

IBM

**Telecommunications
Systems Support - Raleigh**

**Telecommunications
System
Bulletin**

NETCENTER™

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NETCENTER™

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Telecommunications Systems Support

Raleigh, N.C.

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ABSTRACT

This paper provides an overview of the NETCENTER™ * program offering. It contains a executive-level discussion of the benefits of graphics in a network management environment as well as product positioning information.

Illustrations are included which may be used as foil masters.

* NETCENTER™ is a trademark of the IBM Corporation

NETCENTER PRODUCT POSITIONING

(THIS INFORMATION IS FOR BACKGROUND ONLY AND SHOULD NOT BE DIRECTLY USED IN A CUSTOMER PRESENTATION. YOU SHOULD UNDERSTAND IT, HOWEVER, IN ORDER TO ANSWER QUESTIONS THAT MAY COME UP.)

NETCENTER was purchased from US West and is an IBM exclusive which meets customers' immediate requirements for Network Management graphics. It provides a graphics representation for SNA and non-SNA devices monitored through NetView/PC or other service point implementations, therefore supporting heterogeneous networks. Customer usage and market analysis have shown it to be a very strong package.

NETCENTER is IBM's entry for Network Management graphics. We will continue to work on graphic solutions and intend to announce in the future a graphics package that will be OS/2 based and SAA compliant. NETCENTER is now part of our Network Management offerings.

NETCENTER is very easy to install and has a two month test allowance. Thus, we recommend that customers install NETCENTER in order to solve their immediate needs and to begin to use graphics to improve their overall network management productivity. In addition, the skills learned through managing a network using a graphic interface will be applicable to future products in this arena. Each customer will need to evaluate the functions and performance for each unique network. IBM will protect the customer investment by providing an Monthly Licence Charge option and migration information for future Network Management offerings.

NETCENTER

A Graphics Interface for Systems and Network Management

WHY GRAPHICS

There are several benefits to bringing a graphic network interface to the network operator. The real underlying question is "why do you need graphics?"

EASY RECOGNITION OF PROBLEM AREAS: Instead of having to interpret text-based alerts, the network operator can visually see the failure occur on a high level graphical or logical view and be able to understand the problem in the context of the actual configuration of the network.

INTEGRATION OF MULTI-VENDOR NETWORKS: Graphic systems are highly flexible and can visually represent any type of network component. The old adage "a picture is worth a thousand words" holds true in this environment.

IMPROVED KNOWLEDGE OF NETWORK CONFIGURATIONS: With graphics, the network can be represented in a variety of formats either by physical topology or by logical separation of business units. Furthermore, important geographic information can be provided with relative ease.

PROACTIVE MONITORING: Alarms and events can be processed in "real time" and are color coded allowing the operator to immediately recognize network failures or if network automation is indeed recovering all components.

REDUCED OPERATOR SKILL LEVEL REQUIRED: Presenting network control information in a graphic format allows entry level, lower skilled operators to more quickly become productive. It also greatly assists them in learning the network configuration. A simplified command interface makes it possible for these operators to take a proactive role in network management.

ENHANCED IMAGE: As we enter the 1990s, the role of the network control center will continue to grow in both complexity and importance. The use of graphics in this environment can improve the day-to-day operations as well as help senior management to better understand the network control center's functions and needs.

Why Graphics

- Easy Recognition of Problems
- Improved Knowledge of Network Configuration
- Proactive Monitoring of Events
- Reduced Operator Skill Level Required
- Enhance Image

IBM NETCENTER

The IBM program offering NETCENTER, consists of two primary parts. NETCENTER Graphic Network Monitor, using both host and PS/2 based code, presents a graphic representation of a customers communications network. This representation may contain both customer drawn "views" and solicited "views" generated automatically by NETCENTER. Information about the status of devices in the network is presented by the use of color coded icons. This status information is updated in real time. Facilities are also provided to issue commands to the network to gather additional information and/or initiate recovery of failed resources.

NETCENTER Inventory Information Manager is a database of physical device information located on the host and accessed via the PS/2 based code. This information is available as part of the graphic representation of the network resources.

NETCENTER

IBM NETCENTER

- NETCENTER Graphic Network Monitor
- NETCENTER Inventory Information Manager

HIGHLIGHTS

REAL-TIME GRAPHIC NETWORK MONITORING OF SNA AND NON-SNA NETWORKS: NETCENTER provides a graphical representation of the real-time status of the devices in a customer's network. NETCENTER can monitor logical resources known to VTAM as well as non-SNA physical resources that are managed by a service point application, such as NetView/PC.

EFFICIENT TOOLS FOR PROBLEM NOTIFICATION AND DETERMINATION: By using a combination of visual and audible alarms, NETCENTER quickly notifies the operator of problems in the system and/or network. Icons representing network resources automatically change color as the status of the resources change. NETCENTER's "point & shoot" technology allows the operator to quickly issue commands against a resource to determine the cause of the problem.

ALTERNATIVE INTERFACES FOR ISSUING NETWORK COMMANDS: Commands, such as Activate, Inactivate, Monitor and Ignore, are available in a pull-down menu. Issuing one of these commands is a simple matter of using the mouse to "click" on an icon and then "click" on the command.

GENERIC NETWORK COMMANDS WITH AUTOMATIC TARGET RECOGNITION: If the operator needs to issue a command not provided in the pull-down command menu, an alternative pull-down contains a native VTAM command line that can be used to issue any VTAM command that is within the operator's scope of command. Again, the operator can use the mouse to designate the network resource against which the command should be issued.

CUSTOMIZED NETWORK CONFIGURATIONS: Using the built-in drawing program and its many libraries of icons, a NETCENTER administrator can draw customized network configurations (known as Network Views) that reflect different geographic or logical views of a network. Any number of these views can be created and assigned to different operators. In this way, an administrator can partition a network among a number of operators and each will see only that portion of the network for which he/she is responsible. NETCENTER also can create dynamic views of a portion of the network at the operator's request. In this way, only a limited number of Network Views need to be created, instead the operators can react to events in the network by having NETCENTER create a view that shows the problem area.

FILTERED AND PRIORITIZED EVENT HISTORY: When an event occurs in the network, an operator can request an event history on a particular resource. NETCENTER displays that history based on a set of priorities and filters determined by the system administrator. In addition, if the operator selects a particular event from the event history and requests an explanation of that event, NETCENTER will retrieve the probable cause and recommended actions from NetView.

COMPLETE INVENTORY RECORD DISPLAY THROUGH NETCENTER GRAPHIC NETWORK MONITOR: If the Inventory Information Manager option is installed, and the record for a particular resource filled out, that information is available to the NETCENTER operator on the graphics display. Up to two lines of this information can be automatically displayed with the remainder of the data record available upon request.

