Multipath Channel Connection Using MVS System Symbols

You can use MVS system symbols in the names you specify for VTAM definition statements and in the values you specify on the operands on those definition statements in all major nodes and in all definitions for routing and dynamic reconfiguration. These symbols allow a single major node to be used by multiple VTAMs in a multisystem environment. You can also use them to reduce system definition in single system environments.

Note: To use MVS system symbols in VTAM, you must have, at a minimum, MVS/ESA V5R2.

You can, for example, use MVS system symbols to code a multipath channel connection definition. Consider the channel-attachment major node that uses MVS system symbols.

```

*****
* Description: Multiple Path CTC definition deck for host 1A
*
*****
MPC&SYSCONE.  VBUILD &TYPE.=CA
MPCGP&SYSCONE.GROUP LNCTL=MPC,&PU.

```

```

&TYPE.=&NUMBER4.,X
                                REPLYTO=25.5
MPCLN&USERSYM2.&USERSYM1. LINE WRITE=(BC:
&NUMBER0.),READ=(BC1)
MPC&PU.1A &PU.

```

The MVS system symbols used in this major node have been predefined in the IEASYMM1 parmlib member, which assigned values to the standard MVS system symbol &SYSCONE and the installation-defined MVS system symbols &USERSYM1, &USERSYM2, &NUMBER0, &NUMBER4, &TYPE, and &PU, as follows:

```

*****
***** IEASYMM1 MEMBER
*****
SYSDEF  SYSCONE(1A)
        SYMDEF(&USERSYM1='A')
        SYMDEF(&USERSYM2='1')
        SYMDEF(&NUMBER0='0')
        SYMDEF(&NUMBER4='4')
        SYMDEF(&TYPE='TYPE')
        SYMDEF(&PU='PU')
*****
***** LOADM1 MEMBER
*****

```

When these MVS system symbols are resolved, the channel-attachment major node shown above becomes the following:

```

*****
*
* Description: Multiple Path CTC definition deck for host 1A
*
*****
MPC1A  VBUILD TYPE=CA
MPCGP1A GROUP LNCTL=MPC,PUTYPE=4, X
        REPLYTO=25.5
MPCLN1A LINE WRITE=(BC0),READ=(BC1)
MPCPU1A PU

```

Chapter 4. Cross-Domain Resource Major Node

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Using CDRSC Definition Statements for Independent LUs	28	Eliminating and Reducing Searches for Unavailable Resources	31
Limiting Sessions for Independent LUs	30		

About This Chapter

This chapter describes sample cross-domain resource major node definitions.

The cross-domain resource (CDRSC) major node is used to define resources in another domain and independent LUs.

Cross-domain resources are logical units (application programs, peripheral nodes, and terminals) that are controlled by another VTAM domain. Cross-domain resources are defined either dynamically or statically.

VTAM will dynamically define CDRSCs if CDRDYN=YES is coded on the host CDRM definition statement and either CDRSC=OPT is coded on the external CDRM definition statement in the cross-domain resource manager major node (if the target LU is a cross-domain resource) or DYNLU=YES is coded on the PU definition representing the link over which the BIND will be sent (if the target LU is an independent LU). When VTAM creates a dynamic CDRSC for a destination logical unit, it uses the Adjacent Link Station Selection function of the Session Management Exit (SME) and/or an adjacent SSCP table to search for the resource. For sample adjacent SSCP tables, see "Adjacent SSCP Table" on page 201. You do not have to define CDRSCs if you allow dynamic definition, but VTAM's performance is slower because of the time it takes to send session requests to SSCPs that do not own the resource.

You statically define cross-domain resources by predefining them in one or more cross-domain major nodes. You define a cross-domain resource major node by coding one VBUILD definition statement for the major node and one CDRSC definition statement for each cross-domain resource in the major node.

You can define your independent LUs by coding CDRSC definition statements for them, and specifying the adjacent link stations (physical units) that VTAM uses to contact the independent LU. You can specify the adjacent link stations either by using the ALSLIST operand on the CDRSC definition statement, or by using the adjacent link station selection function of the session management exit routine.

As shown in the samples below, cross-domain resource major nodes can be used to implement adjacent SSCP lists for CDRSCs and to permit SNA-to-SNA communication over TCP/IP networks.

For more information about cross-domain resources, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

Using CDRSC Definition Statements for Independent LUs

You can code CDRSC definition statements for your independent logical units, and specify the adjacent link stations (physical units) that VTAM uses to contact the independent logical unit. One way you can do this is by using the ALSLIST operand on the CDRSC definition statement.

For instance in the following CDRSC major node, note the CDRSC statements beginning with A5001 and ending with EC102. These are all independent logical units residing on other hosts across the TCP/IP network. By specifying the operand ALSLIST=(TCPPU1), VTAM is directed to use the adjacent link station TCPPU1 to contact the independent logical units.

The CDRSC statements beginning with SN001R0B and ending with P4ECHO define OS/2 independent logical units across a TCP/IP network. By specifying the operand ALSLIST=(TCPPU1), VTAM is directed to use the adjacent link station TCPPU1 to contact the independent logical units.

TCPPU1 is the name of a PU definition statement in the TCP/IP major node. This PU definition statement defines the physical unit for a TCP/IP major node line. For the corresponding TCP/IP major node, see "Chapter 13. TCP/IP Major Node" on page 157. See also *OS/390 eNetwork Communications Server: AnyNet SNA over TCP/IP* for more information on using SNA over TCP/IP networks.

```
* =====> BEGINNING OF DATA SET A02CDRSC
*****
*   A02CDRSC - VTAM CROSS-DOMAIN RESOURCE MAJOR NODE - SUBAREA A02   *
*****
          VBUILD TYPE=CDRSC,CONFGDS=CDRSCKPT
ECHOA01  CDRSC CDRM=A01N                ** APPLICATION OWNING HOST      **
TPNSA01  CDRSC CDRM=A01N
A01NV    CDRSC CDRM=A01N
ECHO01   CDRSC CDRM=A01N
ECHOA17  CDRSC CDRM=A17N
TPNSA17  CDRSC CDRM=A17N
A17NV    CDRSC CDRM=A17N
ECHOA81  CDRSC CDRM=A81N
TPNSA81  CDRSC CDRM=A81N
A81NV    CDRSC CDRM=A81N
ECHOA50  CDRSC CDRM=A500N
ECHO50   CDRSC CDRM=A500N
TPNSA50  CDRSC CDRM=A500N
TPNSA500 CDRSC CDRM=A500N
A50SPAP8 CDRSC CDRM=A500N
A500NV   CDRSC CDRM=A500N
ECHO01A  CDRSC CDRM=A01N
ECHO01B  CDRSC CDRM=A01N
ECHO01C  CDRSC CDRM=A01N
ECHO17A  CDRSC CDRM=A17N
ECHO17B  CDRSC CDRM=A17N
ECHO17C  CDRSC CDRM=A17N
ECHO50A  CDRSC CDRM=A500N
ECHO50B  CDRSC CDRM=A500N
ECHO50C  CDRSC CDRM=A500N
ECHO81A  CDRSC CDRM=A81N
ECHO81B  CDRSC CDRM=A81N
ECHO81C  CDRSC CDRM=A81N
ECHO82A  CDRSC CDRM=A82N
ECHO82B  CDRSC CDRM=A82N
ECHO82C  CDRSC CDRM=A82N
A0101    CDRSC CDRM=A01N
E0101    CDRSC CDRM=A01N
```

```

A0102   CDRSC CDRM=A01N
E0102   CDRSC CDRM=A01N
*****
* APPC APPLS AVAILABLE VIA SNA OVER IP
*****
A5001   CDRSC ALSLIST=(TCPPU1)    ** SNA OVER IP PU NAME IN TCPMNA
E5001   CDRSC ALSLIST=(TCPPU1)
A5002   CDRSC ALSLIST=(TCPPU1)
E5002   CDRSC ALSLIST=(TCPPU1)
A1701   CDRSC ALSLIST=(TCPPU1)
E1701   CDRSC ALSLIST=(TCPPU1)
A1702   CDRSC ALSLIST=(TCPPU1)
E1702   CDRSC ALSLIST=(TCPPU1)
AB101   CDRSC ALSLIST=(TCPPU1)    ** SNA OVER IP PU NAME IN TCPMNB
EB101   CDRSC ALSLIST=(TCPPU1)
AB102   CDRSC ALSLIST=(TCPPU1)
EB102   CDRSC ALSLIST=(TCPPU1)
AC101   CDRSC ALSLIST=(TCPPU1)    ** SNA OVER IP PU NAME IN TCPMNC
EC101   CDRSC ALSLIST=(TCPPU1)
AC102   CDRSC ALSLIST=(TCPPU1)
EC102   CDRSC ALSLIST=(TCPPU1)
*****
* PS/2 LU NAMES *****
*****
SN001R0B CDRSC ALSLIST=(TCPPU1)
PC1      CDRSC ALSLIST=(TCPPU1)
P1ECHO  CDRSC ALSLIST=(TCPPU1)
P2      CDRSC ALSLIST=(TCPPU1)
PC2     CDRSC ALSLIST=(TCPPU1)
P2ECHO  CDRSC ALSLIST=(TCPPU1)
P3      CDRSC ALSLIST=(TCPPU1)
PC3     CDRSC ALSLIST=(TCPPU1)
P3ECHO  CDRSC ALSLIST=(TCPPU1)
P4      CDRSC ALSLIST=(TCPPU1)
PC4     CDRSC ALSLIST=(TCPPU1)
P4ECHO  CDRSC ALSLIST=(TCPPU1)
        NETWORK NETID=NETB /* CROSS DOMAIN FOR NETWORK B */
ECHOB01 CDRSC CDRM=B01N
ECHOB1  CDRSC CDRM=B01N
TPNSB01 CDRSC CDRM=B01N
B01NV   CDRSC CDRM=B01N
ECHOB128 CDRSC CDRM=B128N
TPNSB128 CDRSC CDRM=B128N
B128NV  CDRSC CDRM=B128N
ECHOB1A CDRSC CDRM=B01N
ECHOB1B CDRSC CDRM=B01N
ECHOB1C CDRSC CDRM=B01N
ECHO27A CDRSC CDRM=B127N
ECHO27B CDRSC CDRM=B127N
ECHO27C CDRSC CDRM=B127N
ECHO28A CDRSC CDRM=B128N
ECHO28B CDRSC CDRM=B128N
ECHO28C CDRSC CDRM=B128N
        NETWORK NETID=NETC /* CROSS DOMAIN FOR NETWORK C */
ECHOC01 CDRSC CDRM=C01N
TPNSC01 CDRSC CDRM=C01N
C01NV   CDRSC CDRM=C01N
ECHOC1A CDRSC CDRM=C01N
ECHOC1B CDRSC CDRM=C01N
ECHOC1C CDRSC CDRM=C01N
* =====> END OF DATA SET A02CDRSC

```

Limiting Sessions for Independent LUs

In the sample CDRSC major node below, the CDRSC definition statement for cross-domain resource ECHO02 specifies MAXSESS=10, which indicates that ten is the maximum number of concurrent LU-LU sessions in which the independent LU ECHO02 can participate per link station. By limiting the number of sessions ECHO02 can establish, MAXSESS prevents ECHO02 from using all of the session control blocks generated in the NCP to which ECHO02 is attached.

```
* =====> BEGINNING OF DATA SET A50CDRSC
*****
*   A50CDRSC - VTAM CROSS-DOMAIN RESOURCE MAJOR NODE - MDH A500   *
*****
          VBUILD TYPE=CDRSC,CONFGDS=CDRSCPT
A01NV   CDRSC CDRM=A01N           ** APPLICATION OWNING HOST   **
ECHOA01 CDRSC CDRM=A01N
TPNSA01 CDRSC CDRM=A01N
TPNSA02 CDRSC CDRM=A02N
A02NV   CDRSC CDRM=A02N
ECHO02  CDRSC CDRM=A02N,           X
          MAXSESS=10           ** MAX NUMBER OF LU-LU SESSIONS **
.
.
.
* =====> END OF DATA SET A50CDRSC
```

Adjacent SSCP Lists for CDRSCs

You can increase control over adjacent SSCP selection by creating adjacent SSCP lists for CDRSCs in an adjacent SSCP table. When an adjacent SSCP list is identified for a CDRSC, session setup requests are sent to only the SSCPs in the list. If the owning SSCP is not found through one of the adjacent SSCPs in the list, session establishment fails.

In the CDRSC major node below you will find CDRSC definition statements that specify the names of adjacent SSCP lists. The ADJLIST operand is used to specify the name of the list.

```
*****
*   NAME:   CDRSC7B
*
*   USE:   DEFINE THOSE CROSS DOMAIN AND CROSS NET RESOURCES KNOWN TO
*          SSCP7B.
*****
CDRSC7B  VBUILD  TYPE=CDRSC
*
NETA     NETWORK NETID=NETA
*
APPL1   CDRSC CDRM=SSCP1A,ADJLIST=LIST1 * Adjacent SSCP List is LIST1
APPL2   CDRSC CDRM=SSCP1A,ADJLIST=LIST2 * Adjacent SSCP List is LIST2
APPL3   CDRSC CDRM=SSCP1A,ADJLIST=LIST3 * Adjacent SSCP List is LIST3
APPL4   CDRSC CDRM=SSCP1A,ADJLIST=LIST4 * Adjacent SSCP List is LIST4
L3A3278A CDRSC CDRM=SSCP1A
L3270A  CDRSC CDRM=SSCP1A
L3270B  CDRSC CDRM=SSCP1A
L3270C  CDRSC CDRM=SSCP1A
LTESTA  CDRSC CDRM=SSCP1A
LTESTB  CDRSC CDRM=SSCP1A
LTESTC  CDRSC CDRM=SSCP1A
L3284A  CDRSC CDRM=SSCP1A
TS01    CDRSC CDRM=SSCP1A
*
NETC     NETWORK NETID=NETC
```

```

*
ECHO11  CDRSC CDRM=SSCP9C,ADJLIST=LIST2 * Adjacent SSCP List is LIST2
ECHO12  CDRSC CDRM=SSCP9C,ADJLIST=LIST1 * Adjacent SSCP List is LIST1
CRECHO1 CDRSC CDRM=SSCP9C
TS09    CDRSC CDRM=SSCP9C,ADJLIST=LIST4 * Adjacent SSCP List is LIST4
L3270C1A CDRSC CDRM=SSCP9C
L3270C1B CDRSC CDRM=SSCP9C
L3270C1C CDRSC CDRM=SSCP9C

```

For samples of adjacent SSCP tables used to implement the adjacent SSCP list function, see “Defining an Adjacent SSCP List for CDRSCs” on page 205.

For a specified cross-domain resource, you can use the MODIFY RESOURCE command while VTAM is running to:

- delete the name of the resource’s current adjacent SSCP list
- add the name of an adjacent SSCP list to a cross-domain resource which does not currently have an adjacent SSCP list defined for it
- replace the name of the current adjacent SSCP list with the name of a different adjacent SSCP list.

For more information on this command, see the *OS/390 eNetwork Communications Server: SNA Operation*

For more information on adjacent SSCP lists for CDRSCs, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

Eliminating and Reducing Searches for Unavailable Resources

When a resource is unreachable in a network, futile attempts to reach it can still occur. Excessive searching for unreachable resources can adversely affect network performance. Therefore, VTAM provides search reduction support, which limits requests for resources that have been found to be unreachable.

Search reduction is turned on in VTAM by using the VTAM start option SRCHRED=ON (the default is OFF). See page 173 for more information on the SRCHRED start option. If search reduction has been turned on, the SRTIMER and SRCOUNT operands can be specified on the CDRSC definition statement or the GROUP definition statement in a CDRSC major node.

The SRTIMER operand specifies for the resource the time period (in seconds) during which requests for the resource will be limited. This time period begins when it is determined that the resource is unreachable. Once the time period expires, the next request for the resource causes VTAM to issue another search for it. This operand overrides the value of the SRTIMER start option for this CDRSC. In the CDRSC major node below, all the cross-domain resources except R50A721 default to an SRTIMER value of 600 seconds, as a result of the SRTIMER specification on the GROUP definition statement.

The SRCOUNT operand specifies for the resource the number of subsequent search requests to be limited after it is determined that the resource is unreachable. Once this limit is reached, the next request for the resource causes VTAM to issue another search for it. This operand overrides the value of the SRCOUNT start option for this CDRSC. See page 173 for more information about the SRCOUNT start option. In the CDRSC major node below, all the cross-domain resources except ECHO50A have a default SRCOUNT value of 15, as a result of the SRCOUNT value specified on the GROUP definition statement.

Search reduction for a resource is stopped when either of these two thresholds is reached. For more information on specifying search reduction values, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

```
* =====> BEGINNING OF DATA SET A02CDRSC
*****
*
*   A02CDRSC - VTAM CROSS-DOMAIN RESOURCE MAJOR NODE - SUBAREA A02   *
*
*****

          VBUILD TYPE=CDRSC,CONFIGDS=CDRSCKPT
NETA     NETWORK NETID=NETA
CDRGRP1  GROUP CDRM=A500N,SRTIMER=600,SRCOUNT=15
NEGAP50  CDRSC
ECHO50A  CDRSC SRCOUNT=1500 * Override default
A50A721  CDRSC SRTIMER=0    * Override default
W3324802 CDRSC
* =====> END OF DATA SET A02CDRSC
```

Chapter 5. Cross-Domain Resource Manager Major Node

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About This Chapter

This chapter describes sample cross-domain resource manager major node definitions.

A cross-domain resource manager (CDRM) is the part of an SSCP that supports cross-domain session setup and takedown. Before logical units in one domain can have cross-domain sessions with logical units in another domain, an SSCP-SSCP session must be established between the SSCPs of the two domains.

You define a cross-domain resource manager in a cross-domain resource manager major node. You need to define a cross-domain resource manager major node to permit cross-domain sessions in subarea networks. For pure APPN networks, in contrast, you do not need to define CDRM major nodes. However, the use of virtual-route-based transmission groups between APPN nodes with subarea capability (interchange nodes and migration data hosts) requires the definition of cross-domain resource major nodes.

SSCP-SSCP Sessions

For an SSCP-SSCP session to exist, VTAM must know about all cross-domain resource managers with which it will communicate. For subarea nodes, you must define to VTAM its own (host) cross-domain resource manager and all other (external) cross-domain resource managers with which SSCP-SSCP sessions are desired.

Thus, to have an SSCP-SSCP session, define two cross-domain resource managers to each VTAM: one for the host and one for the external cross-domain resource manager. You file these definitions in a CDRM major node. Each cross-domain resource manager is a minor node.

Each host in a subarea network has a CDRM definition statement for the other hosts. The name of each CDRM matches the name defined to that host by the SSCPNAME start option.

To illustrate, consider the network depicted in Figure 10 on page 36. In the sample cross-domain resource manager major node named A01CDRM (see below), the CDRM definition statement labeled A01N defines the host cross-domain resource manager for node A01. The CDRM definition statements labeled A02N, A17N, A81N, A500N, and B01N define the external cross-domain resource managers for nodes A02, A17, A81, A500, and B01.

Dynamic Definition of Cross-Domain Resources

You do not have to define resources owned by VTAMs in other domains. VTAM can dynamically create the definition statements to represent resources that reside in other domains.

To have resources in other domains dynamically defined to VTAM:

1. Code your host CDRM definition statement with CDRDYN=YES
2. Code your external CDRM definition statements with CDRSC=OPT.

Dynamically defined CDRSCs are deactivated and deleted by VTAM on a periodic basis if they are not in use, based on the setting of the timer specified in the CDRSCTI start option.

Consider, for example, the network depicted in Figure 10 on page 36. Coding CDRDYN=YES allows A01N to dynamically define CDRSCs of cross-domain or cross-network resources. It is only meaningful for the host CDRM statement. Coding CDRSC=OPT on an external CDRM definition authorizes dynamic definition of cross-domain or cross-network resources owned by that CDRM. For example, since A02 has CDRSC=OPT coded, A01 can dynamically define CDRSCs for sessions with LUs through A02.

```
* =====> BEGINNING OF DATA SET A01CDRM
*****
* A01CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJOR NODE - ICN A01 *
*****
      VBUILD TYPE=CDRM,CONFIGDS=CDRMCKP
NETA  NETWORK NETID=NETA      ** NETWORK IDENTIFIER      **
A01N  CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
      CDRSC=OPT,              ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
      ELEMENT=1,              ** HOST ELEMENT ADDRESS        ** X
      ISTATUS=ACTIVE,         ** CDRM INITIAL ACTIVATION STATUS ** X
      RECOVERY=YES,          ** CDRM AUTOMATIC RECOVERY     ** X
      SUBAREA=1,             ** NETWORK UNIQUE SUBAREA ADDRESS ** X
      VPACING=63              ** CDRM REQS BEFORE PACING RESP **
A02N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,              X
      ELEMENT=1,              X
      ISTATUS=INACTIVE,       X
      RECOVERY=YES,          X
      SUBAREA=2,              X
      VPACING=63
A17N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,              X
      ELEMENT=1,              X
      ISTATUS=INACTIVE,       X
      RECOVERY=YES,          X
      SUBAREA=17,             X
      VPACING=63
A81N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,              X
      ELEMENT=1,              X
      ISTATUS=INACTIVE,       X
      RECOVERY=YES,          X
      SUBAREA=81,             X
      VPACING=63
A500N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,              X
      ELEMENT=1,              X
      ISTATUS=INACTIVE,       X
      RECOVERY=YES,          X
      SUBAREA=500,           X
      VPACING=63
```



```

*****
*      NETWORK B  CDRMS      *
*****
NETB   NETWORK NETID=NETB
B01N   CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
        CDRSC=OPT,           ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
        ISTATUS=INACTIVE    ** CDRM INITIAL ACTIVATION STATUS **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A01 -> A04 ->A03/B03 -> B01
* A01 -> A04 ->A03/B03 -> B31 -> B01
*****
        GWPATH ADJNET=NETB,      ** ADJACENT NETWORK IDENTIFIER  ** X
                ADJNETEL=1,      ** ADJACENT NETWORK ELEMENT    ** X
                ADJNETSA=01,     ** ADJACENT NETWORK SUBAREA   ** X
                ELEMENT=1,       ** ELEMENT ADDRESS            ** X
                SUBAREA=3        ** SUBAREA ADDRESS            **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A01 -> A04 ->A03/C31 -> C03/B31 -> B01
*****
        GWPATH ADJNET=NETC,      X
                ADJNETEL=6,      X
                ADJNETSA=03,     X
                ELEMENT=1,       X
                SUBAREA=3
* =====> END OF DATA SET A01CDRM

```

Connecting Multiple Networks using SNA Network Interconnection

A multiple-network environment consists of multiple independent SNA subarea networks that are interconnected. The SNA network interconnection (SNI) facility enables communication between these separate networks.

To make use of SNA network interconnection, you must identify your different networks and define the resources that enable network-network communication. These resources are:

- Gateway VTAMs
- Gateway NCPs.

CDRM major nodes and NCP major nodes, together with VTAM start options, are used to define these resources. For a full discussion of SNA network interconnection and how to define these resources for various types of SNI configurations, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

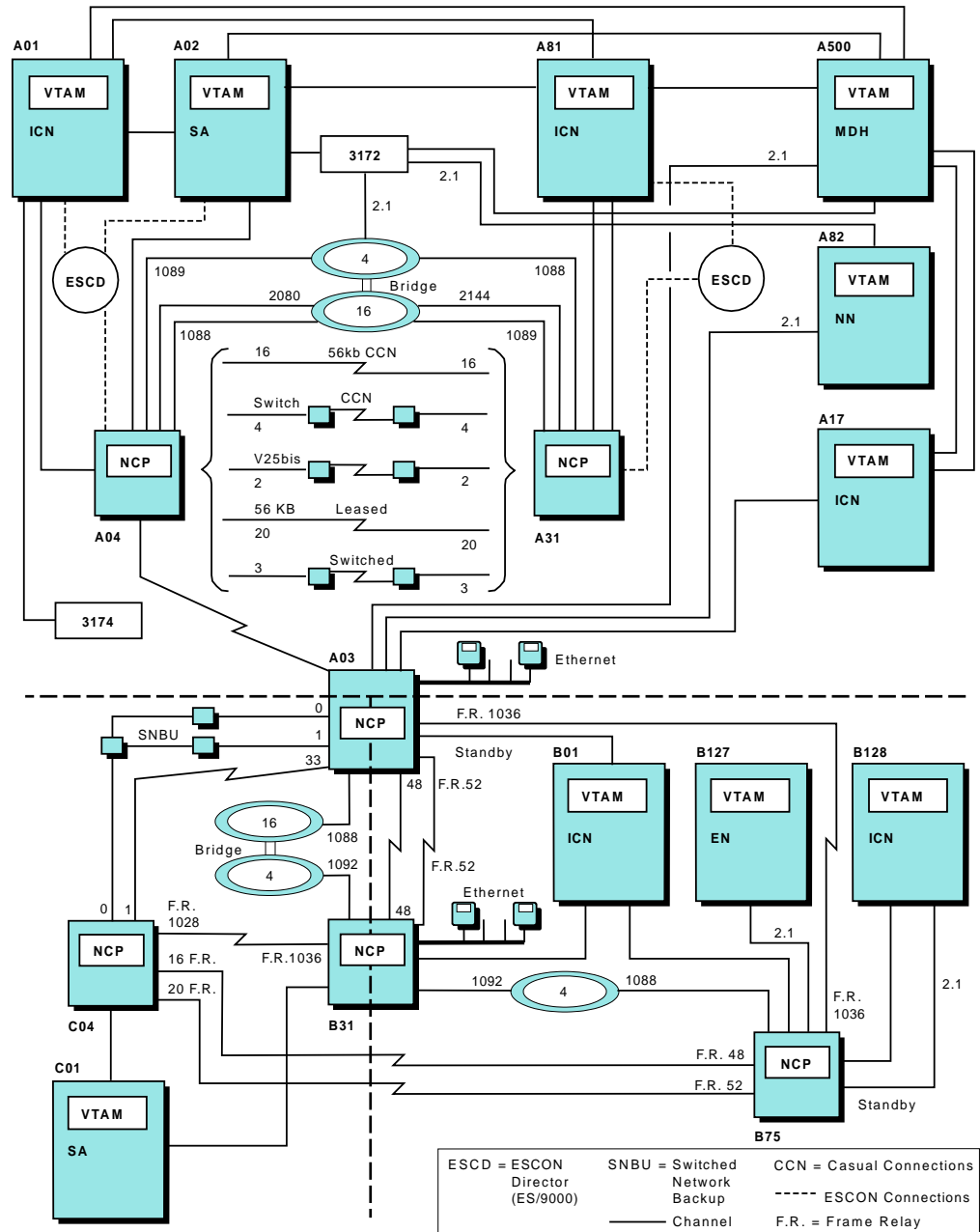


Figure 10. VTAM Hosts in a Multiple-Network Environment

The sample CDRM major node definitions below and the CDRM major node for A01N on page 34, together with the PATH definitions and the associated NCP major node definitions, are necessary to allow LU-LU sessions to be set up among the subarea-capable nodes in the network shown in Figure 10. You will find the PATH definitions for these same nodes in “Chapter 15. Path Definition Statements” on page 165. The sample NCP major node definition for the A03 gateway NCP and its description are found in “Channel-Attached NCP” on page 89 and “Connecting Multiple Networks using SNA Network Interconnection” on page 98, respectively.

CDRM Major Node for Host B01

If VTAM is started at B01 with the start option GWSSCP=YES, B01 is considered to be a gateway VTAM. The GWPATH definition statements in the CDRM major node for B01 define possible cross-network session paths between the gateway host CDRM and a CDRM in another network. NETWORK definition statements define NETA and NETC as the networks in which the cross-network external CDRMs reside.

```

* =====> BEGINNING OF DATA SET B01CDRM
*****
* B01CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJOR NODE - ICN B01 *
*****
      VBUILD TYPE=CDRM,CONFGDS=CDRMCKP
*****
*      NETWORK B  CDRMS      *
*****
NETB   NETWORK NETID=NETB      ** NETWORK IDENTIFIER      **
B01N   CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
        CDRSC=OPT,           ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
        ELEMENT=1,          ** HOST ELEMENT ADDRESS      ** X
        ISTATUS=ACTIVE,     ** CDRM INITIAL ACTIVATION STATUS ** X
        RECOVERY=YES,      ** CDRM AUTOMATIC RECOVERY   ** X
        SUBAREA=01,        ** NETWORK UNIQUE SUBAREA ADDRESS ** X
        VPACING=63         ** CDRM REQ5 BEFORE PACING RESP **
B128N  CDRM  CDRDYN=YES,      X
        CDRSC=OPT,          X
        ELEMENT=1,          X
        ISTATUS=INACTIVE,   X
        RECOVERY=YES,      X
        SUBAREA=1028,      X
        VPACING=63
*      STATOPT='NETB CDRM'
*****
*      NETWORK A  CDRMS      *
*****
NETA   NETWORK NETID=NETA
A01N   CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
        CDRSC=OPT,           ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
        ISTATUS=INACTIVE     ** CDRM INITIAL ACTIVATION STATUS **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03 -> A04 -> A01
* B01 -> B31 -> B03/A03 -> A04 -> A01
*****
      GWPATH ADJNET=NETA,      ** ADJACENT NETWORK IDENTIFIER ** X
        ADJNETSA=01,         ** ADJACENT NETWORK SUBAREA   ** X
        ELEMENT=01,          ** ELEMENT ADDRESS            ** X
        SUBAREA=03           ** SUBAREA ADDRESS            **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C31/A03 -> A04 -> A01
*****
      GWPATH ADJNET=NETC,      X
        ADJNETEL=01,         X
        ADJNETSA=31,         X
        ELEMENT=1,          X
        SUBAREA=31
A02N   CDRM  CDRDYN=YES,      X
        CDRSC=OPT,          X
        ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03 -> A04 -> A02
* B01 -> B31 -> B03/A03 -> A04 -> A02
*****

```

```

                GWPATH ADJNET=NETA,
                    ADJNETSA=02,
                    ELEMENT=02,
                    SUBAREA=03
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C31/A03 -> A04 -> A02
*****
                GWPATH ADJNET=NETC,
                    ADJNETEL=02,
                    ADJNETSA=31,
                    ELEMENT=2,
                    SUBAREA=31
A17N    CDRM  CDRDYN=YES,
                    CDRSC=OPT,
                    ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03 -> A17
* B01 -> B31 -> B03/A03 -> A17
*****
                GWPATH ADJNET=NETA,
                    ADJNETSA=17,
                    ELEMENT=03,
                    SUBAREA=03
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C31/A03 -> A17
*****
                GWPATH ADJNET=NETC,
                    ADJNETEL=03,
                    ADJNETSA=31,
                    ELEMENT=3,
                    SUBAREA=31
A81N    CDRM  CDRDYN=YES,
                    CDRSC=OPT,
                    ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03 -> A04 -> A31 -> A81
* B01 -> B31 -> B03/A03 -> A04 -> A31 -> A81
*****
                GWPATH ADJNET=NETA,
                    ADJNETSA=81,
                    ELEMENT=04,
                    SUBAREA=03
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C31/A03 -> A04 -> A31 -> A81
*****
                GWPATH ADJNET=NETC,
                    ADJNETEL=04,
                    ADJNETSA=31,
                    ELEMENT=4,
                    SUBAREA=31
A500N   CDRM  CDRDYN=YES,
                    CDRSC=OPT,
                    ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03 -> A500
* B01 -> B31 -> B03/A03 -> A500
*****
                GWPATH ADJNET=NETA,
                    ADJNETSA=500,
                    ELEMENT=05,
                    SUBAREA=03

```

```

*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C31/A03 -> A500
*****
      GWPATH ADJNET=NETC,
      ADJNETEL=05,
      ADJNETSA=31,
      ELEMENT=5,
      SUBAREA=31
*****
* NETWORK C CDRMS
*****
NETC NETWORK NETID=NETC
C01N CDRM CDRDYN=YES,
      ISTATUS=INACTIVE,
      CDRSC=OPT
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B31/C03 -> C01
* B01 -> B31/C03 -> C31 -> C04 -> C01
*****
      GWPATH ADJNET=NETC,
      ADJNETSA=01,
      ELEMENT=6,
      SUBAREA=31
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/C31 -> C03 -> C01
* B01 -> B03/C31 -> C04 -> C01
*****
      GWPATH ADJNET=NETC,
      ADJNETSA=01,
      ELEMENT=6,
      SUBAREA=03
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* B01 -> B03/A03/C31 -> C03 -> C01
* B01 -> B03/A03/C31 -> C04 -> C01
*****
      GWPATH ADJNET=NETA,
      ADJNETEL=3,
      ADJNETSA=03,
      ELEMENT=6,
      SUBAREA=03
* =====> END OF DATA SET B01CDRM

```

CDRM Major Node for Host A02

If VTAM is started at A02 with the start option GWSSCP=YES, A02 is considered to be a gateway VTAM. The GWPATH definition statements in the CDRM major node for A02 define possible cross-network session paths between the gateway host CDRM and a CDRM in another network. A NETWORK definition statement defines NETB as the network in which the cross-network external CDRMs reside.

```

* =====> BEGINNING OF DATA SET A02CDRM
*****
* A02CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJ NODE - SUBAREA A02 *
*****
      VBUILD TYPE=CDRM,
      CONFGDS=CDRMCKP
NETA NETWORK NETID=NETA ** NETWORK IDENTIFIER **
A01N CDRM CDRDYN=YES, ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      CDRSC=OPT, ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      ELEMENT=1, ** HOST ELEMENT ADDRESS ** X
      ISTATUS=INACTIVE, ** CDRM INITIAL ACTIVATION STATUS ** X
      RECOVERY=YES, ** CDRM AUTOMATIC RECOVERY ** X

```

```

                SUBAREA=1,          ** NETWORK UNIQUE SUBAREA ADDRESS ** X
                VPACING=63          ** CDRM REQS BEFORE PACING RESP **
A02N   CDRM   CDRDYN=YES,          X
                CDRSC=OPT,          X
                ELEMENT=1,          X
                ISTATUS=ACTIVE,     X
                RECOVERY=YES,       X
                SUBAREA=2,          X
                VPACING=63
A17N   CDRM   CDRDYN=YES,          X
                CDRSC=OPT,          X
                ELEMENT=1,          X
                ISTATUS=INACTIVE,   X
                RECOVERY=YES,       X
                SUBAREA=17,         X
                VPACING=63
A81N   CDRM   CDRDYN=YES,          X
                CDRSC=OPT,          X
                ELEMENT=1,          X
                ISTATUS=INACTIVE,   X
                RECOVERY=YES,       X
                SUBAREA=81,         X
                VPACING=63
A500N  CDRM   CDRDYN=YES,          X
                CDRSC=OPT,          X
                ELEMENT=1,          X
                ISTATUS=INACTIVE,   X
                RECOVERY=YES,       X
                SUBAREA=500,        X
                VPACING=63
*****
*      NETWORK B  CDRMS      *
*****
NETB   NETWORK NETID=NETB
B01N  CDRM   CDRDYN=YES,          ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                CDRSC=OPT,          ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                ISTATUS=INACTIVE    ** CDRM INITIAL ACTIVATION STATUS **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A02 -> A04 ->A03/B03 -> B01
* A02 -> A04 ->A03/B03 -> B31 -> B01
*****
                GWPATH ADJNET=NETB, ** ADJACENT NETWORK IDENTIFIER ** X
                ADJNETEL=1,         ** ADJACENT NETWORK SUBAREA   ** X
                ADJNETSA=01,        ** ADJACENT NETWORK ELEMENT  ** X
                ELEMENT=1,          ** ELEMENT ADDRESS           ** X
                SUBAREA=3           ** SUBAREA ADDRESS           **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A02 -> A04 ->A03/C31 -> C03/B31 -> B01
*****
                GWPATH ADJNET=NETC,          X
                ADJNETEL=6,                  X
                ADJNETSA=03,                 X
                ELEMENT=1,                   X
                SUBAREA=3                     X
* =====> END OF DATA SET A02CDRM

```

CDRM Major Node for Host A17

If VTAM is started at A17 with the start option GWSSCP=YES, A17 is considered to be a gateway VTAM. The GWPATH definition statements in the CDRM major node for A17 define possible cross-network session paths between the gateway

host CDRM and a CDRM in another network. NETWORK definition statements define NETB and NETC as the networks in which the cross-network external CDRMs reside.

```

* =====> BEGINNING OF DATA SET A17CDRM
*****
* A17CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJOR NODE - ICN A17 *
*****
      VBUILD TYPE=CDRM,CONFGDS=CDRMCKP
NETA  NETWORK NETID=NETA      ** NETWORK IDENTIFIER      **
A01N  CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      CDRSC=OPT,            ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      ELEMENT=1,           ** HOST ELEMENT ADDRESS      ** X
      ISTATUS=INACTIVE,    ** CDRM INITIAL ACTIVATION STATUS ** X
      RECOVERY=YES,       ** CDRM AUTOMATIC RECOVERY    ** X
      SUBAREA=01,         ** NETWORK UNIQUE SUBAREA ADDRESS ** X
      VPACING=63          ** CDRM REQ$ BEFORE PACING RESP **
A02N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,            X
      ELEMENT=1,           X
      ISTATUS=INACTIVE,    X
      RECOVERY=YES,       X
      SUBAREA=2,         X
      VPACING=63
A17N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,            X
      ELEMENT=1,           X
      ISTATUS=ACTIVE,     X
      RECOVERY=YES,       X
      SUBAREA=17,         X
      VPACING=63
A81N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,            X
      ELEMENT=1,           X
      ISTATUS=INACTIVE,    X
      RECOVERY=YES,       X
      SUBAREA=81,         X
      VPACING=63
A500N CDRM  CDRDYN=YES,      X
      CDRSC=OPT,            X
      ELEMENT=1,           X
      ISTATUS=INACTIVE,    X
      RECOVERY=YES,       X
      SUBAREA=500,        X
      VPACING=63
*****
* NETWORK B CDRMS *
*****
NETB  NETWORK NETID=NETB
B01N  CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      CDRSC=OPT,            ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      ISTATUS=INACTIVE,    ** CDRM INITIAL ACTIVATION STATUS ** X
      RECOVERY=YES        ** CDRM AUTOMATIC RECOVERY    **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A17 -> A03/B03 -> B01
* A17 -> A03/B03 -> B31 -> B01
*****
      GWPATH ADJNET=NETB,    ** ADJACENT NETWORK IDENTIFIER ** X
      ADJNETSA=01,         ** ADJACENT NETWORK SUBAREA    ** X
      ELEMENT=1,           ** ELEMENT ADDRESS             ** X
      SUBAREA=3            ** SUBAREA ADDRESS             **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A17 -> A03/C31 -> C03/B31 -> B01
*****
      GWPATH ADJNET=NETC,      X

```

```

                ADJNETEL=6,                X
                ADJNETSA=03,              X
                ELEMENT=1,                X
                SUBAREA=3
*****
*      NETWORK C  CDRMS      *
*****
NETC      NETWORK NETID=NETC
C01N     CDRM  CDRDYN=YES,                X
                CDRSC=OPT,                X
                ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A17 -> A03/C31 -> C03 -> C01
* A17 -> A03/C31 -> C04 -> C01
*****
                GWPATH ADJNET=NETC,        X
                ADJNETSA=01,              X
                ELEMENT=3,                X
                SUBAREA=3
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A17 -> A03/B03 -> B31/C03 -> C01
*****
                GWPATH ADJNET=NETB,        X
                ADJNETEL=6,                X
                ADJNETSA=31,              X
                ELEMENT=3,                X
                SUBAREA=3
* =====> END OF DATA SET A17CDRM

```

CDRM Major Node for Host A500

The following sample for host A500 has no network definition statement defining CDRMs in other networks. This means that this host is **not** a gateway VTAM.

```

* =====> BEGINNING OF DATA SET A50CDRM
*****
* A50CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJOR NODE - MDH A500 *
*****
                VBUILD TYPE=CDRM,CONFGDS=CDRMCKP
NETA      NETWORK NETID=NETA      ** NETWORK IDENTIFIER      **
A01N     CDRM  CDRDYN=YES,        ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                CDRSC=OPT,        ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                ELEMENT=1,        ** HOST ELEMENT ADDRESS      ** X
                ISTATUS=INACTIVE, ** CDRM INITIAL ACTIVATION STATUS ** X
                RECOVERY=YES,     ** CDRM AUTOMATIC RECOVERY   ** X
                SUBAREA=1,        ** NETWORK UNIQUE SUBAREA ADDRESS ** X
                VPACING=63        ** CDRM REQ3 BEFORE PACING RESP **
A02N     CDRM  CDRDYN=YES,                X
                CDRSC=OPT,                X
                ELEMENT=1,                X
                ISTATUS=INACTIVE,          X
                RECOVERY=YES,              X
                SUBAREA=2,                X
                VPACING=63
A17N     CDRM  CDRDYN=YES,                X
                CDRSC=OPT,                X
                ELEMENT=1,                X
                ISTATUS=INACTIVE,          X
                RECOVERY=YES,              X
                SUBAREA=17,               X
                VPACING=63
A81N     CDRM  CDRDYN=YES,                X
                CDRSC=OPT,                X
                ELEMENT=1,                X

```



```

                ISTATUS=INACTIVE,           X
                RECOVERY=YES,               X
                SUBAREA=81,                 X
                VPACING=63
A500N   CDRM   CDRDYN=YES,                 X
                CDRSC=OPT,                 X
                ELEMENT=1,                 X
                ISTATUS=ACTIVE,            X
                RECOVERY=YES,              X
                SUBAREA=500,               X
                VPACING=63
*****
* =====> END OF DATA SET A50CDRM

```

CDRM Major Node for Host A81

If VTAM is started at A81 with the start option GWSSCP=YES, A81 is considered to be a gateway VTAM. The GWPATH definition statements in the CDRM major node for A81 define possible cross-network session paths between the gateway host CDRM and a CDRM in another network. A NETWORK definition statement defines NETB as the network in which the cross-network external CDRMs reside.

```

* =====> BEGINNING OF DATA SET A81CDRM
*****
* A81CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJOR NODE - ICN A81 *
*****
                VBUILD TYPE=CDRM,CONFGDS=CDRMCKP
NETA   NETWORK NETID=NETA      ** NETWORK IDENTIFIER      **
A01N   CDRM   CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                CDRSC=OPT,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
                ELEMENT=1,       ** HOST ELEMENT ADDRESS      ** X
                ISTATUS=INACTIVE, ** CDRM INITIAL ACTIVATION STATUS ** X
                RECOVERY=YES,    ** CDRM AUTOMATIC RECOVERY    ** X
                SUBAREA=1,       ** NETWORK UNIQUE SUBAREA ADDRESS ** X
                VPACING=63       ** CDRM REQ3 BEFORE PACING RESP **
A02N   CDRM   CDRDYN=YES,      X
                CDRSC=OPT,      X
                ELEMENT=1,      X
                ISTATUS=INACTIVE, X
                RECOVERY=YES,    X
                SUBAREA=2,      X
                VPACING=63
A17N   CDRM   CDRDYN=YES,      X
                CDRSC=OPT,      X
                ELEMENT=1,      X
                ISTATUS=INACTIVE, X
                RECOVERY=YES,    X
                SUBAREA=17,     X
                VPACING=63
A81N   CDRM   CDRDYN=YES,      X
                CDRSC=OPT,      X
                ELEMENT=1,      X
                ISTATUS=ACTIVE,   X
                RECOVERY=YES,    X
                SUBAREA=81,     X
                VPACING=63
A500N   CDRM   CDRDYN=YES,      X
                CDRSC=OPT,      X
                ELEMENT=1,      X
                ISTATUS=INACTIVE, X
                RECOVERY=YES,    X
                SUBAREA=500,     X
                VPACING=63
*****
* NETWORK B CDRMS *
*****

```

```

NETB    NETWORK NETID=NETB
B01N    CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
          CDRSC=OPT,          ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
          ISTATUS=INACTIVE    ** CDRM INITIAL ACTIVATION STATUS **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A81 -> A31 -> A04 -> A03/B03 -> B01
* A81 -> A31 -> A04 -> A03/B03 -> B31 -> B01
*****
      GWPATH ADJNET=NETB,      ** ADJACENT NETWORK IDENTIFIER  ** X
          ADJNETSA=01,        ** ADJACENT NETWORK SUBAREA    ** X
          ELEMENT=1,          ** ELEMENT ADDRESS              ** X
          SUBAREA=3,          ** SUBAREA ADDRESS              **
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* A81 -> A31 -> A04 -> A03/C31 -> C03 -> B01
*****
      GWPATH ADJNET=NETC,      X
          ADJNETEL=6,         X
          ADJNETSA=03,        X
          ELEMENT=1,          X
          SUBAREA=3
* =====> END OF DATA SET A81CDRM

```

CDRM Major Node for Host C01

If VTAM is started at C01 with the start option GWSSCP=YES, C01 is considered to be a gateway VTAM. The GWPATH definition statements in the CDRM major node for C01 define possible cross-network session paths between the gateway host CDRM and a CDRM in another network. NETWORK definition statements define NETA and NETB as the networks in which the cross-network external CDRMs reside.

```

* =====> BEGINNING OF DATA SET C01CDRM
*****
* C01CDRM - VTAM CROSS-DOMAIN RESOURCE MANAGER MAJ NODE - SUBAREA C01 *
*****
      VBUILD TYPE=CDRM,CONFIGDS=CDRMCKP
NETC    NETWORK NETID=NETC    ** NETWORK IDENTIFIER          **
C01N    CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
          CDRSC=OPT,          ** AUTHORIZE DYNAMIC CDRSC DEF.  ** X
          ELEMENT=1,          ** HOST ELEMENT ADDRESS          ** X
          ISTATUS=ACTIVE,     ** CDRM INITIAL ACTIVATION STATUS ** X
          RECOVERY=YES,       ** CDRM AUTOMATIC RECOVERY       ** X
          SUBAREA=01,         ** NETWORK UNIQUE SUBAREA ADDRESS ** X
          VPACING=63          ** CDRM REQ'S BEFORE PACING RESP **
*****
*      NETWORK A CDRMS
*****
NETA    NETWORK NETID=NETA    ** NETWORK IDENTIFIER          **
A17N    CDRM  CDRDYN=YES,      X
          CDRSC=OPT,          X
          ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C03/B31 -> C31/A03 -> A17
* C01 -> C04 -> C31/A03 -> A17
*****
      GWPATH ADJNET=NETA,      X
          ADJNETSA=17,        X
          ELEMENT=03,         X
          SUBAREA=31
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C03/B31 -> B03/A03 -> A17
*****

```

```

          GWPATH ADJNET=NETB,
              ADJNETEL=03,
              ADJNETSA=03,
              ELEMENT=3,
              SUBAREA=03
A500N  CDRM  CDRDYN=YES,
          CDRSC=OPT,
          ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C03/B31 -> B03/A03 -> A500
* C01 -> C04 -> C31/A03 -> A500
*****
          GWPATH ADJNET=NETA,
              ADJNETSA=500,
              ELEMENT=05,
              SUBAREA=31
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C03/B31 -> B03/A03 -> A500
*****
          GWPATH ADJNET=NETB,
              ADJNETEL=05,
              ADJNETSA=03,
              ELEMENT=5,
              SUBAREA=03
*****
* NETWORK B CDRMS
*****
NETB  NETWORK NETID=NETB
B01N  CDRM  CDRDYN=YES,
          CDRSC=OPT,
          ISTATUS=INACTIVE
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C03/B31 -> B01
* C01 -> C04 -> C31 -> C03/B31 -> B01
*****
          GWPATH ADJNET=NETB,
              ADJNETSA=01,
              ELEMENT=6,
              SUBAREA=3
*****
* GWPATH ROUTING (ORIG HOST -> ... -> DEST HOST)
* C01 -> C04 -> C31/B03 -> B31 -> B01
*****
          GWPATH ADJNET=NETB,
              ADJNETSA=01,
              ELEMENT=6,
              SUBAREA=31
* =====> END OF DATA SET C01CDRM

```

Virtual-Route-Based Transmission Groups

You can also establish CP-CP sessions between two APPN-capable VTAM nodes through a subarea network over existing subarea links and virtual routes. This is accomplished by defining a virtual-route-based transmission group (VR-based TG) between them. To define a VR-based TG you need to either code VRTG=YES on the CDRM definition statement for the adjacent VTAM in the CDRM major nodes of both VTAMs, or code VRTG=YES as a start option at both VTAMs.

If VRTG=YES is coded at both VTAMs, then a VR-based TG is activated automatically when the CDRM session with the adjacent VTAM is activated. If

there are no CP-CP sessions active between the two VTAM nodes, CP-CP establishment is automatically initiated when the VR-based TG is activated.

If CP-CP sessions are not desired over a VR-based TG, and there exists an alternate CP-CP session path between the two VTAMs, you must code `VRTGCPCP=NO` on the CDRM definition statement for the adjacent VTAM in the CDRM major nodes of both VTAMs, or code `VRTGCPCP=NO` as a start option at both VTAMs. `VRTGCPCP=NO` prevents CP-CP sessions from being established over the VR-based TG between the two VTAMs.

The TG number associated with a VR-TG will always be 255. In addition, a VR-TG can only exist:

- between two interchange nodes
- between an interchange node and a migration data host
- between two migration data hosts.

For more information about VR-based TGs, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

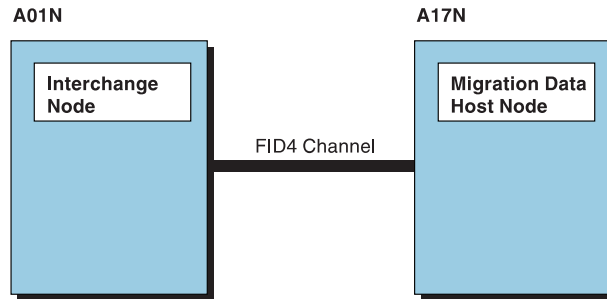


Figure 11. Virtual-Route-Based Transmission Group between Interchange Node and Migration Data Host

The following example shows virtual-route-based transmission group definitions for Figure 11.

Operand

Meaning

VRTG=YES

VR-based TG will be activated when this CDRM is established.

VRTGCPCP=YES

CP-CP sessions are supported over this VR-based TG.

CAPACITY=8K

The virtual routes comprising the transmission group have an effective capacity of 8 Kb per second.

COSTBYTE=0

The least expensive cost-per-byte-transmitted is to be associated with the transmission group.

COSTTIME=0

The least expensive cost per unit of time is to be associated with the transmission group.

NN=NO

The VR-based TG represents a connection to a migration data host.

PDELAY=TERRESTR

The maximum propagation delay of the virtual routes for the transmission group is telephone network delay (between .48 and 49.152 milliseconds).

SECURITY=UNSECURE

There is no security level for the transmission group.

```

*****
* ICN#1 (A01N) definitions
*****
      VBUILD TYPE=CDRM
*
NETA  NETWORK NETID=NETA      ** NETWORK IDENTIFIER      **
A01N  CDRM  CDRDYN=YES,      ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      CDRSC=OPT,           ** AUTHORIZE DYNAMIC CDRSC DEF. ** X
      ELEMENT=1,          ** HOST ELEMENT ADDRESS      ** X
      ISTATUS=ACTIVE,     ** CDRM INITIAL ACTIVATION STATUS** X
      RECOVERY=YES,       ** CDRM AUTOMATIC RECOVERY   ** X
      SUBAREA=1,         ** NETWORK UNIQUE SUBAREA ADDRESS** X
      VPACING=63         ** CDRM REQ5 BEFORE PACING RESP **

*
A17N  CDRM  CAPACITY=8K,     ** EFFECTIVE LINK CAPACITY   ** X
      CDRDYN=YES,        X
      CDRSC=OPT,        X
      COSTBYTE=0,       ** COST PER BYTE TRANSMITTED ** X
      COSTTIME=0,      ** COST PER UNIT OF TIME     ** X
      ELEMENT=1,        X
      ISTATUS=INACTIVE, X
      NN=NO,           ** VR-BASED TG CONNECTS TO MDH ** X
      PDELAY=TERRESTR, ** TELEPHONE NETWORK DELAY   ** X
      RECOVERY=YES,    X
      SECURITY=UNSECURE, ** NO SECURITY LEVEL         ** X
      SUBAREA=17,      X
      VPACING=63,      X
      VRTG=YES,        ** VR-BASED TG CONNECTION REQ'D ** X
      VRTGCPCP=YES     ** CP-CP SESSIONS OVER VRTG  **

*
*****
* ICN#2 (A17N) definitions
*****
      VBUILD TYPE=CDRM
*
NETA  NETWORK NETID=NETA
A17N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,           X
      ELEMENT=1,          X
      ISTATUS=ACTIVE,     X
      RECOVERY=YES,       X
      SUBAREA=17,        X
      VPACING=63

*
A01N  CDRM  CDRDYN=YES,      X
      CDRSC=OPT,           X
      ELEMENT=1,          X
      ISTATUS=INACTIVE,   X
      RECOVERY=YES,       X
      SUBAREA=1,         X
      VPACING=63,        X
      VRTG=YES,          X
      VRTGCPCP=YES

*

```


Chapter 6. External Communication Adapter (XCA) Major Node

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About This Chapter

This chapter describes sample external communication adapter major node definitions.

Local area networks can connect to VTAM through an external communication adapter (XCA), such as an IBM 3172 Nways Interconnect Controller or an IBM S/390 Open Systems Adapter. VTAM and an XCA support the following types of local area networks:

- Carrier sense multiple access with collision detection (CSMA/CD) 802.3
- Token ring IEEE 802.5
- Fiber Distributed Data Interface (FDDI)
- Token-bus.

ATM networks operating in LAN emulation mode appear to VTAM to be CSMA/CD 802.3 LANs or token-ring networks and are defined to VTAM as such. ATM networks operating in native mode are defined differently.

An external communication adapter major node is defined for each LAN connected to the XCA. The major node is defined with a VBUILD TYPE=XCA definition statement. For each LAN connected through an XCA, code a VBUILD TYPE=XCA definition statement. The line groups, lines, and physical units attached to the port are minor nodes defined by GROUP, LINE, and PU definition statements. You can also specify the DIALNO operand on the PATH definition statement for a 3172 switched data network.

Three types of support are defined through the external communication adapter major node:

- Peripheral: attach VTAM to peripheral nodes connected to LAN

- Subarea: attach VTAM to subarea nodes connected to LAN
- APPN: APPN-to-APPN over an IBM 3172 Nways Interconnect Controller.

Peripheral XCA Connection

An XCA, such as an IBM 3172 Nways Interconnect Controller, can be used to attach VTAM to a LAN, allowing communication between peripheral nodes attached to the LAN and VTAM. This type of configuration is shown in Figure 12 on page 51, in which both A02 and A500 are able to communicate over the 3172 to peripheral nodes attached to a token-ring LAN.

To attach VTAM to any peripheral nodes connected to a LAN over an IBM 3172 Nways Interconnect Controller, code the following:

- One external communication adapter major node to represent the physical unit in the XCA. Used for network management purposes, this major node specifies MEDIUM=BOXMGR on the PORT definition statement. Although this definition is not required, it is highly recommended if the NetView program is running.
- One switched major node for the physical unit in the XCA.
- One external communication adapter major node for each LAN connected to the XCA.
- Major nodes for any peripheral devices connected to the LAN.

To define a peripheral external communication adapter node attached to a LAN through an XCA, code the VBUILD (TYPE=XCA) and PORT definition statements followed by the GROUP definition statement (DIAL=YES), and LINE and PU definition statements as pairs in the switched line group.

Subarea XCA Connection

A VTAM attached through an XCA, such as an IBM 3172 Nways Interconnect Controller can communicate to other SNA domains through a token-ring, token-bus, CSMA/CD 802.3 or FDDI local area network. This type of configuration is shown in Figure 12 on page 51, in which A02 and A500 can communicate with each other over the XCA. You define an XCA LAN connection to VTAM using the external communication adapter major major node.

To define this multiple-domain configuration, you code

- An external communication adapter major node to represent the physical unit in the IBM 3172 Nways Interconnect Controller. This definition is used for network management purposes. Although it is not required, it is highly recommended if you are running the NetView program.
- A switched major node for the physical unit in the 3172 interconnect controller.
- An external communication adapter major node for each LAN connected through the IBM 3172 Nways Interconnect Controller. Within each external communication adapter major node, code the VBUILD (TYPE=XCA) and PORT definition statements, followed by the GROUP definition statement (specified with DIAL=NO), and LINE and PU definition statements as pairs in the nonswitched line group. For the case where two VTAMs are connected to the same LAN through a common IBM 3172 Nways Interconnect Controller, each VTAM must code an XCA major node for the LAN.
- Switched major nodes for any peripheral nodes attached to the LAN.

