



# **IBM Tivoli NetView for z/OS 6.1: Fundamentals**

## **Student's Training Guide**

Course: TZ203 ERC: 1.0

August 2011

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# Unit 1: NetView for z/OS basics

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## Unit 1: NetView for z/OS basics



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# Introduction

In this unit, you learn about the key components and tools associated with NetView® for z/OS 6.1.

## Objectives

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### Objectives

When you complete this unit, you can perform the following tasks:

- Describe the packaging and installation of NetView
- Describe structure and components of NetView
- Use JCL procedures and parameters that are necessary to run NetView
- Use the NetView 3270 interface
- Customize NetView using CNMSTYLE
- Use the CNMSTYLE report generator
- Describe NetView operator administration
- Describe IP management with NetView

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# Lesson 1: NetView overview

## NetView for z/OS

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### NetView for z/OS

- Helps maintain the highest degree of availability for IBM zEnterprise System networks
- Provides tools for managing and maintaining complex, multi-vendor, multi-platform networks and systems from a single point of control
- Has advanced correlation facilities to automate any network or system event
- Manages both TCP/IP and SNA networks
- Has management functions that work with other products
- Has open application programming interfaces
- Provides graphical displays and automation for managing systems and networks

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The NetView product has a long history. With each release, more functions have been added to better maintain networks. Earlier versions of NetView supported SNA networks. NetView now combines the support for both SNA and TCP/IP.

## NetView program features

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### NetView program features

- Increased network and system efficiency and availability
- Centralized management
  - TCP/IP and SNA network environments
  - Capability to help reduce the need for duplicate network management systems
- Enhanced operations and message management support
  - Capability for Improving and simplifying operator interactions
  - More control in automating and managing day-to-day operations
- Management as follows:
  - Larger networks
  - More components
  - More systems with fewer resources

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# IP management

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## IP management

- SNA over IP
- Support for dynamic virtual IP addressing (DVIPA)
- Dynamic resource discovery
- IP connection management
- Packet trace collection and formatting
- Packet trace analysis
- Command support
- Automated responses to intrusions
- IPv6 support
- Support for Simple Network Management Protocol (SNMP) commands
- Network address translation (NAT)

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NetView includes numerous commands for supporting IP. It also has been adapted for IPv6 and use of longer addresses.

## Automation introduction

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### Automation introduction

- You enable automated response to messages and events through the NetView Automation Table for reactive automation
- You can use user-written programs for automated responses
- Autotasks can receive messages and issue commands without the need for an operator
- You use message revision table (MRT) to revise message attributes, including text, or to suppress a message
- When necessary, you can create and trigger timer commands for proactive automation
- Event-correlation engine in UNIX System Services (USS) works with user-specified criteria
- You can use the Command Revision Table (CRT) in NetView to examine, modify, or reject MVS commands

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Automation capabilities of the NetView program facilitate and simplify operator interactions. Automation of responses to messages and events is enabled by the *NetView automation table*.

A correlation engine enables messages and **management services units (MSUs)** to correlate according to user-specified criteria. Message revision enables user-defined modification of attributes such as the following items:

- Color
- Route code
- Descriptor code
- Display
- Syslog settings
- Text of original z/OS messages (rather than copies)

Message revision actions include the following options:

- Revising messages before presenting to the system log, console, or automation
- Treating a message differently from others, depending on its source
- Suppressing messages entirely
- Automating only

The message revision table can override actions taken by the z/OS **message processing facility (MPF)** and can replace the MPF. It provides statistics and usage information and a test mode, and is active even when the NetView program is not. The message revision table is controlled by the NetView system programmer rather than by the z/OS system programmer.

User-written command lists and command processors can be used for accomplishing a complex operation by using a single command. These command lists can also perform complex procedures without operator intervention.

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

Autotasks are **operator station tasks (OSTs)** that do not require a workstation or operator. Autotasks can receive messages and issue commands. Autotasks are limited only that they cannot run full-screen applications.



**Important:** Autotasks for automation can be started during NetView initialization. The automation table, command lists, command processors, and timer commands can all issue commands under the autotasks. Autotasks can receive messages and present them to the automation table or to installation-exit routines. Installation exits are user-written routines that take control of processing at certain points to alter the typical course of NetView processing.

## Sysplex monitoring

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### Sysplex monitoring

- Aids in management of complex system configurations and interactions
- NetView agent automatically discovers the following items:
  - All z/OS images in a sysplex
  - All IP stacks on each z/OS image
- Configuration data and status display for systems that are in a sysplex

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Each NetView domain automatically collects information about the local system where it is running. The information pertains to the z/OS system and sysplex, TCP/IP stacks, and NetView itself.

In sysplex management, the NetView program uses z/OS Cross-Systems Coupling Facility (XCF) services to facilitate resource discovery, forward management data, and implement a controlling NetView program. The controlling NetView program, known as the master NetView program, has a complete view of the sysplex.

