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Center**

**Technical
Bulletin**

**SNA Networking
Product Overview**

A. H. Shrader

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Technical Bulletin

SNA NETWORKING PRODUCT OVERVIEW

Hank Shrader

**GG22-9386-00
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PREFACE

This bulletin is an updated version of the first half of a Washington Systems Center Technical Bulletin: "SNA Networking Products Overview and SNA Release/Function Guide" (GG22-9256-00). It is a reorganization and significant update to the "SNA Networking Product Overview" presentation.

(It is NOT a presentation on the benefits of SNA, though many of these are covered by the subject matter by default.)

This bulletin cannot be considered all inclusive. For instance, The bulletin DOES NOT contain information about SERIES/1, PC, or DISOSS. It does contain information about protocol converters and host subsystems that might communicate with these products.

Section 2 of the old bulletin contained release/function matrices; these have not been included here because the Network Program Products General Information manual (GC27-0657 or GC23-0108) has now documented these for the major networking products.

This Bulletin DOES contain compatibility matrices for various releases of the products (e.g. which VTAM goes with which NCP); please verify specific configurations with your IBM support representative.

The latest levels of the products, announced through 4Q 1984 are listed in this bulletin.

NOTE: ACF/TCAM V3, is treated as a networking application of ACF/VTAM. As such, it is not listed in the "Access Method" columns in the release matrices. Please consult the specific section on ACF/TCAM Version 3 to verify limitations of ACF/TCAM V3. Compatible products should be determined using the appropriate ACF/VTAM.

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SNA

NETWORKING

PRODUCT

OVERVIEW

INTRODUCTION

This technical bulletin is a texted presentation of IBM's networking product offerings for an SNA environment with limited interfaces to non SNA network attachments (NTO, NPSI and 3710). The product description foils contain release support matrices where appropriate. They can be used to determine compatibility of releases. Specific configurations should be verified with your IBM support representative.

The major sections are:

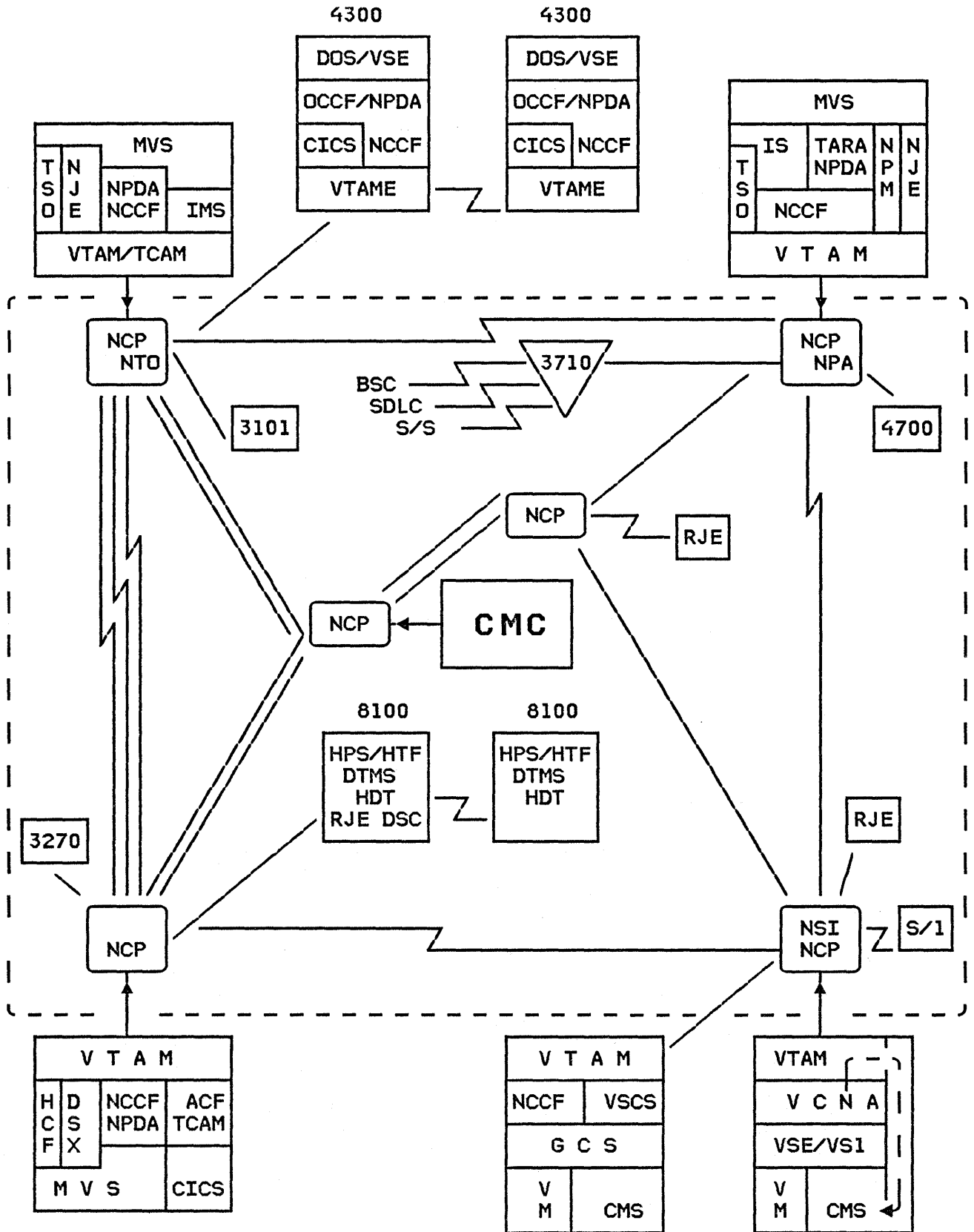
- Overview
- Base Networking Products - Single Domain
- Multiple Domain Environment
- SNA Network Interconnection
- Network Application Products
- Network Management Products
 - Operations
 - Problem Determination
 - Utilities
 - Performance/Monitoring
 - Administration
- Summary

SNA NETWORK CONFIGURATION

The intent of this presentation is to illustrate that a variety of SNA networking products are available and that an installation can establish a network comprised of any or all of the hardware and software components shown in this diagram.

What is illustrated in this network configuration is a number of different implementations of these SNA products. The multiple domain environment, as depicted in this diagram, is the base for different ACF networking applications products (e.g. JES2/NJE, CICS-ISC, IMS-MS, etc.) and network management tools. Distributed data processing (DDP) is shown for 8100's, 4300's, as well as 4700 systems.

The intent of the presentation is not to educate the reader in detail on each product shown in this configuration; instead, it is to show the significant number of IBM SNA product offerings and to convey where and how each one can be utilized in an SNA networking environment.



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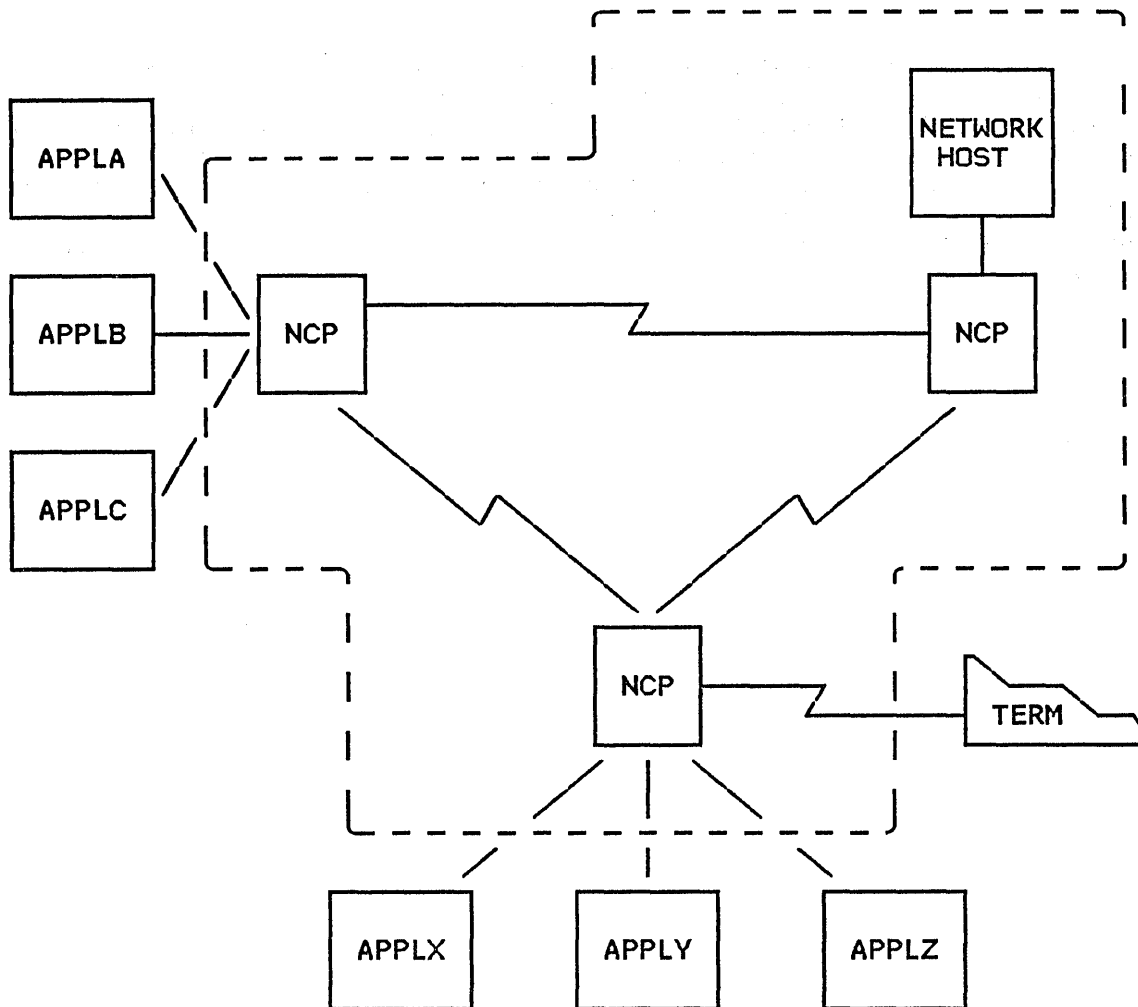
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FOIL 1

COMMUNICATIONS NETWORK

What is networking? As defined here, it is the facility that permits an end user to access any application in any node in a network, often referred to as "any-to-any". It is the ability for any terminal user to access any service (application) in the network or for any application to communicate with any other application in the network. Except for NRF (Foil 16), terminal to terminal communication in today's SNA environment requires the information (data) to always flow through a host node.

COMMUNICATIONS NETWORK



NETWORKING :

A VEHICLE WHICH ALLOWS THE ATTACHMENT
OF DIVERSE END USERS AND PROVIDES FOR
THE INTERCHANGE OF DATA BETWEEN THEM
OR

ANY TO ANY
ANY TERMINAL TO ANY APPLICATION
ANY APPLICATION TO ANY APPLICATION
ANY TERMINAL TO ANY TERMINAL

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FOIL 2

NETWORKING BENEFITS

This list describes some of the potential benefits that can be derived from the establishment of a networking environment. Generally, these benefits fall in two broad categories: more efficient use of an installation's communications facilities and increased functional capabilities.

For example, installations often implement a network in order to reduce the cost of data transmission by sharing communications resources among multiple network services.

Another strong motivation for establishing a network is to increase the accessibility to dispersed services (applications and/or information), a functional capability inherent in a multi-domain environment. This is expanded with Extended Network Addressing (ENA) and SNA Network Interconnection (SNI).

POTENTIAL NETWORK BENEFITS

- MORE EFFICIENT USE OF COMMUNICATION FACILITIES
 - + EXTENDED RESOURCE SHARING:
POTENTIAL DECREASE IN
COMMUNICATION COSTS
 - + ELIMINATION OF SYSTEM REDUNDANCIES:
APPLICATION PROGRAMS AND HARDWARE
 - + POTENTIAL COST REDUCTION:
LOWER ENTRY COST FOR NEW
APPLICATIONS

- INCREASED FUNCTIONAL CAPABILITIES
 - + INCREASED END USER ACCESSIBILITY
TO APPLICATIONS AND INFORMATION
 - + LOCATION OF AN APPLICATION PROGRAM
TRANSPARENT TO END USERS
 - + ABILITY TO ACCESS HOST PROCESSING
 - + IMPROVED BACKUP CAPABILITY OF
CRITICAL APPLICATIONS OR DEVICES

BASE NETWORKING PRODUCTS: EVOLUTION

The intent of this first section is not to review the benefits of SNA. Instead, it is to convey the idea that prior to networking, a single-domain SNA implementation introduced many of the concepts and benefits of multi-domain and multi-network environments. For example, resource sharing was introduced in a pre-SNA environment via the TCAM access method; that is, the communications facilities (e.g. terminals) were owned by the access method and the polling/addressing function was done by a network control program (NCP). This implementation permitted a single terminal to access multiple applications in a single host node.

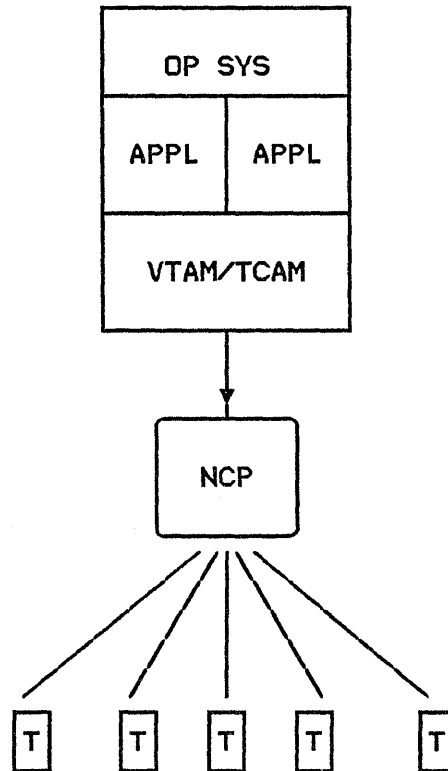
The SNA product line has expanded to include a variety of generally applicable telecommunications software products (e.g. access methods: ACF/TCAM, ACF/VTAM, ACF/VTAME, network control program: ACF/NCP), in addition to subsystems and SNA hardware (e.g. processors, communications controllers, network controllers, modems, protocol converters, and terminals - both general and industry specific).

The next few foils discuss the basic components necessary to implement an SNA network. A subset of the hardware utilized in a networking environment is addressed.

From this point, the format used throughout the presentation is intended to provide some information about the functions and features of each product. Information is provided that indicates the operating systems required, the access methods that could be used, and prerequisite products. An attempt has been made to list compatible combinations. Detailed questions concerning release levels and functions supported should be answered by consulting the Network Program Products General Information manual (GC27-0657 or GC23-0108) or contacting your IBM representative.

NETWORK EVOLUTION

- SINGLE DOMAIN SNA ENVIRONMENT



- OWNERSHIP OF LINES AND TERMINALS BY ACCESS METHOD
- POLLING, ADDRESSING AND MOST ERROR HANDLING BY NCP

BASE NETWORKING PRODUCTS: ACF/VTAM

Clearly, the entry into a networking environment requires some base communications products. The first requirement is a telecommunications access method. IBM offers two different, full function SNA access methods; either or both can be used to implement ACF networking. Shown here is ACF/VTAM and some of its major functions and features. With Version 3, two new functions are added: Extended Network Addressing (discussed later, Foil 25) and Virtual Storage Constraint Relief (VSCR).

ACF/VTAM Version 3 will exploit the 31 bit addressing support provided by MVS/SP Version 2 (MVS/XA). This support extends VTAM's addressing capability in the MVS/XA environment, and allows VTAM to utilize the full two gigabyte address structure provided by MVS/XA. Most of VTAM's modules, common storage, and working set storage have been enhanced to utilize the 31 bit addressing capabilities, thus moving this portion of VTAM above the 24 bit addressing boundary.

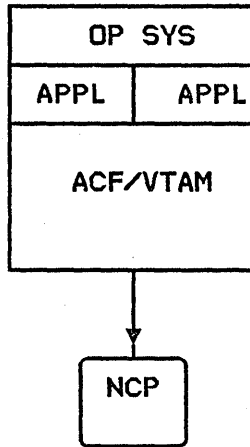
Note:ACF/VTAM V2R1 and V3 for VSE and V3 for VM support the ICA on the 4331 and 4361.

BASE NETWORKING PRODUCTS

ACCESS METHODS :

- **ACF/VTAM**

VIRTUAL TELECOMMUNICATIONS ACCESS METHOD (VS1,MVS: V1R3 5735-RC2)
 (DOS/VSE: V1R3 5746-RC3)
 (VS1-VTAM V2: 5662-280)
 (MVS-VTAM V2: 5665-280)
 (VSE-VTAM V2: 5666-280)
 (MVS/SP-VTAM V3: 5665-313)
 (MVS/XA VTAM V3: 5665-289)
 (DOS/VSE VTAM V3: 5666-313)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE
VSE	ACF/VTAM V1R3,V2R1,V3	NONE
VS1	ACF/VTAM V1R3,V2R1	NONE

FUNCTIONS/FEATURES

- ESTABLISHES, CONTROLS, TERMINATES ACCESS IN THE NETWORK
 - ALLOWS DYNAMIC RESOURCE SHARING
 - TRANSFERS DATA IN THE NETWORK
 - SUPPORTS MULTIPLE APPLICATIONS
 - TERMINAL SUPPORT: SNA, BSC, LOCAL
 - EXTENDED NETWORK ADDRESSING (ENA)
 - MVS/XA 31-BIT ADDRESS EXPLOITATION
- VIRTUAL STORAGE CONSTRAINT RELIEF (VSCR)

BASE NETWORKING PRODUCTS: ACF/VTAM V3 FOR VM/SP

ACF/VTAM V3 for VM/SP, commonly referred to as VM/VTAM, is the first SNA access method to be installed, operated, and maintained in a VM/SP environment without requiring the services of a guest operating system.

VM/VTAM is functionally equivalent to ACF/VTAM V2R1 for OS/VS1 with the following enhancements:

- o 4300 Communications Adapter
- o Force Deactivate of links
- o Elimination of VTAMOBJ
- o UNDIAL Command.

Two features of ACF/VTAM V2R1 for OS/VS1 which are not supported are Configuration Restart and the Encryption Feature of ACF/VTAM. VM/VTAM, with its VM SNA CONSOLE SUPPORT (VSCS) component, allows the VM community to achieve the benefits of SNA, the same goal VM/VTAM Communications Network Application (VM/VCNA) was designed to achieve (see Foil 35). However, unlike VM/VCNA, VM/VTAM does not require the services of a guest operating system such as OS/VS1 or DOS/VSE. VM/VTAM and VSCS (see Foil 36) also provide functions equivalent to natively supported terminals that VM/VCNA was not capable of providing.

The most efficient method of supporting ACF/VTAM in a VM environment was to provide a new interface in VM/SP. This new interface, known as the Group Control System (GCS), is a component of VM/SP Release 4, just as Control Program (CP) and Conversational Monitor System (CMS) are components of VM/SP Release 4. GCS is a multi-tasking virtual supervisor based on a subset of MVS/SP 1.3.1 services. GCS introduces a "GROUP" concept which allows several virtual machines to access a common read/write shared segment. With this approach, ACF/VTAM services in one virtual machine can be made available to applications running in separate virtual machines, such as NCCF or RSCS.

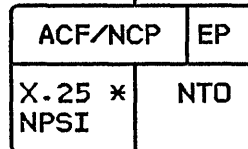
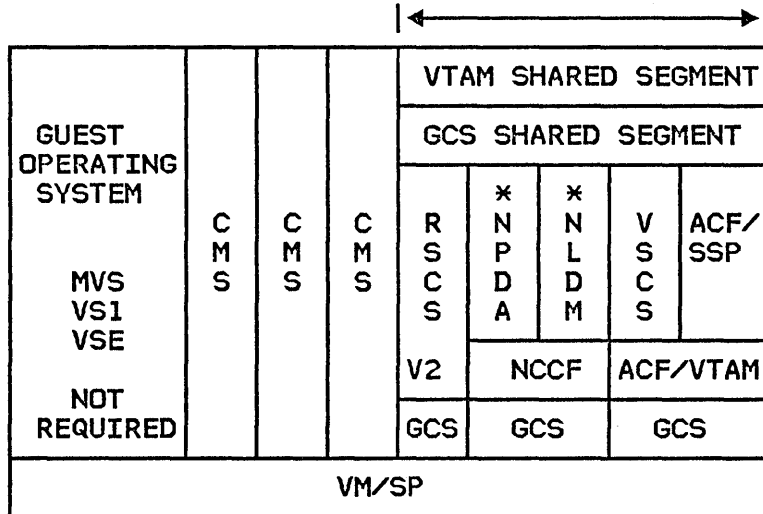
VM/VTAM facilities are available to virtual machines that become members of a GCS group. To become a member of a GCS group, a virtual machine must be identified to the group and IPL GCS. CMS is not capable of becoming a member of a GCS group; however, VSCS provides a bridge between VM/VTAM and CMS, making CMS facilities available to ACF/VTAM terminal users. This GCS "GROUP" concept provides an interesting possibility that is not available to MVS or VSE systems. While only one VM/VTAM virtual machine can be defined to a GCS group, multiple groups can be defined in VM/SP, each with its own VM/VTAM. This allows multiple VM/VTAM's such as "TEST" VM/VTAM and "PRODUCTION" VM/VTAM, to be operating concurrently in the same host CPU. VM/VTAM can also coexist and communicate with ACF/VTAM running under the control of guest operating systems in the same host.

BASE NETWORKING PRODUCTS ACCESS METHODS :

- **VM/VTAM**

ACF/VTAM V3 FOR VM/SP (5664-280)

GCS GROUP



* STATEMENT OF DIRECTION

OP SYS ACCESS METHOD(S)

VM ACF/VTAM V3

PRE-REQUISITE PRODUCTS

VM/SP R4

FUNCTIONS/FEATURES

- **EQUIVALENT TO OS/VS1 ACF/VTAM V2R1**

+ PLUS +

- 4300 COMMUNICATIONS ADAPTER
- FORCED DEACTIVATION OF LINKS
- INTEGRATED VSCS
- UNDIAL COMMAND

- **NATIVE VM/SP SUPPORT**

- GROUP CONTROL SYSTEM
- GUEST OPERATING SYSTEM NOT REQUIRED

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FOIL 6

BASE NETWORKING PRODUCTS: ACF/VTAME

ACF/VTAME as an access method was specifically designed for the 4331 and its associated communications adapter. It is supported on the 4361 in emulation mode.

This product provides the same level of function as ACF/VTAM Version 1 Release 2 but does not require a 3705.

It is important to note that in an ACF/VTAM Version 1 Release 3 or later level network, a node using ACF/VTAME is considered a down-level node, and thus cannot utilize functions such as parallel links or alternate routing.

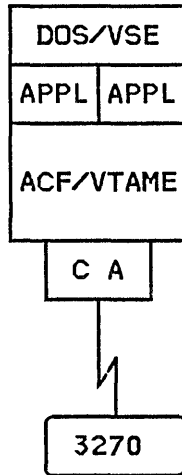
Note: ACF/VTAM V2R1 and V3 for VSE, and ACF/VTAM V3 for VM/SP support the ICA on the 4321, 4331, and 4361 with additional function such as multiple active routes, transmission priorities, and support for both the ICA and 37x5 attachment.

BASE NETWORKING PRODUCTS
ACCESS METHODS:

• **ACF/VTAME**

VIRTUAL TELECOMMUNICATIONS ACCESS METHOD-ENTRY (DOS/VSE: 5746-RC7)

4321/31/61



OP SYS

ACCESS METHOD(S)

PRE-REQUISITE PRODUCTS

VSE

ACF/VTAME

4321/4331/4361 CPU WITH ICA

FUNCTIONS/FEATURES

- PROVIDES ACF/V1R2 LEVEL FUNCTION
- SUPPORTS 4321, 4331, AND 4361 COMMUNICATIONS ADAPTER
- REMOVES 3705 REQUIREMENT FOR PEER-PEER INTERCONNECTION
- LOWER COST/CAPACITY
- EASIER INSTALLATION
- TERMINAL SUPPORT: SNA, BSC, LOCAL

BASE NETWORKING PRODUCTS: ACF/TCAM

ACF/TCAM is the other major SNA access method. It offers many of the same functions as ACF/VTAM.

TCAM also provides such functions as disk queueing, message switching, and more extensive S/S terminal support.

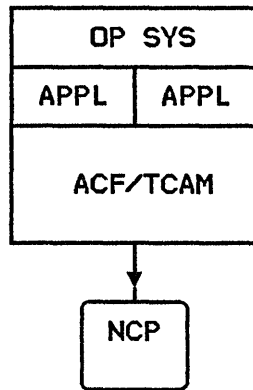
The facilities of the Telecommunications Control System (TCS), some of which are listed here, have been integrated into ACF/TCAM.

ACF/TCAM Version 3 is considered as a Networking Application of ACF/VTAM in this presentation. Its environments, functions, and differences from TCAM V2R4 will be covered in Foil 33.