For more information on implementing LAN support on the 3172 for single-domain and multiple-domain networks, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*

Token-Ring Example Showing Peripheral and Subarea Connection

The following example shows both peripheral and subarea connections across the XCA. It shows a token ring attached to a VTAM network through an IBM 3172 Nways Interconnect Controller.

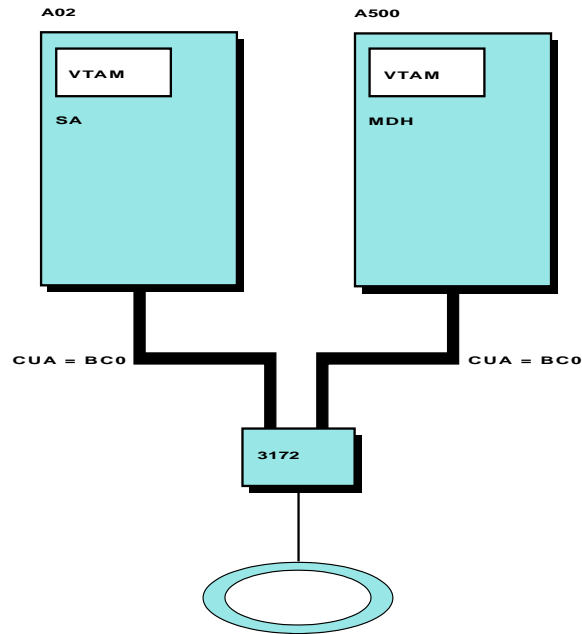


Figure 12. LAN Support through an IBM 3172. Host A02 is a subarea node (SA). Host A500 is a migration data host (MDH).

XCA Major Node for a Box Manager (Token-Ring LAN)

A box manager XCA major node should be coded in one of the VTAMs to which the IBM 3172 Nways Interconnect Controller is attached. In the sample XCA major node below, TYPE=XCA on the VBUILD definition statement indicates that this is an external communication adapter major node.

On the PORT definition statement:

- CUADDR is the device address of the attached LAN.
- MEDIUM=BOXMGR indicates that this is a box manager definition.

A box manager allows an IBM 3172 Nways Interconnect Controller to have minimal network management, as well as allowing generic alerts to flow from an IBM 3172 Nways Interconnect Controller to the NetView program.

Only one GROUP, LINE, and PU definition statement is allowed in a BOXMGR definition.

```
* =====> BEGINNING OF DATA SET XCABOXM
*****
*   X50RBXMA - VTAM 3172 XCA MAJOR NODE                               *
```

```

*
* DESCRIPTION: VTAM 3172 XCA Major Node MVS channel address
*
* BC5, BOX MANAGER
*
*****
XTRBC4  VBUILD  TYPE=XCA
**
PORTBM  PORT    MEDIUM=BOXMGR, CUADDR=BC5
GROUPBM GROUP    ISTATUS=ACTIVE
LINEBM  LINE    ISTATUS=ACTIVE
PUBM    PU      ISTATUS=ACTIVE
* =====> END OF DATA SET XCABOXM

```

A corresponding switched major node definition must be provided to the VTAM host to permit the establishment of a SSCP-PU session between the IBM 3172 and NetView. See “Attaching a Peripheral Node over an IBM 3172 Interconnect Controller” on page 137 for the definition of that switched major node.

XCA Major Node for Host A02 (Token-Ring LAN)

TYPE=XCA on the VBUILD definition statement indicates that this is an external communication adapter major node.

On the PORT definition statement:

- ADAPNO=0 is the adapter number assigned by the 3172.
- CUADDR is the device address of the attached LAN. In this case, A02's CUADDR matches A500's CUADDR (CUADDR=BC0).
- MEDIUM=RING indicates that this is a token ring connection.
- A02's SAPADDR=4 is the SAP address of the connection defined by this major node.

The group named GP2BC1 defines a peripheral node connection to a PS/2 connected to the LAN. DIAL=YES is required for a peripheral node connection. Group name GP2BC1 matches the GRPNM value on the PATH definition statement in the corresponding switched major node on page 137.

The group GP5BC1 is used to define the subarea node connection to host A500. DIAL=NO on the GROUP definition statement is required for a subarea node connection. USER=SNA on the L5BC11 LINE definition statement specifies that the line uses SNA protocols to access an IBM 3172 Nways Interconnect Controller for use by the LAN. A02's SAPADDR for PU P5BC11 must match A500's PORT SAPADDR (SAPADDR=8).

```

* =====> BEGINNING OF DATA SET X02BBC0
*****
* X02BBC0 - VTAM EXTERNAL COMMUNICATION ADAPTER MAJNOD - SUBAREA A02 *
*****
* 3172 XCA DEFINITION FOR HOST A02N
*****
XTBBC0  VBUILD  TYPE=XCA                ** EXTERNAL COMMUNICATION ADAPT**
PORTBC  PORT    ADAPNO=0,                ** 3172 RELATIVE ADAPTER NUMBER** X
          CUADDR=BC0,                    ** CHANNEL UNIT ADDRESS          ** X
          MEDIUM=RING,                   ** LAN TYPE                       ** X
          SAPADDR=4,                      ** SERVICE ACCESS POINT ADDRESS** X
          TIMER=90                         ** CHANNEL ACTIVATE RESP TIME   **
GP2BC1  GROUP  ANSWER=ON,                ** PU DIAL INTO VTAM CAPABILITY** X
          AUTOGEN=(6,L,P),                ** AUTO GENERATE LINES AND PUS  ** X
          CALL=INOUT,                     ** IN/OUT CALLING CAPABILITY    ** X
          DIAL=YES,                        ** SWITCHED CONNECTION          ** X
          ISTATUS=INACTIVE                 ** INITIAL ACTIVATION STATUS    **
*****

```

```

** MAC ADDR FOR 3172 - NOTICE SAPADDR 8 MATCHES SAPADDR ON A500
*****
GP5BC1  GROUP  DIAL=NO          ** LEASED CONNECTION          **
L5BC11  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        USER=SNA              ** LINE PROTOCOL              **
P5BC11  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        MACADDR=40000777056, ** MEDIUM ACCESS CONTROL ADDR ** X
        PUTYPE=5,              ** PHYSICAL UNIT TYPE        ** X
        SAPADDR=8,             ** SERVICE ACCESS POINT ADDRESS** X
        SUBAREA=500,          ** ADJACENT SUBAREA ADDRESS  ** X
        TGN=1                  ** TRANSMISSION GROUP NUMBER **
*****
* THESE MACS AND SAPS MUST MATCH THE NCP DEFINITIONS
*****
L5RC11  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        USER=SNA              ** LINE PROTOCOL              **
P5RC11  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        MACADDR=400000000431, ** MEDIUM ACCESS CONTROL ADDR ** X
        PUTYPE=5,              ** PHYSICAL UNIT TYPE        ** X
        SAPADDR=04,           ** SERVICE ACCESS POINT ADDRESS** X
        SUBAREA=04,          ** ADJACENT SUBAREA ADDRESS  ** X
        TGN=1                  ** TRANSMISSION GROUP NUMBER **
L5RC12  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        USER=SNA              ** LINE PROTOCOL              **
P5RC12  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        MACADDR=400000003131, ** MEDIUM ACCESS CONTROL ADDR ** X
        PUTYPE=5,              ** PHYSICAL UNIT TYPE        ** X
        SAPADDR=04,           ** SERVICE ACCESS POINT ADDRESS** X
        SUBAREA=310,         ** ADJACENT SUBAREA ADDRESS  ** X
        TGN=1                  ** TRANSMISSION GROUP NUMBER **
L1BV11  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS ** X
        USER=VCNS            ** LINE PROTOCOL              **
* =====> END OF DATA SET X02BBC0

```

XCA Major Node for Host A500 (Token-Ring LAN)

TYPE=XCA on the VBUILD definition statement indicates that this is an external communication adapter major node.

On the PORT definition statement:

- ADAPNO=0 is the adapter number assigned by the 3172.
- CUADDR is the device address of the attached LAN. In this case, A02's CUADDR matches A500's CUADDR (CUADDR=BC0).
- MEDIUM=RING indicates that this is a token ring.
- A500's SAPADDR=8 is the SAP address of the connection defined by this major node.

A500's SAPADDR for PU P5BE12 must match A02's PORT SAPADDR (SAPADDR=4).

The group named GP1BE1 defines a peripheral node connection to a PS/2 connected to the LAN. DIAL=YES is required for a peripheral node connection.

The group GP5BC1 is used to define the subarea node connection to host A02N. DIAL=NO on the GROUP definition statement is required for a subarea node connection.

```

* =====> BEGINNING OF DATA SET X50BBE0
*****
* X50BBE0 - VTAM EXTERNAL COMMUNICATION ADAPTER MAJNOD - MDH A500 *
*****

```

```

* 3172 XCA MAJOR NODE FOR HOST A500N
*****
XTBBE0  VBUILD TYPE=XCA          ** EXTERNAL COMMUNICATION ADAPT**
PORTBE  PORT  ADAPNO=0,          ** 3172 RELATIVE ADAPTER NUMBER** X
          CUADDR=BE0,           ** CHANNEL UNIT ADDRESS          ** X
          MEDIUM=RING,          ** LAN TYPE                       ** X
          SAPADDR=8,            ** SERVICE ACCESS POINT ADDRESS** X
          TIMER=90              ** CHANNEL ACTIVATE RESP TIME    **
GP1BE1  GROUP ANSWER=ON,        ** PU DIAL INTO VTAM CAPABILITY** X
          AUTOGEN=(3,L,P),      ** AUTO GENERATE LINES AND PUS   ** X
          CALL=INOUT,           ** IN/OUT CALLING CAPABILITY     ** X
          DIAL=YES,              ** SWITCHED CONNECTION           ** X
          ISTATUS=INACTIVE      ** INITIAL ACTIVATION STATUS     **
*****
** MAC ADDR FOR 3172 - NOTICE SAPADDR 4 MATCHES SAPADDR ON A02
*****
GP5BE2  GROUP DIAL=NO           ** LEASED CONNECTION             **
L5BE12  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          USER=SNA              ** LINE PROTOCOL                 **
P5BE12  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          MACADDR=40000777056, ** MEDIUM ACCESS CONTROL ADDR   ** X
          PUTYPE=5,              ** PHYSICAL UNIT TYPE           ** X
          SAPADDR=4,            ** SERVICE ACCESS POINT ADDRESS** X
          SUBAREA=02,           ** ADJACENT SUBAREA ADDRESS     ** X
          TGN=1                  ** TRANSMISSION GROUP NUMBER    **
*****
** MAC ADDRS MUST MATCH NCP GEN FOR LOCADDR AND TGS MUST MATCH AS WELL
*****
L5RE12  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          USER=SNA              ** LINE PROTOCOL                 **
P5RE21  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          MACADDR=400000000431, ** MEDIUM ACCESS CONTROL ADDR   ** X
          PUTYPE=5,              ** PHYSICAL UNIT TYPE           ** X
          SAPADDR=08,           ** SERVICE ACCESS POINT ADDRESS** X
          SUBAREA=04,           ** ADJACENT SUBAREA ADDRESS     ** X
          TGN=1                  ** TRANSMISSION GROUP NUMBER    **
L5RE22  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          USER=SNA              ** LINE PROTOCOL                 **
P5RE22  PU    ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          MACADDR=4000000003131, ** MEDIUM ACCESS CONTROL ADDR   ** X
          PUTYPE=5,              ** PHYSICAL UNIT TYPE           ** X
          SAPADDR=08,           ** SERVICE ACCESS POINT ADDRESS** X
          SUBAREA=310,          ** ADJACENT SUBAREA ADDRESS     ** X
          TGN=1                  ** TRANSMISSION GROUP NUMBER    **
L1BV21  LINE  ISTATUS=INACTIVE, ** INITIAL ACTIVATION STATUS     ** X
          USER=VCNS             ** LINE PROTOCOL                 **
* =====> END OF DATA SET X50BBE0

```

External Communication Adapter Connection to Token-Bus LAN

The following two sample XCA major nodes are for a subarea external communication adapter connection between two VTAM hosts, SSCP1A and SSCP2A, through a token-bus local area network (MEDIUM=BUS). Inasmuch as only a subarea (DIAL=NO) connection is defined, there is no need to define a corresponding switched major node.

```

*****
*
* NAME:      XCA1AS (XCA MAJOR NODE FOR HOST SSCP1A, SLOT 1 ON 3172,
*              SAP 4 RESERVED FOR SNA)
*
* USE:      ALL LINES ARE LEASED AND ARE DEFINED FOR
*           TYPE 5 TO TYPE 5 SNA CONNECTIONS.
*
*           TO ESTABLISH AS SNA LEASED CONNECTION, FOLLOW THE

```

```

*           FOLLOWING STEPS ON BOTH LOCAL AND REMOTE HOSTS:
*
*           1) ACT XCA_MAJOR_NODE, SCOPE=ONLY
*           2) ACT LEASED_LINE AND PU TO DESTINATION HOST
*              (EG. ACT LN1A2AS AND ACT P1A2AS FOR SNA
*              CONNECTION TO HOST SSCP2A)
*
*****
XCA1AS  VBUILD  TYPE=XCA
PORT1AS PORT    MEDIUM=BUS,ADAPNO=1,SAPADDR=4,CUADDR=500,TIMER=254
GP1AS   GROUP   DIAL=NO, ISTATUS=INACTIVE
*
LN1A2AS LINE    USER=SNA
P1A2AS  PU      MACADDR=004A11111111,PUTYPE=5,SUBAREA=2,TGN=1,      *
          SAPADDR=4
*
LN1A7BS LINE    USER=SNA
P1A7BS  PU      MACADDR=007B11111111,PUTYPE=5,SUBAREA=7,TGN=1,      *
          SAPADDR=4
*
LN1A9CS LINE    USER=SNA
P1A9CS  PU      MACADDR=009C11111111,PUTYPE=5,SUBAREA=9,TGN=1,      *
          SAPADDR=4
*
LN1AAAS LINE    USER=SNA
P1AAAS  PU      MACADDR=00AA11111111,PUTYPE=5,SUBAREA=10,TGN=1,     *
          SAPADDR=4
*
LN1ABAS LINE    USER=SNA
P1ABAS  PU      MACADDR=00BA11111111,PUTYPE=5,SUBAREA=11,TGN=1,     *
          SAPADDR=4
*
LN1ACAS LINE    USER=SNA
P1ACAS  PU      MACADDR=00CA11111111,PUTYPE=5,SUBAREA=12,TGN=1,     *
          SAPADDR=4
*
*LN1ADAS LINE    USER=SNA
*P1ADAS  PU      MACADDR=00DA11111111,PUTYPE=5,SUBAREA=13,TGN=1,     *
          SAPADDR=4
*
*LN1AEAS LINE    USER=SNA
*P1AEAS  PU      MACADDR=00EA11111111,PUTYPE=5,SUBAREA=14,TGN=1,     *
          SAPADDR=4
*
*****
* NAME:      XCA2AS (XCA MAJOR NODE FOR HOST SSCP2A, SLOT 1 ON 3172,
*                SAP 4 RESERVED FOR SNA)
*
* USE:       ALL LINES ARE LEASED AND ARE DEFINED FOR
*            TYPE 5 TO TYPE 5 SNA CONNECTIONS.
*
*           TO ESTABLISH AS SNA LEASED CONNECTION, FOLLOW THE
*           FOLLOWING STEPS ON BOTH LOCAL AND REMOTE HOSTS:
*
*           1) ACT XCA_MAJOR_NODE, SCOPE=ONLY
*           2) ACT LEASED_LINE AND PU TO DESTINATION HOST
*              (EG. ACT LN2A1AS AND ACT P2A1AS FOR SNA
*              CONNECTION TO HOST SSCP1A)
*
*****
XCA2AS  VBUILD  TYPE=XCA
PORT2AS PORT    MEDIUM=BUS,ADAPNO=1,SAPADDR=4,CUADDR=590,TIMER=254
GP2AS   GROUP   DIAL=NO, ISTATUS=INACTIVE
*
LN2A1AS LINE    USER=SNA
P2A1AS  PU      MACADDR=003A11111111,PUTYPE=5,SUBAREA=1,TGN=1,      *
          SAPADDR=4
*

```

```

LN2A7BS LINE USER=SNA
P2A7BS PU MACADDR=007B11111111,PUTYPE=5,SUBAREA=7,TGN=1, *
SAPADDR=4
*
LN2A9CS LINE USER=SNA
P2A9CS PU MACADDR=009C11111111,PUTYPE=5,SUBAREA=9,TGN=1, *
SAPADDR=4
*
LN2AAAS LINE USER=SNA
P2AAAS PU MACADDR=00AA11111111,PUTYPE=5,SUBAREA=10,TGN=1, *
SAPADDR=4
*
LN2ABAS LINE USER=SNA
P2ABAS PU MACADDR=00BA11111111,PUTYPE=5,SUBAREA=11,TGN=1, *
SAPADDR=4
*
LN2ACAS LINE USER=SNA
P2ACAS PU MACADDR=00CA11111111,PUTYPE=5,SUBAREA=12,TGN=1, *
SAPADDR=4
*

```

External Communication Adapter Connection to FDDI LAN

The following is a sample external communication adapter major node defining a connection from VTAM to a FDDI LAN through a 3172 interconnect controller. GROUP GP2FC1 defines a peripheral (DIAL=YES) connection, while GROUP GP5FC1 defines a subarea (DIAL=NO) connection. A corresponding switched major node that defines GRPNM=GP2FC1 on the PATH definition statement must also be defined for the peripheral connection.

```

XFDBC0 VBUILD TYPE=XCA
PORTFC PORT MEDIUM=FDDI,ADAPNO=0,SAPADDR=4,CUADDR=BC0
**
GP2FC1 GROUP DIAL=YES,ISTATUS=INACTIVE,ANSWER=ON,CALL=INOUT
L2FC11 LINE
P2FC11 PU
*
L2FC12 LINE
P2FC12 PU
*
L2FC13 LINE
P2FC13 PU
**
GP5FC1 GROUP DIAL=NO
L5FC11 LINE USER=SNA,ISTATUS=INACTIVE
P5FC11 PU ISTATUS=INACTIVE,MACADDR=400007777787,PUTYPE=5, *
SUBAREA=02,TGN=1,SAPADDR=4
*
L5FC12 LINE USER=VCNS,ISTATUS=INACTIVE

```

External Communication Adapter Connection to CSMA/CD 802.3 LAN

You can code an external communication adapter major node to define a connection from VTAM to a CSMA/CD 802.3 local area network through a 3172 interconnect controller. Figure 13 on page 57 shows a multiple-domain XCA configuration with a CSMA/CD 802.3 local area network and two 3172 interconnect controllers.

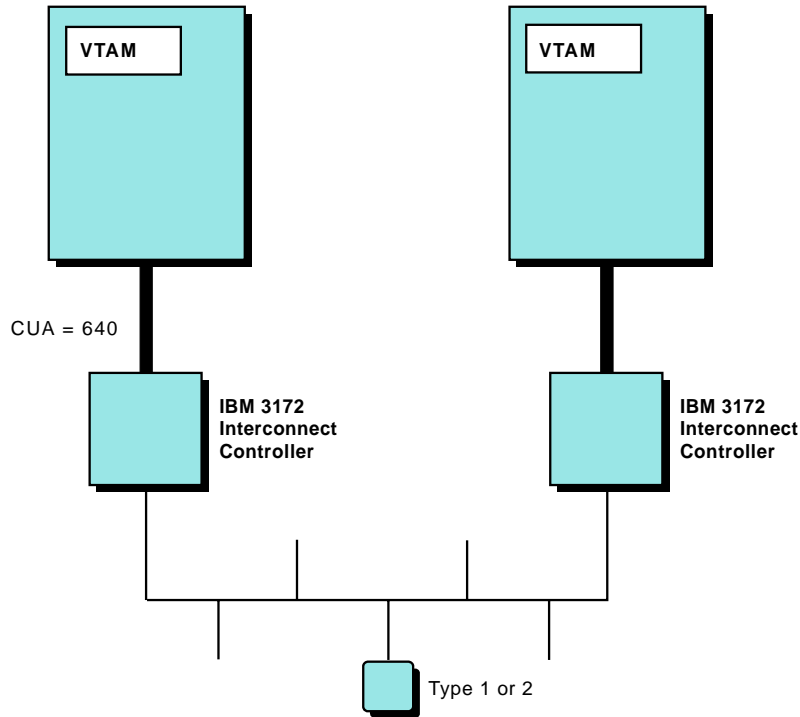


Figure 13. XCA Multiple-Domain Configuration with CSMA/CD 802.3

In the sample external communications adapter major node for one of the two 3172 connections depicted, GROUP GP1C21 defines a peripheral (DIAL=YES) connection, while GROUP GP1C22 defines a subarea (DIAL=NO) connection. A corresponding switched major node that defines GRPNM=GP1C21 on the PATH definition statement must also be defined for the peripheral connection.

```

LMNBC0  VBUILD  TYPE=XCA
PORT1C2 PORT  MEDIUM=CSMACD,ADAPNO=0,SAPADDR=4,CUADDR=BC0
GP1C21  GROUP  DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT
L1C211  LINE
P1C211  PU
L1C212  LINE
P1C212  PU
L1C213  LINE
P1C213  PU
L1C214  LINE
P1C214  PU
*
GP1C22  GROUP  DIAL=NO
L1C221  LINE  USER=SNA,ISTATUS=INACTIVE
P1C221  PU    ISTATUS=INACTIVE,MACADDR=40000EEEE137,PUTYPE=5,      *
          SUBAREA=02,TGN=255,SAPADDR=4
L1CV11  LINE  USER=VCNS,ISTATUS=INACTIVE

```

For more information on attaching a CSMA/CD 802.3 local area network through an IBM 3172 Nways Interconnect Controller, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

CP-CP Sessions through 3172-attached Token-Bus LAN

A 3172 connection can be used to establish CP-CP sessions between two network nodes, or between a network node and an end node. The following example shows how to establish CP-CP sessions between two network nodes across a 3172-attached token-bus LAN.

The resource definitions needed are as follows:

- An XCA major node for the token-bus LAN is coded in each of the two VTAM network nodes.
- An XCA major node for the PU in the IBM 3172 Nways Interconnect Controller is coded in each of the two VTAM network nodes (for network management).
- A switched major node for the PU in the 3172 Interconnect Controller is coded in each of the two VTAM network nodes (for network management).
- If both network nodes must be able to perform switched call-out operations, a switched major node for the token bus is required in both network nodes.

The sample XCA major nodes for the token-bus LAN are shown below. See "CP-CP Sessions through 3172-Attached Token-Bus LAN" on page 139 for the corresponding switched major nodes for the token-bus LAN.

XCA Major Node for Token-Bus LAN for Network Node SSCP1A

```
*****
* NAME:      XCA1A (XCA MAJOR NODE FOR HOST SSCP1A, SLOT 1 ON 3172)
*
* USE:       ALL SWITCHED LINES SHOULD BE USED IN CONJUNCTION
*            WITH SWITCHED MAJOR NODE SWXCA1A. THE SWITCHED
*            PU'S IN SWXCA1A ARE DEFINED FOR APPN CONNECTIONS.
*            TO ESTABLISH A FID2 APPN CONNECTION (WHICH APPEARS TO
*            BE A SWITCHED CONNECTION TO VTAM), PERFORM THE
*            FOLLOWING STEPS ON BOTH LOCAL AND REMOTE HOSTS:
*
*            1) ACT XCA_MAJOR_NODE, SCOPE=ONLY
*            2) ACT LOGICAL_XCA_LINE TO DESTINATION HOST
*               (EG. ACT LN1A2A FOR CONNECTION TO HOST SSCP2A)
*            3) ACT SW_MAJOR_NODE, SCOPE=ONLY
*               (EG. ACT SWXCA1A DEFINED FOR HOST SSCP1A)
*            4) ACT CORRESPONDING_SW_PU TO DESTINATION HOST
*               (EG. ACT SW1A2A FOR CONNECTION TO HOST SSCP2A)
*            5) DIAL THE CORRESPONDING_SW_PU FROM EITHER HOST
*****
XCA1A  VBUILD  TYPE=XCA
PORT1A  PORT   MEDIUM=BUS,ADAPNO=1,SAPADDR=4,CUADDR=500,TIMER=254
GP1A2A  GROUP  DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT
LN1A2A  LINE
P1A2A   PU
```

XCA Major Node for Token-Bus LAN for Network Node SSCP2A

```
*****
* NAME:      XCA2A (XCA MAJOR NODE FOR HOST SSCP2A, SLOT 1 ON 3172)
*
* USE:       ALL SWITCHED LINES SHOULD BE USED IN CONJUNCTION
*            WITH SWITCHED MAJOR NODE SWXCA2A. THE SWITCHED
*            PU'S IN SWXCA2A ARE DEFINED FOR APPN CONNECTIONS.
*            TO ESTABLISH A FID2 APPN CONNECTION (WHICH APPEARS TO
```



```

*          BE A SWITCHED CONNECTION TO VTAM), PERFORM THE
*          FOLLOWING STEPS ON BOTH LOCAL AND REMOTE HOSTS:
*
*          1) ACT XCA_MAJOR_NODE, SCOPE=ONLY
*          2) ACT LOGICAL_XCA_LINE TO DESTINATION HOST
*             (EG. ACT LN2A1A FOR CONNECTION TO HOST SSCP1A)
*          3) ACT SW_MAJOR_NODE, SCOPE=ONLY
*             (EG. ACT SWXCA2A DEFINED FOR HOST SSCP2A)
*          4) ACT CORRESPONDING_SW_PU TO DESTINATION HOST
*             (EG. ACT SW2A1A FOR CONNECTION TO HOST SSCP1A)
*          5) DIAL THE CORRESPONDING_SW_PU FROM EITHER HOST
*****
XCA2A  VBUILD  TYPE=XCA
PORT2A  PORT    MEDIUM=BUS,ADAPNO=1,SAPADDR=4,CUADDR=590,TIMER=254
GP2A1A  GROUP   DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT
LN2A1A  LINE
P2A1A   PU

```

Connecting to a Connection Network over a Token Ring

A connection network is a representation of a shared access transport facility (SATF), such as a local area network (LAN), that enables nodes identifying their connectivity to the SATF by a common virtual routing node to communicate without having individually defined connections to one another. The IBM 3172 Nways Interconnect Controller can be used to connect a VTAM network node or end node to a connection network, as shown in Figure 14 on page 60.

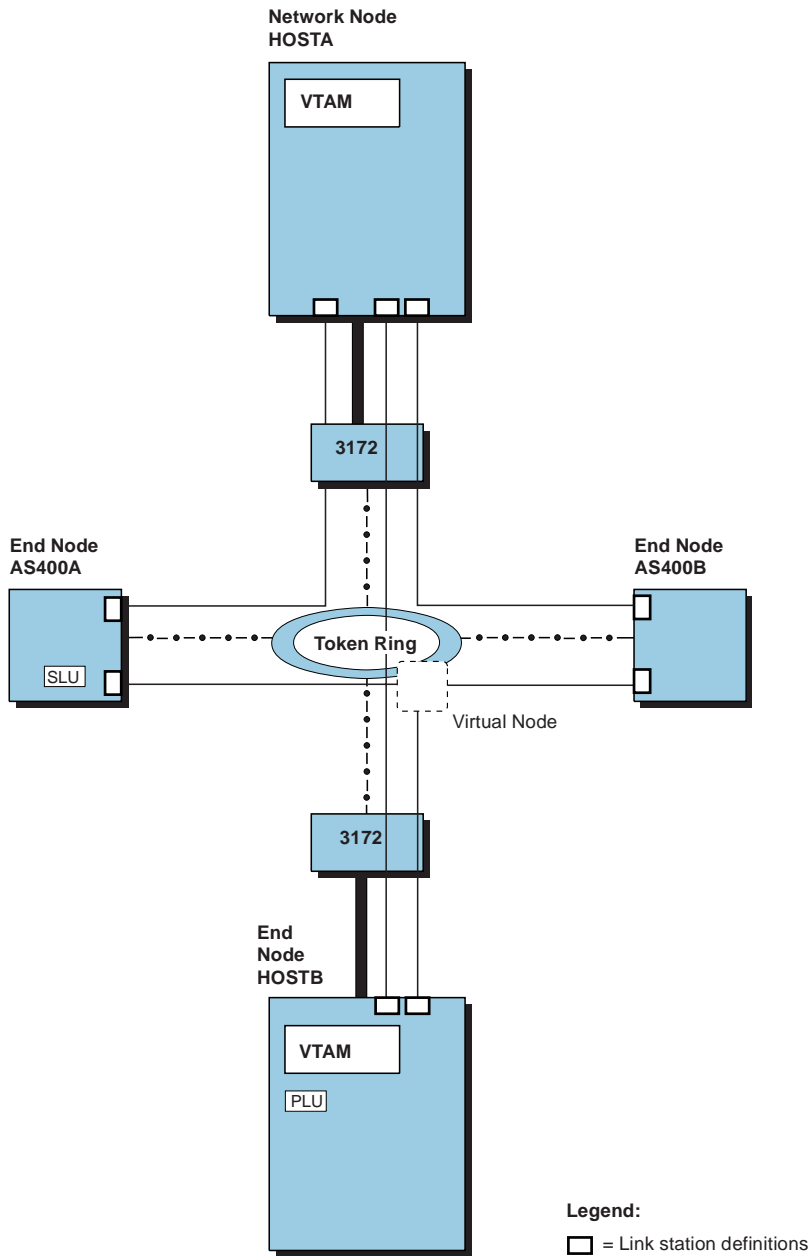


Figure 14. VTAM Attachment to a Connection Network through a 3172

An XCA major node is used to define this connection. The two XCA major nodes shown below define a total of two 3172 token ring connections.

Operands on the PORT definition statement are used to specify a connection to a connection network. VNNAME=CN3172 specifies the CPNAME for the connection network. VNGROUP=GP1RC0 specifies the name of the GROUP containing dial-out links available for use on the connection network named on the VNNAME operand. DYNPU=YES is the default when VNNAME and VNGROUP are coded on the PORT statement. DIAL=YES is required on the GROUP named on the VNGROUP operand.

If it had been coded, the TGP operand of the PORT definition statement would have specified the name of a transmission group profile definition used for the connection network. Since it was not coded in this case, the default TG profile

definition is used. VTAM therefore uses the token ring profile provided by IBM, since MEDIUM=RING. See *VTAM V4R4 Resource Definition Reference* for the values specified by the IBM-supplied APPN transmission group profile definitions.

If CP-CP sessions are desired between two nodes on the connection network, you must define a switched major node at the calling node. This switched major node should define a PU for any node on the connection network that the calling-out node is to call. Since DYNPU=YES is enforced automatically when a session is established through the connection network, it is not necessary for DYNPU=YES to be coded by the called nodes.

For more information on defining connections to connection networks through the IBM 3172 Nways Interconnect Controller, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

```

* =====> BEGINNING OF DATA SET XB1RBC6A
*****
*   XB1RBC6 - VTAM 3172 XCA Major Node
*****
XTRBC6  VBUILD  TYPE=XCA          ** EXTERNAL COMMUNICATION ADAPTER **
PORTR6  PORT    MEDIUM=RING,     ** LAN TYPE                      ** *
          ADAPNO=0,              ** 3172 RELATIVE ADAPTER NUMBER  ** *
          SAPADDR=8,             ** SERVICE ACCESS POINT ADDRESS ** *
          CUADDR=BC6,           ** CHANNEL UNIT ADDRESS         ** *
          TIMER=90,             ** CHANNEL ACTIVATE RESP TIME   ** *
          CAPACITY=8K,          ** TG LINK CAPACITY (BITS PER SEC)** *
          COSTBYTE=0,           ** TG COST PER BYTE TRANSMITTED ** *
          COSTTIME=0,           ** TG COST PER UNIT OF TIME     ** *
          PDELAY=TERRESTR,      ** TG MAXIMUM PROPAGATION DELAY ** *
          SECURITY=UNSECURE,    ** TG SECURITY LEVEL            ** *
          VNNAME=CN3172,       ** CPNAME OF CONNECTION NETWORK ** *
          VNGROUP=GP1RC0      ** NAME OF GROUP FOR CONN. NETWORK**

**
GP1RC0  GROUP  DIAL=YES,
          ISTATUS=INACTIVE,
          ANSWER=ON,
          CALL=INOUT,
          DYNPU=YES,
          DYNPUFX=U3

L1RC01  LINE
P1RC01  PU
L1RC02  LINE
P1RC02  PU
L1RC03  LINE
P1RC03  PU
L1RC04  LINE
P1RC04  PU
L1RC05  LINE
P1RC05  PU
*****
* =====> END OF DATA SET XB1RBC6A
* =====> BEGINNING OF DATA SET X01RBC4B
*****
*   X01RBC4 - VTAM 3172 XCA Major Node
*****
XTRBC4  VBUILD  TYPE=XCA          ** EXTERNAL COMMUNICATION ADAPTER **
PORTR4  PORT    MEDIUM=RING,     ** LAN TYPE                      ** *
          ADAPNO=0,              ** 3172 RELATIVE ADAPTER NUMBER  ** *
          SAPADDR=4,             ** SERVICE ACCESS POINT ADDRESS ** *
          CUADDR=BC4,           ** CHANNEL UNIT ADDRESS         ** *
          TIMER=90,             ** CHANNEL ACTIVATE RESP TIME   ** *
          VNNAME=CN3172,       ** CPNAME OF CONNECTION NETWORK ** *
          VNGROUP=GP1RC0      ** NAME OF GROUP FOR CONN. NETWORK**

**
GP1RC0  GROUP  DIAL=YES,

```

```

                                ISTATUS=INACTIVE,
                                ANSWER=ON,
                                CALL=INOUT,
                                DYNPU=YES,
                                DYNPUFX=U4,
                                AUTOGEN=(6,L,P)
                                *
                                *
                                *
                                *
                                *
L1RC01  LINE
P1RC01  PU
L1RC02  LINE
P1RC02  PU
L1RC03  LINE
P1RC03  PU
L1RC04  LINE
P1RC04  PU
L1RC05  LINE
P1RC05  PU
* =====> END OF DATA SET X01RBC4B

```

Using XCA Over an IBM S/390 OSA Between APPN Nodes

XCA Major Node Definitions For ATM Support

The sample XCA major nodes for the DIAL SVC ATM are shown below. See “Using XCA Over an IBM S/390 OSA Between APPN Nodes” on page 153 for the corresponding switched major nodes for the DIAL SVC ATM. Figure 15 shows a basic ATM configuration enabling HPR APPN communication in native mode.

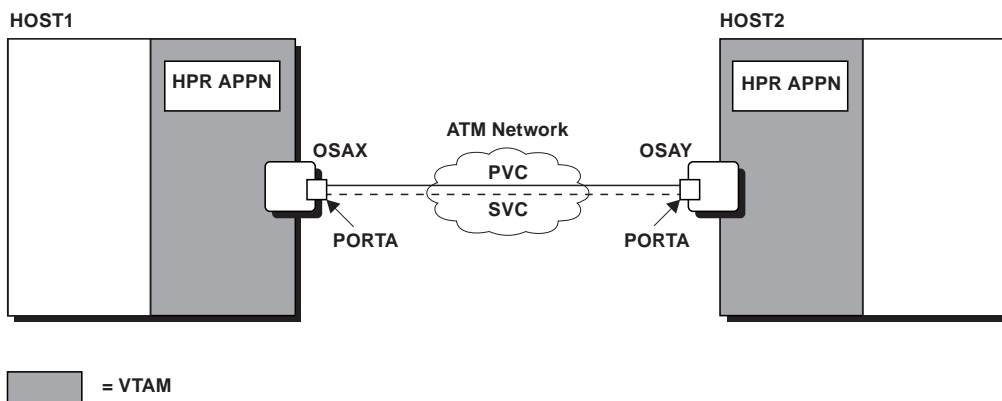


Figure 15. Basic ATM Configuration

XCA Major Node for OSA Port for DIAL SVCS for ICN SSCP1A

```

XCAOSA1A  VBUILD  TYPE=XCA
PORTOSA1  PORT    MEDIUM=ATM,PORTNAME=OSAXA
*
GP121     GROUP   DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT,
                                DYNPU=YES
                                X
L1N12L1   LINE
P1N12L1   PU
L1N12L2   LINE
P1N12L2   PU
L1N12L3   LINE
P1N12L3   PU
L1N12L4   LINE
P1N12L4   PU
L1N12L5   LINE
P1N12L5   PU
L1N12L6   LINE

```

```

P1N12L6  PU
*
GP1A1   GROUP  DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT,      X
          DYNPU=YES

L1N1A1L1 LINE
P1N1A1L1 PU
L1N1A1L2 LINE
P1N1A1L2 PU
*
GP171   GROUP  DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT,                X
          DYNPU=YES

L1N17L1 LINE
P1N17L1 PU
L1N17L2 LINE
P1N17L2 PU
*

```

XCA Major Node for OSA Port for DIAL SVCS for ICN SSCP2A

```

XCAOSA2A VBUILD  TYPE=XCA
PORTOSA1 PORT    MEDIUM=ATM,PORTNAME=OSAYA
*
GP211   GROUP  DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT,                X
          DYNPU=YES

L1N21L1 LINE
P1N21L1 PU
L1N21L2 LINE
P1N21L2 PU
L1N21L3 LINE
P1N21L3 PU
L1N21L4 LINE
P1N21L4 PU
L1N21L5 LINE
P1N21L5 PU
L1N21L6 LINE
P1N21L6 PU
*
GP2A1   GROUP  DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT,      X
          DYNPU=YES

L1N2A1L1 LINE
P1N2A1L1 PU
L1N2A1L2 LINE
P1N2A1L2 PU
*
GP271   GROUP  DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT,                X
          DYNPU=YES

L1N27L1 LINE
P1N27L1 PU
L1N27L2 LINE
P1N27L2 PU
*

```

Connecting to a Connection Network ATM

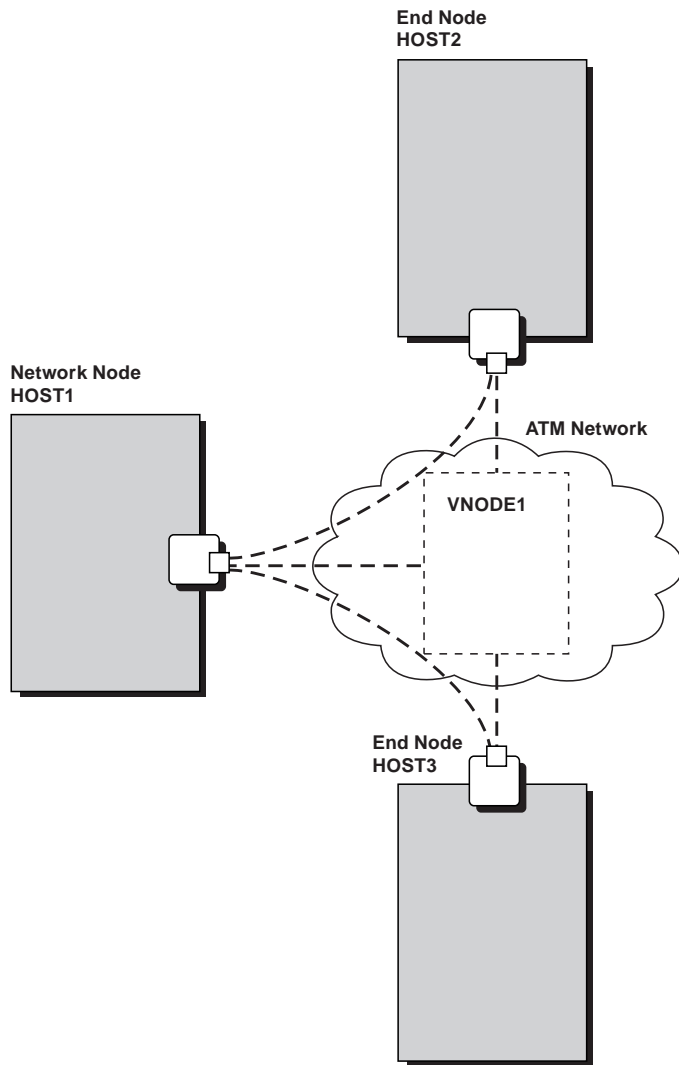


Figure 16. ATM Configuration with a Connection Network

The sample XCA major nodes for the Connection Network are shown below. See “Using XCA Over an IBM S/390 OSA for Connection Network” on page 153 for the corresponding switched major nodes for the Connection Network

XCA Major Node for Connection Network for EN SSCP1A

```

*
XCAOSA1A VBUILD TYPE=XCA
PORTOSA1 PORT MEDIUM=ATM, PORTNAME=OSAXA
*
GP121 GROUP DIAL=YES, ISTATUS=INACTIVE, CALL=INOUT, X
DYNPU=YES

L1N12L1 LINE
P1N12L1 PU
L1N12L2 LINE
P1N12L2 PU
L1N12L3 LINE
P1N12L3 PU
L1N12L4 LINE
    
```

```

P1N12L4 PU
L1N12L5 LINE
P1N12L5 PU
L1N12L6 LINE
P1N12L6 PU
*
GP1A1 GROUP DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT, X
          DYNPU=YES
L1N1A1 LINE
P1N1A1 PU
L1N1A2 LINE
P1N1A2 PU
*
GP171 GROUP DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT, X
          DYNPU=YES
L1N17L1 LINE
P1N17L1 PU
L1N17L2 LINE
P1N17L2 PU
*
* Connection Network
*
GP121C GROUP DIAL=YES,ISTATUS=INACTIVE,ANSWER=ON,CALL=INOUT, X
          DLCADDR=(1,C,ATMSVC,NETA.SSCPVN,EXCLUSIVE), X
          DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
          DLCADDR=(8,X,00,03), X
          DYNPU=YES, X
          COSTTIME=0,COSTBYTE=0,SECURITY=UNSECURE, X
          PDELAY=NEGLIGIB,CAPACITY=32M
*
L1N12L1C LINE
P1N12L1C PU
P1N12L2C LINE
P1N12L2C PU
P1N12L3C LINE
P1N12L3C PU

```

XCA Major Node for Connection Network ATM for EN SSCP2A

```

XCA0SA2A VBUILD TYPE=XCA
PORT0SA1 PORT MEDIUM=ATM,PORTNAME=OSAYA
*
GP211 GROUP DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT, X
          DYNPU=YES
L1N21L1 LINE
P1N21L1 PU
L1N21L2 LINE
P1N21L2 PU
L1N21L3 LINE
P1N21L3 PU
L1N21L4 LINE
P1N21L4 PU
L1N21L5 LINE
P1N21L5 PU
L1N21L6 LINE
P1N21L6 PU
*
GP2A1 GROUP DIAL=YES,ANSWER=ON,ISTATUS=INACTIVE,CALL=INOUT, X
          DYNPU=YES
L1N2A1 LINE
P1N2A1 PU
L1N2A2 LINE
P1N2A2 PU
*
GP271 GROUP DIAL=YES,ISTATUS=INACTIVE,CALL=INOUT, X
          DYNPU=YES
L1N27L1 LINE

```

```

P1N27L1  PU
L1N27L2  LINE
P1N27L2  PU
*
* Connection Network
*
GP211C   GROUP  DIAL=YES, ISTATUS=INACTIVE, ANSWER=ON, CALL=INOUT,      X
          DLCADDR=(1,C,ATMSVC,NETA.SSCPVN,EXCLUSIVE),          X
          DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
          DLCADDR=(8,X,00,03),                                  X
          DYNPU=YES,                                           X
          COSTTIME=0,COSTBYTE=0,SECURITY=UNSECURE,             X
          PDELAY=NEGLIGIB,CAPACITY=32M
*
L1N21L1C LINE
P1N21L1C PU
L1N21L2C LINE
P1N21L2C PU
L1N21L3C LINE
P1N21L4C PU

```

XCA Major Node for Connection Network ATM for NN SSCPAA

```

XCAOSAAA VBUILD  TYPE=XCA
PORTOSA5 PORT    MEDIUM=ATM,PORTNAME=OSAZA
*
GPA15    GROUP   DIAL=YES, ISTATUS=INACTIVE, CALL=INOUT,      X
          DYNPU=YES
L5NA1L1  LINE
P5NA1L1  PU
L5NA1L2  LINE
P5NA1L2  PU
L5NA1L3  LINE
P5NA1L3  PU
L5NA1L4  LINE
P5NA1L4  PU
L5NA1L5  LINE
P5NA1L5  PU
L5NA1L6  LINE
P5NA1L6  PU
*
GPA25    GROUP   DIAL=YES, ANSWER=ON, ISTATUS=INACTIVE, CALL=INOUT,  X
          DYNPU=YES
L5NA2L1  LINE
P5NA2L1  PU
L5NA2L2  LINE
P5NA2L2  PU
*
GPA75    GROUP   DIAL=YES, ISTATUS=INACTIVE, CALL=INOUT,      X
          DYNPU=YES
L5NA7L1  LINE
P5NA7L1  PU
L5NA7L2  LINE
P5NA7L2  PU
*
* Connection Network
*
GP211C   GROUP  DIAL=YES, ISTATUS=INACTIVE, ANSWER=ON, CALL=INOUT,      X
          DLCADDR=(1,C,ATMSVC,NETA.SSCPVN,EXCLUSIVE),          X
          DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
          DLCADDR=(8,X,00,03),                                  X
          DYNPU=YES,                                           X
          COSTTIME=0,COSTBYTE=0,SECURITY=UNSECURE,             X
          PDELAY=NEGLIGIB,CAPACITY=32M
*
L1N21L1C LINE
P1N21L1C PU

```



```
L1N21L2C LINE
P1N21L2C PU
L1N21L3C LINE
P1N21L4C PU
```

Automatic Generation of Lines and Physical Units

To enable VTAM to automatically generate lines and physical units on an external communication adapter major node, code the AUTOGEN operand on the GROUP definition statement of the external communication adapter major nodes where DIAL=YES has been specified. Thus, the lines and PUs need not be explicitly coded. For information on the naming conventions used for the lines and physical units, please refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The following definitions were extracted from the sample “XCA Major Node for Host A500 (Token-Ring LAN)” on page 53. The device address is specified on the CUADDR operand of the PORT definition statement. Here, CUADDR=BE0.

The AUTOGEN operand is specified as (3,L,P), where:

- 3 is a decimal value specifying the number of lines and PUs to be generated automatically by VTAM.
- L is a user-supplied character used in generated line names.
- P is a user-supplied character used in generated physical unit names.

DIAL=YES on the GROUP definition statement is required for automatic generation of lines and physical units.

```
*****
* X50BBE0 - VTAM EXTERNAL COMMUNICATION ADAPTER MAJNOD - MDH A500 *
*****
* 3172 XCA MAJOR NODE FOR HOST A500N
*****
XTBBE0  VBUILD TYPE=XCA          ** EXTERNAL COMMUNICATION ADAPT**
PORTBE  PORT  ADAPNO=0,          ** 3172 RELATIVE ADAPTER NUMBER** X
          CUADDR=BE0,           ** CHANNEL UNIT ADDRESS * X
          MEDIUM=RING,         ** LAN TYPE ** X
          SAPADDR=8,           ** SERVICE ACCESS POINT ADDRESS** X
          TIMER=90             ** CHANNEL ACTIVATE RESP TIME **
GP1BE1  GROUP ANSWER=ON,        ** PU DIAL INTO VTAM CAPABILITY** X
          AUTOGEN=(3,L,P),     ** AUTO GENERATE LINES A* X
          CALL=INOUT,          ** IN/OUT CALLING CAPABILITY ** X
          DIAL=YES,           ** SWITCHED CONNECTION * X
          ISTATUS=INACTIVE     ** INITIAL ACTIVATION STATUS **
*****
```

The three lines generated by VTAM will have line names LOBE0000, LOBE0001, and LOBE0002, where:

- L is the user-supplied character specified in the AUTOGEN operand.
- 0BE0 is the device address, as specified on the CUADDR operand.
- 000, 001, and 002 are sequential hexadecimal numbers assigned by VTAM.

The two physical units generated by VTAM will have PU names POBE0000, POBE0001, and POBE0002, where:

- P is the user-supplied character specified in the AUTOGEN operand.
- 0BE0 is the device address, as specified on the CUADDR operand.
- 000, 001, and 002 are sequential hexadecimal numbers assigned by VTAM.

For more information on the AUTOGEN operand, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

Chapter 7. Local Non-SNA Major Node

About This Chapter

This chapter describes sample local non-SNA major node definitions.

The local non-SNA major node defines a set of channel-attached (local) non-SNA terminals (printers or display stations). Each minor node represents a non-SNA terminal. The only valid non-SNA terminals are 3277, 3284, and 3286 devices.

To define a local non-SNA major node, code an LBUILD definition statement followed by one or more LOCAL definition statements, where the LOCAL definition statement defines a channel-attached non-SNA terminal. LOCAL specifies the 3-digit or 4-digit hexadecimal channel unit address used for the channel-attached terminal, the terminal type (3277, 3284, or 3286), and other information about the terminal. Do not code a PU definition statement and do not code a definition statement for the non-SNA cluster controller (3272 or compatible device) to which the terminal is attached.

Note: A local non-SNA terminal should not be defined to and activated by VTAM if its channel unit address is defined as an MVS console and allocated to console services. Activating a local non-SNA terminal whose channel unit address is in use by console services can cause VTAM, console services, or both to abend.

For more information about local non-SNA definitions, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* .

Sample Local Non-SNA Major Node Definition

Following is an example of a local non-SNA major node. The CUADDR operand defines the channel unit address of the non-SNA terminal. The TERM operand specifies the terminal type.

Resource registration places information about the location of resources in a directory services database. This registration reduces broadcast searches by ensuring that a resource will be found in the directory services database. Resources can be registered to a directory database on a network node server and/or to a central directory server.

For APPN, the REGISTER operand specifies how the local non-SNA resource should be registered.

REGISTER=NETSRVR

An end node resource should be registered to its network node server, but central directory registration should not be requested for it (the default).

REGISTER=CDSERVR

An end node resource should be registered to its network node server and central directory resource registration is requested for it. A network node resource is registered at the central directory server.

REGISTER=NO

An end node resource should not be registered.

The sample local non-SNA major node below illustrates how the REGISTER operand can be used.

```
*****
* LOCAL DEFINITION DECK FOR BISYNC LU *
*****
      LBUILD
L3270A LOCAL TERM=3277,CUADDR=3E0,ISTATUS=(INACTIVE),      C
      FEATUR2=(MODEL2,SELPEN),REGISTER=NO,                C
      USSTAB=USSTABFV,MODETAB=MODETAB3,                  C
      LOGTAB=USSINTAB
L3270B LOCAL TERM=3277,CUADDR=3E1,ISTATUS=(INACTIVE),      C
      FEATUR2=(MODEL2,SELPEN),REGISTER=NETSRVR,          C
      USSTAB=USSTABFV,MODETAB=MODETAB3,                  C
      LOGTAB=USSINTAB
*
L3270C LOCAL TERM=3277,CUADDR=3E3,ISTATUS=(INACTIVE),      C
      FEATUR2=(MODEL2,SELPEN),REGISTER=CDSERVR,          C
      USSTAB=USSTABFV,MODETAB=MODETAB3,                  C
      LOGTAB=USSINTAB
*
L3270D LOCAL TERM=3277,CUADDR=3E4,ISTATUS=(INACTIVE),      C
      FEATUR2=(MODEL2,SELPEN),                            C
      USSTAB=USSTABFV,MODETAB=MODETAB3,                  C
      LOGTAB=USSINTAB
L3270E LOCAL TERM=3277,CUADDR=3E2,ISTATUS=(INACTIVE),      C
      FEATUR2=(MODEL2,SELPEN),                            C
      USSTAB=USSTABFV,                                    C
      LOGTAB=USSINTAB
L3284A LOCAL TERM=3284,CUADDR=3E5,ISTATUS=INACTIVE,        C
      FEATUR2=(MODEL1),MODETAB=MODETAB3,                  C
      DLOGMOD=S3270
LTESTA LOCAL TERM=3277,CUADDR=3E6,ISTATUS=(ACTIVE),        C
      FEATUR2=(MODEL2,SELPEN),                            C
      USSTAB=USSTABFV,MODETAB=MODETAB3,                  C
      LOGTAB=USSINTAB
LTESTB LOCAL TERM=3277,CUADDR=3E7,ISTATUS=(ACTIVE),        C
      FEATUR2=(MODEL2,SELPEN),                            C
      USSTAB=USSTAB2,MODETAB=MODETAB3,                    C
      LOGTAB=INTTAB02
LTESTC LOCAL TERM=3277,CUADDR=3E8,ISTATUS=(ACTIVE),        C
      FEATUR2=(MODEL2,SELPEN),                            C
      USSTAB=USSTAB3,MODETAB=MODETAB3,                    C
      LOGTAB=INTTAB03
```

While VTAM is running, you can change the registration of local non-SNA resources in an APPN network by using the MODIFY RESOURCE command. For more information, see the *OS/390 eNetwork Communications Server: SNA Operation*.

Chapter 8. Local SNA Major Node

About This Chapter	71	High Performance Routing	76
Type 2.1 Channel Connections Between APPN Nodes	71	High Performance Routing over AHHC Connections	76
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Selective Deactivation of Idle LU 6.2 Sessions	73	High Performance Routing over CDLC and Leased SDLC Connections	78
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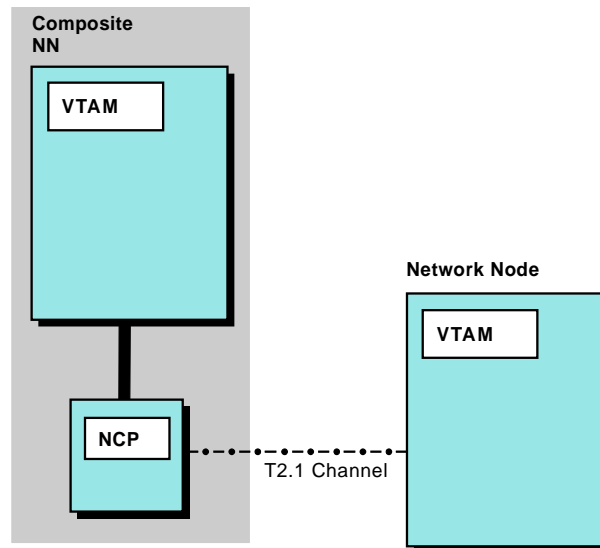
About This Chapter

This chapter describes sample local SNA major node definitions.

A local SNA major node defines a set of channel-attached (local) SNA cluster controllers.

Type 2.1 Channel Connections Between APPN Nodes

Type 2.1 channel connections can be used to connect two network nodes, or a network node and an end node. The following example shows how to connect an NCP in a composite network node to a network node.



APPN Connection -.-

Figure 17. Type 2.1 Channel Connection between a Composite Network Node and a Network Node

To define this type of connection, you must define the following:

- Local SNA major node
- NCP major node.

The local SNA major node resides at the VTAM network node and the NCP major node resides at the VTAM host in the composite network node. Code PUTYPE=2 and XID=YES on the PU definition statement in the local SNA major node to define a peripheral type 2.1 node. Similarly, code PUTYPE=2 and XID=YES on the PU definition statement in the NCP major node to define a peripheral type 2.1 node.

To allow CP-CP sessions to be established between the two nodes, CONNTYPE=APPN and CPCP=YES must be specified on both of those PU definition statements, unless CONNTYPE=APPN and CPCP=YES have been specified as start options.

The CP-CP sessions are established through the NCP by activating the local SNA major node from the network node and the line for the 2.1 channel from the VTAM composite node.