The master program is a logical point for interacting with the NetView user interfaces, the NetView management console, and the Tivoli Enterprise Portal. The master program is also a logical point for managing a Resource Object Data Manager (RODM) data cache from for the sysplex.XCF group. Signaling services enable the NetView programs in the sysplex to inform each other about status and exchange messages with each other.

XCF services enable the NetView programs to be notified when NetView programs enter or leave the sysplex. Information includes which NetView program is the master program, and about the relationship between the master program and other NetView programs. The use of XCF services makes the NetView program a high-availability sysplex application.

An XCF group is a set of related applications that registers with z/OS XCF services by using the same group name. At any given time, only one NetView program can be the master program in an XCF group. NetView XCF groups are named DSIPLEXnn, where nn is the value of the

XCF.GROUPNUM statement in the CNMSTYLE member. The DSIXCFMT task processes commands for joining and leaving XCF groups. It also processes information provided by XCF exit routines for handling messages and group status changes.

CNMSTYLE, located in one of the DSIPARM data sets allocated to NetView, is the primary initialization member for NetView.

Other NetView programs in the sysplex that are members of the same DSIPLXnn group can be defined as backups for the master NetView program, known as master-capable. If the master NetView program is unavailable, one of the master-capable NetView programs can take over the role of master, depending on the rank defined for each master-capable program. NetView programs that are neither master nor master-capable are known as basic NetView programs. Basic NetView programs forward status to the master NetView program but cannot assume the role of master.

## Problem management

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### Problem management

- You can use TECROUTE in NetView PIPE PPI to send an event to Tivoli Directory Integrator for use by Tivoli Service Request Manager or HP-Peregrine ServiceCenter
- NetView can improve information technology (IT) service management

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Use the TECROUTE option of the NetView PIPE PPI stage to send an event from the NetView address space to the Alert Adapter. The Alert Adapter, which converts that event to an EIF event, is in the NetView Event/Automation Service (E/AS). The EIF event is forwarded to Tivoli Directory Integrator for use by Tivoli Service Request Manager (TSRM).



**Note:** To avoid flooding TSRM, the NetView Automation Table should filter out unneeded events, so that only events that warrant a service request are forwarded to TSRM.

# NetView Enterprise Management Agent (EMA)

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## NetView Enterprise Management Agent (EMA)

- Provides enterprise integration with Tivoli Enterprise Portal, a graphical user interface
- Provides availability and performance data in a single interface
- NetView EMA provides OSA,DVIPA, sysplex, packet traces, the NetView log, SNA connection data, IP connection data, and more to the Tivoli Enterprise Portal
- Integrates with information from Tivoli OMEGAMON XE products

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Other user interfaces are NetView management console, web application, NetView web services gateway, and 3270. This unit describes each interface.

OMEGAMON® XE products integrate with the NetView EMA by using dynamic workspace links. Discussion of these products occurs later.

# Security

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## Security

NetView includes provisions to control the following situations:

- User access to the NetView program
  - User IDs and passwords with mixed-case support for SAF
  - Display of station access restrictions with SAF
  - Password lengths that can have as many as 100 characters
- Access to commands and data sets
  - System Authorization Facility (SAF) products
  - NetView command authorization table (CAT)
- Restricted access to NetView Management Console (NMC)
  - Views
  - Individual resources within views

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Restricting NetView Management Console (NMC) views and resources within views is particularly useful for service providers. The service providers can grant an operator access only to the resources of one customer but not another. Discussion about the NMC interface occurs in the next unit.

In addition to commands, NetView keywords and keyword values can be secured. CNMSCAT2, a member included with the product, demonstrates how to add operators to groups and control command authorities by these groups.

For environments with SAF, a sample job stream named CNMSAF2 is available. CNMSAF2 contains various Resource Access Control Facility (RACF®) statements to define operator user IDs, groups, and command permissions. It requires modification before running.

Discussion of CNMSCAT2 and CNMSAF2 occurs later.



**Note:** If the RACF mixed-case password function is enabled and passwords are defined in mixed case, NetView leaves them unchanged. Otherwise, NetView passwords are converted to uppercase. This processing applies to all password handling.