BASE NETWORKING PRODUCTS
ACCESS METHODS:

• **ACF/TCAM**

TELECOMMUNICATIONS ACCESS METHOD VERSION 2 RELEASE 4
 (VS1,MVS: 5735-RC3)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/TCAM V2R4	NONE
VS1	ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- ESTABLISHES, CONTROLS, TERMINATES ACCESS IN THE NETWORK
- TRANSFERS DATA BETWEEN POINTS IN THE NETWORK
- ALLOWS DYNAMIC RESOURCE SHARING
- ALLOWS MULTIPLE TCAM MCP'S & APPL'S
- PROVIDES DISK QUEUEING FACILITY
- PROVIDES MESSAGE SWITCHING FACILITY
- SUPPORTS TCS FUNCTIONS:
 - IMPROVED MESSAGE SWITCHING, ENHANCED OPERATOR CONTROL, BSC PARALLEL LINKS, ACCOUNTING
- **TERMINAL SUPPORT: SNA, BSC, LOCAL, S/S**

BASE NETWORKING PRODUCTS: ACF/SSP

ACF/SSP V3 is a collection of various support programs that will be executed on a selected Host. These programs range from being able to load the ACF/NCP program into the 37x5 communication controller to dumping the contents of the ACF/NCP on to some non-machine readable media, i.e., Paper.

The first program is the loader. The loader will load any ACF/NCP load module (Assembled NCP for proper 37x5) into the proper 37x5 channel attached to the Host executing the loader program. The loader will load ACF/NCP V2 through V4. Be careful here--only 3705 assembled modules will run on 3705's, likewise for 3725's. DO NOT MIX!

The 37x5 dump program is executed to remove the contents in the 37x5 in hex and place the data in a Host data set. The second step of the dump program execution is the formatter. With ACF/SSP V3 an enhanced formatter has been added. Selected buffer printing is now possible (can print either formatted only, or in hex dump only, or both), additionally the NCP module load map indicates start and end address.

A new ACF/NCP assembly process has been added to ACF/SSP V3. This new assembly process is called NCP/EP Definition Facility (NDF). It has the same capability as the old assembler but, is much faster, and generates a more compact printout. The old assembler is still included in ACF/SSP V3. It will be required for any user modules that need to be written and included in the ACF/NCP generation.

The Configuration Report Program (CRP) has been enhanced making the input statements compatible with other NCP parameters. Additional output operands are listed, and more format control of the listings has been provided.

The Trace Analysis Program (ACF/TAP) has been enhanced with changes made to the current output listings. 3710 Network Controller trace capability has been added. A new VTAM internal trace, and support for the new network services RU - NMVT (Network Management Vector Table) have been provided.

A new program contained within ACF/SSP V3 is Configuration Control Program (CCP). CCP provides Host support to the 3710 Network Controller. CCP is to 3710 as SSP is to NCP. It provides network definition and documentation for the 3710 in the ACF/NCP, and NCCF start-up list. CCP is only supported by MVS because it requires ISPF, which requires TSO, which requires MVS.

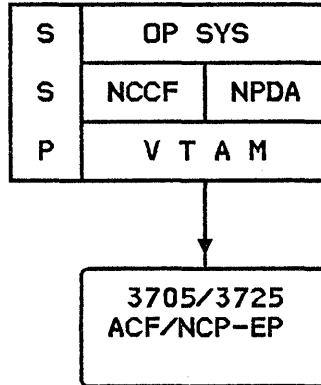
Caution should be exercised when selecting a Version of SSP to operate in a mixed Operating System environment. Note that not all levels of the SSP product operate with all Operating Systems. Consult your IBM representative if there is any doubt as to what level of SSP operates with which Operating System and performs all the SSP functions; Load Dump, Activate, and Generate.

BASE NETWORKING PRODUCTS SYSTEM SUPPORT PROGRAMS:

- **ACF/SSP**

SYSTEMS SUPPORT PROGRAM

(V1R2.1,V1R3:	5735-XX1)
(V2R1:	5735-XX9)
(V3:MVS	5665-338)
(V3:VM	5664-289)
(V3:VSE	5666-322)



OP SYS

MVS
VSE
VS1
VM

SUPPORT PROGRAMS

ACF/SSP V1R2.1,V1R3,V2,V3
ACF/SSP V1R2.1,V1R3,V2,V3
ACF/SSP V1R2.1,V1R3,V2
ACF/SSP V2,V3

ACCESS METHODS

ACF/VTAM, ACF/TCAM
ACF/VTAM
ACF/VTAM, ACF/TCAM
ACF/VTAM

FUNCTIONS/FEATURES

- **GENERATE NCP/EP**
 - NCP/EP DEFINITION FACILITY (NDF)
- **LOAD 3705/3725 NCP**
- **DUMP & FORMAT 3705/3725 NCP**
- **ACF/TAP TO EDIT & FORMAT TRACE**
- **CONFIGURATION REPORT PROGRAM**
- **3710 CONFIGURATION CONTROL PROGRAM**

BASE NETWORKING PRODUCTS: ACF/NCP - 3705

The network control program (NCP), performs a wide range of functions for a data communications network. ACF/NCP, in conjunction with the 3705 hardware, takes over most of the control of the communication lines from the access method. Many of these standard communication control functions are listed here.

The 3705 can also act as a remote line concentrator, thereby potentially reducing line costs.

ACF/NCP Version 2:

The NCP portion of NPA was integrated (see Foil 56).

ACF/NCP Version 3:

New functions added are forced deactivation of links and SNA Network Interconnection (see Foils 26 and 27).

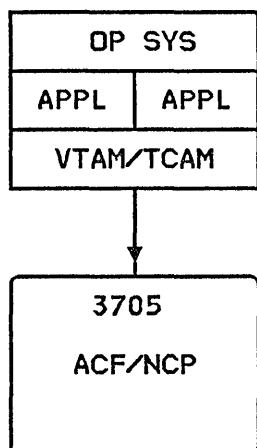
BASE NETWORKING PRODUCTS

CONTROL PROGRAMS :

• ACF/NCP - 3705

NETWORK CONTROL PROGRAM

(V1R2.1,V1R3: 5735-XX1)
 (V2: 5735-XX9)
 (V3: 5667-124)



OP SYS

MVS
 VSE
 VS1
 VM

CONTROL PROGRAMS

ACF/NCP V1R2.1,V1R3,V2,V3
 ACF/NCP V1R2.1,V1R3,V2,V3
 ACF/NCP V1R2.1,V1R3,V2
 ACF/NCP V3

ACCESS METHOD(S)

ACF/VTAM, ACF/TCAM
 ACF/VTAM
 ACF/VTAM, ACF/TCAM
 ACF/VTAM

FUNCTIONS/FEATURES

- POLLS & ADDRESSES STATIONS
- PERFORMS CHARACTER SERVICE
- PERFORMS CHARACTER CODE TRANSLATION
- ATTACHES TO MULTIPLE HOSTS
- PERFORMS REMOTE CONCENTRATOR FUNCTION
- FORCE DEACTIVATION OF LINKS
- INCLUDES NETWORK PERFORMANCE ANALYZER FUNCTION
- PROVIDES SNA NETWORK INTERCONNECTION FACILITY



BASE NETWORKING PRODUCTS: ACF/NCP - 3725

The Network Control Program for the 3725 performs essentially the same function as the NCP for the 3705 plus the additional functions unique to the 3725.

When announced, the 3725 required ACF/NCP Version 2. The initial NCP code supported the new MOSS console, up to six concurrent channel adapters, addressing capability for 1 Meg of memory, scanner enhancements, removed the restriction of certain control blocks below 64K addressing, and integrated the NPA product.

In November 1983 there were additional hardware enhancements to the 3725 announced. ACF/NCP Version 3 is required to take advantage of these enhancements. These include Modulo 128, Start/Stop speeds up to 9600 bps, two Megabytes of memory, and the V.35 interface (LIC3) speeds to 256KB.

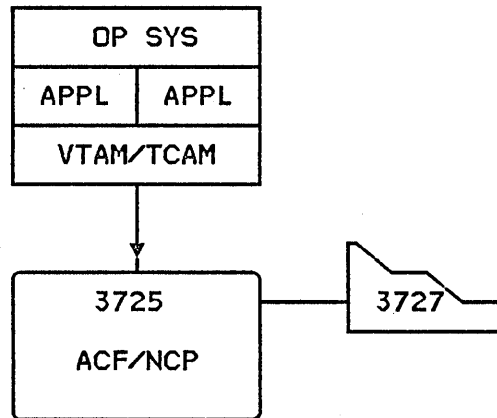
In September 1984 additional enhancements were announced. These include: Extended Network Addressing function (see Foil 25), 3710 Support (see Foil 19), and S/S speeds up to 19.2 KB. To use the ENA function and 3710 full function support requires ACF/NCP Version 4.

BASE NETWORKING PRODUCTS
CONTROL PROGRAMS :

• **ACF/NCP - 3725**

NETWORK CONTROL PROGRAM

(V2: 5735-XX9)
(V3: 5667-124)
(V4: 5668-854)



OP SYS

MVS
VSE
VS1
VM

CONTROL PROGRAMS

ACF/NCP V2,V3,V4
ACF/NCP V2,V4
ACF/NCP V2,V3
ACF/NCP V3

ACCESS METHODS

ACF/VTAM, ACF/TCAM
ACF/VTAM
ACF/VTAM
ACF/VTAM

FUNCTIONS/FEATURES

- INCLUDES ALL 3705 NCP FUNCTION
- + PLUS +
- 3725 UNIQUE FUNCTION
 - EXTENDED NETWORK ADDRESSING
 - 3710 FULL FUNCTION SUPPORT
 - MODULO 128
 - S/S SPEEDS UP TO 19.2 KB
 - T1 CARRIER - 1.5 MEG RPQ

BASE NETWORKING PRODUCTS: EP

The Emulator Program is an IBM program product that allows a channel attached 3705 or 3725 to perform most of the functions of an IBM 2701 Data Adapter Unit and the 2702 and 2703 Transmission Control Unit.

The Emulator Program operates in conjunction with access methods operating under the virtual operating systems OS/VS1, MVS, VM/SP, and VSE. The access methods supported are TCAM and BTAM as well as the access method contained in the subsystems of JES2, JES3, RSCS, and POWER/VSE.

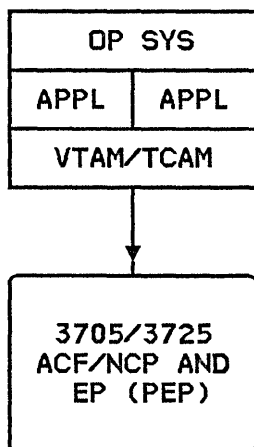
The EP Program Product, in conjunction with the appropriate version of NCP, allows the generation of the Partition Emulation Program (PEP). The new product removes the restriction that key control blocks reside below the 64K boundary.

The EP Program Product, in the 3725 environment, has been updated to exploit hardware improvements such as the speed enhancements which allow S/S operation up to 19.2kbs and BSC tributary operation up to 64 kbs. The EP Program Product, in addition to providing the functions available in earlier releases of EP, also contains enhancements to channel connectivity for the 3725. Up to six channel adapters may be associated with EP.

BASE NETWORKING PRODUCTS CONTROL PROGRAMS :

• E P

EMULATOR PROGRAM FOR IBM COMMUNICATIONS CONTROLLERS (5735-XXB)



V1R1-3725-ACF/NCP V2
WITH ACF/SSP V2R1.1

V1R2-3705/3725-ACF/NCP V3
WITH ACF/SSP V2R2

<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	BTAM, ACF/TCAM, RTAM	* ACF/NCP V2, V3, V4
VSI	BTAM, ACF/TCAM, RTAM	* ACF/NCP V2, V3, V4
VSE	BTAM	* ACF/NCP V2, V3, V4
VM	CP	* ACF/NCP V2, V3, V4

FUNCTIONS/FEATURES

* REQUIRED FOR PEP

- SUPPORTS PARTITIONED EMULATION PROGRAM (PEP) OF ACF/NCP
- CONDITIONAL ASSEMBLER REMOVAL
- CONTROL BLOCKS ABOVE 64K
- 3725 S/S AND BSC ENHANCEMENTS
 - BSC TRIBUTARY SPEED ENHANCEMENT - UP TO 64 KB
 - S/S SPEED ENHANCEMENTS - UP TO 19.2 KB
- ENHANCED CHANNEL ADAPTER SUPPORT
 - MAX. OF 2 ON 3705 - CA T4
 - MAX. OF 6 ON 3725

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FOIL 12

BASE NETWORKING PRODUCTS: NTO

The Network Terminal Option (NTO) is an IBM program product that extends the capabilities of ACF/NCP in a 37x5 to allow SNA support for a select group of non-SNA devices. A list of compatible releases is provided. The IBM subsystems that support NTO are also indicated.

NTO provides a PU Type 1, LU Type 1 appearance to the host access method for the listed devices. This allows NTO devices to communicate in cross-domain sessions, as well as a single-domain. NTO conversion of the data stream is transparent to the device.

NTO Release 2.1 also supports the the Force deactivate function introduced in NCP V3.

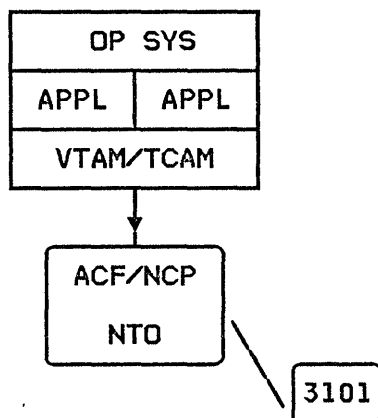
BASE NETWORKING PRODUCTS

CONTROL PROGRAMS :

- **NTO**

NETWORK TERMINAL OPTION
(5735-XX7)

(NTO R1: NCP V1R2.1:3705 ONLY)
 (NTO R2: NCP V1R3 :3705 ONLY)
 (NTO R2: NCP V2 :3705,3725)
 * (NTO R2.1:NCP V3 :3705,3725)
 * (NTO R3: NCP V4 :3725 ONLY)



* NO VS1 SUPPORT

OP SYS

MVS
VSE
VS1
VM

CONTROL PROGRAMS

ACF/NCP V1R2.1,V1R3,V2,V3,V4
 ACF/NCP V1R2.1,V1R3,V2,V3,V4
 ACF/NCP V1R2.1,V1R3,V2
 ACF/NCP V3

ACCESS METHODS

ACF/VTAM, ACF/TCAM
 ACF/VTAM
 ACF/VTAM, ACF/TCAM
 ACF/VTAM

FUNCTIONS/FEATURES

- CAPABILITY FOR NON-SNA TERMINALS TO SHARE VTAM & TCAM APPLICATIONS
- SINGLE & MULTIPLE DOMAIN SUPPORT FOR NON-SNA TERMINALS
- TERMINAL SUPPORT: 2740-1, 2741, TWX 33/35 (3101), WTTY, 3780*
- APPLICATION SUPPORT:
(NO IBM SUBSYSTEM SUPPORT)
CICS, TSO, VCNA, VSCS, IMS
- FORCED DEACTIVATION OF LINKS

BASE NETWORKING PRODUCTS: NPSI (X.25)

The X.25 Network Packet Switch Interface (NPSI) IBM program product extends the capabilities of ACF/NCP to provide support of an X.25 Packet Switched Data Network (PSDN). This program product, in conjunction with the Network Interface Adapter (NIA: 5973-L02), the 3710, or the X.25 feature on the 3274, will permit SNA terminals to access SNA subsystems (e.g. CICS, IMS, TSO) transparently using a PSDN (X.25).

Additionally, NPSI supports the use of multi-domain communication through a PSDN, using the PSDN for cross domain links.

This program product also supports the attachment to user-written applications via a PSDN using the following nodes/terminals (DTEs):

- 1) X.25 nodes
- 2) start/stop terminals via packet assembler/disassembler (PAD).
- 3) control of non-standard PADs (e.g. BSC).

For start/stop terminals a user written application is not required. These terminals may be supported just like an NTO device to IMS, CICS, TSO, VCNA, and VSCS.

NPSI also has the ability to function as a DCE in which case a PSDN is not required. This is a valuable asset for testing. A 3274 with the X.25 feature may connect directly to the 37x5 with NPSI.

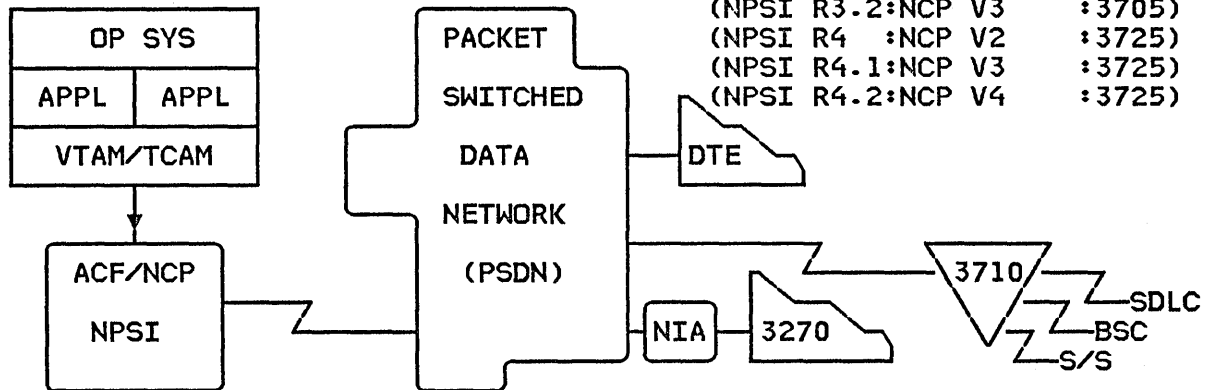
For the 3725 version of NPSI there is a support requirement to have NPDA installed. This is a National Service Division (NSD) requirement for support of 3725 with NPSI. The reason this requirement exists is that the new error records from the 3725 and NPSI are only captured by the NPDA product and do not get written to LOGREC.

BASE NETWORKING PRODUCTS

CONTROL PROGRAMS :

- **NPSI**

X.25 NETWORK PACKET SWITCHED INTERFACE (NPSI R2 :NCP V1R2.1:3705)
(5668-981) (NPSI R3 :NCP V1R3 :3705)



(NPSI R3.1:NCP V2 :3705)
(NPSI R3.2:NCP V3 :3705)
(NPSI R4 :NCP V2 :3725)
(NPSI R4.1:NCP V3 :3725)
(NPSI R4.2:NCP V4 :3725)

<u>OP SYS</u>	<u>CONTROL PROGRAMS</u>	<u>ACCESS METHODS</u>
MVS	ACF/NCP V1R2.1,V1R3,V2,V3,V4	ACF/VTAM, ACF/TCAM
VSE	ACF/NCP V1R2.1,V1R3,V2,V3,V4	ACF/VTAM
VS1	ACF/NCP V1R2.1,V1R3,V2,V3	ACF/VTAM, ACF/TCAM

FUNCTIONS/FEATURES

- CAPABILITY FOR SNA & S/S TERMINALS TO ACCESS VTAM & TCAM APPLICATIONS VIA PACKET SWITCHED DATA NETWORKS
- CAPABILITY FOR X.25 NODES/NON-SNA TERMINALS TO COMMUNICATE WITH USER WRITTEN APPLICATIONS VIA VTAM OR TCAM USING A PACKET SWITCHED DATA NETWORK
- APPLICATION SUPPORT (NTO LIKE)
 - IMS, CICS, TSO, VCNA, VSCS
- FORCED DEACTIVATION OF LINKS

BASE NETWORKING PRODUCTS: NSI

Non-SNA Interconnect (NSI) product permits the "transport" of binary synchronous (BSC) Remote Job Entry (RJE) and Network Job Entry (NJE) data over an SNA backbone network.

The NSI product allows selected BSC RJE terminals to take advantage of some of the "any to any" capabilities of SNA terminals. The traffic from these BSC stations and EP based subsystems may share SDLC links with other SNA based systems. The product provides some new network configuration options which could potentially result in significant reductions in network costs.

NSI is functionally split in two pieces. The NSI Host Support Facility (HSF) interfaces to the Host Subsystem in such a manner that it is transparent to the Emulator Program (EP) based subsystems involved, such as JES, POWER, and RSCS. The NSI Terminal Support Facility (TSF) interfaces to the BSC RJE terminals and is only required in the NCP that has boundary node terminal devices for RJE use.

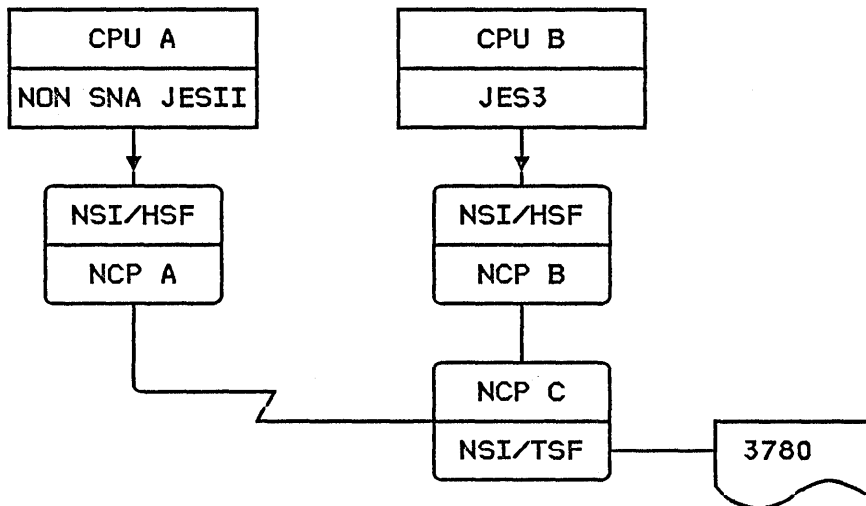
The HSF portion of NSI can be used in conjunction with the 3710 network controller's functional equivalent of NSI's TSF function (BSC enveloping support) to support compatible BSC RJE work stations.

In addition to this increase in function and connectivity, these non SNA resources can be managed with the current IBM network management tools. NSI support is transparent to the EP based subsystems thus no changes are required in the EP based subsystems which are taking advantage of NSI.

BASE NETWORKING PRODUCTS CONTROL PROGRAMS :

- **NSI**

NON-SNA INTERCONNECT (5668-951)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V2R1,V2R2,V3	ACF/NCP V2 3705/3725
VSE	ACF/VTAM V2R1,V3	ACF/NCP V2 3705/3725
VS1	ACF/VTAM V2R1	ACF/NCP V2 3705/3725

FUNCTIONS/FEATURES

- **INCREASED CONNECTIVITY**
 - SELECTED BSC RJE TERMINALS
 - BSC RJE/NJE SUBSYSTEMS
- **SHARE NETWORK RESOURCES**
 - EP TRAFFIC CAN USE SDLC LINKS
- **IMPROVED NETWORK MANAGEMENT**
 - CNM TOOLS AVAILABLE FOR BSC RJE RESOURCES
- **POTENTIAL REDUCTION OF NETWORK COSTS**
- **TRANSPARENT TO EP SUBSYSTEMS**
 - EP SUBSYSTEM REQUIRE NO CHANGES



BASE NETWORKING PRODUCTS: NRF

The Network Routing Facility (NRF) provides a path between NCP attached terminals to allow the routing of messages between these terminals without going through a host processor. The terminals must be attached to the same NCP for NRF R1 but for NRF R1.5 and R2 the terminals can be attached to the same or different NCP's in the network.

NRF provides message routing for the Series/1, the 3650 Programmable Store System, and the 3780. NTO is required to support the 3780.

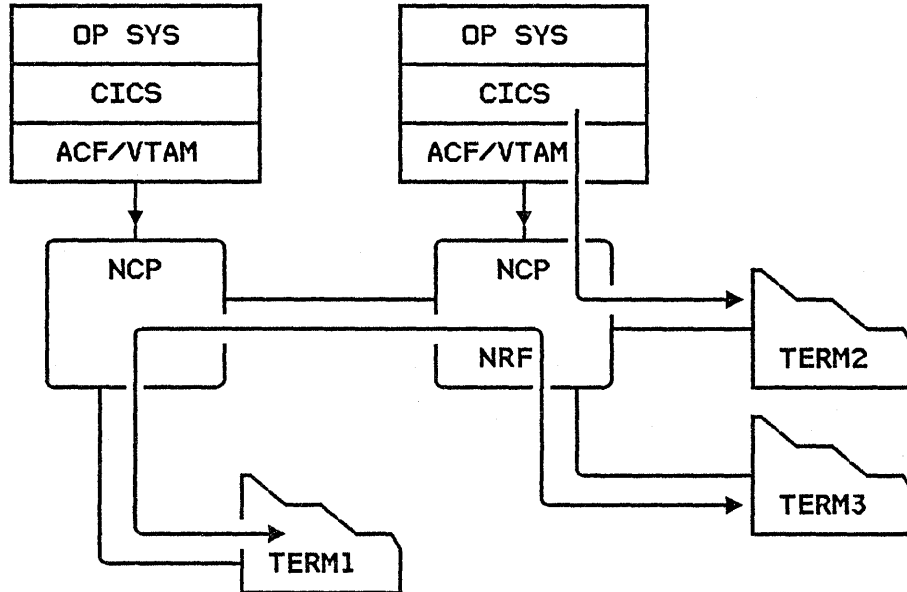
NRF SLU support in conjunction with CICS 3650 pipeline support allows CICS application access from NRF. NRF provides routing functions to modify and edit data, and to perform transaction routing and error handling.