The following sample is taken from the local SNA major node for this connection. The corresponding NCP major node definition is found in "Type 2.1 Channel Connections between APPN Nodes" on page 102.

```
*****
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1.          *
* THE CONNECTION IS BETWEEN SUBAREAS 3 (NCP3AXX) AND A (SSCPAA)      *
*****
LSNA3AA  VBUILD TYPE=LOCAL
LSNA3APA PU    PUTYPE=2,CUADDR=050,ISTATUS=INACTIVE,XID=YES,          *
              VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,                    *
              CONNTYPE=APPN,CPCP=YES
```

Another sample local SNA major node for this type of configuration follows:

```
* =====> BEGINNING OF DATA SET LCL011
*****
* LCL011 - LOCAL SNA MAJOR NODE FOR APPN (T2.1) CHANNEL ACTIVATION  *
*           FOR A500                                                *
* TO ESTABLISH CP-CP SESSIONS BETWEEN A500 AND A17 THROUGH NCP    *
*   A03NCP:                                                         *
* - CHANGE THE CUADDR TO MATCH YOUR DEVICE ADDRESS AND ACTIVATE   *
*   LCL011 FROM A500                                               *
* - FROM A17, ACTIVATE A03CP3 (LINE FOR CHANNEL ADDR 10 - PHYSICAL *
*   PORT 3) ON A03NCP                                             *
*****
CA1      VBUILD TYPE=LOCAL    ** LOCAL SNA MAJOR NODE            **
PUCA1   PU    CUADDR=9B9,    ** DEVICE ADDRESS                  **X
              CONNTYPE=APPN, ** CONNECTION TYPE                  **X
              CPCP=YES,      ** CP-CP SESSION SUPPORT            **X
              DYNLU=YES,     ** DYNAMIC ALLOCATION OF CDRSCS      **X
              ISTATUS=ACTIVE,** INITIAL ACTIVATION STATUS        **X
              MAXBFRU=15,    ** NUMBER OF BUFFER UNITS           **X
              PUTYPE=2,      ** PHYSICAL UNIT TYPE                **X
              SSCPFM=USSSCS, ** RU TYPES SUPPORTED                **X
              VPACING=0,     ** VTAM PACING                       **X
              XID=YES        ** CHANNEL CONTACT PROCEDURE        **
* =====> END OF DATA SET LCL011
```

APPN Host-to-Host Channel Connection

APPN host-to-host channel connections enable two VTAM nodes to communicate using APPN protocols over MPC connections, as illustrated in Figure 30 on page 162.

To define an APPN host-to-host connection, you must define the following at each of the two VTAM nodes:

- A transport resource list (TRL) major node. For more information, see “Chapter 14. Transport Resource List Major Node” on page 161.
- The channel connection to the adjacent VTAM as an APPN PU using the TRLE operand in a PU definition statement of a local SNA major node.

The PU definition statement defines the channel connection and the adjacent VTAM as an APPN PU. The TRLE operand identifies a transport resource list element (TRLE) as defined in the TRL major node. The TRLE contains transport characteristics of the PU.

The following sample local SNA major nodes show transport resource list element (TRLE) definitions for the two hosts in Figure 30 on page 162. For example, TRLE=MPC1 in A11HHC specifies in the corresponding TRL major node the name of the TRLE definition statement VTAM uses to route data over the channel. XID=YES specifies that a PU type 2.1 channel contact procedure is to be used. CONNTYPE=APPN and CPCP=YES indicates that CP-CP sessions are supported on this connection.

```

*****
* Local SNA Major Node for A11N                                     *
*****
* NAME: A11BFTG                                                    *
* USE: APPN HOST TO HOST CHANNEL BF TG (LOCAL SNA MAJNODE)       *
*****
A11HHC  VBUILD TYPE=LOCAL
A11HHCPU1 PU   TRLE=MPC1,                                         *
                ISTATUS=INACTIVE,                                 *
                XID=YES,                                          *
                CONNTYPE=APPN,                                    *
                CPCP=YES
*****
* Local SNA Major Node for A12N                                     *
*****
* NAME: A12BFTG                                                    *
* USE: APPN HOST TO HOST CHANNEL BF TG (LOCAL SNA MAJNODE)       *
*****
A12HHC  VBUILD TYPE=LOCAL
A12HHCPU1 PU   TRLE=MPC1,                                         *
                ISTATUS=INACTIVE,                                 *
                XID=YES,                                          *
                CONNTYPE=APPN,                                    *
                CPCP=YES

```

Selective Deactivation of Idle LU 6.2 Sessions

In the following sample used in the configuration depicted in Figure 4 on page 9, Type 2.1 node B28CCNPU is defined as a limited resource (LIMRES=YES). That means that any LU 6.2 sessions that traverse B28CCNPU (except for LU 6.2 sessions that the VTAM CP is using) will be deactivated if no conversation is detected for the period of time specified on the LIMQSINT operand of the APPL definition statement.

For an example of a LIMQSINT definition, see “Defining LIMQSINT” on page 10.

```

*****
* LOCAL SNA MAJOR NODE FOR CHANNEL-ATTACHED TYPE 2.1 NODE          *
* (FOR CHANNEL BETWEEN B128 AND NCP B75NCP)                       *
*****
B28CCN  VBUILD TYPE=LOCAL
B28CCNPU PU  CUADDR=013,          ** PHYSICAL UNIT ADDRESS      ** X
              LIMRES=YES,        ** LIMITED RESOURCE          ** X
              ISTATUS=INACTIVE,  **                               ** X
              PUTYPE=2,          ** PU TYPE 2.1 OR 2.0          ** X
              XID=YES           ** XID=YES==>2.1 NO==>2.0      **
B75L341A LU  LOCADDR=0,MODETAB=AMODETAB
B75L341B LU  LOCADDR=0,MODETAB=AMODETAB
B75L342A LU  LOCADDR=0,MODETAB=AMODETAB
B75L342B LU  LOCADDR=0,MODETAB=AMODETAB
*****

```

Dynamic Definition of Dependent LUs

Dependent logical units that are attached through an IBM 3174 control unit can be defined dynamically to a VTAM network when the device containing the logical units powers on, rather than during major node activation. See Figure 18.

VTAM defines dependent logical units dynamically by using model logical unit definitions, rather than predefined definitions. The dynamically defined logical unit definitions are updated, if needed, each time the device containing the logical units powers on. You can use this function to add, change, or relocate dependent logical units from a VTAM network without reactivating the major node.

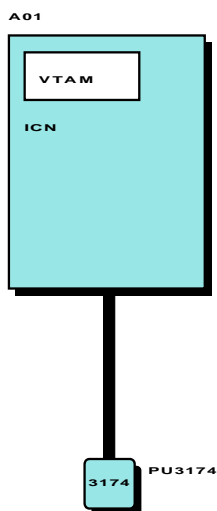


Figure 18. Dynamic Definition of Dependent LUs. Host A01 is an interchange node (ICN).

For more information on this function, including the process VTAM follows to dynamically define dependent logical units, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

To enable dynamic definition of dependent logical units, you must code an LU group major node. The LU group major node defines one or more model LU groups, each of which contains a list of model LU definition statements. For a sample LU group major node, see “Chapter 9. LU Group Major Node” on page 81.

In addition to coding an LU group major node, you must also code the LUGROUP operand on the PU definition statement for the 3174. If you use the SDDL (selection of definitions for dependent LUs) exit routine, you must also code the LUSEED operand on the 3174's PU definition statement.

In the sample local SNA major node named A01LSNA the VBUILD definition statement identifies it as a local SNA major node (TYPE=LOCAL).

In the PU definition statement, PU3174 is the 3174's PU name.

LUGROUP specifies the name of the model LU group (LUGRP) that VTAM uses to select a model LU definition when dynamically defining a logical unit attached through this 3174.

LUSEED provides a pattern name (L3174### in this sample) that is used to create an LU name for the dynamically created LU definition statements.

```
* =====> BEGINNING OF DATA SET A01LSNA
*****
* A01LSNA - VTAM LOCAL SNA MAJOR NODE - LOCAL SNA 3174 *
*****
* 3174 LOCAL SNA PU *
*****
A01LSNA VBUILD TYPE=LOCAL
PU3174 PU CUADDR=7A0, ** CHANNEL UNIT ADDRESS ** X
          DLOGMOD=D4A32784, ** DEFAULT LOGON MODE TABLE ENTRY ** X
          LUGROUP=LUGRP, ** SDDL GROUP - SEE A01LUGRP ** X
          LUSEED=L3174###, ** LU PATTERN NAME ** X
          MAXBFRU=15, ** RECEIVE DATA BUFFER SIZE ** X
          USSTAB=AUSSTAB ** USS TABLE NAME **
* =====> END OF DATA SET A01LSNA
```

Defining Subnetwork Boundaries

When the start option BN=YES is in effect, the operand NATIVE is used on the PU definition statement to specify whether this link station represents a connection to a native node. NATIVE=NO defines a subnetwork boundary between this node and the named adjacent CP, or between this node and the CP represented by the PU statement. NATIVE=NO must be used when both nodes have the same network ID, but a subnetwork boundary is desired. The NATIVE operand is required on only one side of a network or subnetwork boundary. For more information on the how the NATIVE operand is used in local SNA major nodes, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

The following sample local SNA major node illustrates how specifying NATIVE=NO on a PU definition statement defines a subnetwork boundary between two nodes with the same network ID.

```
*****
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1 *
*****
LSNA3A2 VBUILD TYPE=LOCAL
LSNA3APU PU PUTYPE=2,CUADDR=051,ISTATUS=INACTIVE,XID=YES, *
          VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,NATIVE=NO, *
          CONNTYPE=APPN,CPCP=YES
APPL2 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
APPCAP06 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L4A4956A LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L4A3767A LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
```

```

ECHOB12 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
ECHO C12 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3270B LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32783

```

For more information on the BN start option, see “Start Option List with Border Node Support” on page 190.

Authorized Transmission Priority for LEN Connections

In the LSNA3A2 local SNA major node below, AUTHLEN=YES specifies that a session between two independent LUs through a subarea network will use the same transmission priority for both type 2.1 LEN connections (entry and exit). AUTHLEN may only be specified where node type 2.1 is specified and the connection is to be attempted as an APPN connection. AUTHLEN=YES is the default.

```

*****
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1 *
*****
LSNA3A2 VBUILD TYPE=LOCAL
LSNA3APU PU PUTYPE=2,CUADDR=051,ISTATUS=INACTIVE,XID=YES, *
          VPACING=0,SSCPFM=USSSCS,MAXBFRTU=15, *
          CONNTYPE=APPN,CPCP=YES,AUTHLEN=YES
APPL2 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
APPCAP06 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L4A4956A LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L4A3767A LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
ECHOB12 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
ECHO C12 LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3270B LU LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32783

```

High Performance Routing

High performance routing (HPR) allows you to migrate NCP connections to APPN connections without incurring the associated increase in storage and cycles. HPR utilizes a rapid transport protocol (RTP) connection to transport session traffic between session endpoints. HPR routes can also traverse an existing subarea network, as HPR support provides for the mapping of HPR routes over VR-based TGs between intermediate nodes.

HPR support is available only over APPN host-to-host channel (AHC) connections and other type 2.1 channel connections. HPR support for APPN host-to-host connections is not available for composite network nodes.

High Performance Routing over AHC Connections

You can implement high performance routing over an APPN host-to-host channel (AHC) connection, as depicted in Figure 30 on page 162.

To implement an HPR route between network nodes SSCP1A and SSCP2A, for instance, specify HPR=YES on the PU definition statement in the local SNA major nodes on both sides of the connection and specify HPR=RTP in the VTAM start option lists in both nodes. HPR=YES is the default when the start option is HPR=RTP. The PU definition statement must define a type 2.1 node connection. On SSCP1A the local SNA major node is defined as follows:

```

*****
*
* Name:      LSAHHC1A SAMPLE_A
*
* Description: LOCAL SNA MAJOR NODE FOR APPN HHC (SSCP1A)
*
*****
LSAHHC1A VBUILD TYPE=LOCAL
PU1A2A2 PU TRLE=ML1A2A2, ISTATUS=INACTIVE, XID=YES, VPACING=0,      *
          SSCPFM=USSSCS, CONNTYPE=APPN, CPCP=YES, HPR=YES

```

On the SSCP2A side of the connection the local SNA major node is defined as follows:

```

*****
*
* Name:      LSAHHC2A SAMPLE_A
*
* Description: LOCAL SNA MAJOR NODE FOR APPN HHC (SSCP2A)
*
*****
LSAHHC2A VBUILD TYPE=LOCAL
PU2A1A2 PU TRLE=ML2A1A2, ISTATUS=INACTIVE, XID=YES, VPACING=0,      *
          SSCPFM=USSSCS, CONNTYPE=APPN, CPCP=YES, HPR=YES

```

In addition, you must define transport resource list major nodes on both sides of the connection.

For more information on the start option requirements, see “Network Node Start Option List” on page 179.

High Performance Routing over Channel Connections

You can implement high performance routing over a configuration consisting of a channel-attached NCP and local SNA connections, as depicted in Figure 19.

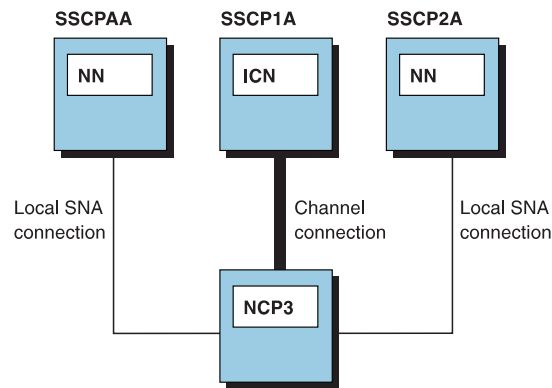


Figure 19. High Performance Routing Over Channel Connections

In this configuration, SSCPAA and SSCP2A are endpoints of an HPR route and SSCP1A provides intermediate node ANR routing. This configuration implements high performance routing by default because HPR=YES is the default value for PUs defined as 2.1 nodes when the connections are not to or from VTAM in a composite network node.

For the sake of illustration, the local SNA major nodes are shown below. Note that YES is the HPR default value.

```

*-----*
*                LOCAL SNA MAJOR NODE LSNA3AA                *
*                                                                 *
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1    *
* THE CONNECTION IS BETWEEN SUBAREAS 3 (NCP3AXX) AND A (SSCPAA) *
*-----*
LSNA3AA  VBUILD TYPE=LOCAL
LSNA3APA PU    PUTYPE=2,CUADDR=050,ISTATUS=INACTIVE,XID=YES,    *
              VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,              *
              CONNTYPE=APPN,CPCP=YES,HPR=YES
APPL2    LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
NETAPPL2 LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3A4956A LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L3A3767A LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
ECHOB12  LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
ECHOC12  LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT

*-----*
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1    *
* THE CONNECTION IS BETWEEN SUBAREAS 3 (NCP3AXX) AND 2 (SSCP2A) *
*-----*
LSNA3A2  VBUILD TYPE=LOCAL
LSNA3APU PU    PUTYPE=2,CUADDR=051,ISTATUS=INACTIVE,XID=YES,    *
              VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,              *
              CONNTYPE=APPN,CPCP=YES,HPR=YES
APPL2    LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
APPCAP06 LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L4A4956A LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L4A3767A LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
ECHOB12  LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
ECHOC12  LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3270B   LU    LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32783

```

See “Network Node Start Option List” on page 179 and “Interchange Node Start Option List” on page 185 for information on how to code VTAM start options for high performance routing. See “High Performance Routing” on page 114 for information on how to code the NCP major node for high performance routing.

High Performance Routing over CDLC and Leased SDLC Connections

You can implement high performance routing over CDLC and leased SDLC connections, as depicted in Figure 20.

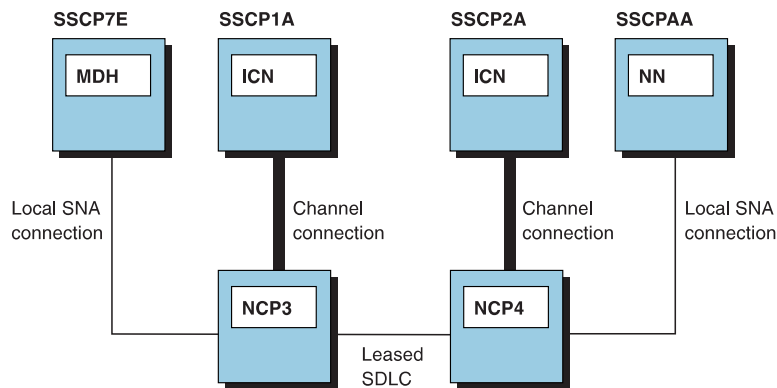


Figure 20. High Performance Routing Over Channel and Leased SDLC Connections

In the following local SNA major nodes, HPR=YES is coded on the PU definition statements for LSNA3AP7 and LSNA4APA. This operand specifies that those PUs provide HPR support.

```

*-----*
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1      *
* THE CONNECTION IS BETWEEN SUBAREAS 3 (NCP3AXX) AND 7 (SSCP7B)  *
*-----*
LSNA3A7  VBUILD TYPE=LOCAL
LSNA3AP7 PU      PUTYPE=2,CUADDR=052, ISTATUS=INACTIVE,XID=YES,    *
                VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,              *
                CONNTYPE=APPN,CPCP=YES,HPR=YES
APPL2    LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
NETAPPL2 LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3A4956A LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L3A3767A LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
ECHO12   LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
*-----*
* THE FOLLOWING IS A DEFINITION FOR CHANNEL ATTACHED PU 2.1      *
* THE CONNECTION IS BETWEEN SUBAREAS 4 (NCP4AXX) AND A (SSCPAA)  *
*-----*
LSNA4AA  VBUILD TYPE=LOCAL
LSNA4APA PU      PUTYPE=2,CUADDR=054, ISTATUS=INACTIVE,XID=YES,    *
                VPACING=0,SSCPFM=USSSCS,MAXBFRU=15,              *
                CONNTYPE=APPN,CPCP=YES,HPR=YES
APPL2    LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
NETAPPL2 LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
L3A4956A LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32781
L3A3767A LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=D4A32782
ECHO12   LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT
ECHO12   LU      LOCADDR=00,MODETAB=ISTINCLM,DLOGMOD=INTERACT

```

For the corresponding requirements for the VTAM start options list see “Network Node Start Option List” on page 179, “Interchange Node Start Option List” on page 185, and “Migration Data Host Start Option List” on page 188.

Chapter 9. LU Group Major Node

About This Chapter 81 Sample LU Group Major Node Definition 81

About This Chapter

This chapter describes a sample LU group major node definition.

Dependent logical units that are attached through an IBM 3174 control unit can be defined dynamically to a VTAM network when the device containing the logical units powers on, rather than during major node activation. See Figure 18 on page 74.

VTAM defines dependent logical units dynamically by using model logical unit definitions, rather than predefined definitions. The dynamically defined logical unit definitions are updated, if needed, each time the device containing the logical units powers on. You can use this function to add, change, or relocate dependent logical units from a VTAM network without reactivating the major node.

For more information on this function, including the process VTAM follows to dynamically define dependent logical units, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

To enable dynamic definition of dependent logical units, you must code an LU group major node. The LU group major node defines one or more model LU groups, each of which contains a list of model LU definition statements.

Note: You cannot take advantage of the sift-down effect in the LU group major node.

Sample LU Group Major Node Definition

In the VBUILD definition statement, TYPE=LUGROUP defines this node to VTAM as an LU group major node.

The LUGROUP definition statement specifies the start of model LU group LUGRP. A model LU group ends when VTAM encounters either another LUGROUP definition statement or a VBUILD definition statement.

```
* =====> BEGINNING OF DATA SET A01LUGRP
*****
* A01LUGRP - VTAM LU GROUP MAJOR NODE FOR SDDLU *
*****
A01LUGRP VBUILD TYPE=LUGROUP
LUGRP LUGROUP
317@ LU DLOGMOD=D4C32782, ** DEFAULT LOGON MODE TABLE ENTRY ** X
      LOGAPPL=ECHOA01, ** CONTROLLING PRIMARY LU ** X
      USSTAB=AUSSTAB ** USS TABLE NAME **
327@ LU DLOGMOD=D4C32782, X
      USSTAB=AUSSTAB, X
      LOGAPPL=ECHOA01
@ LU DLOGMOD=D4C32782, X
      USSTAB=AUSSTAB, X
      LOGAPPL=ECHOA01
* =====> END OF DATA SET A01LUGRP
```

To enable dynamic definition of dependent logical units, you must also code the LUGROUP operand on the PU definition statement for the 3174. If you use the SDDL (selection of definitions for dependent LUs) exit routine, you must also code the LUSEED operand on the 3174's PU definition statement. For a sample local SNA major node that specifies the LUGROUP and LUSEED operands on the 3174's PU definition statement, see page 75.

Chapter 10. Model Major Node

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About This Chapter

This chapter contains samples of model major node definitions, which you can use to dynamically define switched resources.

Dynamically Defining Switched Resources

You can define switched peripheral nodes using either of the following:

- Dynamic PU definition (DYNPU operand)
- Dynamic switched definition facility.

This chapter illustrates how you can utilize the dynamic switched definition facility by defining model major nodes. This facility requires model definition statements and an exit routine, which VTAM uses as follows:

1. A type 1, 2, or 2.1 device dials in to VTAM.
2. A configuration services XID exit routine uses the device's CPNAME (for type 2.1 devices) or IDBLK and IDNUM (for type 1 and 2 devices) to find the following additional information:
 - The device's physical unit name
 - The name of the appropriate physical unit model definition
 - The device's logical unit name
 - The name of the appropriate logical unit model definition.
3. The exit routine passes this information to VTAM.
4. VTAM uses the information and the appropriate model definitions to build the new devices in a dynamic switched major node (ISTDSWMN).

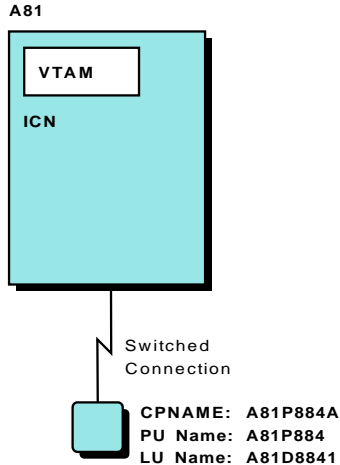


Figure 21. Dynamic Definition of a Switched Connection. Host A81 is an interchange node (ICN).

For more information on this function, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

For a sample configuration services XID exit routine, see *OS/390 eNetwork Communications Server: SNA Customization*.

Defining a Model Major Node

To enable this function, you must first define a model major node whose minor nodes are model physical unit and logical unit definitions. The VBUILD definition statement defines this as a model major node (TYPE=MODEL). MODELPU is the model LU definition statement. MODELPU is the model PU definition statement.

Note: In a model major node the LU definition statements do not have to follow PU definition statements.

The model major node shown immediately below is used to dynamically define the switched connection depicted in Figure 21.

```
*****
* A81MODEL - VTAM MODEL MAJOR NODE *
*****
A81MODEL VBUILD TYPE=MODEL
MODELPU PU ADDR=C1, ** CHANNEL UNIT ADDRESS **X
          ANS=CONTINUE, ** AUTOMATIC NETWORK SHUTDOWN **X
          AUTHLEN=YES, ** AUTHORIZED TRANS PRIORITY **X
          DISCNT=YES, ** DISCONNECT DIAL CONNECTION **X
          MAXDATA=256, ** MAX RECEIVE DATA BYTE SIZE **X
          MAXOUT=1, ** MAX SEND BEFORE RESPONSE **X
          MAXSESS=2, ** MAX NUM OF LU-LU SESSIONS **X
          NATIVE=NO, ** NON-NATIVE CONNECTION **X
          PASSLIM=1, ** MAX NUM OF CONTIGUOUS PIUS **X
          PUTYPE=2 ** PHYSICAL UNIT TYPE **
MODELPU LU LOCADDR=1, ** LOGICAL UNIT LOCAL ADDRESS **X
          MODETAB=AMODETAB ** LOGON MODE TABLE NAME **
```

The sample model major node shown below corresponds to the sample configuration services XID exit routine (named ISTECCS) provided in SYS1.SAMPLIB. The PU and LU names in this sample model major node match the names generated by the exit routine's algorithm.

```

*****
* Descriptive name: VTAM Sample MODEL Major Node *
*
* Function: Defines model names that can be returned by VTAM's sample *
* Configuration Services XID Exit Routine - ISTECCS. *
*****
ISTMODEL VBUILD TYPE=MODEL
*****
*
* Model for IDBLK X'017' - PC 3270 Emulation *
*
*****
PUMOD017 PU ADDR=C1, X
              ANS=CONT, X
              PUTYPE=2
LUMOD017 LU LOCADDR=2, X
              MODETAB=ISTINCLM, X
              USSTAB=ISTINCDT, X
              PACING=1
*****
*
* Model for IDBLK X'056' - AS/400 *
*
*****
PUMOD056 PU ADDR=01, X
              ANS=CONT, X
              PUTYPE=2
LUMOD056 LU LOCADDR=2, X
              MODETAB=ISTINCLM, X
              USSTAB=ISTINCDT, X
              PACING=7
*****
*
* Model for IDBLK X'05D' - OS/2 Communications Manager *
*
*****
PUMOD05D PU ADDR=01, X
              ANS=CONT, X
              PUTYPE=2
LUMOD05D LU LOCADDR=2, X
              MODETAB=ISTINCLM, X
              USSTAB=ISTINCDT, X
              PACING=7

```

You can find another example of a model major node in the *OS/390 eNetwork Communications Server: SNA Network Implementation*

Defining a Model Major Node for XCF

A model can be defined for dynamic XCF local SNA PUs in a model major node, which can override the XCF default values for the operands of the PU definition statement. Coding a TRLE operand signifies that the model is for XCF connections. Only one model definition is in effect at a time. The first model activated is the one used for the dynamic PUs.

For XCF dynamic PU definitions in ISTLSXCF, the name on the PU statement defines the first 1 to 4 characters of the dynamic PU names in ISTLSXCF, followed by an asterisk (*). The default, if just an asterisk (*) is coded for the name on the PU statement, is ISTP. The name on the TRLE operand defines the first one to four characters of the dynamic TRLEs in the TRL major node, followed by an asterisk (*). The default, if just an asterisk (*) is coded on the TRLE operand, is ISTT.

The VBUILD definition statement defines this as a model major node (TYPE=MODEL). The rest of the operands are either ignored, allowed to default, or coded with the default value.

For more information on these operands, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The model major node shown immediately below is used to dynamically define the switched connection depicted in Figure 21 on page 84.

```
*****
* MODEL - VTAM MODEL MAJOR NODE FOR XCF *
*****
* MODEL MAJOR NODE WITH TRLE - FOR XCF
*          PU name   = RISxxxxx
*          TRLE name = ISTTxxxxx
*
MMNXCFS1 VBUILD TYPE=MODEL
RIS*    PU    TRLE=*
```

Defining a PU and an LU for the Configuration Services XID Exit Routine

The configuration services XID exit routine allows you to give VTAM information to create dynamic representations of switched devices without disrupting a switched network. You do not have to explicitly define a switched device to VTAM before the device attempts to dial in.

When an unknown device attempts to dial in:

1. If the device has a CPNAME, the exit checks for the device's definition in the CPNDEF definition file.
2. If the device has an IDBLK and IDNUM, the exit checks for the device's definition in the NIDDEF definition file.
3. If the device does not have a CPNAME, IDBLK, or IDNUM, or if the exit cannot find a definition for the device in CPNDEF or NIDDEF, the exit invokes a name generation function and creates the necessary PU and LU names.

Here's a sample CPNDEF definition file for the connection shown in Figure 21 on page 84, where

- A81P884A is the CPNAME of the device.
- A81P884 is the device's physical unit name.
- MODELPU is the name of the appropriate physical unit model definition.
- A81D8841 is the device's logical unit name.
- MODELLU is the name of the appropriate logical unit model definition.

```
*****
* A81P884A: PU AND LU NAMES
*****
A81P884A
    A81P884
    MODELPU
    A81D8841
    MODELLU
*****
```

For a sample NIDDEF file, as well as another sample CPNDEF file, see *OS/390 eNetwork Communications Server: SNA Customization*

Authorized Transmission Priority for LEN Connections

In the sample model major node on page 84, AUTHLEN=YES specifies that a session between two independent LUs through a subarea network will use the same transmission priority for both type 2.1 LEN connections (entry and exit). AUTHLEN may only be specified where node type 2.1 is specified and where the connection is attempted as an APPN connection.

Limiting Sessions for Switched Resources

In the sample model major node on page 84, MAXSESS=2 specifies that the maximum number of concurrent LU-LU sessions in which an independent LU on MODELPU can participate is two.

Defining Subnetwork Boundaries

When the start option BN=YES is in effect, the operand NATIVE is used on the PU definition statement to specify whether this link station represents a connection to a native node.

The NATIVE operand on a PU definition statement specifies whether this link station represents a connection to a native node. NATIVE=NO is used when both nodes have the same network ID, but a subnetwork boundary is desired. Thus, in the sample model major node on page 84, NATIVE=NO on the PU definition statement for MODELPU indicates that MODELPU represents a connection to a non-native node. The NATIVE operand is required on only one side of a network or subnetwork boundary.

Chapter 11. Network Control Program (NCP) Major Node

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About This Chapter

This chapter contains sample Network Control Program major node definitions.

A Network Control Program (NCP) major node consists of the resources attached to an NCP. The attached resources (lines, physical units, and logical units) are minor nodes. VTAM requires the information in the NCP major node to communicate with the NCP and its attached devices.

This chapter discusses the ways in which you can code NCP major node definitions to aid in implementing various network configurations.

Channel-Attached NCP

To define a channel-attached NCP:

- Code one PCCU (programmed communication control unit) definition statement for each VTAM that is to activate the NCP. It is required and defines the VTAM functions that are provided for this NCP.
- Code one HOST definition statement for each host that activates the NCP. The HOST statement determines the amount of data that VTAM must be prepared to receive from the NCP over the channel.
- Code one BUILD definition statement. Information on the BUILD statement is used primarily by the NCP.
- Code a LINE and a PU definition statement for each channel adapter.

For more information on channel-attached NCPs see the *OS/390 eNetwork Communications Server: SNA Network Implementation* .

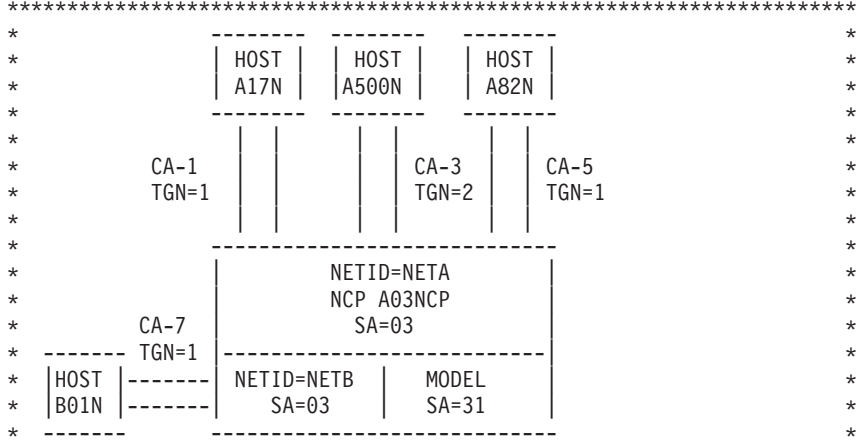
The following sample NCP major node illustrates how a channel-attached NCP may be defined.

```
* =====> BEGINNING OF DATA SET A03NCPB
*****      A03NCP - NCP FOR SAMPLES NETWORK   SUBAREA 03      *****
*****
```

```

*   NCP NAME:   A03NCP
*   VER/REL:   V6 R2
*   SUBAREA:   A03   (GATEWAY: A03/B03/MODEL)
*   BOX-TYPE:  3745

```



- ```

* LINE FUNCTION
* ---- -
* 000 LEASED SDLC 9.6KB SNBU TO LINE 0 IN C04NCP IN NETC
* 001 MULTIPOINT SDLC LINE - DLU'S & ILU'S
* 002 BSC LEASED LINE
* 003 MULTIDROP SUBAREA FROM A04NCP
* 004 MULTIDROP SUBAREA FROM A04NCP
* 016 LEASED 56KB SUBAREA TO LINE 48 B31NCP IN NETB
* 020 LEASED 56KB DR
* 032 LEASED SDLC 9.6KB SNBU BACKUP TO C04NCP IN NETC
* 033 LEASED 9.6KB SUBAREA TO LINE 16 C04NCP IN NETC
* 034 LEASED 9.6KB DR
* 035 LEASED 9.6KB DR
* 048 LEASED 56KB SUBAREA TO LINE 16 B31NCP IN NETA
* 052 FULL DUPLEX 56KB FRAME RELAY
* DLCI TO B31NCP 052
* 1036 FULL DUPLEX HPTSS FRAME RELAY
* DLCI TO B31NCP 1036
* 1070 ETHERNET
* 1071 ETHERNET
* NCST LU TO B31NCP
* NCST LU TO A17N
* NCST LU TO A01N
* 1088 TOKEN RING SUBAREA AND PERIPHERAL
* SUBAREA LOGICAL TO B31NCP 1093 IN NETC (NETA,ANY)
* 1089 TOKEN RING PERIPHERAL ONLY
* 1092 TOKEN RING PERIPHERAL ONLY - DUPLICATE TIC
* 1093 TOKEN RING PERIPHERAL ONLY - DUPLICATE TIC

```

```

* NCP OPTIONS MACRO - MISCELLANEOUS OPTIONS
* *****
* OPTIONS NEWDEFN=(YES,ECHO)
* *****

```

```

* VTAM PCCU MACRO - HOSTS THAT WILL ACTIVATE THIS NCP
* *****
APCCU1 PCCU AUTOSYN=YES,
 BACKUP=YES,
 CDUMPDS=CSPDUMP,
 CONFIGDS=CRNCKPT,
 DUMPDS=VTAMDUMP,
 GWCTL=SHR,
 MAXDATA=4096,
 MDUMPDS=MOSSDUMP,
 NETID=NETA,
 OWNER=A500N,

```

```

X
X
X
X
X
X
X
X
X
X
X

```



```

SUBAREA=500, X
TGN=ANY X
APCCU2 PCCU AUTOSYN=YES, X
BACKUP=YES, X
CDUMPDS=CSPDUMP, X
CONFIGDS=CRNCKPT, X
DUMPDS=VTAMDUMP, X
GWCTL=SHR, X
MAXDATA=4096, X
MDUMPDS=MOSSDUMP, X
NETID=NETA, X
OWNER=A17N, X
SUBAREA=17 X
APCCU3 PCCU AUTOSYN=YES, X
BACKUP=YES, X
CDUMPDS=CSPDUMP, X
CONFIGDS=CRNCKPT, X
DUMPDS=VTAMDUMP, X
GWCTL=SHR, X
MAXDATA=4096, X
MDUMPDS=MOSSDUMP, X
NETID=NETA, X
OWNER=A82N, X
SUBAREA=82 X
APCCU4 PCCU AUTOSYN=YES, X
BACKUP=YES, X
CDUMPDS=CSPDUMP, X
CONFIGDS=CRNCKPT, X
DUMPDS=VTAMDUMP, X
GWCTL=SHR, X
MAXDATA=4096, X
MDUMPDS=MOSSDUMP, X
NETID=NETB, X
OWNER=B01N, X
SUBAREA=01 X

* NCP BUILD MACRO - NCP/CONTROLLER INFO *

A03NCP BUILD ADDSESS=500, X
AUXADDR=500, X
BFRS=128, X
BRANCH=8000, X
CATRACE=(YES,255), X
CNLSQMAX=10000, X
CNLSQTIM=10, X
CSMSG=C3D9C9E340E2C9E340D4C5E2E2C1C7C540C6D6D940E2E24040X
40C2C340E3C5D9D4C9D5C1D3, X
CWALL=26, X
ENABLTO=30.0, X
ERLIMIT=16, X
GWSESAC=(YES,NODEFER,,1000,500,,10,11,12,13,14,15), X
HSBPOOL=6000, X
IPPOOL=NCP, X
IPRATE=(40,50), X
LOADLIB=NCPLoad, X
LOCALTO=19.0, X
LTRACE=8, X
MAXSESS=250, X
MAXSSCP=8, X
MODEL=3745, X
NAMTAB=120, X
NETID=NETA, X
NEWNAME=A03NCP, X
NPA=(YES,DR), X
NUMHSAS=8, X
OLT=YES, X
PWROFF=YES, X

```

```

REMOtto=20.0, X
SALIMIT=1023, X
SESSACC=(YES,ALL,,1000,500,,10,11,12,13,14,15), X
SLODOWN=12, X
SUBAREA=03, X
TRACE=(YES,100), X
TRANSFR=41, X
TYPGEN=NCP, X
TYP SYS=MVS, X
T2TIMER=(1.9,2.0,45), X
USGTIER=5, X
VERSION=V6R2, X
VRPOOL=150, X
VRTIMER0=(180,,50), X
VRTIMER1=(180,,50), X
VRTIMER2=(180,,50) X

* DYNAMIC CONTROL FACILITIES USED BY VTAM *

SYSCNTRL OPTIONS=(BACKUP, X
BHSASSC, X
DLRID, X
DVSINIT, X
ENDCALL, X
LNSTAT, X
MODE, X
NAKLIM, X
RCNTRL, X
RCOND, X
RDEVQ, X
RECMD, X
RIMM, X
SESINIT, X
SESSION, X
SSPAUSE, X
STORDSP, X
XMTLMT) X

* NCP HOST MACRO - CHANNEL ATTACHED HOST DEFINITIONS *

A17N HOST BFRPAD=0, X
INBFRS=6, X
MAXBFRU=16, X
NETID=NETA, X
SUBAREA=17, X
UNITSZ=256
A82N HOST BFRPAD=0, X
INBFRS=6, X
MAXBFRU=16, X
NETID=NETA, X
SUBAREA=82, X
UNITSZ=256
A500N HOST BFRPAD=0, X
INBFRS=6, X
MAXBFRU=16, X
NETID=NETA, X
SUBAREA=500, X
UNITSZ=256
B01N HOST BFRPAD=0, X
INBFRS=6, X
MAXBFRU=16, X
NETID=NETB, X
SUBAREA=01, X
UNITSZ=256
.
.
.

```

```

* CHANNEL ADAPTER DEFINITIONS *

A03CA1 GROUP LNCTL=CA, X
 CA=TYPE7, X
 NCPA=ACTIVE, X
 TIMEOUT=180.0

* CA ADDR - 08 PHYSICAL PORT 1 *

A03CP1 LINE ADDRESS=P1, X
 CASDL=420, X
 INBFRS=3, X
 DELAY=0.2
A03PP1A PU PUTYPE=5, X
 TGN=1

* CA ADDR - 10 PHYSICAL PORT 3 *
* USED TO ESTABLISH CP-CP SESSIONS TO A500 *
* SEE ALSO MEMBER LCL011 IN VTAMLST *

A03CP3 LINE ADDRESS=P3, X
 CASDL=420, X
 INBFRS=3, X
 DELAY=0.2
A03PP3A PU PUTYPE=2, X
 CONNTYPE=APPN,CPCP=YES

* CA ADDR - 00 PHYSICAL PORT 5 *
* USED TO ESTABLISH CP-CP SESSIONS TO A82 *
* SEE ALSO MEMBER LCL013 IN VTAMLST *

A03CP5 LINE ADDRESS=P5, X
 CASDL=420, X
 INBFRS=3, X
 NETID=NETA, X
 DELAY=0.2
A03PP5A PU PUTYPE=2, X
 CONNTYPE=APPN,CPCP=YES

* CA ADDR - 02 PHYSICAL PORT 7 *

A03CP7 LINE ADDRESS=P7, X
 CASDL=420, X
 INBFRS=3, X
 NETID=NETB, X
 DELAY=0.2
A03PP7A PU PUTYPE=5, X
 TGN=1

* NON-NATIVE NETWORK DEFINITIONS FOR NETB *

NETB NETWORK SUBAREA=03,SALIMIT=2047,NETID=NETB, *
 VRTIMER0=(180,,50),VRTIMER1=(180,,50),VRTIMER2=(180,,50)
 GWNAU NETID=NETA,NAME=A01N,NUMSESS=5,ELEMENT=1
 GWNAU NETID=NETA,NAME=A02N,NUMSESS=5,ELEMENT=2
 GWNAU NETID=NETA,NAME=A17N,NUMSESS=5,ELEMENT=3
 GWNAU NETID=NETA,NAME=A81N,NUMSESS=5,ELEMENT=4
 GWNAU NETID=NETA,NAME=A500N,NUMSESS=5,ELEMENT=5
 GWNAU NETID=NETC,NAME=C01N,NUMSESS=5,ELEMENT=6
 GWNAU NETID=NETA,NAME=A82N,NUMSESS=5,ELEMENT=7
 GWNAU NUMADDR=600

* PATH DECK FOR NON-NATIVE NETB *

PATH DESTSA=1, *
 ER0=(1,1),ER2=(1,1),ER4=(1,1),ER6=(1,1), *

```

```

ER1=(31,1),ER3=(31,1),ER5=(31,1),ER7=(31,1), *
VR0=0, *
VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), *
VR1=1, *
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), *
VR2=2, *
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), *
VR3=3, *
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), *
VR4=4, *
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), *
VR5=5, *
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), *
VR6=6, *
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), *
VR7=7, *
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
PATH DESTSA=31, *
ER0=(31,1),ER2=(31,1),ER4=(31,1),ER6=(31,1), *
ER1=(31,1),ER3=(31,1),ER5=(31,1),ER7=(31,1), *
VR0=0, *
VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), *
VR1=1, *
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), *
VR2=2, *
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), *
VR3=3, *
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), *
VR4=4, *
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), *
VR5=5, *
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), *
VR6=6, *
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), *
VR7=7, *
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
PATH DESTSA=(75,1028,1027), *
ER0=(31,1),ER2=(31,1),ER4=(31,1),ER6=(31,1), *
ER1=(31,1),ER3=(31,1),ER5=(31,1),ER7=(31,1), *
VR0=0, *
VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), *
VR1=1, *
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), *
VR2=2, *
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), *
VR3=3, *
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), *
VR4=4, *
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), *
VR5=5, *
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), *
VR6=6, *
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), *
VR7=7, *
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
.
.
.

* NCP GENEND MACRO - END OF GEN *

GENEND GENEND
 END
* =====> END OF DATA SET A03NCPB

```

## NCP-Attached Switched Peripheral PUs

Switched peripheral PUs attached to an NCP are defined by VTAM with an NCP major node and a switched major node. Consider, for example, the configuration shown in Figure 22.

The NCP major node NCP3AB7 defines two switched line groups, as shown in the

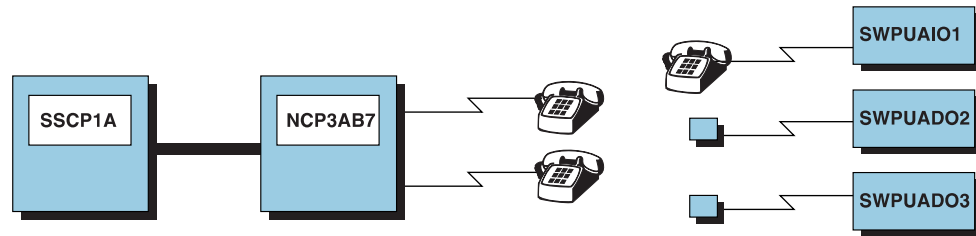


Figure 22. NCP-Attached Switched Peripheral PUs

following excerpt:

```

*
* A U T O - D I A L G R O U P
*
* D I A L I N / O U T ; P U T Y P E = (1 , 2)
*

*
GP3AAI01 GROUP LNCTL=SDLC,DIAL=YES,TYPE=NCP,POLLED=YES, X
 CLOCKNG=EXT,DUPLEX=HALF,SPEED=9600
LN3AAI01 LINE ADDRESS=03B,CALL=INOUT,AUTO=23
P3AAI01 PU PUTYPE=(1,2),MAXLU=10
.
.
.

*
* A U T O - D I A L G R O U P
*
* D I A L O U T ; P U T Y P E = (2 . 1)
*

*
GP3AAD02 GROUP LNCTL=SDLC,DIAL=YES,TYPE=NCP,POLLED=YES, X
 CLOCKNG=EXT,DUPLEX=HALF,SPEED=9600
LN3AAD02 LINE ADDRESS=03E,CALL=OUT,AUTO=20
P3AAD02 PU PUTYPE=2,MAXLU=10
*
*
```

The GROUP statement defines common characteristics for all the NCP-attached links and devices that are defined under it. For switched connections, DIAL=YES must be specified on the GROUP statement.

The LINE statement identifies the switched SDLC link. ADDRESS provides the relative line number of the line. CALL specifies whether VTAM, the device, or both can set up switched connections over the line.

On the PU statement, no keywords need to be specified. This PU statement represents a "dummy" PU (PUX); the actual values for the PU are coded in the switched major node. The function of the PUX is to reserve the network address

for the actual switched PU. If you decide to specify the PUTYPE on the PUX (as in this example), it must match the PU type of the switched PU.

The corresponding switched major node, which defines the PUs, the paths to the PUs, and any LUs associated with the PUs, is shown and discussed in “NCP-Attached Switched Peripheral PUs” on page 125.

## Switched SDLC Subarea Connection

One type of VTAM-to-VTAM NCP connection uses switched SDLC links between two communication controllers. This type of connection is called switched SDLC subarea connection.

The figure below shows switched SDLC connections between communication controllers A04 and A31.

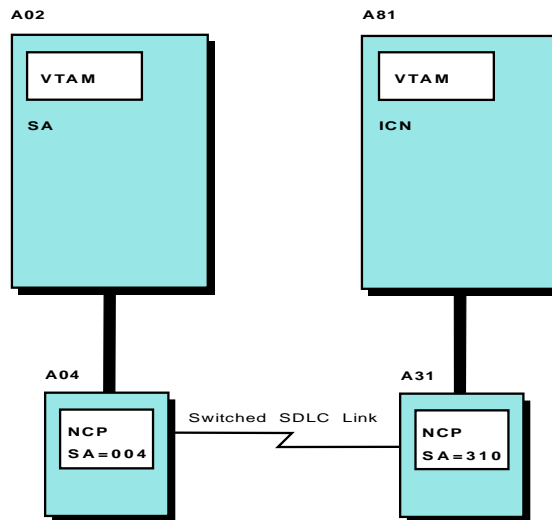


Figure 23. NCP-to-NCP Switched SDLC Connections. Host A02 is a subarea node (SA). Host A81 is an interchange node (ICN).

The VTAM at each end of the connection must define both of the following:

- A switched major node
- An NCP major node.

The switched major node definitions for the above configuration are found in “Switched SDLC Subarea Connection” on page 127. The corresponding NCP major node definitions are given below.

### Defining an NCP Major Node for NCP A04

Group name A04GINN3 matches the one in the PATH definition statement in the switched major node for NCP A04 on page 127.

```

* NCP NAME: A04NCP *

* SDLC SUBAREA LINES - 9.6 KBPS LINK - TGN=1 - SWITCHED CONNECTION *
* CONNECT TO A31NCP LINE 003 OR 035 THROUGH 9.6 K MODEMS *
* - FOR LINE 003 IN A31NCP USE SWITCHED MAJOR NODE A02SAD03 *

```

```

* - FOR LINE 035 IN A31NCP USE SWITCHED MAJOR NODE A02SAD35 *

.
.
.
A04GINN3 GROUP ACTIVTO=300.0, *
 DIAL=YES, *
 LNCTL=SDLC, *
 PUTYPE=4, *
 SDLCST=(S04PRI,S04SEC), *
 TGCONF=MULTI, *
 TYPE=NCP
A04S03 LINE ADDRESS=003, *
 AUTO=010, *
 BRKCON=CONNECTO, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=FULL, *
 MLTGPRI=30, *
 SPEED=9600
A04PU03 PU PUTYPE=4
A04S35 LINE ADDRESS=035, *
 AUTO=042, *
 BRKCON=CONNECTO, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=FULL, *
 MLTGPRI=30, *
 SPEED=9600
A04PU35 PU PUTYPE=4
.
.
.

```

## Defining an NCP Major Node for NCP A31

Group name A31GINN3 matches the one in the PATH definition statement in the switched major node for NCP A31 on page 128.

```

* NCP NAME: A31NCP *
* SDLC SUBAREA LINES - 9.6 KBPS LINK - TGN=1 - SWITCHED CONNECTION *
* CONNECT TO A04NCP LINE 003 OR 035 THROUGH 9.6 KBPS MODEMS *
* - FOR LINE 003 IN A04NCP USE SWITCHED MAJOR NODE A81SAD03 *
* - FOR LINE 035 IN A04NCP USE SWITCHED MAJOR NODE A81SAD35 *

A31GINN3 GROUP ACTIVTO=420.0, *
 DIAL=YES, *
 LNCTL=SDLC, *
 PUTYPE=4, *
 SDLCST=(S31PRI,S31SEC), *
 TGCONF=MULTI, *
 TYPE=NCP
A31S03 LINE ADDRESS=003, *
 AUTO=010, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=FULL, *
 MLTGPRI=30, *
 SPEED=9600
A31PU03 PU PUTYPE=4
A31S35 LINE ADDRESS=035, *
 AUTO=042, *
 CALL=INOUT, *
 CLOCKNG=EXT, *

```

```

 DUPLEX=FULL, *
 MLTGPRI=30, *
 SPEED=9600
A31PU35 PU PUTYPE=4
.
.
.

```

---

## Connecting Multiple Networks using SNA Network Interconnection

To interconnect subarea networks, at least one gateway NCP is required. The gateway NCP performs the address translation necessary for cross-network session traffic.

To illustrate how a gateway NCP is defined, consider NCP A03 in the network depicted in Figure 10 on page 36. The NCP major node for A03, as shown on page 89, specifies the GWCTL and NETID operands on the PCCU definition statements, thereby defining the NCP as a gateway NCP. The NETID operand on the BUILD definition statement specifies NETA as A03's native network. The NETWORK definition statement defines NETB as the network identifier of the non-native network (the network attached to the gateway NCP). The GWNAU definition statements that follow the NETWORK statement define cross-network CDRMs to the non-native network. Finally, the PATH definition statements that follow those GWNAU statements define routes for NETB that originate in the gateway NCP subarea.

For sample CDRM major nodes used in SNA network interconnection, see "Connecting Multiple Networks using SNA Network Interconnection" on page 35.

---

## Attaching Peripheral Nodes to VTAM using NTRI

NCP/Token-Ring Interconnection (NTRI) is an NCP function that allows a communication controller to attach to the IBM Token-Ring Local Area Network and that provides both subarea and peripheral node DLC services in the SNA network. In this section we discuss the peripheral node DLC services that NTRI provides to VTAM.

You implement this type of connection by defining both of the following:

- switched major node
- NCP major node.

The switched major node defines the peripheral nodes and associated logical units that are attached to the token ring.

The NCP major node defines both physical and logical resources:

- The token-ring interface coupler (TIC) connection for NTRI support is defined as a physical connection in a GROUP definition statement specifying ECLTYPE=PHYSICAL.
- The peripheral nodes that are attached to the token ring are defined as logical connections in a GROUP definition statement specifying ECLTYPE=LOGICAL.



The name specified for GRPNM (group name) in the PATH definition statement of the switched major node must match the name of the logical group definition in the NCP major node.

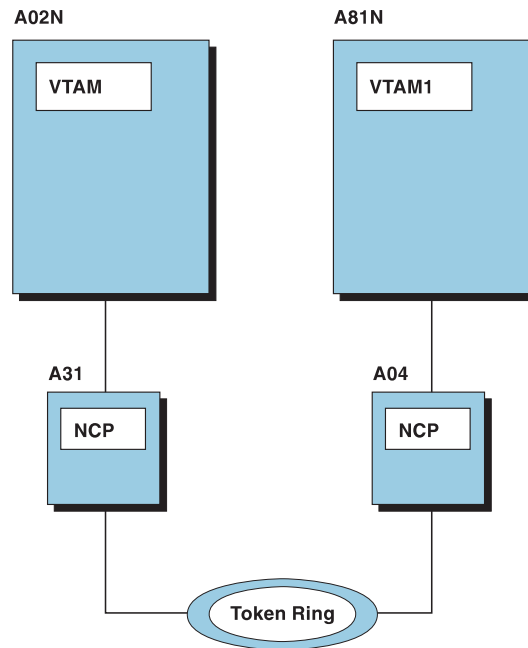


Figure 24. Peripheral Node Attachment to VTAM using NTRI

In the configuration illustrated in Figure 24 the communicating VTAMs A02N and A81N are defined as type 2.1 peripheral nodes to each other and are attached to the token-ring network through NCP A31 and NCP A04.

The samples shown below are the logical line groups defined by the NCP major nodes for this configuration. For the sample switched major nodes used for this same configuration, see “NCP/Token-Ring Interconnection (NTRI) for Peripheral Nodes” on page 129.

```

* NTRI PERIPHERAL LOGICAL LINES - USED WITH A31TR89

A04BNNNG1 GROUP ANS=CONTINUE, CONTINUE IF HOST LOST
 AUTOGEN=20, NUMBER OF DEVICES ON THE LAN
 CALL=INOUT, CONNECTION OPTIONS
 ECLTYPE=LOGICAL,
 ISTATUS=ACTIVE,
 MODETAB=AMODETAB,
 NPACOLL=(YES,EXTENDED),
 PHYPORT=2, ASSOCIATE WITH PHYSICAL PORT
 RETRIES=(10,10,10,10),
 SRT=(100,10,YES),
 USSTAB=AUSSTAB,
 XMITDLY=NONE
.
.
.

* NTRI PERIPHERAL LOGICAL LINES
* USED WITH A31TR88, A31TR89, A31TR92, AND/OR A31TR93

A31BNNNG1 GROUP ANS=CONTINUE, CONTINUE IF HOST LOST
 AUTOGEN=20, NUMBER OF DEVICES ON THE LAN
 CALL=INOUT, CONNECTION OPTIONS

```

```

ECLTYPE=LOGICAL, *
ISTATUS=ACTIVE, *
MODETAB=AMODETAB, *
NPACOLL=(YES,EXTENDED), *
PHYPORT=NONE, ASSOCIATE WITH PHYSICAL PORT *
RETRIES=(10,10,10,10), *
USSTAB=AUSSTAB, *
XMITDLY=NONE

```

---

## Connecting to a Connection Network using NTRI

VTAM can connect to a connection network on a token ring LAN through the NCP Token Ring interconnection (NTRI). An NCP can define multiple token ring connections for connection network in a single major node. These multiple connections can be to the same token ring or different token rings.

**Note:** NCP Version 7 Release 1 is required for NCP/Token-Ring interconnection support of connection network.

To define a connection to a connection network, include the following in the NCP major node:

- The GROUP statement for the NTRI physical lines must specify ECLTYPE=PHYSICAL. VTAM uses the ECLTYPE operand to detect lines used for peripheral devices connected through NTRI.
- The VNNAME operand must be coded on either the LINE or GROUP definition statements. VNNAME specifies a 1-17 character network-qualified CPNAME for the connection network. If VNNAME is coded on the GROUP definition statement, it sifts down to all the subordinate LINE statements.
- The VNGROUP operand must be coded on either the LINE or GROUP definition statements. VNGROUP specifies the name of the logical GROUP containing dial-out links through the connection network named on the VNNAME operand. If VNGROUP is coded on the GROUP definition statement, it sifts down to all the subordinate LINE statements.

The following sample code from an NCP major node definition illustrates NCP connection network support through NTRI.

```

* T O K E N R I N G P E R I P H E R A L P U S
* (PHYSICAL GROUP/LINES/PUS)

*
GP4ATRP1 GROUP ECLTYPE=PHYSICAL, LNCTL=SDLC,DIAL=NO, X
 PUTYPE=1,XID=NO,ANS=CONTINUE,PUDR=NO
*
LN4ATR10 LINE ADDRESS=010,PORTADD=01,LOCADD=40004A000010,CAPACITY=4M, X
 LANNAME=TOKBUS01,VNNAME=NETB.VN1,VNGROUP=GP4ATR10
*
P4ATR10 PU ADDR=01,PUTYPE=1,ANS=CONTINUE
*

```

If CP-CP sessions are desired between two nodes on the connection network, you must define a switched major node at the calling node. This switched major node should define a PU for any node on the connection network that the calling-out node is to call. Since DYNPU=YES is enforced automatically when a session is established through the connection network, it is not necessary for DYNPU=YES to be coded by the called nodes.

---

## NCP Type 2.1 Switched SDLC Casual Connection

In this section the two samples describe a type 2.1 casual connection between two NCPs over a switched SDLC link. In this context, a casual connection occurs when you define the two VTAM-NCP combinations as type 2.1 peripheral nodes to each other (PUTYPE=2 and XID=YES on the PU definition statement).

In this configuration, VTAM A02N is channel-attached to NCP A04 and VTAM A81N is channel-attached to NCP A31. There are two switched SDLC connections between NCP A04 and NCP A31. For a picture of this type of configuration (albeit with one switched connection, instead of two), see Figure 23 on page 96.

Each VTAM must define one NCP major node and two switched major nodes (one for each connection). The switched major node definitions are in "NCP Type 2.1 Switched SDLC Casual Connection" on page 135. The relevant parts of the NCP major node definitions are below.

