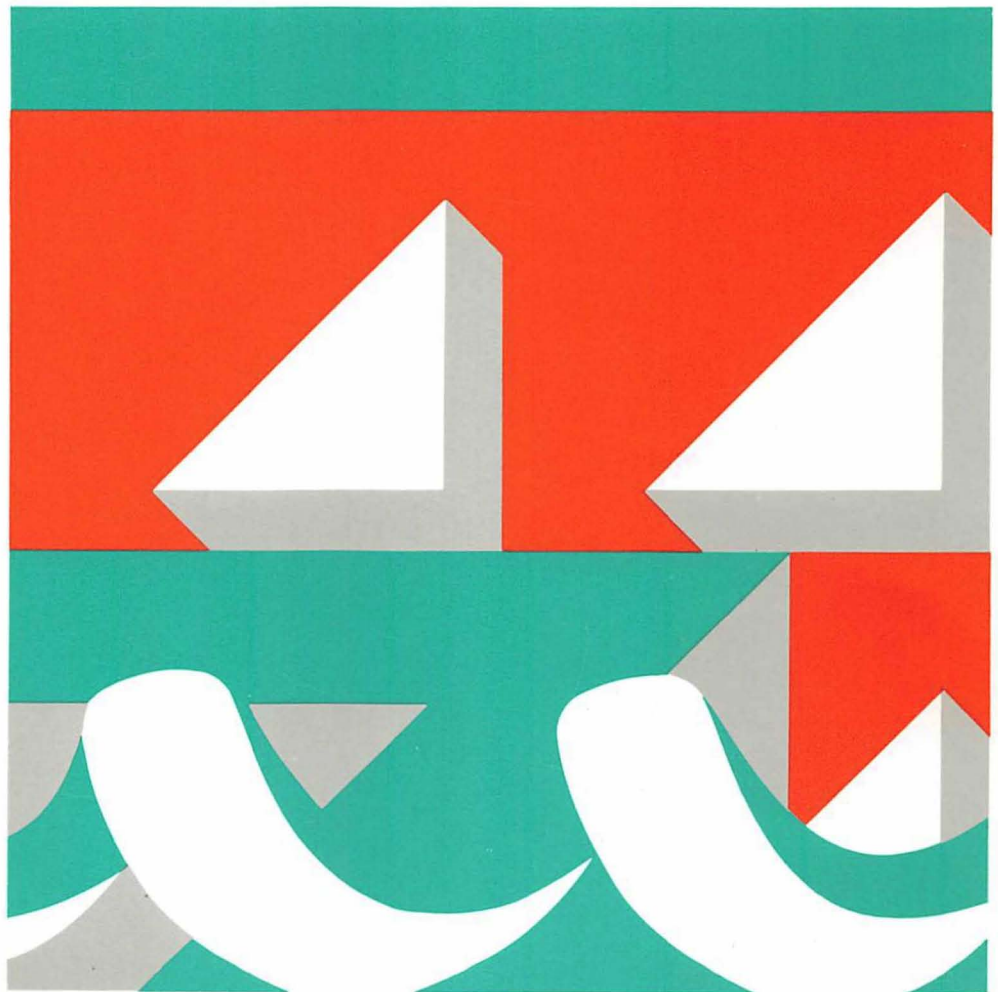




**General Information and Planning  
for NetView Release 2**

MVS, VM and VSE



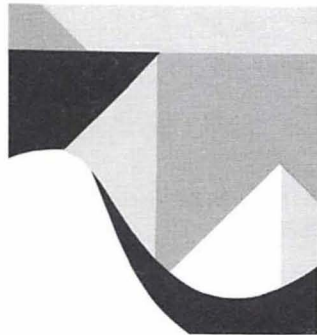


Network Program Products

GC30-3463-0

## **General Information and Planning for NetView Release 2**

MVS, VM and VSE



**First Edition (June 1987)**

This book applies to the following IBM licensed program:

NetView Release 2 for MVS/370 (program number 5665-361), MVS/XA (program number 5665-362), VM (program number 5664-204), and VSE (program number 5666-343).

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## About This Book

This book is designed as a product overview for managers and planners responsible for evaluating the NetView<sup>®</sup> program. It contains information about new functions for NetView and provides information helpful for planning.

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## Who Should Use This Book

This book is directed to system planners and data processing managers who evaluate products. It will also help education planners prepare for the NetView program.

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## How To Use This Book

This book is divided into two chapters:

### Chapter 1: General Information for NetView

This chapter begins with a brief introduction to the NetView program. Within this introduction, we discuss the command facility, hardware monitor, session monitor, status monitor and enhancements for this release.

The second part of chapter 1 covers the enhancements for this release which features *automated operations*. In this chapter, we define automated operations, and we talk about what automated operations includes.

If you are new to NetView, a complete description of NetView Release 1 functions is provided in the *Network Program Products General Information* manual.

### Chapter 2: Planning for NetView

The topics presented in this section are designed to help you plan for NetView Release 2 with an emphasis on the features that this release provides for automating a network, a single host, or complete system.

There is planning information about automating the network, configuration, resource definition, installation, customization, and operating a network using NetView Release 2. If you are new to NetView, a complete description of planning topics is provided in *Network Program Products Planning*.

Figure 1 on page vi is a key to the artwork used in this book. To simplify the illustrations, symbols that are labeled here will not be labeled on the other illustrations; the shape of the symbol alone is sufficient to identify what it represents. Labels will thus be used only for additional information not shown here.

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

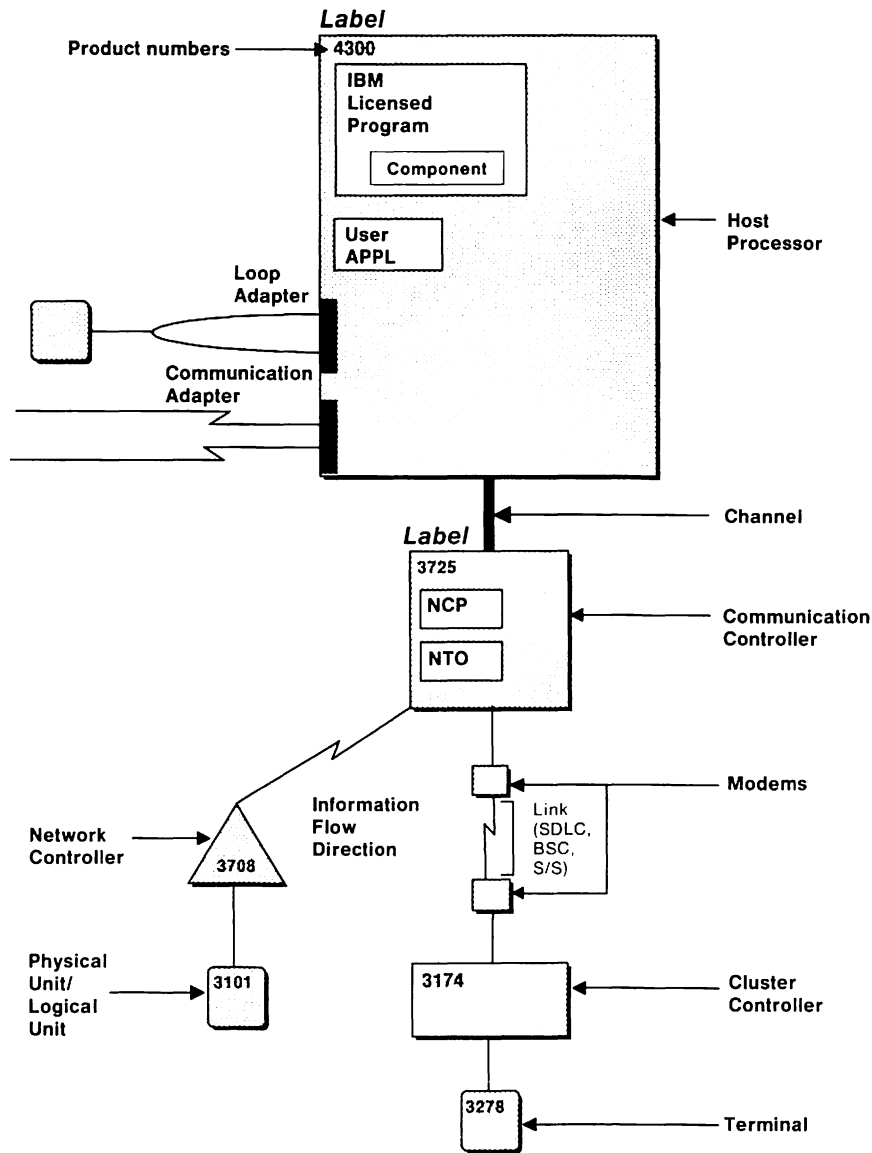


Figure 1. Symbols Used in Artwork for This Book

## Symbols Used in This Book

The following symbols are used in this book to indicate information that pertains to a specific operating system:

- MVS/XA      Indicates information that applies to MVS/XA only.
- MVS/370    Indicates information that applies to MVS/370 only.
- MVS        Indicates information that applies to both MVS/XA and MVS/370, but not VM or VSE.
- VM         Indicates information that applies to VM only.
- VSE        Indicates information that applies to VSE only.

These symbols precede unique information. If a piece of information applies to more than one operating system, but not all of them, more than one symbol may precede the information. For example:

*MVS VM This function locates the resource in this network or another network associated with a given symbolic name or network address.*

The information in the example would apply to *MVS/XA*, *MVS/370*, and *VM*, but not *VSE*. Information that applies to all operating systems is *not* denoted by any symbol.

**Notes:**

1. Unless otherwise indicated, NetView refers to **NetView Release 2**.
2. Unless otherwise indicated, the abbreviations for products refer to the latest version and release of the product.

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## What Is New in This Book

### NetView

- Automated operations
  - Automated processing of alerts
  - Automation task
  - *MVS* system operation from NetView
  - Message automation enhancement
  - NetView operation as an *MVS* subsystem
- Boundary function session information retrieval (SIR)
- Communication network management interface (CNMI) time out
- Communication network management (CNM) router
- Enhanced response time monitor (RTM)
- Fully qualified procedure correlation identification (PCID)
- Generic alerts
- National language support (NLS)
- Purge by date
- RECORD command
- Service point command service (SPCS)
  - NetView/PC<sup>2</sup>
- Support for local area networks
- Session setup failure notification enhancement
- TRACE command

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<sup>2</sup> NetView/PC is a trademark of International Business Machines Corporation.

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# Chapter 1. General Information for NetView

This chapter begins with a brief introduction to the NetView<sup>3</sup> program. This introduction briefly discusses the command facility, hardware monitor, session monitor and status monitor. This release features *automated operations*. This chapter goes on to highlight automated operations and what it includes.

---

## Introduction to NetView

NetView provides a command facility, hardware monitor, session monitor, and status monitor. For a listing of NetView Release 1 functions, see *Network Program Products General Information*, GC30-3350-0.

### Command Facility

The command facility allows you to control, record, and automate various operator tasks. NetView can be used as an operator's interface to VTAM in a data communication network. It provides optional logging of operator commands and messages on either disk or printers.

Figure 2 on page 4 provides an overview of NetView's command facility.

### Hardware Monitor

The hardware monitor enables you to access problem determination information that is generated at resources that are either link-attached or channel-attached to the host system. The information passed to the host consists of:

- Statistics: records of traffic and recoverable errors
- Events: unusual occurrences detected at a device or program.

By reporting the activities of hardware and software components indicated by event and statistical records, alerts identify serious problems so the operator can resolve them before they affect system operation. In addition, alerts help you locate failing components and suggest actions to restore their functions.

### Session Monitor

You can use the session monitor to collect and correlate data about sessions and routes and get online access to the collected data. It allows you, from a central control point, to examine information related to the SNA network and to identify network problems.

The session monitor allows you to collect data about same-domain, cross-domain, and cross-network sessions, and maintains the collected session data on a session basis. Session awareness and routing data may involve non-SNA terminals supported by the IBM licensed program Network Terminal Option (NTO), which appear to the host to be SNA devices. In addition, the session monitor collects data relating to the data flow for bisynchronous 3270 devices and for cross-domain sessions that require NetView or NLDM R3 in each domain. NetView data collection for cross-network sessions requires NetView or NLDM R3 in each gateway SSCP and the session end points.

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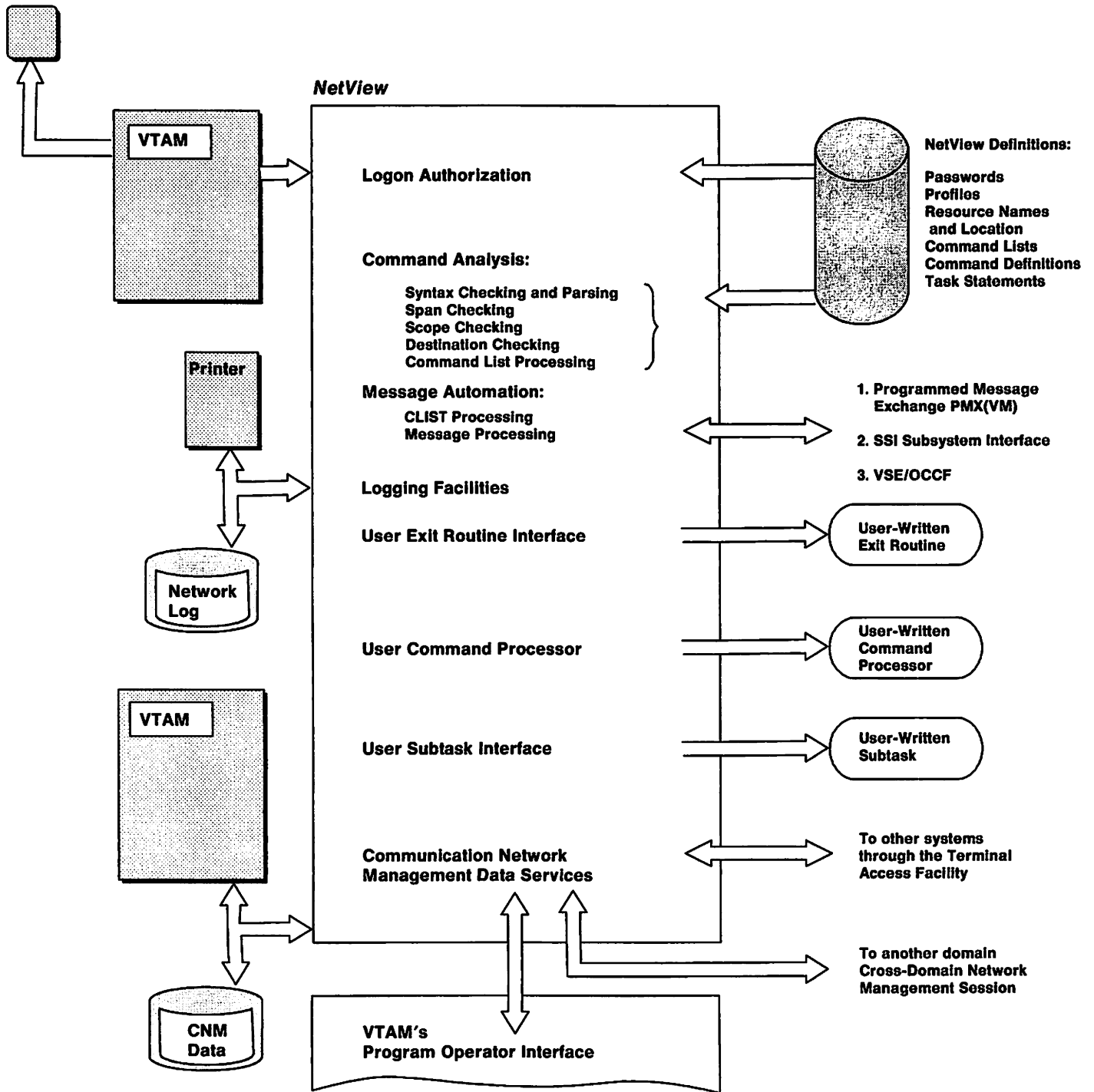


Figure 2. Overview of NetView's Command Facility

## Status Monitor

The status monitor displays network status and accepts network operator commands. Status information that can be displayed includes status summaries or details for a domain; status for a single node, including analysis of activity; and node descriptions, which might include a location or phone number. The status monitor performs automatic reactivation of failed nodes, and displays important message indicators on full-screen panels signifying messages received in the

network log. Commands may be keyed in, or selected commands may be entered with a light pen.