NRF has been enhanced to operate with NLDM R2 to provide information on virtual routes, explicit routes and subareas between LUs. Forced deactivation of SNA resources is supported for NRF R1.5 and R2.

BASE NETWORKING PRODUCTS CONTROL PROGRAMS :

- **NRF**

NETWORK ROUTING FACILITY (5668-963) (NRF R1 NCP V1R3,V2 3705)
 (NRF R1.5 NCP V3 3705/3725)
 (NRF R2 NCP V4 3705)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V2R1,V2R2,V3	ACF/NCP V2,V3 3705/3725

FUNCTIONS/FEATURES

- **PROVIDES TERMINAL TO TERMINAL ROUTING**
- **SUPPORTS ROUTING TO AND FROM CICS**
 - USES 3650 "PIPELINE" LU SUPPORT
- **OPERATES WITH NLDM R2**
 - PROVIDES ER, VR AND SUBAREA INFORMATION FOR NRF LU'S
- **SUPPORTS FORCED DEACTIVATION OF LINKS**

BASE NETWORKING PRODUCTS: 3725

The 3725 is capable of supporting more lines, memory and traffic than its predecessor the 3705. Since its original announcement, the 3725 has been upgraded with the following enhancements.

The 3725 has been upgraded to support Modulo 128. NCP V3 supports this function for INN links to PU type 4's and NCP V4 extends support to links associated with PU type 2 nodes. To date the only PU type 2 node capable of Modulo 128 operation is the 3710 Network Controller.

The 3725 memory has been increased from a maximum of one megabyte to a current maximum of two megabytes.

BSC tributary support on the 3725 has been extended to a maximum speed of 64KBS. CCITT V.35 types of attachments have been enhanced to operate at speeds up to 256 KBPS.

The "Port Swapping" feature allows the 3725 operator to physically substitute 3725 hardware lines in such a manner that it is transparent to NCP. This means that in a backup situations, failing lines can be replaced with good lines and no special NCP is required.

The Line Interface Display as been enhanced to more accurately reflect the 3725's communications line interfaces and the the change of the state of these interface leads. This enhances the operator's ability to perform problem determination.

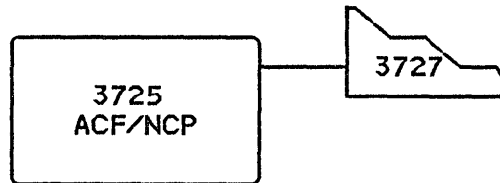
Enhanced Start Stop support allows speeds up to 19.2 KBPS. Additional enhancements are "Direct Attachment" at speeds up to 245 KBPS and attachment capability for T1 facilities at speeds of 1.544 MEGABITS. This T1 capability is provided via a 3725 RPQ.

Additional enhancements for the 3725 Model 2 are: an increase in the maximum number of lines from 24 to 80 of which up to 16 can be 56 KBPS, a maximum of four channel adapters, and up to 2 megabytes of storage.

BASE NETWORKING PRODUCTS HARDWARE PRODUCTS

- **3725**

COMMUNICATION CONTROLLER



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS VSE VM	ACF/NCP V2,V3,V4 ACF/NCP V2,V4 ACF/NCP V3	ACF/VTAM, ACF/TCAM ACF/VTAM ACF/VTAM

FUNCTIONS/FEATURES

- **MODULO 128**
- **UP TO TWO MEGABYTES OF MAIN STORAGE**
- **BSC TRIBUTARY TO 64 KBPS**
- **V.35 SPEEDS UP TO 256 KPBS**
- **PORT SWAPPING**
- **ENHANCED LINE INTERFACE DISPLAY**
- **ICC SPEEDS UP TO 19200 BPS FOR S/S**
- **DIRECT ATTACH SPEEDS UP TO 245 KBPS**
- **T1 SUPPORT - 1.544 MEGABITS (RPQ)**

- **MODEL 2 ENHANCEMENTS**

- UP TO 80 MEDIUM SPEED LINES OR
- UP TO 16 LINES AT 56 KPBS
- UP TO 4 CHANNEL ADAPTERS IN A SINGLE FRAME
- UP TO TWO MEGABYTES OF MAIN STORAGE

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FOIL 17

BASE NETWORKING PRODUCTS: MODEMS: 386X

The IBM 386X modems are a family of microprocessor based modems which operate on analog lines at speeds of 2400, 4800 or 9600 bits per second (bps). The modems are designed to make maximum use of improved signal processing methods, and offer a high level of performance and reliability.

There are models of the 386x for leased and switched lines. There are models which will run 9600 bps on multipoint, unconditioned leased lines. The 386x modems accept any synchronous bit data stream, such as Binary Synchronous (BSC) or Synchronous Data Link Control (SDLC).

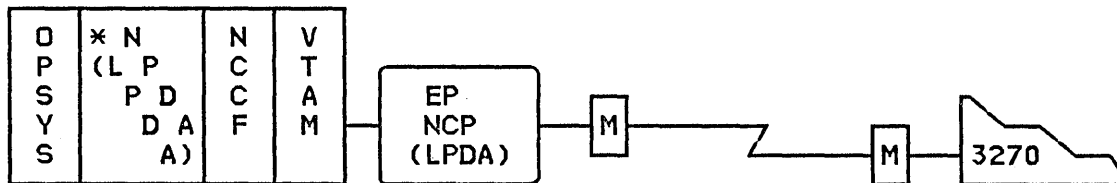
There are standalone models for both leased and switched line operation, and rackmount models for leased line operation.

All models support a special set of diagnostic commands which can be invoked automatically or via operator entry from a terminal attached to a number of different IBM processors. This online diagnostic capability, called Link Problem Determination Aid (LPDA), can be used to isolate communications problems to a failing component, such as a line or control unit, and speed up problem resolution.

Among the special features available with the IBM 386x modems are fanout, which allows one modem to service up to three attached control units. Data Multiplexing allows one point-to-point 9600 bps link to be used as up to four lower speed lines, and enables the creation of multipoint 'tailed' circuits at the remote end of the link. Switched Network Backup, or SNBU, allows two leased-line models to communicate via switched connections if, for example, the leased line is not available.

BASE NETWORKING PRODUCTS
HARDWARE PRODUCTS

• **IBM 386X MODEMS**



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS,VSE VS1,VM	* THE IBM MODEM MAY BE USED ANYWHERE THERE * * IS A REQUIREMENT FOR A SYNCHRONOUS LINK. * *****	

*NPDA AND NCP ARE REQUIRED FOR LPDA SUPPORT - OTHER PROCESSORS SUCH AS S/36 AND 8100 PROVIDE LPDA FUNCTION.

FUNCTIONS/FEATURES

- **FAMILY OF MICROPROCESSOR-BASED MODEMS**
 - FOR LEASED OR SWITCHED LINES
 - UP TO 9600 BPS/UNCONDITIONED LINES
 - ANY SYNCHRONOUS PROTOCOL
 - RACKMOUNT AND STANDALONE MODELS
 - ONLINE DIAGNOSTICS
 - LINK PROBLEM DETERMINATION AID-LPDA
- **SPECIAL FEATURES INCLUDE:**
 - FANOUT
 - DATA MULTIPLEXING/TAILING
 - SWITCHED NETWORK BACKUP (SNBU)

BASE NETWORKING PRODUCTS: NETWORK CONTROLLER: 3710

The 3710 Network Controller is a product capable of handling data traffic from devices using mixed speeds and protocols, and providing short-distance dial-up access.

It concentrates up to 31 lines using S/S BSC and SDLC protocols on one or more upstream SDLC links at speeds of 110 bps to 64,000 bps. In this way it provides the potential for significant savings in line costs.

The 3710 can be multidropped with other SNA control units. Downstream links may be multipoint. Cascaded 3710's, a 3710 attached to another 3710, may be configured in a network.

The 3710 supports display terminals, printers, and control units downstream. The 3710 can support X.25 and SDLC leased line upstream attachments.

Dial support consists of call-in for S/S and selected BSC RJE downstream devices. Autobaud Detect is supported for S/S devices.

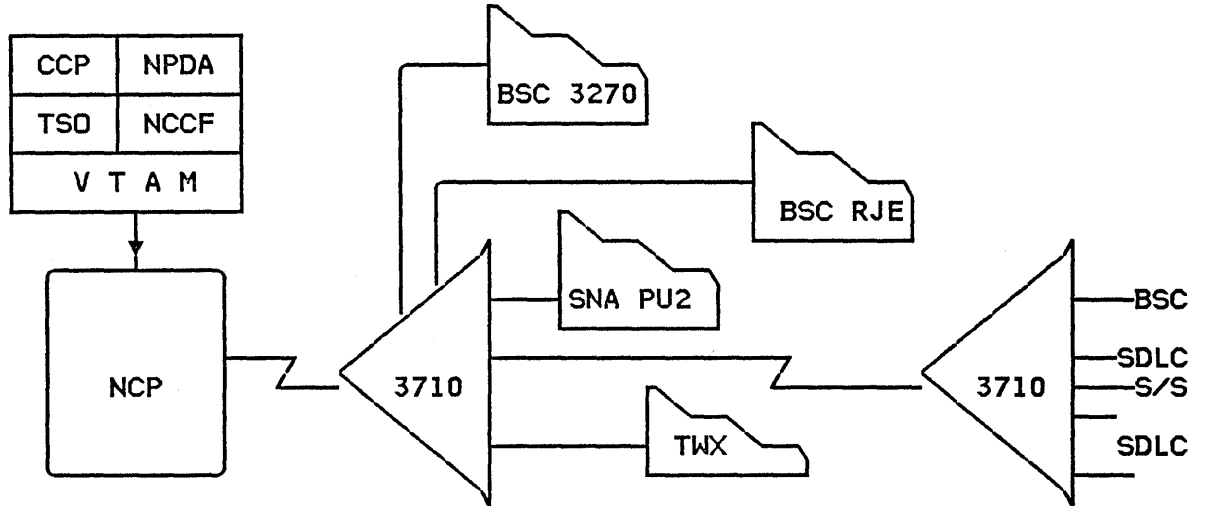
The 3710 also has CNM capabilities including down stream LPDA.

A new program contained within ACF/SSP V3 is CCP. CCP (Configuration Control Program) provides Host support to the 3710 Network Controller. CCP is to 3710 as SSP is to NCP. It provides network definition and documentation for the 3710 in the ACF/NCP, and NCCF start-up list. CCP is only supported by MVS because it requires ISPF, which requires TSO, which requires MVS.

BASE NETWORKING PRODUCTS HARDWARE PRODUCTS

• 3710

NETWORK CONTROLLER



OP SYS ACCESS METHOD(S)

MVS
ACF/VTAM V3
* ACF/VTAM V2R1,V2R2

RELATED PRODUCTS

ACF/NCP V4, ACF/SSP V3
NCCF V2R2, NPDA V3R2
* ACF/NCP V3, ACF/SSP V2R2
NCCF V2R1, NPDA V3R1
* SUPPORTED ENVIRONMENT BUT CANNOT
USE 3710 FULL FUNCTIONS

FUNCTIONS/FEATURES

- SPEEDS TO 64 KBS - UP/DOWNSTREAM
- LINE CONCENTRATION - UP TO 31
 - SNA PU2 DEVICES
 - 3710 CASCADED CONFIGURATIONS
 - MULTIPOINT SUPPORT (UP/DOWNSTREAM)
 - ASCII S/S - EQUIVALENT TO NTO
 - BSC RJE - NSI REQUIRED IN 3725
 - X.25 SUPPORT UPSTREAM - NPSI REQUIRED IN 3725
- MODULO 128 SUPPORT
- DIAL-IN SUPPORT, AUTOBAUD DETECT
- COMMUNICATIONS NETWORK MANAGEMENT
 - NCCF, NPDA
 - LPDA FOR DOWNSTREAM 386X MODEMS

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FOIL 19

BASE NETWORKING PRODUCTS: PROTOCOL CONVERTER: 7171

The IBM 7171 ASCII Device Attachment Control Unit provides low-cost ASCII to 3270 protocol conversion and direct attachment of ASCII displays and printers to mainframe systems.

This device appears to the host as either one or two 3274 model D control units.

Up to 64 devices can be attached to the 7171 using the standard RS232C interface. These connections can either be made via modems or direct attachments.

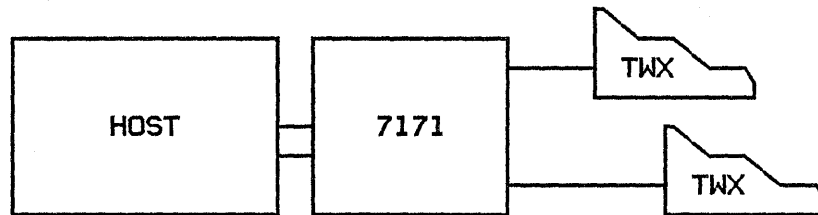
Data rates can be from 300 to 19,200 baud.

The 7171 features downstream Dial-In support as well as Autobaud Detect. Both Echo-Plexing and XON/XOFF pacing are available for terminals that support these functions.

BASE NETWORKING PRODUCTS HARDWARE PRODUCTS

- **7171**

ASCII DEVICE ATTACHMENT CONTROL UNIT



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	* 7171 WILL COMMUNICATE *	NONE
VSE	* WITH ALL ACCESS METHODS *	NONE
VS1	* THAT SUPPORT 3272'S *	NONE
VM	*****	NONE

FUNCTIONS/FEATURES

- **3274-D HOST APPEARANCE**
 - NON-SNA LOCAL
 - 3277 EMULATION
- **16 TO 64 ASYNC ASCII PORTS**
 - IBM 3101
 - OEM S/S
- **SPEEDS UP TO 19.2 KBS**

(FOR NON-SWITCHED ATTACHMENTS)
- **SWITCHED SUPPORT**
 - CALL-IN
 - SPEEDS UP TO 1200 BPS
 - AUTOBAUD DETECT
- **ECHO-PLEXING**
- **XON/XOFF PACING**

BASE NETWORKING PRODUCTS: PROTOCOL CONVERTER: 7426

The 7426 is a S/S to SNA/SDLC protocol converter that supports the attachment of the 3101 display unit and IBM personal computer in 3101 emulation mode to S/370, 8100 systems, 43xx, and 30xx processors. Many other OEM products are also accommodated by the 7426. The 7426 presents the upstream appearance of an SNA 3276 Model 12 control unit.

The 7426 supports four down stream ports and, as such, can serve as a line concentrator.

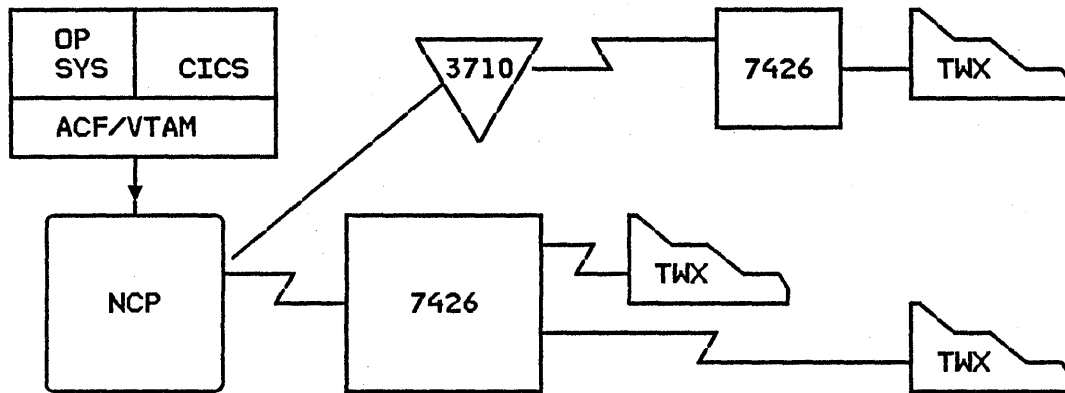
The dial capability consist of Dial-In support on the downstream links as well as Autobaud Detect.

The Downstream Load Utility, 5668-006, is required to load the 7426 with the user configuration.

BASE NETWORKING PRODUCTS HARDWARE PRODUCTS

- **7426**

PROTOCOL CONVERTOR



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	ACF/NCP V1R2.1,V2,V3,V4
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	ACF/NCP V1R2.1,V2,V3,V4
VS1	ACF/VTAM V1R3,V2R1	ACF/NCP V1R2.1,V2,V3,V4

** REQUIRES DOWNSTREAM LOAD UTILITY - 5668-006

FUNCTIONS/FEATURES

- **ASCII TO SNA/SDLC PROTOCOL CONVERSION**
 - 3276 MODEL 12 UPSTREAM APPEARANCE
- **LINE CONCENTRATION**
 - ONE UPSTREAM HOST PORT
 - FOUR DOWNSTREAM PORTS
- **DIAL SUPPORT**
 - CALL-IN SUPPORT
- **AUTOBAUD DETECT**
- **SPEEDS UP TO 9.6 KBS**

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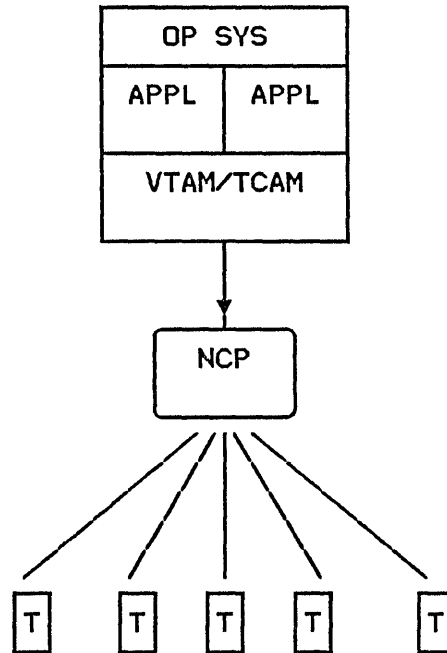
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FOIL 21

NETWORKING EVOLUTION: SINGLE DOMAIN

What has been described to this point are some of the basic products, both hardware and software, required to enter a networking environment. Each of these IBM SNA products addresses a single domain environment. In each case the communications resources are under one control point.

NETWORKING PRODUCTS SINGLE DOMAIN ENVIRONMENT



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE
MVS	ACF/TCAM V2R4	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NONE
VM	ACF/VTAM V3	VM/SP R4

FUNCTIONS/FEATURES

- OWNERSHIP OF LINES AND TERMINALS BY ACCESS METHOD
- POLLING, ADDRESSING AND MOST ERROR HANDLING BY NCP
- RESOURCE SHARING - TERMINALS AND APPLICATIONS

NETWORKING PRODUCTS: MULTIPLE DOMAIN ENVIRONMENT

Use the diagram on Foil 23 to illustrate the points on the following foil. Included here is the support matrix for the various ACF/VTAM and ACF/NCP versions and releases. Note especially that sessions between the latest versions of VTAM and NCP are not supported with the early releases.

MULTIPLE DOMAIN ENVIRONMENT - CONTINUED

(Start of Text for Foil 24, continued next page)

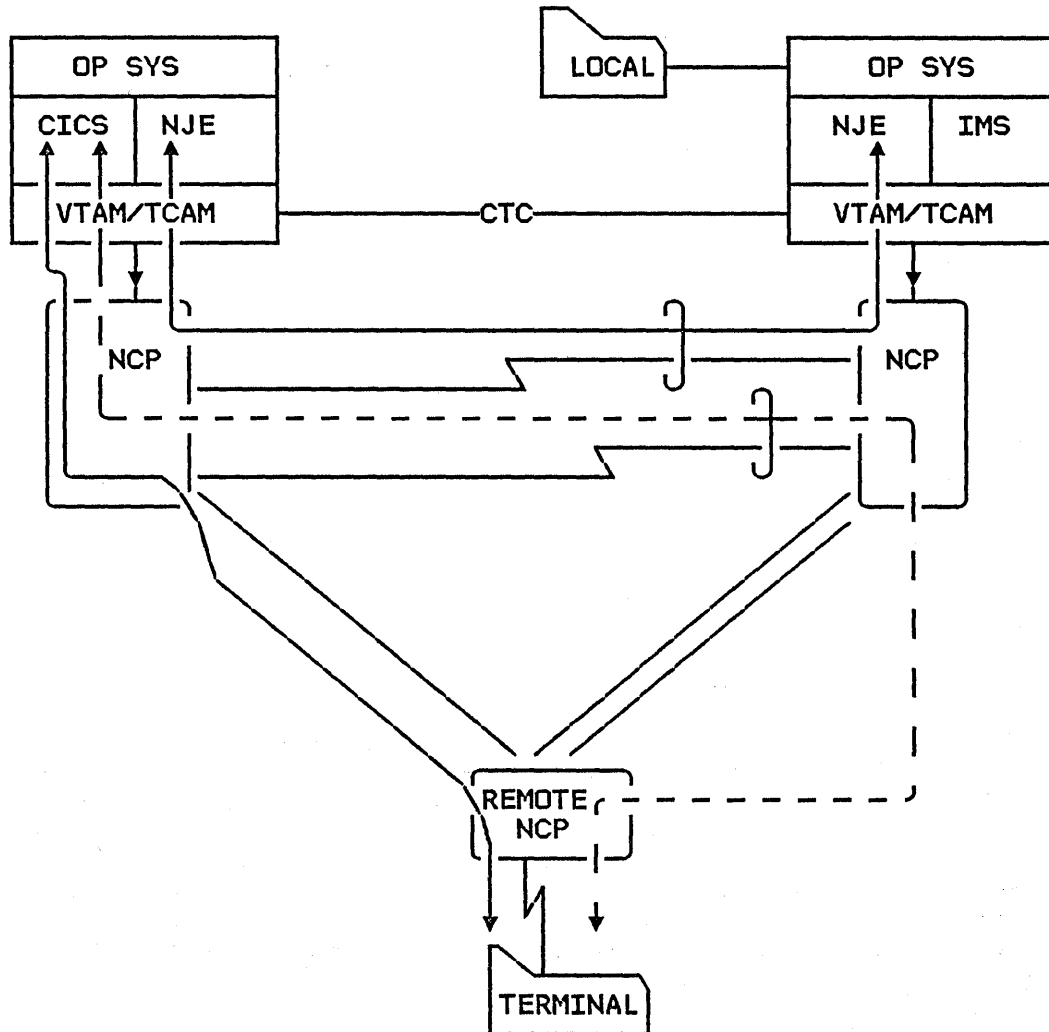
The multi-domain facilities of SNA (MSNF) provide all of the same capabilities for SNA as single domain. In addition, it provides services to connect the resources of two or more domains - points of control for resource ownership. SNA, in a multi-domain environment, provides the capability for any terminal or application in one domain to communicate with an application in another domain.

The capability called "parallel links" permits multiple active SDLC cross domain links to connect two adjacent NCP's; data can flow across the links concurrently. There is no limitation as to the number of parallel links, except for the limitation of 3705 hardware configurations. This facility provides increased bandwidth between adjacent NCP's and permits the links to be fully utilized, since PIUs are divided among the active available links. Also, parallel links can provide increased availability because a single link failure will not disrupt end users sessions when multiple links exist. Parallel links are called Transmission Groups (TG) and may consist of one link for purposes of multiple routing.

"Multiple Active Routes" function provides the capability to have alternate routes defined between two subareas so that if the primary route is not available an alternate can be utilized. Additionally, this capability allows different types of traffic to use different routes through the network thus minimizing the impact of one session traffic type on another. Both capabilities are depicted in the diagram on the previous foil. NJE session traffic uses a single link TG while an alternate route, defined for access to CICS uses another TG. In the case of CICS, the alternate route (dashed line) is used when a failure is encountered on the primary route (solid line).

Continued

NETWORKING PRODUCTS MULTIPLE DOMAIN ENVIRONMENT



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	* ACF/VTAM V1R3	ACF/NCP V1R2.1,R3,V2,V3
MVS	ACF/VTAM V2R1,V2R2	ACF/NCP V1R2.1,R3,V2,V3,V4
MVS	ACF/VTAM V3	ACF/NCP V2,V3,V4
VS1	* ACF/VTAM V1R3	ACF/NCP V1R2.1,R3,V2
VS1	ACF/VTAM V2R1	ACF/NCP V1R2.1,R3,V2
VSE	ACF/VTAM V2R1	ACF/NCP V1R2.1,R3,V2,V3,V4
VSE	ACF/VTAM V3	ACF/NCP V2,V3,V4
VSE	ACF/VTAME	
VM	ACF/VTAM V3	ACF/NCP V3

* REQUIRES MSNF FEATURE

MULTIPLE DOMAIN ENVIRONMENT - CONTINUED

Continuation of Text for Foil 24.