**Note:** The names of the logical line groups in the NCP major node must match the names specified by the GRPNM operand in the PATH statement of the switched major nodes.

```

* CASUAL CONNECTION OVER SWITCHED LINE *
* CONNECT TO A31NCP LINE 004 OR LINE 036 THROUGH SWITCHED MODEMS *
* - FOR LINE 004 IN A31NCP USE SWITCHED MAJOR NODE A02CCN04 *
* - FOR LINE 036 IN A31NCP USE SWITCHED MAJOR NODE A02CCN36 *

A04CCNG1 GROUP CALL=INOUT, *
 DIAL=YES, *
 LNCTL=SDLC, *
 REPLYTO=3, *
 TYPE=NCP, *
 XMITDLY=23.5
A04CCN04 LINE ADDRESS=(004,HALF), *
 AUTO=011, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=HALF, *
 PAUSE=1.0, *
 ROLE=NEG
A04PC04 PU AVGPB=140, *
 PUTYPE=2, *
 XID=YES
A04CCN36 LINE ADDRESS=(036,HALF), *
 AUTO=043, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=HALF, *
 PAUSE=1.0, *
 ROLE=NEG
A04PC36 PU AVGPB=140, *
 PUTYPE=2, *
 XID=YES

* CASUAL CONNECT OVER SWITCHED LINE *
* CONNECT TO A04NCP LINE 004, OR LINE 036 THROUGH SWITCHED MODEMS *
* - FOR LINE 004 IN A04NCP USE SWITCHED MAJOR NODE A81CCN04 *
* - FOR LINE 036 IN A04NCP USE SWITCHED MAJOR NODE A81CCN36 *

A31CCNG1 GROUP DIAL=YES,CALL=INOUT, *
 LNCTL=SDLC, *
 REPLYTO=3, *
 TYPE=NCP, *
```

```

XMITDLY=23.5
A31CCN04 LINE ADDRESS=(004,HALF), *
 AUTO=011, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=HALF, *
 PAUSE=1.0, *
 ROLE=NEG
A31PC41 PU AVGPB=140, *
 PUTYPE=2, *
 XID=YES
A31CCN36 LINE ADDRESS=(036,HALF), *
 AUTO=043, *
 CALL=INOUT, *
 CLOCKNG=EXT, *
 DUPLEX=HALF, *
 PAUSE=1.0, *
 ROLE=NEG
A31PC361 PU AVGPB=140, *
 PUTYPE=2, *
 XID=YES

```

---

## Type 2.1 Channel Connections between APPN Nodes

Type 2.1 channel connections can be used to connect two network nodes, or a network node and an end node. The following example shows how to connect an NCP in a composite network node to a network node, as depicted in Figure 17 on page 71.

To define this type of connection, you must define the following:

- Local SNA major node
- NCP major node.

The local SNA major node resides at the VTAM network node and the NCP major node resides at the VTAM host in the composite network node. Code PUTYPE=2 and XID=YES on the PU definition statement in the local SNA major node to define a peripheral type 2.1 node. Similarly, code PUTYPE=2 and XID=YES on the PU definition statement in the NCP major node to define a peripheral type 2.1 node.

To allow CP-CP sessions to be established between the two nodes, CONNTYPE=APPN and CPCP=YES must specified on the both of those PU definition statements, unless CONNTYPE=APPN and CPCP=YES have been specified as start options.

The CP-CP sessions are established through the NCP by activating the local SNA major node from the network node and the line for the 2.1 channel from the VTAM composite node.

The following sample is taken from the NCP major node for this connection. The corresponding local SNA major node definition is found in “Type 2.1 Channel Connections Between APPN Nodes” on page 71.

```

*-----
* L O C A L S N A G R O U P S
*
* DEFINITIONS FOR CHANNEL ATTACHED PU 2.1 (LOCAL SNA)
*-----
GRP3AAA1 GROUP LNCTL=CA,CA=TYPE5,NPCPA=ACTIVE

```

```

LN3AAA1 LINE ADDRESS=04,TIMEOUT=840.0,CASDL=420.0,TRANSFR=255, X
INBFRS=128,ANS=CONT
P3A21AA1 PU PUTYPE=2,OWNER=SSCP1A,XID=YES, X
CONNTYPE=APPN,CPCP=YES,AUTHLEN=YES

```

---

## Defining 3174 Polling Addresses

For a PU that is to be dynamically reconfigured, you can specify 3174 group addresses for PUs that are attached to peripheral nodes on a nonswitched SDLC link and that are to be dynamically reconfigured. Use of this dynamic reconfiguration capability requires, at a minimum, NCP V6R2.

GP3174=A1 on the NCP major node's PU definition statement specifies, in hexadecimal, the group poll address.

```

* NCP NAME: B75NCP *

* LINE 016 - NORMAL GROUP POLL LINE WITH GP3174=A1 -- 3174#8 (FULL) *

GRPOLL GROUP LNCTL=SDLC, *
 DIAL=NO, *
 GP3174=A1 *
B75S16 LINE ADDRESS=(016,FULL), *
 CLOCKNG=EXT, *
 DUPLEX=FULL, *
 MODULO=8, *
 PAUSE=2.0, *
 MODETAB=NRFLG, *
 NRZI=NO, *
 TRANSFR=20, *
 USSTAB=AUSSTAB *
* 3174 CONTROL TERMINALS
B75P16C1 PU ADDR=C1, *
 PUTYPE=2 *
B75L161A LU LOCADDR=2, *
 PACING=0 *
B75L161B LU LOCADDR=3, *
 PACING=0 *
* PS2N60
B75P16C2 PU ADDR=C2, *
 PUTYPE=2 *
B75L162A LU LOCADDR=2, *
 PACING=3 *
B75L162B LU LOCADDR=3, *
 PACING=3 *
B75L162C LU LOCADDR=4, *
 PACING=3 *
B75L162D LU LOCADDR=5, *
 PACING=3 *
* PS2N50
B75P16C3 PU ADDR=C3, *
 PUTYPE=2 *
B75L163A LU LOCADDR=2, *
 PACING=0 *
* PS2N51
B75P16C4 PU ADDR=C4, *
 PUTYPE=2 *
B75L164A LU LOCADDR=2, *
 PACING=0 *

```

## Defining Retry Values

For a PU that is to be dynamically reconfigured, you can specify the time interval between retry sequences and the number of retry sequences for error recovery attempts made when problems occur during transmission over a link. Use of this dynamic reconfiguration capability requires, at a minimum, NCP V6R2.

In the RETRIES operands, 3 is the time interval in seconds between retry sequences and 5 is the number of retry sequences to be made.

**Note:** Dynamic reconfiguration of retry values on a nonswitched SDLC line does not allow you to specify the number of retries within each retry sequence.

```

* NCP NAME: B75NCP *

* LINE 075 - SWITCHED 3276 USING V25BIS=SS *
* SWITCHED MAJOR NODE IS V25SDLC, LU IS B75L751A *

GV25BIS GROUP DIAL=YES, *
 LNCTL=SDLC, *
 REPLYTO=3, *
 TYPE=NCP, *
 USSTAB=HELLO, *
 V25BIS=(YES,DLSDLC), *
 XMITDLY=23.5 *
B75S75 LINE ADDRESS=075, *
 AUTO=YES, *
 CALL=INOUT, *
 CLOCKNG=INT, *
 DUPLEX=HALF, *
 PAUSE=1.0, *
 REDIAL=(,3,5), *
 RETRIES=(,3,5), *
 RING=YES, *
 SPEED=2400, *
 V25BIS=(YES,DLSS) *
B75P751 PU AVGPB=140, *
 PUTYPE=(1,2) *

```

## Dynamic Reconfiguration of PUs on a Frame Relay Line

Dynamic reconfiguration of PUs enables you to dynamically add and delete type 1 physical units to and from an NCP frame relay line. It also allows you to dynamically add and delete NCP FRSESET (frame relay switching equipment set) definition statements.

Use of dynamic reconfiguration requires, at a minimum, NCP V6R2.

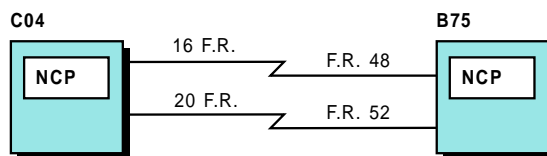


Figure 25. Dynamic reconfiguration of PUs on a frame relay line

Refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference* for information about the NCP definition statements that are validated by VTAM in association with dynamic reconfiguration for NCP frame relay resources.

## Defining a Frame Relay Line for NCP C04

FRELAY=PHYSICAL on the GROUP definition statement indicates that this is a frame relay physical line.

The SUBPORTS operand on the FRSESET definition statement specifies this line's primary frame relay PU type 1 partners and their optional backups.

The PU definition statements define the characteristics of the PU partners.

Note that there are no LU definition statements coded for frame relay lines.

```

* NCP NAME: C04NCP *

* FRAME RELAY PHYSICAL GROUP - FULL DUPLEX *

C04FRGP1 GROUP FRELAY=PHYSICAL, X
 ISTATUS=ACTIVE, X
 TYPE=NCP

* FRAME RELAY PHYSICAL LINE 16 - FULL DUPLEX 56 KB *
* - CONNECTION TO B75NCP LINE 048 *

C04F16 LINE ADDRESS=(016,FULL), *
 MAXFRAME=2106, *
 CLOCKNG=EXT, *
 NRZI=NO, *
 SPEED=56000
C04P16 PU LMI=(ANSI,PRI), *
 SPOLL=6, *
 ERRORT=(3,4), *
 TIMERS=(10,15)
C04P16A PU ADDR=50
C04P16B PU ADDR=51
C04P16C PU ADDR=60
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*C04P16D PU ADDR=52

* FRAME RELAY PHYSICAL LINE 20 - FULL DUPLEX 56 KB *
* - CONNECTION TO B75NCP LINE 052 *

C04F20 LINE ADDRESS=(020,FULL), *
 MAXFRAME=2106, *
 CLOCKNG=EXT, *
 NRZI=NO, *
 SPEED=56000
C04P20 PU LMI=(CCITT,PRI), *
 SPOLL=6, *
 ERRORT=(3,4), *
 TIMERS=(10,15)
C04P20A PU ADDR=60
C04P20B PU ADDR=61
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*C04P20D PU ADDR=62

* FRAME RELAY PHYSICAL LINE 1028 - FULL DUPLEX HPTSS *
* - CONNECTION TO B31NCP LINE 1036 *

C04F1028 LINE ADDRESS=(1028,FULL), *
```

```

 MAXFRAME=2106,
 CLOCKNG=EXT,
 NRZI=NO,
 SPEED=1544000
C04P1028 PU LMI=(CCITT,SEC),
 SPOLL=6,
 ERRORT=(3,4),
 TIMERS=(10,15)
C04P28A PU ADDR=1F
C04P28B PU ADDR=2F
C04P28C PU ADDR=50
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*C04P28D PU ADDR=3F

* FRSESET DEFINITIONS

PVCSET1 FRSESET SUBPORTS=(C04P28A,C04P16A,,C04P20A)
PVCSET2 FRSESET SUBPORTS=(C04P28B,C04P16B,,C04P20B)
PVCSET3 FRSESET SUBPORTS=(C04P28C,C04P16C)
* FRSESET TO BE ADDED USING VTAM 4.1 PERM DR
*VCSET3 FRSESET SUBPORTS=(C04P28D,C04P16D,,C04P20D)

```

## Defining a Frame Relay Line for NCP B75

FRELAY=PHYSICAL on the GROUP definition statement indicates that this is a frame relay physical line.

The SUBPORTS operand on the FRSESET definition statement specifies this line's primary frame relay PU type 1 partners and their optional backups.

The PU definition statements define the characteristics of the PU partners.

Note that there are no LU definition statements coded for frame relay lines.

```

* NCP NAME: B75NCP

* FRAME RELAY PHYSICAL GROUP - FULL DUPLEX

B75FRGP1 GROUP FRELAY=PHYSICAL,
 ISTATUS=ACTIVE,
 TYPE=NCP,
 XMONLNK=YES

* FRAME RELAY PHYSICAL LINE 48 - FULL DUPLEX 56KB

B75F48 LINE ADDRESS=(048,FULL),
 CLOCKNG=EXT,
 MAXFRAME=2106,
 NRZI=NO,
 SPEED=56000
B75P48 PU ERRORT=(3,4),
 LMI=(ANSI,SEC),
 SPOLL=6,
 TIMERS=(10,15)
B75P48A PU ADDR=50
B75P48B PU ADDR=51
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*B75P48C PU ADDR=52

* FRAME RELAY PHYSICAL LINE 52 - FULL DUPLEX 56KB

B75F52 LINE ADDRESS=(052,FULL),
 CLOCKNG=EXT,

```



```

MAXFRAME=2106,
NRZI=NO,
SPEED=56000
B75P52 PU ERROR=(3,4),
LMI=(CCITT,SEC),
SPOLL=6,
TIMERS=(10,15)
B75P52A PU ADDR=60
B75P52B PU ADDR=61
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*B75P52C PU ADDR=62

* FRAME RELAY PHYSICAL LINE 1036 - FULL DUPLEX HPTSS

B75F1036 LINE ADDRESS=(1036,FULL),
CLOCKNG=EXT,
MAXFRAME=2106,
NRZI=NO,
SPEED=1544000
B75P1036 PU ERROR=(3,4),
LMI=(CCITT,SEC),
SPOLL=6,
TIMERS=(10,15)
B75P36A PU ADDR=1E
B75P36B PU ADDR=2E
* FRSE PU TO BE ADDED USING VTAM 4.1 PERM DR
*B75P36C PU ADDR=3E

* FRSESET DEFINITIONS

PVCSET1 FRSESET SUBPORTS=(B75P36A,B75P48A,,B75P52A)
PVCSET2 FRSESET SUBPORTS=(B75P36B,B75P48B,,B75P52B)
* FRSESET TO BE ADDED USING VTAM 4.1 PERM DR
*PVCSET3 FRSESET SUBPORTS=(B75P36C,B75P48C,,B75P52C)

```

---

## X.25 NPSI Switched Subarea Short Hold Mode Connections

Two NCP subarea nodes can communicate across an X.25 packet switching data network with the support of the X.25 NPSI program product. Both permanent virtual circuit and switched virtual circuit connectivity options are supported. See Figure 26 on page 108 for a picture of a multidomain connection across an X.25 network.

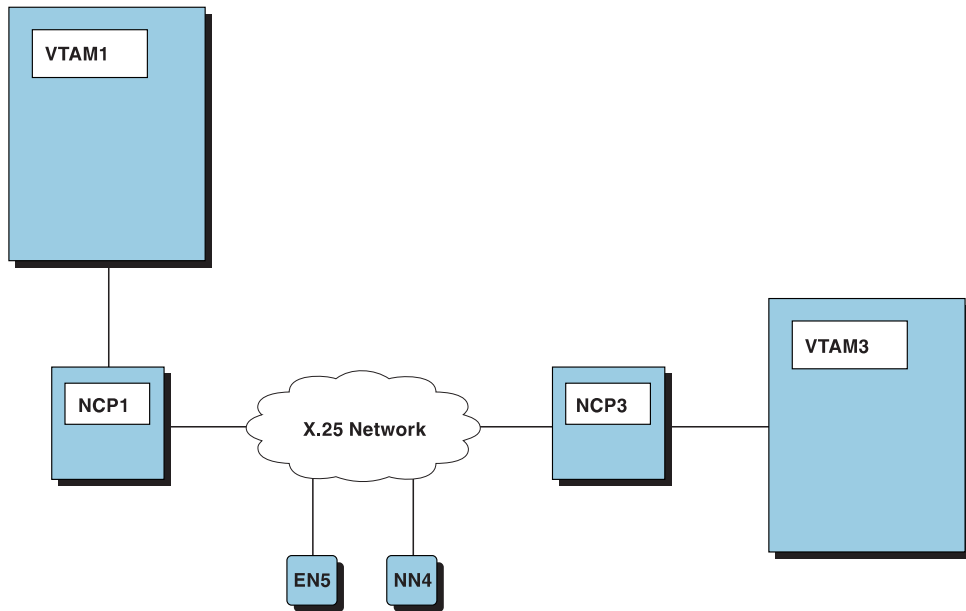


Figure 26. Multidomain X.25 Configuration

X.25 switched virtual circuit (SVC) subarea communication provides connectivity between two subarea nodes over switched virtual circuits. Short hold mode reduces the charge for SVCs, when charging is based on the length of connected time, by clearing the SVC during periods of inactivity and reestablishing the SVC when the connection is required to transmit information.

To define switched subarea short hold mode connections, resources must be defined in an NCP major node and a switched major node on both sides of the connection.

In the NCP major node, you must define the physical circuit and one or more switched virtual circuits. The X25.MCH statement, which describes the physical circuit to X.25 NPSI, must adhere to the following requirements:

- SVCINN (the number of simultaneously active switched subarea connections) must be coded with a value equal to the number of X25.LINE statements defined with DSTNODE=INN and TYPE=S.
- SHM=YES must be specified to permit short hold mode to be used by the subarea switched virtual circuit.

The definition of a switched virtual circuit consists of a SNA resource set and an X.25 resource set on both sides of the connection. The SNA resource set consists of the following:

- An X25.LINE statement that specifies TYPE=S|SWITCHED and DSTNODE=INN, indicating that the virtual circuit is connected to a subarea node. It also specifies a value for the operand NCPGRP, which is the label of the NCP GROUP statement that includes the virtual circuit.
- An X25.PU statement that specifies PUTYPE=4.

The X.25 resource set consists of an X25.VC statement that defines the virtual circuits to X.25 NPSI.

The definition requirements for the corresponding switched major node are found on page 134.

For an example of an NCP major node that contains definitions necessary to establish a switched subarea short-hold mode connection, see the NCP major node named A71SADO below. For the corresponding switched major node definition, see page 134.

```

*
* A 7 1 S A D O
*

*
* NCP NAME: A71SAD - NCP 11.7
* VER/REL: V7R1
* NPSI: V3R7
* SUBAREA: A71N
* BOX-TYPE: 3745
*

* NCP OPTIONS MACRO

*
* OPTIONS NEWDEFN=(YES,ECHO),USERGEN=(X25NPSI,FNMNDFGN)
*

* VTAM PCCU MACRO

*
APCCU1 PCCU AUTOSYN=YES,BACKUP=YES,CDUMPDS=CSPDUMP,CONFGDS=CRNCKPT,X
 DUMPDS=VTAMDUMP,GWCTL=SHR,MAXDATA=8192,MDUMPDS=MOSSDUMP,X
 OWNER=A01N,SUBAREA=01
*

* NCP BUILD MACRO - NCP/CONTROLLER INFO

*
A71SAD BUILD ADDESSESS=5, *JSB
 AUXADDR=5,
 BACKUP=500,
 BFRS=240,
 BRANCH=8000,
 CATRACE=(YES,255),
 CSMMSG=C3D9C9E340E2C9E340D4C5E2E2C1C7C540C6D6D940E2E24040X
 40C2C340E3C5D9D4C9D5C1D3,
 CNLSQMAX=50000,
 CNLSQTIM=60,
 CWALL=26,
 DYNPOOL=(79,78),
 ERASE=YES,
 ERLIMIT=16,
 LOADLIB=NCPLoad,
 LTRACE=8,
 MAXSESS=250,
 MAXSSCP=8,
 MAXSUBA=100,
 MODEL=3745,
 MXRLINE=04,
 MXVLINE=60,
 NAMTAB=3,
 NETID=NETA,
 NEWNAME=A71SAD, *JSB
 NUMHSAS=100,
 OLT=YES,
 PWROFF=YES,
 SALIMIT=255,
 SLODOWN=12,
 SUBAREA=71,
 TRACE=(YES,100),

```

```

TRANSFR=32, X
TWID=(E8D6E4C3C1D3D311,C2C9C7D5C3D7C3C1D3D325), X
TYPGEN=NCP, X
TYPYS=MVS, X
USGTIER=5, X
VERSION=V7R1, NCP Version X
VRPOOL=1000, X
VRTIMER0=(10,10), X
VRTIMER1=(10,10), X
VRTIMER2=(10,10), X
X25.USGTIER=5, X.25 NPSI DEFINITIONS X
X25.SNAP=4000, 4K Snap Trace for DCR X
X25.MCHCNT=1, 7 MCH IN THIS GENERATION X
X25.PREFIX=X, ADDRESS PREFIX = 'X' X
X25.MAXPIU=64K, X
X25.PAHINDX=6, X
X25.IDNUMH=8 1ST DIGIT OF IDNUM IN SMN X
*

* DYNAMIC CONTROL FACILITIES USED BY VTAM *

*
SYSCNTRL OPTIONS=(BACKUP,BHSASSC,DLRID,DVSINIT,ENDCALL, X
LNSTAT,MODE,NAKLIM,RCNTRL,RCOND,RDEVQ,RECMD,RIMM, X
SESINIT,SESSION,SSPAUSE,STORDSP,XMTLMT) X
*

* NCP HOST MACRO - CHANNEL ATTACHED HOST DEFINITIONS *

*
A01N HOST BFRPAD=0,INBFRS=6,MAXBFRU=32,SUBAREA=01, X
UNITSZ=256 X
*

* PATH DECK FOR NATIVE NETWORK *

*

* PATH TO OWNING HOST *

*
PATH DESTSA=01, X
ER0=(01,1),ER1=(01,1),ER2=(01,1),ER3=(01,1), X
ER4=(01,1),ER5=(01,1),ER6=(01,1),ER7=(01,1), X
ER8=(01,1),ER9=(01,1), X
VR0=0, X
VRPWS0=(9,200),VRPWS01=(9,200),VRPWS02=(9,200), X
VR1=1, X
VRPWS10=(9,200),VRPWS11=(9,200),VRPWS12=(9,200), X
VR2=2, X
VRPWS20=(9,200),VRPWS21=(9,200),VRPWS22=(9,200), X
VR3=3, X
VRPWS30=(9,200),VRPWS31=(9,200),VRPWS32=(9,200), X
VR4=4, X
VRPWS40=(9,200),VRPWS41=(9,200),VRPWS42=(9,200), X
VR5=5, X
VRPWS50=(9,200),VRPWS51=(9,200),VRPWS52=(9,200), X
VR6=6, X
VRPWS60=(9,200),VRPWS61=(9,200),VRPWS62=(9,200), X
VR7=7, X
VRPWS70=(9,200),VRPWS71=(9,200),VRPWS72=(9,200) X
*
PATH DESTSA=(04,02), X
ER0=(04,1),ER1=(04,1),ER2=(04,1),ER3=(04,1), X
ER4=(04,1),ER5=(04,1),ER6=(04,1),ER7=(04,1), X
ER8=(04,1),ER9=(04,1), X
VR0=0, X

```

```

VRPWS00=(9,200),VRPWS01=(9,200),VRPWS02=(9,200), X
VR1=1, X
VRPWS10=(9,200),VRPWS11=(9,200),VRPWS12=(9,200), X
VR2=2, X
VRPWS20=(9,200),VRPWS21=(9,200),VRPWS22=(9,200), X
VR3=3, X
VRPWS30=(9,200),VRPWS31=(9,200),VRPWS32=(9,200), X
VR4=4, X
VRPWS40=(9,200),VRPWS41=(9,200),VRPWS42=(9,200), X
VR5=5, X
VRPWS50=(9,200),VRPWS51=(9,200),VRPWS52=(9,200), X
VR6=6, X
VRPWS60=(9,200),VRPWS61=(9,200),VRPWS62=(9,200), X
VR7=7, X
VRPWS70=(9,200),VRPWS71=(9,200),VRPWS72=(9,200)

*

* NCP POOL MACROS - DYN RECONFIG & SWITCHED SDLC LINKS *

*
* PUDRPOOL NUMBER=1
* LUDRPOOL NUMILU=5,NUMTYP1=1,NUMTYP2=5
*

*
* X.25 NPSI NETWORK DEFINITIONS
*

*
PADCHAR1 X25.PAD INDEX=1,PADPARAM=NULL
PADCHAR2 X25.PAD INDEX=2,PADPARAM=070108000100
PADCHAR3 X25.PAD INDEX=3,PADPARAM=070208000100
PADCHAR4 X25.PAD INDEX=4,PADPARAM=070508000100
PADCHAR5 X25.PAD INDEX=5,PADPARAM=070808000100
PADCHAR6 X25.PAD INDEX=6,PADPARAM=070808000100
*
TRANS1 X25.TRAN USER=1,
 DCIN0=00010203372D2E2F1605250B0C0D0E0F,
 DCIN1=101112133C5A322618193F271C1D1E1F,
 DCIN2=404F7F7B5B6C507D4D5D5C4E6B604B61,
 DCIN3=F0F1F2F3F4F5F6F7F8F97A5E4C7E6E6F,
 DCIN4=43C1C2C3C4C5C6C7C8C9D1D2D3D4D5D6,
 DCIN5=D7D8D9E2E3E4E5E6E7E8E9AD51BD5F6D,
 DCIN6=79818283848586878889919293949596,
 DCIN7=979899A2A3A4A5A6A7A8A98BBA9BA107,
 DCIN8=80DCC083DA7C8E08FC9D08B568D8E8F,
 DCIN9=909192FBFB95969798999A9B9C9D9E9F,
 DCINA=A0A1A2A3A4A5A6A7A8A9AA64ACADAEAF,
 DCINB=B0B1B2FAECB5B6B7B8B9BABBBCBDBEBC,
 DCINC=ABCBCCEBBF8FC6C7ABC9CACBCCDCECF,
 DCIND=D0D1D2D3D4D5D6D7D8BBACBDCDDDEDF,
 DCINE=E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF,
 DCINF=F0F1F2F3F4F5F6F7B0F9FAFBFCFDFFEF,
 DCOT0=000102033A093A7F3A3A3A0B0C0D0E0F,
 DCOT1=101112133A0A087F18193A3A1C1D1E1F,
 DCOT2=3A3A3A3A0A171B3A3A3A3A050607,
 DCOT3=3A3A163A3A3A043A3A3A1A153A1A,
 DCOT4=203A3A403A3A3A3A3A5B2E3C282B21,
 DCOT5=265C3A3A3A8C3A3A15242A293B5E,
 DCOT6=2D2F3A3AAB3A3A3A3A7C2C255F3E3F,
 DCOT7=3A3A3A3A3A3A3A603A2385273D22,
 DCOT8=3A6162636465666768693A7B3A3A3AC5,
 DCOT9=3A6A6B6C6D6E6F7071723A7D3A3A3A3A,
 DCOTA=3A7E737475767778797A3AC0DA5B3A3A,
 DCOTB=F83A3A3A3A3A3A3A3AD9BF5D3AC4,
 DCOTC=824142434445464748493AC1C23A3A3A,
 DCOTD=8A4A4B4C4D4E4F505152843A813A3AFF,

```

```

 DCOTE=873A535455565758595A3AC3B43A3A3A, X
 DCOTF=30313233343536373839B393883A3A3A
*
 0 1 2 3 4 5 6 7 8 9 A B C D E F
*

*
 X25.NET DEFINITIONS
*

*
RTPNET X25.NET CPHINDX=7,OUHINDX=19,DM=YES,RESETINO=NO,RFAC=BLCUG, X
 R20=2,R22=2,R23=2,CAUSE=CCITT,NSTDFAC=(00,04,04,08), X
 DCI=YES
*
 X25.VCCPT INDEX=1,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=2,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=3,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=4,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=5,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=6,MAXPKTL=4096,VWINDOW=127
 X25.VCCPT INDEX=7,MAXPKTL=4096,VWINDOW=127
*
 X25.OUFT INDEX=1
 X25.OUFT INDEX=2,OPTFACL=420707430202
 X25.OUFT INDEX=3,OPTFACL=420707430303,USRFILD=1234567890
 X25.OUFT INDEX=4,OPTFACL=420A0A430F0F
*

*
 S A D C O N N E C T I O N S
*
*
 LINE 001 SAD INN Connection SNI NETID=NETA / SA=03
*

*
 PHYSICAL LINE DEFINITIONS
*

*
MCH1028 X25.MCH ADDRESS=1028, X
 RESETPVC=YES, X
 RNRTIMER=30, X
 RNRPKT=YES, X
 FRMLGTH=4100, X
 PKTMODL=128, X
 MMODULO=128, X
 MWINDOW=127, X
 ANS=CONT, X
 DBIT=YES, X
 GATE=NO, X
 LCGDEF=(0,1), X
 LCN0=NOTUSED, X
 LLCLIST=LLC3, X
 LSPRI=NO, X
 LUNAME=AU1028, X
 MBITCHN=YES, X
 NCPGRP=AM1028, X
 NDRETRY=3, X
 NPRETRY=7, X
 PHYSRSC=NO, X
 PUNAME=APA28, X
 SDRTCNT=1, X
 SDRTIME=10, X
 SHM=YES, X
 SPEED=1843200, X
 STATION=DTE, X
 SVCINN=1, X
 TDTIMER=3, X
 TPTIMER=10, X
 XMONLNK=YES
*

```

```

* LOGICAL LINE DEFINITIONS *

*
* X25.LCG LCGN=0
*
ALA28GGH X25.LINE DSTNODE=INN,CALL=INOUT,SPAN=OPER1,TYPE=S, X
 NCPGRP=AGA28SAD
APA28GGH X25.PU ISTATUS=INACTIVE,PUTYPE=4
AUA28GGH X25.VC LCN=1,TYPE=S,OUFINDX=1,VCCINDX=7,CALL=INOUT, X
 ISTATUS=ACTIVE,HEXNAME=NO,SPAN=OPER1,SUFFIX=1, X
 PRFLINE=AM28RESL,PRFPU=AM28RESP,PRFLU=AM28RESU
*

* END OF X.25 DEFINITIONS *

*
* X25.END

* CHANNEL ADAPTER DEFINITIONS *

*
A71CA GROUP LNCTL=CA,CA=TYPE7,NCPCA=ACTIVE,DELAY=0.0,NPACLOO=NO, X
 MAXBFRU=96,CASDL=420,TIMEOUT=180,ISTATUS=ACTIVE
*
A71C01 LINE ADDRESS=P1,CASDL
A71P01A PU PUTYPE=5,TGN=1
*
A71C03 LINE ADDRESS=P3,CASDL
A71P03A PU PUTYPE=5,TGN=1
*
A71C05 LINE ADDRESS=P5,CASDL
A71P05A PU PUTYPE=5,TGN=1
*
A71C07 LINE ADDRESS=P7,CASDL
A71P07A PU PUTYPE=5,TGN=1
*
GENEND GENEND
 END

```

---

## Authorized Transmission Priority for LEN Connections

In the PU definition statement for P3A21AA1 on page 102, AUTHLEN=YES specifies that a session between two independent LUs through a subarea network will use the same transmission priority for both type 2.1 LEN connections (entry and exit). AUTHLEN may only be specified for node type 2.1. AUTHLEN=YES is the default.

---

## Limiting Sessions for Switched Resources

In the excerpt below, taken from a sample NCP major node, MAXSESS=2 specifies that the maximum number of concurrent LU-LU sessions in which the independent LU A03I34A1 can participate is two.

```

* ADDRESS 34 = 9.6 FDx (DR CAPABLE) WITH 5 DLU & 5 ILU EACH *

A03S34 LINE ADDRESS=(034,FULL), X
 CLOCKNG=EXT, X
 DUPLEX=FULL, X
 ISTATUS=ACTIVE, X

```

```

MAXPU=25, X
MODETAB=AMODETAB, X
NRZI=YES, X
PACING=7, X
PUDR=YES, X
RETRIES=(5,5,5), X
SPEED=9600
SERVICE MAXLIST=25
A03P34A PU ADDR=C1, X
XID=YES
A03D34A1 LU LOCADDR=01
A03D34A2 LU LOCADDR=02
A03D34A3 LU LOCADDR=03
A03D34A4 LU LOCADDR=04
A03D34A5 LU LOCADDR=05
A03I34A1 LU LOCADDR=0,RESSCB=5,MAXSESS=2
A03I34A2 LU LOCADDR=0,RESSCB=5
A03I34A3 LU LOCADDR=0,RESSCB=5
A03I34A4 LU LOCADDR=0,RESSCB=5
A03I34A5 LU LOCADDR=0,RESSCB=5

```

---

## High Performance Routing

High performance routing (HPR) allows you to migrate NCP connections to APPN connections without incurring the associated increase in storage and cycles. HPR utilizes a rapid transport protocol (RTP) connection to transport session traffic between session endpoints. HPR routes can also traverse an existing subarea network, as HPR support provides for the mapping of HPR routes over VR-based TGs between intermediate nodes.

HPR support is available only over APPN host-to-host channel connections and other type 2.1 channel connections. To use HPR over NCP, you must have, at a minimum, NCP Version 7 Release 3.

Code HPR=YES to enable HPR support for a particular GROUP, LINE, or PU. HPR=YES is the default. For a PU that has HPR enabled, code LLERP to specify the link-level error recovery procedures (LLERP) preference. For type 2.1 channels, the default is LLERP=REQUIRED. For all other connections, the default is LLERP=NOTPREF (LLERP is required by this PU only if the adjacent link station requires it.)

## Channel-attached NCP and Local SNA Connections

You can implement high performance routing in a network consisting of channel-attached NCP and local SNA connections, as depicted in Figure 19 on page 77.

In this configuration, SSCPAA and SSCP2A are endpoints of an HPR route and SSCP1A provides intermediate node ANR routing. This configuration implements high performance routing by default because HPR=YES is the default value for PUs defined as 2.1 nodes when the connections are not to or from VTAM in a composite network node.

In the following sample from the NCP major node NCP3AB8 residing on SSCP1A, HPR=YES and LLERP=REQUIRED are coded on P3A21 (for the connection to SSCP2A) and on P3A21AA1 (for the connection to SSCPAA). Note that YES is the HPR default value.



```

*-----
* L O C A L S N A G R O U P S
*
* DEFINITIONS FOR CHANNEL ATTACHED PU 2.1 (LOCALSNA)
*-----
GRP3A8 GROUP LNCTL=CA,CA=TYPE5,NCPCA=ACTIVE
LN3A8 LINE ADDRESS=051,TIMEOUT=840.0,CASDL=420.0,TRANSFR=255, X
 INBFRS=128,ANS=CONT
P3A21 PU PUTYPE=2,OWNER=SSCP1A,XID=YES, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=REQUIRED
NETAPPL3 LU LOCADDR=0,PACING=(1),LUDR=YES,RESSCB=10
APPLAA3 LU LOCADDR=0,PACING=(1),LUDR=YES,RESSCB=10
*
GRP3AAA1 GROUP LNCTL=CA,CA=TYPE5,NCPCA=ACTIVE
LN3AAA1 LINE ADDRESS=050,TIMEOUT=840.0,CASDL=420.0,TRANSFR=255, X
 INBFRS=128,ANS=CONT
P3A21AA1 PU PUTYPE=2,OWNER=SSCP1A,XID=YES, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=REQUIRED
APPLAA2 LU LOCADDR=0,PACING=(1),LUDR=YES,RESSCB=10

```

See “Network Node Start Option List” on page 179 for information on how to code VTAM start options for high performance routing for network nodes SSCPAA and SSCP2A, and “Interchange Node Start Option List” on page 185 for interchange node SSCP1A. See “High Performance Routing over Channel Connections” on page 77 for information on how to code the local SNA major nodes on SSCPAA and SSCP2A for high performance routing.

## Channel-attached NCP, Local SNA, and Leased SDLC Connections

In the HPR configuration shown in Figure 20 on page 78, the endpoints of the RTP connection are SSCP7E and SSCPAA. Both SSCP1A and SSCP2A have been started with the start option VRTG=YES, and therefore the connection between SSCP1A and SSCP2A constitutes the VR-based TG portion of the HPR route. An APPNTOSA table is recommended to map APPN COS names to the subarea COS names used by the VR-based TG. For a sample APPNTOSA table, see “APPN-to-Subarea COS Mapping Table” on page 211.

In the following sample from the NCP major node NCP3AB8 residing on SSCP1A, HPR=YES and LLERP=REQUIRED are coded on P3A217B1 (for the 2.1 connection to SSCP7E) and HPR=YES and LLERP=NOTPREF are coded on P3A4956M (for the leased SDLC connection to NCP4).

```

NCP3AB8 TITLE 'CHANNEL ATTACHED 11.7 NCP'
*-----
* NCP3AB8
*-----
* S D L C G R O U P F O R A P P N D E V I C E S
*-----
GRP3A9 GROUP LNCTL=SDLC,DIAL=NO,TYPE=NCP,POLLED=YES, X
LN3A11 LINE ADDRESS=03F
 CLOCKNG=EXT,DUPLEX=FULL,SPEED=1200
*
 SERVICE ORDER=(P3A4956M)
*
P3A4956M PU PUTYPE=2,ADDR=C1,XID=YES,ISTATUS=INACTIVE, X
 SSCPFM=USSSCS,MAXDATA=256,MAXOUT=1,PASSLIM=1, X
 OWNER=SSCP1A,NETID=NETA,ANS=CONTINUE, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=NOTPREF
*

```

```

*-----
* L O C A L S N A G R O U P S
*
* DEFINITIONS FOR CHANNEL ATTACHED PU 2.1 (LOCALSNA)
*-----
*
GRP3A7B1 GROUP LNCTL=CA,CA=TYPE5,NPCPA=ACTIVE
LN3A7B1 LINE ADDRESS=052,TIMEOUT=840.0,CASDL=420.0,TRANSFR=255, X
 INBFRS=128,ANS=CONT
P3A217B1 PU PUTYPE=2,OWNER=SSCP1A,XID=YES, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=REQUIRED
ECHOB12 LU LOCADDR=0,PACING=(1),LUDR=YES,RESSCB=10

```

In the following sample from the NCP major node NCP4AB8 residing on SSCP2A, HPR=YES and LLERP=NOTPREF are coded on P4A4956C (for the leased SDLC connection to NCP3) and P4A21AA1 (for the 2.1 connection to SSCPAA).

```

NCP4AB8 TITLE 'CHANNEL ATTACHED 11.8 NCP'
*-----
* NCP4AB8
*-----
*-----
* S D L C G R O U P F O R A P P N D E V I C E S
*-----
*
GRP4A6 GROUP LNCTL=SDLC,DIAL=NO,MODE=SEC,TYPE=NCP,POLLED=YES, X
 CLOCKNG=EXT,DUPLEX=FULL,SPEED=1200
*
LN4A6 LINE ADDRESS=04E
*
 SERVICE ORDER=(P4A4956C)
*
P4A4956C PU PUTYPE=2,ADDR=C1,XID=YES,ISTATUS=INACTIVE, X
 SSCPFM=USSSCS,MAXDATA=256,MAXOUT=1,PASSLIM=1, X
 OWNER=SSCP2A,NETID=NETA,ANS=CONTINUE, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=NOTPREF
L3A4956G LU LOCADDR=0,RESSCB=3,PACING=(1,1),VPACING=2, X
 ISTATUS=INACTIVE
*-----
* L O C A L S N A G R O U P
*
* DEFINITIONS FOR CHANNEL ATTACHED PU 2.1 (LOCALSNA)
*-----
*
GRP4AAA1 GROUP LNCTL=CA,CA=TYPE5,NPCPA=ACTIVE
LN4AAA1 LINE ADDRESS=054,TIMEOUT=840.0,CASDL=420.0,TRANSFR=255, X
 INBFRS=128,ANS=CONT
P4A21AA1 PU PUTYPE=2,OWNER=SSCP2A,XID=YES, X
 CONNTYPE=APPN,CPCP=YES,HPR=YES,LLERP=REQUIRED
 GENEND

```

---

## Dynamic Reconfiguration of Selected NCP PU Operands

You can dynamically reconfigure the values of selected PU operands in NCP major nodes. The values of these operands are passed to the NCP during dynamic reconfiguration of the NCP. You need NCP V7R3 to use dynamic reconfiguration of selected NCP PU operands. For more information on coding these operands, refer to the *NCP, SSP, and EP Resource Definition Reference*.

You can dynamically change these selected NCP PU operands by editing the VTAMLST and then issuing the VARY ACT,ID= *npc\_name* ,UPDATE=ALL command.

In this sample from an NCP major node, the COMRATE operands on the A71PU88B and A71PU89B PU definition statements specify 3 as the relative transmit priority of a terminating equipment subport or a frame handler subport.

The INTFACE operands on LINE definition statements A71TR88 and A71TR89 specify, for their subordinate PUs, that 1500 bytes is the the maximum transmission frame size over the frame-relay internet interfaces named A71IP88 and A71IP89, respectively.

```

* 3745 NOOTRI PHYSICALS *

A71NTRI1 GROUP ECLTYPE=(PHYSICAL,ANY), X
 USSTAB=AUSSTAB, X
 ISTATUS=ACTIVE, X
 ADAPTER=TIC2, X
 ANS=CONTINUE, X
 TRSPEED=16, X
 XID=NO
A71TR88 LINE ADDRESS=(1088,FULL), X
 PORTADD=88, X
 INTFACE=(A71IP88,1500), X
 MAXTSL=4096, X
 RCVBUFC=8192, X
 MAXFRAME=4096, X
 XMONLNK=YES, X
 LOCADD=400000711088
*
A71PU88A PU PUTYPE=1
A71PU88B PU NETWORK=FRELAY,COMRATE=(,3),PUTYPE=1,ADDR=03
A71PU88C PU PUTYPE=1,NETWORK=IP,ARPTAB=(100,10,NOTCANON)
*
A71TR89 LINE ADDRESS=(1089,FULL), X
 PORTADD=89, X
 INTFACE=(A71IP89,1500), X
 MAXTSL=4096, X
 RCVBUFC=8192, X
 MAXFRAME=4096, X
 XMONLNK=YES, X
 LOCADD=400000711089
A71PU89A PU PUTYPE=1
A71PU89B PU NETWORK=FRELAY,COMRATE=(,3),PUTYPE=1,ADDR=03
A71PU89C PU PUTYPE=1,NETWORK=IP,ARPTAB=(100,10,NOTCANON)
*
*
GENEND GENEND
 END
```

In the following sample, taken from an NCP major node, the DYNWIND keyword on the PU definition statement specifies the values to be used by NCP to modify the IEEE 802.2 LLC working window parameter. DYNWIND=(8,4,4) specifies that 8 frames must be received to increment the working window value by 1, that the working window value is divided by 4 when frame loss occurs, and that the working window value is divided by 4 when backward explicit congestion notification occurs.

The INTFACE operands on PU definition statements A71IP016 and A71IP020 specify that 1500 bytes is the maximum transmission frame size over the frame-relay internet interfaces named FRIP016 and FRIP020, respectively.

```

* FRAME IP POINT TO POINT CONNECTIONS A71 TO A31 *

*
```

```

A71FGRP1 GROUP FRELAY=(PHY,PER), ISTATUS=ACTIVE, MAXFRAME=4096, TYPE=NCP
A71F0016 LINE ADDRESS=(0016, FULL), NRZI=NO, TITIMER=100, X
LMI=ANSI, SPEED=55855, PORTADD=16, X
ARPTAB=(200, , NOTCANON)
A71P0016 PU ANS=CONTINUE, LMI=ANSI, TIMERS=(29,30), ERROR=(9,10), X
DYNWIND=(8,4,4)
A71IP016 PU PUTYPE=1, ADDR=3A, IPADDR=128.60.31.99, X
INTFACE=(FRIP016,1500)
*

* FRAME IP POINT TO POINT CONNECTIONS A71 TO A04 *

*
A71FGRP2 GROUP FRELAY=(PHY,PER), ISTATUS=ACTIVE, MAXFRAME=4096, TYPE=NCP
A71F0020 LINE ADDRESS=(0020, FULL), NRZI=NO, TITIMER=100, X
LMI=ANSI, SPEED=55855, PORTADD=20, X
ARPTAB=(200, , NOTCANON)
A71P0020 PU ANS=CONTINUE, LMI=ANSI, TIMERS=(29,30), ERROR=(9,10), X
DYNWIND=(8,4,4)
A71IP020 PU PUTYPE=1, ADDR=3B, IPADDR=128.50.04.99, X
INTFACE=(FRIP020,1500)

```

In the sample below, taken from an NCP major node, the LADDR keyword on the PU definition statement labeled FRIPPU24 specifies the 4-byte internet address of the associated interface. It is used in defining a frame-relay over internet connection.

The IPQLIM keyword on that same PU definition statement specifies 2106 bytes as the maximum amount of data that can sit on the outbound queue before it is discarded.

```

* A 7 1 I P 0 1 *

* NCP NAME: A71IP01 - IP OVER FRAME-RELAY - Static Routes *
* VER/REL: V7R3F *
* SUBAREA: A71N *
* BOX-TYPE: 3745 *

*
* Frame Relay BNN Connection - Supports BNN and IP over Frame-Relay. *
* Frame-Relay IP PU is setup with *
* IPLOCAL keywords. This eliminates the *
* IPLOCAL definitions below. *

FRPG0224 GROUP FRELAY=(PHYSICAL,PER), MAXFRAME=2106
FRLN0224 LINE ADDRESS=(0224, FULL), CLOCKNG=EXT, X
SPEED=55855, ARPTAB=(40, , NOTCANON)
FRPU224 PU XMONLNK=NO, LMI=ANSI
*
FRIPPU24 PU PUTYPE=1, ADDR=2A, P2PDEST=9.71.224.95, LADDR=9.71.224.1, X
METRIC=1, INTFACE=(FRPU0224,1500), X
SNETMASK=255.255.255.0, PROTOCOL=RIP, X
IPQLIM=2106
*
FRLG224 GROUP FRELAY=(LOGICAL, PERIPHERAL), PHYSRSC=FRPU224, LOCALTO=20, X
CALL=INOUT, AUTOGEN=10
*

* END OF NCP GEN *

*
GENEND GENEND
END

```

In the next sample, the T2TIMER tuning parameter coded on the A71PL2A, A71PL2B, and A71PL2C PU definition statements specifies that 0.5 seconds is the acknowledgement timer (T2) value for connections through a frame-relay network and that 64 is the number of I-frames that can be received without sending an acknowledgement.

```

* FRAME-RELAY LOGICAL INN LINES FOR A71F2624

A71FRGL0 GROUP FRELAY=LOGICAL,
 ISTATUS=ACTIVE,
 SDLCST=(S71PRI,S71SEC),
 MAXOUT=127,
 LOCALTO=5,
 MODULO=128,
 RETRIES=(5,5,5),
 PHYSRSC=A71P2624
 X
 X
 X
 X
 X
 X
 X
*

* T1 <-----> T1

* LOGICAL LINE 1 --- DLCI X'20' TALKS TO DLCI X'20'

A71LL2C LINE ISTATUS=ACTIVE,MONLINK=YES,IPL=YES,MLTGPRI=36
A71PL2C PU PUTYPE=4,BLOCK=(4096,5),
 ADDR=20,
 ANS=CONTINUE,
 TGN=1,
 T2TIMER=(.5,64)
 X
 X
 X
 X
.
.
.

* FRAME-RELAY LOGICAL INN LINES FOR A71F2496

A71FRGL1 GROUP FRELAY=LOGICAL,
 ISTATUS=ACTIVE,
 SDLCST=(S71PRI,S71SEC),
 MAXOUT=127,
 LOCALTO=5,
 MODULO=128,
 RETRIES=(5,5,5),
 PHYSRSC=A71P2496
 X
 X
 X
 X
 X
 X
 X
*

* T1 <-----> T1

* LOGICAL LINE 1 --- DLCI X'20' TALKS TO DLCI X'20'

A71LL2A LINE ISTATUS=ACTIVE,MONLINK=YES,IPL=YES,MLTGPRI=36
A71PL2A PU PUTYPE=4,BLOCK=(4096,5),
 ADDR=20,
 ANS=CONTINUE,
 TGN=1,
 T2TIMER=(.5,64)
 X
 X
 X
 X

* LOGICAL LINE 2 --- DLCI X'21' TALKS TO DLCI X'21'

A71LL2B LINE ISTATUS=ACTIVE,MONLINK=YES,IPL=YES,MLTGPRI=37
A71PL2B PU PUTYPE=4,BLOCK=(4096,5),
 ADDR=21,
 ANS=CONTINUE,
 TGN=1,
 T2TIMER=(.5,64)
 X
 X
 X
 X

```

---

## Defining Spare SDLC Lines

You can generate 3745-attached SDLC peripheral lines as spare lines, as redefinable lines, or as neither. A spare line is not in use and cannot be activated. A redefinable line can be activated and used.

When you generate a spare line in NCP, you create a line address to which you can later add a physical line. When you code spare and redefinable lines, you define the characteristics of the physical line that will be added to or removed from your communication controller.

On the GROUP definition statement, code TYPE=NCP to specify that the line is initially a spare line, a redefinable line, or neither.

On the LINE definition statement:

- Code USE=SPARE to define the line as initially a spare line. This line is being defined for later use, although there is no line physically attached to the line slot in the NCP.
- Code USE=REDEF to define the line as initially a redefinable line. This line is in use and has the capability of being changed to a spare line.

**Note:** The MODIFY LINEDEF command allows you to dynamically change the definition of a redefinable line, where a redefinable line is an SDLC line that has been defined in an NCP major node with USE=REDEF or USE=SPARE.

To use this function, you must have, at a minimum, VTAM V4R3, NCP V7R2, NTuneMon V1R2, and NTuneNCP V1R1.

The sample below illustrates how to code the USE operand to define spare and redefinable SDLC lines.

```

* DEFINITION STATEMENTS FOR SPARE SDLC LINES

* LINE 384 --- USE=SPARE

SDLCGRP GROUP ACTIVTO=60.0, *
 ANS=CONT, *
 AVGPB=128, *
 CLOCKNG=EXT, *
 DIAL=NO, *
 DUPLEX=FULL, *
 IRETRY=YES, *
 ISTATUS=INACTIVE, *
 LNCTL=SDLC, *
 MAXDATA=256, *
 MAXOUT=1, *
 MODETAB=NCP108, *
 NPACOLL=YES, *
 NPATP=YES, *
 NRZI=NO, *
 PASSLIM=2, *
 PACING=7, *
 PUDR=NO, *
 PUTYPE=2, *
 REPLYTO=5, *
 RETRIES=(,3,5), *
 TYPE=NCP, *
 USSTAB=AUSSTAB
```

```

*
L384 LINE ADDRESS=384,USE=SPARE
P3841 PU ADDR=C1
T3841A LU LOCADDR=2

* LINE 385 --- USE=REDEF

SDLCGRP1 GROUP ACTIVTO=60.0, *
 ANS=CONT, *
 AVGPB=128, *
 CLOCKNG=EXT, *
 DIAL=NO, *
 DUPLEX=FULL, *
 IRETRY=YES, *
 ISTATUS=INACTIVE, *
 LNCTL=SDLC, *
 MAXDATA=256, *
 MAXOUT=1, *
 MODETAB=NCP108, *
 NPACOLL=YES, *
 NPATP=YES, *
 NRZI=NO, *
 PASSLIM=2, *
 PACING=7, *
 PUDR=NO, *
 PUTYPE=2, *
 REPLYTO=5, *
 RETRIES=(,3,5), *
 TYPE=NCP, *
 USSTAB=AUSSTAB
*
L385 LINE ADDRESS=385,USE=REDEF
P3851 PU ADDR=C1
T3851A LU LOCADDR=2
T3851B LU LOCADDR=3
T3851C LU LOCADDR=4
T3851D LU LOCADDR=5
T3851E LU LOCADDR=6
T3851F LU LOCADDR=7
T3851G LU LOCADDR=8
T3851H LU LOCADDR=9
P3852 PU ADDR=C2
T3852A LU LOCADDR=2
T3852B LU LOCADDR=3
T3852C LU LOCADDR=4
T3852D LU LOCADDR=5
T3852E LU LOCADDR=6
T3852F LU LOCADDR=7
T3852G LU LOCADDR=8
T3852H LU LOCADDR=9

```

---

## Frame-Relay Networks over Token-Ring Connections

Users who interconnect NCPs with token-ring connections can have a private frame-relay network over these token-ring connections without the need for additional physical lines.

Frame-relay over token-ring resources include a PU type 1 defined on a token-ring physical line and leased logical lines associated with this PU with multiple type 1 PUs.

Code ECLTYPE=(PHYSICAL,ANY) on the GROUP definition statement to specify NTRI physical resources.

The COMRATE operand value specified for the physical PU is used in conjunction with the DATABLK operand value on the associated token-ring physical line to determine each protocol's guaranteed bandwidth (in bytes), relative to each other, of the total token-ring bandwidth.

The DATABLK operand on the token-ring physical line has a default value of 2048. This DATABLK value is used along with the COMRATE value specified for the associated logical line to determine the logical line's guaranteed transmission bandwidth.

The NCP major node excerpt shown below shows how the ECLTYPE, COMRATE, and DATABLK operands are used in defining physical definitions for a frame-relay network over a token-ring connection.

```

* PHYSICAL DEFINITIONS FOR FRAME-RELAY PORTS

*
A31NTRI1 GROUP ECLTYPE=(PHYSICAL,ANY),
 USSTAB=AUSSTAB,
 ISTATUS=ACTIVE,
 ADAPTER=TIC2,
 ANS=CONTINUE,
 TRSPEED=16,
 XID=NO
*
A31TR88 LINE ADDRESS=(1088,FULL),
 DATABLK=2048,
 PORTADD=88,
 MAXTSL=1028,
 MAXFRAME=4096,
 XMONLNK=YES,
 LOCADD=400003101088
A31PU88A PU PUTYPE=1
*
A31PU88B PU NETWORK=FRELAY, COMRATE=(,1), PUTYPE=1, ADDR=03
*
A31TR89 LINE ADDRESS=(1089,FULL),
 PORTADD=89,
 DATABLK=2048,
 MAXTSL=1028,
 MAXFRAME=4096,
 XMONLNK=YES,
 LOCADD=400003101089
A31PU89A PU PUTYPE=1
*
A31PU89B PU NETWORK=FRELAY, COMRATE=(,1), PUTYPE=1, ADDR=03
*
*
A31TR92 LINE ADDRESS=(1092,FULL),
 PORTADD=92,
 MAXTSL=1028,
 DATABLK=2048,
 MAXFRAME=4096,
 XMONLNK=YES,
 LOCADD=400003101092
A31PU92A PU PUTYPE=1
*
A31PU92B PU NETWORK=FRELAY, COMRATE=(,1), PUTYPE=1, ADDR=03
*
A31TR93 LINE ADDRESS=(1093,FULL),
 PORTADD=93,
 DATABLK=2048,
 MAXTSL=1028,
 MAXFRAME=4096,
```



```

 XMONLNK=YES,
 LOCADD=400003101093
A31PU93A PU PUTYPE=1
*
A31PU93B PU NETWORK=FRELAY,COMRATE=(,1),PUTYPE=1,ADDR=03
*

```

Code ECLTYPE=(LOGICAL,FRELAY) on the GROUP definition statement to specify that the group, subordinate lines and PUs are to be treated as frame-relay resources.

On the PHYSRSC operand, specify the name of the frame-relay over token-ring physical PU (NETWORK=FRELAY on the PU definition statement) defined on the token-ring physical line.

When COMRATE is defined on a token-ring logical line statement, the value on the COMRATE operand is used along with the DATABLEK value specified on the token-ring physical line to determine the logical line's guaranteed transmission bandwidth.

The NCP major node excerpt shown below shows how the ECLTYPE, PHYSRSC, and COMRATE operands are used in defining logical definitions for a frame relay port over a token ring connection.

```

* LOGICAL DEFINITIONS FOR FRAME-RELAY PORT A31PU89B

*
A31FRTG2 GROUP ECLTYPE=(LOGICAL,FRELAY),PUTYPE=1,TYPE=NCP,DIAL=NO, X
 LNCTL=SDLC,LINEADD=NONE,COMPOWN=YES,RETRIES=(6,0,0,6), X
 PHYSRSC=A31PU89B,PUDR=YES
A31LFR1B LINE MAXFRAME=4096,NPACOLL=(YES,EXTENDED),MAXPU=240, X
 COMRATE=(,1)
A31LM89A PU LMI=ANSI,ANS=CONT,ADDR=C4400000711089
A31P8920 PU ADDR=20
A31P8921 PU ADDR=21
A31P8922 PU ADDR=22
A31P8923 PU ADDR=23
A31P8924 PU ADDR=24
A31P8925 PU ADDR=25
A31P8926 PU ADDR=26
A31P8927 PU ADDR=27
A31P8928 PU ADDR=28
A31P8929 PU ADDR=29
A31P8930 PU ADDR=30
A31P8931 PU ADDR=31
*
A31P8950 PU ADDR=50
A31P8951 PU ADDR=51
A31P8952 PU ADDR=52
A31P8953 PU ADDR=53
A31P8954 PU ADDR=54
A31P8955 PU ADDR=55
A31P8956 PU ADDR=56
A31P8957 PU ADDR=57
A31P8958 PU ADDR=58
A31P8959 PU ADDR=59
A31P895A PU ADDR=5A
A31P895B PU ADDR=5B
A31P895C PU ADDR=5C
A31P895D PU ADDR=5D
A31P895E PU ADDR=5E

```

```
A31P895F PU ADDR=5F
A31P8999 PU ADDR=99
```

```

```

---

## Chapter 12. Switched Major Node

|                                                                                                              |     |                                                                          |     |
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---

### About This Chapter

This chapter contains sample switched major node definitions for various types of switched connections.

