IBM Z NetView
Version 6 Release 3

User's Guide: NetView

SC27-2867-07

Note

Before using this information and the product it supports, read the information in "Notices" on page 273.

This edition applies to version 6, release 3 of IBM Z NetView (product number 5697-NV6) and to all subsequent versions, releases, and modifications until otherwise indicated in new editions.

This edition replaces SC27-2867-05.

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About this publication

The IBM Z® NetView® product provides advanced capabilities that you can use to maintain the highest degree of availability of your complex, multi-platform, multi-vendor networks and systems from a single point of control. This publication, the *IBM Z NetView User's Guide: NetView* provides information for the operator and system programmer on using the NetView program as the central point to manage their networks and systems.

Intended audience

This publication is for operators and system programmers who use the NetView program. Specific operator procedures are defined by the individual installation to meet local requirements.

Publications

This section lists publications in the IBM Z NetView library and related documents. It also describes how to access NetView publications online and how to order NetView publications.

IBM Z NetView library

The following documents are available in the IBM Z NetView library:

- *Administration Reference*, SC27-2869, describes the NetView program definition statements required for system administration.
- *Application Programmer's Guide*, SC27-2870, describes the NetView program-to-program interface (PPI) and how to use the NetView application programming interfaces (APIs).
- *Automation Guide*, SC27-2846, describes how to use automated operations to improve system and network efficiency and operator productivity.
- *Command Reference Volume 1 (A-N)*, SC27-2847, and *Command Reference Volume 2 (O-Z)*, SC27-2848, describe the NetView commands, which can be used for network and system operation and in command lists and command procedures.
- *Installation: Configuring Additional Components*, GC27-2851, describes how to configure NetView functions beyond the base functions.
- *Installation: Configuring the NetView Enterprise Management Agent*, GC27-2853, describes how to install and configure the IBM Z NetView Enterprise Management Agent.
- *Installation: Getting Started*, GI11-9443, describes how to install and configure the base NetView program.
- *Installation: Migration Guide*, GC27-2854, describes the new functions that are provided by the current release of the NetView product and the migration of the base functions from a previous release.
- *IP Management*, SC27-2855, describes how to use the NetView product to manage IP networks.
- *Messages and Codes Volume 1 (AAU-DSI)*, GC27-2856, and *Messages and Codes Volume 2 (DUI-IHS)*, GC27-2857, describe the messages for the NetView product, the NetView abend codes, the sense codes that are included in NetView messages, and generic alert code points.
- *Programming: Pipes*, SC27-2859, describes how to use the NetView pipelines to customize a NetView installation.
- *Programming: REXX and the NetView Command List Language*, SC27-2861, describes how to write command lists for the NetView product using the Restructured Extended Executor language (REXX) or the NetView command list language.

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- *Security Reference*, SC27-2863, describes how to implement authorization checking for the NetView environment.
- *Troubleshooting Guide*, GC27-2865, provides information about documenting, diagnosing, and solving problems that occur in the NetView product.
- *Tuning Guide*, SC27-2874, provides tuning information to help achieve certain performance goals for the NetView product and the network environment.
- *User's Guide: Automated Operations Network*, SC27-2866, describes how to use the NetView Automated Operations Network (AON) component, which provides event-driven network automation, to improve system and network efficiency. It also describes how to tailor and extend the automated operations capabilities of the AON component.
- *User's Guide: NetView*, SC27-2867, describes how to use the NetView product to manage complex, multivendor networks and systems from a single point.
- *User's Guide: NetView Enterprise Management Agent*, SC27-2876, describes how to use the NetView Enterprise Management Agent.
- *Using Tivoli System Automation for GDPS/PPRC HyperSwap Manager with NetView*, GI11-4704, provides information about the Tivoli® System Automation for GDPS®/PPRC HyperSwap® Manager with NetView feature, which supports the GDPS and Peer-to-Peer Remote Copy (PPRC) HyperSwap Manager services offering.
- *Licensed Program Specifications*, GC31-8848, provides the license information for the NetView product.
- *Program Directory for IBM Z NetView US English*, GI11-9444, contains information about the material and procedures that are associated with installing the NetView product.
- *Program Directory for IBM Z NetView Japanese*, GI11-9445, contains information about the material and procedures that are associated with installing the NetView product.
- *Program Directory for IBM Z NetView Enterprise Management Agent*, GI11-9446, contains information about the material and procedures that are associated with installing the IBM Z NetView Enterprise Management Agent.

The following books are archived:

- *Customization Guide*, SC27-2849, describes how to customize the NetView product and points to sources of related information.
- *Data Model Reference*, SC27-2850, provides information about the Graphic Monitor Facility host subsystem (GMFHS), SNA topology manager, and MultiSystem Manager data models.
- *Installation: Configuring Graphical Components*, GC27-2852, describes how to install and configure the NetView graphics components.
- *Programming: Assembler*, SC27-2858, describes how to write exit routines, command processors, and subtasks for the NetView product using assembler language.
- *Programming: PL/I and C*, SC27-2860, describes how to write command processors and installation exit routines for the NetView product using PL/I or C.
- *Resource Object Data Manager and GMFHS Programmer's Guide*, SC27-2862, describes the NetView Resource Object Data Manager (RODM), including how to define your non-SNA network to RODM and use RODM for network automation and for application programming.
- *SNA Topology Manager Implementation Guide*, SC27-2864, describes planning for and implementing the NetView SNA topology manager, which can be used to manage subarea, Advanced Peer-to-Peer Networking, and TN3270 resources.
- *User's Guide: NetView Management Console*, SC27-2868, provides information about the NetView management console interface of the NetView product.

Related publications

You can find additional product information on the IBM Z NetView web site at https://www.ibm.com/us-en/marketplace/ibm-tivoli-netview-for-zos.

For information about the NetView Bridge function, see *Tivoli NetView for OS/390® Bridge Implementation*, SC31-8238-03 (available only in the V1R4 library).

Terminology in this Library

The following terms are used in this library:

CNMCMD
For the CNMCMD member and the members that are included in it using the %INCLUDE statement

CNMSTYLE
For the CNMSTYLE member and the members that are included in it using the %INCLUDE statement

DSIOPF
For the DSIOPF member and the members that are included in it using the %INCLUDE statement

IBM® Tivoli Netcool®/OMNIbus
For either of these products:

- IBM Tivoli Netcool/OMNIbus
- IBM Tivoli OMNIbus and Network Manager

MVS™
For z/OS® operating systems

MVS element
For the base control program (BCP) element of the z/OS operating system

NetView
For the following products:

- IBM Z NetView version 6 release 3
- IBM Tivoli NetView for z/OS version 6 release 2 modification 1
- NetView releases that are no longer supported

PARMLIB
For SYS1.PARMLIB and other data sets in the concatenation sequence

VTAM®
For Communications Server - SNA Services

Unless otherwise indicated, topics to programs indicate the latest version and release of the programs. If only a version is indicated, the topic is to all releases within that version.

When a topic is made about using a personal computer or workstation, any programmable workstation can be used.

Using IBM Z NetView online help

The following types of IBM Z NetView mainframe online help are available, depending on your installation and configuration:

- General help and component information
- Command help
- Message help
- Sense code information
- Recommended actions

Accessing publications online

IBM posts publications for this and all other products, as they become available and whenever they are updated, to the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter. You can find IBM Z NetView documentation on IBM Z NetView Knowledge Center.

Note: If you print PDF documents on other than letter-sized paper, set the option in the **Print** window that enables Adobe Reader to print letter-sized pages on your local paper.

Ordering publications

You can order many Tivoli publications online at http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss

You can also order by telephone by calling one of these numbers:

- In the United States: 800-426-4968
- In Canada: 800-879-2755

In other countries, contact your software account representative to order Tivoli publications. To locate the telephone number of your local representative, perform the following steps:

1. Go to http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss.
2. Select your country from the list and click the grey arrow button beside the list.
3. Click **About this site** to see an information page that includes the telephone number of your local representative.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. Standard shortcut and accelerator keys are used by the product and are documented by the operating system. Refer to the documentation provided by your operating system for more information.

For additional information, see Appendix E, “Accessibility,” on page 271.

Tivoli user groups

Tivoli user groups are independent, user-run membership organizations that provide Tivoli users with information to assist them in the implementation of Tivoli Software solutions. Through these groups, members can share information and learn from the knowledge and experience of other Tivoli users.

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

Online
Please follow the instructions located in the support guide entry: https://www.ibm.com/support/home/pages/support-guide/?product=4429363.

Troubleshooting information
For more information about resolving problems with the IBM Z NetView product, see the *IBM Z NetView Troubleshooting Guide*. You can also discuss technical issues about the IBM Z NetView product through the NetView user group located at https://groups.io/g/NetView. This user group is for IBM Z NetView customers only, and registration is required. This forum is also monitored by interested parties within IBM who answer questions and provide guidance about the NetView product. When a problem with the code is found, you are asked to open an official case to obtain resolution.

Conventions used in this publication

This section describes the conventions that are used in this publication.

Typeface conventions

This publication uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations**:)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, diskettes, and CDs
- Words defined in text (example: a nonswitched line is called a *point-to-point line*)
- Emphasis of words and letters (words as words example: "Use the word *that* to introduce a restrictive clause."; letters as letters example: "The LUN address must start with the letter *L*.")
- New terms in text (except in a definition list): a *view* is a frame in a workspace that contains data.
- Variables and values you must provide: ... where *myname* represents...

`Monospace`

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Operating system-dependent variables and paths

For workstation components, this publication uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace **$***variable* with **%***variable***%** for environment variables and replace each forward slash (**/**) with a backslash (\) in directory paths. The names of environment variables are not always the same in the Windows and UNIX environments. For example, %TEMP% in Windows environments is equivalent to $TMPDIR in UNIX environments.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.

Syntax diagrams

The following syntax elements are shown in syntax diagrams. Read syntax diagrams from left-to-right, top-to-bottom, following the horizontal line (the main path).

- “Symbols” on page xxiii
- “Parameters” on page xxiv
- “Punctuation and parentheses” on page xxiv
- “Abbreviations” on page xxv

For examples of syntax, see “Syntax examples” on page xxv.

Symbols

The following symbols are used in syntax diagrams:

▶▶─
: Marks the beginning of the command syntax.

─▶◀
: Marks the end of the command syntax.

─▶
: Indicates that the command syntax is continued on the next line.

▶─
: Indicates that a statement is continued from the previous line.

|
: Marks the beginning and end of a fragment or part of the command syntax.

Parameters

The following types of parameters are used in syntax diagrams:

Required
: Required parameters are shown on the main path.

Optional
: Optional parameters are shown below the main path.

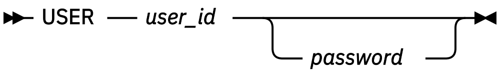
Default
: Default parameters are shown above the main path. In parameter descriptions, default parameters are underlined.

Syntax diagrams do not rely on highlighting, brackets, or braces. In syntax diagrams, the position of the elements relative to the main syntax line indicates whether an element is required, optional, or the default value.

When you issue a command, spaces are required between the parameters unless a different separator, such as a comma, is specified in the syntax.

Parameters are classified as keywords or variables. Keywords are shown in uppercase letters. Variables, which represent names or values that you supply, are shown in lowercase letters and are either italicized or, in NetView help, displayed in a differentiating color.

In the following example, the USER command is a keyword, the *user_id* parameter is a required variable, and the *password* parameter is an optional variable.



Punctuation and parentheses

You must include all punctuation that is shown in the syntax diagram, such as colons, semicolons, commas, minus signs, and both single and double quotation marks.

When an operand can have more than one value, the values are typically enclosed in parentheses and separated by commas. For a single value, the parentheses typically can be omitted. For more information, see "Multiple operands or values" on page xxvi.

If a command requires positional commas to separate keywords and variables, the commas are shown before the keywords or variables.

When examples of commands are shown, commas are also used to indicate the absence of a positional operand. For example, the second comma indicates that an optional operand is not being used:

```
COMMAND_NAME opt_variable_1,,opt_variable_3
```

You do not need to specify the trailing positional commas. Trailing positional and non-positional commas either are ignored or cause a command to be rejected. Restrictions for each command state whether trailing commas cause the command to be rejected.

Abbreviations

Command and keyword abbreviations are listed in synonym tables after each command description.

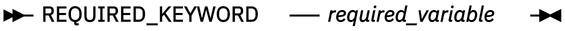
Syntax examples

The following examples show the different uses of syntax elements:

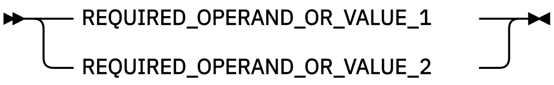
- "Required syntax elements" on page xxv
- "Optional syntax elements" on page xxv
- "Default keywords and values" on page xxv
- "Multiple operands or values" on page xxvi
- "Syntax that is longer than one line" on page xxvi
- "Syntax fragments" on page xxvi

Required syntax elements

Required keywords and variables are shown on the main syntax line. You must code required keywords and variables.

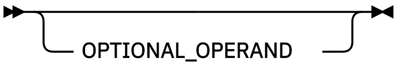


A required choice (two or more items) is shown in a vertical stack on the main path. The items are shown in alphanumeric order.

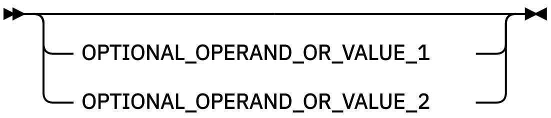


Optional syntax elements

Optional keywords and variables are shown below the main syntax line. You can choose not to code optional keywords and variables.



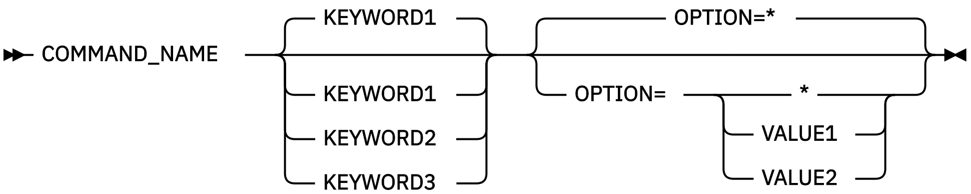
A required choice (two or more items) is shown in a vertical stack below the main path. The items are shown in alphanumeric order.



Default keywords and values

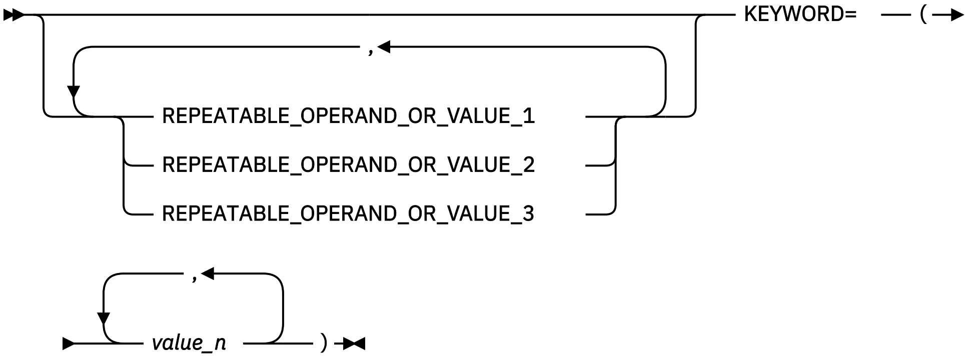
Default keywords and values are shown above the main syntax line in one of the following ways:

- A default keyword is shown only above the main syntax line. You can specify this keyword or allow it to default. The following syntax example shows the default keyword KEYWORD1 above the main syntax line and the rest of the optional keywords below the main syntax line.
- If an operand has a default value, the operand is shown both above and below the main syntax line. A value below the main syntax line indicates that if you specify the operand, you must also specify either the default value or another value shown. If you do not specify the operand, the default value above the main syntax line is used. The following syntax example shows the default values for operand OPTION=* above and below the main syntax line.



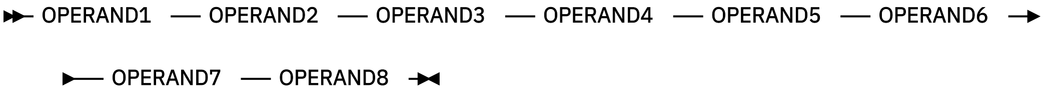
Multiple operands or values

An arrow returning to the left above a group of operands or values indicates that more than one can be selected or that a single one can be repeated.


,
REPEATABLE_OPERAND_OR_VALUE_1
REPEATABLE_OPERAND_OR_VALUE_2
REPEATABLE_OPERAND_OR_VALUE_3
KEYWORD=
(
,
value_n
)

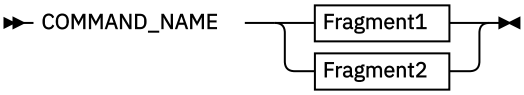
Syntax that is longer than one line

If a diagram is longer than one line, each line that is to be continued ends with a single arrowhead and the following line begins with a single arrowhead.

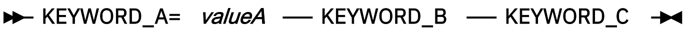


Syntax fragments

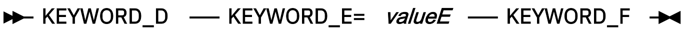
Some syntax diagrams contain syntax fragments, which are used for lengthy, complex, or repeated sections of syntax. Syntax fragments follow the main diagram. Each syntax fragment name is mixed case and is shown in the main diagram and in the heading of the fragment. The following syntax example shows a syntax diagram with two fragments that are identified as Fragment1 and Fragment2.



Fragment1



Fragment2



Part 1. About NetView

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Chapter 1. Introduction

This chapter provides an overview of the IBM Z NetView program, including information about the NetView components. It also describes key programs with which the NetView program interoperates and provides an overview of networking concepts.

IBM Z NetView Overview

The NetView program provides functions to help maintain the highest degree of availability for IBM Z networks. An extensive set of tools is included to manage and maintain complex, multi-vendor, multi-platform networks and systems from a single point of control. The NetView program provides advanced correlation facilities to automate any network or system event and provides support for both TCP/IP and SNA networks. The program also provides a set of user interfaces to meet the needs of any user and management functions that work with other products to provide a complete picture of your networks and systems.

These IBM Z NetView capabilities result in the following benefits:

- Increased network and system efficiency and availability
- Centralized management for TCP/IP and SNA network environments, which reduces the need for duplicate network management systems
- Enhanced operations and message management support to improve and simplify operator interactions and to provide more control in automating and managing day-to-day operations

With open application programming interfaces, the NetView program can be an integration point for both z/OS and distributed vendors. The NetView program enables the management of networks and systems through graphical display and automation. It reduces the need for manual resource definition and complex automation setup through production-ready automation and extends centralized management into multiple network environments. The NetView program can be used in an enterprise as a centralized manager, a mid-level manager, or a z/OS management endpoint.

The NetView program helps maintain system availability and streamline support by consolidating TCP/IP and SNA information from across your enterprise and providing a single platform for automating problem diagnosis. The NetView program can quickly guide support personnel to an appropriate response or even respond automatically.

The NetView program provides the following major capabilities:

- “Automation” on page 3
- “IP Management” on page 5
- “Sysplex and System Management” on page 9
- “Enterprise Integration” on page 9
- “SNA Management” on page 9
- “Security” on page 9

Automation

Automated operations enable corrections to occur without human intervention. The automation capabilities of the NetView program facilitate and simplify operator interactions and include the following functions. For information about the operator use of automated capabilities, see Part 4, “Automating the Network or System,” on page 165. For detailed information about NetView automation capabilities, see *IBM Z NetView Automation Guide*.

- Automation of responses to messages and events

  This automation is enabled by the NetView automation table.

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- Event correlation

  This uses a correlation engine that enables messages and management services units (MSUs) to be correlated according to user-specified criteria.

- Message revision

  This function enables user-defined modification of attributes such as color, route code, descriptor code, display and syslog settings, and text of original z/OS messages (rather than copies). For example, you can take the following actions:

  - Revise messages before they are presented to the system log, console or automation.
  - Treat a message differently depending on its source.
  - Suppress messages entirely.
  - Automate only.

  The message revision table can override actions taken by the z/OS message processing facility (MPF) and can generally replace the MPF. It also provides statistics and usage information, includes a test mode, and is active even when the NetView program is not. Finally, the message revision table is under the control of the NetView system programmer rather than the z/OS system programmer, thus simplifying the administration of message processing.

- Command revision

  This function enables user-defined modification of z/OS commands without needing to transfer the commands to the NetView application address space. Commands can be deleted; parameters and keywords can be added, removed, or modified; nicknames can be expanded (such as creating new command or parameter synonyms); and explanatory WTO and WTOR messages can be issued. Command revision supersedes the MVS command management function in the NetView program. For more information about command revision, see "Command Revision Table" on page 14.

- Command lists and command processors

  These are user-written programs that can be used as if they are NetView commands. A command list or command processor can be used by an operator to accomplish a complex operation with a single command or can perform an entire, complex procedure without operator intervention.

- Timer commands

  These initiate automated actions. Both operators and automation procedures can issue timer commands to schedule other commands, command lists, and command processors at a specified time, after a specified delay, repeatedly after specified intervals or in complex, timed combinations.

- Autotasks

  These are operator station tasks (OSTs) that do not require a terminal or operator. Like other OSTs, autotasks can receive messages and issue commands. Autotasks are limited only in that they cannot run full-screen applications.

  You can define one or more autotasks for automation and have them started during NetView initialization. Then, the automation table, command lists, command processors, and timer commands can all issue commands under the autotasks. The autotasks can receive messages and present them to the automation table or to installation-exit routines. Thus, many of the other automation facilities can use autotasks.

- Installation exits

  These are user-written routines that take control of processing at certain points to alter the usual course of NetView processing.

IP Management

TCP/IP management is an integral part of the IBM Z NetView program. A full array of management functions is provided, including the following functions. For detailed information about these functions, see *IBM Z NetView IP Management*.

- Management of SNA over IP

  The Enterprise Extender technology enables the transport of SNA traffic over an IP network. This technology routes SNA path information units (PIUs) over Advanced Peer-to-Peer Networking nodes using high-performance routing (HPR) and, subsequently, across the IP network using User Datagram Protocol (UDP) packets. The routing provided by Enterprise Extender is more complex and requires additional information about the paths to session partners. To help discover congestion and broken links, the NetView program can locate specific Enterprise Extender sessions passing through a particular link station and provide extensive information about the path to the session partner.
- Support for dynamic virtual IP addresses (DVIPA)

  The use of DVIPAs is a vital technique for eliminating application connection failures because the physical adapter is removed as a point of failure. Distributed DVIPAs distribute the workload of connection requests and provide additional fail-safe precautions in the event of a server failure. The NetView program provides the information that is needed to manage DVIPAs, including the following information:

  - DVIPA definition and status information, including the differentiation of application-instance, stack-defined, and distributed DVIPAs, so that you can ensure that the characteristics of each DVIPA are what you want, such as the following characteristics:
    - The status of the DVIPA on the TCP/IP stack
    - The XCF group that the DVIPA is part of
    - The TCP/IP host to which the DVIPA is defined
    - The origin (how it is configured to the TCP/IP stack)
    - The mobility (the ways that it can be moved to another TCP/IP stack)
    - The rank of the stack to which the DVIPA is defined in the chain of backup stacks
  - Distributed DVIPA information, including sysplex distributors, distributed targets, application server health statistics for distributed targets, and statistics on workload balancing
  - DVIPA connection information, including the number of active connections and abundant information about the current state of the connection
  - DVIPA routing information, including VIPA routes and distributed DVIPA connection routing
  - Historical DVIPA information
- Discovery manager resource discovery

  The discovery manager provides a comprehensive set of monitoring tools for your sysplex, and a view of your physical configuration. The following types of resources can be discovered:

  - Central processor complex (CPC)
  - Channel subsystem identifier
  - Logical partition (LPAR)
  - Sysplex
  - Coupling facility
  - z/OS image
  - TCP/IP stack
  - TCP/IP subplex
  - IP interfaces
  - NetView applications

  - Telnet servers and ports
  - Open Systems Adapter (OSA) channels and ports
  - HiperSockets adapter

  In addition to using this information to manage and monitor your sysplex from the master NetView program, you can view this information at the enterprise master NetView program. For more information about the master and enterprise master NetView programs, see "Sysplex and System Management" on page 9.

- Connection management

  The NetView program manages both active and historical connections, including stack name, local and remote addresses and ports, start time, end time and termination code (for connections that have ended), traffic information such as sent and received byte and segment counts, retransmit counts, and information about the connection state, the interface, the host, TN3270, and more. With this information, for example, connections that end but should still be active or connections with unexpectedly low activity can easily be identified. Data is available both in a form for you to read and in binary form for programming use. Host name translation and IPv4 or IPv6 addresses are supported. In addition, the cross-domain capabilities of the NetView program enable the viewing of connection data at remote z/OS hosts, thus enabling centralized management. The NetView program can also provide details about encryption protocols being used on active connections by exploiting Communication Server's z/OS Encryption Readiness Technology (zERT).

- Packet trace collection and formatting at the stack and Open Systems Adapter (OSA) level

  The examination of packet content is sometimes necessary to debug a problem. The NetView program provides real-time capture and formatting of IP packet or OSA trace data, including both headers and payloads. The formatting is the same as that under IPCS, so that you do not have to learn a new format. Because the formatter is directly integrated with the TCP/IP stack, no translation mismatches can occur. Highly flexible tracing and formatting options are available so that you can filter out unwanted data. Both IPv4 and IPv6 packets are supported, and the data is also available in binary (unformatted) form for use by automation routines. In addition to providing data, the NetView program provides analysis to help locate problem areas. For example, the analysis can indicate how many of your IP connections (TCP, UDP or ICMP) have errors and the kinds of errors (delayed ACKs, resets, retransmissions, and zero window size). With the NetView program, this information is readily available. If necessary, you can run multiple IP packet traces simultaneously. Packet traces can be saved in CTRACE and Sniffer trace format for additional analysis.

- Command support

  Monitoring a network or system can have limited value when you cannot take action on problems that you find. The NetView program provides extensive support for IP-related commands, giving you the control capabilities you need to manage IP resources. The following commands can be issued from the NetView command line directly, in REXX procedures, and in other automation routines:

  - The TN3270 command logs in to remote TCP/IP-connected systems, either from the NetView command line or from the NetView management console.
  - The SNMP command sends requests to SNMP agents to retrieve or set information in the management information bases (MIBs) maintained by those agents. Besides supporting SNMPv1 and SNMPv2c, this command also supports SNMPv3 authentication and encryption from the command line, REXX, and command lists, with switches for the following settings:
    - The authentication protocol (MD5 or SHA) used for authenticating SNMPv3 messages
    - The authentication pass phrase used for authenticating SNMPv3 messages
    - The privacy pass phrase used for encrypted SNMPv3 messages.
    - The encryption (privacy) algorithm (DES or AES) used for encrypting and decrypting SNMPv3 messages.
  - Any UNIX System Services command can be issued directly from the NetView command line or used in REXX procedures and other automation routines.

  - The SOCKET command retrieves information about TCP/IP stacks or can be used to run stack services. It can be used in TCP/IP applications based on the NetView program.
  - The TRACERTE command traces the routes of data packets to a specified IP host from the TCP/IP stack on the host on which the NetView program is running. Use this command to determine connectivity with or routing to a particular endpoint, roundtrip times between the NetView and target hosts, and routers along the way.
  - The PING command tests connectivity to an IP host.
  - The RMTCMD command sends system, subsystem, and network commands to a remote NetView host for processing.
  - The REXEC command sends a command over IP to a remote host for processing and displays the resulting output. The standard UNIX RSH protocol is used. The remote host must have an REXEC server listening at the specified or default port for the command to work.
  - The RSH command sends a command over IP to a remote host for processing. The output can be displayed as line-mode output or in a panel that is placed on the NetView roll stack. If the remote host provides support, additional commands can be issued from the panel where the output is displayed.
  - The IPLOG command sends a message to the syslog daemon on a remote host for processing.
- Detection of hung listeners

  System administrators often have no way to proactively monitor for and manage hung listeners. They find out that a listener is hung only when a user complains that an application is unavailable. The NetView program provides for automated monitoring of customer-designated ports to detect those that refuse connections. If a port that refuses connections is hung, a message that can be automated is issued, thus enabling recovery. If a port that refuses connections is not hung, the connection is ended.
- IP server support

  In addition to client function, the NetView program also provides server function for the following TCP/IP services:

  - REXEC
  - RSH
  - Syslogd
- NetView web services gateway

  This function provides an open interface to the NetView program for issuing commands and receiving responses. SOAP is used for communications, and HTTP or HTTPS is used as the transport mechanism.
- Automated responses to intrusions

  Firewalls are not impenetrable. Even within a firewall, systems can be vulnerable to attack or misuse, whether accidental or malicious. Working in conjunction with the Intrusion Detection Services of z/OS Communications Server, the NetView program offers a variety of automated responses to an intrusion, responses that can eliminate delays that are required if you have to wait for human intervention:

  - Send a notification. Send an e-mail to security administrators, an alert to the NetView console, or a message to designated NetView operators.
  - Take action. Issue UNIX System Services, NetView, or z/OS commands to collect more data or take other actions, for example, shut down a port that is under attack.
  - Collect statistics. Collect statistics and generate a report to send by e-mail to security administrators.
- Events

  The NetView program supports a variety of event types:

  - SNMP traps. The NetView program can emit SNMPv1, SNMPv2c, and SNMPv3 traps. The program can also receive and process SNMP traps through one of the following mechanisms:
    - SNMPv1, SNMPv2c, and SNMPv3 traps, including encrypted and authenticated SNMPv3 traps, can be received for automation processing through NetView base services.

    - SNMPv1 traps can be received through the NetView Event/Automation Service (E/AS), which converts them to alerts for processing. For more information, see "Event/Automation Service" on page 15.
  - Alerts and messages. The NetView Event/Automation Service (E/AS) can convert alerts to SNMPv1 traps and send them to a trap manager. To avoid flooding the trap manager, this conversion is recommended only for alerts that require human intervention.
  - Event Integration Facility (EIF) events. The NetView E/AS can both send and receive EIF events, which enables centralized event management from either a mainframe or a distributed platform.
- IP resource discovery

  The MultiSystem Manager topology manager collects topology and status information about the IP resources in your network and stores the information in the Resource Object Data Manager (RODM) component. After the information is in RODM, you can manage your network resources from graphical displays in the NetView management console.
- Topology correlation

  Topology correlation automatically ties together resources that are managed by different types of topology functions such as IP and open topology. Topology correlation is provided for any resource that is stored in RODM, including resources that are discovered by the discovery manager, by MultiSystem Manager topology functions, by the NetView SNA Topology Manager, and by customer or vendor applications that use the Graphic Monitor Facility host subsystem data model.
- IPv6 support

  In support of the growing adoption of IPv6 addresses, the NetView program provides for IPv6 connectivity, allows IPv6 addresses in command input, and displays IPv6 addresses in messages, views, and most other places where an IP address can be shown.
- Security

  To prevent unauthorized connections to the NetView program from a TCP/IP host, you can restrict access using the NetView command authorization table, the NETCMDS class of an SAF product, and sample definition members that are part of the NetView program. You can also protect IP addresses for command security and span of control. For more information about security, see the *IBM Z NetView Security Reference*.

  The NetView program can also collect security data for active TCP/IP connections. Data includes the state of IP filtering on the connection, the types of encryption protocols being used on the connection (if any), and information on any digital certificates being used on the connection. For each encryption protocol (TLS/SSL, SSH or IPSec), protocol-related information such as encryption algorithms, cipher suites, message authentication algorithms and FIPS140 support is collected. Data is displayed in the Tivoli Enterprise Portal and is available in 3270 messages.
- AON IP functions

  Most IP-related functions that were previously implemented as part of the NetView Automated Operations Network (AON) component are now implemented as base NetView services and no longer require AON enablement and configuration. The following functions are exceptions and still require AON; for more information about these functions, see the *IBM Z NetView User's Guide: Automated Operations Network*.

  - IP server management (managing TSO server sessions)
  - Issuing of line mode TSO and UNIX commands without logging on to TSO
  - SNMPView
  - CISCOWorks Blue Inter-network Status Monitor

For information about installing and enabling the various IP functions, including a "Getting Started" guide for enabling basic IP management, see *IBM Z NetView Installation: Configuring Additional Components*.

Sysplex and System Management

The increasing complexity of managing a sysplex environment has led to the need for management from a single point of control. The NetView program provides high availability sysplex management to ease complex system interactions and to maximize operational effectiveness. A master NetView program is automatically available for you to use in managing and displaying information about your sysplex. Automatic failover to another NetView program that can monitor the sysplex in the event of an outage is also provided. Monitoring of sysplex and system resources, including sysplexes, coupling facilities, z/OS images, TCP/IP stacks, IP interfaces, dynamic virtual IP addresses (DVIPAs), Telnet servers and ports, central processor complexes, logical partitions (LPARs), Open Systems Adapter (OSA) and HiperSockets adapters, is available with this powerful management capability.

A master NetView program can also provide management for systems outside of the sysplex and for another sysplex. The NetView program in this role is known as an enterprise master NetView program. Additional configuration is needed for the enterprise master NetView program to manage systems that are outside of the sysplex. DVIPA information is restricted to sysplex management.

For detailed information about NetView sysplex and system management, see *IBM Z NetView IP Management*.

Enterprise Integration

The management of distributed resources is provided through the MultiSystem Manager component, which stores the topology and status information in Resource Object Data Manager (RODM). It transfers information about resources that are identified and managed locally. After the information is stored in RODM, the NetView operator can view and manage these network resources from the NetView management console.

Topology correlation automatically ties together resources that are managed by different types of topology functions such as open topology. Topology correlation is provided for MultiSystem Manager topology functions, for the SNA Topology Manager, and for customer or vendor applications that use the Graphic Monitor Facility host subsystem data model.

SNA Management

The IBM Z NetView program has a long history of managing SNA resources, including hardware, software, and sessions. Events relating to these resources are available in dynamically updated displays, from which the user can drill down to details that include an analysis of the event and provide a probable cause and recommended actions. A full range of commands is supported to provide control of SNA resources. Graphical topology views show relationships among resources and the statuses of these resources. The NetView program also provides extensive information for managing SNA sessions over IP using the Enterprise Extended technology.

For more information about the SNA management capabilities of the NetView program, see the following topics:

- “Command Facility” on page 12
- “Hardware Monitor” on page 12
- “Session Monitor” on page 12
- “Terminal Access Facility” on page 12
- “SNA Topology Manager” on page 12
- “Automated Operations Network” on page 12
- Information about managing SNA over IP in “IP Management” on page 5

Security

The IBM Z NetView program includes many provisions to ensure that only authorized personnel gain access to the product and its capabilities, and thereby to the networks, systems, and data it controls.

These include user IDs and passwords; limitations on scope of authority; terminal access restrictions; authorization through an SAF product for commands, views and data sets; and other mechanisms.

RACF® supports mixed-case passwords. To support that capability and to reduce the already remote likelihood of a successful random logon attempt, the NetView program also accepts mixed-case passwords. If the RACF mixed-case password function is active and passwords are defined in mixed case, the NetView program leaves them unchanged. Otherwise, NetView passwords are converted to uppercase. This processing applies to all password handling.

The NetView program provides support for password phrase authorization. A password phrase can be used as a substitute for a password for all NetView functions that use a SAF product, such as RACF, for security checking. The password phrase can include phrases that are 9 - 100 characters long, without character restrictions.

The NetView program currently has the capability to perform Multi-factor Authentication (MFA) authentication. This enhancement provides the capability to change MFA passwords and passphrases from the NetView program.

For detailed information about NetView security capabilities, see *IBM Z NetView Security Reference*.

IBM Z NetView Components

The NetView program provides a comprehensive set of management functions from a z/OS host and several graphical interfaces. For the mainframe components, which are shown in the following list, see Figure 1 on page 11.

- “Core Components” on page 11
- “Resource Object Data Manager” on page 13
- “Graphic Monitor Facility Host Subsystem” on page 13
- “NetView Enterprise Management Agent” on page 13
- “NetView REST Server” on page 14
- “Subsystem Interface” on page 14
- “Message Revision Table” on page 14
- “Command Revision Table” on page 14
- “Program-to-Program Interface” on page 15
- “Correlation Engine” on page 15
- “Event/Automation Service” on page 15
- “User Interfaces and Help” on page 15

For the distributed components and the NetView operating environment, including other programs that work with the NetView program, see Figure 2 on page 18 in “Programs That Interact with the IBM Z NetView Program” on page 16.

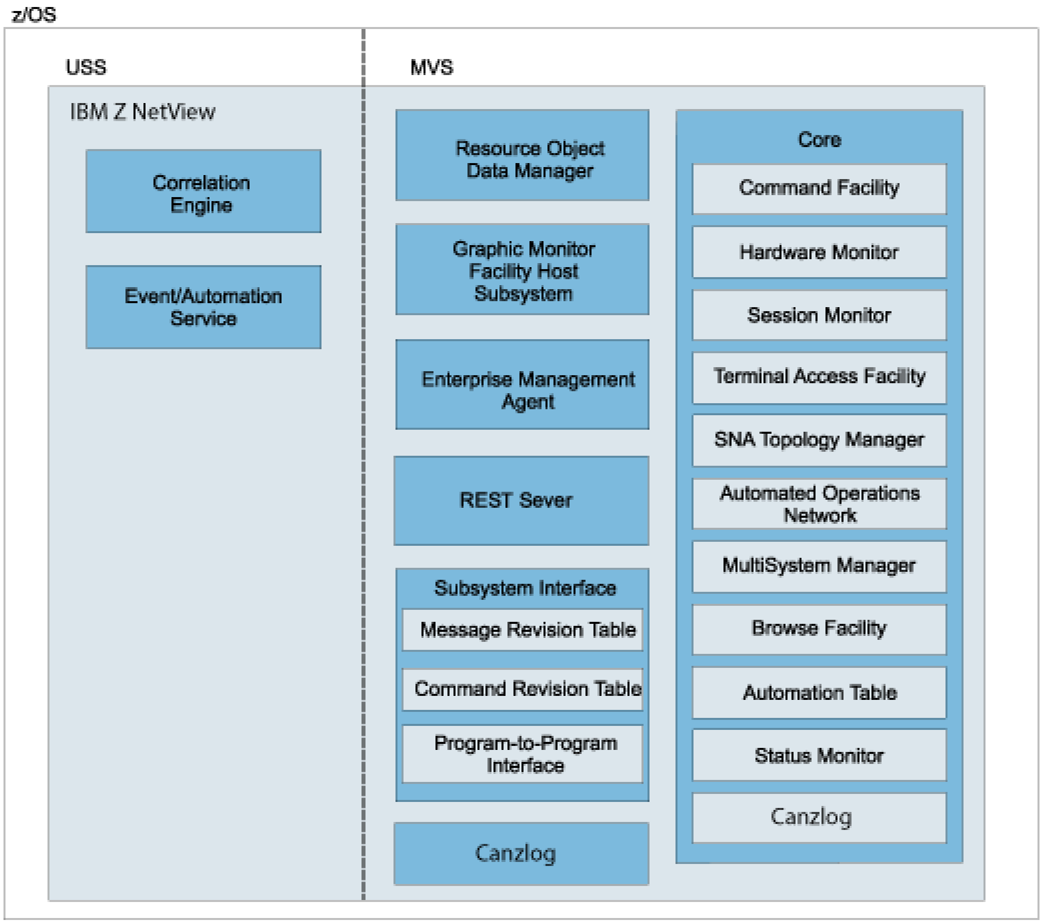

Figure 1. NetView Mainframe Components

Core Components

The core NetView components, which are shown in the following list, run under the MVS element in a z/OS system.

- "Command Facility" on page 12
- "Hardware Monitor" on page 12
- "Session Monitor" on page 12
- "Terminal Access Facility" on page 12
- "SNA Topology Manager" on page 12
- "Automated Operations Network" on page 12
- "MultiSystem Manager" on page 12
- "Browse Facility" on page 13
- "Automation Table" on page 13
- "Status Monitor" on page 13

Command Facility

The command facility is used to send commands and receive messages. It also provides base functions and services for other components, such as intercomponent communication, presentation services, database services, and automation facilities.

Hardware Monitor

The hardware monitor component collects and displays events and statistical data for both hardware and software to identify failing resources in a network. It provides probable cause and recommended actions that operators can use to perform problem determination more efficiently.

Session Monitor

The session monitor component provides information about SNA sessions (subarea and Advanced Peer-to-Peer Networking) including session partner identification, session status, connectivity of active sessions, and response time data. The session monitor also provides session trace data, route data, and Virtual Telecommunications Access Method (VTAM) sense code information for problem determination. It can display all SNA sessions across an Enterprise Extender connection.

Terminal Access Facility

The terminal access facility (TAF) provides operator control of any combination of CICS®, IMS, TSO, and other subsystems from one terminal. The operator does not have to log off or use a separate terminal for each subsystem. The subsystem can be in the same domain or in another domain.

The two types of TAF sessions are operator-control sessions and full-screen sessions. In operator-control sessions, TAF acts like an LU type-1 terminal; that is, any transaction that can be entered from a 3767 terminal attached directly to one of these subsystems can also be entered from the command facility panel. Operator-control sessions are also called 3767-type sessions or LU1 sessions.

In full-screen sessions, TAF acts like an LU type-2 terminal. TAF lets full-screen applications operating on these subsystems use a NetView panel. The NetView operator can also enter commands and data as if the terminal is directly connected to the subsystem. Full-screen sessions are also called 3270-type sessions or LU2 sessions.

SNA Topology Manager

The SNA topology manager dynamically collects topology and status of Advanced Peer-to-Peer Networking and subarea resources. This data is stored in Resource Object Data Manager (RODM) for display by the NetView management console.

The topology agent supplies information consisting of the SNA nodes in a network, the Advanced Peer-to-Peer Networking transmission groups (TGs) between them, and the underlying logical links and ports supporting the TGs, in response to requests from the manager application.

Automated Operations Network

Automated Operations Network (AON) uses NetView automation facilities to automate the monitoring and recovery of both TCP/IP and SNA network resources. AON can monitor messages and alerts, and then automatically perform recovery actions. AON also provides an automated help desk to assist with resolving network problem, and generates reports so that you can monitor how well your automation is working.

AON provides default policy definitions that enable automation, without lengthy configuration, as soon as AON is enabled.

For more information about using AON, see the *IBM Z NetView User's Guide: Automated Operations Network*.

MultiSystem Manager

MultiSystem Manager provides for the management of distributed resources from the NetView program. The NetView operator can use MultiSystem Manager to view and manage resources that are identified and managed locally. The topology and status of these resources are dynamically managed through

RODM and the graphical workstation components of the NetView program. For information about installing and configuring MultiSystem Manager, see *IBM Z NetView Installation: Configuring Graphical Components*. For information about using MultiSystem Manager, see the *IBM Z NetView User's Guide: NetView Management Console*.

Browse Facility

The browse facility is used to view local or remote NetView data set members including the NetView log, NetView parameter files, and NetView panels.

Automation Table

With the NetView automation table, you can specify processing options for incoming messages and MSUs and issue automatic responses. The table contains a sequence of statements that define the actions that the NetView program can take in various circumstances. The automation table is one of several components that provide automation capabilities; for more information about automation, see "Automation" on page 3.

Status Monitor

The status monitor component provides status information about SNA subarea network resources.

Resource Object Data Manager

Resource Object Data Manager (RODM) is an object-oriented data cache. Objects in RODM can represent resources in your network. The data cache is located entirely in the memory of the host processor for fast access to data and high transaction rates. RODM can contain approximately 2 million objects, providing support for large and growing networks.

The NetView program populates RODM with management information such as topology and status that is related to the resources that are being monitored, and maintains that information as changes occur. Using data in RODM, the Graphic Monitor Facility host subsystem component dynamically builds graphical views for display by the NetView management console. When the topology or status changes in RODM, methods automatically update the views that include the affected resources.

Additionally, authorized operators can use the RODMView command to display, create, update, and delete classes, objects, fields, and relationships in RODM.

RODM also provides application programming interfaces (APIs) that can be used by any application running in the host processor. A user API allows a properly authorized address space to access the data contained in the RODM address space and data spaces. Through this user API, objects can be created, organized into hierarchies, or deleted. The user API can also query the value of a field associated with an object or alter the value in that field. It can be called from NetView command processors and from applications written in any programming language that meets the parameter passing conventions of RODM. A method API enables methods that reside in the RODM address space to be called by user applications, by changes to fields in RODM, by other methods, and at RODM initialization.

Graphic Monitor Facility Host Subsystem

The NetView Graphic Monitor Facility host subsystem (GMFHS) component supplies the NetView management console with views and information about RODM resources. It works with RODM and the NetView management console to display graphical views of networks and to route commands to resources that you select from a NetView management console view.

NetView Enterprise Management Agent

The IBM Z NetView Enterprise Management Agent (NetView agent) enables management of your network from the Tivoli Enterprise Portal using sampled and real-time data. The sampled data can provide information about network resources and outages, using situations and expert advice. It can also indicate trends in your network when historical data is used. Additionally, NetView, VTAM, and z/OS commands can be issued directly from the Tivoli Enterprise Portal to provide instant display and troubleshooting capabilities. The NetView agent enables management of both availability and performance data from the Tivoli Enterprise Portal using cross-product links to selected z/OS OMEGAMON® XE agents.

NetView REST Server

The NetView REST Server is an OpenAPI-conforming server that handles front-end requests from applications and provides RESTful APIs that are suited for industry standardization to interact with automation and network resources.

The server can be accessed within Zowe™, hosted by the Open Mainframe Project, or independently from an application. The server runs in UNIX System Services (USS). APIs are available in the following areas:

- Canzlog messages and message attributes
- Automation table statements and automation members
- Sysplex connection distribution statistics for distributed dynamic virtual IP addresses (DDVIPAs) and ports
- NetView task health
- NetView domains accessible to an Enterprise Master NetView program or a Sysplex Master NetView program
- NetView commands

Swagger documentation can be accessed through the Zowe API Mediation Layer or directly from the server.

IBM Server Management Unite Automation V1.1.7 is available with IBM Z NetView V6.3.

Subsystem Interface

The subsystem interface is used to receive system messages and enter system commands. With extended multiple console support (EMCS) consoles, the subsystem interface is used to receive commands, but not messages. In a single system, multiple NetView programs can use the subsystem interface. Each NetView program that uses the subsystem interface requires a NetView subsystem address space in addition to the NetView application address space.

Using the subsystem interface is optional. If you do not need to use the PPI, receive system messages, or enter system commands from a NetView program, then that NetView program does not need to use the subsystem interface.

Message Revision Table

You can use the message revision table to intercept z/OS messages before they are displayed, logged, automated, or routed through your sysplex. With this table, you can make decisions about a message based on its message ID, job name, and other properties and can revise or suppress a message or take certain actions. The message revision table is one of several components that provide automation capabilities. For more information about the message revision table and about automation, see "Automation" on page 3.

Command Revision Table

You can use the command revision table to intercept z/OS commands and to make simple modifications inline, without needing to transfer the command to the NetView application address space. Commands can be deleted; parameters and keywords can be added, removed, or modified; nicknames can be expanded (such as creating new command or parameter synonyms); and explanatory WTO and WTOR messages can be issued.

User authority and other command properties cannot be modified, and more complex changes, such as getting a response to a WTOR message, obtaining responses to other MVS commands, or reading files, require a transfer to the NetView address space. Simple changes can continue when the NetView application address space is down; however, the NetView SSI address space is required. Command revision can act on all commands that are issued to MVS, including commands that are designated for

JES, commands that designated for the NetView program, and commands that are issued by using the NetView MVS command. Command revision cannot be used on commands that are issued as part of a command revision.

Command revision can be useful, for example, in the following situations:

- Operators occasionally shut down a process before it can create a checkpoint. In the command revision table, the shutdown command can be transferred to the NetView program, where a WTOR message can be issued to the console from which the command was entered, requiring the operator to verify the checkpoint before the command is allowed to proceed.
- Certain commands are considered too disruptive to run during prime working hours but are necessary for off-shift and holiday operations. The NetView system programmer can code a CHRON command to mark the transition between prime-shift and off-shift times, such that the CHRON command sets a "revision variable" to a value of ON or OFF. By testing this variable in the command revision table, the processing of these sensitive commands is either allowed or disallowed, as appropriate.

Program-to-Program Interface

The program-to-program interface (PPI) enables application programs to communicate with the NetView program and other applications running in the same host. When an application calls the PPI using its application program interface (API), the request is synchronous.

For more information about the PPI , see the *IBM Z NetView Application Programmer's Guide*.

Correlation Engine

The correlation engine correlates multiple events over time, based on duplicates, thresholds, presence or absence of specific events, and other user-specified criteria. The correlation engine is one of several components that provide automation capabilities. For more information about automation, see “Automation” on page 3.

Event/Automation Service

The Event/Automation Service (E/AS) serves as a gateway for event data between the Z NetView management environment, managers and agents that handle Event Integration Facility (EIF) events, and SNMP managers and agents. With this gateway function, you can manage all network events from the management platform of your choice.

If you manage network events using the Tivoli Netcool/OMNIbus program, the Tivoli Enterprise Console® program, or a similar event manager on a distributed platform, E/AS can convert Z NetView alerts and messages into EIF events before forwarding the event data to that event manager.

If you choose to manage events at the NetView program, E/AS can convert EIF events from an EIF agent into alerts before forwarding the alerts to the Z NetView program through the Alert Receiver PPI mailbox.

The E/AS can convert SNMP traps from SNMP managers into alerts before forwarding the alerts to the Z NetView program through the Alert Receiver PPI mailbox. The E/AS also converts Z NetView alerts into SNMP traps before forwarding the trap data to an SNMP manager. The E/AS performs the function of an SNMP subagent and sends the converted alert data to an SNMP agent for eventual forwarding to an SNMP manager. Note that these functions are also available as base NetView services, independent of E/AS.

For information about the services of the E/AS, see “Services of the Event/Automation Service” on page 104.

User Interfaces and Help

Access to the Z NetView program is provided by the following user interfaces. Distributed components are shown in Figure 2 on page 18.

- Tivoli Enterprise Portal

  Availability data from the Z NetView program is correlated with performance data from OMEGAMON XE products in the Tivoli Enterprise Portal to provide consolidated console for managing availability and performance. For example, you can use this data to understand the performance impact of a network problem or to locate a resource causing a performance problem.

- 3270 session

  3270 sessions provide access to the core components and the command-line interface of the Z NetView program.

- NetView management console

  The NetView management console, which consists of a client based on Java™ technology and a server, uses interactive graphics to display color-coded views that represent network resources being monitored. The views show the statuses of the resources and the relationships of the resources to each other. From the views, you can interactively control resources and see the status changes reflected in the view updates. For additional information about the NetView management console, see the *IBM Z NetView User's Guide: NetView Management Console*.

- Service Management Unite (SMU)

  IBM Service Management Unite is a customizable dashboard interface that brings mainframe management information and tasks from disparate sources into a single environment. NetView dashboards are provided for operators that display Canzlog messages, statistics and graphics about NetView domains and tasks, and the sysplex connection distribution percentage for distributed dynamic virtual IP addresses (DDVIPAs) and ports. NetView dashboards are provided for administrators that enable them to create, validate, and test automation statements, as well as manage NetView automation tables.

If you want information about...	**Refer to...**
Accessing the NetView Program from Service Management Unite	*Accessing the NetView Program from Service Management Unite*
IBM Service Management Unite	IBM Service Management Unite Knowledge Center

The following Z NetView mainframe online help is available, depending on your installation and configuration:

- General help and component information
- Command help
- Message help
- Sense code information
- Recommended actions
- Help desk

The following online help is available in workstations running Z NetView components, depending on your installation and configuration:

- Tivoli Enterprise Portal help
- Web application help
- NetView management console help
- IBM Z NetView Knowledge Center, which includes the Z NetView online library

Programs That Interact with the IBM Z NetView Program

The IBM Z NetView program is the foundation for enterprise management, serving as the focal point for systems and distributed network managers. The NetView automation table and RODM provide a strong automation platform for managing systems, networks, workstations, and LANs.

Many other products complement the IBM Z NetView program to provide a comprehensive set of enterprise management functions. Products that work with the NetView program include the following programs:

- Z System Automation. The IBM Z NetView program provides the automation services, graphic topology services, and other underlying services for Z System Automation, which enables automated management of z/OS systems and applications. See "IBM Z System Automation" on page 20.
- GDPS solution. The IBM Z NetView program provides automation services, data services, communication services, and other underlying services for GDPS. The NetView program also provides the web application, which is used as the GDPS user interface. See "GDPS" on page 20.
- Tivoli Netcool/OMNIbus. The IBM Z NetView program can forward events to Tivoli Netcool/OMNIbus, which collects enterprise-wide event information from a wide variety of IT and network environments. See "Tivoli Netcool/OMNIbus" on page 21.
- Tivoli Business Service Manager. The IBM Z NetView program delivers management services to Tivoli Business Service Manager for handling of z/OS subsystems such as the CICS, DB2®, and IMS subsystems. See "Tivoli Business Service Manager" on page 21.

The following programs also work with the NetView program:

- "z/OS Operating System" on page 19
- "Linux on Z" on page 21
- "IBM Z Decision Support" on page 21
- "IBM Z Workload Scheduler" on page 21
- "MultiSystem Manager Open Topology Agents" on page 21
- "Open Systems Interconnection Agents" on page 22

Figure 2 on page 18 shows a graphical representation of the NetView operating environment, including the distributed IBM Z NetView components and the other products that can be used with the IBM Z NetView program. For more information about other programs, see the product documentation for those programs.

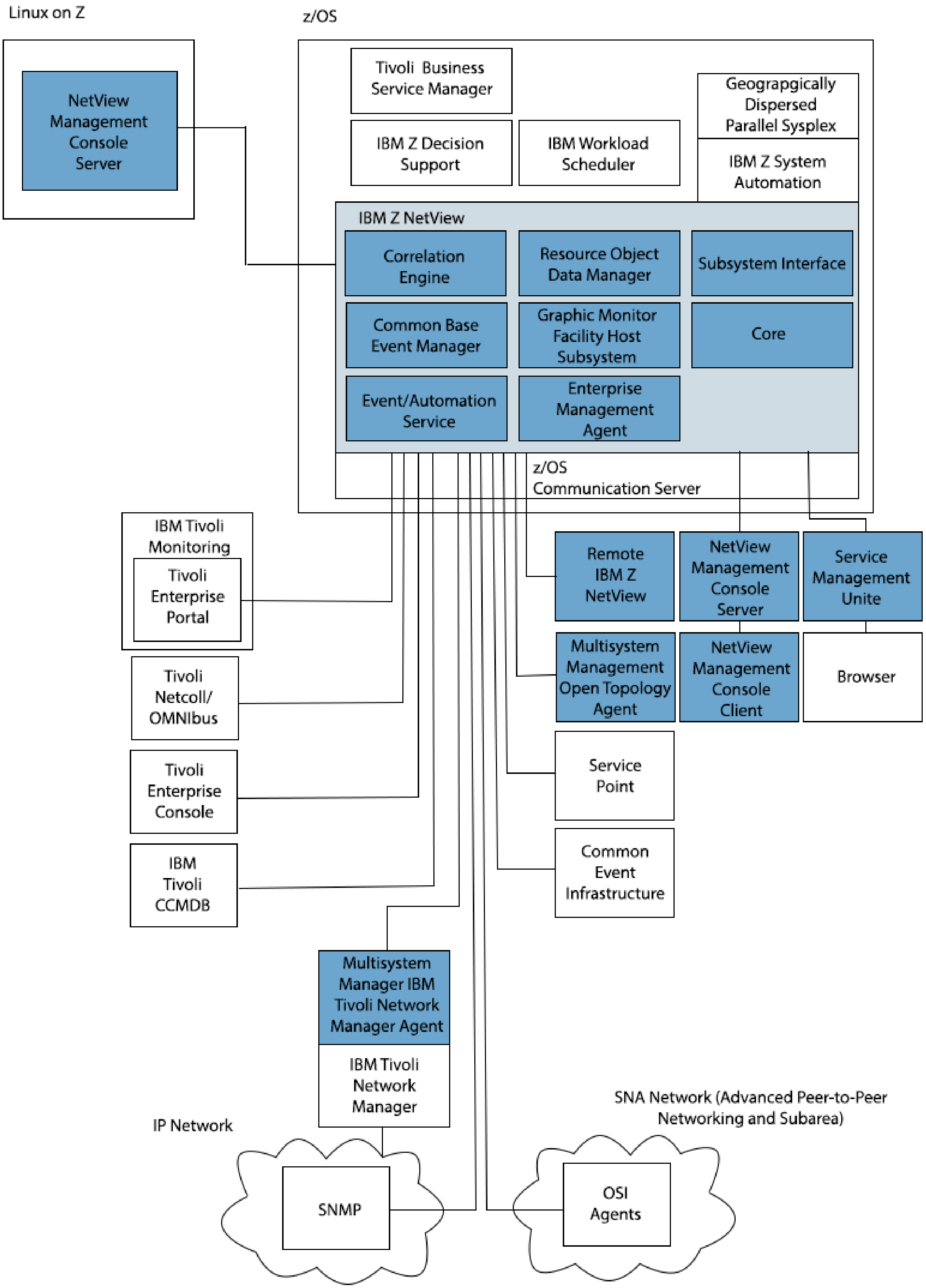
Linux on Z
NetView Management Console Server
z/OS
Tivoli Business Service Manager
Geograpgically Dispersed Parallel Sysplex
IBM Z Decision Support
IBM Workload Scheduler
IBM Z System Automation
IBM Z NetView
Correlation Engine
Resource Object Data Manager
Subsystem Interface
Common Base Event Manager
Graphic Monitor Facility Host Subsystem
Core
Event/Automation Service
Enterprise Management Agent
z/OS Communication Server
IBM Tivoli Monitoring
Tivoli Enterprise Portal
Remote IBM Z NetView
NetView Management Console Server
Service Management Unite
Tivoli Netcoll/ OMNIbus
Multisystem Management Open Topology Agent
NetView Management Console Client
Browser
Tivoli Enterprise Console
Service Point
IBM Tivoli CCMDB
Common Event Infrastructure
Multisystem Manager IBM Tivoli Network Manager Agent
IBM Tivoli Network Manager
IP Network
SNA Network (Advanced Peer-to-Peer Networking and Subarea)
SNMP
OSI Agents

Figure 2. NetView Operating Environment

z/OS Operating System

The z/OS operating system is a widely used mainframe operating system. It offers a stable, secure, and continuously available environment for applications running on the mainframe. The z/OS operating system of today is the result of decades of technological advancement, having evolved from an operating system that could process a single program at a time to an operating system that can handle many thousands of programs and interactive users concurrently.

MVS

MVS services and functions are provided by the Base Control Program (BCP), a base element and the backbone of the z/OS system. These essential services enable reliable, secure workload processing with complete data integrity and without interruption.

UNIX System Services

The IBM Z NetView program uses UNIX System Services for the following functions:

- UNIX command server
- AON/TCP functions
- Event/Automation Service
- Event correlation

NetView operators or programs can interact with z/OS UNIX System Services in the following ways:

- The PIPE UNIX stage, which transfers a command to a UNIX command server where the command is to be processed and from which the results are returned.
- The IPCMD command, which provides a generic API for processing any IP command in a UNIX or TSO environment. The command is issued from the NetView program and correlated responses are returned to the user.
- The UNIX command server, which enables UNIX commands to be entered from the NetView command line and command output to be returned to the NetView console. Running UNIX for z/OS commands from the NetView program requires a dedicated PPI receiver (CNMEUNIX) to receive commands and data from the NetView program. A server process running in a UNIX System Services address space waits on this PPI receiver for incoming commands and data.

z/OS Communication Server

z/OS Communications Server, which is a component of the z/OS operating system, implements the SNA and TCP/IP protocols. SNA applications and transaction servers (such as CICS) can use SNA or TCP/IP to send and receive data. Industry-standard internet applications can use TCP/IP to send and receive data. z/OS Communications Server provides a set of communications protocols that support connectivity functions for both local- and wide-area networks, including the Internet.

z/OS Communications Server includes the following major components:

- The TCP/IP protocol stack. NetView operators or programs can interact with z/OS Communication Server IP using the NetView TSO and UNIX PIPE stages. z/OS Communication Server IP also supports several NetView functions, such as the web server. The IPCMD command can be used to issue any line-mode z/OS Communication Server IP command from the NetView program.
- The SNA protocol stack. This stack is accessed through the Virtual Telecommunications Access Method (VTAM) API. The VTAM API provides communication facilities for the Z NetView program and other applications. It provides status information and control facilities for SNA resources. It also provides the topology agent information for SNA resources, both subarea and Advanced Peer-to-Peer Networking.
- The communications storage manager, which provides a shared I/O buffer area for both TCP/IP and VTAM data flow. The communications storage manager allows authorized host applications to share data without having to physically move the data.

TSO

Operators, administrators, programmers, and others who access z/OS can use Time Sharing Option/ Extensions (TSO/E or simply TSO) to create an interactive session with the z/OS system. TSO provides a single-user logon capability and a basic command prompt interface to the z/OS operating system.

Most users work with TSO through the menu-driven interface, Interactive System Productivity Facility (ISPF). This collection of menus and panels offers a wide range of functions to assist users in working with data files on the system.

NetView operators or programs can interact with TSO using the NetView TSO PIPE stage. For more information, see the help for PIPE TSO.

IBM Z System Automation

The IBM Z System Automation application, which is based on the NetView program, provides a single point of control for a full range of systems management functions. IBM Z System Automation functions include monitoring, controlling, and automating a large range of system elements that spans both the hardware and software resources of your enterprise. IBM Z System Automation plays a key role in supplying high-end automation solutions and can be used to automate I/O, processor, and system operations. It enables high availability for critical business applications through policy-based, self-healing capabilities. Users with single z/OS systems and Parallel Sysplex® clusters can use IBM Z System Automation to ease management, minimize costs, and maximize application availability.

System Operations

The system operations component monitors and controls system operations applications and subsystems such as the Z NetView program, System Display and Search Facility (SDSF), job entry subsystem (JES), Resource Measurement Facility (RMF), Time Sharing Option (TSO), RODM, VTAM, DB2, CICS, IMS, OMEGAMON, Tivoli Business Service Manager , and Tivoli Workload Scheduler. With system operations, you can automate Parallel Sysplex applications. System Automation can automate applications that are distributed over a sysplex by virtually removing system boundaries for automation through its automation manager/automation agent design. System Automation reduces the complexity of managing a Parallel Sysplex cluster through goal-driven automation and concepts such as grouping and powerful dependency support, which you can use to model your configuration. Single systems are also fully supported; the automation scope is then just one system. System Automation uses enterprise monitoring to interoperate with products such as IBM Tivoli Netcool/OMNIbus or the IBM Tivoli Service Request Manager® product in case of an incident and to update the health status information that is displayed on the Tivoli Enterprise Portal through the IBM Tivoli Monitoring infrastructure.

Processor Operations

The processor operations component monitors and controls processor hardware operations. It provides a connection from a focal point processor to a target processor. With the NetView program on the focal point system, processor operations automates operator and system consoles for monitoring and recovering target processors. You can use processor operations to power on, power off, and reset multiple target processors; to load the initial programs; to set the time-of-day clocks; to respond to messages; to monitor status; and to detect and resolve wait states.

I/O Operations

The I/O operations component provides a single point of control for managing connectivity in your active I/O configurations. This component can detect unusual I/O conditions and can be used to view and change paths between a processor and an input/output device, which can involve using dynamic switching, either the enterprise systems connection (ESCON) or fiber channel connection (FICON®) switch. You can change paths by controlling channels, ports, switches, control units, and input/output devices through an operator console or API.

GDPS

The GDPS solutions are multi-site or single-site end-to-end application availability solutions that provide the capability to manage remote copy configuration and storage subsystems, automate Parallel Sysplex operation tasks, and perform failure recovery from a single point of control. You can use the GDPS solutions to automate recovery procedures for planned and unplanned outages to provide near-continuous availability and disaster recovery capability.

Linux on Z

The Linux operating system on the IBM Z platform combines the scalability and reliability of IBM mainframe systems with the flexibility and open standards of the Linux operating systems. It can provide an environment for efficient and effective infrastructure simplification, application deployment and business integration.

Tivoli Business Service Manager

IBM Tivoli Business Service Manager is an enterprise management product that monitors the data processing resources that are critical to a business application. Mission-critical business systems typically span host and distributed environments; include many interconnected application components, both commercial and custom; and rely on diverse middleware, databases, and supporting platforms.

Tivoli Business Service Manager provides end-to-end business systems management to organize related components and give business context to management decisions. A unique, configurable business system view enables management and control of the multiple integrated software components required to deliver a specific business service. The product also shows and allows the manipulation of the relationships between applications, so that you can more easily detect inefficiencies or diagnose problems in critical business systems.

IBM Z Decision Support

IBM Z Decision Support provides a uniform way to collect and process performance data from multiple resources in the managed environment. This application provides performance data collection and reporting functions for z/OS or VM systems, IMS, CICS, networks, and more. IBM Z Decision Support can control the selection and collection of data, provide predefined reports to present the data, and include documentation to help with performance analysis. Data provided by IBM Z Decision Support can be used to fine-tune the performance of the IBM Z NetView program.

IBM Z Workload Scheduler

IBM Z Workload Scheduler can be used to schedule and control workloads in any operating environment where communication with z/OS can be established. It increases the opportunities for centralized control of product workload across your environment. For example, you can use IBM Z Workload Scheduler with the Z NetView program to schedule activities by business cycle or dependencies, control real resources, automatically report and respond to unusual workload conditions, or manage your disaster recovery plan.

Tivoli Netcool/OMNIbus

IBM Tivoli Netcool/OMNIbus is a service level management system that collects enterprise-wide event information from a wide variety of IT and network environments in real time and presents a consolidated view of this information to operators and administrators. Tivoli Netcool/OMNIbus tracks alert information in a high-performance, in-memory database, and presents information of interest to specific users through filters and views that can be configured individually.

MultiSystem Manager Open Topology Agents

Any customer-written or vendor-written manager-agent application that follows the rules established by the Z NetView MultiSystem Manager component can be used to extend the management capability of MultiSystem Manager to resources not already supported. This includes storing them in RODM for display and management using the NetView management console.

Open Systems Interconnection Agents

Open Systems Interconnect (OSI) is a standardized architecture that establishes a framework for interconnection of computer systems, based on the manager/agent model. OSI agents can perform management operations on managed objects and send notifications to a manager on behalf of those managed objects. An agent application provided by VTAM gathers topology information about SNA and Advanced Peer-to-Peer Networking resources.

What Are Network Management Tasks?

The tasks required to manage a complex network fall into the following categories:

- Learn the network management concepts
- Monitor and control the network and system
- Investigate and solve problems
- Control the NetView program

In a multiple-host environment, you can automate the NetView program so that many operation tasks are automatically performed in distributed hosts. Significant events that require intervention can be forwarded to a NetView operator at the focal point host. You can design systems so that little or no intervention is required at the distributed hosts.

Table 1 on page 23 describes these categories of tasks, and the remaining chapters of this book further divide these categories into subcategories and actual tasks that make up network management.

Note: For information about automating the NetView program, see the *IBM Z NetView Automation Guide*.

Table 1. Major NetView Tasks

Task	Task Description
Monitoring and Controlling the Network and System This management task is described in the following topics: • Chapter 3, "Monitoring and Controlling Your Network from a Workstation," on page 43 • Chapter 4, "Monitoring and Controlling Network Configuration," on page 49 • Chapter 5, "Managing Network and System Status," on page 87 • Chapter 6, "Monitoring Hardware and Software Problems," on page 89 • Chapter 7, "Managing Network Inventory," on page 109 • Chapter 8, "Controlling Remote Processors," on page 111 • Chapter 9, "Controlling Operating System Resources," on page 119	Monitoring, controlling, and accounting are three major tasks of daily NetView operation. You monitor resources, control them to prevent or correct problems, and track network usage for billing purposes. *Monitoring* is the examination of the entire network and system for changes in the status of individual components from satisfactory to a status requiring attention. The NetView program achieves this through receipt of status changes, alerts, and messages, which are displayed for analysis. You can explicitly request this status information or the NetView program can present it automatically. You can control the amount of information collected, and you can request more information such as network and system definitions to help you analyze changes in status. *Controlling* is the taking of specific actions against individual network and system components to change their status from unsatisfactory to satisfactory. This includes controlling the configuration and definition of the resources. The NetView program provides controls to limit the functions you can use and the resources you can access. *Accounting* involves recording information about the length of sessions and the amounts of data processed for sessions, such as the amount of session data, the number of PIUs, and the number of bytes. This information can be used to charge end users for their use of network resources.
Controlling the NetView Environment This management task is described in the following chapters: • Chapter 10, "Maintaining the NetView Program," on page 127 • Chapter 11, "Controlling NetView Operation," on page 133 • Chapter 12, "Managing NetView Data," on page 147	*Controlling* the NetView program is the continual adjustment of the NetView environment to achieve the goals of monitoring, investigating, analyzing, and controlling of network and system components.

Table 1. Major NetView Tasks (continued)

Task	Task Description
Automating the Network or System This management task is described in the following chapters: • Chapter 13, "Using the NetView Automation Table," on page 167 • Chapter 14, "Controlling Message Routing Using the ASSIGN Command," on page 177 • Chapter 15, "Starting an Autotask to Handle Automation," on page 179 • Chapter 16, "Scheduling Commands," on page 181 • Chapter 17, "Debugging Automation," on page 201	*Automating* is the understanding of a consistent relationship between an event and the normal reaction to that event, and storing a procedure to automatically recognize the event as well as taking appropriate action. One way of doing this is through analysis of messages and alerts, and the operator actions taken in response to them.
Diagnosing Problems This management task is described in the following chapters: • Chapter 18, "Proactive Investigating," on page 215 • Chapter 19, "Reactive Investigating," on page 223	*Investigating* is the requesting of additional information so that you can further analyze the cause of a status change from satisfactory to unsatisfactory. This can involve requesting more detailed status information or initiating a test on a failing resource. *Solving* is completing the analysis of the problem situation and deciding on the proper action to bypass or resolve the unsatisfactory condition. This can also include logging the problem and its resolution to make future analysis of similar problems more efficient.

Chapter 2. Getting Started

This chapter describes how to get started using the IBM Z NetView program and briefly describes the Z NetView interfaces and functions. It also provides an introduction to the NetView REST Server.

Starting the NetView Program

The NetView host environment consists of the following MVS address spaces:

- NetView program
- NetView REST Server
- NetView subsystem
- Resource Object Data Manager (RODM)
- Graphic Monitor Facility host subsystem (GMFHS)
- Event/Automation Service (E/AS)
- IBM Z NetView Enterprise Management Agent

To start the address spaces manually, enter the following commands from the system console:

- To start the NetView program, enter the following command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the NetView program, such as CNMPROC:

  ```
  s procname
  ```

  When the NetView program starts, certain functions can be specified to start automatically. See Chapter 11, "Controlling NetView Operation," on page 133 for more information.
- To start the NetView subsystem, enter the following command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the NetView subsystem, such as CNMPSSI:

  ```
  s procname
  ```

- To start the Event/Automation Service, enter the following command, where *procname* is the name your system programmer assigned to the cataloged procedure for the Event/Automation Service, such as IHSAEVNT:

  ```
  s procname
  ```

  The Event/Automation Service depends on the following programs being active:

  - TCP/IP
  - NetView subsystem
- The RODM program can be started with, or without, using the checkpoint data set. Use the *procname* that your system programmer assigned to the cataloged procedure for the RODM program, such as EKGXRODM.

  - To cold-start the RODM program, without using the checkpoint data set, enter the following command, where *rodmname* is the name of the RODM program to be started:

    ```
    s procname,type=c,name=rodmname
    ```

    If you do not enter a value for *rodmname*, the NetView program defaults to *procname*.

    You get the following message requesting confirmation not to use the checkpoint data sets:

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```
    EKG1918D  EKGXRODM: RODM rodm WILL COLD START.
              ENTER '1' TO CONTINUE OR '2' TO TERMINATE.
    ```

    Enter 1 to cold-start RODM. The first time you start RODM for the NetView program, specify TYPE=C to cold start RODM.

  – To warm-start the RODM program, using the latest checkpoint data set, enter the following command:

    ```
    s procname,type=w
    ```

    This is the default for the RODM procedure that is supplied by the NetView product (if you do not specify TYPE=C).

  See "Copying the Contents of RODM to a Checkpoint Data Set" on page 163 for information about how to copy the data from the RODM data cache to a checkpoint data set.

- To start the GMFHS program, enter the following command:

  ```
  s procname.id
  ```

- To start the IBM Z NetView Enterprise Management Agent, enter the following command, where *procname* is the name that your system programmer assigned in the **Agent started task** field on the Specify Agent Address Space Parameters panel in the Configuration Tool during agent configuration:

  ```
  s procname
  ```

Replying to a Message

If the DSIWTOMT task is started, the NetView program issues a write-to-operator with reply (WTOR) message to the system console when initialization is complete. This WTOR message is outstanding while the NetView program is active. The message ID is either DSI802A or DSI803A. You can use the REPLY command to issue NetView commands from the system console. For example, if you see the following WTOR message on your system console:

```
*07 DSI802A CNM01 REPLY WITH VALID NCCF SYSTEM OPERATOR COMMAND
```

You can enter the following command:

```
r 07,command
```

Where *command* is any of the following commands:

- CLOSE DUMP
- CLOSE IMMED
- CLOSE NORMAL
- CLOSE STOP
- MSG *operid*,*text*
- MSG LOG,*text*
- MSG SYSOP,*text*
- MSG ALL,*text*
- REPLY P*nn*,*text*
- REPLY L*nn*,*text*

Stopping NetView

To stop the NetView address spaces, enter the following commands from the system console:

- To stop the NetView program, enter the following command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the NetView program, such as CNMCNETV:

  ```
  p procname
  ```

  You can also stop the NetView program by replying to the NetView outstanding WTOR in the following way, where *nn* is the reply identifier for the WTOR message DSI802A or DSI803A:

  ```
  r nn,close stop
  ```

  Using one of these methods allows the NetView program to write recent messages from the Canzlog data space to Canzlog archive files. To allow the NetView program to write recent messages to the Canzlog archive files when it is stopped by another method, use the CANZLOG CUE command. See the help for the CANZLOG command for more information.
- To stop the NetView subsystem, enter the following command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the NetView subsystem, such as CNMPSSI:

  ```
  p procname
  ```
- To stop the Event/Automation Service, enter one of the following commands, where *procname* is the name your system programmer assigned to the cataloged procedure for Event/Automation Service such as IHSAEVNT:

  ```
   f procname,term
  ```

  ```
   p procname
  ```
- To stop the RODM program, enter the following command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the RODM program, such as EKGXRODM:

  ```
  f procname,term
  ```
- To stop the GMFHS program, enter one of the following commands, where *procname* is the name that your system programmer assigned to the cataloged procedure for the GMFHS program, such CNMGMFHS:

  ```
  f procname,term
  ```

  ```
   p procname
  ```
- To stop the Z NetView Enterprise Management Agent, enter the following command, where *procname* is the name that your system programmer assigned in the **Agent started task** field on the Specify Agent Address Space Parameters panel in the Configuration Tool during agent configuration:

  ```
   p procname
  ```

Issuing a NetView Command from MVS

If you have an autotask associated with the system console, you can enter NetView commands from the MVS console.

To associate an autotask with a specific MVS console, use the AUTOTASK statement in the CNMSTYLE member, or the AUTOTASK command. The CONSOLE keyword specifies a console ID from which an operator can issue the MODIFY command. If you specify a console ID of *ANY*, you can use any MVS console to issue a NetView command. Before specifying *ANY*, consider the security implications of allowing NetView commands to be issued from any MVS console.

After you associate an autotask with the system console, you can enter NetView commands from the console using the following MVS MODIFY command, where *procname* is the name that your system programmer assigned to the cataloged procedure for the NetView program, such as CNMCNETV, and is the NetView command that you want to issue:

```
f procname,command
```

For example, to display the MVS console names and IDs used by the NetView program, enter the following command:

```
f procname,disconid
```

When the NetView subsystem is active, you can also enter NetView commands by prefixing the command with a designator that identifies the command as belonging to the NetView program. The default command designator is the 4-character subsystem name. For example, if job T130TEST is the NetView subsystem address space job, the designator is T130. To display the MVS console names and IDs used by the NetView program, enter the following command:

```
t130 disconid
```

You can register the command designator with the MVS system on which the subsystem address space job runs or you can register the prefix for the entire sysplex. This is done when you start the NetView subsystem address space.

Note: If you use the MVS MODIFY command, a designator character for the NetView program is not required.

Topic:	**Reference:**
CNMSJ009 and CNMSJ010 (NetView start procedure)	*IBM Z NetView Installation: Getting Started*
NetView commands	NetView online help
Associating an autotask with an MVS console	AUTOTASK command in the NetView online help
NetView cataloged procedures	*IBM Z NetView Installation: Getting Started*
Activating VTAM, NetView, SSI, RODM, and GMFHS	*IBM Z NetView Installation: Getting Started*

Using NetView from a 3270 Session

This section describes the following topics:

- How to log on to the NetView program
- The parts of a NetView panel
- How to move between the NetView components
- How to issue commands
- How to list your program function key definitions
- How to control the NetView screen

Logging on to NetView from a 3270 Session

To log on to the NetView program from a 3270 session:

1. To establish a session with the NetView program, enter the following command, where *applid* is the name of the NetView application to which you are logging on. LOGMODE and DATA are optional

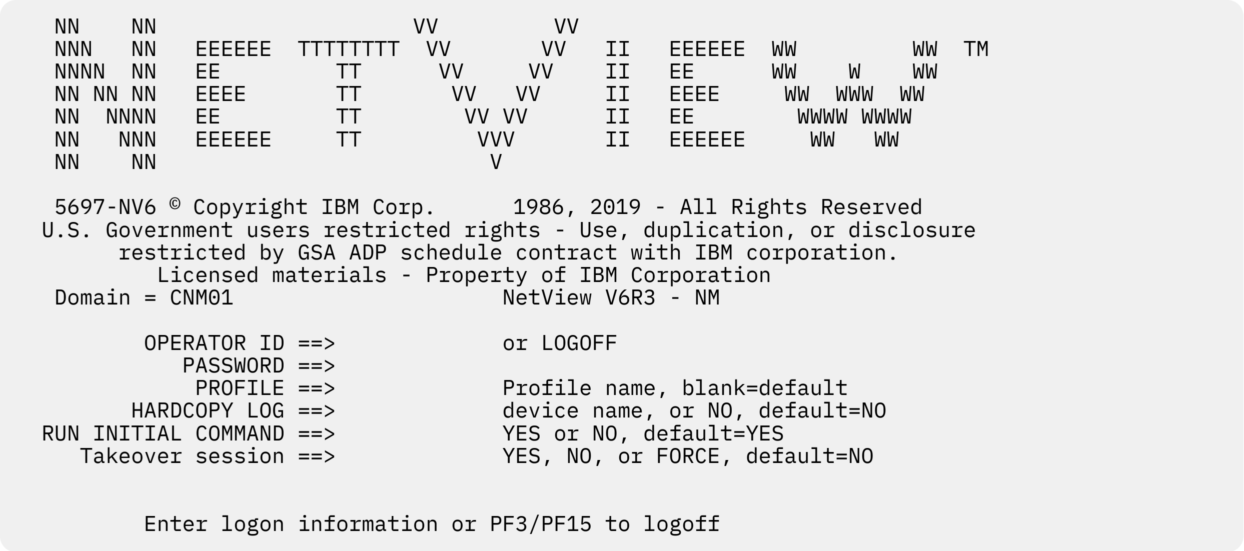
parameters, *logmode* specifies information about your terminal session, and *data* specifies information that is inserted in the **OPERATOR ID** and **PASSWORD** fields of the NetView logon panel:

```
logon applid(applid) logmode(logmode) data(data)
```

The password is accepted only on the VTAM LOGON command when the NetView program has enabled the function through the LOGONPW command. In this case *data* is entered in the form *userid/password*.

When you log on, the NetView program queries the device for screen size and color attributes if the logmode specifies to issue the query. Otherwise, the NetView program uses the screen size specified in the logmode. The command facility adapts to use the entire width and depth of the screen. The hardware monitor and session monitor adapt to use the screen depth, but limit the display to 80 characters in width. "The hardware monitor supports a maximum of 107 rows. All components of the NetView program support color where the display is capable of displaying color.

When a session is established, a NetView logon panel similar to the one shown in Figure 3 on page 29 is displayed.



```
 NN    NN                    VV        VV
 NNN   NN   EEEEEE  TTTTTTTT  VV       VV   II   EEEEEE  WW         WW  TM
 NNNN  NN   EE         TT      VV     VV    II   EE      WW    W    WW
 NN NN NN   EEEE       TT       VV   VV     II   EEEE     WW  WWW  WW
 NN  NNNN   EE         TT        VV VV      II   EE        WWWW WWWW
 NN   NNN   EEEEEE     TT         VVV       II   EEEEEE     WW   WW
 NN    NN                          V

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U.S. Government users restricted rights - Use, duplication, or disclosure
      restricted by GSA ADP schedule contract with IBM corporation.
         Licensed materials - Property of IBM Corporation
 Domain = CNM01                     NetView V6R3 - NM

       OPERATOR ID ==>             or LOGOFF
          PASSWORD ==>
           PROFILE ==>             Profile name, blank=default
      HARDCOPY LOG ==>             device name, or NO, default=NO
RUN INITIAL COMMAND ==>             YES or NO, default=YES
   Takeover session ==>             YES, NO, or FORCE, default=NO


       Enter logon information or PF3/PF15 to logoff
```

Figure 3. Example of NetView Logon Panel

Notes:

- The NetView program provides the option of specifying whether password checking is performed by the NetView program or by an SAF security product such as RACF. The method of checking is specified by the SECOPTS.OPERSEC statement in the CNMSTYLE member, described in the *IBM Z NetView Administration Reference*.

  If you specify that the NetView program is to do password checking, be aware that any password that is defined to the NetView program is automatically converted to uppercase and stored in uppercase. If you specify that password checking is to be done by using an SAF security product, you can use the mixed-case password function. Also, if you are using an SAF security product, you can use a password phrase as a substitute for a password.

  If the value of the SECOPTS.OPERSEC statement in the CNMSTYLE member is SAFDEF, or if the OPERSEC operand was specified as SAFDEF on the REFRESH command, no **PROFILE** field is shown on the Logon panel and the **HARDCOPY LOG** field does not have a default value.
- In the **PROFILE ==>** field, system symbolic substitution is performed on records that are read from the DSIOPF member in the DSIPARM data set and the specified profile member in the DSIPRF data set. The symbolic supplied by the NetView product is also included in the substitution process. The substitution occurs after comment removal but prior to record processing. After substitution,

comments are also removed. Substitution is always performed on the symbolic, unless substitution was disabled when the NetView program was started.

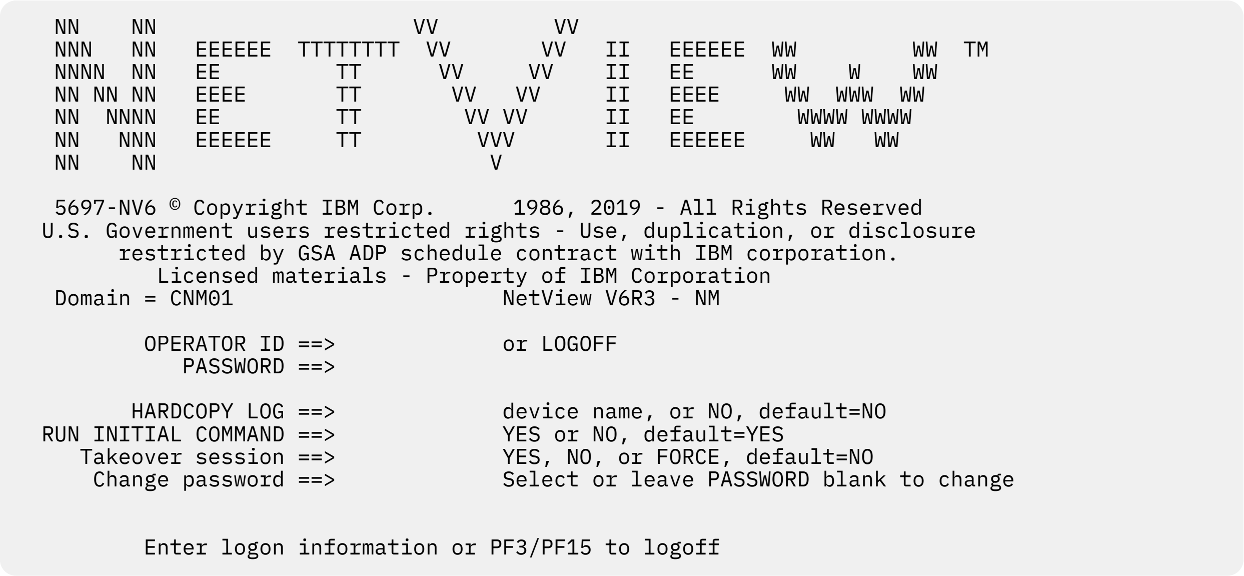
2. Type your operator identification (for example, OPER1) in the space next to the **OPERATOR ID** field, where the cursor is located. If you specified a **DATA** parameter when you established the session, the **OPERATOR ID** field contains the value you specified.
3. Enter your password or password phrase next to the **PASSWORD** field. You do not see your password on the screen as you type it. If you are using a system authorization facility (SAF) security product, such as Resource Access Control Facility (RACF) and want to change your password, leave this field blank.

   If you are using an SAF security product to perform operator identification and password checking, you can log on to the NetView program using a PassTicket rather than a password if you use the Network Security Program/Secure Logon Coordinator product (NetSP/SLC V1.2) with an SAF product that supports PassTickets, such as RACF Version 2 Release 1.

   If you are using an SAF security product and the IBM Multi-Factor Authentication for z/OS product (MFA), you can use a token, passcode, PIN, or whatever is appropriate for any authentication factors that are configured for MFA-enabled user profiles, to log onto the NetView product.
4. If the value of the SECOPTS.OPERSEC CNMSTYLE statement is NETVPW, SAFPW, or SAFCHECK, operator profiles must be defined for the NetView program, and an operator logging onto NetView program may specify a profile name in the **PROFILE** field on the logon panel.

   If the value of the SECOPTS.OPERSEC CNMSTYLE statement is SAFDEF, no **PROFILE** field is presented on the logon panel and operator attributes are specified in the NETVIEW segment of a user profile in the SAF product.
5. If you are using a printer (also called a hardcopy log device) to record your session, you can also type the name of the printer in the **HARDCOPY LOG** field.
6. If you do not want to use an initial command, type no in the **RUN INITIAL COMMAND** field. If you want to use an initial command, leave this field blank or type `yes`. The initial command is set up by your system programmer to eliminate some manual procedures.
7. If the operator ID is already logged on and you want to take over the session, enter YES as the takeover value. If you receive the DSI045I message, which indicates that takeover is blocked, and if you log on to the NetView program by using VTAM, you can enter `FORCE` as the takeover value. When `FORCE` is entered, the NetView program always tries to take over the session without abnormally ending the operator first. If that fails, the NetView program issues a user abend X'101'. If that also fails, the NetView program issues a `STOP FORCE` on the operator ID and continues the logon processing. As a result of the `STOP FORCE`, the operator ID takes an X'EC4' abend. Storage and other resources might be lost. Data sets can be corrupted.
8. To change an SAF password or password phrase for an operator when the NetView program is using an SAF product to check passwords or password phrases, type the operator identification and other selections on the logon panel, but leave the **PASSWORD** field blank and press enter.

   For a user profile in an SAF product, like RACF, with MFA enabled for one or more authentication factors, and particularly when compound in-band authentication is configured, it may not be possible to change an SAF product password by using this change method. An alternative method for changing a password or password phrase for a user profile in an SAF product is available from the logon panel.



```
 NN    NN                    VV         VV
 NNN   NN   EEEEEE  TTTTTTTT  VV       VV   II   EEEEEE  WW         WW  TM
 NNNN  NN   EE         TT      VV     VV    II   EE      WW    W    WW
 NN NN NN   EEEE       TT       VV   VV     II   EEEE     WW  WWW  WW
 NN  NNNN   EE         TT        VV VV      II   EE        WWWW WWWW
 NN   NNN   EEEEEE     TT         VVV       II   EEEEEE     WW   WW
 NN    NN                          V

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U.S. Government users restricted rights - Use, duplication, or disclosure
      restricted by GSA ADP schedule contract with IBM corporation.
         Licensed materials - Property of IBM Corporation
 Domain = CNM01                      NetView V6R3 - NM

        OPERATOR ID ==>             or LOGOFF
           PASSWORD ==>

       HARDCOPY LOG ==>             device name, or NO, default=NO
RUN INITIAL COMMAND ==>             YES or NO, default=YES
   Takeover session ==>             YES, NO, or FORCE, default=NO
    Change password ==>             Select or leave PASSWORD blank to change


        Enter logon information or PF3/PF15 to logoff
```
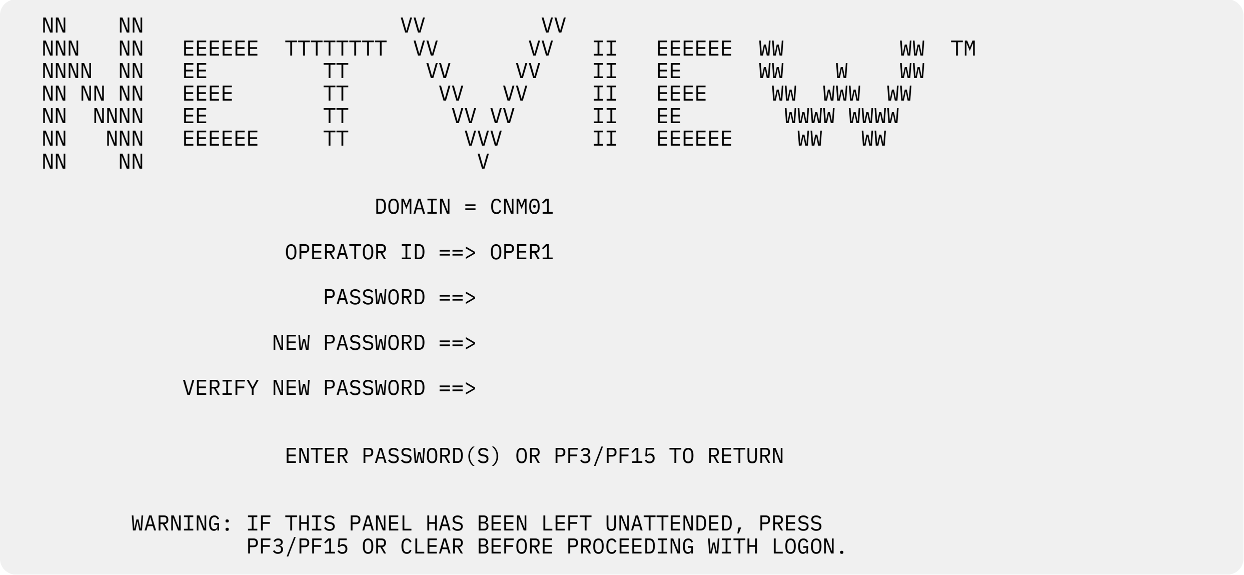

Figure 4. Example of NetView Logon Panel

On the logon panel, type a valid operator identifier in the **OPERATOR ID** field; type the appropriate credential (a token, PIN, passcode, password, password phrase, or some combination of credentials as configured by a security administrator) in the **PASSWORD** field; type the desired options in the **HARDCOPY LOG**, **RUN INITIAL COMMAND**, **Takeover session** fields; type a non-blank character in the **Change password** field, and press enter. The **New Password** panel is presented.

On the **New Password** panel, type the password or password phrase for the user profile in the SAF product, in the OLD PASSWORD field, and type the new password or password phrase for the user profile in the SAF product in the **NEW PASSWORD** and **VERIFY NEW PASSWORD** fields and press enter.

9. Fill in the fields as appropriate
10. Press Enter.

If you left the **PASSWORD** field blank and the NetView program is using an SAF product such as RACF to check passwords or password phrases, the panel shown in Figure 5 on page 31 is displayed.



```
NN    NN                    VV         VV
NNN   NN   EEEEEE  TTTTTTTT  VV       VV   II   EEEEEE  WW         WW  TM
NNNN  NN   EE         TT      VV     VV    II   EE      WW    W    WW
NN NN NN   EEEE       TT       VV   VV     II   EEEE     WW  WWW  WW
NN  NNNN   EE         TT        VV VV      II   EE        WWWW WWWW
NN   NNN   EEEEEE     TT         VVV       II   EEEEEE     WW   WW
NN    NN                          V

                          DOMAIN = CNM01

                   OPERATOR ID ==> OPER1

                      PASSWORD ==>

                  NEW PASSWORD ==>

           VERIFY NEW PASSWORD ==>


                   ENTER PASSWORD(S) OR PF3/PF15 TO RETURN


       WARNING: IF THIS PANEL HAS BEEN LEFT UNATTENDED, PRESS
                PF3/PF15 OR CLEAR BEFORE PROCEEDING WITH LOGON.
```

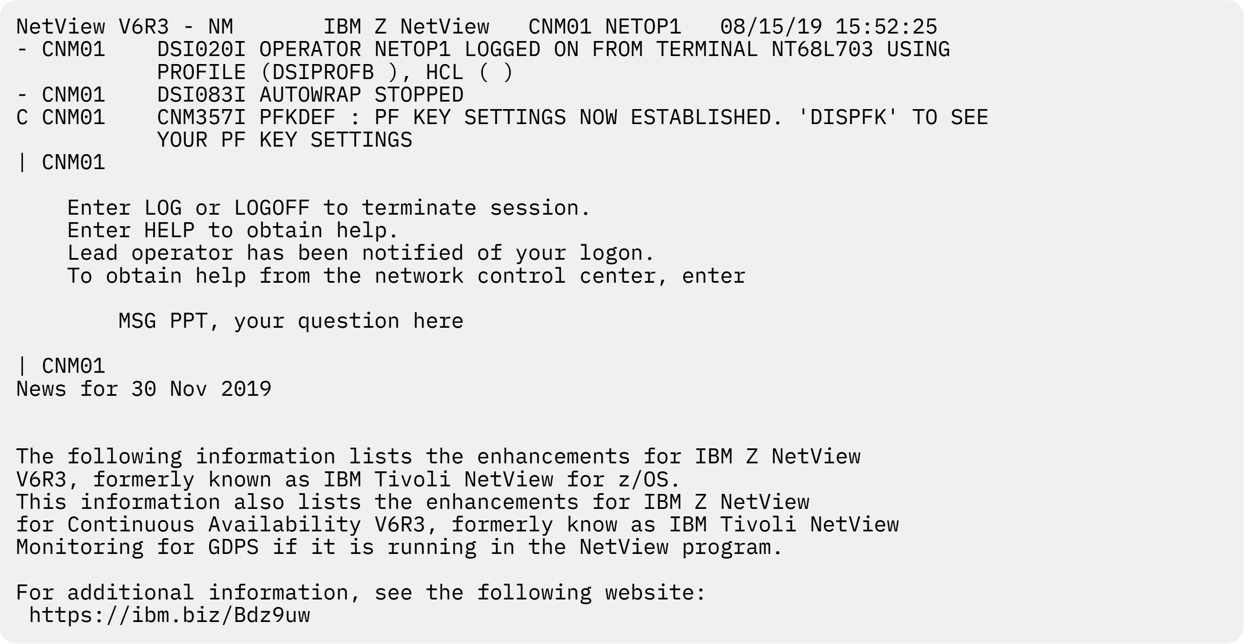
Figure 5. New Password Panel

11. Fill in the fields as appropriate.

    If you try to change a password or password phrase and the logon attempt is *not* successful because of a bad parameter but the password is valid, then the password is changed and a DSI757 message is sent to the NetView log. However, you will not be logged on. For example, if you specify values for profile, HCL, or INITCMD that are not valid, even if the password change is valid, you are not logged on, and you will not receive a message at the console. At your next logon attempt, if entering an SAF password or password phrase is required, remember to use the new password or password phrase, because it was changed.

    For security reasons, do not leave your display unattended while this panel is active. If you have any question about what was entered in the non-displayed fields, press either CLEAR or PF3/PF15 before proceeding.

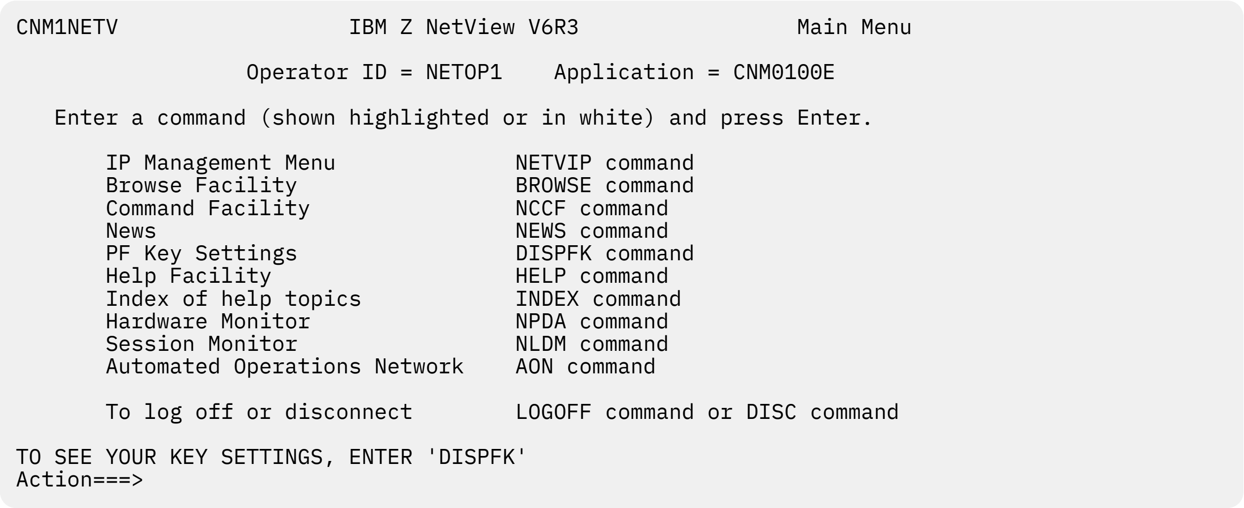
12. Press Enter. A panel similar to Figure 6 on page 32 is displayed.



```
NetView V6R3 - NM       IBM Z NetView   CNM01 NETOP1   08/15/19 15:52:25
- CNM01    DSI020I OPERATOR NETOP1 LOGGED ON FROM TERMINAL NT68L703 USING
           PROFILE (DSIPROFB ), HCL ( )
- CNM01    DSI083I AUTOWRAP STOPPED
C CNM01    CNM357I PFKDEF : PF KEY SETTINGS NOW ESTABLISHED. 'DISPFK' TO SEE
           YOUR PF KEY SETTINGS
| CNM01

    Enter LOG or LOGOFF to terminate session.
    Enter HELP to obtain help.
    Lead operator has been notified of your logon.
    To obtain help from the network control center, enter

        MSG PPT, your question here

| CNM01
News for 30 Nov 2019


The following information lists the enhancements for IBM Z NetView
V6R3, formerly known as IBM Tivoli NetView for z/OS.
This information also lists the enhancements for IBM Z NetView
for Continuous Availability V6R3, formerly know as IBM Tivoli NetView
Monitoring for GDPS if it is running in the NetView program.

For additional information, see the following website:
 https://ibm.biz/Bdz9uw
```

Figure 6. NetView Main Menu Panel

13. Press the Clear or Enter key to clear the screen and go to the NetView Main Menu. After the NetView program processes the operator profile, the following panel is displayed.



```
CNM1NETV                  IBM Z NetView V6R3                 Main Menu

                  Operator ID = NETOP1    Application = CNM0100E

   Enter a command (shown highlighted or in white) and press Enter.

       IP Management Menu              NETVIP command
       Browse Facility                 BROWSE command
       Command Facility                NCCF command
       News                            NEWS command
       PF Key Settings                 DISPFK command
       Help Facility                   HELP command
       Index of help topics            INDEX command
       Hardware Monitor                NPDA command
       Session Monitor                 NLDM command
       Automated Operations Network    AON command

       To log off or disconnect        LOGOFF command or DISC command

TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
Action===>
```

Figure 7. NetView Main Menu

If the NetView Main Menu panel is not displayed:

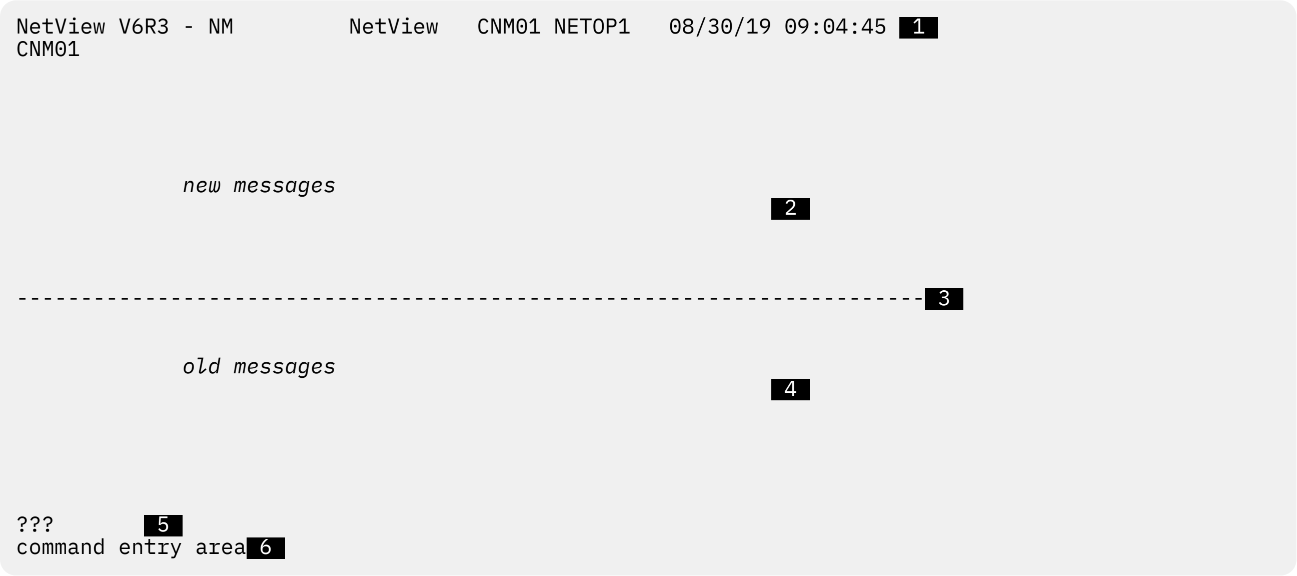
a. Press Enter to access the command facility screen.
b. Type `mainmenu`.
c. Press Enter.

The NetView Main Menu automatically recognizes whether an option on the menu is active or inactive. The NetView Main Menu displays only active options. For example, if the Automated Operations Network and Z System Automation are not active, those options are not displayed on the menu.

If a command on the NetView Main Menu is backlit, it is only partially available. That means that some functions are available using the command, but not all functions. For example, if the BROWSE command is backlit, only partial use of the command is available. You can use the BROWSE *member* command, but not the BROWSE NETLOGA command. If the status of an option changes, you can update the Main Menu by pressing Enter.

Understanding the Panel Layout

Type `nccf` and press Enter to access the command facility.



```
NetView V6R3 - NM         NetView   CNM01 NETOP1   08/30/19 09:04:45  1
CNM01




             new messages
                                                              2



-----------------------------------------------------------------------3


             old messages
                                                              4




???       5
command entry area 6
```

Figure 8. Sample Command Facility Console

You can customize this panel for your needs.For additional information about changing the format of the NetView panel, see sample CNMSCNFT and "Changing the NetView Screen Layout" on page 138.

Session Identification Line

The first line of the panel, identified with 1, shows the name of the panel and the name of the system (NetView). The next field lists the application identifier (CNM01) and your operator identifier (OPER1). The next two fields list the current date and time. The last two fields contain a combination of A, H, P, W, or a blank, which indicates whether messages can be written to the panel. The A, H, P, and W indicators are described in the following list:

A
The autowrap indicator means that AUTOWRAP is active. If autowrap is on and the display is full of data, it is automatically overlaid with new data. If autowrap is not on, press the Clear or Enter key to allow new data to overlay the display screen.

H

The held-screen indicator means that the screen does not roll forward unless it is unlocked by the operator. You can use this indicator if you need time to read the screen before it is erased, or to freeze the screen while you mark messages for deletion or enter a command.

P

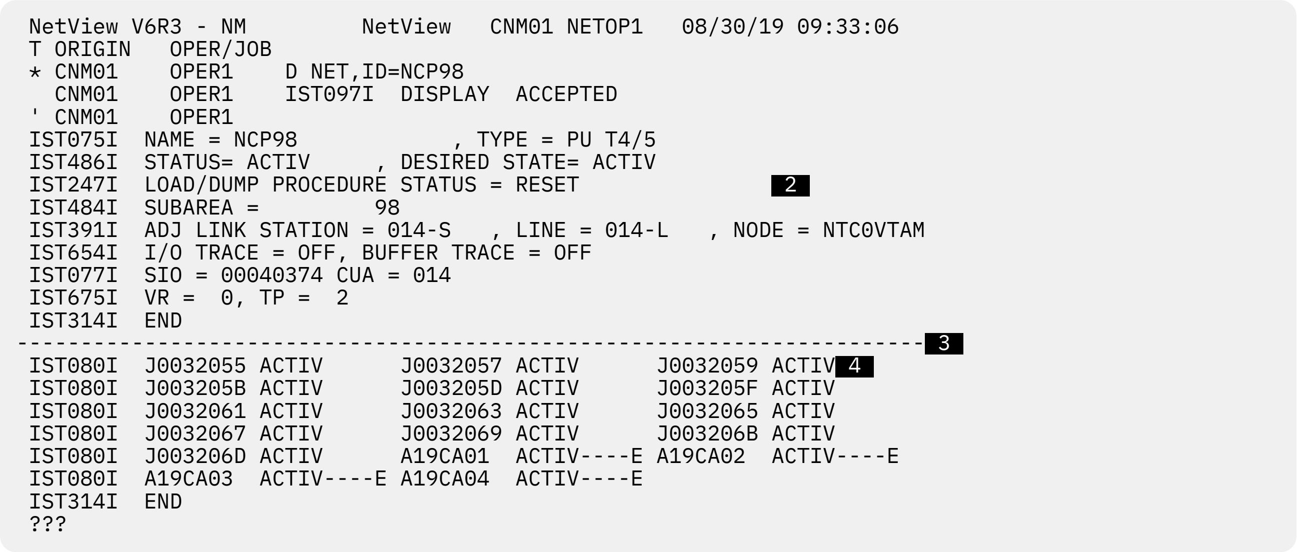
The pause status indicator. A command list running on the operator task is pausing for operator input and does not continue until the operator enters information.