Highlights

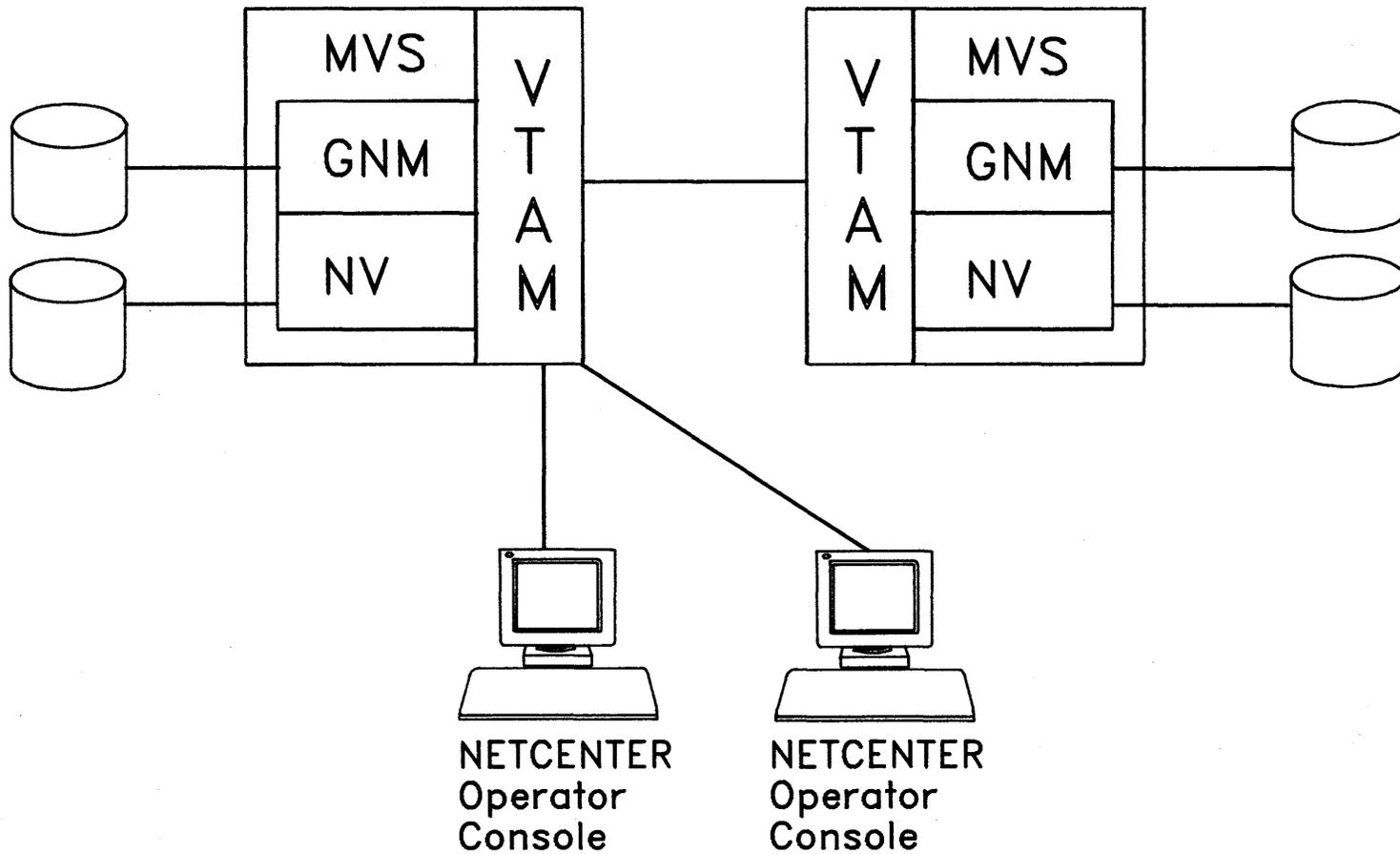
- Real-time Graphic Network Monitoring of SNA and Non-SNA Networks
- Efficient Tools for Problem Notification and Determination
- Alternative Interfaces for Issuing Network Commands
- Generic Network Commands with Automatic Target Recognition
- Customized Network Configurations
- Filtered and Prioritized Event Histories
- Complete Inventory Record Display Through NETCENTER Graphic Network Monitor

ENVIRONMENTAL COMPONENTS

NETCENTER Graphic Network Monitor and Inventory Information Manager are VTAM applications that run on the MVS operating system. When started, GNM collects information about the network as well as the status of all resources known to VTAM. After initialization, this status information is kept current by monitoring VTAM message traffic and, in the case of Service Point Applications, the NetView Hardware Monitor Alerts Dynamic user exit. When an operator logs on and opens a view, GNM downloads the status information for all resources contained in that view. Afterwards, only status update information is sent down to the terminal. This minimizes the traffic on the host link.

If there are multiple MVS VTAM domains in the network, GNM must be installed on each VTAM that you wish to monitor. These separate copies of GNM will communicate with each other over an LU 0 session and all the information about the network is available to an operator logged onto the primary GNM. Using this technique, it is possible to centralize all information about the health of the system and network at one set of operators.

Environmental Components



GNM FEATURES

REAL-TIME NETWORK MONITORING: NETCENTER notifies each operator immediately of changes in the status of the network resources being monitored. This means that the operator can be proactive in solving problems.

GLOBAL EVENT FILTERING: This facility allows the administrator to set up an operator profile that permits that operator to only see events that occur in the portion of the network for which he/she is responsible.

NETWORK COMMAND INTERFACE: Using the NETCENTER command capabilities, an operator can issue a command to gather additional information and/or to recover a lost resource.

PROBLEM NOTIFICATION AND DETERMINATION: NETCENTER's visual and audible alarms, coupled with the ease of migration through the views, permit an operator to quickly and easily determine what the problem is as well as which portions of the network are affected by it.