---

### NCP-Attached Switched Peripheral PUs

Switched peripheral PUs attached to an NCP are defined by VTAM with one or more switched major nodes and an NCP major node. Consider, for example, the configuration shown in Figure 22 on page 95. The switched major node SWND3AB7 defines three PUs, the paths to each PU, and the LUs associated with each PU, as shown in the following excerpt: (The corresponding NCP major node, which defines the switched line groups, is shown and discussed in “NCP-Attached Switched Peripheral PUs” on page 95.)

```
SWND3AB7 VBUILD TYPE=SWNET,MAXNO=35,MAXGRP=9

*
```

```

* AUTOMATIC DIAL IN/OUT GROUPS - GP3AAI01, GP3AAI02
*

* NCP SWITCHED SDLC CONNECTION TO PU_T2.0
*

SWPUAI01 PU ADDR=01, IDBLK=001, IDNUM=00001, X
 MAXPATH=1, MAXDATA=256, X
 PUTYPE=2, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, X
 SSCPFM=USSSCS
PATHAI01 PATH DIALNO=PATH21A-890-3333, PID=1, GID=1, GRPNM=GP3AAI01
SL1DAI01 LU LOCADDR=1, PACING=(1,1), VPACING=2, X
 MODETAB=MODETAB2
SL1DAI02 LU LOCADDR=2, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE
SL1DAI03 LU LOCADDR=3, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE
*-----
*
* NCP SWITCHED SDLC CONNECTION TO LEN PU_T2.1
*
*-----
SWPUADO2 PU ADDR=09, IDBLK=009, IDNUM=00009, CPNAME=LEN090, X
 MAXPATH=1, MAXDATA=256, X
 PUTYPE=2, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, X
 SSCPFM=USSSCS, CONNTYPE=LEN
PATHADO2 PATH DIALNO=PATH21D-890-3333, PID=4, GID=1, GRPNM=GP3AAD02
SL2IAD01 LU LOCADDR=0, PACING=(1,1), VPACING=2, X
 MODETAB=MODETAB2, RESSCB=1
SL2IAD02 LU LOCADDR=0, RESSCB=2, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE
*-----
*
* NCP SWITCHED SDLC CONNECTION TO LEN PU_T2.1
*
*-----
SWPUADO3 PU ADDR=10, IDBLK=010, IDNUM=00010, X
 MAXPATH=1, MAXDATA=256, X
 PUTYPE=2, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, X
 SSCPFM=USSSCS, ANS=CONTINUE, CONNTYPE=LEN
PATHADO3 PATH DIALNO=PATH21E-890-3333, PID=5, GID=1, GRPNM=GP3AAD02
SL3DAD01 LU LOCADDR=6, PACING=(1,1), VPACING=2, X
 MODETAB=MODETAB2
SL3IAD02 LU LOCADDR=0, RESSCB=1, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE

```

The PATH statement defines the path to the PU:

- DIALNO specifies the dial information used to initiate the connection with a PU over the switched link. Thus, PATHAI01 specifies PATH21A-890-3333 as the dial information used to initiate a connection with SWPUAI01 over the line LN3AAI01 (defined in the NCP major node).
- GRPNM identifies the name of a GROUP statement (in the corresponding NCP major node) that defines a group of SDLC switched links. Thus, PATHAI01 in the switched major node identifies GP3AAI01 as the name of the switched line group defined by the NCP major node.

If you examine the PATH definitions for SWPUADO2 and SWPUADO3, you will notice that they specify the same group, GP3AAD02. Since this group only has one line defined, only one of these PUs can be connected at a given time.

---

## Switched SDLC Subarea Connection

One type of VTAM-to-VTAM NCP connection uses switched SDLC links between two communication controllers. This type of connection is called switched SDLC subarea connection.

Figure 23 on page 96 shows switched SDLC connections between communication controllers A04 and A31.

The VTAM at each end of the connection must define both of the following:

- A switched major node
- An NCP major node

The PU definition statements in the switched major node define subareas attached over switched lines that can be dialed into or dialed out from a communication controller using NCP. The PATH definition statements in the switched major node define the possible paths to be used to establish a connection between the communication controller or host processor and the other subarea.

The NCP major node definition specifies GROUP definition statements that define switched line groups. These switched line groups specify LINE definition statements that define the lines and PU definition statements that represent the ports for the PUs that can be connected to the NCP on that line.

**Note:** An automatic calling unit (ACU) is required for switched SDLC subarea connection.

For more information on this type of connection, refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*. Sample switched major node definitions for the connection shown in Figure 23 on page 96 are given below. The corresponding NCP major node definitions are found in Figure 23 on page 96.

### Defining Switched SDLC Subarea Connections for NCP A04

The VBUILD definition statement defines the beginning of this switched major node (TYPE=SWNET).

The PU definition statement defines subarea 310, attached over a switched line that can be dialed into or dialed out from NCP A04. IDNUM=00003 must match the IDNUM at the other end of the switched line (see “Defining Switched SDLC Subarea Connection for NCP A31” on page 128).

For dial-out operations, the PATH definition statement defines the path to be used to establish a connection with the other subarea. GRPNM=A04GINN3 matches the name on the GROUP definition statement in the NCP major node for NCP A04 on page 96. The PATH definition statement also defines the dial-out telephone number (DIALNO=PATH21A-890-3333).

```
* =====> BEGINNING OF DATA SET A02SAD03

* A02SAD03 - VTAM SWITCHED MAJOR NODE - SUBAREA A02 *

* SDLC SAD CONNECTION FROM A04 TO A31 *

A02SAD03 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
```

```

A31PU3 PU MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
 ADDR=C1, ** STATION ADDRESS ** X
 ANS=STOP, ** AUTOMATIC NETWORK SHUTDOWN ** X
 IDNUM=00003, ** DEVICE IDENTIFICATION NUM ** X
 DATMODE=FULL, ** DEVICE IDENTIFICATION NUM ** X
 MAXDATA=5000, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=1, ** NUM DIAL PATHS FOR PU ** X
 NETID=NETA, ** NETWORK IDENTIFIER ** X
 PUTYPE=4, ** PHYSICAL UNIT TYPE ** X
 SUBAREA=310, ** DESTINATION SUBAREA ** X
 TGN=1 ** TRANSMISSION GROUP NUMBER **
 PATH DIALNO=PATH21A-890-3333, ** TELEPHONE NUMBER ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A04GINN3, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=1 ** DIAL RETRY NUMBER **
* =====> END OF DATA SET A02SAD03

```

## Defining Switched SDLC Subarea Connection for NCP A31

The VBUILD definition statement defines the beginning of this switched major node (TYPE=SWNET).

The PU definition statement defines subarea 004, attached over a switched line that can be dialed into or dialed out from NCP A04. IDNUM=00003 must match the IDNUM at the other end of the switched line (see sample on page 127).

For dial-out operations, the PATH definition statement defines the path to be used to establish connection with the other subarea. GRPNM=A31GINN3 matches the name on the GROUP definition statement in the NCP major node for NCP A31 on page 97. The PATH definition statement also defines the dial-out telephone number (DIALNO=PATH21D-890-3333).

```

* =====> BEGINNING OF DATA SET A81SAD03

* A81SAD03 - VTAM SWITCHED MAJOR NODE - ICN A81 *

* SDLC SAD CONNECTION FROM A31 TO A04 *

A81SAD03 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
A04PU3 PU ADDR=C1, ** STATION ADDRESS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 IDNUM=00003, ** DEVICE IDENTIFICATION NUM ** X
 MAXDATA=5000, ** MAX NUM BYTES IN ONE PIU ** X
 DATMODE=FULL, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 NETID=NETA, ** NETWORK IDENTIFIER ** X
 PUTYPE=4, ** PHYSICAL UNIT TYPE ** X
 SUBAREA=004, ** DESTINATION SUBAREA ** X
 TGN=1 ** TRANSMISSION GROUP NUMBER **
 PATH DIALNO=PATH21D-890-3333, ** TELEPHONE NUMBER ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A31GINN3, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=1 ** DIAL RETRY NUMBER **
* =====> END OF DATA SET A81SAD03

```

---

## NCP/Token-Ring Interconnection (NTRI) for Peripheral Nodes

NCP/Token-Ring Interconnection (NTRI) is an NCP function that allows a communication controller to attach to the IBM Token-Ring Local Area Network and that provides both subarea and peripheral node DLC services in the SNA network. In this section we discuss the peripheral node DLC services that NTRI provides to VTAM.

You implement this type of connection by defining both of the following:

- switched major node
- NCP major node

The switched major node defines the peripheral nodes and associated logical units that are attached to the token ring.

The NCP major node defines both physical and logical resources:

- The token-ring interface coupler (TIC) connection for NTRI support is defined as a physical connection in a GROUP definition statement specifying ECLTYPE=PHYSICAL.
- The peripheral nodes that are attached to the token ring are defined as logical connections in a GROUP definition statement specifying ECLTYPE=LOGICAL.

The name specified for GRPNM (group name) in the PATH definition statement of the switched major node must match the name of the logical group definition in the NCP major node.

In the configuration illustrated here, the communicating VTAMs A02N and A81N are defined as type 2.1 peripheral nodes to each other and are attached to the token-ring network through NCP A31 and NCP A04.

Below are four sample switched major nodes for the NTRI peripheral node connection.

For the corresponding sample NCP major nodes used in this configuration, see “Attaching Peripheral Nodes to VTAM using NTRI” on page 98. For more information on NTRI connections, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

### Switched Major Node for Line 1088 from NCP A31

Code a PU definition statement for each physical unit in the switched major node. In this sample of a switched major node residing on the A02N node, the CPNAME operand on the PU definition statement specifies A81N as the control point name of a type 2.1 peripheral node. The CPNAME operand must be used for a switched connection, when the type 2.1 peripheral node is a VTAM. For VTAM to locate the physical and logical unit definitions, the value of the CPNAME operand on the switched line definition must be the same as the value of the SSCPNAME start option in the attaching VTAM type 2.1 peripheral node.

Code a PATH definition statement in the switched major node to allow VTAM to establish the connection to the token-ring attached peripheral node. In this sample, the NTRIPATH PATH statement specifies for the DIALNO operand the value 020440000003131, where

1. 02 is the token-ring interface coupler (TIC) number of the communication controller
2. 04 is the service access point (SAP) address of the terminal
3. 40000003131 are the last six bytes of the terminal's ring-station address.

DIALNO is required if the physical unit is used as a dial-out physical unit.

Because a dial-out connection will be made to the PU associated with this PATH definition statement, the GRPNM operand is required. The name coded for the GROUP definition statement in the NCP major node must match the GRPNM operand on the PATH definition statement in the switched major node. Therefore, by specifying GRPNM=A04BNNG1, you are restricting the users that can dial into your system to the users in the group A04BNNG1.

```
* =====> BEGINNING OF DATA SET A02S1088

* A02S1088 - VTAM SWITCHED MAJOR NODE - SUBAREA A02 *
* - CONNECTS TO A31 LINE 1088 *

* NTRI CASUAL CONNECTION FROM A02 TO A81 *

A02S1088 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9, ** NUMBER UNIQUE PHONE NUMBERS **
NTRI0488 PU ADDR=04, ** STATION ADDRESS ** X
 CPNAME=A81N, ** DESTINATION SSCP NAME ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2, ** PHYSICAL UNIT TYPE **
NTRIPTH PATH DIALNO=020440000003131, ** TELEPHONE NUMBER ** X
 GRPNM=A04BNNG1 ** SWITCHED GROUP NAME **
APPLA81 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MAXSESS=2, ** SESSION LIMIT ** X
 MODETAB=AMODETAB ** LOGON MODE TABLE NAME **
* =====> END OF DATA SET A02S1088
```

## Switched Major Node for Line 1092 from NCP A31

In this sample of a switched major node residing on the A02N node, the CPNAME operand on the PU definition statement specifies A81N as the control point name of a type 2.1 peripheral node. The CPNAME operand must be used for a switched connection, when the type 2.1 peripheral node is a VTAM.

Code a PATH definition statement in the switched major node to allow VTAM to establish the connection to the token-ring-attached peripheral node. In this sample, the NTRIPTH PATH statement specifies for the DIALNO operand the value 020440000003135, where

1. 02 is the token-ring interface coupler (TIC) number of the communication controller
2. 04 is the service access point (SAP) address of the terminal
3. 40000003135 are the last six bytes of the terminal's ring-station address.

DIALNO is required if the physical unit is used as a dial-out physical unit.

Because a dial-out connection will be made to the PU associated with this PATH definition statement, the GRPNM operand is required. The name coded for the GROUP definition statement in the NCP major node must match the GRPNM operand on the PATH definition statement in the switched major node. Therefore,



by specifying GRPNM=A04BNNG1, you are restricting the users that can dial into your system to the users in the group A04BNNG1.

```
* =====> BEGINNING OF DATA SET A02S1092

* A02S1092 - VTAM SWITCHED MAJOR NODE - SUBAREA A02 *
* - CONNECTS TO A31 LINE 1092 *

* NTRI CASUAL CONNECTION FROM A04 TO A31 *

A02S1092 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
NTRI0492 PU ADDR=04, ** STATION ADDRESS ** X
 CPNAME=A81N, ** DESTINATION SSCP NAME ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
NTRIPTH PATH DIALNO=0204400000003135, ** TELEPHONE NUMBER ** X
 GRPNM=A04BNNG1 ** SWITCHED GROUP NAME **
APPLA81 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB ** LOGON MODE TABLE NAME **
* =====> END OF DATA SET A02S1092
```

## Switched Major Node for Line 1089 from NCP A04

In this sample of a switched major node residing on the A81N node, the CPNAME operand on the PU definition statement specifies A02N as the control point name of a type 2.1 peripheral node. The CPNAME operand must be used for a switched connection, when the type 2.1 peripheral node is a VTAM.

Code a PATH definition statement in the switched major node to allow VTAM to establish the connection to the token-ring-attached peripheral node. In this sample, the PATH statement named NTRIPTH specifies for the DIALNO operand the value 020440000000032, where

- 02 is the token-ring interface coupler (TIC) number of the communication controller
- 04 is the service access point (SAP) address of the terminal
- 40000000032 are the last six bytes of the terminal's ring-station address.

DIALNO is required if the physical unit is used as a dial-out physical unit.

Because a dial-out connection will be made to the PU associated with this PATH definition statement, the GRPNM operand is required. The name coded for the GROUP definition statement in the NCP major node must match the GRPNM operand on the PATH definition statement in the switched major node. Therefore, by specifying GRPNM=A31BNNG1, you are restricting the users that can dial into your system to the users in the group A31BNNG1.

```
* =====> BEGINNING OF DATA SET A81S1089

* A81S1089 - VTAM SWITCHED MAJOR NODE - ICN A81 *

* NTRI CASUAL CONNECTION FROM A81 TO A02 *

A81S1089 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
NTRI3189 PU ADDR=04, ** STATION ADDRESS ** X
 CPNAME=A02N, ** DESTINATION SSCP NAME ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
NTRIPTH PATH DIALNO=020440000000032, ** TELEPHONE NUMBER ** X
```

```

 GRPNM=A31BNNG1 ** SWITCHED GROUP NAME **
APPLA02 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB ** LOGON MODE TABLE NAME **
* =====> END OF DATA SET A81S1089

```

## Switched Major Node for Line 1093 from NCP A04

In this sample of a switched major node residing on the A81N node, the CPNAME operand on the PU definition statement specifies A02N as the control point name of a type 2.1 peripheral node. The CPNAME operand must be used for a switched connection, when the type 2.1 peripheral node is a VTAM.

Code a PATH definition statement in the switched major node to allow VTAM to establish the connection to the token-ring-attached peripheral node. In this sample, the NTRIPATH PATH statement specifies for the DIALNO operand the value 0204400000000036, where

1. 02 is the token-ring interface coupler (TIC) number of the communication controller
2. 04 is the service access point (SAP) address of the terminal
3. 400000000036 are the last six bytes of the terminal's ring-station address.

DIALNO is required if the physical unit is used as a dial-out physical unit.

Because a dial-out connection will be made to the PU associated with this PATH definition statement, the GRPNM operand is required. The name coded for the GROUP definition statement in the NCP major node must match the GRPNM operand on the PATH definition statement in the switched major node. Therefore, by specifying GRPNM=A31BNNG1, you are restricting the users that can dial into your system to the users in the group A31BNNG1.

```

* =====> BEGINNING OF DATA SET A81S1093

* A81S1093 - VTAM SWITCHED MAJOR NODE - ICN A81 *

* NTRI CASUAL CONNECTION FROM A81 TO A02 *

A81S1093 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9, ** NUMBER UNIQUE PHONE NUMBERS **
NTRI3193 PU ADDR=04, ** STATION ADDRESS ** X
 CPNAME=A02N, ** DESTINATION SSCP NAME ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2, ** PHYSICAL UNIT TYPE **
NTRIPATH PATH DIALNO=0204400000000036, ** TELEPHONE NUMBER ** X
 GRPNM=A31BNNG1 ** SWITCHED GROUP NAME **
APPLA02 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB ** LOGON MODE TABLE NAME **
* =====> END OF DATA SET A81S1093

```

## Expanded Dial Support

VTAM V4R2 introduces expanded dial information that enables a user of NCP V7R1 to specify up to 250 bytes of signal information on the PATH definition statement of a switched major node. This function also enables a VTAM application program to supply up to 250 bytes of signal data.

VTAM can translate the signal information coded on the PATH definition statement from a variety of input data, including

- Binary coded decimal

- Compressed alphanumeric
- Decimal
- EBCDIC
- Hexadecimal.

The expanded dial information offered in VTAM V4R2 allows greater flexibility in specifying dial information and supports more detailed signal information. The DLCADDR operand on the PATH definition statement of the switched major node is used to specify this expanded dial information.

For more information on expanded dial information, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

The following excerpt from a switched major node illustrates the use of expanded dial information in conjunction with a token-ring DLC.

```

NTRI Sample

F88PH505 PATH GID=2,GRPNM=A71BNNG1, X
 DLCADDR=(1,C,TR), DLC Type X
 DLCADDR=(2,X,06), PORTADD X
 DLCADDR=(3,X,04), Destination SAP X
 DLCADDR=(4,X,400000010001) Destination NTRI Address
NTLU0505 LU LOCADDR=2,DLOGMOD=D6327802,VPACING=63, X
 FEATUR2=EDATS,PACING=63,USSTAB=AUSSTAB
```

---

## X.25 NCP Packet Switching Interface (NPSI) Connections

The X.25 NCP Packet Switching Interface NPSI is an IBM-licensed program that allows SNA users to communicate over packet switched data networks that have interfaces complying with Recommendation X.25 (Geneva 1980) of the CCITT. For a VTAM MVS system to attach to X.25 through a port owned by VTAM, it must do so via NPSI.

### Single-Domain Connections

You can implement communication between an SNA host node and an SNA peripheral node by installing X.25 NPSI in the NCP at the host site. For more information on implementing this type of configuration, refer to *X.25 Network Control Program Packet Switching Interface Planning and Installation*.

### NPSI X.25 Switched Subarea Short Hold Mode Connections

NPSI also supports multidomain connections. Two NCP subarea nodes can communicate across an X.25 packet switching data network with the support of the X.25 NPSI program product. Both permanent virtual circuit and switched virtual circuit connectivity options are supported. See Figure 26 on page 108 for a picture of a multidomain connection across an X.25 network.

X.25 switched virtual circuit (SVC) subarea communication provides connectivity between two subarea nodes over switched virtual circuits. Short hold mode reduces the charge for SVCs, when charging is based on the length of connected time, by clearing the SVC during periods of inactivity and reestablishing the SVC when the connection is required to transmit information.

To define switched subarea short hold mode connections, resources must be defined in a switched major node and an NCP major node on both sides of the connection.

In the switched major node,

- SHM=YES must be specified in the PATH statement associated with the PU definition that is selected when the two link stations make contact.
- Each PATH statement must specify on the GRPNM keyword the label of the NCP GROUP statement that includes the virtual circuit. This label is defined by the NCPGRP keyword of the X25.LINE definition statement of the NCP major node.
- DIALNO is required on the PATH statement to permit outgoing calls.
- The SHMTIM operand may be coded on the PATH statement to specify the time, in seconds and tenths of seconds, to be used as the short-hold mode timer for a short-hold mode connection.
- The PU statements prior to the PATH statements must specify PUTYPE=4 or PUTYPE=5.

For instructions on how to code the NCP major node, see page 108.

For an example of a switched major node that defines one side of a switched subarea short-hold mode connection, see the switched major node named A01SADSM below. For the corresponding NCP major node definition, see page 108.

```
A01SADSM VBUILD MAXGRP=5,MAXNO=5,TYPE=SWNET
*

* SAD CONNECTION TO SUBAREA 02 *

*
SADPU01 PU SUBAREA=02,ADDR=01,ANS=CONT,IDNUM=88888,MAXDATA=1024, X
MAXPATH=2,MAXOUT=7,TGN=1,PUTYPE=4
SADPATH1 PATH DIALNO=5551234531*555123453210701,GID=128,PID=01, X
SHM=YES,SHMTIM=1000,GRPNM=AGA28SAD
*
```

## Expanded Dial Support

VTAM V4R2 introduces expanded dial information that enables a user of NPSI V3R7 to specify up to 250 bytes of signal information on the PATH definition statement of a switched major node. This function also enables a VTAM application program to supply up to 250 bytes of signal data.

VTAM can translate the signal information coded on the PATH definition statement from a variety of input data, including

- Binary coded decimal
- Compressed alphanumeric
- Decimal
- EBCDIC
- Hexadecimal

The expanded dial information offered in VTAM V4R2 allows greater flexibility in specifying dial information and supports more detailed signal information.

The DLCADDR operand on the PATH definition statement of the switched major node is used to specify this expanded dial information.

For more information on expanded dial information, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

In the example below, each DLCADDR operand specifies a subfield that is identified by the subfield identifier—the first number enclosed in parentheses.

**Subfield Identifier**  
**Meaning**

- 1** DLC type identifier (X25)
- 20** Dial information used to initiate a connection with a physical unit over a switched link
- 30** The User Facilities

In addition, the dial information in subfield 20 is broken down as follows:

**5551234571**  
Address of the called DTE

**5551234504**  
Address of the calling DTE

- 2** The one-digit VC code that determines the LLC type
- 01** Points to the VCCPT definitions genned in the NPSI gen
- 01** Points to the OUFT definitions genned in the NPSI gen
- 81002** 5-character IDNUM (valid only for LLC0 and LLC5)

\*\*\*\*\*  
NPSI Sample - Expanded Dial Support  
\*\*\*\*\*

```
PCNEP001 PU ADDR=01,PACING=1,DISCNT=YES,MAXDATA=263,MAXPATH=1, *
 MAXOUT=1,ANS=CONT,PUTYPE=1,IDNUM=81002,IDBLK=069, *
 VPACING=2 *
PCPTH002 PATH GRPNM=AG001SVC,GID=128,PID=01, *
 DLCADDR=(1,C,X25), *
 DLCADDR=(20,C,5551234571*555123450420101*81002), *
 DLCADDR=(30,X,420707430404), *
PCNEL001 LU LOCADDR=0,LOGAPPL=TPNS01
```

---

## NCP Type 2.1 Switched SDLC Casual Connection

In this section the samples describe a type 2.1 casual connection between two NCPs over a switched SDLC link. In this context, a casual connection occurs when you define the two VTAM-NCP combinations as type 2.1 peripheral nodes to each other.

In this configuration, VTAM A02N is channel-attached to NCP A04 and VTAM A81N is channel-attached to NCP A31. There are two switched SDLC connections between NCP A04 and NCP A31. For a picture of this type of configuration (albeit with one switched connection, instead of two), see Figure 23 on page 96.

Each VTAM must define one NCP major node and two switched major nodes (one for each connection).

Switched major nodes A02CCN04 and A02CCN36 reside on VTAM A02N and define switched SDLC casual connections from NCP A04 to NCP A31. Switched

major nodes A81CCN04 and A81CCN36 reside on VTAM A81N and define switched SDLC casual connections from NCP A31 to NCP A04.

Note that for a switched connection, when the type 2.1 peripheral node is a VTAM, the CPNAME operand must be used. The CPNAME operand specifies the control point name of the type 2.1 peripheral node.

The NCP major node definitions are in "NCP Type 2.1 Switched SDLC Casual Connection" on page 101. The switched major node definitions are below.

**Note:** The names of the logical line groups in the NCP major node must match the names specified by the GRPNM operand in the PATH statement of the switched major nodes.

## SDLC Casual Connections from NCP A04 to NCP A31

```

* =====> BEGINNING OF DATA SET A02CCN04

* A02CCN04 - VTAM SWITCHED MAJOR NODE - SUBAREA A02

* SDLC CASUAL CONNECTION FROM A04 TO A31

A02CCN04 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
SWCH0404 PU ADDR=C1, ** STATION ADDRESS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 ASDP=YES, ** DYN DIAL - SEE A02APPLS ** X
 CPNAME=A81N, ** DESTINATION SSCP NAME ** X
 MAXDATA=256, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
SWCPH04 PATH DIALNO=47667, ** TELEPHONE NUMBER ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A04CCNG1, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=4 ** DIAL RETRY NUMBER **
APPLA81 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB, ** LOGON MODE TABLE NAME ** X
 PACING=(1,1) ** LU - BOUNDARY NODE PACING **
* =====> END OF DATA SET A02CCN04

* =====> BEGINNING OF DATA SET A02CCN36

* A02CCN36 - VTAM SWITCHED MAJOR NODE - SUBAREA A02

* SDLC CASUAL CONNECTION FROM A04 TO A31

A02CCN36 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
SWCH0436 PU ADDR=C1, ** STATION ADDRESS ** X
 ASDP=YES, ** DYN DIAL - SEE A02APPLS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 CPNAME=A81N, ** DESTINATION SSCP NAME ** X
 MAXDATA=256, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
SWCPH36 PATH DIALNO=47667, ** TELEPHONE NUMBER - DIAL47 ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A04CCNG1, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=4 ** DIAL RETRY NUMBER **

```

```

APPLA81 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB, ** LOGON MODE TABLE NAME ** X
 PACING=(1,1) ** LU - BOUNDARY NODE PACING **
* =====> END OF DATA SET A02CCN36

```

## SDLC Casual Connections from NCP A31 to NCP A04

```

* =====> BEGINNING OF DATA SET A81CCN04

* A81CCN04 - VTAM SWITCHED MAJOR NODE - ICN A81

* SDLC CASUAL CONNECTION FROM A31 TO A04

A81CCN04 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
SWCH3104 PU ADDR=C1, ** STATION ADDRESS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 CPNAME=A02N, ** DESTINATION SSCP NAME ** X
 MAXDATA=256, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
SWCPH04 PATH DIALNO=45412, ** TELEPHONE NUMBER - DIAL45 ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A31CCNG1, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=4 ** DIAL RETRY NUMBER **
APPLA02 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB, ** LOGON MODE TABLE NAME ** X
 PACING=(1,1) ** LU - BOUNDARY NODE PACING **
* =====> END OF DATA SET A81CCN04
* =====> BEGINNING OF DATA SET A81CCN36

* A81CCN36 - VTAM SWITCHED MAJOR NODE - ICN A81

* SDLC CASUAL CONNECTION FROM A31 TO A04

A81CCN36 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
SWCH3136 PU ADDR=C1, ** STATION ADDRESS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 CPNAME=A02N, ** DESTINATION SSCP NAME ** X
 MAXDATA=256, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
SWCPH36 PATH DIALNO=45412, ** TELEPHONE NUMBER - DIAL45 ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A31CCNG1, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=4 ** DIAL RETRY NUMBER **
APPLA02 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB, ** LOGON MODE TABLE NAME ** X
 PACING=(1,1) ** LU - BOUNDARY NODE PACING **
* =====> END OF DATA SET A81CCN36

```

---

## Attaching a Peripheral Node over an IBM 3172 Interconnect Controller

In the following example, a PS/2 (not shown) is connected to VTAM through a 3172-token ring connection.

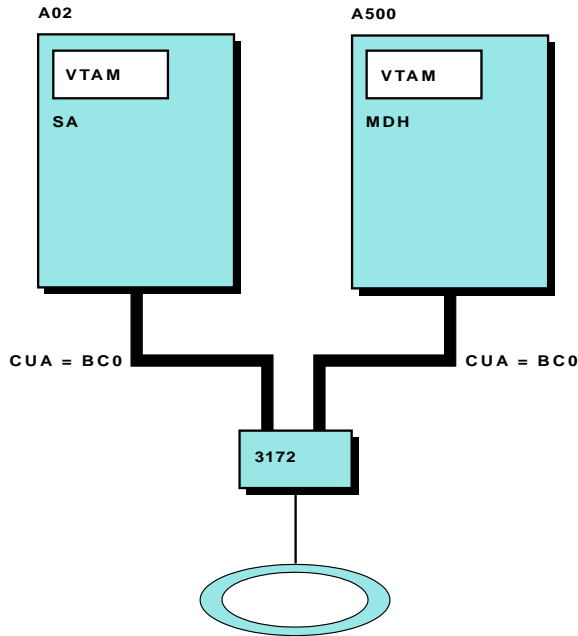


Figure 27. LAN Support through an IBM 3172. Host A02 is a subarea node (SA). Host A500 is a migration data host (MDH).

The switched major node below, together with the external communication adapter major node in “XCA Major Node for Host A02 (Token-Ring LAN)” on page 52, defines the switched connection to this peripheral node.

In the switched major node, the PU definition statement defines peripheral physical units on switched lines that can be dialed into or out from the host through the 3172 Interconnect Controller. For the Personal System/2 attached to the LAN, the CPNAME operand is coded and PUTYPE is specified as 2, indicating that the Personal System/2 is defined as a type 2.1 peripheral node.

For dial-out operations, the PATH definition statement defines the paths used to connect the physical unit to the host through the 3172 Interconnect Controller. Thus, DIALNO specifies the telephone number (in EBCDIC) used to initiate a connection with the Personal System/2 (PS/2). GRPNM=GP2BC1 on the PATH statement matches the group name in the external communication adapter major node for host A02.

The LU definition statements define the LUs associated with the Personal System/2.

```
* ===== BEGINNING OF DATA SET SWPS2

* SWPS2 SWITCHED MAJOR NODE FOR 3172/LAN

SWBC0 VBUILD TYPE=SWNET, X
 MAXNO=8, X
 MAXGRP=8

* DIAL IN/OUT GROUPS

PS2 PU ADDR=01, X
 CPNAME=PS2B101, X
 DISCNT=YES, X
 IRETRY=YES, X
 LOGTAB=INTERP, X
```



```

MAXDATA=256, X
MAXPATH=5, X
MODETAB=AMODETAB, X
PUTYPE=2, X
USSTAB=AUSSTAB

*NOTE: THE LAST 8 DIGITS OF DIALNO ARE THE MAC FOR THE PS/2.
* GRPNM IS THE GROUP LABEL FOR THE SWITCHED LINE FOUND IN THE
* EXTERNAL COMMUNICATION ADAPTER (XCA) MAJOR NODE

PTH1A11 PATH DIALNO=0104400007777B1, X
 GRPNM=GP2BC1
PS2B1011 LU DLOGMOD=M23278I, X
 ISTATUS=INACTIVE, X
 LOCADDR=2
PS2B1012 LU DLOGMOD=M23278I, X
 ISTATUS=INACTIVE, X
 LOCADDR=3
PS2B1013 LU DLOGMOD=M23278I, X
 ISTATUS=INACTIVE, X
 LOCADDR=4
PS2B1014 LU DLOGMOD=M23278I, X
 ISTATUS=INACTIVE, X
 LOCADDR=5
* =====> END OF DATA SET SWPS2

```

To permit the establishment of a SSCP-PU session for SNA management services communications between the IBM 3172 and NetView, you must define both an XCA major node that specifies the operand MEDIUM=BOXMGR on the PORT definition statement, and a switched major node definition that specifies an IDBLK value of 074 and a PUTYPE of 2 on the PU definition statement. The switched major node for the PU of the 3172 does not need a PATH statement, and there should be no LU definitions. A sample switched major node definition follows:

```

*
* SBOXMU01 - VTAM SWITCHED MAJOR NODE FOR BOX MANAGER FOR 3172 *
*
* DESCRIPTION: VTAM SMN MATCHING 3172 XCA MAJOR NODE - *
* ALLOWS BOX MANAGER CONNECTION *

BXMU01 VBUILD TYPE=SWNET,MAXGRP=8,MAXNO=50
SWPBXM01 PU MAXPATH=5,MAXDATA=256,ADDR=01,PUTYPE=2,IDNUM=12301, X
 DISCNT=YES,DYNLU=YES,NETID=NETA,IDBLK=074

```

For the corresponding XCA major node, see “XCA Major Node for a Box Manager (Token-Ring LAN)” on page 51.

---

## CP-CP Sessions through 3172-Attached Token-Bus LAN

A 3172 connection can be used to establish CP-CP sessions between two network nodes, or between a network node and an end node. The following example shows how to establish CP-CP sessions between two network nodes across a 3172-attached token-bus LAN. See “CP-CP Sessions through 3172-attached Token-Bus LAN” on page 58 for the resource definition requirements for such a connection. The sample XCA major node definitions are found in that same section. The sample switched major node definitions are shown below.

## Switched Major Node for Token-Bus LAN in Network Node SSCP1A

```

*
* NAME: SWXCA1A (SWITCHED MAJOR NODE FOR HOST SSCP1A
* FOR 3172 TESTING)
*
* USE: TO BE USED IN CONJUNCTION WITH HOST SSCP1A
* XCA MAJOR NODE XCA1A. THE GROUP NAMES ON
* THE PU POINT BACK TO THE XCA LOGICAL GROUPS.
*
* THIS DEFINES THE SWITCHED PU'S FOR APPN CONNECTIONS.
*

SWXCA1A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW1A2A PU MAXPATH=5,MAXDATA=256,ADDR=03, X
 CPNAME=SSCP2A,CPCP=YES, X
 PUTYPE=2
PATH2A PATH DIALNO=0104004A11111111, X
 GRPNM=GP1A2A
SWLU2A0 LU LOCADDR=0,ISTATUS=INACTIVE
*
```

Note that the value GP1A2A on the GRPNM operand of the PATH statement matches the name of the switched line group in the XCA major node in SSCP1A (see "XCA Major Node for Token-Bus LAN for Network Node SSCP1A" on page 58).

## Switched Major Node for Token-Bus LAN in Network Node SSCP2A

```

*
* NAME: SWXCA2A (SWITCHED MAJOR NODE FOR HOST SSCP2A
* FOR 3172 TESTING)
*
* USE: TO BE USED IN CONJUNCTION WITH HOST SSCP2A
* XCA MAJOR NODE XCA2A. THE GROUP NAMES ON
* THE PU POINT BACK TO THE XCA LOGICAL GROUPS.
*
* THIS DEFINES THE SWITCHED PU'S FOR APPN CONNECTIONS.
*

SWXCA2A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW2A1A PU MAXPATH=5,MAXDATA=256,ADDR=01, X
 CPNAME=SSCP1A,CPCP=YES, X
 PUTYPE=2
PATH1A PATH DIALNO=0104003A11111111, X
 GRPNM=GP2A1A
SWLU1A0 LU LOCADDR=0,ISTATUS=INACTIVE
*
```

---

## Authorized Transmission Priority for LEN Connections

In the A81SMNCP switched major node below, AUTHLEN=YES specifies that a session between two independent LUs through a subarea network will use the same transmission priority for both type 2.1 LEN connections (entry and exit). AUTHLEN may only be specified where type 2.1 is specified and the connection is to be attempted as an APPN connection. AUTHLEN=YES is the default.

```

* =====> BEGINNING OF DATA SET A81SMNCP

* A81SMNCP - SWITCHED MAJOR NODE FOR A81N *

 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE **X
 MAXGRP=2, ** NUMBER OF UNIQUE PATH GROUPS **X
 MAXNO=4 ** NUMBER OF UNIQUE TELEPHONE NUMBERS **
* CONNECTION TO A01 THROUGH A31NCP (A31TR88) AND A04NCP (A04TR89)
A01PU PU ADDR=C1, ** LINK STATION ADDRESS **X
 ANS=CONTINUE, ** AUTOMATIC NETWORK SHUTDOWN VALUE **X
 AUTHLEN=YES, ** AUTHORIZED TRANSMISSION PRIORITY **X
 CONNTYPE=APPN, ** CONNECTION TYPE **X
 CPCP=YES, ** CP-CP SESSION SUPPORT **X
 CPNAME=A01N, ** CONTROL POINT NAME **X
 IDBLK=056, ** ID BLOCK **X
 IDNUM=32395, ** ID NUMBER **X
 ISTATUS=ACTIVE, ** INITIAL ACTIVATION STATUS **X
 MAXDATA=256, ** MAXIMUM DATA RECEIVED **X
 MAXOUT=7, ** MAXIMUM DATA SENT **X
 MAXPATH=3, ** NUMBER OF DIAL PATHS **X
 PACING=7, ** DATA FLOW PACING **X
 PASSLIM=5, ** NUMBER OF PIUS **X
 PUTYPE=2, ** PHYSICAL UNIT TYPE **X
 SSCPFM=FSS, ** RU TYPES SUPPORTED **X
 VPACING=14 ** VTAM PACING **
PATH01 PATH DIALNO=010440000000032, ** TELEPHONE NUMBER **X
 GID=5, ** GROUP IDENTIFIER **X
 GRPNM=A31BNNG1, ** GROUP NAME **X
 PID=1, ** PATH IDENTIFIER **X
 REDIAL=3, ** NUMBER OF REDIALS **X
 USE=YES ** IS PATH INITIALLY USABLE **
* =====> END OF DATA SET A81SMNCP

```

---

## Dependent LU Server Function

The dependent LU server (DLUS) function of VTAM facilitates conversion from a subarea environment to an APPN environment, allowing you to maintain central management of remote dependent LUs while benefiting from APPN throughout a network.

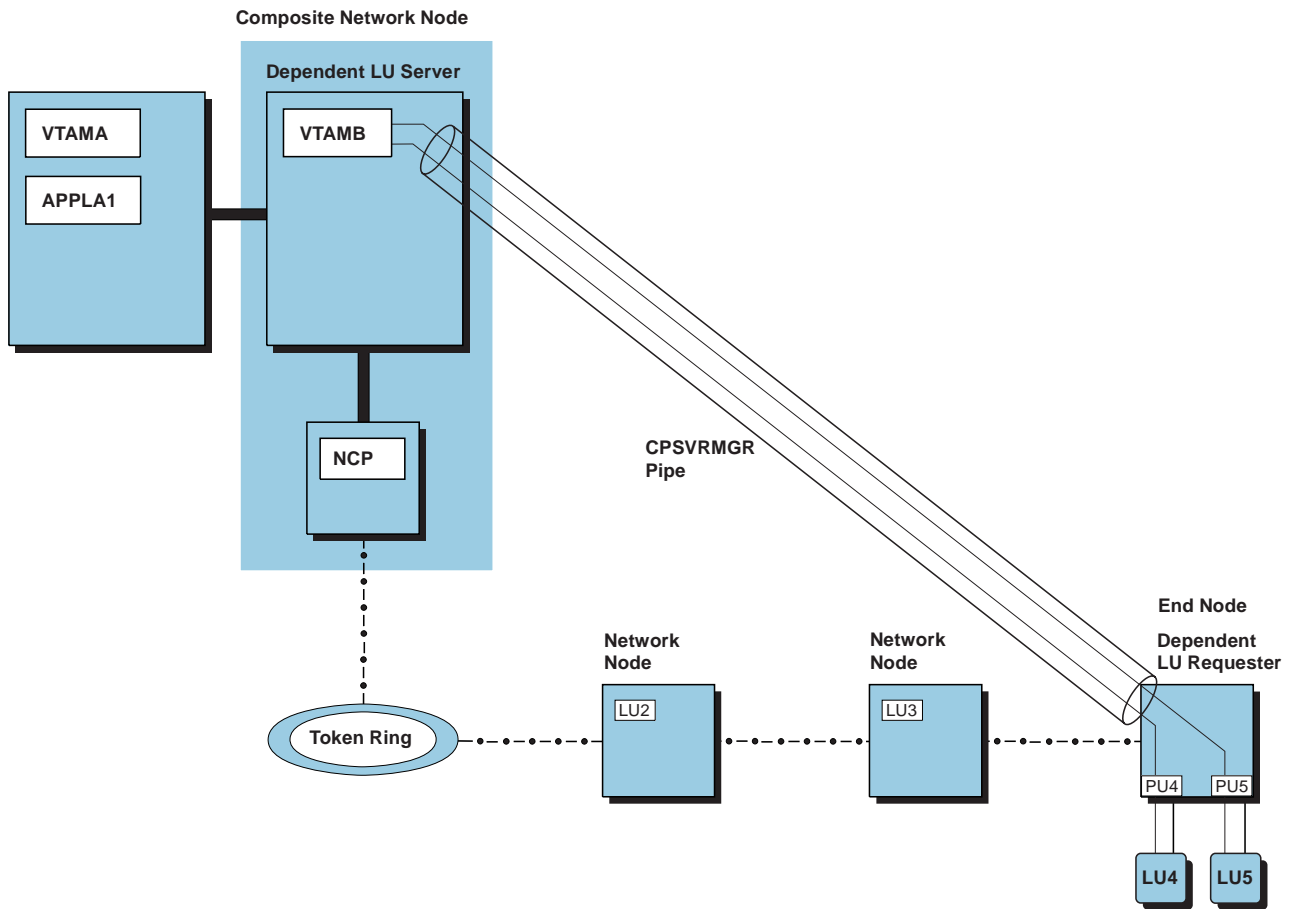


Figure 28. VTAM Functioning as a Dependent LU Server

Two LU 6.2 sessions (one inbound, one outbound) are established between a dependent LU server (DLUS) node (an APPN network node) and a dependent LU requester (DLUR) node (an APPN end node or network node that owns dependent LUs). These LU 6.2 sessions are collectively known as the CPSVRMGR pipe. The CPSVRMGR pipe sessions must be established over APPN and VRTG links only.

SSCP-PU and SSCP-LU session flows use the CPSVRMGR pipe. An SSCP-PU session is established between the DLUS node and the dependent LU's owning PU, and an SSCP-LU session is established between the DLUS node and the dependent LU. Session initiation flows for the dependent LU are sent over the SSCP-LU session, and VTAM can use subarea or APPN flows to initiate the LU-LU session.

Figure 28 shows an example of a non-adjacent DLUS-DLUR configuration.

## DLUR-initiated Connection (Dial-In)

Activation of the PU can be either DLUR-initiated or DLUS-initiated. For DLUR-initiated PU activation, no system definition is required. Instead, the dynamic switched definition facility is used to dynamically define the PU. For information on this facility, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*. Alternatively, you can code a switched major node for the DLUR-supported PU. For instance, in the case where the DLUR is in Communications Manager/2, you can code a switched major node that specifies

IDBLK and IDNUM values that, when combined, match the value specified for NODE\_ID in the Communications Manager/2 DEFINE\_DEPENDENT\_LU\_SERVER definition statement.

## DLUS-initiated Connection (Dial-Out)

For DLUS-initiated PU activation, define the dependent LU requester by specifying the DLURNAME and DLCADDR operands on the PATH definition statement in a switched major node residing on the DLUS node. DLURNAME specifies the CP name of the DLUR that owns the PU. If you do not code the network ID of the DLUR, it defaults to the network ID of the dependent LU server. DLCADDR specifies data link control (DLC) information used by the DLUR to locate the PU. In addition, specify the MAXDLUR operand on the VBUILD definition statement to indicate the maximum number of unique DLURs defined for this switched major node.

You may also specify DWACT=YES on the PU statement to ensure that VTAM initiates the connection as soon as the major node is activated. Otherwise, a VARY DIAL command will need to be performed on the physical unit after activation.

## Sample Switched Major Node for a Dependent LU Server

The following example shows a switched major node for a Dependent LU Server. It defines DLURs for the PUs and LUs that will use this host as a dependent LU server (DLUS). This deck is valid only for network nodes or interchange nodes.

The MAXDLUR operand on the VBUILD definition statement specifies 20 as the maximum number of unique DLUR node definitions in this switched major node deck.

All the PU definition statements specify values for the IDBLK and IDNUM operands, indicating that these are all DLUR PUs that can initiate a CPSVRMGR connection by dialing in.

Both the DLURNAME and DLCADDR operands are coded on the PATH statements, indicating that the dependent LU server has the capability of initiating the CPSVRMGR connection to all the specified DLUR PUs by performing a dial-out. The DLURNAME operand on the PATH statements identifies:

- NNCPA1 as the DLUR that owns PUs AA1PUA, AA1PUC, AA1PUD, and AA1PUE
- NNCPA3 as the DLUR that owns PU AA3PUA
- ENCPA4 as the DLUR that owns PU AA4PUA.

If the DLUS and the DLUR are in different networks, the name assigned to DLURNAME must be network-qualified.

The first DLCADDR entry on the PATH definition statement contains information that identifies the DLC type. For instance, in the PATH definition statement labeled PATHAA1A, the first DLCADDR entry specifies (1,C,INTPU):

**1** The first DLCADDR entry must have a subfield\_id of 1.

**C** The data format of the dial information is EBCDIC.

**INTPU**

The DLC type is internal PU.

For the Communications Manager/2's implementation of the DLUR, DLCADDR=(1,C,INTPU) must be coded for the first DLCADDR entry because the only DLC type supported by this implementation is internal PU.

The remaining DLCADDR entries define the DLC signaling information (addresses and dial digits) for each DLC type. In the same PATH definition statement, this information is specified as (2,X,056A1001):

**2** This subfield\_id is specified by the DLC type.

**X** The data format of the dial information is hexadecimal.

**056A1001**

This is the DLC signaling information.

The value 056A1001 matches the IDBLK and IDNUM values, 056 and A1001, respectively, specified on the PU definition statement. In addition to this matching requirement, the IDBLK/IDNUM specified in the switched major node must also match the NODE\_ID value specified in the Communications Manager/2 response file (RSP) or node definition file (NDF), for the associated LOGICAL\_LINK statement.

The LOCADDR coded on the LU definition statement in the switched major node must match the NAU\_ADDRESS value, for a specific DLUR-supported LU, that is defined in the Communications Manager/2 RSP or NDF files.

```

* SWDLRIA - SWITCHED DECK FOR DLUS/DLUR (DEPENDENT LU SERVER)
* TESTING

*
SWDLRALL VBUILD TYPE=SWNET,MAXNO=20,MAXGRP=20,MAXDLUR=20
*

* INTERNAL PU_T2.0 IN DLUR NETA.NNCPA1

*
AA1PUA PU ADDR=01, ** LINK STATION ADDRESS ** X
 IDBLK=056, ** DEVICE TYPE ** X
 IDNUM=A1001, ** SERIAL NUMBER OF DEVICE ** X
 ISTATUS=ACTIVE, ** BECOMES ACTIVE WITH NODE ** X
 MAXPATH=1, ** NUMBER OF DIAL PATHS **
PATHAA1A PATH PID=1, ** PATH IDENTIFIER ** X
 DLURNAME=NETA.NNCPA1, ** NAME OF DLUR FOR PU ** X
 DLCADDR=(1,C,INTPU), ** DLC TYPE INFORMATION ** X
 DLCADDR=(2,X,056A1001) ** DLC SIGNAL INFORMATION **
AA1LUA1 LU LOCADDR=1, ** LU'S LOCAL ADDRESS ** X
 PACING=(1,1),
 VPACING=2,
 MODETAB=MODETAB2
AA1LUA2 LU LOCADDR=2,
 PACING=(1,1),
 VPACING=2,
 MODETAB=MODETAB2
AA1LUA3 LU LOCADDR=3,
 PACING=(1,1),
 VPACING=2,
 MODETAB=MODETAB2
AA1LUA4 LU LOCADDR=4,
 PACING=(1,1),
 VPACING=2,
 MODETAB=MODETAB2
.
.
.

```

```

* EXTERNAL PU_T2.0 ON TOKEN RING ON DLUR NETA.NNCPA1

*
AA1PUC PU ADDR=03, X
 IDBLK=056, X
 IDNUM=A1003, X
 ISTATUS=ACTIVE, X
 MAXPATH=1
PATHAA1C PATH PID=1, X
 DLURNAME=NETA.NNCPA1, X
 DLCADDR=(1,C,TR), X
 DLCADDR=(2,X,056A1003), X
 DLCADDR=(3,X,04), X
 DLCADDR=(4,X,4000056A1003)
AA1LUC1 LU LOCADDR=1, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUC2 LU LOCADDR=2, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUC3 LU LOCADDR=3, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUC4 LU LOCADDR=4, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2

* EXTERNAL PU_T2.1 ON TOKEN RING ON DLUR NETA.NNCPA1

*
AA1PUD PU ADDR=04, X
 IDBLK=056, X
 IDNUM=A1004, X
 CPNAME=LENCPA14, X
 ISTATUS=ACTIVE, X
 MAXPATH=1
PATHAA1D PATH PID=1, X
 DLURNAME=NETA.NNCPA1, X
 DLCADDR=(1,C,TR), X
 DLCADDR=(2,X,056A1004), X
 DLCADDR=(3,X,04), X
 DLCADDR=(4,X,4000056A1004)
AA1LUD1 LU LOCADDR=1, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUD2 LU LOCADDR=2, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUD3 LU LOCADDR=3, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUD4 LU LOCADDR=4, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2

* EXTERNAL PU_T2.1 ON TOKEN RING ON DLUR NETA.NNCPA1
* NOTE: THIS PU IS NONNATIVE NETWORK ATTACH (NETQ).

*

```

```

AA1PUE PU ADDR=05, X
 IDBLK=056, X
 IDNUM=A1005, X
 CPNAME=LENCPA15, X
 ISTATUS=ACTIVE, X
 MAXPATH=1
PATHAA1E PATH PID=1, X
 DLURNAME=NETA.NNCPA1, X
 DLCADDR=(1,C,TR), X
 DLCADDR=(2,X,056A1005), X
 DLCADDR=(3,X,04), X
 DLCADDR=(4,X,4000056A1005)
AA1LUE1 LU LOCADDR=1, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA1LUE2 LU LOCADDR=2, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
.
.
.

* INTERNAL PU_T2.0 IN DLUR NETA.NNCPA3

*
AA3PUA PU ADDR=07, X
 IDBLK=056, X
 IDNUM=A3001, X
 ISTATUS=ACTIVE, X
 MAXPATH=1
PATHAA3A PATH PID=1, X
 DLURNAME=NETA.NNCPA3, X
 DLCADDR=(1,C,INTPU), X
 DLCADDR=(2,X,056A3001)
AA3LUA1 LU LOCADDR=1, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA3LUA2 LU LOCADDR=2, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA3LUA3 LU LOCADDR=3, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2
AA3LUA4 LU LOCADDR=4, X
 PACING=(1,1), X
 VPACING=2, X
 MODETAB=MODETAB2

* INTERNAL PU_T2.0 IN DLUR NETA.ENCPA4

*
AA4PUA PU ADDR=08, X
 IDBLK=056, X
 IDNUM=A4001, X
 ISTATUS=ACTIVE, X
 MAXPATH=1
PATHAA4A PATH PID=1, X
 DLURNAME=NETA.ENCPA4, X
 DLCADDR=(1,C,INTPU), X
 DLCADDR=(2,X,056A4001)
AA4LUA1 LU LOCADDR=1, X
 PACING=(1,1), X

```



|         |    |                  |   |
|---------|----|------------------|---|
|         |    | VPACING=2,       | X |
|         |    | MODETAB=MODETAB2 |   |
| AA4LUA2 | LU | LOCADDR=2,       | X |
|         |    | PACING=(1,1),    | X |
|         |    | VPACING=2,       | X |
|         |    | MODETAB=MODETAB2 |   |
| AA4LUA3 | LU | LOCADDR=3,       | X |
|         |    | PACING=(1,1),    | X |
|         |    | VPACING=2,       | X |
|         |    | MODETAB=MODETAB2 |   |
| AA4LUA4 | LU | LOCADDR=4,       | X |
|         |    | PACING=(1,1),    | X |
|         |    | VPACING=2,       | X |
|         |    | MODETAB=MODETAB2 |   |

For a configuration where the VTAM DLUS host and the Communications Manager/2 DLUR node are adjacent, the FQ\_ADJACENT\_CP\_NAME defined on the DEFINE\_LOGICAL\_LINK statement in the Communications Manager/2 definitions should be the CPNAME of the VTAM that is configured as the DLUS host.

For more information on VTAM's DLUS function, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* .

---

## Frame Relay

For frame relay, the following excerpt from a switched major node illustrates the use of expanded dial information on the DLCADDR operand of the PATH statement.

```

Frame Relay Sample

PATH0101 PATH GID=2,GRPNM=FRLGA28, X
 DLCADDR=(1,C,FRELAY), DLC Type X
 DLCADDR=(2,D,6), PORTADD X
 DLCADDR=(3,D,4), Destination SAP X
 DLCADDR=(4,X,10) DLCI
FRLU0101 LU LOCADDR=2,DLOGMOD=D6327802,USSTAB=AUSSTAB
*
NTPC0505 PU ADDR=C1,PUTYPE=2,IDBLK=017,IDNUM=00505,MAXPATH=4, X
 DLOGMOD=D6327802,MAXOUT=3,ANS=CONTINUE,ASDP=YES
```

---

## Application-Supplied Operands for Switched Connections

A physical unit is authorized to accept application-supplied dial-out information using the ASDP operand on the PU definition statement of the switched major node.

In the sample switched major node below, physical unit SWCH0404 is authorized to accept application-supplied dial-out parameters (ASDP=YES).

The DIALNO operand in the PATH definition statement is required, but with ASDP=YES an application can supply its own dial number digits, overriding the number specified on DIALNO.

For a sample application program major node that is authorized to supply dial-out information, see Figure 5 on page 10.

```

* =====> BEGINNING OF DATA SET A02CCN04

* A02CCN04 - VTAM SWITCHED MAJOR NODE - SUBAREA A02 *

* SDLC CASUAL CONNECTION FROM A04 TO A31 *

A02CCN04 VBUILD TYPE=SWNET, ** SWITCHED MAJOR NODE ** X
 MAXGRP=9, ** NUMBER UNIQUE PATH GROUPS ** X
 MAXNO=9 ** NUMBER UNIQUE PHONE NUMBERS **
SWCH0404 PU ADDR=C1, ** STATION ADDRESS ** X
 ANS=CONT, ** AUTOMATIC NETWORK SHUTDOWN ** X
 ASDP=YES, ** DYN DIAL - SEE A02APPLS ** X
 CPNAME=A81N, ** DESTINATION SSCP NAME ** X
 MAXDATA=256, ** MAX NUM BYTES IN ONE PIU ** X
 MAXPATH=2, ** NUM DIAL PATHS FOR PU ** X
 PUTYPE=2 ** PHYSICAL UNIT TYPE **
SWCPATH04 PATH DIALNO=47667, ** TELEPHONE NUMBER ** X
 GID=1, ** GROUP IDENTIFIER ** X
 GRPNM=A04CCNG1, ** SWITCHED GROUP NAME ** X
 PID=1, ** PATH IDENTIFIER ** X
 REDIAL=4 ** DIAL RETRY NUMBER **
APPLA81 LU LOCADDR=0, ** LOGICAL UNIT LOCAL ADDRESS ** X
 MODETAB=AMODETAB, ** LOGON MODE TABLE NAME ** X
 PACING=(1,1) ** LU - BOUNDARY NODE PACING **
* =====> END OF DATA SET A02CCN04

```

---

## Delayed Disconnection

The delayed disconnection function enables you to specify how long VTAM delays disconnection of switched resources to provide sufficient time for another LU-LU session to be started. On the DISCNT operand of the PU definition statement you code the DELAY keyword and a time value (in seconds) in the range 1-65535 to specify that VTAM disconnects the physical unit if no LU-LU sessions exist after the value specified expires. If a value is not specified, the current value for the DISCNTIM start option is used (see page 176.)