W

The wait indicator. A command list running on the operator task is waiting for messages or other events, such as for a specified amount of time to elapse.

Message Area

The message area displays commands, responses, and messages from the system. Figure 9 on page 34 shows a sample display screen.



```
 NetView V6R3 - NM         NetView   CNM01 NETOP1   08/30/19 09:33:06
 T ORIGIN   OPER/JOB
 * CNM01    OPER1    D NET,ID=NCP98
   CNM01    OPER1    IST097I  DISPLAY  ACCEPTED
 ' CNM01    OPER1
 IST075I  NAME = NCP98            , TYPE = PU T4/5
 IST486I  STATUS= ACTIV     , DESIRED STATE= ACTIV
 IST247I  LOAD/DUMP PROCEDURE STATUS = RESET                2
 IST484I  SUBAREA =        98
 IST391I  ADJ LINK STATION = 014-S   , LINE = 014-L   , NODE = NTC0VTAM
 IST654I  I/O TRACE = OFF, BUFFER TRACE = OFF
 IST077I  SIO = 00040374 CUA = 014
 IST675I  VR =  0, TP =  2
 IST314I  END
----------------------------------------------------------------------3
 IST080I  J0032055 ACTIV      J0032057 ACTIV      J0032059 ACTIV 4
 IST080I  J003205B ACTIV      J003205D ACTIV      J003205F ACTIV
 IST080I  J0032061 ACTIV      J0032063 ACTIV      J0032065 ACTIV
 IST080I  J0032067 ACTIV      J0032069 ACTIV      J003206B ACTIV
 IST080I  J003206D ACTIV      A19CA01  ACTIV----E A19CA02  ACTIV----E
 IST080I  A19CA03  ACTIV----E A19CA04  ACTIV----E
 IST314I  END
 ???
```

Figure 9. Sample Display Screen

The dashed line, indicated by 3 separates the latest messages from the older ones. The messages are continually updated. You can use this line to locate the most recent messages. The most recent messages are the ones directly above the line, in the area indicated by 2. The oldest messages displayed on the screen are at the bottom of the screen, below the line, in the area indicated by 4.

You can use message suppression to limit the number of messages sent to the screen, as described in the *IBM Z NetView Automation Guide*. See Appendix A, “Message Formats,” on page 237 for additional information about message formats.

To rearrange the messages on the screen, press the Enter key. This redisplays the messages in sequential order and removes the dashed line. If you type a command and press Enter before you rearrange the messages on the screen, you might have to press Enter again to see the full response.

Generally, messages are no longer displayed as the screen scrolls. Examples of exceptions include reply messages, held messages, and windowed responses.

Reply messages are messages to which you need to reply before you delete them from the display screen. These messages are displayed in high intensity on your display screen with a P*number* or L*number* and the message number, where *number* is a 2- or 4-digit number. Unsolicited reply messages received on the system console remain outstanding even after a reply is given. Delete these messages manually using the MVS control (K) command.

Held messages are messages that are defined to be held on the screen. These messages are displayed in high intensity (or are otherwise highlighted) and are shown at the top of the message area. Specific action must be taken to remove them, such as the following actions:

- Specifically deleting them (by the operator)
- De-emphasizing them with a Delete Operator Messages (DOM) command

The DOM command causes messages to lose highlighting immediately. This means they can now scroll off the screen. If more messages are being held than can be displayed on your type of terminal, message DSI151I is displayed and the messages are queued. The queued messages are displayed only when existing ones are deleted.

To delete one or more held messages:

1. Move the cursor to the message line, using either the cursor keys or the TAB key.
2. To delete a single message, press Enter. The cursor returns to the command entry area.
3. To delete multiple messages, erase the first line of each message to be deleted (you can use the Erase EOF key) and press Enter. The cursor returns to the command entry area.

Attention: If an autowrap timeout occurs while you are typing over message text, that text might be moved or refreshed, thus destroying the typing that you did.

To avoid losing information from the command entry area, you can take either of the following actions:

- Turn autowrap off, using the AUTOWRAP NO command.
- Use the HOLD command.

Windowed responses are messages that are displayed in a scrollable window using the NetView WINDOW command. This prevents the message responses from being overwritten by subsequent messages; you can also navigate through the information using standard BROWSE commands. For a description of the behavior of windowed responses, refer to the WINDOW command in the NetView online help.

Response Area

Near the bottom of the screen is a line that begins with the `???` indicator. This line is the response area, indicated by 5 in Figure 8 on page 33. Look here for error messages.

The =X= indicator is displayed in place of the `???` indicator when messages are arriving (prior to entering or after leaving a panel). This indicator means that only a limited set of commands can be used. The following commands are some of the commands you can use:

- AUTOWRAP
- CLOSE
- GO
- HOLD
- LOGOFF
- RESET

Hint: In general, commands that are specified as TYPE=I or TYPE=B in CNMCMD can be used when the =X= indicator is displayed.

Most of these commands change how quickly new information is presented. If you enter any other command, you get message DSI596I, which reads `WAITING TO DISPLAY A PANEL, COMMAND NOT PROCESSED. HIT ENTER.`

Command Entry Area

The cursor is located in the command entry area, indicated by 6 in Figure 8 on page 33. You communicate with the NetView program by entering commands here or you can call another NetView component. If you press a key on a terminal that has no keyboard buffering capability, and the controller is already processing a request from the host, the key is rejected, and the keyboard can lock up. You can then press RESET to unlock the keyboard and enable input to proceed.

The length of the command entry area is limited to three lines of 80 characters each. For input modes of two or three lines, on screens wider than 80 characters, the NetView program indicates the end of the input area with three less-than symbols (<<<). When you press any action key (Enter, PF, PA, or Clear), the command area is erased.

Moving between the Components

To move from one component to another, enter the component name. See the following table for information about moving between the various NetView components.

Table 2. Moving between Components

To move to this component:	**Enter:**
Automated Operations Network	`aon`
Browse facility	`browse` *logname*
Command facility	`nccf`
Hardware monitor	`npda`
Help facility	`help`
Session monitor	`nldm`
Status monitor	`statmon`

For example, to move to the hardware monitor initial screen (or the last panel viewed if the hardware monitor component is still active), enter npda.

In the NetView program, you can have multiple components active at the same time. Use the ROLL function to move among active components in a continuous loop. The PF key that is supplied by the NetView product for ROLL is PF6. If your PF key settings have PF6 set to ROLL, then pressing PF6 returns you to the last panel you viewed in an active component.

To display a list of the active components, enter the following command:

```
LIST ROLL
```

To return to a specific component, enter the following command:

```
RESUME component_name
```

For additional information about the hierarchy of panels within the session monitor, hardware monitor and status monitor, see Appendix B, "NetView Component Hierarchies," on page 239. This information also includes the command that you can use to enter the hierarchy at a specific point.

If you are in a component other than command facility with a panel displayed, you can be interrupted by a message from another component. This message is displayed on the command facility screen. After the message is displayed, the NetView program displays *** at the bottom of the command facility screen. You can press Enter to return to the panel you were using when the interrupt occurred.

Issuing Commands

You can direct commands to explicit destinations in the NetView environment. Table 3 on page 36 shows the possible destinations and how to direct commands to those destinations.

Table 3. Directing Commands

To direct a command to:	**Use:**
Current® operator task	*command_name*
VTAM	*VTAM_command_name*
Another task on this NetView program	EXCMD command or command prefix label

Table 3. Directing Commands (continued)

To direct a command to:	**Use:**
Remote NetView program	RMTCMD command or command prefix label
Service point	RUNCMD command
MVS	MVS command

Note: You do not have to use the NetView MVS command to run the DISPLAY (D) command, the MODIFY (F) command, or the VARY (V) MVS command. For more information on the MVS command, see the *IBM Z NetView Command Reference Volume 1 (A-N)*.

To direct a command to the session monitor or hardware monitor from another component, type the component name followed by the command. For example, to view the total statistics information in the hardware monitor from the session monitor, enter the following command:

```
npda tot st
```

To direct a command to the status monitor, type the command without prefixing it with the component name. For example, to start automatic node reactivation for all applicable nodes from the session monitor, enter the following command:

```
monit start all
```

Using Program Function and Program Access Keys

You can use program function (PF) or program access (PA) keys to send commands to the system. Doing so can save time because you do not have to type a command and then press the Enter key.

Most PF and PA keys have already been set for you, with unique settings by component. They are set to commands that you frequently need to use.

To display the current settings for command facility PF and PA keys, enter the following command:

```
dispfk nccf
```

A scrollable window similar to the following one is displayed, showing the default values that are supplied by the NetView product. Your system might have different values, and each operator can change PF key values, both in a profile and interactively.

```
CNMKWIND OUTPUT FROM  DISPFK                                  LINE 0 OF 32
*------------------------------- Top of Data --------------------------------*
DISPLAY OF PF/PA KEY SETTINGS FOR NCCF
KEY   ----TYPE----   -----------COMMAND-----------  SET-APPL
PA1   IMMED,IGNORE   RESET                          NETVIEW
PA2   IMMED,IGNORE   AUTOWRAP TOGGLE                NETVIEW
PA3   IMMED,IGNORE   RETRIEVE AND EXECUTE           NETVIEW
PF1   IMMED,APPEND   HELP                           NETVIEW
PF2   IMMED,APPEND   GO                             NCCF
PF3   IMMED,IGNORE   RETURN                         NETVIEW
PF4   IMMED,APPEND   DISPFK                         NETVIEW
PF5   IMMED,APPEND   BROWSE LOG                     NETVIEW
PF6   IMMED,IGNORE   ROLL                           NETVIEW
PF7   IMMED,APPEND   BACK                           NETVIEW
PF8   IMMED,APPEND   FORWARD                        NETVIEW
PF9   DELAY,IGNORE   PIPE HELDMSG | CONSOLE DELETE  NCCF
PF10  IMMED,APPEND   WINDOW                         NETVIEW
PF11  IMMED,IGNORE   HOLD                           NCCF
PF12  IMMED,IGNORE   RETRIEVE                       NETVIEW
PF13  IMMED,APPEND   CMD HELP                       NETVIEW
PF14  IMMED,APPEND   STATIONS                       NETVIEW
PF15  IMMED,IGNORE   LINES                          NETVIEW
PF16  IMMED,IGNORE   PFKDEF CNMKEYS2                NETVIEW
PF17  IMMED,IGNORE   BROWSE NETLOGA                 NETVIEW
PF18  IMMED,APPEND   NCCF                           NETVIEW
PF19  IMMED,APPEND   TASKUTIL                       NCCF
PF20  IMMED,APPEND   TS                             NCCF
PF21  DELAY,IGNORE   PIPE HELDMSG | CONSOLE DELETE  NCCF
PF22  IMMED,APPEND   PIPE NETVIEW LIST STATUS=      NCCF
                     TASKS | LOCATE 55.10 /NOT
                     ACTIVE/ | COLLECT | CONSOLE
                     ONLY
PF23  IMMED,APPEND   NPDA                           NETVIEW
PF24  IMMED,IGNORE   RETRIEVE                       NETVIEW
*------------------------------ Bottom of Data ------------------------------*

TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==>
```

Figure 10. Default Command Facility PF Keys That Are Supplied by the NetView Product

You can also display PF key settings for other components, such as status monitor, hardware monitor, and log browse by specifying their component abbreviations on the DISPFK command or a PF key set to that command. For example, the NetView defaults specify the DISPFK command with the APPEND keyword as PF4; you can type a component name on the command line and press PF4 to see the PF keys for that component. Browse the CNMKEYS member or enter `dispfk all` to display all PF key settings. As an example of other default settings supplied by the NetView product, see Figure 45 on page 81.

If you need only a single PF key definition, enter the following command, where *nn* is the PF key number:

```
list key=pfnn
```

See "Defining Program Function Keys" on page 135 for information about changing the settings of PF key defaults across components, or for individual components such as the command facility, hardware monitor and session monitor.

Controlling the NetView Screen

When you are familiar with the initial setup of your screen, you might want to change the way it looks and functions. For example, you can change the PF key settings, the screen colors, the rate at which the screen wraps when full, and the overall screen layout. See "Controlling the NetView Screen Contents and Format" on page 135 for more information.

Accessing the NetView Program from the NetView Management Console

The NetView management console graphically displays systems and networking information provided by the NetView program. You can monitor and control the network, view the topology and connectivity of the network, display events or status changes for a selected resource, issue commands, and build custom views and resource collections. For more information about using the NetView management console, see “Using the NetView Management Console” on page 43; for detailed information, see the *IBM Z NetView User's Guide: NetView Management Console*.

Accessing the NetView Program from the Tivoli Enterprise Portal

You can send commands to the NetView program from the Tivoli Enterprise Portal using take action commands or situations, including Reflex Automation and Policy. The commands can be sent using the Z NetView Enterprise Management Agent or the NetView APSERV receiver. Command and command responses, along with audit trail messages, are displayed in the Z NetView Enterprise Management Agent workspaces. For more information about using the Z NetView Enterprise Management Agent, see the *IBM Z NetView User's Guide: NetView Enterprise Management Agent*. For more information about APSERV, see the *IBM Z NetView Application Programmer's Guide*.

Accessing the NetView Program from Service Management Unite

IBM Service Management Unite is a customizable dashboard interface that brings mainframe management information and tasks from disparate sources into a single environment.

Service Management Unite Automation V1.1.7 provides modern NetView dashboards that allow you to display the following information:

- NetView overview dashboard that displays all NetView domains accessible to an Enterprise Master NetView program
- Canzlog messages
- NetView health dashboard that displays key metrics about NetView domain and its tasks
- Automation dialogs that provide the capability to create, validate, and test automation table statements, as well as manage automation table members
- Sysplex connection distribution dashboard that displays connection distribution metrics and graphical views for DDVIPAs and ports
- Output from NetView commands

The NetView REST Server is a pre-requisite to view the NetView dashboards in Service Management Unite Automation.

If you want information about...	Refer to...
NetView REST Server	*IBM Z NetView Application Programmer's Guide*
IBM Service Management Unite Automation	IBM Service Management Unite Knowledge Center

Part 2. Monitoring and Controlling the Network and System

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Chapter 3. Monitoring and Controlling Your Network from a Workstation

This chapter provides an overview of how to manage your network from a workstation using the following components:

- NetView Enterprise Management Agent, described in "Using the NetView Enterprise Management Agent" on page 43
- NetView management console, described in "Using the NetView Management Console" on page 43

Monitoring is the examination of the entire network and system for changes in the status of individual components from satisfactory to a status requiring attention.

Controlling is the taking of specific actions against individual network and system components to change their status, make them available for monitoring, or to manipulate the use of the resources.

Using the NetView Enterprise Management Agent

Use the IBM Z NetView Enterprise Management Agent to manage your network from the Tivoli Enterprise Portal. Both sampled and real-time NetView data is available in the Tivoli Enterprise Portal with this agent. With the Z NetView Enterprise Management Agent and the OMEGAMON XE performance agents, you can manage and view availability and performance data for your network from a single interface.

Note: The Z NetView Enterprise Management Agent is frequently referred to as the NetView agent.

You can perform the following kinds of tasks:

- Monitor NetView applications
- Monitor NetView task status and performance statistics
- Monitor the status of your TCP/IP stacks
- Monitor DVIPA configuration, workload balance, connections, connection routing, and VIPA routes
- Monitor and diagnose problems with TCP/IP connections
- Monitor the configuration and status of your Telnet servers
- Monitor the configuration and status of OSA channels and ports
- Monitor the configuration and status of HiperSockets interfaces
- Monitor active SNA sessions
- Diagnose TCP/IP problems with packet trace
- Issue commands to manage your network

For more information about using the NetView agent, see the *IBM Z NetView User's Guide: NetView Enterprise Management Agent*.

Using the NetView Management Console

The NetView management console uses interactive graphics to display pictures (*views*) that represent a network, a portion of a network, or a group of networks at various levels of detail. These views show the network resources that you are monitoring. When you monitor a network, resource status changes are reflected graphically in the views.

The NetView management console topology server workstation communicates with host NetView through either an LU 6.2 or IP session. The NetView management console topology server is installed on the

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server workstation and receives topology changes and resource status changes from host the NetView program.

The NetView management console collects topology information from SNA topology manager, or other applications. If you are using the SNA topology manager, status information is collected by Open Systems Interconnection (OSI) agents and sent to the SNA topology manager, which puts that information in the Resource Object Data Manager (RODM) so the NetView management console can display it. The NetView management console topology server forwards topology and status information collected from these sources to all signed-on client workstations.

Use the NetView management console with the following components to manage your network:

- The discovery manager, described in "Using the Discovery Manager" on page 44
- MultiSystem Manager, described in "Using MultiSystem Manager" on page 44
- NetView Resource Manager, described in "Using NetView Resource Manager" on page 45
- SNA topology manager, described in "Using the SNA Topology Manager" on page 46

For examples of non-SNA networks attached to service points, see *IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide*. For information about the NetView management console, see the *IBM Z NetView User's Guide: NetView Management Console*.

Using the Discovery Manager

The discovery manager provides a comprehensive set of monitoring tools for your sysplex, as well as a view of your physical configuration. Before NetView V5R4, Sysplex IP Stack Manager managed TCP/IP stack information, including monitoring of the sysplex, and z/OS image. The discovery manager provides information that you can use to manage and monitor your sysplex from the master NetView program. Additionally, information that is discovered by the discovery manager can be viewed at the enterprise master NetView program.

The following kinds of resources can be monitored by the discovery manager:

- Central processor complex (CPC)
- Channel subsystem identifier
- Logical partition (LPAR)
- Sysplex
- Coupling facility
- z/OS image
- TCP/IP stack
- TCP/IP subplex
- IP interfaces
- NetView applications
- Telnet servers and ports
- Open Systems Adapter (OSA) channels and ports
- HiperSockets adapter

For more information about managing resources that are discovered by the discovery manager, see *IBM Z NetView IP Management*.

Using MultiSystem Manager

The Multisystem Manager transfers topology and status information that is discovered by user written agents through the Open agent. This information is stored in Resource Object Data Manager (RODM). After the information is in RODM, you can view the resources from the NetView management console. Topology correlation automatically ties together resources that managed by different types of open topology functions. Topology correlation is provided for Multisystem Manager topology functions, for the

NetView SNA Topology Manager, and for customer or vendor applications that use the Graphic Monitor Facility host system data model.

The MultiSystem Manager IBM Tivoli Network Manager agent extracts IP topology information from the IBM Tivoli Network Manager topology database about the network resources and relationships that are discovered by Tivoli Network Manager and loads the information into Resource Object Data Manager (RODM). The resources that are discovered include subnetwork resources (such as hosts, routers, and subnetwork connections) and resources that are either z/OS resources or directly connected to a z/OS resource.

For more information about discovering network topology with the MultiSystem Manager IBM Tivoli Network Manager agent, see *IBM Z NetView IP Management*.

Using NetView Resource Manager

Use NetView Resource Manager to graphically monitor and manage NetView tasks for resource utilization and status using the NetView management console. You can monitor all NetView programs in your enterprise using one NetView management console.

NetView Resource Manager includes manager and agent NetView hosts. The agent host forwards local resource utilization information to one or more manager hosts. The manager host then processes resource utilization information for agent hosts (including itself), and provides a graphical interface (NetView management console) to monitor all of your NetView programs. A manager host can also forward data to one or more manager hosts. You can use TCP/IP or SNA to communicate between these NetView programs.

NetView Resource Manager is started with the INITNRM command, manually or at NetView initialization. All of the values that can be customized for NetView Resource Manager can be set by using the CNMSTUSR or C*xx*STGEN member. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.

AUTONRM is the default autotask used for NetView Resource Manager processing. You can specify a different autotask for the NetView Resource Manager function by changing the following statement in the CNMSTUSR or C*xx*STGEN member. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.

```
function.autotask.NRM=AUTORNM
```

Use NetView Resource Manager to set thresholds for the following types of resources:

- Processor
- I/O
- MQS rates
- Storage
- Message queue count

When a resource reaches a threshold, a status change is sent to NetView management console. Reaching a threshold does not cause any action to be taken on the task. The NetView Resource Manager NetView uses the following functions:

- RODM
- RMTCMD
- Hardware Monitor
- TCP/IP Alert Receiver (if your communication method is TCP/IP)

The NetView Resource Manager agent NetView program uses the RMTCMD function. NetView Resource Manager can also be used without the NetView management console. When a threshold for a resource is reached or exceeded, the following message is issued:

```
BNH161I  'keyword' = 'value' LIMIT REACHED FOR TASK 'opid' 'luname'
```

Automation to take an appropriate action can be written for this message. When the limit for the resource returns to a level that is below the threshold, the following message is issued:

```
BNH745I  NO 'keyword' LIMIT REACHED FOR TASK 'opid' 'luname'
```

For more information about setting up and using NetView Resource Manager, see the following documents:

- *IBM Z NetView Installation: Configuring Graphical Components*
- *IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide*

Using the SNA Topology Manager

The NetView program can manage SNA subarea and Advanced Peer-to-Peer Networking resources using the NetView SNA topology manager. SNA topology manager collects topology information from VTAM agents.

The VTAM agent collects topology information from SNA resources, both subarea and Advanced Peer-to-Peer Networking.

The SNA topology manager provides a dynamic, centralized network management system for SNA subarea and Advanced Peer-to-Peer Networking networks. It uses existing NetView components, including RODM and GMFHS, to manage and display SNA subarea and Advanced Peer-to-Peer Networking topology data at the NetView management console workstation. Data is stored in RODM dynamically and can be used for automation.

The SNA topology manager application works with one or more agent applications to gather topology data about SNA subarea and Advanced Peer-to-Peer Networking networks. The agent application supplies topology information about nodes and links in response to requests from the manager application. VTAM V4R3 and later releases provide a topology agent for Advanced Peer-to-Peer Networking and subarea topology information. The SNA topology manager is controlled using the TOPOSNA command.

The SNA topology manager offers the following functions:

- The SNA topology manager gathers topology data for SNA subarea and Advanced Peer-to-Peer Networking nodes in the network. Two types of topology are collected:
  - Network topology which contains information about subarea nodes, network nodes, and transmission groups (TGs) between nodes that are part of an Advanced Peer-to-Peer Networking intermediate routing network.
  - Local topology which contains information about network nodes, end nodes, and low-entry networking nodes; the connections between nodes; and the ports and links that make up the connections.
- SNA topology manager uses the NetView management console to display configuration and status in graphic views. Operators can start network and local topology monitoring dynamically using the NetView management console menus. The topology data can also be monitored automatically using NetView command lists.

  SNA topology manager views are built and updated dynamically, which ensures the most current status and configuration are displayed to the operator. This is especially important for Advanced Peer-to-Peer Networking networks: by their nature, these networks change configuration and status frequently as nodes establish and stop connections. As changes occur in the network, the views are updated. Operators are informed of changes through status color changes and messages, or by failing resources displayed in exception views.
- The SNA topology manager uses RODM to manage the topology data dynamically. Storing objects in RODM allows other applications to make use of the stored data. Objects representing nodes, links, ports, and connections in a network are defined to RODM according to the SNA topology manager data model.
- The SNA topology manager provides several different ways to issue commands. These include:
  - Generic NetView management console commands at the NetView management console workstation

  - Customized command sets at the NetView management console workstation
  - Command line entry using the NetView command interface
- The SNA topology manager provides a sample network to help users become familiar with the SNA topology manager function and to help gain experience with the views in a test environment.

Figure 11 on page 47 shows an overview of the SNA topology manager environment.

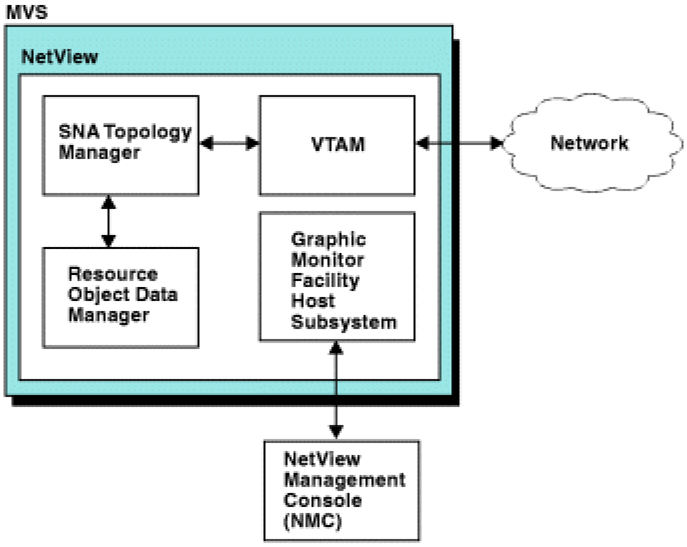
MVS
NetView
SNA Topology Manager
VTAM
Network
Resource Object Data Manager
Graphic Monitor Facility Host Subsystem
NetView Management Console (NMC)

Figure 11. SNA Topology Manager Environment

Chapter 4. Monitoring and Controlling Network Configuration

You can monitor your network and system for changes in the status of individual resources. The NetView program lets you track these changes and display the information for any required analysis. You can explicitly request status information or the NetView program can present it automatically. You can control the amount of information collected, and you can request more information, such as network and system definitions, for use in analyzing changes in status.

You can then take specific actions against individual resources to change their status, make them available for monitoring, or to manipulate their usage. This can include controlling the configuration and definition of the resources. The NetView program provides controls to limit the functions you can use and the resources you can access.

Monitoring Network Resources

You can use various programs to monitor your network. You can use some of these programs to monitor only specific types of resources, for example, SNA (subarea and Advanced Peer-to-Peer Networking) or LAN resources.

To monitor your entire network (consisting of hardware and software, SNA and non-SNA resources), use the graphical workstations.

Monitoring SNA (Subarea and Advanced Peer-to-Peer Networking) Resources

To monitor and control the network, use a combination of the following functions:

- Status monitor
- Hardware monitor
- Session monitor
- Graphic Monitor Facility host subsystem
- SNA topology manager
- User-written command lists
- Messages and message indicators
- Alerts
- NetView management console

You can use the NetView program to monitor SNA subarea networks. The NetView hardware monitor and session monitor collect information about events in the network, log this information, and display it. You can use this information to discover network problems and to monitor the performance of the network.

The NetView program can also manage SNA Advanced Peer-to-Peer Networking networks. In an SNA Advanced Peer-to-Peer Networking network, no single resource controls the network. You designate a single network node as the network management focal point so that network management can be centralized. The rest of the network nodes in the SNA Advanced Peer-to-Peer Networking network act as end nodes or entry points and filter and forward network management data to your network management focal point node.

In a multiple-domain environment, you can expand your control through the use of NetView-to-NetView communications or terminal access facility (TAF) sessions.

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Monitoring IP Resources

Monitoring IP resources in the network is more complex than monitoring SNA resources because of the various places in which the status information can be stored and the many different ways in which this information can be queried. You can monitor the status of IP resources by using the IBM Z NetView 3270 sessions, the NetView management console, the Tivoli Enterprise Portal, or Service Management Unite, depending on the resources being monitored.

IP resource information is discovered and stored in RODM. In general, this discovery occurs in the NetView program, but it can depend on other products. Depending on the method used to view the IP resources, status can be kept and displayed in the NetView management console, or real-time statistics can be kept and viewed through the Tivoli Enterprise Portal.

For a complete description of the IP management capabilities of the NetView program see *IBM Z NetView IP Management*.

Using VTAM Commands (SNA Subarea, SNA Advanced Peer-to-Peer Networking)

When VTAM activates a resource, it owns that resource. Session requests and alerts from that resource are delivered to the owning VTAM. With the hierarchical structure used in the resource definition, you can control a group of resources as a single unit. You can then activate a specified resource, the specified resource and other resources associated with it, or the specified resource and all its associated resource nodes with the initial status set to active.

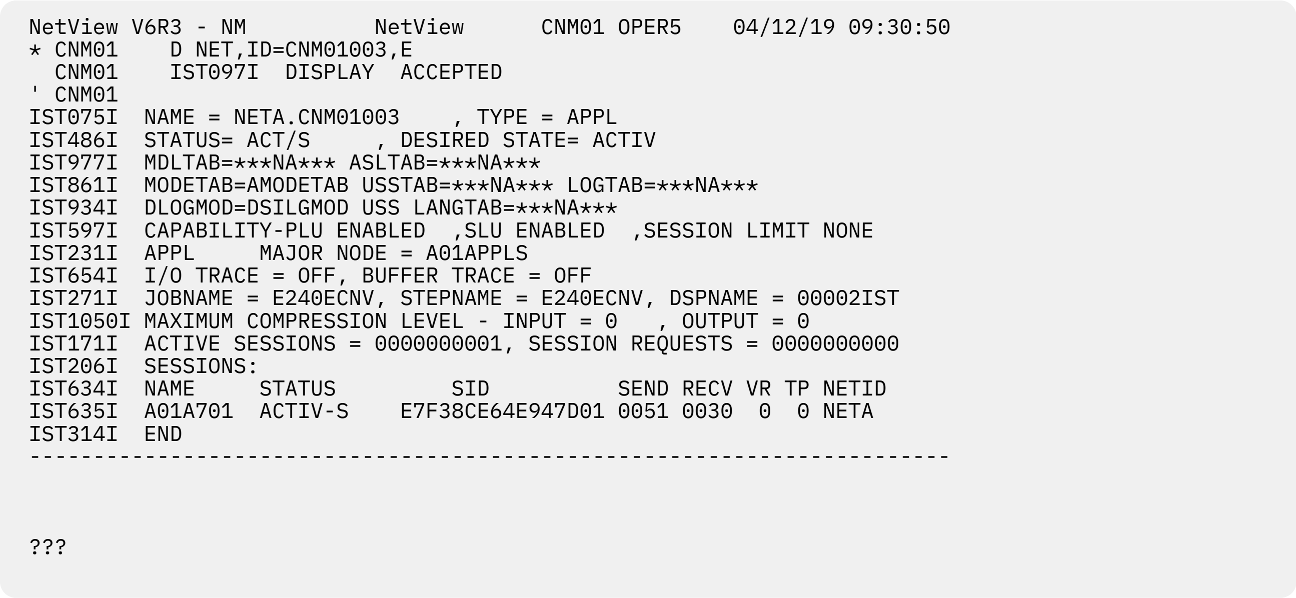
When you use a VTAM DISPLAY, MODIFY, or VARY command, the NetView program checks your authority to issue the command and your authority to access the resource. This authorization check is either against the original issuer of the command (AUTHCHK=SOURCEID) or against the task under which the VTAM command runs (AUTHCHK=TARGETID). The AUTHCHK keyword is specified in the CNMSTYLE member or on the REFRESH command.

Checking the Status of a Resource

You can use the DISPLAY ID VTAM command to check the status of a resource. For example, to check the status of an application CNM01003, enter:

```
d net,id=cnm01003,e
```

A panel similar to Figure 12 on page 51 is displayed.



```
NetView V6R3 - NM          NetView      CNM01 OPER5    04/12/19 09:30:50
* CNM01    D NET,ID=CNM01003,E
  CNM01    IST097I  DISPLAY  ACCEPTED
' CNM01
IST075I  NAME = NETA.CNM01003    , TYPE = APPL
IST486I  STATUS= ACT/S     , DESIRED STATE= ACTIV
IST977I  MDLTAB=***NA*** ASLTAB=***NA***
IST861I  MODETAB=AMODETAB USSTAB=***NA*** LOGTAB=***NA***
IST934I  DLOGMOD=DSILGMOD USS LANGTAB=***NA***
IST597I  CAPABILITY-PLU ENABLED  ,SLU ENABLED  ,SESSION LIMIT NONE
IST231I  APPL     MAJOR NODE = A01APPLS
IST654I  I/O TRACE = OFF, BUFFER TRACE = OFF
IST271I  JOBNAME = E240ECNV, STEPNAME = E240ECNV, DSPNAME = 00002IST
IST1050I MAXIMUM COMPRESSION LEVEL - INPUT = 0   , OUTPUT = 0
IST171I  ACTIVE SESSIONS = 0000000001, SESSION REQUESTS = 0000000000
IST206I  SESSIONS:
IST634I  NAME     STATUS         SID          SEND RECV VR TP NETID
IST635I  A01A701  ACTIV-S    E7F38CE64E947D01 0051 0030  0  0 NETA
IST314I  END
------------------------------------------------------------------------



???
```

Figure 12. Command Facility Display for the D NET,ID Command

Notice that the application CNM01003 is active and currently has one session running. The NetView program supplies command lists (DIS, ACT, INACT, DISG) that can be used instead of the VTAM commands. For more information about these commands, see "Using NetView Commands (SNA Subarea, SNA Advanced Peer-to-Peer Networking)" on page 52, and refer to the NetView online help.

Controlling Resources Defined to VTAM

You can use VTAM commands to control SNA (subarea and Advanced Peer-to-Peer Networking) resources that are defined to VTAM. For example, if a user receives a status code of 695 at the bottom of his terminal screen, you can reset this condition in some cases by changing the status of the SNA subarea resource to inactive and then back to active.

To control SNA resources, complete the following steps from your NetView terminal:

1. To inactivate a resource named NRU0505, enter:

   ```
   v net,id=nru0505,inact
   ```

2. To reactivate the resource, enter:

   ```
   v net,id=nru0505,act
   ```

To activate, inactivate, or load an NCP, complete the following steps from the NetView command facility:

1. To inactivate an NCP named NCP45, enter:

   ```
   v net,id=ncp45,inact
   ```

2. To activate and load the NCP, enter:

   ```
   v net,id=ncp45,act,load=yes
   ```

Using NetView Commands (SNA Subarea, SNA Advanced Peer-to-Peer Networking)

You can use NetView commands to control all or part of a domain by requesting both hardware and software data from network resources. This data can be used to determine when errors occur in the network.

Using the APPLSPEN Command

You can use the APPLSPEN command to list sessions in a specific state for a particular application program. For example, to display all active sessions with the application named a01a701, enter the following command:

```
applspen a01a701,act
```

The system responds with messages similar to the following messages:

```
CNM221I APPLSPEN : NAME = 'A01A701', STATUS = 'ACT/S',
        DESIRED STATE = 'ACTIV'
CNM220I APPLSPEN : ACTIVE SESSIONS = '0000000001',
        SESSION REQUESTS = '0000000000'
CNM311I APPLSPEN : NAME      STATUS    SESSION ID
CNM313I APPLSPEN : TSO0101   ACTIV-P   E7FF38CE6EE8A9AD7
CNM312I APPLSPEN : 1 SESSION(S) IN THE ACT STATE FOR A01A701
```

Using the DISG Command

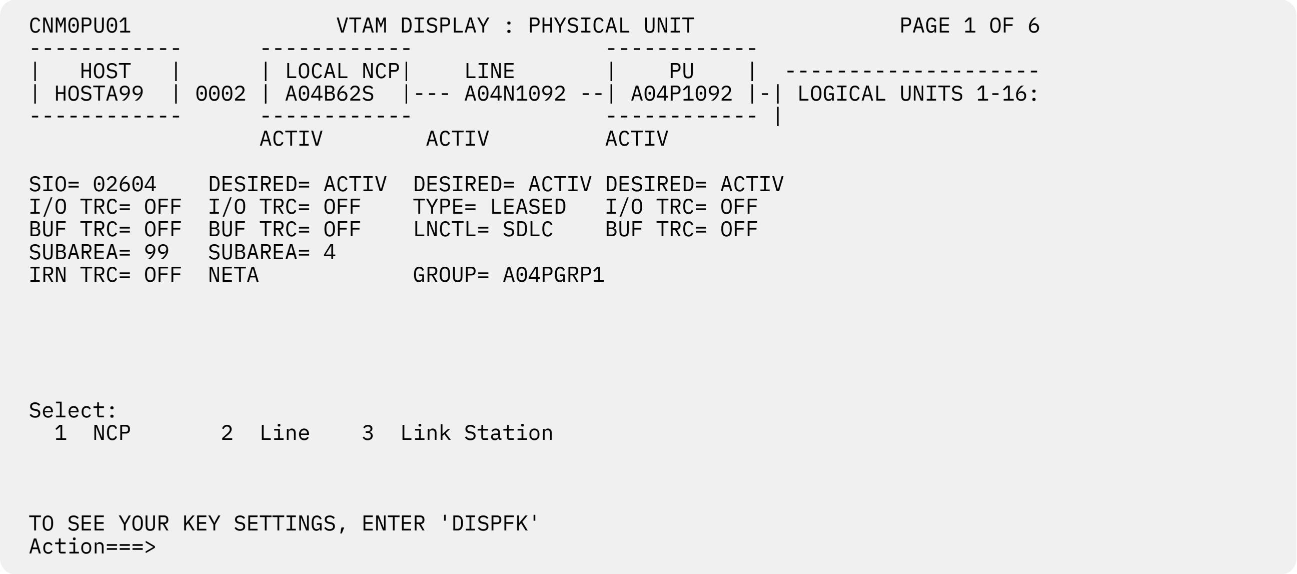
You can use the DISG command list to display the status of resources and to provide connectivity information for LUs, PUs, lines, network control programs (NCPs), and major nodes.

Note: The DISG command cannot be routed to a remote NetView program. To process the DISG command in a remote NetView program, you must log on to that NetView program either directly or through the use of the terminal access facility (TAF) for NetView program.

To issue a DISG command, enter the DISG command followed by the name of the resource. For example, to display the resource status for PU A04P1092, enter the following command:

```
disg a04p1092
```

A panel similar to Figure 13 on page 52 is displayed.

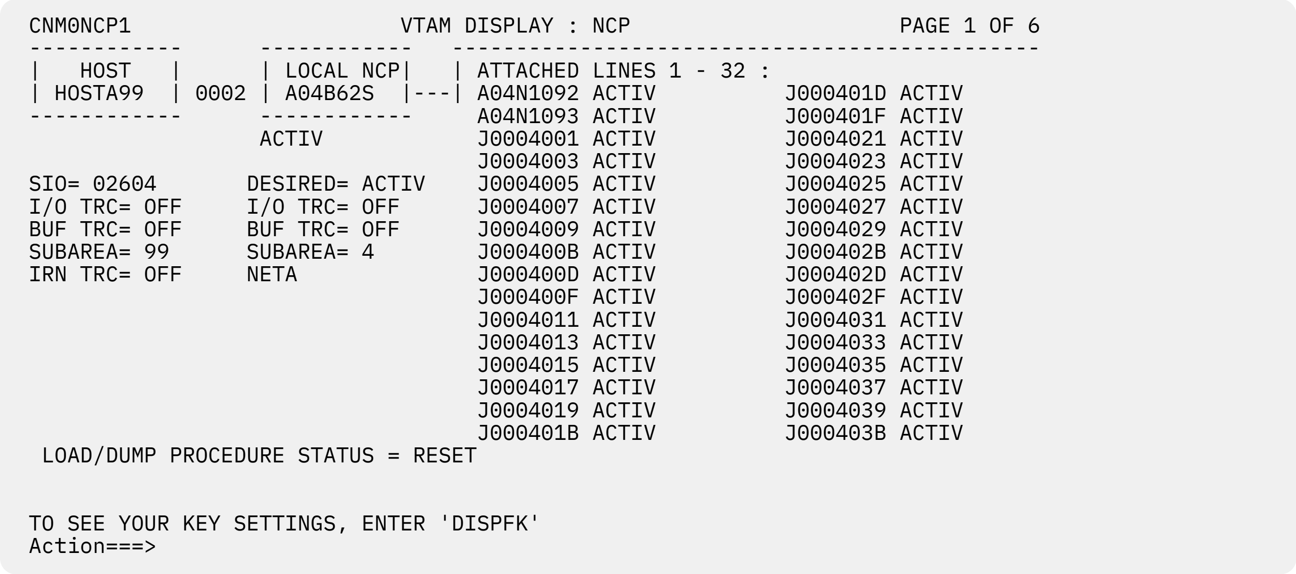


```
CNM0PU01                VTAM DISPLAY : PHYSICAL UNIT                PAGE 1 OF 6
------------      ------------               ------------
|   HOST   |      | LOCAL NCP|    LINE       |    PU    |  --------------------
| HOSTA99  | 0002 | A04B62S  |--- A04N1092 --| A04P1092 |-| LOGICAL UNITS 1-16:
------------      ------------               ------------ |
                  ACTIV        ACTIV         ACTIV

SIO= 02604    DESIRED= ACTIV  DESIRED= ACTIV DESIRED= ACTIV
I/O TRC= OFF  I/O TRC= OFF    TYPE= LEASED   I/O TRC= OFF
BUF TRC= OFF  BUF TRC= OFF    LNCTL= SDLC    BUF TRC= OFF
SUBAREA= 99   SUBAREA= 4
IRN TRC= OFF  NETA            GROUP= A04PGRP1




Select:
  1  NCP       2  Line    3  Link Station



TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
Action===>
```

Figure 13. Display of a Physical Unit

This panel is useful in determining the highest level node that is inactive or disabled. You can then use the highest level inactive resource as your starting point in isolating problems.

Depending on how the resource is connected, you can display detailed information about specific components. In this example, you can display detailed information about the NCP, line, and link station shown in the connectivity diagram. For example, if you choose to display detailed information for the NCPs, a panel similar to Figure 14 on page 53 is displayed.



```
CNM0NCP1                     VTAM DISPLAY : NCP                    PAGE 1 OF 6
------------      ------------   ----------------------------------------------
|   HOST   |      | LOCAL NCP|   | ATTACHED LINES 1 - 32 :
| HOSTA99  | 0002 | A04B62S  |---| A04N1092 ACTIV          J000401D ACTIV
------------      ------------     A04N1093 ACTIV          J000401F ACTIV
                  ACTIV            J0004001 ACTIV          J0004021 ACTIV
                                   J0004003 ACTIV          J0004023 ACTIV
SIO= 02604       DESIRED= ACTIV    J0004005 ACTIV          J0004025 ACTIV
I/O TRC= OFF     I/O TRC= OFF      J0004007 ACTIV          J0004027 ACTIV
BUF TRC= OFF     BUF TRC= OFF      J0004009 ACTIV          J0004029 ACTIV
SUBAREA= 99      SUBAREA= 4        J000400B ACTIV          J000402B ACTIV
IRN TRC= OFF     NETA              J000400D ACTIV          J000402D ACTIV
                                   J000400F ACTIV          J000402F ACTIV
                                   J0004011 ACTIV          J0004031 ACTIV
                                   J0004013 ACTIV          J0004033 ACTIV
                                   J0004015 ACTIV          J0004035 ACTIV
                                   J0004017 ACTIV          J0004037 ACTIV
                                   J0004019 ACTIV          J0004039 ACTIV
                                   J000401B ACTIV          J000403B ACTIV
 LOAD/DUMP PROCEDURE STATUS = RESET


TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
Action===>
```

Figure 14. Detailed NCP Information

Using the RMTCMD Command

To control resources that are managed by a remote NetView program from your local NetView program, use the RMTCMD command. This command is especially useful when you want to issue a sequence of commands to one or more remote NetView programs.

Sending Commands

The following example uses the local NetView program and a remote NetView program named CNM02. Complete the following steps to activate an NCP controlled by the VTAM program on CNM02:

1. From your local NetView console, enter the following command:

   ```
   rmtcmd lu=cnm02,act ncp2
   ```

   This command establishes an association with a RMTCMD autotask using the same name as your operator ID running in the remote NetView program CNM02.
2. To ensure the NCP is now active, enter:

   ```
    rmtcmd lu=cnm02,dis ncp2
   ```

   The command response indicates that you activated the NCP successfully.

The first time you issue the RMTCMD command, the NetView program establishes an association between your operator ID and your RMTCMD autotask in the remote NetView program. Subsequent commands are sent using this association. The association remains active until:

- You log off your local NetView program.
- You send a LOGOFF command to your RMTCMD autotask.

- You enter an ENDTASK command from your local NetView console. The NetView program then ends your RMTCMD autotask:

  ```
  endtask lu=cnm02,stop
  ```

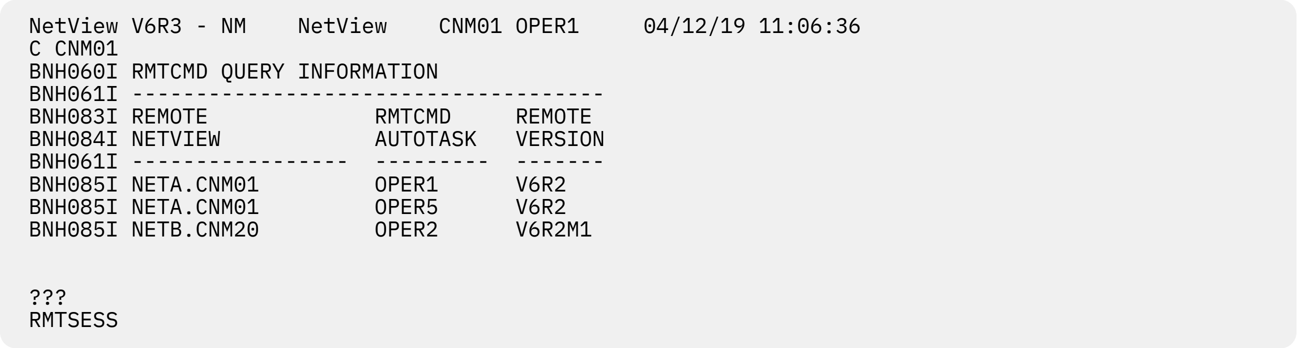
- An SNA sense code is received indicating a communication failure with the remote NetView program.

Listing the Autotasks You Started

To list the active RMTCMD autotasks which you started, enter the following command from your local NetView console:

```
rmtsess
```

A list of the RMTCMD autotasks which you have started is displayed. An example is shown on Figure 15 on page 54:



```
NetView V6R3 - NM    NetView    CNM01 OPER1     04/12/19 11:06:36
C CNM01
BNH060I RMTCMD QUERY INFORMATION
BNH061I -------------------------------------
BNH083I REMOTE             RMTCMD     REMOTE
BNH084I NETVIEW            AUTOTASK   VERSION
BNH061I -----------------  ---------  -------
BNH085I NETA.CNM01         OPER1      V6R2
BNH085I NETA.CNM01         OPER5      V6R2
BNH085I NETB.CNM20         OPER2      V6R2M1


???
RMTSESS
```

Figure 15. Sample Output from the RMTSESS Command

Notice in this example that the operator started two RMTCMD autotasks on NETA.CNM01: OPER1 and OPER5. Also, the operator started a RMTCMD autotask on NETB.CNM20: OPER2.

Restricting Access before Using the RMTCMD Command

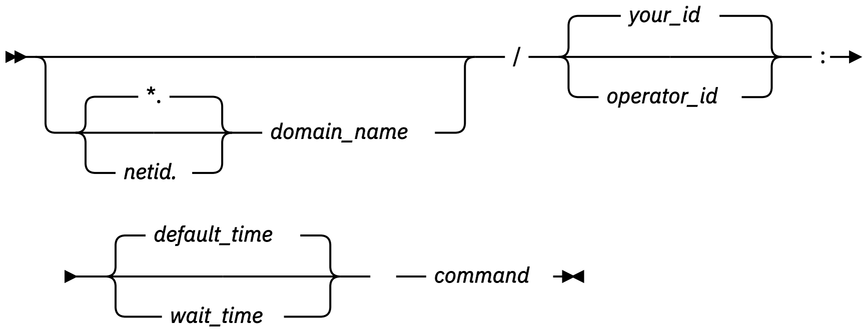
Before using the RMTCMD command, you should consider how to restrict access to cross-domain resources and commands. To restrict access, you can have the NetView program validate an operator's authority to start or stop an autotask through the RMTCMD command.

Using Labels to Route Commands

You can use a label to route a command so it processes under another task, either within your NetView program or to a remote NetView program. The syntax is shorter than using the NetView RMTCMD or EXCMD commands, and labels provide correlated responses, which is useful to hold responses with commands and in conjunction with a NetView pipe CORRCMD stage.

Syntax

In the simplest case, entering `/:` *`command`* allows the label to default to your domain and your operator ID. In this case, the label prefix bypasses RMTCMD or EXCMD processing, and simply correlates the responses with the command.



Where:

netid
: Specifies the VTAM network ID that should be used for routing the command. If specified, the *netid* value, including an asterisk (*), must be followed by a period (.). If you do not specify a value or an asterisk, the default value is to find the network ID dynamically. See the description of the RMTCMD command in the *IBM Z NetView Command Reference Volume 1 (A-N)* for more information.

domain_name
: Specifies the application name (such as CNM02) of the NetView program to which the command should be routed. The presence of this value determines that the label is treated like a RMTCMD SEND request.

If the domain name that you specify was defined for IP routing by your system programmer (using a RMTSYN statement in the CNMSTYLE member), your command is routed over TCP/IP.

operator_id
: Specifies the name of the operator task where the command should process. If you specify an *opid* value, other than your operator ID, the label is treated like an EXCMD command. If you do not specify a value or enter an asterisk (*), the default is to send the command to your operator ID.

wait_time
: Specifies the maximum time in seconds that the command running on the target is to collect correlated messages.

If you do not specify *wait_time*, the *default_time* is defined by the CCDEF command specifications, such as the values supplied by the NetView product in the DSICCDEF profile. If the label specifies a remote domain, the *default_time* of the CCDEF specifications at the remote domain determines the default wait time.

command
: Specifies the command, keyword, or values, which are routed and correlated by the label prefix.

Usage Notes

The following list includes usage considerations:

- A label can be used anywhere a regular NetView command can be entered, except on the assembler interface described in *IBM Z NetView Programming: Assembler*.
- You must enter a blank before any command, immediately after the colon. No blanks can be used within the label.
- Error conditions and messages, including authority checking, typically apply as if you had entered a RMTCMD or EXCMD command. Unlike RMTCMD or EXCMD, the label syntax causes correlated responses from the command to be returned to the originator. For more information, refer to the description of the NetView RMTCMD and EXCMD commands in the NetView online help.
- If your label addresses a remote NetView program, the command is transmitted by either LU 6.2 or TCP/IP as determined by the RMTSYN definitions in the CNMSTYLE member.
- When using labeled commands to send a VTAM command to a remote VTAM, ensure the automation table entries for IST097I match in both the local and remote NetView systems.

- For commands with slower than expected response times (for example MVS ROUTE), you might need to set longer time-out values. The slower response time causes the target task to remain in a wait state, possibly delaying other scheduled commands. For some commands, responses received after the time-out interval is displayed at the target task (but not returned to the labeled command issuer). You can browse the NetView log on the target domain to see the responses. The VTAM VARY and MVS commands are in this category, along with commands that your system programmer has identified with PERSIST in the CCDEF definitions.

Topic:	Reference:
ENDTASK, REFRESH, RMTCMD command	NetView online help
Defining RMTCMD and RMTCMD Security	*IBM Z NetView Installation: Configuring Additional Components*
Security Definitions (RMTSEC and RMTSECUR parameters)	*IBM Z NetView Administration Reference*

Example

The following example shows how to use the `/AUTO1: QRYGLOBL TASK,VARS=*` command to query the values of a task global variable under another task:

```
* NTV7E     /AUTO1: QRYGLOBL TASK,VARS=*
! NTV7E    QRYGLOBL TASK,VARS=*
' NTV7E
BNH031I NETVIEW GLOBAL VARIABLE INFORMATION
BNH103I COMMAND ISSUED AT: 05/23/19 08:38:25
BNH061I
BNH033I TASK GLOBAL VARIABLES FOR AUTO1
BNH036I GLOBAL VARIABLE NAME:               GLOBAL VARIABLE VALUE:
BNH061I ---------------------               ----------------------
BNH039I GLTIME                              19/05/23 08:37:31
BNH039I LINKOPER                            GEORGE
BNH035I NUMBER OF VARIABLES FOUND: 2
BNH061I
BNH037I NETVIEW GLOBAL VARIABLE INFORMATION COMPLETE
```

Figure 16. Querying the Values of a Task Global Variable

Using the TOPOSNA Command

To control the collection of SNA subarea and Advanced Peer-to-Peer Networking topology information, use the TOPOSNA command. You can start the SNA topology manager manually using the STARTCNM SNATM command, or you can automatically start it using the NetView automation table with DSIPARM member FLBAUT.

Monitoring Topology Information

Topology information is one of three categories:

Network topology

For Advanced Peer-to-Peer Networking, network topology consists of all the network nodes within a particular subnetwork and the TG circuits connecting them.

For subarea, network topology consists of all CDRMs that are active at the node where the topology is being collected.

Local topology

For Advanced Peer-to-Peer Networking, local topology consists of the node where the topology is being collected and all adjacent nodes, connections to those adjacent nodes, and the local underlying ports and logical links making up those connections.

For subarea, local topology consists of the resources (except LUs) contained in the domain of the node where the topology is being collected.

LU topology

For VTAM agents only, consists of both dependent and independent LUs of various types such as terminals, applications, and CDRSCs.

To collect topology information, use the TOPOSNA MONITOR command. For example, to begin collection of network topology from the agent residing at node A11M, enter:

```
toposna monitor node=a11m network
```

Monitoring Critical LUs

You can monitor critical LUs using the TOPOSNA CRITICAL command. This command causes NetView to discover the LU through VTAM, create an object in RODM, and monitor the status of the LU. A CDRSC must be known in the domain where the LU is monitored before the TOPOSNA CRITICAL command can be issued. For example, to begin monitoring a critical LU named N3111LUC in the node A11M in network NETA, enter:

```
toposna critical startmon=neta.a11m.neta.n3111luc
```

You can create a member in DSIOPEN that contains a list of critical LUs to be monitored. You can then use the REFRESHC command to start or stop monitoring of these LUs. NetView provides a sample list FLBCRLUS (FLBS8002). To start monitoring critical LUs listed in member FLBCRLUS, enter:

```
refreshc startmon member=flbcrlus
```

Displaying the Status of Monitoring Requests

You can display a list of the nodes which are currently being monitored using the TOPOSNA LISTREQS command. This command lists the type of monitoring in effect, the status of the monitor request, and the duration of the monitor request. Use the TOPOSNA CRITICAL command with the LIST keyword to display a list of LUs and CDRSCs that the SNA topology manager is currently monitoring continuously.

Using the Session Monitor (SNA Subarea, SNA Advanced Peer-to-Peer Networking)

The primary tool for solving logical problems dealing with sessions is the NetView session monitor. The session monitor collects and correlates data about SNA (subarea and Advanced Peer-to-Peer Networking) sessions. The session monitor also helps identify network problems and conditions that might cause errors. Some examples of this are failing or unresponsive terminals, lost path information units (PIUs), buffer errors, and resource status errors.

The session monitor collects data about same-domain, cross-domain, and cross-network subarea sessions and SNA Advanced Peer-to-Peer Networking sessions, and maintains the collected data on a session basis. The SNA subarea sessions can involve non-SNA terminals supported by the Network Terminal Option (NTO). These NTO sessions are seen by the host as normal SNA sessions. The session monitor also collects data about data flows for certain non-SNA terminals that are not supported by NTO.

You can use the session monitor to display information about resources in pure SNA subarea, pure SNA Advanced Peer-to-Peer Networking, or mixed networks. This information includes:

- Session parameter data
- Session configuration data
- Session event time stamps
- Session partner identification
- Session response time
- Session trace data
- Session virtual-route data, explicit-route data, and Advanced Peer-to-Peer Networking route data

- Advanced Peer-to-Peer Networking flow control data
- Transmission group information

The data is stored in virtual memory and at session end is written to the VSAM database. See Figure 17 on page 58 for an overview of the sources of session monitor data.

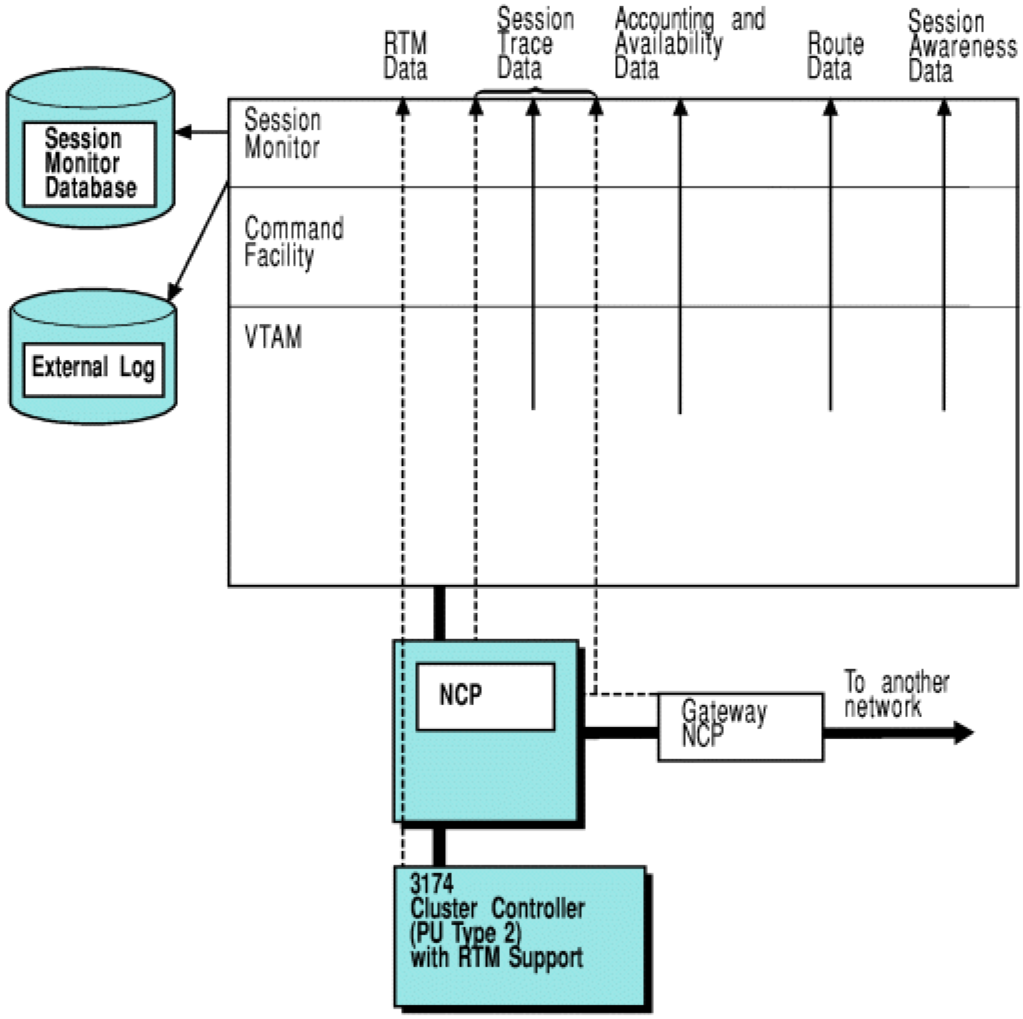


Figure 17. Session Monitor Data Collection

Session Response Time Data

The session monitor collects the response time data on command and when the session ends, and displays the data in various formats. The control units accumulate the measured response times into ranges of time that are specified by the performance class definitions. Sessions are associated with certain performance classes, and each performance class has associated with it a specific response time objective. You can display response-time graphs that show how the actual response time compares to a specified objective.

Response time data is displayed in:

- Response time summary for a terminal LU
- Response time trend for a terminal LU
- Response time for a session by collection period

Response time and configuration data for each session can be written to an external log as the response time data is collected, allowing other programs to process it.

Session Trace Data

Session trace data consists of session activation parameters, VTAM path information unit (PIU) data, and network control program (NCP) data.

Before the session monitor collects session trace data, start a session trace. You can start a trace for a resource before it is activated. After you start a trace for a node, the session monitor remembers to trace the node if it is deactivated and then activated again. NCP gateway trace data does not depend on trace activation status.

You can display the parameters used in session activation. Session activation parameters are those parameters included in the SNA command used to activate the session. BIND, activate physical unit (ACTPU), activate logical unit (ACTLU), and activate cross-domain resource manager (ACTCDRM) are examples of those commands. The session activation parameters can be displayed in hexadecimal or text representation.

You can display two types of NCP trace data for sessions involving NCP-attached resources: boundary function trace data and gateway trace data. Boundary function NCP data consists of the last four PIU sequence numbers (the last two outbound and last two inbound) and selected fields from control blocks passed to the session monitor from the NCP. (These fields are described in *NCP and EP Reference Summary and Data Areas* .) Gateway NCP data consists of the last four PIU sequence numbers (the last two outbound and the last two inbound) to cross the gateway NCP. This data also contains all control blocks sent from the gateway NCP. The NCP control blocks displayed depend on the type of resource in the session.

You can display VTAM PIU data of all sessions for which the session monitor collects session trace data. PIU data includes the transmission header (TH), the request/response header (RH), and the request unit (RU). Truncated PIUs have a maximum of 11 bytes of the RU displayed; otherwise the complete PIU is displayed. PIU data can be displayed in hexadecimal or text representation.

PIUs that are discarded by VTAM are transferred to the session monitor for trace processing. These PIUs fall into two main categories:

- PIUs that are associated with a specific active session and are discarded because of a protocol violation; for example, a data count field (DCF) that is not valid
- PIUs that are discarded because they are not associated with a specific active session; for example, extraneous traffic

In each case, the session monitor retains copies of the discarded PIUs in a *pseudosession* trace buffer. You can access this buffer using the following command:

```
sess *discard
```

Because the PIUs in this area are associated with many different sessions, no session parameters or session configuration data are available. However, selection from the SESS panel displays the trace data. The size of the *DISCARD area is specified by the session monitor KEEPDISC initialization statement. The *DISCARD data is not saved in the VSAM database when the session monitor is brought down unless the save is set up by a FORCE command. You can use this command with a timer-driven command list.

If associated with a specific session, PIUs discarded by the access method are inserted in the active session's PIU wrap area. You can then examine the discarded PIU in the context of that session's PIU flow. If the PIU is discarded from this area (because of session activity), a copy can still exist in the *DISCARD file.

Network Accounting and Availability Measurement Data

Network accounting and availability data measurement provides you with network availability data and distribution of use of network resources. Start this function when you initialize the session monitor. The measured data is written to an external log by the RECORD command and at session end for offline processing. See the *IBM Z NetView Installation: Configuring Additional Components* for your operating system for more information.

Route Data

Active route data is collected whenever a route is first used by a session. The route information includes a list of PUs and transmission groups (TGs) that make up the explicit route. Use the session monitor to view the route data and then proceed into the session hierarchy on a route-by-route basis.

Active route data is displayed in the following ways:

- Active explicit route list
- Active virtual route list
- Active virtual route status
- Explicit route configuration
- Transmission group information
- Advanced Peer-to-Peer Networking route data

Session Awareness Data

Session awareness data is information about session activity within the networks. This data identifies the partners of each session, which can be in the same domain, in different domains, or in different networks.

When the session monitor is active, session awareness data is collected whenever a session begins or ends. Session awareness data consists of information from VTAM, such as:

- Session activation status
- Session type
- Session partner names

  Session partners can be:

  - Logical unit to logical unit (LU-LU)
  - System services control point to logical unit (SSCP-LU)
  - System services control point to physical unit (SSCP-PU)
  - System services control point to system services control point (SSCP-SSCP)
  - Control point to control point (CP-CP)
- LU application states, such as:
  - Active
  - Inactive
  - Recovery pending
  - Recovery in progress
  - Recovery complete
- Session configuration data

Activation status includes BIND failure, UNBIND reason and sense codes, and INIT failure. Session awareness data includes information about the activation status for certain non-SNA terminals not supported by the Network Terminal Option.

Session awareness data is displayed in various forms. Some examples are resource lists, domain lists, session histories for specific resources, and session configuration diagrams. Session awareness data is required for all other types of data collection.

Setting Up the Session Monitor

To view the data described in the previous section, ensure that the session monitor is defined correctly, especially with regard to defining session awareness data, trace data, and so on. For additional information about defining the session monitor, refer to the *IBM Z NetView Installation: Configuring Additional Components* . In addition:

- To collect data for cross-domain sessions, a session monitor must be available in each domain.
- To collect data for cross-network sessions, a session monitor must be available in each gateway host on the session path and at the session end points.
- To collect data for SNA Advanced Peer-to-Peer Networking sessions, a session monitor must be available at the Interchange node.

Session Monitor Scenarios

The scenarios in this section show how to navigate through the session monitor panels. A brief description of each panel is provided. You can get general online help for session monitor by entering `help nldm` from the command line. You can obtain specific field level help by entering the following command, where *term* specifies one or more words of the field:

```
help nldm 'term'
```

The scenarios illustrate the following kinds of sessions:

- An LU-LU session for an SNA subarea network
- A CP-CP session for an SNA Advanced Peer-to-Peer Networking network
- An LU-LU session for an SNA Advanced Peer-to-Peer Networking or mixed network
- An SNA session through an Advanced Peer-to-Peer Networking Network (DLUR/DLUS)
- An LU-LU session for an SNA Advanced Peer-to-Peer Networking or mixed network showing Takeover/ Giveback data

In addition, the Session and Storage Information panel (obtained with the SESSMDIS command) is explained in detail.

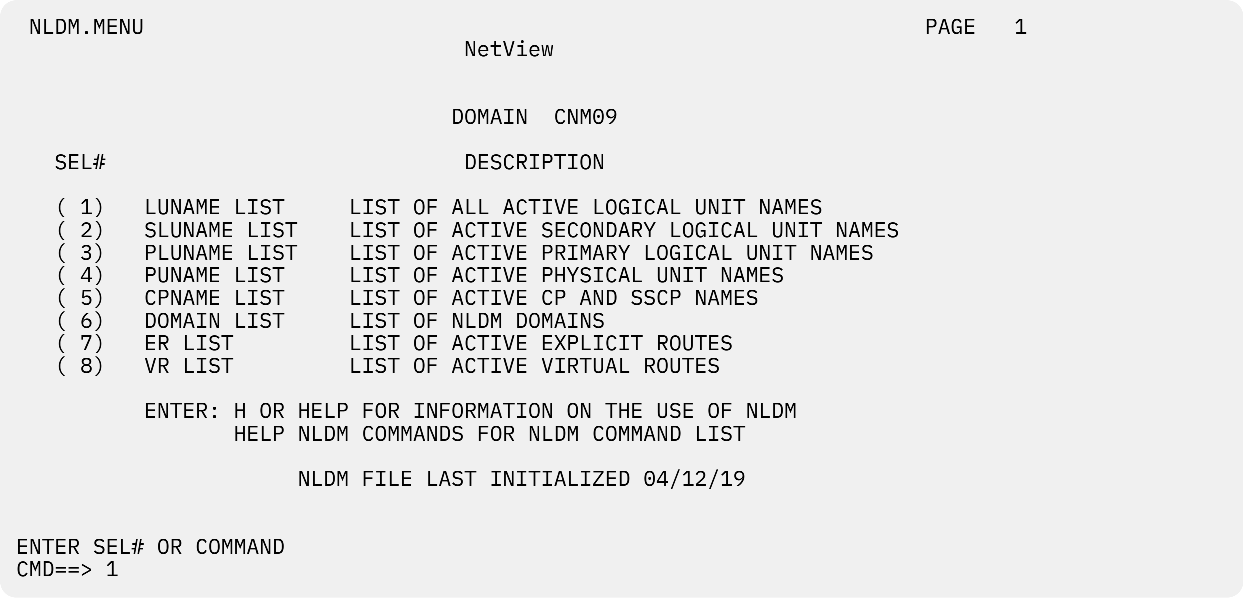
For help on any term on these screens, type:

```
HELP NLDM 'term'
```

Typical LU-LU Session for an SNA Subarea Network

To monitor an LU-LU session for an SNA subarea network:

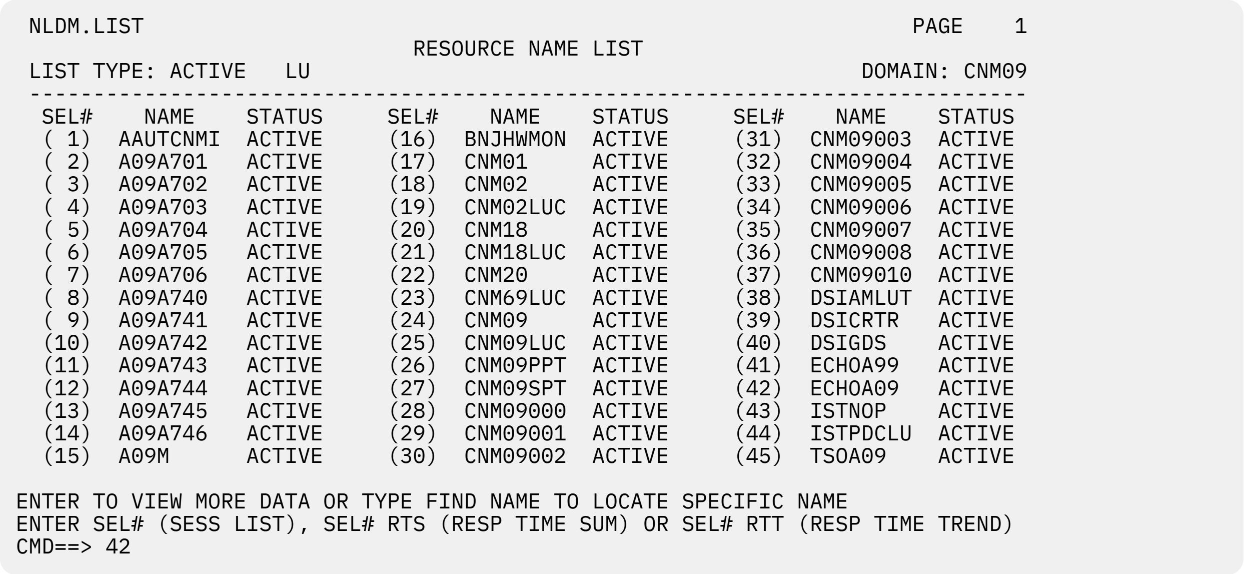
1. Type **nldm** at the command line to access the session monitor main menu. A panel similar to Figure 18 on page 62 is displayed.



```
 NLDM.MENU                                                     PAGE   1
                                  NetView


                                 DOMAIN  CNM09

   SEL#                           DESCRIPTION

   ( 1)   LUNAME LIST     LIST OF ALL ACTIVE LOGICAL UNIT NAMES
   ( 2)   SLUNAME LIST    LIST OF ACTIVE SECONDARY LOGICAL UNIT NAMES
   ( 3)   PLUNAME LIST    LIST OF ACTIVE PRIMARY LOGICAL UNIT NAMES
   ( 4)   PUNAME LIST     LIST OF ACTIVE PHYSICAL UNIT NAMES
   ( 5)   CPNAME LIST     LIST OF ACTIVE CP AND SSCP NAMES
   ( 6)   DOMAIN LIST     LIST OF NLDM DOMAINS
   ( 7)   ER LIST         LIST OF ACTIVE EXPLICIT ROUTES
   ( 8)   VR LIST         LIST OF ACTIVE VIRTUAL ROUTES

          ENTER: H OR HELP FOR INFORMATION ON THE USE OF NLDM
                 HELP NLDM COMMANDS FOR NLDM COMMAND LIST

                      NLDM FILE LAST INITIALIZED 04/12/19


ENTER SEL# OR COMMAND
CMD==> 1
```

Figure 18. Session Monitor Main Menu

2. Select *1* to display the list of active LUs. You can also enter **list lu** from the command line to access the list of LUs. A panel similar to Figure 19 on page 62 is displayed.

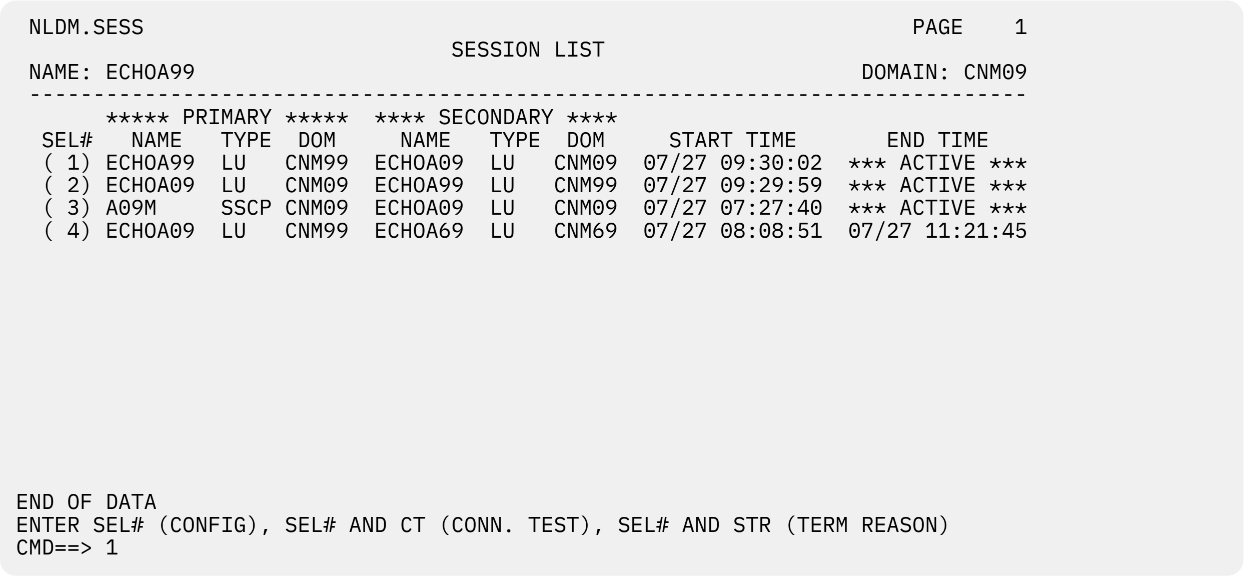


```
 NLDM.LIST                                                    PAGE    1
                              RESOURCE NAME LIST
 LIST TYPE: ACTIVE   LU                                   DOMAIN: CNM09
 ---------------------------------------------------------------------------
  SEL#    NAME    STATUS     SEL#    NAME    STATUS     SEL#    NAME    STATUS
  ( 1)  AAUTCNMI  ACTIVE     (16)  BNJHWMON  ACTIVE     (31)  CNM09003  ACTIVE
  ( 2)  A09A701   ACTIVE     (17)  CNM01     ACTIVE     (32)  CNM09004  ACTIVE
  ( 3)  A09A702   ACTIVE     (18)  CNM02     ACTIVE     (33)  CNM09005  ACTIVE
  ( 4)  A09A703   ACTIVE     (19)  CNM02LUC  ACTIVE     (34)  CNM09006  ACTIVE
  ( 5)  A09A704   ACTIVE     (20)  CNM18     ACTIVE     (35)  CNM09007  ACTIVE
  ( 6)  A09A705   ACTIVE     (21)  CNM18LUC  ACTIVE     (36)  CNM09008  ACTIVE
  ( 7)  A09A706   ACTIVE     (22)  CNM20     ACTIVE     (37)  CNM09010  ACTIVE
  ( 8)  A09A740   ACTIVE     (23)  CNM69LUC  ACTIVE     (38)  DSIAMLUT  ACTIVE
  ( 9)  A09A741   ACTIVE     (24)  CNM09     ACTIVE     (39)  DSICRTR   ACTIVE
  (10)  A09A742   ACTIVE     (25)  CNM09LUC  ACTIVE     (40)  DSIGDS    ACTIVE
  (11)  A09A743   ACTIVE     (26)  CNM09PPT  ACTIVE     (41)  ECHOA99   ACTIVE
  (12)  A09A744   ACTIVE     (27)  CNM09SPT  ACTIVE     (42)  ECHOA09   ACTIVE
  (13)  A09A745   ACTIVE     (28)  CNM09000  ACTIVE     (43)  ISTNOP    ACTIVE
  (14)  A09A746   ACTIVE     (29)  CNM09001  ACTIVE     (44)  ISTPDCLU  ACTIVE
  (15)  A09M      ACTIVE     (30)  CNM09002  ACTIVE     (45)  TSOA09    ACTIVE

ENTER TO VIEW MORE DATA OR TYPE FIND NAME TO LOCATE SPECIFIC NAME
ENTER SEL# (SESS LIST), SEL# RTS (RESP TIME SUM) OR SEL# RTT (RESP TIME TREND)
CMD==> 42
```

Figure 19. Resource Name List Panel

In a large network, listing all the LUs can be resource intensive and can result in several panels of information. In such a case, you might consider using the SESS command, as explained in the following step.

3. Locate the specific resource name and select the corresponding number to display a list of sessions for that resource. For example, to list all the sessions for ECHOA09, enter 42 in the `CMD==>` field. You can also enter `sess echoa09` from the command line to get to the session list panel. A panel similar to Figure 20 on page 63 is displayed.

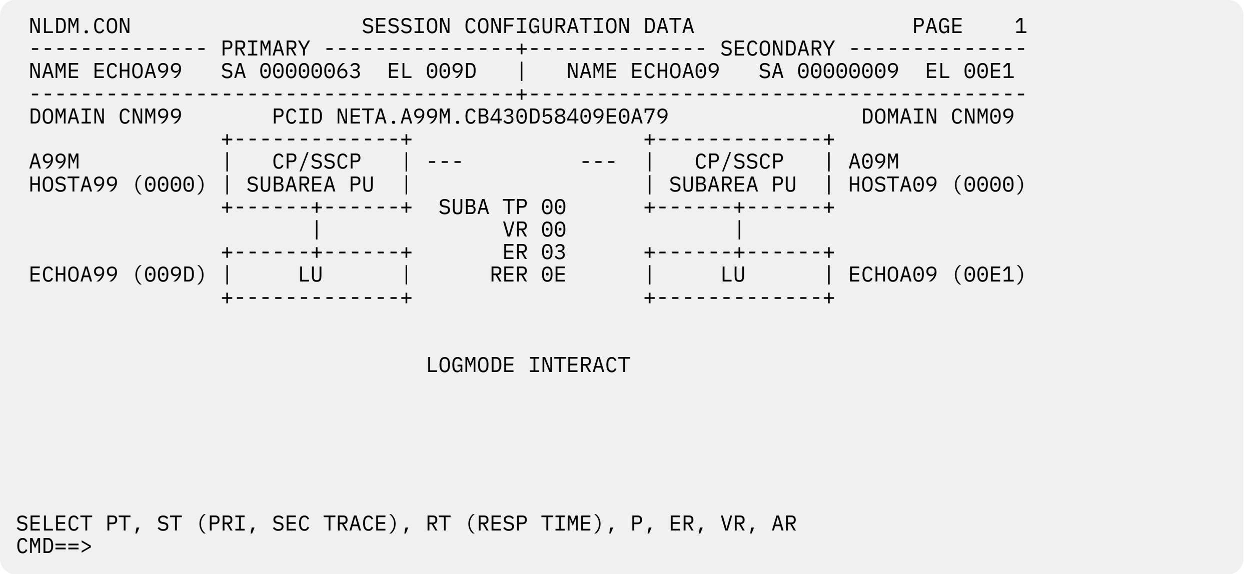


```
 NLDM.SESS                                                            PAGE    1
                                  SESSION LIST
 NAME: ECHOA99                                                    DOMAIN: CNM09
 ------------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
  ( 1) ECHOA99  LU   CNM99  ECHOA09  LU   CNM09  07/27 09:30:02  *** ACTIVE ***
  ( 2) ECHOA09  LU   CNM09  ECHOA99  LU   CNM99  07/27 09:29:59  *** ACTIVE ***
  ( 3) A09M     SSCP CNM09  ECHOA09  LU   CNM09  07/27 07:27:40  *** ACTIVE ***
  ( 4) ECHOA09  LU   CNM99  ECHOA69  LU   CNM69  07/27 08:08:51  07/27 11:21:45









END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==> 1
```

Figure 20. Session List Panel

This panel lists the active and stopped sessions that are still in the database for a resource. Each entry in the list is one session. Each line shows the session date, start time, session partner, and current status.

4. Select a session number to obtain configuration data for that session (in this case, session 1). A panel similar to Figure 21 on page 63 is displayed.

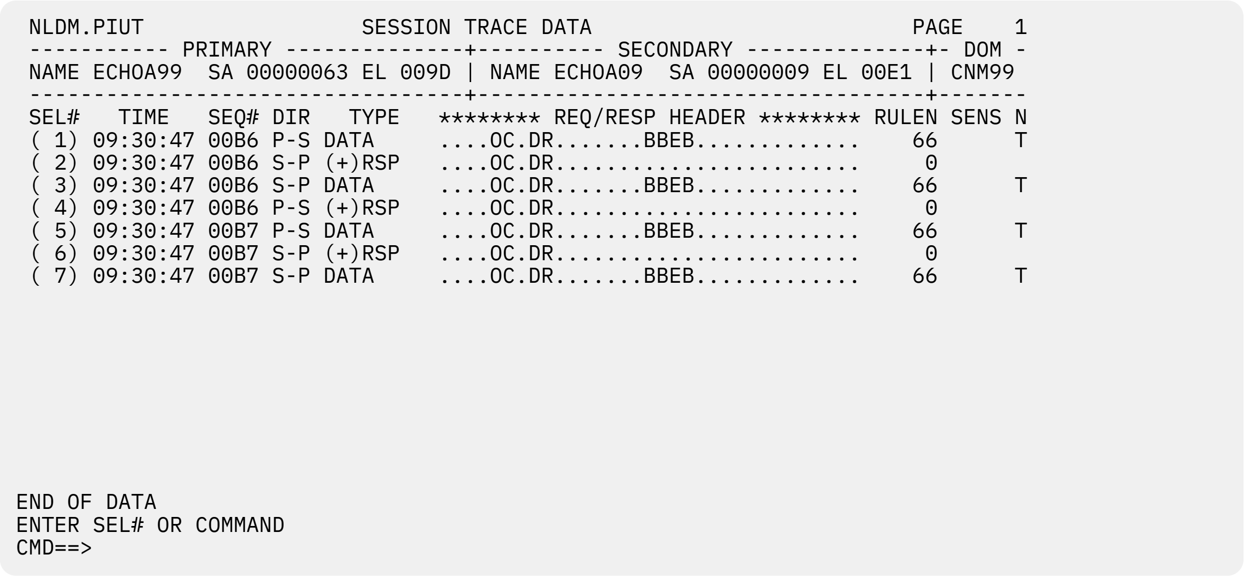


```
 NLDM.CON                  SESSION CONFIGURATION DATA                 PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME ECHOA99   SA 00000063  EL 009D   |   NAME ECHOA09   SA 00000009  EL 00E1
 --------------------------------------+---------------------------------------
 DOMAIN CNM99       PCID NETA.A99M.CB430D58409E0A79               DOMAIN CNM09
                +-------------+                  +-------------+
 A99M           |   CP/SSCP   | ---         ---  |   CP/SSCP   | A09M
 HOSTA99 (0000) | SUBAREA PU  |                  | SUBAREA PU  | HOSTA09 (0000)
                +------+------+  SUBA TP 00      +------+------+
                       |              VR 00             |
                +------+------+       ER 03      +------+------+
 ECHOA99 (009D) |     LU      |      RER 0E      |     LU      | ECHOA09 (00E1)
                +-------------+                  +-------------+


                                LOGMODE INTERACT






SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR, AR
CMD==>
```

Figure 21. Session Configuration Data Panel

This panel shows how each LU is physically connected to its own subarea. Note that even though AR (Advanced Peer-to-Peer Networking Route) is listed as an option, LU-LU sessions across pure SNA subarea networks do not have Advanced Peer-to-Peer Networking route data. If you choose this option, you receive a message stating that Advanced Peer-to-Peer Networking session route data is not available.

5. Enter the option to display trace data. You can enter **pt** to display primary session trace data or **st** to display secondary session trace data. If you enter **st**, a panel similar to Figure 22 on page 64 is displayed:



```
 NLDM.PIUT                 SESSION TRACE DATA                         PAGE    1
 ----------- PRIMARY --------------+---------- SECONDARY --------------+- DOM -
 NAME ECHOA99  SA 00000063 EL 009D | NAME ECHOA09  SA 00000009 EL 00E1 | CNM99
 ----------------------------------+-----------------------------------+-------
 SEL#   TIME   SEQ# DIR   TYPE   ******** REQ/RESP HEADER ******** RULEN SENS N
 ( 1) 09:30:47 00B6 P-S DATA     ....OC.DR.......BBEB.............    66      T
 ( 2) 09:30:47 00B6 S-P (+)RSP   ....OC.DR........................     0
 ( 3) 09:30:47 00B6 S-P DATA     ....OC.DR.......BBEB.............    66      T
 ( 4) 09:30:47 00B6 P-S (+)RSP   ....OC.DR........................     0
 ( 5) 09:30:47 00B7 P-S DATA     ....OC.DR.......BBEB.............    66      T
 ( 6) 09:30:47 00B7 S-P (+)RSP   ....OC.DR........................     0
 ( 7) 09:30:47 00B7 S-P DATA     ....OC.DR.......BBEB.............    66      T









END OF DATA
ENTER SEL# OR COMMAND
CMD==>
```

Figure 22. Session Trace Data Panel

This panel shows the flow of the most recent PIUs on a session. Also shown is the time, type, and length of the data that was sent, and the direction in which it was sent. Complete PIUs are available for LU-LU session debugging. If the data is truncated, a T marker is displayed in the right margin.

6. If you enter a selection number for a PIU, the PIU is displayed in hexadecimal and EBCDIC representation on the NLDM.PIUD panel.

   If `SEL# AND F (FORMATTED RU)` is an option, you can enter a selection number followed by a space followed by F to display the formatted PIU, if formatted data is available, on the NLDM.PIUF panel. Formatting is generally available for PIUs with the following characteristics:

   - They contain an SNA request/response header (RH) and a format header (FMH) type 5.
   - They are complete enough to format.
   - They are not compressed.

   The first formatted page shows the FMH. Subsequent pages show the different general data stream (GDS) variable types that are included in the PIU.

   Note: Formatting is limited to approximately the first 1000 bytes.

   From any page in the formatted display, you can enter `SET HEX ON` to reference the hexadecimal and EBCDIC PIU. The resulting NLDM.PIUF.HEX panel displays the hexadecimal and EBCDIC representation associated with that particular page, as indicated by the matching hex offsets listed on either panel. Enter `SET HEX OFF` to return to the formatted display.

7. If you use the default PF key values supplied by the NetView product, press PF3 to return to the Session Configuration Data panel. If your PF keys have different values, select the PF key which is set to RETURN.

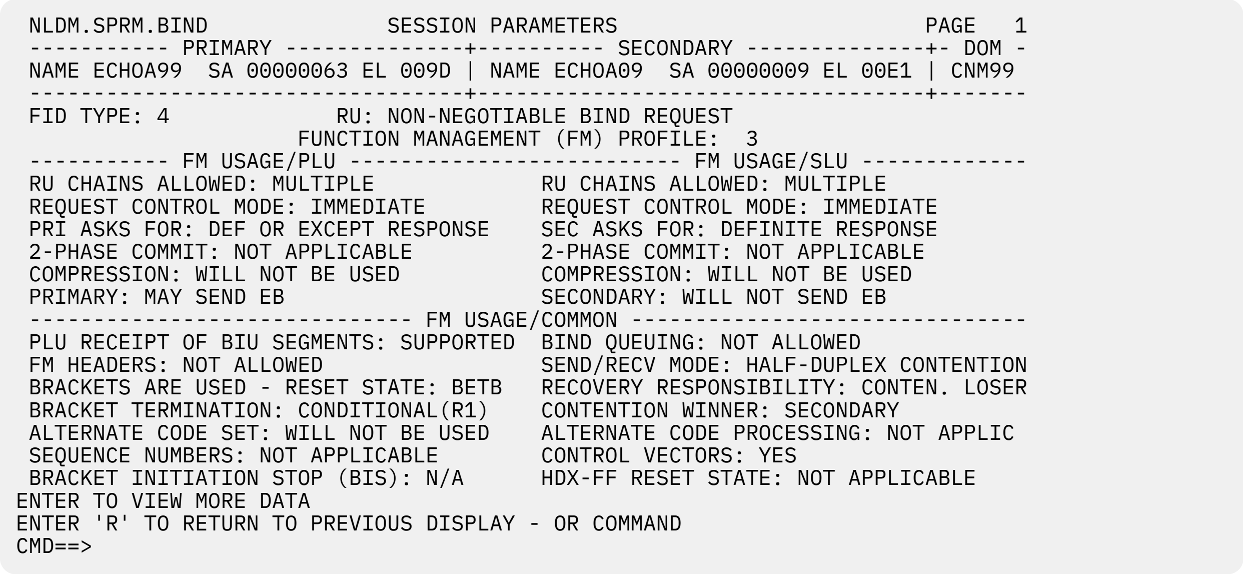
   To determine your current PF key settings, use the NetView DISPFK command to display the values in effect for the current component.

   For more information about how your PF keys are set, refer to the NetView PFKDEF command in the NetView online help, and browse the CNMKEYS sample.

8. Enter **p** to display the Session Parameters panel. If the KEEPPIU count is zero, you have access to the Session Parameters panel, but no other PIUs are kept. You cannot access primary or secondary trace data, the PT and ST options, from the Session Configuration Data panel. The KEEPPIU count is found in the AAUPRMLP member (used to initialize the session monitor). Depending on the session type, the following information is displayed:

Session type	Information code	Information description
LU-LU, CP-CP	BIND	Bind
SSCP-LU	ACTLU	Logical unit
SSCP-PU	ACTPU	Physical unit
SSCP-SSCP	ACTCDRM	Cross-domain resource manager

For an LU-LU session, a panel similar to Figure 23 on page 65 is displayed:



```
 NLDM.SPRM.BIND              SESSION PARAMETERS                        PAGE   1
 ----------- PRIMARY --------------+---------- SECONDARY --------------+- DOM -
 NAME ECHOA99  SA 00000063 EL 009D | NAME ECHOA09  SA 00000009 EL 00E1 | CNM99
 ----------------------------------+-----------------------------------+-------
 FID TYPE: 4             RU: NON-NEGOTIABLE BIND REQUEST
                     FUNCTION MANAGEMENT (FM) PROFILE:  3
 ----------- FM USAGE/PLU -------------------------- FM USAGE/SLU -------------
 RU CHAINS ALLOWED: MULTIPLE             RU CHAINS ALLOWED: MULTIPLE
 REQUEST CONTROL MODE: IMMEDIATE         REQUEST CONTROL MODE: IMMEDIATE
 PRI ASKS FOR: DEF OR EXCEPT RESPONSE    SEC ASKS FOR: DEFINITE RESPONSE
 2-PHASE COMMIT: NOT APPLICABLE          2-PHASE COMMIT: NOT APPLICABLE
 COMPRESSION: WILL NOT BE USED           COMPRESSION: WILL NOT BE USED
 PRIMARY: MAY SEND EB                    SECONDARY: WILL NOT SEND EB
 ------------------------------ FM USAGE/COMMON -------------------------------
 PLU RECEIPT OF BIU SEGMENTS: SUPPORTED  BIND QUEUING: NOT ALLOWED
 FM HEADERS: NOT ALLOWED                 SEND/RECV MODE: HALF-DUPLEX CONTENTION
 BRACKETS ARE USED - RESET STATE: BETB   RECOVERY RESPONSIBILITY: CONTEN. LOSER
 BRACKET TERMINATION: CONDITIONAL(R1)    CONTENTION WINNER: SECONDARY
 ALTERNATE CODE SET: WILL NOT BE USED    ALTERNATE CODE PROCESSING: NOT APPLIC
 SEQUENCE NUMBERS: NOT APPLICABLE        CONTROL VECTORS: YES
 BRACKET INITIATION STOP (BIS): N/A      HDX-FF RESET STATE: NOT APPLICABLE
ENTER TO VIEW MORE DATA
ENTER 'R' TO RETURN TO PREVIOUS DISPLAY - OR COMMAND
CMD==>
```

Figure 23. Session Parameters Panel

This panel interprets the BIND request unit for the session displayed. The selected session is identified in the panel heading. The BIND response and the BIND are recorded in the session monitor database.

Several panels of session parameter data are available. For additional information about the information contained in each of the panels, type **help nldm** or **help nldm 'term'** to access the online help for the session monitor.

9. Enter `r` or press the PF key with a value of RETURN (NetView default is PF3) to return to the Session Configuration Data panel.
10. Enter `er` to display the explicit route for the session. A panel similar to Figure 24 on page 66 is displayed.

```
 NLDM.ER                   SPECIFIC ER CONFIGURATION                  PAGE    1
 ------------------------------------------------------------------------------
 SUBAREA1 00000063   SUBAREA2 00000009  ER  03 | NODES (TOTAL/MIGRATION): 02/00
 ------------------------------------------------------------------------------


  +-----+ NAME: HOSTA99
  | INN |   SA: 00000063
  +--+--+ SSCP: A99M
     |
 1) TG001
     |
  +--+--+ NAME: HOSTA09
  | INN |   SA: 00000009
  +--+--+ SSCP: A09M






END OF DATA
ENTER SEL# (FOR TG DETAIL)
CMD==>
```

Figure 24. Session Parameters Panel

You can use ER data to list the sessions using a specific explicit route, display the network configuration for the explicit route, and display the lines which make up a transmission group. If too many sessions are using the same explicit route, this can result in slow session response.

11. Press the PF key with a value of RETURN (NetView default is PF3) to return to the Session Configuration Data panel.
12. Enter `vr` to display the virtual route for the session. A panel similar to Figure 25 on page 66 is displayed.

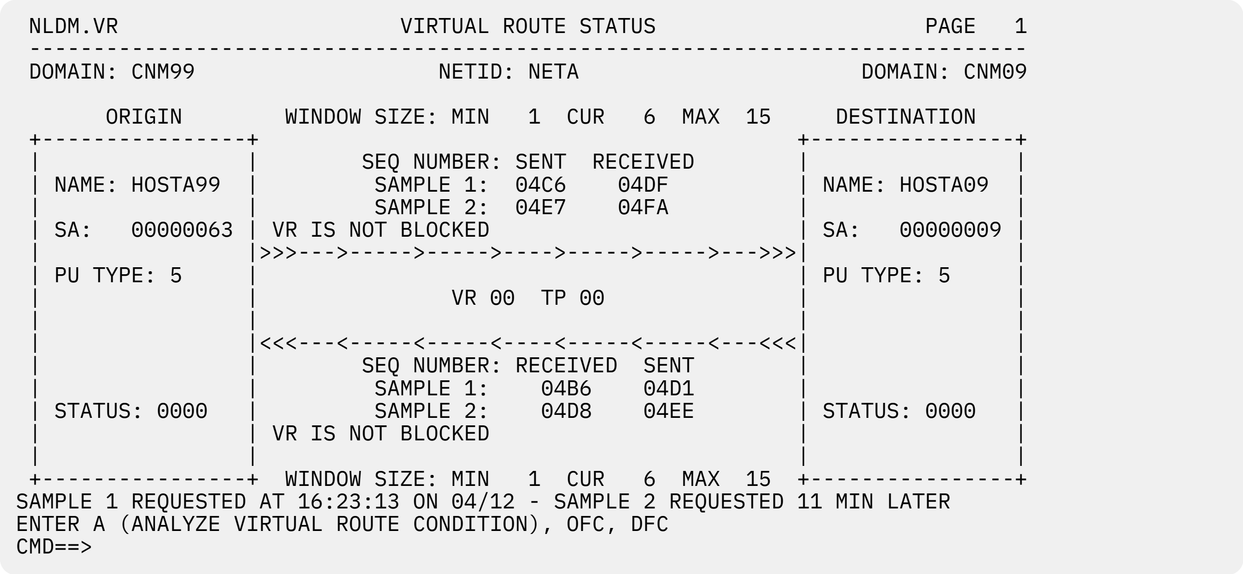
```
 NLDM.VR                      VIRTUAL ROUTE STATUS                     PAGE   1
 ------------------------------------------------------------------------------
 DOMAIN: CNM99                   NETID: NETA                      DOMAIN: CNM09

       ORIGIN       WINDOW SIZE: MIN   1  CUR   6  MAX  15     DESTINATION
 +----------------+                                          +----------------+
 |                |        SEQ NUMBER: SENT  RECEIVED        |                |
 | NAME: HOSTA99  |         SAMPLE 1:  04C6    04DF          | NAME: HOSTA09  |
 |                |                                          |                |
 | SA:   00000063 |                                          | SA:   00000009 |
 |                |>>>--->----->----->---->----->----->--->>>|                |
 | PU TYPE: 5     |                                          | PU TYPE: 5     |
 |                |               VR 00  TP 00               |                |
 |                |                                          |                |
 |                |<<<---<-----<-----<----<-----<-----<---<<<|                |
 |                |        SEQ NUMBER: RECEIVED  SENT        |                |
 |                |         SAMPLE 1:    04B6    04D1        |                |
 | STATUS: 0000   |                                          | STATUS: 0000   |
 |                |                                          |                |
 |                |                                          |                |
 +----------------+  WINDOW SIZE: MIN   1  CUR   6  MAX  15  +----------------+
SAMPLE 1 REQUESTED AT 16:23:13 ON 08/12
ENTER A (ANALYZE VIRTUAL ROUTE CONDITION), OFC, DFC
CMD==>
```

Figure 25. Virtual Route Status Panel

A ***virtual route*** (VR) is a logical data path from one resource to another. Control information flows along the VR to regulate the amount of data flowing at a particular time. The amount of data allowed to flow expands and contracts dynamically based on the capability of intermediate nodes to store and forward data. When you access this panel, the session monitor issues a ROUTE-TEST request. The information in the RSP (ROUTE-TEST) is used to determine the status of the VR.

Use the VR data to list the active virtual routes. From this list, you can display the sessions that use a specific VR, their PUs, and transmission groups. These displays are used to identify users that might have similar problems, especially performance problems that are related to congestion, and to compare which lines are involved in the problem. You can also use VR data to ensure that the route is not being blocked.

13. Enter a at the command line to analyze the virtual route. The session monitor issues another ROUTE-TEST request. The results are then shown in the Virtual Route Status panel (see Figure 26 on page 67).



```
 NLDM.VR                      VIRTUAL ROUTE STATUS                     PAGE   1
 ------------------------------------------------------------------------------
 DOMAIN: CNM99                    NETID: NETA                     DOMAIN: CNM09

       ORIGIN        WINDOW SIZE: MIN   1  CUR   6  MAX  15     DESTINATION
 +----------------+                                          +----------------+
 |                |        SEQ NUMBER: SENT  RECEIVED        |                |
 | NAME: HOSTA99  |         SAMPLE 1:  04C6    04DF          | NAME: HOSTA09  |
 |                |         SAMPLE 2:  04E7    04FA          |                |
 | SA:   00000063 | VR IS NOT BLOCKED                        | SA:   00000009 |
 |                |>>>--->----->----->---->----->----->--->>>|                |
 | PU TYPE: 5     |                                          | PU TYPE: 5     |
 |                |              VR 00  TP 00                |                |
 |                |                                          |                |
 |                |<<<---<-----<-----<----<-----<-----<---<<<|                |
 |                |        SEQ NUMBER: RECEIVED  SENT        |                |
 |                |         SAMPLE 1:    04B6    04D1        |                |
 | STATUS: 0000   |         SAMPLE 2:    04D8    04EE        | STATUS: 0000   |
 |                | VR IS NOT BLOCKED                        |                |
 |                |                                          |                |
 +----------------+  WINDOW SIZE: MIN   1  CUR   6  MAX  15  +----------------+
SAMPLE 1 REQUESTED AT 16:23:13 ON 04/12 - SAMPLE 2 REQUESTED 11 MIN LATER
ENTER A (ANALYZE VIRTUAL ROUTE CONDITION), OFC, DFC
CMD==>
```

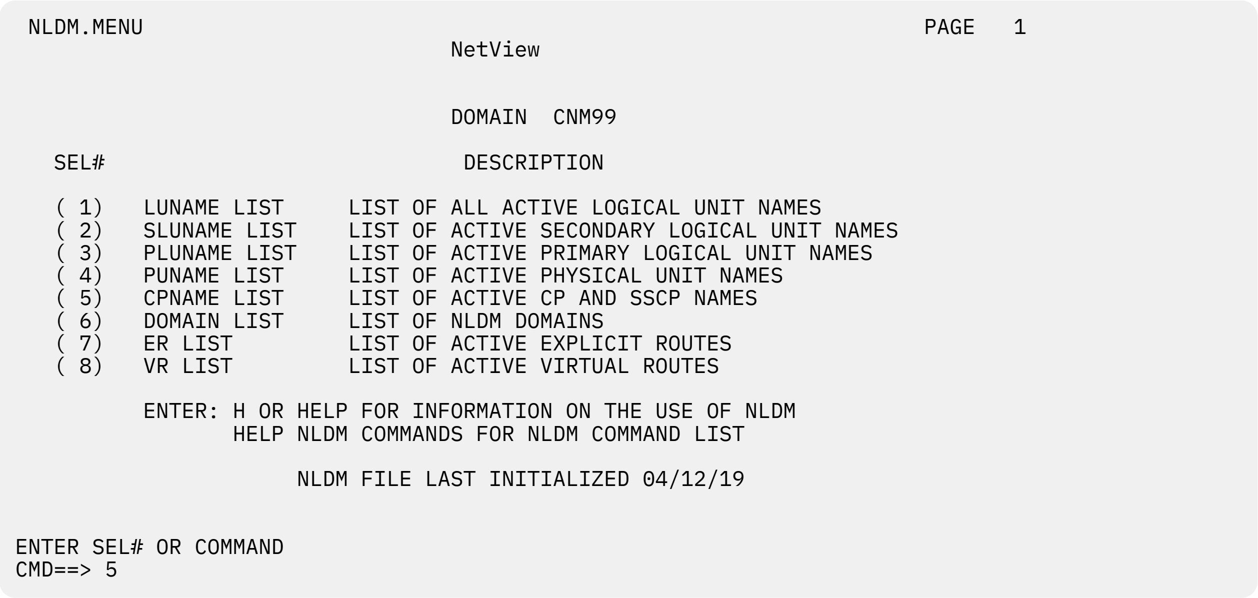
Figure 26. Virtual Route Status Panel with Analysis Data

Based on the two most recent samples taken, status conclusions are displayed on the panel. In this case, the conclusion for both samples is `VR IS NOT BLOCKED`.