## Other NetView Features

NetView also provides the following:

- *Machine readable samples:* The complete definitions for a sample network are distributed on tape with NetView. Included are VTAM definitions, VTAM tables, NCP generation definitions, NetView definitions, command lists, and installation procedures.
- *Browse function:* From NetView, the operator can browse library files; however, the logical record length for all files to be browsed must be 80. This allows the operator to view VTAM major nodes or NetView definitions. The operator can also browse all operator commands and messages in the network log.
- *Online help:* NetView provides overviews for NetView, VTAM and Network Performance Monitor. Help panels are provided to explain the syntax and usage of commands and CLISTS. Explanations are also provided for recommended actions, and VTAM return and feedback codes.
- *Online help desk:* The NetView help desk facility provides step-by-step instructions for operators performing network problem determination. Users can customize the NetView help desk to conform to their own network configurations and procedures.

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## New Functions for NetView Release 2

NetView offers a new way to control and automate system console operations. It allows processing of system messages using NetView commands and CLISTS. System messages can be selected based on MSGID, SYSID, JOBNAME, or other criteria. System operator commands can be issued from NetView. NetView supports single-domain, multiple-domain and interconnected SNA networks and allows control to be centralized at a single location or distributed to different points.

**VM VSE NetView** offers a new installation option that conserves DASD space for program library storage by eliminating most panel information. This installation option should only be used in a distributed NetView environment where operator access to the distributed NetView is through a focal point. The NetView operator can access data at the distributed system using NetView cross-domain services and format the data using panels from the complete NetView library at the focal point.

## Distributed Management

NetView Release 2 provides CLISTS that support message and alert notification routing. The user may tailor the CLISTS to allow important messages and alert notifications to be routed from a distributed system to an operator at a NetView focal point. This enhanced function, along with current NetView facilities, provides the NetView focal point operator with the capability to monitor an unattended system. Based on the message or alert notification, the focal point operator can take appropriate action. NetView automation facilities can be incorporated at both the distributed system and at the focal point.

## Automated Operations

*Automated operations* is defined as the tools, techniques, and facilities used to improve an operator's ability to provide a high level of availability through error minimization, improved productivity, and problem prediction and prevention. Some benefits of automated operations are:

- To maintain and control rapid terminal and application growth without sacrificing availability
- To reduce the number of consoles.

Automated operations includes:

- Automated processing of alerts
- Automation task
- MVS system operation from NetView
- Message automation enhancement
- NetView operation as an MVS subsystem.

**Automated processing of alerts:** When alerts are presented to NetView, a message is issued that drives a CLIST. This CLIST may be written so that it handles the condition that caused the alert, or generates a new alert for those remaining cases that cannot be automated in the CLIST. The GENALERT command allows any automation CLIST to generate an alert when a specific operator action may be needed.

**Automation task:** The automation task enables NetView to respond to operating system, subsystem and network messages without operator intervention. It also allows NetView to execute whether or not VTAM is active. This task provides:

- Unattended console operation
- Ability to start, stop, and restart VTAM and its applications.

**MVS system operation from NetView:** NetView provides interfaces with the MVS/370 (JES2) and MVS/XA (JES2 and JES3) operating systems that:

- Allow NetView to automatically process messages destined for the MVS console operator
- Allow NetView operators and automation CLISTS to issue MVS commands
- Allow NetView CLISTS to communicate with MVS console operators
- Allow NetView CLISTS and line-by-line commands to be invoked from MVS consoles.

**Message automation enhancement:** NetView provides a more flexible and powerful way to define messages that will drive CLISTS or commands for automation. An IF ... THEN ... syntax replaces the MSGCMD statement to allow selection of messages based on one or more text fields in a message. Messages may be selected for automation processing based on other criteria, including domain of origin, and, in MVS, originating job name, job number, system ID, and descriptor codes.

**NetView operation as an MVS subsystem:** NetView runs as a subsystem in MVS/370 and MVS/XA. NetView commands may be entered from MVS consoles. Similarly, NetView messages are sent to MVS system operator consoles that issue NetView commands. Installation procedures to update the subsystem names table, the authorized program facilities list, and SYS1.PROCLIB are provided as samples.

**NetView operation as a VM console:** NetView uses the programmable operator/NCCF message exchange (PMX) to receive messages from the VM programmable operator facility. NetView also uses the PROP command to issue programmable operator and VM commands to the programmable operator function of VM from the command facility.

## **Boundary Function Session Information Retrieval (SIR)**

The session monitor enables a subarea node to provide protocol support for attached peripheral nodes, such as:

- Interconnecting subarea path control and peripheral path control elements
- Performing session sequence numbering for low-function peripheral nodes.

The above function is only available with VTAM Version 3 Release 2 and a then current NCP.

## **Communication Network Management Interface (CNMI) Time Out**

The command facility CNMI time out function provides the ability to “time out” on CNMI requests. A new parameter has been added to the DSIZCSMS macro for user support. The session monitor time out function terminates the request if the request is not satisfied within a specified time limit. The time out facility has been extended to include the LINEMAP command, the TRACE command, the NCP trace request and the response time monitor commands. The time out also allows the operator to continue entering hardware monitor commands without having to first terminate the hardware monitor session.

This function is supported with VTAM Version 3 Release 2 only.

## **Communication Network Management (CNM) Router**

The CNM router function centralizes the routing of unsolicited CNM data in the command facility. Unsolicited network management vector transport (NMVT) data and other records, such as RECMS and RECFMS, are directed to a NetView component based on the identification in the record. The user can intercept all data by specifying an exit on the CNM router task definition or may intercept the data under responsible subtasks by writing a communications network management interface (CNMI) input exit or an unsolicited command processor.

## **Fully Qualified Procedure Correlation Identification (PCID)**

The fully qualified PCID is a unique identifier of a session. The format of the fully qualified PCID is:

- The network where the CP that generated the PCID resides
- The name of the CP that generated the PCID
- The PCID (in hexadecimal).

This function is supported with VTAM Version 3 Release 2 only.

## Enhanced Response Time Monitor (RTM)

In support of the IBM 3174 Subsystem Control Unit, the NetView session monitor permits the specification of a new definition of response time that defines the requested measurement as the transaction time between the attention or action key depression and the receipt of the last character received prior to the next attention or action key depression. This measurement more accurately reflects the response time for given situations in environments such as IMS and VM/CMS.

The required level of 3174 support for this NetView enhancement is Configuration Support-A, Release 3 Microcode.

## Generic Alerts

Generic alerts allow coded alert data to be transported within an alert, thus eliminating the need for hardware monitor stored screens. The coded data may be either:

- Code points used as an index into predefined tables containing short units of text to be used in building a display
- Textual data to be displayed directly on the display.

In both of the above cases, the data is completely product-independent to NetView in support of open network management. The text strings indexed by the code points and the display of textual data that is sent in the alert are in exactly the same format regardless of what product sent the alert. Also, the same terminology is used to define similar problems within different products, since each product uses terminology that has been defined by IBM.

Generic alerts produce basically the same alert, recommended action, and detail displays that the hardware monitor produced previously, but the displays are built dynamically (rather than using stored screens). Code points index into the following tables:

- Alert description
- Probable causes
- User causes
- Installation causes
- Failure causes
- Recommended actions
- Data ID.

The alert description and probable causes code points are used to build the Alerts-Dynamic, Alerts-Static, Alerts-History, Event Detail, and Most Recent Events screens. The user causes, installation causes, failure causes, and recommended action code points are used to build the Recommended Action screen. The data ID code points are used to identify the qualifiers that may appear on either the Recommended Action or Event Detail screens.

NetView supports two sets of generic alert tables: a set of IBM tables that contain code points defined by IBM, and a set of user tables into which the customer can add code points. A range of code points have been reserved and a set of tables defined for customers.

## Local Area Network

Local area network support consists of handling single adapter and fault domain alerts describing conditions on the local area network. Single adapter alerts are generated because of a hard failure in the adapter. A fault domain is two adapters and the connection between them to which an error is isolated. It is described by the address of the adapters.

In addition to logging alerts, the hardware monitor allows you to access the event data by either the SNA resource name or the adapter address. Purging and setting recording filters via adapter address is also supported. The adapter address in hexadecimal is a keyword on many hardware monitor commands. Modified commands are TOTAL, MRECENT, PURGE, and SRFILTER.

For all local area network subsystems being managed by a local area network manager that supports adapter names, the hardware monitor displays the name associated with the adapter, along with the adapter's address, on the Link Configuration display. Although the alerts are not indexed by adapter name, the names will aid the network operator in identifying the physical equipment.

## National Language Support (NLS)

NetView has national language support for Japanese, which is represented by a double-byte character set. This enhancement supports the translation of some messages and display panels.

## Purge by Date

To limit VSAM data base growth, you can use the session monitor PURGE command. This command allows you to purge session and route data by date. It provides the following benefits:

- Removal of data from the data base is no longer dependent on network activity. The operator knows that all network data that has not been specifically filtered or deleted by use of the PURGE command is available.
- This command separates data base cleanup from data recording, thereby increasing the performance of data recording.
- This command does not depend entirely on session partner names, so there is no longer a concern with:
  - Applications that dynamically generate the primary session partner name
  - INIT failures caused by incorrectly specified application names
- This command allows the operator to delete non-session data
- The network operator may synchronize the session monitor and the hardware monitor VSAM data bases by using the session monitor and hardware monitor PURGE commands, or by using the new purge data base CLIST, PURGEDB.

## RECORD Command

The session monitor RECORD command has been enhanced to record storage and host processor utilization data to the SMF log. For more information, see the *NetView Administration Reference*.

## Service Point Command Service (SPCS)

Service point command service is a NetView command facility enhancement to network product support. Commands offered by SPCS are:

- **RUNCMD:** Allows service point application commands to be sent to a service point and executed by a given service point application.
- **LINKDATA:** Requests that a service point application return device data for a given link or link segment.
- **LINKTEST:** Requests that a service point application test a given link or link segment.
- **LINKPD:** Requests that a service point application do problem determination on a given link or link segment.

An example of a service point is NetView/PC™<sup>4</sup>, which allows the extension of communication network management (CNM) support to IBM Token-Ring Networks, non-SNA communication devices, and voice networks (CBX and PBX). NetView/PC, in conjunction with NetView, provides services that allow user-written programs to extend CNM to non-IBM communication devices.

## Session Setup Failure Notification Enhancement

This function is now enhanced to include:

- The name of the RU that caused the session termination
- The name of the resources that reported the session termination
- The name of a related resource.

This function is supported with VTAM Version 3 Release 2 only.

## TRACE Command

The session monitor TRACE command has been enhanced to include the NET keyword. The network ID has also been added to the Display Trace panel.

This function is supported with VTAM Version 3 Release 2 only.

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



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## Chapter 2. Planning for NetView

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### Introduction

The topics presented in this section are designed to help you plan for NetView Release 2 with an emphasis on the features that this release provides for automating a network, a single host, or a multiple host system. If you are new to NetView, a complete description of planning topics is provided in *Network Program Products Planning*.

NetView is a licensed program that has two purposes. The first is network management. Network management allows NetView to monitor the network and to provide basic data to the operator and system programmer. The second purpose, system automation, has been enhanced for this release and allows NetView to automate systems, whether there is a network or not.

An operator performs many tasks that are standard responses to messages. Many messages are sent out from the system that indicate an action of some kind has taken place in the host. Some messages are extremely important, some require intervention, and some can be ignored, but messages represent most of the communication between the system and the operator or user. For this reason messages are the central focus of the automation process.

Computers have been automating processes for years. This release provides computers with the ability to automate their own processes by automating responses to messages. Using information in the message you can direct the message to a given terminal, a single operator, or to several operators. You can use the message to drive a command or a list of commands to recover failing components or to start/inactivate components. One of the biggest benefits of all, you can suppress unnecessary messages, that are taking up operator time, and do not require any action or response.

Automation streamlines a system and provides greater reliability. Some of the major benefits that automation provides are that it:

- Speeds up recovery of failing components by substituting automated procedures for manual ones
- Reduces the number of repetitive processes performed by operators
- Reduces the number of consoles needed to control a system or a network
- Provides higher availability of the system
- Allows the system to grow without adding personnel.

## Automation Using NetView

Several features in NetView Release 2 facilitate the automation process. These include:

- **System Automation:** With NetView Release 2 you can automate operating systems, subsystems, and networks. NetView interacts with operation system facilities to perform the following automated tasks:
  - Issue operating system and subsystem commands from any NetView CLIST or operator station.
  - Enter NetView CLISTS and line-by-line commands on an operating system console.
  - Enter operating system commands from a remote NetView (NetView in another domain).
  - Access message attributes, such as job name and time, as qualifications for automation.
- **Subsystem Interface:** In MVS NetView replaces some MVS/OCCF functions by defining NetView as an MVS subsystem. NetView uses the subsystem interface (SSI) to receive and automate MVS messages.
- **Programmable Operator Facility:** In VM systems the programmable operator (PROP) facility allows any virtual machine to provide functions similar to those provided by the MVS subsystem interface (SSI) for message and commands.
- **VSE Operator Communication Control Facility:** NetView uses the facilities provided by the VSE/Operator Communication Control Facility (OCCF) to simulate the functions provided by the SSI.
- **Automation Message Table:** NetView can invoke a NetView CLIST or command processor based on any operator message. The automation message table provides enhanced message *parsing and selection*. This parsing and selection capability opens up many new possibilities for processing messages. For example, you can scan a message to see if it has the string "IST" anywhere in the text, at the beginning of the text, or at any designated position in the text.