For example, in the sample switched major node that follows, the delay value for both SWPUAIO1 and SWPUADO1 would be 15 seconds if the default value is taken for DISCNTIM start option. The delay value for SWPUAIO4 is 122 seconds.

```

*
*
* SWND3A84 VBUILD TYPE=SWNET,MAXNO=35,MAXGRP=9
*
* AUTOMATIC DIAL IN/OUT GROUP - GP3AAI01
*
SWPUAIO1 PU ADDR=01,IDBLK=001,IDNUM=00001, C
 MAXPATH=1,MAXDATA=256, C
 PUTYPE=2,MAXOUT=1,PASSLIM=1, C
 ISTATUS=INACTIVE,I_RETRY=NO,DISCNT=(DELAY,F), C
 SSCPFM=USSSCS
PATHAI01 PATH DIALNO=PATH21A-890-3333,PID=1,GID=1,GRPNM=GP3AAI01
SL1DAIO1 LU LOCADDR=1,PACING=(1,1),VPACING=2, C
 MODETAB=MODETAB2
SL1DAIO2 LU LOCADDR=2, C
 PACING=(1,1),VPACING=2,ISTATUS=ACTIVE
SL1DAIO3 LU LOCADDR=3, C
 PACING=(1,1),VPACING=2,ISTATUS=ACTIVE
*
SWPUAIO4 PU ADDR=04,IDBLK=004,IDNUM=00004, C
 MAXPATH=1,MAXDATA=256, C
 PUTYPE=1,MAXOUT=1,PASSLIM=1, C

```

```

 ISTATUS=INACTIVE,IRETRY=NO,DISCNT=(DELAY,NF,122), C
 SSCPFM=USSSCS
PATHAI04 PATH DIALNO=PATH21F-890-3333,PID=6,GID=1,GRPNM=GP3AAI01
SL4DAI01 LU LOCADDR=7,PACING=(1,1),VPACING=2, C
 MODETAB=MODETAB2
SL4DAI02 LU LOCADDR=8, C
 PACING=(1,1),VPACING=2,ISTATUS=ACTIVE
*
* AUTOMATIC DIAL OUT GROUP - GP3AAD01
*
SWPUAD01 PU ADDR=05,IDBLK=005,IDNUM=00005, C
 MAXPATH=1,MAXDATA=256, C
 PUTYPE=2,MAXOUT=1,PASSLIM=1, C
 ISTATUS=INACTIVE,IRETRY=NO,DISCNT=(DELAY,F), C
 SSCPFM=USSSCS
PATHAD01 PATH DIALNO=PATH21A-890-3333,PID=1,GID=1,GRPNM=GP3AAD01, C
 REDIAL=0
SL1DAD01 LU LOCADDR=1,PACING=(1,1),VPACING=2, C
 MODETAB=MODETAB2
SL1DAD02 LU LOCADDR=2, C
 PACING=(1,1),VPACING=2,ISTATUS=ACTIVE
*
.
.
.

```

---

## Limiting Sessions for Switched Resources

In the sample switched major node on page 130, MAXSESS=2 specifies that the maximum number of concurrent LU-LU sessions in which APPLA81 can participate is two.

---

## Defining Subnetwork Boundaries

The NATIVE operand on a PU definition statement specifies whether this link station represents a connection to a native node. NATIVE=NO is used when both nodes have the same network ID, but a subnetwork boundary is desired.

Consider, for example, two network nodes, SSCP1A and SSCP2A, which are defined with the same NETID, but which reside in different subnetworks. Thus, in the first sample switched major node shown below, NATIVE=NO on the PU definition statement for SW1A2A indicates that SW1A2A represents a connection to the non-native node SSCP2A. In the second sample switched major node shown below, NATIVE=NO on the PU definition statement for SW2A1A indicates that SW2A1A represents a connection to the non-native node SSCP1A.

```

*
* NAME: SWXCA1A (SWITCHED MAJOR NODE FOR HOST 1A)
*
* USE: TO BE USED IN CONJUNCTION WITH HOST 1A
* XCA MAJOR NODE XCA1A. THE GROUP NAMES ON
* THE PU POINT BACK TO THE XCA LOGICAL GROUPS.
*
* THIS DEFINES THE SWITCHED PU'S FOR APPN CONNECTIONS.
*
* NOTE: TO OVERRIDE THE CPCP=YES OPERAND ON THE PU
* STATEMENT, ACTIVATE THE PU WITH KEYWORD CPCP=NO.
*

```

```

*

SWXCA1A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW1A2A PU IDBLK=003, IDNUM=00003, MAXPATH=5, MAXDATA=256, ADDR=03, X
 CPNAME=SSCP2A, CPCP=YES, NATIVE=NO, X
 PUTYPE=2
PATH2A PATH DIALNO=0108004A11111111, X
 GRPNM=GP1A2A
SWLU2A0 LU LOCADDR=0, ISTATUS=INACTIVE
.
.
.

*
* NAME: SWXCA2A (SWITCHED MAJOR NODE FOR HOST 2A)
*
* USE: TO BE USED IN CONJUNCTION WITH HOST 2A
* XCA MAJOR NODE XCA2A. THE GROUP NAMES ON
* THE PU POINT BACK TO THE XCA LOGICAL GROUPS.
*
* THIS DEFINES THE SWITCHED PU'S FOR APPN CONNECTIONS.
*
* NOTE: TO OVERRIDE THE CPCP=YES OPERAND ON THE PU
* STATEMENT, ACTIVATE THE PU WITH KEYWORD CPCP=NO.
*

SWXCA2A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW2A1A PU IDBLK=001, IDNUM=00001, MAXPATH=5, MAXDATA=256, ADDR=01, X
 CPNAME=SSCP1A, CPCP=YES, NATIVE=NO, X
 PUTYPE=2
PATH1A PATH DIALNO=0108003A11111111, X
 GRPNM=GP2A1A
SWLU1A0 LU LOCADDR=0, ISTATUS=INACTIVE
.
.
.
*

```

---

## Dynamic Reconfiguration of Selected NCP PU Operands

You can dynamically reconfigure the values of selected NCP PU operands in switched major nodes. The values of these operands are passed to the NCP during switched PU connection. You need NCP V7R3 to use dynamic reconfiguration of selected NCP PU operands.

You can dynamically change the NCP communication rate operands by editing the VTAMLST and then issuing the VARY ACT,UPDATE=ALL command.

In the sample switched major node SWND3AB8, the COMRATE operand on the SWPUAIO1 PU definition statement specifies 3 as the relative transmit priority of a terminating equipment subport or a frame handler subport. The T2TIMER operand on the same definition statement specifies that 0.5 seconds is the acknowledgement timer (T2) value for connections through a frame-relay network and that 64 is the number of I-frames that can be received without sending an acknowledgement. The DYNWIND operand on the PU definition statement specifies the values to be used by NCP to modify the IEEE 802.2 LLC working window parameter. DYNWIND=(8,4,4) specifies that 8 frames must be received to increment the working window value by 1, that the working window value is divided by 4 when

frame loss occurs, and that the working window value is divided by 4 when backward explicit congestion notification occurs.

```

SWND3AB8 VBUILD TYPE=SWNET,MAXNO=35,MAXGRP=9

*
* AUTOMATIC DIAL IN/OUT GROUPS - GP3AAI01, GP3AAI02
*

*
* NCP SWITCHED SDLC CONNECTION TO PU_T2.0
*

SWPUAI01 PU ADDR=01, IDBLK=001, IDNUM=00001, X
 MAXPATH=1, MAXDATA=256, LUGROUP=GROUP1, LUSEED=BB##B, X
 PUTYPE=2, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, X
 COMRATE=(,3), X
 T2TIMER=(.5,,64), X
 DYNWIND=(8,4,4), X
 SSCPFM=USSCS
PATHAI01 PATH DIALNO=PATH21A-890-3333, PID=1, GID=1, GRPNM=GP3AAI01
SL1DAI01 LU LOCADDR=1, PACING=(1,1), VPACING=2, X
 MODETAB=MODETAB2
SL1DAI02 LU LOCADDR=2, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE
SL1DAI03 LU LOCADDR=3, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE

```

---

## High Performance Routing

High performance routing (HPR) allows the user to migrate NCP connections to APPN connections without incurring the associated increase in storage and cycles. HPR utilizes a rapid transport protocol (RTP) connection to transport session traffic between session endpoints. HPR routes can also traverse an existing subarea network, as HPR support provides for the mapping of HPR routes over VR-based TGs between intermediate nodes.

HPR support is available only over APPN host-to-host channel connections and other type 2.1 channel connections. To use HPR over NCP, you must have, at a minimum, NCP Version 7 Release 3.

To support high performance routing in the following configuration, shown in Figure 29 on page 152, modifications must be made to the switched major nodes defined in VTAM interchange nodes SSCP1A and SSCP2A.

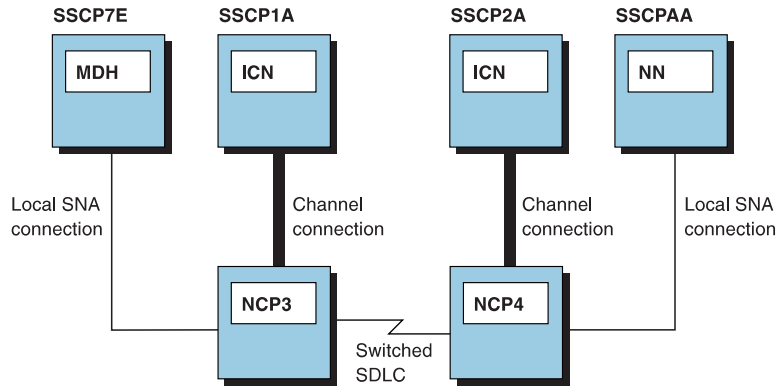


Figure 29. High Performance Routing Using Switched SDLC Connections

In the following excerpt from switched major node SWND3AB8, defined on SSCP1A, HPR=YES indicates that SWPUAIOA provides HPR support. LLERP=NOTPREF specifies that link-level error recovery procedures are required by this PU only if the adjacent link station requires it.

```

*-----
*
* NCP SWITCHED SDLC CONNECTION TO SSCP2A
*
*-----
SWPUAIOA PU ADDR=16, IDBLK=016, IDNUM=00016, CPNAME=SSCP2A, X
 PUTYPE=2, SIMTYPE=1, X
 MAXPATH=1, MAXDATA=256, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, SSCPFM=USSSCS, X
 ANS=CONTINUE, NETID=NETA, X
 CONNTYPE=APPN, CPCP=YES, HPR=YES, LLERP=NOTPREF
PATHAIOA PATH DIALNO=PATH21E-890-3333, PID=5, GID=1, GRPNM=GP3AAI02
SLAIAI01 LU LOCADDR=0, RESSCB=2, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE

```

In the following excerpt from switched major node SWND4AB8, defined on SSCP2A, HPR=YES indicates that SWPU4A08 provides HPR support. LLERP=NOTPREF specifies that link-level error recovery procedures are required by this PU only if the adjacent link station requires it.

```

*-----
*
* NCP SWITCHED SDLC CONNECTION TO SSCP1A
*
*-----
SWPU4A08 PU ADDR=08, IDBLK=008, IDNUM=00008, CPNAME=SSCP1A, X
 PUTYPE=2, SIMTYPE=1, X
 MAXPATH=1, MAXDATA=256, MAXOUT=1, PASSLIM=1, X
 ISTATUS=INACTIVE, IRETRY=NO, DISCNT=YES, SSCPFM=USSSCS, X
 ANS=CONTINUE, NETID=NETA, X
 CONNTYPE=APPN, CPCP=YES, HPR=YES, LLERP=NOTPREF
PATH4A08 PATH DIALNO=PATH21A-890-4008, PID=5, GID=1, GRPNM=GP4AAI02
SL4A08I1 LU LOCADDR=0, RESSCB=2, X
 PACING=(1,1), VPACING=2, ISTATUS=ACTIVE
*

```

---

## Using XCA Over an IBM S/390 OSA Between APPN Nodes

VTAM accesses the ATM network through a port on the IBM S/390 Open Systems Adapter. Associated with the port are links used for permanent virtual channels (PVCs) and switched virtual channels (SVC). These PVCs and SVCs carry data across the ATM network. See Figure 15 on page 62

Switched virtual channels represent temporary connections. They appear to VTAM as switched lines. The TGs that are assigned to them are defined in the XCA Major Node in a GROUP definition statement that specifies DIAL=YES (see :refid=atmsvc0.). The SVC connections are established through a dial operation, using a PU from the Switched Major Node, and are available for as long as the connection is desired.

---

### Switched Major Node Definition for SVC ATM Support - HOST1A

```
SWXCA1A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW12P111 PU IDBLK=002, IDNUM=00002,MAXPATH=5,MAXDATA=256,ADDR=02, X
 CPNAME=SSCP2A,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO),TGP=SWTNET
PTH2P111 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(21,X,0002,21111111111111111111111111111111, X
 1111110), X
 DLCADDR=(8,X,03,03,03), X
 DLCADDR=(9,X,FFFF), X
 DLCADDR=(51,X,00,10,00,00,01,01), X
 DLCADDR=(61,BCD,00,05,00032767,00032767), X
 GRPNM=GP121
SL12P111 LU LOCADDR=1,ISTATUS=INACTIVE
*
```

---

### Switched Major Node Definition for SVC ATM Support - HOST2A

```
SWXCA2A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW21P111 PU IDBLK=001, IDNUM=00001,MAXPATH=5,MAXDATA=256,ADDR=01, X
 CPNAME=SSCP1A,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO)
PTH1P111 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(21,X,0002,11111111111111111111111111111111, X
 1111100), X
 DLCADDR=(8,X,03,03,03), X
 DLCADDR=(9,X,FFFF), X
 DLCADDR=(51,X,00,10,00,00,01,01), X
 DLCADDR=(61,BCD,00,05,00032767,00032767), X
 GRPNM=GP211
SL21P111 LU LOCADDR=1,ISTATUS=INACTIVE
*
```

---

## Using XCA Over an IBM S/390 OSA for Connection Network

In a large configuration with many nodes connected by many SVCs, the definition of TGs can become overwhelming.

APPN's connection network function reduces this extensive TG definition for connections among multiple nodes across an ATM network. A connection network is a representation of a shared access transport facility, such as an ATM network, that handles the routing of data among the nodes communicating across the shared access transport facility. It does this by enabling the shared access transport facility to be defined as a virtual node. As a result, end nodes need to define TGs only to the virtual node and to the network node server (see Figure 16 on page 64).

Connections through connection networks occur over SVCs, which appear to VTAM as switched lines. Thus, TGs to connection networks are defined in the XCA Major Node in a GROUP definition statement that specifies DIAL=YES.

Because SVCs are associated with a port on the IBM S/390 Open Systems Adapter, TGs to connection networks are defined in the XCA major node that defines the port with which the SVCs are associated (see refid=atmcn.).

In the examples below, SSCP1A and SSCP2A can call SSCPAA to set up the CP-CP sessions, or SSCPAA can call both SSCP1A and SSCP2A to set up the CP-CP sessions (CP-CP sessions are between SSCP1A-SSCPAA and SSCP2A-SSCPAA), and also the Connection Network Node, VNODE1.

## Switched Major Node Definitions for CN - ATM - HOST1A

```

SWXCA1A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW1AP215 PU MAXPATH=5,MAXDATA=256,ADDR=0A, X
 CPNAME=SSCPAA,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO)
PTHAP215 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(21,X,0002,51111111111111111111111111111111, X
 11111100), X
 GRPNM=GP1A1
SL1AP215 LU LOCADDR=1,ISTATUS=INACTIVE
*
GP1A2AC GROUP DIAL=YES,ISTATUS=INACTIVE,ANSWER=ON,CALL=INOUT, X
 DLCADDR=(1,C,ATMSVC,NETA.VNODE1,EXCLUSIVE), X
 DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
 DLCADDR=(8,X,00,03), X
 DYNPU=YES
*
LN1A2AC1 LINE
P1A2AC1 PU

```

## Switched Major Node Definitions for CN - ATM - HOST2A

```

SWXCA2A VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
SW2AP215 PU MAXPATH=5,MAXDATA=256,ADDR=0A, X
 CPNAME=SSCPAA,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO)
PTHAP215 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(21,X,0002,51111111111111111111111111111111, X
 11111100), X
 GRPNM=GP2A1
SL2AP215 LU LOCADDR=1,ISTATUS=INACTIVE
*
GP1A2AC GROUP DIAL=YES,ISTATUS=INACTIVE,ANSWER=ON,CALL=INOUT, X
 DLCADDR=(1,C,ATMSVC,NETA.VNODE1,EXCLUSIVE), X
 DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X

```



DLCADDR=(8,X,00,03), X  
DYNPU=YES

\*  
LN1A2AC1 LINE  
P1A2AC1 PU

## Switched Major Node Definitions for CN - ATM - HOSTAA

```
SWXCAA VBUILD TYPE=SWNET,MAXNO=256,MAXGRP=256
*
*
SWA1P151 PU MAXPATH=5,MAXDATA=256,ADDR=01, X
 CPNAME=SSCP1A,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO)
PTH1P151 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(21,X,0002,11111111111111111111111111111111, X
 11111100), X
 DLCADDR=(8,X,03,03,03), X
 DLCADDR=(9,X,FFFF), X
 DLCADDR=(51,X,00,10,00,00,01,01), X
 DLCADDR=(61,BCD,00,05,00032767,00032767), X
 GRPNM=GPA15
SLA1P151 LU LOCADDR=1,ISTATUS=INACTIVE
*
SWA1P152 PU MAXPATH=5,MAXDATA=256,ADDR=01, X
 CPNAME=SSCP1A,CPCP=YES,HPR=YES,CONNTYPE=APPN, X
 PUTYPE=2,DISCNT=(NO)
PTH1P152 PATH DLCADDR=(1,C,ATMSVC,EXCLUSIVE), X
 DLCADDR=(7,BCD,00,00,00000079,00000047,00012287,00, X
 00000047,00000031,00016383,00), X
 DLCADDR=(8,X,03,03,03), X
 DLCADDR=(9,X,FFFF), X
 DLCADDR=(51,X,00,10,00,00,01,01), X
 DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
 DLCADDR=(21,X,0002,21111111111111111111111111111111, X
 11111100), X
 GRPNM=GPA15
SLA1L152 LU LOCADDR=1,ISTATUS=INACTIVE
*
GP1A2AC GROUP DIAL=YES,ISTATUS=INACTIVE,ANSWER=ON,CALL=INOUT, X
 DLCADDR=(1,C,ATMSVC,NETA.VNODE1,EXCLUSIVE), X
 DLCADDR=(7,BCD,03,00,00004000,00004000,00005360,00), X
 DLCADDR=(8,X,00,03), X
 DYNPU=YES
*
LN1A2AC1 LINE
P1A2AC1 PU
```



---

## Chapter 13. TCP/IP Major Node

|                                                      |     |                                                            |     |
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| Defining the TCP/IP Major Node . . . . .             | 157 |                                                            |     |
| Defining a TCP/IP Major Node for Network A . . . . . | 157 |                                                            |     |

---

### About This Chapter

This chapter contains sample TCP/IP major node definitions.

The VTAM V4R2 AnyNet host feature permits SNA-to-SNA communication over a Transmission Control Protocol/Internet Protocol (TCP/IP) network. The specific configurations it supports include the following:

- VTAM to VTAM over a single IP network
- VTAM to Communications Manager/2 over a single IP network
- VTAM to AIX SNA Server over a single IP network
- VTAM as a multiprotocol transport networking (MPTN) gateway between an SNA network and an IP network.

The following must be defined for SNA access to the IP network:

- A TCP/IP major node
- A CDRSC definition for the destination LU in the IP network.

For more information on the types of configurations supported by AnyNet and how to define them, see *OS/390 eNetwork Communications Server: AnyNet SNA over TCP/IP*.

---

### Defining the TCP/IP Major Node

The TCP/IP major node defines the TCP/IP network to VTAM. It is defined as a single nonswitched major node with no switched lines and no LUs. The major node consists of a VBUILD definition statement that specifies TYPE=TCP, plus at least one of each of the following:

#### **GROUP**

Defines the group for the line in the TCP/IP major node.

**LINE** Defines the line for the TCP/IP major node.

**PU** Defines the physical unit for a TCP/IP major node. You must define the TCP/IP PU as type 2.1, but it cannot be an APPN PU.

You can define more than one GROUP, LINE, and PU in a single TCP/IP major node; however, only one LINE and one PU can be active at one time. For more information on defining the TCP/IP major node, see *OS/390 eNetwork Communications Server: AnyNet SNA over TCP/IP*.

### Defining a TCP/IP Major Node for Network A

In the sample TCP/IP Major Node for Network A (see below), the VBUILD definition statement is required to define the major node. The CONTIMER operand specifies the length of time, in seconds, that VTAM should wait for the MPTN (multi-protocol transport networking) connection to be established after the TCP

connection has been activated. If the MPTN connection is not established within the time specified by CONTIMER, the session initiation fails. In the sample, a value of 30 seconds (the default value) is specified for CONTIMER.

The DGTIMER operand specifies the length of time, in seconds, between retries of sending a datagram for SNA expedited data, SNA session termination requests, or an MPTN KEEPALIVE datagram to a remote system using SNA over TCP/IP. DGTIMER=30 indicates that the interval between retries is 30 seconds.

The DSNSUFFIX operand specifies the domain name suffix to be used when VTAM creates an IP domain name from an SNA LU name and SNA network ID. The DSNSUFFIX operand ensures that any SNA LU name and SNA network ID specified in the form *luname.netid* is distinct from any existing IP domain name. In this example, SNA.IBM.COM is the default value for DSNSUFFIX.

EXTIMER specifies the length of time, in seconds, between sending expedited data over the TCP connection associated with an SNA session and sending the SNA expedited data using a datagram. The value specified here--3 seconds--is the default value.

IATIMER specifies the length of time, in seconds, that VTAM allows two IP addresses to remain inactive before sending an MPTN KEEPALIVE datagram to test the connectivity between the two IP addresses. The default value is 120 seconds.

The PORT operand specifies the TCP and UDP (User Datagram Protocol) protocol port that VTAM uses to support SNA sessions over an IP network. The default value is 397. All nodes that establish SNA sessions over an IP network must use the same PORT number if those nodes are to communicate with each other. Since 397 is the well-defined port reserved for SNA over TCP/IP communication, it is recommended that you use the default.

The TCB operand specifies the number of MVS subtasks that can be used by VTAM to access TCP/IP. Each MVS subtask can handle up to 120 sessions. The default TCB value is 10.

The TCPIPJOB operand on the VBUILD statement specifies TCPST as the TCP/IP job name used to start the TCP/IP address space. The value assigned to TCPIPJOB must match the name specified on the TCPIPJOBNAME statement in the TCP/IP data file.

The name of the PU definition statement, TCPPU1, provides the minor node name of the PU represented by this definition statement. This name is used to represent an adjacent link station (ALS) for an LU to which a session is to be established over an IP network. This ALS name is used by the following:

- ALSLIST operand on the CDRSC definition statement
- ALS selection function on the session management exit routine.

```
* =====> BEGINNING OF DATA SET TCPMNA

* TCPMNA - TCP/IP MAJOR NODE FOR NETWORK A

TCPMNI VBUILD TYPE=TCP, ** TCP/IP MAJOR NODE ** X
 CONTIMER=30, ** MPTN CONNECTION TIMER ** X
 DGTIMER=30, ** DATAGRAM RETRY TIMER ** X
 DSNSUFFIX=SNA.IBM.COM, ** DOMAIN NAME SUFFIX ** X
 EXTIMER=3, ** EXPEDITED DATA TIMER ** X
 IATIMER=120, ** INACTIVE ADDRESS TIMER ** X
```

```

 PORT=397, ** TCP/UDP PROTOCOL PORT ** X
 TCB=10, ** MVS SUBTASKS FOR TCP/IP ** X
 TCP/IPJOB=TCPST ** TCP/IP JOB NAME **
TCPGRP1 GROUP ISTATUS=INACTIVE
TCPLINE1 LINE
TCP/PU1 PU NETID=NETA
* =====> END OF DATA SET TCPMNA

```

---

## Defining the TCP/IP LU as a Cross-Domain Resource

If VTAM initiates an LU-LU session to an LU located in the IP network, you need to define the LU to VTAM using a CDRSC definition statement or using the ALS selection function of the session management exit routine. A CDRSC definition for an LU in the IP network must utilize the ALSLIST operand to point to the TCP/IP PU defined in the TCP/IP major node.

If an IP-attached LU initiates a session with VTAM, VTAM can define the LU dynamically.

For examples of CDRSC definitions that use ALSLIST to point to the TCP/IP PU, see “Using CDRSC Definition Statements for Independent LUs” on page 28.



---

## Chapter 14. Transport Resource List Major Node

|                                                                 |     |                                                                                  |     |
|-----------------------------------------------------------------|-----|----------------------------------------------------------------------------------|-----|
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| Sample Transport Resource List Major Node Definitions . . . . . | 162 |                                                                                  |     |

---

### About This Chapter

This chapter contains sample transport resource list major node definitions.

A transport resource list major node is used, along with a local SNA major node, to define an APPN host-to-host channel connection. APPN host-to-host channels enable you to use APPN protocols between two channel-attached APPN nodes. The transport resource list element is not a resource, but describes the connectivity characteristics of the multipath channel line that is used for the connection.

For a connection between VTAM and an adjacent APPN node, the TRLE operand on the PU definition statement in the local SNA major node that defines the adjacent APPN node identifies the TRLE definition statement VTAM uses to route data over the connection.

For a connection between VTAM and a port on an IBM S/390 Open Systems Adapter through which native access to an ATM network is achieved, the PORT definition statement in the XCA major node that defines the port identifies the TRLE definition statement VTAM uses to route data over the connection. The determination of which TRLE definition statement is used is made by matching the port name specified on the PORTNAME operand on the PORT definition statement to the port name specified on the PORTNAME operand on a TRLE definition statement in the TRL major node.

Refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation* for more information about MPC connections.

**Note:** To use this function, you need to have at least one multipath channel defined between the two nodes. This multipath channel may be an ESCON channel, an IBM 3088 or a virtual channel-to-channel connection. Furthermore, you must be running MVS/ESA at the V4R3 level or later.

To define a transport resource list major node, code the following definition statements:

- One VBUILD TYPE=TRL definition statement to begin the transport resource list major node.
- One TRLE (transport resource list element) definition statement for each multipath channel (MPC) connection, such as an APPN host-to-host connection, or a connection to an IBM S/390 Open Systems Adapter.

In addition to the transport resource list major node, you must also define a local SNA major node that defines the channel connection to the adjacent VTAM as an APPN PU. The PU definition statement in the local SNA major node must specify the TRLE operand to identify the particular transport resource list element to be used for the PU.

When an adjacent link station is activated, the TRLE operand on the PU definition statement identifies which TRLE definition statement VTAM uses to route data over the channel. See “APPN Host-to-Host Channel Connection” on page 72 for a sample local SNA major node used for APPN host-to-host channel connection.

For additional information on APPN host-to-host channel connections, please refer to the *OS/390 eNetwork Communications Server: SNA Network Implementation*

---

## Sample Transport Resource List Major Node Definitions

The following example shows transport resource list (TRL) major node definitions for the two hosts shown in Figure 30. Each TRL major node describes the transport characteristics of the multipath channel that is being used by the APPN host-to-host connection.

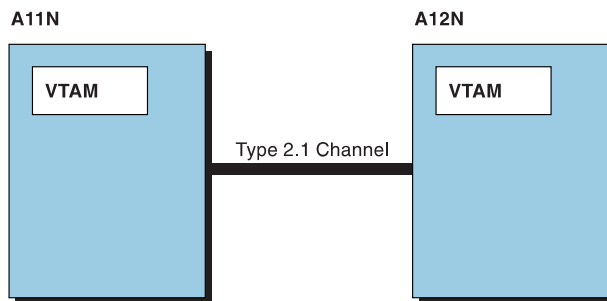


Figure 30. APPN Host-to-Host Channel Connection

LNCTL=MPC indicates that the link is a multipath channel-attachment link that can be used as an APPN host-to-host connection.

The READ operand specifies the subchannel addresses used to read data from the adjacent host. The WRITE operand specifies the subchannel addresses used to write data to the adjacent host.

For each subchannel address on the READ operand, the corresponding subchannel address is coded on the WRITE operand in the adjacent host to provide a complete path. The READ subchannel address and the corresponding WRITE subchannel address must reference the same physical connection between the two nodes; the two addresses do not need to be identical. For example, node A11N can have a READ subchannel address of BC0 and node A12N can have a corresponding WRITE subchannel address of BD0 as long as A11N's BC0 is physically connected to A12N's BD0.

Notice that although a pair of subchannel addresses is defined in this sample, the subchannel addresses can be defined as a single address, a range of addresses, or both.

MAXBFRU=6 specifies that VTAM uses six 4K buffer pages to receive data when activating the multipath channel.

REPLYTO=3.0 specifies that VTAM waits 3 seconds for completion of a multipath channel (MPC) XID I/O operation after starting a channel program. If this timeout expires, a message is written to inform the operator that a timeout has occurred.



```

* TRL Major Node for A11N *

* TRANSPORT RESOURCE LIST MAJOR NODE FOR *
* APPN HOST-TO-HOST CHANNEL. *
* LINE AND PU STATEMENTS AND A TG *
* CODED SO THAT IT FLOWS OVER TWO SEPARATE *
* CHANNELS (CHPID'S). *

MPCTRL VBUILD TYPE=TRL,CONFGDS=CTC1011
* VIRTUAL CONNECTIONS USING TWO CHANNEL PATH IDS TO A12N
MPC1 TRLE LNCTL=MPC, X
 READ=(BC0,BE0), X
 WRITE=(BC1,BE1), X
 MAXBFRU=6, X
 REPLYTO=3.0

* TRL Major Node for A12N *

* TRANSPORT RESOURCE LIST MAJOR NODE FOR *
* APPN HOST-TO-HOST CHANNEL. *
* LINE AND PU STATEMENTS AND A TG *
* CODED SO THAT IT FLOWS OVER TWO SEPARATE *
* CHANNELS (CHPID'S). *

MPCTRL VBUILD TYPE=TRL,CONFGDS=CTC1011
* VIRTUAL CONNECTIONS USING TWO CHANNEL PATH IDS TO A11N
MPC1 TRLE LNCTL=MPC, X
 READ=(BC1,BE1), X
 WRITE=(BC0,BE0), X
 MAXBFRU=6, X
 REPLYTO=3.0

```

---

## Sample TRLE for VTAM's Connection to the IBM S/390 Open Systems Adapter

The following example shows transport resource list (TRL) major node definitions for the two hosts shown in Figure 31 on page 164. Each TRL major node describes the transport characteristics of the multipath channel that is being used by the APPN host-to-host connection.

**PORTNAME** on the TRLE statement must match **PORTNAME** on the XCA Major Node (see :refid=atmsvc0.).

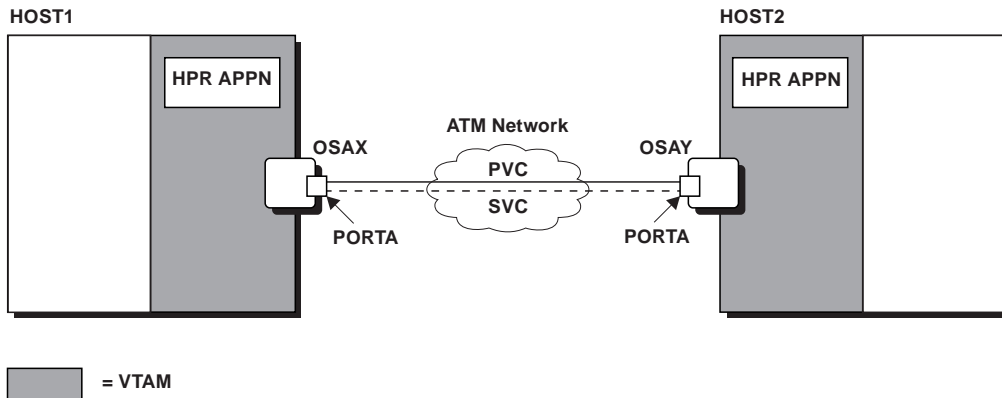


Figure 31. Basic ATM Configuration

```

* TRL Major Node for SSCPIA - ATM *

* TRANSPORT RESOURCE LIST MAJOR NODE FOR *
* LINE AND PU STATEMENTS AND A TG *
* CODED SO THAT IT FLOWS OVER TWO SEPARATE *
* CHANNELS (CHPID'S). *

TRL1A VBUILD TYPE=TRL
OSA1 TRLE LNCTL=MPC,READ=(0514),WRITE=(0515),PORTNAME=OSAXA
OSA2 TRLE LNCTL=MPC,READ=(0516),WRITE=(0517),PORTNAME=OSAXB
*
TRLE1A TRLE LNCTL=MPC,READ=(0408),WRITE=(0508)
*
TRLE1B TRLE LNCTL=MPC,READ=(02F0),WRITE=(03F0)
*
TRLE1C TRLE LNCTL=MPC,READ=(0408,02F0),WRITE=(0508,03F0)
*
TRLE1D TRLE LNCTL=MPC,READ=(0404),WRITE=(0504)

* TRL Major Node for SSCP2A - ATM *

* TRANSPORT RESOURCE LIST MAJOR NODE FOR *
* APPN HOST-TO-HOST CHANNEL. *
* LINE AND PU STATEMENTS AND A TG *
* CODED SO THAT IT FLOWS OVER TWO SEPARATE *
* CHANNELS (CHPID'S). *

TRL2A VBUILD TYPE=TRL
OSA1 TRLE LNCTL=MPC,READ=(051C),WRITE=(051D),PORTNAME=OSAYA
OSA2 TRLE LNCTL=MPC,READ=(051E),WRITE=(051F),PORTNAME=OSAYB
*
TRLE1A TRLE LNCTL=MPC,READ=(0408),WRITE=(0508)
*
TRLE1B TRLE LNCTL=MPC,READ=(02F0),WRITE=(03F0)
*
TRLE1C TRLE LNCTL=MPC,READ=(0408,02F0),WRITE=(0508,03F0)
*
TRLE1D TRLE LNCTL=MPC,READ=(0404),WRITE=(0504)

```

---

## Chapter 15. Path Definition Statements

|                                                      |     |                                                   |     |
|------------------------------------------------------|-----|---------------------------------------------------|-----|
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---

### About This Chapter

This chapter describes sample path definitions.

Communication between two network accessible units (NAUs) over a subarea connection requires a definition of at least one route connecting them. This definition includes a physical and logical path between the two. PATH definition statements are the representations of the routes VTAM takes to communicate with other subarea nodes. Paths are only defined for hosts with subarea function.

The physical path between two subarea nodes is an explicit route (ER). The logical path between two subarea nodes is a virtual route (VR). PATH definition statements define both explicit routes and virtual routes. You may code one PATH definition statement for each destination subarea, or you may code a single PATH definition statement defining the routes to multiple destination subareas.

The first operand on a PATH definition statement is typically the DESTSA operand. DESTSA specifies the destination subarea numbers for which this PATH statement is defining routes. The numbers specified must not exceed the value specified on the MXSUBNUM start option.

On a PATH definition statement, the operands ER0-ER15 define explicit routes to adjacent subareas. Each ERx operand specifies the subarea number of the adjacent subarea and, optionally, a transmission group number for the explicit route being defined. The x in the ERx operand designates the number of the explicit route.

The operands VR0-VR7 associate a virtual route with an explicit route. explicit routes to adjacent subareas. Each VRx operand specifies the explicit route number to which the virtual route is mapped. The x in the VRx operand designates the number of the virtual route.

In addition, the VRPWS00-VRPWS72 operands specify the pacing window size for combinations of virtual routes and transmission priorities.

You do not need to define PATH definitions for APPN connections.

For more information about paths, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

The remainder of this chapter shows path definitions for each of the subarea-capable nodes in the network depicted in Figure 10 on page 36.

---

## Path Definitions for Interchange Node A01N

```
* =====> BEGINNING OF DATA SET A01PATHS

* A01PATHS - VTAM PATH DEFINITIONS - ICN A01 *

 PATH DESTSA=(2,3,4,17,81,310,500), **DEST SUBAREA** *
 ER0=(4,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** *
 ER1=(4,1), *
 ER2=(4,1), *
 ER3=(4,1), *
 ER4=(2,1), *
 ER5=(81,1), *
 ER6=(500,1), *
 ER7=(2,1), *
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** *
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** *
 VRPWS01=(1,3),VRPWS02=(1,3),
 VR1=1, *
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), *
 VR2=2, *
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), *
 VR3=3, *
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), *
 VR4=4, *
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), *
 VR5=5, *
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), *
 VR6=6, *
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), *
 VR7=7, *
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET A01PATHS
```

---

## Path Definitions for Subarea Node A02N

```
* =====> BEGINNING OF DATA SET A02PATHS

* A02PATHS - VTAM PATH DEFINITIONS - SUBAREA A02 *

 PATH DESTSA=(1,3,4,17,81,310,500), **DEST SUBAREA** X
 ER0=(4,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(4,1), X
 ER2=(4,1), X
 ER3=(4,1), X
 ER4=(1,1), X
 ER5=(500,1), X
 ER6=(81,1), X
 ER7=(1,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
```

```

 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET A02PATHS

```

---

## Path Definitions for Interchange Node A17N

```

* =====> BEGINNING OF DATA SET A17PATHS

* A17PATHS - VTAM PATH DEFINITIONS - ICN A17 *

 PATH DESTSA=(1,2,3,4,81,310), ** DESTINATION SUBAREA ** X
 ER0=(3,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(3,1), X
 ER2=(3,1), X
 ER3=(3,1), X
 ER4=(3,1), X
 ER5=(3,1), X
 ER6=(3,1), X
 ER7=(3,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
 PATH DESTSA=500, ** DESTINATION SUBAREA ** X
 ER0=(3,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(3,1), X
 ER2=(500,2), X
 ER3=(500,3), X
 ER4=(3,1), X
 ER5=(3,1), X
 ER6=(3,1), X
 ER7=(3,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET A17PATHS

```

## Path Definitions for Migration Data Host A500N

```

* =====> BEGINNING OF DATA SET A50PATHS

* A50PATHS - VTAM PATH DEFINITIONS - MDH A500 *

 PATH DESTSA=(1,2,4,81,310), ** DESTINATION SUBAREA ** X
 ER0=(3,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(3,2), X
 ER2=(17,2), X
 ER3=(17,3), X
 ER4=(81,1), X
 ER5=(2,1), X
 ER6=(1,1), X
 ER7=(81,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
 PATH DESTSA=17, ** DESTINATION SUBAREA ** X
 ER0=(3,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(3,2), X
 ER2=(17,2), X
 ER3=(17,3), X
 ER4=(81,1), X
 ER5=(2,1), X
 ER6=(1,1), X
 ER7=(81,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
 PATH DESTSA=(3), ** DESTINATION SUBAREA ** X
 ER0=(3,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(3,2), X
 ER2=(17,2), X
 ER3=(17,3), X
 ER4=(81,1), X
 ER5=(2,1), X
 ER6=(1,1), X
 ER7=(81,1), X

```

```

VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
VRPWS01=(1,3),VRPWS02=(1,3), X
VR1=1, X
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
VR2=2, X
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
VR3=3, X
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
VR4=4, X
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
VR5=5, X
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
VR6=6, X
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
VR7=7, X
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET A50PATHS

```

---

## Path Definitions for Interchange Node A81N

```

* =====> BEGINNING OF DATA SET A81PATHS

* A81PATHS - VTAM PATH DEFINITIONS - ICN A81 *

PATH DESTSA=(1,2,3,4,17,310,500), **DEST SUBAREA** X
ER0=(310,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
ER1=(310,255), X
ER2=(310,1), X
ER3=(310,255), X
ER4=(500,1), X
ER5=(1,1), X
ER6=(2,1), X
ER7=(500,1), X
VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
VRPWS01=(1,3),VRPWS02=(1,3), X
VR1=1, X
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
VR2=2, X
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
VR3=3, X
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
VR4=4, X
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
VR5=5, X
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
VR6=6, X
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
VR7=7, X
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET A81PATHS

```

---

## Path Definitions for Interchange Node B01N

```

* =====> BEGINNING OF DATA SET B01PATHS

* B01PATHS - VTAM PATH DEFINITIONS - ICN B01 *

PATH DESTSA=(75,1028), **DEST SUBAREA** X
ER0=(75,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
ER1=(31,1), X
ER2=(75,1), X
ER3=(75,1), X
ER4=(75,1), X
ER5=(75,1), X

```

```

ER6=(75,1), X
ER7=(75,1), X
VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
VRPWS01=(1,3),VRPWS02=(1,3), X
VR1=1, X
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
VR2=2, X
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
VR3=3, X
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
VR4=4, X
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
VR5=5, X
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
VR6=6, X
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
VR7=7, X
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
PATH DESTSA=3, X
ER0=(3,1), X
ER1=(31,1), X
ER2=(3,1), X
ER3=(31,1), X
ER4=(3,1), X
ER5=(31,1), X
ER6=(3,1), X
ER7=(31,1), X
VR0=0, X
VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), X
VR1=1, X
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
VR2=2, X
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
VR3=3, X
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
VR4=4, X
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
VR5=5, X
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
VR6=6, X
VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
VR7=7, X
VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
PATH DESTSA=31, X
ER0=(3,1), X
ER1=(31,1), X
ER2=(3,1), X
ER3=(31,1), X
ER4=(3,1), X
ER5=(31,1), X
ER6=(3,1), X
ER7=(31,1), X
VR0=0, X
VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), X
VR1=1, X
VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
VR2=2, X
VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
VR3=3, X
VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
VR4=4, X
VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
VR5=5, X
VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
VR6=6, X

```



```

 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET B01PATHS

```

---

## Path Definitions for Interchange Node B128N

```

* =====> BEGINNING OF DATA SET B28PATHS

* B28PATHS - VTAM PATH DEFINITIONS - ICN B128 *

 PATH DESTSA=(1,3,31,75), **DEST SUBAREA** X
 ER0=(75,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** X
 ER1=(75,1), X
 ER2=(75,1), X
 ER3=(75,1), X
 ER4=(75,1), X
 ER5=(75,1), X
 ER6=(75,1), X
 ER7=(75,1), X
 VR0=0, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** X
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** X
 VRPWS01=(1,3),VRPWS02=(1,3), X
 VR1=1, X
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6), X
 VR2=2, X
 VRPWS20=(2,6),VRPWS21=(2,6),VRPWS22=(2,6), X
 VR3=3, X
 VRPWS30=(2,6),VRPWS31=(2,6),VRPWS32=(2,6), X
 VR4=4, X
 VRPWS40=(3,9),VRPWS41=(3,9),VRPWS42=(3,9), X
 VR5=5, X
 VRPWS50=(3,9),VRPWS51=(3,9),VRPWS52=(3,9), X
 VR6=6, X
 VRPWS60=(3,9),VRPWS61=(3,9),VRPWS62=(3,9), X
 VR7=7, X
 VRPWS70=(3,9),VRPWS71=(3,9),VRPWS72=(3,9)
* =====> END OF DATA SET B28PATHS

```

---

## Path Definitions for Subarea Node C01N

```

* =====> BEGINNING OF DATA SET C01PATHS

* C01PATHS - VTAM PATH DEFINITIONS - SUBAREA C01 *

 PATH DESTSA=3, **DEST SUBAREA** *
 ER0=(4,1), ** EXPLICIT ROUTE - ADJSUB,TGN ** *
 ER1=(3,1), *
 VR0=1, ** VIRTUAL TO EXPLICIT ROUTE MAPPING ** *
 VRPWS00=(1,3), ** PACING WINDOW SIZE - MIN,MAX ** *
 VRPWS01=(1,3),VRPWS02=(1,3), *
 VR1=0, *
 VRPWS10=(3,9),VRPWS11=(3,9),VRPWS12=(3,9)
 PATH DESTSA=4, *
 ER0=(3,1),ER1=(4,1), *
 VR0=1, *
 VRPWS00=(1,3),VRPWS01=(1,3),VRPWS02=(1,3), *
 VR1=0, *
 VRPWS10=(3,9),VRPWS11=(3,9),VRPWS12=(3,9)
 PATH DESTSA=31, *
 ER0=(3,1),ER1=(4,1), *
 VR0=0, *
 VRPWS00=(2,6),VRPWS01=(2,6),VRPWS02=(2,6), *
 VR1=1, *
 VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(2,6)
* =====> END OF DATA SET C01PATHS

```



---

## Chapter 16. VTAM Start Option Lists

|                                                  |     |                                                                    |     |
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---

### About This Chapter

This chapter contains sample VTAM start option lists for defining VTAM nodes.

For more information about the different types of VTAM nodes, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

For more information about start options and configuration lists, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

---

### IBM-Supplied Default Start Option List

ATCSTR00 is the default start option list supplied by IBM. It initializes VTAM as a subarea node. For this list to take effect when you start up VTAM, you must copy it out of the GENDECK data set in SYS1.ASAMPLIB and put that copy in the SYS1.VTAMLIB, the VTAM definition library.

**Note:** The values specified in ATCSTR00 are not necessarily the default values for the start options listed there. If ATCSTR00 is the only start option list you use for a particular node, that node will be initialized as a subarea VTAM node.

The CACHETI start option defines the number of minutes that routing information about a previous locate search is stored. The default is 8 minutes. The range of permissible values is 0-1440 minutes.

The CMPVTAM start option specifies the maximum compression level allowed for sessions involving the host's application programs. CMPVTAM=0 indicates that no compression is allowed.

The HOTIOTRM start option specifies the percentage of the current size of the IO buffer pool that a single LU-LU session must have allocated to it to cause VTAM to automatically terminate all sessions between the two logical units. HOTIOTRM=0 (the default value) indicates that VTAM will not terminate sessions based on IO buffer pool usage.

The SRCHRED start option allows you to specify whether this node can reduce searches for resources which are found to be unreachable. SRCHRED=ON indicates that search reduction is to be performed. You can change the SRCHRED value with the MODIFY VTAMOPTS command while VTAM is running.

If you specify SRCHRED=ON, you can use the SRCOUNT start option to specify how many search requests must be limited before VTAM performs another resource discovery search. The default value is 10 search requests.

In addition, if search reduction has been specified, you can specify the number of seconds during which VTAM does not conduct searches for an unreachable resource by specifying the SRTIMER start option. The default value is 30 seconds.

For a specific cross-domain resource or group of cross-domain resources, the values on the SRTIMER and SRCOUNT start options are overridden by the values on the SRTIMER and SRCOUNT operands of the CDRSC definition statement. See “Eliminating and Reducing Searches for Unavailable Resources” on page 31.

The SSCPDYN start option specifies whether VTAM dynamically adds entries to the adjacent SSCP table. SSCPDYN=YES (the default) specifies that VTAM adds a new entry to a cross-domain resource’s adjacent SSCP table whenever it receives a session initiation request from the resource through an SSCP that is not already in the table.

The SSCPORD start option specifies whether VTAM, when establishing sessions, searches the adjacent SSCP table in priority order (the default) or in the order in which the table is defined. SSCPORD=PRIORITY specifies that VTAM gives priority to the SSCP that owns the destination LU (if known), then to SSCPs for which the most recent session attempt succeeded. The combination of SSCPORD=PRIORITY and SSCPDYN=YES gives you the greatest flexibility for setting up routes across networks, and, if your adjacent SSCP table is large, it gives you the best performance during session setup.

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option allows you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The SIZE option for the VTAM internal trace specifies the number of pages in the internal trace table. The default SIZE option value has been increased to 100 pages, starting with VTAM Version 4 Release 3.

```
* =====> BEGINNING OF DATA SET ATCSTR00

* ATCSTR00 - VTAM START LIST FOR A SUBAREA NODE - DEFAULT LIST *

 ALSREQ=NO, ** ADJ LINK STAT IN ALS LIST **X
 ASYDE=TERM, ** ASYNCH DEVICE SESSION TERM **X
 BSCMDRS=(STATS,INOPS), ** REPORT BISYNC INOP STATS **X
 CACHETI=8, ** CACHE TIMER VALUE **X
 CDRSCTI=480, ** DYNAMIC CDRSC INTERVAL **X
 CMPVTAM=0, ** MAX HOST APPL COMPRESSION **X
 COLD, ** CONFIG RESTART STATUS **X
 CSALIMIT=0, ** MAXIMUM CSA LIMIT **X
 CSA24=0, ** 24 BIT ADDR STORAGE LIMIT **X
 DATEFORM=MDY, ** AUTO IPL DATE FORM **X
 DLRTCB=32, ** NCP DUMP/LOAD/RESTART TCBS **X
 DYNASSCP=YES, ** DYNA SESS REQ ROUTE TO ADJS **X
 DYNLU=YES, ** DYNAMIC DLU CAPABILITY **X
 ENCRYPTN=NO, ** APPL ENCRYPTION CAPABILITY **X
 GWSSCP=YES, ** GATEWAY SSCP CAPABILITY **X
 HOTIOTRM=0, ** HOT I/O TERMINATION **X
```

```

IOINT=180,
MAXSUBA=15,
MSGMOD=NO,
NCPBUFSZ=512,
NMVTLOG=NPDA,
NODELST=NODEDS1,
PPOLOG=NO,
PROMPT,
SDLCMDRS=(STATS,INOPS),
SONLIM=(60,30),
SRCHRED=ON,
SRCOUNT=10,
SRTIMER=30,
SSCPDYN=YES,
SSCPORD=PRIORITY,
SUPP=NOSUP,
TNSTAT,TIME=60,
VFYRED=YES,
XNETALS=YES,
TRACE,TYPE=VTAM,MODE=INT,OPT=NONE,SIZE=100,
USSTAB=ISTINCNO,
APBUF=(16,,2,,1,3),
BSBUF=(100,,0,,25,60),
CRPLBUF=(100,,0,,1,29),
IOBUF=(100,384,5,,1,30),
LFBUF=(25,,0,,1,1),
LPBUF=(70,,0,,5,1),
SFBUF=(51,,0,,1,1),
SPBUF=(10,,0,,1,1),
XDBUF=(6,,0,,1,5)
** OUTSTANDING RESPONSE DISPLAY **X
** HIGHEST SUBAREA VALUE **X
** VTAM MODULE MESSAGE DISPLAY **X
** NCP LOAD/DUMP RU SIZE **X
** NMVT RECORDING **X
** WARM RESTART NODE LIST **X
** PPO LOG RECORDING **X
** START OPTIONS PROMPT **X
** REPORT SDLC INOP STATS **X
** IO BUF % FOR SESS OUT NOTIFY **X
** PERFORM SEARCH REDUCTION **X
** SEARCH REDUCTION COUNT LIMIT **X
** SEARCH REDUCTION TIME LIMIT **X
** DYNAMIC ADD ENTRY TO ADJSSCP **X
** ADJSSCP SEARCH ORDER **X
** VTAM MESSAGE CLASS SUPPRESS **X
** TUNING STATISTICS **X
** LU 6.2 VERIFICATION REDUCTION**X
** NON NATIVE NET CONNECTIVITY **X
X
** VTAM MESSAGE & COMMAND TABLE **X
** 24 BIT CSA BUFFER **X
** BOUNDARY LU SESSION BUFFER **X
** APPL REQUEST BUFFER **X
** PIU INPUT/OUTPUT BUFFER **X
** ACTIVE APPL BUFFER EAS < 30 **X
** ACTIVE VTAM PROCESS BUFFER **X
** ACTIVE APPL BUFFER EAS >= 30 **X
** LARGE MESSAGE REQUEST BUFFER **X
** XID EXCHANGE PROCESS BUFFER **
* =====> END OF DATA SET ATCSTR00

```

---

## Subarea Node Start Option List

A VTAM subarea node uses SSCP-SSCP, SSCP-PU, SSCP-LU and LU-LU sessions to control communications in its network. It does not provide APPN function. Subarea nodes depend on routing definitions such as path, virtual route (VR) and explicit route (ER). For more information about VTAM in a subarea network, see in the *OS/390 eNetwork Communications Server: SNA Network Implementation*

The following sample shows the VTAM start options for A02. Not coding the NODETYPE start option is what makes this node a subarea node.

NETID, SSCPID, and SSCPNAME are required start options. HOSTPU is not required, however, it is recommended if you are using NetView. The CONFIG start option identifies a unique name of the configuration list to be activated when VTAM starts.

The AUTHLEN start option indicates whether VTAM will pass the transmission priority specified by the entry LEN node to another LEN node. AUTHLEN=YES (the default value) specifies that it will.

AUTORTRY specifies whether adjacent node activation will cause a retry of pending automatic logon requests and, if it does, what kinds of adjacent nodes will cause such retries upon activation. AUTORTRY=AUTOCAP (the default) specifies that such requests are retried only when an adjacent CDRM or an adjacent CP that supports automatic logon is activated.

The AUTOTI start option allows you to specify how often pending automatic logon requests owned by this host are retried. AUTOTI=0 (the default) specifies that such requests are not retried periodically.

The CINDXSIZ start option specifies the maximum size of the CID and CONVID index tables. The new default value is 8176 bytes.

The CMPMIPS start option is used by VTAM to determine the amount of time the adaptive compression tables are in adaptive mode versus being static. The higher the value specified, the greater the amount of time spent in adaptive mode and, consequently, the more efficient the compression and the more CPU cycles that are consumed. CMPMIPS=50 provides the most effective beginning balance between compression efficiency and CPU usage. The CMPMIPS value is meaningful only if the value for CMPVTAM is greater than 1.

The CMPVTAM start option specifies the maximum compression level allowed for sessions involving the host's application programs. CMPVTAM=3 specifies that the medium adaptive compression table is to be used.

The DISCNTIM start option specifies the amount of time that VTAM delays deactivation of the SSCP-PU session when there are no outstanding LU-LU session requests. This option is valid only for PU types 2 and 2.1 that have DISCNT=DELAY specified on the PU definition statement. DISCNTIM=15 (the default value) specifies this amount of time as 15 seconds. The valid range of values for DISCNTIM is 1-65535. You can change the value of DISCNTIM with the MODIFY VTAMOPTS command while VTAM is running.

The DSPLYDEF start option limits the number of messages displayed when many types of DISPLAY commands are issued without the MAX or NUM operands. Therefore, DSPLYDEF=100 specifies 100 as the number of messages displayed in these cases. For more information about the DSPLYDEF start option, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The DSPLYMAX start option sets the maximum value that can be specified for the DSPLYDEF start option and for the MAX or NUM operands on the commands to which the DSPLYDEF start option apply. DSPLYMAX=65535 (the default value) therefore sets 65535 as the maximum value that can be specified for the DSPLYDEF start option. The range of valid values is 1-65535. For more information about the DSPLYMAX start option, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

Wildcard values enable an operator to expand a display by substituting special symbols (for example, \* and ?) to represent unspecified characters in the name of a resource. The DSPLYWLD=FULLWILD start option specifies that wildcards are permitted in DISPLAY commands from all network operators, and that wildcards are permitted in DISPLAY commands from program operator applications whose APPL or GROUP definition statements indicate DSPLYWLD=YES.

The DYNDLGMD start option specifies the name of a logon mode table entry used by default when the session SLU is a dynamic cross-domain resource and a logon mode table entry is not otherwise provided. In the start option list below, DYNDEFULT is specified as the name of this entry. You can change the DYNDLGMD value with the MODIFY VTAMOPTS command while VTAM is running. You can also override the DYNDLGMD value for a specific dynamic cross-domain resource with the MODIFY DEFAULTS or MODIFY RESOURCE command.

The DYNMODTB start option specifies the name of a logon mode table used to correlate each logon mode name with a set of session parameters for a dynamic cross-domain resource session SLU. In the start option list below, SMPDYNLM is specified as the name of this table. You can change the DYNMODTB value with the MODIFY VTAMOPTS command or the MODIFY TABLE,OPTION=LOAD,TYPE=MODETAB command while VTAM is running. You can also override this value for a specific dynamic cross-domain resource with the MODIFY TABLE,OPTION=ASSOCIATE,TYPE=MODETAB command. See “Default Logon Mode Table for Dynamic CDRSCs” on page 218 for a sample default logon mode table for dynamic cross-domain resources.

The ENHADDR start option specifies whether VTAM can assign element addresses greater than 65,535 (high-order addresses) to resources establishing sessions within this subarea. ENHADDR=NO (the default) indicates that VTAM cannot assign such element addresses.

The FLDTAB start option specifies whether VTAM suppresses duplicate messages sent to the operator console or system hardcopy log and, if it does, whether to use the IBM-supplied message flooding prevention table or a user-specified table. FLDTAB=ISTMSFLD (the default value) indicates that VTAM uses the internal message flooding table supplied by IBM to suppress duplicate messages.