Typical CP-CP Session for an SNA Advanced Peer-to-Peer Networking Network

To monitor a CP-CP session for an SNA Advanced Peer-to-Peer Networking network:

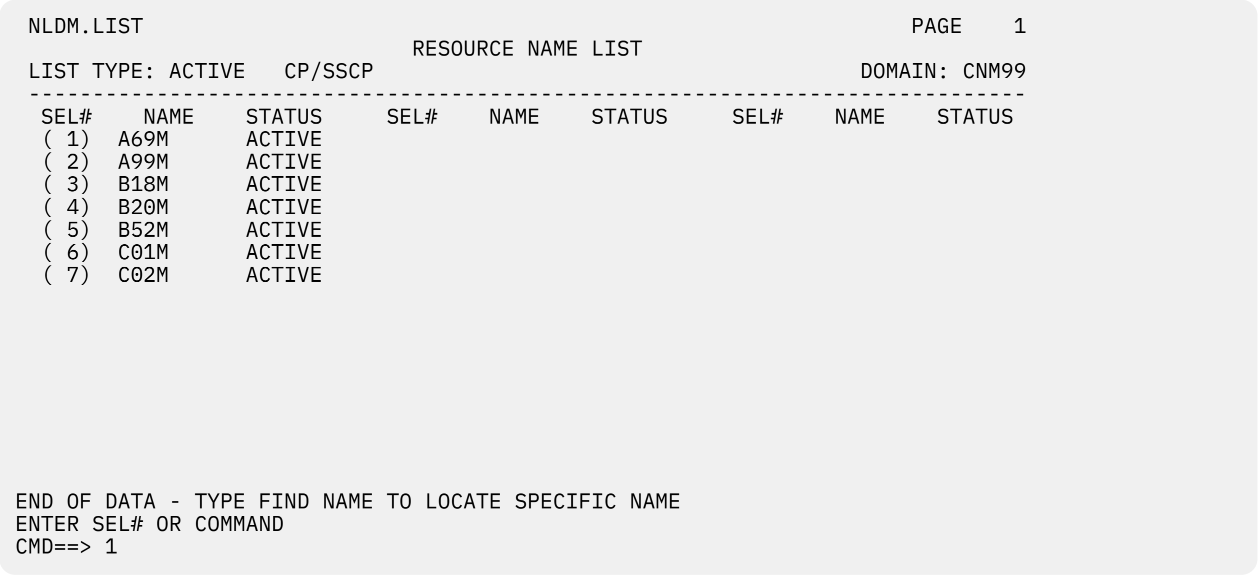
1. Type **nldm** at the command line to access the session monitor main menu. A panel similar to Figure 27 on page 68 is displayed:



```
 NLDM.MENU                                                              PAGE   1
                                  NetView


                                  DOMAIN  CNM99

   SEL#                            DESCRIPTION

   ( 1)   LUNAME LIST     LIST OF ALL ACTIVE LOGICAL UNIT NAMES
   ( 2)   SLUNAME LIST    LIST OF ACTIVE SECONDARY LOGICAL UNIT NAMES
   ( 3)   PLUNAME LIST    LIST OF ACTIVE PRIMARY LOGICAL UNIT NAMES
   ( 4)   PUNAME LIST     LIST OF ACTIVE PHYSICAL UNIT NAMES
   ( 5)   CPNAME LIST     LIST OF ACTIVE CP AND SSCP NAMES
   ( 6)   DOMAIN LIST     LIST OF NLDM DOMAINS
   ( 7)   ER LIST         LIST OF ACTIVE EXPLICIT ROUTES
   ( 8)   VR LIST         LIST OF ACTIVE VIRTUAL ROUTES

          ENTER: H OR HELP FOR INFORMATION ON THE USE OF NLDM
                 HELP NLDM COMMANDS FOR NLDM COMMAND LIST

                      NLDM FILE LAST INITIALIZED 04/12/19


ENTER SEL# OR COMMAND
CMD==> 5
```

Figure 27. Session Monitor Main Menu

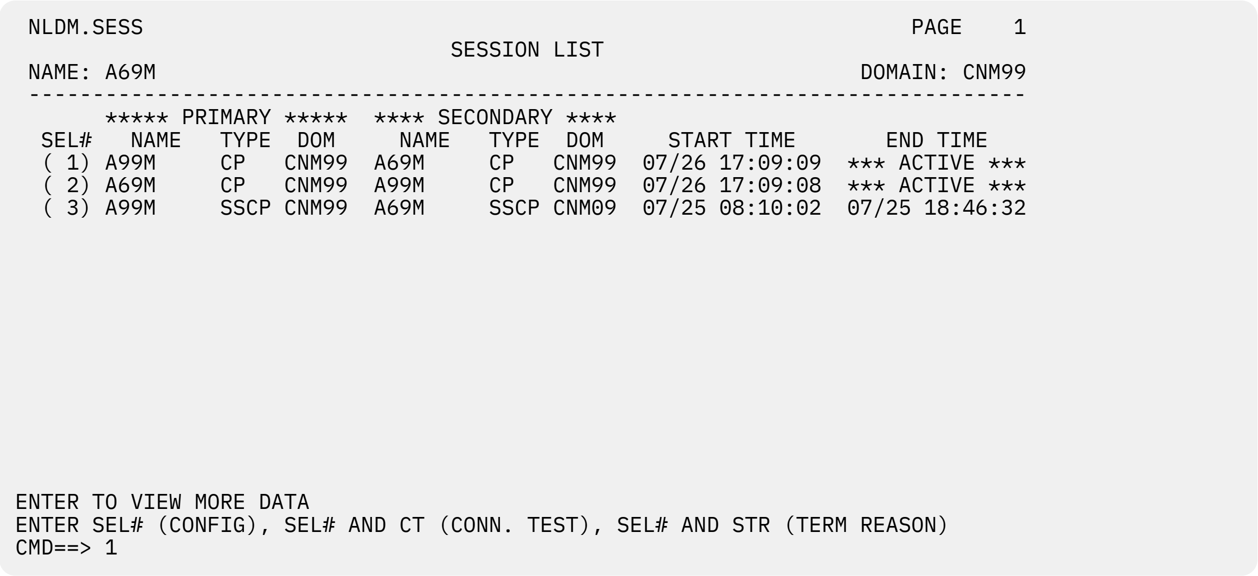
2. Select option 5 to display the list of active CP and SSCP names. You can also enter `list cp` or `list sscp` from the command line to access the list of CPs or SSCPs. A panel similar to Figure 28 on page 68 is displayed.



```
 NLDM.LIST                                                             PAGE    1
                               RESOURCE NAME LIST
 LIST TYPE: ACTIVE   CP/SSCP                                       DOMAIN: CNM99
 -------------------------------------------------------------------------------
  SEL#    NAME    STATUS     SEL#    NAME    STATUS     SEL#    NAME    STATUS
  ( 1)  A69M      ACTIVE
  ( 2)  A99M      ACTIVE
  ( 3)  B18M      ACTIVE
  ( 4)  B20M      ACTIVE
  ( 5)  B52M      ACTIVE
  ( 6)  C01M      ACTIVE
  ( 7)  C02M      ACTIVE









END OF DATA - TYPE FIND NAME TO LOCATE SPECIFIC NAME
ENTER SEL# OR COMMAND
CMD==> 1
```

Figure 28. Resource Name List Panel

3. Locate the specific resource name and select the corresponding option to display a list of sessions for that resource. For example, to list all the sessions for A69M, enter 1 in the CMD==> field. You can also enter `sess a69m` from the command line to display the list of sessions. A panel similar to Figure 29 on page 69 is displayed.

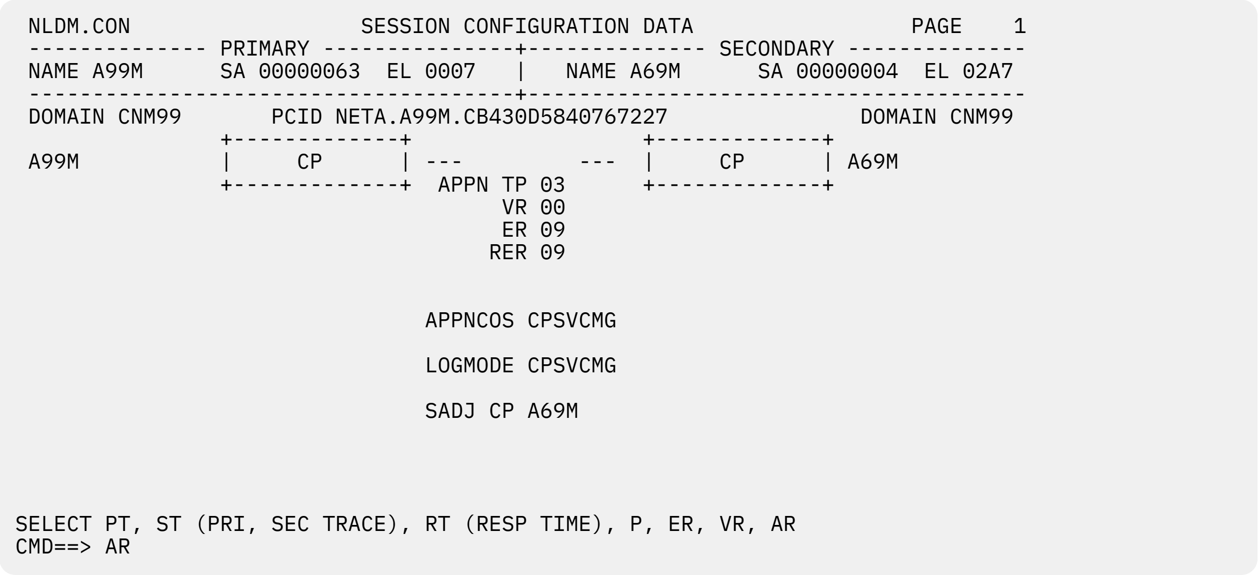


```
 NLDM.SESS                                                            PAGE    1
                                  SESSION LIST
 NAME: A69M                                                       DOMAIN: CNM99
 ------------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
  ( 1) A99M     CP   CNM99  A69M     CP   CNM99  07/26 17:09:09  *** ACTIVE ***
  ( 2) A69M     CP   CNM99  A99M     CP   CNM99  07/26 17:09:08  *** ACTIVE ***
  ( 3) A99M     SSCP CNM99  A69M     SSCP CNM09  07/25 08:10:02  07/25 18:46:32










ENTER TO VIEW MORE DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==> 1
```

Figure 29. Session List Panel

This panel lists the active and stopped sessions for a resource. Each entry in the list is one session. Each line shows the session date, start time, session partner, and current status.

4. Select a session number to obtain configuration data for that session (in this case, session 1). A panel similar to Figure 30 on page 69 is displayed.

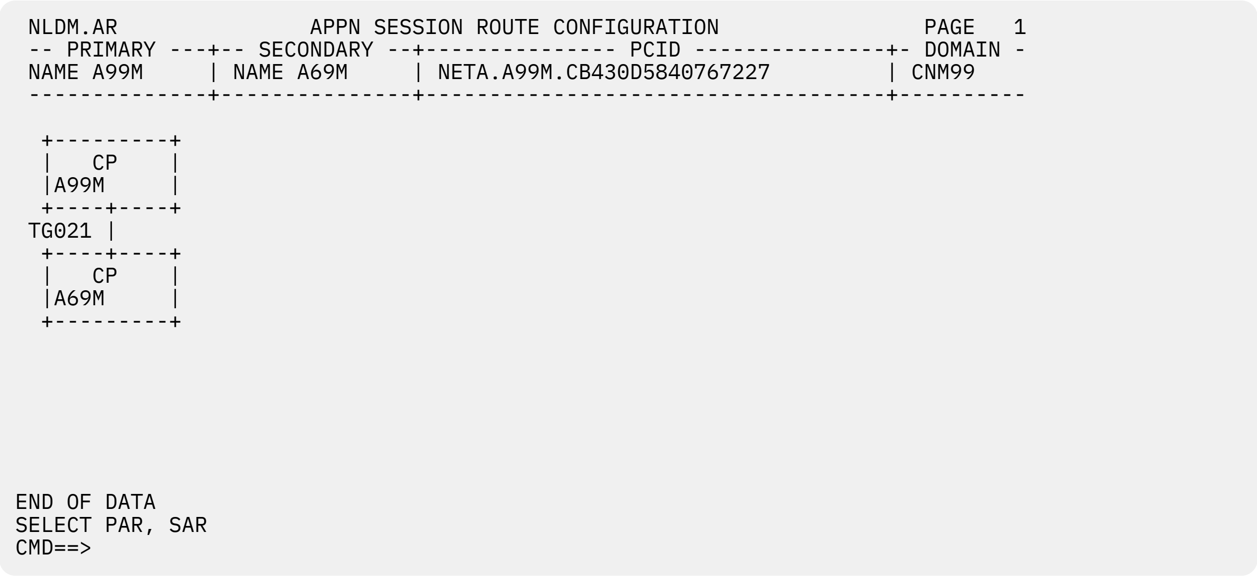


```
 NLDM.CON                  SESSION CONFIGURATION DATA                 PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME A99M      SA 00000063  EL 0007   |   NAME A69M      SA 00000004  EL 02A7
 --------------------------------------+---------------------------------------
 DOMAIN CNM99       PCID NETA.A99M.CB430D5840767227              DOMAIN CNM99
                +-------------+                  +-------------+
 A99M           |     CP      | ---         ---  |     CP      | A69M
                +-------------+  APPN TP 03      +-------------+
                                      VR 00
                                      ER 09
                                     RER 09


                                APPNCOS CPSVCMG

                                LOGMODE CPSVCMG

                                SADJ CP A69M




SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR, AR
CMD==> AR
```

Figure 30. Session Configuration Data Panel

This panel shows how each CP is physically connected. The PT (Primary Trace), ST (Secondary Trace), P (Parameters), ER (Explicit Route), and VR (Virtual Route) options are described in "Typical LU-LU Session for an SNA Subarea Network" on page 61.

5. Enter `ar` to display the Advanced Peer-to-Peer Networking route configuration panel. A panel similar to Figure 31 on page 70 is displayed.



```
 NLDM.AR               APPN SESSION ROUTE CONFIGURATION                PAGE   1
 -- PRIMARY ---+-- SECONDARY --+--------------- PCID ---------------+- DOMAIN -
 NAME A99M     | NAME A69M     | NETA.A99M.CB430D5840767227         | CNM99
 --------------+---------------+------------------------------------+----------

  +---------+
  |   CP    |
  |A99M     |
  +----+----+
 TG021 |
  +----+----+
  |   CP    |
  |A69M     |
  +---------+








END OF DATA
SELECT PAR, SAR
CMD==>
```

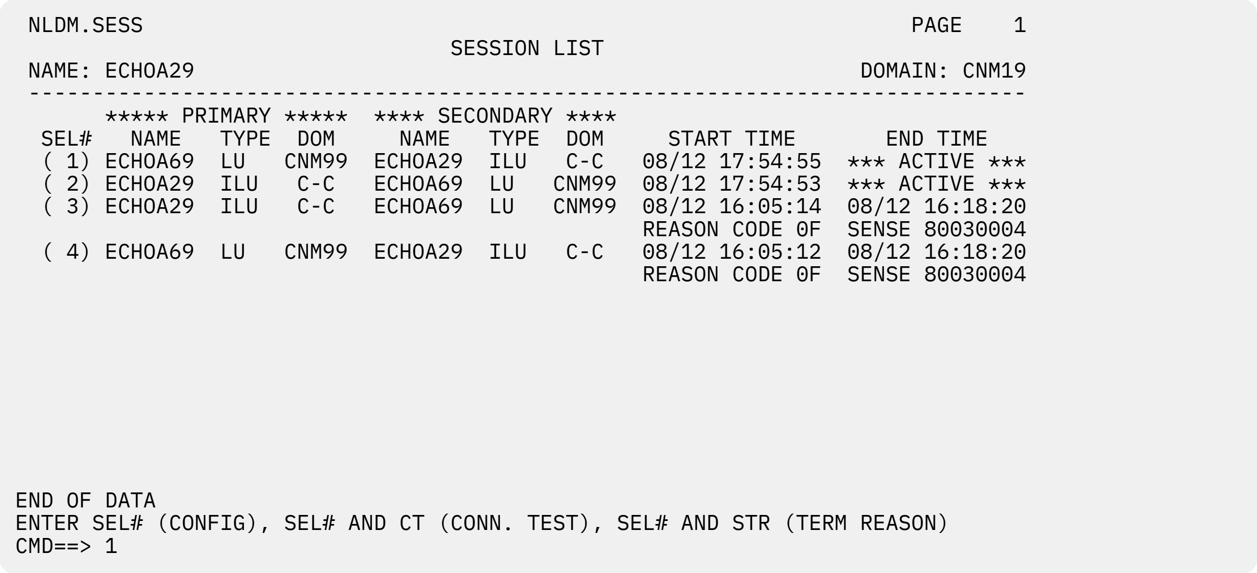
Figure 31. Advanced Peer-to-Peer Networking Session Route Configuration Panel

This panel displays Advanced Peer-to-Peer Networking nodes and connecting groups in an Advanced Peer-to-Peer Networking session path.

Typical LU-LU Session for an SNA Advanced Peer-to-Peer Networking Network

Complete the following steps to monitor an LU-LU session for an SNA Advanced Peer-to-Peer Networking or mixed network.

1. Enter **sess echoa29** from the session monitor command line or **nldm sess echoa29** from the NCCF command line to access the session list for resource echoa29. A panel similar to Figure 32 on page 70 is displayed.

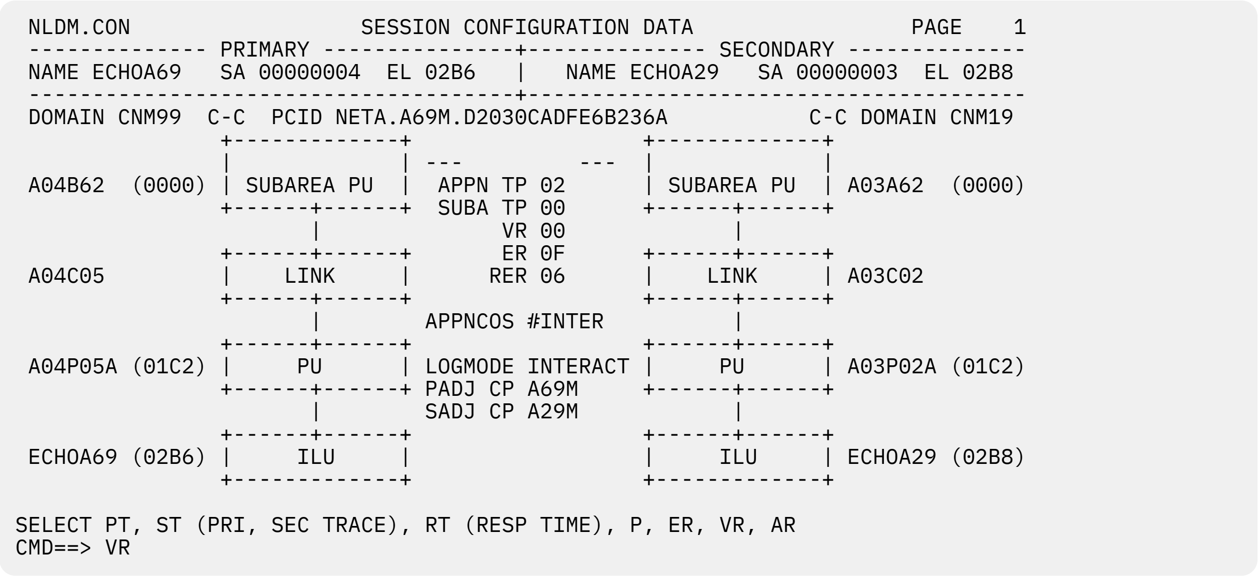


```
 NLDM.SESS                                                          PAGE    1
                                 SESSION LIST
 NAME: ECHOA29                                                  DOMAIN: CNM19
 ----------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME      END TIME
  ( 1) ECHOA69  LU   CNM99  ECHOA29  ILU   C-C   08/12 17:54:55  *** ACTIVE ***
  ( 2) ECHOA29  ILU   C-C   ECHOA69  LU   CNM99  08/12 17:54:53  *** ACTIVE ***
  ( 3) ECHOA29  ILU   C-C   ECHOA69  LU   CNM99  08/12 16:05:14  08/12 16:18:20
                                                 REASON CODE 0F  SENSE 80030004
  ( 4) ECHOA69  LU   CNM99  ECHOA29  ILU   C-C   08/12 16:05:12  08/12 16:18:20
                                                 REASON CODE 0F  SENSE 80030004









END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==> 1
```

Figure 32. Session List Panel

This panel lists the active and stopped sessions for a resource. Each entry in the list is one session. Each line shows the session date, start time, session partner, and current status.

2. Select a session number to obtain configuration data for that session. A panel similar to Figure 33 on page 71 is displayed.

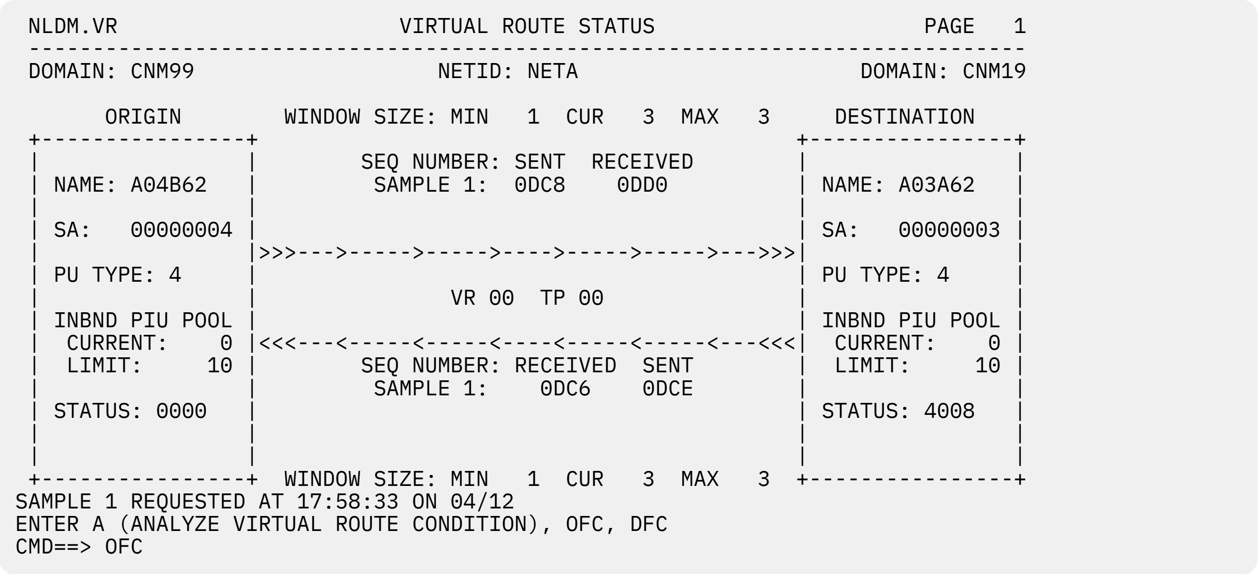


```
 NLDM.CON                  SESSION CONFIGURATION DATA                 PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME ECHOA69   SA 00000004  EL 02B6   |   NAME ECHOA29   SA 00000003  EL 02B8
 --------------------------------------+---------------------------------------
 DOMAIN CNM99  C-C  PCID NETA.A69M.D2030CADFE6B236A           C-C DOMAIN CNM19
                +-------------+                  +-------------+
                |             | ---         ---  |             |
 A04B62  (0000) | SUBAREA PU  |  APPN TP 02      | SUBAREA PU  | A03A62  (0000)
                +------+------+  SUBA TP 00      +------+------+
                       |              VR 00             |
                +------+------+       ER 0F      +------+------+
 A04C05         |    LINK     |      RER 06      |    LINK     | A03C02
                +------+------+                  +------+------+
                       |        APPNCOS #INTER          |
                +------+------+                  +------+------+
 A04P05A (01C2) |     PU      | LOGMODE INTERACT |     PU      | A03P02A (01C2)
                +------+------+ PADJ CP A69M     +------+------+
                       |        SADJ CP A29M            |
                +------+------+                  +------+------+
 ECHOA69 (02B6) |     ILU     |                  |     ILU     | ECHOA29 (02B8)
                +-------------+                  +-------------+

SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR, AR
CMD==> VR
```

Figure 33. Session Configuration Data Panel

See "Typical LU-LU Session for an SNA Subarea Network" on page 61 for descriptions of the PT (Primary Trace), ST (Secondary Trace), P (Parameters), and ER (Explicit Route) options.

3. Enter `vr` to display the virtual route for the session. A panel similar to Figure 34 on page 71 is displayed.



```
 NLDM.VR                      VIRTUAL ROUTE STATUS                     PAGE   1
 ------------------------------------------------------------------------------
 DOMAIN: CNM99                   NETID: NETA                      DOMAIN: CNM19

       ORIGIN        WINDOW SIZE: MIN   1  CUR   3  MAX   3     DESTINATION
 +----------------+                                          +----------------+
 |                |        SEQ NUMBER: SENT  RECEIVED        |                |
 | NAME: A04B62   |         SAMPLE 1:  0DC8    0DD0          | NAME: A03A62   |
 |                |                                          |                |
 | SA:   00000004 |                                          | SA:   00000003 |
 |                |>>>--->----->----->---->----->----->--->>>|                |
 | PU TYPE: 4     |                                          | PU TYPE: 4     |
 |                |               VR 00  TP 00               |                |
 | INBND PIU POOL |                                          | INBND PIU POOL |
 |  CURRENT:    0 |<<<---<-----<-----<----<-----<-----<---<<<|  CURRENT:    0 |
 |  LIMIT:     10 |        SEQ NUMBER: RECEIVED  SENT        |  LIMIT:     10 |
 |                |         SAMPLE 1:    0DC6    0DCE        |                |
 | STATUS: 0000   |                                          | STATUS: 4008   |
 |                |                                          |                |
 |                |                                          |                |
 +----------------+  WINDOW SIZE: MIN   1  CUR   3  MAX   3  +----------------+
SAMPLE 1 REQUESTED AT 17:58:33 ON 04/12
ENTER A (ANALYZE VIRTUAL ROUTE CONDITION), OFC, DFC
CMD==> OFC
```

Figure 34. Virtual Route Status Panel

A virtual route (VR) is a logical data path from one resource to another. For an SNA Advanced Peer-to-Peer Networking network, this panel lets you access flow control data. You can issue flow control requests from this screen: origin flow control (OFC) requests and destination flow control (DFC) requests. DFC requests provide flow control data in the secondary direction at the point where the SNA subarea and SNA Advanced Peer-to-Peer Networking network meet. OFC requests provide flow control data in the primary direction at the point where the SNA subarea and SNA Advanced Peer-to-Peer Networking network meet.

You can enter a at the command line to analyze the virtual route.

4. Enter **ofc** or **dfc** to display flow control data. Enter **ofc** (to display origin flow control data) and a panel similar to Figure 35 on page 72:

```
 NLDM.FC                   FLOW CONTROL DATA                           PAGE    1
 ----------- PRIMARY --------------+----------- SECONDARY -------------+- DOM -
 NAME ECHOA69  SA 00000004 EL 02B6 | NAME ECHOA29  SA 00000003 EL 02B8 | CNM99
 ----------------------------------+-----------------------------------+-------
 FULLY QUALIFIED PCID: NETA.A69M.D2030CADFE6B236A

                               PRIMARY SESSION STAGE
 MOST RECENT PIUS:
   LAST PIU SENT (TH,RH)       2C00010803C1 0380C0
   LAST PIU RECEIVED (TH,RH)   2C00080103C1 0380C0

 PACING DATA:
   LAST IPM SENT               83010000002D
   NEXT SEND WINDOW SIZE          15
   NEXT REC WINDOW SIZE           45
   MSGS IN PACING QUEUE            0

 RESIDUAL PACING COUNTS
   SEND WINDOW                     0
   RECEIVE WINDOW                 29

END OF DATA

CMD==>
```

Figure 35. Flow Control Data Panel (Origin)

If you enter **dfc** (to display destination flow control data), a panel similar to Figure 36 on page 72 is displayed:

```
 NLDM.FC                   FLOW CONTROL DATA                           PAGE    1
 ----------- PRIMARY --------------+----------- SECONDARY -------------+- DOM -
 NAME ECHOA69  SA 00000004 EL 02B6 | NAME ECHOA29  SA 00000003 EL 02B8 | CNM19
 ----------------------------------+-----------------------------------+-------
 FULLY QUALIFIED PCID: NETA.A69M.D2030CADFE6B236A

                                                        SECONDARY SESSION STAGE
 MOST RECENT PIUS:
   LAST PIU SENT (TH,RH)                                2E000301038F 838000
   LAST PIU RECEIVED (TH,RH)                            2E000103038F 0380C0

 PACING DATA:
   LAST IPM SENT                                        830100007FFF
   NEXT SEND WINDOW SIZE                                    7
   NEXT REC WINDOW SIZE                                 32767
   MSGS IN PACING QUEUE                                     0

 RESIDUAL PACING COUNTS
   SEND WINDOW                                              0
   RECEIVE WINDOW                                        3770

END OF DATA

CMD==>
```

Figure 36. Flow Control Data Panel (Destination)

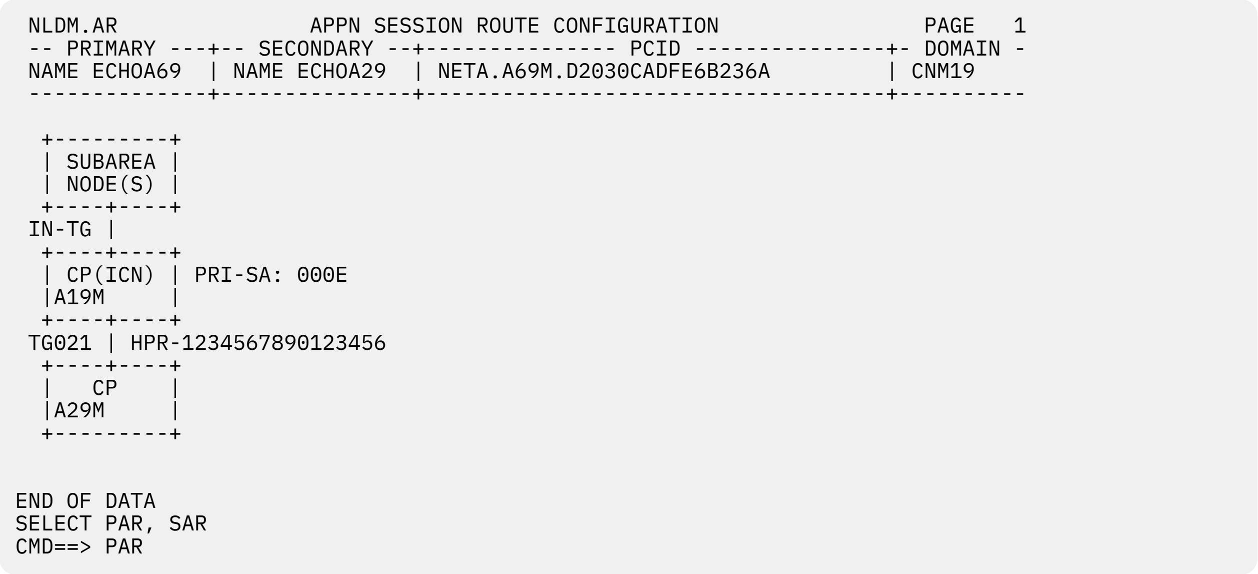
Flow control data is maintained for low-entry networking (LEN) and Advanced Peer-to-Peer Networking connections where the transmission group (TG) ends in an SNA subarea node. If the TG intersects a virtual route, you can enter `fc`, `ofc`, or `dfc` from the Virtual Route Status panel to access this panel. If the TG ends in VTAM and no connecting virtual route exists, you can enter `fc` from the Session Configuration Data panel to display this panel.

From this panel, you can:

- Look for missing responses in the flow control which might lead to blocked virtual routes.
- Look for requests to close the VR window. A large number of those requests can indicate an intermediate node running over capacity. The pacing data (specifically the size of the pacing windows) controls the number of PIUs allowed to flow on a virtual route before the SNA subarea

node receiving the PIUs authorizes the sending of more data. If the number of messages in the pacing queue is high (indicating a congestion problem), you might need to increase the size of the pacing window sending the PIUs (SEND WINDOW SIZE).

5. Press the PF key with a value of RETURN (NetView default is PF3) twice to return to the Session Configuration Data panel.
6. Enter **ar** to display the Advanced Peer-to-Peer Networking route configuration panel. A panel similar to Figure 37 on page 73 is displayed.



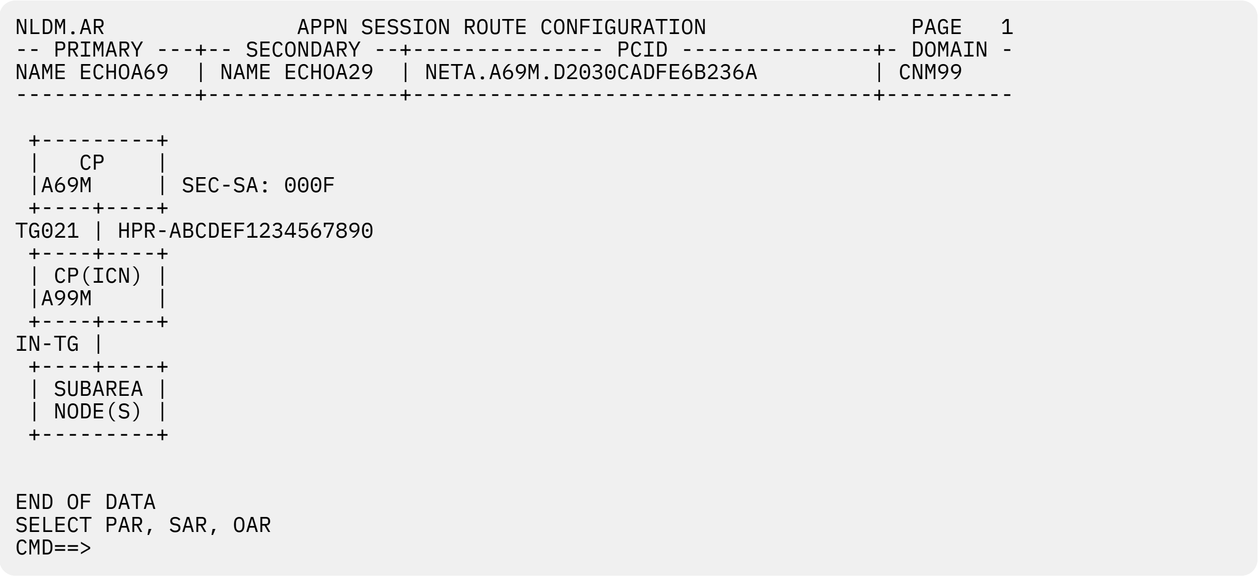
```
 NLDM.AR               APPN SESSION ROUTE CONFIGURATION                PAGE   1
 -- PRIMARY ---+-- SECONDARY --+--------------- PCID ---------------+- DOMAIN -
 NAME ECHOA69  | NAME ECHOA29  | NETA.A69M.D2030CADFE6B236A         | CNM19
 --------------+---------------+------------------------------------+----------

  +---------+
  | SUBAREA |
  | NODE(S) |
  +----+----+
 IN-TG |
  +----+----+
  | CP(ICN) | PRI-SA: 000E
  |A19M     |
  +----+----+
 TG021 | HPR-1234567890123456
  +----+----+
  |   CP    |
  |A29M     |
  +---------+


END OF DATA
SELECT PAR, SAR
CMD==> PAR
```

Figure 37. Advanced Peer-to-Peer Networking Session Route Configuration Panel with Subarea Number from Primary Side

In the SNA Advanced Peer-to-Peer Networking environment, the number of Advanced Peer-to-Peer Networking subnetworks that a session can flow through has no limit. This means that a single session could have more than one Route Selection Control Vector (RSCV). Because of the possibility of multiple RSCVs, this panel only displays local RSCV data. When additional RSCVs are in the session path, the user can scroll in the primary direction (using the PAR option) or in the secondary direction (using the SAR option) to view these RSCVs. SNA subarea nodes existing between the SNA Advanced Peer-to-Peer Networking nodes are shown with a generic subarea node box.

If VTAM is unable to provide part of the route data to the NetView program, a box containing ROUTE DATA NA at either the beginning or end of the RSCV display identifies where data is not available for display. If the primary endpoint node name of the RSCV being displayed is not known, UNKNOWN is displayed. The corresponding PAR and SAR options are not displayed for these situations.

7. Enter par to scroll in the primary direction. A panel similar to Figure 38 on page 74 is displayed.



```
NLDM.AR               APPN SESSION ROUTE CONFIGURATION                PAGE   1
-- PRIMARY ---+-- SECONDARY --+--------------- PCID ---------------+- DOMAIN -
NAME ECHOA69  | NAME ECHOA29  | NETA.A69M.D2030CADFE6B236A         | CNM99
--------------+---------------+------------------------------------+----------

 +---------+
 |   CP    |
 |A69M     | SEC-SA: 000F
 +----+----+
TG021 | HPR-ABCDEF1234567890
 +----+----+
 | CP(ICN) |
 |A99M     |
 +----+----+
IN-TG |
 +----+----+
 | SUBAREA |
 | NODE(S) |
 +---------+


END OF DATA
SELECT PAR, SAR, OAR
CMD==>
```

Figure 38. Advanced Peer-to-Peer Networking Session Route Configuration Panel with Subarea Number from Secondary Side and OAR Prompt

Note: The following paragraphs explain some of the abbreviations that are displayed on the screen:

The terms PRI-SA (see Figure 37 on page 73) and SEC-SA (Figure 38 on page 74) indicate the subarea number that is associated with an Advanced Peer-to-Peer Networking node from its primary (above) or secondary (below) side.

HPR indicates a TG that is part of an HPR pipe whose TCID number is shown. VTAM reports path switches and NLDM reflects them in the route.

You might see HPRC, instead of HPR. HPRC indicates a hop that is believed to be part of an HPR pipe; however this NLDM does not know about any path switches.

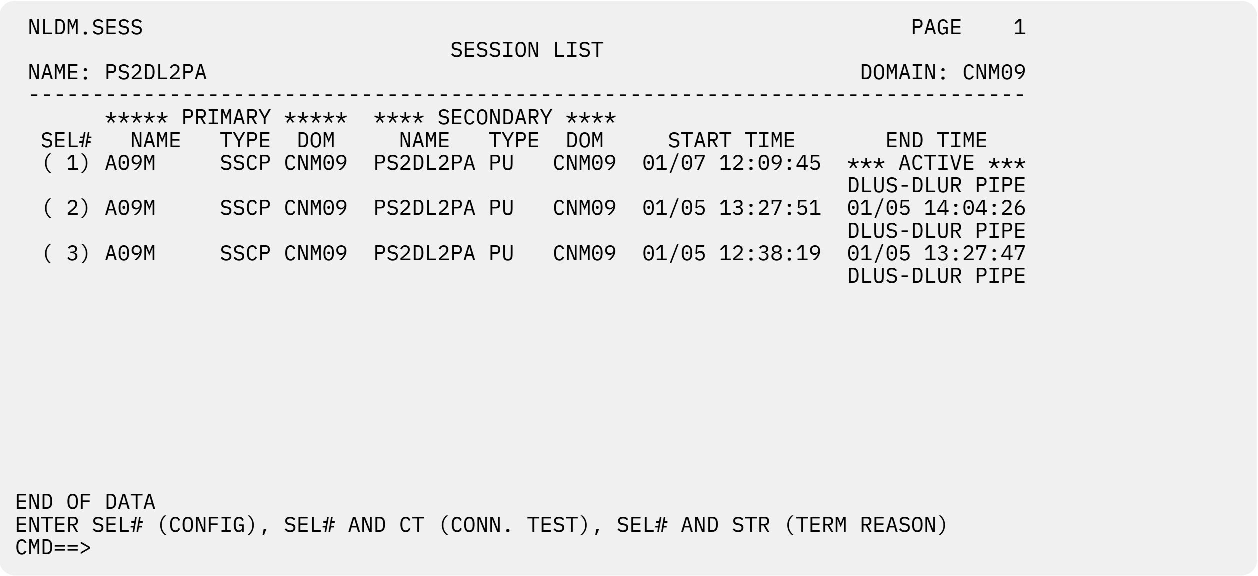
If you see an OAR prompt at the bottom of the NLDM.CON or the NLDM.AR panel, it means that outboard Advanced Peer-to-Peer Networking route data is present (from a 2210 or 2216 router, for example). If you select the OAR prompt, a panel displays that is similar to Figure 38 on page 74, but which shows the RSCV that the outboard CP reports.

For details about these terms, see the online help.

SNA Session through an Advanced Peer-to-Peer Networking Network

Complete the following steps to monitor the SSCP-PU session that connects through an Advanced Peer-to-Peer Networking network using an LU 6.2 session pipe. This pipe is established by using the DLUR and DLUS functions. The ability to monitor a session over a pipe was added in NetView V3R1.

1. Enter **sess ps2dl2pa** from the session monitor command line from the NCCF command line to access the session list for resource ps2dl2pa. A panel similar to Figure 39 on page 75 is displayed.

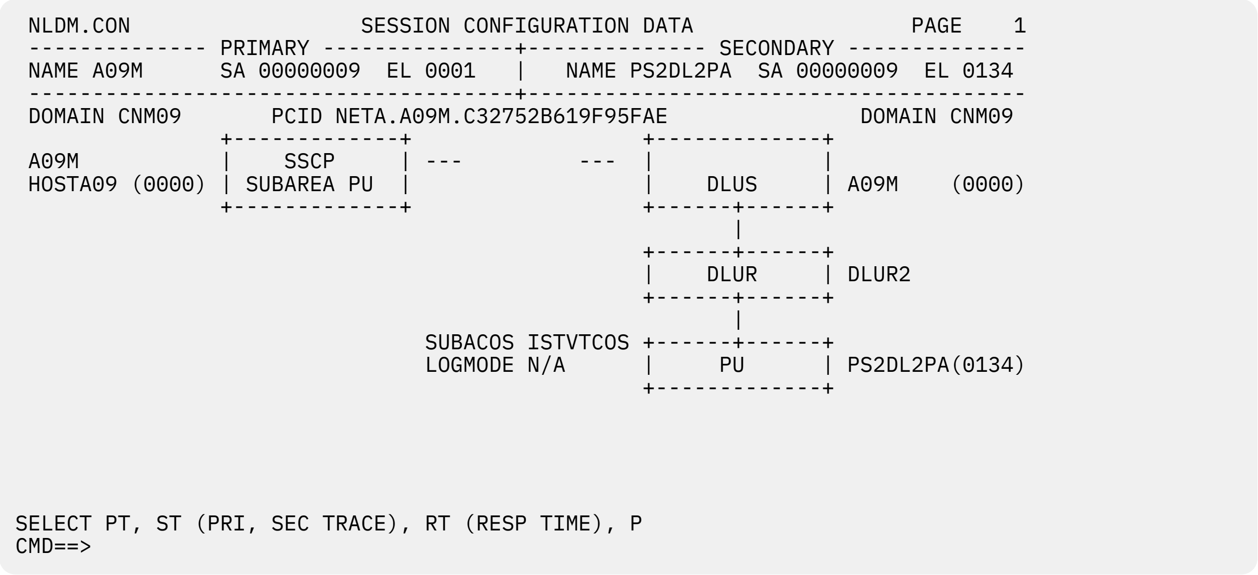


```
 NLDM.SESS                                                            PAGE    1
                                  SESSION LIST
 NAME: PS2DL2PA                                                   DOMAIN: CNM09
 ------------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#  NAME    TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
  ( 1) A09M     SSCP CNM09  PS2DL2PA PU   CNM09  01/07 12:09:45  *** ACTIVE ***
                                                                 DLUS-DLUR PIPE
  ( 2) A09M     SSCP CNM09  PS2DL2PA PU   CNM09  01/05 13:27:51  01/05 14:04:26
                                                                 DLUS-DLUR PIPE
  ( 3) A09M     SSCP CNM09  PS2DL2PA PU   CNM09  01/05 12:38:19  01/05 13:27:47
                                                                 DLUS-DLUR PIPE









END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==>
```

Figure 39. Session List Panel

This panel lists the active and stopped sessions for a resource. Each entry in the list is one session. Each line shows the session date, start time, session partner, and current status. These sessions also have DLUS-DLUR PIPE displayed below the current status. This designation indicates that the sessions contain an Advanced Peer-to-Peer Networking network that is crossed using a LU 6.2 session pipe. The pipe is established and controlled by the dependent LU server (DLUS) and dependent LU requestor (DLUR) functions.

2. Session 1 is the only active session. Select session 1 to obtain configuration data for that session. A panel similar to Figure 40 on page 75 is displayed.



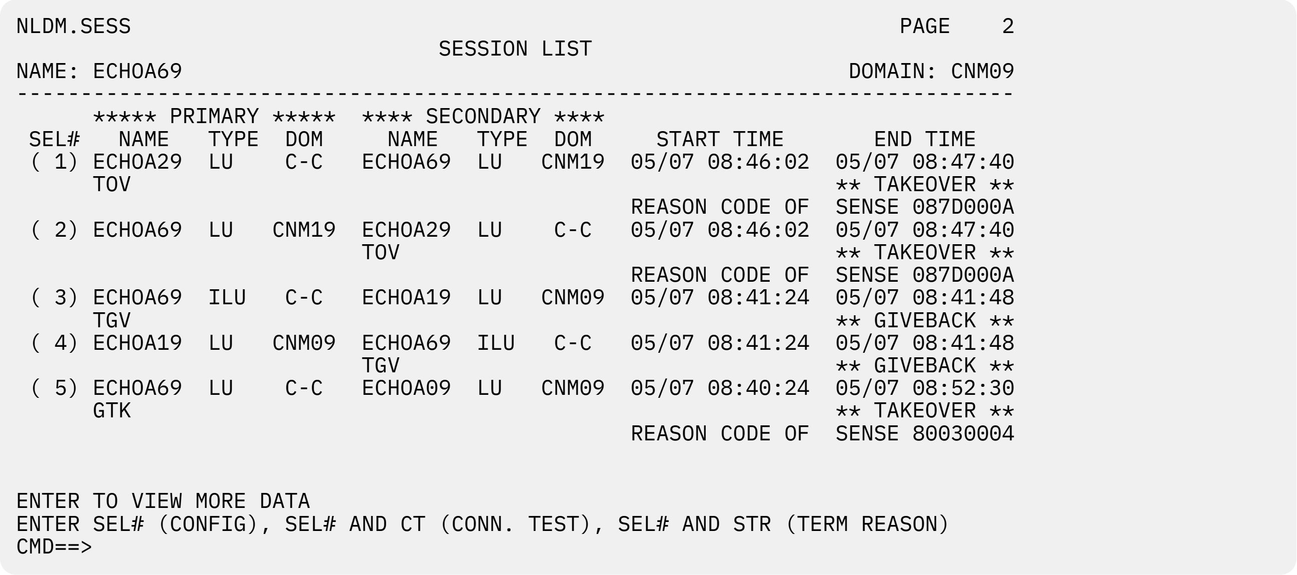
```
 NLDM.CON                  SESSION CONFIGURATION DATA                 PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME A09M      SA 00000009  EL 0001   |   NAME PS2DL2PA  SA 00000009  EL 0134
 --------------------------------------+---------------------------------------
 DOMAIN CNM09       PCID NETA.A09M.C32752B619F95FAE               DOMAIN CNM09
                +-------------+                  +-------------+
 A09M           |    SSCP     | ---         ---  |             |
 HOSTA09 (0000) | SUBAREA PU  |                  |    DLUS     | A09M    (0000)
                +-------------+                  +------+------+
                                                        |
                                                 +------+------+
                                                 |    DLUR     | DLUR2
                                                 +------+------+
                                                        |
                                SUBACOS ISTVTCOS +------+------+
                                LOGMODE N/A      |     PU      | PS2DL2PA(0134)
                                                 +-------------+





SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P
CMD==>
```

Figure 40. Session Configuration Data Panel

This panel displays the resource (ps2dl2pa) and session path that connects it to the host (hosta09). The DLUR and DLUS ends of the LU 6.2 pipe that travels through the Advanced Peer-to-Peer Networking network are also shown. The DLUR function for this session is located in resource dlur2, and the DLUS function is located in resource a09m. Note that the Advanced Peer-to-Peer Networking network itself is not displayed. Similar data is also available for the SSCP-LU sessions. To display more information about the resources that the pipe crosses, view the Advanced Peer-to-Peer Networking Route Data displays (AR) for the DLUR-DLUS sessions.

Typical Takeover/Giveback Session

To monitor an LU-LU session in a takeover/giveback scenario for either an SNA subarea or SNA Advanced Peer-to-Peer Networking network, enter `sess echoa29` from the session monitor command line or `nldm sess echoa29` to access the session list for resource echoa29. A panel similar to Figure 41 on page 76 is displayed.



```
NLDM.SESS                                                            PAGE    2
                                 SESSION LIST
NAME: ECHOA69                                                    DOMAIN: CNM09
------------------------------------------------------------------------------
      ***** PRIMARY *****  **** SECONDARY ****
 SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
 ( 1) ECHOA29  LU    C-C   ECHOA69  LU   CNM19  05/07 08:46:02  05/07 08:47:40
      TOV                                                       ** TAKEOVER **
                                                REASON CODE OF  SENSE 087D000A
 ( 2) ECHOA69  LU   CNM19  ECHOA29  LU    C-C   05/07 08:46:02  05/07 08:47:40
                           TOV                                  ** TAKEOVER **
                                                REASON CODE OF  SENSE 087D000A
 ( 3) ECHOA69  ILU   C-C   ECHOA19  LU   CNM09  05/07 08:41:24  05/07 08:41:48
      TGV                                                       ** GIVEBACK **
 ( 4) ECHOA19  LU   CNM09  ECHOA69  ILU   C-C   05/07 08:41:24  05/07 08:41:48
                           TGV                                  ** GIVEBACK **
 ( 5) ECHOA69  LU    C-C   ECHOA09  LU   CNM09  05/07 08:40:24  05/07 08:52:30
      GTK                                                       ** TAKEOVER **
                                                REASON CODE OF  SENSE 80030004


ENTER TO VIEW MORE DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==>
```

Figure 41. Session List Panel for an SNA Advanced Peer-to-Peer Networking or Mixed Network

VTAM can take over or give back control of the NCP providing boundary function for some sessions. When takeovers and givebacks exist, the Session List panel can display Takeover/Giveback statuses (as shown here) and the active and stopped status (as shown in "Typical LU-LU Session for an SNA Subarea Network" on page 61).The following takeover/giveback notifications are possible:

**** TAKEOVER ****
: Indicates that the local VTAM has taken over the NCP boundary function connection to one of the session endpoints. One of the following values is displayed under the name of the resource which has been taken over:

  TOV
  : To indicate that the resource has been taken over

  GTK
  : To indicate that the resource was previously given back and has been taken over.

**** GIVEBACK ****
: Indicates that the local VTAM has given up the NCP boundary function connection to one of the session endpoints. One of the following values is displayed under the name of the resource which has been given up:

  GBK
  : To indicate that the resource has been given back

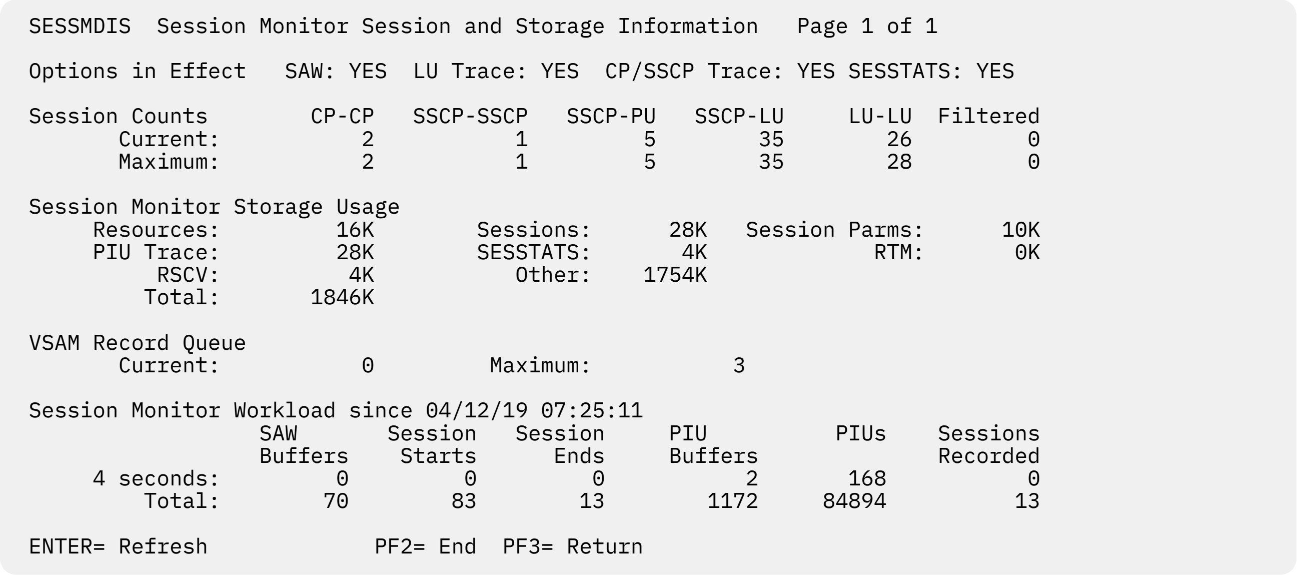
  TGV
  : To indicate that the resource was previously taken over and has now been given back.

For additional information about this and other session monitor panels, see "Typical LU-LU Session for an SNA Subarea Network" on page 61, "Typical CP-CP Session for an SNA Advanced Peer-to-Peer Networking Network" on page 67, and "Typical LU-LU Session for an SNA Advanced Peer-to-Peer Networking Network" on page 70.

Because of the limited data received in the takeover notification, some session PD route functions might be limited.

SESSMDIS Command

You can display session and storage information by entering the NetView SESSMDIS command from the command line. A panel similar to Figure 42 on page 77 is displayed.



```
SESSMDIS  Session Monitor Session and Storage Information   Page 1 of 1

Options in Effect   SAW: YES  LU Trace: YES  CP/SSCP Trace: YES SESSTATS: YES

Session Counts        CP-CP   SSCP-SSCP   SSCP-PU   SSCP-LU     LU-LU  Filtered
       Current:           2           1         5        35        26         0
       Maximum:           2           1         5        35        28         0

Session Monitor Storage Usage
     Resources:         16K        Sessions:      28K   Session Parms:      10K
     PIU Trace:         28K        SESSTATS:       4K             RTM:       0K
          RSCV:          4K           Other:    1754K
         Total:       1846K

VSAM Record Queue
       Current:           0         Maximum:           3

Session Monitor Workload since 04/12/19 07:25:11
                  SAW       Session   Session     PIU          PIUs    Sessions
                  Buffers    Starts      Ends     Buffers              Recorded
     4 seconds:         0         0         0           2       168           0
         Total:        70        83        13        1172     84894          13

ENTER= Refresh             PF2= End  PF3= Return
```

Figure 42. Session and Storage Information Panel

Check the following information:

- The session count. If the session count is 0, no sessions are active between the given resource types. On Figure 42 on page 77, two CP-CP sessions are active, one active SSCP-SSCP session, and so on.
- The amount of session and trace storage used. If, for example, the session storage amount is too high, you might want to filter certain session types (CP-CP, LU-LU, and so on), or to decrease trace storage, limit tracing functions.

Topic:	**Reference:**
Description of the output displayed from the SESSMDIS command	Additional information about the SESSMDIS command can be found in the *IBM Z NetView Tuning Guide*
NLDM panel help	NetView Online Help
NLDM panel Field Level Help	NetView Online Field Level Help `help nldm '`*`term`*`'`
Configuration examples	Appendix C, “Interpreting Session Data,” on page 253
Setting up the session monitor	*IBM Z NetView Installation: Configuring Additional Components* and “Using Session Monitor Filters” on page 144

Using the Status Monitor (SNA Subarea)

The status monitor dynamically collects information about SNA resources in the network and summarizes this information into a full screen display. You can also use the status monitor to automatically reactivate specified failing resources. You can use the status monitor in a 3270 environment, where the NetView management console is not available.

The status monitor, like VTAM, groups resources into major and minor nodes. Figure 43 on page 78 shows an example of the hierarchy that the status monitor uses.

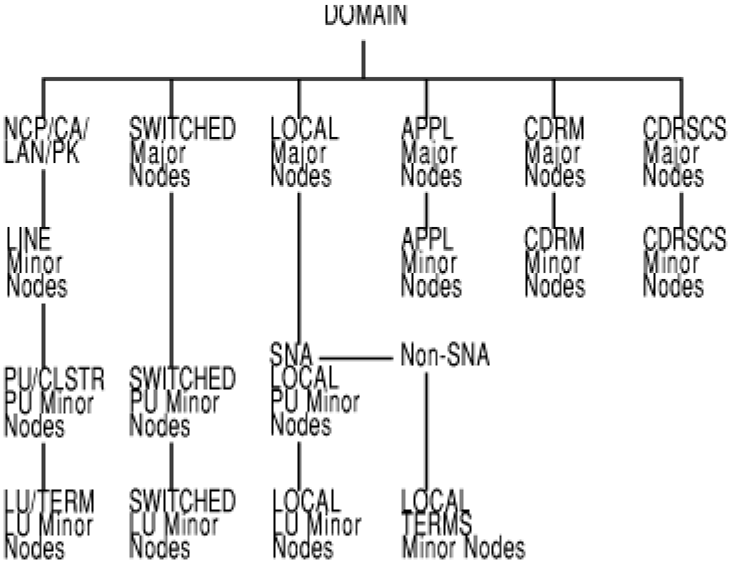


Figure 43. Status Monitor Hierarchy

The term ***higher node*** refers to the next node up in the hierarchy. For example, in Figure 43 on page 78, the switched major nodes are the next higher node in relation to the switched PU minor nodes. The term ***lower node*** refers to the next node down in the hierarchy. ***Domain*** represents the highest level in the status monitor hierarchy. Resources of the same type are considered to be at the same level. For example, all PUs are on the same level in the hierarchy.

Understanding the Status Monitor Panel Colors

The status monitor uses colors on color terminals or high and normal intensity on monochrome terminals to display information about different resource states. The following states are used:

ACTIVE
Nodes that are active (shown in green or normal intensity)

PENDING
Nodes that are waiting to become active or inactive (shown in white or normal intensity)

INACT
Nodes that have been inactivated (shown in red or high intensity)

MONIT
Nodes that are inactive, but that the status monitor is automatically trying to reactivate (shown in turquoise or normal intensity)

NEVACT
Nodes that have never been in an active state (shown in turquoise or normal intensity)

OTHER
All other possible states (shown in turquoise or normal intensity)

When you first enter the status monitor, the status of the resources shown in the status monitor panels is refreshed automatically.

Understanding Status Mapping

Table 4 on page 79 shows how the VTAM states are generally mapped to the status monitor states:

Table 4. Mapping VTAM States to Status Monitor States

VTAM Status Code	VTAM Status	Status Monitor Status	Notes
00*xx*	Inactive	Inactive (INACT)	The following exceptions are used: • 0000 (Reset) is mapped to OTHER. This is a substate of the VTAM Inactive status and is handled differently because of multiple ownership considerations. • 0002 (Released) is mapped to OTHER. This is a substate of the VTAM Inactive status and is handled differently because of multiple ownership considerations. • If the resource has been selected for re-activation by using the STATOPT statement, it is mapped to MONIT. • If the resource never reaches the active state since the resource has been known to VTAM, it is mapped to NEVACT. If the resource is released or reset, all the information associated with the resource is lost. Inactivating a major node causes all of the resources under it to be reset.
01*xx*	Pending Inactive	Pending (PENDING)	
02*xx*	Connectable	Other (OTHER)	
03*xx*	Reactivate		This VTAM status is changed to a VTAM Active or Inactive status after the resource it reactivated. Until then, this VTAM status is not mapped to a status monitor status.
04*xx*	Pending Active	Pending (PENDING)	
05*xx*	Active	Active (ACTIVE)	
06*xx*	Routable	Other (OTHER)	

Setting Up the Status Monitor

If the status monitor does not work as described in the previous section, check for the following actions:

- Resources and relationships are defined between resources. You can define these relationships using STATOPT statements in VTAMLST. In the following example, resource LINE01 is assigned the description LINE020 and is excluded from automatic reactivation (NOMONIT):

  ```
  LINE01    LINE    ADDR=(001,FULL),
                    SPEED=56000
                    STATOPT=('LINE020',NOMONIT)
  ```

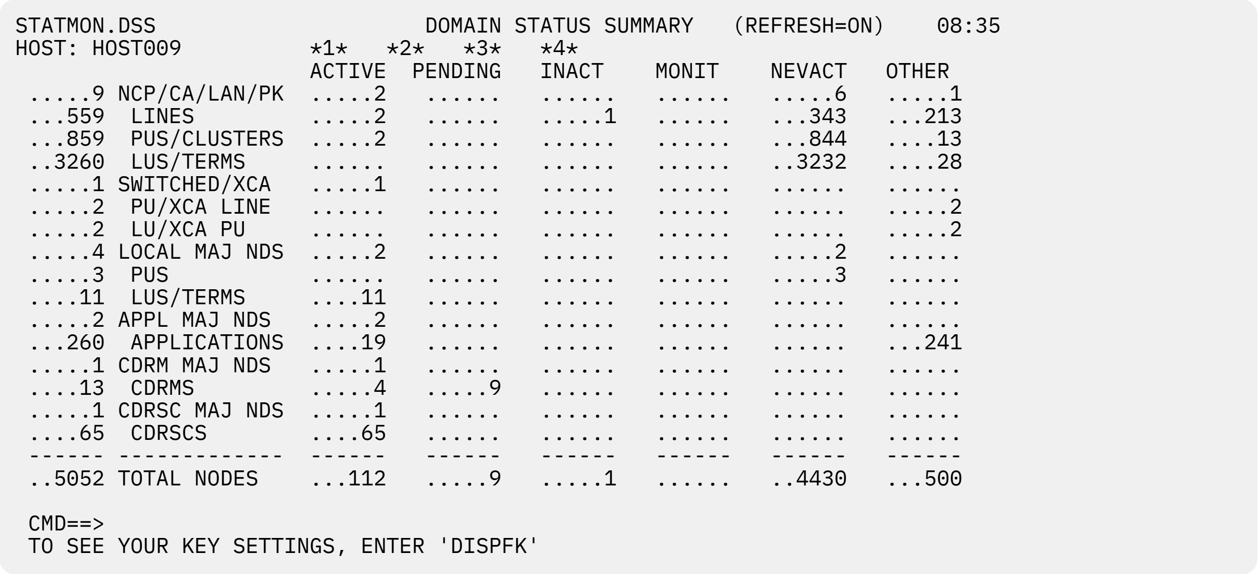
- The preprocessor, CNMNDEF, which reads the VTAMLST members and creates a member DSINDEF in DSIPARM, has run. DSINDEF is used by the status monitor initialization process.
- The status monitor is defined. This can be done in the status monitor initialization member sample DSICNM. In this sample, you can specify the following items:
  - Command lists available for processing through the status monitor
  - The automatic reactivation function

- A secondary status monitor
- The message alert settings
- The message filter parameters

Navigating Status Monitor Panels

Complete the following steps to use the status monitor panels:

1. Enter **statmon** at the command line. A panel similar to Figure 44 on page 80 is displayed.



```
STATMON.DSS                     DOMAIN STATUS SUMMARY   (REFRESH=ON)    08:35
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
 .....9 NCP/CA/LAN/PK  .....2   ......   ......   ......   .....6   .....1
 ...559  LINES         .....2   ......   .....1   ......   ...343   ...213
 ...859  PUS/CLUSTERS  .....2   ......   ......   ......   ...844   ....13
 ..3260  LUS/TERMS     ......   ......   ......   ......   ..3232   ....28
 .....1 SWITCHED/XCA   .....1   ......   ......   ......   ......   ......
 .....2  PU/XCA LINE   ......   ......   ......   ......   ......   .....2
 .....2  LU/XCA PU     ......   ......   ......   ......   ......   .....2
 .....4 LOCAL MAJ NDS  .....2   ......   ......   ......   .....2   ......
 .....3  PUS           ......   ......   ......   ......   .....3   ......
 ....11  LUS/TERMS     ....11   ......   ......   ......   ......   ......
 .....2 APPL MAJ NDS   .....2   ......   ......   ......   ......   ......
 ...260  APPLICATIONS  ....19   ......   ......   ......   ......   ...241
 .....1 CDRM MAJ NDS   .....1   ......   ......   ......   ......   ......
 ....13  CDRMS         .....4   .....9   ......   ......   ......   ......
 .....1 CDRSC MAJ NDS  .....1   ......   ......   ......   ......   ......
 ....65  CDRSCS        ....65   ......   ......   ......   ......   ......
 ------ -------------  ------   ------   ------   ------   ------   ------
 ..5052 TOTAL NODES    ...112   .....9   .....1   ......   ..4430   ...500

 CMD==>
 TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 44. Domain Status Summary Panel

   This panel summarizes the status for all the resource types within the domain's hierarchy. The status monitor uses two types of panels:

   Summary
   Provides information about the status for all resource types under any resource

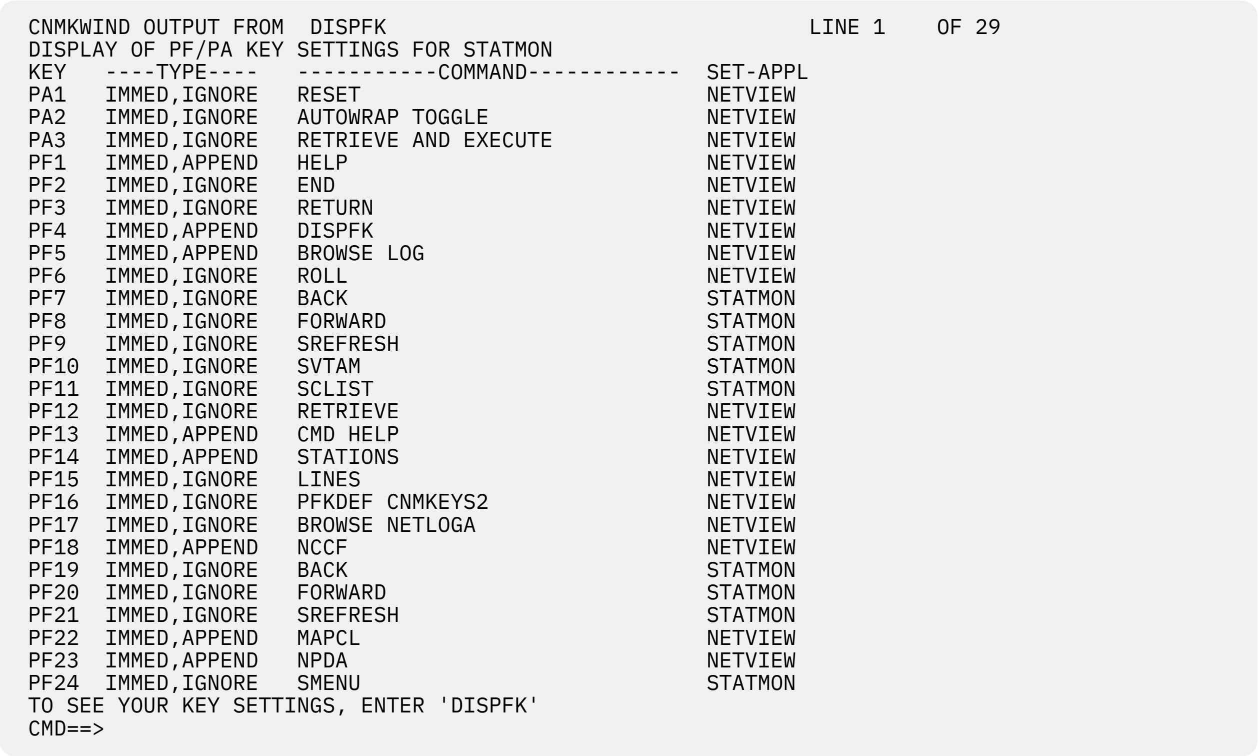
   Detail
   Provides a list of resources (by name) one level immediately below the resource for which the detail panel was selected

   For more information about the hierarchy of the status monitor panels, see Appendix B, "NetView Component Hierarchies," on page 239.

   You can then use the NetView SREFRESH command or press a PF key set to that command (NetView default for status monitor is PF9) to switch the status monitor Domain Status Summary panel between dynamic and static states.

   In the current setting of the panel, the REFRESH=ON state, changes to the displayed resources are reflected dynamically on the panel as they occur. If you are using the default PF key setting that is supplied by the NetView product for the status monitor component, pressing PF9 or entering SREFRESH switches the panel to the REFRESH=OFF state. In this state, the panel is static, and resource status changes are not refreshed automatically on the panel.

2. To determine your current PF key settings, use the NetView DISPFK command to display the values in effect for the current component. For example, if you enter DISPFK while in the status monitor component, you see one or more screens similar to the one shown here:



```
CNMKWIND OUTPUT FROM  DISPFK                                 LINE 1    OF 29
DISPLAY OF PF/PA KEY SETTINGS FOR STATMON
KEY   ----TYPE----   -----------COMMAND------------  SET-APPL
PA1   IMMED,IGNORE   RESET                           NETVIEW
PA2   IMMED,IGNORE   AUTOWRAP TOGGLE                 NETVIEW
PA3   IMMED,IGNORE   RETRIEVE AND EXECUTE            NETVIEW
PF1   IMMED,APPEND   HELP                            NETVIEW
PF2   IMMED,IGNORE   END                             NETVIEW
PF3   IMMED,IGNORE   RETURN                          NETVIEW
PF4   IMMED,APPEND   DISPFK                          NETVIEW
PF5   IMMED,APPEND   BROWSE LOG                      NETVIEW
PF6   IMMED,IGNORE   ROLL                            NETVIEW
PF7   IMMED,IGNORE   BACK                            STATMON
PF8   IMMED,IGNORE   FORWARD                         STATMON
PF9   IMMED,IGNORE   SREFRESH                        STATMON
PF10  IMMED,IGNORE   SVTAM                           STATMON
PF11  IMMED,IGNORE   SCLIST                          STATMON
PF12  IMMED,IGNORE   RETRIEVE                        NETVIEW
PF13  IMMED,APPEND   CMD HELP                        NETVIEW
PF14  IMMED,APPEND   STATIONS                        NETVIEW
PF15  IMMED,IGNORE   LINES                           NETVIEW
PF16  IMMED,IGNORE   PFKDEF CNMKEYS2                 NETVIEW
PF17  IMMED,IGNORE   BROWSE NETLOGA                  NETVIEW
PF18  IMMED,APPEND   NCCF                            NETVIEW
PF19  IMMED,IGNORE   BACK                            STATMON
PF20  IMMED,IGNORE   FORWARD                         STATMON
PF21  IMMED,IGNORE   SREFRESH                        STATMON
PF22  IMMED,APPEND   MAPCL                           NETVIEW
PF23  IMMED,APPEND   NPDA                            NETVIEW
PF24  IMMED,IGNORE   SMENU                           STATMON
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==>
```

Figure 45. Default Status Monitor PF Keys Supplied by the NetView Product

For more information about how your PF keys are set, refer to the NetView PFKDEF command in the NetView online help, and browse the CNMKEYS sample. Press **PF3** to return to the Domain Status Summary screen.

3. To select detailed information about specific resources:

   a. Press the **Tab** key to position the cursor in front of the resource type for which you want more information. To display detailed information for applications, position the cursor in the following way:

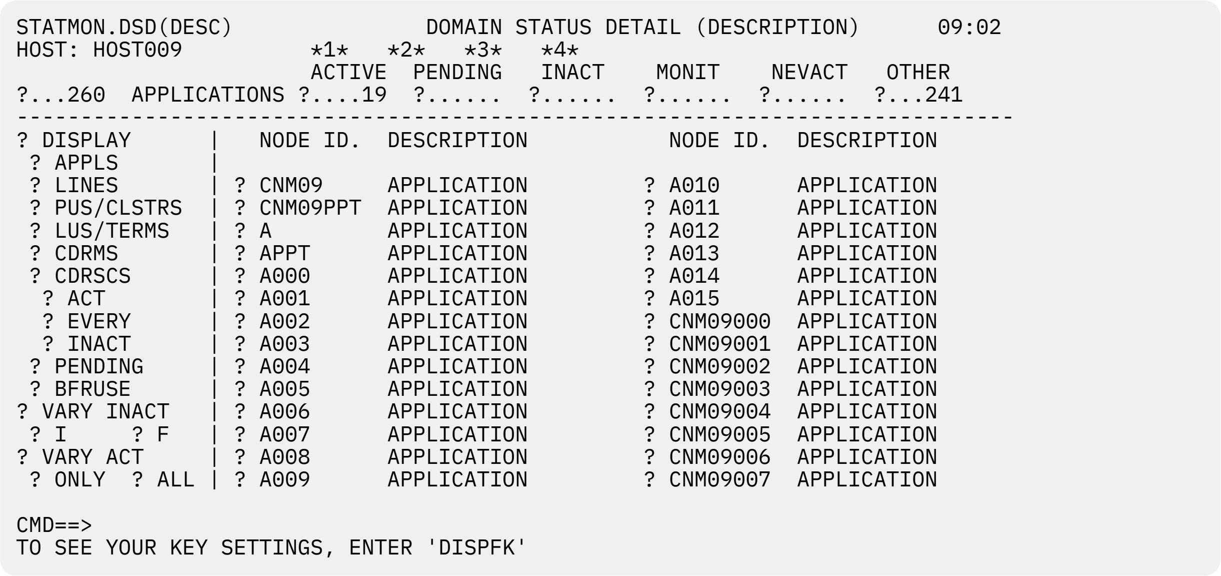
   ```
   _...260  APPLICATIONS  ....19   ......   ......   ......   ......   ...241
   ```

   b. Type any character except a blank in the space immediately before the field you just located. For example:

   ```
   x...260  APPLICATIONS  ....19   ......   ......   ......   ......   ...241
   ```

   c. Press **Enter**.

   A panel similar to Figure 46 on page 82 is displayed.

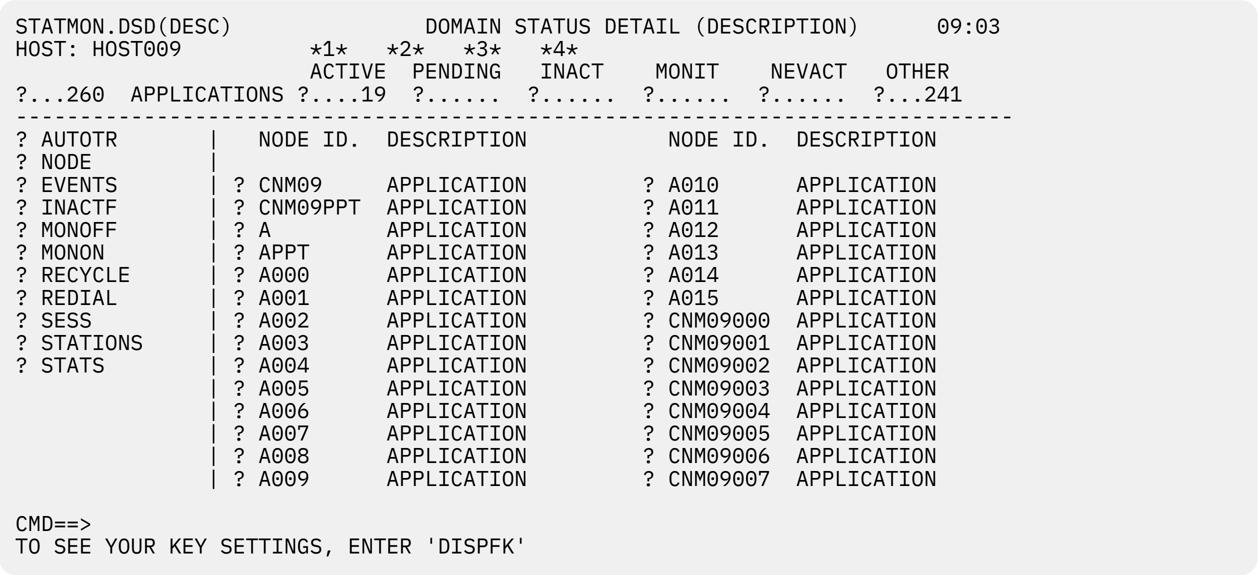


```
STATMON.DSD(DESC)               DOMAIN STATUS DETAIL (DESCRIPTION)      09:02
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
-------------------------------------------------------------------------------
? DISPLAY      |   NODE ID.  DESCRIPTION           NODE ID.  DESCRIPTION
 ? APPLS       |
 ? LINES       | ? CNM09     APPLICATION         ? A010      APPLICATION
 ? PUS/CLSTRS  | ? CNM09PPT  APPLICATION         ? A011      APPLICATION
 ? LUS/TERMS   | ? A         APPLICATION         ? A012      APPLICATION
 ? CDRMS       | ? APPT      APPLICATION         ? A013      APPLICATION
 ? CDRSCS      | ? A000      APPLICATION         ? A014      APPLICATION
  ? ACT        | ? A001      APPLICATION         ? A015      APPLICATION
  ? EVERY      | ? A002      APPLICATION         ? CNM09000  APPLICATION
  ? INACT      | ? A003      APPLICATION         ? CNM09001  APPLICATION
 ? PENDING     | ? A004      APPLICATION         ? CNM09002  APPLICATION
 ? BFRUSE      | ? A005      APPLICATION         ? CNM09003  APPLICATION
? VARY INACT   | ? A006      APPLICATION         ? CNM09004  APPLICATION
 ? I     ? F   | ? A007      APPLICATION         ? CNM09005  APPLICATION
? VARY ACT     | ? A008      APPLICATION         ? CNM09006  APPLICATION
 ? ONLY  ? ALL | ? A009      APPLICATION         ? CNM09007  APPLICATION

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 46. Domain Status Detail (Description) Panel Showing the VTAM Commands You Can Run against the Resources

This panel displays the name and description for each resource in the resource group you selected to access this panel. You can use any of the VTAM commands listed on this panel to display, activate, or inactivate any of the resources shown in the panel. To make a selection on the VTAM command menu, type any character except a blank or a question mark (?) over the ? field next to the command you want to use and next to the resource for which you want the command performed, then press Enter.

4. Enter the NetView SCLIST command to display the command lists that you can run from this panel, or press a PF key set to that command, such as the NetView default STATMON setting of PF11. A panel similar to Figure 47 on page 82 is displayed.



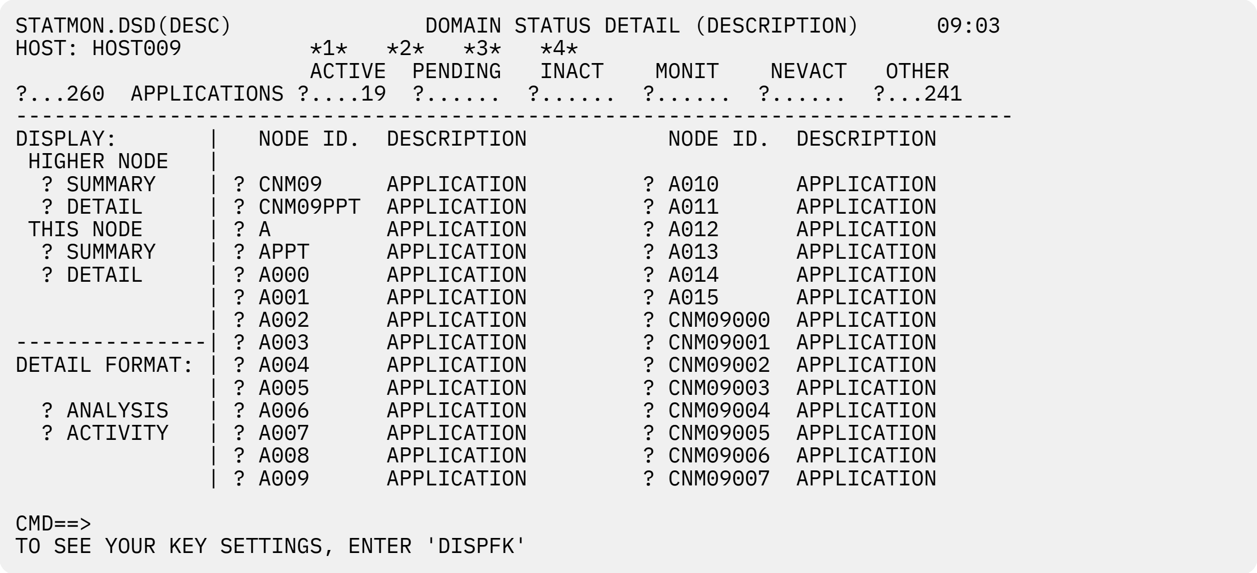
```
STATMON.DSD(DESC)               DOMAIN STATUS DETAIL (DESCRIPTION)      09:03
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
-------------------------------------------------------------------------------
? AUTOTR       |   NODE ID.  DESCRIPTION           NODE ID.  DESCRIPTION
? NODE         |
? EVENTS       | ? CNM09     APPLICATION         ? A010      APPLICATION
? INACTF       | ? CNM09PPT  APPLICATION         ? A011      APPLICATION
? MONOFF       | ? A         APPLICATION         ? A012      APPLICATION
? MONON        | ? APPT      APPLICATION         ? A013      APPLICATION
? RECYCLE      | ? A000      APPLICATION         ? A014      APPLICATION
? REDIAL       | ? A001      APPLICATION         ? A015      APPLICATION
? SESS         | ? A002      APPLICATION         ? CNM09000  APPLICATION
? STATIONS     | ? A003      APPLICATION         ? CNM09001  APPLICATION
? STATS        | ? A004      APPLICATION         ? CNM09002  APPLICATION
               | ? A005      APPLICATION         ? CNM09003  APPLICATION
               | ? A006      APPLICATION         ? CNM09004  APPLICATION
               | ? A007      APPLICATION         ? CNM09005  APPLICATION
               | ? A008      APPLICATION         ? CNM09006  APPLICATION
               | ? A009      APPLICATION         ? CNM09007  APPLICATION

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 47. Domain Status Detail (Description) Panel Showing the Command Lists You Can Run against the Resources

This panel displays the command lists that you can run against one or more of the resources listed. To return to the original panel, enter the SVTAM command or press the NetView default STATMON PF10 key to display the VTAM commands that you can run from that panel.

To issue a command for a resource, type any character over the ? field next to the command you want to use and next to the resource for which you want the command performed, then press Enter.

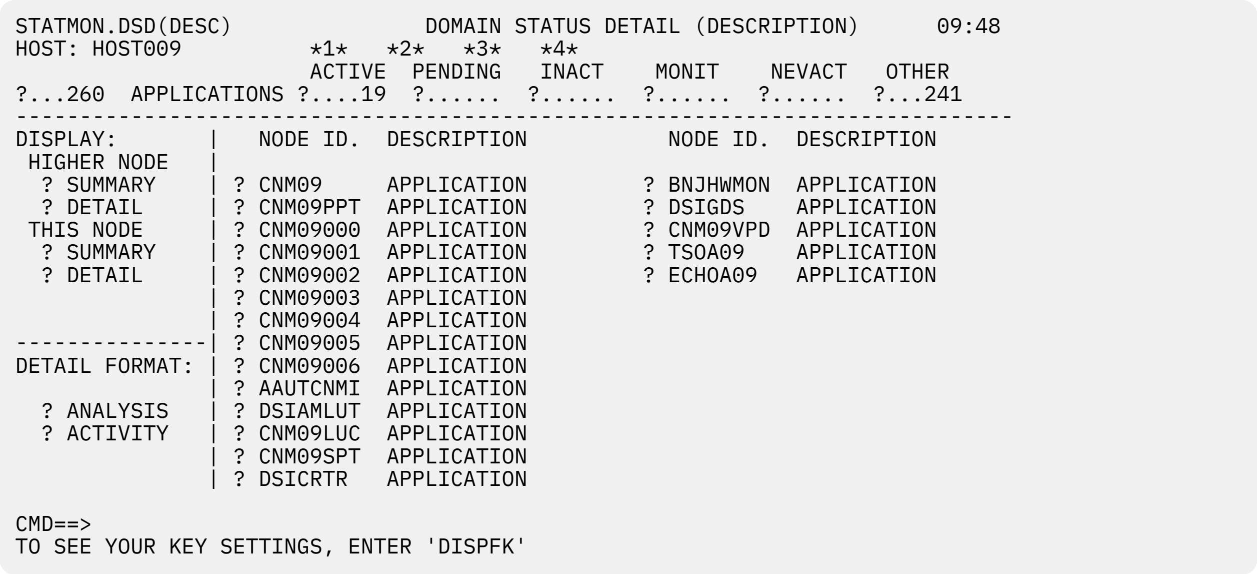
5. Enter the NetView SMENU command, or press a PF key set to that command (the NetView status monitor default is PF24) to display activity and analysis information for the selected resources. A panel similar to Figure 48 on page 83 is displayed.



```
STATMON.DSD(DESC)               DOMAIN STATUS DETAIL (DESCRIPTION)      09:03
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
------------------------------------------------------------------------------
DISPLAY:       |   NODE ID.  DESCRIPTION           NODE ID.  DESCRIPTION
 HIGHER NODE   |
  ? SUMMARY    | ? CNM09     APPLICATION         ? A010      APPLICATION
  ? DETAIL     | ? CNM09PPT  APPLICATION         ? A011      APPLICATION
 THIS NODE     | ? A         APPLICATION         ? A012      APPLICATION
  ? SUMMARY    | ? APPT      APPLICATION         ? A013      APPLICATION
  ? DETAIL     | ? A000      APPLICATION         ? A014      APPLICATION
               | ? A001      APPLICATION         ? A015      APPLICATION
               | ? A002      APPLICATION         ? CNM09000  APPLICATION
---------------| ? A003      APPLICATION         ? CNM09001  APPLICATION
DETAIL FORMAT: | ? A004      APPLICATION         ? CNM09002  APPLICATION
               | ? A005      APPLICATION         ? CNM09003  APPLICATION
  ? ANALYSIS   | ? A006      APPLICATION         ? CNM09004  APPLICATION
  ? ACTIVITY   | ? A007      APPLICATION         ? CNM09005  APPLICATION
               | ? A008      APPLICATION         ? CNM09006  APPLICATION
               | ? A009      APPLICATION         ? CNM09007  APPLICATION

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 48. Domain Status Detail (Description) Panel Containing Activity and Analysis Information

You can use the status indicators (ACTIVE, PENDING, and so on) displayed in the heading to view information about a portion of the resources displayed on this panel. For example, to view information about only the ACTIVE applications, type any character over the ? field below ACTIVE and press Enter. The status monitor displays a new Description panel with information about only the active applications, as shown in Figure 49 on page 83:



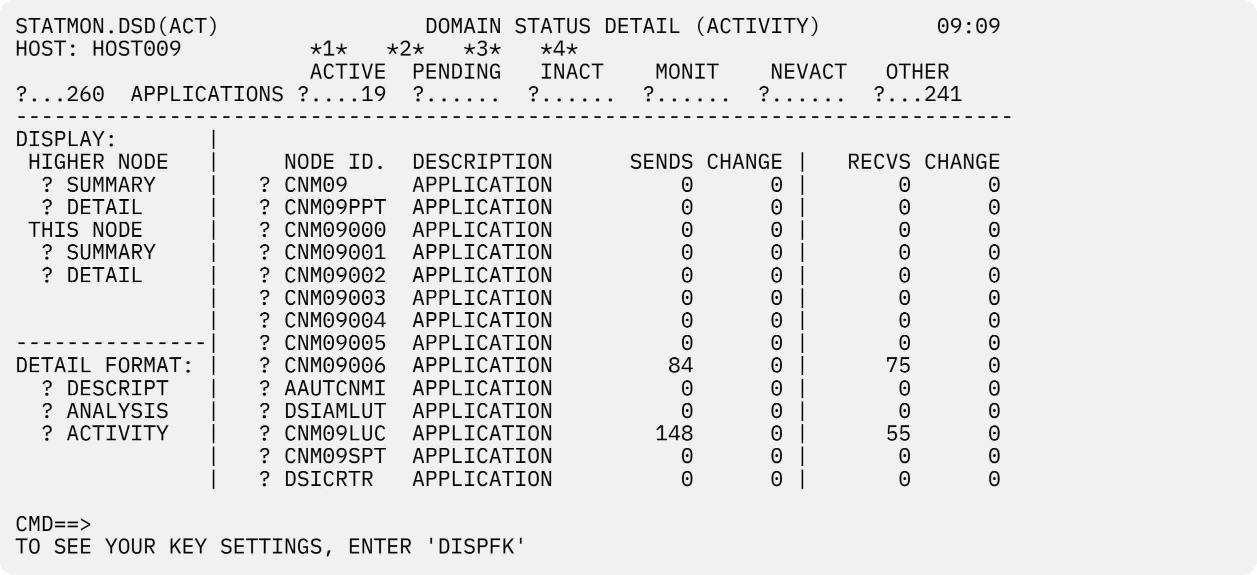
```
STATMON.DSD(DESC)               DOMAIN STATUS DETAIL (DESCRIPTION)      09:48
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
------------------------------------------------------------------------------
DISPLAY:       |   NODE ID.  DESCRIPTION           NODE ID.  DESCRIPTION
 HIGHER NODE   |
  ? SUMMARY    | ? CNM09     APPLICATION         ? BNJHWMON  APPLICATION
  ? DETAIL     | ? CNM09PPT  APPLICATION         ? DSIGDS    APPLICATION
 THIS NODE     | ? CNM09000  APPLICATION         ? CNM09VPD  APPLICATION
  ? SUMMARY    | ? CNM09001  APPLICATION         ? TSOA09    APPLICATION
  ? DETAIL     | ? CNM09002  APPLICATION         ? ECHOA09   APPLICATION
               | ? CNM09003  APPLICATION
               | ? CNM09004  APPLICATION
---------------| ? CNM09005  APPLICATION
DETAIL FORMAT: | ? CNM09006  APPLICATION
               | ? AAUTCNMI  APPLICATION
  ? ANALYSIS   | ? DSIAMLUT  APPLICATION
  ? ACTIVITY   | ? CNM09LUC  APPLICATION
               | ? CNM09SPT  APPLICATION
               | ? DSICRTR   APPLICATION

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 49. Domain Status Detail (Description) Panel Showing only Active Applications

Use the **DISPLAY** menu on the upper left side of the panel to ask for summary information or more details about the resources displayed on this panel (THIS NODE) or about the next HIGHER NODE above THIS NODE in the network configuration. To make your selection, type any character over the ? field next to your choice on the DISPLAY menu and next to the resource for which to display the information, then press Enter.

Use the **DETAIL FORMAT** menu on the lower left side of the panel to ask for more status information about the resources listed on this panel. You can view an analysis of the status of the resources by replacing the question mark in front of ANALYSIS with any character and pressing Enter. For resource types of APPLICATIONS and APPL MAJ NDS , an ACTIVITY option displays application message traffic information. You can view information about the activity of the applications with their current session partners by replacing the question mark in front of ACTIVITY with any character and pressing Enter.

6. Replace the question mark in front of ACTIVITY with any character and press Enter to view activity information. A panel similar to Figure 50 on page 84 is displayed.

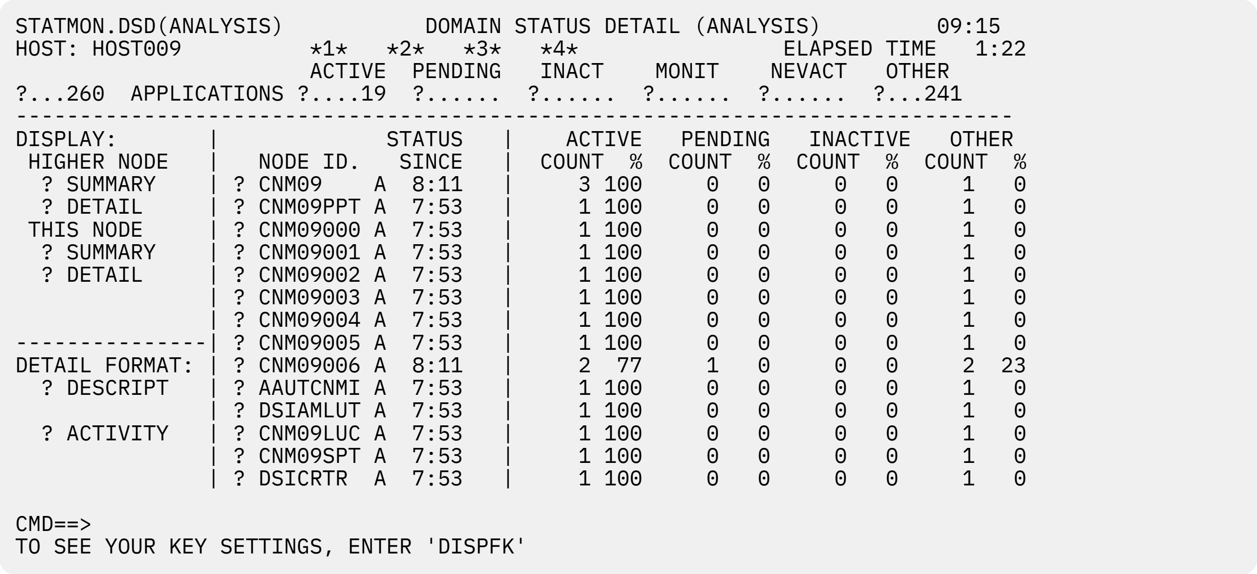


```
STATMON.DSD(ACT)                DOMAIN STATUS DETAIL (ACTIVITY)         09:09
HOST: HOST009          *1*   *2*   *3*   *4*
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
------------------------------------------------------------------------------
DISPLAY:       |
 HIGHER NODE   |     NODE ID.  DESCRIPTION      SENDS CHANGE |   RECVS CHANGE
  ? SUMMARY    |   ? CNM09     APPLICATION          0      0 |       0      0
  ? DETAIL     |   ? CNM09PPT  APPLICATION          0      0 |       0      0
 THIS NODE     |   ? CNM09000  APPLICATION          0      0 |       0      0
  ? SUMMARY    |   ? CNM09001  APPLICATION          0      0 |       0      0
  ? DETAIL     |   ? CNM09002  APPLICATION          0      0 |       0      0
               |   ? CNM09003  APPLICATION          0      0 |       0      0
               |   ? CNM09004  APPLICATION          0      0 |       0      0
---------------|   ? CNM09005  APPLICATION          0      0 |       0      0
DETAIL FORMAT: |   ? CNM09006  APPLICATION         84      0 |      75      0
  ? DESCRIPT   |   ? AAUTCNMI  APPLICATION          0      0 |       0      0
  ? ANALYSIS   |   ? DSIAMLUT  APPLICATION          0      0 |       0      0
  ? ACTIVITY   |   ? CNM09LUC  APPLICATION        148      0 |      55      0
               |   ? CNM09SPT  APPLICATION          0      0 |       0      0
               |   ? DSICRTR   APPLICATION          0      0 |       0      0

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 50. Domain Status Detail (Activity) Panel

This panel displays information about the activity between applications and the terminals and LUs in session with them. For the application you choose, the panel shows the number of messages sent to and received from the session partners of each application. You can use this information to monitor how frequently a particular application is accessed and how heavily it is used at any given time of day.

7. Replace the question mark in front of ANALYSIS with any character and press Enter to view analysis information. A panel similar to Figure 51 on page 84 is displayed.



```
STATMON.DSD(ANALYSIS)           DOMAIN STATUS DETAIL (ANALYSIS)         09:15
HOST: HOST009          *1*   *2*   *3*   *4*                ELAPSED TIME   1:22
                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
?...260  APPLICATIONS ?....19  ?......  ?......  ?......  ?......  ?...241
------------------------------------------------------------------------------
DISPLAY:       |             STATUS   |    ACTIVE   PENDING   INACTIVE   OTHER
 HIGHER NODE   |   NODE ID.   SINCE   |  COUNT  %  COUNT  %  COUNT  %  COUNT  %
  ? SUMMARY    | ? CNM09    A  8:11   |     3 100     0   0     0   0     1   0
  ? DETAIL     | ? CNM09PPT A  7:53   |     1 100     0   0     0   0     1   0
 THIS NODE     | ? CNM09000 A  7:53   |     1 100     0   0     0   0     1   0
  ? SUMMARY    | ? CNM09001 A  7:53   |     1 100     0   0     0   0     1   0
  ? DETAIL     | ? CNM09002 A  7:53   |     1 100     0   0     0   0     1   0
               | ? CNM09003 A  7:53   |     1 100     0   0     0   0     1   0
               | ? CNM09004 A  7:53   |     1 100     0   0     0   0     1   0
---------------| ? CNM09005 A  7:53   |     1 100     0   0     0   0     1   0
DETAIL FORMAT: | ? CNM09006 A  8:11   |     2  77     1   0     0   0     2  23
  ? DESCRIPT   | ? AAUTCNMI A  7:53   |     1 100     0   0     0   0     1   0
               | ? DSIAMLUT A  7:53   |     1 100     0   0     0   0     1   0
  ? ACTIVITY   | ? CNM09LUC A  7:53   |     1 100     0   0     0   0     1   0
               | ? CNM09SPT A  7:53   |     1 100     0   0     0   0     1   0
               | ? DSICRTR  A  7:53   |     1 100     0   0     0   0     1   0

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 51. Domain Status Detail (Analysis) Panel

This panel displays statistics about changes in the status of network resources. For the major resource you selected to display this panel, the status monitor presents the following information about that major resource and the minor resources grouped under it.

- The current status of each resource
- The time of day each resource went into its current state
- The number of times each resource has been in the `ACTIVE`, `PENDING`, `INACTIVE`, or `OTHER` state
- The percentage of time each resource has been in the `ACTIVE`, `PENDING`, `INACTIVE`, or `OTHER` state

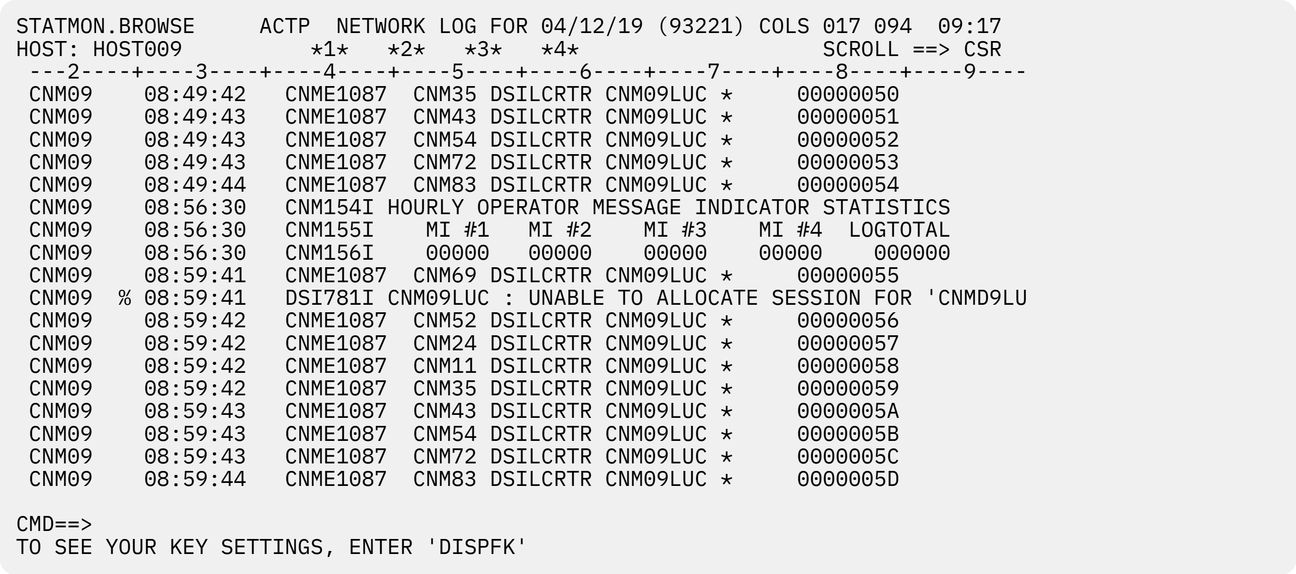
The status monitor begins collecting statistics about network resources when it is initialized. These statistics are updated each time the status of a resource changes. You can use the NetView CLRSTATS command to clear these statistics from the status monitor database. This resets all counts to zero and begins accumulating new data (as though it had been reinitialized).

The amount of time the status monitor has been collecting statistics since its last initialization or since the CLRSTATS command was issued is displayed in the heading under the `ELAPSED TIME` field.

To browse the active network log from any of the status monitor panels, take one of the following actions:

- Enter **BROWSE NETLOGA**
- Press a PF key that is set to BROWSE NETLOGA (such as the NetView default PF setting of PF17)
- Select one of the message indicators at the top of the panel

Tab to select one of the message indicators, type a character to the left of the indicator (for example, `*1*`) and press Enter. A figure similar to Figure 52 on page 85 is displayed.



```
STATMON.BROWSE     ACTP  NETWORK LOG FOR 04/12/19 (93221) COLS 017 094  09:17
HOST: HOST009          *1*   *2*   *3*   *4*                  SCROLL ==> CSR
 ---2----+----3----+----4----+----5----+----6----+----7----+----8----+----9----
 CNM09    08:49:42   CNME1087  CNM35 DSILCRTR CNM09LUC *     00000050
 CNM09    08:49:43   CNME1087  CNM43 DSILCRTR CNM09LUC *     00000051
 CNM09    08:49:43   CNME1087  CNM54 DSILCRTR CNM09LUC *     00000052
 CNM09    08:49:43   CNME1087  CNM72 DSILCRTR CNM09LUC *     00000053
 CNM09    08:49:44   CNME1087  CNM83 DSILCRTR CNM09LUC *     00000054
 CNM09    08:56:30   CNM154I HOURLY OPERATOR MESSAGE INDICATOR STATISTICS
 CNM09    08:56:30   CNM155I    MI #1   MI #2    MI #3    MI #4  LOGTOTAL
 CNM09    08:56:30   CNM156I    00000   00000    00000    00000    000000
 CNM09    08:59:41   CNME1087  CNM69 DSILCRTR CNM09LUC *     00000055
 CNM09  % 08:59:41   DSI781I CNM09LUC : UNABLE TO ALLOCATE SESSION FOR 'CNMD9LU
 CNM09    08:59:42   CNME1087  CNM52 DSILCRTR CNM09LUC *     00000056
 CNM09    08:59:42   CNME1087  CNM24 DSILCRTR CNM09LUC *     00000057
 CNM09    08:59:42   CNME1087  CNM11 DSILCRTR CNM09LUC *     00000058
 CNM09    08:59:42   CNME1087  CNM35 DSILCRTR CNM09LUC *     00000059
 CNM09    08:59:43   CNME1087  CNM43 DSILCRTR CNM09LUC *     0000005A
 CNM09    08:59:43   CNME1087  CNM54 DSILCRTR CNM09LUC *     0000005B
 CNM09    08:59:43   CNME1087  CNM72 DSILCRTR CNM09LUC *     0000005C
 CNM09    08:59:44   CNME1087  CNM83 DSILCRTR CNM09LUC *     0000005D

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 52. Browse Network Log Panel

Topic:	**Reference:**
Network log message format	Appendix A, “Message Formats,” on page 237
STATMON, CLRSTATS command	NetView online help
STATOPT statement syntax	*IBM Z NetView Administration Reference*
Defining the status monitor	*IBM Z NetView Installation: Configuring Additional Components*

Using the Status Monitor for Automatic Reactivation of Resources

The status monitor MONIT statement enables automatic reactivation of failing resources.To set up automatic reactivation, the O MONIT statement must be coded in the status monitor initialization member DSICNM.

Major nodes, applications, cross domain resources, and resources past the local NCP cannot be reactivated automatically with the MONIT function. Other resources can be excluded from automatic reactivation by coding NOMONIT on the STATOPT statement in the VTAMLST definition for the resource.

When a resource that is eligible for automatic reactivation becomes INACTIVE, and the status of its higher node is ACTIVE or CONNECTABLE, the status monitor attempts to reactivate the resource every minute until the resource status is no longer INACTIVE. The resource is placed in the MONIT column on the status monitor screen during this time.

If a resource is inactivated in a solicited manner (for example, a VARY NET,INACT command was issued), the status monitor does not attempt to reactivate the resource unless a `MONIT START,ID=resname` command is issued for that resource after it has been inactivated.

You can use the MONIT command to start or stop global monitoring, or to start or stop monitoring for one or more resources. When global monitoring is set off, status monitor does not attempt to reactivate any resources. For more information, refer to the MONIT command in the NetView online help and the O MONIT statement in the *IBM Z NetView Administration Reference*.

Chapter 5. Managing Network and System Status

To manage the status of your network from a workstation, use the NetView management console or the IBM Z System Automation graphical interface to collect status data and display it in real time. From a 3270 terminal, use the following products to monitor the status of your network and to provide performance measurements:

- Tivoli Workload Scheduler for z/OS
- Tivoli Decision Support for z/OS
- IBM Z System Automation

Note: These products are not shipped with the NetView product.

Using Tivoli Workload Scheduler for z/OS

Using Tivoli Workload Scheduler for z/OS to plan and control your production workload according to your business schedules, you can perform the following tasks:

- Define the deadlines, order of processing, and resource requirements of your production batch jobs and started tasks. This information is used by Tivoli Workload Scheduler for z/OS to automatically start your processing in the correct order. When conflicts arise, such as when more processing needs to be started than the available resources can accommodate, Tivoli Workload Scheduler for z/OS gives priority to processing that is closest to the defined deadline.
- Schedule communication with the NetView program when a NetView process is dependent on the business processing schedules.
- Generate alerts to the NetView program when problems are detected in the production workload, such as under the following conditions:
  - An operations ends in error
  - A batch job has been queued by JES for a long time
  - A batch job or started task has been running longer than expected
  - Processing is getting late and deadlines are in jeopardy
  - A Tivoli Workload Scheduler for z/OS subtask fails
  - A defined threshold has been reached on the Tivoli Workload Scheduler for z/OS queue
- Provide a hot standby facility to maximize the availability of the controlling functions in a z/OS sysplex.
- Automatically recover failures in batch jobs and started tasks, including cleaning up the catalog.
- Automatically restart or reroute the processing of controlled destinations to alternate destinations when the primary destination is not available, such as when a z/OS failure or a communications outage occurs.

Using Z Decision Support

IBM Z Decision Support accepts the output of the session monitor to create a logical view of the layout of your network. For example, groups of lines are grouped with the communication controllers and PUs which they connect. NCPs are also linked with the communication controllers on which they run and with the VTAM programs to which they connect so that users can perform availability, response time, throughput, and exception reporting on a higher level.

For example, line utilization on an aggregate or unit basis can be queried for a given geographical location. Z Decision Support resolves individual network component names (in this case, line names) to

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geographical sites that have meaning to the enterprise. This is particularly valuable when enterprises are trying to quantify end-user availability site by site, application by application, or NCP by NCP.

These statistics are provided by Z Decision Support through the NetView RECORD SESSTATS command and the NetView program's ability to write System Management Facilities (SMF) Record Type 39.

Z Decision Support is dependent on data obtained by the session monitor. Therefore, define the session monitor to pass the required information (SMF Record Type 39) to the NetView Log Task.

Topic:	**Reference:**
Installation and customization	*Z Decision Support Administration Guide and Reference*
Setting up the Session Monitor to log data to the external log (SMF)	*IBM Z NetView Installation: Configuring Additional Components*

Chapter 6. Monitoring Hardware and Software Problems

Hardware problems are associated with the physical structure of a network. The physical network consists of the hardware and software that connect network resources, allowing them to communicate with each other. The physical network includes the following connections:

- Hosts
- Communication controllers
- Cluster controllers
- Cable, telephone lines, or satellites
- Various devices such as printers and terminals

Associated with each connection is the network problem determination application (NPDA) responsible for performing link tests and diagnosing problems.

You can use the NetView management console or the hardware monitor to detect hardware problems. The sections that follow describe how to use the hardware monitor; to obtain additional information about using the NetView management console to monitor hardware problems, see Chapter 3, “Monitoring and Controlling Your Network from a Workstation,” on page 43.

Using the Hardware Monitor

Many hardware resources in a network send information records and error records to the host system. The hardware monitor collects this information and arranges and displays the data to help you with problem determination and prevention.

You can use the hardware monitor to display the most recent events and statistics recorded for a network resource. The hardware monitor analyzes error data for probable causes and lists actions that can be taken to correct the problem. You can use filters to keep extraneous information from complicating your problem-solving efforts (for additional information about setting filters, see “Using Hardware Monitor Filters” on page 140). An alert function informs you quickly of high-priority problems. You can also record problems directly into the Information/Management System from the hardware monitor. Use the NetView management console to display the GMFALERT records, which represent resources monitored by the NetView management console.

Data Collection

The hardware monitor collects data from many different sources in various formats and gives a common structure to this information. This data can be classified as solicited or unsolicited data.

Figure 53 on page 90 provides an illustration of hardware monitor data collection.