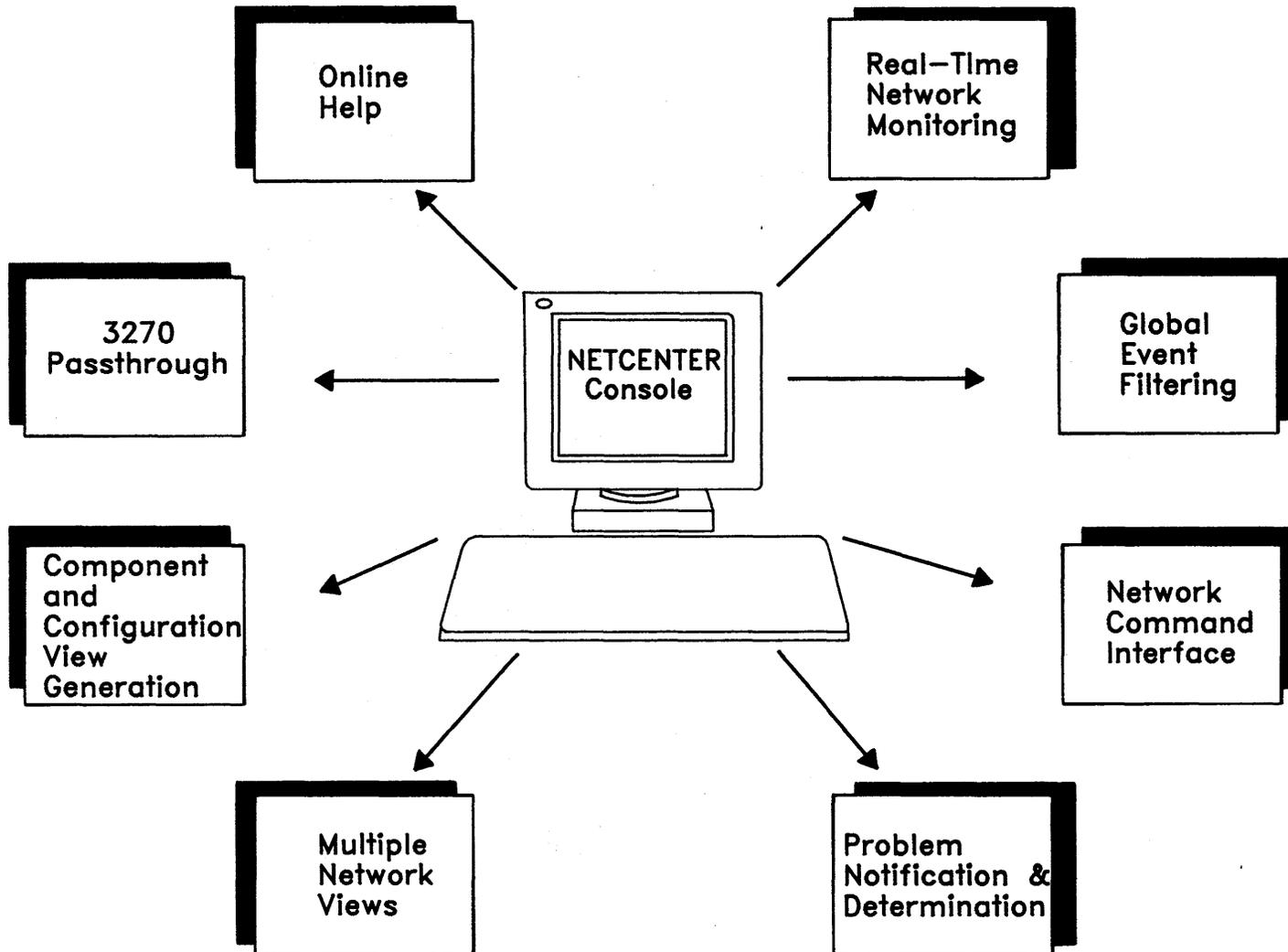
MULTIPLE NETWORK VIEW: An operator may keep up to seven active views displayed on a NETCENTER workstation at one time. An icon representing each view will be shown on the left side of the display. If a resource contained in a view that is not currently in the foreground changes status the corresponding icon will change color. The operator can then use the mouse pointer to select that icon and the appropriate view will be brought to the foreground. In addition, the operator may set up the workstation to cycle selected views. This will automatically cycle through all selected views, bring each in turn to the foreground. This permits a single operator to monitor a number of views.

COMPONENT AND CONFIGURATION VIEW GENERATION: These dynamically generated views are built automatically by NETCENTER at the operator command. The component view shows a named resource and all the immediate resources connected to it. For example, a component view of a cluster controller would show the controller, its upstream link and all the configured terminals under it. The configuration view shows a named resource and how it is connected to the network. If our example were a terminal, the configuration view would contain the terminal, its controller, the controller's line, and the NCP. In both cases, the status of all the resources in the views would be shown.

3270 PASSTHROUGH: Up to three 3270 emulation sessions are available to the operator if the NETCENTER workstation is connected to a DFT port on the controller. These sessions are in windows that may be sized to fit on the screen along with NETCENTER views that the operator may also be monitoring. This is an excellent way to allow the NETCENTER operator to have the full capabilities of NetView available in order to solve those problems that may be beyond the scope of NETCENTER.

ONLINE HELP: Context sensitive help is available to the NETCENTER operator on almost every screen in the product.

GNM Features



IIM FEATURES

OPEN DATA FORMAT: NETCENTER Inventory Information Manager data format is open and published as part of the product documentation. Users can easily write data conversion utilities to automatically load IIM from an existing data base of physical inventory information.

EASY DATA ENTRY: When an icon representing a network resource is selected, the appropriate form is quickly presented and the IIM administrator need only "fill in the blanks".

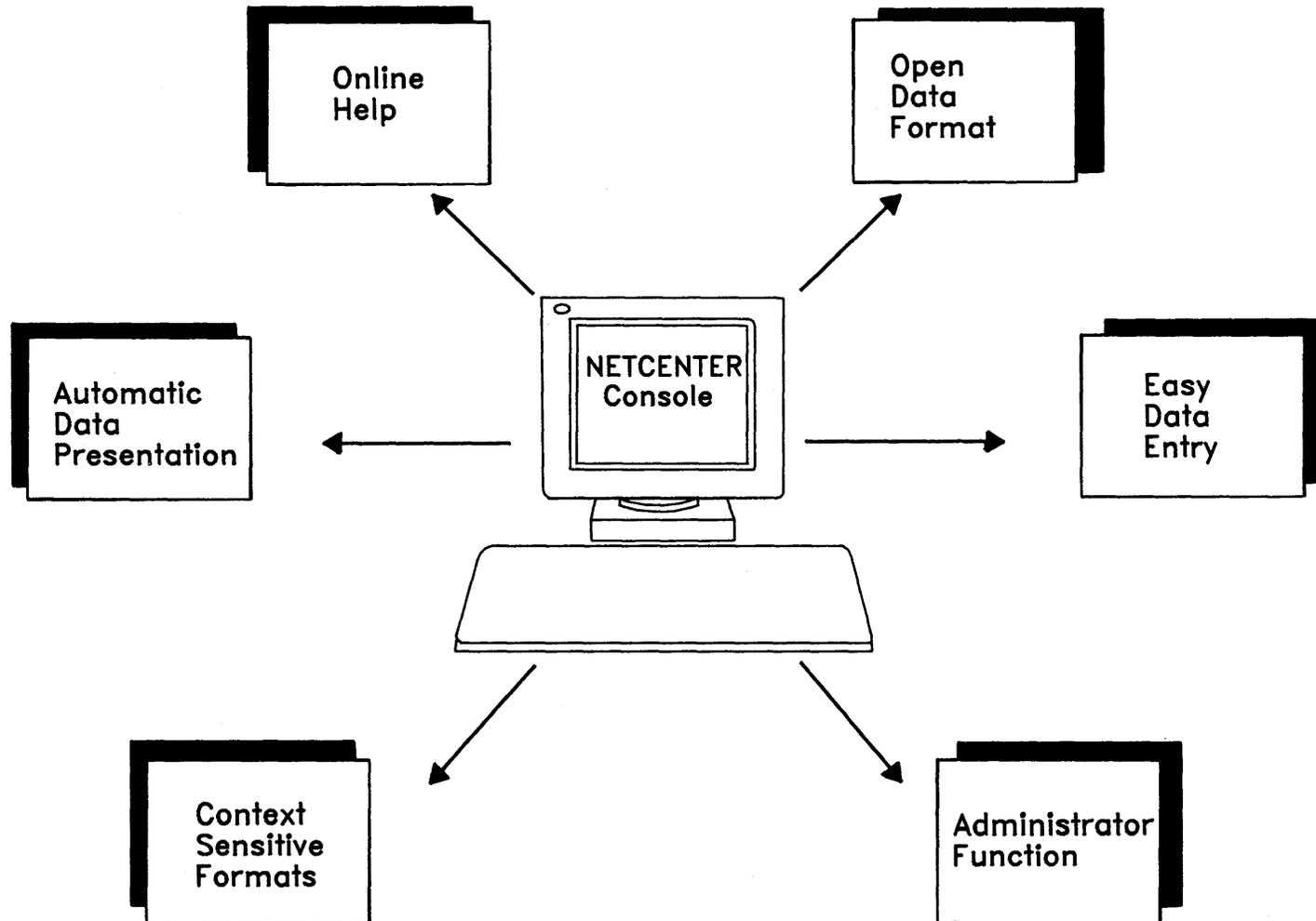
ADMINISTRATOR FUNCTION: Data entry can be limited to specific NETCENTER operators who have been given IIM administrator capability.