Increased connectivity is primarily an NCP enhancement. This allows channel attached 3705s and link attached 3705s to be functionally equivalent. Extended NCP interconnection also allows up to eight SNA access methods to share resource ownership of any NCP. There can also be up to eight owners of a cross-domain link and link station. As such, failure notification about the adjacent NCP is propagated to all of the owning access methods.

Backup and recovery improvements provide reliability enhancements. They are in three major areas: session outage notification (SON), host-to-host (SSCP-SSCP) "warm restart", and host-to-terminal (SSCP-LU) "warm restart". The major thrust of each of the facilities is to preserve cross-domain sessions when network failures occur and to provide complete notification to each network node under failure conditions so that appropriate action may be taken with minimal impact to the network.

With ACF/VTAM Version 2 Release 1:

ACF/VTAM (MVS and VS1) supports the channel-to-channel adapter (CTCA) as another network path. That is, a terminal session could access an application in another host via a cross-domain session using the CTCA. Application-to-application sessions can also use the CTCA. For example, the IMS subsystem, as depicted in the diagram, could utilize the CTCA support for IMS/ISC to CICS.

This release of ACF/VTAM also provides host intermediate routing node (IRN) support. That is, a terminal attached to a 3705 communications controller can now use the host as a transient node to access applications in other hosts via a cross-domain session. As depicted in this diagram, the network path could be via an SDLC cross-domain link or could utilize the CTCA support.
(NOTE: This function requires the NCP's channel connected to ACF/VTAM Version 2 to be at ACF/NCP V1R3 or above level.)

With ACF/VTAM Version 2 Release 2:

ACF/VTAM together with ACF/NCP V3 provides the facility to interconnect independent networks (see Foils 26 and 27).

With ACF/VTAM Version 3:

ACF/VTAM running under MVS/XA exploits the 31 bit addressing of XA, providing virtual storage constraint relief (VSCR), discussed previously (Foil 5). Extended network addressing is a capability of VTAM V3 and ACF/NCP Version 4 (see Foil 25).

NETWORKING PRODUCTS - CONTINUED MULTIPLE DOMAIN ENVIRONMENT

FUNCTIONS/FEATURES

- ALL PREVIOUS CAPABILITIES
 - + PLUS +
- CONNECTION OF SINGLE DOMAIN NETWORKS
- PARALLEL LINKS
- MULTIPLE ACTIVE ROUTES
- EXTENDED NCP INTERCONNECTION
- ENHANCED BACKUP/RECOVERY
 - + PLUS WITH ACF/VTAM VERSION 2
- CHANNEL-TO-CHANNEL SUPPORT
- HOST INTERMEDIATE ROUTING NODE
 - + PLUS WITH ACF/VTAM VERSION 2 REL 2
- INTERCONNECT INDEPENDENT SNA NETWORKS
 - + PLUS WITH ACF/VTAM VERSION 3
- EXTENDED NETWORK ADDRESSING
- MVS/XA 31-BIT ADDRESS EXPLOITATION
 - VIRTUAL STORAGE CONSTRAINT RELIEF (VSCR)

EXTENDED NETWORK ADDRESSING - ENA

ACF/VTAM V3, ACF/NCP V4 and SSP V3 enable Extended Network Addressing. This allows very large networks to continue to expand.

ENA nodes allow up to 255 subareas per network, as many as can be addressed by 8 bits. ENA subareas allow up to 32,768 elements per subarea, as many elements as can be addressed by 15 bits. All pre-ENA nodes that exist in the same network will continue to specify the same MAXSUBA. As well, all ENA nodes coexisting in the same network will need to specify MAXSUBA so that the ENA node can interpret the pre-ENA node address.

ACF/VTAM V3 exploitation of MVS/XA 31 bit addressing has been discussed earlier in single domain (Foil 5).

ENA enhancements can be categorized in two major areas: (1) VTAM's capability to control a larger network (i.e. perform the network ownership and network control); (2) VTAM's capability to handle increased transaction volumes or increased numbers of sessions (e.g. as a result of Extended Network Addressing). The virtual storage relief eliminates VTAM as a growth inhibitor in MVS/XA systems for application subsystems that do not support full 31 bit addressing.

Subareas with the following levels of products can coexist with ENA subareas in the same network. These levels are: ACF/VTAM V2R2, ACF/VTAM V2R1, ACF/TCAM V2R4, ACF/NCP V3, and ACF/NCP V2.

VS1/VTAM V2R1 can coexist in an ENA network. VM/VTAM or VS1 can activate a channel connected NCP V4, but cannot load or dump the NCP.

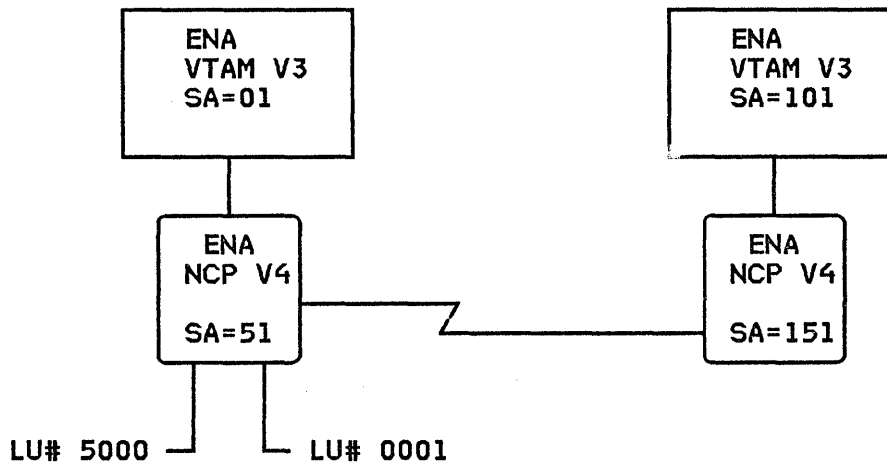
In addition to the above releases, if ACF/NCP V1R2.1 or TPF V2R2 require sessions with an ENA network, they will be supported using the SNA Network Interconnect (SNI) facility of ACF/NCP V3. Other releases of VTAM, NCP and TPF cannot coexist in the same (or in other networks via SNI) and support sessions.

There are two reasons TPF V2R2 and NCP V1R2.1 are supported by ACF/NCP V3 only. The first is that these releases of TPF and NCP use FID1 headers. These headers must be converted to FID4 headers before entering the ENA network. ACF/NCP V4 does not have this FID conversion capability. The second reason is that ENA nodes do not have migration route function required for pre-NCP V1R3 and pre-VTAM V1R3 level subareas. Using gateway function splits routes between the ACF/NCP V1R2.1 network and the ENA network so that the ENA network does not interface to a subarea requiring a migration route.

Refer to ENA technical bulletin, GG22-9385, for additional information.

NETWORKING PRODUCTS
MULTIPLE DOMAIN ENVIRONMENT

- **EXTENDED NETWORK ADDRESSING - ENA**



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V3	ACF/NCP V4 - 3725 ONLY
VSE	ACF/VTAM V3	ACF/NCP V4 - 3725 ONLY
<u>FUNCTIONS/FEATURES</u>		

- **PROVIDES NEW ADDRESS STRUCTURE**
 - 255 SUBAREAS
 - 32,768 ELEMENTS PER SUBAREA
- **EXPLOITS MVS/XA 31-BIT ADDRESSING**
 - VIRTUAL STORAGE CONSTRAINT RELIEF (VSCR)
- **CO-EXISTENCE WITH VTAM V2, NCP V2 AND NCP V3 FOR MIGRATION**

SNA NETWORK INTERCONNECTION

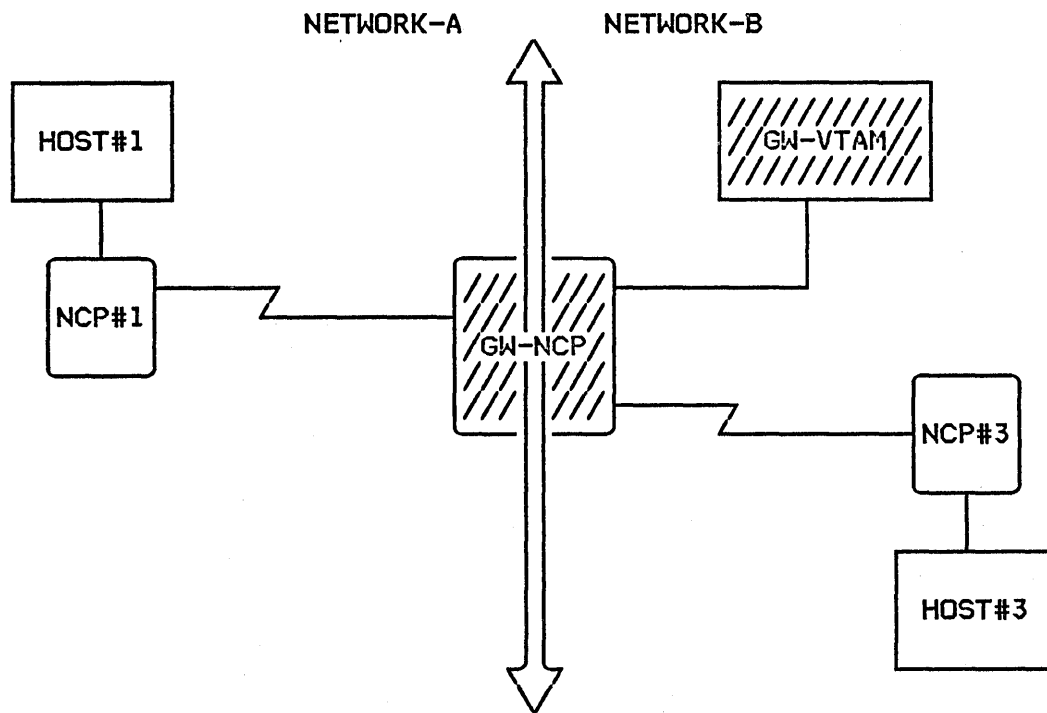
SNA Network Interconnection (SNI) is a function that allows two (or more) independent SNA networks to be connected together without changing the existing addressing structures (MAXSUBA) or naming conventions of the networks involved. The NCCF V2 Name Translation Facility is required if duplicate names exist.

Only two components are required in a SNI configuration: one gateway VTAM (ACF/VTAM V2R2 or V3) and one gateway NCP (ACF/NCP V3 or V4). These two together manage all the sessions that flow between the interconnected networks. Various ACF Versions and Releases can communicate through the gateway node without upgrading to the new levels. Some restrictions and PTFs exist.

There are several reasons why a user might implement the SNI function.

- o Independent networks exist that have only recently developed a need to communicate with each other. Examples include company acquisitions and divisional networks that need to connect to corporate data bases.
- o An existing large network might be managed more efficiently if it were split into smaller networks. This is especially true if parts of the network control their own network changes.
- o Parts of an existing network may need to be isolated from the main network for purposes of an ENA migration.
(See previous section.)

NETWORKING PRODUCTS SNA NETWORK INTERCONNECTION



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>
MVS	ACF/VTAM V2R2,V3

<u>PRE-REQUISITE PRODUCTS</u>
ACF/NCP V3 (3705/3725) OR ACF/NCP V4 (3725)

FUNCTIONS/FEATURES

- **INTERCONNECT INDEPENDENT SNA NETWORKS**
 - INDEPENDENT ADDRESS STRUCTURES MAINTAINED
 - INDEPENDENT NETWORK NAMES MAINTAINED (NCCF V2 REQUIRED)
 - NETWORK MANAGEMENT FOR INTERCONNECTED NETWORKS
- **TWO COMPONENTS REQUIRED TO MANAGE CROSS NETWORK COMMUNICATION**
 - GATEWAY-VTAM (GW-VTAM)
 - GATEWAY-NCP (GW-NCP)
- **SUPPORT CROSS-NETWORK COMMUNICATION FOR DIFFERENT ACF VERSIONS/RELEASES**

SNA NETWORK INTERCONNECTION (CONTINUED)

SNI is an evolution of the existing SNA architecture. It is an extension of MSNF function, which supported communication of resources (Logical Units or LUs) in different domains, to communication of LUs in different networks. Included are:

- terminal to application sessions
- application to application sessions
- parallel sessions
- multiple concurrent sessions between compatible LUs

In general, if a session was possible in a cross domain environment it is possible in an SNI cross network environment.

SNI allows networks to be connected in many configurations. The simplest was shown on the previous foil. In addition, multiple gateway NCPs might be considered for capacity reasons, multiple gateway VTAM's for backup reasons, or non-adjacent networks for isolation reasons. For additional considerations of the more complex configurations please see Network Program Products Planning (SC27-0658) or the technical bulletin SNI Network Interconnection: A Technical Overview (GG22-9352).

NETWORKING PRODUCTS SNA NETWORK INTERCONNECTION

(CONTINUED)

- **EVOLUTION - EXISTING SNA ARCHITECTURE**
 - EXTENSION OF ACF/MSNF CROSS-DOMAIN
- **SUPPORT COMMUNICATION BETWEEN LOGICAL UNITS IN SEPARATE SNA NETWORKS**
 - ACCESS TO CROSS-NETWORK RESOURCES
 - TERMINAL-TO-APPLICATION
 - APPLICATION-TO-APPLICATION
 - MULTIPLE CONCURRENT "CROSS-NETWORK" SESSIONS BETWEEN COMPATIBLE LU'S

- **INTERCONNECTS MULTIPLE NETWORKS SIMULTANEOUSLY IN MORE COMPLEX CONFIGURATIONS**
 - SINGLE GATEWAY-VTAM & SINGLE GATEWAY-NCP
 - SINGLE GATEWAY-VTAM & MULTIPLE GATEWAY-NCP'S
 - MULTIPLE GATEWAY-VTAM'S & SINGLE GATEWAY-NCP
 - ADJACENT & NON-ADJACENT NETWORKS

- **MULTIPLE FACTORS INVOLVED:**
 - AVAILABILITY/RECOVERY
 - PERFORMANCE
 - NETWORK MANAGEMENT

NETWORKING APPLICATION PRODUCTS

What has been presented to this point are the base products required and functions available in an SNA communications network. However, there are several SNA application products that utilize these networking facilities. Additionally, several different tools are available for managing an SNA network. The remainder of the presentation is an attempt to introduce some of these application and network management products that were shown in the network diagram at the beginning of this presentation.

COMMUNICATIONS PRODUCTS

- NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
(CICS + IMS)
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

- NETWORK MANAGEMENT PRODUCTS
OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTE TABLE GENERATOR - RTG

NETWORKING APPLICATION PRODUCTS: JES2 JOB NETWORKING

The JES2/NJE facility allows selected jobs, in-stream (SYSIN) data sets, system output (SYSOUT) data sets, operator commands, messages, and job accounting information to be transmitted from one computer to another. Node-to-node communications is done over SDLC lines. Other methods of communication supported are: BSC and CTC.

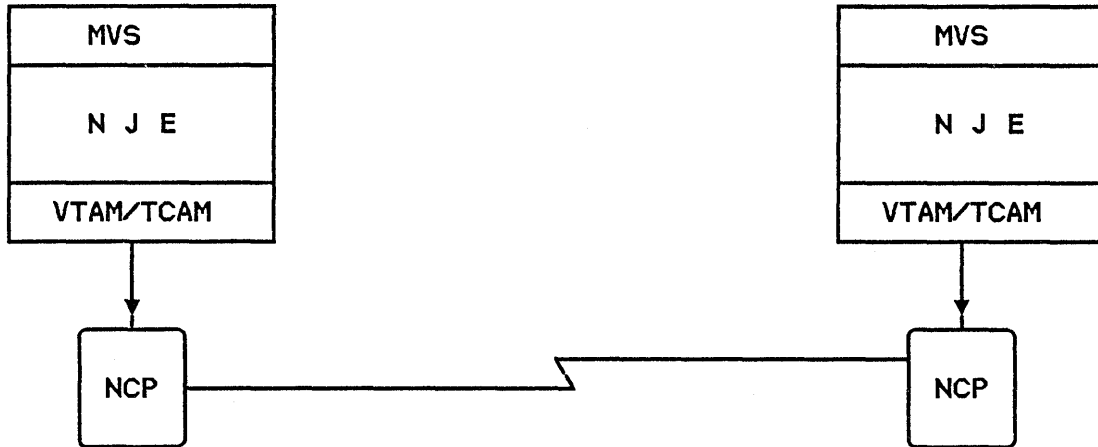
NJE (5752-XR8) has been integrated into MVS/SP(5740-XYS).

NETWORKING APPLICATION PRODUCTS

JOB NETWORKING :

- **JES2/NJE**

NETWORK JOB ENTRY



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE
MVS	ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- **FULL NJE NODE**
 - SUBMIT JOB(S) INTO NJE NETWORK
 - TRANSMIT JOBS, OUTPUT, MESSAGES, OPERATOR COMMANDS BETWEEN NODES
 - ROUTE OUTPUT TO JES/RJE STATION
- **DIRECT COMMUNICATION BETWEEN JOB ENTRY NODES (NO STORE-AND-FORWARD)**
- **MULTI-DOMAIN SUPPORT**
- **SDLC, BSC, CTC SUPPORT**

NETWORKING APPLICATION PRODUCTS: JEP/FTP JOB NETWORKING

The JEP program product provides the function of job entry from remote VSE hosts to a central-site host. Job output can be processed locally at the host, transmitted back to the VSE host, or routed to an alternate destination. As such, JEP provides the functions of an RJE workstation, but does not provide the full function of an NJE node. JEP can communicate with: JES2, JES3, JES2/NJE, and VS1/RES.

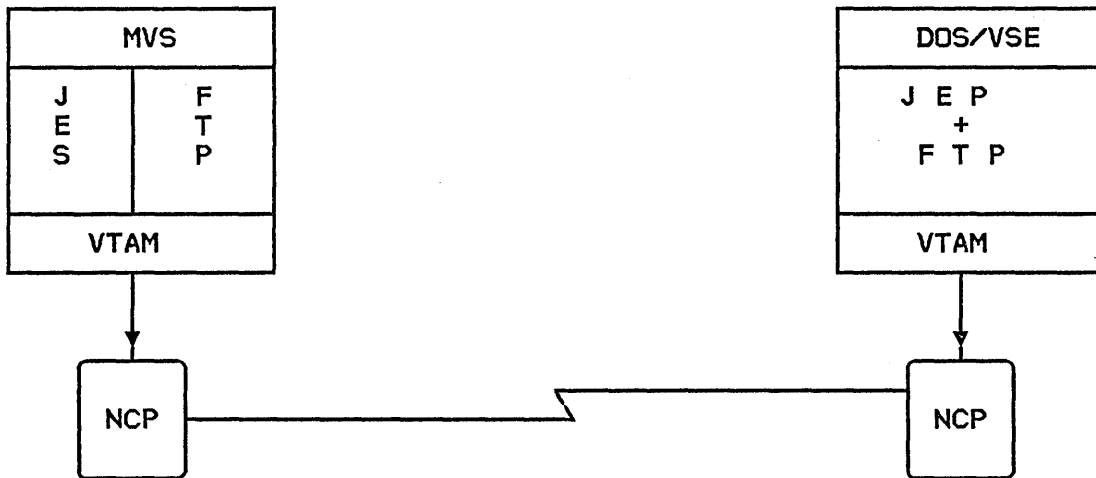
The FTP program product, if installed at another host, provides the capability for VSE jobs to be submitted from that host to the VSE host to be executed. The transmitting host can use an OS/VS1, MVS, or VSE operating system. The output produced at the VSE host can be processed at the VSE host, transmitted back to the submitting host, or routed to an alternate host. Also, with FTP installed at the other host, sequential files can be transmitted between the host and the VSE node.

JEP V2R2 has integrated CDNDT and FTP functions and is supported by the VSE and MVS operating systems.

NETWORKING APPLICATION PRODUCTS
JOB NETWORKING :

• **POWER/JEP/FTP**

JOB ENTRY PROGRAM/
 FILE TRANSFER PROGRAM (5748-XE6)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
VSE	ACF/VTAM VIR3,V2R1,V3,VTAM/E	NONE

FUNCTIONS/FEATURES

- PARTIAL NJE NODE
- WORKSTATION SUPPORT
 - SUBMIT JOB(S) TO CENTRAL HOST
 - ROUTE OUTPUT TO ORIGINATING NODE, CENTRAL HOST, ALTERNATE NODE
- VSE JOB SUBMISSION FROM CENTRAL HOST TO VSE HOST (FTP)
- FILE TRANSMISSION (FTP)
- MULTI-DOMAIN SUPPORT

NETWORKING APPLICATION PRODUCTS: RSCS NETWORKING V2

Remote Spooling Communications Subsystem (RSCS) Networking V2 is a program product that allows VM/SP to communicate with RJE workstations and NJE hosts. RSCS V2 has been restructured to operate with the new Group Control System (GCS) provided in VM/SP R4. This allows RSCS V2 to continue to support the same device types supported by RSCS V1R3. It also allows RSCS V2 to be defined as an application to ACF/VTAM V3 for VM/SP (VM/VTAM) for SNA 3270 printer support and SNA/NJE support.

RSCS V2 supports BSC RJE devices in the same manner that RSCS V1 provided support. These BSC RJE devices are supported without the use of VM/VTAM facilities; i.e., Emulation Program (EP) for the 37x5 Communications Controllers or Non-SNA Interconnect is required. RSCS V2 does not support SNA/RJE workstations.

SNA 3270 printer support is functionally equivalent to non-SNA 3270 printer support provided previously by RSCS V1R3. SNA 3270 printers are supported as LU_T1 or LU_T3. LU_T1 is recommended for overall line performance and support of the PA1(READY), PA2(START), and CANCEL PRINT keys. SNA 3270 printers supported through VTAM can also be shared among several applications such as CICS, IMS, or other RSCS applications. RSCS will request a printer when a file is queued and will release the printer the file is printed. RSCS V2 can send output to non-SNA 3270 printers supported by CP or to SNA 3270 printers supported by ACF/VTAM.

RSCS V2 also supports the printing of files produced by GDDM R3 or subsequent releases. RSCS V2 can send GDDM output to non-SNA 3270 printers supported by CP or to SNA 3270 printers supported by ACF/VTAM only when configured using the LU_T3 support.

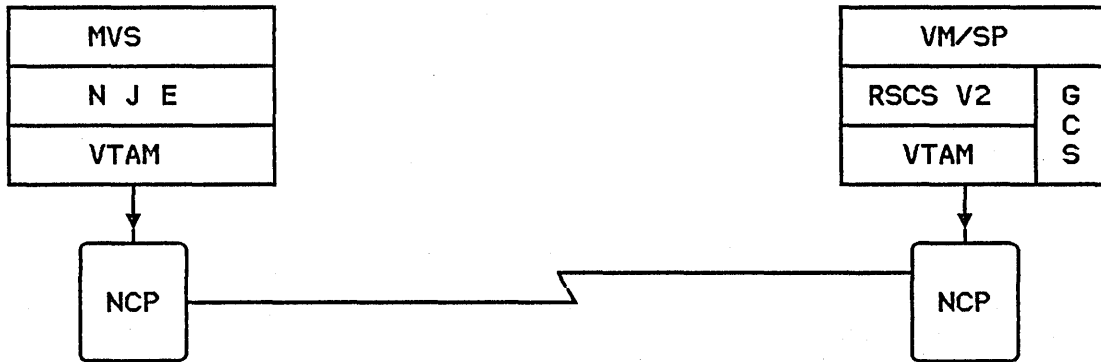
RSCS V2 now has a single line driver for all non-SNA NJE support, whether across BSC links or CTC adapters. For SNA/NJE, RSCS V2 uses the Multisystems Networking Facilities of VM/VTAM to participate in peer sessions with JES2, VSE/POWER V2, RSCS/SNA (FDP), or another RSCS V2. As a full SNA/NJE participant, RSCS V2 can simultaneously transmit and receive files in a session. SNA/NJE also allows host nodes to establish sessions directly, rather than performing the store-and-forward approach of non-SNA NJE nodes. This allows files to be transferred quicker and without impacting the resources of intervening nodes. Additionally, a new multi-streaming facility has been added to RSCS V2 to allow up to seven streams to be defined between two NJE hosts, allowing small high-priority files to be sent in parallel with larger files. This prevents high-priority files from being delayed by the larger files and is available for both SNA and non-SNA NJE transmissions.

NETWORKING APPLICATION PRODUCTS

JOB NETWORKING :

- **RSCS**

REMOTE SPOOLING COMMUNICATIONS SUBSYSTEM
NETWORKING VERSION 2 (5664-188)



OP SYS

VM/SP

ACCESS METHOD(S)

ACF/VTAM V3

PRE-REQUISITE PRODUCTS

VM/SP R4

FUNCTIONS/FEATURES

- **NATIVE ACF/VTAM SUPPORT**
- **TERMINAL SUPPORT**
 - BSC/RJE VIA EP
 - SNA/3270 VIA VTAM (LU1 AND LU3)
 - GDDM SUPPORT FOR SNA/3270 PRINTERS (LU3)
- **FULL NJE NODE**
 - SNA, BSC, CTC SUPPORT
 - DIRECT COMMUNICATION TO NODES
 - MULTI-STREAMING SUPPORT

NETWORKING APPLICATION PRODUCTS: INTER-SYSTEMS COUPLING

CICS/ISC, IMS/MSC, and IMS to CICS via ISC provide the capability for two or more subsystems to communicate using SNA Networking. CICS/ISC allows requests to be shipped between CICS subsystems using SNA parallel session support. This facility provides for a direct transaction-to-transaction interface, which permits user function to be distributed between systems in the network.