Based on information in the message, NetView can route the message to the system log, the network log, or it can be displayed at one operator console or sent to several operators, or it can be suppressed. The criteria can be a specific text, several pieces of text, or it can be a job name, time of day, route codes, or other criteria. Using the message table, you can assign strings to variables that are passed as parameters to a command list. You can route the message to any location and specify a list of actions for the message based on information selected from the message.

- **Automation Task:** The NetView automation task executes NetView tasks that are not dependent on a physical terminal logged on or with NetView can respond to operating system, subsystem, and network messages without operator intervention. The automation task allows NetView to execute whether or not VTAM is active. The automation task also enables:
  - Several automation tasks to execute concurrently
  - NetView to initiate functions after VTAM becomes active
  - NetView functions that require VTAM to be deactivated after VTAM terminates
  - MVS Routing of write-to-operator (WTO) and write-to-operator-with-reply (WTOR) messages
  - MVS Descriptor codes and other message processing options within a user-written CLIST to solicit replies from system operators.

- **NetView Commands from MVS Consoles:** NetView commands may be entered on an MVS console by using the designator character for the NetView subsystem. NetView functions that require full-screen mode, such as session monitor, status monitor, and many hardware monitor functions, still require a NetView console.
- **Hardware Monitor Alert Automation:** The NetView hardware monitor now provides an additional operator alert notification message that allows a CLIST to automate an appropriate operator action in response to the alert.
- **Alert Handling:** Alerts are sent to the hardware monitor data base and may be displayed at an operator console. The response to an alert can be automated using recommended action lists in a CLIST. However, alerts are not displayed in a remote host if NetView is installed using the DASD conservation option. In this case, the best solution is to automate the response to the alert at the remote host. If the response cannot be automated, a CLIST can forward a message with the alert parameters in it. This message is then forwarded to the focal point host. A CLIST using the GENALERT command processor can be used to change the message back into an alert for display at the focal point host.
- **Multisystem Support:** There are two ways to automate a system. The first is to use the software programs installed in the central site and in remote systems. The software used for automation is illustrated in Figure 3 on page 16. In this case the automation processes use the software within each host and in normal cross-domain sessions, but cannot handle the initialization process of remote hosts.

The second is to add hardware between central sites and target systems that allows you to develop automation tasks to initiate system processes. Startup and shutdown, which require an initial program load (IPL), can be automated by using a direct connection from the central site to a remote host. An IBM Personal Computer (PC) can be used load the microcode, IPL, and initialize the target (remote) host's programs. There are two program offerings — one that runs in the host, Inter-System Control Facility, and one that runs in the PC, Inter-System Control Facility/PC — that are required for automation of remote initialization processes. The ability to use hardware connections is an important automation feature and its use is illustrated in Figure 4 on page 17.

These program offerings are documented in *Inter-System Control Facilities Planning and Installation* and *Inter-System Control Facilities Operation*.

Procedures to implement these connections and various other automation topics are discussed in some of the marketing publications listed in "Marketing Publications" on page 40. These publications also discuss many other topics related to automation and most of them give examples on how to code the necessary procedures.

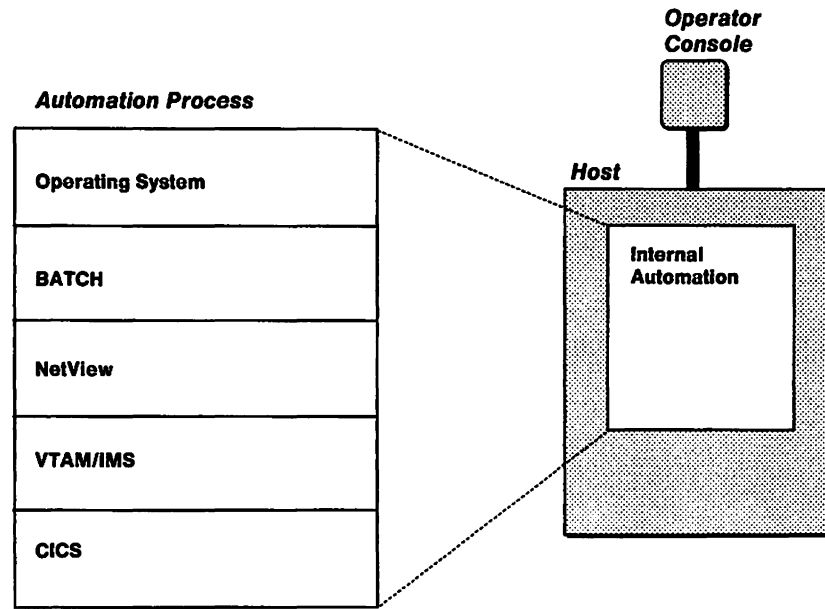


Figure 3. Automation Using Software within a System

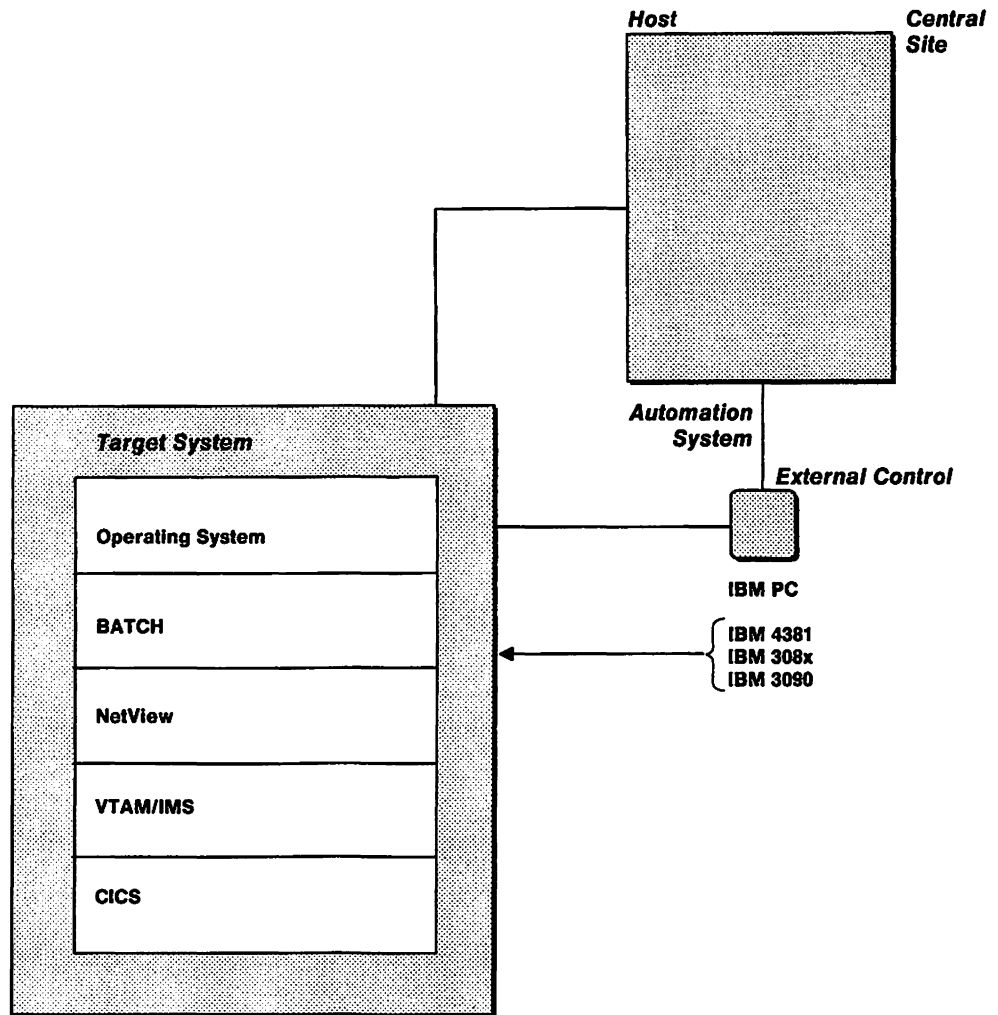


Figure 4. Automation Using Hardware Connected to the System

## Planning for Automated Operation

The role of the operator changes when a system is automated, so that the distinction between network operator and system operator no longer exists. A single person can perform the operation functions for the entire system. Therefore the term *operator* can refer to the system engineer, the operator analyst, or the network operator.

The operator's major tasks are reading messages that appear on an operator's terminal, identifying those that require action, and taking appropriate actions. Using NetView, messages can be limited to those that require operator intervention, such as mounting tapes, or changing forms on a printer. Because of their familiarity with running the network, operators can identify procedures that are good candidates for automation. Other sources that help identify procedures that can be automated are:

- System, NetView (or NCCF), and application logs
- Operator procedures

Handbooks, manuals and especially operator handwritten notes are excellent sources of procedures. This information is especially useful on a shift basis. It provides information about procedures that can be automated using the timer function. These procedures need to be checked for accuracy before they can be successfully automated.

- Problem management data base

This data highlights repairs that are needed for different problems. The data base also provides information useful in setting priorities for procedure automation.

- User phone calls to the help desk
- Operator experience and rules of thumb. Operator experience is a valuable asset when implementing automated operations.

The operator may assist with the installation of the sample NetView including the automation CLISTS and tables supplied with the product. CLISTS and tables can be tailored to optimize the effect they have on operator productivity.

## The System Programmer's Role in Automation

The system programmer, who performs the tasks of both the system programmer and the network programmer, needs to be familiar with the following functions in order to use the automation features of NetView:

- NetView CLIST language
- The NetView DSIPARM members or NCCFLST files
- NCCFIC (NetView Initial CLIST)
- Operator IDs and profiles
- Operator logon initial CLISTS
- Message table language
- NetView AUTOTASK command
- Message flow in NetView and the operating systems
- MVS Definition of subsystem consoles
- VM Use of PROP
- VSE Use of VSE/OCCF.

System programmers, with assistance from operators, determine what procedures need to be automated. They can then write appropriate exit routines or CLISTS to execute these procedures without operator intervention. This reduces the number of repetitive tasks performed by operators and helps eliminate careless errors, thus improving system reliability.

Automation tasks can be defined to execute CLISTS in response to messages. The operator does not need to be logged on to these tasks. In order to activate an automation task, programmers need to use the AUTOTASK command and supply the operator IDs and profiles. If the automation message table routes a CLIST to an automation task, there must be an active automation task with an operator ID to which it can be routed. These operator IDs must be assigned passwords. This prevents unauthorized users from logging on to an operator ID intended for automation task use.

Using NetView automation, messages that do not require action can be suppressed. Messages that require a command or commands as a response can be automated so that the commands are not displayed.

The NetView tape contains samples that define the scope of the AUTOTASK command. By modifying these samples, a system programmer can restrict the use of the AUTOTASK command for his network.

MVS Automation tasks are also needed to execute NetView commands entered from an MVS console. Responses to these commands need to be directed back to the console from which the commands were entered.

MVS System programmers are also responsible for defining the scope of the AUTOTASK command, adding AUTOTASKS that specify `CONSOLE = nn` so that MVS operators can issue CLISTS, and testing each new CLIST using the TEST mode of the AUTOMSG command.

## Security and Authority

The system programmer is responsible for ensuring that only properly authorized operators have access to various network control facilities. This can be done using operator profiles.

**Operator Profiles:** An operator profile describes what commands an operator can execute when managing the system or the network. There must be at least one operator profile for each domain where an operator can control resources. Operators can use the same profile, or one operator can have several profiles. The operator specifies which profile should be used by typing the profile name on the NetView logon panel.

An operator profile:

- Defines operator control as global or specific. *Global* operators control all network resources, whereas *specific* operators control only the resources assigned to them.
- Defines which commands an operator can execute and the files an operator can browse (scope of commands).
- Lists, for a specific operator, resources this operator can control (the span control).
- Designates the domains with which the operator can start cross-domain sessions
- Names a command or command list which executes automatically at logon.
- Designates the hardcopy printer which starts automatically when an operator logs on.
- Defines whether this operator should receive undeliverable messages.

Defines whether this operator receives undeliverable messages.

NetView requires that an operator profile be defined. However, only the profile name is required.

There should be at least one operator in each domain whose profile specifies that the operator is an *authorized message receiver*. An authorized message receiver gets all undeliverable messages, such as authorization and lost terminal messages not covered by the ASSIGN command.



## The Operator's Role

The operator interacts with the operating system, NetView, and VTAM to monitor and control network resources within the VTAM domain. After the system programmer has created operating procedures, the operator uses the procedures to manage the domain. The operator receives and responds to messages and enters commands to change the way the domain is operating.

Automated operations assists operators in doing their jobs better by:

- Reducing the number of messages sent to an operator
- Replacing standard recommended actions with automated procedures
- Highlighting the messages that really need operator intervention
- Using procedures that provide greater up-time
- Simplifying task management to make operator training quicker and easier.

For more information on these subjects, refer to *NetView Installation and Administration Guide*.

## Operation Procedures

Prior to NetView Release 2, NetView provided a total *network* management system. It provided network problem determination data, information on network sessions, and data on network status. Now, Release 2, allows NetView to manage the operating system. With NetView executing as a program on the MVS subsystem interface, the user has several options in designing the startup or shutdown of the network or of the system. Choose the option that best fits the objectives of your installation. Determine what system features you need. For example, do you need the facilities provided by JES such a PROCLIB or user catalog to be available during the network startup or do you want NetView to activate JES and other system application programs?

## Start Procedures

*MVS* With NetView on the subsystem interface (SSI) there are different ways to initiate NetView, each with its own advantages. Prior to NetView Release 2, the steps of the startup process were:

1. IPL MVS.
2. Start JES2 or JES3.
3. Start VTAM.
4. Start NetView (including OCCF).
5. Start the network with the application programs, controllers, etc..

In this scenario the network management and the system automation features of NetView were not available to the user until VTAM was up and running. In contrast, with NetView on the subsystem interface there are several alternative paths.

One of the alternate paths would be to:

1. IPL MVS.
2. Start NetView.
3. Use NetView automation to activate JES.
4. Use NetView to bring up VTAM and the network (optional).
5. Start all required application programs.

Using this path, the automation features of NetView are used to bring up the entire system. JES and the network management features of NetView are available to bring up VTAM. This process emphasizes the automation features of NetView and is

useful even if you are not going to use NetView for network management functions. It allows NetView to become a system manager as well as a network manager. The advantage of this order is that it maximizes the use of the automation features of NetView. Initial CLISTS can be designed to bring up all the applications and even handle exceptional conditions automatically. One step does it all. The disadvantages of this procedure are that it requires defining NetView so that it is not dependent on JES. The system must wait until JES is available to take full advantages of the JES utilities. All the procedures must be in SYS1.PROCLIB and the libraries must be cataloged in the master catalog.