CONTEXT SENSITIVE FORMATS: The data in the Inventory Information Manager is formatted for each specific device type. For example, a database entry for a line would be quite different from a database entry for a controller. In each case, the administrator or operator is presented with the appropriate form in which to place the data.

AUTOMATIC DATA PRESENTATION: Up to two lines of product information data from the IIM database can be automatically displayed beside an icon representing a network resource. This can aid an operator in quickly identifying a failing resource.

ONLINE HELP: Context sensitive help is available to the NETCENTER operator on almost every screen in the product.

IIM Features



WORKSTATION FEATURES

CAPABILITIES: Three different levels of NETCENTER workstation code are available, each with different capabilities.

- Administrator code allows an operator, with the proper password, full capability to administer the NETCENTER environment. This includes all monitoring and control capabilities, assigning of operator passwords and IDs as well as setting all global variables that control how data is presented.
- Network Control Center operator code allows an operator with the proper password to perform all function necessary to monitor and control the network. This includes monitoring all views available to that operator and issuing commands that have been defined as being in his/her span of control.
- Manager code allows an operator with the proper password to monitor the network. This code does not allow any operational capability.

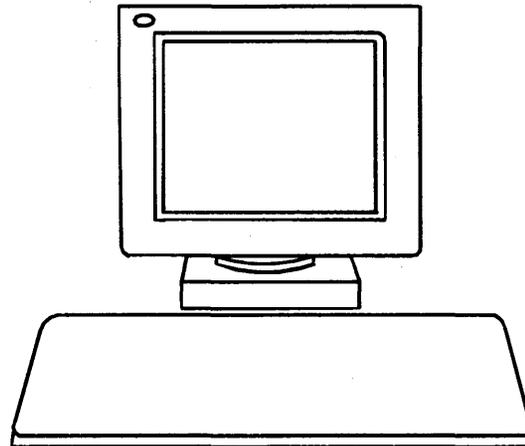
If an operator should log on to a workstation that is running code that has more capabilities than his/her password will allow, NETCENTER will automatically permit that operator only those functions permitted in their password profile.

REQUIREMENTS: The requirements listed on the foil are the minimum requirements needed to run the NETCENTER workstation code.

Workstation Features

CAPABILITIES:

- Administrator
- NCC Operator
- Manager



REQUIREMENTS:

- PS/2
- 2 Meg of Memory
- 30 Meg Hard Disk
- 3270 Emulation Card
- Mouse
- DOS 3.3
- 3174 Host Connection