IMS/MSC program product permits the interconnection of two or more IMS subsystems in a multi-domain environment. The user can thus distribute function, resources, and processing loads among IMS subsystems to satisfy particular business requirements.

Lastly, the ISC capability permits CICS and IMS to communicate using SNA facilities. This transaction-to-transaction capability uses an SNA LU 6.2 protocol. The distributed transaction processing capability is provided to allow users to distribute functions across a network of CICS and IMS as well as the CICS-to-CICS and IMS-to-IMS.

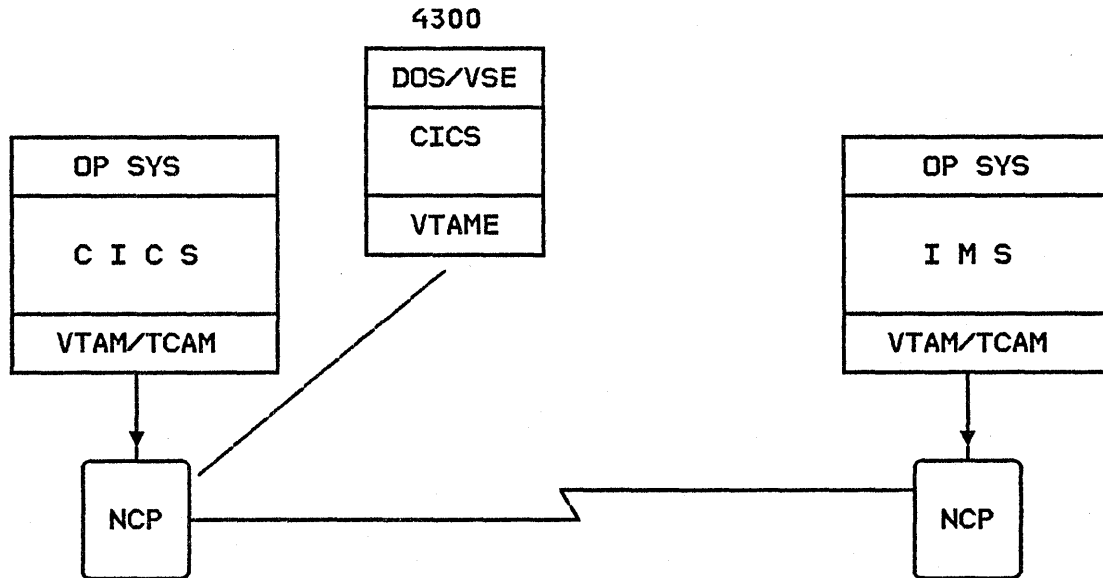
NETWORKING APPLICATION PRODUCTS DB/DC INTER-SYSTEMS COUPLING (ISC):

- **CICS/ISC**

INTER-SYSTEMS COUPLING (5740-XX1)

- **IMS/MS-CISC**

MULTI-SYSTEMS COUPLING (5740-XX2)



OP SYS	ACCESS METHOD(S)	PRE-REQUISITE PRODUCTS
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3,ACF/TCAM V2R4	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VS1	ACF/VTAM V1R3,V2R1,V3,ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- **APPL-TO-APPL COMMUNICATION:**

CICS <----> CICS (PARALLEL SESSIONS: ACF/VTAM ONLY)
 IMS <----> IMS (PARALLEL SESSIONS: ACF/VTAM ONLY)
 CICS <----> IMS (PARALLEL SESSIONS: ACF/VTAM ONLY)

- **DISTRIBUTED DATA & TRANSACTION PROCESSING**

- **TRANSACTION ROUTING**

NETWORKING APPLICATION PRODUCTS: TCAM V3

The ACF/TCAM Version 3 program product is not intended to provide a queuing system under VTAM. It should be considered as a migration aid for those customers who want the functions, features, and reliability of the VTAM access method.

Customers using ACF/TCAM V3 will be able to run existing MPPs as well as the CICS DCB interface with at most minor modifications. Existing SNA Message Handlers should also work with the TCAM V3 without modification. The intent is to preserve the customer's investment in TCAM applications while providing an environment in which migration to IMS or CICS based queuing can be used to replace TCAM queuing and get the benefits of VTAM at the same time. As mentioned above, the CICS DCB interface has been preserved.

ACF/TCAM Version 3 no longer supports TSO, NCCF, or the products supported under the RAPI interface. These interfaces must be replaced with the equivalent VTAM support.

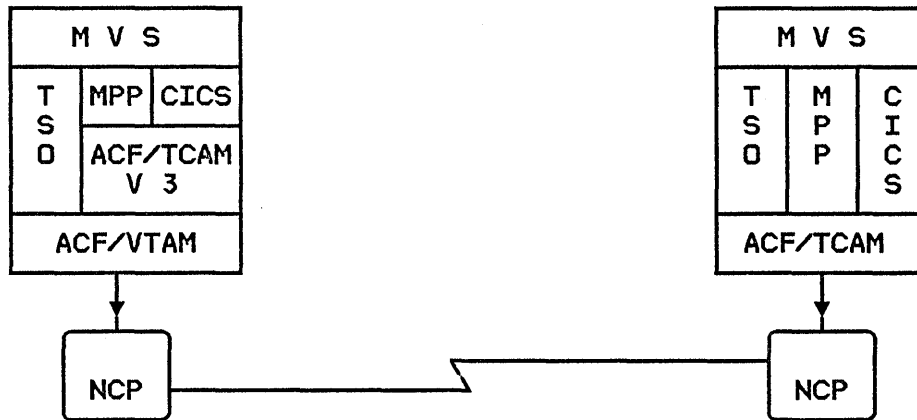
While the programmed operator interface is preserved in TCAM V3, care must be taken when attempting to convert this interface from V2 to V3 as the network resources are no longer under the control of TCAM and must be managed by VTAM. It possible that replacing the programmed operator altogether with NCCF CLISTS (as opposed to attempting to convert the existing code) is a better solution for some users.

Another major consideration for the potential user of version 3 is that the supported terminals are those supported by VTAM. Since this is a much smaller population than that of TCAM Version 2, arrangements must be made to support such devices as TWX or 3780 so far as VTAM is concerned. Protocol conversion, NTO, or any of a number of other options exist to perform this function.

NETWORKING APPLICATION PRODUCTS: APPLICATION PRODUCTS

• ACF/TCAM VERSION 3

TELECOMMUNICATIONS ACCESS METHOD VERSION 3 (MVS: 5665-314)



OP SYS

MVS

ACCESS METHOD(S)

ACF/TCAM V3

PRE-REQUISITE PRODUCTS

ACF/VTAM V2R1,V2R2,V3

FUNCTIONS/FEATURES

- PROVIDES MESSAGE QUEUEING & SWITCHING
- MIGRATION PATH FOR TCAM TO VTAM AND
- PRESERVES NECESSARY FUNCTIONS:
 - CICS DCB INTERFACE
 - USER DCB APPLICATIONS
 - PROGRAM OPERATOR INTERFACE
 - SNA MH CODING
- TCAM V3 DOES NOT PERFORM
 - ACCESS METHOD FUNCTION
 - SUB-SYSTEM INTERFACE FUNCTION
 - TSO SUPPORT
 - CNM SUPPORT

NETWORKING APPLICATION PRODUCTS: PROGRAM DEVELOPMENT - TSO

The program development facilities available via TSO and TSO/E are easily accessible via SNA networking.

To provide cross-domain terminal access to TSO is a simple definition process. This case is no different than the support of other subsystems such as CICS, IMS, and RJE using JES2 or JES3, though not previously discussed. That is, definition of cross-domain resources (CDRSCs) for a multi-domain environment is required in order to provide access to a specific service. With ACF/VTAM V2R2 CDRSC definition may be dynamic for both the initiating and receiving SNA control point (SSCP).

File transmission between MVS systems with TSO/E and VM/SP systems is supported.

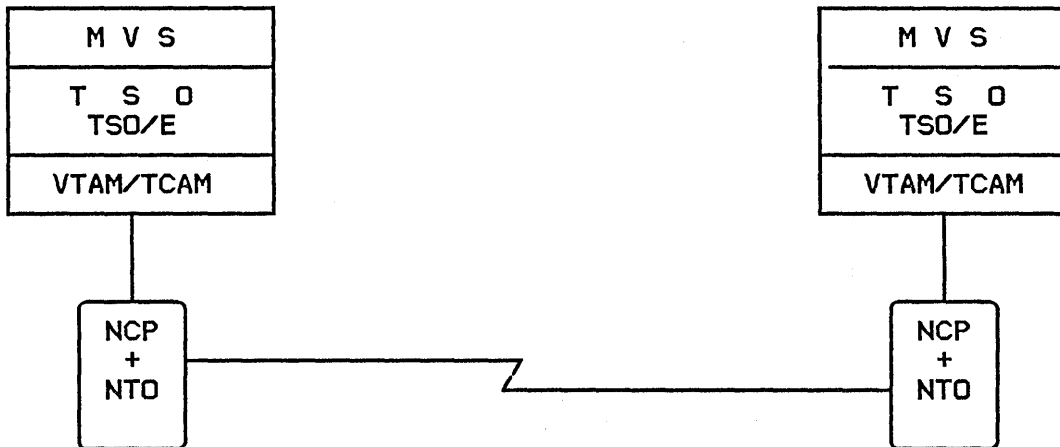
The Information Center Facility feature associated with TSO/E allows an MVS installation to easily install and maintain an information center.

NETWORKING APPLICATION PRODUCTS PROGRAM DEVELOPMENT

- **TSO, TSO/E**

TIME SHARING OPTION EXTENSIONS

MVS/XA (5665-293)
MVS, MVS/XA (5665-285)



OP SYS

MVS
MVS

ACCESS METHOD(S)

ACF/VTAM V1R3,V2R1,V2R2,V3
ACF/TCAM V2R4

PRE-REQUISITE PRODUCTS

NONE

FUNCTIONS/FEATURES

- **SNA MULTI-DOMAIN
TERMINAL ACCESS TO
PROGRAM DEVELOPMENT**
- **NTO: S/S TERMINAL SUPPORT**
- **SEND/RECEIVE FILES - TSO/E**
- **INFO CENTER FACILITY - TSO/E**

NETWORKING APPLICATION PRODUCTS: PROGRAM DEVELOPMENT - VCNA

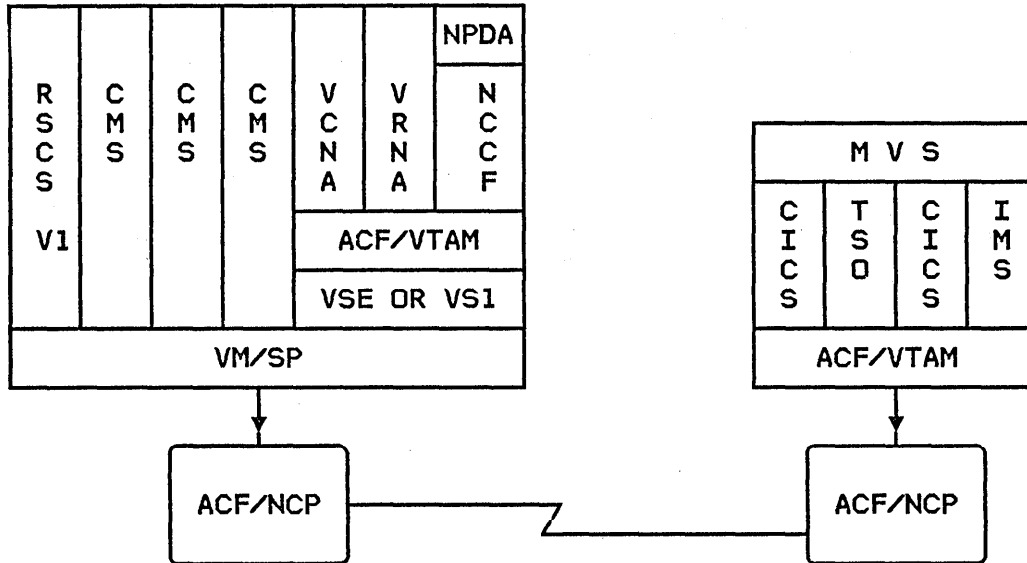
The VM/VCNA (Virtual Machine/VTAM Communications Network Application) program product provides the ability to use an SNA terminal as a virtual machine operator console. VM/VCNA provides an interface between VM/SP's console support and ACF/VTAM's application program interface (API). This allows terminals attached to a VM host to participate in an SNA network, using MSNF, in order to access other SNA applications, such as TSO, CICS, and IMS. It also allows terminals attached to other SNA hosts to access CMS through the use of MSNF.

VM/VCNA executes in a virtual machine as an ACF/VTAM application under the control of either an OS/VS1 or DOS/VSE guest operating system. This virtual machine containing VM/VCNA, ACF/VTAM, and either the OS/VS1 or DOS/VSE guest is referred to as the VTAM Service Machine (VSM).

NETWORKING APPLICATION PRODUCTS PROGRAM DEVELOPMENT

• VM/VCNA

VTAM COMMUNICATIONS NETWORK APPLICATION (5735-RC5)



GUEST SCP

VS1
VSE

ACCESS METHOD(S)

ACF/VTAM V1R3,V2R1,V3
ACF/VTAM V1R3,V2R1,V3,VTAM/E

PRE-REQUISITE PRODUCTS

VM/SP

FUNCTIONS/FEATURES

- SNA SUPPORT FOR VM/SP
 - SNA TERMINALS CAN ACCESS CMS
 - VM TERMINALS CAN ACCESS SNA APPLICATIONS (CICS, IMS, TSO, ETC.)
- REQUIRES AN ACF/VTAM SERVICE MACHINE
 - DOS/VSE
 - OS/VS1
- NTO S/S TERMINAL SUPPORT

NETWORKING APPLICATION PRODUCTS: PROGRAM DEVELOPMENT VSCS

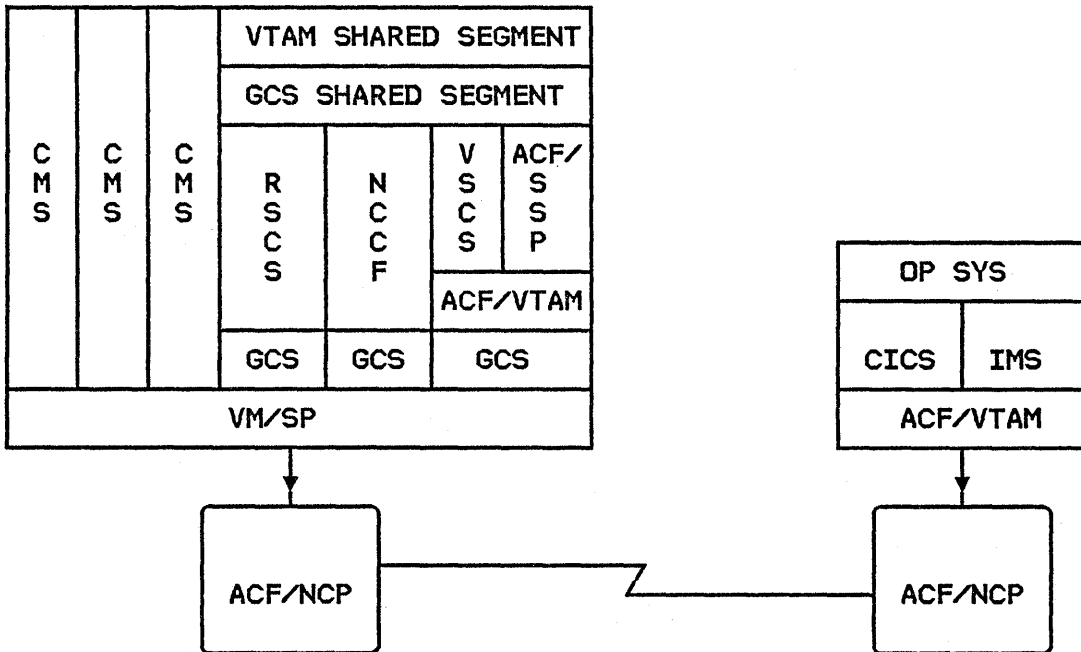
VM SNA Console Support (VSCS) is a component of VM/VTAM that provides a superset of the functions available with VCNA (Foil 35). VSCS supports local and remote VTAM terminals as virtual machine consoles. VSCS is the interface between VM/VTAM's application program interface (API) and VM/SP's console support. Additionally, VSCS has been enhanced with features that VCNA did not provide.

- o 3290 Support - VSCS provides support for the 3290 large screen (62 X 160 characters) and also allows application support for screen partitioning.
- o CP DIAL - VSCS allows VTAM terminals to use CP's DIAL command. This is an extensively used feature of VM that has been available to terminals attached natively (EP) to VM but has not been available to VTAM-owned terminals until now.
- o VMEXIT - VSCS extends the use of the VMEXIT command to LU1 devices as well as the previously supported 3270 terminals.
- o 3270 Console Status Area - VSCS allows the same information to be displayed in the console status area as a 3270 terminal attached natively (EP) to VM/SP.
- o Dynamic SNA Printer Sharing - VSCS supports SNA printers for PF Key Copy. VSCS will acquire and release the SNA printers so that the printers may be shared with other VTAM applications.
- o TWX Terminal Support Enhanced - VCNA placed many limitations on asynchronous terminal functions supported through NTO and ACF/NCP. VSCS has been enhanced to provide functions that are equivalent to TWX terminals supported when attached natively (EP) to VM/SP. These enhancements include support for APL/ASCII, PF Keys, VM/SP's 'SCROLL' and 'PROMPT' terminal commands, and removal of the VCNA line size restriction so that the line size may be specified up to 255 characters. The DIAL command is NOT supported for NTO-attached terminals. Therefore, environments where TWX terminal operators use the DIAL command to access virtual machines (i.e., 3101 PVM) may need to maintain EP support for some of their TWX terminals.
- o Large Message Performance Enhancement Outbound - This is an option of the ACF/VTAM 'SEND' macro that allows VTAM to perform chaining rather than have the application, such as VCNA, perform chaining.
- o Serviceability Improvements - VSCS has been made more serviceable with the addition of internal trace points (i.e., VSCS API trace), additional trace records, improved error recovery, and improved dump processing.
- o Simplified Installation - VSCS is now a component of ACF/VTAM V3 for VM/SP and is installed and maintained as a part of VM/VTAM.

NETWORKING APPLICATION PRODUCTS PROGRAM DEVELOPMENT

- **VSCS**

VM/SNA CONSOLE SUPPORT - COMPONENT OF VM/VTAM



OP SYS ACCESS METHOD(S)

VM ACF/VTAM V3

PRE-REQUISITE PRODUCTS

VM/SP R4

FUNCTIONS/FEATURES

- **COMPONENT OF VM/VTAM**
- **SUPERSET OF VM/VCNA**
- **SNA SUPPORT FOR VM/SP**
 - SNA TERMINALS CAN ACCESS CMS
 - VM TERMINALS CAN ACCESS SNA APPLICATIONS (CICS, IMS, TSO, ETC.)

NETWORKING APPLICATION PRODUCTS: 8100 DDP

The 8100 provides the capability to distribute both data and function within a network. The 8100 supports 8100-to-host communication via an RJE facility with both JES or VSE/POWER.

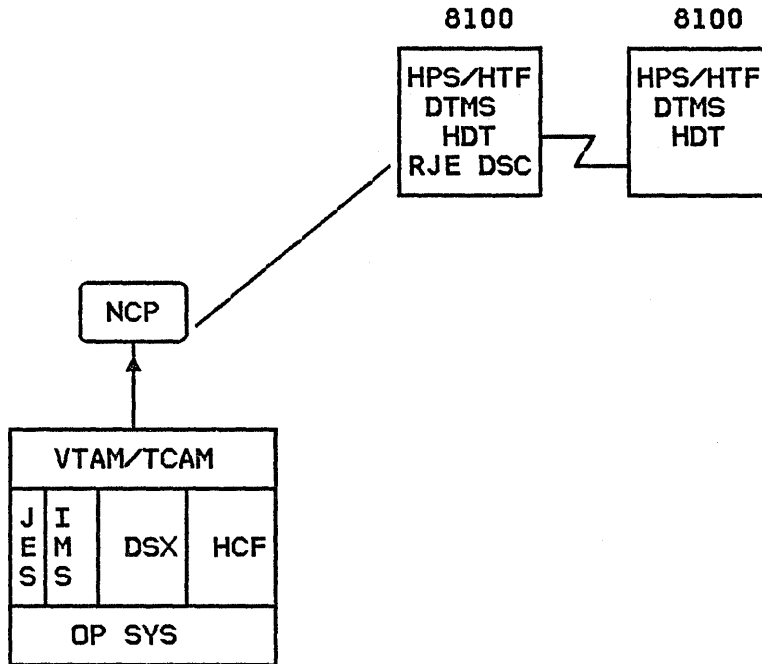
HTF/DTMS provides a transaction-to-transaction facility from the 8100 to the host for IMS and CICS.

Also, via data stream compatibility (DSC), an 8100 terminal can access multiple applications in a host processor.

With DSX in the host and HDT in the 8100, file transmission is available.

NETWORKING APPLICATION PRODUCTS

• 8100 DDP



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3,ACF/TCAM V2R4	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- **DISTRIBUTED DATA & FUNCTION**
 - **HOST-TO-8100 COMMUNICATION:**
 - RJE <---> JES + VSE/POWER
 - IMS/CICS <---> HTF/DTMS
- **TERMINAL-TO-APPL CONNECTIVITY**
 - **DATA STREAM COMPATIBILITY (DSC)**
 - **FILE TRANSMISSION FACILITY**
 - **DATA + MAINTENANCE TO/FROM 8100/HOST (DSX <---> HDT)**

NETWORKING APPLICATION PRODUCTS: 4331/61 DDP

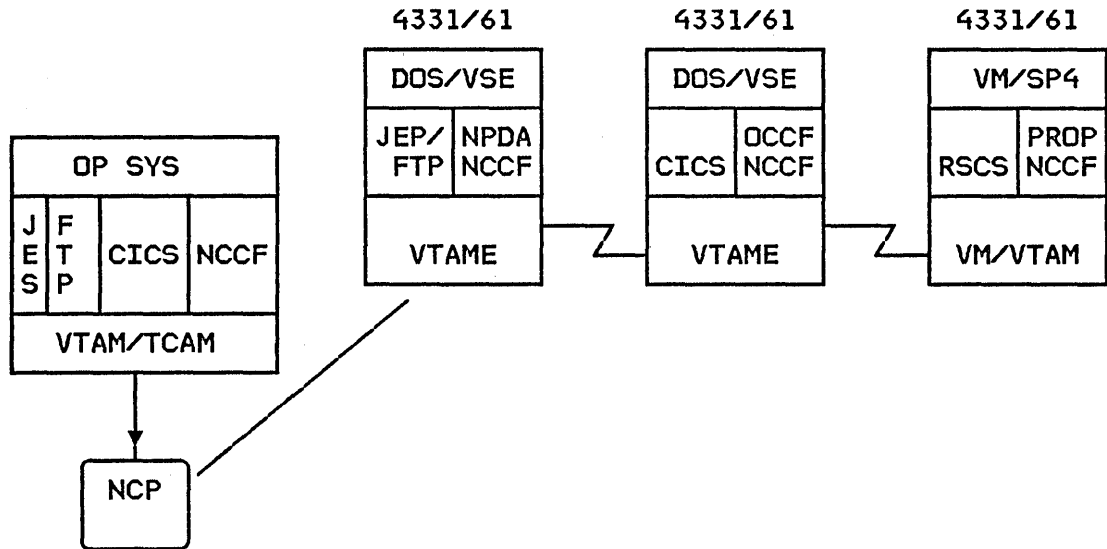
The 4331/61 with ACF/VTAM(E) provides many of these same capabilities to distribute both data and function to remote processing sites. Host-to-4300 communication is provided for job processing via JEP and transaction-to-transaction processing via CICS and IMS. Terminal-to-application processing is simply via the cross-domain facilities of SNA.

Clearly, larger processors can be used for a DDP environment; the 4331 and 4361 are focused upon because of the unique nature of the hardware (i.e. no 3705 requirement).

Access method support is provided via ACF/VTAME or ACF/VTAM V2R1 or V3 for either VSE or VM.

NETWORKING APPLICATION PRODUCTS

• 4331/4361 DDP



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
VSE	ACF/VTAM V2, VTAM/E	4300 CPU WITH ICA
VM	ACF/VTAM V3	4300 CPU WITH ICA

FUNCTIONS/FEATURES

- **DISTRIBUTED DATA & FUNCTION**
 - **HOST-TO-4331/61 COMMUNICATION:**
 - JES <----> JEP
 - JES <----> RSCS
 - IMS/CICS <----> CICS
- **TERMINAL-TO-APPL CONNECTIVITY**
 - **CROSS-DOMAIN/NETWORK ACCESS**
- **FILE TRANSMISSION FACILITY**
 - **FTP**

NETWORKING MANAGEMENT PRODUCTS

The products discussed to this point have been networking application products; that is, application programs that utilize the facilities of an SNA network. However, another set of products is available to aid in the management and control of that network. The next portion of the presentation will deal with these. For purposes of this presentation, the network management products are divided into the categories shown here: network operations, problem determination, network utilities, monitoring facilities, and network administration products.