Another process is:

1. IPL MVS.
2. Use MVS to start JES.
3. Start NetView.
4. Use NetView to bring up VTAM and the network.
5. Start all required application programs.

Once VTAM is started, the network management capabilities become active to support full startup of the network. This method provides ensures that the JES facilities of the MVS operating system, such as PROCLIB, user catalog, dynamic allocation, and catalog alias support are available to the NetView job.

VM NetView runs in a virtual machine under the group control system (GCS) and can be started with a GCS EXEC. For additional information on GCS see *VM Group Control System Command and Macro Reference*

VSE Similar procedures for starting NetView can be developed for VSE using VSE/OCCF.

Also, see *NetView Operation* for additional information on starting NetView in all of the operating systems.

## Automatic Network Startup

**mvs** With the AUTOTASK command, CLISTS issued from the MVS console activate the network at a certain time every day. During a system bring-up or scheduled VTAM restart, the network, including network applications, can be started automatically without operator intervention.

1. After initializing the value of necessary task global variables to track status of the overall procedure, a CLIST issues a START VTAM command.
2. When VTAM initialization is complete, NetView begins using VTAM interfaces for session and hardware monitoring. As each required interface becomes active, global variables can be set and tested to determine when full network management function is available.
3. When network management is fully available, CLISTS can activate the network with full NetView support and logging of events and messages.
4. Network applications may also be started at this point, and any operator interactions they may require during startup may be automated.
5. When the global variables indicate that network has resources and applications are available, the automation sequence for startup is complete and the global variables can be reset. This state may be used as an initial state for automated recovery routines.

## Shutdown

The network management facilities can be used both for automation and for operation support when shutting down a system. NetView continues to function even after VTAM has been brought down. Therefore, support for automation continues for the scheduled and unscheduled restarts for the network and other system application programs.

The command Z NET stages the shutdown by preventing new sessions from being established. The network operator can deactivate other sessions or the process of deactivating network resources can be automated. NetView continues to display messages that might occur during shutdown of the network.

## Problem Determination

The most common problem that is likely to arise with automation, is that a message that normally drives a CLIST does not occur. Some of the events associated with the message occurred but results normally accomplished by the CLIST do not occur.

To determine why the message did not occur:

1. Inspect the appropriate console, network, and system logs.
2. Check message table entries and determine which message automation table is active.
3. Determine which task processed the message.
4. If necessary, use the procedure in "Reporting a Problem" to report the problem.

A second type of problem that occurs is that a CLIST executes when it was not expected to. If this happens, perform the following:

1. Verify that the suspected CLIST did, in fact, execute.
2. Find the log entry that designates which message table IF condition was matched.
3. If necessary, use the procedure in "Reporting a Problem" to report the problem.

## Reporting a Problem

To report the problem to an IBM representative you need:

- Log showing message but no command or command response
- Log showing erroneous message table match (if applicable)
- Log showing active message automation table
- Listing of message automation table and MVS message processing facility (MPF).

---

## Customization

NetView allows you to write your own code to supplement existing NetView functions. Customization is an on-going activity. Operators and system programmers need to recognize alerts and operational procedures that arise routinely and identify them as candidates for automation. NetView provides several ways to automate the network:

- Customize messages and alerts.
- Route Messages.
- Write CLISTS.

- Use exit routines to perform specialized tasks.
- Add functions with command processors.
- Adapt commands.
- Define automation subtasks.

## Messages and Alerts

Three types of occurrences that trigger messages or warnings to operators are candidates for automation.

1. Regular messages that indicate the start of a batch job or the activation of application programs on a regular schedule. These messages need system information in order to trigger and automate them.
2. Real time messages that indicate that an occurrence (an alert or an event, a program execution etc.) has taken place. Several related messages may be issued for an event, so the whole group of messages must be automated.
3. Alerts sent to the hardware monitor data base. This alert is described in "Automation Using NetView" on page 14 in the section *Alert Handling*.

Many of the message handling and message display features of NetView have been revised and enhanced. Detailed information on filtering, message automation, and displaying messages is available in the following publications:

- *NetView Operation*
- *Network Program Products Samples*
- *NetView Installation and Administration Guide*
- *NetView Customization*.

## Message Automation

The NetView message table allows enhanced message parsing and selection. The new format allows the user to scan a message for pertinent information in each message with an IF statement that uses flexible text scanning. See the example in Figure 5.

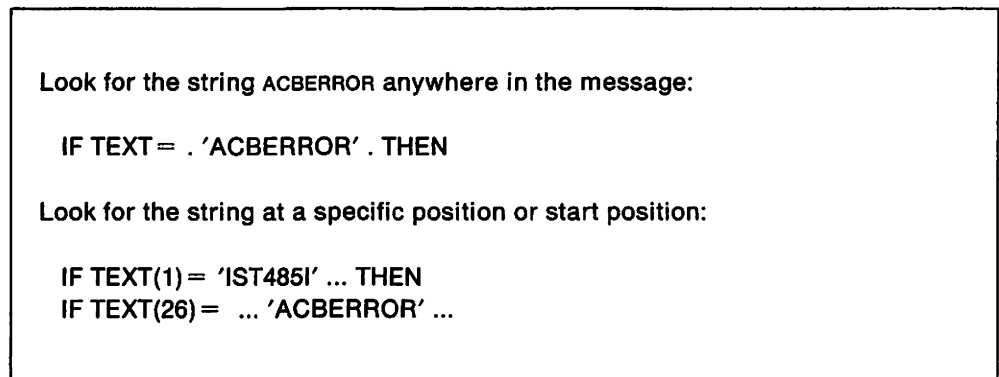


Figure 5. Examples of Flexible Text Scanning

A string extracted from the message can be passed to a variable to be used in a command list. You can do this using several different messages. The THEN portion of the statement is an action list for the messages recognized by the IF statement. This action list can be taken from the Recommended Action panel or from the *NetView Diagnosis* manual and turned into a list of commands. This is illustrated in Figure 6 on page 24. The message table can be updated dynamically. In NetView Release 2, the message table replaces MSGCMD.

Action list for recognized message:

```
IF TEXT(1)= 'IST' ... 'RECEIVE'  
... 'SENSE=' SENSECD ...  
THEN EXEC ( CMD('RCVERR ' SENSECD)  
ROUTE(ONE AUTO1 AUTO2) )  
DISPLAY(Y) HOLD(N)  
SYSLOG(Y) NETLOG(N);
```

Figure 6. Example of Message Table Action List

**WTO** Write-to-operator (WTO) messages can be processed by NetView.

**VM/VSE** Using VM/PROP and VSE/OCCF NetView can process operating system commands.

The existing AUTOMSG has additional message handling features that allow more options for dealing with messages, such as suppressing them, using the message table in conjunction with a CLIST to have the system respond to the message, and highlighting messages that the operator really needs to see.

## Message Filtering

You can set up message filters that correspond to the important message indicators on the status monitor and browse the network log. You can then browse the network log to see which message caused the highlighted message indicator.

## Non-Deletable Messages

When NetView receives a message, it displays the message on the screen. When the screen wraps, NetView writes over the old messages with new ones. You can define certain messages to be non-deletable using the message automation table facility (AUTOMSG) facility. NetView holds the message on the operator's screen, even if the screen changes. The operator can delete the message when it is no longer needed. Messages requiring a reply and full-screen messages are automatically held on the screen. Refer to *NetView Operation* for further information.

## Message Routing

NetView Release 2 offers several message handling enhancements. The message table has been refined and must be reviewed for the new automation functions. The ASSIGN and AUTOMSG commands have also been altered. MSGCMD has been changed to use the IF ... THEN ... format in the automation message table. Review any routing procedures that contain these commands. Refer to *NetView Operation*, *Network Program Products Samples*, and *NetView Installation and Administration Guide* for additional information.

Route message based on the originating domain:

```
IF DOMAINID = 'CNM01'  
THEN EXEC (  
    ROUTE(EASTNET))
```

Route message based on the route code:

```
IF ROUTECD(2) = '1000000X' &  
    ROUTECD(1) = 'X0XXXXXX'  
THEN ROUTE(AUTHRCV)
```

Figure 7. Routing Using the Message Table

Before using NetView, you need to set up a message routing scheme for your network. Many network messages are *solicited*. That is, they are sent in response to a particular command. These solicited messages are sent to the operator who entered the command. Copies of solicited messages can also be routed to other operators.

There are also general system messages, such as lost terminal messages, unsuccessful logon messages, or undeliverable messages, that are not sent to a particular operator. These messages are called *unsolicited messages*. NetView lets you use an ASSIGN command to define which operators should receive these unsolicited messages.

Messages can be routed by the message identifier or the prefix of a message identifier. Messages can also be divided into categories, such as lost terminal messages or storage messages, and sent to designated operators.

You may also want to define one or more of your operators to receive any messages not specifically routed with the ASSIGN command. This is done with the MSGRCVER=YES operand of the AUTH definition statement. Messages not routed to an operator with an ASSIGN command or with the AUTH definition statement are sent to the system console operator.

Use the following procedure for establishing a message routing scheme:

1. Decide which tasks each network operator does.
2. Determine which messages can be received for any given task.
3. Determine which operators should get the unsolicited messages and which operators need to see copies of them.
4. Decide which operators should get a copy of solicited messages that are sent as the direct result of a command.
5. Distribute the message automation work across several automation tasks.
6. Identify any message-driven procedures that may represent more processing than a single automation task can handle. To alleviate the condition when a single task cannot handle a message:

- Break the task into events and assign a specific automation task to handle each event.
  - Specify this task name in the message table entry.
  - Do this for each message.
7. Define automation tasks for a specific network domain.
  8. Add an AUTOTASK command to the NCCFIC CLIST for an operator ID that is set up to provide special environments needed for certain commands.

## Command Lists

A command list (CLIST) is a group of commands and special instructions collected under one user-defined command name. When the operator types the CLIST name at a terminal, all the commands and instructions in the CLIST run. Therefore, CLISTS save time and make the operator's job easier.

CLISTS are the most useful tool for customization and automation. A ready-made set comes with the NetView tape. Then let necessity and research be your guide. CLISTS are the prime tool for automating your network system.

To determine which CLISTS you need, analyze the tasks the operator performs repetitively. For example, you can use a CLIST to reduce a long VTAM operator command to a short command name. As you become familiar with the capabilities of CLISTS, you should re-evaluate which operator tasks you can simplify or automate with a CLIST.

CLISTS expand operator control. They can automate network operations and simplify the operator's task. The most basic CLIST format is a list of NetView, VTAM, and MVS commands that run when the operator types in the CLIST name.

CLISTS are written in an interpreted CLIST language. When you think of a function that you want to add to NetView, first see if a CLIST can do the function.

It is important that each CLIST contain documentation that describes its function and how it is used. CLISTS with good documentation are easier to use, maintain, and expand.

When planning your CLISTS, use the following guidelines:

1. Start with simple functions.
2. Document each logical step with comments.
3. Code the lists in modular fashion.
4. Provide user help and prompting.
5. Use fully tested CLISTS to build new ones.

Use CLISTS to automate the following:

- Routine daily tasks
- Simple system problems
- Recovery from minor system job failures
- Recovery from major system job failures (example: restart Customer Information Control System/Virtual Storage (CICS/VS) when it abends)
- Variations in the order that commands are run
- Messages sent to the operator
- Network events and the action on these events.

**MVS** Whenever an existing procedure or CLIST issues an MVS or a JES command, the command uses the new MVS command processor in NetView.

Information about messages is made available to a CLIST through a set of preset local variables. This procedure is described in *NetView Command Lists*.

## Global Command List Variables

*Global command list* variables are values that can be passed to a CLIST to be updated, defined, or referenced by different operators. They offer the system programmer flexibility and mobility within the network. They also provide the operation staff opportunities to automate tasks such as indicating a message suppression level or message compression that is different for different types of operators. Global variables can also be used to store cumulative information from unsolicited messages. Refer to *NetView Command Lists* for the rules used when defining and using global variables.

## CLISTs for Backup and Recovery

Use CLISTs to automate recovery and backup functions. NetView supplies a basic set of CLISTs designed to intercept certain events and perform the recommended action to recover from these events. These CLISTs have help panels. Some of these CLISTs are message-driven. Message-driven CLISTs allow the system to control messages which would otherwise have shown up on a NetView console and required operator intervention. For additional information, see *NetView Command Lists*.

## Using Timer Commands and CLISTs

Use the AT and EVERY commands to schedule a command or CLIST to run at a certain time, or in certain time intervals. For example, you might want to schedule a CLIST to run at 9:00 every morning, or a command to run every hour. Operators can also schedule a command or CLIST to run after they have logged off. For more information on these commands, see *NetView Operation*.

**MVS** Timer CLISTs can also issue MVS commands, which makes them an ideal tool for system automation.

## Initial CLISTs

An initial CLIST is a CLIST that executes automatically when NetView is started. This initial CLIST can call other CLISTs. Use the initial CLIST to define the functions you want performed each time NetView is initialized. For example, you might want to use timer commands to activate or deactivate network resources on a daily basis. Another possibility is to place an ASSIGN command in the initial CLIST to set up global message routing at NetView initialization.

It is a good idea to put your ASSIGN commands in an initial CLIST to be run when NetView is started. You may want to use the scope of commands to limit the use of the ASSIGN command to one operator to avoid conflicting assignments. For more information on the ASSIGN command, refer to *NetView Operation*.

**MVS** With NetView as an MVS subsystem, it is possible to issue CLISTs from an MVS console that enable NetView to bring up and recover VTAM as well as TSO, IMS, CICS, and other VTAM-dependent applications and subsystems. NetView message automation and CLIST facilities can be used uniformly and consistently for automated control of operator functions in multiple console support (MCS), job entry subsystems (JES), and applications that can be accessed by the NetView terminal access facility (TAF). The AUTOTASK command can be added to the NetView initial



CLIST and can be used to bring up MVS application programs. A single NetView CLIST can issue commands to any of the above systems and applications and its execution can be triggered or modified by messages from any or all of them.

## Operator Logon CLIST

An *operator logon* CLIST is a single CLIST that can be defined to execute automatically when an operator logs on. As a start, use the operator logon CLIST to set up PA and PF keys and define which unsolicited messages this operator should receive. You can also use the operator logon CLIST to automatically start TAF sessions or cross-domain sessions. The NetView logon screen allows operators to decide whether or not they want to run the operator logon CLIST when they logon.

NetView supplies a sample logon profile CLIST called LOGPROF1. This CLIST can be used as is or it can be altered to fit the needs of your operators. You can also write a different CLIST for each operator to execute automatically after the operator logs on to NetView.