The ISTCOSDF start option specifies the resource types that can use the ISTCOSDF logmode entry. This entry is used when the logmode name specified for the session is not found. ISTCOSDF=INDLU (the default value) indicates that ISTCOSDF is restricted to use by independent LUs.

The LIMINTCP start option specifies the number of seconds to retain free SNASVCMG sessions on limited resources for the control point. The CP SNASVCMG session is used for some network management flows. This option has effect only for network connections defined as limited resources. Network connections are defined as limited resources by specifying LIMRES=YES on the applicable GROUP, LINE, or PU definition statements.

The NSRTSIZE start option allows you to specify the SRT directory size for specific network identifiers. The size specified overrides the value specified on the OSRTSIZE start option.

The OSIEVENT start option specified here indicates that only network events associated with major nodes and LUs will be passed to CMIP services for evaluation.

The OSIMGMT start option enables support of CMIP applications on VTAM, including the VTAM topology agent. OSIMGMT=YES specifies that the VTAM topology agent code and the CMIP services code is to be loaded and activated for use.

The OSITOPO start option lets you control whether the VTAM topology agent reports logical lines to CMIP manager application programs. It also lets you control whether all CDRSCs are reported, or only all independent logical units. The OSITOPO start option in the following start option list specifies that no logical lines are to be reported (NOLLINES) and that all independent logical units, but no other CDRSCs, are to be reported (ILUCDRSC). These are the default values. You can change the value of OSITOPO with the MODIFY VTAMOPTS command while VTAM is running, with the following restriction. If you code OSIMGMT=NO, you

can specify any value for OSITOPO on the command. But, if you code OSIMGMT=YES, you can specify only OSITOPO=ILUCDRSC and OSITOPO=NOLLINES.

The UPDDELAY start option specifies the maximum number of seconds the VTAM topology agent waits between checking the list of resources in transient states to determine whether updates for those resources should be sent to the topology manager. UPDDELAY=60 specifies that 60 seconds is the amount of time the VTAM topology agent waits.

The SRCHRED start option specifies whether this node can reduce searches for resources which are found to be unreachable. SRCHRED=OFF, the default value, specifies that this node does not reduce searches. You can change the SRCHRED value with the MODIFY VTAMOPTS command while VTAM is running.

The SWNORDER start option specifies the way VTAM locates a switched PU. SWNORDER=CPNAME (the default value) specifies that VTAM searches for a switched PU by the CPNAME first and then, if not yet found, by the station identifier (IDBLK and IDNUM operands on the PU definition statement for the switched major nodes).

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option allows you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The TRACE,TYPE=BUF,ID=ISTTOPAG start option specifies that a VTAM buffer contents trace is to be started for the VTAM topology agent. The trace will show requests and responses to and from the VTAM topology agent. Make sure that GTF with the TRACE=USR option is active before starting this trace.

The TRACE,TYPE=BUF,ID=ISTNOTIF start option specifies that a VTAM buffer trace is to be started for notification services. The buffer trace will trace event notification activity between the VTAM topology agent and notification services of CMIP services. Make sure that GTF with the TRACE=USR option is active before starting this trace.

```
* =====> BEGINNING OF DATA SET ATCSTR02

* ATCSTR02 - VTAM START LIST FOR A SUBAREA NODE - SUBAREA A02 *

 AUTHLEN=YES, ** WILL FORWARD TRANS PRIORITY ** X
 AUTORTRY=AUTOCAP, ** AUTOLOGON RETRY ACTIVATION VALUE ** X
 AUTOTI=0, ** NO PERIODIC AUTOLOGON RETRIES ** X
 CINDXSIZ=8176, ** CIT & CONVT INDEX TABLE SIZE ** X
 CMPMIPS=50, ** ADAPTIVE COMPRESSION CPU USAGE ** X
 CMPVTAM=3, ** MEDIUM ADAPTIVE COMPRESSION TABLE** X
 CONFIG=02, ** MAJOR NODE ACTIVATION CONFIG LIST** X
 DISCNTIM=15, ** SSCP-PU DEACTIVATION DELAY ** X
 DSPLYDEF=100, ** DEFAULT VALUE FOR MAX AND NUM ** X
 DSPLYMAX=65535, ** MAXIMUM DSPLYDEF VALUE ** X
 DSPLYWLD=FULLWILD, ** WILDCARDS PERMITTED ** X
 DYNDLGMD=DYNDEFLT, ** DEFAULT LOGMODE FOR DYNAMIC CDRSC** X
 DYNMODTB=SMPDYNLM, ** DEFAULT LOGMODE TABLE FOR DYNAMIC** X
 ENHADDR=NO, ** NO HIGH-ORDER ELEMENT ADDRESSES ** X
 FLDTAB=ISTMSFLD, ** MESSAGE FLOODING PREVENTION ** X
 HOSTPU=A02NPU, ** HOST SUBAREA PU NETWORK NAME ** X
```



```

HOSTSA=02, ** UNIQUE SUBAREA ADDRESS ** X
ISTCOSDF=INDLU, ** ISTCOSDF RESOURCE TYPES ** X
LIMINTCP=29, ** CP SNASVCMG LIMITED RESOURCE ** X
NETID=NETA, ** HOST NETWORK IDENTIFIER ** X
NSRFSIZE= ** SPECIFIC NET SRT SIZES ** X
 (NETD,10, X
 NETE,11, X
 NETE,11, X
 NETF,12, X
 NETG,91, X
 NETH,97, X
 NETI,100, X
 NETJ,110, X
 NETL,2097148), X
OSIEVENT=MC, ** SELECT EVENTS TO REPORT TO CMIP ** X
OSIMGMT=YES, ** SUPPORT CMIP APPLICATIONS ** X
OSITOP0=(NOLLINES, ** SELECT TOPOLOGY TO REPORT ** X
 ILUCDRSC), X
OSRFSIZE=43, ** SRT SIZE FOR NON-NATIVE NETWORKS ** X
UPDELAY=60, ** UPDATE DELAY IN SECONDS ** X
SRCHRED=OFF, ** SEARCH REDUCTION SETTING ** X
SSCPID=02, ** UNIQUE SSCP IDENTIFIER ** X
SSCPNAME=A02N, ** GATEWAY SSCP NAME ** X
SWNORDER=CPNAME, ** SWITCHED PU SEARCH ORDER ** X
VFYRED=YES, ** LU 6.2 VERIFICATION REDUCTION ** X
TRACE, X
 TYPE=BUF, X
 ID=ISTTOPAG, ** TRACE FOR TOPOLOGY AGENT ** X
 AMOUNT=FULL, ** FULL NEEDED FOR ISTTOPAG ** X
 ID=ISTNOTIF, ** TRACE FOR NOTIFICATION SERVICES ** X
 AMOUNT=FULL ** FULL NEEDED FOR ISTNOTIF ** X
* =====> END OF DATA SET ATCSTR02

```

---

## Network Node Start Option List

A VTAM network node is an APPN node that supports its own end users and the end nodes it serves by providing directory and route selection services. Network nodes and their interconnections form an intermediate routing network. The VTAM network node performs searches of the network to locate resources and calculates the best session route from the node of the primary LU to the node of the secondary LU, based on user-specified criteria. Network nodes **do not** depend on routing definitions such as path, virtual route (VR) and explicit route (ER).

Network nodes can be classified into two basic categories: pure network nodes, which provide APPN function only, and interchange nodes, which provide both APPN and subarea function. An interchange node together with any NCPs it owns is known as a composite network node. In addition, a border node is an APPN network node that interconnects APPN networks having independent topology databases in order to support LU-LU sessions between these networks. When a network node supports the LUs on attached end nodes it is known as a network node server. Finally, you can configure any network node to act as a central directory server, which builds and maintains a directory of resources throughout the network.

In this section, we show a sample start option list for a pure network node. For information about VTAM in an APPN network, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

The following sample shows the start options for SSCPEA. It is the combination of NODETYPE=NN and HOSTSA not coded that defines this node as a pure APPN network node. Pure network nodes have no subarea function.

The APPNCOS start option specifies the APPN class of service to be used if a requested class of service cannot be found in the topology and routing services class-of-service database. APPNCOS=NONE is the default value.

AUTORTRY specifies whether adjacent node activation will cause a retry of pending automatic logon requests and, if it does, what kinds of adjacent nodes will cause such retries upon activation. AUTORTRY=AUTOCAP (the default) specifies that such requests are retried only when an adjacent CDRM or an adjacent CP that supports automatic logon is activated.

The AUTOTI start option allows you to specify how often pending automatic logon requests owned by this host are retried. AUTOTI=0 (the default) specifies that such requests are not retried periodically.

The CINDXSIZ start option specifies the maximum size of the CID and CONVID index tables. The new default value is 8176 bytes.

CPCP=YES enables this node for CP-CP sessions with all adjacent APPN nodes.

The BN start option specifies whether this node is to provide extended border node function. An extended border node supports intermediate network routing, allowing it to support LU-LU sessions that do not terminate in its native network. BN=NO (the default value) specifies that it does not provide that function. The BN start option is meaningful only for nodes that specify NODETYPE=NN.

NETID, SSCPID, and SSCPNAME are required start options. HOSTPU is not required, however, it is recommended if you are using NetView. The CONFIG start option identifies a unique name of the configuration list to be activated when VTAM starts.

The start option CDSERVER=NO specifies that this network node will not be a central directory server. NO is the default value.

The start option CDSREFER=3 specifies that this network node only refers to the three closest (minimal weight route) central directory servers in the network. For more information on the CDSREFER start option, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The CONNTYPE start option specifies for a type 2.1 PU whether the connection is established as a LEN connection or attempted as an APPN connection. CONNTYPE=APPN (the default) specifies that the connection is attempted as an APPN connection.

The DISCNTIM start option specifies the amount of time that VTAM delays deactivation of the SSCP-PU session when there are no outstanding LU-LU session requests. This option is valid only for PU types 2 and 2.1 that have DISCNT=DELAY specified on the PU definition statement. DISCNTIM=15 (the default value) specifies this amount of time as 15 seconds. You can change the value of DISCNTIM with the MODIFY VTAMOPTS command while VTAM is running.

The DLRTCB specifies the largest number of task control blocks (TCBs) used by VTAM for dump/load/restart subtasks and file I/O services. For an APPN network node, you should specify at least 3 for DLRTCB. Two TCBs are needed to process directory services data sets and topology and routing services data sets, and one TCB is needed for other dump/load/restart functions. A value less than 3 can cause VTAM initialization to stall, or suspend a session initiation for a function requiring a TCB until a TCB becomes available. The default value for DLRTCB is 32 TCBs.

The DIRSIZE start option helps control the size of the directory services database on a VTAM network node. DIRSIZE specifies the maximum number of dynamic APPN resources that VTAM stores in that database. Once the number specified is reached, storage from the oldest resources is freed and reused. DIRSIZE=0 (the default value) specifies that no limit is enforced for the number of dynamic APPN resources in the directory services database. You can change the value of DIRSIZE with the MODIFY VTAMOPTS command while VTAM is running.

The DIRTIME start option also helps control the size of the directory services database on a VTAM network node. DIRTIME indicates how long an unused resource may remain in the database; the default is 8 days (DIRTIME=8D). You can change the value of DIRTIME with the MODIFY VTAMOPTS command while VTAM is running.

DYNADJCP=YES indicates that adjacent control point (ADJCP) minor nodes are allowed to be created dynamically and placed in the dynamic adjacent control point major node (ISTADJCP).

DYNLU=YES directs VTAM to dynamically allocate host representations of independent LUs during session activation. There is no need for you to predefine your independent LUs if you specify this start option.

The ENHADDR start option specifies whether VTAM can assign element addresses greater than 65,535 (high-order addresses) to resources establishing sessions within this subarea. ENHADDR=NO (the default) indicates that VTAM cannot assign such element addresses.

The HPR start option specifies the level of HPR support provided by VTAM. HPR=RTP indicates that this VTAM network node provides RTP-level HPR support, meaning that it can be the endpoint of an HPR route. RTP is the default HPR value for VTAM network nodes that do not specify HOSTSA.

The HPRPST start option allows you to specify the maximum amount of time that VTAM will continue trying to path-switch before terminating the RTP logical connection. The HPRPST start option value is valid only if the HPR=RTP start option has been coded. In the sample below, HPRPST=(30M,1M,20S) sets a limit of 30 minutes for path switch attempts of RTP connections using low transmission priority classes of service, 1 minute for medium, and 20 seconds for high. The default is 60 seconds (for all three priorities).

ROUTERES=1 indicates that it is highly desirable to have this node provide intermediate session routing. During route calculation, this value would be compared with the ROUTERES values of other network nodes.

The start option INITDB specifies whether the directory services and topology and routing services databases are loaded when VTAM is started. INITDB=ALL (the

default value) specifies that both databases are loaded at that time. The INITDB start option is meaningful only if the NODETYPE=NN start option is also specified.

The LIMINTCP start option specifies the number of seconds to retain free SNASVCMG sessions on limited resources for the control point. CP SNASVCMG sessions are used for some network management flows. This option has effect only for network connections defined as limited resources. Network connections are defined as limited resources by specifying LIMRES=YES on the applicable GROUP, LINE, or PU definition statements.

The setting of the SSEARCH start option determines whether the subarea network is searched when search requests from the APPN network arrive at an interchange node. SSEARCH=YES (the default value) indicates that the subarea network is to be searched. Resources in the domain of the interchange node are found even if SSEARCH=NO is specified. You can change the value of SSEARCH with the MODIFY VTAMOPTS command while VTAM is running.

The STRGR start option allows you to rename the generic resources structure. STRGR is a valid start option only on an APPN node (running, at a minimum, MVS/ESA V5R1) that is part of a sysplex environment. An MVS coupling facility is also required. STRGR=ISTGENERIC specifies the IBM-supplied generic resources structure. ISTGENERIC is the default value. Typically, ISTGENERIC is used for the generic resources structure used to run a production environment in a sysplex. For a test environment in the same sysplex, you should define your own name. This name must conform to the restrictions specified in *VTAM Resource Definition Reference*. For an example, see “End Node Start Option List” on page 184.

The VERIFYCP start option is used to specify whether VTAM is to perform LU-LU session-level verification during activation of LU 6.2 sessions involving control points. VERIFYCP=NONE specifies that no verification of the partner LU's identity is to take place during session activation.

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option may allow you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The VFYREDTI start option specifies the amount of time resource verification reduction is to be performed before the resource's location is verified. VFYREDTI=8H specifies 8 hours as the amount of time resource verification reduction is to be performed. For more information about the VFYREDTI start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The TRACE,TYPE=VTAM,OPT=ALL start option indicates that all VTAM internal trace options should be started. A new VTAM internal trace option, CMIP, has been added by VTAM V4R3. It generates entries that help you determine whether a CMIP problem is in VTAM or in a CMIP application program. You can explicitly enable the CMIP trace option by specifying OPT=CMIP. Specifying OPT=ALL automatically enables the CMIP trace option, along with all other VTAM internal trace options. Another new VTAM internal trace option, HPR, has been added by VTAM V4R3. It generates entries that help you isolate problems related to high

performance routing. You can explicitly enable the HPR trace option by specifying OPT=HPR. Specifying OPT=ALL automatically enables the HPR trace option, along with all other VTAM internal trace options.

The TRACE,TYPE=BUF,ID=ISTNOTIF start option specifies that a VTAM buffer trace is to be started for notification services. The buffer trace will trace event notification activity between the VTAM topology agent and notification services of CMIP services. Make sure that GTF with the TRACE=USR option is active before starting this trace.

```

* =====> BEGINNING OF DATA SET ATCSTREA

* NAME: ATCSTREA (VTAM START LIST FOR HOST EA)

APPNCOS=NONE, NO BACKUP APPN CLASS OF SERVICE X
SSCPID=4, HOST ID X
SSCPNAME=SSCPEA HOST NAME X
CONFIG=EA, START CONFIG LIST X
NETID=NETA, IN NETA X
NODETYPE=NN, PURE APPN NN, NO SUBAREA CAPABILITIES X
AUTORTRY=AUTOCAP, AUTOLOGON RETRY ACTIVATION VALUE X
AUTOTI=0, NO PERIODIC AUTOLOGON RETRIES X
BN=NO, NO EXTENDED BORDER NODE FUNCTION X
CDSERVR=NO, NOT A CENTRAL DIRECTORY SERVER X
CDSREFER=3, REFER TO 3 NEAREST CENTRAL DIRECTORY SERVERS X
CINDXSIZ=8176, CIT & CONVT INDEX TABLE SIZE X
CONNTYPE=APPN, APPN CONNECTIONS FOR APPN PUS X
CPCP=YES, CP-CP SESSION CAPABLE X
DIRSIZE=0, NO UPPER LIMIT ON DYNAMIC APPN RESOURCES X
DIRTIME=8D, AFTER 8 DAYS UNUSED APPN RESOURCES DELETED X
DISCNTIM=15, SSCP-PU DEACTIVATION DELAY X
DLRTCB=32, TCBS FOR DUMP/LOAD/RESTART AND FILE I/O X
DYNADJCP=YES, DYNAMIC ADJACENT CP X
DYNLU=YES, DYNAMIC LU X
ENHADDR=NO, NO HIGH-ORDER ELEMENT ADDRESSES FOR PLUS X
HPR=RTP, RTP-LEVEL HPR SUPPORT X
HPRPST=(30M,1M,20S), HPR PATH SWITCH TIMER VALUES X
INITDB=ALL, LOAD APPN DATABASES AT VTAM START X
LMINTCP=29, CP SNASVCMG LIMITED RESOURCE INTERVAL X
SSEARCH=YES, SEARCH IN SUBAREA NETWORK X
STRGR=ISTGENERIC, GENERIC RESOURCE STRUCTURE NAME X
VERIFYCP=NONE, VERIFY CP (DEFAULT) X
VFYRED=YES, LU 6.2 VERIFICATION REDUCTION X
VFYREDTI=8H, VERIFICATION REDUCTION TIMER VALUE X
TRACE, X
 TYPE=VTAM, X
 OPT=ALL, ALL INTERNAL TRACE TYPES STARTED X
 SIZE=200, START VIT X
TRACE, X
 TYPE=BUF, X
 ID=ISTNOTIF, START BUFFER TRACE FOR NOTIFICATION SERVICES X
 AMOUNT=FULL, REQUIRED FOR ISTNOTIF X
 CRPLBUF=(200), PAGEABLE RPL POOL X
 LFBUF=(100,,10,,10,33), FIXED LARGE BUFFER POOL X
 LPBUF=(64,,4,,4,22), PAGEABLE LARGE BUFFER POOL X
 SFBUF=(60), FIXED SMALL BUFFER POOL X
 SPBUF=(32), PAGEABLE SMALL BUFFER POOL X
ROUTERES=1 ROUTE ADDITION RESISTANCE VALUE X
* =====> END OF DATA SET ATCSTREA

```

---

## End Node Start Option List

An end node is an APPN node that relies on the services of a network node to provide directory and route selection services. It does this by registering its resources to a network node server. An end node is conceptually located on the periphery of an APPN network, as shown in Figure 32.

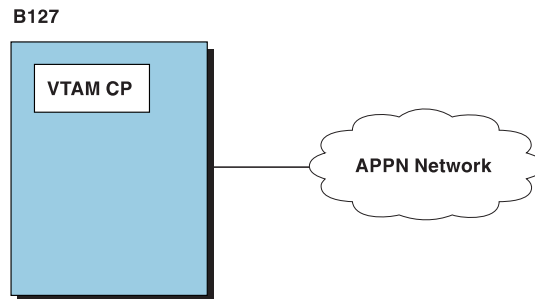


Figure 32. VTAM End Node B127 in an APPN Network

The following sample shows the start options for B127. It is the combination of `NODETYPE=EN` and `HOSTSA` not coded that defines this node as a pure end node. `CPCP=YES` allows this end node to activate CP-CP sessions with an adjacent network node, acting as the end node's network node server. The end node is permitted to activate CP-CP sessions with only one adjacent network node (its network node server) at a time.

`NETID`, `SSCPID`, and `SSCPNAME` are required start options. `HOSTPU` is not required. However, it is recommended if you are using NetView because NetView uses the name specified to determine which VTAM host physical unit it is tracing. The `CONFIG` start option identifies a unique name of the configuration list to be activated when VTAM starts.

The `CINDXSIZ` start option specifies the maximum size of the CID and CONVID index tables. The new default value is 8176 bytes.

The `CONNTYPE` start option specifies for a type 2.1 PU whether the connection is established as a LEN connection or attempted as an APPN connection. `CONNTYPE=APPN` (the default) specifies that the connection is attempted as an APPN connection.

The `HPR` start option specifies the level of HPR support provided by VTAM. `HPR=RTP` indicates that this VTAM end node provides RTP-level HPR support, meaning that it can be the endpoint of an HPR route. RTP is the default HPR value for VTAM end nodes.

The `STRGR` start option allows you to rename the generic resources structure. `STRGR` is a valid start option only on an APPN node running MVS/ESA V5R1 (at a minimum). A sysplex environment and an MVS coupling facility are also required. If this system is part of a sysplex, and this system is being used for test purposes, `STRGR=ISTGENERIC_TEST` would specify `ISTGENERIC_TEST` as the name of the generic resource structure used by this system. The name you choose must conform to the restrictions specified in *VTAM Resource Definition Reference*

The VERIFYCP start option is used to specify whether VTAM is to perform LU-LU session-level verification during activation of LU 6.2 sessions involving control points. VERIFYCP=NONE specifies that no verification of the partner LU's identity is to take place during session activation.

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option allows you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

```
* =====> BEGINNING OF DATA SET ATCSTR27

* ATCSTR27 - VTAM START LIST FOR AN APPN END NODE - B127 *

 CINDXSIZ=8176, ** CIT & CONVT INDEX TABLE SIZE **X
 CONFIG=27, ** MAJOR NODE ACTIVATION CONFIG LIST **X
 CONNTYPE=APPN, ** APPN CONNECTION TO APPN PU **X
 CPCP=YES, ** CP-CP SESSION **X
 HOSTPU=B127NPU, ** HOST SUBAREA PU NETWORK NAME **X
 HPR=RTP, ** RTP-LEVEL HPR SUPPORT **X
 NETID=NETB, ** HOST NETWORK IDENTIFIER **X
 NODETYPE=EN, ** END NODE **X
 SSCPID=1027, ** UNIQUE SSCP IDENTIFIER **X
 STRGR=ISTGENERIC_TEST, ** GENERIC RESOURCES STRUCTURE **X
 VERIFYCP=NONE, ** PARTNER LU VERIFICATION **X
 VFYRED=YES, ** LU 6.2 VERIFICATION REDUCTION **X
 SSCPNAME=B127N ** GATEWAY SSCP NAME **
* =====> END OF DATA SET ATCSTR27
```

---

## Interchange Node Start Option List

An interchange node combines the function of a subarea node and a network node. It resides on the border of an APPN network and a subarea network. It provides protocol conversion between subarea and APPN networks to enable the integration of APPN and subarea networks. For more information about interchange nodes, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

Below is the start list for A01. It is the combination of NODETYPE=NN and HOSTSA=01 as shown below that defines this node as an interchange node. CPCP=YES enables this node for CP-CP sessions with all adjacent APPN nodes.

NETID, SSCPID, and SSCPNAME are required start options. HOSTPU is not required. However, it is recommended if you are using NetView. The CONFIG start option identifies a unique name of the configuration list to be activated when VTAM starts.

The CINDXSIZ start option specifies the maximum size of the CID and CONVID index tables. The new default value is 8176 bytes.

DYNLU=YES enables dynamic definition of independent LUs using CDRSC definitions.

AUTHLEN=YES means that VTAM will forward the transmission priority specified from one LEN node to another LEN node.

AUTORTRY specifies whether adjacent node activation will cause a retry of pending automatic logon requests and, if it does, what kinds of adjacent nodes will cause such retries upon activation. AUTORTRY=AUTOCAP (the default) specifies that such requests are retried only when an adjacent CDRM or an adjacent CP that supports automatic logon is activated.

The AUTOTI start option allows you to specify how often pending automatic logon requests owned by this host are retried. AUTOTI=0 (the default) specifies that such requests are not retried periodically.

The BN start option specifies whether this node is to provide extended border node function. BN=NO (the default value) specifies that it does not provide this function. The BN start option is meaningful only for nodes that specify NODETYPE=NN.

The start option CDSERVER=NO specifies that this network node will not be a central directory server. NO is the default value.

The start option CDSREFER=3 specifies that this network node only refers to the three closest (minimal weight route) central directory servers in the network. For more information on the CDSREFER start option, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The DISCNTIM start option specifies the amount of time that VTAM delays deactivation of the SSCP-PU session when there are no outstanding LU-LU session requests. This option is valid only for PU types 2 and 2.1 that have DISCNT=DELAY specified on the PU definition statement. DISCNTIM=15 (the default value) specifies this amount of time as 15 seconds. You can change the value of DISCNTIM with the MODIFY VTAMOPTS command while VTAM is running.

DYNADJCP=YES specifies that ADJCP minor nodes will be created as needed and placed in the ISTADJCP major node. This option defaults to YES.

The start option INITDB specifies whether the directory services and topology and routing services databases are loaded when VTAM is started. INITDB=ALL (the default value) specifies that both databases are loaded at that time. The INITDB start option is meaningful only if the NODETYPE=NN start option is also specified.

ENHADDR=YES specifies that VTAM can assign element addresses greater than 65,535 for PLUs.

The HPR start option specifies the level of HPR support provided by VTAM. HPR=ANR indicates that this VTAM network node provides ANR-level HPR support, meaning that it can be an intermediate node on an HPR route, but it cannot be the endpoint of an HPR route. ANR is the default HPR value for VTAM network nodes that also specify HOSTSA. The value HPR=RTP is not valid for VTAM interchange nodes.

NQNMOME=NQNAME indicates that VTAM defines cross-network resources by their network-qualified names only.

The ROUTERES (routing resistance) start option is used to specify the relative desirability for this node to perform the intermediate session routing function. The value specified must be in the range 0-255. The lower the value, the more desirable



it is to have this node provide intermediate session routing. Therefore, ROUTERES=1 indicates that it is highly desirable to have A02 provide this function.

The SORDER start option controls the order in which the APPN and subarea networks are searched when a search request for an unknown LU is received at this node from the subarea network. SORDER=APPN (the default value) specifies that the APPN network is to be searched first. The user may specify that the subarea network is to be searched first (SORDER=SUBAREA).

The SWNORDER start option specifies the way VTAM locates a switched PU. SWNORDER=CPNAME (the default value) specifies that VTAM searches for a switched PU by the CPNAME first and then, if not yet found, by the station identifier (IDBLK and IDNUM operands on the PU definition statement for the switched major nodes).

The VERIFYCP start option is used to specify whether VTAM is to perform LU-LU session-level verification during activation of LU 6.2 sessions involving control points. VERIFYCP=NONE specifies that no verification of the partner LU's identity is to take place during session activation.

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option may allow you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The VFYREDTI start option specifies the amount of time resource verification reduction is to be performed before the resource's location is verified. VFYREDTI=8H specifies that resource verification reduction is to be performed for 8 hours. For more information about the VFYREDTI start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The VRTG start option indicates whether VR-based transmission group connections are to be activated when SSCP-SSCP sessions are established for this node. This option is valid only for interchange nodes and migration data hosts. VRTG=YES indicates that such connections are activated when SSCP-SSCP sessions are established. You can change the value of VRTG with the MODIFY VTAMOPTS command while VTAM is running.

The VRTGCPCP start option indicates whether CP-CP sessions are supported over the VR-based transmission group. This option is meaningful only for interchange nodes and migration data hosts that also specify VRTG=YES. VRTGCPCP=YES (the default value) indicates that CP-CP sessions are supported over VR-based transmission groups.

```
* =====> BEGINNING OF DATA SET ATCSTR01

* ATCSTR01 - VTAM START LIST FOR AN ICN NODE - A01 *

AUTHLEN=YES, ** AUTHORIZE LEN PRIORITY **X
AUTORTRY=AUTOCAP, ** **X
AUTOTI=0, ** **X
BN=NO, ** NO EXTENDED BORDER NODE FUNCTION **X
CDSERVER=NO, ** NOT A CENTRAL DIRECTORY SERVER **X
```

```

CDSREFER=3, ** CENTRAL DIRECTORY SERVER SELECTION**X
CINDXSIZ=8176, ** CIT & CONVT INDEX TABLE SIZE **X
CONFIG=01, ** MAJOR NODE ACTIVATION CONFIG LIST **X
CPCP=YES, ** CP-CP SESSION CAPABLE **X
DISCNTIM=15, ** SSCP-PU DEACTIVATION DELAY **X
DYNADJCP=YES, ** DYNAMIC ADJACENT CP (DEFAULT) **X
DYNLU=YES, ** DYNAMIC LU **X
ENHADDR=YES, ** CAN USE HIGH ORDER ELEMENT ADDRESS**X
HOSTPU=A01NPU, ** HOST SUBAREA PU NETWORK NAME **X
HOSTSA=01, ** UNIQUE SUBAREA ADDRESS **X
HPR=ANR, ** ANR-LEVEL HPR SUPPORT **X
INITDB=ALL, ** BOTH DS AND TRS DATABASES LOADED **X
MSGLEVEL=V4R1, ** MESSAGES **X
NETID=NETA, ** HOST NETWORK IDENTIFIER **X
NODETYPE=NN, ** ICN NETWORK NODE **X
NQNMODE=NQNAME, ** FULLY QUALIFIED NAMES USED **X
ROUTERES=1, ** ROUTING RESISTANCE **X
SORDER=APPN, ** APPN NETWORK SEARCHED FIRST **X
SSCPID=01, ** UNIQUE SSCP IDENTIFIER **X
SSCPNAME=A01N, ** GATEWAY SSCP NAME **X
SWNORDER=CPNAME, ** SWITCHED PU SEARCH ORDER **X
VFYRED=YES, ** LU 6.2 VERIFICATION REDUCTION **X
VFYREDTI=8H, ** VERIFICATION REDUCTION TIMER **X
VRTG=YES, ** VR-BASED TG SUPPORTED **X
VRTGCPCP=YES, ** CP-CP SESSIONS OVER VRTG LINKS **X
VERIFYCP=NONE ** VERIFY CP (DEFAULT) **X
* =====> END OF DATA SET ATCSTR01

```

---

## Composite Network Node Start Option List

A composite network node is composed of a VTAM and any NCPs that it owns. In an APPN network, it functions as a network node and appears to the APPN network as a single node.

A composite network node is defined by coding the HOSTSA start option, specifying the NODETYPE start option as NN, and by activating an NCP from that VTAM. If the composite network node has APPN connections through its NCP, the NCP needs to be at Version 6 Release 2 or greater. In addition, for border node or connection network connections, the NCP needs to be at Version 7 Release 1 or greater.

For an example of a start option list used by a composite network node, see “Interchange Node Start Option List” on page 185.

For more information about composite network nodes, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* .

---

## Migration Data Host Start Option List

A migration data host (MDH) combines the function of an end node with the function and role of a subarea data host. It resides on the border of an APPN network and a subarea network. For more information about migration data hosts, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

The following sample is the start list for A01. It is the combination of NODETYPE=EN and the HOSTSA start option as shown below that defines this node as a migration data host (MDH). CPCP=YES allows this end node to activate CP-CP sessions with an adjacent network node, acting as the end node’s network

node server. The end node is permitted to activate CP-CP sessions with only one adjacent network node (its network node server) at a time.

NETID, SSCPID, and SSCPNAME are required start options. HOSTPU is not required, however, it is recommended if you are using NetView. The CONFIG start option identifies a unique name of the configuration list to be activated when VTAM starts.

The CINDXSIZ start option specifies the maximum size of the CID and CONVID index tables. The new default value is 8176 bytes.

DYNLU=YES enables dynamic definition of independent LUs using CDRSC definitions.

The HPR start option specifies the level of HPR support provided by VTAM. HPR=RTP indicates that this migration data host provides RTP-level HPR support, meaning that it can be the endpoint of an HPR route. RTP is the default HPR value for migration data hosts.

GWSSCP=NO should always be coded for migration data hosts. If it is not, the node will come up successfully, but an error message will be issued.

MSGLEVEL=V4R2 specifies that VTAM issues the V4R2 version of messages listed in *OS/390 eNetwork Communications Server: SNA Messages*

The SORDER start option controls the order in which the APPN and subarea networks are searched when a search request for an unknown LU is received at this node from the subarea network. SORDER=APPN (the default value) specifies that the APPN network is to be searched first. The user may specify that the subarea network is to be searched first (SORDER=SUBAREA).

The VERIFYCP start option is used to specify whether VTAM is to perform LU-LU session-level verification during activation of LU 6.2 sessions involving control points. VERIFYCP=NONE specifies that no verification of the partner LU's identity is to take place during session activation.

The VFYRED start option specifies whether the node should attempt to perform resource verification reduction. VFYRED=YES indicates that LU 6.2 session initiation requests do not need to be delivered to the target LU. Using the VFYRED start option may allow you to significantly reduce directed verification searches. For more information about the VFYRED start option, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

VRTG=YES indicates that a VR-based transmission group connection is to be activated whenever SSCP-SSCP sessions are established for this node. Since both the NODETYPE and HOSTSA start options were used, VRTGCPCP=YES, indicating that CP-CP sessions are supported over VR-based transmission groups, is taken as the default.

SRCHRED=ON specifies that this node reduces searches for resources which are found to be unreachable. The default value for SRCHRED is OFF.

SRCOUNT=100 specifies that requests for a resource are to be limited to 100 before VTAM attempts to locate the resource again. SRCOUNT is meaningful only if search reduction is active. The default value for SRCOUNT is 10.

SRTIMER=1000 specifies that VTAM will not conduct a search for an unreachable resource until 1000 seconds have elapsed.

ENHADDR=YES specifies that VTAM can assign element addresses greater than 65,535 for PLUs.

The TRACE,TYPE=VTAM,OPT=ALL start option indicates that all VTAM internal trace options should be started. A new internal trace option, OPTION=CFS, has been added for the generic resources function.

```
* =====> BEGINNING OF DATA SET ATCSTRV1

* ATCSTRV1 - VTAM START LIST FOR A MIGRATION DATA HOST NODE - A01N *

SSCPID=010001, HOST ID X
MSGLEVEL=V4R2, VTAM V4R2 VERSION OF VTAM MESSAGES X
SORDER=APPN, APPN NETWORK SEARCHED FIRST X
MSGMOD=NO, DO NOT IDENTIFY MESSAGE-ISSUING VTAM MODULE X
SSCPNAME=A01N, HOST NAME X
CONFIG=01, START CONFIG X
CINDXSIZ=8176, CIT & CONVT INDEX TABLE SIZE X
NETID=NETA, IN NETA X
NQNAME=NQNAME, FULLY QUALIFIED NAMES USED X
NODETYPE=EN, END NODE X
HOSTSA=01, SUBAREA HOST NUMBER X
GWSSCP=NO, SSCP CAN NOT BE A GATEWAY SSCP X
DYNLU=YES, DYNAMIC LU X
HPR=RTP, HPR CAPABILITY X
VRTG=YES, VIRTUAL ROUTE-BASED TRANSMISSION GROUPS X
SRCHRED=ON, SEARCH REDUCTION FOR UNREACHABLE RESOURCES X
SRCOUNT=100, SEARCH REDUCTION RESOURCE REQUEST LIMIT X
SRTIMER=1000, SEARCH REDUCTION TIME LIMIT X
TRACE, VTAM INTERNAL TRACE OPTIONS X
TYPE=VTAM, X
OPT=ALL, ALL INTERNAL TRACE TYPES STARTED X
SIZE=500, NUMBER OF PAGES IN INTERNAL TRACE TABLE X
VFYRED=YES, LU 6.2 VERIFICATION REDUCTION X
XNETALS=YES, ALLOWS CONNECTION TO ADJACENT NETWORKS X
ENHADDR=YES, CAN USE HIGH ORDER ELEMENT ADDRESSES FOR PLUSX
CPCP=YES, CP-CP SESSION X
DYNADJCP=YES, DYNAMIC ADJACENT CP (DEFAULT) X
VERIFYCP=NONE, VERIFY CP (DEFAULT) X
CRPLBUF=(200), PAGEABLE RPL POOL X
LFBUF=(100,,10,,10,33), FIXED LARGE BUFFER POOL X
LPBUF=(64,,4,,4,22), PAGEABLE LARGE BUFFER POOL X
SFBUF=(60), FIXED SMALL BUFFER POOL X
SPBUF=(32), PAGEABLE SMALL BUFFER POOL X
* =====> END OF DATA SET ATCSTRV1
```

---

## Start Option List with Border Node Support

A VTAM border node (BN=YES) is an extension to VTAM network node capabilities which allows APPN connectivity between APPN networks and allows partitioning of APPN networks into smaller subnetworks to reduce topology and search activity.

**Note:** NCP Version 7 Release 1 or later is required for border node function through an NCP.

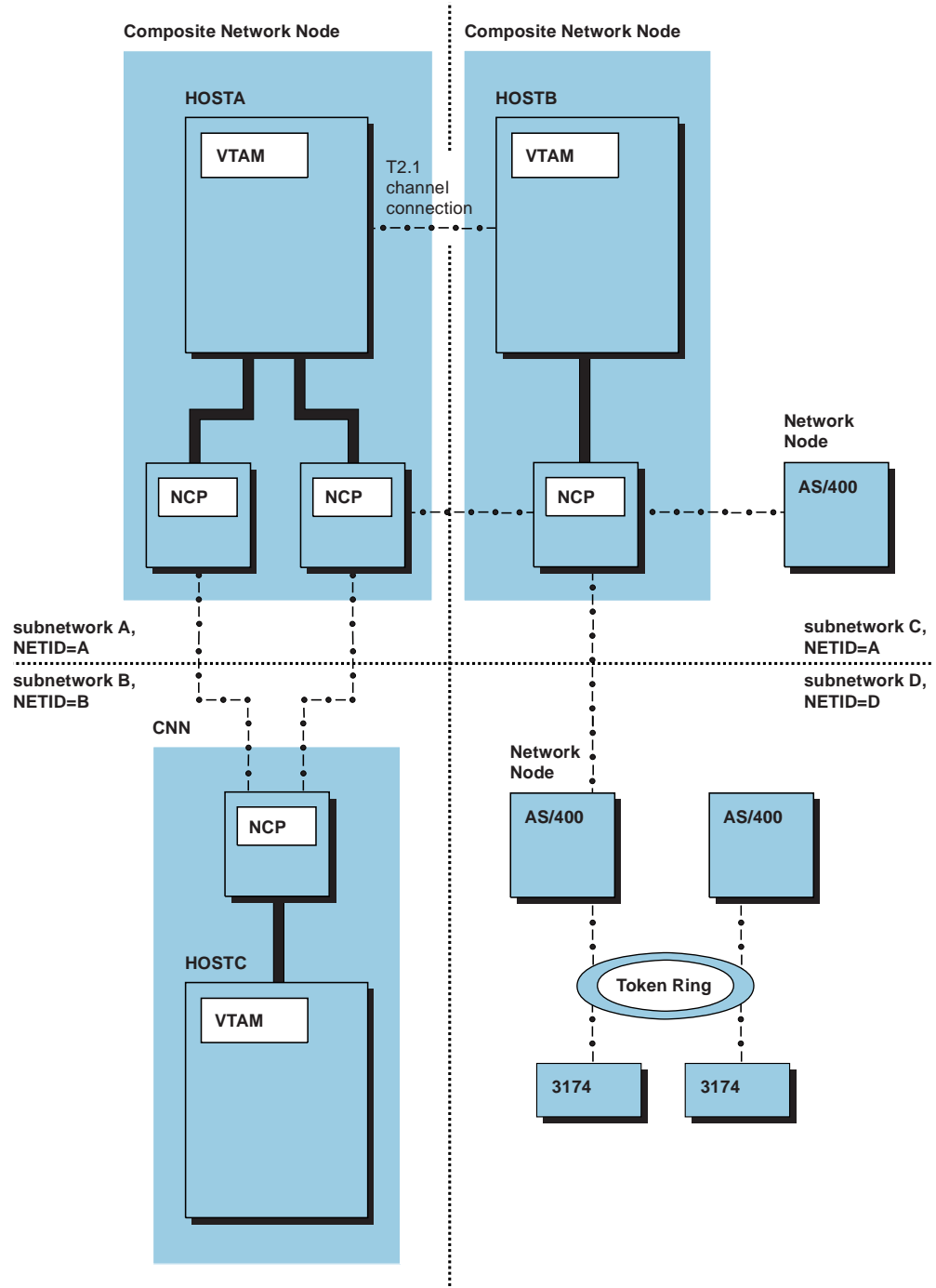


Figure 33. APPN Subnetworks through APPN Multiple Network Connectivity Support

VTAM border node implements extended border node function, which allows two types of subnetwork boundaries. An extended subnetwork boundary interconnects two extended border nodes. A peripheral subnetwork boundary interconnects a border node with a network node which does not have the extended border node function. While the peripheral boundary allows more flexibility concerning the capabilities of the partner node across the boundary, it is limited to supporting searches and sessions where either the origin or destination of the search resides in

the subnetwork of the non-native partner node. See the *OS/390 eNetwork Communications Server: SNA Network Implementation* for more information about border nodes.

In Figure 33 on page 191, the subnetwork boundary between HOSTA and HOSTB is an extended boundary, provided both VTAMs were started with BN=YES. The boundary between HOSTB and the AS/400 in subnetwork D is a peripheral boundary since the AS/400 does not have extended border node capabilities.

On page 192 is a start list for an APPN interchange node implementing the border node function.

The BNDYN start option controls the level of dynamics that VTAM uses when routing a request across APPN subnetwork boundaries. BNDYN=NONE defeats dynamics and requires that adjacent cluster routing lists be defined for all cross-subnetwork routing. BNDYN=LIMITED allows cross-subnetwork routing targets which match the destination resource's network identifier to be included dynamically, in addition to any cross-subnetwork routing targets through which this node has learned the destination resource's network identifier. BNDYN=FULL will exhaustively search all active cross-subnetwork targets in its search for the destination resource. The BNDYN start option is valid only when BN=YES for this node.

The BNORD start option is used to control the search order when searching across subnetwork boundaries. BNORD=PRIORITY (the default) tells VTAM that in performing cross-subnetwork searches VTAM should give preference to nodes for which the most recent search was successful and to nodes whose NETID matches the DLU's NETID. BNORD=DEFINED specifies that searches are performed in the order that you define border nodes and nonnative network nodes. The BNORD start option is valid only when BN=YES for this node.

The SNVC (subnetwork visit count) start option is a number between 1-255 that specifies the maximum number of subnetworks that the border node will search when looking for a resource. SNVC=1 restricts the search to the current network. Thus, SNVC=4 restricts the search to networks three hops away. This start option is valid only when BN=YES for this node.

```
* =====> BEGINNING OF DATA SET ATCSTR01

* ATCSTR01 - VTAM START LIST FOR AN ICN NODE - A01 *

 BN=YES, ** BORDER NODE **X
 BNDYN=FULL, ** DYNAMIC ADJCLUST TABLE **X
 BNORD=PRIORITY, ** TABLE SEARCH ORDER **X
 CONFIG=01, ** MAJOR NODE ACTIVATION CONFIG LIST **X
 CPCP=YES, ** CP-CP SESSION CAPABLE **X
 DYNLU=YES, ** DYNAMIC LU **X
 HOSTPU=A01NPU, ** HOST SUBAREA PU NETWORK NAME **X
 HOSTSA=01, ** UNIQUE SUBAREA ADDRESS **X
 NETID=NETA, ** HOST NETWORK IDENTIFIER **X
 NODETYPE=NN, ** NETWORK NODE **X
 SNVC=4, ** SUBNETWORK VISIT COUNT **X
 SSCPID=01, ** UNIQUE SSCP IDENTIFIER **X
 SSCPNAME=A01N ** GATEWAY SSCP NAME **
* =====> END OF DATA SET ATCSTR01
```

To customize routing for a VTAM border node to match the requirements of your installation, VTAM offers the ability to define adjacent cluster routing lists. For more information on these lists, see “Adjacent Cluster Routing List” on page 206.

An APPN network boundary is automatically established when two APPN network nodes have differing network identifiers. In addition, you can also create a subnetwork boundary by coding the NATIVE operand on the ADJCP statement or PU statement representing a partner APPN network node. For an example of a subnetwork boundary for a local SNA PU (using APPN host-to-host channel) see “Defining Subnetwork Boundaries” on page 75.

---

## Central Directory Server Start Option List

A central directory server is a network node that builds and maintains a directory of resources throughout the network. This directory reduces the number of network broadcast searches to at most one per resource. VTAM network nodes and end nodes register their resources with a central directory server. For additional information on VTAM central directory servers, see the *VTAM Network Implementation Guide*.

In the sample start option list below, the start option CDSERVR=YES means that this node will be a central directory server. Only network nodes can be central directory servers.

NETID, SSCPID, and SSCPNAME are required start options. HOSTPU is not required, however, it is recommended if you are using NetView. The CONFIG start option identifies a unique name of the configuration list to be activated when VTAM starts.

```
* =====> BEGINNING OF DATA SET ATCSTR82

* ATCSTR82 - VTAM START LIST FOR AN APPN NETWORK NODE (PURE) - A82 *

 CDSERVR=YES, ** CENTRAL DIRECTORY SERVER **X
 CONFIG=82, ** MAJOR NODE ACTIVATION CONFIG LIST **X
 CPCP=YES, ** CPCP SESSION **X
 DYNLU=YES, ** DYNAMIC LU **X
 HOSTPU=A82NPU, ** HOST SUBAREA PU NETWORK NAME **X
 NETID=NETA, ** HOST NETWORK IDENTIFIER **X
 NODETYPE=NN, ** NETWORK NODE **X
 SSCPID=82, ** UNIQUE SSCP IDENTIFIER **X
 SSCPNAME=A82N ** GATEWAY SSCP NAME **
* =====> END OF DATA SET ATCSTR82
```

---

## Using MVS System Symbols to Define Start Option Lists

By using MVS system symbols in VTAMLST, you can code a single start option list that can be used to start VTAM on multiple systems. You also can use MVS system symbols to reduce system definition in single system environments.

**Note:** To use MVS system symbols in VTAM, you must have, at a minimum, MVS/ESA V5R2.

For instance, to define a single start option list for use on any of your VTAM interchange nodes you could use the following start option list that uses MVS system symbols.

```

*
* Description: Start definition deck for host 1A
*

```

```

*
SSCPID=0&NUMBER1., Host ID X
SSCPNAME=SSCP&SYSCLONE., Host name X
CONFIG=&SYSCLONE., Start config X
&NET.&ID=&NET.&USERSYM1;, In NETA X
NODETYPE=NN, ICN node X
HOSTSA=0&NUMBER1., Subarea host number X
MAXSUBA=&NUMBER2.&NUMBER5.&NUMBER5., Max Subarea Number X
HOSTPU=PUT5&SYSCLONE., HOST PU X
CPCP=YES, CP-CP session X
DYNADJCP=YES, Dynamic adjacent CP (default) X
ROUTERES=1, Route address X
DYNLU=YES, Dynamic LU X
VERIFYCP=NONE, Verify CP (default) X
CDSERVR=NO, DIRECTORY SERVER X
TRACE, X
 TYPE=VTAM, X
 OPT=ALL, X
 SIZE=200, Start VIT X
CRPLBUF=(&NUMBER2.&NUMBER0.&NUMBER0.), CRPL X
LFBUF=(100,,10,,10,33), Fixed large buffer pool X
LPBUF=(6&NUMBER4.,,&NUMBER4.,,&NUMBER4.,22), X
SFBUF=(60), Fixed small buffer pool X
SPBUF=(32) Pagable small buffer pool X

```

You assign values to MVS system symbols by including definitions for them in the IEASYMM1 parmlib member, as in the sample below:

```

***** IEASYMM1 MEMBER

SYSDEF SYSCLONE(1A)
 SYMDEF(&USERSYM1='A')
 SYMDEF(&USERSYM2='1')
 SYMDEF(&USERSYM3='GUY')
 SYMDEF(&USERSYM4='A1A*')
 SYMDEF(&USERSYM5='APPL1A')
 SYMDEF(&USERSYM6='P')
 SYMDEF(&USERSYM7='SSCPNAME')
 SYMDEF(&NET='NET')
 SYMDEF(&NAME='NAME')
 SYMDEF(&ID='ID')
 SYMDEF(&SSCP='SSCP')
 SYMDEF(&NUMBER0='0')
 SYMDEF(&NUMBER1='1')
 SYMDEF(&NUMBER01='01')
 SYMDEF(&NUMBER2='2')
 SYMDEF(&NUMBER4='4')
 SYMDEF(&NUMBER5='5')
 SYMDEF(&NUMBER10='10')
 SYMDEF(&N60000='60000')
 SYMDEF(&LIST='LIST')
 SYMDEF(&LIST1A='1A')
 SYMDEF(&APPL1A='APPL1A')
 SYMDEF(&PATH1A='PATH1A')
 SYMDEF(&CDRSC1A='CDRSC1A')
 SYMDEF(&CDRM1A='CDRM1A')
 SYMDEF(&HOST1A='1A')
 SYMDEF(&HOST2A='2A')
 SYMDEF(&NETA='2A')
 SYMDEF(&SSCPNAME='SSCP1A')
 SYMDEF(&CONFIG='GM')
 SYMDEF(&APPLNAME='POAPPL1A')
 SYMDEF(&APPL='APPL')
 SYMDEF(&USERXX='XX')
 SYMDEF(&USERYY='YY')
 SYMDEF(&UNET='A')

```



```

SYMDEF(&QUESTION='?')
SYMDEF(&ASTER='*')
SYMDEF(&ER='&')
SYMDEF(&LINE='LINE')
SYMDEF(&TYPE='TYPE')
SYMDEF(&CTC='CTC')
SYMDEF(&PU='PU')
SYMDEF(&LU='LU')

***** LOADM1 MEMBER

```

When these MVS system symbols are resolved, the start list shown above becomes the following:

```

*
* Description: Start definition deck for host 1A
*

*
SSCPID=01, Host ID X
SSCPNAME=SSCP1A, Host name X
CONFIG=1A, Start config X
NETID=NETA, In NETA X
NODETYPE=NN, ICN node X
HOSTSA=01, Subarea host number X
MAXSUBA=255, Max Subarea Number X
HOSTPU=PUT51A, HOST PU X
CPCP=YES, CP-CP session X
DYNADJCP=YES, Dynamic adjacent CP (default) X
ROUTERES=1, Route address X
DYNLU=YES, Dynamic LU X
VERIFYCP=NONE, Verify CP (default) X
CDSERVR=NO, DIRECTORY SERVER X
TRACE,
 TYPE=VTAM,
 OPT=ALL,
 SIZE=200, Start VIT X
CRPLBUF=(200), CRPL X
LFBUF=(100,,10,,10,33), Fixed large buffer pool X
LPBUF=(64,,4,,4,22), Pageable large buffer pool X
SFBUF=(60), Fixed small buffer pool X
SPBUF=(32), Pagable small buffer pool

```



---

## Chapter 17. Configuration Lists

|                                                      |     |                                                             |     |
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---

### About This Chapter

This chapter contains sample configuration lists.

A configuration list specifies the resources that are to be activated automatically when you start VTAM. Writing a configuration list:

- Reduces the amount of operator involvement and the chance of entering incorrect information
- Enables VTAM to initialize the domain faster.

Each entry in the configuration list identifies the name of a member of the VTAM definition library. For more information on implementing configuration lists, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

The rest of this chapter shows sample configuration lists for various types of VTAM nodes.

---

### Configuration List for an Interchange Node

```
* =====> BEGINNING OF DATA SET ATCCON01

* ATCCON01 - VTAM CONFIG LIST FOR AN APPN ICN NODE - A01 *

 A01ADJ, ** ADJACENT SSCP TABLE **X
 A01APPLS, ** HOST APPLICATIONS **X
 A01CDRM, ** CROSS DOMAIN RESOURCE MANAGERS **X
 A01CDRSC, ** CROSS DOMAIN RESOURCES **X
 A01LOCAL, ** LOCAL NON-SNA TERMINALS **X
 A01PATHS ** PATH TABLES **X
* =====> END OF DATA SET ATCCON01
```

---

### Configuration List for a Subarea Node

```
* =====> BEGINNING OF DATA SET ATCCON02

* ATCCON02 - VTAM CONFIG LIST FOR A SUBAREA NODE - SUBAREA A02 *

 A02ADJ, ** ADJACENT SSCP TABLE **X
 A02APPLS, ** HOST APPLICATIONS **X
 A02CDRM, ** CROSS DOMAIN RESOURCE MANAGERS **X
 A02CDRSC, ** CROSS DOMAIN RESOURCES **X
 A02LOCAL, ** LOCAL NON-SNA TERMINALS **X
 A02PATHS ** PATH TABLES **X
* =====> END OF DATA SET ATCCON02
```

---

## Configuration List for a Network Node

**Note:** As you will notice below, the configuration list for an APPN network node does not include entries for an adjacent SSCP table, cross-domain resource manager major node, cross-domain resource major node, or path table. Since an APPN network node does not have subarea capability, these resources have no meaning for that node.

```
* =====> BEGINNING OF DATA SET ATCCON82

* ATCCON82 - VTAM CONFIG LIST FOR AN APPN NETWORK NODE - A82 *

 A82APPLS, ** HOST APPLICATIONS **X
 A82LOCAL ** LOCAL NON-SNA TERMINALS
* =====> END OF DATA SET ATCCON82
```

---

## Configuration List for a Migration Data Host Node

```
* =====> BEGINNING OF DATA SET ATCCON50

* ATCCON50 - VTAM CONFIG LIST FOR AN APPN MDH NODE - A500 *

 A50ADJ, ** ADJACENT SSCP TABLE **X
 A50APPLS, ** HOST APPLICATIONS **X
 A50CDRM, ** CROSS DOMAIN RESOURCE MANAGERS **X
 A50CDRSC, ** CROSS DOMAIN RESOURCES **X
 A50LOCAL, ** LOCAL NON-SNA TERMINALS **X
 A50PATHS ** PATH TABLES
* =====> END OF DATA SET ATCCON50
```

---

## Configuration List for an End Node

**Note:** As you will notice below, the configuration list for an APPN end node does not include entries for an adjacent SSCP table, cross-domain resource manager major node, cross-domain resource major node, or path table. Since an APPN end node does not have subarea capability, these resources have no meaning for that node.

```
* =====> BEGINNING OF DATA SET ATCCON27

* ATCCON27 - VTAM CONFIG LIST FOR AN APPN END NODE - B127 *

 B27APPLS, ** HOST APPLICATIONS **X
 B27LOCAL ** LOCAL NON-SNA TERMINALS

```

---

## Configuration List Using MVS System Symbols

By using MVS system symbols in VTAMLST, you can code a single configuration list that can be used to start VTAM on multiple systems.

**Note:** To use MVS system symbols in VTAM, you must have, at a minimum, MVS/ESA V5R2.

The following configuration list is coded using MVS system symbols.

```

*
* Description: Configuration definition deck for host 1A
*

CDRSC&SYSCONE.,
PATH&SYSCONE.,
APPL&USERSYM2.&USERSYM1.,
CDRM&SYSCONE.

```

```

X
X
X

```

You assign values to MVS system symbols by including definitions for them in the IEASYMM1 parmlib member, as in the sample below:

```

***** IEASYMM1 MEMBER

SYSDEF SYSCONE(1A)
 SYMDEF(&USERSYM1='A')
 SYMDEF(&USERSYM2='1')

***** LOADM1 MEMBER

```

When these MVS system symbols are resolved, the configuration list shown above becomes the following:

```

*
* Description: Configuration definition deck for host 1A
*

CDRSC1A,
PATH1A,
APPL1A,
CDRM1A

```

```

X
X
X

```



---

## Chapter 18. Table Definitions

|                                                  |     |                                                 |     |
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---

### About This Chapter

This chapter contains sample definitions (or references sample definitions) for VTAM's user-defined tables.

---

### Adjacent SSCP Table

The adjacent SSCP table is only used by nodes with subarea capability. Thus, nodes which have APPN capability but not subarea capability do not use adjacent SSCP tables.

The adjacent SSCP table contains lists of adjacent SSCPs that can be in session with a host VTAM or be used to establish sessions with SSCPs in other networks. VTAM searches other SSCPs when it receives a session request for a resource that is not in its domain. First, it sends a session initiation request to the SSCP specified in the CDRM operand of that resource's CDRSC statement. If a CDRM is not coded, and you have defined a default SSCP list, VTAM sends the session setup request for the undefined destination logical unit to each SSCP in the list until either the owning SSCP is found or the end of the list is reached. You can also allow VTAM to dynamically define an adjacent SSCP table by coding the start option DYNASSCP=YES or letting it default.