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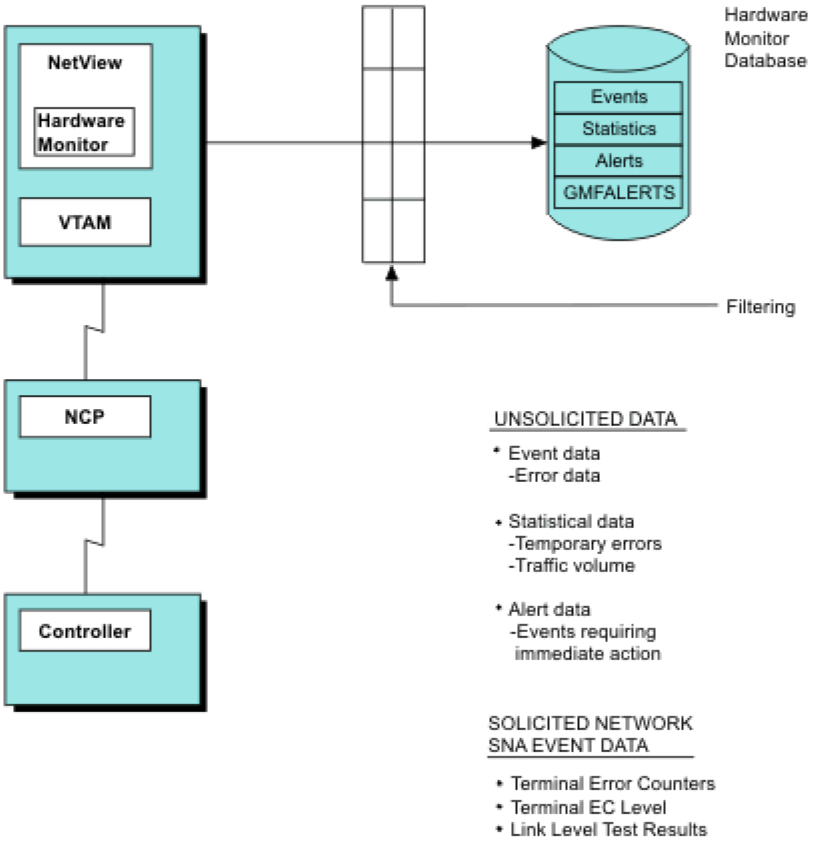


Figure 53. Data Collected by the Hardware Monitor

Solicited Data

Solicited data is received as the result of a specific request for information or as the result of an action that you have taken. Certain SNA control units keep counters of different types of communication errors they detect and transmit the counters to the host only as solicited data.

Unsolicited Data

Unsolicited data can be recorded as a statistic, an event, or as a GMFALERT record. Unsolicited data is received without any action on your part. You can receive unsolicited data when an error or performance problem is detected in the network. Unsolicited data can also be received when a problem in the network is resolved or a resource is deactivated.

Statistics are records of traffic volumes and temporary errors. *Events* can be records of permanent errors, or of other unusual occurrences, and can come from statistics that qualify for event status because of a high ratio of temporary errors to traffic. Hardware alerts are events that require attention. *GMFALERT records* represent events that pertain to resources monitored by the NetView management console.

When the hardware monitor receives unsolicited data, it creates a record containing information about the data and stores it as an event, statistical record, or GMFALERT in the database. If the data qualifies as an alert, an alert record is also created. Unsolicited alerts can also be received when forwarded from distributed NetView programs or entry point nodes.

Record Types

The hardware monitor creates a database made up of several record types: statistics, events, GMFALERTs, and alerts.

Statistics

Statistics are records of traffic and recoverable error counts that have been collected at certain resources and reported to the host system. Statistical data generated by resources is sent to the host, and the hardware monitor stores these records in its database. For certain resources, the hardware monitor analyzes each statistical record to determine whether to create a performance event record, which can become an alert.

A statistic can become an event when it exceeds the limits that you have set as a threshold. A threshold is a ratio of temporary errors compared to the traffic associated with the resource and is expressed as a percentage. A threshold indicates the least acceptable percentage of temporary errors. If the threshold is exceeded, the hardware monitor creates an event record to record this condition. The original record is also recorded as a statistic.

Events

Events are unexpected occurrences in network operation. An event can be created when the attempted activation of a resource fails. This failure can be because of a physical error in the network. Event data detected and generated by resources is sent to the host system for the hardware monitor to store in its database and to determine whether to issue and record an alert. Resolution major vectors (X'0002'), which inform you that an alert was resolved, are also stored on the database as events.

GMFALERTs

GMFALERT records represent events that pertain to resources monitored by the NetView management console. If the NetView management console is not installed, the GMFALERT records, which are a subset of NetView management console event report records, are recorded in the hardware monitor database. The alert history window of NetView management console is one place where GMFALERT records are displayed. Prior to NetView V3R2, the GMFALERT records were recorded to the GMFHS VSAM database along with the other event report records. See the *IBM Z NetView Customization Guide* for more information.

Alerts

Alerts are events (including resolutions) that require attention. If the records pass the event filters, the hardware monitor checks the current state of its recording filters to see if this event qualifies for alert status. If it does, several things occur:

- An alert record about the event is written to the hardware monitor database.
- A line item is created for presentation to the hardware monitor users on the Alerts-Dynamic panel if their viewing filters are set to pass an alert of this type from this resource. These users' panels are automatically updated to reflect the occurrence of this special event. They can then take immediate action as called for by the nature of the event and any pertinent local procedures.
- An alert can also be forwarded to the NetView alert focal point. The following methods are used to forward alerts:
  - The primary method uses the ROUTE filter. This filter controls the selection of alert records that are routed.
  - The secondary method uses the OPER filter and NetView automation. With this method, the alert is converted to a message and sent to the focal point. The message is converted back to an alert at the focal point.

    Note: The message might not contain all the important data stored at the sending NetView program. Use the ROUTE filter for forwarding alerts to the focal point. See "Network Management for Multiple Domains" on page 101 for more information.

An alert is displayed on your Alerts-Dynamic panel as a one-line summary of the event that shows the error description and probable cause. The alert summary also shows the NetView domain where the alert originated. The hardware monitor also issues a message about the alert to an authorized operator, if filters are set up to provide this function. For a description of the different alert types, see *SNA Formats*.

Events are classified by type. Table 5 on page 92 provides a list of event types and their corresponding abbreviations and codes.

Table 5. Event Types with Abbreviations and Codes

Abbr.	Event Type	Description	Code
AVAL	Availability	The availability status of the reported resource has changed.	09
BYPS	Alert bypass	A loss of availability was circumvented to allow the resource or an alternative resource to be used. The original problem still exists and you might not notice recovery. The recovery can be accomplished by intervention, either internal or external to the reporting product.	14
CUST	Customer application generated	A program that does not have an IBM order number generated the problem record.	05
DLRC	Delayed recovery	The sender is reporting a previously detected alertable condition that prevented reporting when detected, or the sender is reporting recovery from a condition that occurred earlier.	0F
ENV	Environment	A physical environmental problem has occurred.	0B
HELD	Held alert flag	An error condition was detected earlier, but the record was not sent at the time because no session is available to send it. In filtering, the hardware monitor treats the HELD flag as if it was a second alert or event type. This means a HELD flag is always associated with another event type. The HELD event type has the same filter priority as all other event types.	--
IMPD	Impending problem	Availability to the user is about to be lost.	11
IMR	Intensive Mode Recording	An error record resulted from the user calling intensive mode recording, a feature of the NCP. When IMR is called, an error record is generated each time the NCP goes through an error retry.	08
INST	Installation	A system definition or an incompatibility between components was reported.	0C
INTV	Intervention required	Intervention of a human operator is needed for corrective action.	04
NTFY	Notification of status change	Availability to the user is about to be lost. An important change of component, system, or network status requiring operator notification is required.	0A
PAFF	Permanently affected resource	The originator of this alert has determined that the target resource is lost because of a persistent error in a resource other than the target.	10
PERF	Performance	A recognized measurement of performance, such as response time, has exceeded a determined threshold.	03
PERM	Permanent error	Availability to the user is lost unless external intervention to the reporting product is provided.	01

Table 5. Event Types with Abbreviations and Codes (continued)

Abbr.	Event Type	Description	Code
PROC	Operation or procedure	A requested function cannot be performed because of an operational or procedural error.	0D
REDL	Redundancy lost	Redundant hardware or software is provided to ensure continued operation in the event of a failure or malfunction. As a result, failure of the remaining operational hardware or software results in a loss of corresponding services.	15
RSLV	Resolve major vector	The resolve major vector provides notification of the resolution of a previously reported problem. It contains an identification of the type of problem resolution and an identification of the failing resource.	--
RSNT	Resent alert flag	The alert was resent, providing additional information about the original problem. In filtering, the hardware monitor treats the resent flag as if it were a second alert or event type.	--
SCUR	Security	A report of an incident that can indicate a possible security violation was detected.	0E
SNA	SNA summary	A record containing SNA summary error counters. The record is typically the result of a NetView hardware monitor solicitation.	07
TEMP	Temporary or recoverable error	A momentary loss of availability is noticeable by the user, but is recovered from without intervention external to the reporting product.	02
USER	End user generated	A problem record initiated by a terminal operator.	06
UNKN	Unknown	The severity of the alert cannot be assessed.	12

Note: BYPS, IMPD, PAFF, PERF, PERM, REDL, and TEMP are supported as part of the generic alert architecture.

In certain instances, the definitions of alert or event types used by non-generic alert records differ from the current architected generic definitions.

You can use event types in filter-setting commands to control the types of data recorded in the hardware monitor's database or viewed by a NetView operator.

Secondary Recording of Event Records

In certain cases, the hardware monitor analyzes event data and determines that the resource causing the failure is not the resource that was specified in the event data. In this situation, the resource specified in the event data was affected by the failure but is not the cause. When this occurs, the hardware monitor records events for the actual failing resource and the resource reported in the event data. The default recording filters create alerts only for events against failing resources.

By recording two event records in this situation, you can display the information about this event condition using either the name of the actual failing resource, or the name of the resource affected by this event condition.

With LUC alert forwarding, hardware monitor secondary recording is prevented from occurring at the focal point. So, even if two alerts are logged at the entry point (one for the primary alert and one for the secondary alert), only one primary alert is logged at the focal point.

However, with SNA-MDS/LU 6.2 alert forwarding, secondary recording of SNA-MDS/LU 6.2 forwarded alerts can occur at the focal point. Thus, two alerts can be logged at the focal point for a single SNA-MDS/LU 6.2 (NetView or non-NetView) forwarded alert. Zero alerts can also be logged if the ESREC and AREC recording filters of the focal point are blocked. For NetView-forwarded alerts, this requires using the automation table SRF action, because the normal recording filter settings, using the SRFILTER command to specify filter settings from the hardware monitor, are not supported for this type of alert. For information about using the SRF action, see the *IBM Z NetView Automation Guide*.

ALERT-NETOP, an architected alert focal point introduced in NetView V2R2, supports secondary recording of SNA-MDS/LU 6.2 non-NetView-forwarded alerts, and local (non-forwarded) alerts. As of V3, the NetView program also supports secondary recording of SNA-MDS/LU 6.2-forwarded alerts from entry point NetView hosts.

Network Monitoring with the Hardware Monitor Panels

You can use the hardware monitor panels to monitor your system and react to problem situations. To obtain help for any field in any hardware monitor panel, type `help`, followed by one or more field names within single quotation marks. For example, to obtain help for the RESNAME field in the Alerts-Static panel, enter:

```
help 'resname'
```

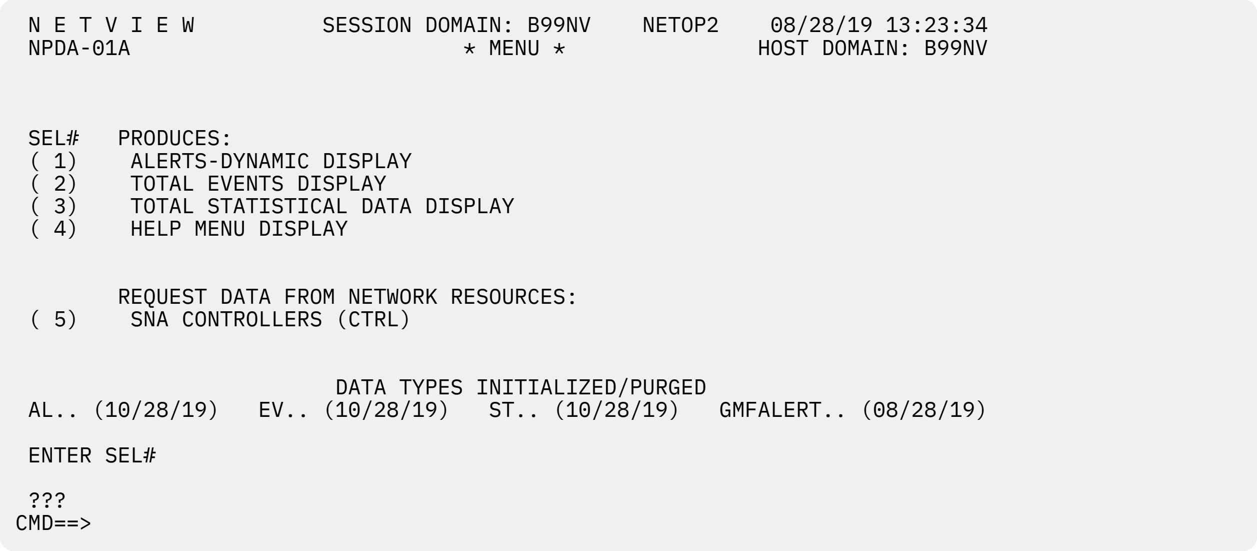
You can also enter `help` from any hardware monitor panel to access the main help menu.

This section describes typical scenarios using the major hardware monitor panels. For additional information about how to use the hardware monitor panels to solve specific network problems, see Part 3, “Controlling the NetView Environment,” on page 125.

Investigating Alerts

The following scenario shows how to investigate the cause of an alert.

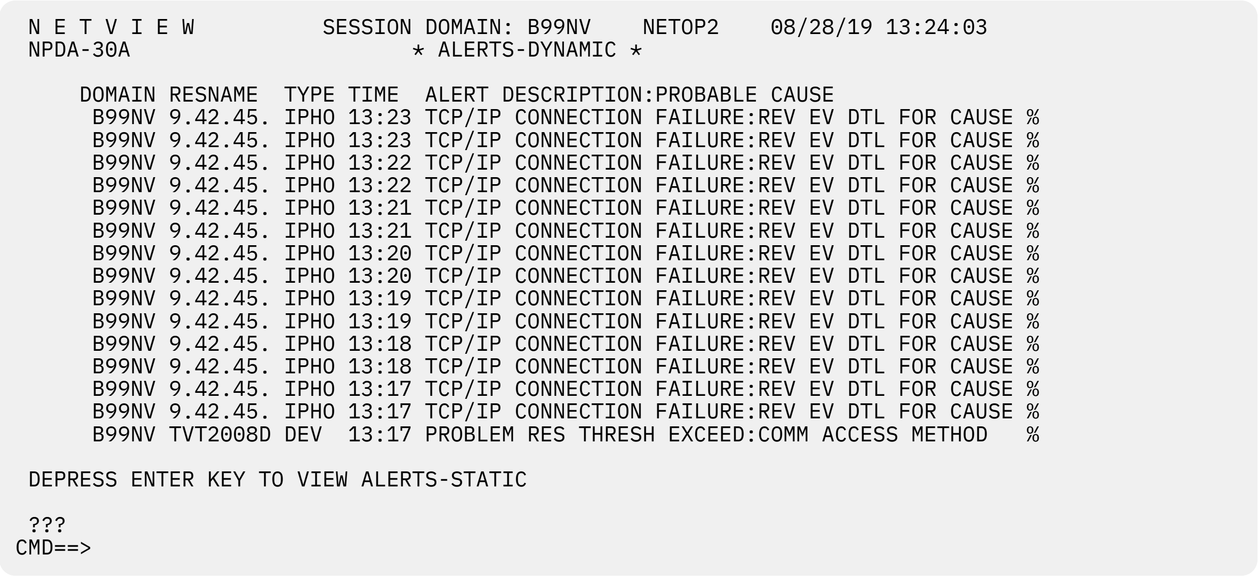
1. Enter **npda** from the main menu panel. A panel similar to Figure 54 on page 94 is displayed.



```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:23:34
 NPDA-01A                          * MENU *               HOST DOMAIN: B99NV



 SEL#   PRODUCES:
 ( 1)    ALERTS-DYNAMIC DISPLAY
 ( 2)    TOTAL EVENTS DISPLAY
 ( 3)    TOTAL STATISTICAL DATA DISPLAY
 ( 4)    HELP MENU DISPLAY


        REQUEST DATA FROM NETWORK RESOURCES:
 ( 5)    SNA CONTROLLERS (CTRL)


                         DATA TYPES INITIALIZED/PURGED
 AL.. (10/28/19)   EV.. (10/28/19)   ST.. (10/28/19)   GMFALERT.. (08/28/19)

 ENTER SEL#

 ???
CMD==>
```

Figure 54. Hardware Monitor Main Menu

2. Select option **1** to monitor the alerts. A panel similar to Figure 55 on page 95 is displayed.



```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:24:03
 NPDA-30A                     * ALERTS-DYNAMIC *

     DOMAIN RESNAME  TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
      B99NV 9.42.45. IPHO 13:23 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:23 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:22 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:22 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:21 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:21 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:20 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:20 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:19 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:19 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:18 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:18 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:17 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV 9.42.45. IPHO 13:17 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
      B99NV TVT2008D DEV  13:17 PROBLEM RES THRESH EXCEED:COMM ACCESS METHOD   %

 DEPRESS ENTER KEY TO VIEW ALERTS-STATIC

 ???
CMD==>
```

Figure 55. Alerts-Dynamic Panel

This is the Alerts-Dynamic panel, a single-page display designed to continuously show local alerts and alerts forwarded from entry points. As failures occur, each alert is displayed at the top of the display, and the alert at the bottom of the display is removed.

For each alert the following information can be displayed:

DOMAIN
The name of the domain from which the alert originated

RESNAME
The name of the device or other resource which is the one most affected by the event that originated the alert

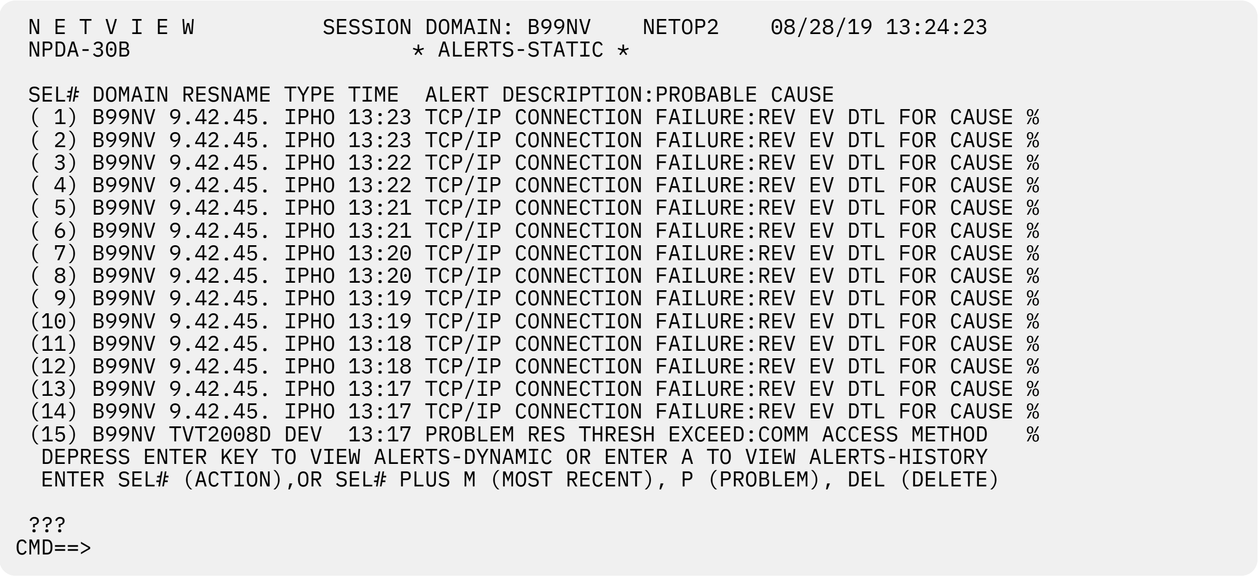
TYPE
An abbreviation of the resource type

TIME
The time the alert was recorded on the database

ALERT DESCRIPTION:PROBABLE CAUSE
An abbreviated message describing the error that occurred and the probable cause

Note: Other formats are available for displaying alerts. You can code the ALT_ALERT statement in the member specified by the MEM keyword of the BNJDSERV TASK statement to select a specific format for the Alerts-Dynamic, Alerts-Static, and Alerts-History panels.

3. Press Enter to display the Alerts-Static panel. A panel that is similar to the one in Figure 56 on page 96 is displayed.



```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:24:23
 NPDA-30B                      * ALERTS-STATIC *

 SEL# DOMAIN RESNAME TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
 ( 1) B99NV 9.42.45. IPHO 13:23 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 2) B99NV 9.42.45. IPHO 13:23 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 3) B99NV 9.42.45. IPHO 13:22 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 4) B99NV 9.42.45. IPHO 13:22 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 5) B99NV 9.42.45. IPHO 13:21 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 6) B99NV 9.42.45. IPHO 13:21 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 7) B99NV 9.42.45. IPHO 13:20 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 8) B99NV 9.42.45. IPHO 13:20 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 ( 9) B99NV 9.42.45. IPHO 13:19 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (10) B99NV 9.42.45. IPHO 13:19 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (11) B99NV 9.42.45. IPHO 13:18 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (12) B99NV 9.42.45. IPHO 13:18 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (13) B99NV 9.42.45. IPHO 13:17 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (14) B99NV 9.42.45. IPHO 13:17 TCP/IP CONNECTION FAILURE:REV EV DTL FOR CAUSE %
 (15) B99NV TVT2008D DEV  13:17 PROBLEM RES THRESH EXCEED:COMM ACCESS METHOD   %
  DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER A TO VIEW ALERTS-HISTORY
  ENTER SEL# (ACTION),OR SEL# PLUS M (MOST RECENT), P (PROBLEM), DEL (DELETE)

 ???
CMD==>
```

Figure 56. Alerts-Static Panel

The Alerts-Static panel freezes the current contents of the Alerts-Dynamic panel. It does not allow new alerts to be displayed on the panel, because a dynamic display can show alerts so quickly that it might be difficult to view. The alerts are listed in reverse chronological order.

The following options are listed at the bottom of the panel:

A

Use this option to display all the alerts recorded in the database. You can then press the Enter key to page forward through the alerts.

SEL#

This option is used to view the recommended actions for a specific alert.

SEL# M

Use this option to view the most recent events recorded for a specific resource (such as a controller). You can enter the number of one of the alerts generated by that resource followed by **m**. For example, to view the most recent events for CTRL D11CCL48, enter **1 m**.

SEL# P

Use this option to create a problem report for a specific alert. For example, to create a problem report for the first alert shown on the panel, enter **1 p**.

SEL# DEL

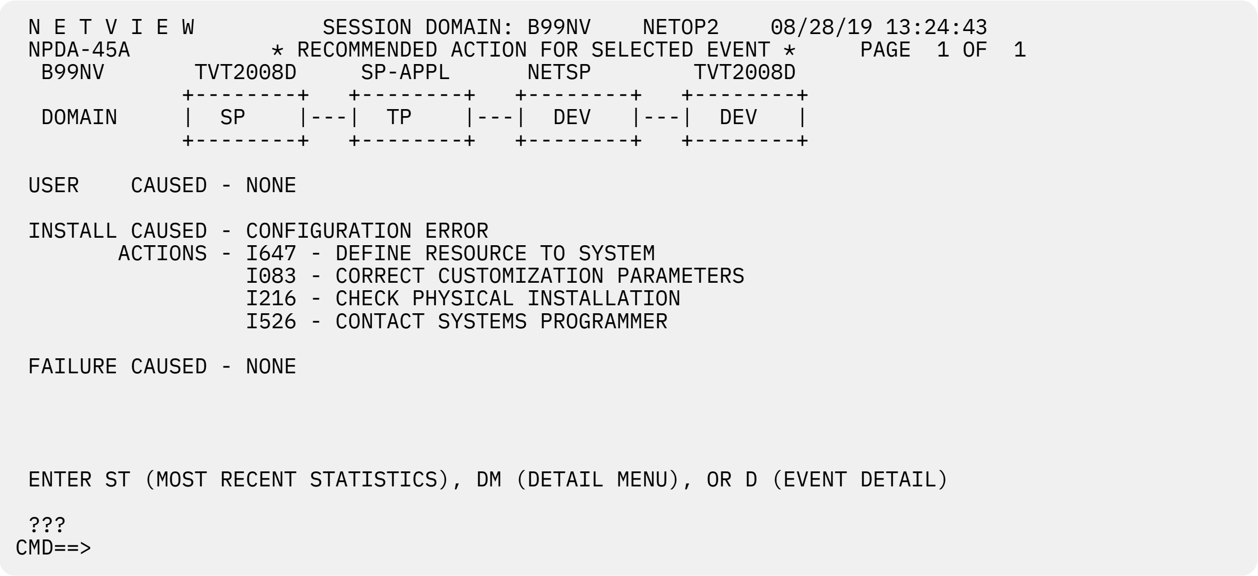
Use this option to delete a specific alert from the hardware monitor database. For example, to delete the first alert shown on the panel, enter **1 del**.

Not all of the available options are shown at the bottom of the panel. For a list of all the available options, enter **help** and then select **PROMPTS** from the help menu.

You can also scroll through panels using PF keys. The default hardware monitor PF key setting supplied by the NetView product for FORWARD is PF8. To determine your current hardware monitor PF key settings, use the NetView DISPFK command.

You can also display current PF key settings for other components, such as command facility or status monitor. For a list of default settings for those components, see Figure 10 on page 38 and Figure 45 on page 81.

4. Enter the alert number in the command area to obtain the recommended actions for the alert. For example, if you enter **15**, a panel that is similar to the one in Figure 57 on page 97 is displayed.



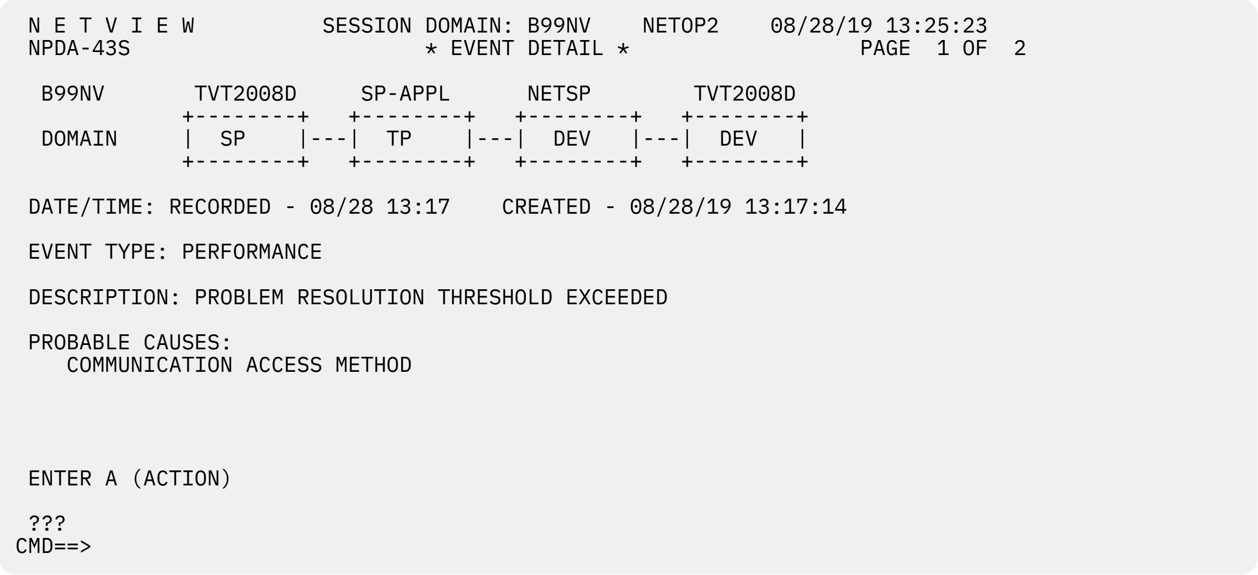
```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:24:43
 NPDA-45A           * RECOMMENDED ACTION FOR SELECTED EVENT *      PAGE  1 OF  1
  B99NV       TVT2008D     SP-APPL      NETSP        TVT2008D
             +--------+   +--------+   +--------+   +--------+
  DOMAIN     |  SP    |---|  TP    |---|  DEV   |---|  DEV   |
             +--------+   +--------+   +--------+   +--------+

 USER    CAUSED - NONE

 INSTALL CAUSED - CONFIGURATION ERROR
        ACTIONS - I647 - DEFINE RESOURCE TO SYSTEM
                  I083 - CORRECT CUSTOMIZATION PARAMETERS
                  I216 - CHECK PHYSICAL INSTALLATION
                  I526 - CONTACT SYSTEMS PROGRAMMER

 FAILURE CAUSED - NONE




 ENTER ST (MOST RECENT STATISTICS), DM (DETAIL MENU), OR D (EVENT DETAIL)

 ???
CMD==>
```

Figure 57. Recommended Action for Selected Event Panel

The Recommended Action panel lists the probable causes of a problem and shows the configuration of the resources that are associated with the problem. The probable causes are listed from three perspectives: user caused, install caused, and failure caused. This type of panel is available for any error that the hardware monitor lists, whether the error is a permanent or temporary problem.

The action numbers (D*nnn*, E*nnn*, I*nnn*, or R*nnn*) indicate actions that you can take to investigate the error. If you want to display an explanation of these recommended actions first, you can enter `action` followed by the action number. While D*nnn* actions have associated panels that are supplied with the NetView product, E*nnn*, I*nnn*, and R*nnn* actions do not have panels that are supplied with the NetView product,. However, with the NetView program, you can overlay I-numbers and E-numbers with action numbers to create panels that are specific to the sending product. For additional information about creating your own action panels, see the *IBM Z NetView Customization Guide*.

5. Enter **d** to display event detail information for the alert. A panel that is similar to the one in Figure 58 on page 97 is displayed.



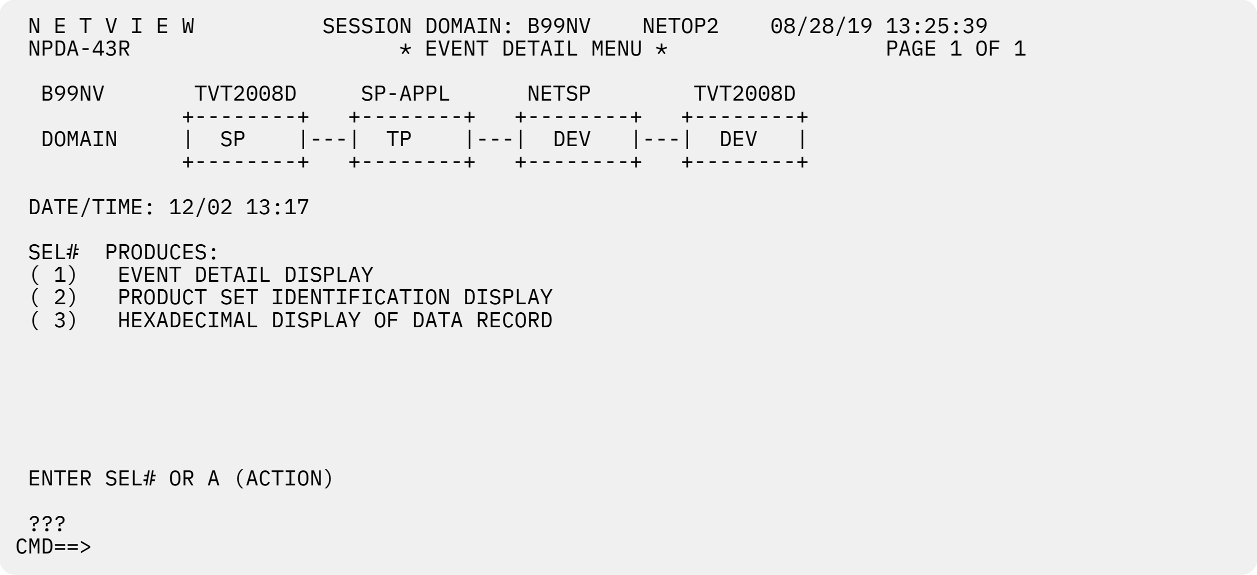
```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:25:23
 NPDA-43S                       * EVENT DETAIL *                   PAGE  1 OF  2

  B99NV       TVT2008D     SP-APPL      NETSP        TVT2008D
             +--------+   +--------+   +--------+   +--------+
  DOMAIN     |  SP    |---|  TP    |---|  DEV   |---|  DEV   |
             +--------+   +--------+   +--------+   +--------+

 DATE/TIME: RECORDED - 08/28 13:17    CREATED - 08/28/19 13:17:14

 EVENT TYPE: PERFORMANCE

 DESCRIPTION: PROBLEM RESOLUTION THRESHOLD EXCEEDED

 PROBABLE CAUSES:
    COMMUNICATION ACCESS METHOD




 ENTER A (ACTION)

 ???
CMD==>
```

Figure 58. Event Detail

The Event Detail panel displays additional information about the event that generated the alert. Event detail data has several distinct formats. These formats are tailored to the type of resource for which the data is being displayed. In general, this panel can contain the following information collected at the time of the error:

- The resource ID
- The name of the application that was running
- The channel identifier
- The operation with which the resource was involved
- The channel status
- The unit status
- Sense data

6. Enter **a** to return to the Recommended Action panel.
7. If one of the recommended actions is to view the most recent statistics, you can enter **st** to display the Most Recent Statistical Data panel. This panel provides statistics about the most recent data transmissions sent over the line between the resources shown in the pictorial hierarchy. Starting with the most recent transmission, the panel shows for each transmission the amount of traffic that has traveled over the line, the number of temporary errors that have occurred, and the percentage of the total transmissions that contained temporary errors. The panel also displays a configuration diagram for the resources you specified and other related resources. The purpose of the display is to look for temporary errors which might be causing problems a lack of symptoms, which show a problem must be elsewhere. To see total statistical data for the hardware monitor, see "Displaying Total Statistical Data" on page 100.
8. You can also look at additional details about the event. From the Recommended Action panel, you can enter **dm** to display the Event Detail Menu. A panel similar to Figure 59 on page 98 is displayed.



```
 N E T V I E W          SESSION DOMAIN: B99NV    NETOP2    08/28/19 13:25:39
 NPDA-43R                     * EVENT DETAIL MENU *                 PAGE 1 OF 1

  B99NV       TVT2008D     SP-APPL      NETSP        TVT2008D
             +---------+   +---------+   +---------+   +---------+
  DOMAIN     |  SP     |---|  TP     |---|  DEV    |---|  DEV    |
             +---------+   +---------+   +---------+   +---------+

 DATE/TIME: 12/02 13:17

 SEL#  PRODUCES:
 ( 1)   EVENT DETAIL DISPLAY
 ( 2)   PRODUCT SET IDENTIFICATION DISPLAY
 ( 3)   HEXADECIMAL DISPLAY OF DATA RECORD






 ENTER SEL# OR A (ACTION)

 ???
CMD==>
```

Figure 59. Event Detail Menu

This panel lists available detailed information about the problem. In this example, three options are provided. The number of options provided depends on the problem.

Event Detail Display
: This option provides detailed information about the problem associated with the alert. You can also access this panel by using the D option from the Recommended Action panel (see step "5" on page 97).

Product Set Identification Display
: This option provides information about the origin of the alert. It identifies the software or hardware components from which the alert was sent. This can help you isolate problems by directing you to the appropriate documentation.

Hexadecimal Display of Data Record

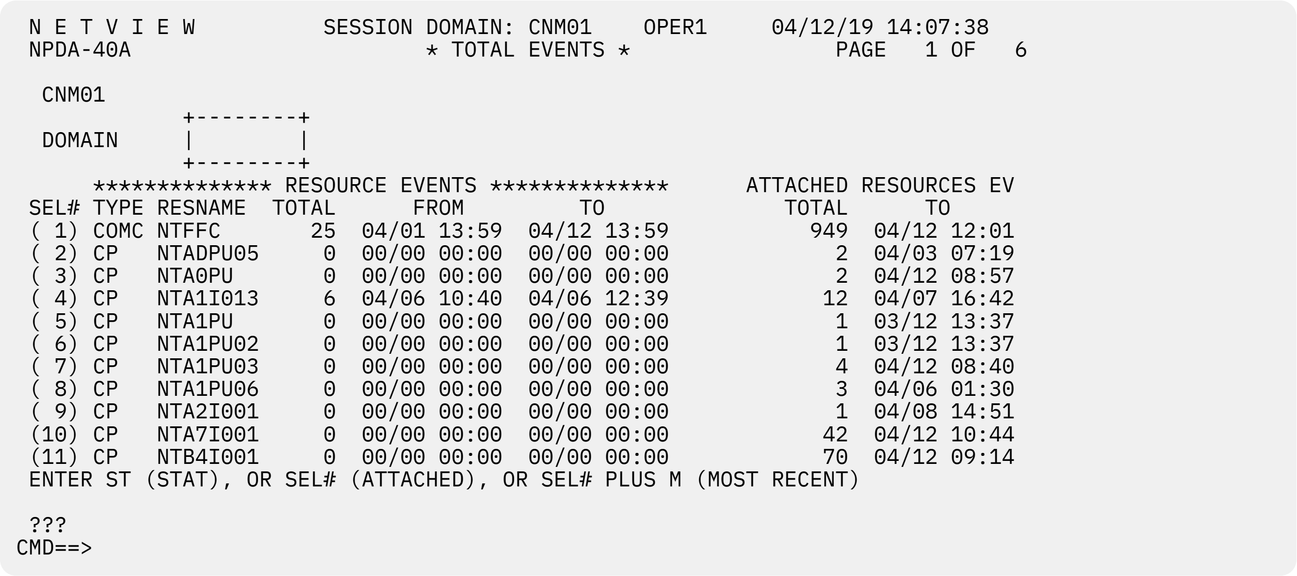
This option provides the complete alert data record or dump of the data record. This can be useful in isolating unrecognized vectors, for example, when you are running an older version of the NetView program. For additional description of all the major vectors, see *SNA Network Product Formats.*

Displaying Total Events

The `TOTAL EVENTS DISPLAY` option in the hardware monitor main menu gives summary totals of event data about specified resources.

The Total Events display for a particular resource level identifies the higher level resource to which the requested resource level is attached. The pictorial representation always includes an empty box. As you select lower and lower resource level displays, the pictorial representation shows the current level hardware connections.

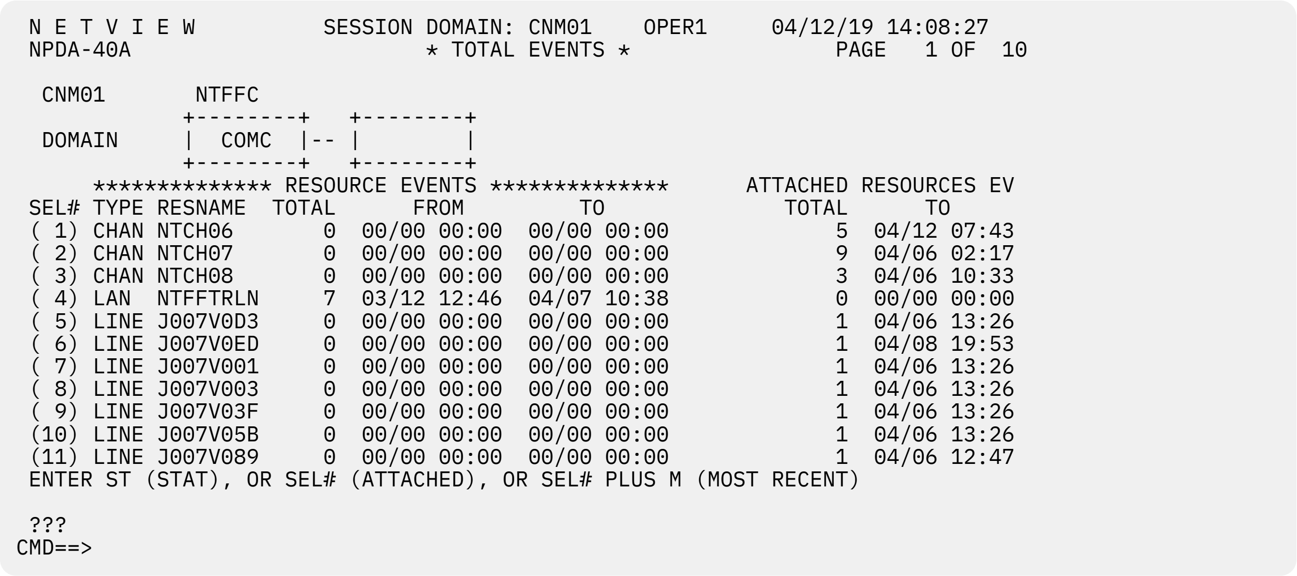
When you select option 2, a panel similar to Figure 60 on page 99 is displayed.



```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 14:07:38
 NPDA-40A                       * TOTAL EVENTS *                PAGE   1 OF   6

  CNM01
             +--------+
  DOMAIN     |        |
             +--------+
     *************** RESOURCE EVENTS **************      ATTACHED RESOURCES EV
 SEL# TYPE RESNAME  TOTAL      FROM         TO              TOTAL      TO
 ( 1) COMC NTFFC       25  04/01 13:59  04/12 13:59           949  04/12 12:01
 ( 2) CP   NTADPU05     0  00/00 00:00  00/00 00:00             2  04/03 07:19
 ( 3) CP   NTA0PU       0  00/00 00:00  00/00 00:00             2  04/12 08:57
 ( 4) CP   NTA1I013     6  04/06 10:40  04/06 12:39            12  04/07 16:42
 ( 5) CP   NTA1PU       0  00/00 00:00  00/00 00:00             1  03/12 13:37
 ( 6) CP   NTA1PU02     0  00/00 00:00  00/00 00:00             1  03/12 13:37
 ( 7) CP   NTA1PU03     0  00/00 00:00  00/00 00:00             4  04/12 08:40
 ( 8) CP   NTA1PU06     0  00/00 00:00  00/00 00:00             3  04/06 01:30
 ( 9) CP   NTA2I001     0  00/00 00:00  00/00 00:00             1  04/08 14:51
 (10) CP   NTA7I001     0  00/00 00:00  00/00 00:00            42  04/12 10:44
 (11) CP   NTB4I001     0  00/00 00:00  00/00 00:00            70  04/12 09:14
 ENTER ST (STAT), OR SEL# (ATTACHED), OR SEL# PLUS M (MOST RECENT)

 ???
CMD==>
```

Figure 60. Total Events Panel

This panel shows the total counts for first-level resource types. It provides the highest-level view of all attached events recorded for the domain. From this panel, you can select the total display for the next lower resource level. For example, if you select event 1, a panel similar to Figure 61 on page 100 is displayed.



```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 14:08:27
 NPDA-40A                       * TOTAL EVENTS *                PAGE   1 OF  10

  CNM01       NTFFC
             +--------+   +--------+
  DOMAIN     |  COMC  |-- |        |
             +--------+   +--------+
      ************** RESOURCE EVENTS **************      ATTACHED RESOURCES EV
 SEL# TYPE RESNAME  TOTAL      FROM         TO            TOTAL      TO
 ( 1) CHAN NTCH06       0  00/00 00:00  00/00 00:00             5  04/12 07:43
 ( 2) CHAN NTCH07       0  00/00 00:00  00/00 00:00             9  04/06 02:17
 ( 3) CHAN NTCH08       0  00/00 00:00  00/00 00:00             3  04/06 10:33
 ( 4) LAN  NTFFTRLN     7  03/12 12:46  04/07 10:38             0  00/00 00:00
 ( 5) LINE J007V0D3     0  00/00 00:00  00/00 00:00             1  04/06 13:26
 ( 6) LINE J007V0ED     0  00/00 00:00  00/00 00:00             1  04/08 19:53
 ( 7) LINE J007V001     0  00/00 00:00  00/00 00:00             1  04/06 13:26
 ( 8) LINE J007V003     0  00/00 00:00  00/00 00:00             1  04/06 13:26
 ( 9) LINE J007V03F     0  00/00 00:00  00/00 00:00             1  04/06 13:26
 (10) LINE J007V05B     0  00/00 00:00  00/00 00:00             1  04/06 13:26
 (11) LINE J007V089     0  00/00 00:00  00/00 00:00             1  04/06 12:47
 ENTER ST (STAT), OR SEL# (ATTACHED), OR SEL# PLUS M (MOST RECENT)

 ???
CMD==>
```

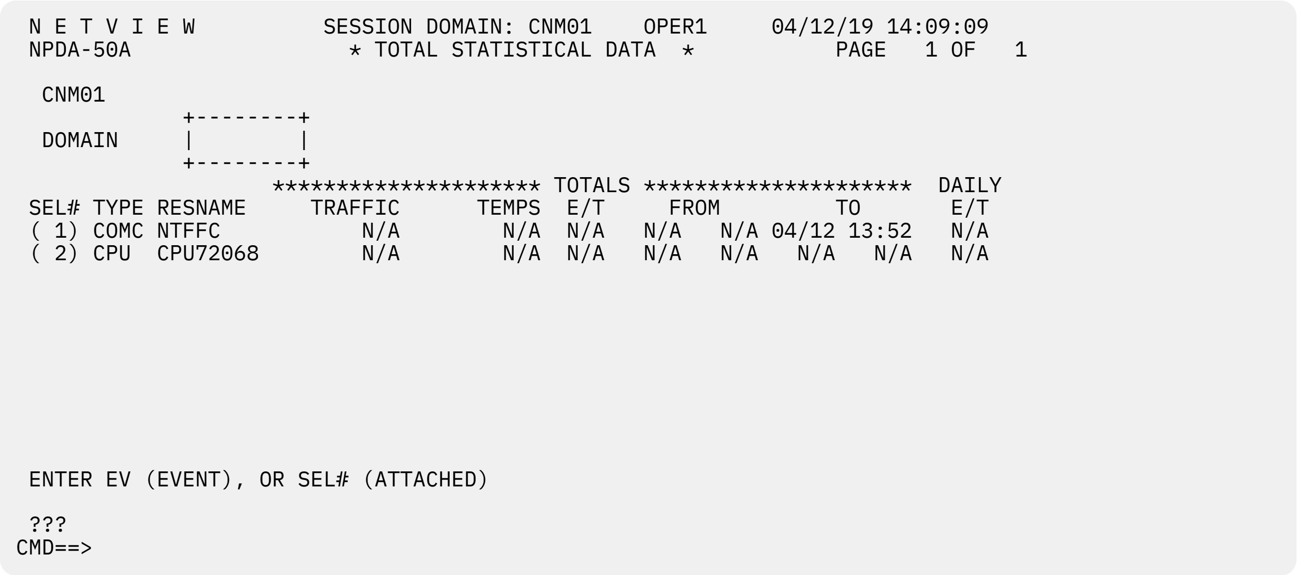
Figure 61. Total Events Panel, Next Level

As you can see, this panel displays the event totals for the communication controller NTFFC. To continue to display event totals for lower resource levels, select a resource from this panel. During event tracking you can choose total event displays for the next lower resource until you reach the resource level suspected of causing the problem.

Displaying Total Statistical Data

Statistical data is generated by resources and stored in the hardware monitor database. For certain resources, the hardware monitor analyzes each statistical record to determine whether to create a performance event record which can become an alert. This analysis consists of a comparison of current error-to-traffic (E/T) ratios to pre-established E/T thresholds for those resources that can provide the error and traffic statistics. For information about how to set the E/T threshold values using the NetView SRATIO command, see the NetView online help.

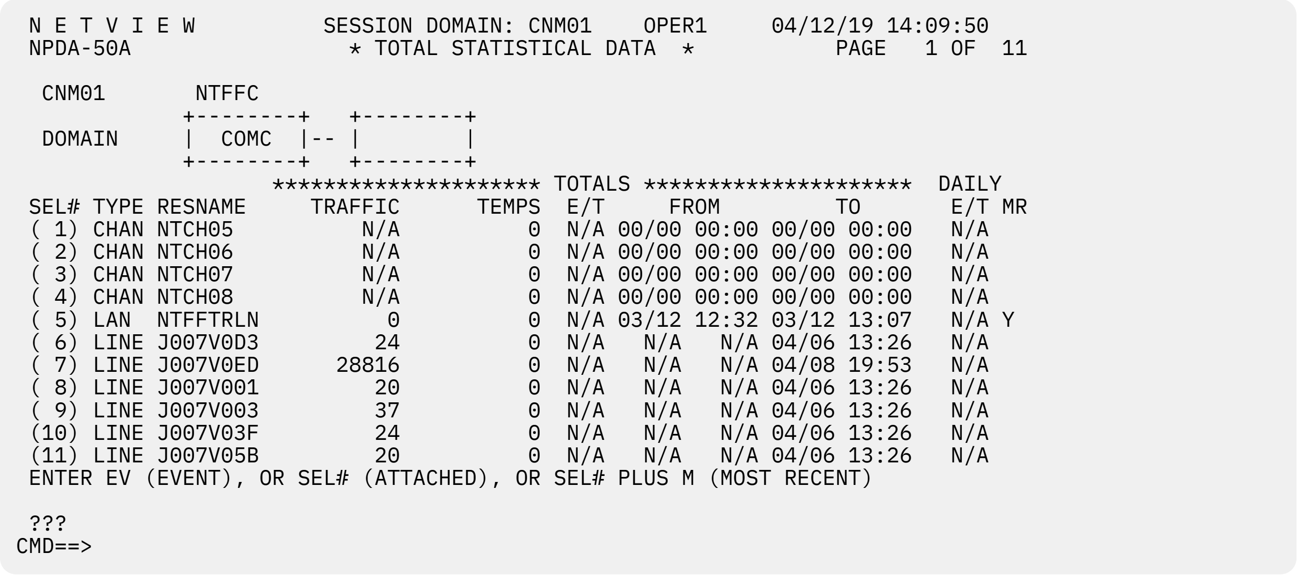
When you select option 3 from the hardware monitor main menu, a panel similar to Figure 62 on page 100 is displayed.



```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 14:09:09
 NPDA-50A                 * TOTAL STATISTICAL DATA  *           PAGE   1 OF   1

  CNM01
             +--------+
  DOMAIN     |        |
             +--------+
                    ********************* TOTALS *********************  DAILY
 SEL# TYPE RESNAME     TRAFFIC      TEMPS  E/T     FROM         TO       E/T
 ( 1) COMC NTFFC           N/A        N/A  N/A   N/A   N/A 04/12 13:52   N/A
 ( 2) CPU  CPU72068        N/A        N/A  N/A   N/A   N/A   N/A   N/A   N/A









 ENTER EV (EVENT), OR SEL# (ATTACHED)

 ???
CMD==>
```

Figure 62. Total Statistical Data Panel

This panel displays the statistical record totals for first-level resources. To navigate these panels in the same manner as the total events panels and display record totals for lower resource levels, select the appropriate resource. For example, if you select resource 1, a panel similar to Figure 63 on page 101 is displayed.

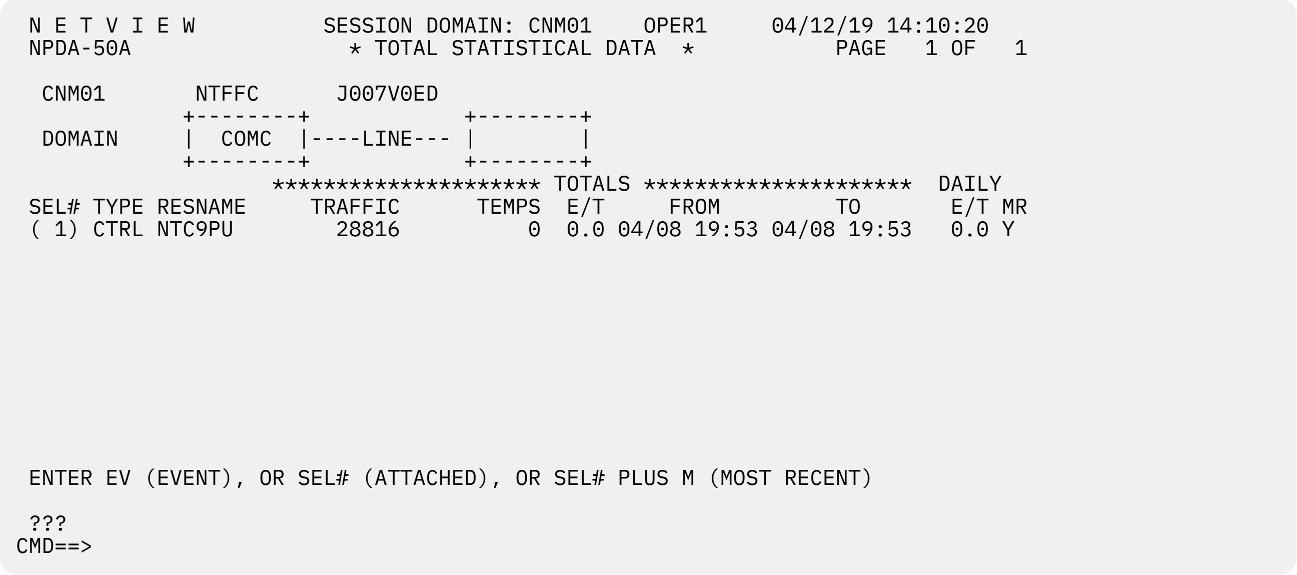


```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 14:09:50
 NPDA-50A                 * TOTAL STATISTICAL DATA  *           PAGE   1 OF  11

  CNM01       NTFFC
             +---------+   +---------+
  DOMAIN     |  COMC   |-- |         |
             +---------+   +---------+
                    ********************* TOTALS *********************  DAILY
 SEL# TYPE RESNAME     TRAFFIC      TEMPS  E/T     FROM         TO        E/T MR
 ( 1) CHAN NTCH05          N/A          0  N/A 00/00 00:00 00/00 00:00   N/A
 ( 2) CHAN NTCH06          N/A          0  N/A 00/00 00:00 00/00 00:00   N/A
 ( 3) CHAN NTCH07          N/A          0  N/A 00/00 00:00 00/00 00:00   N/A
 ( 4) CHAN NTCH08          N/A          0  N/A 00/00 00:00 00/00 00:00   N/A
 ( 5) LAN  NTFFTRLN          0          0  N/A 03/12 12:32 03/12 13:07   N/A Y
 ( 6) LINE J007V0D3         24          0  N/A   N/A   N/A 04/06 13:26   N/A
 ( 7) LINE J007V0ED      28816          0  N/A   N/A   N/A 04/08 19:53   N/A
 ( 8) LINE J007V001         20          0  N/A   N/A   N/A 04/06 13:26   N/A
 ( 9) LINE J007V003         37          0  N/A   N/A   N/A 04/06 13:26   N/A
 (10) LINE J007V03F         24          0  N/A   N/A   N/A 04/06 13:26   N/A
 (11) LINE J007V05B         20          0  N/A   N/A   N/A 04/06 13:26   N/A
 ENTER EV (EVENT), OR SEL# (ATTACHED), OR SEL# PLUS M (MOST RECENT)

 ???
CMD==>
```

Figure 63. Total Statistical Data Panel, Level 2

This panel displays statistical record counts for the resources attached to the communication controller NTFFC.

To display statistical record counts for the resource attached to line J007V0ED, enter **7**. A panel similar to Figure 64 on page 101 is displayed.



```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 14:10:20
 NPDA-50A                 * TOTAL STATISTICAL DATA  *           PAGE   1 OF   1

  CNM01       NTFFC      J007V0ED
             +---------+          +---------+
  DOMAIN     |  COMC   |----LINE--- |         |
             +---------+          +---------+
                    ********************* TOTALS *********************  DAILY
 SEL# TYPE RESNAME     TRAFFIC      TEMPS  E/T     FROM         TO        E/T MR
 ( 1) CTRL NTC9PU        28816          0  0.0 04/08 19:53 04/08 19:53   0.0 Y










 ENTER EV (EVENT), OR SEL# (ATTACHED), OR SEL# PLUS M (MOST RECENT)

 ???
CMD==>
```

Figure 64. Total Statistical Data Panel, Level 3

Network Management for Multiple Domains

Using the hardware monitor, an operator at a single central host domain can monitor the alert activity for one or more entry point host domains. This ability simplifies the task of network management for multiple domains.

The central host domain is known as the *focal point domain*, or the *focal point*, and the entry point host domains are called *distributed hosts*. The sphere of control for a focal point is the set of distributed hosts that forwards alerts to a particular focal point. A distributed host can forward alerts to only one focal point. Thus, a host can reside within the sphere of control of only one focal point. Note in Figure 65 on page 102 that distributed hosts CNM03 through CNM15 reside in the sphere of control of focal point CNM01, while distributed hosts CNM17 and CNM22 reside in the sphere–of–control of focal point CNM02. Planning decisions determine the number of focal points and the number of distributed hosts that reside in the sphere-of-control for each focal point.

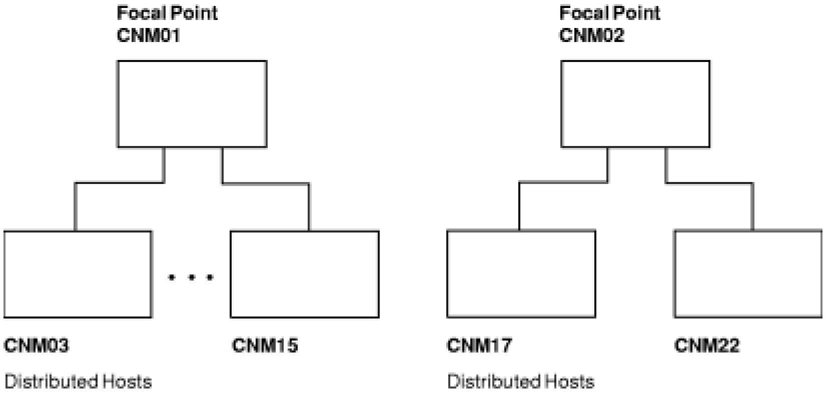
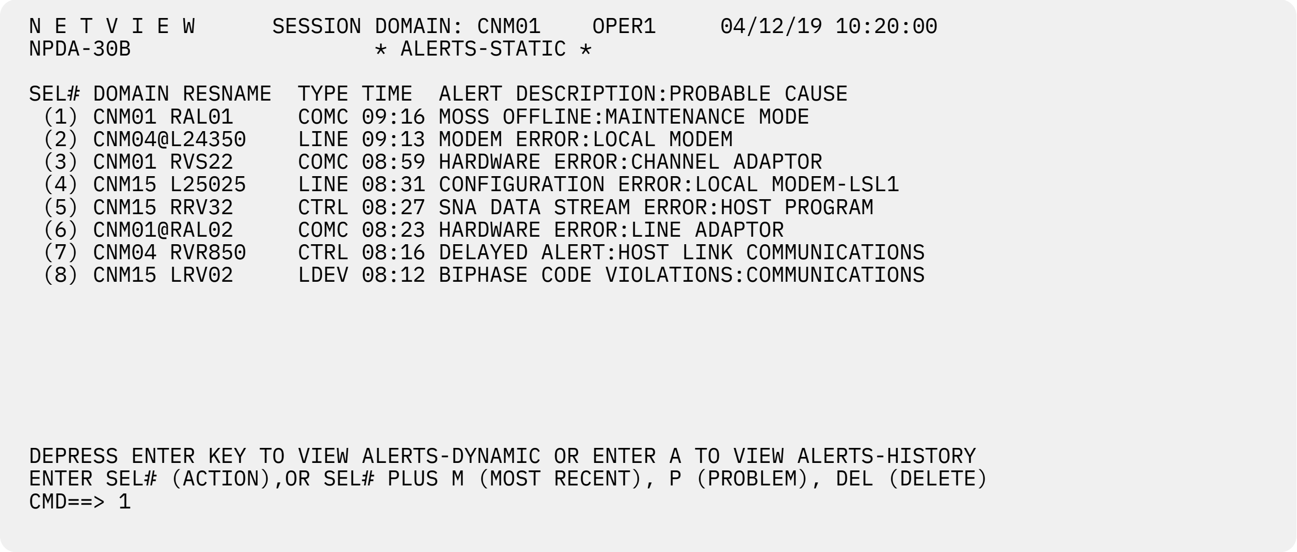


Figure 65. Distributed Hosts

Alert Forwarding

Any operators logged on to the focal point can view these forwarded and local alerts on the Alerts-Dynamic, Alerts-Static panel, or Alerts-History panels. See Figure 66 on page 102 for an example of an Alerts-Static panel.



```
N E T V I E W      SESSION DOMAIN: CNM01    OPER1     04/12/19 10:20:00
NPDA-30B                   * ALERTS-STATIC *

SEL# DOMAIN RESNAME  TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
 (1) CNM01 RAL01     COMC 09:16 MOSS OFFLINE:MAINTENANCE MODE
 (2) CNM04@L24350    LINE 09:13 MODEM ERROR:LOCAL MODEM
 (3) CNM01 RVS22     COMC 08:59 HARDWARE ERROR:CHANNEL ADAPTOR
 (4) CNM15 L25025    LINE 08:31 CONFIGURATION ERROR:LOCAL MODEM-LSL1
 (5) CNM15 RRV32     CTRL 08:27 SNA DATA STREAM ERROR:HOST PROGRAM
 (6) CNM01@RAL02     COMC 08:23 HARDWARE ERROR:LINE ADAPTOR
 (7) CNM04 RVR850    CTRL 08:16 DELAYED ALERT:HOST LINK COMMUNICATIONS
 (8) CNM15 LRV02     LDEV 08:12 BIPHASE CODE VIOLATIONS:COMMUNICATIONS







DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER A TO VIEW ALERTS-HISTORY
ENTER SEL# (ACTION),OR SEL# PLUS M (MOST RECENT), P (PROBLEM), DEL (DELETE)
CMD==> 1
```

Figure 66. Alerts-Static Panel for LU 6.2

The *session* domain of CNM01 is presented on the first line of the Alerts-Static panel. The session domain is the domain with which the operator is currently in session. More specifically, it is the domain associated with the hardware monitor database being accessed. The domain names shown under the DOMAIN column heading are owning domains. The owning domain is the domain that originally received the alert. For example, the alert corresponding to selection 2 originated in distributed host (and owning) domain CNM04 and was forwarded to the focal point (and session) domain CNM01.

The session domain is always on the first line of all hardware monitor panels. The owning domain is presented on all hardware monitor panels that have a pictorial hierarchy, and on the Alerts-Dynamic/

Static/History panels. For those panels with a pictorial hierarchy, the owning domain is the value above the constant DOMAIN, the leftmost entry of the pictorial hierarchy. The session and owning domains match, except when the session domain is also a focal point. Only focal points have alerts forwarded to them from other domains, such as distributed NetView programs or entry points.

Using the DOMAIN operand of the SVFILTER command, the focal point operator can prevent alerts from specified entry point host domains from displaying on the Alerts-Dynamic, Alerts-Static, and Alerts-History panels.

With the ROUTE option of the SRFILTER command, the distributed host operator can control which alerts are forwarded to the alert focal point. For more information about these commands and operands, see the NetView online help.

NetView supports two alert forwarding methods:

- SNA-MDS/LU 6.2
- NV-UNIQ/LUC

Alerts forwarded over SNA-MDS (using LU 6.2) have an @indicator following the owning domain name, as shown by the alerts corresponding to selections 2 and 6 in Figure 66 on page 102. When the owning domain and the session domain for an SNA-MDS forwarded alert are the same, as they are in the alert for selection 6, this indicates that the alert was forwarded from a non-NetView entry point such as an AS/400. When the owning domain is not the same as the session domain, as in the section 2 alert, this indicates that the alert was forwarded over SNA-MDS from a NetView entry point. You can display the entry point name for SNA-MDS forwarded alerts by entering the selection number followed by "Q". For example, entering 2 q causes the following message to be displayed in the message line:

```
BNH092I ALERT WAS FORWARDED FROM NODE NETA.CNM04 VIA SNA-MDS.
```

The selection 4 alert was forwarded over LUC. You can determine this because the owning domain and session domain are different and no @ indicator exists.

The selection 1 alert is a local alert as indicated by the absence of an @ indicator and the fact that the owning domain is the same as the session domain.

Topic:	**Reference:**
Alert forwarding	*IBM Z NetView Automation Guide*

Distributed Database Retrieval

From the Alerts-Static or Alerts-History panels, the focal point operator can enter a selection number to display Recommended Action data or a selection number followed by M to display Most Recent Events data. If the operator requests data for an alert forwarded from an entry point NetView (if the owning domain does not match the session domain), the hardware monitor sends the request for data to the owning domain (distributed host) rather than the session domain (focal point). This allows data to be retrieved from a domain other than the session domain without having to change session domains by using the SDOMAIN command. Automatic retrieval of data from a domain other than the session domain is known as *distributed database retrieval*. Distributed database retrieval is possible only when the session domain is a focal point.

Distributed database retrieval begins when an operator makes a selection for data for an alert forwarded from an entry point NetView from the Alerts-Static or Alerts-History panels, and continues as long as the prompts at the bottom of each panel are taken to traverse displays (unless you select a prompt which processes an explicit command, such as ST or EV). Distributed database retrieval ends whenever an explicit command is issued, such as when an explicit MENU command is entered, or when the RETURN command is repeatedly entered until the Alerts-Static panel or Alerts-History panel is redisplayed. Distributed database retrieval has occurred when the owning domain in the pictorial hierarchy does not match the session domain on the first line.

: Additional information about distributed database retrieval follows:

- When logging to Information/Management (MVS only) is requested with selection P, the logging is done at the domain of the NetView program where the operator is logged on. This domain is referred to as the *host* domain, and it can differ from the session and owning domains.
- Whenever the set recording filter (SRFILTER) command is requested with the SRF selection, the command is processed at the owning (distributed host) domain, not the focal point. A focal point operator who wishes to clear the filters that were set at the owning domain must set up a cross-domain session with the distributed host using the SDOMAIN command, and then issue the CLEAR command.
- Whenever the selection DEL command is entered from the Alerts-Static or Alerts-History panel, the alert is deleted from the session (focal point) domain database, not the owning (distributed host) domain database.
- See the NPDA SDOMAIN command description in the NetView online help for restrictions that apply when distributed database retrieval is called in a cross-domain session.
- If an operator at the focal point attempts to retrieve hardware monitor data from an entry point using distributed database retrieval, and one or more intermediate nodes separate the focal point and entry point, the focal point might not be able to establish a cross-domain session (using LU 6.2 or LUC) with the entry point. If this happens, the focal point operator cannot retrieve the requested data using distributed database retrieval. An operator can use the NPDA SDOMAIN command to try to establish a session to retrieve the data.
- When an operator enters "**SEL# M**" from the Alerts Static panel for an alert forwarded from a remote entry point NetView, the transport used to forward the alert is the same transport that is used to retrieve the requested event data from the entry points database.

  For example, if an alert is forwarded using LU 6.2, the LU 6.2 transport is used to retrieve the event data from the entry point database. As another example, if an alert is forwarded using LUC, the LUC transport is used.

  To summarize, the transport used to forward the alert from the entry point to the focal point is the same transport that is used to retrieve the data.
- Distributed database retrieval is performed even though the data might be present in the focal point database.

  When SNA-MDS/LU 6.2 forwarded alerts are received from an entry point NetView, the default is to log these only as alerts (not as event or statistical data) in the database. However, using the automation table SRF action, you can override this default and cause event and statistical data to be logged. But this data is logged against the local focal point domain name, not against the sending NetView entry point domain name. Therefore, if an operator enters SEL# M from the Alerts Static panel the event data might already be present on the focal point database. However, distributed database retrieval is still performed (just as it is with LUC forwarded alerts), and the event data is retrieved from the entry point database rather than the focal point database.

Topic:	**Reference:**
Using filters	"Using Hardware Monitor Filters" on page 140
Implementing filtering decisions using the XITCI exit	*IBM Z NetView Automation Guide*

Services of the Event/Automation Service

The Event/Automation Service integrates the management of events from SNMP managers and from managers and agents that deal with Event Integration Facility (EIF) events with events from the IBM Z NetView platform. By acting as a gateway between these platforms, the E/AS enables centralized network management from any platform.

The Event/Automation Service is composed of the following services:

- "Alert Adapter Service" on page 105

- “Confirmed Alert Adapter Service” on page 105
- “Message Adapter Service” on page 105
- “Confirmed Message Adapter Service” on page 105
- “Event Receiver Service” on page 105
- “Alert to Trap Service” on page 105
- “Trap to Alert Service” on page 106

Topic:	Reference:
IBM Z NetView adapters	• *IBM Z NetView Installation: Configuring Additional Components* • *IBM Z NetView Customization Guide* • *IBM Tivoli Netcool/OMNIbus Event Integration Facility Reference*

Alert Adapter Service

The alert adapter service converts NetView alerts into EIF events through a conversion rules file (IHSAACDS) that can be customized. This conversion rules file is referred to as the Class Definition Statement (CDS) file. The alert adapter service then forwards the events to a manager than handles EIF events, such as Tivoli Netcool/OMNIbus.

Confirmed Alert Adapter Service

The confirmed alert adapter service is an event adapter that converts an SNA alert that is received by the NetView hardware monitor to an EIF event and forwards it to an event server. The event server then replies with a confirmation that indicates acceptance of the EIF event.

The confirmed alert adapter service uses class definition statements to map data from the alert into name/value pairs within an EIF event. For examples, see the IHSABCDS sample.

Message Adapter Service

The message adapter service converts NetView messages that originate from the automation table into EIF events using a conversion rules file (IHSAMFMT) that can be customized. You can customize this file to specify how various pieces of information from the message are encoded into the slot/value pairs that compose an event. The message adapter service then forwards the events to a manager than handles EIF events, such as Tivoli Netcool/OMNIbus.

Confirmed Message Adapter Service

The confirmed message adapter service is an event adapter that converts a message that is forwarded by NetView automation into an EIF event and forwards it to an event server. The event server then replies with a confirmation that indicates acceptance of the EIF event.

The confirmed message adapter uses rules that are defined in a message format file to translate a message into an EIF event. The rules enable subsets of the message data to be selected and mapped into name/value pairs within the EIF event. For an example, see the IHSANFMT sample.

Event Receiver Service

The event receiver service converts EIF events into NetView alerts using a conversion rules file (IHSAECDS) that can be customized. The event receiver service then forwards the alerts to the alert receiver PPI mailbox.

Alert to Trap Service

The alert to trap service converts NetView alerts into SNMP traps through a conversion rules file (IHSATCDS) that can be customized. The service then forwards the events to an SNMP manager using an SNMP agent.

Trap to Alert Service

The trap to alert service converts SNMP traps into NetView alerts using a conversion rules file (IHSALCDS) that can be customized. The service then forwards the alerts to the alert receiver PPI mailbox.

Problem Management

Problem management is a function that lists, creates, displays, and updates problem reports. Problem reports are records that identify known problems with individual resources and are stored in the Information/Management database.

Sending Event Data to Information/Management

Use the hardware monitor Information/Management link to send event data to Information/Management and open problem records. From the hardware monitor Alerts-Static, Alerts-History, Most Recent Events, and Event Summary panels, you can transfer problem data directly into an Information/Management problem record. Include the NetView operator ID in an Information/Management privilege class that has authority to update Information/Management records. Table 6 on page 106 shows the data transferred from the hardware monitor to Information/Management.

Table 6. Hardware Monitor to Information/Management Data Transfer

NPDA Field Name	Length (Bytes)	V2 Info/Mgmt Field Name	Length (Bytes)
Resource Name (see note)	8–40	Resource Names	8–40
EV/AL DESC:PROB CAUSE	48	Description Abstract	45 (might be truncated)
Date	8	Date Occurred	8
Time	5	Time Occurred	5
Operator ID	8	Reported By	8
Constant (NPDA)	4	Reporter Dept	4
Domain Name	5	System Name	5
Action Panel ID	8	Action Panel ID	8
Detail Event Description	1040	Free Form Description	1040
Recommended Action	1120	Free Form Status	1120
Resource Type	4–20	Resource Types	4–20

Note: The hardware monitor sends as many as five resource names to define the failing resource. You can then enter additional data about a specific problem into Information/Management.

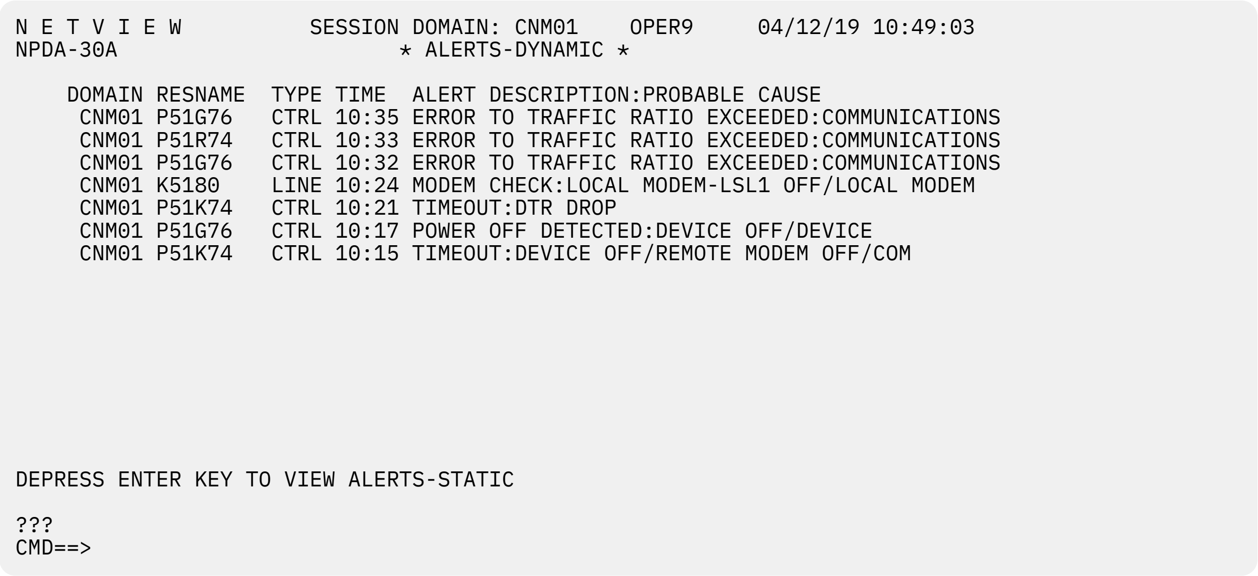
Creating a Problem Report

Complete the following steps to create a problem report from the hardware monitor.

1. From a NetView command line, enter the hardware component Alerts-Dynamic Display:

   ```
   npda ald
   ```

   A panel similar to Figure 67 on page 107 is displayed. This single-page panel continuously shows the system being monitored. As failures occur, each alert is shown at the top of the panel, and the alert at the bottom of the panel is removed.



```
N E T V I E W         SESSION DOMAIN: CNM01    OPER9     04/12/19 10:49:03
NPDA-30A                         * ALERTS-DYNAMIC *

    DOMAIN RESNAME  TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
     CNM01 P51G76   CTRL 10:35 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
     CNM01 P51R74   CTRL 10:33 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
     CNM01 P51G76   CTRL 10:32 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
     CNM01 K5180    LINE 10:24 MODEM CHECK:LOCAL MODEM-LSL1 OFF/LOCAL MODEM
     CNM01 P51K74   CTRL 10:21 TIMEOUT:DTR DROP
     CNM01 P51G76   CTRL 10:17 POWER OFF DETECTED:DEVICE OFF/DEVICE
     CNM01 P51K74   CTRL 10:15 TIMEOUT:DEVICE OFF/REMOTE MODEM OFF/COM










DEPRESS ENTER KEY TO VIEW ALERTS-STATIC

???
CMD==>
```

Figure 67. Alerts-Dynamic Panel

The top of the Alerts-Dynamic panel shows the date and time the panel was last updated and the domain name. Each alert is displayed on a separate line according to the following format:

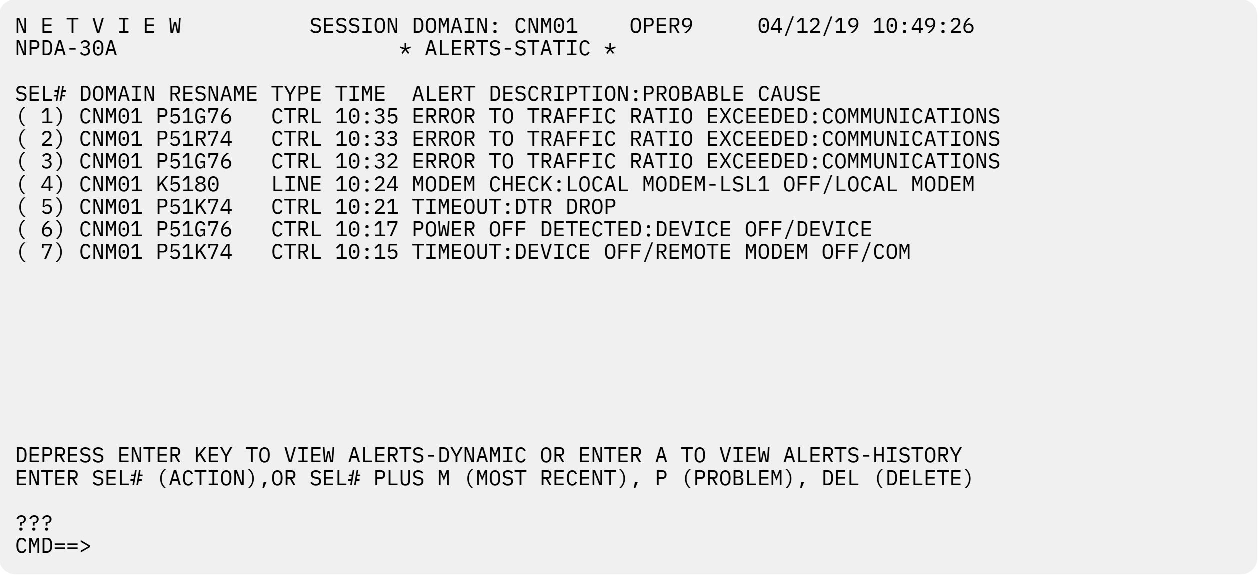
RESNAME
The name of the resource associated with the alert

TYPE
The resource type

TIME
The time the alert was received from the system

ALERT DESCRIPTION:PROBABLE CAUSE
An abbreviated message describing the error that has occurred and the probable cause. The probable cause is the component that is most likely to have caused the failure.

2. Press **Enter** to switch to the Alerts-Static panel. A panel similar to Figure 68 on page 107 is displayed.



```
N E T V I E W         SESSION DOMAIN: CNM01    OPER9     04/12/19 10:49:26
NPDA-30A                         * ALERTS-STATIC *

SEL# DOMAIN RESNAME TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
( 1) CNM01 P51G76   CTRL 10:35 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
( 2) CNM01 P51R74   CTRL 10:33 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
( 3) CNM01 P51G76   CTRL 10:32 ERROR TO TRAFFIC RATIO EXCEEDED:COMMUNICATIONS
( 4) CNM01 K5180    LINE 10:24 MODEM CHECK:LOCAL MODEM-LSL1 OFF/LOCAL MODEM
( 5) CNM01 P51K74   CTRL 10:21 TIMEOUT:DTR DROP
( 6) CNM01 P51G76   CTRL 10:17 POWER OFF DETECTED:DEVICE OFF/DEVICE
( 7) CNM01 P51K74   CTRL 10:15 TIMEOUT:DEVICE OFF/REMOTE MODEM OFF/COM









DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER A TO VIEW ALERTS-HISTORY
ENTER SEL# (ACTION),OR SEL# PLUS M (MOST RECENT), P (PROBLEM), DEL (DELETE)

???
CMD==>
```

Figure 68. Alerts-Static Panel

3. Type the alert number followed by p in the **CMD==>** field to create the problem report. For example, to create a problem report for alert 4, enter 4 p in the **CMD==>** field. A message similar to the following message is displayed in reverse video at the bottom of the panel:

   ```
   BNJ276I PROBLEM FILED BY INFORMATION/MANAGEMENT, ID IS 00000426
   ```

Note: The Information/Management load library SBLMMOD1 must be one of the concatenated libraries for this process to work. For more information on configuring Information/Management to work with the NetView program, see the Information/Management library.

Chapter 7. Managing Network Inventory

To effectively manage the various parts of your Information System, from your central computers to your most remote terminal, stay informed of all its components. An effective configuration management process with maintaining a centralized, up-to-date inventory of system components and their relationships to one another, and with the ability to gather, organize, and locate information about your Information System (IS) installation.

You can create records about your system and store them in a database. You can then extract facts about your system, update the records as changes occur, create reports and diagrams, and search for records with specific information. You can also maintain financial information specific to one component or to a group of components, and you can establish relationships to these configuration components with the problem and change management information. With this information at your fingertips, you can react more quickly to a potential failure. You can help your network group more easily detect failing components, swap or bypass components, and institute recovery procedures.

Using Vital Product Data

Vital Product Data (VPD), also known as Network Asset Management (NAM), is a feature of many IBM and Tivoli products that provides the following information:

- Product details
- DCE details
- Answering node configuration data
- Attached device configuration data
- User details and device location

Any device that supports the REQUEST/REPLY product set identification (PSID) architecture can report VPD data. Use this data to control the terminal inventory of remote locations from a central site. Without this function, you have to check all the terminal serial numbers using visual verification upon visiting all the locations or by calling terminal users and asking them to check the numbers. This can be a major task in large, geographically distributed networks.

VPD data can be collected centrally at the host site by the NetView program. This information is collected online either through operator commands or by using a command list. In a multi-domain network, VPD data can also be collected at each domain and then forwarded to a focal point host. After it is collected at the host, the data can be logged and management reports can be generated.

To request VPD data from the NetView program, use VPD commands. With these commands, you can retrieve data from supported devices within your network. You can solicit data from the NetView program for the following resources:

- A specific LU
- A specific PU and its ports
- DCEs between an NCP and a PU

Collecting Vital Product Data

Use the following commands to collect VPD data: VPDALL and VPDCMD.

Use the VPDALL command to create commands to collect VPD data and write it to the external log for PUs and link segments defined in the user's VTAM configuration definitions. The VPDALL command can either run these VPD commands as they are generated or create a command list containing the VPD command that can be processed later.

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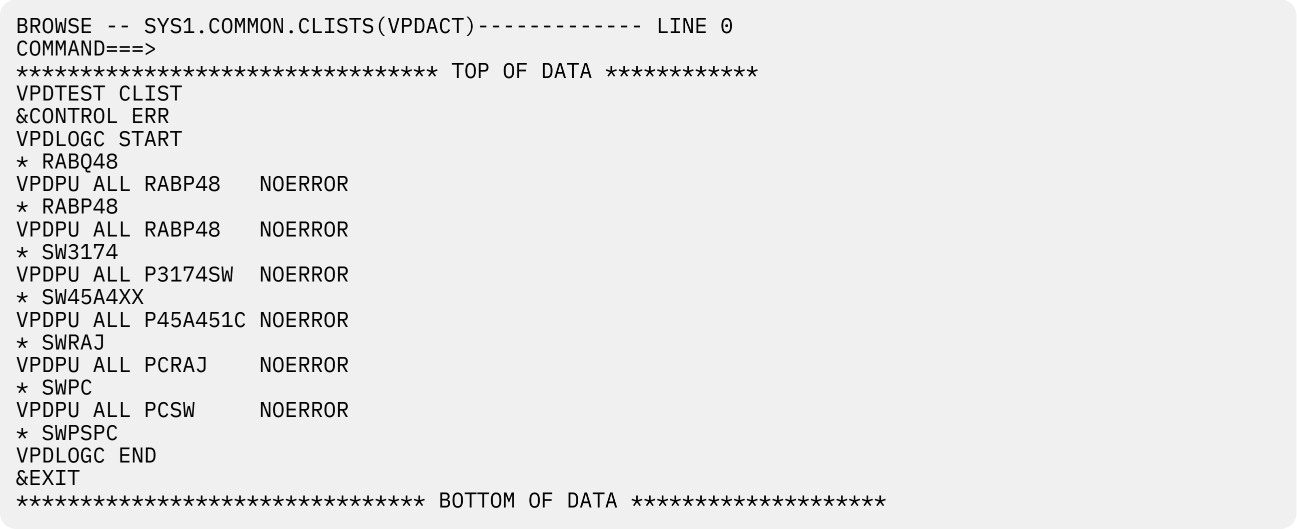
To create a command list (named VPDACT) to collect VPD data for all VTAM major node definitions listed in the configuration member ATCCON01, enter:

```
vpdall config(atccon01),create,clist(vpdact),add
```

An example of the command list generated is shown in Figure 69 on page 110:



```
BROWSE -- SYS1.COMMON.CLISTS(VPDACT)------------- LINE 0
COMMAND===>
********************************* TOP OF DATA ************
VPDTEST CLIST
&CONTROL ERR
VPDLOGC START
* RABQ48
VPDPU ALL RABP48   NOERROR
* RABP48
VPDPU ALL RABP48   NOERROR
* SW3174
VPDPU ALL P3174SW  NOERROR
* SW45A4XX
VPDPU ALL P45A451C NOERROR
* SWRAJ
VPDPU ALL PCRAJ    NOERROR
* SWPC
VPDPU ALL PCSW     NOERROR
* SWPSPC
VPDLOGC END
&EXIT
******************************** BOTTOM OF DATA ********************
```

Figure 69. VPDACT Command List

Use the VPDCMD command to retrieve VPD data from the following devices:

- A specific LU
- A specific PU and its ports
- Data circuit-terminating equipment (DCE) between and NCP and a PU

The solicited VPD data is displayed on your terminal and is not saved in storage. However, you can use a command list to automate the collection of VPD data, and to write it to an external log.

For example, to request VPD data from PU H040PU and all devices attached to the PU, enter the following command:

```
vpdcmd all h040pu
```

Setup for Configuring VPD to Work with the NetView Program

Complete the following steps to configure the NetView program to support VPD:

1. Define the following ACBNAME parameter in your APPL statements:

   ```
   CNM01VPD  APPL  AUTH=CNM,ACBNAME=VPDACB,PRTCT=CNM01
                   STATOPT='VPD TASK'
   ```

2. Define the following statements in DSIVPARM. DSIVPARM contains the initialization parameter for the VPD task:

   ```
   VPDINIT ACBNAME=VPDACB,PASSWORD=CNM01,VPDREQ=001
   VPDINIT VPDWAIT=030,SNAPRQ=OFF,VPDSTOR=02
   ```

Topic:	**Reference:**
Defining VPD to the NetView program	Refer to *IBM Z NetView Installation: Configuring Additional Components*.
VPDALL and VPDCMD commands	NetView online help

Chapter 8. Controlling Remote Processors

IBM Z NetView provides the ability to control remote processors. In typical operation, NetView communicates with a peer NetView program on the remote z/OS processor to issue commands and receive responses and unsolicited messages. When not available with distributed NetView programs, the NetView program uses the facilities provided by Processor Operations to directly communicate with the remote processor to perform tasks such as IPL and system or subsystem initialization. In this case, the goal is to initialize the environment including the remote NetView so that typical NetView-to-NetView communication can take over.

The NetView program can also control remote processors that are not z/OS processors and that support the host command facility (HCF) interface. Additionally, you can use the IBM Tivoli Remote Control product from a workstation to control a remote workstation.

For information about setting NetView timer commands for remote systems and processors, see Chapter 16, “Scheduling Commands,” on page 181.

Using the Target System Control Facility

You can use the Target System Control Facility (TSCF) status panel to monitor the overall status of the components in your TSCF configuration. You can also view the current settings of variables that are relevant to the operation of the system, how the TSCF application is defined, which components are in use for which target system, and so on.

In addition, TSCF provides commands that extend the automation capabilities of the NetView program to provide for the operation of target systems. You can use these commands for the following tasks:

- Perform a power-on reset of the target processor.
- Initialize the target system (IPL).
- Shut down the target system.
- Specify commands to the target system.

Note: For information about issuing NetView timer commands to remote targets, see Chapter 16, “Scheduling Commands,” on page 181.

Using the Status Panels

Complete the following steps to display detailed information for a specific target system:

1. Type **isqxdst** from a NetView command line. A panel similar to Figure 70 on page 112 is displayed.

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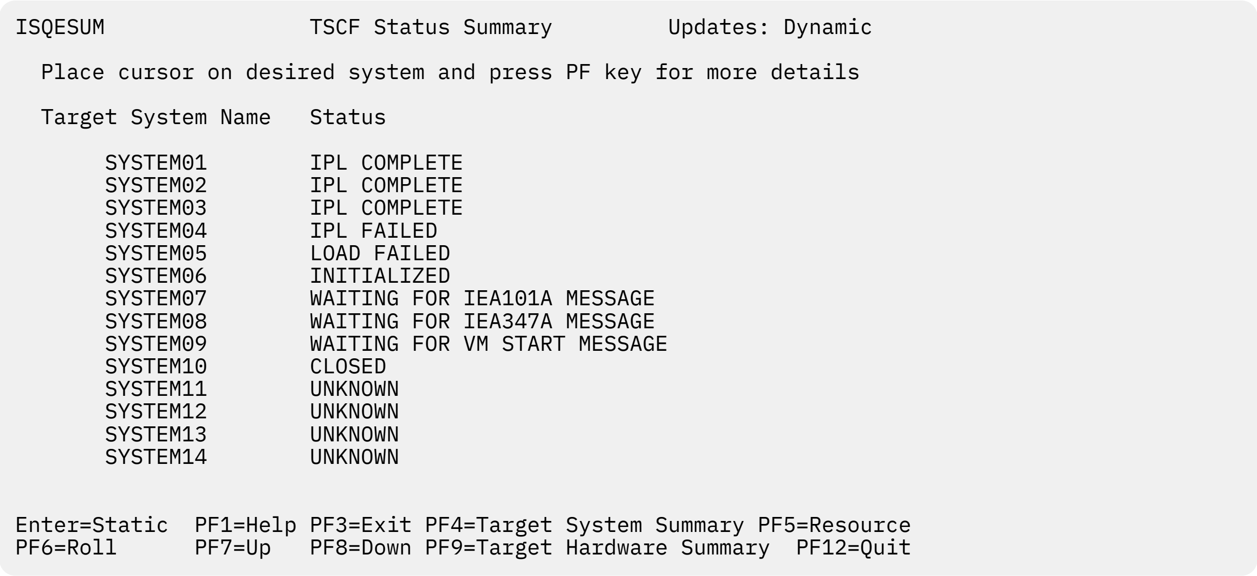
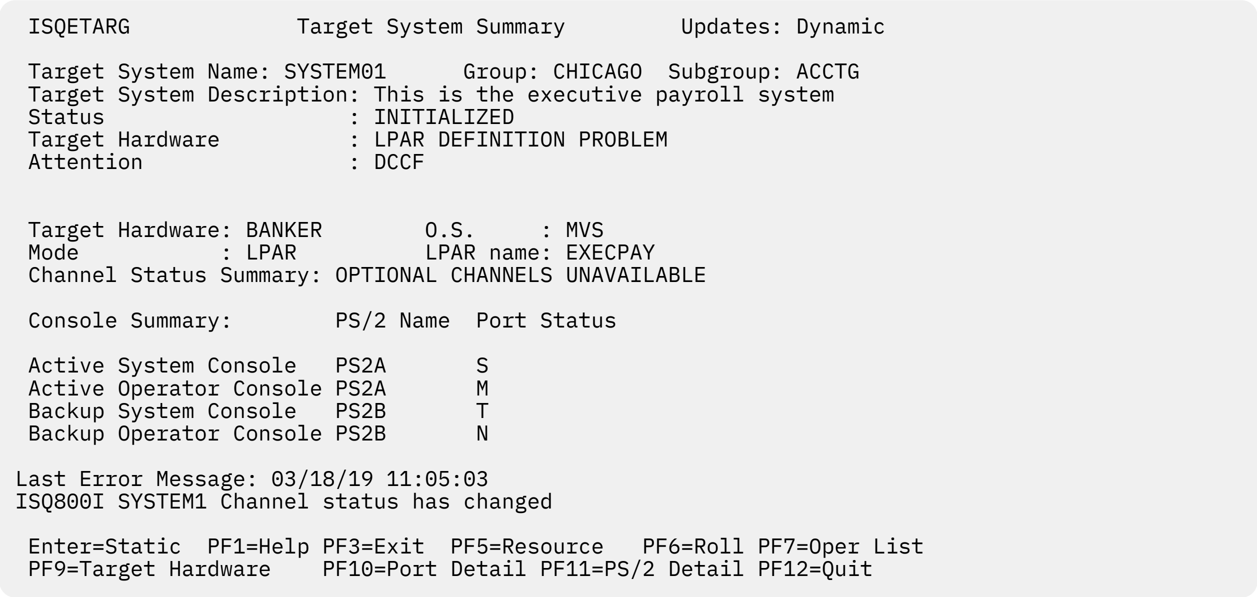


```
ISQESUM                TSCF Status Summary         Updates: Dynamic

  Place cursor on desired system and press PF key for more details

  Target System Name   Status

       SYSTEM01        IPL COMPLETE
       SYSTEM02        IPL COMPLETE
       SYSTEM03        IPL COMPLETE
       SYSTEM04        IPL FAILED
       SYSTEM05        LOAD FAILED
       SYSTEM06        INITIALIZED
       SYSTEM07        WAITING FOR IEA101A MESSAGE
       SYSTEM08        WAITING FOR IEA347A MESSAGE
       SYSTEM09        WAITING FOR VM START MESSAGE
       SYSTEM10        CLOSED
       SYSTEM11        UNKNOWN
       SYSTEM12        UNKNOWN
       SYSTEM13        UNKNOWN
       SYSTEM14        UNKNOWN


Enter=Static  PF1=Help PF3=Exit PF4=Target System Summary PF5=Resource
PF6=Roll      PF7=Up   PF8=Down PF9=Target Hardware Summary  PF12=Quit
```

Figure 70. TSCF Status Summary Panel

Notice that in this example, the panel is being updated dynamically (the update status is displayed on the upper right corner of the panel, in the `Updates:` field). To toggle between a dynamic and a static display, press the Enter key. This applies to this panel and to any other TSCF status panels. If update are very frequent, you might want to place the panel in a static condition.

2. Move the cursor to the name of the target system you want to monitor and press PF4. A panel similar to Figure 71 on page 112 is displayed.



```
 ISQETARG             Target System Summary         Updates: Dynamic

 Target System Name: SYSTEM01      Group: CHICAGO  Subgroup: ACCTG
 Target System Description: This is the executive payroll system
 Status                   : INITIALIZED
 Target Hardware          : LPAR DEFINITION PROBLEM
 Attention                : DCCF


 Target Hardware: BANKER        O.S.     : MVS
 Mode           : LPAR          LPAR name: EXECPAY
 Channel Status Summary: OPTIONAL CHANNELS UNAVAILABLE

 Console Summary:        PS/2 Name  Port Status

 Active System Console   PS2A       S
 Active Operator Console PS2A       M
 Backup System Console   PS2B       T
 Backup Operator Console PS2B       N

Last Error Message: 03/18/19 11:05:03
ISQ800I SYSTEM1 Channel status has changed

 Enter=Static  PF1=Help PF3=Exit  PF5=Resource   PF6=Roll PF7=Oper List
 PF9=Target Hardware    PF10=Port Detail PF11=PS/2 Detail PF12=Quit
```

Figure 71. TSCF Target System Summary Panel

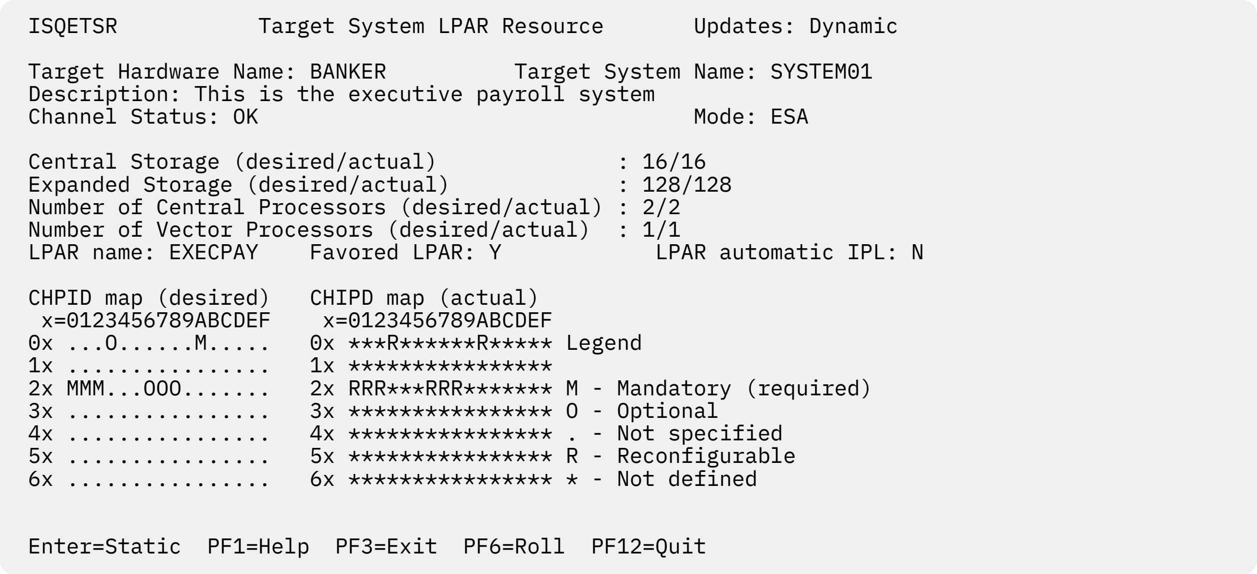
3. Review the information in this panel. Some of the information provided is:

   - The group and subgroup to which the target system was assigned.
   - The current value of the TSCF internal variable *tstat* (displayed in the `Status` field). This variable indicates the status of the target system (if the system was initialized successfully, if a communication link with the target system has failed, and so on). This value is displayed in green to indicate a normal condition, yellow to indicate a situation that requires attention by an operator or a transient state, and red to indicate an unsatisfactory state that requires action.
   - The type of operating system on the target system.

- The status of the active and backup system or operator console.

Note: For the purpose of this explanation, this panel is used as the starting point in accessing the other status panels. Many of the other panels can be accessed from other locations and directly by issuing a command from the NetView command line.

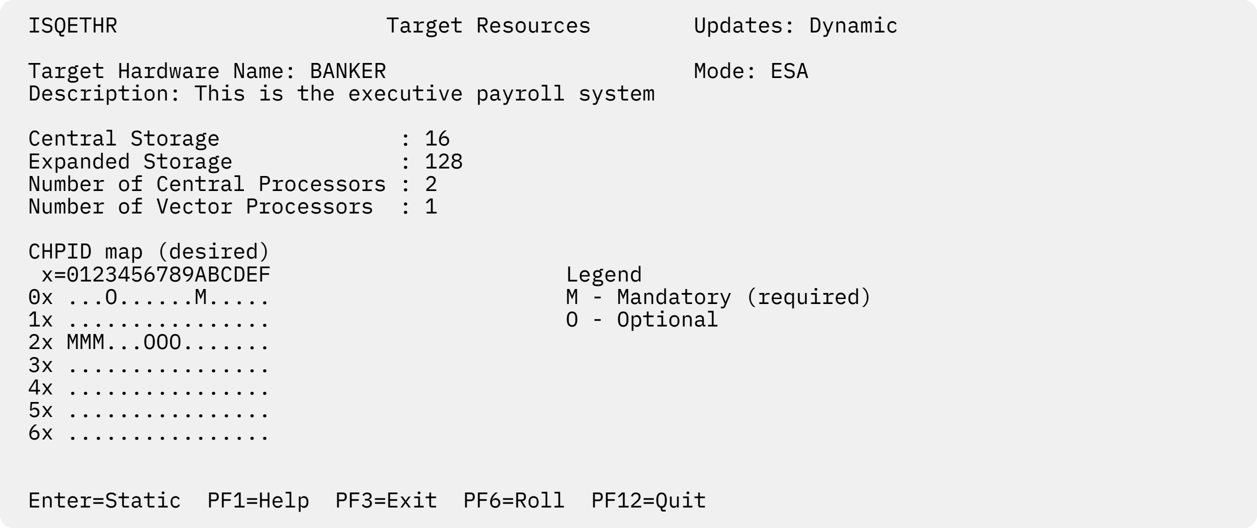
4. To view the status of the resources available to the target system, press PF5. If the target system is running on hardware that is in LPAR mode, a panel similar to Figure 72 on page 113 is displayed.



```
ISQETSR           Target System LPAR Resource       Updates: Dynamic

Target Hardware Name: BANKER          Target System Name: SYSTEM01
Description: This is the executive payroll system
Channel Status: OK                                  Mode: ESA

Central Storage (desired/actual)              : 16/16
Expanded Storage (desired/actual)             : 128/128
Number of Central Processors (desired/actual) : 2/2
Number of Vector Processors (desired/actual)  : 1/1
LPAR name: EXECPAY    Favored LPAR: Y            LPAR automatic IPL: N

CHPID map (desired)   CHIPD map (actual)
 x=0123456789ABCDEF    x=0123456789ABCDEF
0x ...O......M.....   0x ***R******R***** Legend
1x ................   1x ****************
2x MMM...OOO.......   2x RRR***RRR******* M - Mandatory (required)
3x ................   3x **************** O - Optional
4x ................   4x **************** . - Not specified
5x ................   5x **************** R - Reconfigurable
6x ................   6x **************** * - Not defined


Enter=Static  PF1=Help  PF3=Exit  PF6=Roll  PF12=Quit
```

Figure 72. Target System LPAR Resource Status Panel

If the target system is running on hardware that is not in LPAR mode, a panel similar to Figure 73 on page 113 is displayed.



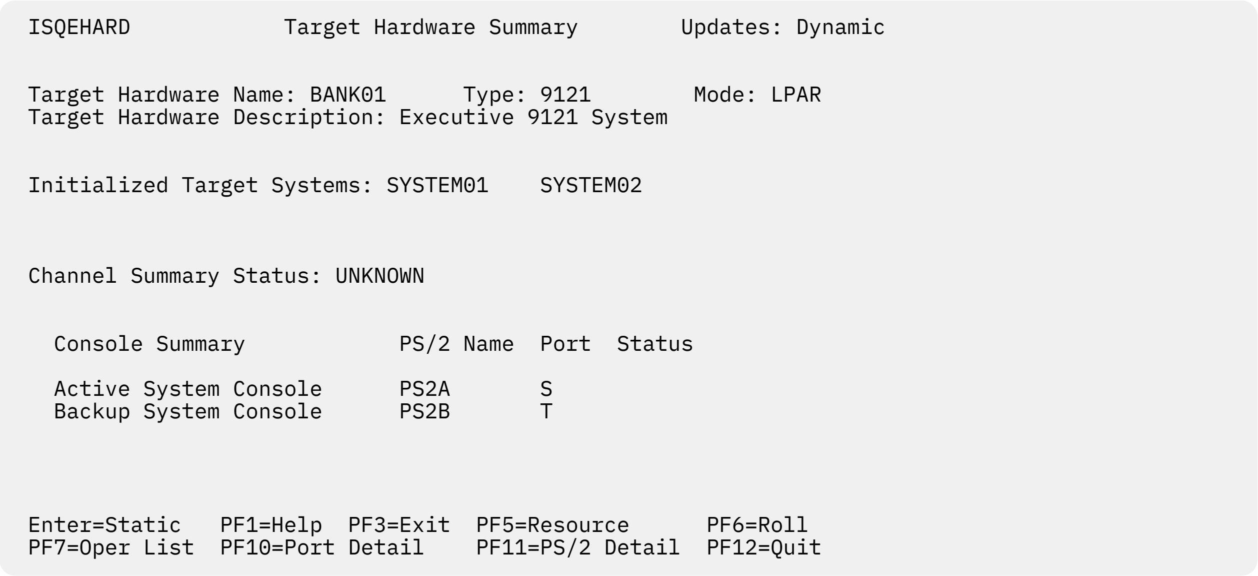
```
ISQETHR                     Target Resources        Updates: Dynamic

Target Hardware Name: BANKER                        Mode: ESA
Description: This is the executive payroll system

Central Storage             : 16
Expanded Storage            : 128
Number of Central Processors : 2
Number of Vector Processors  : 1

CHPID map (desired)
 x=0123456789ABCDEF                       Legend
0x ...O......M.....                       M - Mandatory (required)
1x ................                       O - Optional
2x MMM...OOO.......
3x ................
4x ................
5x ................
6x ................


Enter=Static  PF1=Help  PF3=Exit  PF6=Roll  PF12=Quit
```

Figure 73. Target System Resource Status Panel

Depending on the type of hardware on which the target is running (for example, a 9021 can have up to 256 CHPIDs), these panels might be split into two panels (with the CHPID map information on a different panel and accessible by pressing the PF2 key).

When you review the information, press PF3 to return to the Target System Summary panel.

5. To view detailed status information about the target hardware on which the target system is defined, press PF9. A panel similar to Figure 74 on page 114 is displayed.