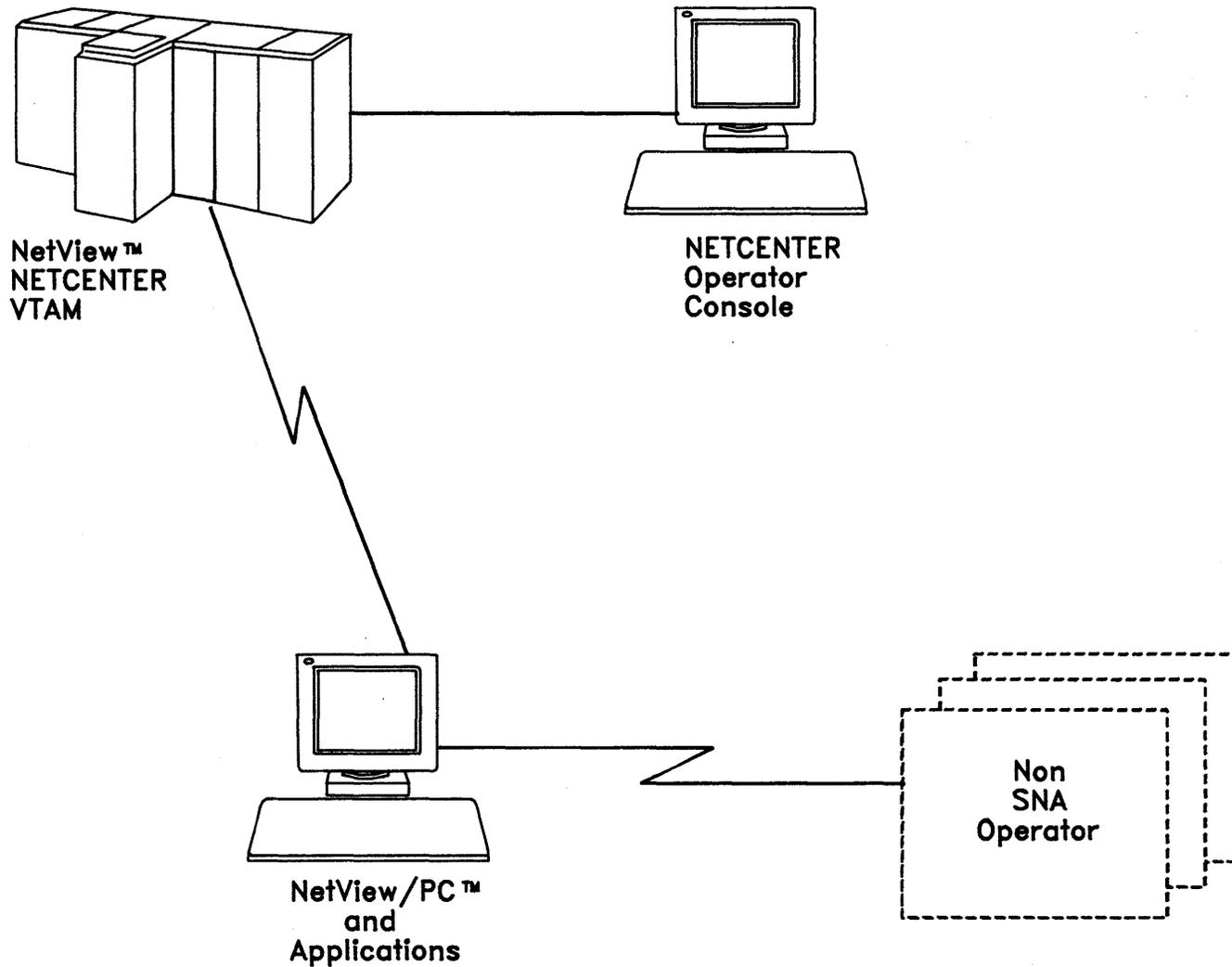
NON-SNA SUPPORT

In addition to monitoring and controlling the VTAM resources in the network, NETCENTER has a facility for providing the same services for the non-SNA portion of the network. This facility is known as the Service Point Interface. Once an operator has defined the non-SNA device(s) that are sending alerts through a service point implementation to NetView, NETCENTER, using the Service Point Interface, captures the alert information and converts it into a status message for the NETCENTER workstation. The SPI also provides the ability to issue RUNCMDs to the service point applications which allows NETCENTER to manage the non-SNA device.

Any application that provides the architected service point functions can be used with NETCENTER. IBM currently provides four different service point applications; LAN Manager V2.0, OSI/CS, and INTERLINK's SNS/NetConnect are all protocol specific service points while NetView/PC is a generic service point for user-provided applications.

NETCENTER

Non-SNA Support



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NETWORK VIEWS

This foils represents a custom designed Network View. It was drawn on one of the many maps that are part of the Administrator workstation code. The geographic icons at New York, Chicago, Dallas and Los Angeles represent data centers for our fictional network. When a network resource changes status, the operator would be notified by a change in this view and a audible alarm. The function line along the top of the screen contains pull-down menus that the operator uses to tailor his/her workstation, solicited additional information, issue commands or access the 3270 emulation windows. All input to this screen is through the use of the mouse to "point and shoot" at objects.



Functions Options



Display Changes Test

NETMGR



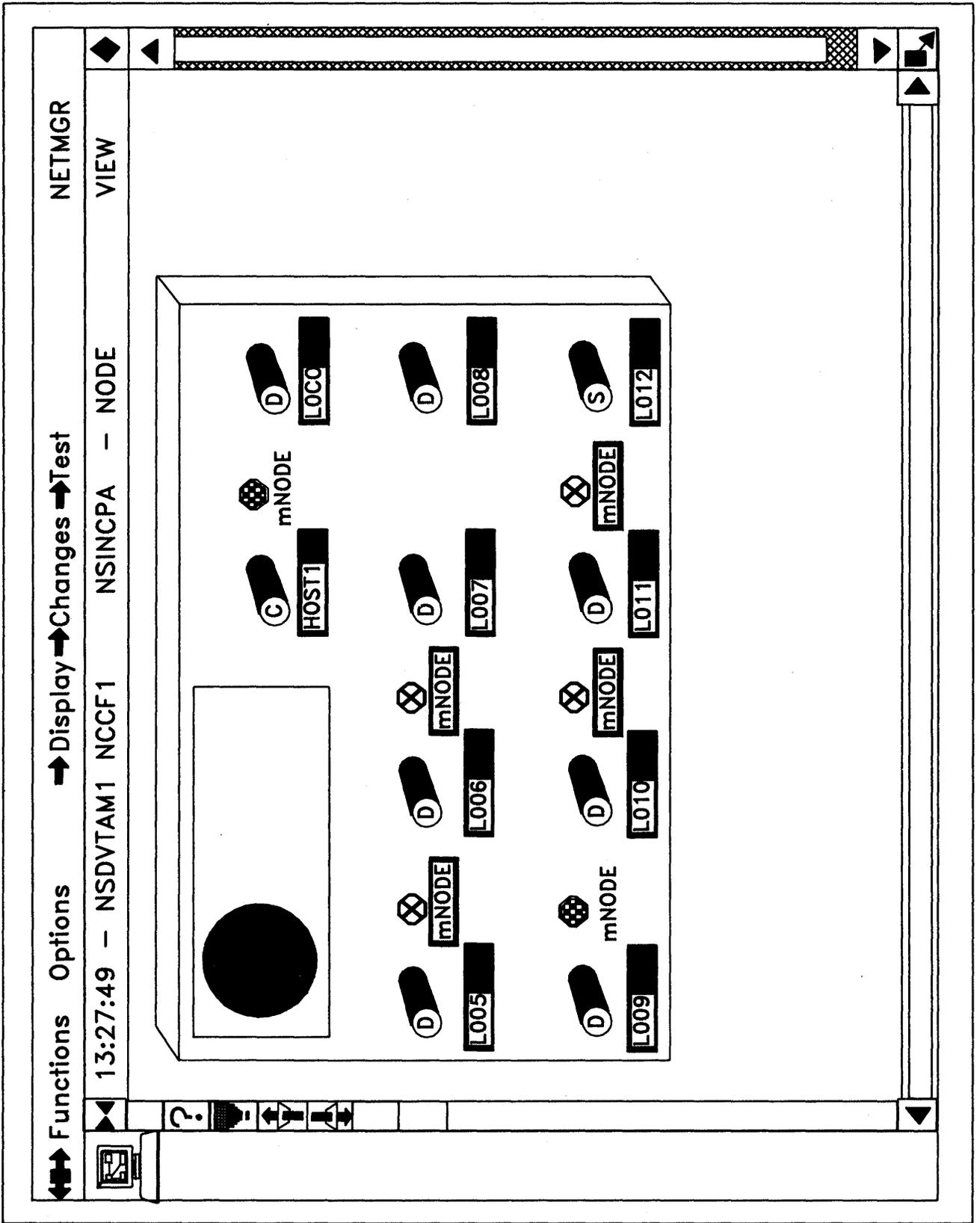
09:47:02 NATNET

ABC Home Mortgage



COMPONENT VIEWS

This foil represents a Component View. This view was automatically derived by NETCENTER at the request of an operator. This can be done either by pointing at an icon in a view and requesting a component view or by filling in the blank on a pull-down menu. This view represents a network resource, in this case a host processor, and all the resources immediately connected to it. There is a channel to another host as well as nine dedicated lines to down-stream devices. The smaller icons represent minor nodes that have changed status.