To improve SSCP search performance, you can use the adjacent SSCP selection function of the session management exit routine to shorten or reorder the list of adjacent SSCPs to which an LU-LU session request is directed.

For more information about adjacent SSCP tables, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The adjacent SSCP tables for the subarea-capable nodes in the network depicted by Figure 10 on page 36 are shown below.

## Adjacent SSCP Table for Host C01

The first two ADJCDRM statements in the following sample comprise a default SSCP list because they are not preceded by any CDRM or NETWORK statement. A17N and B01N comprise a default list that C01 will use for routing throughout the SNA-interconnected network when either of the following is true:

- The network of the destination logical unit (DLU) is unknown.
- The destination network's ID is known, but no adjacent SSCP tables are defined which correspond to the destination network.

The default list for NETA is A17N and B01N. The default list for NETB is B01N and A17N.

If the destination CDRM is known to be A17N, A500N, or A01N in network NETA, the adjacent list is comprised of A17N.

```
* =====> BEGINNING OF DATA SET C01ADJ

C01N VBUILD TYPE=ADJSSCP
A17N ADJCDRM
B01N ADJCDRM

* NETWORKA ADJSSCPS *

NETA NETWORK NETID=NETA
A17N ADJCDRM
B01N ADJCDRM
A17N CDRM
A500N CDRM
A01N CDRM
A17N ADJCDRM
A02N CDRM
A17N ADJCDRM
A81N CDRM
A17N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
A17N ADJCDRM
B01N CDRM
B128N CDRM
B01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET C01ADJ
```

## Adjacent SSCP Table for Host A01

```
* =====> BEGINNING OF DATA SET A01ADJ

A01N VBUILD TYPE=ADJSSCP
A02N ADJCDRM
A17N ADJCDRM
A81N ADJCDRM
A500N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
A17N ADJCDRM
B01N CDRM
B128N CDRM
```



```

B01N ADJCDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N CDRM
C01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET A01ADJ

```

## Adjacent SSCP Table for Host A02

```

* =====> BEGINNING OF DATA SET A02ADJ

A02N VBUILD TYPE=ADJSSCP
A01N ADJCDRM
A17N ADJCDRM
A81N ADJCDRM
A500N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
A17N ADJCDRM
B01N CDRM
B128N CDRM
B01N ADJCDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET A02ADJ

```

## Adjacent SSCP Table for Host A17

```

* =====> BEGINNING OF DATA SET A17ADJ

A17N VBUILD TYPE=ADJSSCP
A01N ADJCDRM
A02N ADJCDRM
A81N ADJCDRM
A500N ADJCDRM
B01N ADJCDRM
C01N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
C01N ADJCDRM
B01N CDRM
B128N CDRM
B01N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
B01N ADJCDRM
* =====> END OF DATA SET A17ADJ

```

## Adjacent SSCP Table for Host A500

```
* =====> BEGINNING OF DATA SET A50ADJ

A500N VBUILD TYPE=ADJSSCP
A01N ADJCDRM
A02N ADJCDRM
A17N ADJCDRM
A81N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
A17N ADJCDRM
B01N CDRM
B128N CDRM
B01N ADJCDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET A50ADJ
```

## Adjacent SSCP Table for Host A81

```
* =====> BEGINNING OF DATA SET A81ADJ

A81N VBUILD TYPE=ADJSSCP
A01N ADJCDRM
A02N ADJCDRM
A17N ADJCDRM
A500N ADJCDRM

* NETWORKB ADJSSCPS *

NETB NETWORK NETID=NETB
B01N ADJCDRM
A17N ADJCDRM
B01N CDRM
B128N CDRM
B01N ADJCDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET A81ADJ
```

## Adjacent SSCP Table for Host B01

```
* =====> BEGINNING OF DATA SET B01ADJ

B01N VBUILD TYPE=ADJSSCP
B128N ADJCDRM
A17N ADJCDRM

* NETWORKA ADJSSCPS *

NETA NETWORK NETID=NETA
A17N ADJCDRM
A17N CDRM
```

```

A500N CDRM
A01N CDRM
A17N ADJCDRM
A02N CDRM
A17N ADJCDRM
A81N CDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET B01ADJ

```

## Adjacent SSCP Table for Host B128

```

* =====> BEGINNING OF DATA SET B28ADJ
B128N VBUILD TYPE=ADJSSCP
B01N ADJCDRM

* NETWORKA ADJSSCPS *

NETA NETWORK NETID=NETA
A17N ADJCDRM
B01N ADJCDRM
A17N CDRM
A500N CDRM
A01N CDRM
A17N ADJCDRM
A02N CDRM
A17N ADJCDRM
A81N CDRM
A17N ADJCDRM

* NETWORKC ADJSSCPS *

NETC NETWORK NETID=NETC
C01N ADJCDRM
B01N ADJCDRM
A17N ADJCDRM
* =====> END OF DATA SET B28ADJ

```

## Defining an Adjacent SSCP List for CDRSCs

You can assign a list of adjacent SSCPs to a CDRSC as the route to use for cross-domain and cross-network session requests. The list defines the only routes available when establishing a session with this resource. If these routes are not available, the session fails. This function should be used when close control of route selection is desirable.

To define a list of adjacent SSCPs code an ADJLIST definition statement in the adjacent SSCP table. VTAM builds the adjacent SSCP list from the ADJCDRM definition statements which follow one or more ADJLIST statements.

The name of the ADJLIST definition statement defines the name of the adjacent SSCP list. This name is used by the ADJLIST operand on the CDRSC definition statement for a resource to specify which adjacent SSCPs should be used for all session setup requests for that resource. Only one adjacent list may be specified for a specific cross-domain resource.

The sample adjacent SSCP table below defines four adjacent SSCP lists: LIST1, LIST2, LIST3, and LIST4. LIST1 and LIST3 are identical. See “Adjacent SSCP Lists for CDRSCs” on page 30 for the corresponding CDRSC cross-domain resource major node. That cross-domain resource major node defines cross-domain resources that specify LIST1, LIST2, LIST3, and LIST4 as their adjacent SSCP lists.

The NETID operand is omitted from the NETWORK statement labeled NETB, indicating that the three ADJCDRM statements that follow define a default SSCP list for all networks.

For more information on implementation of adjacent SSCP lists, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

```

* ADJSSCP DECK = ADJ7B FOR HOST SSCP7B *

*
ADJ7B VBUILD TYPE=ADJSSCP
*
LIST1 ADJLIST * list1 and List3 are identical lists
LIST3 ADJLIST
SSCP1A ADJCDRM * sscp1a tried first
SSCP9C ADJCDRM * sscp9c tried next if sscp1a fails
* * no other sscps will be tried
*
LIST2 ADJLIST
SSCP9C ADJCDRM
SSCP1A ADJCDRM
*
LIST4 ADJLIST * use list4 if only sscp1a to be used
SSCP1A ADJCDRM
*
NETB NETWORK
*
SSCP1A ADJCDRM
SSCP2A ADJCDRM
SSCP9C ADJCDRM
*
NETA NETWORK NETID=NETA
*
SSCP2A ADJCDRM
SSCP1A ADJCDRM
*
NETC NETWORK NETID=NETC
*
SSCP9C ADJCDRM
```

---

## Adjacent Cluster Routing List

The adjacent cluster (ADJCLUST) routing list allows you to define which adjacent APPN subnetworks a VTAM border node should search. For each adjacent subnetwork, you can define a list that specifies the adjacent nodes to which a search request is sent. Adjacent cluster routing lists require that the host nodes at which they are installed be defined with the BN=YES start option.

In the sample adjacent cluster table shown below, the VBUILD definition statement identifies A50ADJC1 as an adjacent cluster routing list.

The NETWORK definition statement optionally specifies the NETID operand and the SNVC (subnet visit count) operand. A NETWORK definition statement

indicates the beginning of the definition of a list of adjacent nodes that should be searched when VTAM receives a request to search for a resource with a NETID matching one of those specified on the NETWORK definition statement. Thus, the second NETWORK statement begins the definition of a routing list that is used if the search request is for a resource with the network ID NETA. In addition, the SNVC=5 coded on the third NETWORK statement indicates that the maximum number of subnetworks this border node will search when looking for a resource with either network ID NETB or network ID NETC is 4.

By not coding NETID, you define a default routing list, as illustrated by the first NETWORK definition statement. This routing list is used if

- a non-network qualified request is received, or
- a network qualified request is received and the NETID specified is not defined in any NETWORK statement.

The nodes that make up the routing list are defined by the NEXTTCP definition statements that follow the NETWORK definition statement. Thus, if a search request arrives specifying a resource with NETA as a network ID, NETA.A81N is the next node to be searched for that resource.

The SNVC operand, specified on either the NETWORK or NEXTTCP statement, overrides the value of the SNVC start option for this host. In addition, the SNVC value on the NEXTTCP statement overrides the SNVC value on the preceding NETWORK statement if the SNVC value on the NEXTTCP statement is lower. See “Start Option List with Border Node Support” on page 190 for examples of how to code border node start options.

```
A50ADJC1 VBUILD TYPE=ADJCLUST
*
 NETWORK * Default routing list
A81N NEXTCP CPNAME=NETA.A81N
B01N NEXTCP CPNAME=NETB.B01N,SNVC=4
*
 NETWORK NETID=NETA * NETA routing list
A81N NEXTCP CPNAME=NETA.A81N
*
 NETWORK NETID=(NETB,NETC),SNVC=5 * Routing list for NETA,NETB
C01N NEXTCP CPNAME=NETC.C01N
B01N NEXTCP CPNAME=NETB.B01N,SNVC=4
```

For more information about adjacent cluster tables, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

---

## Border Node Class-of-Service Mapping Definitions

The border node class-of-service (COS) mapping definitions (BNCOSMAP) enable you to define how the COS name from an adjacent APPN network (that is, a nonnative COS name) should be mapped to the local network COS name (that is, the native COS name). The border node COS mapping definitions enables each subnetwork to maintain its own COS names.

A sample BNCOSMAP is found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*. Another one is included below. The VBUILD definition statement marks the beginning of the BNCOSMAP table. A NETWORK definition statement is coded for each network for which you are defining a BNCOSMAP table. The NETID operand on the NETWORK statement specifies the network

identifier of the adjacent network. The MAPSTO definition statement defines the native and nonnative APPN COS mappings. As an example, for NETB, the nonnative COS name #CONNECT maps to the native COS name #INTER.

```
* =====> BEGINNING OF DATA SET COSMAP BNLB10
COSMAP VBUILD TYPE=BNCOSMAP
NETWORKB NETWORK NETID=NETB ADJACENT NETWORK ID
#CONNECT MAPSTO COS=#INTER MAP COS
COS2 MAPSTO COS=COSB MAP COS
NETWORKC NETWORK NETID=NETC ADJACENT NETWORK ID
COS8 MAPSTO COS=COSY MAP COS
COS9 MAPSTO COS=COSZ MAP COS
NETWORKA NETWORK NETID=NETA ADJACENT NETWORK ID
#INTER MAPSTO COS=SNASVCMG MAP COS
SNASVCMG MAPSTO COS=#CONNECT MAP COS
#CONNECT MAPSTO COS=#INTER MAP COS
* =====> END OF DATA SET COSMAP BNLB10
```

For more information on BNCOSMAP, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

---

## Subarea Class-of-Service Mapping Table

A class of service specifies a set of performance characteristics used in routing data between two subareas. To define subarea classes of service, create a class-of-service (COS) table with entries containing lists of routes grouped together on the basis of characteristics such as security, transmission priority, and bandwidth.

VTAM does not provide a default subarea COS table. Any user-specified COS table for routes entirely contained within the same network must be named ISTSDCOS. For information on COS tables for interconnected networks, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*

A sample subarea COS table for routes contained entirely within a single network is shown below. The COSTAB macroinstruction begins the COS table. Each COS macroinstruction defines a class-of-service entry. The VR operand specifies one or more ordered pairs of numbers, where the first number is a virtual route number and the second number is a transmission priority indicator number. The SUBSTUT operand (which is defaulted in each of the COS entries to NO) indicates whether this entry will be substituted when VTAM does not recognize the COS name that is specified. Only one entry in the COS table is allowed to specify SUBSTUT=YES.

The COS entry named ISTVTCOS specifies the routes used for SSCP sessions (SSCP-SSCP, SSCP-PU, and SSCP-LU).

The unnamed COS entry is used when either of the following are true:

- No class-of-service name is obtained from the logon mode entry for an LU-LU session
- No ISTVTCOS entry exists in the COS table, and an SSCP session has been requested.

You need not define a COS table if the only COS names to be used are ISTVTCOS and the unnamed class of service; VTAM uses its own class-of-service defaults.

For more information on subarea class-of-service tables generally, see the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

```

ISTSDCOS COSTAB
COS1 COS VR=((0,1),(1,1),(2,1),(3,1),(4,1),(5,1))
*
COS2 COS VR=((0,1),(2,1),(1,1),(3,1),(4,1),(5,1))
*
COS3 COS VR=((0,1),(3,1),(2,1),(1,1),(4,1),(5,1))
*
COS4 COS VR=((0,1),(4,1),(2,1),(3,1),(1,1),(5,1))
*
COS5 COS VR=((0,1),(5,1),(2,1),(3,1),(4,1),(1,1))
*
COS6 COS VR=((1,1),(0,1),(2,1),(3,1),(4,1),(5,1))
*
COS7 COS VR=((1,1),(2,1),(0,1),(3,1),(4,1),(5,1))
*
COS8 COS VR=((1,1),(3,1),(2,1),(0,1),(4,1),(5,1))
*
COS9 COS VR=((1,1),(4,1),(2,1),(3,1),(0,1),(5,1))
*
COS10 COS VR=((1,1),(5,1),(2,1),(3,1),(4,1),(0,1))
*
COS11 COS VR=((2,1),(0,1),(1,1),(3,1),(4,1),(5,1))
*
COS12 COS VR=((2,1),(1,1),(0,1),(3,1),(4,1),(5,1))
*
COS13 COS VR=((2,1),(3,1),(0,1),(1,1),(4,1),(5,1))
*
COS14 COS VR=((2,1),(4,1),(0,1),(3,1),(1,1),(5,1))
*
COS15 COS VR=((2,1),(5,1),(0,1),(3,1),(4,1),(1,1))
*
COS16 COS VR=((3,1),(0,1),(2,1),(1,1),(4,1),(5,1))
*
COS17 COS VR=((3,1),(1,1),(2,1),(0,1),(4,1),(5,1))
*
COS18 COS VR=((3,1),(2,1),(1,1),(0,1),(4,1),(5,1))
*
COS19 COS VR=((3,1),(4,1),(2,1),(0,1),(1,1),(5,1))
*
COS20 COS VR=((3,1),(5,1),(2,1),(0,1),(4,1),(1,1))
*
COS21 COS VR=((4,1),(0,1),(2,1),(3,1),(1,1),(5,1))
*
COS22 COS VR=((4,1),(1,1),(2,1),(3,1),(0,1),(5,1))
*
COS23 COS VR=((4,1),(2,1),(1,1),(3,1),(0,1),(5,1))
*
COS24 COS VR=((4,1),(3,1),(2,1),(1,1),(0,1),(5,1))
*
COS25 COS VR=((4,1),(5,1),(2,1),(3,1),(0,1),(1,1))
*
COS26 COS VR=((5,1),(0,1),(2,1),(3,1),(4,1),(1,1))
*
COS27 COS VR=((5,1),(1,1),(2,1),(3,1),(4,1),(0,1))
*
COS28 COS VR=((5,1),(2,1),(1,1),(3,1),(4,1),(0,1))
*
COS29 COS VR=((5,1),(3,1),(2,1),(1,1),(0,1),(0,1))
*
COS30 COS VR=((5,1),(4,1),(2,1),(3,1),(1,1),(0,1))
*
COS31 COS VR=((0,2),(1,2),(2,2),(3,2),(4,2),(5,2))
*
COS32 COS VR=((0,2),(2,2),(1,2),(3,2),(4,2),(5,2))
*
COS97 COS VR=((0,2),(3,2),(1,2),(2,2),(4,2),(5,2))
*

```

```

MINCOS1 COS VR=((3,2),(0,2),(1,2),(2,2),(4,2),(5,2))
*
MINCOS2 COS VR=((3,2),(1,2),(0,2),(2,2),(4,2),(5,2))
*
MINCOS3 COS VR=((3,2),(2,2),(0,2),(1,2),(4,2),(5,2))
*
BTBCOS1 COS VR=((4,2),(0,2),(1,2),(2,2),(3,2),(5,2))
*
BTBCOS2 COS VR=((4,2),(1,2),(0,2),(2,2),(3,2),(5,2))
*
BTBCOS3 COS VR=((4,2),(2,2),(0,2),(1,2),(3,2),(5,2))
*
SHR3COS1 COS VR=((5,2),(0,2),(1,2),(2,2),(3,2),(4,2))
*
SHR3COS2 COS VR=((5,2),(1,2),(0,2),(2,2),(3,2),(4,2))
*
SHR3COS3 COS VR=((5,2),(2,2),(0,2),(1,2),(3,2),(4,2))
*
ROUTECOS COS VR=((7,0))
*
 COS VR=((7,2),(0,2),(1,2),(2,2),(3,2),(4,2))
*
ISTVTCOS COS VR=((0,0),(1,0),(2,0),(3,0),(4,0),(5,0),(6,0))
*
 COSEND

```

---

## APPN Class-of-Service Table

IBM provides two sets of COS definitions: COSAPPN and ISTACST2. Each set contains the same seven default APPN COS definitions. However, differences exist in the way four of the seven classes of services are defined in each set.

The definitions in COSAPPN are made up of 8-row LINEROW and NODEROW entries for all classes of service and are appropriate for most sessions.

The definitions in ISTACST2 are made up of 12-row LINEROW entries for the following classes of service: #BATCH, #BATCHSC, #INTER, and #INTERSC. Twelve-row LINEROW entries better enable VTAM to select an optimal route for a session. This is most useful when multiple types of connections with different TG characteristics—for example, channel-to-channel, token-ring network, FDDI LAN, ATM—are used in the network.

The new IBM-supplied APPN COS definitions are in the distribution library, SYS1.ASAMPLIB, under the name

COSAPPN and ISTACST2 are shipped in SYS1.ASAMPLIB. To use, copy the set of definitions into the SYS1.VTAMLST library at VTAM installation. Both sets can be copied into SYS1.VTAMLST but only one set can be active at any time. You do not need to create APPN classes of service unless your network has special requirements.

The APPNCOS definition statement marks the beginning of the definition of an APPN class-of-service. The PRIORITY operand on the APPNCOS statement indicates the transmission priority assigned to the class-of-service. The NETWORK transmission priority of NETWORK, which is used for APPN network services traffic, is valid only for the CPSVCMG and SNASVCMG classes of service. The NUMBER operand enables the user to specify which set of default values is to be used for the APPN COS table.



The LINEROW definition statement contains the operands that specify line characteristics. The NODEROW definition statement contains the operands that specify node characteristics.

The default COSAPPN table is shown in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

For more information on APPN COS definitions, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

## APPN-to-Subarea COS Mapping Table

The APPN-to-subarea COS mapping table (APPNTOSA) allows you to map a particular APPN COS to a subarea COS when transitioning from an APPN network to a subarea network. By coding an APPNTOSA table, you avoid having to change your logon mode table. To use this table you must specify the NODETYPE start option in your start option list. This table is used when in an ICN host, or in the SLU host when the APPNCOS operand is not coded in the logon mode table entry.

DEFAULT=YES indicates that this entry is the default APPN COS for this table. See the sample table below:

```

* *
* TABLE1 - APPN-to-Subarea COS Mapping Table *
* *

TABLE1 VBUILD TYPE=APPNTOSA
#connect MAPSTO COS=cosapp11
#batch MAPSTO COS=cosapp12
#batchsc MAPSTO COS=cosapp13
#inter MAPSTO COS=cosapp14
snasvcmg MAPSTO COS=cosapp15,default=yes
#intersc MAPSTO COS=cosapp16
```

## Subarea-to-APPN COS Mapping Table

The subarea-to-APPN COS mapping table (SATOAPPN) allows you to map a particular subarea COS to an APPN COS when transitioning from a subarea network to an APPN network. By coding a SATOAPPN table, you avoid having to change your logon mode table. To use this table you must specify the NODETYPE start option in your start option list. This table is used when in an ICN host, or in the SLU host when the APPNCOS operand is not coded in the logon mode table entry.

DEFAULT=YES indicates that this entry is the default APPN COS for this table. See the sample SATOAPPN table below:

```

* *
* Sample SATOAPPN COS Mapping Table *
* *

TABLE2 VBUILD TYPE=SATOAPPN
cosapp11 MAPSTO COS=#connect
cosapp12 MAPSTO COS=#batch
```

```
cosapp13 MAPSTO COS=#batchsc
cosapp14 MAPSTO COS=#inter
cosapp15 MAPSTO COS=snasvcmg,default=yes
cosapp16 MAPSTO COS=#intersc
```

---

## Network Node Server List

A network node server is a network node that provides resource location and route selection services to the LUs it serves. A network node server list is defined at a given end node to specify the adjacent network nodes that can act as that end node's network node server. Without a network node server list, an end node establishes CP-CP sessions with the first acceptable network node that it becomes aware of, and this network node then acts as the end node's server.

A network node server list allows you to control which network node is selected by an end node to be its server. For example, you might want to shield a particular network node from network node server responsibilities; acting as a server does involve some overhead, such as originating search requests and issuing domain broadcasts. You might also want to isolate particular end nodes from certain network nodes for security reasons.

To create a network node server list, create a VTAMLST member containing a VBUILD TYPE=NETSRVR definition statement, and one or more NETSRVR definition statements. This member should be installed at the end node. Each NETSRVR definition statement that has a name in its name field corresponds to a specific network node that you want in that list, where the name is the CPNAME of the network node. If desired, you can also include as the last statement in the list a NETSRVR definition statement with no name in its name field. This "nameless" entry allows the end node to select any other known adjacent network node that meets the defined criteria as its network node server.

Below are four sample network node server lists. The first two specify ORDER=FIRST on the VBUILD; the last two specify ORDER=NEXT. ORDER=FIRST specifies that the end node always attempts to find a network node server from the network node server list starting with the first entry. Thus, a prioritized list is created where the most preferred network node server is the first entry, the second most preferred is the second entry, and so on. ORDER=NEXT specifies that the end node attempts to find a network node server starting with the next entry after the network node selected the last time the list was used. When the bottom of the list is encountered, the first entry in the list is considered to be the next entry. Thus, network nodes are selected in a round-robin manner and no preference is given to one node in the list over another node. ORDER=FIRST is the default value.

The SLUINIT operand on the NETSRVR statement is used to restrict the network node server to one that has the same level of support for SLU-initiated sessions as the end node. SLUINIT=REQ (the default) specifies that CP-CP sessions can only be established with a network node that supports SLU-initiated sessions. If you define SLUINIT=OPT, then CP-CP sessions are established with a network node server regardless of whether the network node supports SLU-initiated sessions.

The default network node server list at an end node is considered to be a list consisting of a nameless entry only.

More information on implementing network node server lists is found in the *OS/390 eNetwork Communications Server: SNA Network Implementation* and the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

```

* =====> BEGINNING OF DATA SET NNSLISTM

* SAMPLE NETWORK NODE SERVER LIST WITH PRIORITY PROCESSING *

NNSLIST3 VBUILD TYPE=NETSRVR,ORDER=FIRST
NRRF0001 NETSRVR SLUINIT=OPT
 NETSRVR SLUINIT=OPT
* =====> END OF DATA SET NNSLISTM

* =====> BEGINNING OF DATA SET NNSLIST0

* SAMPLE NETWORK NODE SERVER LIST WITH ROUND-ROBIN PROCESSING *

NNSLIST1 VBUILD TYPE=NETSRVR,ORDER=NEXT
A500N NETSRVR
* =====> END OF DATA SET NNSLIST0

* =====> BEGINNING OF DATA SET NNSLIST1

* SAMPLE NETWORK NODE SERVER LIST WITH ROUND-ROBIN PROCESSING *

NNSLIST1 VBUILD TYPE=NETSRVR,ORDER=NEXT
A500N NETSRVR
A01N NETSRVR
A02N NETSRVR
C11N NETSRVR NETID=NETC
NS2N63 NETSRVR SLUINIT=OPT
CP400C NETSRVR SLUINIT=OPT
* =====> END OF DATA SET NNSLIST1

* =====> BEGINNING OF DATA SET NNSLIST2

* SAMPLE NETWORK NODE SERVER LIST WITH PRIORITY PROCESSING *

NNSLIST2 VBUILD TYPE=NETSRVR,ORDER=FIRST
NS2NUM3 NETSRVR
A500N NETSRVR
A01N NETSRVR
A02N NETSRVR
CP400A NETSRVR
NETC.C11N NETSRVR
* =====> END OF DATA SET NNSLIST2

```

---

## Message-Flooding Prevention Table

VTAM's message-flooding prevention facility identifies and suppresses duplicate messages that are issued in rapid succession. This reduces the possibility of duplicate messages flooding the operator console and concealing critical information.

For each candidate message, the message flooding prevention table contains the criteria that must be met before VTAM suppresses duplicate messages and whether suppressed messages are sent to the hardcopy log. The suppression criteria include the amount of time between the original and subsequent messages, and an indication of which variable text fields are to be compared. If the message is reissued within the specified time interval and the specified variable text fields contain the same information, VTAM suppresses the message.

A message-flooding prevention table is defined using the FLDTAB, FLDENT, and FLDEND macroinstructions.

The LIST keyword of the FLDENT macroinstruction can be used for the first message in a message group. It serves to identify up to 5 other messages, also present as FLDENT entries in the table, that should be linked with the first message in determining whether the message group should be suppressed.

The IBM-supplied default message-flooding prevention table is named ISTMSFLD. The sample definition for ISTMSFLD is found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

For information on how to customize the message-flooding prevention table, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

The FLDTAB start option specifies whether VTAM is to use a message-flooding prevention table. If it is desired, FLDTAB also specifies whether the table to be used is the IBM-supplied table or a user-defined table. See page 176 for more information.

For information on how to use the VTAM MODIFY command to change which message-flooding prevention table is used by VTAM, see the *OS/390 eNetwork Communications Server: SNA Operation*

---

## APPN Transmission Group Profile Definitions

A transmission group profile defines the following set of characteristics for a transmission group:

- Capacity (effective capacity of the link that comprises the TG, in either kilobits or megabits per second)
- Cost-per-byte-transmitted (on a scale of 0 to 255)
- Cost-per-unit-of-time (on a scale of 0 to 255)
- Maximum propagation delay of the link (maximum time needed for a signal to travel from one end of the link to the other)
- Security (the security level of the transmission group).

When an adjacent link station (PU) is activated, VTAM attempts to locate the TG profile specified by the TGP operand of its PU definition statement.

For more information on transmission group profiles, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

The IBM-supplied APPN TG Profile Definitions are found in IBMTGPS. The sample definition for IBMTGPS is found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

---

## Model Name Table

The model name table contains model names that can be passed to VTAM application programs in their LOGON exits. VTAM application programs use the model names to create dynamic definitions for their session-partner resources. IBM does not supply a default model name table.

Operands on an SLU's resource definition associate that SLU with the proper model name data. The MDLTAB operand specifies the model name table to be used and the MDLENT operand specifies the proper entry within the table.

In the sample model name table below, MTAB3 is the name of the model name table. ENTRY1 is the name of the first model name table entry. ENTRY1 specifies JOHN as the model name expected by the subsystem for the terminal. JOHN is therefore the default model name to be used with any PLU.

ENTRY2 is the name of the second model name table entry. ENTRY2 specifies PAUL as the model name expected by the subsystem for the terminal. The first MDLPLU macroinstruction defines model name data for the PLU named APPL1. The model name JONES is sent to the application or to the subsystem during session initiation. The second MDLPLU macroinstruction defines model name data for the PLU named APPL3. That the MODEL operand is omitted from this macroinstruction means that no model name is sent to the application or subsystem during session initiation.

```
MTAB3 MDLTAB
ENTRY1 MDLENT MODEL=JOHN
ENTRY2 MDLENT MODEL=PAUL
ENT2PLU1 MDLPLU PLU=APPL1,MODEL=JONES
ENT2PLU2 MDLPLU PLU=APPL3
```

---

## Associated LU Table

An associated LU table contains associated LU names that can be passed to VTAM application programs in their logon exits. VTAM application programs use the associated LU names to create dynamic definitions for their session-partner resources. These names specify primary and alternate printers that are logically related to the SLU.

Operands on an SLU's resource definition associate that SLU with the proper associated LU data. The ASLTAB operand specifies the associated LU table to be used, and the ASLENT operand specifies the proper entry within the table.

In the sample associated LU table below, the ASLTAB macroinstruction indicates the beginning of the table. The ASLENT macroinstruction indicates the start of an associated LU table entry and optionally builds a default set of associated LU data. ENTRY1 in the table below can be used as an illustration. It specifies ALPHONSE as the primary printer associated with the terminal identified in the SLU's network, and BOREGARD as the alternate printer associated with the terminal as identified in the SLU's network. VTAM uses these values for all PLUs associated with the SLU except for PLUs APPL1 and APPL3. APPL1 will not receive any associated LU data. For APPL3, the primary printer to be associated with the SLU is CHUCK.

```
ATAB1 ASLTAB
ENTRY1 ASLENT PRINTER1=ALPHONSE,PRINTER2=BOREGARD
ENT1PLU1 ASLPLU PLU=APPL1
ENT1PLU2 ASLPLU PLU=APPL3,PRINTER1=CHUCK
ENTRY2 ASLENT PRINTER2=DELBERT
ENT2PLU1 ASLPLU PLU=APPL4,PRINTER1=EDWINA,PRINTER2=FRITZ
ENT2PLU2 ASLPLU PLU=APPL1
ENT2PLU3 ASLPLU PLU=APPL3,PRINTER1=GIGI,PRINTER2=HORACE
```

For more information on associated LU tables, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

---

## Session Awareness Data Filter

VTAM provides a filter to reduce the amount of session awareness (SAW) data that is passed to communication network management (CNM) application programs, such as the NetView program. Using the SAW data filter, only data for sessions that match predefined PLU-SLU name combinations is sent over the CNM interface to the CNM application program.

VTAM includes a default filter, ISTMGC10 in VTAMLIB, that allows data for all sessions to be passed across the CNM interface. You can modify ISTMGC10 or replace it with one of your own using the MODIFY TABLE command.

The text of ISTMGC10 is included below. The KEEPMEM macroinstruction defines the beginning of the data filter and is used to name the filter. The KCLASS macroinstruction below directs VTAM to pass SAW data over the CNM interface for the sessions defined in a subsequent MAPSESS macroinstruction. SAW=YES is the default value. The MAPSESS macroinstruction below specifies that, for any combination of PLU name and SLU name, the KCLASS instruction named DOSAW should be used by VTAM to determine whether SAW data is passed over the CNM interface. That is, VTAM will pass SAW data over the CNM interface for all sessions. The END macroinstruction indicates the end of the SAW data filter.

For more information on implementing your own SAW data filter, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

```
ISTMGC10 KEEPMEM START
DOSAW KCLASS SAW=YES
 MAPSESS KCLASS=DOSAW,PRI=*,SEC=**
 KEEPMEM STOP
 END
```

---

## Logon Mode Table

A logon mode is a set of session protocols expressed as a string of characters called session parameters. These session parameters describe how the session is to be conducted in terms of data compression, data encryption, pacing, class-of-service, RU size, and so on. A logon mode table contains definitions for one or more logon modes.

VTAM has an IBM-supplied logon mode table named ISTINCLM that provides generally accepted session protocols for a basic list of IBM device types. You can define a supplemental logon mode table, and you can then associate it with a logical unit by specifying the table's name in the MODETAB operand of the logical unit's definition statement.

For more information on implementing a logon mode table, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*. The default logon mode table is found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

---

## Session-Level Unformatted System Services Table

The session-level unformatted system services (USS) table contains:

- Definitions for terminal user commands (such as LOGON) that can be received from a terminal
- Messages that VTAM sends to a terminal
- A translation table that is used for character-coded input from the terminal.

The session-level USS table converts character-coded commands that follow the USS command syntax into field-formatted SNA requests. The default session-level USS table is named ISTINCDT.

You can create a supplementary session-level USS table using USS macroinstructions to redefine the VTAM terminal operator commands or messages that you want to change. To associate the new terminal operator commands or messages with a specific LU, either specify the name of the supplementary table on the USSTAB operand of the LU's definition statement or specify the LANGTAB operand on any of the three terminal operator commands: LOGON, LOGOFF, and IBMTEST.

For more information on implementing your own session-level USS table, refer to the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

The default session-level USS table can be found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*.

---

## Operation-Level Unformatted System Services Table

The operation-level unformatted system services (USS) table contains USS commands (such as DISPLAY ROUTE) that can be received from the VTAM operator or a program operator application and messages issued in response to those commands. The default operation-level USS table is named ISTINCNO.

You can create a supplementary operation-level USS table using USS macroinstructions to redefine the VTAM operator commands or messages that you want to change. To specify a supplementary operation-level USS table for the VTAM operator, specify the name of the table on the USSTAB start option. To specify a supplementary operation-level USS table for the program operator, use the SSCPFM and USSTAB operands of the program operator's APPL definition statement.

For more information on implementing your own operation-level USS table, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

A listing of the default operation-level USS table can be found in the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

---

## Interpret Table

When VTAM receives a logon or logoff request, it uses the interpret table to determine which application program is to be notified. The standard logon procedure should meet the needs of most installations. But you can write your own interpret table for special circumstances. For example, the logon sequence you want to use might not follow the syntax for USS commands.

In the sample interpret table below, DINTAB is specified as the name of the interpret table. The first LOGCHAR macroinstruction defines 'ITAPPL1' as the

required part of the logon message for the application program named NETAPPL1. The fourth LOGCHAR macroinstruction defines 'IUVAPPL1' as the required part of the logon message for the USERVAR named UVAPPL1. The ENDINTAB macroinstruction defines the end of the table.

For more information on interpret tables, see the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

```

* INTERPRET TABLE *

XDINTAB INTAB
LOGCHAR APPLID=(APPLICID,NETAPPL1),SEQNCE='ITAPPL1'
LOGCHAR APPLID=(APPLICID,NETAPPL2),SEQNCE='ITAPPL2'
LOGCHAR APPLID=(APPLICID,NETAPPL3),SEQNCE='ITAPPL3'
LOGCHAR APPLID=(APPLICID,NETAPPL5),SEQNCE='ITUVAPPL'
LOGCHAR APPLID=(USERVAR,UVAPPL1),SEQNCE='IUVAPPL1'
LOGCHAR APPLID=(USERVAR,UVAPPL2),SEQNCE='IUVAPPL2'
LOGCHAR APPLID=(USERVAR,UVAPPL3),SEQNCE='IUVAPPL3'
LOGCHAR APPLID=(USERVAR,UVAPPL),SEQNCE='ITUVAPPL'
LOGCHAR APPLID=(USERVAR,UVAPPL),SEQNCE='UVAPPL1'
ENDINTAB
END
```

---

## CNM Routing Table

VTAM refers to a communication network management (CNM) routing table to determine which CNM application program is to receive an unsolicited network-services request unit that requires further processing. The IBM-supplied default CNM routing table is named ISTMGC01. For any user-written application program to use the CNM interface to receive unsolicited request units, write a supplemental table with an entry for each RU. This table should be named ISTMGC00.

A CNM routing table consists of a 12-byte header entry and routing table entries. The 12-byte header entry contains the size and number of routing table entries that follow it. Each routing table entry contains the network services RU type to be routed, followed by the application program name to which the network services RU is to be routed.

A listing of the IBM-supplied CNM routing table is found in *OS/390 eNetwork Communications Server: SNA Customization*

For detailed information on how to implement a user-written CNM routing table, see *OS/390 eNetwork Communications Server: SNA Customization*

---

## Default Logon Mode Table for Dynamic CDRSCs

You can define a default logon mode table for dynamic cross-domain resources. This table is used to correlate a logon mode name with a set of session parameters for a dynamic cross-domain resource session SLU.

You specify the name of this table using the DYNMODTB start option. You can change the DYNMODTB value while VTAM is running by using the MODIFY VTAMOPTS command or the MODIFY TABLE,OPTION=LOAD command.



The following sample of such a table, SMPDYNLM, assigns a different set of session parameters to each of three logon mode names: DYNBATCH, DYNINTER, and DYNDEFLT.

```

* /* START OF SPECIFICATIONS ****
*
01 MODULE-NAME = SMPDYNLM
*
01 DESCRIPTIVE-NAME = DEFAULT LOGON MODE TABLE for Dynamic CDRSCs
*
* To use this table for all dynamic CDRSCs use the following
* START option settings:
*
* DYNMODTB=SMPDYNLM
* and
* DYNDLGMD=DYNBATCH or DYNINTER or DYNDEFLT
*
**** END OF SPECIFICATIONS ***/
EJECT
SMPDYNLM MODETAB
EJECT

*
* LOGMODE TABLE FOR BATCH SESSIONS ON RESOURCES CAPABLE
* OF ACTING AS LU 6.2 DEVICES
*

DYNBATCH MODEENT LOGMODE=DYNBATCH,FMPROF=X'13',TSPROF=X'07',
ENCR=B'0000',SSNDPAC=3,RUSIZES=X'F7F7',
SRCVPAC=3,PSNDPAC=3,APPNCOS=#BATCH

*
* LOGMODE TABLE FOR INTERACTIVE SESSIONS ON RESOURCES
* CAPABLE OF ACTING AS LU 6.2 DEVICES
*

DYNINTER MODEENT LOGMODE=DYNINTER,FMPROF=X'13',TSPROF=X'07',
ENCR=B'0000',SSNDPAC=7,RUSIZES=X'F7F7',
SRCVPAC=7,PSNDPAC=7,APPNCOS=#INTER

*
* LOGMODE TABLE ENTRY THAT SUPPLIES A DEFAULT COS
* AND USES LU 6.2 DEVICE CHARACTERISTICS
*

DYNDEFLT MODEENT LOGMODE=DYNDEFLT,FMPROF=X'13',
TSPROF=X'07',PRIPROT=X'B0',SECPROT=X'B0',
COMPROT=X'D0B1',PSERVIC=X'06020000000000000000300',
RUSIZES=X'8989',ENCR=B'0000',TYPE=0,
APPNCOS=#CONNECT
MODEEND , END OF DEFAULT TABLE ENTRIES
END , END OF SMPDYNLM

```

---

## Directory Definition File for CMIP Services (CMIPDDF)

You use the directory definition file for CMIP services to control access to VTAM CMIP services from CMIP services on other nodes. In this table, you can list the instances of CMIP services on other hosts that the CMIP services on this host can exchange requests and actions with. For more information about coding this table, see the *OS/390 eNetwork Communications Server: SNA Network Implementation*. A sample directory definition file follows:

```
This is a directory definition file for CMIP Services.
```

```
#####
```

```

The class "managed object" maps a resource name to an AE-title.
In this class, each entry consists of a pair of "name" and "aetitle"
attributes. This class continues until the next "class" attribute.
#####
class managed object

#-----#
In the following entry in class "managed object",
all messages from NETA will be directed to the AE-title OSISMASE
(which is CMIP Services) on SSCP1A.
#
Note that a long line can be continued by coding an ampersand as the
last non-blank character. The next line continues in column 1.
#-----#
 name '1.3.18.0.2.4.6=NETA'
 aetitle '1.3.18.0.2.4.6=NETA;2.9.3.2.7.4=(name SSCP1A);&
1.3.18.0.2.4.12=OSISMASE'

#-----#
In the following entry in class "managed object",
all messages from NETA.SSCP1B will be directed to the CMIP
application which registered itself with AE-title "FRED".
#-----#
 name '1.3.18.0.2.4.6=NETB;2.9.3.2.7.4=(name SSCP1B)'
 aetitle '1.3.18.0.2.4.6=NETB;2.9.3.2.7.4=(name SSCP1B);&
1.3.18.0.2.4.12=FRED'

#####
The class "aetitle" is used for security and for addressing.
Each entry in this class may contain the attributes
"name", "address", "associationKey", and/or "timeSync".
#####
class aetitle

#-----#
The following entry in class "aetitle" specifies global defaults.
The name value '*' will match any name not specifically listed
under "class aetitle".
#
The value '-' for attribute "associationKey" means that CMIP Services
will refuse to establish an association with any application
which is not specifically listed in a "name" attribute.
#
CMIP Services will establish a default time synchronization limit of
3 minutes (180 seconds) with the "timeSync" attribute.
#-----#
 name '*'
 associationKey '-'
 timeSync '180'

#-----#
The following entry in class "aetitle" is for a sample
network (SAMPLENW).
#
The value for the "associationKey" attribute is 16 hexadecimal
characters, which means DES encryption will be used for all
associations. These 16 hexadecimal characters are the
DES encryption key.
#-----#
 name '1.3.18.0.2.4.6=SAMPLENW'
 associationKey 'a1b2c2d4e5f67890'

#-----#
The following entry in class "aetitle" is for
Lucy's PS/2 using SNA transport and managing the MVS Agent.
#

```

```

The address of this machine is specified.
#
Security information for application-level authentication MUST be
supplied by applications, as denoted by the "associationKey" value.
#
We need a little more leeway for association requests, indicated by
the "timeSync" value of 600 seconds (10 minutes).
#-----#
name '1.3.18.0.2.4.6=SAMPLENW;2.9.3.2.7.4=(name NR55501);&
1.3.18.0.2.4.12=OSISMASE'
address SAMPLENW.RALVS1
associationKey '.'
timeSync '600'

#-----#
The following entry in class "aetitle" is for CMIP Services on
NETA.SSCP1A.
#
The value '*' for attribute "associationKey" means that CMIP Services
will allow associations to be created with CMIP Services on
NETA.SSCP1A. The value '*' also means that applications are allowed
but not required to specify application-level security information.
A value is required for attribute "associationKey" in order to
override the default value of '-' specified above (for name '*').
#-----#
name '1.3.18.0.2.4.6=NETA;2.9.3.2.7.4=(name "SSCP1A");&
1.3.18.0.2.4.12=OSISMASE'
associationKey '*'

```



---

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## Bibliography

### eNetwork Communications Server for OS/390 V2R5 Publications

Following are descriptions of the books in the eNetwork Communications Server for OS/390 V2R5 library. The books are arranged in the following categories:

- Softcopy Information
- Marketing Information
- Planning
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A Networking Overview and the following IBM Networking Previews are available:

- VTAM

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### Planning

*OS/390 eNetwork Communications Server: SNA Planning and Migration Guide (SC31-8622).* This guide helps you upgrade to eNetwork Communications Server for OS/390 V2R5. It includes:

- Installation procedures
- Planning to upgrade
  - Upward and downward compatibility
  - Software and hardware requirements
  - Storage requirements
  - Impacts of new functions and enhancements performed without changes to user interfaces
  - Changes to installation process
- Upgrading user interfaces
  - Changes to start options
  - Changes to buffer pools
  - Changes to definition statements
  - Changes to IBM-supplied default user-definable tables and modules
  - Changes to user-definable table macroinstructions
  - Changes to commands
  - Changes to messages
  - Changes to SNA application programming interface
  - Changes to installation-wide exit routines
  - Changes to control blocks
- Implementing optional functions and enhancements introduced in eNetwork Communications Server for OS/390 V2R5.
  - Overview of each new function and enhancement introduced since VTAM V4R4
  - Pointers to other books in the library where implementation details can be found.

*OS/390 eNetwork Communications Server: IP Planning and Migration Guide (SC31-8512).* This book is intended to help you plan for TCP/IP whether you are migrating from a previous version or installing TCP/IP for the first time. This book also identifies the suggested and

## Bibliography

required modifications needed to enable you to use the enhanced functions provided with TCP/IP.

## Installation, Resource Definition, Configuration, and Tuning

*Program Directory*. These documents are shipped with the product tape and explains the steps for installing VTAM and TCP/IP.

*OS/390 eNetwork Communications Server: IP Configuration* (SC31-8513). This book is for people who want to configure, customize, administer, and maintain TCP/IP. Familiarity with MVS operating system, TCP/IP protocols, and IBM Time Sharing Option (TSO) is recommended.

*OS/390 eNetwork Communications Server: SNA Network Implementation* (SC31-8563). This book presents the major concepts involved in implementing a SNA network, and includes:

- Buffer pools, slowdown, pacing, storage considerations
- Implementation considerations
- Sample major node definitions
- Migration considerations
- Tables and filters
- TSO, VCNS, and other programs that run with VTAM
- Tuning procedures
- VTAM start options.

Use this book in conjunction with the *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

*OS/390 eNetwork Communications Server: SNA Resource Definition Reference* (SC31-8565). This book describes each VTAM definition statement, start option, and macroinstruction for user tables. It also describes NCP definition statements that affect VTAM. The information includes:

- IBM-supplied default tables (logon mode and USS)
- Major node definitions
- User-defined tables and filters
- VTAM start options.

If you are unfamiliar with the major concepts involved in implementing a SNA network, use this book in conjunction with the *OS/390 eNetwork Communications Server: SNA Network Implementation*.

*OS/390 eNetwork Communications Server: SNA Resource Definition Samples* (SC31-8566). This book contains sample definitions to help you implement VTAM functions in your networks, and includes sample major node definitions. Use this book in conjunction with the *OS/390 eNetwork Communications Server: SNA Network Implementation* and *OS/390 eNetwork Communications Server: SNA Resource Definition Reference*

*OS/390 eNetwork Communications Server: AnyNet SNA over TCP/IP* (SC31-8578). This guide provides information to help you install, configure, use, and diagnose SNA over TCP/IP.

*OS/390 eNetwork Communications Server: AnyNet Sockets over SNA* (SC31-8577). This guide provides information to help you install, configure, use, and diagnose Sockets over SNA. It also provides information to help you prepare application programs to use sockets over SNA.

## Operation

*OS/390 eNetwork Communications Server: IP User's Guide* (GC31-8514). This book is for people who want to use TCP/IP for data communication activities such as FTP and Telnet. Familiarity with MVS operating system and IBM Time Sharing Option (TSO) is recommended.

*OS/390 eNetwork Communications Server: SNA Operation* (SC31-8567). This book serves as a reference for programmers and operators requiring detailed information about specific operator commands. The information includes:

- VTAM commands and start options
- Logon manager commands
- DISPLAY output examples (messages received)
- VSCS commands.

*OS/390 eNetwork Communications Server: Operation Quick Reference* (SX75-0121). This book contains essential information about VTAM operator commands.

*High Speed Access Services User's Guide* (GC31-8676).

## Customization

*OS/390 eNetwork Communications Server: SNA Customization* (LY43-0110). This book enables you to customize VTAM, and includes:



- Communication network management (CNM) routing table
- Logon-interpret routine requirements
- Logon manager installation-wide exit routine for the CLU search exit
- TSO/VTAM installation-wide exit routines
- VTAM installation-wide exit routines:
  - Command verification exit (ISTCMMND)
  - Configuration services XID exit (ISTEXCCS) with description of IBM-supplied default exit
  - Directory services management exit (ISTEXCDM)
  - Generic resource resolution exit (ISTEXCGR)
  - Performance monitor exit (ISTEXCPM)
  - SDDLU exit (ISTEXCSD) with description of IBM-supplied default exit
  - Session accounting exit (ISTAUCAG)
  - Session authorization exit (ISTAUCAT)
  - Session management exit (ISTEXCAA) with example
  - TPRINT processing exit (ISTRAEUE)
  - USERVAR exit (ISTEXCUV) with description of IBM-supplied default exit
  - Virtual route pacing window size calculation exit (ISTPUCWC)
  - Virtual route selection exit (ISTEXCVR).

*OS/390 eNetwork Communications Server: IP Network Print Facility* (SC31-8522). This book is for system programmers and network administrators who need to prepare their network to route VTAM, JES2, or JES3 printer output to remote printers using TCP/IP.

## Writing Application Programs

*OS/390 eNetwork Communications Server: IP API Guide* (SC31-8516). This book describes the syntax and semantics of program source code necessary to write your own application programming interface (API) into TCP/IP. You can use this interface as the communication base for writing your own client or server application. You can also use this book to adapt your existing applications to communicate with each other using sockets over TCP/IP.

*OS/390 eNetwork Communications Server: IP CICS Sockets Guide* (SC31-8521). This book is for people who want to set up, write application programs

for, and diagnose problems with the socket interface for CICS using TCP/IP for MVS.

*OS/390 eNetwork Communications Server: IP IMS Sockets Guide* (SC31-8546). This book is for programmers who want application programs that use the IMS TCP/IP application development services provided by IBM TCP/IP for MVS.

*OS/390 eNetwork Communications Server: IP Programmer's Reference* (SC31-8515). This book describes the syntax and semantics of a set of high-level application functions that you can use to program your own applications in a TCP/IP environment. These functions provide support for application facilities, such as user authentication, distributed databases, distributed processing, network management, and device sharing. Familiarity with the MVS operating system, TCP/IP protocols, and IBM Time Sharing Option (TSO) is recommended.

*OS/390 eNetwork Communications Server: SNA Programming* (SC31-8573). This book describes how to use VTAM macroinstructions to send data to and receive data from (1) a terminal in either the same or a different domain, or (2) another application program in either the same or a different domain. The information includes:

- API concepts
  - Cryptography
  - RUs and exchanges
  - Session establishment and termination
- BIND area format
- Communication Network Management Interface
- Dictionary of VTAM macroinstructions
- OPEN or CLOSE errors
- Operating system differences
- Program Operator Coding requirements
- RAPI DSECTs and control block mappings (ACB, ADSP, BLENT, CV29, EXLST, MTS, NIB, NIB DEVCHAR, NIB PROC, RH, RPL, RPL RTNCD=FDB2=FDBK=DSECT)
- RAPI global variables
- Vector lists
- RPL-based macroinstructions
- RPL RTNCD,FDB2 codes
- User exit routines.

*OS/390 eNetwork Communications Server: SNA Programmers LU 6.2 Guide* (SC31-8581). This book describes how to use the VTAM LU 6.2 application programming interface for host application programs. This book applies to programs that use only LU 6.2 sessions or that

## Bibliography

use LU 6.2 sessions along with other session types. (Only LU 6.2 sessions are covered in this book.) The information includes:

- VTAM's implementation of the LU 6.2 architecture
- Design considerations for LU 6.2 application programs
- Negotiating session limits with partner LUs
- BIND image and response
- Allocating and deallocating conversations
- FMH-5 and PIP data
- Conversation states
- Sending and receiving data
- Using high performance data transfer (HPDT)
- Session- and conversation-level security and data encryption
- Register usage
- Sync point services
- LU 6.2 global variables
- Vector lists
- Sense codes for FMH-7 and UNBIND
- RCPRI, RCSEC codes
- User exit routines.

*OS/390 eNetwork Communications Server: SNA Programmers LU 6.2 Reference* (SC31-8568). This book provides reference material for the VTAM LU 6.2 programming interface for host application programs. The information includes:

- APPCCMD macroinstructions
- Primary and secondary return codes (RCPRI, RCSEC)
- DSECTs
- Examples of using VTAM's LU 6.2 API
- Register usage

*OS/390 eNetwork Communications Server: CSM Guide* (SC31-8575). This book describes how applications use the communications storage manager. The information includes:

- Creating and deleting buffer pools
- Obtaining and freeing buffers
- Return codes and reason codes
- DSECTs

*OS/390 eNetwork Communications Server: CMIP Services and Topology Agent Guide* (SC31-8576). This book describes the Common Management Information Protocol (CMIP) programming interface for application programmers to use in coding CMIP application programs. The book provides guide and reference information about CMIP services and the VTAM topology agent and includes the following topics:

- Management information base (MIB) API functions

- CMIP message strings
- Special CMIP message strings
- Read queue exit routine
- Sample CMIP application program
- VTAM resources as CMIP objects
- Naming conventions for objects
- VTAM resources and OSI states
- Attributes to object cross-reference
- ASN.1 syntax for CMIP messages
- GDMO table format
- ACYAPHDH header file.

## Diagnosis

*OS/390 eNetwork Communications Server: IP Diagnosis* (SC31-8521). This book explains how to diagnose TCP/IP problems and how to determine whether a specific problem is in the TCP/IP product code. It explains how to gather information for and describe problems to the IBM Software Support Center.

*OS/390 eNetwork Communications Server: SNA Diagnosis* (LY43-0079). This book helps you identify a VTAM problem, classify it, and collect information about it before you call the IBM Support Center. The information collected includes traces, dumps, and other problem documentation. The information includes:

- Command syntax for running traces and collecting and analyzing dumps
- VIT entries
- Procedures for collecting documentation (VTAM, TSO)
- VTAM internal trace and VIT analysis tool
- FFST Probes
- Channel programs
- Flow diagrams
- Procedures for locating buffer pools
- CPCB operation codes
- Storage and control block ID codes
- Offset names and locations for VTAM buffer pools.

*OS/390 eNetwork Communications Server: Data Areas Volume 1* (LY43-0111). This book describes VTAM data areas and can be used to read a VTAM dump. It is intended for IBM programming service representatives and customer personnel who are diagnosing problems with VTAM.

*OS/390 eNetwork Communications Server: Data Areas Volume 2* (LY43-0112). This book describes VTAM data areas and can be used to read a VTAM dump. It is intended for IBM programming

service representatives and customer personnel who are diagnosing problems with VTAM.

## Messages and Codes

*OS/390 eNetwork Communications Server: SNA Messages* (SC31-8569). This book describes the following types of messages and other associated information:

- Messages:
  - ELM messages for logon manager
  - IKT messages for TSO/VTAM
  - IST messages for VTAM network operators
  - ISU messages for sockets-over-SNA
  - IVT messages for the communications storage manager
  - IUT messages
  - USS messages
- Other information that displays in VTAM messages:
  - Command and RU types in VTAM messages
  - Node and ID types in VTAM messages
- Supplemental message-related information:
  - Message additions, deletions, and changes
  - Message flooding prevention
  - Message groups and subgroups
  - Message routing and suppression including descriptor codes, routing codes, and suppression levels for ELM, IKT, IST, and ISU messages
  - Message text and description formats
  - Message text of MSGLVL option messages including general information on the MSGLVL option
  - Message text of all VTAM network operator messages including variable field lengths

*OS/390 eNetwork Communications Server: IP Messages Volume 1* (SC31-8517). This volume contains TCP/IP messages beginning with EZA.

*OS/390 eNetwork Communications Server: IP Messages Volume 2* (SC31-8570). This volume contains TCP/IP messages beginning with EZB.

*OS/390 eNetwork Communications Server: IP Messages Volume 3* (SC31-8674). This volume contains TCP/IP messages beginning with EZY, EZZ, and SNM.

*OS/390 eNetwork Communications Server: IP and SNA Codes* (SC31-8571). This book describes codes and other information that display in CS/390 messages:

- Sense codes including VTAM sense code hints, SNA sense field values for RPL-based macroinstructions, and 3270 SNA and non-SNA device sense fields
- Return codes for macroinstructions including ACB OPEN and CLOSE macroinstruction error fields, RTNCD-FDB2 return code combinations, and LU 6.2 RCPRI-RCSEC return codes
- Data link control (DLC) status codes
- Status codes including resource status and session state codes
- Wait state event codes and IDs
- Abend codes
- ATM network-generated cause and diagnostic codes

## APPC Application Suite

*OS/390 eNetwork Communications Server: APPC Application Suite User's Guide* (GC31-8619). This book documents the end-user interface (concepts, commands, and messages) for the AFTP, ANAME, and APING facilities of the APPC application suite. Although its primary audience is the end user, administrators and application programmers may also find it useful.

*OS/390 eNetwork Communications Server: APPC Application Suite Administration* (SC31-8620). This book contains the information that administrators need to configure the APPC application suite and to manage the APING, ANAME, AFTP, and A3270 servers.

*OS/390 eNetwork Communications Server: APPC Application Suite Programming* (SC31-8621). This book provides the information application programmers need to add the functions of the AFTP and ANAME APIs to their application programs.

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## Multiprotocol Transport Networking (MPTN) Architecture Publications

Following are selected publications for MPTN:

## **Bibliography**

*Networking Blueprint Executive Overview*  
(GC31-7057)

*Multiprotocol Transport Networking: Technical Overview* (GC31-7073)

*Multiprotocol Transport Networking: Formats*  
(GC31-7074)

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## **OS/390 Publications**

For information on OS/390 and other products, refer to *OS/390 Information Roadmap* (GC28-1727-04).

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