## Exit Routines

NetView provides exits to enable you to write exit routines to edit data flowing to or from NetView. In NetView Release 1, some of the exits were used for special functions. In Release 2, these functions have been incorporated into NetView so that all the exits provided by NetView are available for use. See *NetView Customization* for further information.

## Command Processors

A command processor is code that runs a NetView command. You may want to write your own command processors to add functions to NetView that are not covered by the existing commands. User command processors are written in assembler language and assembled and link-edited as load modules. The name of any command processor must be defined with CMDMDL statements when NetView is started.

Command processors are powerful customization tools. They allow you to create your own commands and functions.

Command processors may be used along with user-written exit routines to automate certain operator tasks. For example, you can write a procedure to respond to certain error messages by deactivating failing links and activating others or by initiating a VTAM trace facility. (These functions can also be done with command lists.)

## Subtasks

NetView allows the system programmer to write subtasks. These are called *optional* subtasks.

**MVS** In order for subtasks to execute CLISTS in response to messages without requiring operators to be logged on to those tasks, the system programmer needs to decide how to use the AUTOTASK command and supply operator IDs and profiles for the automation tasks to use.

**MVS** Automation tasks are also needed to execute NetView commands entered at an MVS console and direct the command response back to the same console. The AUTOTASK command can be added to the NetView initial CLIST. For example, you might write a subtask to centralize a process that would be used by several

different subtasks, such as access to a data base. You might also write a subtask to process certain types of data or to perform other functions.

For more information on customizing NetView, see *NetView Customization*.

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## NetView Configuration

NetView provides effective network and system operation from a central site. For network operations, NetView together with NetView/PC gives the customer a framework for managing SNA and non-SNA components.

## Distributed Management

NetView Release 2 is available with an alternative installation option for users of remote VM and VSE systems in a distributed environment. This option is used to conserve storage (DASD). NetView, in the distributed environment, is installed in the remote system without most of the operator or help panels. Alerts are forwarded to the central site, as is other data that normally appears at a network operator's console. Data that is provided by the status monitor and the browse facility is still available at the remote site.

The new installation option can be used to connect, automate, and manage from a central site. Sessions are managed from the central site and can be started and stopped dynamically. The necessary links can be activated and deactivated using timers and automation features.

## Configuration Planning

To understand the importance of configuration planning, you must understand that NetView gets its configuration information from several places:

- VTAM: When VTAM is informed that a session has started or ended, it sends session-related information to the NetView program that resides in the same host.
- NCP: NCP sends trace information to NetView.
- Other NetView programs: Some information about a session must be obtained from NetView programs in other domains. This information is requested and received through a NetView-NetView session.

The following tables summarize the data that NetView provides. Use these tables to help in planning the placement of complete NetView programs and the placement of NetView programs that have the installation option.

Type of Data	Information Displayed or Collected
Configuration data	<ul style="list-style-type: none"> <li>• Number of subareas on route</li> <li>• The addresses of the host and the subarea nodes that the host owns on a route</li> <li>• Addresses used in each network to represent session ends points</li> <li>• Real and alias logical unit (LU) names.</li> </ul>
Trace data	<ul style="list-style-type: none"> <li>• NCPs (Boundary function and gateway trace data)</li> <li>• Path information units (PIU)</li> </ul>
Route data (path data)	<ul style="list-style-type: none"> <li>• Explicit route (ER) number</li> <li>• Virtual route (VR) number</li> <li>• Reverse ER number</li> <li>• Route configuration</li> <li>• Number of sessions currently using a particular VR or ER.</li> </ul>
Response time <sup>5</sup>	Actual end-user response time information measured and accumulated in display control units equipped with the response time monitor (RTM).
Accounting and availability measurement <sup>5</sup>	<ul style="list-style-type: none"> <li>• PIU count on a session basis</li> <li>• Session starts</li> <li>• Session ends</li> </ul>
Event and storage counters <sup>5</sup>	<ul style="list-style-type: none"> <li>• Event —Determines the amount of work (host processor utilization) performed by the network</li> <li>• Storage —Tracks control blocks and control block storage.</li> </ul>

Figure 8. Session Monitor Data

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<sup>5</sup> Data is collected in the system management facility (SMF) or another external log. The collection process should be driven using NetView CLISTS running under an automation task. This ensures that the data is recorded at regular intervals. By defining several CLISTS, one for each group of resources you can record, data for each group. In multiple subarea environments, recording data by groups reduces the impact of data collection on the network and the host.

<b>Type of Data</b>	<b>Description of Information</b>
Node analysis data	<ul style="list-style-type: none"> <li>• A count of number of times the VTAM status of each resource is changed</li> <li>• Percentage of time a resource is in each VTAM state</li> <li>• Counts and statistics are set to zero by command or at initialization.</li> </ul>
Application activity data	<ul style="list-style-type: none"> <li>• Provides a view of active applications and the terminals logged on to them</li> <li>• Tabulates the number of sends and receives between the application and the terminal LU</li> <li>• Provides an indication of the current activity for a particular application.</li> </ul>

Figure 9. Status Monitor Data

<b>Type of Data</b>	<b>Level of Presentation Detail</b>
Traffic and performance	<ul style="list-style-type: none"> <li>• Total Statistics —summary data for specified resources</li> <li>• Most Recent Statistics —A reverse chronological listing for specified resources of the hardware monitor data base</li> <li>• Link Problem Determination Aid (LPDA)</li> <li>• Temporary error counter values recorded for physical and virtual links.</li> </ul>
Event	<ul style="list-style-type: none"> <li>• Total Events</li> <li>• Most Recent Events —Reverse chronological listing from hardware monitor data base for specified resources</li> <li>• Recommended Action —Actions recommended to bypass or resolve the event</li> <li>• Event Detail.</li> </ul>
Alert	<ul style="list-style-type: none"> <li>• Alerts-Dynamic —Display of continuously updated alerts from hardware monitor data base</li> <li>• Alerts-Static —Display as in dynamic alerts, but can be held so that work on a problem can continue</li> <li>• Alerts-History — Displays all alerts on hardware monitor data base.</li> </ul>

Figure 10. Hardware Monitor Data

Type of Data	Command
Modem data	<ul style="list-style-type: none"> <li>• LPDA-1 operands (for 386X or 586X modems) <ul style="list-style-type: none"> <li>– Link status (LS) for local modem, remote modem, and remote device</li> <li>– Remote digital terminal equipment (DTE) Interface for current and transition states of Electronic Industries Association (EIA) leads</li> <li>– Remote modem self-test (RST) for modem configuration, engineering change (EC) level, and failing field-replaceable units.</li> </ul> </li> <li>• LPDA-2 operands (for 586X modems only) <ul style="list-style-type: none"> <li>– Line analysis (LA) for line parameters</li> <li>– Transmit/receive test (TRT) causes a pair of modems to exchange sequences of predefined bit patterns over the line and report results</li> <li>– Modem and line status (MLS) for modem configuration, type of link segment, installed features, analog parameters, and the remote DTE interface status.</li> </ul> </li> </ul>

Figure 11. Hardware Monitor Data—Modem Data

## Required NetView-NetView Sessions

To obtain data at a host other than the one that collected the data, NetView-NetView sessions are required. Only hosts that have participated in the session setup can obtain data about a session.

In order to send operating system commands from one host to another, a NetView-NetView session is required. The session then allows control of the remote system.

**Required Sessions Within a Single Network:** For one NetView to obtain session information that was collected by another NetView in the same network, the two NetView programs must have a session between them.

**Required Sessions Across Multiple Networks:** For one NetView to obtain session information that was collected by NetView in another network, the NetView in each gateway host must have a session with NetView in the adjacent hosts in the session setup path. This allows one NetView to obtain session information that was collected by NetView in another network, even if the two NetView programs do not have a direct session with each other.

## Terminal Access Facility (TAF)

To use TAF, you need to plan which subsystems to use, and which operators control these subsystems. You also need to define some additional items to VTAM, NetView, and the subsystem.

TAF lets an operator control any combination of the following subsystems from one NetView terminal. The operator does not have to log off the NetView terminal or

use a separate terminal for each subsystem. Subsystems you can access from a NetView terminal are:

- Customer Information Control System/Virtual Storage (CICS/VS)
- MVS Information Management System/Virtual Storage (IMS/VS)
- MVS Time Sharing Option (TSO)
- VM VM SNA Console Support (VSCS)
- Distributed Systems Executive (DSX) Versions 2 and 3
- Host Command Facility (HCF)
- Network Performance Monitor (NPM) Release 2
- IBM 8100/Distributed Processing Programming Executive (DPPX)
- IBM 8100/Distributed Processing Control Executive (DPCX)
- Cross-domain NetView systems.

For more information, see *NetView Installation and Administration Guide*.

## Other Products that Work with NetView

NetView acts as a program base for IBM communications network management products. The network operator can operate these products through the NetView terminal and use them to help control and monitor the network. Each of these products must be ordered separately.

**VM and Group Control System (GCS):** NetView runs in a virtual machine under the Group Control System (GCS). For additional information see *VM Group Control System Macro Reference*.

You must use Programmable Operator Facility (PROP), (available with VM) in conjunction with GCS to allow any virtual machine console or NetView terminal to perform VM system operator functions and receive VM system operator messages, thereby allowing for greater flexibility in operator control. For more information on PROP, refer to *VM Application Development Guide*.

**VSE/Operator Communication Control Facility (OCCF):** A licensed program that allows a central site operator to control multiple remote systems. Allows a user to code a table with programmed responses to system and subsystem messages and to suppress information-only messages. Functions provided are useful in stand-alone and distributed environments. See *VSE/Operator Communication Control Facility General Information* for more information.

**Tele-Processing Network Simulator (TPNS):** Is a testing tool for online systems. It simulates network resources and can be used to test applications, subsystems, network configurations, and hardware. TPNS can be used to perform stress testing, performance testing, regression testing, and function testing. See *Tele-Processing Network Simulator General Information* for further information.

**Inter-System Control Facility:** There are two program offerings, one that runs in the host (Inter-System Control Facility) and one that runs in the PC (Inter-System Control Facility for the Personal Computer) that make the connection for automation of remote initialization processes.

**MVS Information/Management Feature of Information/System:** Works with NetView, to report and track problems at a data processing installation. It can also help you plan, coordinate, and monitor network changes, and maintain information about the system inventory of hardware and software components.

Information/Management can help network operators record error data captured by NetView, and thus automatically create a new problem record to track hardware problems in the network.

For more information, see *Information/Management: User's Guide*.

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## Installation

All installations of NetView begin with the procedures described in the *Program Directory* which is shipped with the product tape. The *Program Directory* guides you in moving NetView from the product tape onto the target system. When the process is finished, you must complete the steps in *NetView Installation and Administration Guide* to prepare NetView for production.

The installation of NetView is based on a set of precoded and tested sample network definitions. The sample definitions are shipped in machine readable form on the product tape and are documented in *Network Program Products Samples*.

The NetView installation then follows one of two separate processes described in *NetView Installation and Administration Guide*.

The first process, Part I of *NetView Installation and Administration Guide*, is for users who have previously installed NetView Release 1 using the sample definitions and are now migrating from NetView Release 1 to NetView Release 2.

Part II of *NetView Installation and Administration Guide* is for users who have not previously installed NetView Release 1 using the sample definitions. These users include those who are now converting from NCCF and those who are new to IBM network management products.

NetView also provides a simplified installation and customization procedure that includes:

- JCL in MVS and EXECs in VM to install NetView
- Command facility definitions for each of the components
- Sample data bases for each of components
- Start-up procedures to initiate and test NetView
- Sample VTAM definitions.

## Installation for System Automation

MVS NetView can manage and operate networks. Now, NetView can also manage systems even if they are not part of a network. If you want to use NetView, with the primary aim being to automate a system, you should perform certain functions before installing NetView. NetView must be installed on the MVS subsystem interface (SSI). This installation requires that an MVS IPL must be done. Before installing NetView, prepare for the IPL by doing the following:

- Update the authorized program facility list. NetView must run as an authorized program from this list.
- Update the program properties table to include NetView.
- Change the subsystem names table to include NetView.
- Define an adequate list of subsystem consoles that NetView can use to issue MVS commands.

**MVS** NetView can be used to automate MVS operations even when no network management functions are required.

**VM/VSE** NetView Release 2 offers a new installation option that conserves program library storage by eliminating most information stored in panels. The installation option is designed for use in a distributed environment where there is a central site network operator who can access remote data in the target systems.

**VSE** When installing NetView on VSE, part of the command facility component is installed in the shared virtual area. The complete NetView is installed in NetView's user area. See *NetView Installation and Administration Guide* for additional information.

## Testing the New System

The automation message table has to be created and tested before it can be used on a production system. Use a test system, separate from the production system, to test all changes.

Verify that a message automation table does what it should before putting it into production. Logic errors in a syntactically correct message table entry may cause system or network commands to be issued in error with unpredictable and potentially damaging results.

In some situations, testing dummy CLISTS that display information about how they are called may be useful in a test environment. You can use this method to check the message table logic. Refer to *NetView Installation and Administration Guide* for a complete description of the process.

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## Migration

NetView provides a simplified installation and customization procedure for all the NetView components that includes:

- JCL in MVS and EXECs in VM to install NetView
- Command facility definition for each of the components
- Sample data bases for components
- Start-up procedures to initiate and test NetView
- Sample VTAM definitions.

**MVS** If you are converting from NetView Release 1, you can take full advantage of the automation features of the NetView by adding MVS system and job entry subsystem (JES2 or JES3) commands to the CLISTS. This enables you to use new CLISTS to automate system functions and applications beyond the scope of VTAM.

**Note:** If you are migrating from NetView Release 1, with MVS OCCF, you need to review the CLISTS that issue MVS or JES commands. Existing OCCF CLISTS have to be rewritten with NetView CLIST commands. For migration purposes OCCF can run with NetView Release 2.

NetView Release 2 communicates with NetView Release 1 in another domain.



## Message Table Conversion

The system programmer needs to convert the NetView Release 1 message automation table to the new NetView format. A sample job to do the conversion is provided with NetView Release 2.

**MVS** If you have been using MVS OCCF to automate system messages, the position in a message where specific text occurs needs to be adjusted. The assumption is made that the first character of message text starts in column one. The JES JOBID is referenced as a message variable not as part of the text. The book listed in "Marketing Publications" on page 40, *NMPF/NetView Migration and Automation*, contains specific information on how to make the adjustment.

## Compatibility

NetView Release 2 is functionally upwardly compatible from NetView Release 1 and the following are also upwardly compatible:

- NCCF V2R2 for MVS, MVS/XA and VSE
- NCCF V2 for VM
- NLDM R3 for MVS, MVS/XA and VSE
- NLDM for VM
- NPDA V3R2 for MVS, MVS/XA, VM, and VSE

In a multiple-domain network, or across multiple SNA networks, NetView can communicate with another NetView regardless of operating system. Also, in a multiple-domain network or across multiple SNA networks, NetView for MVS/370, MVS/XA, VM, or VSE can communicate with:

- NCCF V2 for MVS MVS/XA VSE or VM
- NCCF V1R2 for MVS or VSE
- NPDA V3 for MVS, MVS/XA, VSE, or VM
- NLDM R3 for MVS, MVS/XA, or VSE
- NLDM R2 for VM.