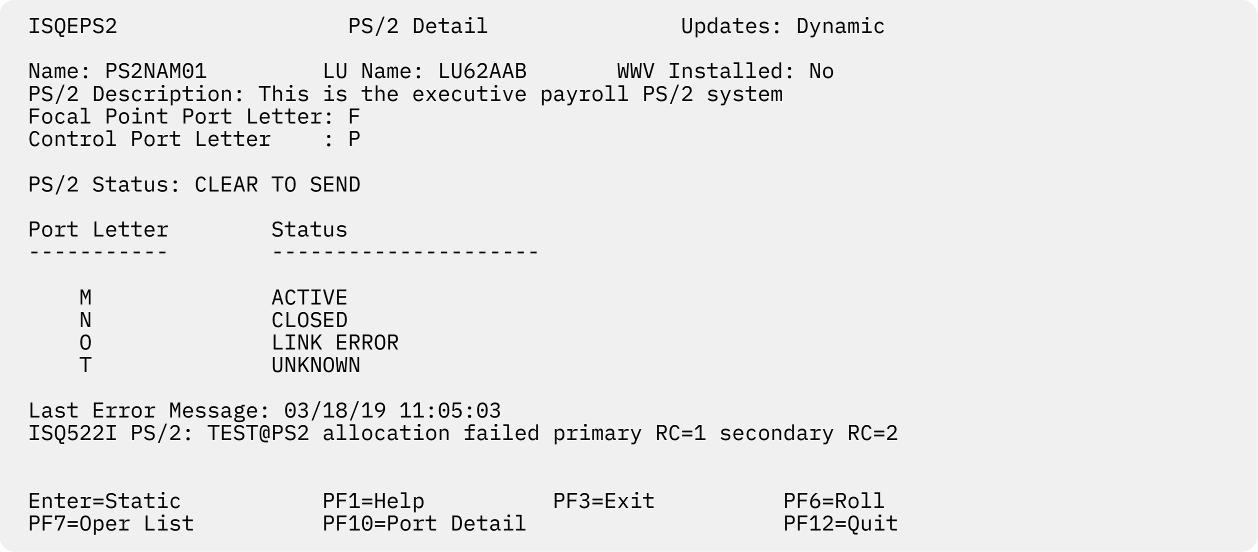


```
ISQEHARD            Target Hardware Summary        Updates: Dynamic


Target Hardware Name: BANK01      Type: 9121        Mode: LPAR
Target Hardware Description: Executive 9121 System


Initialized Target Systems: SYSTEM01    SYSTEM02



Channel Summary Status: UNKNOWN


  Console Summary            PS/2 Name  Port  Status

  Active System Console      PS2A       S
  Backup System Console      PS2B       T




Enter=Static   PF1=Help  PF3=Exit  PF5=Resource      PF6=Roll
PF7=Oper List  PF10=Port Detail    PF11=PS/2 Detail  PF12=Quit
```

Figure 74. Target System Hardware Summary Status Panel

When you have reviewed the information, press PF3 to return to the Target System Summary panel.

6. To view detailed status information about a specific workstation, move the cursor to the name of the workstation you want to monitor and press PF11. A panel similar to Figure 75 on page 114 is displayed.

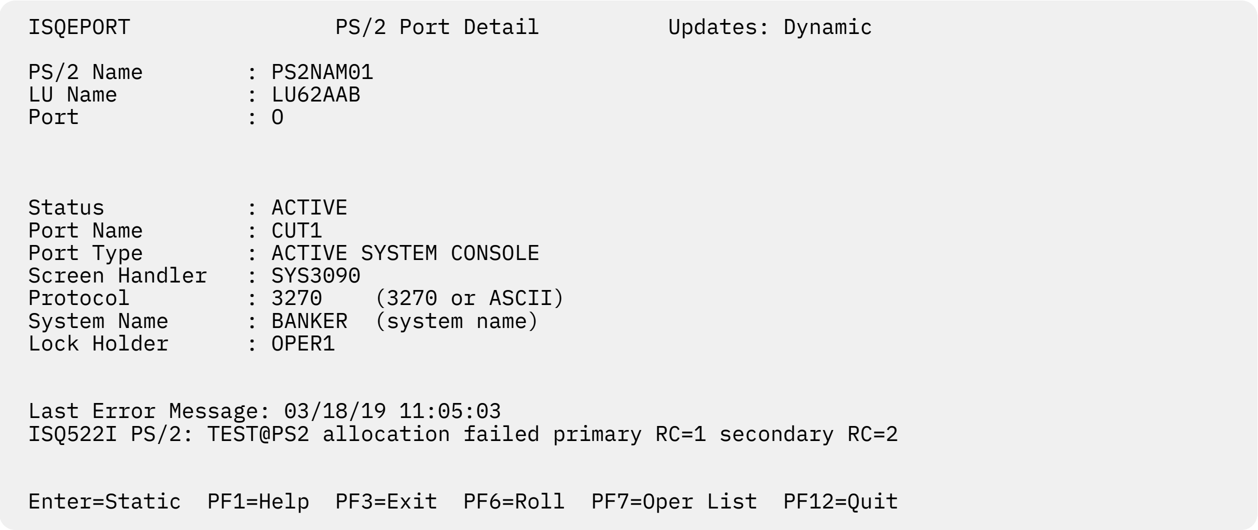


```
ISQEPS2                  PS/2 Detail               Updates: Dynamic

Name: PS2NAM01         LU Name: LU62AAB       WWV Installed: No
PS/2 Description: This is the executive payroll PS/2 system
Focal Point Port Letter: F
Control Port Letter    : P

PS/2 Status: CLEAR TO SEND

Port Letter        Status
-----------        ---------------------

    M              ACTIVE
    N              CLOSED
    O              LINK ERROR
    T              UNKNOWN

Last Error Message: 03/18/19 11:05:03
ISQ522I PS/2: TEST@PS2 allocation failed primary RC=1 secondary RC=2


Enter=Static           PF1=Help          PF3=Exit          PF6=Roll
PF7=Oper List          PF10=Port Detail                    PF12=Quit
```

Figure 75. PS/2 Detail Status Panel

When you have reviewed the information, press PF3 to return to the Target System Summary panel.

7. To view detailed status information about a specific workstation port, move the cursor to the name of the workstation and port letter you want to monitor and press PF10. A panel similar to Figure 76 on page 115 is displayed.

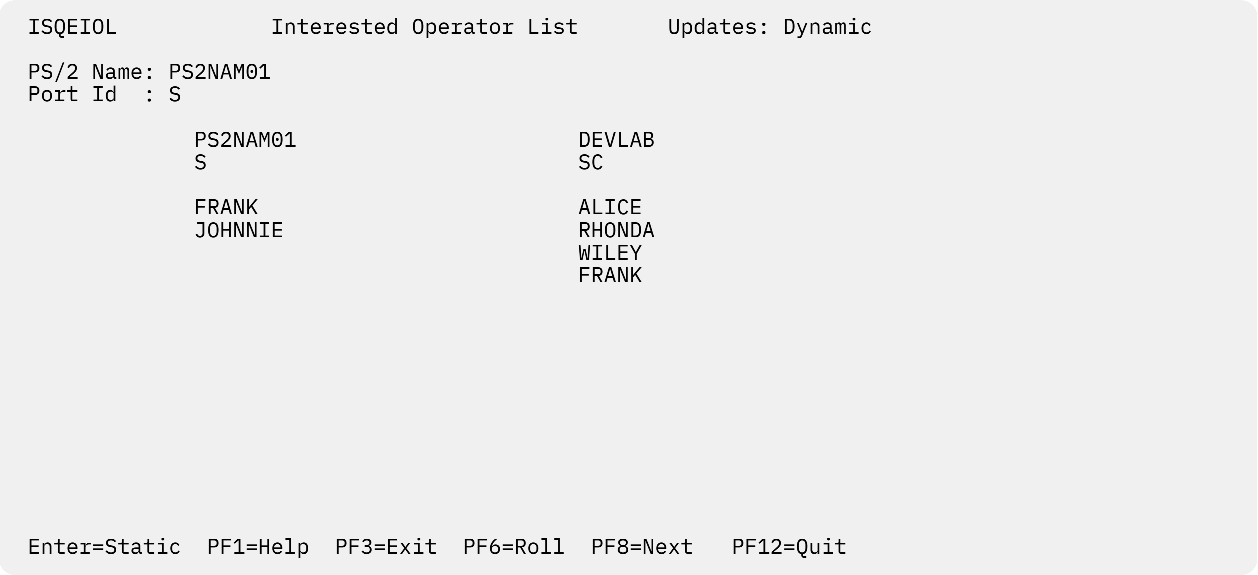


```
ISQEPORT                PS/2 Port Detail          Updates: Dynamic

PS/2 Name        : PS2NAM01
LU Name          : LU62AAB
Port             : 0



Status           : ACTIVE
Port Name        : CUT1
Port Type        : ACTIVE SYSTEM CONSOLE
Screen Handler   : SYS3090
Protocol         : 3270    (3270 or ASCII)
System Name      : BANKER  (system name)
Lock Holder      : OPER1


Last Error Message: 03/18/19 11:05:03
ISQ522I PS/2: TEST@PS2 allocation failed primary RC=1 secondary RC=2


Enter=Static  PF1=Help  PF3=Exit  PF6=Roll  PF7=Oper List  PF12=Quit
```

Figure 76. PS/2 Port Detail Status Panel

When you have reviewed the information, press PF3 to return to the Target System Summary panel.

8. To view detailed status information about the operators that receive messages from the console connected to a specified port and workstation, move the cursor to the name of the workstation and port letter you wish to monitor and press PF7. A panel similar to Figure 77 on page 115 is displayed.



```
ISQEIOL            Interested Operator List       Updates: Dynamic

PS/2 Name: PS2NAM01
Port Id  : S

             PS2NAM01                      DEVLAB
             S                             SC

             FRANK                         ALICE
             JOHNNIE                       RHONDA
                                           WILEY
                                           FRANK










Enter=Static  PF1=Help  PF3=Exit  PF6=Roll  PF8=Next   PF12=Quit
```

Figure 77. Interested Operator List Status Panel

If more data exists than can fit on this panel, press PF8 to scroll through the data.

When you have reviewed the information, press PF3 to return to the Target System Summary panel. From this panel, press PF3 again to return to the TSCF Status Summary panel and to select a different target system.

Using the Commands

You can use TSCF commands to perform an IPL or to shutdown target systems. In addition, you can send commands directly to the operator console or to the system console of a target system.

Performing an IPL of a Target System

To IPL a target system, initialize the target system and load and start the operating system software. You can use the Activate common command to initialize a target system. This initialization extends from a power-on reset to performing the initial program load process. For example, to initialize the target system SYS2, enter:

```
isqccmd sys2 activate
```

Use the Load common command to load and start a target system's operating system, without initializing the system. This can happen if, for example, the target system is reinitialized after a disabled wait state. For example, to load and start the target system SYS2, enter:

```
isqccmd sys2 load
```

Use the ISQXIII command to initialize a target system (without starting and loading the operating system software). Initializing a target system associates the target system with the target hardware and with the PS/2 computers and PS/2 ports that provide the communication path between the focal point system and the target system. For example, to initialize the active and backup operator and system console for SYS2, enter:

```
isqxiii sys2
```

Shutting Down a Target System

Use the Deactivate common command to shut down a target system. This command causes the target system to end normal operation and also closes the system console and operator console ports. For example, to shut down the target system SYS2, enter:

```
isqccmd sys2 deactivate
```

Specifying Commands at the Target System

Use TSCF to interact with a single console in a simple and efficient manner. You can use the ISQSEND command to send commands to an operator console (OC) or to a system console (SC) at a specified target system. You can also use the ISQTCC command to establish a pass-through session between the current operator station task (OST) and a specific target system. Use the passthrough session to enter commands as if you were at the console of the target system and to immediately see the results of each command without any messages from other systems cluttering up the screen.

Topic:	Reference:
Monitoring the status of the components in your TSCF configuration.	*Target System Control Facility Operations and Commands*

Using Tivoli Remote Control

The Tivoli Remote Control component provides a remote console function that allows one programmable workstation, called a controlling workstation, to control the keyboard input and monitor the display output of another programmable workstation, called the target workstation.

When the remote control session is in the monitoring state, you can see the screen image of the target workstation's display from the controlling workstation. When the remote control session is in the active state, you can use the controlling workstation to operate and control the target workstation. Any keystrokes that you type at the controlling workstation are relayed to the target workstation and acted upon as if they were typed by the target workstation user. The remote control component provides the following network management and maintenance functions:

- Remote help desk assistance for applications, online education, and maintenance of application programs
- Remote problem determination for trace and dump analysis, including the transfer of data

- Remote control of unattended workstations (for example, LAN servers)
- Remote management of personal computers, and accessibility to data and programs stored on it (for example, a system running in the home or in the office)
- Remote access to system consoles when they are implemented on personal computers
- Remote monitoring of work in progress on target workstations (for example, between teachers and students)

As an example of using the remote control component, suppose a target workstation user is having difficulty understanding the company's new accounting program. The target workstation user contacts you, and you open a session with that particular workstation. With the accounting program on the screen, you can switch to the active state and type the correct keystrokes to run the accounting program. The user at the target workstation observes the process and learns how to use the new accounting program. You then switch to monitoring the state and return control to the user at the target workstation.

Topic:	**Reference:**
Using the Distributed Console Access Facility	*IBM Distributed Console Access Facility User's Guide*

Chapter 9. Controlling Operating System Resources

You can manage operating system resources through the NetView program, IBM Z System Automation, and Tivoli Workload Scheduler for z/OS. In addition, you can use the NetView program and the Programmable Operator Facility of VM to control VM systems and the Operator Communication Control Facility of VSE to control VSE systems.

Using the NetView Program

Use the NetView program as a control point to manage operating system resources and to perform some of the tasks that operators have traditionally performed, including:

- Processing messages
- Running regularly scheduled procedures
- Recovering and restarting the system and network in the event of a failure

Issuing MVS System Commands

To issue commands to MVS, use the NetView MVS command to control MVS system operations without using a separate screen for multiple console support (MCS).

To issue a command from the NetView command facility, enter MVS followed by a valid MVS command. For example, to display a list of active MVS tasks, enter the following command:

```
mvs d a,l
```

The NetView command facility displays the response from MVS.

Setup Required to Issue Commands to MVS

If extended MCS consoles are used, no setup is required.

If standard MCS consoles are used:

- Start the NetView subsystem.
- Start the NetView subsystem router to issue MVS commands.

To issue commands to MVS, the NetView subsystem and the NetView subsystem router, must be started. Refer to *IBM Z NetView Installation: Getting Started* for more information.

Automating MVS Commands

You can automate MVS and subsystem commands entered from any MVS console or console interface. To do this, you must install a load module as an MVS command exit, add a CMD statement in one of the `MPFLSTxx` members, and issue a `SET MPF=`*xx* command to activate the exit. Refer to *IBM Z NetView Installation: Configuring Additional Components* for more information.

When MVS Commands Fail

You can receive the following messages:

CNM560I

The NetView subsystem router is not active. To start the NetView subsystem router, enter the following command:

```
start task=CNMCSSIR
```

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CNM564I

You had a syntax error in your MVS command. Correct the error and issue the command again.

CNM566I

The NetView console ID table is not available. This is probably because the NetView subsystem is not active. To start the NetView subsystem, enter the following command:

```
s procname
```

From the MVS console, where *procname* is the name of the procedure defined by your system programmer to start the NetView subsystem.

If the subsystem is already started, your system programmer can check the startup parameters for the NetView subsystem interface. Refer to the *IBM Z NetView Installation: Getting Started*.

Hint: You do not need to start the subsystem to send MVS commands from the NetView operator if you are using extended MCS consoles.

CNM567I

No MVS console is available. You can either ask your system programmer to define additional MVS consoles or you can enter the following command:

```
disconid
```

To determine which other operators have consoles assigned to them and ask one of them to release their console. An operator can release a console by entering the following command:

```
relconid
```

CNM568I

You do not have command authorization to issue the keyword. Contact your system programmer to give your operator task access.

DWO338I

The console you requested is already in use. To request a different console, enter the following command, where *name* is a different console than you first requested, and the default console name is the same as your operator ID:

```
getconid console=name
```

Topic:	**Reference:**
MVS, GETCONID, RELCONID, DISCONID, SETCONID commands	NetView online help
Consoles	*IBM Z NetView Automation Guide*
MVS System Commands	*MVS/ESA System Commands Reference*
Defining consoles	*MVS/ESA Initialization and Tuning Reference*

Issuing JES2 Commands

To issue a JES2 command, enter MVS from the NetView command facility, followed by a valid JES2 command. For example, you can issue commands to accomplish the following tasks:

1. Determine the current job printing on prt15
2. Keep JES2 from printing any other jobs on prt15
3. Allow the current job on prt15 to finish printing on another printer

Perform the following steps:

1. To display the status of prt15, enter the following command:

   ```
   mvs $du,prt15
   ```

2. To drain prt15, enter the following command:

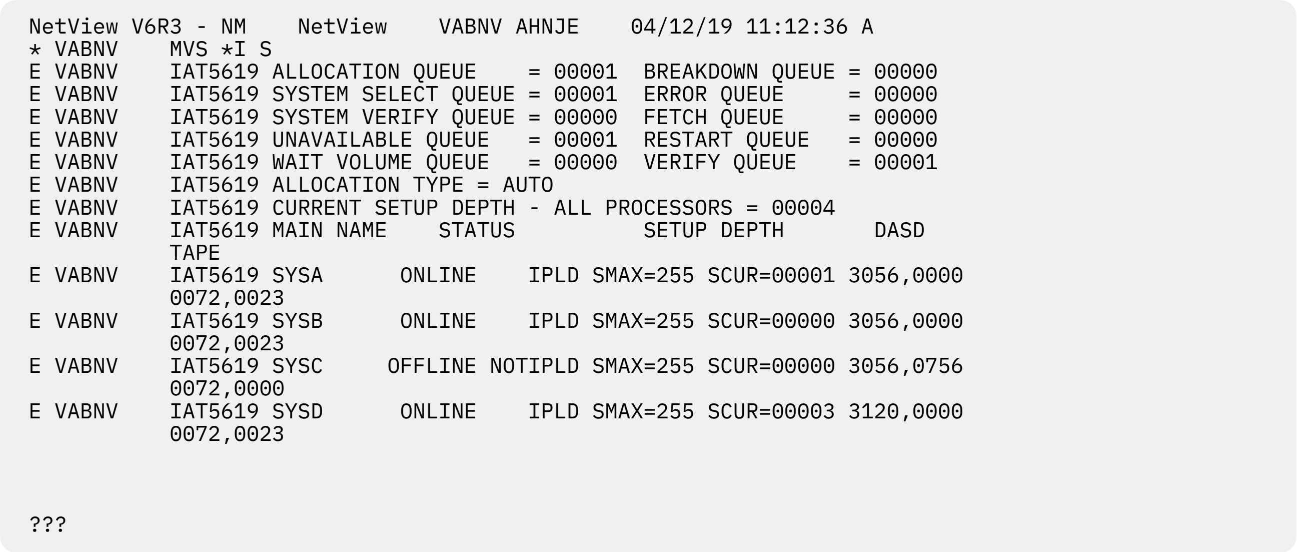
   ```
   mvs $pprt15
   ```

3. To interrupt the job printing on prt15, enter the following command:

   ```
   mvs $iprt15
   ```

Issuing JES3 Commands

You can issue commands to JES3 from the NetView program. Figure 78 on page 121 shows how to issue the JES3 *I S command to display the status of JES3 system resources.



```
NetView V6R3 - NM    NetView    VABNV AHNJE    04/12/19 11:12:36 A
* VABNV    MVS *I S
E VABNV    IAT5619 ALLOCATION QUEUE    = 00001  BREAKDOWN QUEUE = 00000
E VABNV    IAT5619 SYSTEM SELECT QUEUE = 00001  ERROR QUEUE     = 00000
E VABNV    IAT5619 SYSTEM VERIFY QUEUE = 00000  FETCH QUEUE     = 00000
E VABNV    IAT5619 UNAVAILABLE QUEUE   = 00001  RESTART QUEUE   = 00000
E VABNV    IAT5619 WAIT VOLUME QUEUE   = 00000  VERIFY QUEUE    = 00001
E VABNV    IAT5619 ALLOCATION TYPE = AUTO
E VABNV    IAT5619 CURRENT SETUP DEPTH - ALL PROCESSORS = 00004
E VABNV    IAT5619 MAIN NAME    STATUS          SETUP DEPTH       DASD
           TAPE
E VABNV    IAT5619 SYSA      ONLINE    IPLD SMAX=255 SCUR=00001 3056,0000
           0072,0023
E VABNV    IAT5619 SYSB      ONLINE    IPLD SMAX=255 SCUR=00000 3056,0000
           0072,0023
E VABNV    IAT5619 SYSC     OFFLINE NOTIPLD SMAX=255 SCUR=00000 3056,0756
           0072,0000
E VABNV    IAT5619 SYSD      ONLINE    IPLD SMAX=255 SCUR=00003 3120,0000
           0072,0023



???
```

Figure 78. Issuing a JES3 Command from the NetView Program

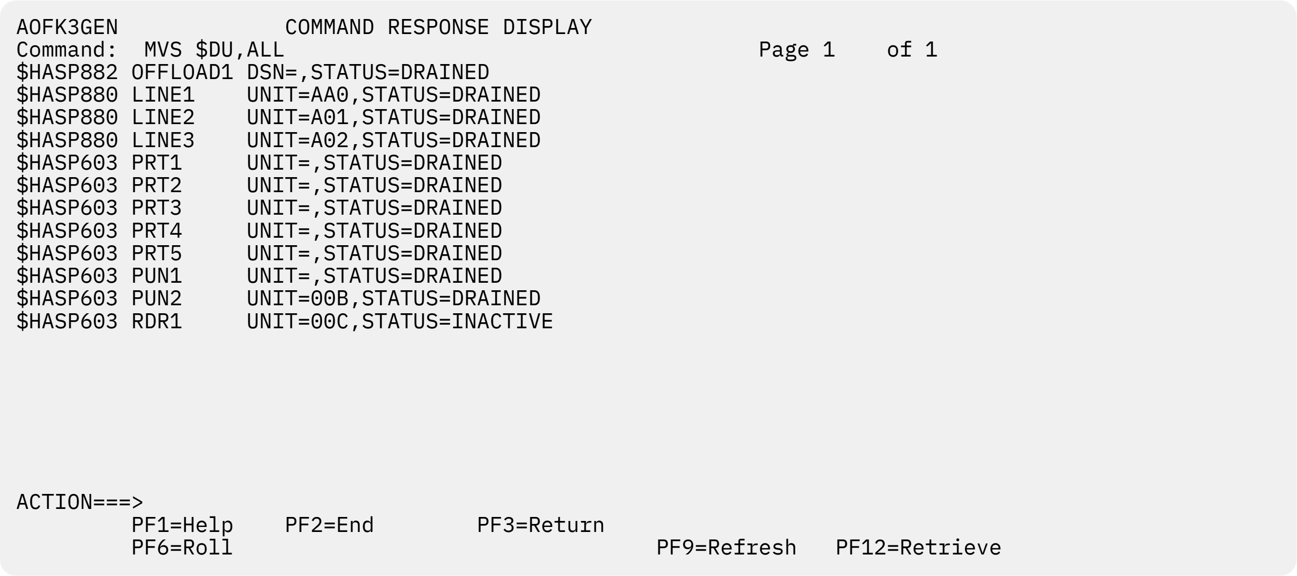
Topic:	**Reference:**
Issuing JES3 commands from the NetView program	*IBM Z NetView Automation Guide*

Issuing JES2 Subsystem Commands

Use the JES2 command to issue JES2 subsystem commands. You can page through the full-screen response. For example, to display the status of all or specified local JES2 controlled non-direct access devices, enter the following command:

```
jes2 du,all
```

A full-screen panel similar to Figure 79 on page 122 is displayed.



```
AOFK3GEN             COMMAND RESPONSE DISPLAY
Command:  MVS $DU,ALL                                    Page 1    of 1
$HASP882 OFFLOAD1 DSN=,STATUS=DRAINED
$HASP880 LINE1    UNIT=AA0,STATUS=DRAINED
$HASP880 LINE2    UNIT=A01,STATUS=DRAINED
$HASP880 LINE3    UNIT=A02,STATUS=DRAINED
$HASP603 PRT1     UNIT=,STATUS=DRAINED
$HASP603 PRT2     UNIT=,STATUS=DRAINED
$HASP603 PRT3     UNIT=,STATUS=DRAINED
$HASP603 PRT4     UNIT=,STATUS=DRAINED
$HASP603 PRT5     UNIT=,STATUS=DRAINED
$HASP603 PUN1     UNIT=,STATUS=DRAINED
$HASP603 PUN2     UNIT=00B,STATUS=DRAINED
$HASP603 RDR1     UNIT=00C,STATUS=INACTIVE






ACTION===>
         PF1=Help    PF2=End        PF3=Return
         PF6=Roll                                 PF9=Refresh   PF12=Retrieve
```

Figure 79. Displaying the Status of JES2 Access Devices

The ALL operand displays detailed information about all local JES2 controlled devices, active remote devices, and internal readers.

Topic:	Reference:
MVS command	NetView online help
Setting up, displaying, and changing the IBM Z System Automation automation control file	*IBM Z System Automation Customization and Programming* and *IBM Z System Automation User's Guide*
Assigning automation operators for IBM Z System Automation messages	*IBM Z System Automation User's Guide*
Managing the status of MVS resources	*IBM Z System Automation User's Guide*
Issuing MVS and JES2 commands from IBM Z System Automation	*IBM Z System Automation User's Guide*

Controlling Resources Utilization Using OPC/ESA

Your data center has resources, both physical and logical, that must be shared between the batch jobs and started tasks that run to satisfy the business processing needs of your enterprise. Optimum utilization of resources not only maximizes the throughput of processing but is also critical to your ability to meet the increasingly high service demands of your customers.

OPC/ESA defines three resources types to represent the various resources in your environment. The availability indicators of each resource type can be changed dynamically by the NetView program to reflect the actual resource status. The different resource types are shown in the following list:

Parallel servers
: Define the total number of operations that can be started at a workstation simultaneously. On computer batch workstations, parallel servers represent JES initiators.

Workstation resources

Two workstation resources are recognized per workstation. You decide what these resources represent. They are most commonly used to represent tape or cartridge drives. They represent a pool of resources that are shared by the operations.

Special resources

Any other resource which cannot be described as a parallel server or workstation resource. They describe a situation that for scheduling purposes is important. For example, batch jobs which cannot process while an online transaction processor is active. A special resource can be allocated by an operation for shared or exclusive use. Availability of the resource can be used as a trigger to start an operation or to include some processing in the schedule that cannot be planned.

Parallel Servers and Workstation Resources

OPC/ESA is not aware of the actual status of resources in your environment. Instead, it schedules the work according to what it believes to be the case, that is, the number and status of resources you have previously defined. This can lead to over-scheduling or under-scheduling of the resources if the status or number of resources is changed by an operator or automatically by the system.

The impacts of over-scheduling resources such as JES initiators or a pool of tape drives might not be immediately obvious. When a queue for JES initiators exists, queuing is handled on a first-in-first-out basis. Additionally, JES automatically increases the priority of a queued job if it has been queued for a long time. This queuing mechanism is efficient for many purposes, but it does not reflect the relative priority of the jobs nor does it consider your deadlines.

Over-scheduling a tape or cartridge pool can create many problems. MVS tries to give all requestors what it considers an equal share of the devices. This means that volumes are dismounted at step end if outstanding device requests exist. Valuable time is lost rewinding, dismounting, remounting, and repositioning the volume. Further, the volume is unlikely to be remounted on the same device from which it was dismounted, this means your operators wage a never-ending battle chasing volumes from device to device.

When the NetView program is used to adjust the status of resources defined to OPC/ESA as a result of events occurring in the operating environment, resource utilization can always be maximized and over-scheduling of critical resources can be avoided.

Modifying Resource Ceilings from the NetView Program

The OPC/ESA sample library member EQQPIFWI contains a program which can be used to modify the number of parallel servers and workstation resources in the current plan. You can tailor this program to your installation requirements and call the program from the NetView program to modify resource ceilings in response to events initiated, or detected, by the NetView program.

Part 3. Controlling the NetView Environment

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Chapter 10. Maintaining the NetView Program

Controlling the NetView program is the continual adjustment of the NetView environment to achieve the goals of monitoring, investigating, analyzing, and controlling network and system components.

For information about how to protect commands and resources, define operators to the NetView program, and restrict access to data sets, refer to the *IBM Z NetView Administration Reference*.

Defining a NetView Command

Use the CMDDEF statements (located in CNMCMD) to define commands to the NetView program. For example, the LIST command is defined by the following statement:

```
CMDDEF.LIST.MOD=DSISHP
```

Where DSISHP is the name of the module that contains the code to run the command. If you are defining your own command processor, be sure to specify a unique module name on the MOD operand. Do not use a name that the system might recognize as a NetView program command, because the NetView program attempts to process the NetView command instead of your command processor. Use the following conventions when defining commands:

- Start the name with an alphabetical character.
- Do not use NetView prefixes.
- Avoid special characters such as commas and colons.
- Avoid NetView command names, both internal commands and those shipped in CNMCMD.

For more information about NetView prefixes and internal command names, refer to the *IBM Z NetView Customization Guide*.

You can also include CMDDEF statements for a command list for which you want to provide a synonym. For example, to define a command list named MYSTATUS and a synonym of MYSTAT, include the following statements in DSIPARM member CNMCMDU:

```
CMDDEF.MYSTATUS.MOD=DSICCP
CMDDEF.MYSTATUS.CMDSYN=MYSTAT
```

You can define command security using the NetView command authorization table, or a system authorization facility (SAF) security product such as Resource Access Control Facility (RACF). When you make changes to command security using the NetView command authorization table or SAF product, you do not need to recycle the NetView program for these changes to take effect.

For more information, refer to the *IBM Z NetView Security Reference*.

Defining Resources in the Network

A *resource* is an element of a network to which a name can be assigned. Resources can also be called *nodes*. Subarea nodes are defined to VTAM using the VTAMLST data set. Advanced Peer-to-Peer Networking nodes are dynamically defined to VTAM. Nodes are grouped together into an aggregation called a *major node*. An example of a major node is a cluster controller and its subordinate logical units (LUs). A major node is represented in VTAMLST by a single member. Individual nodes within a major node are called ***minor nodes***. An example of a minor node is an LU.

The NetView program uses the VTAMLST data set to define the network that is monitored by the status monitor. If the SNA topology manager is not being used, and if the MONIT function is required, when changes are made to the VTAMLST data set, the status monitor preprocessor (CNMNDEF) must be run to update the tables used by the status monitor.

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Topic:	Reference:
Status Monitor Preprocessor	*IBM Z NetView Installation: Configuring Additional Components*

Maintaining Objects and Relationships in RODM

The Resource Object Data Manager (RODM) is an in-memory data cache that stores, retrieves, and manages operational resource information needed for network and systems management.

For the NetView management console to manage non-SNA resources in your system and network, the resources and relationships between them must exist in the RODM data cache. Several facilities can be used for creating, updating and deleting objects and relationships in RODM:

- NetView MultiSystem Manager
- NetView discovery manager
- NetView SNA topology manager
- Remote Operations Manager
- NetView RODM load utility
- RODMView
- NetView Resource Manager

The NetView MultiSystem Manager program collects topology information and internet protocol (IP) resources. This program stores this information in RODM for the NetView management console to use.

The NetView discovery manager discovers sysplex and System z® resources and stores the information in RODM for use with the NetView Enterprise Management Agent and the NetView management console.

The SNA Topology Manager collects topology information for SNA subarea and Advanced Peer-to-Peer Networking resources, and stores the topology information in RODM for use with the NetView management console.

The NetView Remote Operations Manager creates, updates, and deletes objects and relationships in RODM that represent NetView Remote Operations Agent/400s.

The NetView RODM load utility reads control statements that specify the creation, update, or deletion of objects and relationships in the RODM data cache.

The NetView RODMView function can be used directly, from a command line as EKGV commands, or from a series of NetView panels. Using RODMView simplifies the task of defining classes, objects, and fields to the NetView GMFHS data model.

The NetView Resource Manager collects resource utilization information from NetView hosts and stores the information in RODM for use with the NetView management console.

Using the NetView MultiSystem Manager

You can use NetView MultiSystem Manager to manage your Open Topology Interface resources. MultiSystem Manager dynamically collects resource and configuration information from open agents in the network, and places this information in RODM. As the topology changes, MultiSystem Manager updates this configuration information in RODM. You can also use REXX calls to MultiSystem Manager Access to load objects into RODM. As in the case of the agents in the network, status information is kept in RODM for the NetView management console to use.

Topic:	Reference:
Viewing topology	*IBM Z NetView User's Guide: NetView Management Console*

Using the NetView SNA Topology Manager

Use the NetView SNA topology manager to gather and record data about SNA subarea and Advanced Peer-to-Peer Networking topology. The SNA topology manager collects topology data from a VTAM agent. The topology data collected is stored in RODM for use by the NetView management console.

Topic:	Reference:
SNA topology manager usage	*IBM Z NetView SNA Topology Manager Implementation Guide*

Using the NetView RODM Load Utility

Use the NetView RODM load utility to load object class definitions, objects, and relationships into the RODM data cache using a previously generated load file. A load file can be generated by NetView Network Planner/2, a user-written utility, or an editor.

Topic:	Reference:
NetView RODM load utility usage	*IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide*

Using the RODMVIEW Command

The RODMView panel interface is a series of menu-driven, full-screen panels with context and PF key help. You can use the RODMView panels to create or modify objects such as SNA subarea and Advanced Peer-to-Peer Networking objects, domains, gateways, non-SNA objects, and SNA shadow objects and their connectivity and containment relationships.

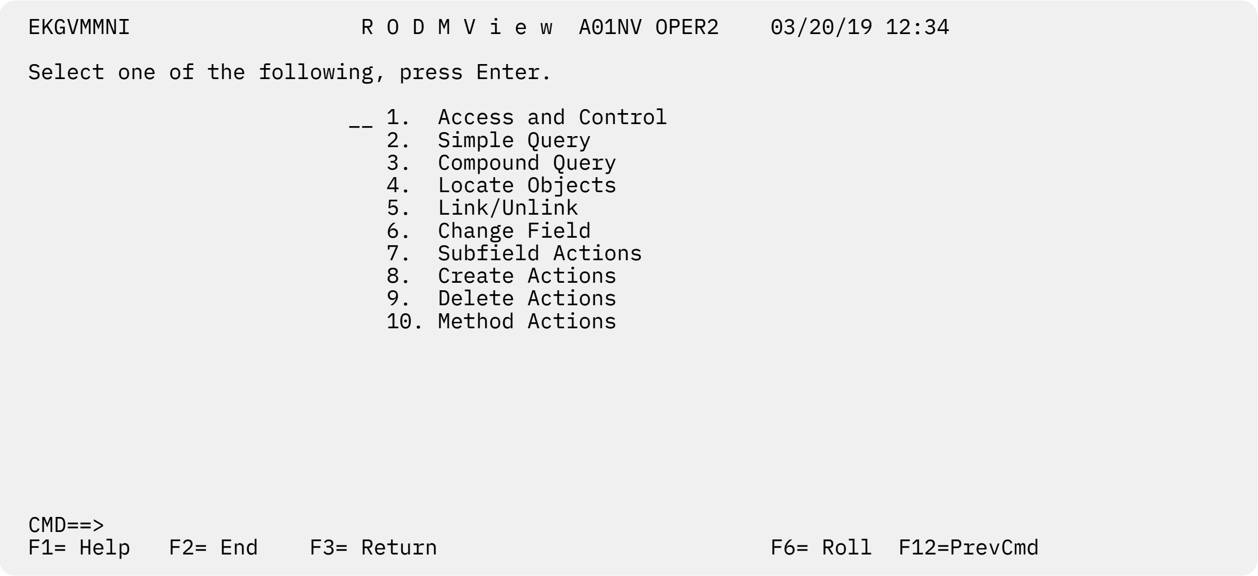
The RODMView panels simplify the display, addition, updating, and deletion of objects and relationships in the RODM data cache. The panels perform one operation at a time directly on the RODM data cache. Also, refer to the NetView online help for information about the RODMView EKGV commands.

Changing the Value of a RODM Object Attribute Using RODMView

You can use the NetView RODMView command to trigger a RODM method, and to add, change, and delete the values of RODM classes, objects, and fields.

You can trigger a RODM method either as an object-independent or object-specific (named) method. To trigger a RODM method, perform the following steps:

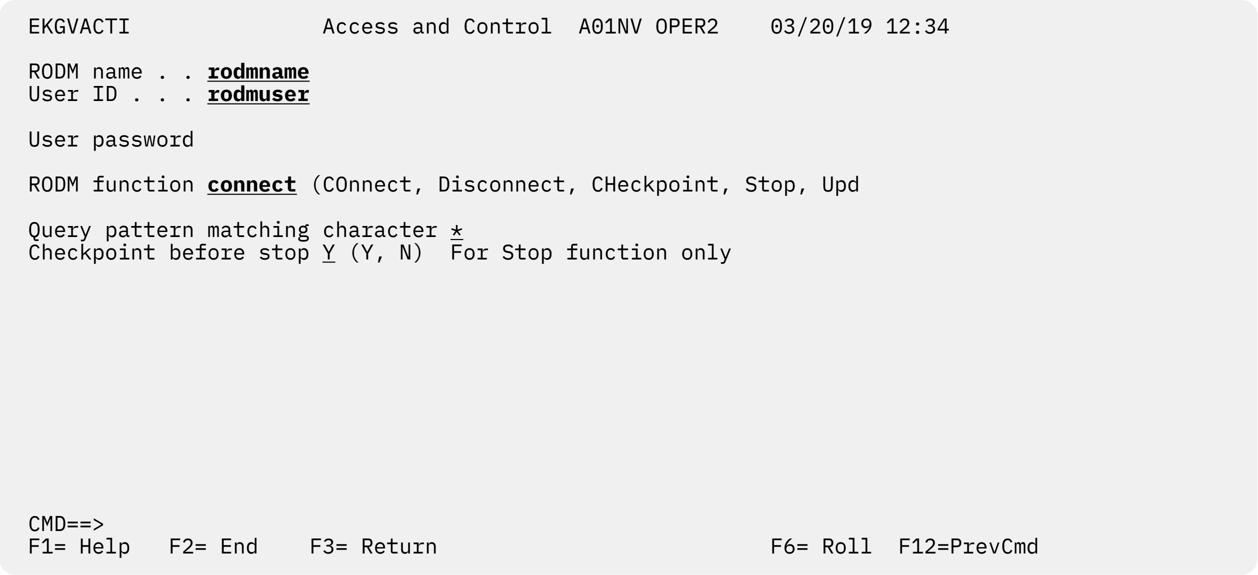
1. Type **rodmview** on the NetView command facility command line and press Enter. The RODMView main menu is displayed as shown in Figure 80 on page 130:



```
EKGVMMNI                  R O D M V i e w  A01NV OPER2    03/20/19 12:34

Select one of the following, press Enter.

                         __ 1.  Access and Control
                            2.  Simple Query
                            3.  Compound Query
                            4.  Locate Objects
                            5.  Link/Unlink
                            6.  Change Field
                            7.  Subfield Actions
                            8.  Create Actions
                            9.  Delete Actions
                            10. Method Actions










CMD==>
F1= Help   F2= End    F3= Return                          F6= Roll  F12=PrevCmd
```

Figure 80. RODMView Program Main Menu

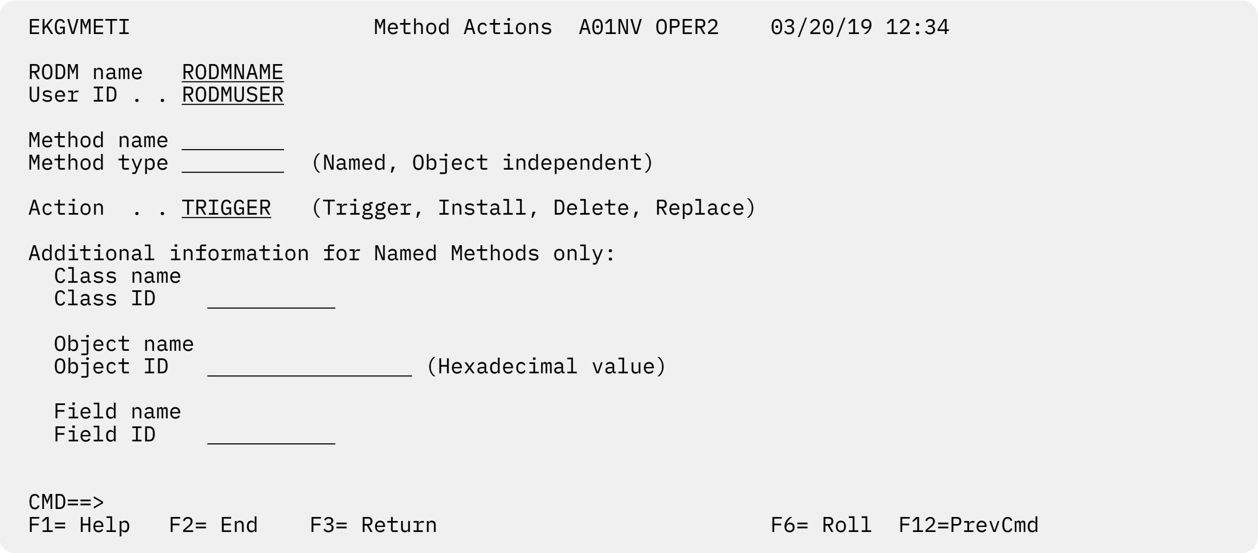
2. Select option **1** (Access and control). The Access and Control panel is displayed as shown in Figure 81 on page 130. Enter your RODM name, your user ID and password or password phrase, and specify **connect**. When the connection is successful, press the Return key to return to the RODMView main menu.



```
EKGVACTI               Access and Control  A01NV OPER2    03/20/19 12:34

RODM name . . rodmname
User ID . . . rodmuser

User password

RODM function connect (COnnect, Disconnect, CHeckpoint, Stop, Upd

Query pattern matching character *
Checkpoint before stop Y (Y, N)  For Stop function only










CMD==>
F1= Help   F2= End    F3= Return                          F6= Roll  F12=PrevCmd
```

Figure 81. RODMView Access and Control Panel

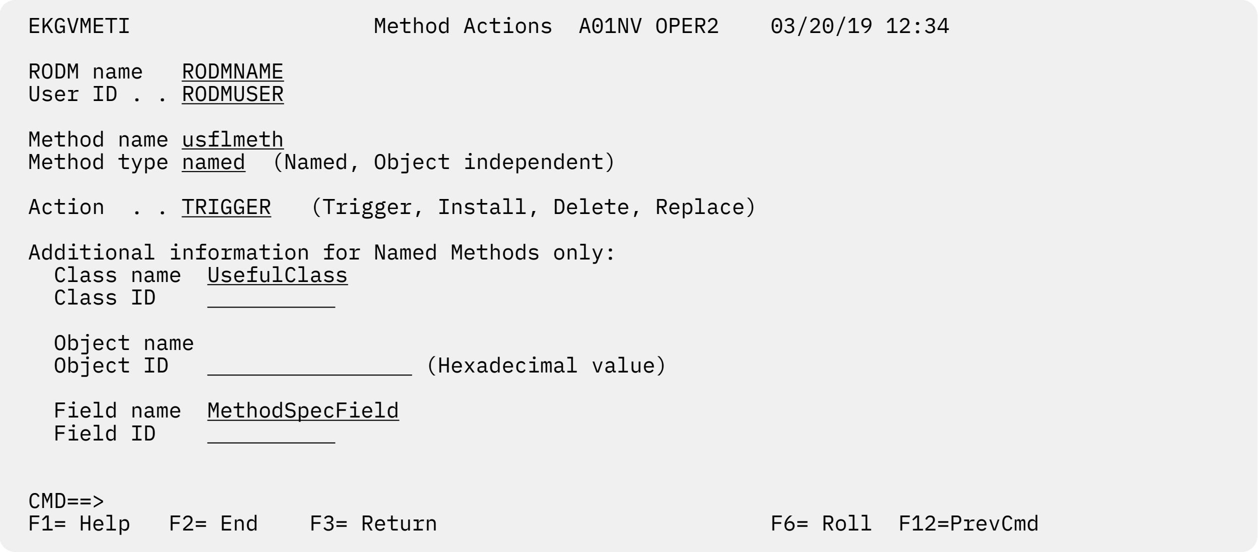
3. Select option **10** (Method actions). The Method Actions panel is displayed as shown in Figure 82 on page 131.



```
EKGVMETI                   Method Actions  A01NV OPER2    03/20/19 12:34

RODM name    RODMNAME
User ID . .  RODMUSER

Method name  ________
Method type  ________  (Named, Object independent)

Action   . . TRIGGER   (Trigger, Install, Delete, Replace)

Additional information for Named Methods only:
  Class name
  Class ID    __________

  Object name
  Object ID   ________________ (Hexadecimal value)

  Field name
  Field ID    __________


CMD==>
F1= Help   F2= End    F3= Return                      F6= Roll  F12=PrevCmd
```

Figure 82. RODMView Methods Actions Panel - EKGVMETI

4. Enter the appropriate values in the corresponding fields. For example, if you have a field called MethodSpecField of type MethodSpec defined on the class UsefulClass, and MethodSpecField has a value that includes a method called USFLMETH, you can call it by entering the information as shown in Figure 83 on page 131:



```
EKGVMETI                   Method Actions  A01NV OPER2    03/20/19 12:34

RODM name    RODMNAME
User ID . .  RODMUSER

Method name  usflmeth
Method type  named  (Named, Object independent)

Action   . . TRIGGER   (Trigger, Install, Delete, Replace)

Additional information for Named Methods only:
  Class name  UsefulClass
  Class ID    __________

  Object name
  Object ID   ________________ (Hexadecimal value)

  Field name  MethodSpecField
  Field ID    __________


CMD==>
F1= Help   F2= End    F3= Return                      F6= Roll  F12=PrevCmd
```

Figure 83. Triggering a Named Method

Topic:	**Reference:**
Introduction to RODMView	"Changing the Value of a RODM Object Attribute Using RODMView" on page 129
RODMView panel flow	"Using the RODMView Panels" on page 251
RODMView panels and usage	*IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide* .

Displaying Data Sets Used by the NetView Program

If you are authorized, you can BROWSE members of NetView data sets including:

- Parameter data set (DSIPARM)
- Help source data sets (CNMPNL1, BNJPNL1, and BNJPNL2)
- Command list data sets (DSICLD)
- Operator profile data set (DSIPRF)
- Network definitions and span information (DSIVTAM)
- Automation table listings and usage reports data set (DSILIST)
- Unprotected definitions, such as PF keys (DSIOPEN)
- Message members (DSIMSG)
- Automation testing reports (DSIARPT) and source files (DSIASRC)

For example, to view the DISPFK command list, enter:

```
browse dispfk
```

You can display members of data sets on a remote NetView system. For example, to view the CNMKEYS settings for PF keys on the remote NetView system NETV2, enter:

```
browse lu=netv2 cnmkeys
```

Use the following BROWSE command to view the contents of an active network `netv2` log:

```
browse netloga
```

If your command security is appropriately configured and allows remote system access, you can use the BROWSE command to view the contents of a remote network log or remote member on *netv2* as shown in the following examples:

```
 browse lu=netv2 netloga
```

Topic:	**Reference:**
BROWSE command	NetView online help
Protecting data sets	*IBM Z NetView Administration Reference*

Chapter 11. Controlling NetView Operation

Generally, NetView tasks are started automatically when the NetView program starts and remains active. You can use the STARTCNM and STOPCNM command lists to start or stop groups of DST or OPT tasks by function or all tasks. For example, to start all tasks for the NetView management console, enter the following command:

```
startcnm graphics
```

There might also be tasks, which are not frequently used, that you might need to start or stop. Here are the steps to follow:

1. To start a task named MYTASK that was predefined in the CNMSTYLE member, enter:

   ```
   start task=mytask
   ```

   If the task was not predefined in the CNMSTYLE member, you can still start the task and specify its characteristics using additional parameters on the START command.
2. To stop a task named MYTASK that is active, enter:

   ```
   stop task=mytask
   ```

Each NetView task is assigned a dispatching priority of 1 - 9, where 9 is the lowest and 1 is the highest. The initial priority of a task can be defined by using the CNMSTUSR or C*xx*STGEN member or when the task is started. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*. You can display the priority of all tasks with the LIST command. For example, to list the priorities of all active tasks, enter the following command:

```
list priority
```

You can also specify the priority of a task on the START command. For example, to change the priority of task MYTASK to 8, first stop and then restart the task:

```
stop task=mytask
start task=mytask,pri=8
```

Note: Changing the priority of a task can affect the performance of other tasks running on your system.

Topic:	**Reference:**
Additional task definitions	*IBM Z NetView Administration Reference*
AUTOTASK, START, STOP, STARTCNM, and STOPCNM commands	NetView online help
For a list of tasks	*IBM Z NetView Installation: Getting Started*

Controlling Resource Utilization

Use the NetView resource utilization function to prioritize, monitor, and limit the resource usage for various tasks in the NetView program. Resource limits are set and monitored using the TASKMON, TASKURPT, LOGTSTAT, DEFAULTS, and OVERRIDE commands. You can obtain information to help you plan and tune your network and to adjust tasks according to

- The amount of storage and processor consumed

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- Based on the rate of I/O activity
- The message-queuing traffic to and from NetView tasks

Topic:	Reference:
TASKMON, LOGTSTAT, DEFAULTS, and OVERRIDE commands	*IBM Z NetView Command Reference Volume 1 (A-N)*
TASKURPT	*IBM Z NetView Troubleshooting Guide*

Defining and Deleting NetView Operators

You can dynamically add or delete NetView operators while the NetView program is running. You can define new operator profiles in the NetView product or in an SAF security product, such as Resource Access Control Facility (RACF).

For information about adding new NetView operators, when operators are defined to an SAF product or when operators are defined using DSIOPF NetView definitions, see the *IBM Z NetView Administration Reference*.

Defining NetView Operators

Here are the steps to follow:

1. If defining operators using the NetView product rather than an SAF product, verify that enough application (APPL) statements are defined in your APPL major node for each additional operator you want to add. The samples use member A01APPLS (CNMS0013).
2. If not enough APPL statements are defined for new NetView operators, create a new APPL major node similar to your existing APPL major node. In this new member, define an APPL statement for each new operator you want to add. Be sure to either transfer the new APPL statements to a major node defined in VTAM sample ATCCON*xx* (CNMS0003), or add the new major node to ATCCON*xx*.
3. Activate the new APPL major node.
4. Define the new operator. If using NetView for operator definitions, you can assign an existing profile to the operator. You can define new operator definitions in the NetView product or in an SAF product, such as RACF. Using NetView to define operators, specify the profile for the new operator in a DSIPRF data set member, such as DSIPROFA. Using an SAF product, define the operator in the NETVIEW segment.
5. If the operator definitions are in a NetView DSIPRF data set member, issue the REFRESH OPERS command to dynamically refresh the operator definitions in DSIOPF. Message DWO831I is displayed for each operator successfully added, then message DSI633I is displayed to indicate that the refresh command completed successfully.

   If the operator definitions are in an SAF product, the operator definition is dynamic, taking effect as soon as the operator is defined to the SAF product and permitted to the resource representing NetView in the APPL class.
6. Log onto NetView using the new operator ID.

Topic:	Reference:
APPL statements	*IBM Z NetView Installation: Getting Started*
Operator definitions in DSIPRF and DSIOPF, or in an SAF product	*IBM Z NetView Administration Reference*
REFRESH command	NetView online help

Deleting NetView Operators

To dynamically delete NetView operators while the NetView program is running, follow these steps:

1. If defining operators using the NetView product, update DSIOPF to delete statements for operators you no longer want or need.

   If you delete a statement in DSIOPF for an operator that was already logged on, the operator session continues until the operator logs off. However, the operator can no longer issue the DISPLAY, MODIFY, or VARY commands for any resource that is defined in any span of control. If you do not want a deleted operator to remain logged on after issuing the REFRESH OPERS command, issue the STOP FORCE command to stop the operator session.

   If the operator is not logged on when you issue the REFRESH OPERS command, the operator can no longer log on.

   If defining operators using an SAF product, delete the operator from the SAF product.
2. Issue the REFRESH OPERS command to dynamically refresh the operator statements in DSIOPF. Message DWO830I is displayed on your screen for each operator successfully deleted, then message DSI633I is displayed to indicate that the refresh command completed successfully.

Topic:	**Reference:**
Operator definitions in DSIOPF or in an SAF product	*IBM Z NetView Administration Reference*
REFRESH and STOP commands	NetView online help

Controlling the NetView Screen Contents and Format

You can control the format and the amount of information presented on the NetView screen. You can also control the setting of your program function keys, the date and time format, and the way you enter data.

Setting Date and Time Formats

The date and time can be entered freeform and presented in the format you specify. The format is specified using the DEFAULTS or OVERRIDE commands. When sending commands with dates or times to other tasks or other NetView programs, use the receiver's format.

Topic:	**Reference:**
The DEFAULTS command	*IBM Z NetView Command Reference Volume 1 (A-N)*
Help information	The online help facility

Defining Program Function Keys

You can use PF and PA keys to send commands to the system. You can modify the CNMKEYS member that is supplied with the NetView product in DSIOPEN to change the commands sent by the PF and PA keys for various components, then use the NetView PFKDEF command to use those settings. To view the current settings of the PF keys, use the NetView DISPFK command.

You can set and display PF keys by component, determine whether a PF key sends a command immediately or delays, and whether it uses information entered by the operator on the command line or it ignores input.

Use the NetView SET command to change individual PF keys from the command line. For example, to interactively set PF9 in the current component to display the status of the lines and channel links in your part of the network, and to have the command sent immediately to the system, enter:

```
set pf9,immed,lines
```

If instead, you want to define the PF key for just the command facility component, and add text to a command before sending it to the system, enter:

```
set nccf pf9 append dis
```

When the command facility is active and you press PF9, anything typed from the input area is placed directly following the DIS command before processing it. You can enter a resource name without having to enter the DIS command and press the Enter key.

You can specify different PF keys for each component. For example, in addition to specifying `nccf` as the component name, you can specify any of the following keywords:

Keyword
: **Component Name**

NETVIEW
: The default setting, unless otherwise specified

LBROWSE
: Log browse

MAINMENU
: The NetView main menu panel

MBROWSE
: Member browse

NCCF
: Command facility

NLDM
: Session monitor

NPDA
: Hardware monitor

STATMON
: Status monitor

VIEW
: View applications, such as the NetView WINDOW command

WINDOW
: The NetView WINDOW command

PFKDEF
: The PFKDEF display

If an operator data set is defined for you, an OVERRIDE DSIOPEN=*datasetname* command may have already been issued in your logon profile. You can check this by issuing LIST OVERRIDE. If a data set name is shown next to DSIOPEN: under OVERRIDES, you can use the SAVE function of DISPFK to save your key settings across logons or NetView restarts. Settings are saved in that data set in member CNMKEYSV, and picked up by the PFKDEF command.

Topic:	Reference:
Setting PF keys	PFKDEF and NCCF SET in the NetView online help
PF key definitions	Browse member CNMKEYS or enter DISPFK ALL
Saving PF Keys	DISPFK and PFKDEF in the NetView online help. For additional information, refer to operator data set references in the online help for OVERRIDE and in the *IBM Z NetView Installation: Configuring Additional Components*.

Repeating Commands

The RETRIEVE command tells the system to place the last command you entered on the command line. If necessary, you can alter the command on the command line, or leave it as it is, then press Enter to send the command to the system.

You can repeat the RETRIEVE command several times to display the last few commands that you sent to the system. The easiest way to use the RETRIEVE command is by assigning it to a PF key. The default setting that is supplied by the NetView product for the RETRIEVE command is PF12.

Entering Mixed–Case Commands

When you enter a command, the NetView program converts lowercase characters to uppercase before processing, if the `transTbl = DSIEBCDC` statement is in effect in the CNMSTYLE member. Prefixing your commands with NETVASIS prevents this conversion and allows you to enter commands in mixed case.

NETVASIS is valid only from the command line of the following panels:

- Command facility
- WINDOW
- NetView management console

Use NETVASIS in either of the following ways:

- Prefix commands with NETVASIS
- Use the OVERRIDE command with NETVASIS

Many commands do not recognize mixed case for certain values, for example, START DOMAIN. When you use NETVASIS or OVERRIDE NETVASIS in these cases, specify the values in uppercase. For commands that do not support synonyms, use uppercase for keywords and values. If you are not using DSIEBCDC, your command name must be in uppercase.

Prefixing Commands with NETVASIS

You can use the prefix NETVASIS with a command to prevent NetView from converting lowercase characters in the command to uppercase. For example, RODM class names are case-sensitive; to call your command list RODMINST that displays a list of network management gateways defined in RODM, enter the following command:

```
netvasis rodminst NMG_Class
```

Note that NETVASIS is recognized only when it is followed by a command.

Using the OVERRIDE Command with NETVASIS

You can use the OVERRIDE command with NETVASIS to prevent NetView from converting lowercase characters in commands to uppercase. For example, RODM class names are case-sensitive; to call your command list RODMINST that displays a list of network management gateways defined in RODM, enter the following command:

```
OVERRIDE NETVASIS=YES
```

```
rodminst NMG_Class
```

Note that when `OVERRIDE NETVASIS=YES` is entered, the ??? at the bottom of the panel is replaced by >>>. `OVERRIDE NETVASIS=YES` remains in effect until `OVERRIDE NETVASIS=NO` is entered.

Suppressing Commands

You might want to keep certain information, such as a password, from being echoed to your screen, being recorded in the NetView log, or being retrieved. You can use a suppression character to do this. A question mark (?) is the default suppression character.

To suppress a command, enter the suppression character immediately before the command name (if you are also using NETVASIS, NETVASIS must precede the suppression character). For example, to dynamically allocate a data set with a password, enter the following command:

```
?allocate dsn(user.init),shr,password(xyz)
```

If the text of one command is embedded in another command, for example with EXCMD, you must enter the suppression character as the first character on the command line or the command buffer, as shown in the following example:

```
?excmd oper1,allocate dsn(user.init),shr,password(xyz)
```

Note: The suppression character must precede the EXCMD command; do not enter the suppression character with the queued command.

The suppression character is defined by using the SUPPCHAR statement in the CNMSTUSR or C*xx*STGEN member. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*. To automatically suppress the command echo for a command, you can include ECHO=N on the CMDDEF statement for the command in DSIPARM member CNMCMDU. Command echo suppression works only in the command facility and is not supported in full-screen data mode.

Controlling Message Wrapping

The AUTOWRAP command controls how your terminal displays new messages. You can have the system wait for you to request new messages manually, or you can control how often new messages are displayed on your screen automatically.

To have the system wait for you to request new messages, enter:

```
 autowrap no
```

In the response area (next to ???), the following message is displayed:

```
 DSI083I AUTOWRAP STOPPED
```

Your screen locks when the message area is full. When you see the asterisks (***) at the bottom of the screen, press either the Clear or Enter key, or enter a command to receive more messages.

To have the system automatically update messages every 5 seconds, enter the following command:

```
 autowrap 5
```

In the response area (next to ???), the following message is displayed:

```
 DSI082I AUTOWRAP STARTED
```

The A in the upper right corner of the screen indicates that AUTOWRAP is being used.

Changing the NetView Screen Layout

You can customize how the following items are presented on the NetView screen:

- Message prefixes
- How much of the screen is to be used for action and held messages
- Default colors for the different classes of messages
- Colors for the command area

- Colors for the different fields on the screen

To define a screen layout, use the system editor to create the DSIPARM member that contains your screen definitions. The NetView program provides a sample member CNMSCNFT that you can use as a model.

To specify a customized screen layout described by DSIPARM member SHIFT01, enter:

```
override scrnfmt=shift01
```

To reset the screen format to the system defaults, enter:

```
override scrnfmt=*
```

To display the screen format currently in effect, enter:

```
list override
```

You can also control message colors and attributes using the NetView automation table.

Topic:	**Reference:**
Setting up your screen definitions	*IBM Z NetView Customization Guide*
Syntax of screen definition statements	*IBM Z NetView Administration Reference*
OVERRIDE and LIST commands	NetView online help

Defining Receivers for Alerts and Other MDS-MUs

The NetView product enables a focal point to manage unattended remote sites. The hardware monitor at the focal point processes alerts and other major vectors that it receives in various formats, including:

- Multiple-domain support message units (MDS-MUs)
- Control point management services units (CP-MSUs)
- Network Management Vector Transports (NMVTs)

The generic automation receiver and the hardware monitor submit received MDS-MUs to the NetView automation table for processing.

To enable the generic automation receiver function, follow these steps:

1. If you expect your use of the generic automation receiver to be heavy, change the RES specification for the DSINVGRP command definition from N to Y by adding the following statement to CNMCMDU:

   ```
   CMDDEF.DSINVGRP.RES=Y
   ```

2. If you define operators using an SAF product, define operator DSINVGR.
3. If you define operators in an SAF product, such as RACF, define the IC, MSGRECVR, CTL and other values in the NETVIEW segment of the SAF product as defined in DSIPRF member DSIPRFGR.
4. Define and start the alert receiver autotask (DSINVGR), by using the CNMSTUSR or C*xx*STGEN member. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.

See the *IBM Z NetView Administration Reference* for examples of various operator and autotask definitions.

Deleting Alerts

After NetView alerts have been resolved or are no longer useful, you can use the hardware monitor to remove the alerts from the hardware monitor database and therefore from hardware monitor screens. You can do this from the command facility screen and from the hardware monitor alerts display screens.

To delete a specific alert from the hardware monitor database while viewing the Alerts Static panel, enter the selection number from the hardware monitor screen followed by the DEL function.

To delete all alerts recorded in the hardware monitor database using the command facility screen, follow these steps:

1. Delete all the alerts by resetting the wrap count for alerts:

   ```
   npda sw al 0
   ```

2. Reset the wrap count to its default setting:

   ```
   npda sw al 100
   ```

Topic:	**Reference:**
SWRAP Command	NetView online help

Using Hardware Monitor Filters

A filter is a method of controlling what data is processed by the hardware monitor. Filters process data that has not been previously suppressed by the NetView automation table.

Overview of Filter Types

The NetView program provides viewing filters and recording filters.

Viewing filters provides a way to see only a subset of alerts while you are using the hardware monitor. Use the SVFILTER command to define the criteria for displaying different alerts on different terminals.

Recording filters control what data is written on the hardware monitor database or forwarded to a hardware monitor focal point. Use the SRFILTER command to define the criteria for recording event and alert data in the database. Recording filters are similar to viewing filters; however, recording filters control all the data (events, statistics, and alerts) while viewing filters affect one operator. When statistics and event records are received by the hardware monitor, the ESREC recording filters determine whether the records are stored in the database. AREC recording filters then determine whether an event record also qualifies as an alert, and is stored in the alert portion of the database. When an alert record is recorded, OPER recording filters determine if messages are issued to a NetView operator task. ROUTE recording filters determine which data is forwarded to a hardware monitor focal point. TECROUTE recording filters determine which data is forwarded to a Tivoli event server.

You can also use the SRF action in the NetView automation table. The advantage of this is that you can be even more specific regarding the conditions under which the recording filter is set.

Strategy for Implementing Filters

The goal of filtering is to prevent alerts that are repetitive or which do not require operator action. You want to provide information an operator can effectively use to identify and resolve system problems.

Use the following steps to implement filters:

1. Disable all filter settings to create and display alerts for all events recorded. One way to do this is with a NetView or REXX command list. For example, issue the **npda dfilter arec** command to list alerts that are written to the hardware monitor database and displayed on the Alerts panels. A panel similar to Figure 84 on page 141 is displayed:

```
 N E T V I E W          SESSION DOMAIN: CNM01    OPER1     04/12/19 11:06:36
 NPDA-20A                  * CURRENT FILTER STATUS *          REC 1 TO 15
                           FILTER TYPE: AL RECORDING

 SEL# ACTION DATA   ETYPE FTYPE   -------- RESNAME, TYPE, OR ADAPTADR ---
 ( 1) BLOCK  .....  HELD  TREF    CTRL
 ( 2) BLOCK  .....  HELD  TREF    LCTL
 ( 3) PASS   .....  PERM  TREF    CTRL
 ( 4) PASS   .....  PERF  TREF    CTRL
 ( 5) PASS   .....  PERM  TREF    LCTL
 ( 6) PASS   .....  PERF  TREF    LCTL
 ( 7) BLOCK  .....  ....  TREF    CPU
 ( 8) BLOCK  .....  HELD
 ( 9) PASS   .....  PERM
 (10) PASS   .....  USER
 (11) PASS   .....  NTFY
 (12) PASS   .....  INST
 (13) PASS   .....  SCUR
 (14) PASS   .....  UNKN
 (15) PASS   .....  PERF
 ENTER SEL# FOLLOWED BY DEL (DELETE)

 ???
CMD==>
```

Figure 84. Alerts Defaults

You can then use the sample REXX command list shown in Figure 85 on page 141 to delete the alert filters listed:

```
/* REXX command list to delete default alert filter settings */
'NPDA SRF AREC DELETE E HELD TREF CTRL'
'NPDA SRF AREC DELETE E HELD TREF LCTL'
'NPDA SRF AREC DELETE E PERM TREF CTRL'
'NPDA SRF AREC DELETE E PERF TREF CTRL'
'NPDA SRF AREC DELETE E PERM TREF LCTL'
'NPDA SRF AREC DELETE E PERF TREF LCTL'
'NPDA SRF AREC DELETE        TREF CPU'
'NPDA SRF AREC DELETE E HELD'
'NPDA SRF AREC DELETE E PERM'
'NPDA SRF AREC DELETE E USER'
'NPDA SRF AREC DELETE E NTFY'
'NPDA SRF AREC DELETE E INST'
'NPDA SRF AREC DELETE E SCUR'
'NPDA SRF AREC DELETE E UNKN'
'NPDA SRF AREC DELETE E PERF'
'NPDA SRF AREC PASS DEFAULT'
EXIT
```

Figure 85. Command List to Delete Alert Filters

Note: The last statement in the command list allows all alerts to flow as a default.

2. Determine which alerts are unnecessary. You have to run your system with the defaults disabled for a period of time before you can gather the data necessary to make your filtering decisions. Ask the following questions for each alert:

   - Does the event need to be recorded or deleted?
   - Does the event need to be made an alert: does it require operator intervention or attention?
   - Can the response be automated?

   Based on these answers, you can:

   - Record the event and create an alert
   - Not record the event
   - Record the event and not make it an alert
   - Add automation to handle the event
   - Forward the event or alert to the hardware monitor focal point

Note: Each time you create a new filter, review the other filters to ensure that no conflicts with other filter settings exist.

3. Add alerts that are critical. Specific events or alerts that cannot be handled by automation, such as critical network resources or important applications, probably need to be recorded and displayed by the hardware monitor.

Setting Viewing Filters

You can use the hardware monitor SVFILTER command to define your viewing filters for the Alerts panels. The valid filter options are CLEAR, PASS, BLOCK, and DELETE. The CLEAR option is used to remove filters you have set and returns the filter settings to the default settings that are supplied by the NetView product.The PASS option is used to display alerts. The BLOCK option is used to block alerts from being displayed. The DELETE option is used to remove filters. For example, to block all alerts for resource T66PLN17 from being displayed, enter:

```
npda svf block n t66pln17
```

Table 7 on page 142 shows examples of how to set specific viewing filters.

Table 7. Examples of Viewing Filters

To:	Example:
Not display alerts for event type IMR.	`NPDA SVF BLOCK E IMR`
Not display alerts for event type IMR from resource GRETL.	`NPDA SVF BLOCK E IMR N GRETL`
Not display alerts for event type IMR from resource type COMC.	`NPDA SVF BLOCK E IMR T COMC`
Not display alerts for event 04C10.	`NPDA SVF BLOCK C 04C10`
Display alerts for event 04C10 from resource GRETL.	`NPDA SVF PASS C 04C10 N GRETL`
Not display alerts for product ID 5601227 with an alert ID of 6D3EF9A1 from resource GRETL.	`NPDA SVF BLOCK P 5601227 6D3EF9A1 N GRETL`
Start displaying alerts for domain CNM01.	`NPDA SVF CLEAR D CNM01`

Setting Recording Filters

You can use the hardware monitor SRFILTER command to define recording filters. Include the type of action to take on the data. The valid types are CLEAR, PASS, BLOCK, and DELETE. The CLEAR option is used to remove filters you have set and returns the filter settings to the default settings that are supplied by the NetView product.The PASS option is used to generate alerts or record events.The BLOCK option is used to block alerts or stop the recording of events. The DELETE option is used to remove filters.

The hardware monitor SRFILTER command can be issued from the command facility screen, and the BLOCK option of the SRFILTER command can be called from either the Alerts Dynamic or Alerts Static panel.

For example, for a given alert displayed on the Alerts Static panel, you can block future creation of alerts for the specific alert code and resource by entering the selection number followed by SRF. To block future creation of alerts for the specific alert code for all resources, enter the selection number followed by SRF ALL.

From the command facility screen, all options of the SRFILTER command are available. For example, to block alert 04C10 for device T66PLN17, enter:

```
npda srf arec block c 04c10 n t66pln17
```

Table 8 on page 143 shows examples of how to set specific recording filters.

Table 8. Examples of Recording Filters

To:	**Example:**

Block specific events (identified by the unique codes 04C10 and 05823) from being recorded on the hardware monitor database. Remember that if you block an event, an alert cannot be created.	`NPDA SRF ESREC BLOCK C 04C10`
	`NPDA SRF ESREC BLOCK C 05823`

Prevent alerts from being recorded as a result of events identified by the unique codes 04C10 and 05823.	`NPDA SRF AREC BLOCK C 04C10`
	`NPDA SRF AREC BLOCK C 05823`

Block event 04C10 for device T66PLN17.	`NPDA SRF ESREC BLOCK C 04C10 N T66PLN17`
Block alert 04C10 for device T66PLN17.	`NPDA SRF AREC BLOCK C 04C10 N T66PLN17`
Block information-only events (identified by the unique code FFD4C). This filter applies to all devices that send in this event.	`NPDA SRF ESREC BLOCK C FFD4C`
Block all alerts with a specific product ID (5601227) and alert ID (6D3EF9A1) regardless of which device (of the same type) caused the event to occur.	`NPDA SRF AREC BLOCK P 5601227 6D3EF9A1`
Block alerts that contain resources of type COMC, LINE, CTRL, LAN, or CP in the hierarchy resource list.	`NPDA SRF AREC BLOCK T COMC LINE CTRL LAN CP`
Create alerts for the event type IMR for the NCP resource GRETL.	`NPDA SRF AREC PASS E IMR N GRETL`
Generate alerts for the event type of IMPD for a device with adapter address 400047140419.	`NPDA SRF AREC PASS E IMPD A 400047140419`
Block temporary alerts for the NCP called GRETL and for all its attached devices.	`NPDA SRF AREC BLOCK E TEMP NREF GRETL`

Resetting a Filter

Use the CLEAR option to remove filters you have set and return the filter settings to the default settings that are supplied by the NetView product. To remove a filter that blocks a specific event (whose unique character code is 04C10), use the following command:

```
npda srf esrec clear c 04c10
```

Diagnosing Filter Performance

The most likely reason a filter is not working as expected is that it might have been negated by another filter. Check your search order and priority. Filter statements are processed in priority order. Priority is determined by how specific a filter is. If two filters of equal priority are encountered, they are processed in the order in which they were entered. You can display the filter statements to see the order that the hardware monitor has established by entering `df arec` from the hardware monitor. This display shows you if the hardware monitor is processing filters in a different order than you expected.

Be sure to check the actions taken in your automation table for possible SRF settings. You can view the automation table using the BROWSE command.

Topic:	Reference:
SVFILTER, SRFILTER, and DFILTER commands	NetView online help
Automation table	*IBM Z NetView Automation Guide*
SRF action in the automation table	*IBM Z NetView Automation Guide*

Using Session Monitor Filters

A filter is a method of controlling what data is passed to and processed by the session monitor.

Overview of Filter Types

The two basic filter types are filters that control the session awareness data processed by the session monitor and filters that control the data stored on the session monitor database.

Strategy for Implementing Filters

One goal of filtering is to suppress unwanted session awareness data. Ideally this is done as close to the source as possible. You can suppress unwanted session awareness data in VTAM and prevent it from being sent to the session monitor, and you can suppress the processing of the unwanted session awareness data in the session monitor. In either case, you control the suppression on a session-by-session basis.

Another goal of filtering is to prevent storage of session-related data that you are not going to use. You can suppress the storage of session monitor data on the database.

Setting Session Awareness Data Filters in VTAM

VTAM filtering of session awareness data is performed by the ISTMGC10 VTAM filter table. The two statements that define the filtering rules are KCLASS and MAPSESS. In the VTAM table, KCLASS specifies whether or not to pass session awareness data to the session monitor, and MAPSESS specifies which sessions relate to a given KCLASS.

For example, if you want to filter out session awareness data for all LU-LU sessions with terminals whose names begin with T3277, unless those terminals are in session with IMS. In the following example, the VTAM SSCP name is SSCP1:

1. Create the following source statements for VTAM table ISTMGC10:

   ```
   ISTMGS10 KEEPMEM START
   NOSAW    KCLASS  SAW=NO
   SAW      KCLASS  SAW=YES
   M1       MAPSESS KCLASS=SAW,PRI=SSCP1,SEC=*
   M2       MAPSESS KCLASS=SAW,PRI=IMS,SEC=*
   M3       MAPSESS KCLASS=NOSAW,PRI=*,SEC=T3277*
            KEEPMEM STOP
            END
   ```

   VTAM examines the session partner names for session awareness data against each of the MAPSESS statements. The first MAPSESS statement that matches determines the KCLASS and therefore the action taken on the data. If no MAPSESS statement matches the session partner names, VTAM defaults to SAW=YES for that data.

2. Assemble and link edit IGCMGC10 into SYS1.VTAMLIB.

3. You can dynamically load or reload session awareness filter table IGCMGC10 from the NetView console by entering:

   ```
   mvs f net,table,type=filter,option=load,newtab=istmgc10
   ```

Setting Session Awareness Data Filters in the Session Monitor

Using session awareness data filters in the session monitor, you can control both the session awareness data that is processed and the amount of session awareness data that is stored on the session monitor database. You can only filter SSCP-LU and LU-LU sessions. The session monitor filter statements are stored in a DSIPARM member whose name is specified in DSIPARM member AAUPRMLP. The two statements that define the filtering rules are KCLASS and MAPSESS. KCLASS specifies how to process session awareness data, and MAPSESS specifies which sessions relate to a given KCLASS. Using the KCLASS statement, you can control:

- Whether to filter the session awareness data
- Whether to record the session awareness data as session history
- The number of sessions kept on the session monitor database
- The amount of trace data collected

Table 9 on page 145 shows examples of how to define KCLASS statements and Table 10 on page 145 shows examples of MAPSESS statements.

Table 9. Examples of KCLASS Statements

To:	**Example:**
Keep session awareness data and store it on the database, keeping 42 PIUs per session.	`DASDK42 KCLASS SAW=YES,DASD=YES,KEEPPIU=42`
Keep session awareness data in storage only, keeping 10 PIUs per session.	`STORK10 KCLASS SAW=YES,DASD=NO,KEEPPIU=10`
Keep session awareness data and store it on the database if trace or RTM data for the session exists, or if a BIND failure, INIT failure, or abnormal UNBIND occurs, keeping 14 PIUs per session.	`FAILK14 KCLASS SAW=YES,DASD=(DATA,FAILURES),KEEPPIU=14`
Keep session awareness data and store it on the database for a maximum of 500 sessions, keeping 30 PIUs per session.	`DASDK30 KCLASS SAW=YES,DASD=YES,KEEPPIU=30,KEEPSESS=500`

Table 10. Examples of MAPSESS Statements

To:	**Example:**
Control session awareness data using KCLASS DASDK42 for sessions whose primary session partner is SSCP1 and whose secondary session partner name begins with CDRM.	`M1 MAPSESS KCLASS=DASDK42,PRI=SSCP1,SEC=CDRM*`
Control session awareness data using KCLASS STORK10 for sessions whose primary session partner is SSCP1 and whose secondary session partner name has the characters LU in the fourth and fifth positions.	`M2 MAPSESS KCLASS=STORK10,PRI=SSCP1,SEC=???LU*`

Table 10. Examples of MAPSESS Statements (continued)

To:	Example:
Control session awareness data using KCLASS FAILK14 for sessions whose primary session partner is SSCP1 and whose secondary session partner name begins with CICS.	`M3 MAPSESS KCLASS=FAILK14,PRI=SSCP1,SEC=CICS*`
Control session awareness data using KCLASS DASDK30 for any session that did not match a prior MAPSESS statement.	`M4 MAPSESS KCLASS=DASDK30,PRI=*,SEC=*`

To define the session monitor filters:

1. Specify a valid value for NLDM.KEEPMEM by using the CNMSTUSR or C*xx*STGEN member, for example `FILTER1`. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.
2. Create DSIPARM member FILTER1, including appropriate KCLASS and MAPSESS statements to define filtering conditions and session awareness data processing policy. Keep in mind that the session monitor searches the MAPSESS statements when a session begins, and determines the session awareness data processing based on the first MAPSESS statement that matches the session partner names. Session awareness can also be filtered by Exit 20, which requires assembler code but allows more flexibility than KCLASS and MAPSESS statements.

Topic:	Reference:
VTAM filter table ISTMGC10	See the z/OS Communications Server library.

Chapter 12. Managing NetView Data

Focal points are the designated receivers of management data. *Entry points* are the designated senders of management data. The NetView program can act as a focal point or an entry point for the following items:

- Alerts
- Link services
- Operations management data
- Service point command services
- User-defined categories

The roles of focal point and entry point can be set from the NetView program. Generally the roles are defined by the sphere of control manager (SOC-MGR) at the focal point through its use of a sphere of control configuration file (DSIPARM member DSI6SCF). The focal point *sphere-of-control* is defined as the set of entry points that have an established relationship with the focal point.

Setting the Primary Focal Point

Use the FOCALPT CHANGE command to establish your system as the focal point for problem management data sent from an entry point. To do this, complete the following steps at the NetView console of the new focal point:

1. To set your system as the focal point to receive operations management data from the entry point CNM02, enter the following command:

   ```
   focalpt change fpcat=ops_mgmt,target=cnm02
   ```

2. To set your system as the focal point to receive alerts from the entry point CNM02, enter the following command:

   ```
   focalpt change fpcat=alert,target=cnm02
   ```

Also use the FOCALPT CHANGE command to establish a backup focal point for problem management data sent from an entry point. To do this, complete the following steps at the NetView console of the primary focal point:

1. To retain your system as the focal point to receive operations management data from the entry point CNM02 and to establish CNM88 as the backup focal point, enter the following command:

   ```
   focalpt change fpcat=ops_mgmt,target=cnm02,backup=cnm88
   ```

2. To retain your system as the focal point to receive alerts from the entry point CNM02, and to establish CNM88 as the backup focal point, enter the following command:

   ```
   focalpt change fpcat=alert,target=cnm02,backup=cnm88
   ```

Changing the Primary Focal Point from an Entry Point

To use the FOCALPT ACQUIRE command to allow the primary focal point to be acquired at the entry point, complete the following steps at the NetView console of the entry point:

1. To name CNM99 as the new primary focal point for operations management data, enter the following command:

   ```
   focalpt acquire fpcat=ops_mgmt,backup=cnm99
   ```

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All existing backup focal points are dropped and the existing primary focal point remains unchanged.

2. To name CNM99 as the new primary focal point for alerts, enter the following command:

   ```
   focalpt acquire fpcat=alert,backup=cnm99
   ```

   All existing backup focal points are dropped and the existing primary focal point remains unchanged.

Changing the Backup Focal Point from an Entry Point

To use the FOCALPT ACQUIRE command to acquire the backup focal point at the entry point, complete the following steps at the NetView console of the entry point:

1. To name CNM99 as the new backup focal point for operations management data, enter the following command:

   ```
   focalpt acquire fpcat=ops_mgmt,backup=cnm99
   ```

   Existing backup focal points are dropped and the existing primary focal point remains unchanged.
2. To name CNM99 as the new backup focal point for alerts, enter the following command:

   ```
   focalpt acquire fpcat=alert,backup=cnm99
   ```

   Existing backup focal points are dropped and the existing primary focal point remains unchanged.

Displaying the Primary and Backup Focal Points

You can use the FOCALPT QUERY command to display the primary and backup focal points for an entry point. To do this, at the NetView console of the entry point, enter the following command:

```
focalpt query fpcat=ops_mgmt
```

This command displays the primary focal point and the list of backup focal points for this entry point.

Displaying the Sphere of Control for a Focal Point

You can use the FOCALPT DISPSOC command to display all the entry points in the sphere of control for a focal point. To do this, at the NetView console of the focal point, enter the following command:

```
focalpt dispsoc fpcat=alert,target=*,active
```

This command displays active entry points that are to forward alerts to this focal point.

Removing an Entry Point from the Focal Point Sphere of Control

You can use the FOCALPT DELETE command to remove an entry point from the sphere of control of the focal point. To do this, at the NetView console of the focal point, enter the following command:

```
focalpt delete fpcat=alert,target=cnm03
```

This command removes CNM03 from the sphere of control of the focal point.

Note: The entry point is not removed until either the session with the entry point ends or the entry point issues a FOCALPT DROP command.

Refreshing the Focal Point Sphere of Control

You can use the FOCALPT REFRESH command to refresh the sphere of control of the focal point to the state defined in the sphere of control configuration file. To do this, at the NetView console of the focal point, enter the following command:

```
focalpt refresh
```

This command reads the sphere of control configuration file and issues FOCALPT CHANGE commands to each entry point to establish a sphere of control as specified.

Topic:	Reference:
FOCALPT commands	NetView online help
Setting up focal points	*IBM Z NetView Installation: Configuring Additional Components*

Controlling the Processing of Problem Management Data

NetView receives problem management data in the form of SNA alerts or other forms such as RECFMS. These alerts originate in the network or in the same host as the NetView program. Alerts that originate in the network are forwarded to NetView through the communications network management interface (CNMI), or other interfaces such as LU 6.2. Alerts that originate in the same host as the NetView program arrive through the program-to-program interface (PPI) or other interfaces such as the GENALERT command. Regardless of the source of the alert, it passes through several filters that decide which alerts are presented to the operator, which alerts are saved in the hardware monitor database, and which are discarded.

Generating Alerts Using GENALERT

You can use the GENALERT command to specify the information contained in an alert which is then processed by the NetView program. The alert sent by the GENALERT command can be one of the following types:

- Generic
- Nongeneric
- RECFMS

The default format is a generic alert format.

Generating Alerts Using the PPI

You can use the PPI to send an alert from any address space on the same host as the NetView program. For example, a program encounters an out of storage condition and needs to notify an operator to initiate a recovery procedure. To do this, the program must take the following actions:

1. Generate an NMVT that contains alert information such as software alert, out-of-storage condition, and initiate recovery procedure.
2. Build a data transport request buffer which references the NMVT.
3. Query the status of the PPI to ensure that it is active.
4. Start the PPI to send the NMVT to the NetView program.

An example of this scenario is in CNMSAMP member CNMS4227 (PL/I).

Setting Error Thresholds for Alerts

Whenever statistics are reported to the hardware monitor, the error counters and traffic counters are compared to determine the current error-to-traffic ratio. If this ratio exceeds the threshold set by your system programmer, the statistic becomes an alert, unless blocked by an alert recording filter.

For a specified resource, you can use the SRATIO command to change the threshold value that generates an alert. For example, to change the threshold value for PU08 to 2.0 per cent, enter the following command:

```
sratio 020 n pu08
```

Topic:	Reference:
GENALERT command	NetView online help
SRATIO command	NetView online help
Filtering	"Overview of Filter Types" on page 140
Alert types	Chapter 9 in *SNA Formats*
Sending alerts using the PPI	*IBM Z NetView Application Programmer's Guide*

Using and Maintaining Canzlog Data

The consolidated audit, NetView, and z/OS log (Canzlog) provides a comprehensive means of displaying the following kinds of information:

- MVS messages. This is similar to the SYSLOG function, but, unlike SYSLOG, logging on to TSO is not necessary.
- NetView messages. This is similar to the NETLOG function.
- Broadcast messages.
- DOMS.
- Command echoes.
- Trace and audit messages.

Canzlog data is stored in a data space that is defined as a maximum of 500 MB that is specified with TINYDS as an initialization parameter to SSI initialization routine DSI4LSIT, or 2 GB that is specified or defaulted with the FULLDS initialization parameter. The amount of storage that is used in the data space can be configured to be dynamic or static (other initialization parameters). Storage in the data space is divided into 8MB sections called plots, which are objects that can be archived. Each plot holds an average of about 32,000 messages. For more information about configuring the attributes of the Canzlog data space, see the description of customizing the IEFSSNxx PARMLIB member in the *Installation: Getting Started* manual.

Displaying Canzlog Data

The BROWSE command provides function for displaying Canzlog information from a local or remote NetView program. You can also use the BROWSE command to display Canzlog data from a cluster of related NetView programs. For example, you can display Canzlog data for all the NetView programs in a specific sysplex or for a set of NetView programs that is defined as a group with the ENT.GROUP.*groupname* statement in the CNMSTUSR or C*xx*STGEN member.

The following commands, which you can use while you are using the BROWSE command, provide considerable flexibility:

- ALL
- BACK
- BOTTOM
- DISPMSG
- END
- FIND
- FORWARD
- LEFT
- LOCATE
- RETURN

- RIGHT
- SHOWTEXT
- TARGET
- TOP
- WHAT
- WHENCE

The following commands contain additional function to display Canzlog data.

DISPMSG
Displays additional data regarding a specific message.

From an operator console, place the cursor on the message and press Enter. The information that is displayed depends on the information controlled by the message TAG.

LIST STATUS=CANZLOG
Displays the following information:

- Total messages since an IPL
- Average message rate during the prior minute
- The number of messages that can be collected
- The maximum size that the data space can grow to in megabytes
- The size of the active data space in megabytes
- Status of Canzlog archiving
- Status of message automation (stress level)
- The user-defined skip level
- The user-defined skip gap
- Date and time from which data is available
- Archive high-level qualifier (if any)

SHOWTEXT
Shows multiline messages and messages that have a long length.

WHENCE
Shows the date, time, and the source of the message.

Filtering Canzlog Data

A powerful function of the Canzlog process is the ability to customize filters and to then save these filters. You can customize filters that are made available to all operators. You can use one customized filter to display a log and use a second one from inside the log with FIND and ALL. For example, you can create a TASK filter to show certain message IDs only and then from inside the log use ALL with a named filter that shows only messages with a specific operator ID. It is even possible to use one customized filter to display a log and then use a second filter from within the log with FIND and ALL.

Individual operators can create and save filters for their personal use. If set up correctly, these filters then become available when the operator logs on. If DEFAULT filters are used when BR LOG is issued, each operator also can set the filter to individual preferences by using the OVERRIDE function

When a log is open, FIND and ALL allow the use of all BFS KEYSPECS, adding to the ability to specify messages to be found.

These are examples of custom filters that can be used to browse Canzlog data:

Task level filters
Filters created by an operator.

Task filters are saved in an operator data set that is specified on the DSIOPEN DD statement. The member name used with task filters is OVCZFLTR. If an operator data set is not found, filters are saved in storage only. The filters that are saved in storage are not saved when the operator logs off and they are not restored at logon.

Common level filters

Filters created by the system programmer.

Common filters are saved in the first concatenated data set that is specified on the DSIOPEN DD statement. The member name used with common filters is DFCZFLTR.

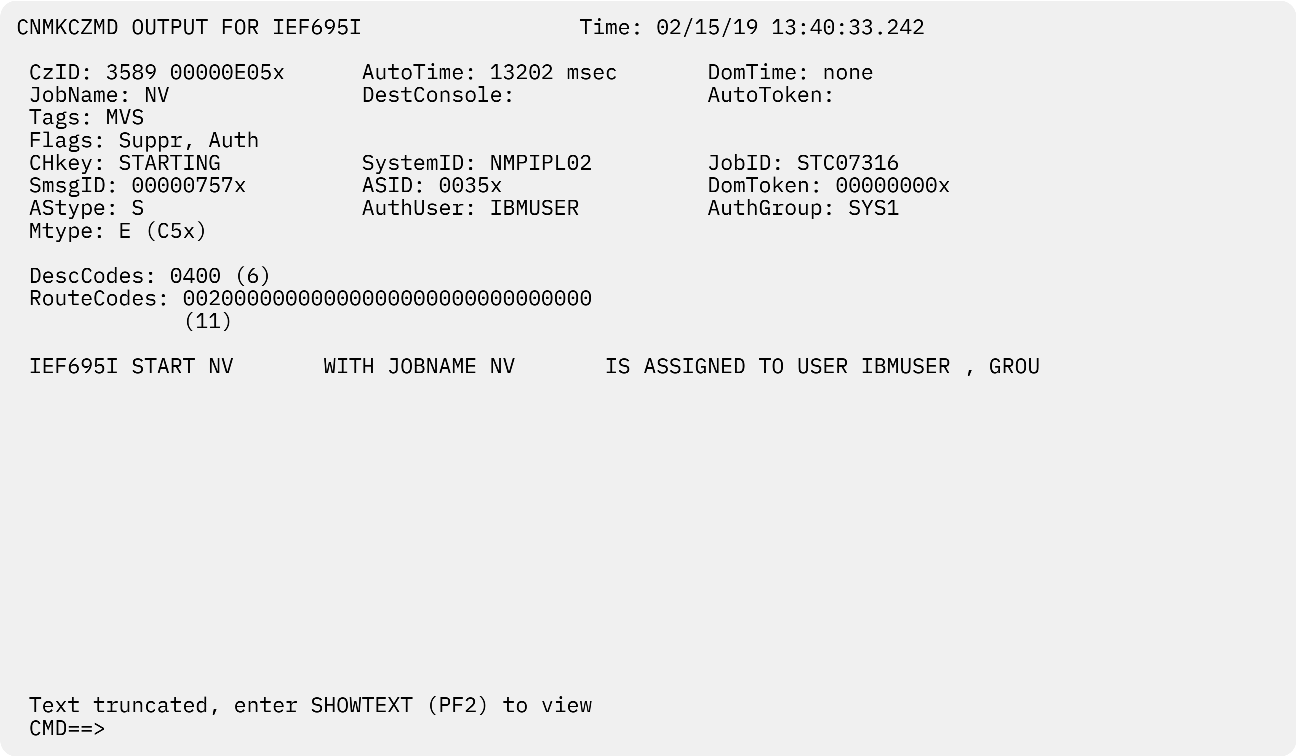
Canzlog Filtering Example

This example shows the BR LOG command using the filter established by DEFAULTS or OVERRIDE. This operator has pressed ENTER with the cursor in the command line to show information about the filter in the immediate message area. The time of each message is shown at the left using the default CZFORMAT format and the date with a time range is shown at the upper right. The time is shown only on the first line of a multi-line message. Notice that the operator has also moved the cursor to an IEF695I message.

```
Canzlog  MVS & local NetView messages FILTER=LOG  02/15/19 13:28:07 -- 13:40:34
13:28:07 IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE NMP181
13:40:32 S NV
13:40:32 IRR813I NO PROFILE WAS FOUND IN THE STARTED CLASS FOR
                 NV WITH JOBNAME NV. RACF WILL USE ICHRIN03.
13:40:33 $HASP100 NV       ON STCINRDR
13:40:33 IEFC165I // S T630EENV.NV,NV2I=7E,TOOL=NMPTLS,REG=0,DEPT=USER2
13:40:33 S T630EENV.NV,NV2I=7E,TOOL=NMPTLS,REG=0,DEPT=USER2
13:40:33_IEF695I START NV       WITH JOBNAME NV       IS ASSIGNED TO USER IBMUS
13:40:33 $HASP373 NV       STARTED
13:40:33 IEF403I NV - STARTED - TIME=13.40.33
13:40:33 -                                                --TIMINGS (MINS.)--
13:40:33 -JOBNAME  STEPNAME PROCSTEP    RC   EXCP   CONN    TCB    SRB  CLOCK
13:40:33 -NV                NV621        00      0      0    .00    .00     .0
13:40:33 IEF404I NV - ENDED - TIME=13.40.33
13:40:33 -NV       ENDED.  NAME-                     TOTAL TCB CPU TIME=   .00
13:40:33 IRR813I NO PROFILE WAS FOUND IN THE STARTED CLASS FOR
                 T630EENV WITH JOBNAME T630EENV. RACF WILL USE ICHRIN03.
13:40:33 $HASP395 NV       ENDED
13:40:33 IEA989I SLIP TRAP ID=X33E MATCHED.  JOBNAME=*UNAVAIL, ASID=0035.
13:40:33 $HASP100 T630EENV ON STCINRDR
13:40:33 IEF695I START T630EENV WITH JOBNAME T630EENV IS ASSIGNED TO USER IBMUS
13:40:33 $HASP373 T630EENV STARTED
13:40:33 IEF403I T630EENV - STARTED - TIME=13.40.33
13:40:33 IEF196I IEF237I 0573 ALLOCATED TO SYS00013
13:40:33 CNM910I 'BPX1SDD WITH PROCESSDEFER+JOBPERM+NOJSTUNDUB+UNIQUEACEE' REQU
13:40:33 BNJ080I BNJLINTB - BUFFER SIZE=24K,SLOT SIZE=200
13:40:34 DSI244I NETVIEW TRACE ACTIVE FOR TASK = ALL : MODE = INT, SIZE = 4000
13:40:34 DSI899I DSI244I , SAF TRACE = FAILURES FOR REQUEST TYPES = AUTH EXTRAC
13:40:34 DSI530I 'DSIDCBMT' : 'DSIDCBMT' IS READY AND WAITING FOR WORK
 MVS & local NetView messages FILTER=LOG TAG=(NVMSG,MVSMSG)
CMD==>
```

Figure 86. Result of a BR LOG Command

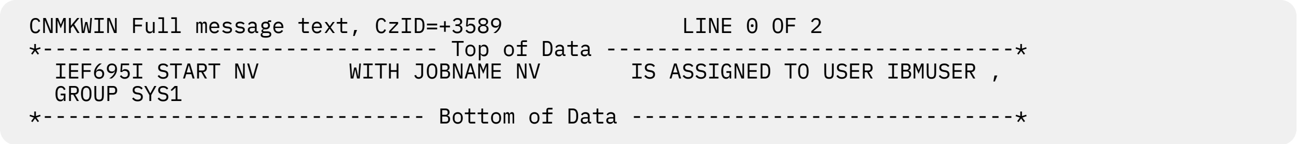
After pressing ENTER on the previous display, detail information about the selected message is shown. The time display here is for the message origin. This message required more than 13 seconds to automate because the NetView program was not active when it was issued. The immediate message indicates that the message was too wide (or had too many lines) for a complete display.



```
CNMKCZMD OUTPUT FOR IEF695I                 Time: 02/15/19 13:40:33.242

 CzID: 3589 00000E05x      AutoTime: 13202 msec       DomTime: none
 JobName: NV               DestConsole:               AutoToken:
 Tags: MVS
 Flags: Suppr, Auth
 CHkey: STARTING           SystemID: NMPIPL02         JobID: STC07316
 SmsgID: 00000757x         ASID: 0035x                DomToken: 00000000x
 AStype: S                 AuthUser: IBMUSER          AuthGroup: SYS1
 Mtype: E (C5x)

 DescCodes: 0400 (6)
 RouteCodes: 00200000000000000000000000000000
             (11)

 IEF695I START NV       WITH JOBNAME NV       IS ASSIGNED TO USER IBMUSER , GROU


















 Text truncated, enter SHOWTEXT (PF2) to view
 CMD==>
```

Figure 87. Detailed Information about the IEF695I Message

After pressing PF2 (SHOWTEXT) on either of the two previous panels, the full message text is displayed. SHOWTEXT is also useful for viewing a long multi-line message as a separate unit. The CzID number in the title is useful for troubleshooting; see description of pipe stage CZR in *IBM Z NetView Programming: Pipes*.



```
CNMKWIN Full message text, CzID=+3589              LINE 0 OF 2
*------------------------------- Top of Data --------------------------------*
  IEF695I START NV       WITH JOBNAME NV       IS ASSIGNED TO USER IBMUSER ,
  GROUP SYS1
*------------------------------ Bottom of Data ------------------------------*
```

Figure 88. Display of Full Message Text from the SHOWTEXT Command

Archiving Canzlog Data

The Canzlog function provides a method to archive data. Without archiving, the active log is retained only until the log wraps or the operating system is restarted. With archiving, data sets can be retained as long as required. The oldest data set can be deleted as needed without impact to the operator.

When you access archived data, you can limit the search time. For example, to find activity from a prior day or time, specify a date and time range using the TO and FROM fields (and the operator ID or any other operands).

Active and archived data are one logical file. You can use filters to access archived data. To set up Canzlog archiving, modify the ARCHIVE statements in the CNMSTYLE member and then issue the RESTYLE ARCHIVE command.

In this example, the Canzlog archiving function is active. The high-level qualifier that is being used for the archive data sets is ROOT.NETV1

```
* NTV5B    LIST STATUS=CANZLOG
' NTV5B
CNM600I Canzlog status: Active
Total messages, this IPL: 107570
Average Message Rate, prior minute: 0
```

```
Data available from 01/17/19 09:23:14 at HLQ=ROOT.NETV1
For system NMPIPL28 archiving running at subsystem T630
```

Printing Canzlog Data

The Canzlog function provides multiple methods to print Canzlog messages. You can issue the PRINT command from the following ways:

- NetView operator's console with a filter specification
- Browse Canzlog window and specify the number of rows to print
- Canzlog filter panel
- NVINFO

If you want to print Canzlog messages by using the PRINT command from the NetView command line, you must at least specify a named filter on the PRINT command. The named filter can be a common level filter, a task level filter, or a filter defined in the **CNMSTYLE** configuration file. You can also define the filter on the command itself.

If you want to print Canzlog in a browse window that displays Canzlog messages, you can issue only the PRINT command without any parameters. It will print the Canzlog messages that start from the current selected message. The print destination is controlled by the CZ.PRINT.OUTPUT statement in CNMSTYLE or an included member.

If you issue the PRINT command from the Canzlog panel, it will filter the Canzlog messages by using the filter specifications defined in the panel, and print the messages to the output destination that is defined by the CZ.PRINT.OUTPUT statement in CNMSTYLE or an included member.

Using and Maintaining the Network Log

The network log is the record of the terminal activity that has occurred on the system. You can send commands, responses, and messages to the network log. Each message contains the time and date it was sent and the names of the operator and system it came from.

You can print the inactive network log file in batch mode, while the system is using the active file as the log.

Displaying the Network Log

You can use the BROWSE command to display a particular network log data set. You can select the active or inactive log, or you can name the specific log (primary or secondary) to browse. For example, to display the active log, enter the following command:

```
browse netloga
```

You can also specify a time and date range to limit the amount of network log information displayed. For example, to display the primary network log from 1:00 p.m. on 4/07/19 to 8:30 a.m. on 4/08/19, enter the following command:

```
browse netlogp from 4/07/19 13:00 to 4/08/19 8:30
```

Note: If you specify a time range for browsing the network log, the first and the last record of the specified time range remains the first and the last record during the entire browse.

You can use the FIND or ALL commands to locate specific information while you are browsing the network log. For example, to find the words INVALID COMMAND, enter the following command:

```
f 'invalid command'
```

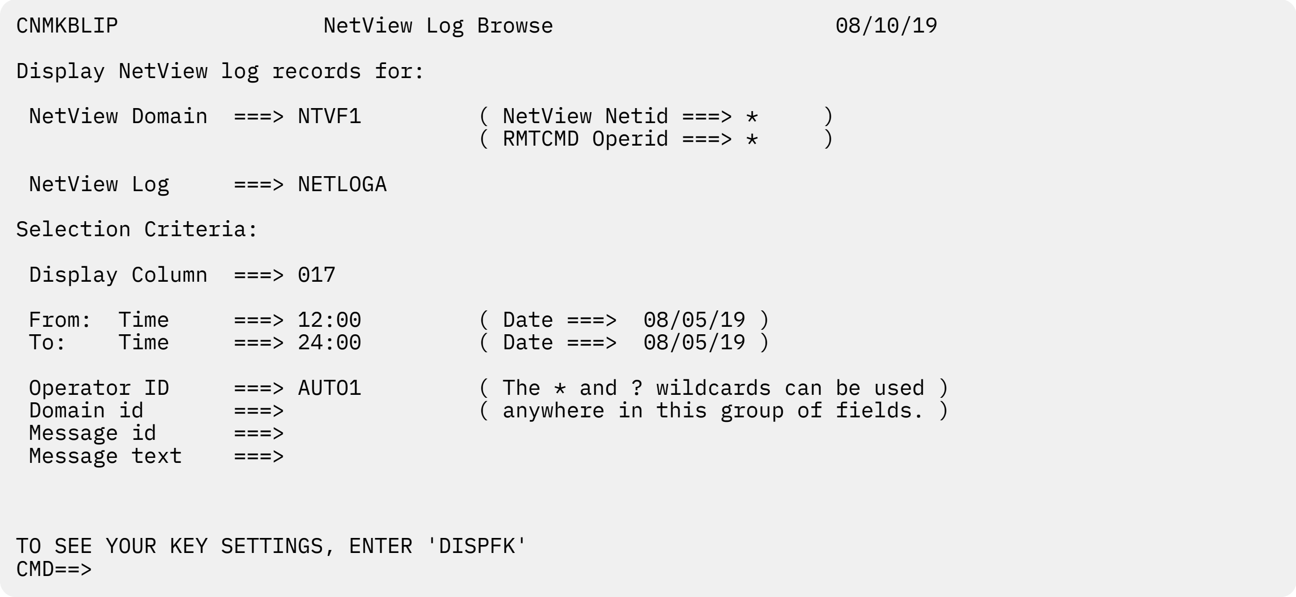
Log Browse Filtering

The BLOG command activates the network log browse facility based on filters. You can select which records to display using any combination of the following filters:

- Select a local or remote NetView system. The default is the local NetView system. Changing the NetView domain, netid, or operid fields can result in browsing a remote NetView log.
- Select the NETLOGA, NETLOGI, NETLOGS, or NETLOGP log.
- Select the starting display column.
- Select the operator ID for which records were logged.
- Select the origin domain of records that were logged.
- Select the message identifier of messages that were logged.
- Select the starting time and date for records that were logged.
- Select the ending time and date for records that were logged.
- Select a character string to be matched with the text of a message that was logged.

For example, you might decide to browse all records on a remote NetView NTVF1 logged by operator AUTO1 between noon and midnight on August 5, 2013.

Figure 89 on page 155 is an example of the log browse interface:



```
CNMKBLIP                NetView Log Browse                     08/10/19

Display NetView log records for:

 NetView Domain  ===> NTVF1         ( NetView Netid ===> *     )
                                    ( RMTCMD Operid ===> *     )

 NetView Log     ===> NETLOGA

Selection Criteria:

 Display Column  ===> 017

 From:  Time     ===> 12:00         ( Date ===>  08/05/19 )
 To:    Time     ===> 24:00         ( Date ===>  08/05/19 )

 Operator ID     ===> AUTO1         ( The * and ? wildcards can be used )
 Domain id       ===>               ( anywhere in this group of fields. )
 Message id      ===>
 Message text    ===>



TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==>
```

Figure 89. Example of a BLOG Input Panel

The following list describes BLOG input fields:

NetView Domain
Specifies the NetView domain where the network log to be browsed resides. The default value is the local NetView domain; you can change this value to another NetView domain to activate remote netlog browse. The value of this field is used on the LU parameter of the BROWSE command when a remote browse is necessary.

NetView Netid
Specifies the NetView netid name where the network log to be browsed resides. The default value is an asterisk. The value of this field is used on the NETID parameter of the BROWSE command when remote browse is necessary.

RMTCMD Operid
Specifies the RMTCMD autotask used for a remote browse display. The value of this field is used on the OPERID parameter of the BROWSE command when a remote browse is necessary.

NetView Log

Indicates one of the following logs:

NETLOGA

The active network log

NETLOGI

The inactive network log

NETLOGP

The primary network log

NETLOGS

The secondary network log

Display column

Indicates the starting display column for the browse display. This value is used on the STARTCOL parameter of the OVERRIDE command to set the display column when entering browse.

From Time

Indicates the starting time for the netlog display. This value corresponds to the FROM parameter of the BROWSE command for specifying time. The format for entering the time follows the format set in your environment.

From Date

Indicates the starting date for the netlog display. This value corresponds to the FROM parameter of the BROWSE command for specifying date. The format for entering the date follows the format set in your environment.

To Time

Indicates the ending time for the netlog display. This value corresponds to the TO parameter of the BROWSE command for specifying time. The format for entering the time follows the format set in your environment.

To Date

Indicates the ending date for the netlog display. This value corresponds to the TO parameter of the BROWSE command for specifying date. The format for entering the date follows the format set in your environment.

Operator ID

Indicates the operator ID that is to be matched with log records for display. This value corresponds to the *oper_id* parameter of the BLOG command. You can use the * and ? characters as wildcard characters anywhere in this specification. The * matches zero or more characters and the ? matches exactly one character.

Domain ID

Indicates the domain ID that is to be matched with log records for display. This value corresponds to the *domain_id* parameter of the BLOG command. You can use the * and ? characters as wildcard characters anywhere in this specification. The * matches zero or more characters and the ? matches exactly one character.

Message ID

Indicates the message ID that is to be matched with log records for display. This value corresponds to the *msg_id* parameter of the BLOG command. You can use the * and ? characters as wildcard characters anywhere in this specification. The * matches zero or more characters and the ? matches exactly one character.

Message text

Indicates the message text that is to be matched with log records for display. This value corresponds to the *msg_id* parameter of the BLOG command. You can use the * and ? characters as wildcard characters anywhere in this specification. The * matches zero or more characters and the ? matches exactly one character.

Note that browse filters are not case-sensitive.

Switching the Network Log

You can use the LIST command to determine which network log is active, then use the SWITCH command to change the active network log. Typically, NetView automatically switches to the inactive log when the active log fills up.

To display which network log is active, enter the following command:

```
list dsilog
```

To switch to the secondary network log, enter the following command:

```
switch dsilog,s
```

Using Browse

If the BROWSE screen defaults are set to display a scroll field, as shown in the following example, entering a number on the command line before pressing a PF key for BACK or FORWARD affects only the next time a PF key is pressed.

```
 NETVIEW.BRWS ------ BROWSE CNMKEYS  (DSIOPEN ) --- LINE 00000 TO 00036 OF 00165
                                                                SCROLL ==> CSR
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----
```

You can enter a new value for the SCROLL field to change the effect of the BACK and FORWARD PF keys.