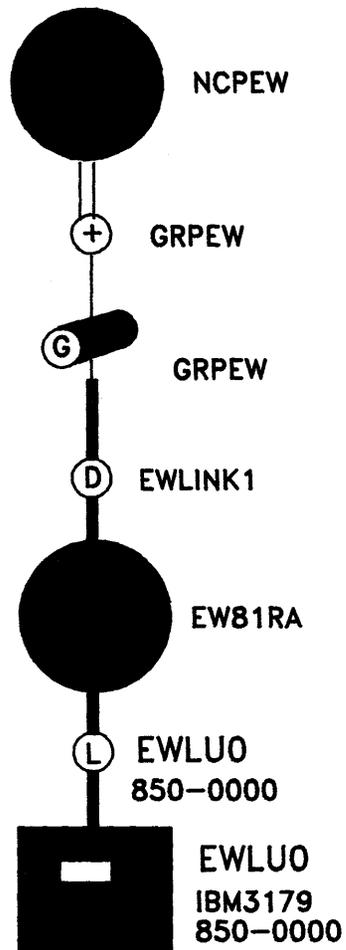
CONFIGURATION VIEWS

This foil represents a Configuration View. This view was automatically derived by NETCENTER at the request of an operator. This can be done either by pointing at an icon in a view and requesting a configuration view or by filling in the blank on a pull-down menu. This view represents a network resource, in this case a terminal, and the way in which it is connected back to its NCP. Notice that the line from the cluster controller to the control unit is part of a line group. If the operator were to select this line group and then select the sibling icon (the double ended arrow) on the left side of the view, NETCENTER would expand this view to show all line groups off the NCP. There are also selections that show the parent - child relationship of resources in the view. You should also notice that Inventory Information Manager data is printed beside the terminal icon. This would enable the operator to quickly contact that terminal's operator if that should be necessary.

Functions Options Display Changes Test

NETMGR

13:40:58 - USIBMMK MKN21 EWLUO



IIM VIEWS

This foil represents a data record from the NETCENTER Inventory Information Manager database. If the operator had selected the terminal used in our previous foil and ask for INFORMATION from the pull-down menu, he/she would have gotten this screen. Notice that the data format is unique to a terminal resource. The screen would appear differently if the operator had asked for information on a line or a controller. By selecting the small diamond in the upper right corner of an information field, the NETCENTER operator can expand that particular information field to see additional data about the resource. As an example, if we selected the diamond in the upper right corner of the LOCATION field, we would see additional information on where this terminal was located. For customer data that does not fit into a particular field there is a generous NOTES section that can be used for free form data.

INVENTORY INFORMATION MANAGER

Functions Options Display Changes Test

NETMGR

13:40:58 - USIBMMK MKN21 EWL00 -- Information

GENERIC COMPONENT

TERM

TERMINAL

ALIAS NAMES

EWDEMOLU

LOCAL TIME

12/05/89

13:19

EST

NETWORK RESOURCE

3279 Color Terminal

NETWORK ADDRESS: 02

INVENTORY

IBM Corporation

IBM 3170 Color Terminal

TYPE: 3179 MDL: a11

ORGANIZATION

MAINTENANCE

RESPONSIBLE

IBM National Service Division
1-800-IBM-SERV

INV. NAME:

SITE CONTACT

Joe User
850-0000

LOCATION

5401 Six Forks Road
EW Demo Room
Raleigh
North Carolina

NOTES:

MULTIPLE VIEW WINDOWS

This foil is an example of how an operator might use multiple windows to monitor different views of a network. The NETCENTER operator can interact only with the window in the foreground. NETCENTER will however, automatically update the status of any icon in any view as that status changes. The operator may select any view by moving the mouse to that view and depressing the left mouse button.

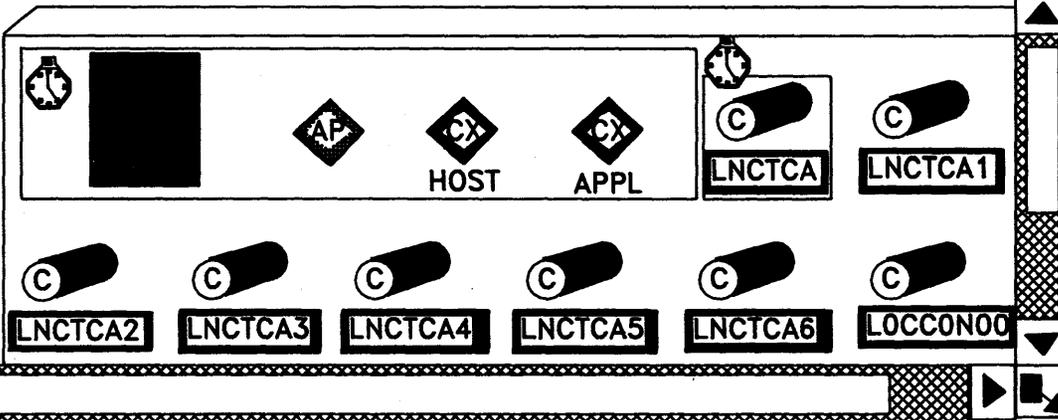
The two network views represent the southwest U.S. and the Los Angeles area and show that there has been a status change in the L.A. area. This is indicated by the presence of a small clock located beside the geographic icons. This clock appears whenever there is a status change in a view. It first appears as black on yellow, then "decays" to a black on white and finally becomes gray on white, becoming smaller with each successive change. The length of time between color changes is set by the system administrator. The clock allows an operator to see the relative age of status changes in a view.

You will notice that the operator is performing problem determination and has also brought up a configuration view of a host system. As explained earlier, this is a view of a particular network resource and all the network resources immediately adjacent to it.