The NetView Release 1 hardware monitor component may not be used to view NetView Release 2 hardware monitor data. NPDA V3R2 or prior releases may not be used to view NetView data.

NetView is an alternative for NCCF, NPDA, and NLDM. However, to aid customer migration, the various releases of each of these products that can run with VTAM V3R1.1, V3R1.2, or V3R2 for the appropriate operating system are stated below. The current releases of these products that can run on VTAM V3R1.1 by operating system are as follows:

Product	MVS/XA	MVS/370 *	VM
NCCF	V2R2	V2R2	V2
NCCF		V1R2	
NPDA	V3R2	V3R2	V3R2
NPDA		V2	
NLDM	R3	R3	R2

**Note:** \* Runs on VTAM V3R1.1 for MVS/370 on MVS/XA in 24-bit compatibility mode

The current releases of these products that can run on VTAM V3R1.2 by operating system are as follows:

Product	VM	VSE
NCCF	V2	V2R2
NCCF		V1R2
NPDA	V3R2	V3R2
NPDA		V2
NLDM	R2	R3

The releases of these products that can run on VTAM V3R2 by operating system are as follows:

Product	MVS/XA *	MVS/370 **	VM	VSE
NCCF	V2R2	V2R2	V2	V2R2
NPDA	V3R2	V3R2	V3R2	V3R2
NLDM	R3	R3	R2	R3

**Note:** \* Requires the MVS/XA version of VTAM V3R2

**Note:** \*\* Runs on VTAM V3R2 for MVS/370 on MVS/XA in 24-bit compatibility mode

## Conversion Aids

In order to help the automation process, the NetView tape provides a set of CLISTS and a sample network. *Network Program Products Samples* provides a guide on how to set up a network.

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# Bibliography

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## NetView Publications

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The following paragraphs briefly describe the library of manuals for NetView Release 2.

This PC-based tutorial introduces SNA and basic network management concepts to NetView users. It is primarily designed for new or inexperienced network operators.

*Automated Operations Planning Guide* (SC30-3474)

This book is for system planners and system programmers who are developing a strategy for network automation using NetView. The book covers an assortment of planning tasks, such as learning what automated operations is, deciding which network components can be automated, and identifying repetitive operator tasks.

*NetView Installation and Administration Guide* (SC30-3476)

This guide helps system programmers install and prepare NetView for operation. It is arranged in a simplified, step-by-step style and is meant to be used in conjunction with the sample network documented in *Network Program Products Samples*.

*NetView Administration Reference* (SC30-3361)

This reference book is for system programmers and network operators who need a complete understanding of NetView's resource definition statements. This book lists each statement in alphabetical order giving its purpose and location.

*NetView Customization* (SC30-3462)

This manual is designed for system programmers and others who want to customize NetView to reflect their network's needs or operating procedures. It discusses how to write exit routines, command processors, and subtasks and explains how to modify NetView help panels and problem determination displays.

*NetView Command Lists* (SC30-3423)

This manual explains how to simplify network operator tasks by using command lists (CLISTS). It provides step-by-step instructions for writing simple and advanced CLISTS and for migrating from NCCF message automation to NetView message automation.

*Automated Operations Using NetView Command Lists* (SC30-3477)

This manual is designed to help system programmers and network operators write NetView command lists (CLISTS). It gives step-by-step procedures for designing, writing, and testing CLISTS.

*NetView Operation Primer* (SC30-3363)

This book, written for new network operators, provides a basic description of the network management task. Topics include starting and stopping a network, controlling resources, monitoring a network, and gathering the necessary data to report a problem.

*NetView Operation* (SC30-3364)

This manual, designed for system programmers and experienced network operators, provides a comprehensive explanation of network management using NetView. Topics include detailed command explanation and panel flows, as well as information on how the various components interact with each other.

*NetView Messages* (SC30-3365)

This manual helps system programmers interpret and respond to the error messages issued by NetView. It explains briefly what each message means, what the system action is, what the operator response should be, and what the related commands are.

*NetView Operation Scenarios* (SC30-3376)

This book shows how to use NetView in a problem determination setting in order to identify and to solve common network operation problems.

*NetView Command Summary* (SX27-3620)

This reference card provides network operators with a quick way to find the format of all the commands and the more commonly used CLISTS for NetView. The commands are listed in alphabetical order by component.

*NetView Diagnosis* (LY30-5587)

This manual aids system programmers in identifying a NetView problem, classifying it, and then accurately describing it to an IBM Support Center so a solution can be found.

*NetView Hardware Problem Determination Reference* (SC30-3366)

This manual provides alert information beyond that offered in the NetView panels. It is designed to assist system programmers, help-desk operators, and

network operators determine which specific component is causing the alert. It includes formats of trace records sent to NetView from the products that NetView supports.

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## Other Network Program Products Publications

For more information about the manuals listed in this section, see *Network Program Products Bibliography and Master Index*.

*Network Program Products General Information* (GC30-3350)

*Network Program Products Planning* (SC30-3351)

*Network Program Products Samples* (SC30-3352)

*Network Program Products Bibliography and Master Index* (GC30-3353)

*Network Program Products Storage Estimates* (SC30-3403)

## VTAM Publications

The following list shows the publications for VTAM V3R1.1.

*VTAM Installation and Resource Definition* (SC23-0111)

*VTAM Customization* (SC23-0112)

*VTAM Operation* (SC23-0113)

*VTAM Messages and Codes* (SC23-0114)

*VTAM Programming* (SC23-0115)

*VTAM Diagnosis Guide* (SC23-0116)

*VTAM Diagnosis Reference* (LY30-5582)

*VTAM Data Areas for MVS* (LY30-5584)

*VTAM Data Areas for VM* (LY30-5583)

*VTAM Reference Summary* (SC23-0135)

## NetView/PC Publications

The following list shows the publication for NetView/PC.

*NetView/PC Planning and Operation Guide* (SC30-3408)

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## Marketing Publications

The following publications are manuals or guidebooks that describe different techniques for automating and managing your network. Your IBM system representative can provide a list that contains summaries of the contents of each of the books.

The information contained in these documents has not been submitted to formal IBM tests. The use of the information is a customer responsibility.

*MVS/XA Operations: System Commands* (GC28-1206)

*MVS/XA System Programming Library: User Exits* (GC28-1147)

*Automated Operations (AO) Using Standard S/INM Products* (GG24-3083)

*Automated Operations Implementation Guide* (GG24-3111)

*Automated Systems Operations for High Availability: Concepts and Examples* (GG66-0260)

*NMPF/NetView Migration and Automation* (GG24-3113)

*Alert Management Techniques* (GG24-3114)

*Operating Remote VM Systems from a Central MVS System* (GG24-3009)

*Communication Network Management/Managing Interconnected Systems* (GG24-1539)

*Communication Network Management/NCCF Terminal Access Feature* (GG24-1540)

*Communication Network Management/Central Site Operation* (GG24-1558)

*Communication Network Management/Remote Maintenance and Distribution* (GG24-1575)

*Communication Network Management/Operational Considerations for Large Networks* (GG24-1602)

*Communication Network Management/Performance Considerations* (GG24-1617)

*Advanced Communications Function Products Installation Guide* (GG24-1557)

*SNA Problem Determination Guide/ACF R3 Volume 1* (GG24-1514)

*SNA Problem Determination Guide/ACF R3 Volume 2* (GG24-1523)

*Automated Recovery in a Communications Management Configuration Environment* (GG66-0256)

*Systems Analysis for High Availability, An Availability Management Technique* (GG22-9391)

*System Outage Analysis* (GC20-1871)

*Measuring Availability* (GG22-9324)

*MVS/XA Planning, Recovery, and Reconfiguration* (GC28-1160)

*DASD Availability Topics* (GG66-0202)

*TPNS: A Systems Test Tool to Improve Service Levels* (GG22-9243)

*Improving Stability in Large Systems* (GG22-9051)

*Component Failure Impact Analysis: An Availability Management Tool* (GC20-1865)

*An Introduction to the Communications Management Configuration* (GG24-1521)

## **VM/SP Publications**

*VM/SP Operator's Guide*, (SC19-6020)

*VM/SP System Programmer's Guide*, (SC19-6203)

*VM/SP Application Development Guide*, (SC24-5247)

*VM/SP Group Control System Guide*, (SC24-5249)

*VM/SP Group Control System Macro Reference*, (SC24-5250)

## **Other Related Publications**

*Inter-System Control Facilities Planning and Installation*, (SC30-3472)

*Inter-System Control Facilities Operation*, (SC30-3473)

# Glossary

This glossary defines important NetView, NetView/PC SSP, and VTAM abbreviations and terms. It includes information from the *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699. Definitions from the *American National Dictionary for Information Processing* are identified by an asterisk (\*). Definitions from draft proposals and working papers under development by the International Standards Organization, Technical Committee 97, Subcommittee 1 are identified by the symbol **(TC97)**. Definitions from the *CCIT Sixth Plenary Assembly Orange Book, Terms and Definitions* and working documents published by the Consultative Committee on International Telegraph and Telephone of the International Telecommunication Union, Geneva, 1980 are preceded by the symbol **(CCITT/ITU)**. Definitions from published sections of the *ISO Vocabulary of Data Processing*, developed by the International Standards Organization, Technical Committee 97, Subcommittee 1 and from published sections of the *ISO Vocabulary of Office Machines*, developed by subcommittees of ISO Technical Committee 95, are preceded by the symbol **(ISO)**.

For abbreviations, the definition usually consists only of the words represented by the letters; for complete definitions, see the entries for the words.

## Reference Words Used in the Entries

The following reference words are used in this glossary:

*Contrast with.* Refers to a term that has an opposed or substantively different meaning.

*Deprecated term for.* Indicates that the term should not be used. It refers to a preferred term, which is defined.

*See.* Refers to multiple-word terms that have the same last word.

*See also.* Refers to related terms that have similar (but not synonymous) meanings.

*Synonym for.* Appears in the commentary of a less desirable or less specific term and identifies the preferred term that has the same meaning.

*Synonymous with.* Appears in the commentary of a preferred term and identifies less desirable or less specific terms that have the same meaning.

**ABEND.** Abnormal end of task.

**abnormal end of task (ABEND).** Termination of a task before its completion because of an error condition that

cannot be resolved by recovery facilities while the task is executing.

**access method.** A technique for moving data between main storage and input/output devices.

**accounting exit routine.** In VTAM, an optional installation exit routine that collects statistics about session initiation and termination.

**ACF.** Advanced Communications Function.

**activate.** To make a resource of a node ready to perform the functions for which it was designed. Contrast with *deactivate*.

**active.** (1) The state a resource is in when it has been activated and is operational. Contrast with *inactive*, *pending*, and *inoperative*. (2) Pertaining to a major or minor node that has been activated by VTAM. Most resources are activated as part of VTAM start processing or as the result of a VARY ACT command.

**Advanced Communications Function (ACF).** A group of IBM licensed programs (principally VTAM, TCAM, NCP, and SSP) that use the concepts of Systems Network Architecture (SNA), including distribution of function and resource sharing.

**alert.** (1) In SNA, a record sent to a system problem management focal point to communicate the existence of an alert condition. (2) In the NetView program, a high priority event that warrants immediate attention. This data base record is generated for certain event types that are defined by user-constructed filters.

**API.** Application program interface.

**application program interface (API).** (1) The formally defined programming language interface between an IBM system control program or licensed program and its user. (2) The interface through which an application program interacts with an access method. In VTAM, it is the language structure used in control blocks so that application programs can reference them and be identified to VTAM.

**automatic logon.** (1) A process by which VTAM automatically creates a session-initiation request to establish a session between two logical units (LUs). The session will be between a designated primary logical unit (PLU) and a secondary logical unit (SLU) that is neither queued for nor in session with another PLU. See also *controlling application program* and *controlling logical unit*. (2) In VM, a process by which a virtual machine is initiated by other than the user of that virtual machine. For example, the primary VM

operator's virtual machine is activated automatically during VM initialization.

**automatic reactivation.** In NetView, the activation of a node from the inactive state without any action by the network operator.

**channel.** \* A path along which signals can be sent, for example, data channel, output channel.

**channel-attached.** Pertaining to the attachment of devices directly by System 370 input-output channels to a host processor.

**CICS.** Customer Information Control System.

**CLIST.** Command list.

**CMC.** Communication management configuration.

**CNM.** Communication network management.

**command.** (1) A request from a terminal for the performance of an operation or the execution of a particular program. (2) In SNA, any field set in the transmission header (TH), request header (RH), and sometimes portions of a request unit (RU), that initiates an action or that begins a protocol; for example: (a) Bind Session (session-control request unit), a command that activates an LU-LU session, (b) the change-direction indicator in the RH of the last RU of a chain, (c) the virtual route reset window indicator in a FID4 transmission header.

**command facility.** The component of the NetView program that is a base for command processors that can monitor, control, automate, and improve the operation of a network.

**command list (CLIST).** In the NetView program, a sequential list of commands and control statements that is assigned a name. When the name is invoked (as a command) the commands in the list are executed.

**command processor.** A program that performs an operation specified by a command.

**communication controller.** A type of communication control unit whose operations are controlled by one or more programs stored and executed in the unit; for example, the IBM 3725 Communication Controller. It manages the details of line control and the routing of data through a network.

**communication management configuration (CMC).** (1) In VTAM, a technique for configuring a network that allows for the consolidation of many network management functions for the entire network in a single host processor. (2) A multiple-domain network configuration in which one of the hosts, called the communication management host, performs most of the controlling functions for the network, thus allowing the

other hosts, called data hosts, to process applications. This is accomplished by configuring the network so that the communication management host owns most of the resources in the network that are not application programs. The resources that are not owned by the communication management host are the resources that are channel-attached stations of data hosts.

**communication network management (CNM).** The process of designing, installing, operating, and managing the distribution of information and controls among end users of communication systems.

**communication network management (CNM) application program.** A VTAM application program that issues and receives formatted management services request units for physical units. For example, NetView.

**configuration.** (1) (TC97) The arrangement of a computer system or network as defined by the nature, number, and the chief characteristics of its functional units. The term may refer to a hardware or a software configuration. (2) The devices and programs that make up a system, subsystem, or network. (3) In CCP, the arrangement of controllers, lines, and terminals attached to an IBM 3710 Network Controller. Also, the collective set of item definitions that describe such a configuration.

**configuration services.** In SNA, one of the types of network services in the control point (CP) and in the physical unit (PU); configuration services activate, deactivate, and maintain the status of physical units, links, and link stations. Configuration services also shut down and restart network elements and modify path control routing tables and address-translation tables.