If your SCROLL field is not displayed on the BROWSE screens, entering a value on the command line changes the number of lines scrolled by the BACK and FORWARD PF keys. You can change whether the BROWSE screens have a SCROLL field using `OVERRIDE SCROLL=OFF`. For more information about the effects of the OVERRIDE command, see the NetView online help.

Topic:	**Reference:**
Setting up the network log	*IBM Z NetView Installation: Configuring Additional Components*
Filtering the log display using the log browse installation exit DSIEX18	*IBM Z NetView Programming: Assembler*
Printing the network log (DSIPRT)	*IBM Z NetView Installation: Configuring Additional Components*
Message formats	Appendix A, “Message Formats,” on page 237
BROWSE and FIND commands	NetView online help

Creating and Displaying NetView Trace Data

The NetView program provides facilities for tracing internal events which you can use for solving problems. The command facility can create trace records in storage, on an external data set, or to be handled by the MVS Generalized Trace Facility (GTF). The session monitor can trace session awareness data (SAW) and path information unit data (PIU). The program-to-program interface (PPI) can create trace records in storage or to be handled by MVS GTF.

Creating and Displaying Command Facility Trace Data

The command facility trace can record dispatching, queuing of buffers, presentation services, module entry and exit, getting and freeing of storage, and installation exit calls for one or more types of tasks. For example, to start tracing module entry and exit including installation exits for operator station tasks (OSTs) and record the trace information about an external data set, perform the following steps:

1. Start the DSITRACE task:

```
nccf start task=dsitrace
```

2. Start the command facility trace:

   ```
   nccf trace on,option=(mod,uexit),mode=ext,task=ost
   ```

3. Verify trace settings:

   ```
   nccf list trace
   ```

4. To stop the trace, enter the following command:

   ```
   nccf trace end
   ```

5. Stop the DSITRACE task:

   ```
   stop task=dsitrace
   ```

6. To print the trace data, use the DSIPRT command facility utility program. An example of the job to start this utility is located in the CNMS6214 member of the CNMSAMP data set.

Topic:	**Reference:**
Setting up the command facility trace log	*IBM Z NetView Installation: Configuring Additional Components*
Command facility LIST, START, STOP, and TRACE commands	NetView online help
Reading the command facility trace data	Information about diagnostic tools for the NetView program in *IBM Z NetView Troubleshooting Guide*

Creating and Displaying Session Monitor Trace Data

The session monitor trace can record SAW or PIU data. For example, to trace complete PIUs for logical unit (LU) TERM1 in domain CNM01, network NETA, perform the following steps:

1. To start the session monitor trace from the command facility, enter the following command:

   ```
   nldm trace start cpiu term1
   ```

2. To stop the trace, enter the following command:

   ```
   nldm trace stop cpiu term1
   ```

3. To display the trace, see “Typical LU-LU Session for an SNA Subarea Network” on page 61.

Topic:	**Reference:**
Session monitor TRACE command	NetView online help

Creating and Displaying PPI Trace Data

The PPI can record buffers destined for one or all receivers. For example, to trace buffers destined for receiver TASK1, and send the data to MVS GTF, perform the following steps:

1. Start the MVS GTF task from the command facility. Set GTF up to trace to an external data set, and to trace USR events of class X'5EF'. To start GTF from the command facility, enter the following command:

   ```
   mvs s gtf.gtf
   ```

2. Start the PPI trace for SSI task NETVSSI from the command facility. Enter the following command:

```
mvs f netvssi,traceppi on rcvrid=task1
```

3. To stop the trace, enter the following command:

```
mvs f netvssi,traceppi end
```

4. Stop the MVS GTF task from the command facility:

```
mvs p gtf
```

5. To display the trace data, use IPCS and the NetView sample CNMS4501 to format the PPI trace records.

Topic:	**Reference:**
Using GTF to collect PPI trace data	*IBM Z NetView Application Programmer's Guide*
MVS START and STOP commands	*MVS/ESA System Commands*
TRACEPPI command	NetView online help
Displaying the trace data	*MVS/ESA Diagnosis: Using Dumps and Traces*

Maintaining the Hardware Monitor Database

The hardware monitor database contains history records which summarize cumulative information regarding a specific device, and detail records which contain detail information regarding one error incident. The database also contains cross-reference records which correlate specific resources with specific configuration hierarchies in the network.

While only one physical hardware monitor database exists, it is divided into four logical databases containing history and detail records:

- Alerts
- Events
- Statistics
- GMFALERTs

Switching Primary and Secondary Databases

If the active database is either near full as determined by the LISTCAT command or full as noted by message BNJ022I, you can use the DBAUTO command to switch from the active to the inactive hardware monitor database. For example, enter the following command:

```
dbauto npda,switch
```

Controlling the Amount of Data Retained in the Hardware Monitor Database

You can control the number of event or statistical records to be retained for a specific resource or the total number of alert records to be retained on the hardware monitor database.

For example, to retain a maximum of 500 alerts for all resources, enter the following from the command facility:

```
npda swrap al 500
```

Also, to retain a maximum of 100 events for resource RES1, enter the following from the command facility:

```
npda swrap ev 100 n res1
```

Removing Unwanted Data from the Hardware Monitor Database

When you no longer need certain data in the database (for example, older than a certain date), you can remove this data using the DBAUTO command. For example, to remove data older than 60 days, enter the following command:

```
dbauto npda,purge,60
```

To reclaim the space used by the purged records, reorganize the database. To do this, enter the following command:

```
dbauto npda,reorg
```

Note: If the default is not what you want, you can also specify primary and secondary space allocation.

To delete all data in the database, enter the following command:

```
dbauto npda,clear
```

If you use the CLEAR option, it is not necessary to reorganize the database.

You can automate the process of maintaining the database by using the automation table.

Collecting Hardware Monitor Data in an SMF Data Set

You can enter the REPORTS command from the NetView console to start data collection to the system management facilities (SMF) log. However, when you use this command all the hardware monitor alerts is recorded. You cannot select which alerts are logged.

To start alert recording, enter the following command:

```
npda reports on
```

Topic:	Reference:
Setting up the hardware monitor database	*IBM Z NetView Installation: Configuring Additional Components*
Maintaining the hardware monitor database through automation	Refer to *IBM Z NetView Installation: Configuring Additional Components*
Using SMF logs	Refer to *IBM Z NetView Installation: Configuring Additional Components*.
REPORTS and SWRAP commands	NetView online help
Processing SMF data	*Service Level Reporter Version 3 Release 3 Command and Macro Reference*

Using and Maintaining the Session Monitor Database

The session monitor collects data about same-domain, cross-domain, and cross-network SNA (subarea and Advanced Peer-to-Peer Networking) sessions, and maintains the collected data on a session basis. To collect data for cross-domain sessions, a session monitor must be available in each domain. To collect data for cross-network sessions, a session monitor must be available in each gateway host on the session path and at the session end points.

The session monitor collects the following types of data:

- Session awareness data
- Session trace data

- Session response time data
- Route data
- Network accounting and availability measurement data

The data is stored in memory and at session end is written to the VSAM database.

Switching Primary and Secondary Logs

If the active log is either near full as determined by the LISTCAT command or full as noted by messages AAU022I and AAU272I, you can use the DBAUTO command list to switch to the inactive session monitor database. For example, enter the following command:

```
dbauto nldm,switch
```

Removing Unwanted Data from the Session Monitor Log

When you no longer need certain data in the log (for example older than a certain date), you can remove this data using the DBAUTO command. For example to remove data older than 60 days, enter the following command:

```
dbauto nldm,purge,60
```

To reclaim the space used by the purged records, reorganize the log. To do this, enter the following command:

```
dbauto nldm,reorg
```

To delete all data in the log, enter the following command:

```
dbauto nldm,clear
```

If you use the CLEAR option, it is not necessary to reorganize the log.

You can automate the process of maintaining the database by using the automation table.

Collecting Session Monitor Data in an SMF Data Set

You can enter the RECORD command from the NetView console to write accounting and resource statistics or storage and processor utilization data to the SMF data set.

To write accounting and resource statistics to the external log for sessions between primary session partner PRIMLU1 and secondary session partner SECLU2 enter the following command:

```
nldm record sesstats primlu1 seclu2
```

To write storage and processor utilization data to the external log enter the following command:

```
nldm record strgdata
```

Topic:	**Reference:**
Setting up the session monitor log	*IBM Z NetView Installation: Configuring Additional Components*
Maintaining the session monitor log through automation	*IBM Z NetView Installation: Configuring Additional Components*
DBAUTO, LISTCAT, and RECORD commands	NetView online help

Topic:	Reference:
Using Session Monitor filters	“Using Session Monitor Filters” on page 144

Maintaining the Save/Restore Database

The save/restore databases are two VSAM databases used to save and restore global variables and timed events. The primary database is defined by DSISVRTP and the secondary database is defined by DSISVRTS.

Switching Primary and Secondary Databases

If the active database is full as determined by the LISTCAT command, you can use the DBAUTO command to switch to the inactive database. For example, enter the following command:

```
dbauto save,switch
```

Removing Unwanted Data from the Save/Restore Database

To clear the Save/Restore database, you can use the DBAUTO command. The database must be inactive before it can be cleared. For example, enter the following command:

```
dbauto save,clear
```

Reorganizing the Save/Restore Database

When you have determined using the LISTCAT command that the index level is higher than 3, you can reorganize the inactive database to reclaim the space or improve performance of the database respectively. To do this, enter the following command:

```
dbauto save,reorg
```

Note: You might also want to specify primary and secondary space allocation if the default is not what you want.

Topic:	Reference:
Setting up the save/restore data set	*IBM Z NetView Installation: Configuring Additional Components*
DBAUTO and LISTCAT commands	NetView online help

Using the MVS System Log (SYSLOG)

MVS maintains a log of messages, commands, and responses. This includes commands sent by NetView using the MVS subsystem interface (SSI) and MVS extended consoles. MVS/JES makes the contents of the log available for printing either when the size of the log reaches its defined maximum size or the operator issues the MVS WRITELOG command.

You can use the NetView automation table to log messages to the MVS system log.

Using and Maintaining the RODM Log

The RODM log contains log types 0–10. You can use the data contained in these logs to assist in problem determination and diagnosis. For example, you can use log record types 9 and 10 for method debugging.

User-supplied information can be written to the RODM log through the Output to Log method application program interface (MAPI) function. You can customize member EKGCUST to specify which log records to write to the RODM log, or you can start a MAPI call from a RODM method to write records to the RODM log.

Switching the Primary and Secondary RODM Logs

You can switch the primary log to the secondary log. You might want to do this if you want to format the active log to review the information contained on the log. To do this, complete the following steps:

1. From the NetView console, issue the MVS modify command to write any existing internal buffers to the active log:

   ```
   f ekgxrodm,logf
   ```

   Where EKGXRODM is the RODM startup procedure.
2. Determine which RODM log is active (primary or secondary)

   ```
   f ekgxrodm,logq
   ```
3. Make the inactive log the active log:

   ```
   f ekgxrodm,logs
   ```

   Where LOGS is the name of the newly active log.

Formatting the RODM log

You can use the RODM log formatter to format the inactive RODM log. You can start the RODM log formatter using a submit JCL, EKGRLOG. A sample job is found in member EKGRLOG of the CNMSAMP data set. The SYSPRINT data set contains the formatted log.

Topic:	**Reference:**
Setting up the RODM log	*IBM Z NetView Installation: Configuring Additional Components*
Calling a MAPI call from a RODM method to write records to the RODM log	*IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide*
Customizing member EKGCUST	*IBM Z NetView Administration Reference*
Using the RODM log formatter for problem diagnosis	*IBM Z NetView Troubleshooting Guide*

Copying the Contents of RODM to a Checkpoint Data Set

The RODM data cache resides in memory. This means that in the event of a system failure, the data in the cache is lost. For this reason, RODM provides a checkpoint capability that you can use to copy the contents of the RODM data cache to a checkpoint data set. You can also load the data cache during RODM initialization from a checkpoint data set. Therefore, you need to checkpoint the contents of the RODM data cache either periodically or when you make a significant update to the data in the cache.

To copy the contents of RODM to a checkpoint data set, perform the following steps:

From the NetView console, enter the following command:

```
mvs f ekgxrodm,chkpt
```

This command causes RODM to checkpoint to the next available checkpoint data set. EKGXRODM is the RODM startup procedure. Message EKG1303I is displayed when the checkpoint is complete.

Note: Before starting RODM, specify one or more checkpoint data sets in the RODM procedure.

Topic:	**Reference:**
Setting up the RODM checkpoint data set	*IBM Z NetView Installation: Configuring Additional Components*
MVS command	NetView online help

Part 4. Automating the Network or System

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Chapter 13. Using the NetView Automation Table

Automating the network and system consists of developing procedures which respond to specific events. Development of an automated procedure requires you to understand how to detect the condition to which you want to respond automatically, and what action the automatic response includes. You can then use a combination of the NetView automation table and RODM to correlate events and their automated responses. You have the flexibility of using the automation table and RODM together or each can be used separately. These automated responses can include the calling of a command list or command processor using an automation task.

You can also schedule commands at periodic intervals or specific times. This is helpful for maintaining status information about your environment for automation. You can also perform routine operations automatically.

The NetView automation table provides a way to examine and separate data, and then take actions in response. It enables the following actions:

- Processing system, subsystem, application, and network messages
- Scanning for any errors or indicators of significant events in the network
- Collecting status information by analyzing messages
- Examining network management service units (MSUs) for errors or significant events in the network. An *MSU* is a data structure, such as an alert major vector X'0000' contained within a Network management vector transport (NMVT) that carries management services data that the NetView program uses to manage the system or network. Many IBM and non-IBM products send data to the NetView program in the form of MSUs. You can also create your own MSUs.

  NetView automation processes the following MSU types:

  - Network management vector transports (NMVT), including alerts, resolutions, link configuration data, link events, and problem determination statistics
  - Control point management services units (CP-MSU)
  - Multiple domain support message units (MDS-MU), which usually contains a CP-MSU
  - Record maintenance statistics (RECMS)
  - Record formatted maintenance statistics (RECFMS)

Use the generic automation receiver function of the NetView program to send data from your application to the NetView program without having to provide your own receiving application. The data must be in the form of a multiple domain support message unit (MDS-MU). The generic automation receiver presents the received data to the NetView automation table. For more information about the generic automation receiver, refer to the *IBM Z NetView Customization Guide*.

Automation Table and Alerts

You can use the SRFILTER and PDFILTER commands to change recording filters. The PDFILTER command list is called from a statement in the sample NetView automation table (DSITBL01) when the NetView BNJDSERV task completes initialization. You can customize the PDFILTER command list by using NPDA.PDFILTER statements in the CNMSTUSR or C*xx*STGEN member. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.

Usually, you set the AREC (alert recording) filters to cause the hardware monitor to send alerts for any high-priority problem records that require immediate attention. The following types of data can become hardware monitor alerts:

- Alert major vectors carried to the hardware monitor in MSUs

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- System-format alert records, such as OBR, MCH, CWR, and SLH records, received from local MVS or VM devices

Many of the records that the hardware monitor receives go to the automation table during the course of typical processing. There, you can have the automation table change filtering and highlighting attributes or issue automatic responses. The hardware monitor sends only the following major vectors:

- Alerts, key X'0000'
- Link events, key X'0001'
- Resolutions, key X'0002'
- Problem determination statistics, key X'0025'
- Record maintenance statistics (RECMS), key X'1044'
- Record formatter maintenance statistics (RECFMS), key X'1045'
- Link configuration data, key X'1332'

Automate most messages and MSUs so that only the few situations requiring operator action are forwarded to an operator.

Setting Network and System Security

If you are using a system authorization facility security product (SAF) , such as Resource Access Control Facility (RACF), work with your security administrator to determine appropriate command and data set security so network and system programmers can work with the automation table:

- Restrict unauthorized viewing or altering of automation table statements.
- Enable modification of automation table statements.
- Enable creation of usage reports using the AUTOCNT command.
- Restrict access to use of the LISTING keyword of the AUTOTBL command.

Your security administrator can define data set security and protect the AUTOTBL and AUTOCNT commands and their keywords using command security.

Topic:	**Reference:**
Using the AUTOTBL and AUTOCNT commands	NetView online help
Protecting data sets	*IBM Z NetView Security Reference*
Protecting commands and keywords	*IBM Z NetView Security Reference*
Planning security for automation	*IBM Z NetView Security Reference*

Planning Message or MSU Automation

This comparison of automating messages and MSUs shows the steps necessary before updating an automation table. For information about adding statements to the automation table, see the *IBM Z NetView Automation Guide*.

Table 11. Planning Message and MSU Automation

If you are automating a message:	**If you are automating an MSU:**
Obtain a copy of the actual message (using network or system logs).	Look at the contents of the MSU (using the hardware monitor).

Table 11. Planning Message and MSU Automation (continued)

If you are automating a message:	**If you are automating an MSU:**
Obtain the ID of the message.	Get the major vector of the MSU.
Identify any specific message instances that you wish to automate (such as from a particular domain, network device, or application).	Identify any specific MSU instances that you want to automate (such as from a particular domain, network device, or application).
If the message is issued for several purposes, specify the purpose for which the message is to be automated. Specify the particular message text position or message token that contains the information, such as the message number or message text.	If the MSU is issued for several purposes, specify the purpose for which the MSU is to be automated. Each MSU can be identified using some part of the MSU, such as a particular subvector or subfield.
Identify what actions need to be performed when the message is processed by NetView automation. You might want to suppress the message from display, change the coloring or other highlight attributes, suppress it from logging, process a command or command list, or route it to a particular operator or group of operators.	Identify the actions to be performed when the MSU is processed by NetView automation. You might want to block the MSU from recording and being displayed, change the coloring or other highlight attributes, or process a command or command list.

Browsing the Automation Tables

You can browse your automation tables using the NetView BROWSE command. For example, if your automation table is named AUTOTAB2, enter the following command:

```
browse autotab2
```

Notice that all the automation table statements are displayed, including those which are in embedded members.

The automation tables are located in the DSIPARM library.

You can analyze the existing statements in the automation table with the NetView AUTOCNT command, as described in“Analyzing Automation Table Usage” on page 171.

You can create a listing of an automation table using the NetView AUTOTBL command. This listing is placed in a member of the first data set defined by the DSILIST DD statement. You might want to do this before you design your changes to the automation table. For example, if your automation table is named AUTOTAB2, enter:

```
autotbl autotab2,listing=autolist,test
```

This places a listing of this automation table including all embedded members in the AUTOLIST member of the DSILIST data set. If the AUTOLIST member already exists, the existing list is not replaced unless you use the REPLACE parameter on AUTOTBL.

Testing an Automation Table

To test the automation table:

1. Use the AUTOTBL command with the TEST and MEMBER keywords, to verify that the syntax of the statements is correct. For example, to test DSIPARM member DSITBL01 without activating it and to generate an automation table listing to EXLIST, enter:

```
 autotbl member=dsitbl01 test listing=exlist
```

2. Use the TRACE action on an IF-THEN statement to trace the processing of a message or MSU through the automation table. Detailed trace information is displayed by message BNH370I for each part of the automation table statement that analyzes the AIFR. The following example shows an automation statement with a TRACE action:

```
IF (LABEL: STATEMENT1) TEXT = 'WAC' . THEN
 TRACE('TRCTAG01');
```

   When a message whose text begins with the characters WAC is processed by the automation table statement, message BNH370 is generated and includes the trace results.

3. Use the AUTOTEST command to test the automation table. Specify the LISTING keyword, to generate an automation table listing, and the REPORT keyword, to generate a listing of the commands that have been run. For example, to test the DSIPARM member DSITBL01, generating an automation table listing to EXLIST and a report to TESTRPT, enter the following command:

```
autotest member=dsitbl01 listing=exlist report=testrpt source=parallel
```

   This command tests the automation table DSITBL01 in parallel with the active automation table.

4. Use the following AUTOTEST command with the STATUS keyword to verify that testing is still active:

```
autotest status
```

5. Use one of the following AUTOTEST commands to end the test:

```
autotest off
autotest source=off
```

6. Browse the report by entering the following command:

```
browse testrpt
```

Activating an Automation Table

To activate the automation table:

1. Verify that the syntax of the automation table statements is correct by using the AUTOTBL command with the TEST and MEMBER keywords. For example, to test DSIPARM member DSITBL01 without activating it and to generate an automation table listing to EXLIST, enter:

```
autotbl member=dsitbl01 test listing=exlist
```

   The following example shows how a syntax error is displayed in the listing:

```
0011 001 IF BADFUNC = 'INFO' THEN DISPLAY(N);
ERROR    CNM505E INVALID FUNCTION NAME "BADFUNC" SPECIFIED IN
            CONDITIONAL
```

2. Activate the automation table by using the AUTOTBL command without the TEST keyword. Specify the LISTING keyword to generate an automation table listing. For example, to activate the DSIPARM member DSITBL01 and to generate an automation table listing to EXLIST, enter:

```
 autotbl member=dsitbl01 listing=exlist replace
```

   When activated successfully, two messages are displayed: message DWO044 indicating that the listing was successfully generated, and message DSI410 indicating that the table is active.

3. To add another DSIPARM member to the list of active automation tables, specify where in the list the new member is to be inserted. For example, to insert member DSITBL99 as the second member in the list of active automation table members, enter:

   ```
   autotbl member=dsitbl99 at=2
   ```

4. To ensure that a specific DSIPARM member is always the first or last table within the list of automation tables, you can use the FIRST or LAST keyword on the AUTOTBL command. For example, to ensure that DSITBL99 is always the last table, enter:

   ```
   autotbl member=dsitbl99 insert last
   ```

5. To verify the automation table is still active, use the AUTOTBL command with the STATUS keyword.

   ```
   autotbl status
   ```

Enabling and Disabling Sections of an Automation Table

You can enable or disable sections of the automation table using the AUTOTBL command. These sections can be selected statements or groups of statements.

If a block of automation table statements in member DSITBL01 are identified by LABEL=VTAM and ENDLABEL=VTAM, you can enter the following statements:

```
IF LABEL:VTAM MSGID = 'IST051A"
   THEN EXEC (CMD('CLISTA') ROUTE (ONE * OPER1));
IF MSGID = 'IST052A"
   THEN EXEC (CMD('CLISTB') ROUTE (ONE * OPER1));
IF ENDLABEL:VTAM MSGID = 'IST053A"
   THEN EXEC (CMD('CLISTC') ROUTE (ONE * OPER1));
```

To disable this block of automation table statements, enter the following command:

```
autotbl member=dsitbl01 disable block=vtam
```

If, instead, you want to enable the single automation table statement identified by LABEL=VTAM (and not the entire block of statements), enter the following command:

```
autotbl member=dsitbl01 enable label=vtam
```

You can also enable or disable automation table statements with the AUTOMAN command. See the *IBM Z NetView User's Guide: Automated Operations Network* for more information.

Analyzing Automation Table Usage

You can use an automation table report to analyze how your automation table is functioning in the following ways:

- To determine whether any statements need to be moved to improve performance
- To assess the automation workload
- To compare historical statistics for capacity planning and system stress analysis
- To locate statements that are not supposed to match messages or MSUs but do match
- To recognize statements that are supposed match but do not match
- To verify new condition items before adding corresponding actions
- To determine the impact of changes made to the system or network automation table

Use the AUTOCNT command to generate usage reports, which can be summary, detailed, or both. Each type of report can include message statements, MSU statements, or both. Because the output can be lengthy, especially for detailed reports, you can use the FILE option to send the output to a file. You can also generate the report from a command list and process the information automatically.

Automation Table Detail Usage Report

To generate a detailed usage report, enter the following command:

```
autocnt stats=detail report=both file=report
```

See Figure 90 on page 172 and Figure 91 on page 172.

```
- DWO800I AUTOMATION TABLE MSG DETAIL REPORT BY OPER1

DWO803I ------------( AUTOSEG1 MESSAGE DETAILS  04/12/19 14:32:42 )------------
DWO805I                                                      |-- PERCENTAGES --|
DWO806I STMT   SEQ      MEMBER    COMPARE    MATCH  E  C  A MATCH/ COMP/ MATCH/
DWO807I NUMBER NUMBER   NAME      COUNT      COUNT  C  I  I COMP   TOTAL TOTAL
DWO808I -----------------------------------------------------------------------
DWO809I 00001  00000800 AUTOSEG1     2304      798           34.6  100.0  34.6
DWO809I 00002  00001000 AUTOSEG1      798      177           22.2   34.6   7.7
DWO809I 00003  00001400 AUTOSEG1      621        9  1         1.4   27.0   0.4
DWO809I 00004  00001600 AUTOSEG1      612        0  1         0.0   26.6   0.0
DWO809I 00005  00002000 AUTOSEG1      612      612        X 100.0   26.6  26.6
DWO809I 00007  00002700 AUTOSEG1     1506      160           10.6   65.4   6.9
DWO809I 00008  00002900 AUTOSEG1      160       52           32.5    6.9   2.3
DWO809I 00009  00003400 AUTOSEG1      108        1            0.9    4.7   0.0
DWO809I 00010  00003700 AUTOSEG1      107      107        X 100.0    4.6   4.6
DWO808I ----------------------------------------------------------------------
```

Figure 90. MSG Detail Report

```
- DWO800I AUTOMATION TABLE MSU DETAIL REPORT BY OPER1

DWO804I --------------( AUTOSEG1 MSU DETAILS  04/12/19 14:32:42 )--------------
DWO805I                                                      |-- PERCENTAGES --|
DWO806I STMT   SEQ      MEMBER    COMPARE    MATCH  E  C  A MATCH/ COMP/ MATCH/
DWO807I NUMBER NUMBER   NAME      COUNT      COUNT  C  I  I COMP   TOTAL TOTAL
DWO808I -----------------------------------------------------------------------
DWO809I 00012  00004400 AUTOSEG1     3363     3233           96.1  100.0  96.1
DWO809I 00013  00004700 AUTOSEG1     3233        5            0.2   96.1   0.1
DWO809I 00014  00005200 AUTOSEG1     3228       17            0.5   96.0   0.5
DWO809I 00015  00005600 AUTOSEG1     3211     3211        X 100.0   95.5  95.5
DWO808I -----------------------------------------------------------------------
```

Figure 91. MSU Detail Report

To analyze a detail report, associate specific automation statements with the actual statements in the source member or the automation table listing; the actual text of the statement is not shown in the report. For each statement, the detail report provides:

- The member name and sequence number of the source statement. Note that these values might not be current if the source automation table member has been changed since the automation table was activated.
- The sequential statement number as stored in an automation table list. Note that this is only current if the list was generated when the automation table was loaded and not replaced after the table was activated.

If an automation table list is generated when the automation table is activated, and no AUTOCNT RESET command is issued between the automation table activation and the usage report generation, the date and time in the listing match the STATISTICS STARTED date and time in the summary usage report. Comparing the dates and times is one way you can verify that you have correlation between the detailed usage report statements and the actual automation statements.

Automation Table Summary Usage Report

To generate a summary usage report, issue the AUTOCNT command with STATS=SUMMARY. See Figure 92 on page 173 and Figure 93 on page 173.

```
- DWO801I AUTOMATION TABLE MSG SUMMARY REPORT BY OPER1

 DWO810I ------------( AUTOSEG1 MESSAGE SUMMARY  04/12/19 14:32:42 )------------
 DWO812I STATISTICS STARTED          = 04/12/19  13:32
 DWO813I TOTAL MSGS PROCESSED        =     2304
 DWO814I MSGS MATCHED                =      958
 DWO815I MSGS RESULTING IN COMMANDS  =        9
 DWO816I TOTAL COMMANDS EXECUTED     =        9
 DWO817I TOTAL ROUTES EXECUTED       =        1
 DWO818I AVERAGE COMPARES/MSG        =        2.58
 DWO819I TOTAL MSGS/MINUTE           =       38
 DWO820I MINUTES ELAPSED             =       60
 DWO808I
```

Figure 92. MSG Summary Report for Message Automation

```
 - DWO801I AUTOMATION TABLE MSU SUMMARY REPORT BY OPER1

 DWO811I --------------( AUTOSEG1 MSU SUMMARY  04/12/19 14:32:42 )--------------
 DWO812I STATISTICS STARTED          = 04/12/19  13:32
 DWO821I TOTAL MSUS PROCESSED        =     3363
 DWO822I MSUS MATCHED                =     3233
 DWO823I MSUS RESULTING IN COMMANDS  =        0
 DWO816I TOTAL COMMANDS EXECUTED     =        0
 DWO824I AVERAGE COMPARES/MSU        =        2.92
 DWO825I TOTAL MSUS/MINUTE           =       56
 DWO820I MINUTES ELAPSED             =       60
 DWO808I ------------------------------------------------------------------------
```

Figure 93. MSU Summary Report for MSU Automation

Storing Summary Usage Reports

Store summary data for comparison purposes so that you can see the impact of automation when changes are made to the environment, such as the following kinds of changes:

- Adding more devices to the network (possibly more MSUs to process)
- Adding more software to the system (possibly more messages to process)
- Changing the automation table (adding new statements, adding BEGIN/END sections
- Effect of shift changes, different days of the week, or holidays on your automation processing, and so on

Summary reports can be stored using the FILE keyword on the AUTOCNT command, or the information can be processed and stored in a custom format by processing the report in a REXX command list and storing to a file using the TSO/E EXECIO function.

Hint: Because the AUTOCNT command FILE option does not support adding information to the end of an existing file, use EXECIO if you want to store the data from multiple summary reports in the same file.

Reviewing Summary Usage Reports

To track the amount of work that automation is accomplishing, the summary report contains:

- The number of messages or MSUs processed and messages or MSUs per minute indicate the traffic levels in the system for those messages or MSUs processed by the system.
- The number of messages or MSUs matched and commands processed indicate how much work the automation table is handling, so operators do not have to react to the messages or MSUs.
- The number of routes processed indicate how many messages were automatically routed to the correct operator to handle the message.
- The number of comparisons and the number of messages and MSUs processed is indicative of the performance load of processing the automation table.

- The number of messages or MSUs processed minus the number of messages or MSUs matched indicates the number of messages or MSUs that were processed but not automated. Reduce this as much as possible for messages by suppressing system messages in the operating system message facility that are not required.

  If a particular message, class of messages, or MSU type is not automated, but is frequently received, you can add a statement near the top of the automation table to indicate that no further processing of this message is to be performed. For example, the following statement indicates that automation processing is to stop for any message with a message identifier that begins with XYZ:

  ```
  IF MSGID = 'XYZ'. THEN;
  ```

  The next example indicates that automation processing is to stop for all problem determination statistics major vectors (key X'0025'):

  ```
  IF MSUSEG(0025) ¬= ' THEN;
  ```

  Note: When an ALWAYS statement is processed for a message or MSU, the message or MSU is then counted as being matched. Therefore, the number of messages or MSU matches can be misleading if you use ALWAYS statements.

Analyzing the Detail Usage Report

The following table shows some of the ways to analyze the data from a detailed usage report:

Table 12. Analyzing Detail Usage and Summary Reports

Indicators	**Possible Error Source**
COMPARE COUNT = MATCH COUNT MATCH COUNT > 0 A I (Always Indicator) = blank	The automation table statement might have a logic error causing it to always match a message or MSU when it is compared
COMPARE COUNT = 0 MINUTES ELAPSED = substantial	A prior statement might be preventing this statement from being compared when it needs to be compared
MATCH COUNT = 0 MINUTES ELAPSED = substantial	This statement might no longer be needed because the message or MSU the statement is trying to match is no longer generated, or a coding error on the condition might be preventing the message or MSU from matching.

Where possible (without changing the automation logic), order the automation table in the following way:

- Place BEGIN/END sections with the highest MATCH COUNT at the top of the table and those with the lowest MATCH COUNT at the bottom.
- Within BEGIN/END sections, place statements with the highest MATCH COUNT at the top and those with the lowest MATCH COUNT at the bottom.

Ordering your automation table in this way optimizes the performance of your automation processing so that the automation table requires less time to process messages and MSUs.

Maintaining the Automation Table

After you add statements to the automation table, the statements need to be maintained because products add, change, and delete messages. When installing or upgrading system products, notice messages that are added, changed, or deleted. Most IBM product documentation lists this information.

Topic:	**Reference:**
AUTOTBL and AUTOCNT commands	NetView online help
Automation table language, automation table listings, and automation table usage reports	*IBM Z NetView Automation Guide*
Planning for automation	*IBM Z NetView Automation Guide*
MSUs in NetView	*IBM Z NetView Automation Guide*
MSUs in SNA	*SNA Management Services Reference* and *SNA Formats*

Chapter 14. Controlling Message Routing Using the ASSIGN Command

You can use the NetView ASSIGN command to route solicited and unsolicited messages and to assign operators to groups. The ASSIGN command is useful for preliminary routing of messages to autotasks to get messages to the automation table faster, and for assigning operators to groups.

If operators in a group are not yet defined when the ASSIGN command is issued, the assignment takes effect after the operator is defined and logs on to NetView program.

If the ASSIGN command defines message routing to a single operator, and that operator is not yet defined, the assignment fails.

To activate changes to operators defined by NetView profiles, modify the definition in DSIOPF, then issue the NetView REFRESH OPERS command.

If the operators are defined in a system authorization facility (SAF) security product (SAF) product such as RACF, changes to the NETVIEW segment definitions take effect immediately.

Topic:	Reference:
ASSIGN and REFRESH commands	NetView online help

Assigning Operators to Groups

You can use the ASSIGN command with the GROUP option to assign a list of operators to a particular group. You can then use the operator group with other assign commands, with the MSGROUTE command in a command list, or with the EXEC(ROUTE) action in the automation table. For example, to assign operators OPER1 and OPER2 to group +GROUP1, enter:

```
assign group=+group1,op=(oper1,oper2)
```

All group names must begin with a plus sign (+).

Working with Unsolicited Messages

An ***unsolicited message*** is a message that was not expected in response to an operator action. If an unsolicited message has not been suppressed, you might want to direct it to an operator or autotask to handle the situation. The ASSIGN command is particularly useful when you want to route messages or groups of messages by message ID. The messages are routed in specific-to-general order. For example, if you enter:

```
assign msg=*,pri=oper1,sec=oper2
assign msg=ist*,pri=(vtamoper,auto1)
assign msg=ist5*,pri=(vtamoper,auto2)
```

Messages beginning with IST5 are routed to VTAMOPER or AUTO2, and all other IST messages are routed to VTAMOPER or AUTO1. All remaining messages are routed to OPER1 and if OPER1 is available, they are also routed to OPER2.

Working with Solicited Messages

A ***solicited message*** is a message which is sent in response to an operator command, and which has a specific destination, such as a NetView operator, an autotask, or a NetView-to-NetView task.

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You can use the ASSIGN command with the COPY option to send a copy of a solicited message to all operators. For example, if you want OPER2, OPER3, and OPER4 to be notified whenever anyone uses the STOP command to stop a NetView task, enter:

```
assign msg=dsi660i,copy=(oper2,oper3,oper4)
```

Chapter 15. Starting an Autotask to Handle Automation

Creating and using NetView automated operator station tasks (autotasks) enables work to be performed automatically. Autotasks can do work usually performed by operators, thus providing more time for operators to perform less repetitive tasks. Autotasks can perform the following tasks:

- Perform a wide range of tasks, such as running command lists in response to messages and MSUs, sending messages to other operator tasks, scheduling commands to run using NetView timer commands, and so on.
- Respond quickly to system or network failures.
- Facilitate cross domain communication, thus reducing the required number of NetView programs to which an operator must be logged on.
- Ensure consistent responses to system and network problems.

For information about defining autotasks, see the *IBM Z NetView Automation Guide*.

You can start autotasks by using the NetView AUTOTASK or RMTCMD command. Table 13 on page 179 shows how each command implements an autotask:

Table 13. Starting an Autotask Using AUTOTASK and RMTCMD

Autotasks started with the AUTOTASK command:	**Autotasks started with the RMTCMD command:**
• Perform tasks usually reserved for NetView operators. • Can be started before the VTAM program is started so the NetView program can be used to monitor VTAM program failures and recover them automatically. • Can be associated with MVS consoles when started, and NetView commands can be entered at the MVS console which are then processed under the NetView autotask associated with that MVS console.	• Are used to provide cross domain communication using LU 6.2. • Can be used to provide an operation path into another NetView program on the same host or on a different host. Commands can be processed on different NetView systems, and the results can be viewed.

For example, to start an autotask AUTO3 using the AUTOTASK command, enter:

```
autotask opid=auto3
```

To start an autotask named OPER2 on the remote NetView CNM02 and display the name of the alert focal point, enter:

```
 rmtcmd lu=cnm02,operid=oper2,list focpt=alert
```

Topic:	**Reference:**
AUTOTASK and RMTCMD commands	NetView online help
Defining operators using a security application	*IBM Z NetView Administration Reference.*

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Chapter 16. Scheduling Commands

A command issued by a timer command is a *timed command*. Any command that you can issue from the NetView program can be a timed command. For example, command lists and NetView, VTAM, and MVS commands can be timed commands.

Like other NetView commands, timed commands can be issued from the following places:

- An operator console
- An autotask
- A command list or command processor
- Any active task

NetView timer commands include AT, AFTER, CHRON, and EVERY. You can use timer commands to issue commands whenever you choose and to conveniently issue commands repeatedly.

Note: A timed command is subject to any restrictions of the task under which it runs.

You can schedule a command to automatically perform tasks that operators traditionally perform, such as the following tasks:

- Periodically reviewing the status of a critical resource
- Starting a process at a scheduled time
- Verifying, after a designated period of time, whether a process completed successfully

You can issue timed commands in either of the following two ways:

- Using NetView commands at the command line
- Using NetView Timer Management Panels

Preparing to Issue NetView Timer Commands

Before you establish a NetView timer, follow these steps:

1. Determine a timer ID naming convention.

   Having a naming convention simplifies the creation and maintenance of timer commands. For example, to delete a timer command, knowing the timer ID saves time by not having to list all the timer commands.

2. Determine the tasks that should issue timer commands.

   You need to determine if you are going to use the PPT for running the timed commands, a particular autotask, or different operator tasks.

3. Enable command authorization for PPT timer commands.

   Command security cannot protect commands issued by the PPT task. You can enable command authorization for PPT timer commands in either of the following two ways:

   - By checking the authorization of the originating task
   - By protecting the PPT operand for the timer commands

   If you are using SECOPTS.CMDAUTH=TABLE or SECOPTS.CMDAUTH=SAF, you can specify SECOPTS.AUTHCHK = SOURCEID by using the CNMSTUSR or C*xx*STGEN member, or AUTHCHK = SOURCEID on the REFRESH command to have command security check the authorization of the original issuer of the command. For information about changing CNMSTYLE statements, see *IBM Z NetView Installation: Getting Started*.

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Restricting access to the PPT keyword prevents operators from routing commands to the PPT task. Refer to *IBM Z NetView Security Reference* for a description of how to protect AFTER, AT, CHRON, and EVERY commands and keywords.

4. If you are using the Save/Restore capability, redefine the VSAM database, which was originally defined during NetView installation.

   For more information, refer to the *IBM Z NetView Installation: Configuring Additional Components*.

Using NetView Commands at the Command Line

You can issue NetView timer commands by typing the commands at the command line at the lower left side of the screen.

Issuing Timer Commands for a Specified Date or Time

To issue commands at a specific date and time, use the NetView AT or CHRON command.

If PPT is not specified, the timed command attempts to process on the task that issued the timer. This can cause the following problems:

- If the operator is not logged on at the specified time the timed command is scheduled to run, the command is not processed.
- If the operator is in the middle of an important task when the command starts processing, the task is interrupted when the timed command runs.

Note: You can customize date and time formats through the DEFAULTS and OVERRIDE commands. For more detailed information about the DEFAULTS and OVERRIDE commands, see the NetView online help.

By specifying PPT, timer commands process under the primary program operator interface task (PPT). This is convenient because the PPT is always active when the NetView program is active. Another option is to issue timer commands from one or more NetView autotasks, because autotasks are typically active when NetView is active.

It is better to issue timer commands from autotasks rather than the PPT, because the PPT should be available to perform critical work.

For example, to schedule the STATREP timed command for 09/24 at 9:00 a.m., enter the following command:

```
at 09/24 09:00:00,id=statrep,statrep
```

Issuing Commands at Regular Intervals

To issue commands at regular intervals, use the NetView EVERY or CHRON command with a time interval.

For example, to process a TASKUTIL every hour from the NetView Primary POI Task (PPT), enter the following command:

```
every 1:00:00,ppt,taskutil
```

Issuing Commands After a Specified Time Period

To issue commands after a specified delay in time, use the NetView AFTER or CHRON command.

For example, to process the CHKVTAM command an hour from now, enter the following command:

```
after 1:00:00,id=statvtam,chkvtam
```

Displaying Timers That Are Waiting to Process

The LIST TIMER command lists the following information:

- The type of timer command
- When the timer is scheduled to run
- What timed command is to be issued
- Whether the PPT operand was specified
- Whether the timer was saved in the VSAM database

To display the active timer commands for all the NetView operators, enter the following command:

```
list timer=all,op=all
```

To display a specific timer command with an ID, specify an ID with the TIMER parameter. For example, to display a timer command with an ID of SHOWLINK on the task of the calling operator, enter the following command:

```
list timer=showlink
```

To display all timers for a specific operator, add OP= followed by the operator ID. For example, to display all timers issued by operator OPER1, enter the following command:

```
list timer=all,op=oper1
```

Note: To facilitate viewing timer information, preface the LIST command with the WINDOW command. This displays the list timer output in a scrollable window.

Deleting Timer Commands

You can use The NetView PURGE command to delete timer commands that you no longer require.

For example, you might have issued an EVERY command to periodically check something that is now fixed, or you might have made an error when entering the timer command, and you want to remove the timer in error.

To delete the timed command previously issued by OPER1 with an ID of STATUS1, enter the following command:

```
purge op=oper1,timer=status1
```

If the SAVE parameter was used on the timer command, purging the timer also deletes it from the Save/Restore database.

Saving a Timer

To restore a TIMER command so that it can be processed when the NetView program is recycled, use the SAVE parameter. This parameter saves the TIMER command in the Save/Restore VSAM database.

For example, to schedule the TASKUTIL timed command for 09/24 at 9 a.m. and to have the timed command saved in case NetView is recycled, enter the following command:

```
at 09/24 09:00:00,id=taskstat,save,taskutil
```

Restoring Timers

The NetView RESTORE command can be used to restore timers that have been saved to the VSAM database.

To restore all saved timers, enter the following command:

```
restore timer
```

To erase all saved timer records from the database, add the DELETE option:

```
restore timer delete
```

Topic:	Reference:
AT, AFTER, CHRON, EVERY, LIST, PURGE, and RESTORE commands	NetView online help
Timed commands	*IBM Z NetView Automation Guide*
Using IBM Z System Automation to set timers	*IBM Z System Automation User's Guide*

Using NetView Timer Management Panels

Timers issue commands and command lists at specified time intervals. The types of timers are EVERY, AT, AFTER, and CHRON.

You can schedule a timer setting for a specific date and time, after a certain date and time, or repetitively at defined intervals. You can use the Timer Management panel (and its subordinate panels) to add, change, delete, and purge timers of various types.

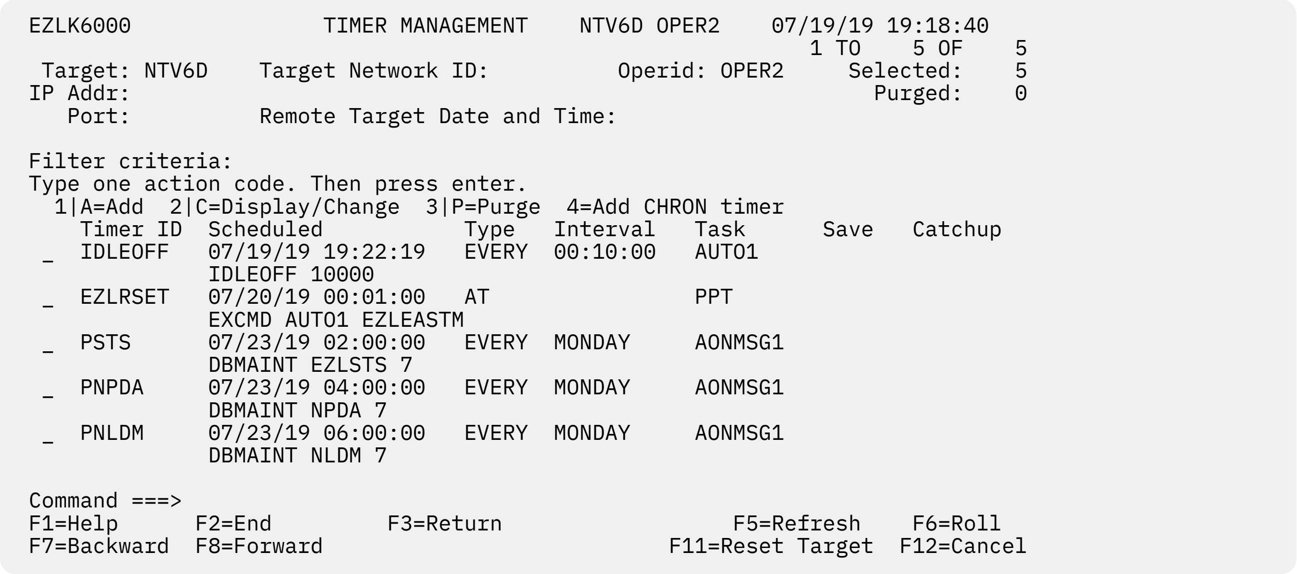
Timers can be scheduled several ways. For example, with the NetView program, you can issue the AT, EVERY, AFTER, and CHRON command in the following ways:

- From a command list
- On the command line
- From the Timer Management panel

To display the Timer Management panel, type `TIMER` on any command line; or, if using AON, type `AON 1.6` at the command line.

The Timer Management panel is displayed, as shown in Figure 94 on page 184.

Note: Although **D** for Delete is not an option on the Timer Management panel, it is supported.



```
EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 19:18:40
                                                             1 TO    5 OF    5
 Target: NTV6D    Target Network ID:          Operid: OPER2     Selected:    5
IP Addr:                                                          Purged:    0
   Port:          Remote Target Date and Time:

Filter criteria:
Type one action code. Then press enter.
  1|A=Add  2|C=Display/Change  3|P=Purge  4=Add CHRON timer
    Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
 _  IDLEOFF   07/19/19 19:22:19   EVERY  00:10:00   AUTO01
              IDLEOFF 10000
 _  EZLRSET   07/20/19 00:01:00   AT                PPT
              EXCMD AUTO01 EZLEASTM
 _  PSTS      07/23/19 02:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT EZLSTS 7
 _  PNPDA     07/23/19 04:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NPDA 7
 _  PNLDM     07/23/19 06:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NLDM 7

Command ===>
F1=Help      F2=End         F3=Return                  F5=Refresh    F6=Roll
F7=Backward  F8=Forward                           F11=Reset Target  F12=Cancel
```

Figure 94. Timer Management Panel

The Timer Management panel displays the following data fields:

Target
Specifies the ID of the remote system whose timers you want to display.

Target Network ID
Specifies the ID of the remote domain whose timers you want to display. If you do specify Target Network ID, the Target field is used as a domain name.

Operid
Specifies the operator ID on the remote domain whose timers you want to display. This field is displayed only when COMMON.EZLRMTTIMER = NETV is specified in the CNMSTYLE member.

IP Addr
Specifies the IP address or host name of the remote domain whose timers you want to display. This field is displayed only when COMMON.EZLRMTTIMER = NETV is specified in the CNMSTYLE member.

Port
Specifies the port number on the remote domain whose timers you want to display. This field is displayed only when COMMON.EZLRMTTIMER = NETV is specified in the CNMSTYLE member.

Timer ID
Specifies the IDs of the active timers. The IDs are supplied by the operators that create the timers.

Scheduled
Specifies the date and time when the command is to be issued.

Type
Specifies the type of timer:

- EVERY
- AT
- AFTER
- CHRON

Interval
Specifies how often timers repeat.

Task
Specifies which task is to issue the command.

If task=PPT, a specific task is not required for the command to be issued.

Save
Indicates to the NetView program whether this timer event is saved to the NetView SAVE/RESTORE database.

If SAVE=YES, the timer is stored in the NetView SAVE/RESTORE database. If SAVE is set to NO or is left blank, the timer is not saved. If SAVE is set to YES, the timer is restored after a NetView outage. If CATCHUP=YES is specified in the AON control files, SAVE=YES is required.

Catchup
Indicates that a timer that was saved is to be caught up after a system outage (if the timer was defined in an AON control file).

You can use the Timer Management panel to add, change, purge, and reinstate timers. The following sections explain how to perform these actions:

- "Selecting Remote Targets" on page 185
- "Setting Timers for a Specific Date and Time" on page 188
- "Adding a Timer" on page 189
- "Purging (Deleting) Timers" on page 197
- "Reinstating Timers" on page 198

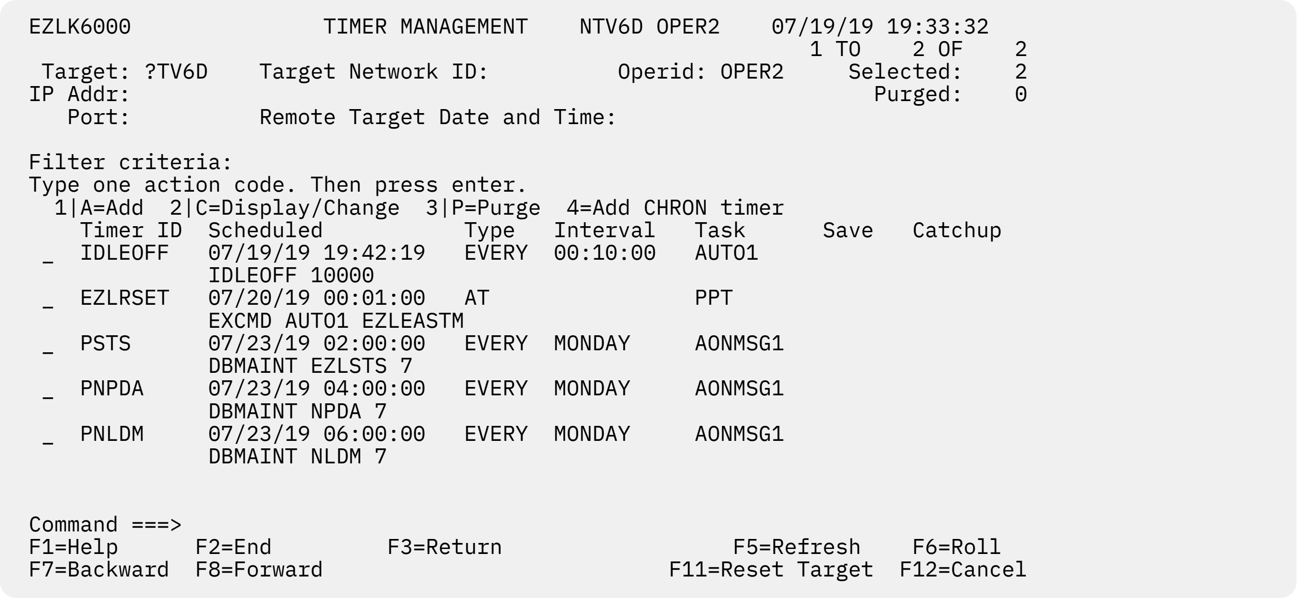
Selecting Remote Targets

To display the Remote Target Selection panel, type ? in one of the following fields on the Timer Management panel:

- Target Network ID

- Target
- Operid
- IP Addr
- Port

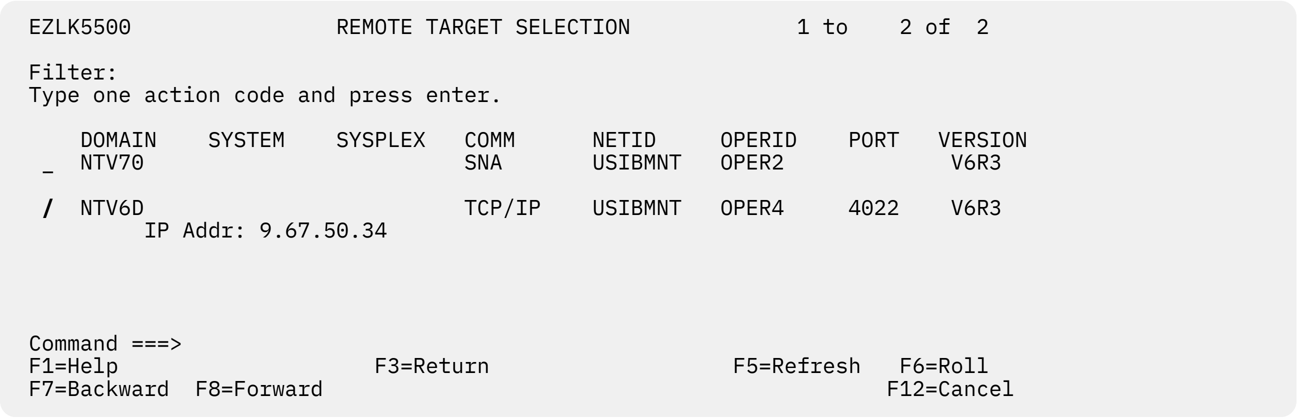
For example, type a question mark in the Target field, as shown in Figure 95 on page 186, and press Enter.



```
EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 19:33:32
                                                             1 TO    2 OF    2
 Target: ?TV6D    Target Network ID:          Operid: OPER2     Selected:    2
IP Addr:                                                          Purged:    0
   Port:          Remote Target Date and Time:

Filter criteria:
Type one action code. Then press enter.
  1|A=Add  2|C=Display/Change  3|P=Purge  4=Add CHRON timer
    Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
 _  IDLEOFF   07/19/19 19:42:19   EVERY  00:10:00   AUTO1
              IDLEOFF 10000
 _  EZLRSET   07/20/19 00:01:00   AT                PPT
              EXCMD AUTO1 EZLEASTM
 _  PSTS      07/23/19 02:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT EZLSTS 7
 _  PNPDA     07/23/19 04:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NPDA 7
 _  PNLDM     07/23/19 06:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NLDM 7


Command ===>
F1=Help      F2=End         F3=Return                  F5=Refresh    F6=Roll
F7=Backward  F8=Forward                           F11=Reset Target  F12=Cancel
```

Figure 95. Timer Management Panel with Target Specified

If you are using the NetView RMTCMD interface (the COMMON.EZLRMTTIMER = NETV statement in the CNMSTYLE member), the Remote Target Selection panel is displayed, as shown in Figure 96 on page 186.



```
EZLK5500                REMOTE TARGET SELECTION             1 to    2 of  2

Filter:
Type one action code and press enter.

    DOMAIN    SYSTEM    SYSPLEX   COMM      NETID     OPERID    PORT   VERSION
 _  NTV70                         SNA       USIBMNT   OPER2             V6R3

 /  NTV6D                         TCP/IP    USIBMNT   OPER4     4022    V6R3
         IP Addr: 9.67.50.34




Command ===>
F1=Help                    F3=Return                   F5=Refresh   F6=Roll
F7=Backward  F8=Forward                                           F12=Cancel
```

Figure 96. Remote Target Selection Panel (COMMON.EZLRMTTIMER = NETV)

The Remote Target Selection Panel displays the following columns of data:

Filter
Used for specifying a DOMAIN, SYSTEM, SYSPLEX, or COMM method to display.

DOMAIN
Specifies the IDs of the domains that you can select as a target.

SYSTEM
Specifies the IDs of systems that you can select as a target.

SYSPLEX
Specifies the IDs of sysplexes that you can select as a target.

COMM
Specifies the communications facility over which the data is transferred between remote domains.

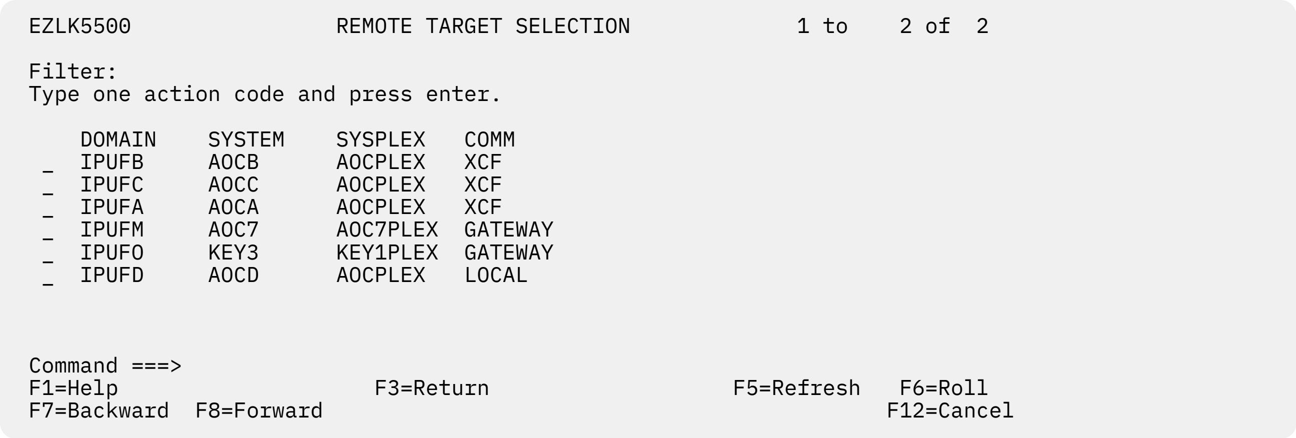
NETID
Specifies the network ID of the remote domain whose timers you want to display.

OPERID
Specifies the autotask to be used on the remote domain for processing the command. The default is your operator ID.

PORT
Specifies the port number to be used for TCP/IP communications.

VERSION
Specifies the version of the remote NetView program.

If you are using the IBM Z System Automation interface (the COMMON.EZLRMTTIMER = SA statement in the CNMSTYLE member), the NetView program displays the Remote Target Selection panel, as shown in Figure 97 on page 187.

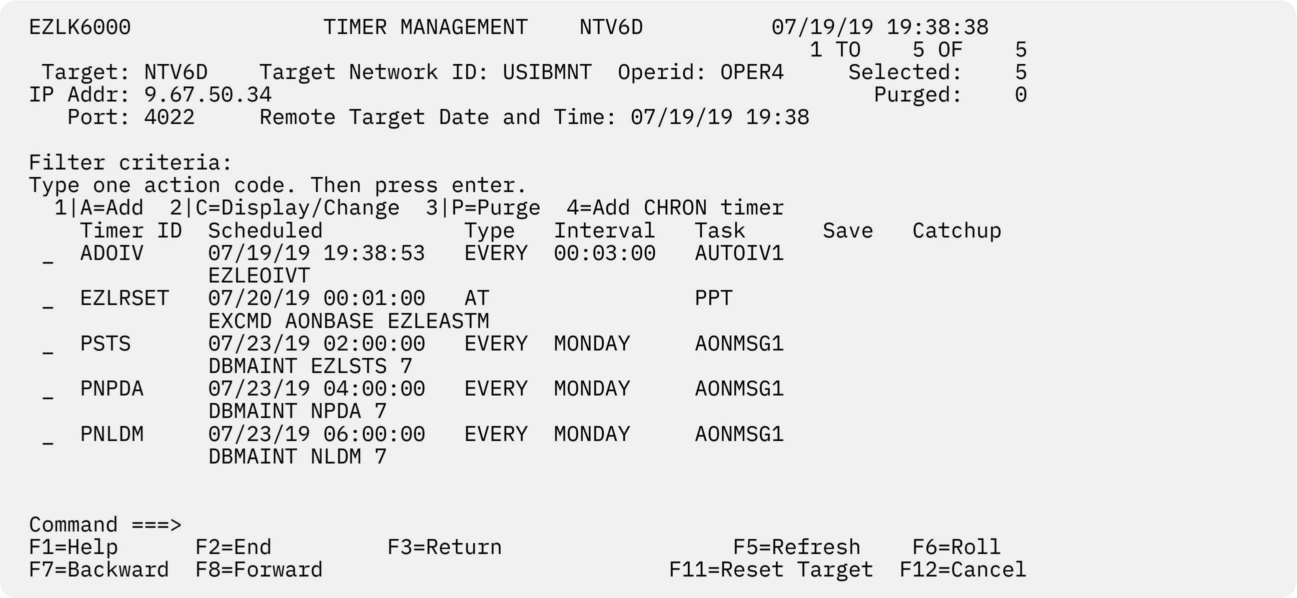


```
EZLK5500                REMOTE TARGET SELECTION             1 to    2 of  2

Filter:
Type one action code and press enter.

    DOMAIN    SYSTEM    SYSPLEX   COMM
 _  IPUFB     AOCB      AOCPLEX   XCF
 _  IPUFC     AOCC      AOCPLEX   XCF
 _  IPUFA     AOCA      AOCPLEX   XCF
 _  IPUFM     AOC7      AOC7PLEX  GATEWAY
 _  IPUFO     KEY3      KEY1PLEX  GATEWAY
 _  IPUFD     AOCD      AOCPLEX   LOCAL



Command ===>
F1=Help                    F3=Return                   F5=Refresh   F6=Roll
F7=Backward  F8=Forward                                            F12=Cancel
```

Figure 97. Remote Target Selection Panel (COMMON.EZLRMTTIMER = SA)

Type any character to select a target system, as shown in Figure 96 on page 186, and press Enter.

The NetView program displays the active timers for the Target that you selected.



```
EZLK6000               TIMER MANAGEMENT    NTV6D          07/19/19 19:38:38
                                                             1 TO    5 OF    5
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER4     Selected:    5
IP Addr: 9.67.50.34                                               Purged:    0
   Port: 4022     Remote Target Date and Time: 07/19/19 19:38

Filter criteria:
Type one action code. Then press enter.
  1|A=Add  2|C=Display/Change  3|P=Purge  4=Add CHRON timer
    Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
 _  ADOIV     07/19/19 19:38:53   EVERY  00:03:00   AUTOIV1
              EZLEOIVT
 _  EZLRSET   07/20/19 00:01:00   AT                PPT
              EXCMD AONBASE EZLEASTM
 _  PSTS      07/23/19 02:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT EZLSTS 7
 _  PNPDA     07/23/19 04:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NPDA 7
 _  PNLDM     07/23/19 06:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NLDM 7


Command ===>
F1=Help      F2=End         F3=Return                  F5=Refresh    F6=Roll
F7=Backward  F8=Forward                           F11=Reset Target  F12=Cancel
```

Figure 98. Timer Management Panel for the Selected Target

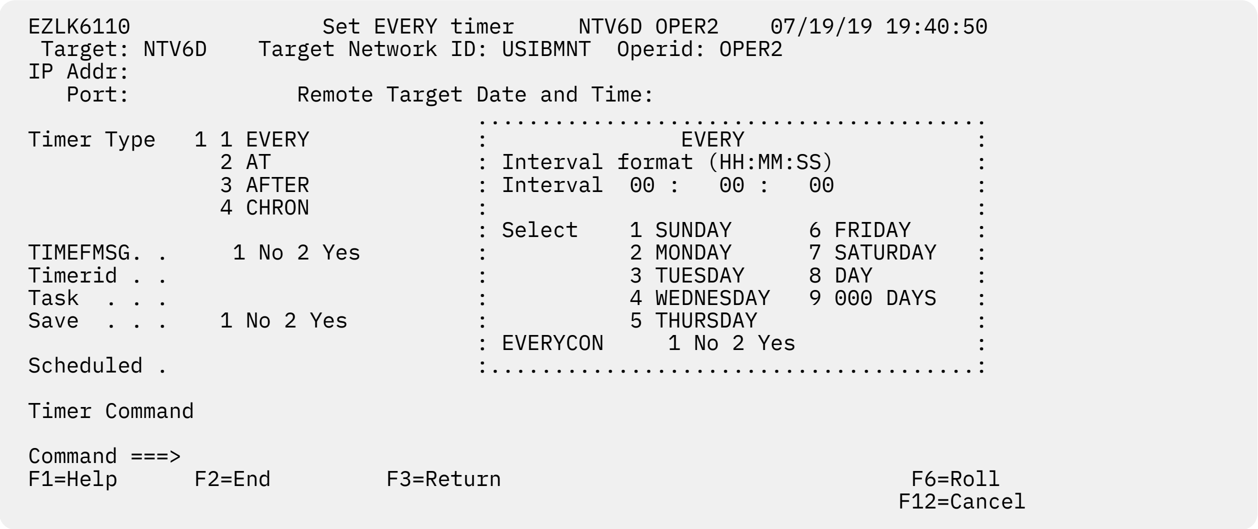
Setting Timers for a Specific Date and Time

To add an EVERY, AT or AFTER timer:

1. Display the Timer Management panel.

   To display the Timer Management panel, see “Using NetView Timer Management Panels” on page 184.
2. Type 1 or A in the entry field either next to an existing timer or on the command line.
3. Press Enter.

   A Timer Set panel is displayed, as shown in Figure 99 on page 188, in which an EVERY timer was selected:



```
EZLK6110               Set EVERY timer     NTV6D OPER2    07/19/19 19:40:50
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
                                   .........................................
Timer Type   1 1 EVERY             :               EVERY                   :
               2 AT                : Interval format (HH:MM:SS)            :
               3 AFTER             : Interval  00 :   00 :   00            :
               4 CHRON             :                                       :
                                   : Select    1 SUNDAY      6 FRIDAY      :
TIMEFMSG. .     1 No 2 Yes         :           2 MONDAY      7 SATURDAY    :
Timerid . .                        :           3 TUESDAY     8 DAY         :
Task  . . .                        :           4 WEDNESDAY   9 000 DAYS    :
Save  . . .    1 No 2 Yes          :           5 THURSDAY                  :
                                   : EVERYCON     1 No 2 Yes               :
Scheduled .                        :.......................................:

Timer Command

Command ===>
F1=Help      F2=End         F3=Return                                F6=Roll
                                                                    F12=Cancel
```

Figure 99. Timer Set Panel for a Type of EVERY

   The pop-up window that displays on the panel depends on the type of the timer whose entry field you used to make the add request on the Timer Management panel. The timers are one of the following types:

EVERY
The timer times out at recurring intervals each time the interval passes. The timer is rescheduled for the next interval automatically after it goes off.

AT
The timer goes off at the specified date and time.

AFTER
The timer goes off after the specified interval passes.

CHRON
The timer can have any of the properties described above with additional functions available. See the CHRON command in the *IBM Z NetView Command Reference Volume 1 (A-N)* for more information.

The following sections explain how to set each type of timer.

Adding a Timer

You can add the following types of timers:

- "EVERY Timer" on page 189
- "AT Timer" on page 190
- "AFTER Timer" on page 191
- "CHRON Timer" on page 193

EVERY Timer

To add a timer that pops at recurring intervals and is not deleted:

1. Display the Timer Management panel.

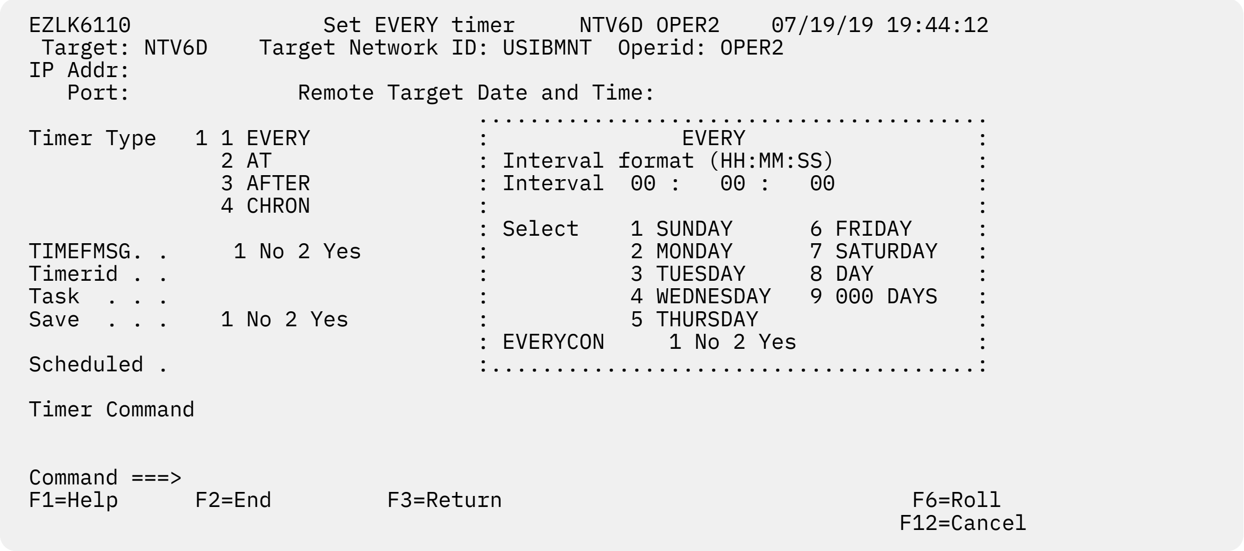
   To display the Timer Management panel, see "Using NetView Timer Management Panels" on page 184.

2. Display the Timer Set panel.

   To display the Timer Set panel, see "Setting Timers for a Specific Date and Time" on page 188.

3. If the EVERY pop-up window is not already displayed on the Timer Set panel, type 1 in the `Timer` Type field and press Enter.

   The Timer Set panel, shown in Figure 100 on page 189, is displayed with the EVERY pop-up window.



```
EZLK6110               Set EVERY timer     NTV6D OPER2    07/19/19 19:44:12
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
                                   ........................................
Timer Type   1 1 EVERY             :               EVERY                  :
               2 AT                : Interval format (HH:MM:SS)           :
               3 AFTER             : Interval  00 :   00 :   00           :
               4 CHRON             :                                      :
                                   : Select    1 SUNDAY      6 FRIDAY     :
TIMEFMSG. .     1 No 2 Yes         :           2 MONDAY      7 SATURDAY   :
Timerid . .                        :           3 TUESDAY     8 DAY        :
Task  . . .                        :           4 WEDNESDAY   9 000 DAYS   :
Save  . . .    1 No 2 Yes          :           5 THURSDAY                 :
                                   : EVERYCON     1 No 2 Yes              :
Scheduled .                        :......................................:

Timer Command


Command ===>
F1=Help      F2=End         F3=Return                                F6=Roll
                                                                    F12=Cancel
```

Figure 100. Timer Set Panel for a Timer Type of EVERY

Note: To set the timer for a different domain or system, see "Selecting Remote Targets" on page 185.

4. Define whether you want messages generated if the requested timer fails. Specify TIMEFMSG as follows:

   - Type 1 if you do not want messages generated.
   - Type 2 if you want messages generated.

5. In the Interval and Select fields, choose one of these options:

   To specify a timer that goes off more than once every day, type the time of day in the Interval field, type 9 in the Select field, but leave `000` in the DAYS field.

   For example, to set the timer for every 15 minutes everyday, type:

   ```
   Interval  00 : 15 : 00
   Select  9
             9 000 DAYS
   ```

   To specify a time of day and a day of the week, type the time in the Interval fields, and in the **Select** field, type the number that corresponds to the day. The time is shown in military time or the *hh:mm:ss* format.

   For example, to set the timer for Sunday at 2 p.m., type:

   ```
   Interval  14 : 00 : 00
   Select  1
   ```

   To specify a timer that goes off at a certain time of day every *x* number of days, type the time of day in the Interval fields, and type 9 in the Select field. Then, specify a number of days in the **DAYS** field.

   For example, to set the timer for noon every 5 days, type:

   ```
   Interval  12 : 00 : 00
   Select  9
             9 005 DAYS
   ```

6. Specify an ID for the timer in the `Timerid` field (Optional).
7. Specify a task in the `Task` field (Optional).
8. Define whether you want EVERY timers to continue to be scheduled if one fails.

   Specify EVERYCON in the following way:

   - Enter 1 if you do not want EVERY timers to continue to be scheduled.
   - Enter 2 if you want EVERY timers to be scheduled.

9. Specify 1 if you do not want to save the timer, or 2 to save the timer in the `Save` field.
10. Type the command that you want to be issued in the `Timer Command` field.
11. Press Enter.

    The following message is displayed to confirm the timer you set:

    ```
     EZL973I REQUESTED TIMER timer ADDED
    ```

AT Timer

To add a timer that pops on a specific date and time:

1. Display the Timer Management panel.

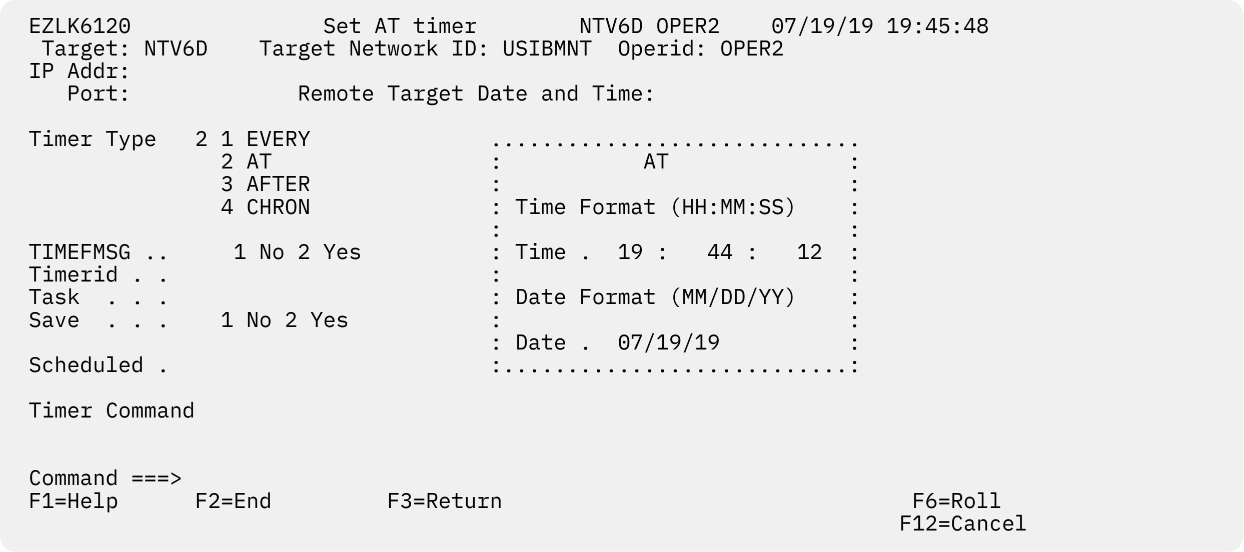
   To display the Timer Management panel, see "Using NetView Timer Management Panels" on page 184.

2. Display the Timer Set panel.

   To display the Timer Set panel, see "Setting Timers for a Specific Date and Time" on page 188.

3. If the Timer Set panel does not already display the AT pop-up window, type 2 in the `Timer Type` field and press Enter.

   The Timer Set panel shown is displayed with the AT pop-up window, as shown in Figure 101 on page 191.



```
EZLK6120               Set AT timer        NTV6D OPER2    07/19/19 19:45:48
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:

Timer Type   2 1 EVERY              .............................
               2 AT                 :           AT              :
               3 AFTER              :                           :
               4 CHRON              : Time Format (HH:MM:SS)    :
                                    :                           :
TIMEFMSG ..     1 No 2 Yes          : Time .  19 :   44 :   12  :
Timerid . .                         :                           :
Task  . . .                         : Date Format (MM/DD/YY)    :
Save  . . .    1 No 2 Yes           :                           :
                                    : Date .  07/19/19          :
Scheduled .                         :...........................:

Timer Command


Command ===>
F1=Help      F2=End         F3=Return                              F6=Roll
                                                                  F12=Cancel
```

Figure 101. Timer Set Panel with Timer Type of AT

   Note: To set the timer for a different domain or system, see "Selecting Remote Targets" on page 185.

4. Define whether you want messages generated if the requested timer fails. Specify TIMEFMSG as follows:

   - Type 1 if you do not want messages generated.
   - Type 2 if you want messages generated.

5. In the `Time` field of the pop-up window, type the time of day when you want the command to run. The time is shown in the *hh:mm:ss* format; for example, specify 2:43:58 p.m. in the following format:

```
14 : 43 : 58
```

6. In the `Date` field of the pop-up window, type the date when you want the command to run. The date follows the *mm/dd/yy* format; for example, specify August 3, 2013 in the following way:

```
08/03/19
```

7. Type an ID for the timer in the `Timerid` field (Optional).
8. Specify a task in the Task field (Optional).
9. Type 1 if you do not want to save the timer or type 2 to save the timer in the `Save` field.
10. Type the command that you want to be issued in the `Timer Command` field.
11. Press Enter.

    The following message is displayed to confirm the timer you set:

```
 EZL973I REQUESTED TIMER timer ADDED
```

AFTER Timer

To add a timer that goes off after a specified period of time:

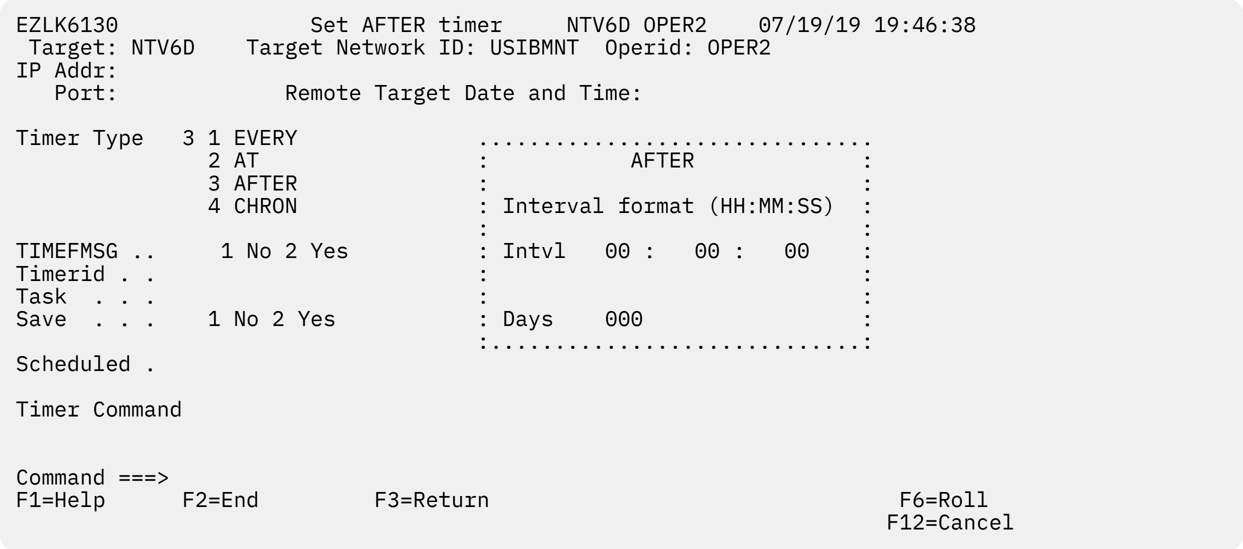
1. Display the Timer Management panel.

   To display the Timer Management panel, see "Using NetView Timer Management Panels" on page 184.

2. Display the Timer Set panel.

   To display the Timer Set panel, see “Setting Timers for a Specific Date and Time” on page 188.

3. If the Timer Set panel does not already display the AFTER window, type 3 in the **Timer Type** field and press Enter. The AFTER window, which is shown in Figure 102 on page 192, is displayed.



```
EZLK6130               Set AFTER timer     NTV6D OPER2    07/19/19 19:46:38
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:

Timer Type   3 1 EVERY              ...............................
               2 AT                 :           AFTER             :
               3 AFTER              :                             :
               4 CHRON              : Interval format (HH:MM:SS)  :
                                    :                             :
TIMEFMSG ..     1 No 2 Yes          : Intvl   00 :   00 :   00    :
Timerid . .                         :                             :
Task  . . .                         :                             :
Save  . . .    1 No 2 Yes           : Days    000                 :
                                    :.............................:
Scheduled .

Timer Command


Command ===>
F1=Help      F2=End         F3=Return                                F6=Roll
                                                                    F12=Cancel
```

Figure 102. Timer Set Panel with Timer Type of AFTER

   The AFTER timer type works differently from the EVERY and AT types.

   When you use the AFTER type, do not specify a time of day or a date setting for the timer. Instead, specify a number of days, hours, minutes, and seconds after which you want the timer to expire. An interval is set that begins the moment you set the timer and ends after the specified number of days, hours, minutes, and seconds have passed.

   Note: To set the timer for a different domain or system, see “Selecting Remote Targets” on page 185.

4. Use the **Intvl** and **Days** fields together to specify the timer setting.

   For example, to set the timer for 14 hours from now, type:

```
Intvl  14 : 00 : 00
Days   000
```

   When you set the number of days to 000, the day the timer goes off is today. If you specify a number other than 000, the timer goes off after the specified number of days from the current day.

   For example, to set the timer for 5 days, 12 hours, 10 minutes, and 15 seconds from now, type:

```
Intvl  12 : 10 : 15
Days   005
```

   To set the timer for the current time 5 days from now, type:

```
Intvl  00 : 00 : 00
Days   005
```

5. Define whether you want messages generated if the requested timer fails. Specify TIMEFMSG as follows:

   - Type 1 if you do not want messages generated.
   - Type 2 if you want messages generated.

6. Specify a timer ID in the **Timerid** field (Optional).
7. Specify a task in the Task field (Optional).

8. Specify 1 if you do not want to save the timer or 2 to save the timer in the `Save` field.
9. Type the command that you want to be issued in the `Timer Command` field.
10. Press Enter.

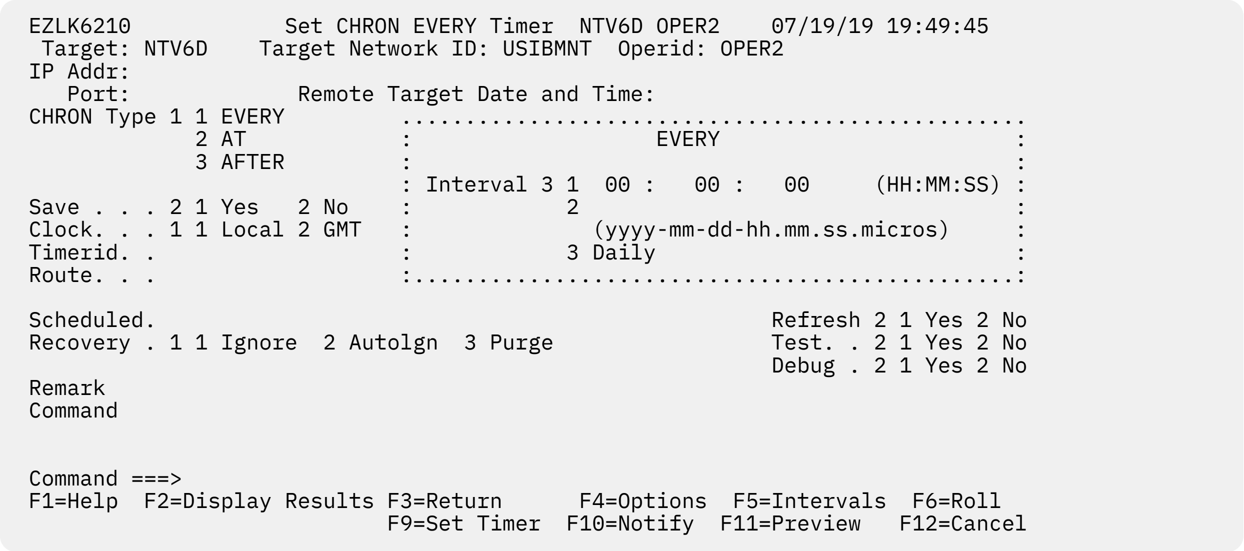
    The following message is displayed to confirm the timer you set:

    ```
    EZL973I REQUESTED TIMER timer ADDED
    ```

CHRON Timer

To add a CHRON timer that pops on regular intervals, perform the following steps:

1. Display the Timer Management panel. To display the Timer Management panel, see "Using NetView Timer Management Panels" on page 184.
2. Display the Timer Set panel. To display the Timer Set panel, see "Setting Timers for a Specific Date and Time" on page 188.
3. If the Timer Set panel does not already display the CHRON pop-up window, type 4 in the **Timer Type** field and press Enter. The pop-up window matching the CHRON timer type is displayed, as shown in Figure 103 on page 193.



```
EZLK6210            Set CHRON EVERY Timer  NTV6D OPER2    07/19/19 19:49:45
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
CHRON Type 1 1 EVERY         ..................................................
             2 AT            :                   EVERY                        :
             3 AFTER         :                                                :
                             : Interval 3 1  00 :   00 :   00     (HH:MM:SS)  :
Save . . . 2 1 Yes   2 No    :            2                                   :
Clock. . . 1 1 Local 2 GMT   :              (yyyy-mm-dd-hh.mm.ss.micros)      :
Timerid. .                   :            3 Daily                             :
Route. . .                   :................................................:

Scheduled.                                                Refresh 2 1 Yes 2 No
Recovery . 1 1 Ignore  2 Autolgn  3 Purge                 Test. . 2 1 Yes 2 No
                                                          Debug . 2 1 Yes 2 No
Remark
Command


Command ===>
F1=Help  F2=Display Results F3=Return      F4=Options  F5=Intervals  F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 103. Set Panel with CHRON Timer Type of EVERY

Note: To set the timer for a different domain or system, see "Selecting Remote Targets" on page 185.

- In the Interval pop-up window, specify how often you want your command to be issued in one of the following ways:
  - Type 1 to specify how often the command is to be issued in your local time format.
  - Type 2 to specify how often the command is to be issued in programmer format, which specifies intervals greater than 24 hours.
  - Type 3 to specify that the command is to be issued every 24 hours.

  Note: The pop-up windows for CHRON AT and CHRON AFTER timers contain slightly different information.
- Type 1 in the **Save** field to save the timer or type 2 if you do not want to save the timer.
- Type 2 in the **Clock** field for Greenwich Mean Time, or type 1 if you want local time.
- Specify a timer ID in the **Timerid** field (optional).
- Type the operator ID that is to issue the command in the Route field (optional).

- Type 1 in the **Recovery** field to ignore the command if the task on which it is to run is not active, type 2 to automatically have the task started to issue the command, or type 3 to purge the timer if the task is not active.
- Type 1 in the **Refresh** field for Yes, to refresh the command; or type 2 for No, do not Refresh.
- Type 1 for Yes, in the **Test** field to test the command, or type 2 for No, do not Test.
- Type 1 in the **Debug** field for Yes, to debug the command or type 2 for No, do not Debug.
- Type a comment to be included in the CHRON command in the **Remark** field, for example: `This timer periodically displays a list of active operators.`
- Type the command that you want to be issued in the **Command** field, for example: `list status=ops`

The following list describes the function keys for the CHRON TIMER panels:

F1
Displays brief help for the current panel.

F2
Displays the results of the CHRON command that was issued when F9 was pressed.

F3
Displays the previous panel. No data is saved.

F4
Displays the options panel.

F5
This function key is available only for a CHRON EVERY timer; use it to specify more detailed interval options.

F6
Rolls you to another component.

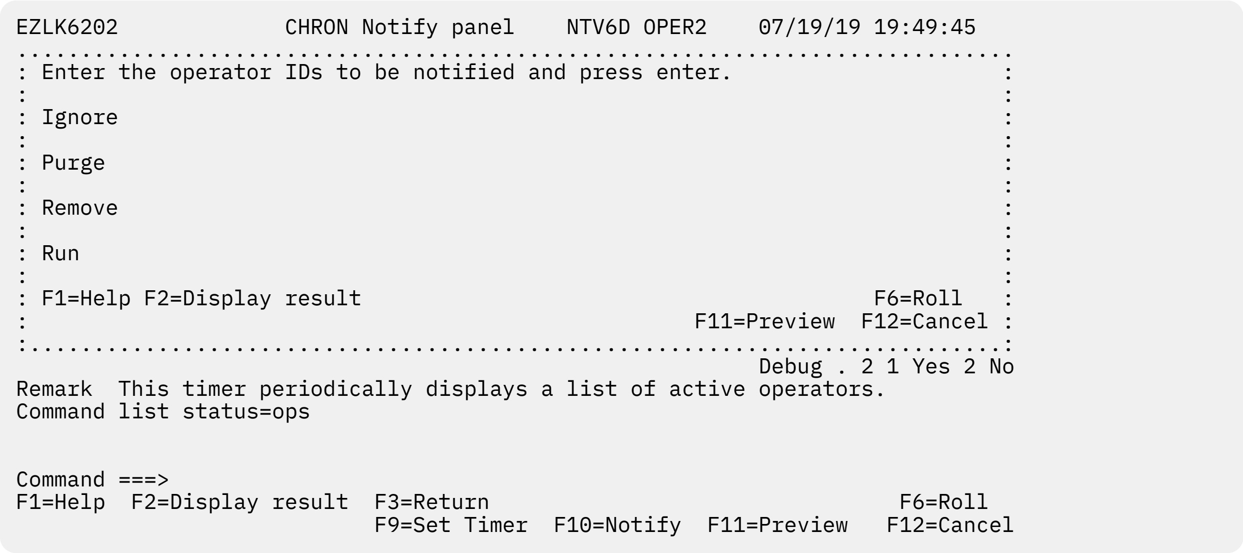
F9
Sets the CHRON timer.

F10
Displays the Notify panel.

F11
Displays a preview of the CHRON command that is to be issued when you press F9.

F12
Displays the previous panel. No data is saved.

4. When you press F10 in the timer set panels, the panel shown in Figure 104 on page 195 is displayed.

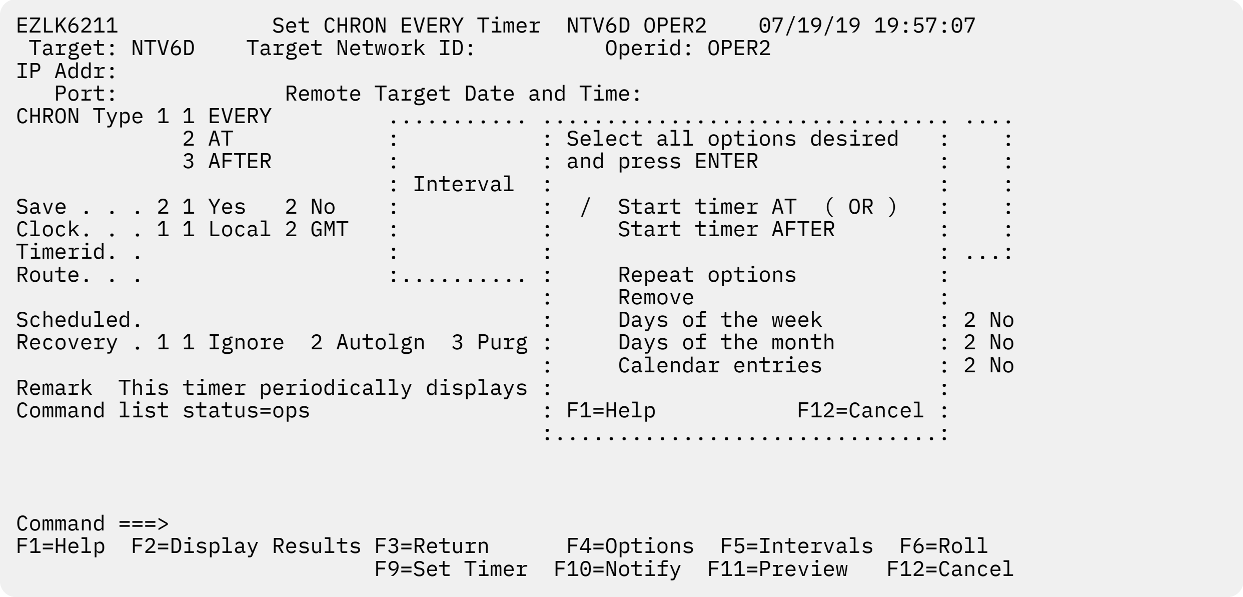


```
EZLK6202             CHRON Notify panel    NTV6D OPER2    07/19/19 19:49:45
..............................................................................
: Enter the operator IDs to be notified and press enter.                     :
:                                                                            :
: Ignore                                                                     :
:                                                                            :
: Purge                                                                      :
:                                                                            :
: Remove                                                                     :
:                                                                            :
: Run                                                                        :
:                                                                            :
: F1=Help F2=Display result                                        F6=Roll   :
:                                                    F11=Preview  F12=Cancel :
:............................................................................:
                                                          Debug . 2 1 Yes 2 No
Remark  This timer periodically displays a list of active operators.
Command list status=ops


Command ===>
F1=Help  F2=Display result  F3=Return                               F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 104. Timer Notify Panel

- Type one or more operator IDs in the **Ignore** field to specify which operators to notify when the command does not run because the specified task is not active.
- Type one or more operator IDs in the **Purge** field to specify which operators to notify when the command does not run because it was purged.
- Type one or more operator IDs in the **Remove** field to specify which operators to notify when the command does not run because it was removed.
- Type one or more operator IDs in the **Run** field to specify which operators to notify when the command runs.

5. Press Enter to return to the EZLK6210 panel.
6. If you press F5 in the EZLK6210 panel, for more detailed interval options, the panel shown in Figure 105 on page 195 is displayed:



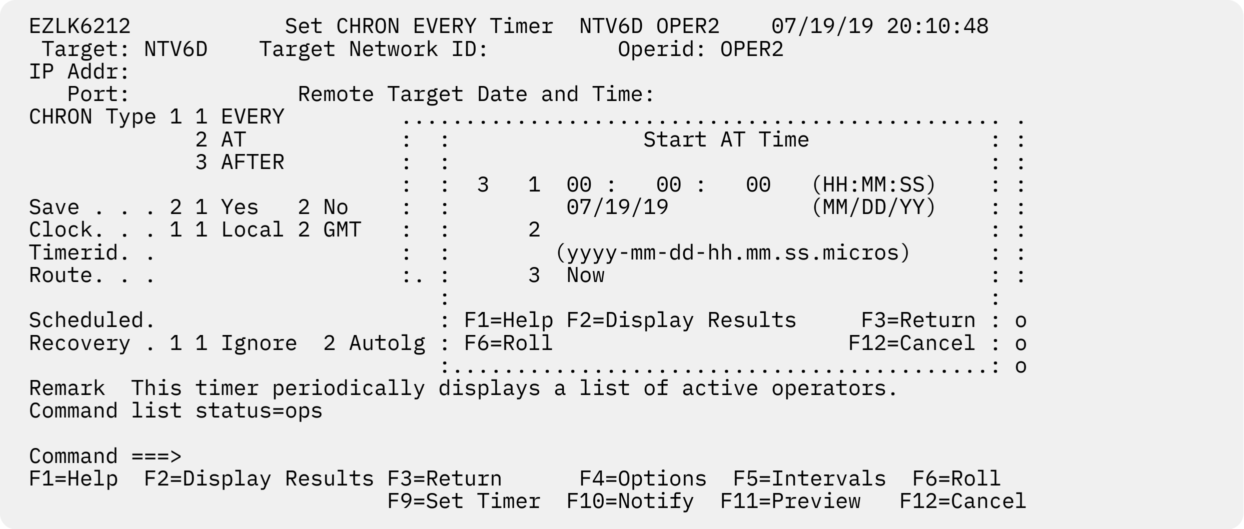
```
EZLK6211            Set CHRON EVERY Timer  NTV6D OPER2    07/19/19 19:57:07
 Target: NTV6D    Target Network ID:          Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
CHRON Type 1 1 EVERY         ........... ................................ ....
             2 AT            :           : Select all options desired   :    :
             3 AFTER         :           : and press ENTER              :    :
                             : Interval  :                              :    :
Save . . . 2 1 Yes   2 No    :           :  /  Start timer AT  ( OR )   :    :
Clock. . . 1 1 Local 2 GMT   :           :     Start timer AFTER        :    :
Timerid. .                   :           :                              : ...:
Route. . .                   :.......... :     Repeat options           :
                                         :     Remove                   :
Scheduled.                               :     Days of the week         : 2 No
Recovery . 1 1 Ignore  2 Autolgn  3 Purg :     Days of the month        : 2 No
                                         :     Calendar entries         : 2 No
Remark  This timer periodically displays :                              :
Command list status=ops                  : F1=Help           F12=Cancel :
                                         :..............................:



Command ===>
F1=Help  F2=Display Results F3=Return      F4=Options  F5=Intervals  F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 105. Timer Interval Panel

- **Start timer AT** displays a panel where you can specify the time when the EVERY is to start.
- **Start timer AFTER** displays a panel where you can specify a delay interval after which the EVERY is to start.

- **Repeat options** displays a panel where you can specify how often a command is issued.
- **Remove** displays a panel where you can specify when the command is to be deleted.
- **Days of the week** displays a panel where you can specify the days of the week the command is or is not to be issued.
- **Days of the month** displays a panel where you can specify the days of the month the command is or is not to be issued.
- **Calendar entries** displays a panel where you can specify key names (that are defined in DSISCHED) on which the command is or is not to be issued.

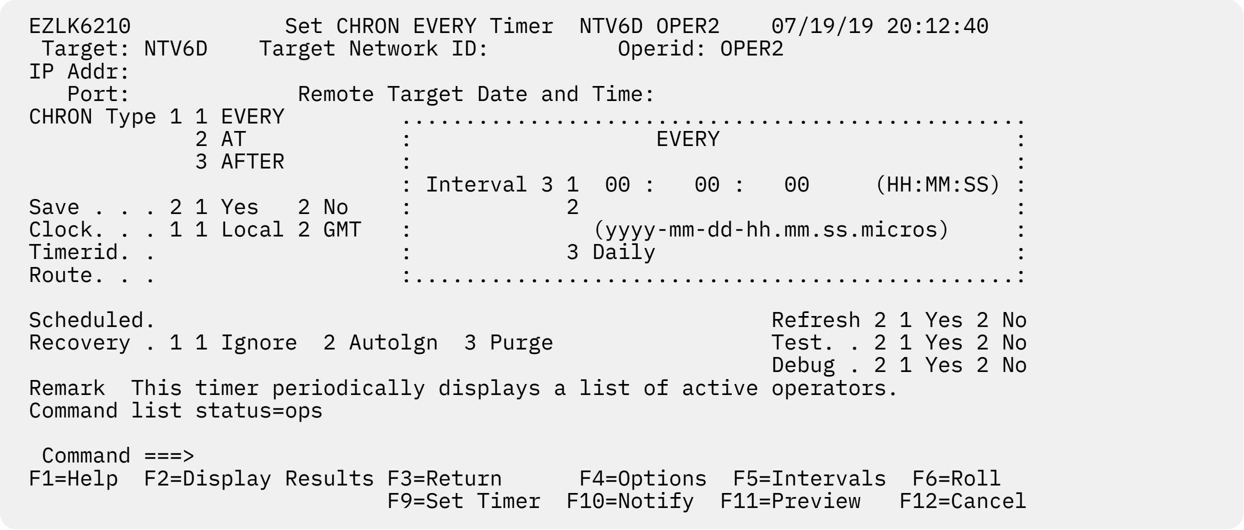
7. Select the options you want, in this case, **Start timer AT**, and press Enter. A panel similar to the panel shown in Figure 106 on page 196 is displayed.



```
EZLK6212            Set CHRON EVERY Timer  NTV6D OPER2    07/19/19 20:10:48
 Target: NTV6D    Target Network ID:          Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
CHRON Type 1 1 EVERY         ............................................... .
             2 AT            :  :               Start AT Time              : :
             3 AFTER         :  :                                          : :
                             :  :  3   1  00 :   00 :   00   (HH:MM:SS)    : :
Save . . . 2 1 Yes   2 No    :  :         07/19/19           (MM/DD/YY)    : :
Clock. . . 1 1 Local 2 GMT   :  :      2                                   : :
Timerid. .                   :  :        (yyyy-mm-dd-hh.mm.ss.micros)      : :
Route. . .                   :. :      3  Now                              : :
                                :                                          :
Scheduled.                      : F1=Help F2=Display Results     F3=Return : o
Recovery . 1 1 Ignore  2 Autolg : F6=Roll                       F12=Cancel : o
                                :..........................................: o
Remark  This timer periodically displays a list of active operators.
Command list status=ops

Command ===>
F1=Help  F2=Display Results F3=Return      F4=Options  F5=Intervals  F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 106. CHRON EVERY Timer Example

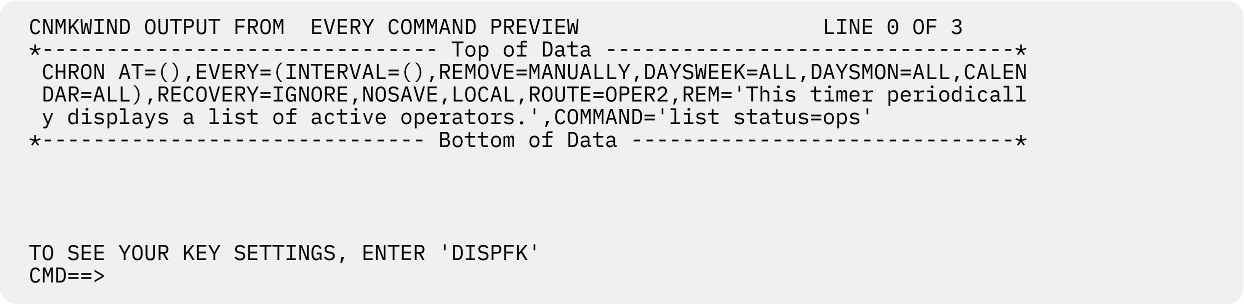
8. To return to the EZLK6210 panel, press Enter. A panel similar to the panel shown in Figure 107 on page 196 is displayed.



```
EZLK6210            Set CHRON EVERY Timer  NTV6D OPER2    07/19/19 20:12:40
 Target: NTV6D    Target Network ID:          Operid: OPER2
IP Addr:
   Port:             Remote Target Date and Time:
CHRON Type 1 1 EVERY         .................................................
             2 AT            :                   EVERY                       :
             3 AFTER         :                                               :
                             : Interval 3 1  00 :   00 :   00     (HH:MM:SS) :
Save . . . 2 1 Yes   2 No    :            2                                  :
Clock. . . 1 1 Local 2 GMT   :              (yyyy-mm-dd-hh.mm.ss.micros)     :
Timerid. .                   :            3 Daily                            :
Route. . .                   :...............................................:

Scheduled.                                                Refresh 2 1 Yes 2 No
Recovery . 1 1 Ignore  2 Autolgn  3 Purge                 Test. . 2 1 Yes 2 No
                                                          Debug . 2 1 Yes 2 No
Remark  This timer periodically displays a list of active operators.
Command list status=ops

 Command ===>
F1=Help  F2=Display Results F3=Return      F4=Options  F5=Intervals  F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 107. CHRON EVERY Timer Example

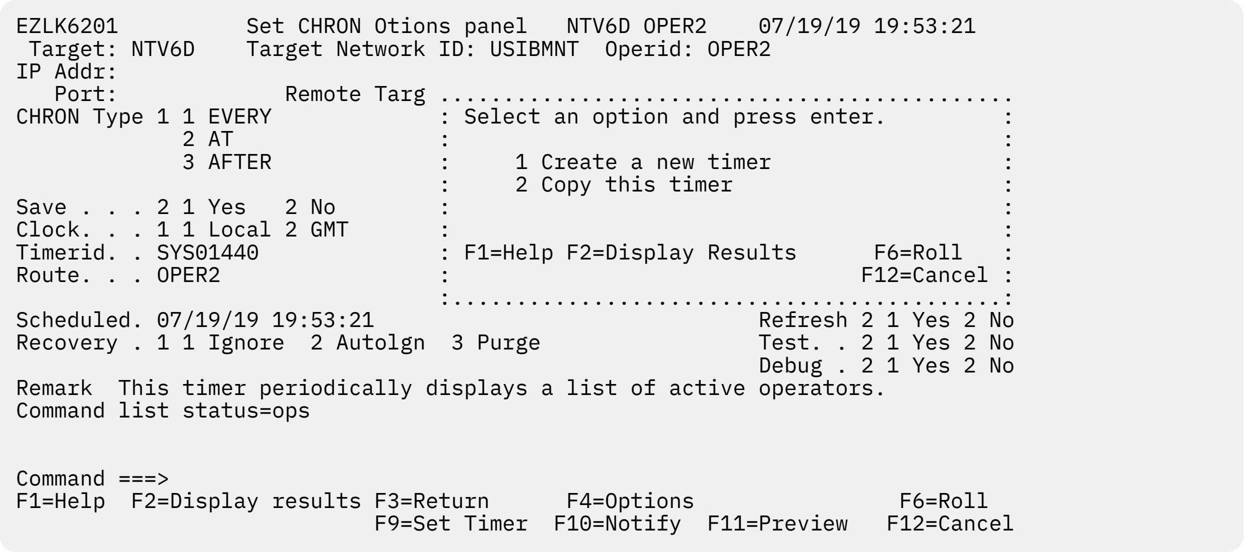
9. To see the options that are set in the CHRON command, press F11. A panel similar to the panel shown in Figure 108 on page 197 is displayed.



```
CNMKWIND OUTPUT FROM  EVERY COMMAND PREVIEW                  LINE 0 OF 3
*------------------------------- Top of Data -------------------------------*
 CHRON AT=(),EVERY=(INTERVAL=(),REMOVE=MANUALLY,DAYSWEEK=ALL,DAYSMON=ALL,CALEN
 DAR=ALL),RECOVERY=IGNORE,NOSAVE,LOCAL,ROUTE=OPER2,REM='This timer periodicall
 y displays a list of active operators.',COMMAND='list status=ops'
*------------------------------ Bottom of Data ------------------------------*




TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==>
```

Figure 108. CHRON EVERY Timer Preview

10. After previewing the timer, press F3 to return to the EZLK6210 panel.
11. To set the timer, press F9. A message saying the timer is set is displayed.
12. Press F2 to display the results of the CHRON command.
13. To return to the EZLK6210 panel, press F3.
14. To create a new timer or to copy the timer you created, press F4 to display the panel shown in Figure 109 on page 197.