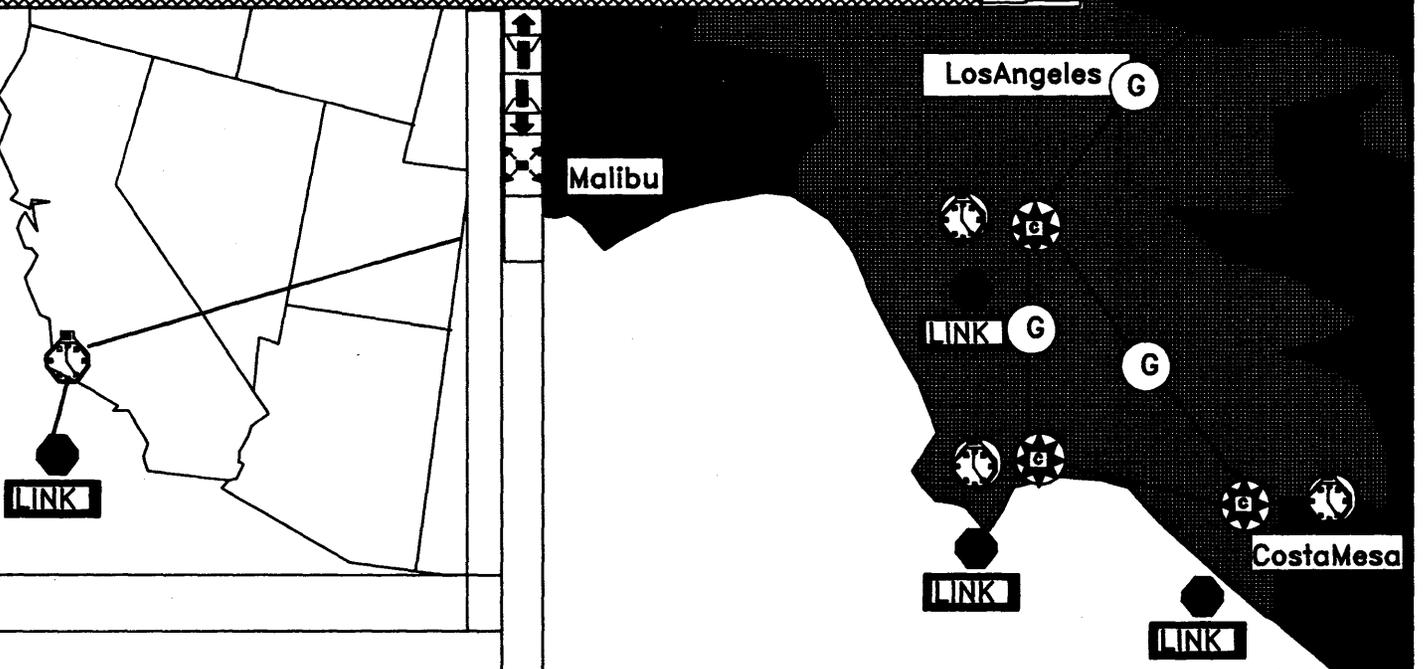
Functions Options Display Changes Test

NETMGR

19:45:44 - NSDVTAM1 NCCF1 HOST1 - NODE VIEW



aizer-Untitled



EVENT HISTORY

When a status change occurs in the network, the NETCENTER operator can display the cause of that change by selecting the icon and requesting the "Event History" from the DISPLAY pull-down menu. This foil is an example of just such a request against a link named LNCTCA. This display covers two days and there are additional events that can be accessed by selecting the MORE selector at the bottom of the screen. If the NETCENTER operator requires additional information, he/she can highlight a particular event and select the "open book" icon on the left side of the display. NETCENTER will automatically go to NetView and bring back probable cause and recommended action information from the Hardware Monitor Facility.

Functions Options Display Changes Test NETMGR

History of Events for: NSDVTAM1 NCCF1 LNCTCA

Log of Events for July 22, 1987

Time	Pr	Compid	Status	TYPE/Description
22:53	3	LNCTCA	Normal	CHANNEL NO NATIVE TEXT RETURNED Status change detected - unknown cause

Log of Events for July 23, 1987

Time	Pr	Compid	Status	TYPE/Description
15:12	2	LNCTCA	Abnormal	LINK IST574E START I/O TIMEOUT OCCURRED FOR LNCTCA Unable to process input message Protocol response time out
16:19	2	LNCTCA	Abnormal	LINK IST574E START I/O TIMEOUT OCCURRED FOR LNCTCA Unable to process input message Protocol response time out
16:22	2	LNCTCA	Abnormal	LINK IST574E START I/O TIMEOUT OCCURRED FOR LNCTCA Unable to process input message Protocol response time out
16:26	2	LNCTCA	Abnormal	LINK IST574E START I/O TIMEOUT OCCURRED FOR LNCTCA Unable to process input message Protocol response time out
16:31	2	LNCTCA	Abnormal	LINK IST574E START I/O TIMEOUT OCCURRED FOR LNCTCA Unable to process input message Protocol response time out

Maximum event count reached. To see more events, click on MORE

MORE

VTAM COMMAND RESPONSE

This foil is an example of the native command line facility of NETCENTER. A NETCENTER operator may have occasion to issue a command that is not available in the CHANGES pull-down menu. If this happens, he/she may use the native command line facility available on the OPTIONS pull-down menu. Any command that that operator has the authority to issue may be issued from this line. In our example, the operator has requested a display of the status of a terminal named C14011. The bottom portion of the screen contains the response.

← Functions Options → Display → Changes → Test NETMGR

Network Command Response

Native Command Response

Network: NSDVTAM1 Date: 87/04/17 Time: 16.35.17

Domain: NCCF1__

Command: d net, id=c14011 _____

IST097I DISPLAY ACCEPTED

IST075I VTAM DISPLAY - NODE TYPE = LOGICAL UNIT

IST486I NAME= C140L14 , STATUS= ACT/S , DESIRED STATE=ACT

IST597I CAPABILITY-PLU INHIBITED,SLU ENABLED ,SESSION LIMIT 000000

IST598I NETID = NSINET1

IST135I PHYSICAL UNIT = C140PU , CUA = 140

IST136I LOCAL SNA MAJOR NODE = LOCSNA00

IST082I DEVTYPE = LU , CONTROLLING PLU =

IST654I I/O TRACE = OFF, BUFFER TRACE = OFF

IST171I ACTIVE SESSIONS = 00001, SESSION REQUESTS = 00000

IST314I END

STATUS LEGEND

As part of the on-line, context sensitive help available in NETCENTER , this status legend shows the operator what each of the status colors represent. Most of these have a rather specific conventional definition, other do not. Some that might be new include;

1. Intermittent...devices that have exceeded the customer-set threshold for the number of status changes in a given period of time are said to be intermittent. An operator might use this as a reason to take a device out of service.
2. Performance...an NCP can go into a "slow-down" status based on customer-set parameters. If this occurs, NETCENTER will change the icon to the performance status color.
3. Transient...devices that are in an "in-between" status such as PCTD2, are represented as transient.

Functions Options

Display Changes Test

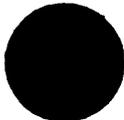
NETMGR

15:17:35 USAAONE - A-ONE Products Inc.