**cross-domain resource manager (CDRM).** In VTAM, the function in the system services control point (SSCP) that controls initiation and termination of cross-domain sessions.

**cross-network.** In SNA, pertaining to control or resources involving more than one SNA network.

**Customer Information Control System (CICS).** A licensed program that enables transactions entered at remote terminals to be processed concurrently by user-written application programs. It also includes facilities for building, using, and maintaining data bases.

**data link.** In SNA, synonym for *link*.

**data terminal equipment (DTE).** (TC97) That part of a data station that serves as a data source, data link, or both, and provides for the data communication control function according to protocols.

**deactivate.** To take a resource of a node out of service, rendering it inoperable, or to place it in a state in which

it cannot perform the functions for which it was designed. Contrast with *activate*.

**definite response (DR).** In SNA, a value in the form-of-response-requested field of the request header. The value directs the receiver of the request to return a response unconditionally, whether positive or negative, to that request. Contrast with *exception response* and *no response*.

**definition statement.** (1) In VTAM, the statement that describes an element of the network. (2) In NCP, a type of instruction that defines a resource to the NCP. See also *macroinstruction*.

**display.** (1) To present information for viewing, usually on a terminal screen or a hard-copy device. (2) A device or medium on which information is presented, such as a terminal screen. (3) Deprecated term for *panel*.

**domain.** (1) An access method, its application programs, communication controllers, connecting lines, modems, and attached terminals. (2) In SNA, (a) a system services control point (SSCP) and the physical units (PUs), logical units (LUs), links, link stations, and all the associated resources that the SSCP has the ability to control by means of activation requests and deactivation requests; (b) an SSCP.

**domain operator.** In a multiple-domain network, the person or program that controls the operation of the resources controlled by one system services control point. Contrast with *network operator* (2).

**double-byte character set (DBCS).** A set of graphic characters where two bytes are used to represent the character set of such languages as Chinese and Japanese.

**DR.** (1) In NCP and CCP, dynamic reconfiguration. (2) In SNA, definite response.

**DSCP.** Data services command processor.

**DTE.** Data terminal equipment.

**dump.** (1) Computer printout of storage. (2) To write the contents of all or part of storage to an external medium as a safeguard against errors or in connection with debugging. (3) (ISO) Data that have been dumped.

**EIA.** Electronic Industries Association. Provides interface standards for electrical and electronic equipment.

**Emulation Program (EP).** An IBM control program that allows a channel-attached 3705 or 3725 communication controller to emulate the functions of an IBM 2701 Data Adapter Unit, an IBM 2702 Transmission Control, or an IBM 2703 Transmission Control.

**ER.** (1) Explicit route. (2) Exception response.

**event.** (1) In the NetView program, a record indicating irregularities of operation in physical elements of a network. (2) An occurrence of significance to a task; typically, the completion of an asynchronous operation, such as an input/output operation.

**EXEC.** In a VM operating system, a user-written command file that contains CMS commands, other user-written commands, and execution control statements, such as branches.

**exit routine.** Any of several types of special-purpose user-written routines.

**explicit route (ER).** In SNA, the path control network elements, including a specific set of one or more transmission groups, that connect two subarea nodes. An explicit route is identified by an origin subarea address, a destination subarea address, an explicit route number, and a reverse explicit route number.

**extended network addressing.** The network addressing system that splits the address into an 8-bit subarea and a 15-bit element portion. The subarea portion of the address is used to address host processors or communication controllers. The element portion is used to permit processors or controllers to address resources.

**feature.** A particular part of an IBM product that a customer can order separately.

**filter.** In the NetView program, a function that limits the data that is to be recorded on the data base and displayed at the terminal. See *recording filter* and *viewing filter*.

**focal point.** The control point for any management services element containing control of the functions responsible for network management data. See also *management services*.

**frame.** (1) The unit of transmission in some local area networks, including the IBM Token-Ring Network. It includes delimiters, control characters, information, and checking characters. (2) In SDLC, the vehicle for every command, every response, and all information that is transmitted using SDLC procedures.

**gateway.** The combination of machines and programs that provide address translation, name translation, and system services control point (SSCP) rerouting between independent SNA networks to allow those networks to communicate. A gateway consists of one gateway NCP and at least one gateway SSCP.

**gateway host.** A host node that contains a gateway system services control point (SSCP).

**GCS.** Group control system.



**generic alert.** A product-independent method of encoding alert data by means of textual data or code points that index short units of stored text.

**group.** In the NetView/PC program, to identify a set of application programs that are to run concurrently.

**group control system (GCS).** A component of VM that provides multi-programming and shared memory support to virtual machines. It is a saved system intended for use with SNA products.

**hardware monitor.** The component of the NetView program that helps identify network problems, such as hardware, software, and microcode, from a central control point using interactive display techniques.

**HCF.** Host Command Facility.

**help desk.** In the NetView program, an online information facility that guides the help desk operator through problem management procedures.

**help desk operator.** A person who receives questions or problem reports from network users.

**help panel.** An online display that tells you how to use a command or another aspect of a product.

**High Performance Option (HPO).** A licensed program that is an extension of VM/SP. It provides performance and operation enhancements for large system environments.

**Host Command Facility (HCF).** An IBM licensed program that enables a user at a System/370 terminal to access applications in systems such as the 8100 or System/36.

**host node.** A node providing an application program interface (API).

**host processor.** (1) (TC97) A processor that controls all or part of a user application network. (2) In a network, the processing unit in which the data communication access method resides.

**HPO.** High Performance Option.

**IMS.** Information Management System/Virtual Storage.

**IMS/VS.** Information Management System/Virtual Storage. Synonym for *IMS*.

**inactive.** Describes the state of a resource that has not been activated or for which the VARY INACT command has been issued. Contrast with *active*. See also *inoperative*.

**Information/Management.** A feature of the Information/System licensed program that provides

interactive systems management applications for problem, change, and configuration management.

**Information Management System (IMS).** A general purpose system whose full name is Information Management System/Virtual Storage (IMS/VS). It enhances the capabilities of OS/VS for batch processing and telecommunication and allows users to access a computer-maintained data base through remote terminals.

**Information/System.** An interactive retrieval program with related utilities designed to provide systems programmers with keyword access to selected technical information contained in either of its companion products, Information/MVS or Information/VM-VSE.

**interconnected networks.** SNA networks connected by gateways.

**interface.** \* A shared boundary. An interface might be a hardware component to link two devices or it might be a portion of storage or registers accessed by two or more computer programs.

**JCL.** Job control language.

**job control language (JCL).** \* A problem-oriented language designed to express statements in a job that are used to identify the job or describe its requirements to an operating system.

**Kanji.** A character set of symbols used for Japanese ideograms. See also *double-byte character set*.

**keyword.** (1) (TC97) A lexical unit that, in certain contexts, characterizes some language construction. (2) \* One of the predefined words of an artificial language. (3) One of the significant and informative words in a title or document that describes the content of that document. (4) A name or symbol that identifies a parameter. (5) A part of a command operand that consists of a specific character string (such as DSNAME=).

**link.** In SNA, the combination of the link connection and the link stations joining network nodes; for example: (1) a System/370 channel and its associated protocols, (2) a serial-by-bit connection under the control of Synchronous Data Link Control (SDLC). A link connection is the physical medium of transmission. A link, however, is both logical and physical. Synonymous with *data link*.

**link connection segment.** A portion of the configuration that is located between two resources listed consecutively in the service point command service (SPCS) query link configuration request list.

**Link Problem Determination Aid (LPDA).** A series of testing procedures initiated by NetView that provide

modem status, attached device status, and the overall quality of a communications link.

**link status (LS).** Information maintained by local and remote modems.

**load module.** (ISO) A program unit that is suitable for loading into main storage for execution; it is usually the output of a linkage editor.

**local area network (LAN).** (1) A network in which a set of devices are connected to one another for communication and that can be connected to a larger network. See also *token ring*. (2) A network in which communications are limited to a moderately sized geographic area such as a single office building, warehouse, or campus, and which do not generally extend across public rights-of-way. Contrast with *wide area network*.

**logical unit (LU).** In SNA, a port through which an end user accesses the SNA network and the functions provided by system services control points (SSCPs). An LU can support at least two sessions—one with an SSCP and one with another LU—and may be capable of supporting many sessions with other LUs.

**log off.** To request that a session be terminated.

**logoff.** In VTAM, an unformatted session termination request.

**log on.** To initiate a session.

**logon.** In VTAM, an unformatted session initiation request for a session between two logical units. See *automatic logon* and *simulated logon*. See also *session-initiation request*.

**LPDA.** Link Problem Determination Aid.

**LU.** Logical unit.

**management services.** In SNA, one of the types of network services for logical units (LUs). Management services, for example, forward a request for network data on error statistics and deliver the data in a reply.

**message.** (1) (TC97) A group of characters and control bit sequences transferred as an entity. (2) In VTAM, the amount of function management data (FMD) transferred to VTAM by the application program with one SEND request.

**migration.** Installing a new version or release of a program when an earlier version or release is already in place.

**modem.** A device that modulates and demodulates signals transmitted over data communication facilities. The term is a contraction for modulator-demodulator.

**multiple-domain network.** In SNA, a network with more than one system services control point (SSCP). Contrast with *single-domain network*.

**Multiple Virtual Storage (MVS).** An IBM licensed program whose full name is the Operating System/Virtual Storage (OS/VS) with Multiple Virtual Storage/System Product for System/370. It is a software operating system controlling the execution of programs.

**Multiple Virtual Storage for Extended Architecture (MVS/XA).** An IBM licensed program whose full name is the Operating System/Virtual Storage (OS/VS) with Multiple Virtual Storage/System Product for Extended Architecture. Extended architecture allows 31-bit storage addressing. MVS/XA is a software operating system controlling the execution of programs.

**Multiple Virtual Storage/Operator Communication Control Facility (MVS/OCCF).** A facility that intercepts messages from the MVS supervisor. NetView and MVS/OCCF help a network operator control multiple MVS systems from a central site.

**MVS.** Multiple Virtual Storage operating system.

**MVS/OCCF.** Multiple Virtual Storage/Operator Communication Control Facility.

**MVS/XA.** Multiple Virtual Storage for Extended Architecture operating system.

**NCCF.** Network Communications Control Facility.

**NCP.** (1) Network Control Program (IBM licensed program). Its full name is Advanced Communications Function for the Network Control Program. (2) Network control program (general term).

**NCP/Token-Ring Interconnection (NTRI).** An NCP function that allows a communication controller to attach to the IBM Token-Ring Network by providing a basic boundary network node interface.

**NetView.** A system 370-based IBM licensed program used to monitor a network, manage it, and diagnose its problems.

**NetView/PC.** A PC-based IBM licensed program through which application programs can be used to monitor, manage, and diagnose problems in IBM Token-Ring networks, non-SNA communication devices, and voice networks.

**network.** (1) (TC97) An interconnected group of nodes. (2) In data processing, a user application network. See *path control network*, *public network*, *SNA network*, *subarea network*, *type 2.1 network*, and *user-application network*.

**network address.** In SNA, an address, consisting of subarea and element fields, that identifies a link, a link station, or a network addressable unit. Subarea nodes use network addresses; peripheral nodes use local addresses. The boundary function in the subarea node to which a peripheral node is attached transforms local addresses to network addresses and vice versa.

**Network Communications Control Facility (NCCF).**

(1) An IBM licensed program that is a base for command processors that can monitor, control, automate, and improve the operations of a network. Its function is included and enhanced in NetView's command facility. (2) A traditional, alternative name for the command facility of NetView.

**network control (NC).** In SNA, an RU category used for requests and responses exchanged for such purposes as activating and deactivating explicit and virtual routes and sending load modules to adjacent peripheral nodes.

**Network Control Program (NCP).** An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability. Its full name is Advanced Communications Function for the Network Control Program.

**network log.** A file that contains all messages processed by NetView.

**Network Logical Data Manager (NLDM).** (1) An IBM licensed program that collects and correlates session-related data and provides online access to this information. It runs as an NCCF communication network management (CNM) application program. Its function is included and enhanced in NetView's session monitor. (2) A traditional, alternative name for the session monitor of NetView.

**network manager.** A program or group of programs that is used to monitor, manage, and diagnose the problems of a network.

**network name.** (1) In SNA, the symbolic identifier by which end users refer to a network addressable unit (NAU), a link, or a link station. See also *network address*. (2) In a multiple-domain network, the name of the APPL statement defining a VTAM application program is its network name and it must be unique across domains. Contrast with *ACB name*. See *uninterpreted name*.

**network node.** (1) Synonym for *type 2.1 node*. Contrast with *end node*. (2) Synonym for *node*.

**network operator.** (1) A person or program responsible for controlling the operation of all or part of a network. (2) The person or program that controls all the domains in a multiple-domain network. Contrast with *domain operator*.

**Network Performance Monitor (NPM).** An IBM licensed program that uses VTAM to record performance data collected for various devices in a network.

**Network Problem Determination Application (NPDA).**

(1) An IBM licensed program that helps identify network problems, such as hardware, software, and microcode, from a central control point using interactive display techniques. It runs as an NCCF communication network management (CNM) application program. Its function is included and enhanced in NetView's hardware monitor. (2) A traditional, alternative name for the hardware monitor of NetView.

**network product support (NPS).** The function of NetView that provides operations control for the IBM 3710 Network Controller, 5860 family of modems, and the NCP; and configuration of 3710s and the 5860 family of modems. NPS provides operator commands to run diagnostics for link problem determination and to change product operating parameters.

**Network Terminal Option (NTO).** An IBM licensed program used in conjunction with NCP that allows certain non-SNA devices to participate in sessions with SNA application programs in the host processor. NTO converts non-SNA protocol to SNA protocol when data is sent to the host from a non-SNA device and reconverts SNA protocol to non-SNA protocol when data is sent back to the device.

**NLDM.** Network Logical Data Manager.

**node.** (1) In SNA, an endpoint of a link or junction common to two or more links in a network. Nodes can be distributed to host processors, communication controllers, cluster controllers, or terminals. Nodes can vary in routing and other functional capabilities.

**node type.** In SNA, a designation of a node according to the protocols it supports and the network addressable units (NAUs) that it can contain. Five types are defined: 1, 2.0, 2.1, 4, and 5. Type 1, type 2.0, and type 2.1 nodes are peripheral nodes; type 4 and type 5 nodes are subarea nodes.

**NPA.** Network performance analyzer.

**NPDA.** Network Problem Determination Application.

**NPM.** Network Performance Monitor.

**NTO.** Network Terminal Option.

**NTRI.** NCP/Token-Ring interconnection.

**OCCF.** Operator Communication Control Facility.

**online.** Stored in a computer and accessible from a terminal.

**operand.** (1) **(ISO)** An entity on which an operation is performed. (2) \* That which is operated upon. An operand is usually identified by an address part of an instruction. (3) Information entered with a command name to define the data on which a command processor operates and to control the execution of the command processor. (4) An expression to whose value an operator is applied. See also *keyword*, *keyword parameter*, and *parameter*.