Operations will be discussed first, starting with NCCF

COMMUNICATIONS PRODUCTS

• NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

• NETWORK MANAGEMENT PRODUCTS

OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTE TABLE GENERATOR - RTG



NETWORKING OPERATION PRODUCTS: NCCF

The Network Communication Control Facility (NCCF) program product, which supports both TCAM and VTAM, permits multiple network operators with assigned responsibilities, at various locations to operate and control a network. NCCF operators can enter access method control commands to modify and display information about network resources. An operator's control can be restricted to a subset of the network resources.

NCCF also permits the addition of user-written command lists (CLIST) and command processors to perform additional functions. The later releases of NCCF provide enhanced control of CLISTs, such as: timers, conditional execution, and PAUSE. An operator's use of the IBM-supplied and user-written commands and command operands can be also restricted.

NCCF also provides for user-written exit routines.

Additionally, NCCF supports operator communication between domains; commands can be routed for execution in other domains and the responses returned to the issuing operator.

For the users of SNA Network Interconnection (see Foils 26 and 27) NCCF's Name Translation Facility, available in Version 2, can be used to handle duplicate resource names in multiple independent networks.

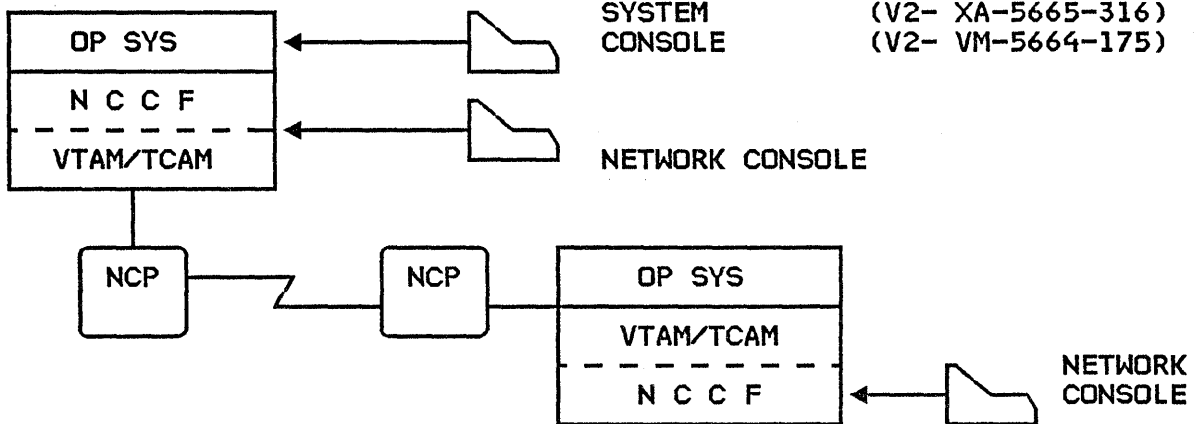
NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS :

- **NCCF**

NETWORK COMMUNICATIONS CONTROL FACILITY

(V1 5735-XX6)
 (V2-MVS-5668-947)
 (V2-VSE-5666-285)
 (V2- XA-5665-316)
 (V2- VM-5664-175)



OP SYS	ACCESS METHOD(S)	PRE-REQUISITE PRODUCTS
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3,ACF/TCAM V2R4	NONE
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VM	ACF/VTAM V3	NONE

FUNCTIONS/FEATURES

- **VTAM/TCAM OPERATOR CONTROL FACILITY**
- **SINGLE OR MULTIPLE OPERATOR CONSOLES**
 - SPAN OF CONTROL/SCOPE OF COMMANDS
- **USER CUSTOMIZATION**
 - COMMAND LISTS
 - COMMAND PROCESSORS
 - USER EXITS
- **CROSS-DOMAIN COMMUNICATION**
 - NCCF TO NCCF
 - NCCF TO NCCF/OCCF
 - NCCF TO NCCF/PROP
 - COMMAND EXECUTION IN OTHER HOSTS
- **HARDCOPY AND DISK LOG**

NETWORKING OPERATION PRODUCTS: TAF

Terminal Access Facility permits the consolidation of multiple network terminal functions onto a single terminal. This capability allows users to merge the network control and subsystems master terminal operator functions. A CICS and/or IMS master terminal operator can use the same terminal as the VTAM network operator. Also, using Host Command Facility (HCF) Version 2, that same terminal can be used to control multiple 8100 DPPX systems.

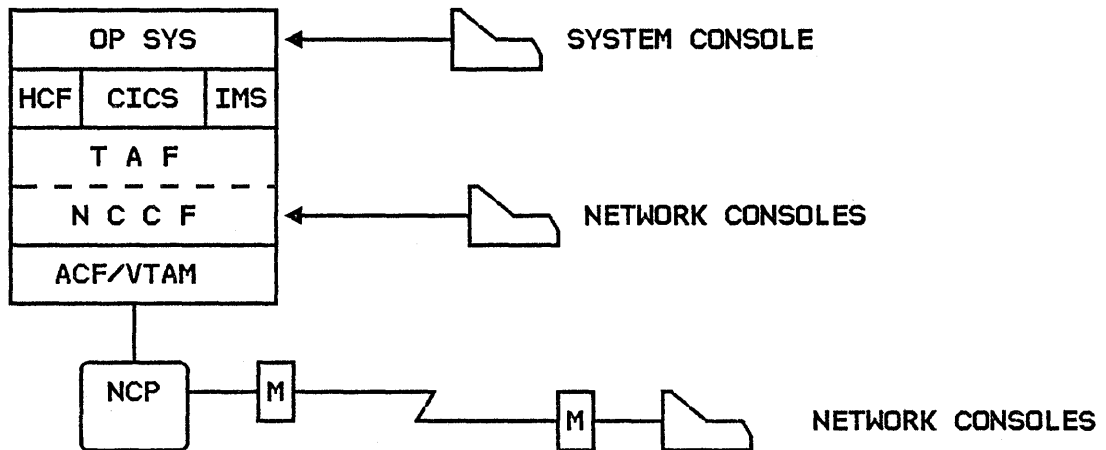
TAF was re-packaged as an integral facility of NCCF Version 2.

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS:

- **TAF**

TERMINAL ACCESS FACILITY - INCLUDED WITH NCCF VERSION 2



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE
MVS	ACF/TCAM V2R4	NONE
VM	ACF/VTAM V3	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- **CONSOLIDATE VTAM NETWORK OPERATOR & CICS / IMS MASTER TERMINAL OPERATOR FUNCTIONS ONTO THE SAME TERMINAL**
- **PROVIDE NCCF OPERATOR CONTROL OF 8100 DPPX SYSTEMS VIA HOST COMMAND FACILITY (HCF)**
- **CENTRALIZED NETWORK OPERATOR ACCESS**
 - 3270 FULL-SCREEN APPLICATIONS
 - 8100 DPPX/DPCX SYSTEMS VIA HCF, CICS, IMS

NETWORKING OPERATION PRODUCTS: OCCF

Operator Communications Control Facility (OCCF) provides remote operator control for both MVS and VSE systems.

This program product provides the capability to control, from central operator stations, a number of systems installed at remote locations. OCCF can route the MVS or VSE console traffic to an NCCF operator at a central site. The central site operator can also return responses or commands to the remote systems.

OCCF provides the facilities to: route messages from the remote system to a centralized console, enter commands and replies for the remote system from a centralized console, reply to messages automatically, and suppress the display of messages (VSE only).

These facilities are designed to reduce operator interaction for MVS and VSE systems and permit minimum operator attendance for remote site operation.

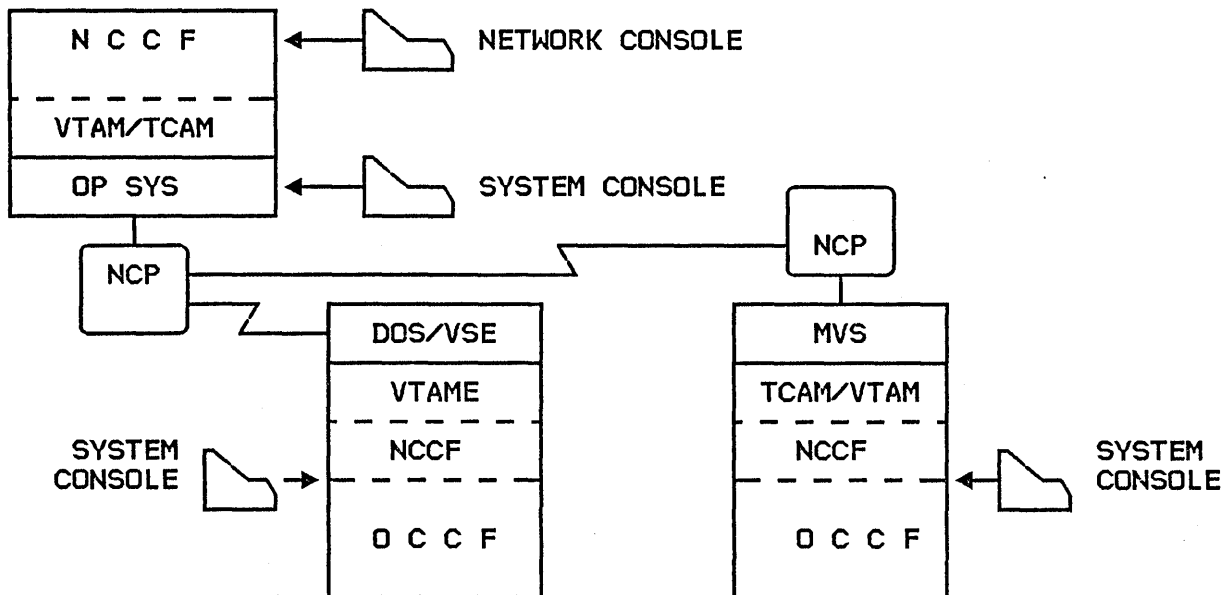
Additionally, MVS/OCCF supports the 4300 Remote Operator Console Facility (ROCF) to allow an IML/IPL of a remote 4300 system from an MVS host which has MVS/OCCF installed. (The remote 4300 must have the ROCF feature installed. The line is limited to 1200 baud using BSC 3275 protocols, which requires EP at the MVS/OCCF host.)

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS:

• OCCF

OPERATOR COMMUNICATIONS CONTROL FACILITY (VSE: 5746-XC5)
(MVS: 5665-288)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NCCF
MVS	ACF/TCAM V2R4	NCCF
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NCCF

FUNCTIONS/FEATURES

- REMOTE OPERATOR CONTROL
 - CENTRALIZED CONTROL
- SINGLE OR MULTIPLE OPERATOR CONSOLES
- REMOTE IPL/IML FACILITY
- NCCF INTERFACE FOR ACF OPERATIONS
- ROUTE COMMANDS TO REMOTE HOST, MESSAGE ROUTING, AUTOMATIC MESSAGE REPLY, MESSAGE SUPPRESSION

NETWORKING OPERATION PRODUCTS: PROP

The Programmable Operator Facility (PROP) is a VM/SP facility that allows distributed VM/SP systems to be automated and controlled from a central location. Prior to VM/SP R4 and VM/VTAM, this control was established through RSCS links.

In VM/SP R4, PROP has been extended to operate with NCCF for VM/SP. This extension makes it possible for VM/SP hosts to be operated in an SNA network in the same manner that MVS and VSE hosts are operated with OCCF (see Foil 42). PROP, in conjunction with NCCF, can enhance network operations in the single domain environment. However, when used in a multi-systems network environment, NCCF and PROP can be used to centralize operations of remote VM/SP systems.

To provide this capability, an interface to PROP has been added in NCCF V2 for VM/SP. This interface, called the PROP/NCCF Message Exchange (PMX), will allow an NCCF operator to become the PROP logical operator. As the PROP logical operator, the NCCF user can receive messages from any VM/SP component or virtual machine. The NCCF user can also issue any VM/SP command that the PROP virtual machine is authorized to execute.

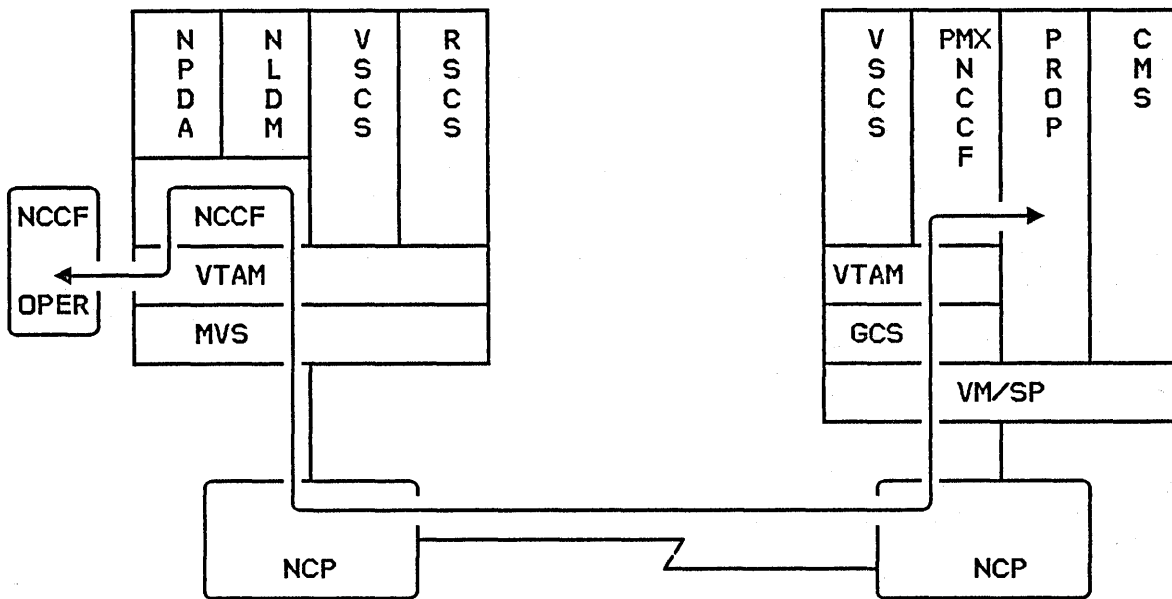
It is important to note that PROP is required if VSCS is to be controlled from an NCCF terminal. Because VSCS does not support ACF/VTAM's POI, NCCF cannot interface directly to VSCS. However, with the use of PROP, an NCCF operator can issue a command that is routed to PROP at the distributed site. PROP will then recognize the destination virtual machine that is running VSCS and forward the command to be executed by that virtual machine. VSCS can be started, halted, and traced in this manner.

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS:

- **PROP**

PROGRAMMABLE OPERATOR (COMPONENT OF VM/SP)



OP SYS

VM

ACCESS METHOD(S)

ACF/VTAM V3

PRE-REQUISITE PRODUCTS

VM/SP R4, NCCF

FUNCTIONS/FEATURES

- CENTRAL SITE NETWORK CONTROL
- ROUTE COMMANDS TO REMOTE HOST
 - VTAM COMMANDS
 - NCCF COMMANDS
 - VM COMMANDS

NETWORKING OPERATION PRODUCTS: NLDM

Network Logical Data Manager (NLDM) is an NCCF application that can enhance network operations and control. NLDM is designed to collect information about active sessions in the network, such as the session partner names/addresses, the route being used, the session BIND parameters, and trace data of the most recent PIUs that have flowed on the session.

NLDM can also collect and display session response time data from SNA models of the IBM 3274 with the Response Time Monitor(RTM) feature. NLDM provides menus and HELP facilities to aid network operators in accessing the data collected by NLDM. Several NLDM displays use diagrams and color(if available) to enhance data presentation to the user. NLDM will automatically communicate with other copies of NLDM in other domains and networks to gather complete session data for the user. NLDM functions are available from the same terminal used for NCCF and NPDA.

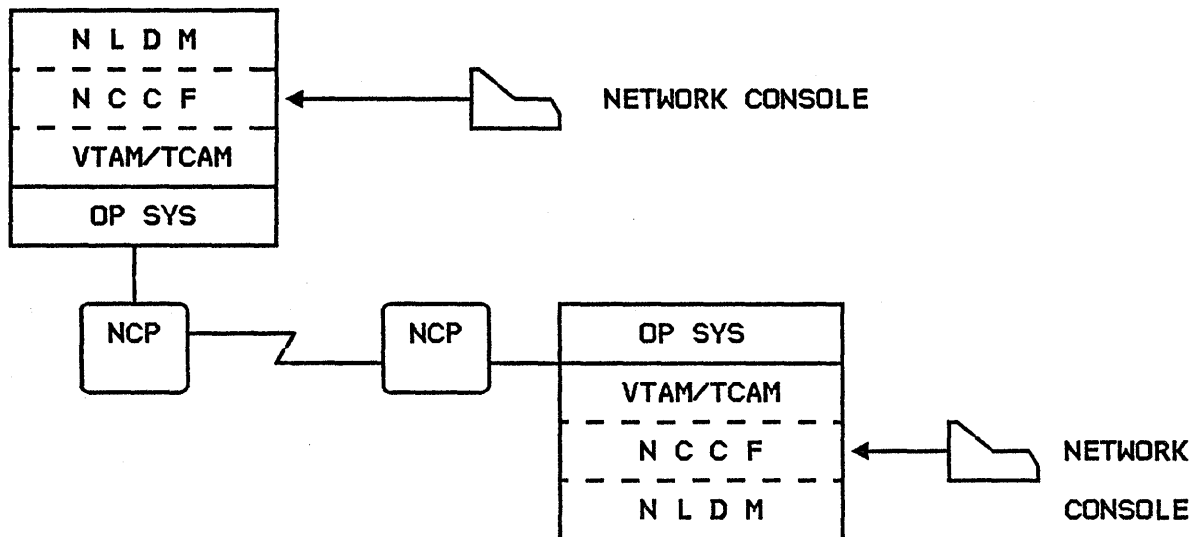
(NOTE: There are three releases of NLDM with increasing functional capability - however many NLDM functions depend on specific VTAM version/release levels as corequisites. Review the detailed product documentation to determine which NLDM functions are supported in your environment.)

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS:

- **NLDM**

NETWORK LOGICAL DATA MANAGER (5668-971)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V2,V3	NCCF V2 (NLDM R2 AND R3)
MVS	ACF/VTAM V1R3	NCCF (NLDM R1)
MVS	ACF/TCAM V2R4	

FUNCTIONS/FEATURES

- CONTINUOUS COLLECTION OF SESSION DATA
 - SESSION AWARENESS
 - SESSION CONFIGURATION/ROUTE
 - SESSION TRACE DATA
 - SESSION RESPONSE TIME (3274 RTM)
- MENUS, HELP SCREENS, COLOR DIAGRAMS
- SINGLE DOMAIN, MULTI-DOMAIN, AND MULTI-NETWORK OPERATION
- USE SAME TERMINAL FOR NCCF/NPDA/NLDM

DISTRIBUTED SYSTEMS EXECUTIVE: DSX

Distributed Systems Executive (DSX) is a network management program that assists in the management and controlled distribution of software and data in distributed data processing environments. DSX provides a range of change management, data distribution management, and problem management facilities for an expanding group of IBM SNA distributed processing systems. DSX Version 3, for MVS only, provides new support for System/36 nodes, as well as an interactive planning interface using TSO and ISPF. Operations are also improved by allowing planning and transmission functions to be active concurrently

DSX manages a library of distributed software resources (programs, CLISTS, maps) and a holding file for datasets being retrieved or sent. Functions are provided by DSX to manage these host files, put objects under DSX control, and schedule transmission sessions with remote nodes. DSX also provides the transmission program that carries out the scheduled retrieval or distribution of the data and software resources. The transmission program is a VTAM or TCAM(ACB) application which will run either automatically (unattended) or under the control of a DSX control operator. DSX reports on the outcome of transmission requests and keeps a history of DSX activity with the remote nodes.

NETWORKING MANAGEMENT PRODUCTS

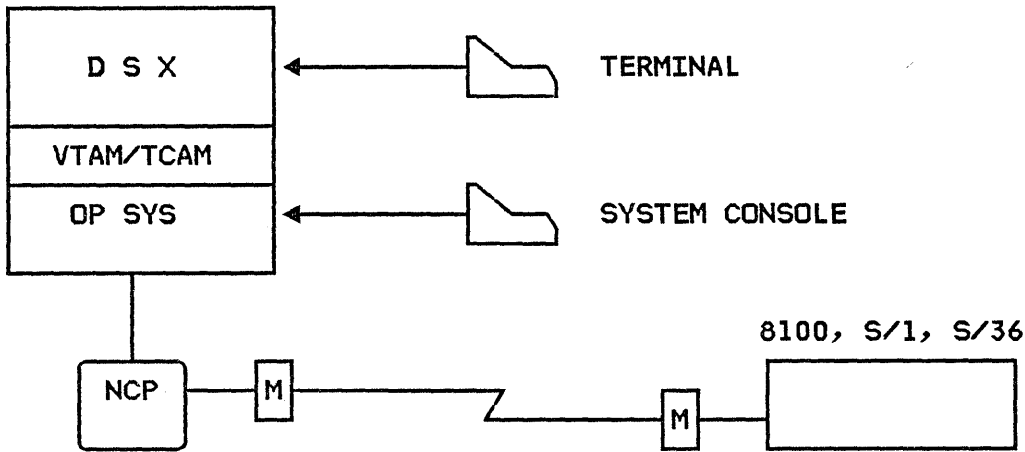
NETWORK OPERATIONS :

- DSX**

DISTRIBUTED SYSTEMS EXECUTIVE

(V2 - 5668-986)

(V3 - 5668-915)



OP SYS

MVS
VS1
VSE

ACCESS METHOD(S)

ACF/VTAM V1R2,V2,V3
ACF/TCAM V1R2,V2
ACF/VTAME

PRE-REQUISITE PRODUCTS

8100 DPPX OR DPCX
S/1 EDX OR RPS WITH RM
S/36 SSP WITH C&SM FEAT.

FUNCTIONS/FEATURES

- AIDS IN CENTRAL CONTROL OF SNA DISTRIBUTED PROCESSING PRODUCTS
 - RETRIEVES/STORES/SENDS DATA AND SOFTWARE IN DISTRIBUTED NETWORKS
 - TRACKING OF RESOURCES SENT/RETRIEVED
 - ATTENDED OR UNATTENDED OPERATION
 - V3 (MVS ONLY) HAS SIGNIFICANT FUNCTION/USABILITY ENHANCEMENTS
- CONCURRENT TRANSMISSION AND PLANNING ACTIVITY
 - INTERACTIVE PLANNING INTERFACE USING TSO AND ISPF

NETWORKING OPERATION PRODUCTS: HCF

Host Command Facility (HCF) allows an operator at a central site (System 370 or 4300) to operate and control 8100 systems. Maintenance, service, and control are available at the central site for the remote operator to do system control and problem determination. This type of function, remote operational control of an 8100 system using HCF in a host and the Program Operator Facility (POF) in the 8100 system, is analogous to that provided for a 4300 DDP network via NCCF and OCCF.

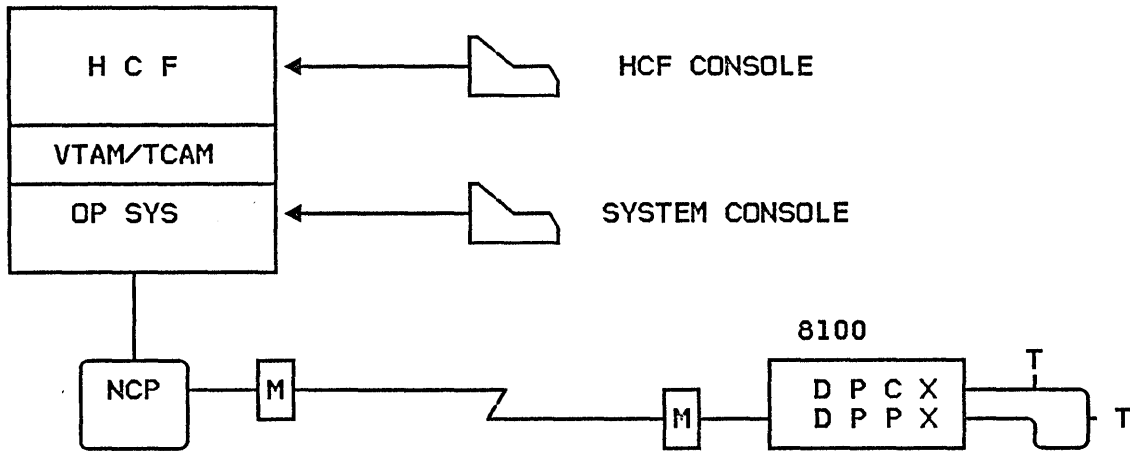
NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS :

- **HCF**

HOST COMMAND FACILITY

(V1 - 5735-XR1)
(V2 - 5668-985)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	DPPX/DPCX
MVS	ACF/TCAM V2R4	DPPX/DPCX
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	DPPX/DPCX
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	DPPX/DPCX

FUNCTIONS/FEATURES

- **CENTRAL 8100 CONTROL/OPERATION**
 - ACCESS TO 8100 CONTROL COMMANDS
 - WORK INITIATION/TERMINATION
 - ROUTE SYSTEM MESSAGES TO HOST
- **CENTRAL ACCESS TO 8100 DATA SETS**
- **CENTRAL 8100 PROBLEM DETERMINATION**
 - ERROR LOG, DIAGNOSTICS, DUMP/TRACE

NETWORKING OPERATION PRODUCTS: TARA

The 3600/4700 feature of NPDA, known as Threshold Analysis and Remote Access (TARA), provides remote operator control and problem determination for IBM 3600 and 4700 controllers.