```
EZLK6201          Set CHRON Otions panel   NTV6D OPER2    07/19/19 19:53:21
 Target: NTV6D    Target Network ID: USIBMNT  Operid: OPER2
IP Addr:
   Port:             Remote Targ .............................................
CHRON Type 1 1 EVERY             : Select an option and press enter.         :
             2 AT                :                                           :
             3 AFTER             :     1 Create a new timer                  :
                                 :     2 Copy this timer                     :
Save . . . 2 1 Yes   2 No        :                                           :
Clock. . . 1 1 Local 2 GMT       :                                           :
Timerid. . SYS01440              : F1=Help F2=Display Results      F6=Roll   :
Route. . . OPER2                 :                                F12=Cancel :
                                 :...........................................:
Scheduled. 07/19/19 19:53:21                              Refresh 2 1 Yes 2 No
Recovery . 1 1 Ignore  2 Autolgn  3 Purge                 Test. . 2 1 Yes 2 No
                                                          Debug . 2 1 Yes 2 No
Remark  This timer periodically displays a list of active operators.
Command list status=ops


Command ===>
F1=Help  F2=Display results F3=Return      F4=Options               F6=Roll
                            F9=Set Timer  F10=Notify  F11=Preview   F12=Cancel
```

Figure 109. Timer Options Panel to Create a New Timer or Copy a Timer

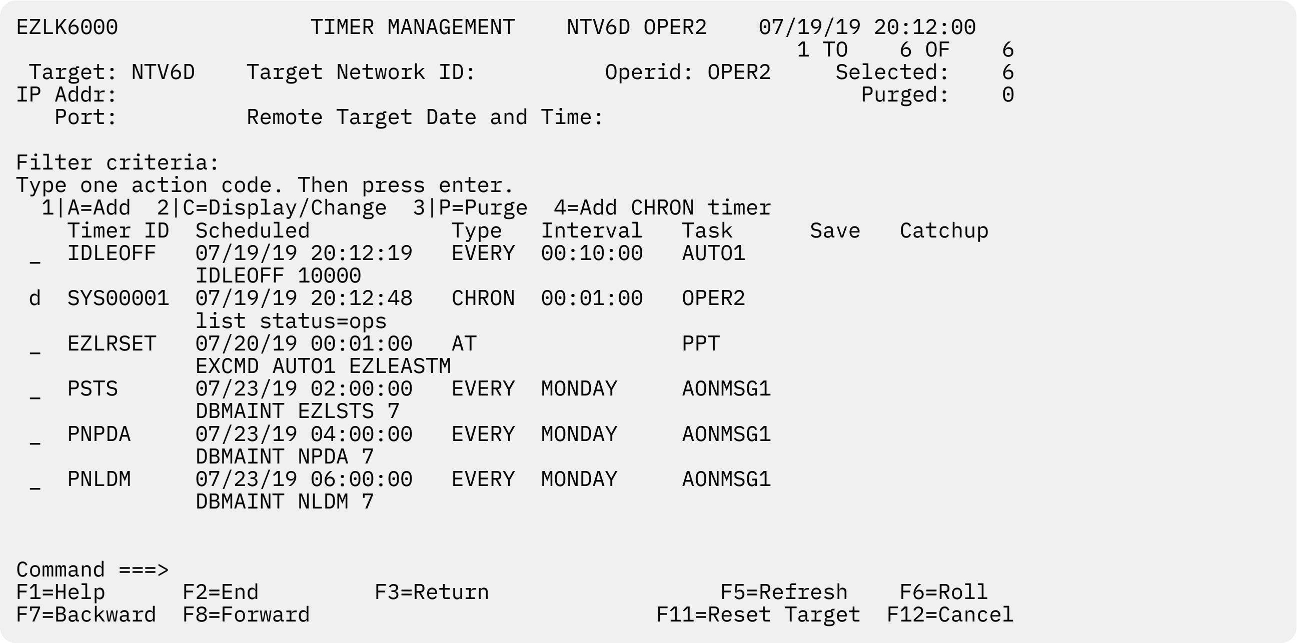
Type 1 to create a new timer of the same type or type 2 to copy a timer. You can copy a timer only if it was set previously.

Purging (Deleting) Timers

To purge a timer, type 3 or P in the input field beside the timer you want to purge and press Enter.

Note: Although D for Delete is not an option on the Timer Management panel, it is supported.

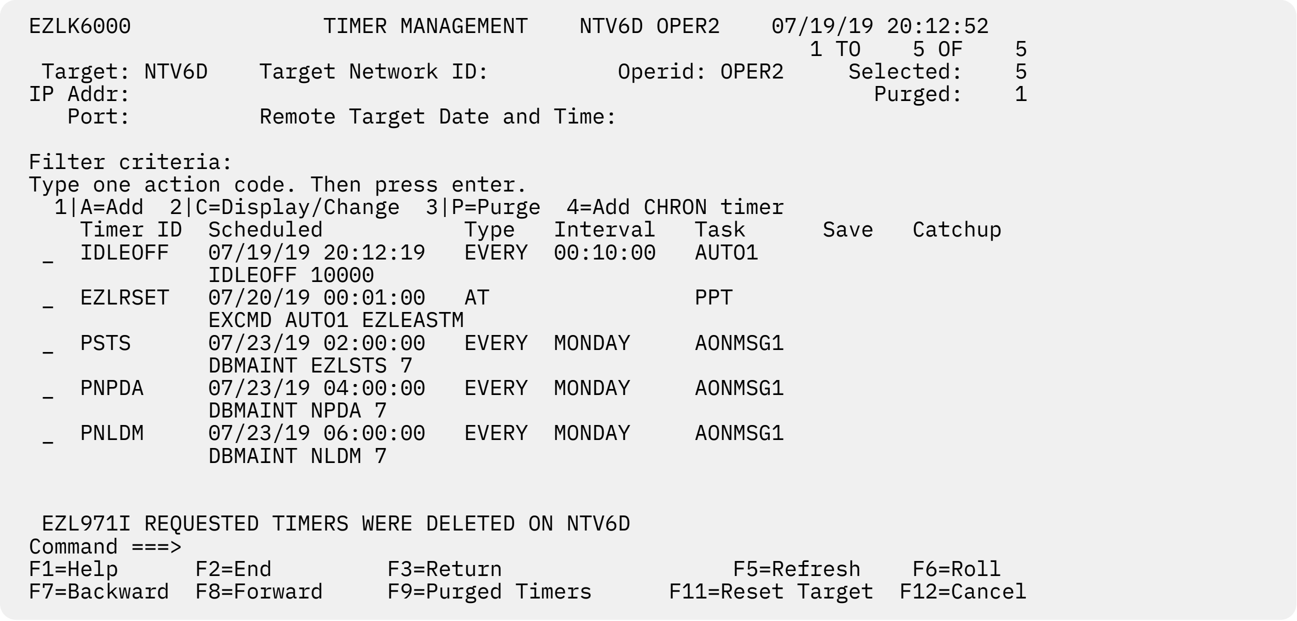
Figure 110 on page 198 shows a timer being purged.



```
EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 20:12:00
                                                             1 TO    6 OF    6
 Target: NTV6D    Target Network ID:          Operid: OPER2     Selected:    6
IP Addr:                                                          Purged:    0
   Port:          Remote Target Date and Time:

Filter criteria:
Type one action code. Then press enter.
  1|A=Add  2|C=Display/Change  3|P=Purge  4=Add CHRON timer
    Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
 _  IDLEOFF   07/19/19 20:12:19   EVERY  00:10:00   AUTO1
              IDLEOFF 10000
 d  SYS00001  07/19/19 20:12:48   CHRON  00:01:00   OPER2
              list status=ops
 _  EZLRSET   07/20/19 00:01:00   AT                PPT
              EXCMD AUTO1 EZLEASTM
 _  PSTS      07/23/19 02:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT EZLSTS 7
 _  PNPDA     07/23/19 04:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NPDA 7
 _  PNLDM     07/23/19 06:00:00   EVERY  MONDAY     AONMSG1
              DBMAINT NLDM 7


Command ===>
F1=Help      F2=End         F3=Return                 F5=Refresh    F6=Roll
F7=Backward  F8=Forward                          F11=Reset Target  F12=Cancel
```

Figure 110. Example of Purging a Timer

After you press Enter to purge a specific timer, the panel shown in Figure 111 on page 198 is displayed. In the following example, the Total Purged Timers is now set to **1**, and **F9=Purged Timers** is displayed.

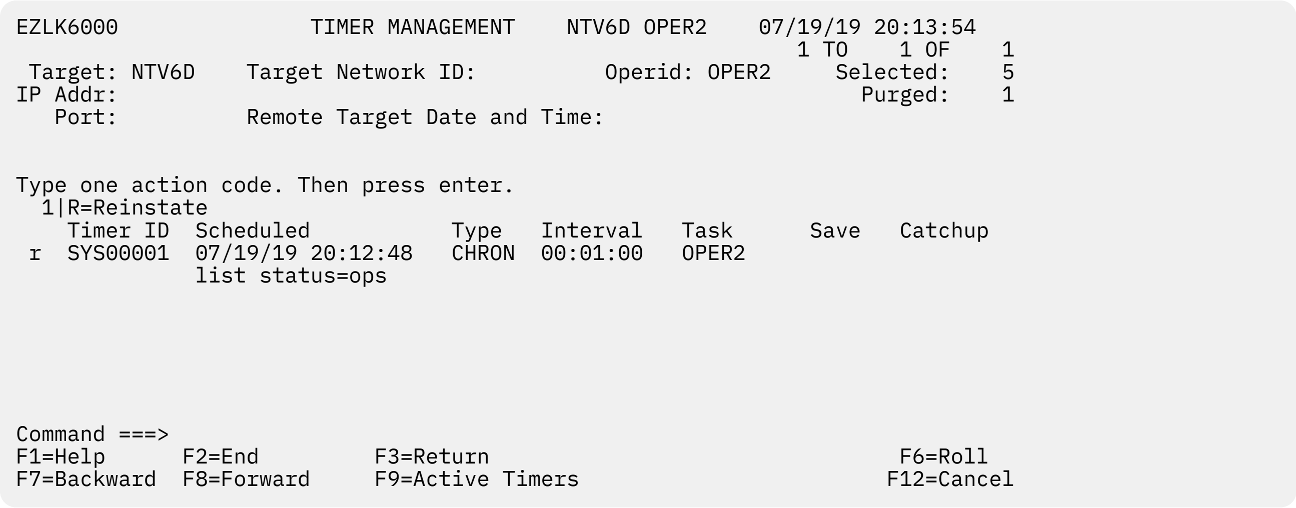


```
 EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 20:12:52
                                                              1 TO    5 OF    5
  Target: NTV6D    Target Network ID:          Operid: OPER2     Selected:    5
 IP Addr:                                                          Purged:    1
    Port:          Remote Target Date and Time:

 Filter criteria:
 Type one action code. Then press enter.
   1|A=Add  2|C=Display/Change  3|P=Purge  4=Add CHRON timer
     Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
  _  IDLEOFF   07/19/19 20:12:19   EVERY  00:10:00   AUTO1
               IDLEOFF 10000
  _  EZLRSET   07/20/19 00:01:00   AT                PPT
               EXCMD AUTO1 EZLEASTM
  _  PSTS      07/23/19 02:00:00   EVERY  MONDAY     AONMSG1
               DBMAINT EZLSTS 7
  _  PNPDA     07/23/19 04:00:00   EVERY  MONDAY     AONMSG1
               DBMAINT NPDA 7
  _  PNLDM     07/23/19 06:00:00   EVERY  MONDAY     AONMSG1
               DBMAINT NLDM 7


  EZL971I REQUESTED TIMERS WERE DELETED ON NTV6D
 Command ===>
 F1=Help      F2=End         F3=Return                 F5=Refresh    F6=Roll
 F7=Backward  F8=Forward     F9=Purged Timers      F11=Reset Target  F12=Cancel
```

Figure 111. Active Timer Panel After a Purge

Reinstating Timers

To display purged (or deleted) timers, press F9 on the Active Timer panel. Figure 112 on page 199 shows an example of a Purged Timer panel.



```
EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 20:13:54
                                                             1 TO    1 OF    1
 Target: NTV6D    Target Network ID:          Operid: OPER2     Selected:    5
IP Addr:                                                          Purged:    1
   Port:          Remote Target Date and Time:


Type one action code. Then press enter.
  1|R=Reinstate
    Timer ID  Scheduled           Type   Interval   Task      Save   Catchup
 r  SYS00001  07/19/19 20:12:48   CHRON  00:01:00   OPER2
              list status=ops






Command ===>
F1=Help      F2=End         F3=Return                                F6=Roll
F7=Backward  F8=Forward     F9=Active Timers                        F12=Cancel
```

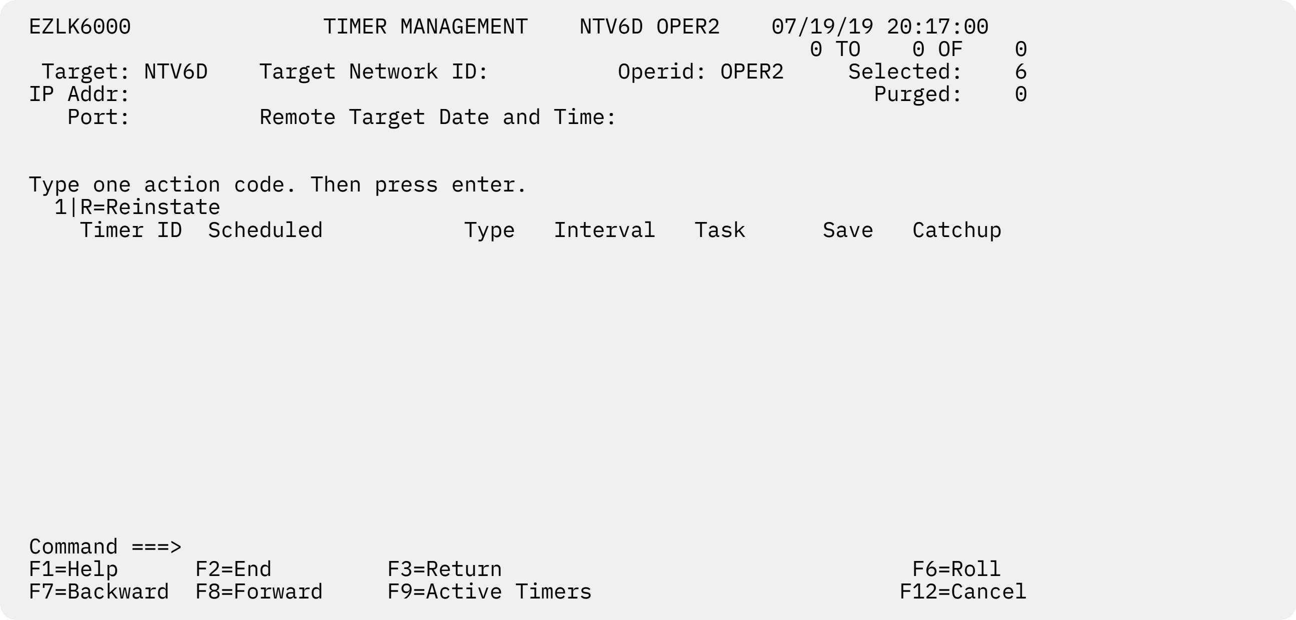
Figure 112. Example of Purged (or Deleted) Timer Panel

To reinstate a purged timer, type 1 in the input field beside the timer that you want to reinstate and press Enter. The Change Timer panel that is appropriate for the timer you requested to be reinstated is displayed. Follow the steps listed previously for changing timers and make any necessary changes before setting the timer.

Figure 113 on page 199 shows the panel that is displayed after the requested timer has been set. Note the following changes on the panel:

- The timer is no longer displayed.
- The Selected field is increased by 1.
- The Purged field is decreased by 1.

Press F9 to display your active timers.



```
 EZLK6000               TIMER MANAGEMENT    NTV6D OPER2    07/19/19 20:17:00
                                                              0 TO    0 OF    0
  Target: NTV6D    Target Network ID:          Operid: OPER2     Selected:    6
 IP Addr:                                                          Purged:    0
    Port:          Remote Target Date and Time:


 Type one action code. Then press enter.
   1|R=Reinstate
     Timer ID  Scheduled           Type   Interval   Task      Save   Catchup












 Command ===>
 F1=Help      F2=End         F3=Return                                F6=Roll
 F7=Backward  F8=Forward     F9=Active Timers                        F12=Cancel
```

Figure 113. Purged (or Deleted) Timer Panel After Reinstating

Chapter 17. Debugging Automation

In automating your enterprise using the NetView program, the unexpected occasionally happens: a command list that was supposed to handle a problem does not handle it; a message that was supposed to be automated was not; an alert that was supposed to be suppressed was not; a timed command does not run when it was supposed to; and so on.

Even in the most comprehensive automated environment, human intervention is sometimes required to solve a problem that automation was not designed to handle and to update automation when it fails to detect or recover a problem. The remainder of this chapter contains problem scenarios followed by problem determination steps and possible solutions.

Determining Why a Message Is Not Automated by the Automation Table

If a message was not automated by the automation table, first consider the message type. If the message is a log-only message (a message that only goes to the network log), it is not subject to processing by the automation table or by the ASSIGN command. An example of a log-only message is CNM154I.

If the message is processed by the operating system before being forwarded to NetView, complete the following steps to determine why the message was not automated by the automation table:

1. Determine whether AUTO(NO) is specified for the message in MPF. In MPF, specifying AUTO(NO) either as a default or specifically on an MPF entry for a message prevents the message from being forwarded to the NetView program for automation. If AUTO(NO) is specified in your MPF table for this message, AUTO(YES) or AUTO(token) needs to be specified if you want the message to be processed by the NetView program.
2. If you are using the MVS subsystem interface (SSI) rather than extended consoles for automation, determine whether the SSI address space is active. Issue the command `d a,l` from the MVS operating system console to return a list of active system address spaces (among other information), one of which is be the NetView subsystem address space application name. If the NetView subsystem address space is inactive, it can be activated by starting the NetView subsystem procedure (CNMPSSI as shipped with NetView).
3. Determine whether the NetView CNMCSSIR task is active. Issue the NetView command, LIST STATUS=OPT, to find out if the CNMCSSIR task is active. If it is not active, the NetView program does not receive unsolicited system messages over the subsystem interface.
4. If you are using MVS extended consoles, you must have:

   - An extended console with the AUTO(YES) attribute
   - The task with load module name CNMCSSIR active

   Optionally, you can have another task receive AUTO(YES) messages.

Checking Other Areas

Use the following additional steps to determine why a message was not automated:

1. Determine whether the installation exit DSIEX02A, DSIEX16, or DSIEX17 is changing or deleting the message. If you have an active DSIEX02A, DSIEX16, or DSIEX17 exit routine, it can affect the message. DSIEX02A and DSIEX17 can change or delete the message prior to automation, and DSIEX16 can affect the message or automation actions scheduled by the automation table.
2. Determine whether a TRAP in a REXX or HLL program, an &WAIT in a NetView command list language command list, or a PIPE command is suppressing the message. The message is not processed by the automation table or logged to the network log if:

   - It is being processed on a NetView task that has an active TRAP AND SUPPRESS (REXX and HLL).

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   - It is being processed on a NetView task that has a &WAIT that is waiting for the message with &WAIT SUPPRESS in effect (NetView command list language).
   - It is issued within a PIPE command without the EXPOSE stage.
3. Issue a NetView AUTOTBL STATUS command to find out which automation table is currently active and determine whether this is the correct automation table.
4. Determine whether the automation table is receiving the message. You can accomplish this by adding the following statement to your automation table:

   ```
   IF MSGID = 'XYZ123I' THEN
      EXEC(CMD('MSG OPER1 AUTOMATION IS RECEIVING XYZ123I'))
      CONTINUE(Y);
   ```

   This statement sends OPER1 a message (DSI039I) when the message that is to be automated is received by the automation table. This statement does not affect any other processing of the message by subsequent statements in the automation table because of the CONTINUE(Y) action, which allows later automation table statements in the table to also process the message. Message DSI039I identifies the task that processed the message.
5. Trace the processing of a message or MSU through the automation table using the TRACE action. The TRACE action sets a trace tag in the AIFR and an indicator that the AIFR is to be traced as it is processed by the automation table. Detailed trace information is displayed on the console by message BNH370I for each part of each automation table statement that analyzes the AIFR.

   An example automation table statement to trace a message whose text begins with the characters WAC follows:

   ```
   IF (LABEL: STATEMENT1) TEXT = 'WAC' . THEN
     TRACE('TRCTAG01');
   ```
6. Use the AUTOCNT command to generate a detailed automation table usage report, then determine whether multiple statements in the automation table match the message. A message detail usage report shows how often an automation table statement was compared against messages and how often it was matched with messages.

Reading the Message Detail Report

Table 14 on page 202 shows how to interpret some of the data from the detail report.

Table 14. Determining Why a Message Was Not Automated Using the Detail Report

Indicators	**Possible explanation**
COMPARE COUNT > 0 MATCH COUNT = 0	The automation table statement might be coded incorrectly, in which case the automation statement never matches the message
MATCH COUNT = 0 COMPARE COUNT = 0	It is possible that a prior statement in the automation table matches the message and prevents the statement from being processed

If a command was scheduled, determine which of the following situations prevented it from running:

- It was sent to a task that was not logged on.

  You can use the LIST STATUS=OP command to determine whether the task that was supposed to receive the command is logged on, although it does not tell you if the task was logged on at the time the message was automated. You can also check the network log for DWO032E messages, which are written when a command is sent to a task that is not logged on. A CNM493I message found near a DWO032E message identifies the statement in the automation table that scheduled the command.

- Another command list is running and has not finished. The following example situations might cause a command list not to finish running, thus possibly preventing other command lists from running:
  - Using an &WAIT (NetView command list) or a TRAP or WAIT (REXX) without a timeout value. The command list waits forever without a timeout value.
  - For command lists running under an autotask, using an &PAUSE (NetView command list) or a PULL (REXX) to wait for operator input in a command list, causes the command list to wait forever because no console is available to provide input.
  - Using a WTOR to the system console that never gets a reply.
  - Processing in an infinite loop, which never completes.

  To determine which command list is preventing the task from ending:

  - Use the LIST *taskname* command for a task to show whether a command list is currently running. Then enter `EXCMD taskname,RESET` to halt the command list that is currently running. This command generates a message in the NetView log that informs that the command list was reset.
  - Scan the network log for the last CNM493I message for this operator. This typically indicates the last command scheduled to that task from the automation table. However, this does not indicate commands scheduled with timer commands, started using EXCMD from other tasks, and other non-operator commands.
- Determine whether command security prevents a command or command list from being issued from the automation table. If you set AUTOSEC=CHECK using the NetView DEFAULTS command, all commands routed from the automation table are authority checked against the target task, unless SEC=BY was specified on the CMDDEF statement.

Topic:	**Reference:**
The AUTOTBL, AUTOCNT, and TASKUTIL commands	NetView online help
Using the TASKUTIL command	Additional information about the TASKUTIL command can be found in the *IBM Z NetView Tuning Guide*
The DSIEX16 and DSIEX17 installation exits	*IBM Z NetView Programming: Assembler*
DSIEX02A and XITCI installation exits	*IBM Z NetView Programming: Assembler* or *IBM Z NetView Programming: PL/I and C*
Using MPF, PROP, and OCCF	*IBM Z NetView Automation Guide*
MVS extended consoles for automation	*IBM Z NetView Automation Guide*
Command security	*IBM Z NetView Security Reference*

Determining Why an Alert Is Not Automated

To determine why an alert is not automated:

1. Determine whether the alert is blocked by a RATE statement. If you do not use an AUTORATE statement, MSUs blocked by a filter set by the RATE function are not automated.
2. If the alert is not showing up in the hardware monitor database, it might be blocked by either an SRFILTER command in the hardware monitor or an SRF action in the automation table.
3. Determine whether the intended automation statement is coded correctly. For example, when you specify a *byte* position within an MSU major vector, subvector, or subfield for the MSUSEG condition item, be sure to include key and length values. Note that *byte* position refers to position, not offset

(start counting at 1, not at 0). To determine whether an MSU condition is not coded correctly, consider adding a statement similar to the following example to display portions of the MSU:

```
IF MSUSEG(0000.xx.xx) = ALERT_SUBFIELD THEN
   EXEC(CMD('MSG NETOP1 ALERT 0000.xx.xx RECEIVED, xx SUBFIELD
        IS 'ALERT_SUBFIELD)
   ROUTE(ONE AUTOx))
   CONTINUE(Y);
```

This can assist you in determining how to correctly code automation table statements.

4. Determine whether the installation exit XITCI or DSIEX16B is changing or deleting the alert. If you have an active XITCI or DSIEX16B exit routine, it can affect the alert. XITCI can change or delete the alert prior to automation, and DSIEX16B can affect the alert or automation actions scheduled by the automation table.
5. Issue the NetView AUTOTBL STATUS command to find out which automation table is currently active and determine whether this is the correct automation table.
6. Determine whether the automation table is receiving the alert. You can accomplish this by adding a statement like this to your automation table:

```
IF MSUSEG(0000.xx) = . 'xxxxxxx' . THEN
   EXEC(CMD('MSG OPER1 AUTOMATION IS RECEIVING xxxxxxxx ALERT')
        ROUTE (ONE AUTOx))
   CONTINUE(Y);
```

Note: The ROUTE statement is included because under certain conditions (for example, if BNJDSERV is not started from an OST) certain actions fail because they cannot be processed under BNJDSERV (DST). This statement sends OPER1 a message (DSI039I) when the alert is received by the automation table.

This statement does not affect other processing of the alert by subsequent statements in the automation table because of the CONTINUE(Y) action. The CONTINUE(Y) action allows other or subsequent automation table statements in the table to also process the alert.

7. Use the AUTOCNT command to generate a detailed automation table usage report, then determine whether multiple statements in the automation table match the alert. A detailed automation table usage report shows how often an automation table statement was compared against an alert and how often it was matched with an alert.

Table 15 on page 204 shows how to interpret some of the data from the detail report.

Table 15. Determining Why an Alert Was not Automated Using the Detail Report

Indicators	Explanation
COMPARE COUNT > 0 MATCH COUNT = 0	The automation table statement might be coded incorrectly, in which case the automation statement never matches the alert
MATCH COUNT = 0 COMPARE COUNT = 0	It is possible that a prior statement in the automation table matches the alert and prevents the statement from being processed

8. Determine whether the conditions and actions are coded correctly on the automation statement.
9. Determine whether an automation table MSUSEG function has a typographical error.
10. If a command was scheduled, determine whether it was prevented from running because:

    - It was sent to a task that was not logged on.

      You can use the LIST STATUS=OP command to determine whether the task that was supposed to receive the command is logged on, although it does not tell you if the task was logged on at the time the alert was automated. You can also check the network log for DWO032E messages, which are written when a command is sent to a task that is not logged on. A CNM493I message found near a DWO032E message identifies the statement in the automation table that scheduled the command.

- Another command list is running and has not finished. The following example situations might cause a command list not to finish running, thus possibly preventing other command lists from running:

  - Using an &WAIT (NetView command list) or a TRAP or WAIT (REXX) without a timeout value. The command list waits without a timeout value.
  - Using an &PAUSE (NetView command list) or a PULL (REXX) to wait for operator input in a command list. Because no console is available to provide input, the command list waits. This applies only to command lists running under an autotask.
  - Using a WTOR to the system console that never gets a reply.
  - Processing in an infinite loop, which never completes.

  To determine which command list is preventing the task from ending:

  - Use the LIST *taskname* command for a task to show whether a command list is currently running. Then enter `EXCMD` *`taskname`*`,`RESET to halt the command list that is currently running. This command generates a message in the NetView log that informs that the command list was reset.
  - Scan the network log for the last CNM493I message for this operator. This typically indicates the last command scheduled to that task from the automation table. However, this does not indicate commands scheduled with timer commands, started using EXCMD from other tasks, and other non-operator commands.

Topic:	**Reference:**
RATE, AUTORATE statements	*IBM Z NetView Administration Reference*
SRFILTER, AUTOTBL, AUTOCNT, TASKUTIL commands	NetView online help
Using the TASKUTIL command	Additional information about the TASKUTIL command can be found in the *IBM Z NetView Tuning Guide*
MSUSEG condition item	*IBM Z NetView Automation Guide*
XITCI installation exit	*IBM Z NetView Programming: Assembler* or *IBM Z NetView Programming: PL/I and C*
DSIEX16B installation exit	*IBM Z NetView Programming: Assembler*

Determining Why an Alert Is Not Displayed in the Tivoli Netcool/OMNIbus Event List

To determine why a NetView alert is not displayed in the Tivoli Netcool/OMNIbus event list:

1. Verify that the NetView hardware monitor is active. If not, ensure that the NPDA tower is enabled.
2. Determine whether the NetView alert passed the NetView TECROUTE filter (defined on the SRFILTER command). To see the current definition for the TECROUTE filter, enter the `DFILTER TECROUTE` command. See the NetView online help for information about how to code the TECROUTE filter. The TECROUTE filter can also be set by the automation table.
3. Verify that the alert adapter (ALERTA) task of the Event/Automation Service (E/AS) is started. This task converts alert data to Event Integration Facility (EIF) events and sends them to the Netcool/OMNIbus EIF probe, which is an EIF event server.
4. Verify that an active subsystem interface (SSI) procedure (for example, the CNMSJ010 sample) enables the program-to-program interface (PPI). If not, start (or restart) an SSI procedure to enable the PPI.

5. Check your Tivoli event filters to determine whether the event was screened out by a filter. The IHSAACFG sample shows how to configure the ALERTA task and code the filters.
6. Ensure that Netcool/OMNIbus EIF event probe configuration is not causing the EIF events that are sent by the E/AS ALERTA task to be discarded.
7. If you customized the NetView class definition statements (CDS) file, check for the following errors:
   - Verify the syntax in the CDS file. A syntax error results in a NetView error message, and the event is not sent to the Netcool/OMNIbus EIF event probe.
   - Ensure that all slot names that are specified in the CDS file are compatible with the Netcool/OMNIbus EIF event probe.

Determining Why an Event Integration Facility Event Is Not Forwarded to the NetView Program

To determine why an Event Integration Facility (EIF) event is not forwarded to the NetView program, follow these steps:

1. Ensure that the EIF event source is configured to send EIF events to the event receiver task (EVENTRCV) of the Event/Automation Service of the NetView program.
2. Ensure that the Event/Automation Service and the EVENTRCV task are initialized.
3. Verify that an active subsystem interface (SSI) procedure (for example, the CNMSJ010 sample) enables the program-to-program interface (PPI). If not, start (or restart) an SSI procedure to enable the PPI.
4. Verify that the NetView alert receiver is active. The NetView alert receiver is an optional task that is defined or started with `MOD=CNMCALRT`.
5. Verify that the NetView hardware monitor is active. If it is not, check your NetView startup procedure for the hardware monitor startup command, and start the hardware monitor.
6. Determine whether the NetView recording filters (ESREC and AREC) are defined to pass this particular event through their filters. See the SRFILTER command definition in the NetView online help and "Using Hardware Monitor Filters" on page 140 for information about changing the ESREC and AREC filter definitions.

Determining Why a Command List Does Not Complete

Sometimes, a command list is not processed correctly. For example, you might know from message CNM493I that the command list was called by automation; however, one of the commands from the command list might not have been issued.

Use the following steps to determine why one or more commands from a command list did not run:

1. Determine whether command security prevented the command list from being issued. Command security can be defined by:
   - The NetView command authorization table
   - An SAF product, such as RACF

   If command security prevented the command list from running, message DSI213I in the netlog indicates that the command list is being protected.

   Look in the CNMCMD members for a CMDDEF statement. If you use a synonym for the command list, the command identifier in the CMDDEF statement needs to match the command security in effect.

   If you set AUTOSEC=CHECK using the NetView DEFAULTS command, all commands and command lists routed from the automation table are authority checked against the target task, unless SEC=BY was specified on the CMDDEF statement.

If your security administrator has set up command security to protect your command list, refer to the *IBM Z NetView Administration Reference* to get your security matching your expectations.

2. Verify that the command list was called correctly in the following way:

If called from...	Then...
Automation table	Verify that it ran under an active task. Unless you specify otherwise, the network log contains a CNM493I message for each command list called from the automation table.
A TIMER command	Verify that the timed command was scheduled to run, and that the task that was to run the command was active.
Another command list	Check to see that the logic path to call the command list was taken in the prior command list.

3. Trace the processing of the command list. You can use the REXX TRACE instruction and the NetView command list &CONTROL statement to:

   - Control the amount of feedback during processing
   - Indicate how statements are interpreted
   - Indicate whether statements complete processing

   Tracing helps identify problems such as:

   - Logic errors in the command list that produce unexpected results
   - Severe errors that halt processing
   - WAIT instructions or &WAIT control statements that continue processing while waiting for a message
   - The use of &PAUSE (NetView command list) or PULL (REXX) to wait for operator input in a command list running under an autotask causes the autotask to wait forever because no console is available to provide input.
   - Nested command lists that cause problems

4. Use the TASKUTIL command to determine whether the command did not run because another command, with a higher priority, was issued first and prevented the command from running. The TASKUTIL command can show if the task is currently running another command list.

In addition, the following NetView commands can affect how command lists are processed:

CMD, DEFAULTS, OVERRIDE
These commands can effect the priority at which a command is run.

RESET
This command can be used to cancel a command list that is running.

Topic:	Reference:
TRACE, PULL instruction	*TSO/E REXX/MVS Reference*
WAIT instruction	*IBM Z NetView Programming: REXX and the NetView Command List Language*
&CONTROL, &PAUSE statement	*IBM Z NetView Programming: REXX and the NetView Command List Language*
&WAIT statement	*IBM Z NetView Programming: REXX and the NetView Command List Language*
CMD, DEFAULTS, OVERRIDE, RESET, TASKUTIL commands	NetView online help

Topic:	Reference:
Using the TASKUTIL command	Additional information about the TASKUTIL command can be found in the *IBM Z NetView Tuning Guide*

Determining Why a Timed Command Does Not Run

To determine why a timed command did not run:

1. Determine whether command security protects the timer command or prevents the task from issuing the command. For instance, the command, its keywords, or values might be protecting using a NetView command authorization table or an SAF product such as RACF.

   In addition, depending on which task is checked for command authorization, the level of authorization at the source of the timer command might be wrong. To ensure that your timer command security meets your expectations, see the *IBM Z NetView Administration Reference*.
2. Verify that you specified the correct timer command. For example, if you want to schedule the STATREP command to run at 11:00 a.m., but you specify `after 11:00,statrep`, the command runs 11 hours from when you enter it, not at 11:00 a.m. (You can use the AT command to schedule the command at 11:00 a.m.).
3. Determine whether the command was scheduled for the following day because of an incorrect time specification on the AT command. Issue the LIST TIMER=ALL,OPER=ALL command to list all currently scheduled timed commands. If the timed command is listed there, but is scheduled to run on the following day, it is possible the time was specified incorrectly. An important thing to remember is that the timer command AT uses a 24 hour clock, so if you want to schedule a command for 6:00 p.m., specify 18:00, and not 6:00. For example, if you specify the AT 6:00,STATREP command after 6 a.m., the command is scheduled for 6:00 a.m. on the next day.
4. Determine whether the task that was supposed to run the command is logged off. The task that is to run the scheduled command needs to be active for the command to be issued. It is a good idea to schedule timer commands from autotasks that are always active, or to specify the PPT operand on the timer command so that they run on the NetView PPT task, which is always active. However, the PPT task and autotasks cannot process full-screen commands.
5. Determine whether a timer command scheduled to run under the NetView PPT task is not allowed to run under the PPT. In this case, schedule the command to run under an autotask or other operator task.
6. Determine whether the timer command was issued successfully. For example, it needs to have been issued from a command list but the command list never completed because of a syntax error in the command. The NetView log contains the syntax error message.
7. Determine whether the command was scheduled to a task but did not run because of a command list that is already running, but never finished. The following example situations might cause a command list to continue running, thus possibly preventing other command lists from running:

   - Using an &WAIT (NetView command list) or a TRAP or WAIT (REXX) without a timeout value. The command list waits forever without a timeout value.
   - Using an &PAUSE (NetView command list) or a PULL (REXX) to wait for operator input in a command list. Because no console is available to provide input, the command list waits forever. This applies only to command lists running under an autotask.
   - Using a WTOR to the system console that never gets a reply.
   - Processing in an infinite loop, which never completes.

   See “Determining Why a Command List Does Not Complete” on page 206 for additional information about determining why a command list did not run.
8. Determine whether the system went down and the timed command was not saved or restored.

Topic:	Reference:
AFTER, AT, EVERY command	NetView online help
&PAUSE statement	*IBM Z NetView Programming: REXX and the NetView Command List Language*
&WAIT statement	*IBM Z NetView Programming: REXX and the NetView Command List Language*
TRAP, WAIT instructions	*IBM Z NetView Programming: REXX and the NetView Command List Language*
PULL statement	*TSO/E REXX/MVS Reference*

Determining Why Automation Is Taking Too Much Processing Time

You can use the following NetView commands to help you determine how to tune your NetView automation processing:

TASKMON

This command displays processor, storage, message queuing, penalty time, and input/output statistics for tasks running in NetView program. Use this information to determine:

- Which tasks are taking too much processing time
- Which tasks are delayed by resource penalties
- Which tasks have excessive input/output that LOADCL procedures might help
- Which tasks have excessive message queuing activity or are causing delays in other tasks

TASKUTIL

This command shows total processing time (processor usage), and shows system and NetView percentages separately for each active NetView task. You can use this information to spot which autotask is using the most processing time to find which autotasks need help.

AUTOCNT

This command is used to determine how the automation table is being utilized by generating:

- Detailed usage reports that show on a statement-by-statement basis how often each statement has been compared and how often it has been matched. These numbers can be used to determine whether the table needs to be restructured.
- Summary reports that show the total number of commands processed from the automation table and the average messages and average alerts processed per minute. This information can help you spot increased system processing as a result of running a large number of commands and having automation process large numbers of messages and alerts.

You can then tune your NetView automation processing by:

- Placing the most heavily matched statements at the top of the automation table. Because a preprocessed, internal version of the automation table is searched in a top-down method, this saves processing.
- Suppressing system messages, where possible, using the operating system message processing facility (MPF in MVS, PROP in VM, OCCF in VSE).
- Using the XITCI exit to process alerts, and use assembler rather than a high-level language for quickest processing.
- Using BEGIN and END statements to segment the automation table logically. Because the automation table skips the entire BEGIN/END section if it does not match the message or alert, this improves performance.

- Using the LOADCL command to load into storage those command lists that are most frequently used. This decreases the processing load and increased performance savings because the command lists are not loaded to and deleted from main storage every time they are run.
- Using the automation table when possible to automate messages or alerts, rather than of using command lists. This saves the processing time required to load and process the command list. The AUTOCNT summary usage report can give you an idea of how many commands are processed from the automation table.
- Using compiled REXX command lists instead of interpreted REXX command lists. Most command lists, especially those that do a lot of mathematical computations, benefit from being compiled.

Topic:	**Reference:**
TASKUTIL, AUTOCNT commands	NetView online help
LOADCL command	*IBM Z NetView Programming: REXX and the NetView Command List Language*
Using the TASKUTIL command	Additional information about the TASKUTIL command can be found in the *IBM Z NetView Tuning Guide*
Using the AUTOCNT command	Additional information about the AUTOCNT command can be found in the *IBM Z NetView Tuning Guide*
Using MPF, PROP, OCCF	*IBM Z NetView Automation Guide*
Using the XITCI exit	*IBM Z NetView Programming: Assembler*
TASKMON	NetView Online Help

Determining Why a Message Is Routed to the Wrong Operator

Check the following things to determine why an operator received a message meant for another operator.

- Check to see that the correct automation table statement is acting on the message.
- If the message is being routed using the ASSIGN command (ASSIGN PRI for solicited messages and ASSIGN COPY for unsolicited messages), check to see that it is being routed correctly.

  If the message is being routed using the ASSIGN PRI command, check the list of operators who are to receive the message. Because only the first operator who is logged on receives the message, ensure that an incorrect operator was not added near the beginning of the list.

  You can also check to see that specific ASSIGN commands targeted at a message or message block do not override more general ASSIGN commands for the same message or message block. For example, if message XYZ123I is processed by the NetView program, operators assigned to receive MSG=XYZ123I receive the message, and operators assigned to receive MSG=XYZ* do not. Operator assignments can be verified using the NetView LIST command.
- Check to see that the EXEC(ROUTE) command in the automation table and the MSGROUTE command from a command list are used correctly. If the ONE option is used to route a message to only one operator, and not to all the operators in a list of operators or operator groups, the intended operator is the first operator in the list of operators that can receive the message.
- If you have an installation exit routine for DSIEX02A, DSIEX16, or DSIEX17, examine the exit code to ensure that it is not changing the routing for the message.

Topic:	**Reference:**
ASSIGN, LIST commands	NetView online help
EXEC(ROUTE) action	*IBM Z NetView Automation Guide*

Topic:	Reference:
MSGROUTE command	*IBM Z NetView Programming: REXX and the NetView Command List Language*
Solicited and unsolicited messages	"How Messages Flow" on page 268
Exits DSIEX16 and DSIEX17	*IBM Z NetView Programming: Assembler*
Exit DSIEX02A	*IBM Z NetView Programming: Assembler* or *IBM Z NetView Programming: PL/I and C*

Determining Why a Pipe Command Does Not Process Correctly

If a PIPE command does not process correctly, it is possible that the command and its messages are not correlated. Pipelines also support a variety of DEBUG options. You can use the HOLD stage to determine whether a command and its messages are correlated. For more information, refer to *IBM Z NetView Programming: Pipes*.

Part 5. Problem Diagnostics

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Chapter 18. Proactive Investigating

Problem diagnosis involves the requesting of additional information to let you further analyze the cause of a status change from satisfactory to unsatisfactory. You can then resolve the problem situation and decide on the proper action to bypass or resolve the unsatisfactory condition.

This topic provides problem scenarios that illustrate how to solve potential problems before they affect the status of your network. The tools used to solve these problems are the NetView Graphic Monitor Facility, command facility, status monitor, and hardware monitor.

Chapter 19, “Reactive Investigating,” on page 223 provides problem scenarios that illustrate how to solve problems that have already occurred. The tools used to solve these problems are the NetView management console, session monitor, hardware monitor, VTAM commands, NPM, AON, and command facility.

Preventing Problems

Proactive investigating involves resolving potential problems before they affect the network. You can accomplish this by monitoring the status of various network components (such as controllers, links, and so on) and studying response time trends. Use the following scenarios to investigate potential network problems. Table 16 on page 215 gives an overview of the problem scenarios that are described in this chapter. For each scenario, the table lists the product used to solve the problem and the types of resources involved.

Table 16. Proactive Scenarios Cross Reference

Problem Scenario	**Component Used to Resolve Problem**	**Resources Involved**
Analyzing system performance using TASKUTIL	Command facility	Subarea
Initiating error recovery	Status monitor	Subarea
Displaying the status of a resource	Status monitor	Subarea
Identifying intermittent problems	Hardware monitor	Subarea
Checking the status of the session monitor and hardware monitor databases	Command facility	Subarea
Anticipate excessive use of task resources	Command facility Automate messages BNH162I and BNH163I	Task-specific processor, storage, I/O, task-to-task messages
Anticipate depletion of the NetView address space storage	Command facility Automate messages BNH162I and BNH163I	NetView storage

Analyzing System Performance Using TASKUTIL (Command Facility)

You can use the TASKUTIL or the newer TASKMON command to display performance information, including processor utilization, queue lengths, storage use, and active command lists. Consider setting an EVERY timer under an autotask to call TASKUTIL or TASKMON at least once a day (or even once every hour). The output from TASKUTIL can be compared to the output from the previous day and used to diagnose performance or storage problems.

For example, if you enter:

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```
taskutil type=dst
```

A response similar to Figure 114 on page 216 is received (by default, command responses are also sent to the network log).

```
DWO022I
TASKNAME TYPE DPR     CPU-TIME N-CPU% S-CPU% MESSAGEQ STORAGE-K  CMDLIST
-------- ---- --- ------------ ------ ------ -------- --------- --------
AAUTSKLP DST  249     22019.13  49.02   9.37        0     87521      N/A
BNJDSERV DST  250      4466.25   7.35   1.41        0       357      N/A
DSIELTSK DST  253      4731.99   7.24   1.38        0        31      N/A
DSICRTR  DST  251      1362.16   1.97   0.38        0        32      N/A
DSILOG   DST  254       624.64   1.40   0.27        0        23      N/A
DSIAMLUT DST  248      1145.74   1.34   0.26        0        26      N/A
AAUTCNMI DST  249        94.44   0.33   0.06        0       463      N/A
CNMTAMEL DST  249         0.36   0.00   0.00        0        49      N/A
CNM01LUC DST  251       306.54   0.00   0.00        0        43      N/A
DSIGDS   DST  254         1.89   0.00   0.00        0        46      N/A
DSIHPDST DST  252         2.15   0.00   0.00        0        39      N/A
DSIKREM  DST  250         2.15   0.00   0.00        0       549      N/A
DSIROVS  DST  251         0.03   0.00   0.00        0        13      N/A
DSISVRT  DST  253         0.93   0.00   0.00        0       105      N/A
DSIUDST  DST  250         2.59   0.00   0.00        0        14      N/A
DSI6DST  DST  251        28.98   0.00   0.00        0        41      N/A
NETVIEW  OTHR N/A          N/A   0.00   0.00      N/A       N/A      N/A
NETVIEW  SRB  N/A      4026.90   5.93   1.13      N/A       N/A      N/A
NETVIEW  TOTL 157     54766.96 100.00  19.11      253    157477      N/A
SYSTEM   TOTL N/A          N/A    N/A  63.70      N/A       N/A      N/A
```

Figure 114. TASKUTIL Command Output

For each task, the task name (TASKNAME), task type (TYPE), dispatching priority (DPR), and processor usage (CPU-TIME) is displayed. In addition, you can use the following information (shown in Figure 114 on page 216) to diagnose performance or storage problems.

Table 17. TASKUTIL Output Description

Field Name/Description	How to Use
N-CPU% (NetView program CPU utilization) Relative contribution of the task to the NetView program processor utilization, based on a maximum of 100%.	• If this value is continuously high for an operator task, autotask, distributed task, or NNT, this can indicate an endless loop condition in a command list or argument. The active command list is displayed in the CMDLIST field. • If this value is low, with the same command list active and message buildup for an operator task, autotask, distributed task, or NNT, this can indicate that the command list is stuck in a WAIT.
S-CPU% (system CPU utilization) Contribution of the task to the total system processor utilization, based on a maximum of 100%.	• If this value is continuously high for an operator task, autotask, distributed task, or NNT, this can indicate an endless loop condition in a command list or argument. The active command list is displayed in the CMDLIST field. • If this value is low, with the same command list active and message buildup for an operator task, autotask, distributed task, or NNT, this can indicate that the command list is stuck in a WAIT.

Table 17. TASKUTIL Output Description (continued)

Field Name/Description	How to Use
MESSAGEQ Number of messages currently backed up on the 3 public message queues of the task (HIGH, NORMAL, and LOW).	• If this value is high, with the same command list active and low processor usage for an operator task, autotask, distributed autotask, or NNT, this can indicate that the command list is stuck in a WAIT. • If this value continues to grow for a task during a steady state period when you are expecting the workload activity of the NetView program to be fairly uniform, and if the total system processor utilization is near 100%, this can indicate that the NetView program is not getting dispatched frequently enough to do its work. Continued growth results in continued NetView storage growth, which can lead to storage abends. If you detect such a condition, consider ending low-priority processor-intensive applications to relieve the system processor constraint. If the NetView program regularly experiences message growth, consider making the MVS dispatching priority for the NetView address space more favorable.
STORAGE-K Amount of pooled and non-pooled queued storage, in kilobytes, currently being used by the task.	If this value continues to rise for a task, this can indicate that the task is getting queued storage but not freeing it properly.
CMDLIST Current active command list running on the task, if any.	If the same command list is active, with message buildup and low processor usage for an operator task, autotask, distributed autotask, or NNT, this can indicate that the command list is stuck in a WAIT.

Topic:	Reference:
Tuning your system using TASKUTIL	*IBM Z NetView Tuning Guide*
TASKUTIL command	NetView online help

Initiating Error Recovery (Status Monitor)

You can use the status monitor to initiate error recovery. The status monitor tries to reactivate nodes that have failed and have been made inactive by VTAM. You can also specify in VTAMLST the nodes that cannot be reactivated automatically by specifying NOMONIT when defining the node for the status monitor. All the nodes marked as NOMONIT are stored in a reactivation exclusion list. You can add nodes to this list using the MONIT STOP command or the MONOFF command list.

For example, to stop the automatic node reactivation function of all nodes, enter:

```
monit stop,all
```

or

```
monoff all
```

You can remove nodes from this list (to allow reactivation) using the MONIT START command or MONON command list (so long as NOMONIT was not specified in the VTAMLST file for the particular node). For example, to start the automatic node reactivation function of all nodes, enter:

```
monit start,all
```

or

```
monon all
```

To start automatic reactivation for LINE27, enter:

```
monit start,line27
```

or

```
monon line27
```

You can also initiate error recovery using Automated Operations Networks (AON). AON recovers network resources by monitoring critical VTAM messages and taking automated action based on preset tailored criteria. AON reacts to adverse conditions of network resources and notifies operators of these conditions, when appropriate. Recovery criteria can be set based on resource type, resource naming convention, explicit resource name, or network-wide settings. A variety of parameters and options can be selected to control when and how recovery takes place.

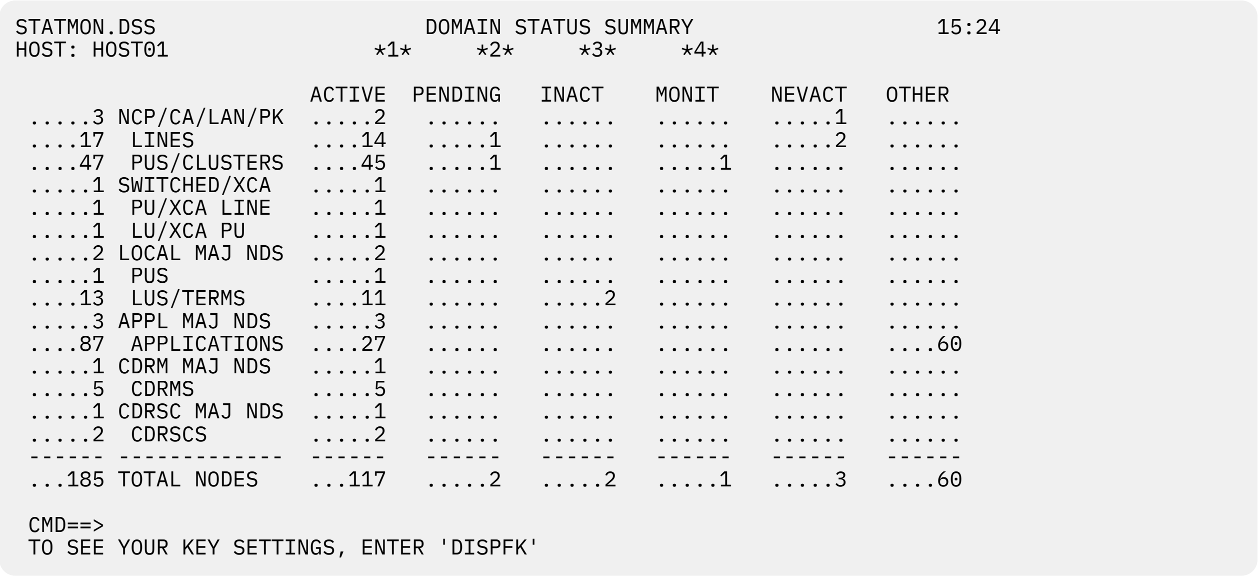
Topic:	**Reference:**
MONIT, MONON, MONOFF commands	NetView online help

Displaying Resource Status (Status Monitor)

As a network operator, one of the first things you do after logging on to the NetView program is to monitor the network resources you are responsible for controlling. You can use the status monitor to collect and summarize information about the status of resources defined in a VTAM domain. You can then use this information to activate, inactivate, or display the resources.

Complete the following steps to monitor the status of resources and to activate inactive resources using the status monitor:

1. Enter the STATMON command to access the Domain Status Summary panel of the status monitor. A panel similar to Figure 115 on page 219 is displayed.



```
STATMON.DSS                     DOMAIN STATUS SUMMARY                   15:24
HOST: HOST01                *1*     *2*     *3*     *4*

                       ACTIVE  PENDING   INACT    MONIT    NEVACT   OTHER
 .....3 NCP/CA/LAN/PK  .....2   ......   ......   ......   .....1   ......
 ....17  LINES         ....14   .....1   ......   ......   .....2   ......
 ....47  PUS/CLUSTERS  ....45   .....1   ......   .....1   ......   ......
 .....1 SWITCHED/XCA   .....1   ......   ......   ......   ......   ......
 .....1  PU/XCA LINE   .....1   ......   ......   ......   ......   ......
 .....1  LU/XCA PU     .....1   ......   ......   ......   ......   ......
 .....2 LOCAL MAJ NDS  .....2   ......   ......   ......   ......   ......
 .....1  PUS           .....1   ......   ......   ......   ......   ......
 ....13  LUS/TERMS     ....11   ......   .....2   ......   ......   ......
 .....3 APPL MAJ NDS   .....3   ......   ......   ......   ......   ......
 ....87  APPLICATIONS  ....27   ......   ......   ......   ......   ....60
 .....1 CDRM MAJ NDS   .....1   ......   ......   ......   ......   ......
 .....5  CDRMS         .....5   ......   ......   ......   ......   ......
 .....1 CDRSC MAJ NDS  .....1   ......   ......   ......   ......   ......
 .....2  CDRSCS        .....2   ......   ......   ......   ......   ......
 ------ -------------  ------   ------   ------   ------   ------   ------
 ...185 TOTAL NODES    ...117   .....2   .....2   .....1   .....3   ....60

 CMD==>
 TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

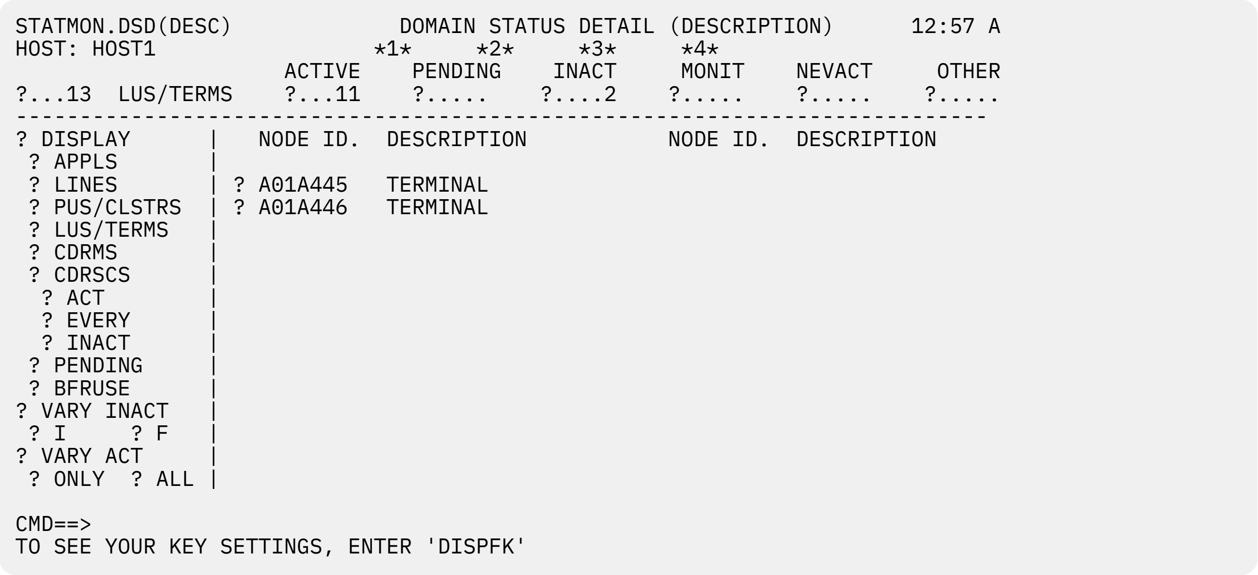
Figure 115. Domain Status Summary Panel

The panel displays information about resources. The resources listed are divided into major and minor nodes. The major nodes are NCP/CA/LAN/PK, SWITCHED/XCA, LOCAL MAJ NDS, APPL MAJ NDS, CDRM MAJ NDS, and CDRSC MAJ NDS. Under each major node are the minor nodes (individual resources) that make up the major node. By using this panel, you can find and correct problems before users report them, or before other resources are affected.

The status monitor displays status condition names, called states, near the top of the panel. A resource can be in any of six states: ACTIVE, PENDING, INACT, MONIT, NEVACT, and OTHER. Each state is associated with a color. For a description of these states, see "Understanding the Status Monitor Panel Colors" on page 78.

Notice that two of the logical units or terminals have become inactive.

2. To display detailed information about the inactive units, insert any character except a blank before the first period under the INACT column of LUS/TERMS and press Enter. A panel similar to Figure 116 on page 219 is displayed.



```
STATMON.DSD(DESC)             DOMAIN STATUS DETAIL (DESCRIPTION)      12:57 A
HOST: HOST1                 *1*     *2*     *3*     *4*
                     ACTIVE    PENDING    INACT     MONIT    NEVACT     OTHER
?...13  LUS/TERMS    ?...11    ?.....    ?....2    ?.....    ?.....    ?.....
---------------------------------------------------------------------------
? DISPLAY      |   NODE ID.  DESCRIPTION           NODE ID.  DESCRIPTION
 ? APPLS       |
 ? LINES       | ? A01A445   TERMINAL
 ? PUS/CLSTRS  | ? A01A446   TERMINAL
 ? LUS/TERMS   |
 ? CDRMS       |
 ? CDRSCS      |
  ? ACT        |
  ? EVERY      |
  ? INACT      |
 ? PENDING     |
 ? BFRUSE      |
? VARY INACT   |
 ? I     ? F   |
? VARY ACT     |
 ? ONLY  ? ALL |

CMD==>
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
```

Figure 116. Domain Status Detail Panel

The right side shows the inactive resources for one major node followed by a brief description. The left side shows you a list of available VTAM commands. You can use these commands to display information about resources (DISPLAY), activate resources (VARY ACT), or deactivate resources (VARY INACT).

3. To activate each resource, type any character except a blank or question mark (?) over the question mark next to the resource and over the question mark next to the VARY ACT command and press **Enter**.

   The command facility displays the following messages:

   ```
   * CNM01    V NET,ACT,ID=A01A445
   * CNM01    V NET,ACT,ID=A01A446
     CNM01    IST097I  VARY     ACCEPTED
     CNM01    IST097I  VARY     ACCEPTED
     CNM01    IST093I  A01A445 ACTIVE
     CNM01    IST093I  A01A446 ACTIVE
   ```

   The last two messages tell you that the resources are now active.

4. Press Enter to return to the status monitor.

Topic:	**Reference:**
Monitoring and controlling resources using the status monitor	"Using the Status Monitor (SNA Subarea)" on page 77

Identifying Intermittent Problems (Hardware Monitor)

You can use the hardware monitor to predict where problems are likely to occur by monitoring key temporary error counters and looking for trends in the frequency of temporary errors. You can set the hardware monitor to check the frequency of these errors and to notify you if the frequency is greater than specified. By tracking the error rate trends, you might be able to predict performance degradation and take action to prevent a problem from becoming serious.

Intermittent problems are often related to performance problems. For example, if a resource alternates between active and inactive, try to see if a correlation exists between the problem and the time when it occurs. If the problem occurs during a period of high system usage, this can indicate a performance problem. You might then have to tune the performance of your system (by rerouting or redistributing tasks) to solve the problem.

You can use the hardware monitor to monitor alerts and to display statistical data. For additional information, see "Network Monitoring with the Hardware Monitor Panels" on page 94. You might want to keep in mind the following failure-cause code points used to identify intermittent problems:

Hex value
    Description

0411
    INTERMITTENT STORAGE CONTROLLER ERROR

0412
    INTERMITTENT WORKSTATION CONTROLLER ERROR

0413
    INTERMITTENT COMMUNICATIONS SUBSYSTEM CONTROLLER ERROR

Topic:	**Reference:**
Modifying the Code Point tables	*IBM Z NetView Customization Guide*
List of code points provided by the NetView program	Information about codes and messages in *IBM Z NetView Troubleshooting Guide*
Alert types	*SNA Formats*

Checking Session Monitor and Hardware Monitor Database Status (Command Facility)

The NetView program uses VSAM key-sequenced data sets for the session monitor and hardware monitor databases. Each component has a primary and secondary database.

Follow these steps to monitor the active database for the component and, when it becomes full, switch to the alternate database:

1. From the command facility, enter the following command to display the space used on the hardware monitor database:

   ```
   listcat bnjdserv
   ```

   Note: For the session monitor database, use AAUTSKLP instead of BNJDSERV.

2. Figure 117 on page 221 shows the response to the LISTCAT command.

```
LISTCAT Listcat of Active VSAM Data Base for BNJDSERV 09:07:03 Page 1 of 1
VSAM ACB Options: LSR, ADR, KEY, SEQ, DIR, OUT
Cluster Information:
          DDNAME: BNJLGPR        KEYLEN: ..........76      RKP: ...........0
           BSTRNO: ...........0    STRNO: ..........11   STRMAX: ...........2
           BUFSP: ...........0
     DATA Component Information:
           LRECL: ........4086     CINV: ........4096
           BUFND: ..........12    BUFNO: ...........0
            NEXT: ...........6       FS: ..........28
            NCIS: ........1516     NSSS: ...........3
           NEXCP: ......151037    NLOGR: ........5249    NRETR: ......455779
           NINSR: .......11804    NUPDR: .......18641    NDELR: ........6565
          AVSPAC: .....2945024   ENDRBA: .....4587520  HALCRBA: .....4587520
     INDEX Component Information:
           LRECL: ........4089     CINV: ........4096
           BUFNI: ...........0    BUFNO: ...........0
            NEXT: ...........7     NIXL: ...........2
           NEXCP: ........7132    NLOGR: ...........5
          AVSPAC: .......53248   ENDRBA: .......73728  HALCRBA: .......73728


 ENTER= Refresh  PF1= Help  PF2= End  PF3= Return
```

Figure 117. LISTCAT BNJDSERV Output

   Pay particular attention to the following values:

   DDNAME
   This value shows whether the primary or secondary database is active

   AVSPAC, HALCRBA
   These values are continually updated with the number of bytes available in the DATA component. This number changes based on extents allocated by VSAM. If the available space is near zero, the database is near full and you need to switch to the alternate database.

   NIXL
   This value shows the index record level. If this number is greater than 3, you can improve the database performance by reorganizing the database.

3. To switch the hardware monitor database from primary to secondary, enter:

   ```
   dbauto npda switch
   ```

Note that this NetView panel has the PF keys listed on the panel, and that you cannot use the NetView DISPFK command from this panel.

Topic:	Reference:
Maintaining hardware monitor databases (including switching to a secondary database using the DBAUTO command)	“Maintaining the Hardware Monitor Database” on page 159
Maintaining session monitor databases (including switching to a secondary database using the DBAUTO command)	“Using and Maintaining the Session Monitor Database” on page 160
DBAUTO command	NetView online help

Chapter 19. Reactive Investigating

In reactive investigating, you react to a problem that has already occurred. You learn about this problem in monitoring the problem or through a phone call. In general, you have some idea about the location of the problem and the kind of problem that has occurred.

Table 18 on page 223 contains an overview of the scenarios that are covered in this chapter. For each scenario, the table lists the product used to solve the problem and the types of resources involved. Note that all scenarios might not be applicable, depending on which option of the NetView program is installed.

Table 18. Reactive Investigating Cross Reference

Problem Scenario	**Product Used to Resolve the Problem**	**See This Information**
Finding and repairing the cause of a hung session	Session monitor	"Hung Session (Session Monitor)" on page 223
Finding and repairing the cause of a broken session	Session monitor	"Broken Session (Session Monitor)" on page 225
Handling a line failure	Hardware monitor	"Line Failure (Hardware Monitor)" on page 229
Determining if a virtual route is blocked	VTAM commands	"Blocked Virtual Route (VTAM)" on page 231
Identifying and terminating looping or hung NetView tasks	Command facility	"Hung or Looping NetView Tasks (Command Facility)" on page 232
Measuring response time with control units using the RTM feature	Session monitor	"Measuring Response Time with Control Units Using RTM (Session Monitor)" on page 232

Hung Session (Session Monitor)

In the following scenario, an end user at terminal T11 reports that the directions on his screen (generated by an application program) ask for data to be entered, but the keyboard is locked. You can:

1. Enter **sess t11** from the session monitor command line to display the session list for resource T11. A panel similar to Figure 118 on page 224 is displayed:

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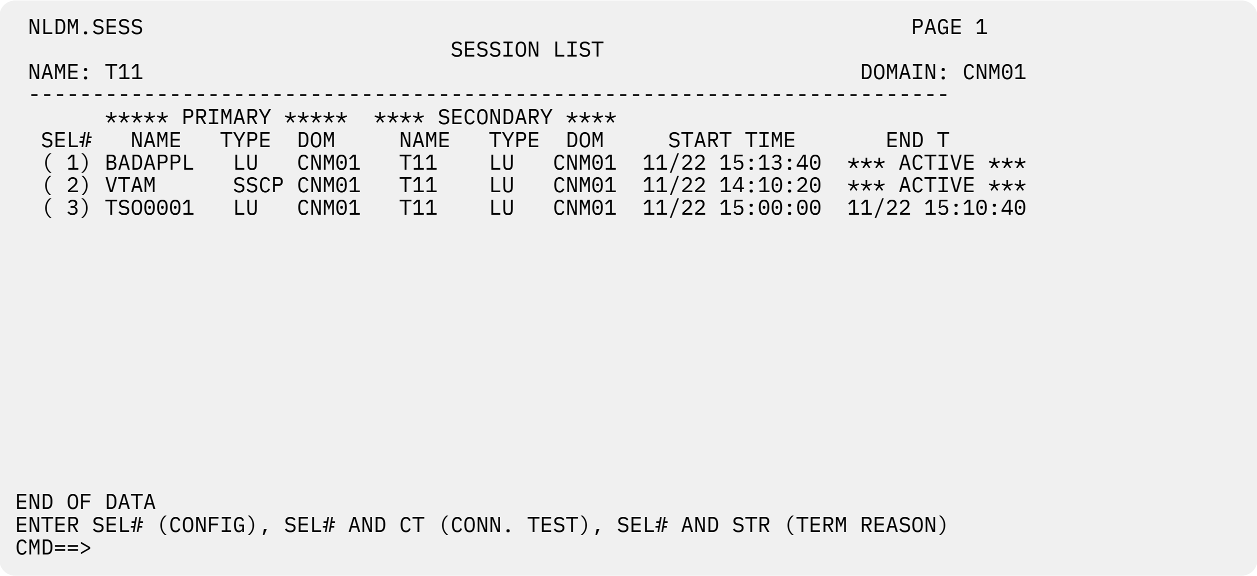
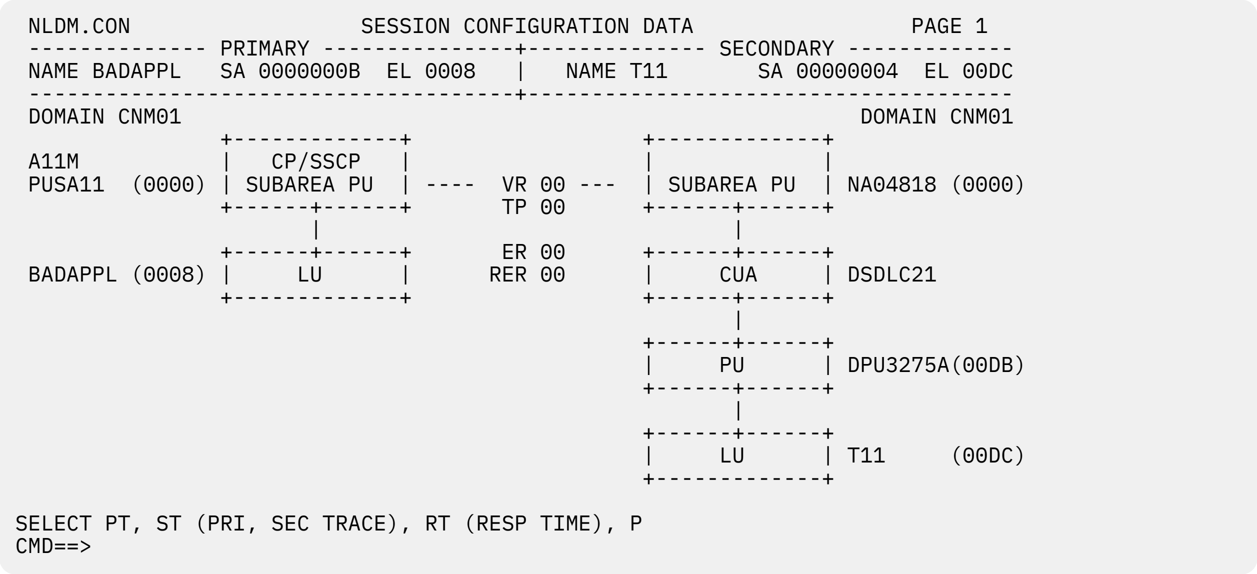


```
 NLDM.SESS                                                             PAGE 1
                                  SESSION LIST
 NAME: T11                                                         DOMAIN: CNM01
 -------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE   DOM     START TIME       END T
  ( 1) BADAPPL   LU   CNM01   T11    LU    CNM01  11/22 15:13:40  *** ACTIVE ***
  ( 2) VTAM      SSCP CNM01   T11    LU    CNM01  11/22 14:10:20  *** ACTIVE ***
  ( 3) TSO0001   LU   CNM01   T11    LU    CNM01  11/22 15:00:00  11/22 15:10:40










END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==>
```

Figure 118. Session List Panel

The display shows that both the SSCP-LU and application LU sessions are active. According to the end user, however, the keyboard is locked and data cannot be entered. Because a contradiction exists, you need to look at the path information unit (PIU) trace data.

2. Select **1** to display the Session Configuration Data panel for the BADAPPL-T11 session. A panel similar to Figure 119 on page 224 is displayed.

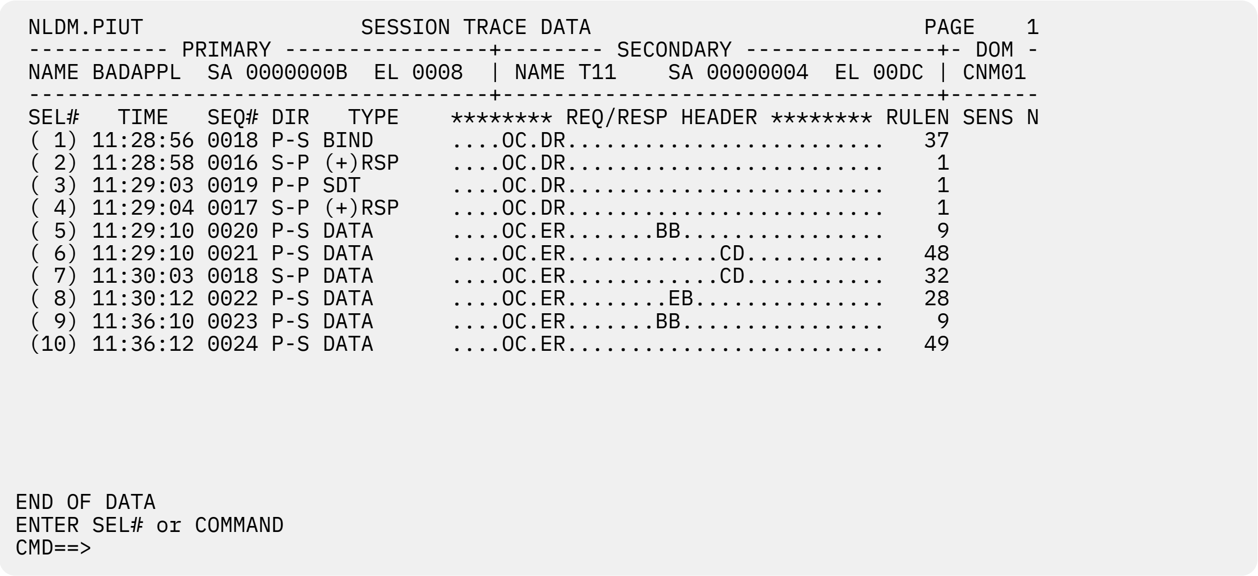


```
 NLDM.CON                  SESSION CONFIGURATION DATA                  PAGE 1
 -------------- PRIMARY ----------------+-------------- SECONDARY -------------
 NAME BADAPPL   SA 0000000B  EL 0008    |   NAME T11       SA 00000004  EL 00DC
 ---------------------------------------+--------------------------------------
 DOMAIN CNM01                                                      DOMAIN CNM01
                +-------------+                   +-------------+
 A11M           |   CP/SSCP   |                   |             |
 PUSA11  (0000) | SUBAREA PU  | ----   VR 00 ---  | SUBAREA PU  | NA04818 (0000)
                +------+------+        TP 00      +------+------+
                       |                                 |
                +------+------+        ER 00      +------+------+
 BADAPPL (0008) |      LU     |       RER 00      |     CUA     | DSDLC21
                +-------------+                   +------+------+
                                                         |
                                                  +------+------+
                                                  |     PU      | DPU3275A(00DB)
                                                  +------+------+
                                                         |
                                                  +------+------+
                                                  |     LU      | T11     (00DC)
                                                  +-------------+

SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P
CMD==>
```

Figure 119. Session Configuration Data Panel

This panel shows how each LU (BADAPPL and T11) is connected to its own subarea. From this panel you can now access trace data.

3. Enter `pt` on the command line to display the primary PIU trace for the session between terminal T11 and application BADAPPL. Note that the trace facility must be set either through the initial session monitor definition (in AAUPRMLP) or through the TRACE command. A panel similar to Figure 120 on page 225 is displayed.



```
 NLDM.PIUT                 SESSION TRACE DATA                          PAGE    1
 ----------- PRIMARY ----------------+-------- SECONDARY ---------------+- DOM -
 NAME BADAPPL  SA 0000000B  EL 0008  | NAME T11    SA 00000004  EL 00DC | CNM01
 ------------------------------------+----------------------------------+-------
 SEL#   TIME   SEQ# DIR   TYPE    ******** REQ/RESP HEADER ******** RULEN SENS N
 ( 1) 11:28:56 0018 P-S BIND      ....OC.DR.........................   37
 ( 2) 11:28:58 0016 S-P (+)RSP    ....OC.DR.........................    1
 ( 3) 11:29:03 0019 P-P SDT       ....OC.DR.........................    1
 ( 4) 11:29:04 0017 S-P (+)RSP    ....OC.DR.........................    1
 ( 5) 11:29:10 0020 P-S DATA      ....OC.ER.......BB................    9
 ( 6) 11:29:10 0021 P-S DATA      ....OC.ER............CD...........   48
 ( 7) 11:30:03 0018 S-P DATA      ....OC.ER............CD...........   32
 ( 8) 11:30:12 0022 P-S DATA      ....OC.ER........EB...............   28
 ( 9) 11:36:10 0023 P-S DATA      ....OC.ER.......BB................    9
 (10) 11:36:12 0024 P-S DATA      ....OC.ER.........................   49






END OF DATA
ENTER SEL# or COMMAND
CMD==>
```

Figure 120. Session Trace Data Panel

Figure 120 on page 225 shows the primary trace data. Each trace entry has the time-of-day, sequence number, flow direction (P-S/S-P), and PIU type. Important indicators in the Request/Response Header (RH) are formatted. The trace response data is described in the following list:

OC
Only one in chain

DR
Definite response

ER
Exception response

The first four trace entries show the session getting established, and the next five trace entries show a normal exchange of data. The BB/EB indicators show bracket protocol is in effect. Each flow direction change is signaled by a change direction (CD) flag.

In this scenario, the error source is the host application program. The NAU named BADAPPL did not insert a change direction (CD) flag in trace 10. Therefore, the terminal did not unlock the keyboard and the operator cannot respond with more data.

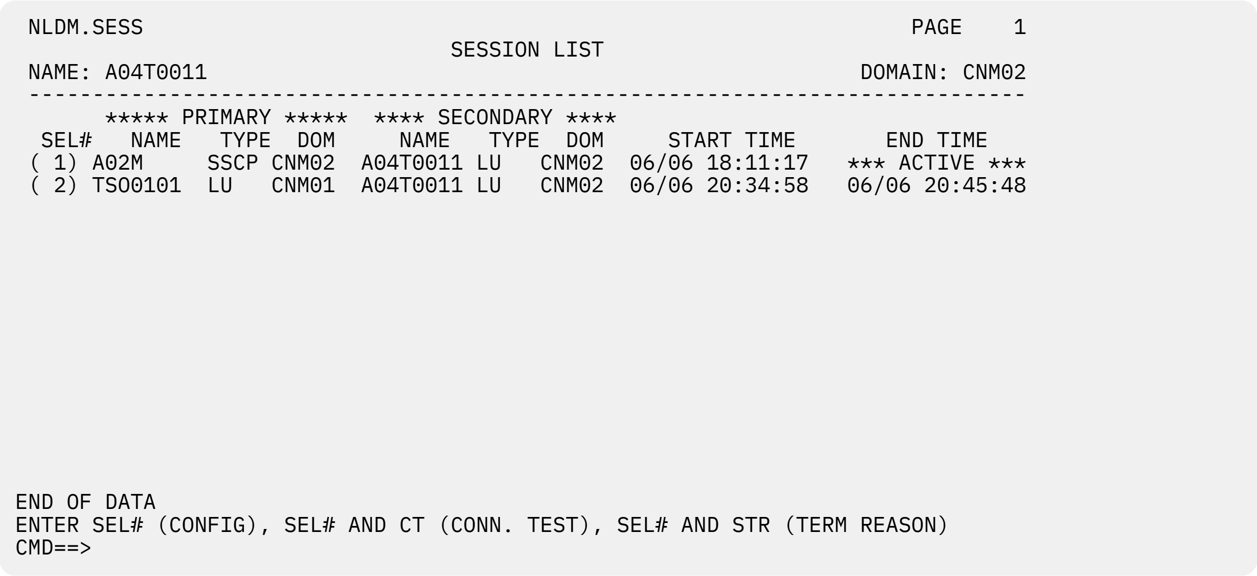
Further resolution of this problem is up to the BADAPPL programmer.

Topic:	**Reference:**
Using the session monitor panels	"Session Monitor Scenarios" on page 61

Broken Session (Session Monitor)

The following scenario illustrates the loss of a session in a cross-domain environment. In this scenario, a user (with terminal ID A04T0011) is using an application when the system logs the user off. The user calls to report the problem. You can:

1. Enter **sess a04t0011** at the command prompt to display the session list for terminal a04t011. A panel similar to Figure 121 on page 226 is displayed.



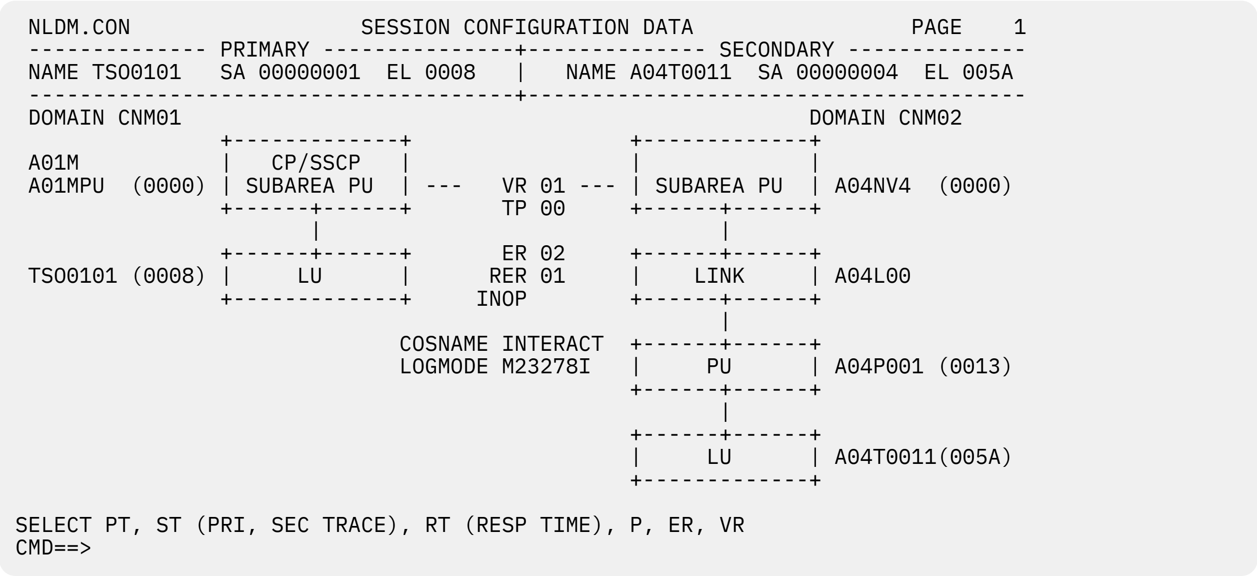
```
 NLDM.SESS                                                            PAGE    1
                                  SESSION LIST
 NAME: A04T0011                                                   DOMAIN: CNM02
 ------------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
 ( 1) A02M     SSCP CNM02  A04T0011 LU   CNM02  06/06 18:11:17   *** ACTIVE ***
 ( 2) TSO0101  LU   CNM01  A04T0011 LU   CNM02  06/06 20:34:58   06/06 20:45:48



END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==>
```

Figure 121. Session List Panel

The active SSCP-LU session (option 1) indicates that the user terminal is still active. The inactive LU-LU session (option 2) between application TSO0101 and terminal A04T0011 is the one about which the user called.

The panel also shows that application TSO0101 is in domain CNM01 and that terminal A04T0011 is in domain CNM02. This is a cross-domain session.

2. Select option **2** to display the Session Configuration Data panel for the inactive session. A panel similar to Figure 122 on page 226 is displayed:



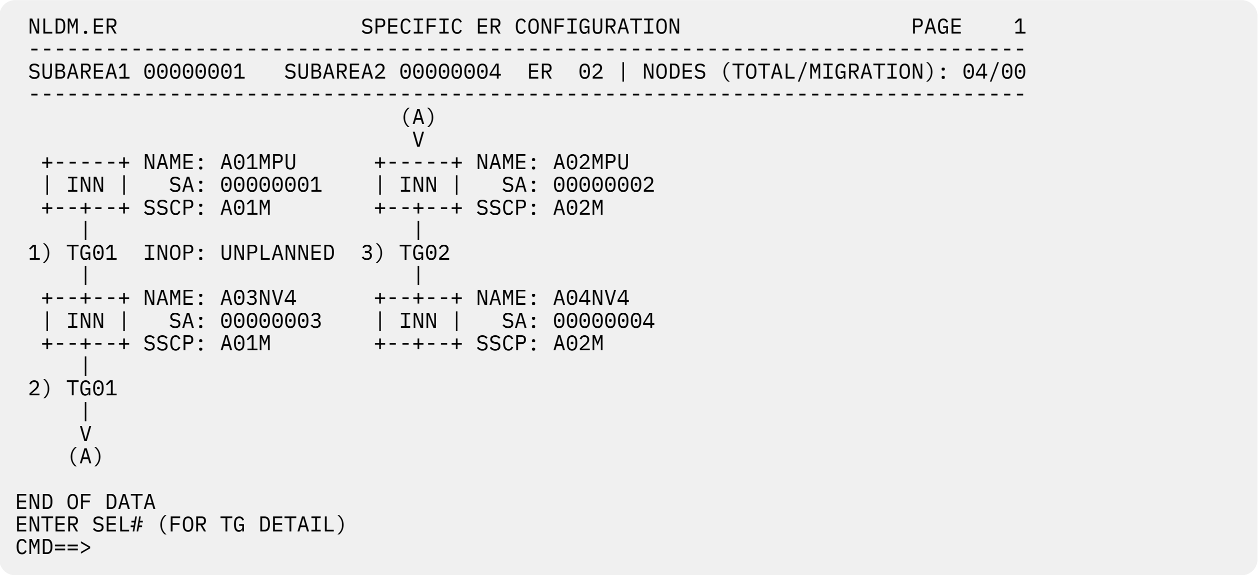
```
 NLDM.CON                  SESSION CONFIGURATION DATA                 PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME TSO0101   SA 00000001  EL 0008   |   NAME A04T0011  SA 00000004  EL 005A
 --------------------------------------+---------------------------------------
 DOMAIN CNM01                                                 DOMAIN CNM02
                +-------------+                 +-------------+
 A01M           |   CP/SSCP   |                 |             |
 A01MPU  (0000) | SUBAREA PU  | ---   VR 01 --- | SUBAREA PU  | A04NV4  (0000)
                +------+------+       TP 00     +------+------+
                       |                               |
                +------+------+       ER 02     +------+------+
 TSO0101 (0008) |     LU      |      RER 01     |    LINK     | A04L00
                +-------------+     INOP        +------+------+
                                                       |
                             COSNAME INTERACT  +------+------+
                             LOGMODE M23278I   |     PU      | A04P001 (0013)
                                                +------+------+
                                                       |
                                                +------+------+
                                                |     LU      | A04T0011(005A)
                                                +-------------+

SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR
CMD==>
```

Figure 122. Session Configuration Data Panel

Review the information on the panel. This panel shows the path between the session from the primary LU (TSO0101) to its host PU (A01MPU) and from the secondary LU (A04T0011) to its NCP (A04NV4). It also shows the explicit route between them for this session. The explicit route is identified by an explicit route number (in this case, the explicit route number is 02).

Notice the term INOP that is displayed in the center of the panel. INOP indicates that the explicit route the session was using became inoperative. This occurred because a node or transmission group (TG) in the route became inoperative.

3. Enter **er** to display the explicit route. A panel similar to Figure 123 on page 227 is displayed.

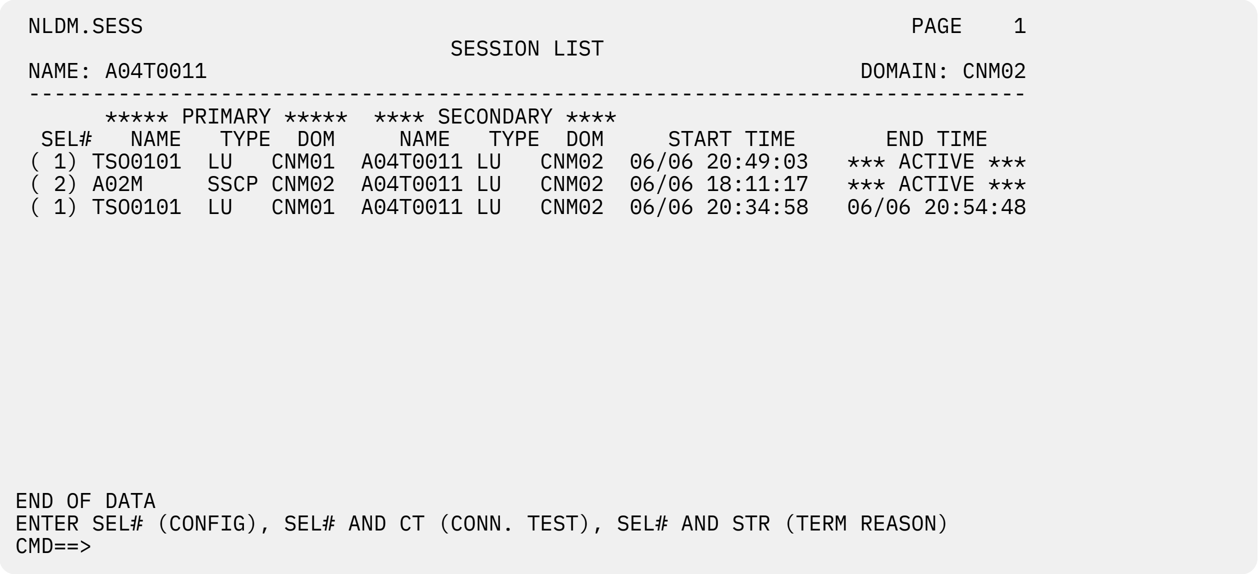


```
 NLDM.ER                   SPECIFIC ER CONFIGURATION                 PAGE    1
 ------------------------------------------------------------------------------
 SUBAREA1 00000001   SUBAREA2 00000004  ER  02 | NODES (TOTAL/MIGRATION): 04/00
 ------------------------------------------------------------------------------
                              (A)
                               V
  +-----+ NAME: A01MPU      +-----+ NAME: A02MPU
  | INN |   SA: 00000001    | INN |   SA: 00000002
  +--+--+ SSCP: A01M        +--+--+ SSCP: A02M
     |                         |
 1) TG01  INOP: UNPLANNED  3) TG02
     |                         |
  +--+--+ NAME: A03NV4      +--+--+ NAME: A04NV4
  | INN |   SA: 00000003    | INN |   SA: 00000004
  +--+--+ SSCP: A01M        +--+--+ SSCP: A02M
     |
 2) TG01
     |
     V
    (A)

END OF DATA
ENTER SEL# (FOR TG DETAIL)
CMD==>
```

Figure 123. Specific ER Configuration Panel

Notice the placement of the notation `INOP: UNPLANNED` next to item 1, `TG01`. This indicates that the explicit route is inoperative, because either the host PU (A01MPU) or the transmission group between A01MPU and A03NV4 (TG01) became inactive.

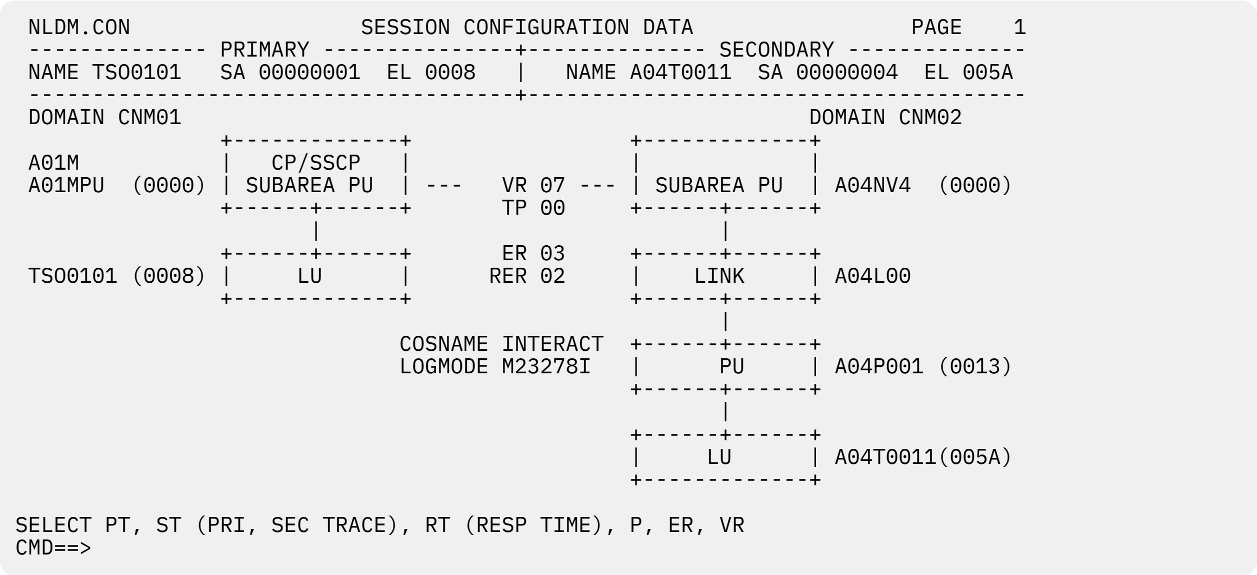
4. Enter the COPY command in the command line to store the Specific ER Configuration panel in the network log. The system programmer can use the information when further investigating this problem.
5. Tell the user to log on to the TSO application again and perhaps establish another route.
6. Confirm that the session is active by entering **sess a04t0011**. The panel shown in Figure 124 on page 227 is displayed.



```
 NLDM.SESS                                                             PAGE    1
                                  SESSION LIST
 NAME: A04T0011                                                    DOMAIN: CNM02
 ------------------------------------------------------------------------------
       ***** PRIMARY *****  **** SECONDARY ****
  SEL#   NAME   TYPE  DOM     NAME   TYPE  DOM     START TIME       END TIME
 ( 1) TSO0101  LU   CNM01  A04T0011 LU   CNM02  06/06 20:49:03   *** ACTIVE ***
 ( 2) A02M     SSCP CNM02  A04T0011 LU   CNM02  06/06 18:11:17   *** ACTIVE ***
 ( 1) TSO0101  LU   CNM01  A04T0011 LU   CNM02  06/06 20:34:58   06/06 20:54:48














END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
CMD==>
```

Figure 124. Session List Panel

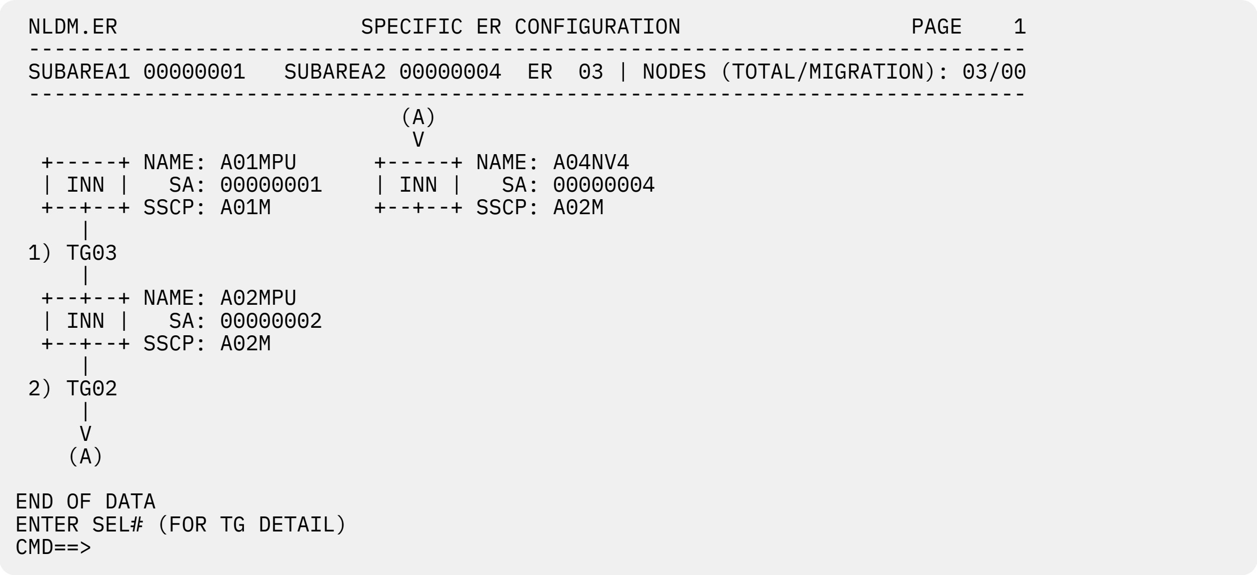
7. Enter **1** to look at the active session configuration and to determine the route. A panel similar to Figure 125 on page 228 is displayed. Note that a different explicit route (ER 03) is used for this session.



```
 NLDM.CON                  SESSION CONFIGURATION DATA                PAGE    1
 -------------- PRIMARY ---------------+-------------- SECONDARY --------------
 NAME TSO0101   SA 00000001  EL 0008   |   NAME A04T0011  SA 00000004  EL 005A
 --------------------------------------+---------------------------------------
 DOMAIN CNM01                                                DOMAIN CNM02
                +-------------+                 +-------------+
 A01M           |   CP/SSCP   |                 |             |
 A01MPU  (0000) | SUBAREA PU  | ---   VR 07 --- | SUBAREA PU  | A04NV4  (0000)
                +------+------+       TP 00     +------+------+
                       |                               |
                +------+------+       ER 03     +------+------+
 TSO0101 (0008) |     LU      |      RER 02     |    LINK     | A04L00
                +-------------+                 +------+------+
                                                       |
                              COSNAME INTERACT  +------+------+
                              LOGMODE M23278I   |      PU     | A04P001 (0013)
                                                +------+------+
                                                       |
                                                +------+------+
                                                |     LU      | A04T0011(005A)
                                                +-------------+

SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR
CMD==>
```

Figure 125. Session Configuration Data Panel

8. Enter **er** to view the explicit route. A panel similar to Figure 126 on page 228 is displayed.



```
 NLDM.ER                   SPECIFIC ER CONFIGURATION                 PAGE    1
 ------------------------------------------------------------------------------
 SUBAREA1 00000001   SUBAREA2 00000004  ER  03 | NODES (TOTAL/MIGRATION): 03/00
 ------------------------------------------------------------------------------
                              (A)
                               V
  +-----+ NAME: A01MPU      +-----+ NAME: A04NV4
  | INN |   SA: 00000001    | INN |   SA: 00000004
  +--+--+ SSCP: A01M        +--+--+ SSCP: A02M
     |
 1) TG03
     |
  +--+--+ NAME: A02MPU
  | INN |   SA: 00000002
  +--+--+ SSCP: A02M
     |
 2) TG02
     |
     V
    (A)

END OF DATA
ENTER SEL# (FOR TG DETAIL)
CMD==>
```

Figure 126. Specific ER Configuration Panel

Note that the new TSO session has been established. The route is now going directly from the host PU (A01MPU) in subarea 1 (SA: 00000001) to the host PU (A02MPU) in subarea 2 (SA: 00000002). It no longer passes through NCP A03NV4.

Because this panel shows the new session route, the information on the panel might help the system programmer when further investigating this problem. Enter the COPY command from command line to store the Specific ER Configuration panel to the network log.

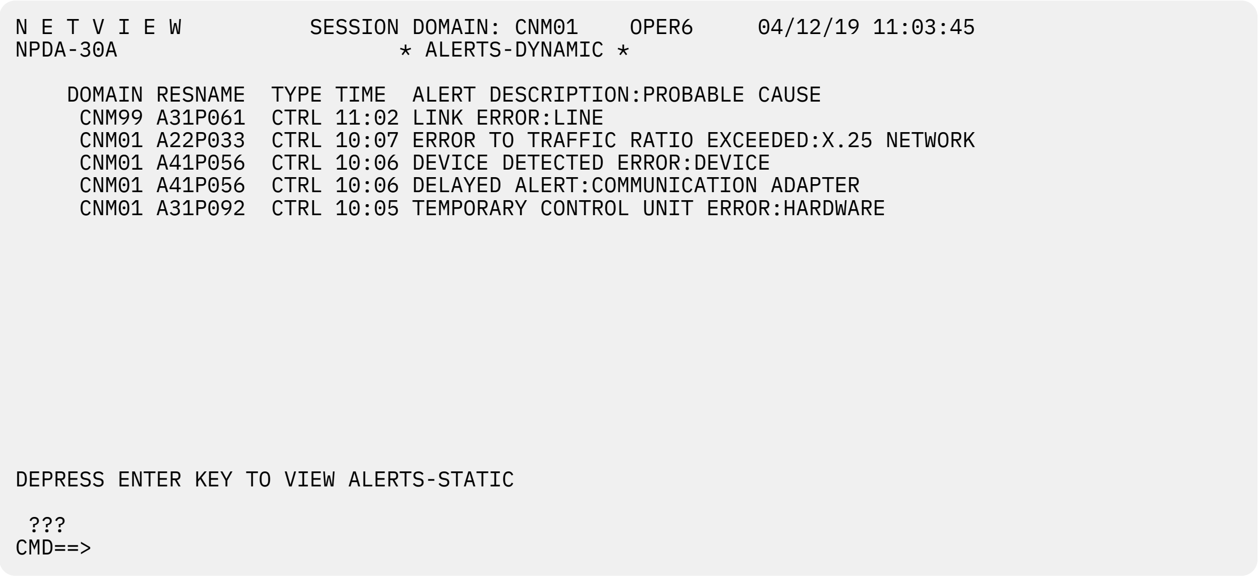
The user can continue working while the inoperative route is being repaired.

Topic:	Reference:
Using the session monitor panels	“Session Monitor Scenarios” on page 61

Line Failure (Hardware Monitor)

The following scenario illustrates how to handle a link error caused by a faulty line:

1. Enter **npda ald** from the command line to access the Alerts-Dynamic panel. A panel similar to Figure 127 on page 229 is displayed.

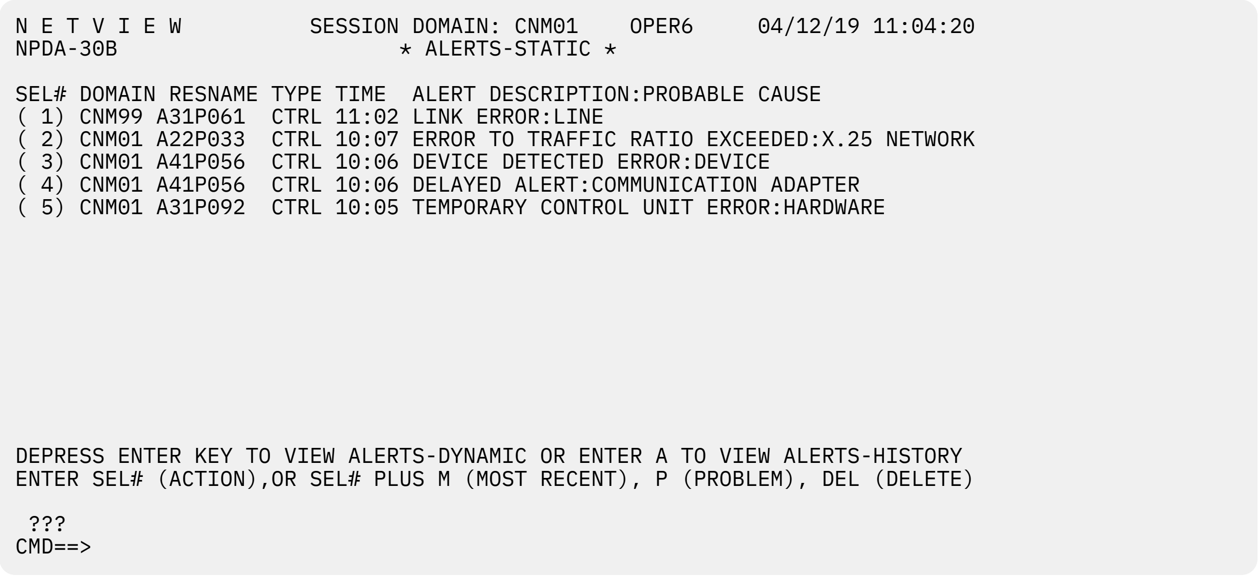


```
N E T V I E W          SESSION DOMAIN: CNM01    OPER6     04/12/19 11:03:45
NPDA-30A                      * ALERTS-DYNAMIC *

    DOMAIN RESNAME  TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
     CNM99 A31P061  CTRL 11:02 LINK ERROR:LINE
     CNM01 A22P033  CTRL 10:07 ERROR TO TRAFFIC RATIO EXCEEDED:X.25 NETWORK
     CNM01 A41P056  CTRL 10:06 DEVICE DETECTED ERROR:DEVICE
     CNM01 A41P056  CTRL 10:06 DELAYED ALERT:COMMUNICATION ADAPTER
     CNM01 A31P092  CTRL 10:05 TEMPORARY CONTROL UNIT ERROR:HARDWARE











DEPRESS ENTER KEY TO VIEW ALERTS-STATIC

 ???
CMD==>
```

Figure 127. Alerts-Dynamic Panel

Notice that CNM01 is the focal point for CNM99, the entry point.

2. Press Enter to view the Alerts-Static panel. A panel similar to Figure 128 on page 229 is displayed.



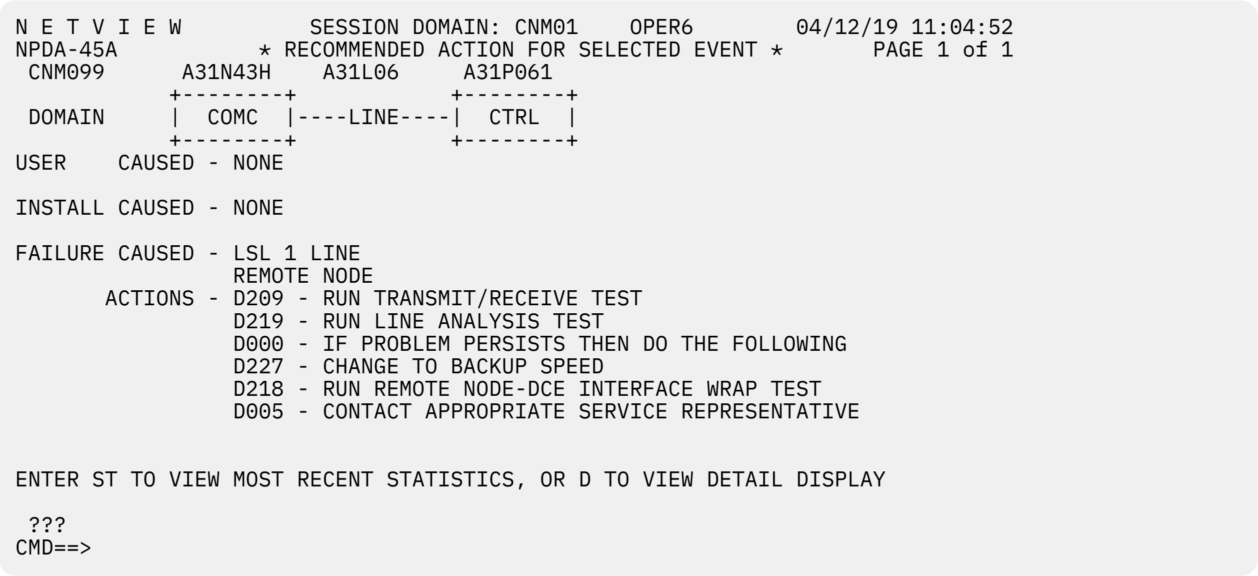
```
N E T V I E W          SESSION DOMAIN: CNM01    OPER6     04/12/19 11:04:20
NPDA-30B                      * ALERTS-STATIC *

SEL# DOMAIN RESNAME TYPE TIME  ALERT DESCRIPTION:PROBABLE CAUSE
( 1) CNM99 A31P061  CTRL 11:02 LINK ERROR:LINE
( 2) CNM01 A22P033  CTRL 10:07 ERROR TO TRAFFIC RATIO EXCEEDED:X.25 NETWORK
( 3) CNM01 A41P056  CTRL 10:06 DEVICE DETECTED ERROR:DEVICE
( 4) CNM01 A41P056  CTRL 10:06 DELAYED ALERT:COMMUNICATION ADAPTER
( 5) CNM01 A31P092  CTRL 10:05 TEMPORARY CONTROL UNIT ERROR:HARDWARE










DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER A TO VIEW ALERTS-HISTORY
ENTER SEL# (ACTION),OR SEL# PLUS M (MOST RECENT), P (PROBLEM), DEL (DELETE)

 ???
CMD==>
```

Figure 128. Alerts-Static Panel

Notice that the first alert on the panel is a link error from the distributed node CNM99.

Note: To obtain a description of all the available options from this panel, see "Network Monitoring with the Hardware Monitor Panels" on page 94 or enter **help** to access the help menu and select PROMPTS.

3. Select option **1** to obtain detailed information about the alert and recommended actions for the link error. A panel similar to Figure 129 on page 230 is displayed.



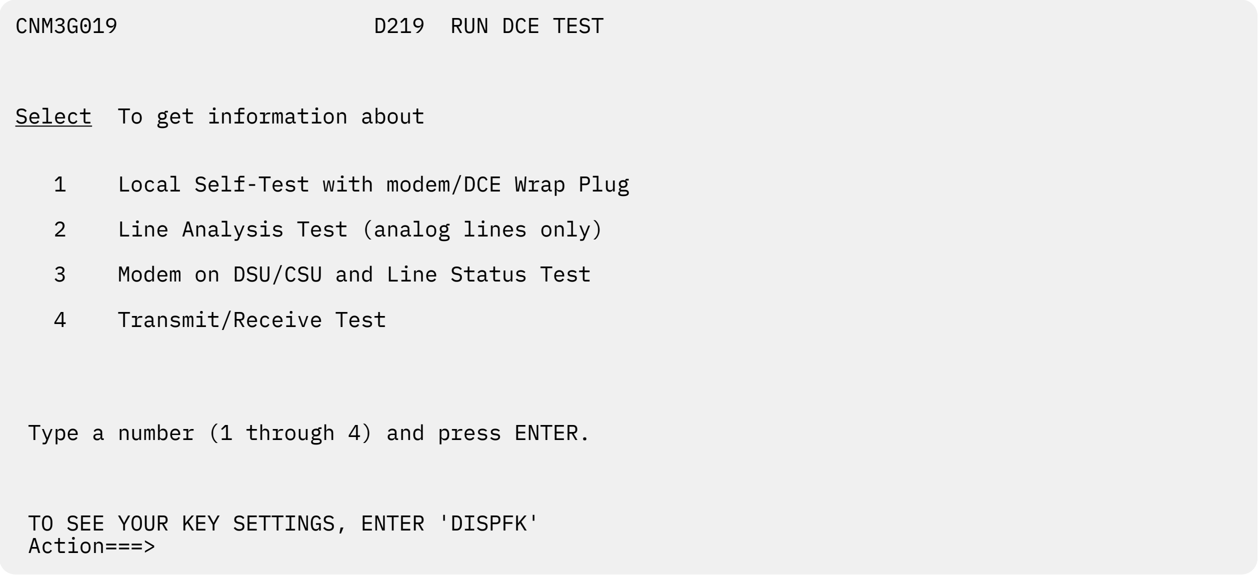
```
N E T V I E W          SESSION DOMAIN: CNM01    OPER6        04/12/19 11:04:52
NPDA-45A            * RECOMMENDED ACTION FOR SELECTED EVENT *       PAGE 1 of 1
 CNM099      A31N43H    A31L06     A31P061
            +--------+            +--------+
 DOMAIN     |  COMC  |----LINE----|  CTRL  |
            +--------+            +--------+
USER    CAUSED - NONE

INSTALL CAUSED - NONE

FAILURE CAUSED - LSL 1 LINE
                 REMOTE NODE
       ACTIONS - D209 - RUN TRANSMIT/RECEIVE TEST
                 D219 - RUN LINE ANALYSIS TEST
                 D000 - IF PROBLEM PERSISTS THEN DO THE FOLLOWING
                 D227 - CHANGE TO BACKUP SPEED
                 D218 - RUN REMOTE NODE-DCE INTERFACE WRAP TEST
                 D005 - CONTACT APPROPRIATE SERVICE REPRESENTATIVE


ENTER ST TO VIEW MOST RECENT STATISTICS, OR D TO VIEW DETAIL DISPLAY

 ???
CMD==>
```

Figure 129. Recommended Action Panel

This panel includes a diagram of the configuration of resources. The rightmost resource (described in the **RESNAME** field of the Alerts-Static panel) is the one most affected by the event described in the panel.

Note the resource names at each end of the line (A31L06). The resource names are A31N43H and A31P061. You need these two names to run a line analysis test.

4. For this scenario, assume that action D209 (`RUN TRANSMIT/RECEIVE TEST`) has been tried and the results are positive (for example, no failures were detected). The next recommended action is D219 (`RUN LINE ANALYSIS TEST`). Enter `action d219` to get more information about how to run the line analysis test. A panel similar to Figure 130 on page 230 is displayed.