**operator.** (1) In a language statement, the lexical entity that indicates the action to be performed on operands. (2) A person who operates a machine. See *network operator*.

**Operator Communication Control Facility (OCCF).** A licensed program that allows communication with and the operation of remote MVS or VSE systems.

**operator profile.** In the NetView program, the resources and activities a network operator has control over. The statements defining these resources and activities are stored in a file that is activated when the operator logs on.

**panel.** (1) A formatted display of information that appears on a terminal screen. See also *help panel* and *task panel*. Contrast with *screen*. (2) In computer graphics, a display image that defines the locations and characteristics of display fields on a display surface.

**parameter.** (1) **(ISO)** A variable that is given a constant value for a specified application and that may denote the application. (2) An item in a menu for which the user specifies a value or for which the system provides a value when the menu is interpreted. (3) Data passed to a program or procedure by a user or another program, namely as an operand in a language statement, as an item in a menu, or as a shared data structure.

**path.** (1) In SNA, the series of path control network components (path control and data link control) that are traversed by the information exchanged between two network addressable units (NAUs). See also *explicit route (ER)*, *route extension*, and *virtual route (VR)*. (2) In VTAM when defining a switched major node, a potential dial-out port that can be used to reach that node. (3) In the NetView/PC program, a complete line in a configuration that contains all of the resources in the service point command service (SPCS) query link configuration request list.

**path control (PC) layer.** In SNA, the layer that manages the sharing of link resources of the SNA network and routes basic information units (BIUs) through it. See also *BIU segment*, *blocking of PIUs*, *data link control layer*, and *transmission control layer*.

**path control (PC) network.** In SNA, the part of the SNA network that includes the data link control and path

control layers. See *SNA network* and *user application network*. See also *boundary function*.

**path information unit (PIU).** In SNA, a message unit consisting of a transmission header (TH) alone, or of a TH followed by a basic information unit (BIU) or a BIU segment. See also *transmission header*.

**PC.** (1) Path control. (2) Personal Computer. Its full name is the IBM Personal Computer.

**Personal Computer (PC).** The IBM Personal Computer line of products including the 5150 and subsequent models.

**physical unit (PU).** In SNA, a type of network addressable unit (NAU). A physical unit (PU) manages and monitors the resources (such as attached links) of a node, as requested by a system services control point (SSCP) through an SSCP-PU session. An SSCP activates a session with the physical unit in order to indirectly manage, through the PU, resources of the node such as attached links.

**PIU.** Path information unit.

**PLU.** Primary logical unit.

**PPT.** Primary POI task.

**primary logical unit (PLU).** In SNA, the logical unit (LU) that contains the primary half-session for a particular LU-LU session. Each session must have a PLU and secondary logical unit (SLU). The PLU is the unit responsible for the bind and is the controlling LU for the session. A particular LU may contain both primary and secondary half-sessions for different active LU-LU sessions. Contrast with *secondary logical unit (SLU)*.

**primary POI task (PPT).** The NetView subtask that processes all unsolicited messages received from the VTAM program operator interface (POI) and delivers them to the controlling operator or to the command processor. The PPT also processes the initial command specified to execute when NetView is initialized and timer request commands scheduled to execute under the PPT.

**primary session.** An extended recovery facility (XRF) session between the active application subsystem and a terminal user.

**problem determination.** The process of identifying the source of a problem; for example, a program component, a machine failure, telecommunication facilities, user or contractor-installed programs or equipment, an environment failure such as a power loss, or a user error.

**profile.** In the Conversational Monitor System (CMS) or the group control system (GCS), the characteristics defined by a PROFILE EXEC file that executes

automatically after the system is loaded into a virtual machine. See also *operator profile*.

**programmable operator facility (PROP).** A VM facility that allows remote control of a virtual machine by intercepting messages directed for that machine and taking preprogrammed action.

**PROP.** Programmable operator facility.

**PU.** Physical unit.

**recommended action.** Procedures suggested by NetView that can be used to determine the causes of network problems.

**recording filter.** In the NetView program, the function that determines which events, statistics, and alerts are stored on a data base.

**release.** For VTAM, to relinquish control of resources (communication controllers or physical units). See also *resource takeover*. Contrast with *acquire (2)*.

**remote.** Concerning the peripheral parts of a network not centrally linked to the host processor and generally using telecommunication lines with public right-of-way.

**remote modem self-test (RST).** A check on hardware to identify a field-replaceable unit that is failing.

**request unit (RU).** In SNA, a message unit that contains control information, end-user data, or both.

**request/response unit (RU).** In SNA, a generic term for a request unit or a response unit. See also *request unit (RU)* and *response unit*.

**resource.** (1) Any facility of the computing system or operating system required by a job or task, and including main storage, input/output devices, the processing unit, data sets, and control or processing programs. (2) In the NetView program, any hardware or software that provides function to the network.

**response time.** (1) The amount of time it takes after a user presses the enter key at the terminal until the reply appears at the terminal. (2) For response time monitoring, the time from the activation of a transaction until a response is received, according to the response time definition coded in the performance class.

**response time monitor (RTM).** A feature available with certain hardware devices to allow measurement of response times, which may be collected and displayed by NetView.

**response unit (RU).** In SNA, a message unit that acknowledges a request unit; it may contain prefix information received in a request unit. If positive, the response unit may contain additional information (such as session parameters in response to Bind Session), or

if negative, contains sense data defining the exception condition.

**return code.** \* A code [returned from a program] used to influence the execution of succeeding instructions.

**route.** See *explicit route* and *virtual route*.

**RST.** Remote modem self-test.

**RTM.** Response time monitor.

**RU.** Request/response unit.

**scanner interface trace (SIT).** A record of the activity within the communication scanner processor (CSP) for a specified data link between a 3725 Communication Controller and a resource.

**scope of commands.** In the NetView program, the facility that provides the ability to assign different responsibilities to various operators.

**screen.** An illuminated display surface; for example, the display surface of a CRT or plasma panel. Contrast with *panel*.

**secondary logical unit (SLU).** In SNA, the logical unit (LU) that contains the secondary half-session for a particular LU-LU session. An LU may contain secondary and primary half-sessions for different active LU-LU sessions. Contrast with *primary logical unit (PLU)*.

**service point (SP).** A control point that provides management services to non-SNA references.

**service point command service (SPCS).** An extension of the command facility in the NetView program that allows the host processor to communicate with a service point by using the communication network management (CNM) interface.

**session.** In SNA, a logical connection between two network addressable units (NAUs) that can be activated, tailored to provide various protocols, and deactivated, as requested. Each session is uniquely identified in a transmission header (TH) by a pair of network addresses, identifying the origin and destination NAUs of any transmissions exchanged during the session.

**session data.** Data about a session, collected by NetView, that consists of session awareness data and session trace data.

**session information retrieval (SIR).** The function that allows an operator to enable or disable session information retrieval for a particular gateway or for all gateway sessions. When a gateway session ends, trace information about the most recent sequence or FID0 numbers to cross the gateway is passed back to

all system services control points (SSCPs) that have enabled SIR for that session or for all sessions. This information can also be passed back to the requesting host.

**session monitor.** The component of NetView that collects and correlates session-related data and provides online access to this information.

**session services.** In SNA, one of the types of network services in the control point (CP) and in the logical unit (LU). These services provide facilities for an LU or a network operator to request that the SSCP initiate or terminate sessions between logical units.

**session setup failure notification (SSFN).** Session awareness data provided by NetView when there is a failure. It identifies the system services control point (SSCP) that detects an error, which SSCP's are involved, and the names of the session partners affected.

**shutdown.** To stop or quiesce a program, an application program, or a system.

**single-domain network.** In SNA, a network with one system services control point (SSCP). Contrast with *multiple-domain network*.

**SIT.** Scanner interface trace.

**SLU.** Secondary logical unit.

**SMP.** System Modification Program.

**SNA.** Systems Network Architecture.

**SNA network.** The part of a user-application network that conforms to the formats and protocols of Systems Network Architecture. It enables reliable transfer of data among end users and provides protocols for controlling the resources of various network configurations. The SNA network consists of network addressable units (NAUs), boundary function components, and the path control network.

**SNA network interconnection.** The connection, by gateways, of two or more independent SNA networks to allow communication between logical units in those networks. The individual SNA networks retain their independence.

**SP.** Service point.

**SPCS.** Service point command service.

**span.** In the NetView program, a user-defined group of network resources within a single domain. Each major or minor node is defined as belonging to one or more spans. See also *span of control*.

**span of control.** The total network resources over which a particular network operator has control. All the network resources listed in spans associated through profile definition with a particular network operator are within that operator's span of control.

**SSCP.** System services control point.

**SSP.** System Support Programs (IBM licensed program). Its full name is Advanced Communications Function for System Support Programs.

**station.** (1) One of the input or output points of a network that uses communication facilities; for example, the telephone set in the telephone system or the point where the business machine interfaces with the channel on a leased private line. (2) One or more computers, terminals, or devices at a particular location.

**status monitor.** A component of NetView that collects and summarizes information on the status of resources defined in a VTAM domain.

**subarea.** A portion of the SNA network consisting of a subarea node, any attached peripheral nodes, and their associated resources. Within a subarea node, all network addressable units, links, and adjacent link stations (in attached peripheral or subarea nodes) that are addressable within the subarea share a common subarea address and have distinct element addresses.

**subarea host node.** A host node that provides both subarea function and an application program interface (API) for running application programs. It provides system services control point (SSCP) functions, subarea node services, and is aware of the network configuration.

**subarea node.** In SNA, a node that uses network addresses for routing and whose routing tables are therefore affected by changes in the configuration of the network. Subarea nodes can provide gateway function, and boundary function support for peripheral nodes. Type 4 and type 5 nodes are subarea nodes.

**subsystem.** A secondary or subordinate system, usually capable of operating independent of, or asynchronously with, a controlling system.

**switched line.** A communication line in which the connection between the communication controller and a remote link station is established by dialing.

**System Modification Program (SMP).** An operating system component that facilitates the process of installing and servicing an MVS system. See also *System Modification Program Extended*.

**system services control point (SSCP).** In SNA, a central location point within an SNA network for managing the configuration, coordinating network operator and

problem determination requests, and providing directory support and other session services for end users of the network. Multiple SSCPs, cooperating as peers, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its domain.

**Systems Network Architecture (SNA).** The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through and controlling the configuration and operation of networks.

**System Support Programs (SSP).** An IBM licensed program, made up of a collection of utilities and small programs, that supports the operation of the NCP.

**TAF.** Terminal access facility.

**takeover.** The process by which the failing active subsystem is released from its extended recovery facility (XRF) sessions with terminal users and replaced by an alternate subsystem.

**task.** A basic unit of work to be accomplished by a computer. The task is usually specified to a control program in a multiprogramming or multiprocessing environment.

**terminal.** A device that is capable of sending and receiving information over a link; it is usually equipped with a keyboard and some kind of display, such as a screen or a printer.

**terminal access facility (TAF).** In the NetView program, a facility that allows a network operator to control a number of subsystems. In a full-screen or operator control session, operators can control any combination of such subsystems simultaneously.

**time sharing option (TSO).** An optional configuration of the operating system that provides conversational time sharing from remote stations.

**token.** A sequence of bits passed from one device to another along the token ring. When the token has data appended to it, it becomes a frame.

**token ring.** A local area network, having a ring topology, that passes tokens from one attaching device to another. For example, the IBM Token-Ring Network.

**TSO.** Time sharing option.

**tutorial.** Online information presented in a teaching format.

**user.** Anyone who requires the services of a computing system.

**variable.** In the NetView program, a character string beginning with & that is coded in a command list and is assigned a value during execution of the command list.

**viewing filter.** In the NetView program, the function that allows a user to select the data to be displayed on a terminal. All other stored data is blocked.

**virtual machine.** A functional simulation of a computer and its associated devices.

**Virtual Machine (VM).** A licensed program whose full name is the Virtual Machine/System Product (VM/SP). It is a software operating system that manages the resources of a real processor to provide virtual machines to end users. As a time-sharing system control program, it consists of the virtual machine control program (CP), the conversational monitor system (CMS), the group control system (GCS), and the interactive problem control system (IPCS).

**virtual route (VR).** In SNA, a logical connection (1) between two subarea nodes that is physically realized as a particular explicit route, or (2) that is contained wholly within a subarea node for intranode sessions. A virtual route between distinct subarea nodes imposes a transmission priority on the underlying explicit route, provides flow control through virtual-route pacing, and provides data integrity through sequence numbering of path information units (PIUs).

**virtual storage.** (ISO) The notion of storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses are mapped into real addresses. The size of virtual storage is limited by the addressing scheme of the computer system and by the amount of auxiliary storage available, not by the actual number of main storage locations.

**Virtual Storage Access Method (VSAM).** An access method for direct or sequential processing of fixed and variable-length records on direct access devices. The records in a VSAM data set or file can be organized in logical sequence by a key field (key sequence), in the physical sequence in which they are written on the data set or file (entry-sequence), or by relative-record number.

**Virtual Storage Extended (VSE).** An IBM licensed program whose full name is the Virtual Storage Extended/Advanced Function. It is a software operating system controlling the execution of programs.

**Virtual Telecommunications Access Method (VTAM).** An IBM licensed program that controls communication and the flow of data in an SNA network. It provides single-domain, multiple-domain, and interconnected network capability.

**VM.** Virtual Machine operating system. Its full name is Virtual Machine/System Product.

**VM SNA console support (VSCS).** A VTAM component for the VM environment that provides Systems Network Architecture (SNA) support. It allows SNA terminals to be virtual machine consoles.

**VM/SP.** Virtual Machine/System Product operating system. Synonym for *VM*.

**VR.** Virtual route.

**VSAM.** Virtual Storage Access Method.

**VSCS.** VM SNA console support.

**VSE.** Virtual Storage Extended operating system.

**VTAM.** Virtual Telecommunications Access Method (IBM licensed program). Its full name is Advanced Communications Function for the Virtual Telecommunications Access Method.

**VTAM internal trace (VIT).** A trace used in VTAM to collect data on channel I/O, use of locks, and storage management services.

**VTAM operator.** A person or program authorized to issue VTAM operator commands. See *domain operator*, *program operator*, and *network operator (2)*.

**VTAM operator command.** A command used to monitor or control a VTAM domain.



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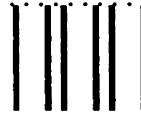


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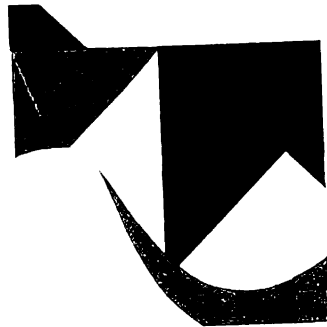


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