This program product allows remote operator access to the 3600 and 4700 system monitor and notifies the central operator of a problem and error conditions.

Additionally, the operator, via TARA, can collect data from the 3600 and 4700: transaction response time, loop quality, statistical counts, and the systems message log.

Lastly, message switching is facilitated between an NCCF central operator and a 3600 and 4700 control operator.

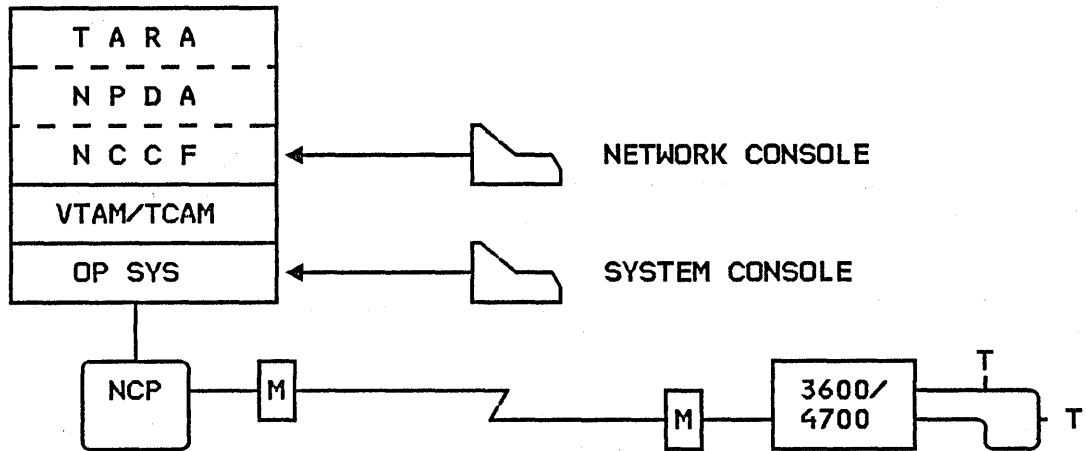
The capability to remotely control these systems is functionally comparable to other products discussed previously.

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATIONS:

- **TARA**

THRESHOLD ANALYSIS AND REMOTE ACCESS - 3600/4700 FEATURE OF NPDA



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NCCF & NPDA
MVS	ACF/TCAM V2R4	NCCF & NPDA
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NCCF & NPDA
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NCCF & NPDA

FUNCTIONS/FEATURES

- **CENTRALIZED OPERATION**

- ACCESS TO 3600/4700 SYSTEM MONITOR
- NOTIFICATION OF 3600/4700 CRITICAL CONDITIONS
- DATA COLLECTION:
 - . TRANSACTION RESPONSE TIME
 - . LOOP QUALITY/STATUS

- **SOLICIT MESSAGE LOG/STATISTICS**

- **NCCF-TO-3600/4700 OPERATOR COMMUNICATION**

NETWORKING OPERATION PRODUCTS: NMPF

Network Management Productivity Facility (NMPF) is a set of job streams, programs, and data sets, which can help network systems and operations personnel install, learn, and productively use many of IBM's systems and network management products (NCCF, NPDA, NLDM, OCCF, and others). It supports an environment with MVS, ACF/VTAM, and NCCF.

NMPF contains tutorials, HELP facilities, operational scenarios, sample data bases, and sample procedures, all of which show network personnel how to make effective use of IBM's products to manage a network. It is built on NCCF and uses standard command list (CLIST), command processor, and user exit facilities.

Some of the highlights of NMPF are:

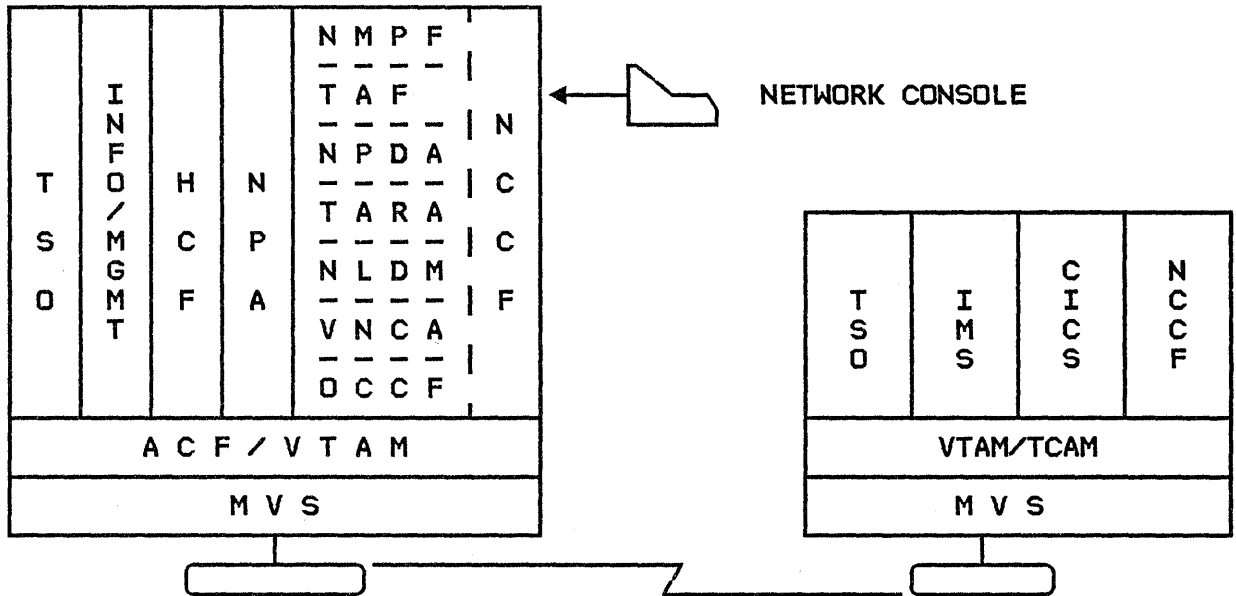
- o Simplified installation and customization of multiple licensed programs that support systems and network management: HCF V2, Information/Management, MVS/OCCF, NCCF, NLDM, NPA, NPDA, SOF (Secondary Operator Facility), TAF, TARA, and VNCA (VTAM Node Control Application).
- o On-line guidance in effective operation of the installed system.
- o Enhanced functions for the NCCF operator. NMPF command processors and exit routines enable the NCCF operator to:
 - Browse NCCF and VTAM definition data sets
 - Display NCCF control blocks
 - Delete messages that have been held on the screen by NMPF
 - Assign program function (PF) keys dynamically
 - Use existing system facilities (e.g., SDSF) to access a combined sequential NCCF and system log
- o Base for further customizing by the user. Most of the licensed programs supported by NMPF provide extensive opportunities for customization. NMPF supplies a "starter" set, which each user may wish to customize further in accordance with installation-specific requirements. For example, default names can be changed, CLISTS can be added, and the full screen tutorial can be customized dynamically.

NETWORKING MANAGEMENT PRODUCTS

NETWORK OPERATION:

- **NMPF**

NETWORK MANAGEMENT PRODUCTIVITY FACILITY (5798-DPC)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V2	NCCF VIR2

FUNCTIONS/FEATURES

- **INTEGRATED TOOLS FOR S/NCC**

- | | |
|--------|-------------|
| - NCCF | - VNCA |
| - TAF | - OCCF |
| - NPDA | - INFO/MGMT |
| - TARA | - HCF |
| - NLDM | - NPA |

- **INSTALLATION/CUSTOMIZATION AIDS**

- JOB STREAMS
- NCCF DEFINITIONS
- NCCF EXITS, COMMAND PROCESSORS

- **OPERATIONS/TRAINING AIDS**

- HELP FACILITIES
- FULL SCREEN TUTORIAL
- NCCF CLIST'S
- SAMPLE DATA BASES
- ON-LINE DEMONSTRATIONS

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FOIL 48

NETWORK PROBLEM DETERMINATION PRODUCTS

Previous section covered Network management products from a operation point of view.

The next section relates to Problem Determination.

COMMUNICATIONS PRODUCTS

• NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

• NETWORK MANAGEMENT PRODUCTS

OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTING TABLE GENERATOR - RTG

NETWORK PROBLEM DETERMINATION PRODUCTS: NPDA

Network Problem Determination Application (NPDA) assists users in performing telecommunications network problem determination by collecting and interpreting (PROBABLE CAUSE) records of errors detected within a network and by recommending possible resolutions (USER ACTION). The NPDA user has access, via an NCCF terminal, to the accumulated error data and statistics. The cross-domain facilities in a multi-domain network can be used to permit displays of errors collected in other network domains running NPDA.

Shown here is a list of many of the communication components for which NPDA collects error data. Each release of NPDA provides additional device support, thus earlier releases may not support all listed devices. Consult NPDA specific documentation for your environment.

Version 3 of NPDA provides improved filtering, unrecognized ALERT processing, performance enhancements, and expanded data transfer to INFO/MANAGEMENT V2.

Version 3 Release 2 provides MVS/XA exploitation, batch report enabling, on-line HELP screens, and more performance enhancements.

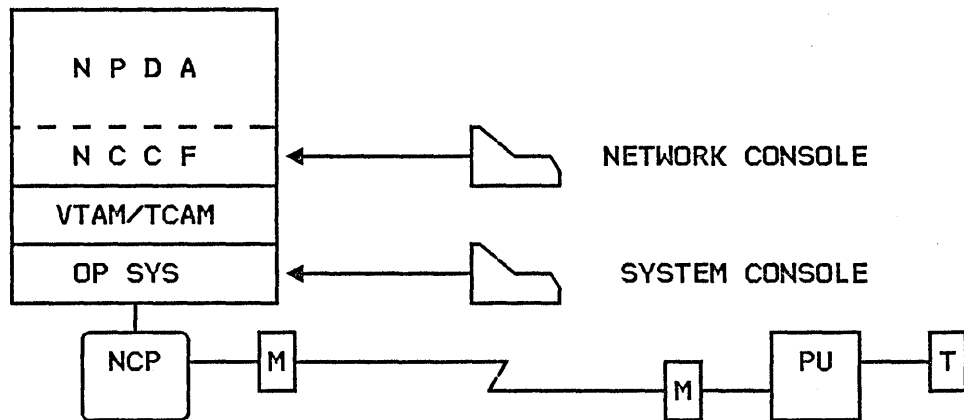
NETWORKING MANAGEMENT PRODUCTS

NETWORK PROBLEM DETERMINATION:

- **NPDA**

NETWORK PROBLEM DETERMINATION APPLICATION

(V2 - 5668-983)
 (V3 - MVS - 5668-920)
 (V3 - XA - 5668-321)
 (V3 - VSE - 5668-295)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NCCF
MVS	ACF/TCAM V2R4	NCCF
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NCCF
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NCCF

FUNCTIONS/FEATURES

- ACCUMULATES ERROR STATISTICS ON NETWORK HARDWARE
- ALERT MANAGER & MONITOR
- TERMINAL INQUIRY VIA NCCF
- HIERARCHICAL NCP-LINE-STATION
- SUMMARY & DETAIL INFORMATION
- PROBLEM ISOLATION ASSISTANCE
- EP, LOCALS, & NCP SUPPORT:

37X5, 3710, LINES (SDLC, BSC, S/S), SNA3270, 3770-MLU, LOCAL DEVICES, EP DEVICES, BSC 3270, 386X MODEMS, 8100, S/1, S/36, S/38, 4700, 3650, X.25(NPSI), DISPLAYWRITER

NETWORK PROBLEM DETERMINATION PRODUCTS: NLDM

Network Logical Data Manager (NLDM) provides powerful on-line facilities to assist in performing network problem determination.

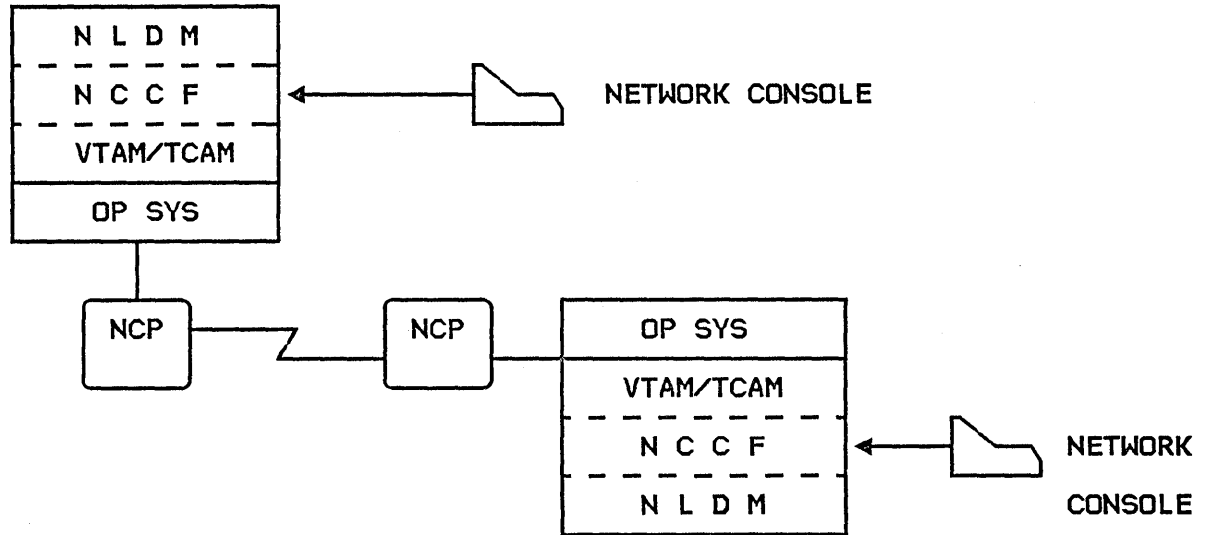
NLDM can maintain continuous awareness of sessions that exist in the network and maintain in virtual storage a history of the most recent data exchanged on each session. These facilities provide the potential for 'first failure data capture' in many cases. Session trace data can be reviewed on-line from NCCF/NLDM terminals and the data can be stored in an NLDM history database. Session BIND and trace data is interpreted in the on-line NLDM displays.

When NLDM is active in multiple domains and/or networks, the NLDMs can exchange information automatically to provide complete information about cross-domain or cross-network sessions. NLDM provides diagrams of the session configuration and route information, and on request NLDM will initiate connectivity tests between the endpoints (subareas) of a session.

NETWORKING MANAGEMENT PRODUCTS NETWORK PROBLEM DETERMINATION:

• NLDM

NETWORK LOGICAL DATA MANAGER (5668-971)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2,V3	NCCF V2 (NLDM R2 AND R3)
MVS	ACF/TCAM V2R4	NCCF (NLDM R1)

FUNCTIONS/FEATURES

- COLLECTION OF SESSION TRACE DATA
- GLOBAL OR SELECTIVE TRACING
- SINGLE DOMAIN, MULTI-DOMAIN, AND MULTI-NETWORK OPERATION
- FULL-SCREEN COLOR DISPLAYS
- TRACE DATA IN DISPLAYS FORMATTED AND INTERPRETED
- END TO END CONNECTIVITY TEST

NETWORK UTILITY PRODUCTS

Two data transfer programs will be covered in this section.

COMMUNICATIONS PRODUCTS

• NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

• NETWORK MANAGEMENT PRODUCTS OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTING TABLE GENERATOR - RTG

NETWORK UTILITY PRODUCTS: CDNDT

Cross Domain Network Data Transfer (CDNDT), a field developed program (FDP), provides the capability to transmit data between SNA network nodes.

The program, via a VTAM application-to-application session, permits the user to transmit sequential files, with fixed or variable length records, from disk or tape between network nodes using SNA multi-domain facilities.

Additionally, the program supports both compression and compaction and provides a summary report about the file transmission.

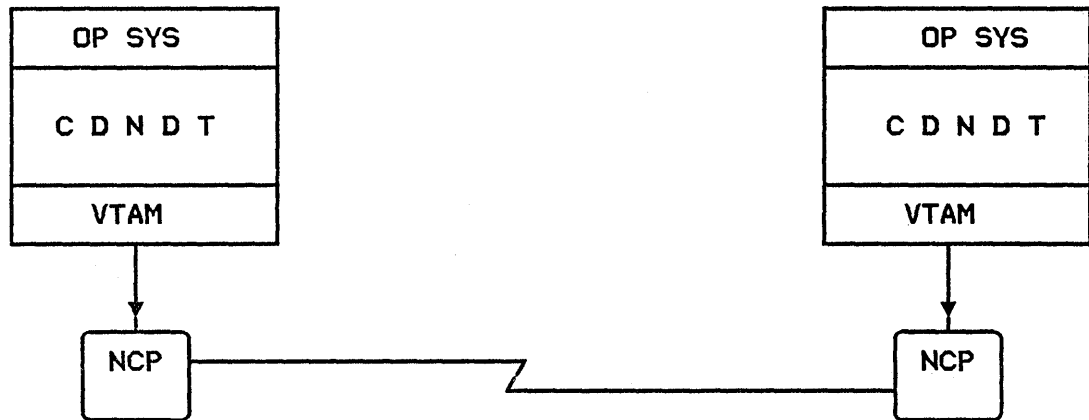
The product can be used to transmit problem determination data between network sites so that a central-site operation can also do problem diagnosis.

NETWORKING MANAGEMENT PRODUCTS

NETWORK UTILITIES:

- **CDNDT**

CROSS DOMAIN NETWORK DATA TRANSFER (5798-DAE)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE
MVS	ACF/TCAM V2R4	NONE
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E	NONE
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	NONE

FUNCTIONS/FEATURES

- **DATA TRANSMISSION BETWEEN NODES IN MULTI-NODE SNA NETWORK**
- **SEQUENTIAL FILES**
 - FIXED OR VARIABLE
 - REBLOCK & CHANGE RECORD LENGTH
- **DATA COMPRESSION/COMPACTION**
- **TRANSMISSION SUMMARY REPORT**
- **PROBLEM DETERMINATION DATA:**
 - DUMPS, TRACES, ERROR LOGS

NETWORK UTILITY PRODUCTS: BDT

The Bulk Data transfer product is a VTAM based application program designed to enable the transmission of bulk data between host nodes in an SNA network. Both sequential and partition data sets can be transferred.

With the checkpoint facility, interrupted transfers can be rescheduled and resumed from the most recent checkpoint. Data transfer requests may be initiated from TSO, JES consoles or from batch jobs.

Because the application is SNA based there is no need for dedicated network resources, such as TP links, since existing resources can be shared.

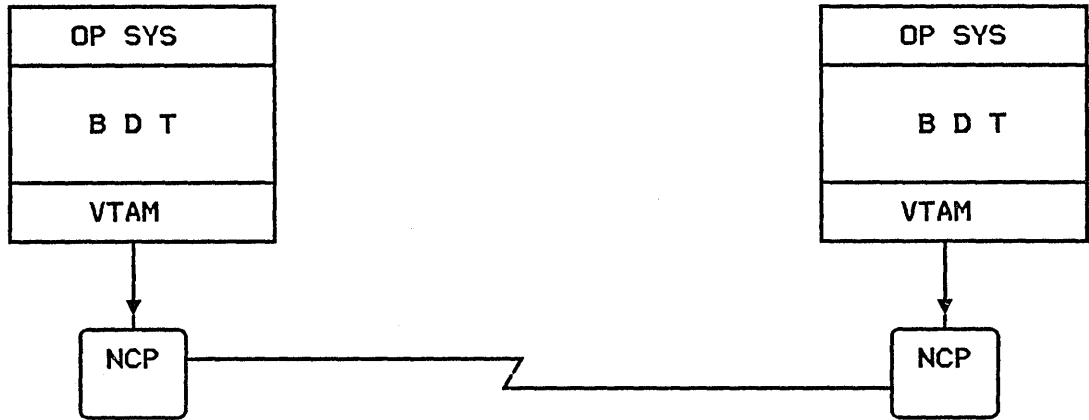
The product allows the assignment of scheduling priorities which gives the user control over the order in which data transfers are executed.

NETWORKING MANAGEMENT PRODUCTS
NETWORK UTILITIES:

• **BDT**

BULK DATA TRANSFER

(5665-302)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	NONE

FUNCTIONS/FEATURES

- DATA TRANSMISSION BETWEEN NODES IN MULTI-DOMAIN SNA NETWORKS
- SEQUENTIAL AND PARTITION DATA SETS
- CHECKPOINT RESTART
- TSO/JES OPERATOR CONTROL OVER TRANSMISSION INITIATION
- SCHEDULING PRIORITIES

NETWORK PERFORMANCE MONITORING

Several aspects of performance will be discussed including the new RTM functions of NLDM.

COMMUNICATIONS PRODUCTS

• NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

• NETWORK MANAGEMENT PRODUCTS

OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTING TABLE GENERATOR - RTG

NETWORK MONITORING PRODUCTS: NPA

Network Performance Analyzer (NPA) an extended field developed program (FDP), collects operating data such as message traffic, error counts, line usage, and 3705 utilization. The information gathered can be displayed online, as collected, or reviewed later. The data can be formatted into reports for offline evaluation and comparison with prior periods.

NPA collects three types of data for SDLC resources and BSC 3270's: 3705 NCP statistics, line control statistics, and message traffic statistics. NPA does NOT collect data for start/stop devices.

In monitor mode, a specific type of data is monitored against user defined criteria (i.e. high/low message rate for a particular line), and if the rate exceeds the limits an informational message is displayed at a terminal.

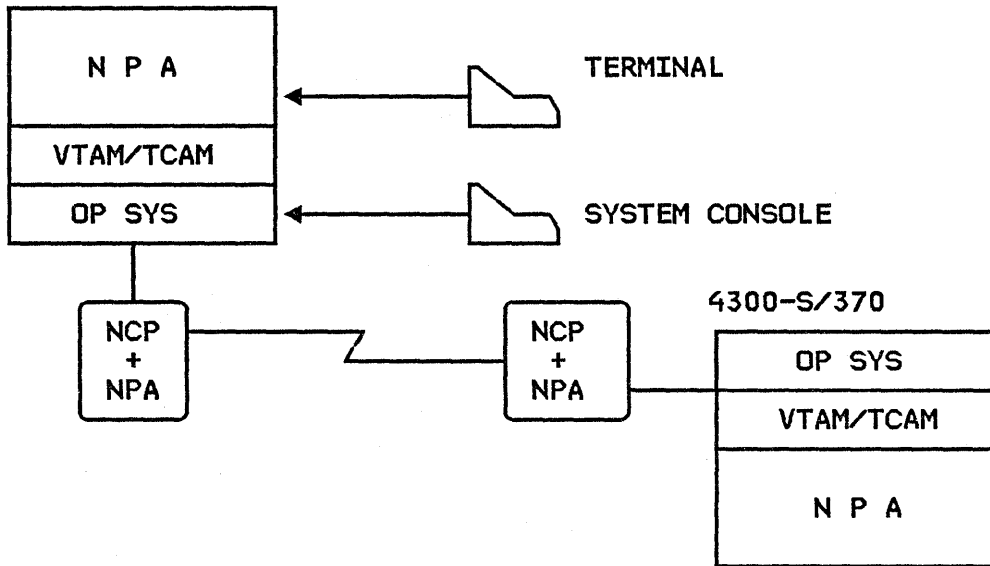
NPA can extremely useful as a network tuning tool or as a capacity planning tool.

There are two NPA products, one; NPA/HOST, runs in the Host and the other, NPA/NCP, runs in the NCP. NPA/NCP has been integrated into NCP Version 2. NPA/HOST is superseded by Network Performance Monitor (NPM), see Foil 57.

NETWORKING MANAGEMENT PRODUCTS PERFORMANCE/MONITORING :

- **NPA**

NETWORK PERFORMANCE ANALYZER (5798-CZT-NCP)
(5798-CZR-HOST)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3	* ACF/NCP V1R2.1,V1R3
MVS	ACF/TCAM V2R4	* ACF/NCP V1R2.1,V1R3
VS1	ACF/VTAM V1R3,V2R1,ACF/TCAM V2R4	* ACF/NCP V1R2.1,V1R3

FUNCTIONS/FEATURES

* V2 NCP REQUIRES HOST NPA ONLY

- MONITORS 3705 & LINE UTILIZATION
- GATHERS STATISTICS ON
NCP, LINE, MESSAGE TRAFFIC
- MONITORS DATA & ALERTS OPERATOR
WHEN HIGH/LOW CRITERIA EXCEEDED
- PROVIDES NETWORK TUNING INFORMATION
- ASSISTS NETWORK CAPACITY PLANNING

NETWORK MONITORING PRODUCTS: NPM

Network Performance Monitor (NPM) is a program product which collects network performance data such as transit times (estimated response time), message traffic, error counts, line usage, session connect/disconnect times and 3705 utilization. This data is divided into two types: network data which is collected in NCP and session data which is collected in VTAM.