```
CNM3G019                    D219  RUN DCE TEST



Select  To get information about


   1    Local Self-Test with modem/DCE Wrap Plug

   2    Line Analysis Test (analog lines only)

   3    Modem on DSU/CSU and Line Status Test

   4    Transmit/Receive Test




 Type a number (1 through 4) and press ENTER.



 TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
 Action===>
```

Figure 130. D219 Run DCE Test Panel

This is the help panel menu for running the data communication equipment (DCE) tests.

5. Select option **2** to get more information about the line analysis test. A panel similar to Figure 131 on page 231 is displayed.

```
CNM3GB19              D219  RUN LINE ANALYSIS TEST



A severe line impairment has been found in the inbound, outbound, or
both connections.

Use the LA (Line Analysis) option of the hardware monitor TEST command on
both the first and second link segments to provide the line characteristics and
to determine the failing segment.  The results are presented on a single page
display (NPDA-24B), accompanied by normal or acceptable limit values.  This
test can be run only on analog lines.

Report this trouble to the telephone company, indicating the values you have
recorded for all line parameters.  Emphasize any values that are beyond the
acceptable limits.







TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
Action===>
```

Figure 131. D219 Run Line Analysis Test Panel

Because this alert originated from the distributed node CNM99, change to that domain to run the line analysis test for this alert.

6. Enter **npda sdomain cnm99** to access the hardware monitor main menu panel in the CNM99 domain.

Topic:	**Reference:**
Using the hardware monitor panels	"Network Monitoring with the Hardware Monitor Panels" on page 94

Blocked Virtual Route (VTAM)

You can use the VTAM DISPLAY ROUTE command to display the status of virtual routes and to test virtual routes. The TEST operand lets you test all routes between the host subarea and any destination subarea for their ability to transfer data. The following example tests all virtual routes starting at node a0453le and ending at subarea address 01:

```
d net,route,destsub=01,netid=netc,origin=a0453le
```

The following output is displayed:

```
IST097I DISPLAY ACCEPTED
IST535I ROUTE DISPLAY 14 FROM SA 4 TO SA 1
IST808I ORIGIN PU = A0453LE DEST PU = C01NPU NETID = NETC
IST536I VR  TP    STATUS   ER       ADJSUB  TGN  STATUS  CUR MIN MAX
IST537I  0   1    INACT     5            1    1  ACTIV3
IST537I  1   1    INACT     1            3    1  INOP
IST537I  2   1    INACT     0           31    1  INOP
IST537I  4   1    INACT     6            3    1  INOP
IST537I  5   1    BLCKD     7           31    1  INOP
IST537I  7   1    INACT     3         1023    1  INOP
IST314I END
```

To obtain a description for a specific status, type `status` followed by the status keyword. For example, to obtain a description for the BLCKD status, enter:

```
status blckd
```

Also, the session monitor can be used to display and test virtual routes.

Topic:	Reference:
VTAM DISPLAY ROUTE command	See the z/OS Communications Server library.
Using the NetView Performance Monitor to determine if a virtual route is blocked	*NetView Performance Monitor User's Guide*
Using the session monitor to determine if a virtual route is blocked	"Typical LU-LU Session for an SNA Subarea Network" on page 61

Hung or Looping NetView Tasks (Command Facility)

If you notice that a command procedure processes much slower than usual, you can use the TASKUTIL command to help determine the cause of the problem. To do this, complete the following steps:

1. From the NetView command facility, issue the TASKUTIL command. Note that you must be logged on to a different operator ID from the one in which the command procedure is running. For example:

   ```
   taskutil type=ost duration=5
   ```

   This command measures NetView task utilization for 5 seconds and displays the results on your operator console. An example of the output follows:

   ```
    NetView V6R3 - NM    NetView   CNM01 OPER2   04/12/19 15:14:35
   * CNM01    TASKUTIL
   ' CNM01
   DWO022I
   TASKNAME TYPE DPR    CPU-TIME N-CPU% S-CPU% MESSAGEQ STORAGE-K  CMDLIST
   -------- ---- --- ----------- ------ ------ -------- ---------  -------
   OPER1    OST  251       66.94  99.86  84.00        6        66  CLIST1
   OPER2    OST  251        0.93   0.11   0.09        0        59  **NONE**
   OPER3    OST  251        0.47   0.00   0.00        0        83  **NONE**
   NETVIEW  OTHR N/A         N/A   0.00   0.00      N/A       N/A       N/A
   NETVIEW  SRB  N/A        5.34   0.03   0.03      N/A       N/A       N/A
   NETVIEW  TOTL  32       92.40 100.00  84.11        6      3625       N/A
   SYSTEM   TOTL N/A         N/A    N/A 100.00      N/A       N/A       N/A
   END DISPLAY
   ```

   High CPU utilization indicates the command procedure is in a loop. In this example, task OPER1 was using 99.86% of the CPU used by the NetView program and this was 84.00% of the total system CPU usage. The problem might be a loop in command list CLIST1 because CLIST1 is identified as being active and work is queued to the task.
2. Cancel the looping command list by using the following STOP command:

   ```
   STOP FORCE=OPER1
   ```
3. If Step "2" on page 232 does not clear the problem, issuing the STOP FORCE command again results in more forceful action.
4. If the STOP FORCE command in Step "2" on page 232 was successful but the task is still having problems, issue STOP TASK=*opid* or STOP TASK=*luname* to cause the task to log off.

Topic:	Reference:
STOP and TASKUTIL commands	NetView online help

Measuring Response Time with Control Units Using RTM (Session Monitor)

One of the objectives of monitoring the response time is to detect performance degradation before it becomes visible to the user. Session response time data is measured and accumulated by control units having the response time monitor (RTM) feature. Examples of control units having the RTM feature include the 3274 and 3174 control units. The session monitor collects the response time data on command and when the session ends, and displays the data in various formats. The control units accumulate the measured response times into ranges of time that are specified by the performance class definitions. Sessions are associated with certain performance classes, and each performance class has associated with it a specific response time objective. You can display response-time graphs that show how the actual response time compares to a specified objective.

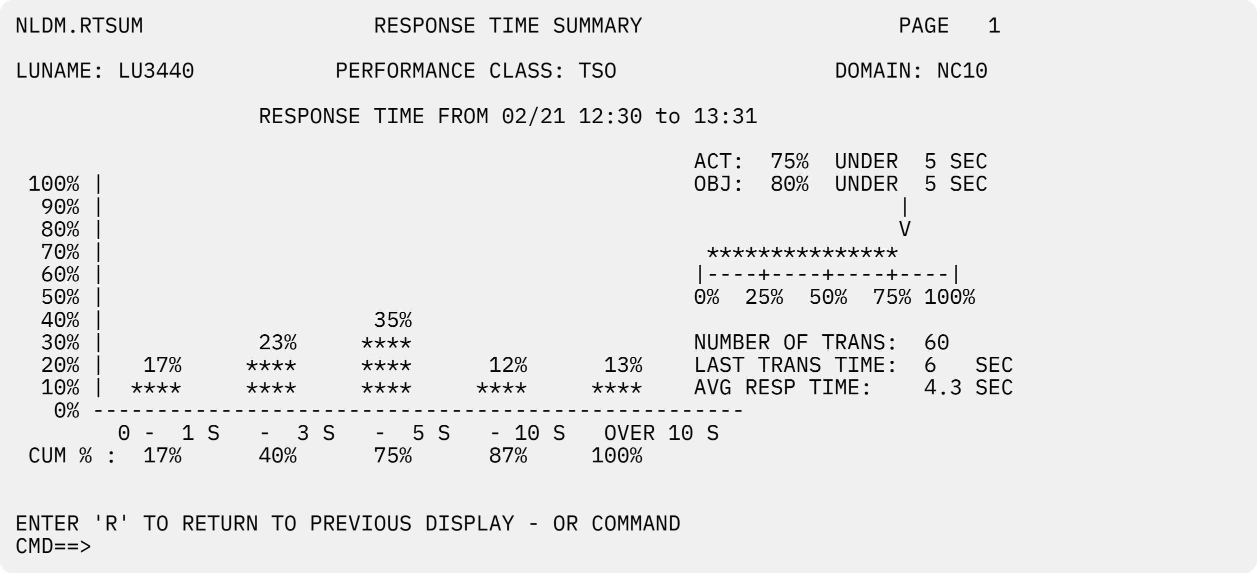
Response time data is displayed in one of the following ways:

- Response time summary for a terminal LU
- Response time trend for a terminal LU
- Response time for a session by collection period

Response time and configuration data for each session can be written to an external log as the response time data is collected, allowing other programs to process it.

In the following scenario, a user calls at 13:30 to complain about the terminal response time. The user also states that the response time has been getting slower since logging on at 11:20. To solve the problem, you can perform the following steps:

1. Determine the terminal ID (LU name) of the user. In this case, the terminal ID is LU3440.
2. Enter `nldm rtsum lu3440 * *` to display the summary of the response time data for LU3440 for the past hour. A panel similar to Figure 132 on page 233 is displayed:



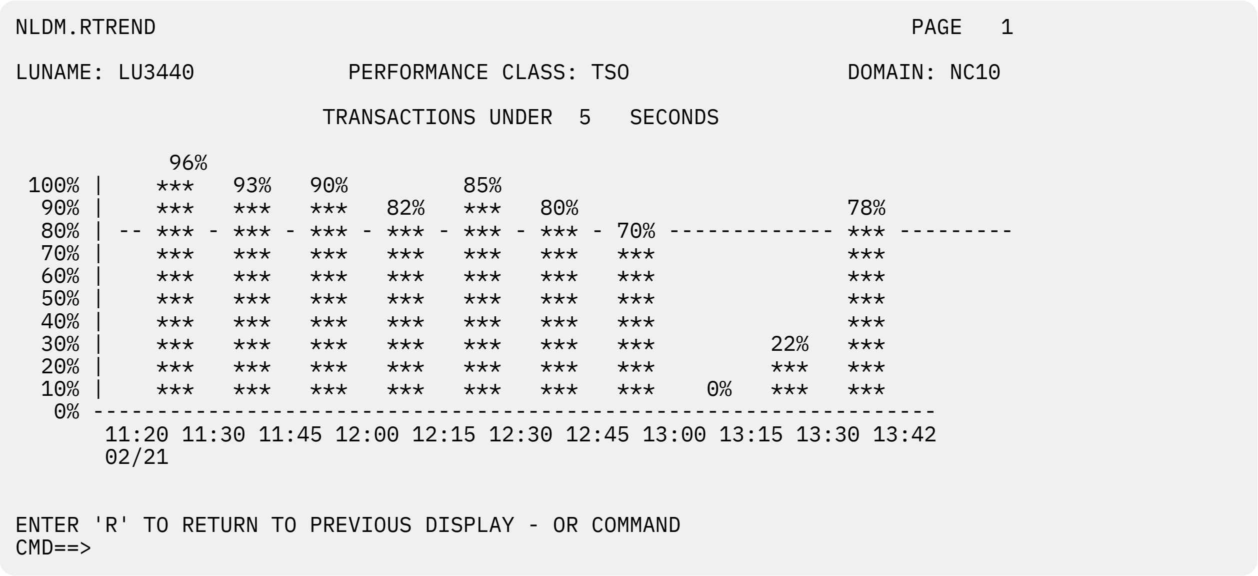
```
NLDM.RTSUM                  RESPONSE TIME SUMMARY                    PAGE   1

LUNAME: LU3440           PERFORMANCE CLASS: TSO                 DOMAIN: NC10

                   RESPONSE TIME FROM 02/21 12:30 to 13:31

                                                     ACT:  75%  UNDER  5 SEC
 100% |                                              OBJ:  80%  UNDER  5 SEC
  90% |                                                              |
  80% |                                                              V
  70% |                                               ***************
  60% |                                              |----+----+----+----|
  50% |                                              0%  25%  50%  75% 100%
  40% |                     35%
  30% |            23%     ****                      NUMBER OF TRANS:  60
  20% |   17%     ****     ****      12%      13%    LAST TRANS TIME:  6   SEC
  10% |  ****     ****     ****     ****     ****    AVG RESP TIME:    4.3 SEC
   0% --------------------------------------------------
        0 -  1 S   -  3 S   -  5 S   - 10 S   OVER 10 S
 CUM % :  17%      40%      75%      87%     100%


ENTER 'R' TO RETURN TO PREVIOUS DISPLAY - OR COMMAND
CMD==>
```

Figure 132. Response Time Summary Panel

   You notice that the user response time is actually 75% under 5 seconds, and the objective is for 80 per cent of the transactions to be completed in under 5 seconds. Because the user response times do not meet the response time objective, the horizontal bar is highlighted (or shown in red, depending on the terminal type).

   At this point, inform the appropriate support personnel of the slow response time.

3. Because the user complained about a continually degrading response time, enter **nldm rtrend lu3440 11:20 *** to check the response times trend for LU3440. A panel similar to Figure 133 on page 234 is displayed:



```
NLDM.RTREND                                                           PAGE   1

LUNAME: LU3440            PERFORMANCE CLASS: TSO                 DOMAIN: NC10

                        TRANSACTIONS UNDER  5   SECONDS

            96%
 100% |    ***   93%   90%         85%
  90% |    ***   ***   ***   82%   ***   80%                     78%
  80% | -- *** - *** - *** - *** - *** - *** - 70% ------------- *** ---------
  70% |    ***   ***   ***   ***   ***   ***   ***               ***
  60% |    ***   ***   ***   ***   ***   ***   ***               ***
  50% |    ***   ***   ***   ***   ***   ***   ***               ***
  40% |    ***   ***   ***   ***   ***   ***   ***               ***
  30% |    ***   ***   ***   ***   ***   ***   ***         22%   ***
  20% |    ***   ***   ***   ***   ***   ***   ***         ***   ***
  10% |    ***   ***   ***   ***   ***   ***   ***    0%   ***   ***
   0% ------------------------------------------------------------------
       11:20 11:30 11:45 12:00 12:15 12:30 12:45 13:00 13:15 13:30 13:42
       02/21


ENTER 'R' TO RETURN TO PREVIOUS DISPLAY - OR COMMAND
CMD==>
```

Figure 133. Response Time Trend Panel

You notice that the user response time has become worse in the last hour. The last bar suggests that the trend might have been reversed, but not enough time has elapsed since 13:30 to decide whether the response time is now approaching its previous level.

4. Log a problem report. You can now display the configuration for this session using the Session Configuration Data panel of the session monitor. See "Using the Session Monitor (SNA Subarea, SNA Advanced Peer-to-Peer Networking)" on page 57 for additional information about using the session monitor.

   Use the information obtained, along with other problem determination tools (such as Hardware monitor and Network performance monitor) to locate problems which were identified along this session path.

Topic:	**Reference:**
AUTOCOLL, COLLECT, RTREND, RTSUM, QUERY RANGE, SET RANGE command	NetView online help

Using the NetView Help Desk

The NetView help desk can provide problem determination data and circumvent or resolve resource problems. To access the help desk, enter:

```
helpdesk
```

Choose from the following topics that are listed in the help desk:

```
                NETVIEW HELPDESK TOPICS

1     Introduction

0     Contents

1     If a terminal is not working
2     If a transaction or an application is not working
3     If there is slow response time
4     If there are problems identified through network monitoring
5     If you need help using NetView
6     If an agent or service point problem occurs
7     If you want to display status and statistics
8     If you want to gather trace data
9     Common checklists
```

Appendix A. Message Formats

This appendix describes the formats of NCCF and network log messages. It also describes the codes that are used in these messages.

NCCF Message Format

Most NCCF messages have the following format:

```
type domid code msgno text
```

Where:

type
Message type. For more information about message type symbols, refer to HDRMTYPE in the DSITIB macro.

domid
Domain or application of the message origin

code
Code (see "Message Codes" on page 238)

msgno
Message number you can use to look up more information using the online help.

msgtext
Text of the message

The NCCF message format can be customized; see the online help for information about the SCRNFMT option for the DEFAULTS and OVERRIDE commands.

Network Log Message Format

Most network log messages have the following format:

```
number    taskid domid code     time type text
```

Where:

number
The sequential serial number of NETLOG.

taskid
Generally the ID of the logging operator or task, but, if applicable, can be another name such as an SAF user ID.

domid
Generally the originating domain, but, if applicable, can be another name such as an SAF user ID, a PPI name, a PDS member, or a TAF session ID. These names can be up to 8 characters and can therefore overwrite the *code* field, which otherwise is the next field.

code
If the previous field is a domain ID, which is 5 or fewer characters, this field is the code (see "Message Codes" on page 238). The *domid* field can cause this field to be overwritten or missing.

time
The time that the task logged the message.

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type

Message type. For more information about message type symbols, refer to HDRMTYPE in the DSITIB macro.

msgno

Message number you can use to look up more information using the online help.

msgtext

Text of the message

Message Codes

The following message codes indicate the origin or destination of a message:

B

The command came from the NetView Web browser.

P

The message came from the PPT.

%

The message was sent only to the authorized receiver of the messages (assigned with PRI).

P%

The message was sent to the authorized receiver and came from the PPT.

*****

The message was sent to a secondary receiver (assigned with SEC).

P*

The message was sent to a secondary receiver (assigned with SEC) from the PPT.

+

The message has been copied and sent to this receiver (assigned with COPY).

?

The message is an important message echoed to the system console by the status monitor. The question mark prevents the echoed message from being logged as an important message by the status monitor.

In some cases, the initial portion of the message (*type domid code*) is displayed on a line by itself as a title, and the remainder of the message (*msgno text*) is on the following line.

Appendix B. NetView Component Hierarchies

This section describes the following NetView component hierarchies:

- "Using the NetView Host Help" on page 239
- "Using the Hardware Monitor Panels" on page 242
- "Using the Session Monitor Panels" on page 246
- "Using the Status Monitor Panels" on page 250
- "Using the RODMView Panels" on page 251

Using the NetView Host Help

Use the NetView HELP command to obtain help for components, panel fields, commands, messages, sense codes, and return and feedback codes. Entering `help` or pressing PF1 (if your PF keys use the default settings supplied by the NetView program) displays the overview help for the current component.

Displaying Host Help Information

Host help information is provided online in an indexed format. Table 19 on page 239 shows the types of help available and the command for displaying each type:

Table 19. Types of Help Information

To obtain help for...	Enter...
NetView commands	HELP COMMANDS
Specific NetView command	HELP *command*
NetView components	HELP *component*
NetView commands by component	HELP *component* COMMANDS
Specific NetView command for a component	HELP *component command*
NetView messages	HELP *msg_number*
NetView product	HELP NetView
VTAM return codes and feedback codes	RCFB *code, feedback_code*
SNA sense codes	SENSE *sense_code*
VTAM status codes	STATUS *code*
Explicit and virtual route status codes	ERST *code* and VRST *code*
Recommended actions for hardware monitor panels	ACTION *number*
Field descriptions	HELP *component 'field'*
Help Desk	HELPDESK
Help index	INDEX *letter*

Using the Help Facility Main Menu

Entering `help netview` or pressing PF1 from the NetView main menu panel displays the NetView Help Facility Main Menu, similar to the panel shown in Figure 134 on page 240.

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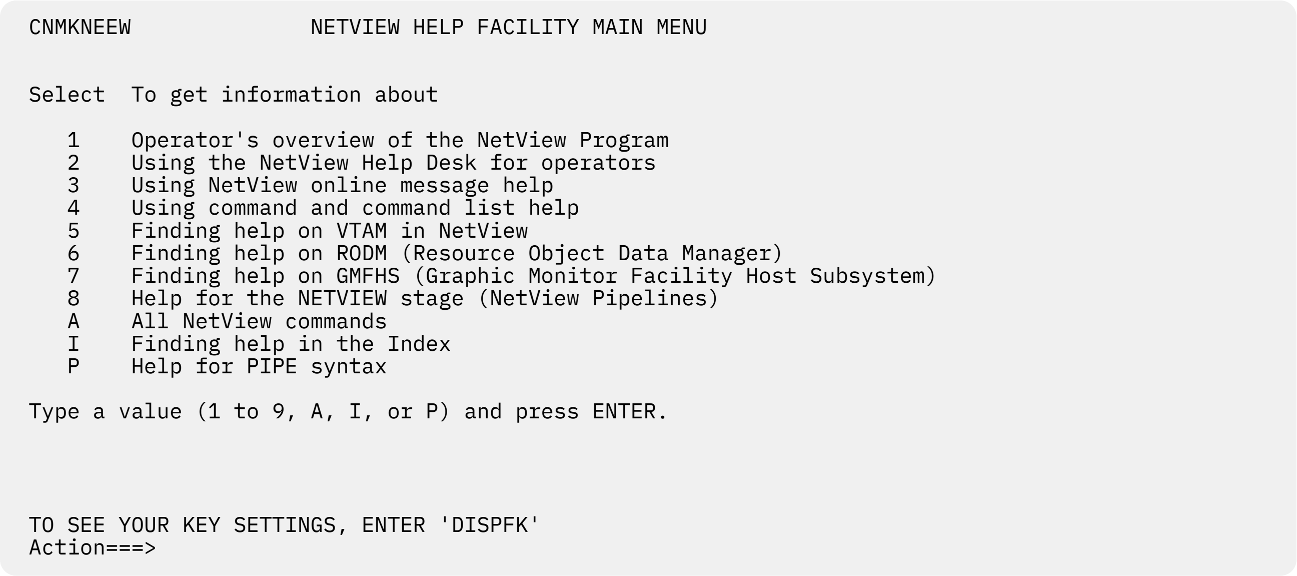


```
CNMKNEEW              NETVIEW HELP FACILITY MAIN MENU


Select  To get information about

   1    Operator's overview of the NetView Program
   2    Using the NetView Help Desk for operators
   3    Using NetView online message help
   4    Using command and command list help
   5    Finding help on VTAM in NetView
   6    Finding help on RODM (Resource Object Data Manager)
   7    Finding help on GMFHS (Graphic Monitor Facility Host Subsystem)
   8    Help for the NETVIEW stage (NetView Pipelines)
   A    All NetView commands
   I    Finding help in the Index
   P    Help for PIPE syntax

Type a value (1 to 9, A, I, or P) and press ENTER.




TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
Action===>
```

Figure 134. NetView Help Facility Main Menu

The following list shows the commands that correspond to certain selections on the help facility main menu:

2

HELPDESK

3

HELP *msg_number*

5

HELP VTAM

6

HELP RODM

7

HELP GMFHS

8

HELP PIPE NETVIEW

A

HELP COMMANDS

I

HELP INDEX

P

HELP PIPE

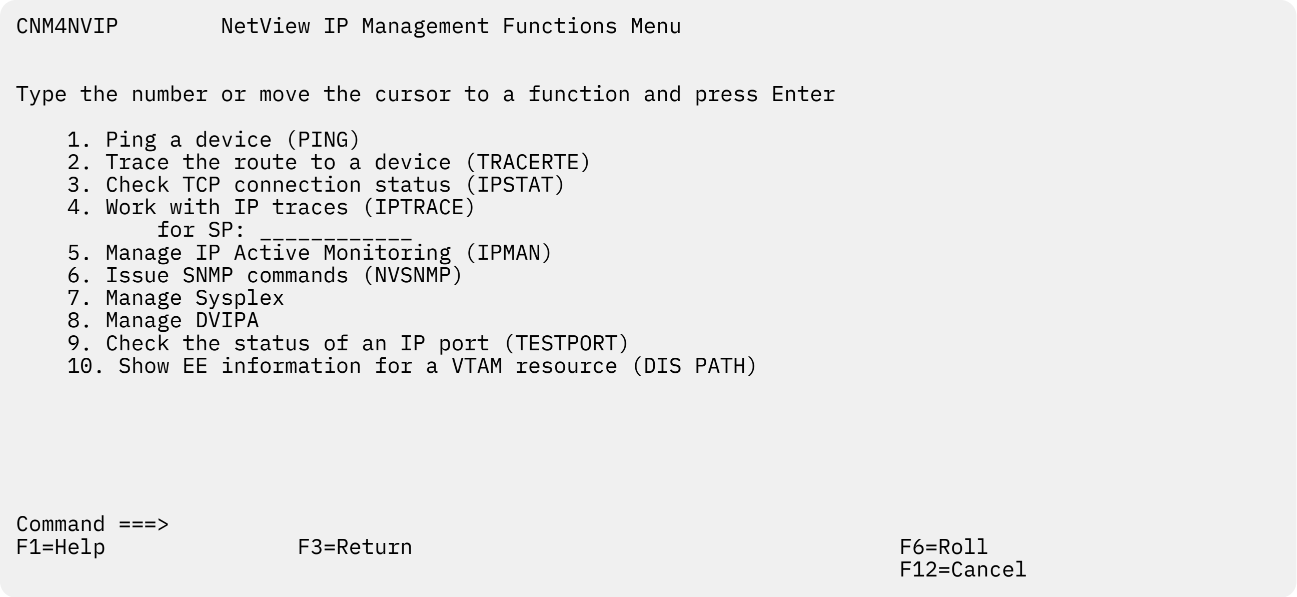
Using the IP Management Panels

You can use the NetView program to monitor and manage IP resources with the following functions:

- PING command
- TRACERTE command
- IPSTAT command
- IPTRACE command
- IPMAN command
- NVSNMP command
- Sysplex management

- DVIPA management
- Critical port monitoring
- Management of SNA over IP

You can access these functions from the NetView IP Management Functions Menu panel, which is shown in Figure 135 on page 241. To access the menu panel, use the NETVIP command.



```
CNM4NVIP        NetView IP Management Functions Menu


Type the number or move the cursor to a function and press Enter

    1. Ping a device (PING)
    2. Trace the route to a device (TRACERTE)
    3. Check TCP connection status (IPSTAT)
    4. Work with IP traces (IPTRACE)
        for SP: ____________
    5. Manage IP Active Monitoring (IPMAN)
    6. Issue SNMP commands (NVSNMP)
    7. Manage Sysplex
    8. Manage DVIPA
    9. Check the status of an IP port (TESTPORT)
    10. Show EE information for a VTAM resource (DIS PATH)






Command ===>
F1=Help              F3=Return                                    F6=Roll
                                                                  F12=Cancel
```

Figure 135. NetView IP Management Functions Menu Panel

The functions are briefly described briefly. For detailed information about these functions, see *IBM Z NetView IP Management*.

Ping a device (PING)
Test connectivity to an IP host, which can often be useful in determining if a resource can be reached.

Trace the route to a device (TRACERTE)
Trace the routes of data packets to a specified IP host from the IP stack on the host on which the NetView program is running. Use this command to determine connectivity with or routing to a particular endpoint, roundtrip times between the NetView and target hosts, and routers along the way.

Check TCP connection status (IPSTAT)
Display connections for a stack, display connection information such as connection endpoints and the type of connection, and determine if a connection is stopped.

Work with IP traces (IPTRACE)
Start and view diagnostic traces to help resolve TCP/IP problems. IP packet trace is used for IP data flow problems and for copying IP packets as they are received or sent. OSA packet trace is used for Open Systems Adapter (OSA) data flow problems and for copying OSA packets as they are received or sent. Component trace is used to trace data processing problems between the client and the server.

Manage IP Active Monitoring (IPMAN)
Control the monitoring of IP resources. You can start and stop monitoring; add, change, or delete an instore control file policy of a given resource; and display resources.

Issue SNMP commands (NVSNMP)
Manage IP devices through SNMP. You can use the Get, Set, Walk, and Group commands. You can also use extended SNMP groups.

Manage Sysplex
Manage sysplex resources by using the following information from the sysplex management functions panel (CNM4NVSP):

- Stack configuration and status (CNMSSTAC)

- IP stack interfaces (CNMSIFST)
- NetView configuration and status (CNMSNVST)
- OSA channel and ports (CNMSOSAP)
- HiperSockets adapters (CNMSHIPR)
- Telnet servers (CNMSTNST)
- Telnet server ports (CNMSTPST)

Manage DVIPA

Manage DVIPA resources by using the following information from the DVIPA management functions panel (CNM4NVDV):

- DVIPA definition and status (CNMSDVIP)
- DVIPA sysplex distributors (CNMSPLEX)
- DVIPA server health (CNMSDVPH)
- DVIPA distributed targets (CNMSTARG)
- DVIPA connection route status (CNMSVPRT)
- DVIPA connection routing (CNMSDDCR)
- DVIPA connections (CNMSDVPC)
- DVIPA status (CNMSDVST)

Check the status of an IP port (TESTPORT)

Check a port that looks active but might be refusing connections because it is inactive. The TESTPORT command can use settings that are defined by COMMON.IPPORTMON statements in the CNMSTUSR or C*xx*STGEN member. With these statements, you can specify the IP port to monitor, the IP address that is associated with the IP port, and how frequently to monitor the IP port.

Show EE information for a VTAM resource (DIS PATH)

Enterprise Extender technology enables the transporting of SNA traffic over an IP network. This technology routes SNA path information units (PIUs) over Advanced Peer-to-Peer Networking nodes using high-performance routing (HPR) and across IP using User Datagram Protocol (UDP). The routing that is provided by Enterprise Extender is more complex than the routing for SNA traffic only. The NetView DIS command provides additional data for this routing.

Using the Hardware Monitor Panels

Many hardware resources in a network send information and error records to the host system. The hardware monitor collects this information and arranges and displays the data to help you with problem determination.

Navigating the Hardware Monitor Panel Hierarchy

Figure 136 on page 243 shows the general relationship of the hardware monitor panels. You can usually arrive at a specific panel in several ways. You can move down the hierarchy of panels, or you can use an explicit hardware monitor command, as shown in the left column in Figure 136 on page 243, to go directly to the information you need.

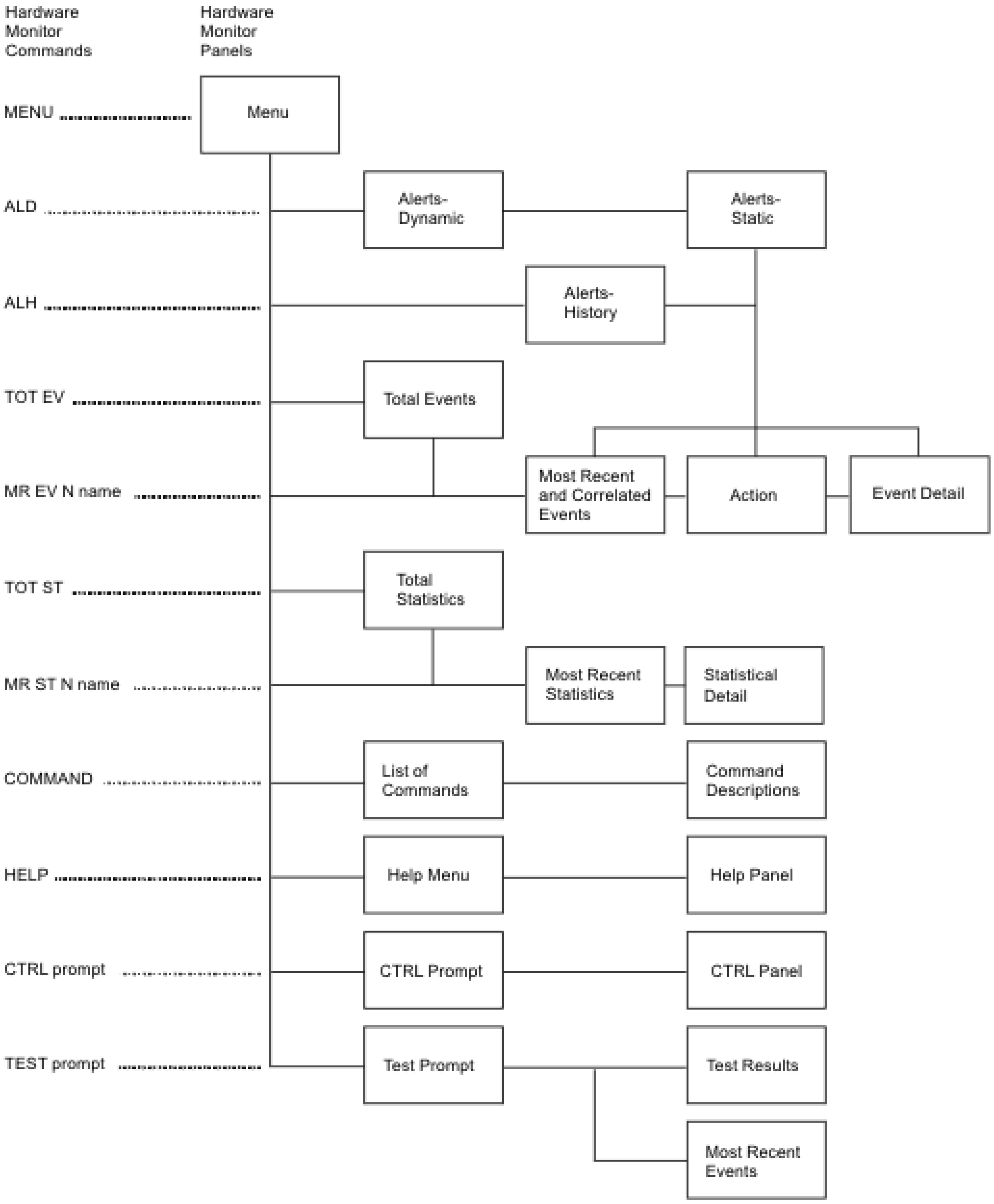


Figure 136. Hardware Monitor Panel Hierarchy

The panels in Figure 136 on page 243 are described in the following list:

Menu Panel
: Provides a selection of different hardware monitor functions and shows database initialization dates. This panel also indicates with which domain you are in session and the domain to which you are attached.

Alerts-Dynamic Panel
: Provides a continuously updated single page of alerts retrieved from the database, presented in reverse chronological order. A C in column 80 indicates that there might be correlated records for the listed resource.

Alerts-Static Panel
: Similar to the dynamic panel, but can hold alerts (take a “snapshot” of the Alerts-Dynamic panel) so you can continue to work on problems. From this panel, you can also enter a problem in the Information/Management (MVS only) system. See “Creating a Problem Report” on page 106 for additional information. A C in column 80 indicates that correlated records are available for the listed resource. You can enter CE to display the related records.

Alerts-History Panel

Displays all alerts on the database. This can be a multipage panel.

A C in column 80 indicates that correlated records are available for the listed resource. You can enter CE to display the related records. From this panel, you can also enter a problem in the Information/Management system.

The Information/Management system does not support the printing of double-byte character set (DBCS) characters. Unexpected results can occur.

Total Events Panel

Provides summary totals of events about specific resources.

Most Recent and Correlated Events Panel

Provides a listing of the events in the database for a specified resource or correlated resource in reverse chronological order. A C in column 68 indicates that correlated records are available for the listed resource. From this panel, you can also enter a problem in the Information/Management system.

Information/Management does not support the printing of DBCS characters. Unexpected results can occur.

Action Panel

Provides a recommended action to bypass or resolve the event, or the actual action taken to fix a previously reported problem. This can be a multipage panel.

Event Detail Menu Panel

Provides a selection of information panels with different levels of detail.

The Event Detail Menu is available for network management vector transport (NMVT) record types only.

Total Statistics Panel

Displays summary of statistical data about specific resources.

Most Recent Statistics Panel

Provides a reverse chronological listing of the statistics on the database for the specific resource.

Link Problem Determination Aid Panel

Provides a list of tests initiated by the communication controller that provide data circuit-terminating equipment (DCE) status, attached device status, and the overall quality of a communications link.

Statistical Detail Panel

Provides a list of temporary error counter values recorded for physical and virtual links.

List of Commands Panel

Provides details and examples of how to use hardware monitor commands. You can also reach this panel from the hardware monitor HELP menu.

Command Descriptions

Provides individual command descriptions including the format and description of operands, and, where applicable, usage notes, examples, and responses.

Help Menu

Provides access to help for using the hardware monitor.

Help Panel

Provides help for terms and prompts seen on the panels. This panel also provides general information about how to use the panels and the hardware monitor.

CTRL Prompt Panel

Describes the CTRL command and prompts you for a resource name.

CTRL Panel

Provides link test counts, summary error counts, most recent events, and release level information from the SNA controller retrieved as a result of the CTRL command.

Test Prompt Panel

Describes the use of the TEST command and prompts for resource names.

Test Results Panel
Displays the status of the modems or line or both. Also displays the current and transition states of the Electronic Industries Association (EIA) leads for a selected remote station. For the line, analog and digital parameters are listed.

You can request help for any of the fields on NetView panels. To search for an explanation of a term shown on a hardware monitor panel, enter:

```
help npda 'term'
```

Where *term* specifies one or more words on a panel. If you do not specify a component, all component fields are searched.

To leave the panel hierarchy and return to the component that you were using before you entered the hardware monitor, enter the NetView END command or press a PF key with that setting. The PF key setting that is supplied by the NetView product for END is PF2.

Understanding the Hardware Monitor Panel Terminology

To make the best possible use of the hardware monitor, you need to know how the different components in your system or network are connected to each other and to the host controller. You also need to understand how the hardware monitor sees your configuration, because the probable cause terminology used by the hardware monitor might be unfamiliar to you.

Figure 137 on page 245 gives you more information about how the hardware monitor's physical components and levels are related to each other in one typical configuration.

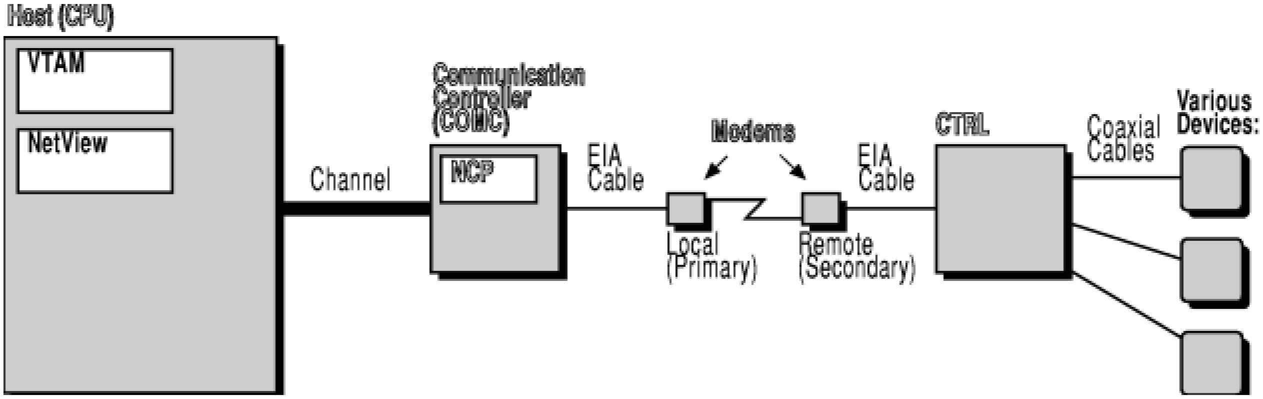


Figure 137. Hardware Monitor Physical Components and Levels

The following abbreviations are associated with the hardware monitor:

COMC
Communication controller, such as 3704, 3705, 3720, 3725, or 3745

CPU
Central processing unit, the processor, the host computer

LINE
The communication path between the COMC and CTRL, including the local and remote modems

CTRL
The cluster controller on the remote end of the line, such as a 3174, 3274, 3276, 8100, or 3777

DEV
The terminal connected to the cluster controller, such as a 3278, or 8775

CHAN
Channel—the path between the host processor and a channel-attached device

LCTL
A cluster controller attached to the processor by the channel

LDEV
A device attached to a channel-attached cluster controller

Table 20. Symbolic Names for Locally Attached Devices

Type	Name	Description
CPU	CPU (SSSSS)	For processor devices (such as 3090)
CPU	$LOCAL	For the 43X1 loop adapter and the 3274 MDL 1A
CHAN	CH (XX)	For channels (such as 2860) running in an MVS environment
LCTL	LCTL (XXYZ)	For local SNA display controllers (such as 3274 MDL 1A)
LCTL	LCTL (XXY)	For local non-SNA display controllers (such as 3272)
LCTL	LCTL (User-defined)	For local display controllers (such as 3274)
TCU	TAPE (XXY)	For tape controllers (such as 3803)
SCU	DASD (XXY)	For DASD storage controllers (such as 3830)
IOCU	ICOU (XXY)	For printer controllers
LDEV	LDEV (XXYZ)	For local non-SNA display devices (such as 3277)
(NNNN)	TDEV (XXYZ)	For tape devices (such as 3420)
(NNNN)	DDEV (XXYZ)	For DASD devices (such as 3350)
(NNNN)	IODV (XXYZ)	For printer devices

This table uses the characters XX, Y, and Z to describe the first, second, third, and fourth hexadecimal characters, respectively, of the channel unit address.

XX
Represents either a channel number or a channel path ID.

XXY
Represents a controller on a channel.

XXYZ
Represents a device on a controller. These characters might also represent a controller when the device cannot be addressed.

NNNN
Is the numerical IBM machine type designator expressed in decimal.

SSSSS
Is the resource serial number expressed in decimal.

Resource names and types, all leading or embedded blanks, all characters below X'40', and characters with a value of X'FF' are converted to an underscore (_). Names and types consisting of all blanks are converted to all underscores.

Using the Session Monitor Panels

The session monitor collects and correlates data about Systems Network Architecture (SNA) sessions (subarea and Advanced Peer-to-Peer Networking). The session monitor also helps identify network problems and conditions that might cause errors. Some examples of this are failing or unresponsive terminals, lost path information units (PIUs), buffer errors, and resource status errors.

The session monitor collects data about same-domain, cross-domain, and cross-network SNA sessions (subarea and Advanced Peer-to-Peer Networking), and maintains the collected data on a session basis. The SNA sessions can involve non-SNA terminals supported by the Network Terminal Option (NTO).

These NTO sessions look like normal SNA sessions to the host. The session monitor also collects data about data flows for certain non-SNA terminals that are not supported by NTO. To collect data for cross-domain sessions, a session monitor must be available in each domain. To collect data for cross-network sessions, a session monitor must be available in each gateway host on the session path and at the session end points. To collect data for SNA Advanced Peer-to-Peer Networking sessions, a session monitor must be available at the interchange node.

Figure 138 on page 247 shows the general relationship of the session monitor panels. You can usually arrive at a specific panel in several ways. You can move down the hierarchy of panels, or you can use an explicit session monitor command, as shown in the left column in Figure 138 on page 247, to go directly to the information you need.

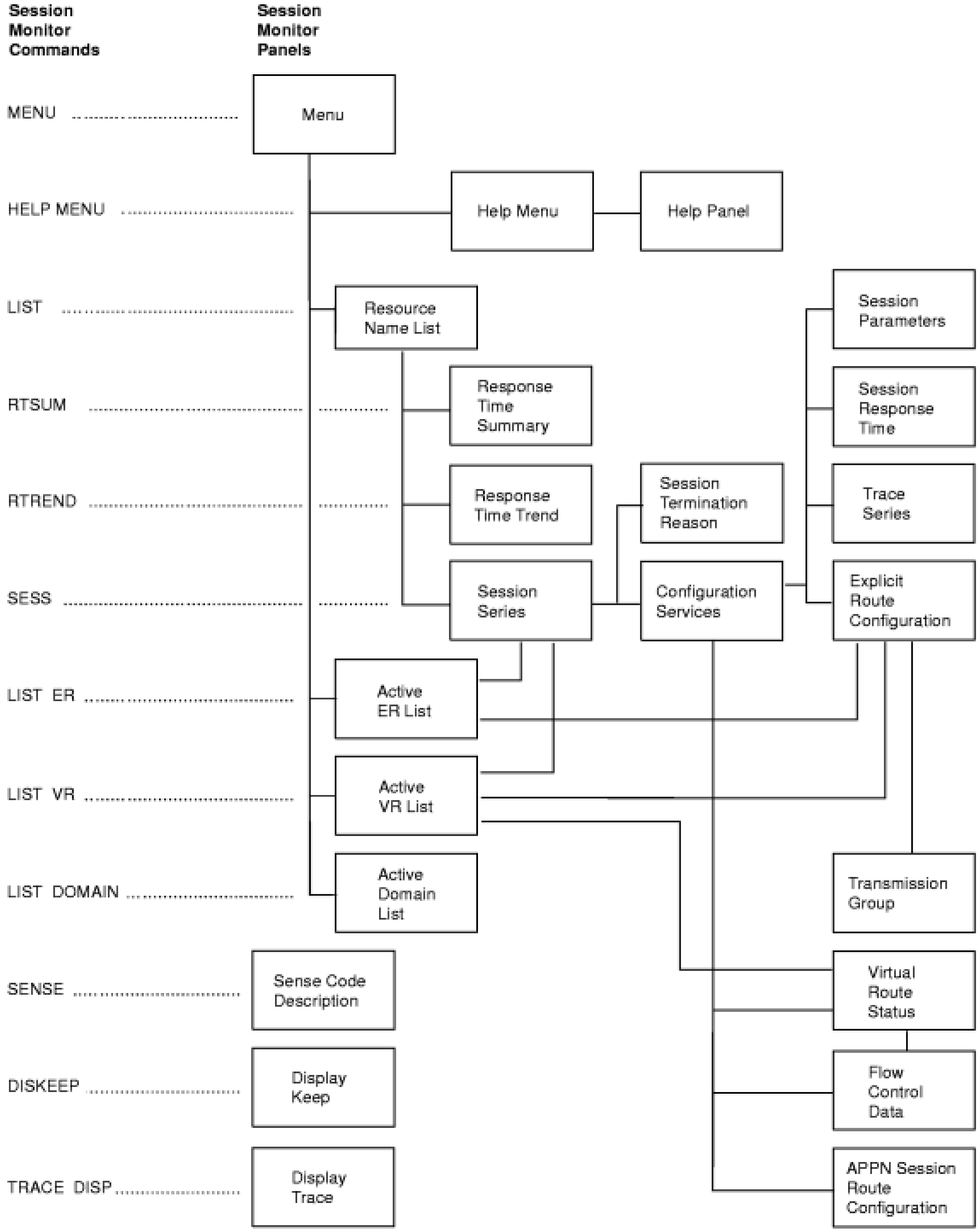


Figure 138. Session Monitor Panel Hierarchy

The panels in Figure 138 on page 247 are described in the following list:

Menu Panel
Provides for the selection of the resource list type, list of domains, active explicit routes (ERs), or active virtual routes (VRs) for which you want information.

Help Menu
Lists and describes the session monitor commands for which online help is available.

Help Panel
Describes the syntax of the command selected from the previous help panel.

Resource Name List Panel
Displays a list of resources for which data is available. From this panel, you can view the Response Time Summary, Response Time Trend, or Session Series panels.

Response Time Summary Panel
Is a series of graphs showing the percentage of transactions in each response time range for a specified period of time. Graphing is done for a specific logical unit in a given domain. This series of graphs can be a multipage panel. The various performance classes have different pages.

Response Time Trend Panel
Is a graph for a specific terminal logical unit that shows the percentage of transactions with response times that are less than a specified maximum objective for each data collection period. You can specify a maximum, or your system programmer can set up the limits. The objective is displayed on the panel.

Session Series Panel
Shows a list of sessions for the resources you name on the command. From this panel, you can view session configuration data, start a session connectivity test for an active session, or display the reason code and sense code for an inactive session.

Session Termination Reason Panel
Presents in detail a description of the reason codes and sense codes associated with UNBIND, BIND failures or INIT failures. These reason codes and sense codes are displayed only for LU-LU sessions.

Configuration Services Panel
Shows the local network configuration for a selected session. You can shift the panel to the left or right to view adjacent network configurations using the NetView LEFT and RIGHT commands, or PF keys with those settings. The session monitor PF key setting that is supplied by the NetView product for LEFT is PF10, and for RIGHT is PF11. From this panel, you can display trace information, session parameters, explicit route information, session response time, active virtual route status, Advanced Peer-to-Peer Networking route data, and flow control data.

The INIT failure configuration panel shows the configuration of SSCPs that attempted to establish the selected failed session.

Note: This function depends on the session monitor being fully functional in each SSCP that attempted to establish the session.

Session Parameters Panels
Display the session parameters for a given session. You can have the information interpreted or displayed in hexadecimal.

Session Response Time Panel
Is a graph of the percentage of transactions in each response time range for each data collection period of a session. Each data collection period is a separate page, beginning with the earliest period. To display the most recent period, enter the BOTTOM command.

Trace Series Panel
Provides trace data for the type of trace you requested on the previous panel. Whether you get a formatted or unformatted list depends on the trace you requested and whether you have HEX set on or off.

Explicit Route Configuration Panel
Provides a configuration for an explicit route. Explicit route information includes the translation of subarea PU addresses into network names, wherever possible. From this panel, you can select a panel to view transmission group detail information.

Active ER List Panel
Lists the active explicit routes for which data is available. From this panel, you can display a list of sessions using a specific explicit route or display the configuration of the explicit route.

Active VR List Panel
Lists the active virtual routes for which data is available. From this panel, you can display the virtual route status, display a list of sessions, or display the configuration of the virtual route.

Active Domain List Panel
Lists other known domains. This panel also shows the status of sessions that have been started to each of these domains.

Transmission Group Panel
Displays a list of all the SSCPs that have activated links on either side of the selected transmission group. If SSCP names are not available, their subarea addresses are displayed in EBCDIC.

Virtual Route Status Panel
Lists the virtual route status data from the virtual route end points. From this panel, you can display flow control data.

Flow Control Data Panel
Displays primary or secondary stage data, or both, for a TG ending in either an NCP or VTAM.

APPN Session Route Configuration Panel
Displays the route configuration through the SNA Advanced Peer-to-Peer Networking networks. You can shift the panel for more data in the primary or secondary directions by issuing PAR or SAR, respectively.

Sense Code Description Panel
Presents in detail a description for sense codes.

Display Keep Panel
Lists the PIU KEEP counts that have been set for a specific network name or for a name pair, or the DASD session keep counts for the global keep count or for a specific name pair.

Display Trace Panel
Lists the specific resource names that have been activated or deactivated for tracing with the TRACE command. The first resource listed (GLOBAL) reflects the setting of the TRACE ALL function. If global trace is ON, you can use TRACE STOP to deactivate the trace for all sessions with the specified resource. The session monitor lists the specific network names that have been deactivated. If global trace is OFF, you can use the TRACE START to activate the trace for all sessions with the specified resource. The session monitor lists the specific resource names that have been activated.

For an online explanation of a panel, enter:

```
help nldm.panelname
```

Where *panelname* is the name of the panel, found in the upper left corner of each session monitor panel. For example, to receive help for the main menu, enter:

```
help nldm.menu
```

For an explanation of the fields shown on the panels, enter:

```
help nldm 'term'
```

Where *term* specifies one or more words on a panel. You can request help for any of the terms on the panels.

To leave the panel hierarchy and return to the component that you were using before you entered the session monitor, enter the NetView END command or press a PF key with that setting. The PF key setting that is supplied by the NetView product for END is PF2.

Using the Status Monitor Panels

The status monitor collects and summarizes information about the status of resources defined in a VTAM domain. The status monitor can automatically restart failing network resources and monitor important NetView messages.

Figure 139 on page 250 shows the general relationship of the status monitor panels. You can usually arrive at a specific panel in several ways. You can move down the hierarchy of panels, or you can use an explicit status monitor command, as shown in the left column in Figure 139 on page 250, to go directly to the information you need.

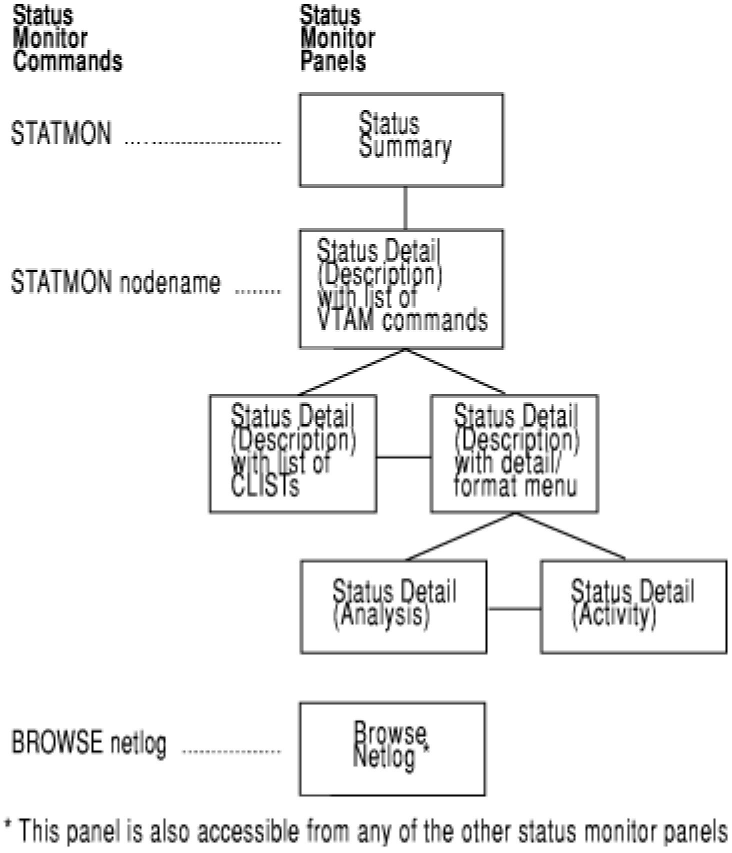

Status Monitor Commands
Status Monitor Panels
STATMON
Status Summary
STATMON nodename
Status Detail (Description) with list of VTAM commands
Status Detail (Description) with list of CLISTs
Status Detail (Description) with detail/ format menu
Status Detail (Analysis)
Status Detail (Activity)
BROWSE netlog
Browse Netlog*
* This panel is also accessible from any of the other status monitor panels

Figure 139. Status Monitor Panel Hierarchy

The panels in Figure 139 on page 250 are described in the following list:

Status Summary Panel

When you access this panel by typing `statmon`, this panel displays every type of major and minor resource (node) within your domain. For each resource type, this panel displays the total resource count and the number of resources that fall into each of the status monitor's interpretation of VTAM states.

When you access this panel from the Status Detail panel that contains the detail/format menu (by selecting a resource and SUMMARY from the `DISPLAY: HIGHER NODE` option), this panel displays, for the specified resource type, the total resource count and the number of resources that fall into the status monitor's interpretation of VTAM states.

Status Detail Panels

By selecting any total in the Domain Status Summary, you can display the Domain Status Detail panel for that resource type. For example, if you select LINES, the Domain Status Detail panel displays all of the lines for the domain identified in the header section.

Initially, the Domain Status Detail panel is presented in description format with a list of available VTAM commands that can be applied to the listed resources. In this format, each listed resource is followed by a description of the resource. You can press the following keys to toggle to a different format:

SCLIST

Displays the command lists that you can run against one or more of the displayed resources. The status monitor PF key setting that is supplied by the NetView product for SCLIST is PF11.

SMENU

Displays activity and analysis information for the selected resources displayed on the status monitor screen. The analysis format summarizes the status of each displayed node over a period of time. The activity format, available only for application programs and application program major nodes, summarizes the message traffic to and from the listed application programs or terminal LUs.

From the detail/format menu you can also select a resource and `DETAIL` from the `DISPLAY: THIS NODE` option to display information for that specific resource. At this point, the status monitor panels display information only for that resource.

Network Log Panel

By selecting one of the message indicators at the top of a status monitor panel you can look at messages that are written to the active network log. Depending on the indicator you selected, the messages are highlighted in different colors. You can also look at the network log by entering `browse netlog`*x* where *x* is either a for the active log, `i` for the inactive log, p for the primary log or s for the secondary log. :edl

To leave the panel hierarchy and return to the component that you were using before you entered the status monitor, enter the NetView END command or press a PF key with that setting. The PF key setting that is supplied by the NetView product for END is PF2.

Using the RODMView Panels

Use RODMView to simplify the process of adding, deleting, changing, and querying fields and data in RODM.

Figure 140 on page 252 shows the general relationship of the RODMView panels. The main panel is the starting point for all subsequent panels. Each RODMView panel has a corresponding Help panel, accessed by pressing PF1. From each Help panel, you can access the Keys Help panel, which describes how to use the RODMView-specific PF keys. Unlike NetView PF keys, RODMView PF keys cannot be changed interactively, nor displayed with DISPFK. From any RODMView panel, use PF keys PF14 through PF22 to display the RODMView input panels as shown in Figure 140 on page 252.

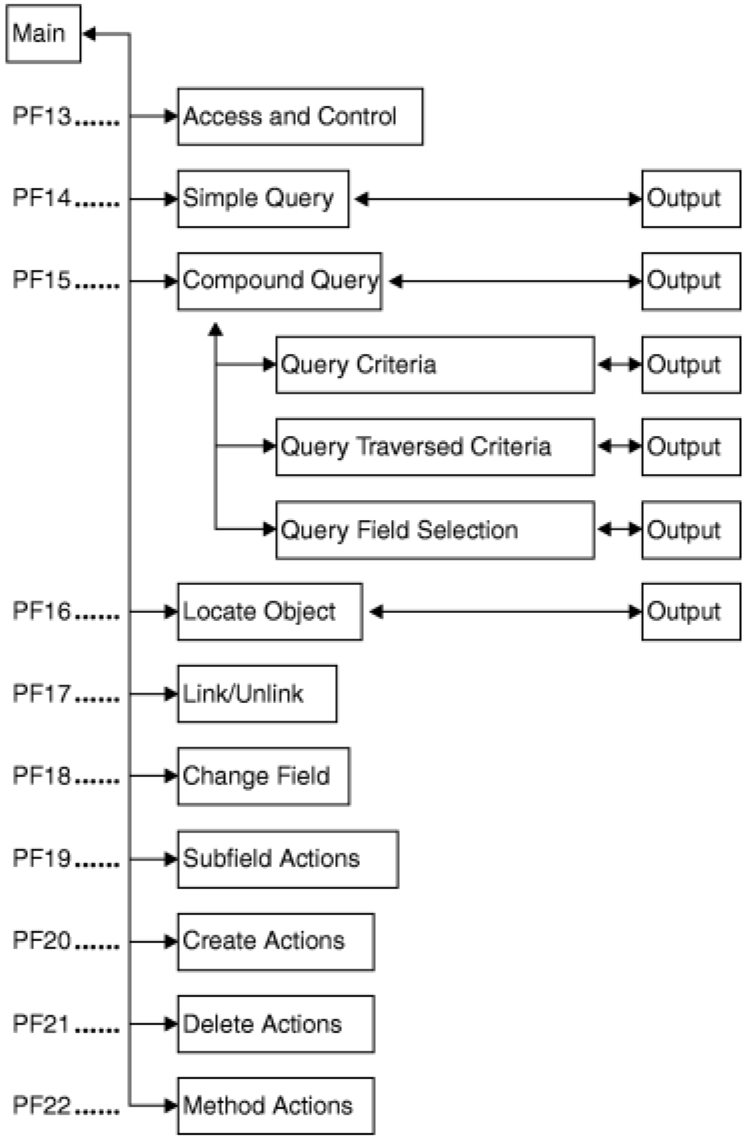


Figure 140. RODMView Panel Hierarchy

For a description of the panels in Figure 140 on page 252, refer to *IBM Z NetView Resource Object Data Manager and GMFHS Programmer's Guide*.

You can get function equivalent to the RODMView panels through the NetView EKGV commands. The EKGV commands do not display the RODMView panels. For a list and descriptions of the RODMView commands, refer to the NetView online help.

Appendix C. Interpreting Session Data

You can use the session monitor to provide information about sessions and resources in pure SNA subarea, pure SNA Advanced Peer-to-Peer Networking, or mixed networks. This section provides scenarios that show:

- Typical SNA subarea and SNA Advanced Peer-to-Peer Networking configurations and the network management data available at the session monitor in each of the network nodes
- The session monitor data resulting from taking over or giving back one or more endpoints in a session

For additional information about defining SNA Advanced Peer-to-Peer Networking session configurations, refer to the *IBM Z NetView Installation: Configuring Additional Components* .

Sessions-Data Availability Scenarios

In the SNA Advanced Peer-to-Peer Networking environment, a VTAM interchange node and the NCP it owns are viewed logically as a single SNA Advanced Peer-to-Peer Networking node (referred to as a composite network node), allowing them to interact with other SNA Advanced Peer-to-Peer Networking nodes. At the same time, they continue to provide subarea support. Using Session PD support, the user can view both SNA Advanced Peer-to-Peer Networking and SNA subarea information for a single session. The session configuration and the placement of the session monitor in the session path determines the amount of data available locally to the user. For optimal session PD, the user should be at an interchange node. Here, both SNA Advanced Peer-to-Peer Networking and SNA subarea data is available locally.

The following scenarios represent some of the configurations you can set up. These scenarios show examples of how SNA subarea and SNA Advanced Peer-to-Peer Networking nodes can be connected together and the network management data that is available in these different combinations. In each of the configurations, all CPs are VTAM V4R1 with NetView V2R4 or later.

SNA Session

The configuration shown in Figure 141 on page 253 is composed of an LU-LU session in a pure SNA subarea network. An SSCP-SSCP session exists between SSCP1 and SSCP2.

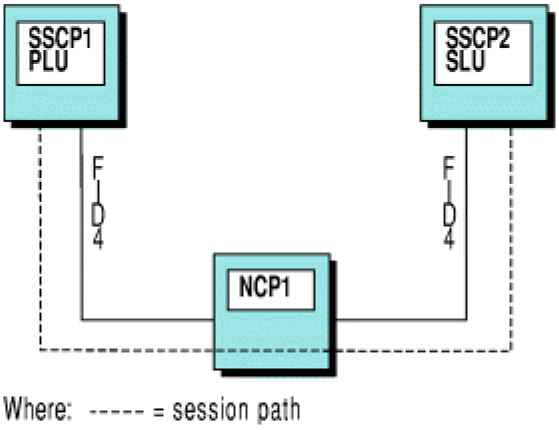


Figure 141. SNA Session

Node	Available data
SSCP1	• Session awareness (SAW) data • Subarea route data (explicit route and virtual route)

Node	Available data
SSCP2	• SAW data • Subarea route data (explicit route and virtual route)

SNA Advanced Peer-to-Peer Networking Session through a Composite Node

The configuration shown in Figure 142 on page 254 is composed of an LU-LU session going through a composite node. This configuration contains two NCP subarea nodes. CP-CP sessions exist between CP1-CP2 and CP2-CP3.

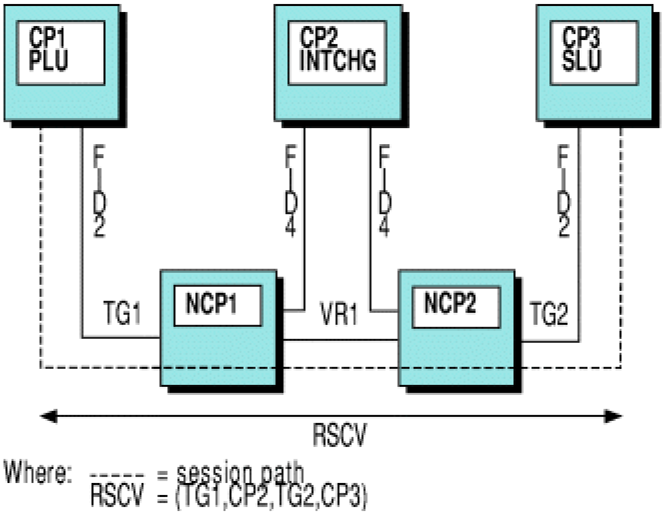


Figure 142. SNA Advanced Peer-to-Peer Networking Sessions through Composite Nodes

Node	Available data
CP1	• Session awareness (SAW) data, including the Route Selection Control Vector (RSCV) for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG1 in the secondary direction • Subarea route data (by issuing a Set Domain to CP2)
CP2	• SAW data, including Virtual Route (VR) information • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG1 in the primary direction) by soliciting NCP1 • Destination flow control data (data for TG2 in the secondary direction) by soliciting NCP2
CP3	• SAW data, including the RSCV for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG2 in the primary direction • Subarea route data (by issuing a Set Domain to CP2)

SNA Advanced Peer-to-Peer Networking Session through Non-Adjacent Composite Nodes

The configuration shown in Figure 143 on page 255 consists of a single network with multiple non-adjacent composite nodes. The network has multiple VRs: an internal VR for NCP1 and another VR between NCP2 and NCP3.

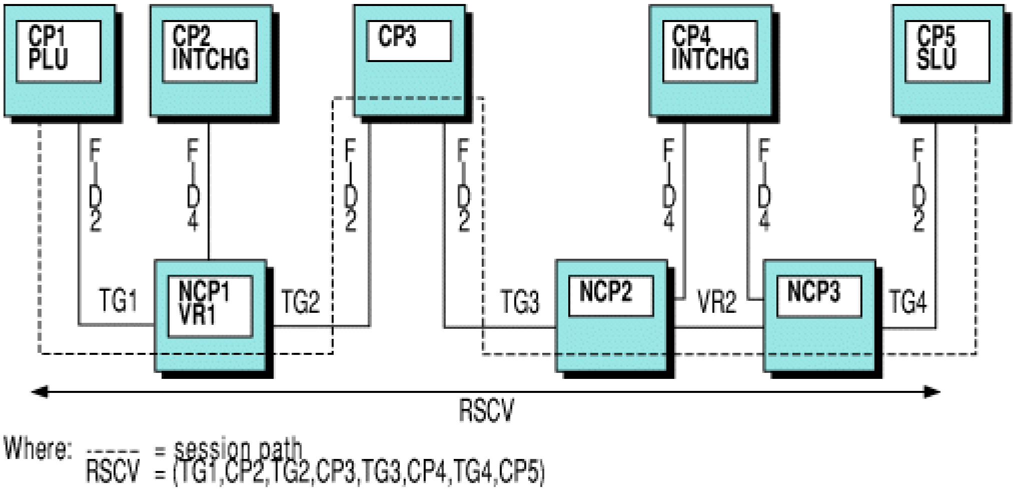


Figure 143. SNA Advanced Peer-to-Peer Networking Session through Nonadjacent Composite Nodes

Node	Available data
CP1	• Session awareness (SAW) data, including the Route Selection Control Vector (RSCV) for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG1 in the secondary direction • Subarea route data (by issuing a Set Domain to CP2 or to CP4)
CP2	• SAW data, including Virtual Route (VR) information for VR1 • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG1 in the primary direction) by soliciting NCP1 • Destination flow control data (data for TG2 in the secondary direction) by soliciting NCP1
CP3	• Session awareness (SAW) data, including the Route Selection Control Vector (RSCV) for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG2 in the primary direction) by soliciting NCP2 • Destination flow control data (data for TG3 in the secondary direction) by soliciting NCP3
CP4	• SAW data, including Virtual Route (VR) information for VR2 • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG3 in the primary direction) by soliciting NCP2 • Destination flow control data (data for TG4 in the secondary direction) by soliciting NCP3

Node	Available data
CP5	• SAW data, including the RSCV for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG4 in the primary direction • Subarea route data (by issuing a Set Domain to CP4 or to CP2)

SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes

The configurations shown in Figure 144 on page 256 and Figure 145 on page 257 consist of a single network with adjacent composite nodes. These nodes can be connected in two ways. Figure 144 on page 256 shows them connected with a Casual Connection (FID2). Figure 145 on page 257 shows them connected with a VR.

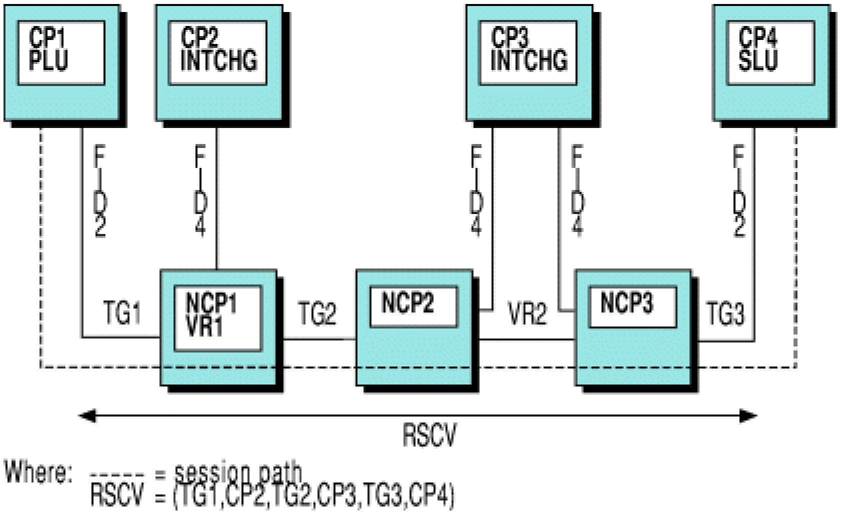


Figure 144. SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with FID2 Connection

Table 21 on page 256 displays the data available with a Casual connection.

Table 21. Data Available for SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with Casual Connection

Node	Available data
CP1	• Session awareness (SAW) data, including the Route Selection Control Vector (RSCV) for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG1 in the secondary direction • Subarea route data (by issuing a Set Domain to CP2 or CP3)
CP2	• SAW data, including Virtual Route (VR) information for VR1 • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG1 in the primary direction) by soliciting NCP1 • Destination flow control data (data for TG2 in the secondary direction) by soliciting NCP1

Table 21. Data Available for SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with Casual Connection (continued)

Node	Available data
CP3	• SAW data, including Virtual Route (VR) information for VR2 • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Origin flow control data (data for TG2 in the primary direction) by soliciting NCP2 • Destination flow control data (data for TG3 in the secondary direction) by soliciting NCP3
CP4	• SAW data, including the RSCV for the session • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV) from the Session Configuration display • Flow control data for TG3 in the primary direction • Subarea route data (by issuing a Set Domain to CP3 or CP2)

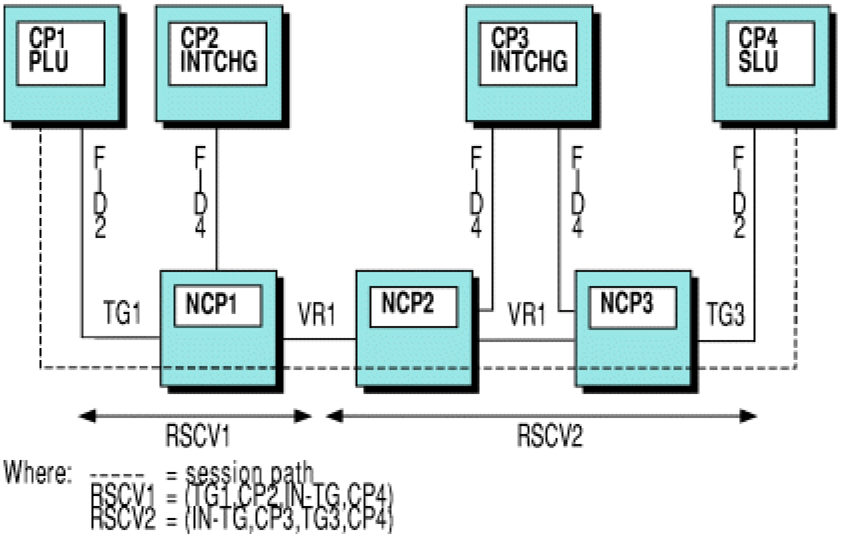


Figure 145. SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with VR Connection

Table 22 on page 257 displays the data available with a VR connection.

Table 22. Data Available with SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with a VR Connection

Node	Available data
CP1	• Session awareness (SAW) data, including the local Route Selection Control Vector (RSCV), RSCV1, for the node • Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV1) from the Session Configuration display The adjacent RSCV (RSCV2) can be viewed by issuing a SAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Flow control data for TG1 in the secondary direction • Subarea route data (by issuing a Set Domain to CP2 or CP3)

Table 22. Data Available with SNA Advanced Peer-to-Peer Networking Session through Adjacent Composite Nodes with a VR Connection (continued)

Node	Available data
CP2	• SAW data, including the local RSCV (RSCV1) and Virtual Route (VR) information for VR1 for the node • Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV1) from the Session Configuration display RSCV2 data can be viewed by issuing a SAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Origin flow control data (data for TG1 in the primary direction) by soliciting NCP1
CP3	• SAW data, including the local RSCV (RSCV2) and Virtual Route (VR) information for VR1 for the node • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from RSCV2) from the Session Configuration display RSCV1 data can be viewed by issuing a PAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Destination flow control data (data for TG3 in the secondary direction) by soliciting NCP3
CP4	• SAW data, including the local RSCV (RSCV2) for the node • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from the RSCV2) from the Session Configuration display RSCV1 data can be viewed by issuing a PAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Flow control data for TG3 in the primary direction • Subarea route data (by issuing a Set Domain to CP3 or CP2)

SNA Advanced Peer-to-Peer Networking Session through a SNI Gateway

The configuration shown in Figure 146 on page 258 consists of two composite nodes connected through a gateway NCP. This configuration always results in multiple RSCVs.

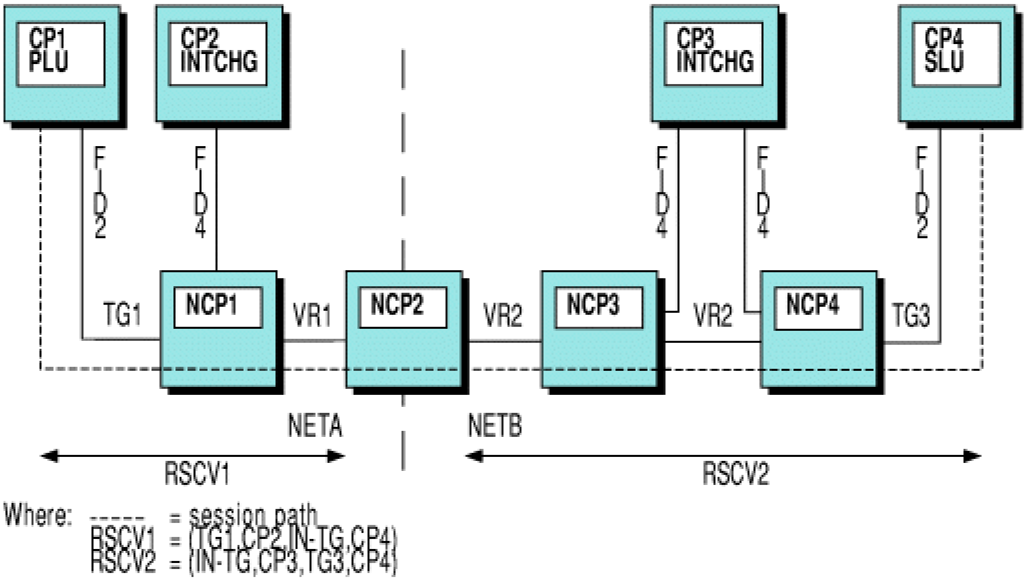


Figure 146. SNA Advanced Peer-to-Peer Networking Session through SNI Gateway

Node	Available data
CP1	• Session awareness (SAW) data, including the RSCV for NETA (RSCV1) for the session • Configuration data for NETA from the SAW data • Configuration data for NETB, including the RSCV for NETB (RSCV2), can be viewed by issuing a RIGHT command from the session monitor Session Configuration Data panel, or by issuing a SAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Flow control data for TG1 in the secondary direction
CP2	• SAW data, including the RSCV for NETA (RSCV1) • Configuration data for NETA from the SAW data • Configuration data for NETB, including the RSCV for NETB (RSCV2), can be viewed by issuing a RIGHT command from the session monitor Session Configuration Data panel, or by issuing a SAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Origin flow control data (data for TG1 in the primary direction) by soliciting NCP1
CP3	• SAW data, including the RSCV for NETB (RSCV2) • Configuration data for NETB from the SAW data • Configuration data for NETA, including the RSCV for NETA (RSCV1), can be viewed by issuing a LEFT command from the session monitor Session Configuration Data panel, or by issuing a PAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Destination flow control data (data for TG3 in the secondary direction) by soliciting NCP4
CP4	• SAW data, including the RSCV for NETB (RSCV2) • Configuration data for NETB from the SAW data • Configuration data for NETA, including the RSCV for NETA (RSCV1), can be viewed by issuing a LEFT command from the session monitor Session Configuration Data panel, or by issuing a PAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Flow control data for TG3 in the primary direction

Session between 2 SNA Advanced Peer-to-Peer Networking Subnetworks with a LEN Connection

The configuration shown in Figure 147 on page 260 consists of 2 SNA Advanced Peer-to-Peer Networking subnetworks joined with a LEN connection. This type of connection results in multiple RSCVs for the session.

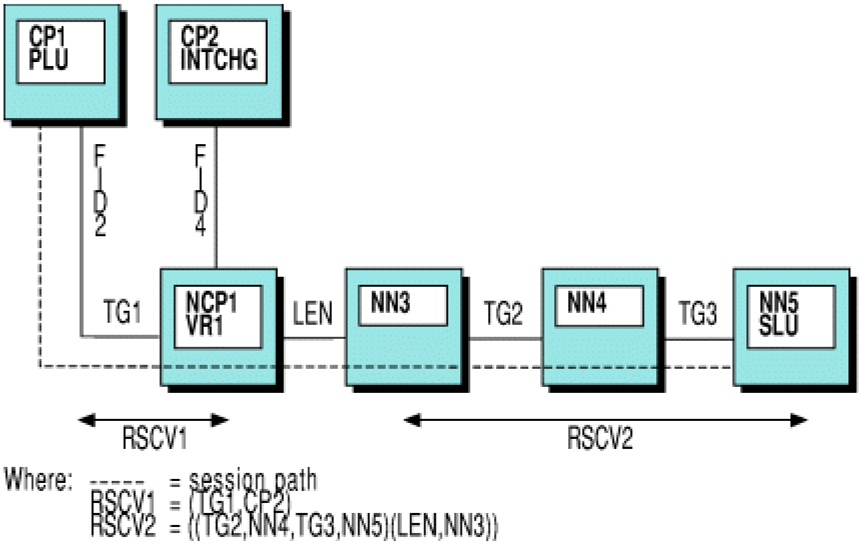


Figure 147. Session between 2 SNA Advanced Peer-to-Peer Networking Subnetworks through a LEN Connection

Node	Available data
CP1	• Session awareness (SAW) data, including the Route Selection Control Vector (RSCV1) for the first subnetwork for the session • Advanced Peer-to-Peer Networking Session Route Configuration (built from RSCV1) The RSCV for the second subnetwork (RSCV2) can be viewed by issuing a SAR command from the session monitor Advanced Peer-to-Peer Networking Session Route Configuration panel • Flow control data for TG1 in the secondary direction • Subarea route data (by issuing a Set Domain to CP2)
CP2	• SAW data, including Virtual Route (VR) information • RSCV1 • RSCV2, including the name for its primary end (NN3), along with an indicator to identify it as a LEN RSCV • Complete Advanced Peer-to-Peer Networking Session Route Configuration (built from RSCV1 and RSCV2) • Flow control data for TG1 in the primary direction

SNA Session through an Advanced Peer-to-Peer Networking Network

The configuration shown in Figure 148 on page 261 illustrates a session using a DLUS-DLUR pipe to cross an Advanced Peer-to-Peer Networking network.

The Advanced Peer-to-Peer Networking network consists of two network nodes, and is indicated by the RSCV designation. The pipe is established and controlled by the DLUS (dependent LU server) and DLUR (dependent LU requestor) functions.

SSCP-LU (1) and SSCP-PU (2) sessions exist between the VTAM (CP1) and the LU and PU that it owns. The LU is also the SLU in an SLU-PLU session (3) with an application in CP2.

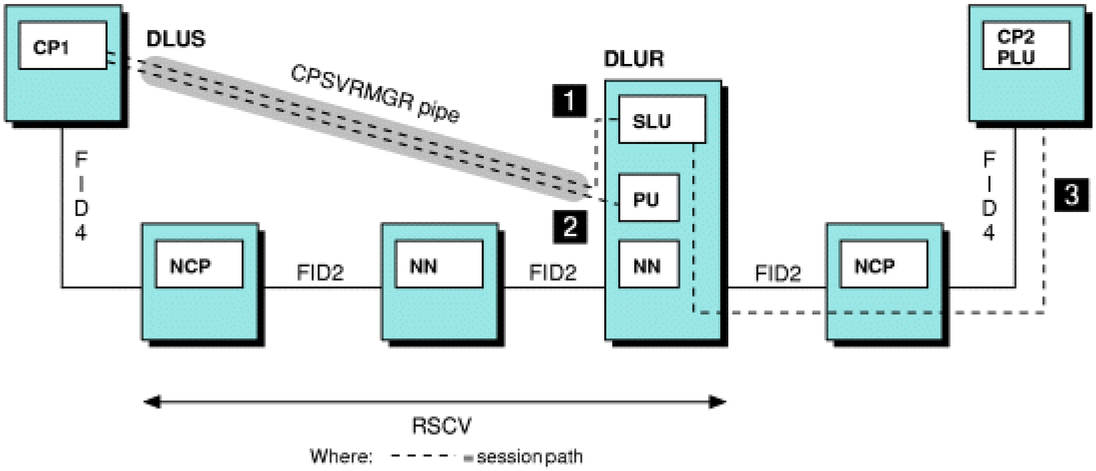


Figure 148. SNA Session through an Advanced Peer-to-Peer Networking Network

Node	Available data
CP1	• Session awareness (SAW) data for all sessions, including the LU 6.2 session pipe between the DLUS and DLUR • Complete Advanced Peer-to-Peer Networking Session Route Configuration for the two LU-LU sessions between the DLUS and DLUR, and the application LU to dependent LU session (3)
CP2	• SAW data for the SLU-PLU session (3) • Complete Advanced Peer-to-Peer Networking Session Route Configuration for the SLU-PLU session (3)

SSCP Takeover/Giveback Scenarios

The following four scenarios of SSCP Takeover/Giveback are processed:

- In the first scenario, the session monitor receives awareness that one endpoint of the session has been given up, while local awareness of the other endpoint is not available in the current domain. Another local VTAM takes over the connection to the endpoint that was given up.
- In the second scenario, the session monitor receives awareness that both endpoints of the session have been given up. Another local VTAM takes over the connection to both endpoints in a session.
- In the third and fourth scenarios, one endpoint of a session has been given up, while local awareness of the other endpoint is still available in the current domain.

Note that VTAM sends takeover and giveback notifications to the session monitor when they occur, at which time the takeover and giveback indicators can be seen on the session monitor panels. However, each time the session monitor restarts and requests SAW data for currently active sessions, VTAM no longer knows if these active sessions were previously involved in takeovers or givebacks. Therefore, the session monitor at that time has no takeover or giveback knowledge for any active sessions (even if it knew about a given session before the session monitor was restarted).

The following sample configurations illustrate these scenarios. For each one, the data available to the NetView operator is described.

SSCP Takeover/Giveback of NCP BF Connection - Scenario 1

In the configuration shown in Figure 149 on page 262, an LU-LU session exists between LUA and LUB, where CP2 is the owner of the NCP BF connection to the adjacent link station ALS2. When the session is started, session monitor in CP1 and CP2 receives SAW data for the session. When CP2 loses ownership of the connection to ALS2, CP3 takes over the connection.

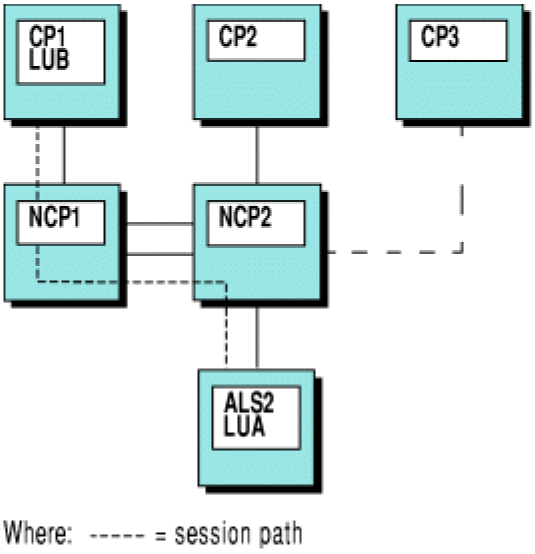


Figure 149. SSCP Takeover/Giveback of NCP BF Connection - Scenario 1

Table 23 on page 262 shows the data available before and after CP3 takes over the connection to ALS2.

Table 23. Data Comparisons for Takeover/Giveback Scenario 1

Node	Initial State	After Giveback	After Takeover
CP1	Session monitor receives SAW data for the session.	No change.	No change. Session monitor still thinks CP2 owns the connection to ALS2.
CP2	Session monitor receives SAW data for the session.	• If the line between the NCPs is PUTYPE=4, the session is displayed on the session monitor session list with an end time (the time when CP2 lost its awareness of the session) and with a GIVEBACK indicator. • If the line between the NCPs is PUTYPE=2, the session is displayed on the session monitor session list as ACTIVE and with a GIVEBACK indicator. • The resource names are displayed with a GBK (giveback) indicator.	No change.

Table 23. Data Comparisons for Takeover/Giveback Scenario 1 (continued)

Nod e	Initial State	After Giveback	After Takeover
CP3	Session monitor is not aware of the session.	The session monitor has no awareness of the session. It becomes aware of the session after the session is taken over.	• The session is displayed on the session monitor session list as ACTIVE and with a TAKEOVER indicator. • The resource names are displayed with a TOV (takeover) indicator. • Because of the limited data received in the takeover notification, some Session PD route functions can be limited.

SSCP Takeover/Giveback of NCP BF Connection - Scenario 2

In the configuration shown in Figure 150 on page 263, an LU-LU session exists between LUC and LUD, where CP1 is the owner of the NCP BF connection to the adjacent link stations ALS1 and ALS2. The connection can be either an SNA Advanced Peer-to-Peer Networking connection or a LEN connection. When the session is started, session monitor in CP1 receives SAW data for the session. When CP1 loses ownership of the connection to ALS1 and ALS2, CP2 takes over that connection.

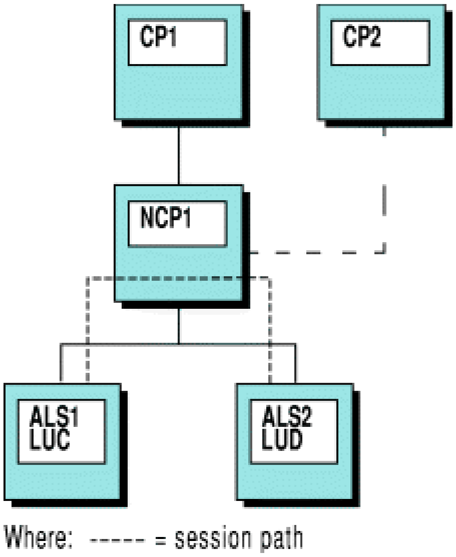


Figure 150. SSCP Takeover/Giveback of NCP BF Connection - Scenario 2

Table 24 on page 263 shows the data available before and after CP2 takes over the connection to ALS1 and ALS2.

Table 24. Data Comparison for Takeover/Giveback Scenario 2

Nod e	Initial State	After Giveback of both links	After Takeover of both links
CP1	Session monitor receives SAW data for the session.	• The session is displayed on the session monitor session list with an end time and with a GIVEBACK indicator. • The resource names are displayed with a GBK (giveback) indicator.	No change.

Table 24. Data Comparison for Takeover/Giveback Scenario 2 (continued)

Node	Initial State	After Giveback of both links	After Takeover of both links
CP2	Session monitor is not aware of the session.	Session monitor is not aware of the session. It becomes aware of the session after the session is taken over.	• The session is displayed on the session monitor session list as ACTIVE and with a TAKEOVER indicator. • The resource names are displayed with a TOV (takeover) indicator. • Because of the limited data received in the takeover notification, some Session PD route functions can be limited.

SSCP Takeover/Giveback of NCP BF Connection - Scenario 3

In the configuration shown in Figure 151 on page 264, an LU-LU session exists between LUA and LUB, where CP1 is the owner of the NCP BF connection to the adjacent link station ALS1. When the session is started, session monitor in CP1 receives SAW data for the session. When CP1 loses ownership of the connection to ALS1, CP2 takes over that connection.

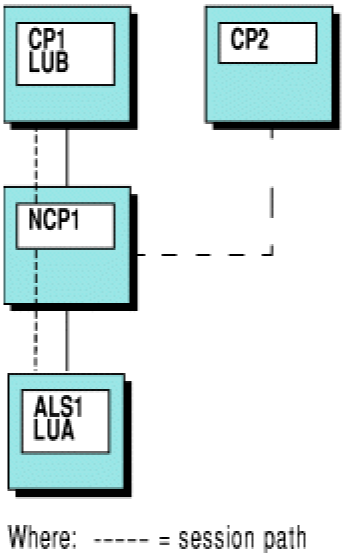


Figure 151. SSCP Takeover/Giveback of NCP BF Connection - Scenario 3

Table 25 on page 264 shows the data available before and after CP2 takes over the connection to ALS1.

Table 25. Data Comparison for Takeover/Giveback Scenario 3

Node	Initial State	After Giveback	After Takeover
CP1	Session monitor receives SAW data for the session.	• The session is displayed on the session monitor session list as ACTIVE and with a GIVEBACK indicator • The resource names are displayed with a GBK (giveback) indicator.	No change.

Table 25. Data Comparison for Takeover/Giveback Scenario 3 (continued)

Nod e	Initial State	After Giveback	After Takeover
CP2	Session monitor is not aware of the session.	Session monitor is not aware of the session. It becomes aware of the session after the session is taken over.	• The session is displayed on the session monitor session list as ACTIVE and with a TAKEOVER indicator. • The resource names are displayed with a TOV (takeover) indicator. • Because of the limited data received in the takeover notification, some Session PD route functions can be limited.

SSCP Takeover/Giveback of NCP BF Connection - Scenario 4

In the configuration shown in Figure 152 on page 265, an LU-LU session exists between LUA and LUB, where CP1 is the owner of the NCP BF connection to the adjacent link station ALS1. In contrast to the previous scenario, LUB is located at CP2. When the session is started, session monitor in CP1 receives SAW data for the session. When CP1 loses ownership of the connection to ALS1, CP2 takes over that connection.

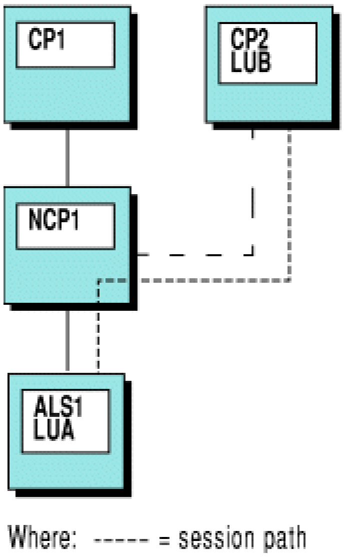


Figure 152. SSCP Takeover/Giveback of NCP BF Connection - Scenario 4

Table 26 on page 265 shows the data available before and after CP2 takes over the connection to ALS1.

Table 26. Data Comparison for Takeover/Giveback Scenario 4

Nod e	Initial State	After Giveback	After Takeover
CP1	Session monitor receives SAW data for the session.	• The session is displayed on the session monitor session list with an end time and with a GIVEBACK indicator. • The resource names are displayed with a GBK (giveback) indicator.	No change.

Table 26. Data Comparison for Takeover/Giveback Scenario 4 (continued)

Node	Initial State	After Giveback	After Takeover
CP2	Session monitor receives SAW data for the session.	No change. Session monitor has SAW data for the session.	• The session is displayed on the session monitor session list as ACTIVE and with a TAKEOVER indicator. • The resource names are displayed with a TOV (takeover) indicator. • Because of the limited data received in the takeover notification, some Session PD route functions can be limited.

Appendix D. How Data Is Sent to the Z NetView Program

This appendix describes how data is sent to the Z NetView program.

The NetView program implements a structure that enables open network management. The structure has three parts:

- The *focal point* provides centralized network management support to control functions such as change management and operations control. The NetView program can act as a focal point application.
- The *entry point* is a distributed point of control for all SNA devices that send information to the focal point and receive commands from the focal point.
- The *service point* is the distributed point of control for non-SNA resources. A service point is SNA-addressable and can convert SNA information to a format for the attached components.

In a focal point NetView program, data is received from distributed programs. Messages can be filtered out at several levels by NetView or operating system filters, such as MPF on MVS.

Alerts can be filtered using the SVFILTER and SRFILTER commands. In addition, you can use the SRFILTER command to forward alerts to the focal point. See "Alert Forwarding" on page 102 for additional information about forwarding alerts. See the NetView online help for additional information about the SVFILTER and SRFILTER commands.

To analyze problems, you need to know how data gets to the NetView program. Problems are often identified by resources sending events, statistics, or alerts. See Figure 153 on page 267 for some of the command destinations and for some of the sources of events, statistics, alerts, and messages.

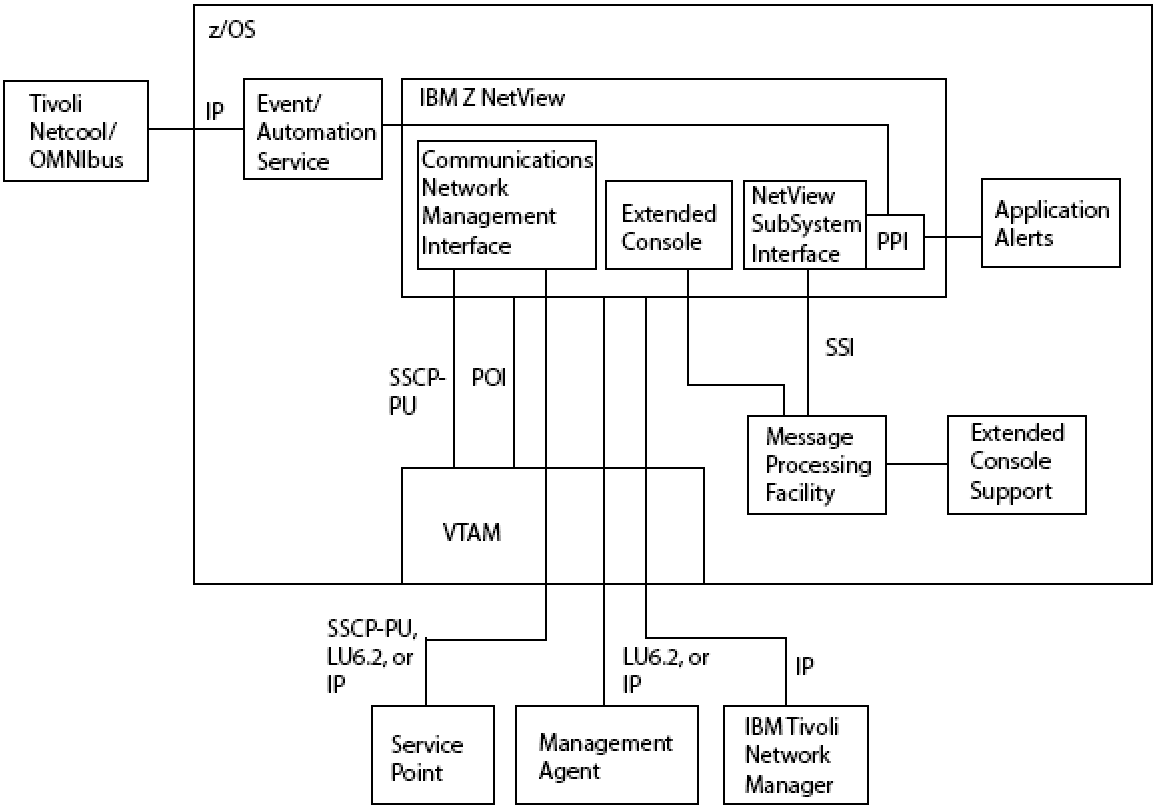


Figure 153. Data Flows to the NetView Program

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How Commands and Responses Flow

The NetView operator can issue commands from the NetView program and receive responses. The NetView operator can issue commands to the z/OS operating system, to z/OS subsystems or applications, or to any resource with an IP address. For example, if VTAM is the destination of the NetView operator command, the response to the command flows back to the NetView program through the VTAM programmed operator interface (POI). The NetView program receives the response, which it then passes through the NetView automation table.

The NetView program might be the destination of the command. If the destination is the local NetView program, the response passes through the NetView automation table. If the destination is the remote NetView program, the operator uses the RMTCMD command to send the command to the remote NetView program. The response to the command passes through the automation table on the remote NetView program and then through the automation table of the local NetView program.

Service point applications might be the destination of a command. The operator uses the RUNCMD command to send the command to the service point application. The NetView program receives the response to the command through the CNMI and then passes it through the NetView automation table.

In general, the NetView program passes command response messages (and not, for example, return codes) through the NetView automation table (including responses to commands sent from the MVS console or from a NetView workstation).

How Events, Statistics, and Alerts Flow

The NetView program collects network data. The data comes from both hardware and software and can be grouped into the following categories:

- Events, including SNMP traps, Event Integration Facility (EIF) events, events based on the Common Base Event specification, and SNA events
- Statistics
- Alerts

Events are exception conditions detected by a device about itself or on behalf of a device it controls. Events can be records of permanent errors and other warning and exception conditions. Statistics include information describing the number of transmissions and retransmissions for traffic on a line. An alert is an event that is considered critical and requires operator attention. Whether an event is important enough to be considered an alert can be determined by a filter. This filtering decision is made using criteria set in your installation based on how you want to manage and control your network and what information the operators need to see.

Selected alerts can be forwarded from the hardware monitor through the Event/Automation Service to an event receiver, such as such as the Tivoli Netcool/OMNIbus program or the Tivoli Enterprise Console.

The Common Event Infrastructure, an IBM component technology, can also be used to manage events formatted according to the Common Base Event specification that are generated by the NetView program from selected messages and management services units (MSUs). Use the correlation engine to specify criteria which allows messages and MSUs to be routed as you direct. The *IBM Z NetView Automation Guide* contains additional information about these events and using the Common Event Infrastructure for routing data.

How Messages Flow

If the destination for a message is known, the NetView program treats the message as a *solicited message*. The NetView program queues solicited messages to the known destination task. An example of a solicited message is a command response message. If the destination for a message is unknown, the NetView program treats the message as an *unsolicited message*. Unsolicited messages originate in the network or system to notify an operator of a condition or event that might require action. See Figure 153 on page 267 for some of the sources of unsolicited messages.

The z/OS operating system, subsystems, and applications are designed to issue unsolicited messages that are displayed to the z/OS operator. The z/OS message processing facility (MPF) can control whether a system message is displayed to the z/OS operator, made available for NetView automation, written to the system log, or any combination including discarding the message. However, message handling specified in the MPF can be overridden or altered by the NetView message revision table, including availability to NetView automation. In fact, the message revision table can replace the MPF. If the message is available for automation, the NetView program accepts the message from the z/OS operating system and passes it through the NetView automation table, which determines whether automatic processing needs to occur.

Communications Server enables an application to act as a programmed operator using the VTAM programmed operator interface (POI). The NetView program acts as a VTAM programmed operator and, in this role, receives unsolicited messages from the VTAM program.

A NetView task might issue unsolicited messages. If the task resides on the same NetView program that is performing automation, that NetView program passes the messages through the automation table. If the task resides on a remote NetView, the messages pass first through the automation table on the remote NetView program. The messages can then be routed to the local NetView program (such as when the task is started by using the RMTCMD command from the local NetView program) and passed through the automation table of the local NetView program.

Service point applications might generate unsolicited messages that flow on the management session (LU 6.2 or SSCP-PU) to the focal point NetView program. The NetView program receives these messages from VTAM using the communications network management interface (CNMI) and then passes them through the NetView automation table.

Selected messages can be forwarded from NetView automation through the Event/Automation Service to an event receiver, such as such as the Tivoli Netcool/OMNIbus program or the Tivoli Enterprise Console.

For more information about solicited and unsolicited messages, see the *IBM Z NetView Automation Guide*.

Appendix E. Accessibility

Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully. IBM Z NetView supports several user interfaces. Product functionality and accessibility features vary according to the interface.

The major accessibility features in this product enable users in the following ways:

- Use assistive technologies, such as screen-reader software and digital speech synthesizer, to hear what is displayed on the screen. Consult the product documentation of the assistive technology for details on using those technologies with this product.
- Operate specific or equivalent features using only the keyboard.
- Magnify what is displayed on the screen.

The product documentation includes the following features to aid accessibility:

- All documentation is available in both HTML and convertible PDF formats to give the maximum opportunity for users to apply screen-reader software.
- All images in the documentation are provided with alternative text so that users with vision impairments can understand the contents of the images.

The Information Center and its related publications are accessibility-enabled. For more information about the accessibility features of the information center, see Accessibility and keyboard shortcuts in the information center.

Interface information

The interface offers the greatest range of functionality, but is not entirely accessible.

Keyboard-only operation

Standard shortcut and accelerator keys are used by the product and are documented by the operating system. See the documentation provided by your operating system for more information.

Magnification of screen content

You can enlarge information on the product windows using facilities provided by the operating systems on which the product is run. For example, in a Microsoft Windows environment, you can lower the resolution of the screen to enlarge the font sizes of the text on the screen. See the documentation provided by your operating system for more information.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility.

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