STATUS LEGEND

Normal

Color



Graphic

n/a

Intermittent

Color



Graphic



Abnormal

Color



Graphic



Down

Color



Graphic



Transient

Color



Graphic

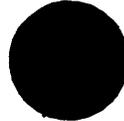


New Status



Performance

Color

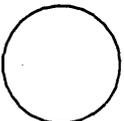


Graphic



Not Config'd

Color



Graphic

n/a

Disabled

Color



Graphic



Ignore

Color



Graphic

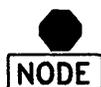


Unavailable

Color



Graphic



More...

CANCEL

NETCENTER BENEFITS

We feel that NETCENTER can offer our customers the following benefits when used with NetView to form a complete system and network management facility.

1. **INTERFACES WITH NETVIEW TO ENHANCE ANO/ACO:** NETCENTER can display an icon that responds to generic alerts, which may be issued by the Automated Network Operation or Automated Console Operation SolutionPacs. Using this facility, an operator can monitor the operation of the ANO/ACO autotasks and respond if they fail for any reason. In this way, an operator does not have to be concerned with network resources that are being controlled by automation unless the automation fails.
2. **SUPPORTS BOTH LOGICAL AND PHYSICAL CONFIGURATIONS:** Using the Service Point Interface, NETCENTER can provide support for those network resources that are reporting through a service point as well as the SNA resources that report through the entry point. This flexibility allows us to design a graphics network management process that supports the entire network, end-to-end and multi-vendor.
3. **MINIMAL IMPLEMENTATION EFFORT REQUIRED:** The NETCENTER host code is standard MVS VTAM applications and can usually be install in a couple of hours. The PS/2 code is a standard DOS 3.3 application and can be installed in about 1/2 hour. The product includes operator tutorials that quickly and easily teach each level of operator how to perform their tasks.
4. **STANDARD PLATFORM - PERSONAL SYSTEM/2:** The workstation code can be operated on any PS/2 Model 50 or larger.

Benefits of NETCENTER

- Interfaces with NetView™ to Enhance ANO/ACO
- Supports Both Logical and Physical Configurations
 - Entry Point
 - Service Point
- Minimal Implementation Effort Required
- Standard Platform – Personal System/2

NETCENTER PRODUCTS & APPLICATIONS

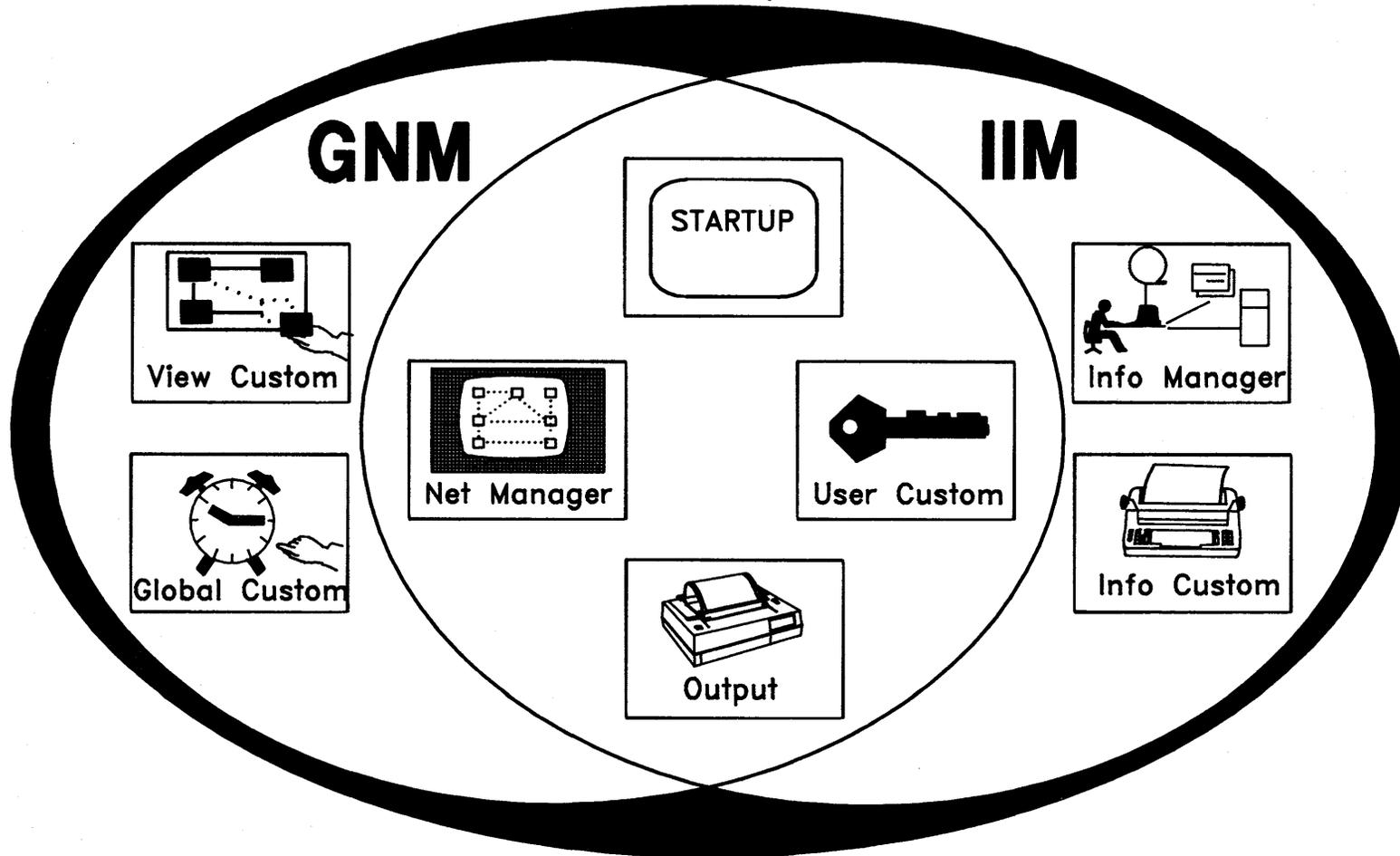
The NETCENTER Graphic Network Monitor and Inventory Information Manager, working in concert with NetView provide a full-function, easy-to-use facility for systems and network management. Its various components allow operators and administrators to manage the enterprise-wide, multi-vendor information system that is the heart of today's businesses.

You can install NETCENTER today, being sure that it will be a productive tool for systems and network management while preparing your operators for the graphics-based interfaces that will soon become a reality in other CNM applications.

NETCENTER

NETCENTER Products & Applications

NETCENTER Family of Products



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READER'S COMMENT FORM

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Form Number: GG22-9148-00

You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that IBM may use or distribute whatever information you may supply in any way it believes appropriate without incurring any obligation to you.

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Telephone: _____

Occupation: _____

Comments: _____

Please mail to: R. Gary Byrd
International Business Machines Corporation
Telecommunications Systems Support
Department 997; Building 657
P.O. Box 12195
Research Triangle Park, NC 27709



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