Most of the data can be displayed online, as collected, or reviewed later in either character or color graphics format. Such programs as SLR, NETPARS and VTAMPARS II can be used to produce batch reports from NPM data.

Transit times are presented as Host, Network, and Operator Components. The Operator and Network Components are only valid for SNA terminal types which are not in session with TSO and for which an SNA definite response is requested.

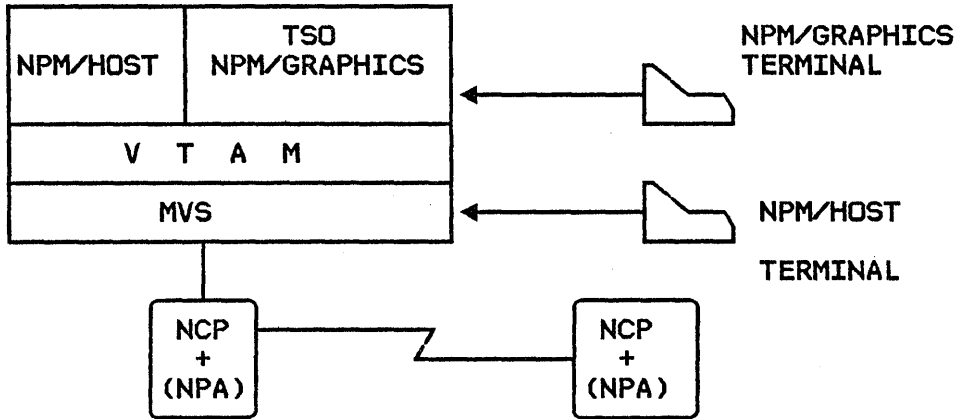
There are two types of monitor capabilities; the first compares network statistics to predefined criteria (e.g. high/low message rate for a particular line), and if the value exceeds the limits an informational message is displayed to the NPM operator. The second monitor capability analyzes the session and network data and uses periodically updated color graphics displays to show the transit time and utilization status.

NPM can be used for such network performance applications as response time measurement, capacity planning, network tuning, and performance problem determination.

NETWORKING MANAGEMENT PRODUCTS PERFORMANCE/MONITORING :

- **NPM**

NETWORK PERFORMANCE MONITOR (5665-333)



OP SYS

MVS

ACCESS METHOD(S)

ACF/VTAM V1R3,V2R1,V2R2,V3

PRE-REQUISITE PRODUCTS

PGF, TSO - FOR GRAPHICS

FUNCTIONS/FEATURES

- DISPLAYS 3705 UTILIZATION
- DISPLAYS MESSAGE TRAFFIC FOR NCP, LINE, CLUSTER & TERMINAL
- MONITORS DATA & INFORMS OPERATOR WHEN HIGH/LOW CRITERIA EXCEEDED
- DISPLAYS TERMINAL TRANSIT TIMES
- SHOWS STATUS IN GRAPHICS FORMAT
- NETWORK PERFORMANCE APPLICATIONS

NETWORK MONITORING PRODUCTS: NLDM/RTM

Network Logical Data Manager (NLDM) Releases 2 and 3 provide the capability to collect session response time data from SNA models of the IBM 3274 Control Unit with the Response Time Monitor (RTM) feature.

The response time data is combined with other session awareness data collected by NLDM to give a record of actual end user response times and session configuration for each session.

On-line NLDM displays (optionally in color) can be used to determine whether the measured response times are meeting the defined objectives for the installation.

Response time objectives can be defined for different applications and different terminal types and routes.

The same session response time data can be optionally recorded to SMF for later off-line analysis using a program such as Service Level Reporter (SLR).

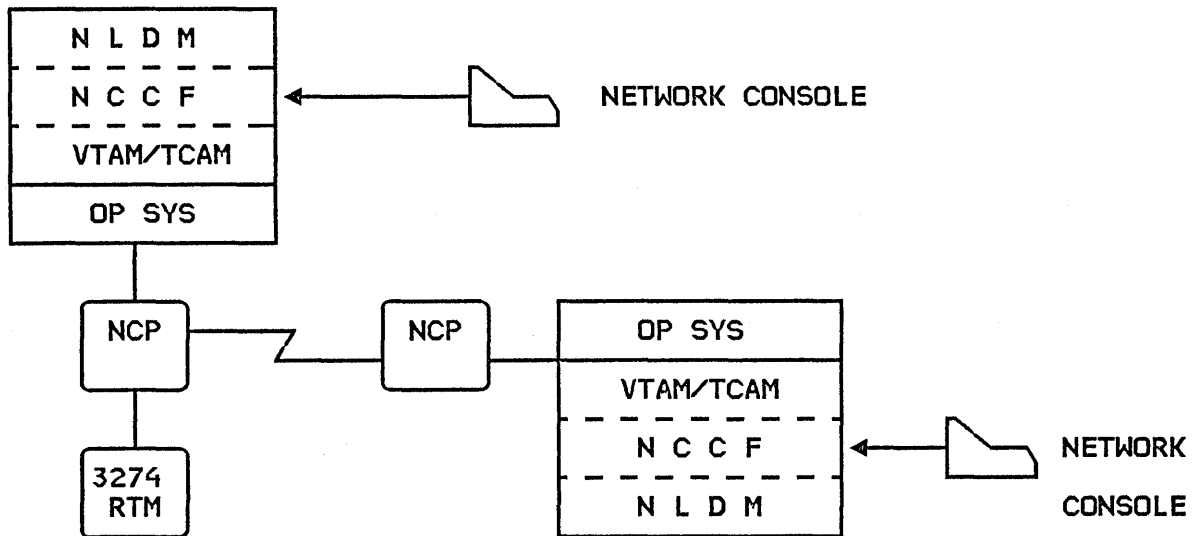
NLDM Release 3 adds the option to collect and record accounting and availability data to SMF as well.

NETWORKING MANAGEMENT PRODUCTS

NETWORK MONITORING :

- **NLDM**

NETWORK LOGICAL DATA MANAGER (5668-971)



<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3,V4	NCCF V2 (NLDM R2 AND R3)
MVS	ACF/TCAM V2R4	NCCF (NLDM R1)

FUNCTIONS/FEATURES

- COLLECT SESSION AWARENESS DATA
- COLLECTION OF RESPONSE TIME DATA FROM 3274 RTM FEATURE
- ONLINE DISPLAYS OF RTM DATA
- COLLECTION OF ACCOUNTING & AVAILABILITY DATA
- OPTIONAL SMF RECORDING OF DATA

TELEPROCESSING NETWORK SIMULATOR (TPNS)

TPNS is a systems test tool which can simulate real terminals and SNA domains entering transactions to a system under test.

A high level scripting language is provided which allows the user to code the messages in "terminal operator terms" which will TPNS send to the system being tested.

A script generator capability is also provided which allows the user to generate TPNS scripts from data which was entered from a real terminal.

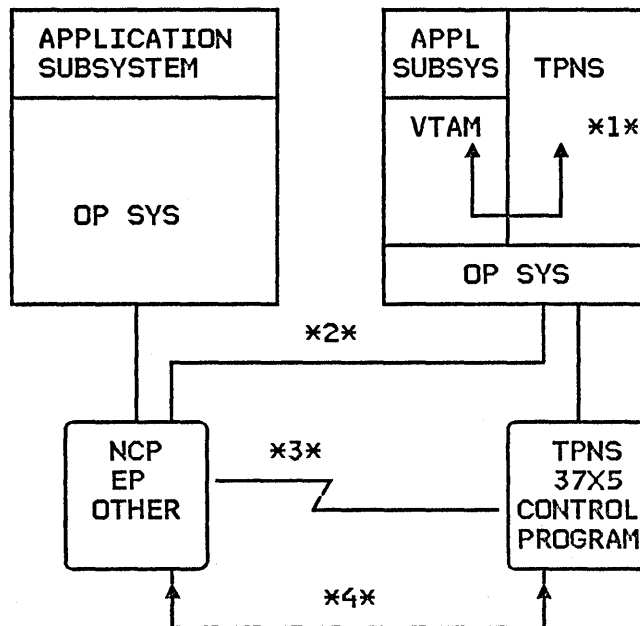
While TPNS is running it displays information about the test to the TPNS operator such as message rate, permanent errors, inactive terminals, etc. The operator can dynamically change the TPNS test parameters such as message content and message rate.

TPNS logs all of the messages which are transmitted and received so that batch reports can be generated. The report types include: terminal operator response time by transaction type and message data sent and received in screen image format.

TELEPROCESSING NETWORK SIMULATOR

• TPNS

TELEPROCESSING NETWORK SIMULATOR (5662-262)



** WAYS TO CONNECT TPNS TO TESTED SYSTEM

<u>OP SYS</u>	<u>ACCESS METHOD(S)</u>	<u>PRE-REQUISITE PRODUCTS</u>
MVS	ALL	NONE
VM/SP4	ALL	NONE
VS1	ALL	NONE

TPNS IS CAPABLE OF TESTING MOST TELECOMMUNICATION SYSTEMS

FUNCTIONS/FEATURES

- SIMULATES MOST IBM TERMINAL TYPES
- PROVIDES HIGH LEVEL LANGUAGE FOR MESSAGE SCRIPTING
- CAN BE OPERATED FROM TSO TERMINAL
- GENERATES RESPONSE TIME REPORTS & FORMATTED MESSAGES

NETWORK ADMINISTRATION PRODUCTS

This is the final section of Network Management products

COMMUNICATIONS PRODUCTS

• NETWORKING APPLICATION PRODUCTS

- JOB NETWORKING
- DB/DC INTER-SYSTEMS COUPLING
- ACF/TCAM VERSION 3
- PROGRAM DEVELOPMENT
- DDP

• NETWORK MANAGEMENT PRODUCTS

OPERATIONS :

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION :

- NPDA
- NLDM

NETWORK UTILITIES :

- CDNDT
- BDT

PERFORMANCE/MONITORING :

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION :

- INFORMATION SYSTEM
- ROUTING TABLE GENERATOR - RTG

NETWORK ADMINISTRATION PRODUCTS: INFO/SYS

Information/System (INFO/SYS) Version 1, a program product, supports "Systems Management" tasks through the use of three optional features:

- 1) Information/Management is a conversational application that can be used to manage information about problems, changes, and system configuration components. These data are maintained in a data base that can be searched according to the user's criteria. This feature of Information/System provides a means of reporting and tracking a system or network problem. It also provides a mechanism to plan and coordinate change activities such as equipment change, new applications, ECs, and PUT maintenance. The user also has the ability to create an on-line data base of the network components. Thus with this feature, the user can create, update, display, and print records that document an installation problem, an installation change, and the system configuration.
- 2) Information/Data is an IBM-supplied data base of technical material pertinent to an MVS, VM/370, VSE, and VS1 environments. The data base, which is periodically updated, consists of information such as: technical newsletters, flashes, SECOM entries, Field Engineering data (Early Warning System), and other material from product development groups. The user can inquire into this data base via keyword searches to retrieve, browse, and print selected data. VM and VSE support of Information/System is for this feature only.
- 3) Information/Access extends the capabilities of an installation to do "systems management" by providing teleprocessing access to the IBM Customer Software Support Facility (CSSF) data base. With this facility, the user can request data from CSSF about: known problems reported against IBM software (APARs), formal fixes to those problems (PTFs), and installation of software changes (upgrades) such as new releases, PUT tapes, etc.

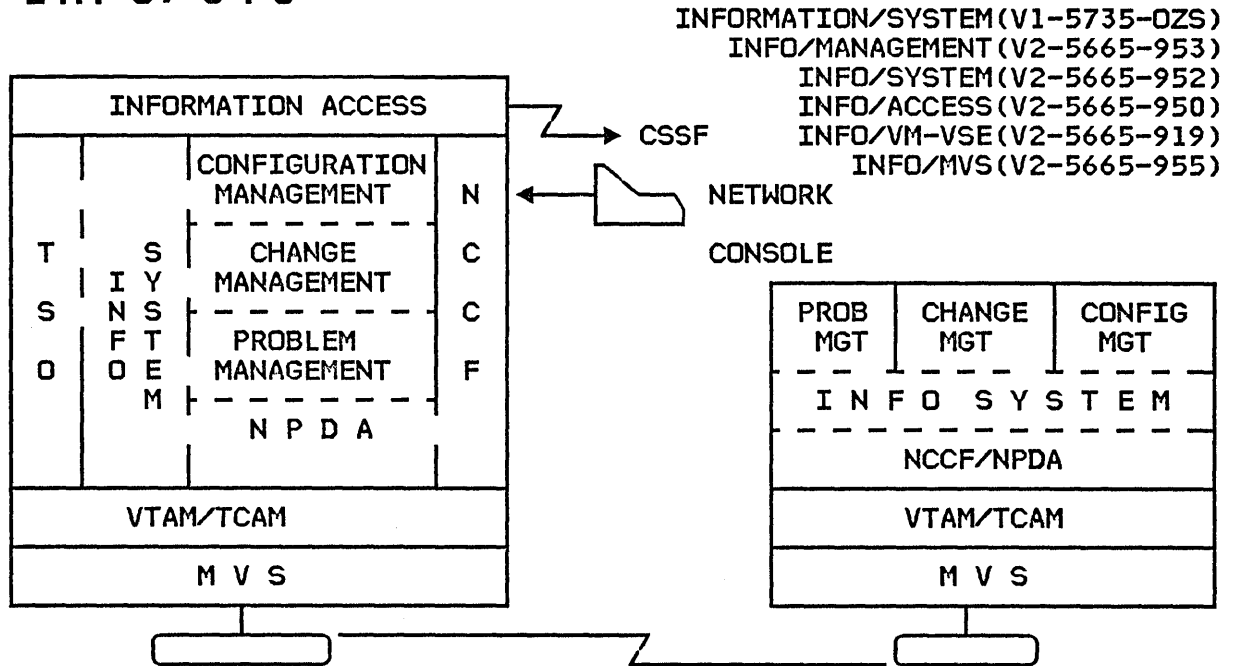
The Information/System product has been enhanced with Version 2. The Panel Modification Facility (PMF) is the key function added to the product. This allows the user to "custom build" panels if the panels shipped with the product are not exactly as the user would prefer.

A totally new packaging structure occurred with Version 2. Each of the features described above in Version 1 were split into separate products. Version 2 also provides a VM-VSE product, like INFO MVS, which is a technical library retrieval system for a VM or VSE host.

NETWORKING MANAGEMENT PRODUCTS

NETWORK ADMINISTRATION:

• INFO/SYS



OP SYS	ACCESS METHOD(S)
MVS	ACF/VTAM V1R3,V2R1,V2R2,V3
MVS	ACF/TCAM V2R4
VSE	ACF/VTAM V1R3,V2R1,V3,VTAM/E
VM	ACF/VTAM V3

PRE-REQUISITE PRODUCTS
TSO OR *NCCF
TSO OR *NCCF
* VERSION 1 ONLY

FUNCTIONS/FEATURES

- **INTERACTIVE SYSTEMS MANAGEMENT**
 - CHANGE MANAGEMENT
 - PROBLEM MANAGEMENT
 - CONFIGURATION MANAGEMENT
- **DATA BASE RETRIEVAL**
 - IBM-SUPPLIED TECHNICAL INFORMATION
- **PROBLEM RESOLUTION - ACCESS IBM CSSF**
(CUSTOMER SOFTWARE SUPPORT FACILITY)
- **PANEL MODIFICATION FACILITY (PMF)**



NETWORK ADMINISTRATION PRODUCTS: RTG

The Routing Table Generator product assists in the design and analysis of paths connecting subareas in an SNA network. This product can greatly reduce the time and effort require to design the original network as well as modify existing networks.

RTG can generate all possible routes between subareas in a network or can generate routes meeting user designated criteria.

The output of the RTG aid in addition to summary reports describing the characteristics of all routes, also generates the parameters for the Path statements and Class of Service Tables required at each node in the network.

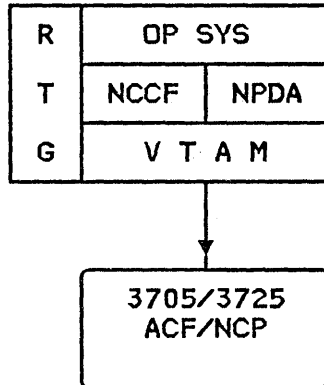
RTG has been updated for use in the SNA Interconnection environment.

NETWORKING MANAGEMENT PRODUCTS NETWORK ADMINISTRATION:

- **RTG**

ROUTING TABLE GENERATOR

(5798-DFL)



OP SYS

ACCESS METHOD(S)

PRE-REQUISITE PRODUCTS

MVS

ACF/SSP V1R2.1,V1R3,V2,V3

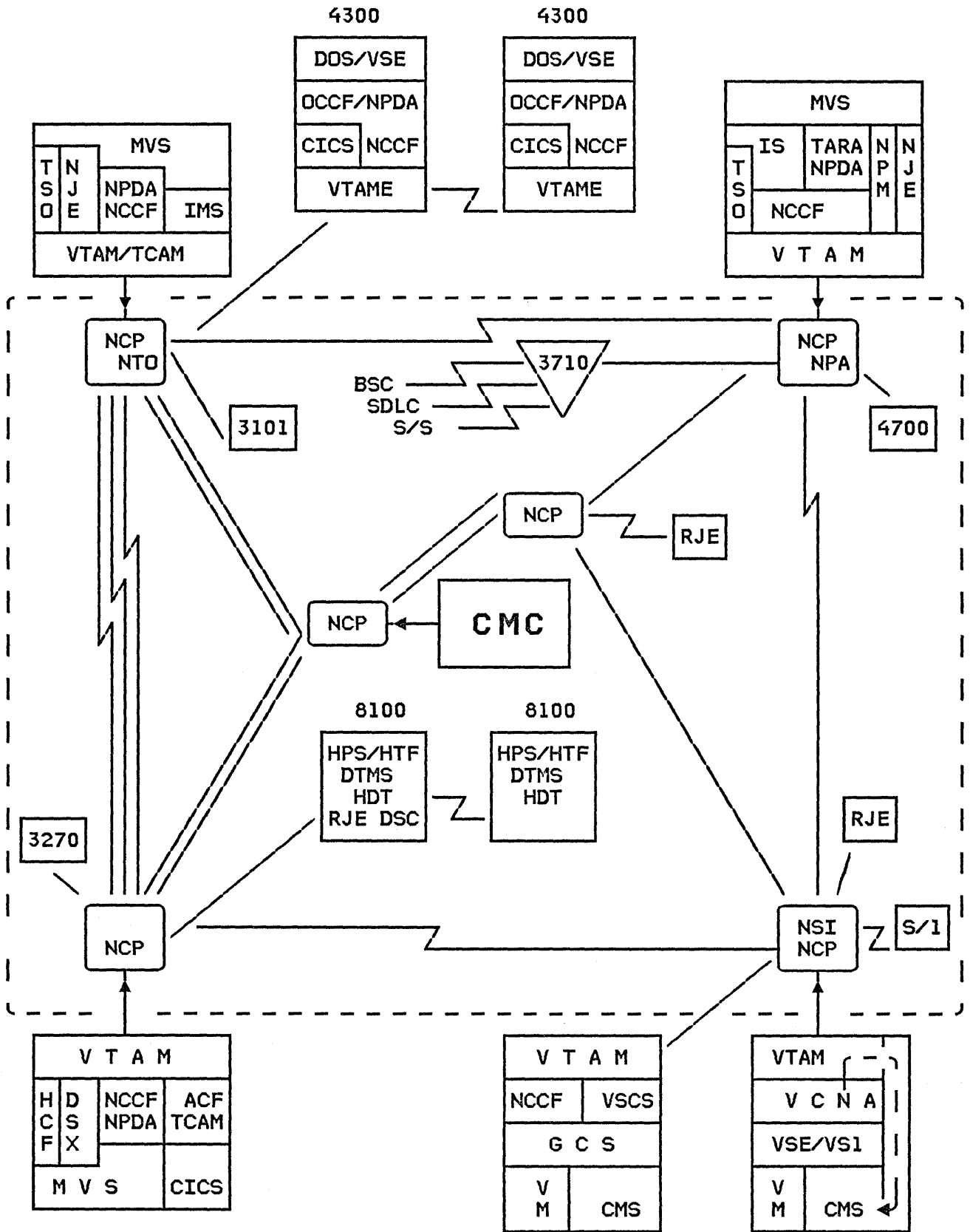
ACF/VTAM, ACF/TCAM

FUNCTIONS/FEATURES

- **GENERATE PATH MACRO'S FOR**
 - UP TO 8 EXPLICIT ROUTE NUMBERS
 - MULTI-DOMAIN OR MULTI-NETWORK
 - HOST NODES
 - NCP NODES
- **COS TABLE PARAMETERS**

SNA NETWORK CONFIGURATION REVIEW

What has been presented to this point are many of the base products, networking products, network applications, and network management tools that comprise this diagram. One major topic remains, the "CMC".



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COMMUNICATIONS MANAGEMENT CONFIGURATION (CMC)

A list of software products that comprise a "CMC" would not differ significantly from those just covered in this presentation. What, then is a "CMC"?

NETWORKING MANAGEMENT
COMMUNICATIONS MANAGEMENT
CONFIGURATION (CMC) SOFTWARE

- OPERATING SYSTEMS:
 - MVS, VS1, VSE, AND VM

- COMMUNICATIONS ACCESS METHODS:
 - VTAM, VTAME, TCAM
 - CONSOLIDATION OF OWNERSHIP
 - SEPARATION OF APPLICATIONS

- ADDITIONAL FUNCTIONS:
 - ISC FOR CICS, IMS
 - TCAM MESSAGE HANDLERS
 - USER WRITTEN PROGRAMS
 - ...
 - ...

- NETWORK CONTROL TOOLS:
 - NCCF, NPDA, TAF, NPA
 - INFO SYSTEM
 - ...
 - ...

COMMUNICATIONS MANAGEMENT CONFIGURATION (CMC)

A "CMC" is not a product, it is an implementation technique. That is, it is really an integration of products into a centralized network management approach and an appropriate hardware configuration to support the approach.

NETWORKING MANAGEMENT
COMMUNICATIONS MANAGEMENT
CONFIGURATION (CMC):

- NOT A PRODUCT

.. AN IMPLEMENTATION TECHNIQUE

- SYSTEMS INTEGRATION OF PRODUCTS
INTO.....

- A CENTRALIZED MANAGEMENT APPROACH

- AN APPROPRIATE
HARDWARE CONFIGURATION

NETWORKING PRODUCT SUMMARY

This foil shows the various categories of products that have been covered in this presentation. It illustrates that the SNA product line has many offerings in many different areas, from base networking facilities, to applications that utilize those capabilities, to tools and products to manage a multi-domain or interconnected network environment.

COMMUNICATIONS PRODUCTS

- **CONNECTIVITY:**

- ACF/VTAM
- ACF/TCAM
- ACF/NCP + NTO + NPSI

- **NETWORKING APPLICATION PRODUCTS:**

- JOB NETWORKING
- DBDC INTER-SYSTEMS COUPLING
- PROGRAM DEVELOPMENT
- DDP

- **NETWORK MANAGEMENT PRODUCTS OPERATIONS:**

- NCCF
- NCCF-TAF
- OCCF
- PROP
- NLDM
- DSX
- HCF
- TARA
- NMPF

PROBLEM DETERMINATION:

- NPDA
- NLDM

UTILITIES:

- CDNDT
- BDT

PERFORMANCE/MONITORING:

- NPA
- NPM
- NLDM/RTM
- TPNS

ADMINISTRATION:

- INFORMATION SYSTEM
- ROUTING TABLE GENERATOR - RTG

SUMMARY

What has been presented is a brief overview of some of the networking products that IBM offers. The SNA product set offers a great deal of function to support a systems solution that is comprehensive and has many options. It is continually expanding and evolving to provide the customer with even more capabilities.

Any detailed questions concerning release levels, function/feature support, subsystem support, or network management product support should be answered by consulting the Network Program Products General Information manual (GC27-0657 or GC23-0108) or by contacting your IBM support representative.

SUMMARY

IBM NETWORKING :

- . A SYSTEMS SOLUTION
- . THAT IS VERY COMPREHENSIVE
 - FUNCTION
 - PRODUCT SUPPORT
- . HAVING MANY OPTIONS
- . WHICH IS CONTINUALLY GROWING
 - SNA NETWORKS ARE EVOLVING
 - NEW FUNCTION
 - CUSTOMER USAGE

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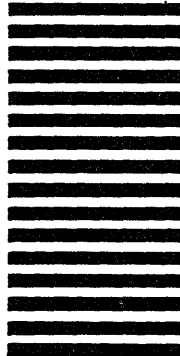
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