# NetView 6.1 information center publications

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## NetView 6.1 information center publications

### Using

User's Guide: NetView  
User's Guide: NetView Enterprise Management Agent  
User's Guide: NetView Management Console  
User's Guide: Automated Operations Network  
IP Management

### Installing

Installation: Getting Started  
Installation: Configuring Additional Components  
Installation: Configuring Graphical Components  
Installation: Configuring the GDPS Active/Active Continuous Availability Solution  
Installation: Configuring the NetView Enterprise Management Agent  
Installation: Migration

### Customizing

Application Programmer's Guide  
Automation Guide  
Customization Guide  
Programming: Assembler  
Programming: Pipes  
Programming: PL/I and C  
Programming: REXX and the NetView Command List Language  
Resource Object Data Manager and GMFHS Programmer's Guide  
SNA Topology Manager Implementation Guide  
Tuning Guide

### Troubleshooting

Troubleshooting Guide

### Reference

Administration Reference  
Command Reference Volume 1 (A-N)  
Command Reference Volume 2 (O-Z)  
Data Model Reference  
Messages and Codes Volume 1 (AAU-DSI)  
Messages and Codes Volume 2 (DUI-IHS)  
Security Reference  
Licensed Program Specifications  
Program Directory for IBM Tivoli NetView for z/OS US English  
Program Directory for IBM Tivoli NetView for z/OS Japanese  
Program Directory for IBM Tivoli NetView for z/OS Enterprise Management Agent

### IBM Tivoli NetView for z/OS V6R1 Online Library

LCD7-4913, contains the publications that are in the NetView for z/OS library. The publications are available in PDF, HTML, and BookManager® formats.

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The web address for the NetView publications is [publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.itnetviewforzos.doc/ic-homepage.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.itnetviewforzos.doc/ic-homepage.html)

# Lesson 2: IBM Tivoli NetView packaging and installation

## Packaging and installation of NetView host code

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### Packaging and installation of the NetView host code

- Product deliverables are shipped only via CBPDO, ServerPac, SystemPac®
- CBPDO and ServerPac are offered for Internet delivery in countries where ShopzSeries product ordering is available
- Minimum supported z/OS release levels have changed for the installation and execution of NetView 6.1
- The NetView Enterprise Management Agent requires the use of the Installation and Configuration Tool (ICAT), which is used by OMEGAMON products
- NetView is delivered in SMP/E installable format
- The installed product consists of a base Function Modification Identification (FMID) and a language FMID
- The z/OS supported levels are 1.10 or newer

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NetView 6.1 contains a base component and ***national language support (NLS)*** feature:

- Base components and parts are installed using System Modification Program/Extended (SMP/E) with the HNV610B FMID. The base component is necessary for all installations.
- Using JNV610E FMID installs the English-language feature. Using JNV610J FMID installs the Japanese-language feature. The NLS component is based on ordering English or Japanese. NetView supports the installation of one NLS FMID.

## NetView EMA code: z/OS

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### NetView EMA code: z/OS

- NetView Enterprise Management Agent (EMA) component expands support and integration in the Tivoli Enterprise Portal
- The NetView components include NetView EMA code
- The NetView for z/OS Installation: The Getting Started manual has information on preparing MVS for the NetView EMA
- Refer to Installation: Configuring the Tivoli NetView for z/OS Enterprise Management Agent

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The data set members, starting with the *KNA* prefix make up the agent code on the host. Three NetView data sets contain KNA parts CNMLINK, CNMSAMP, and SCNMAGNT. The NetView EMA host code is included in NetView for z/OS 6.1 but has its own HNV610A FMID.

The *NetView for z/OS Program Directory* for the NetView Agent contains information for the prerequisite product, IBM Tivoli Monitoring.

The NetView EMA code should be installed in the data sets where the IBM Tivoli Monitoring is installed. If not, the NetView EMA code needs to be moved after SMP/E installation to the IBM Tivoli Monitoring data sets.

IBM Tivoli Management Services 6.2.2 is a free product with NetView for z/OS 6.1 that must be ordered by product number 5698-A79. It contains the z/OS components that are required for the NetView EMA. It includes FMIDs HKDS622, HKLV622, HKCI310, and HKT1710. Minimum service level for IBM Tivoli Monitoring is Fixpack 3 (FP3). IBM Tivoli Monitoring code for running Tivoli Enterprise Portal Server and Tivoli Enterprise Monitoring Server on Windows®, Linux®, and Linux® for System z is also delivered with 5698-A79.

Product number 5698-A79 consists of the following FMIDs:

- HKDS622 Tivoli Enterprise Monitoring Server on z/OS V622
- HKLV622 TMS: Engine V622
- HKCI310 Configuration Assistance Tool V310
- HKT1710 File Transfer Enabler for z/OS V1710

## NetView EMA data files: Distributed

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### NetView EMA data files: Distributed

- Minimum IBM Tivoli Monitoring 6.2.2
  - Prerequisite FixPack 3 (FP3) or newer
  - Separately orderable and priced product
  - As of June 2011, the current IBM Tivoli Monitoring version: 6.2.2 FixPack 4
- The NetView EMA data files compact disc (CD) includes files for the following items:
  - Tivoli Enterprise Portal
  - Tivoli Enterprise Portal Server
  - Distributed Tivoli Enterprise Monitoring Server support

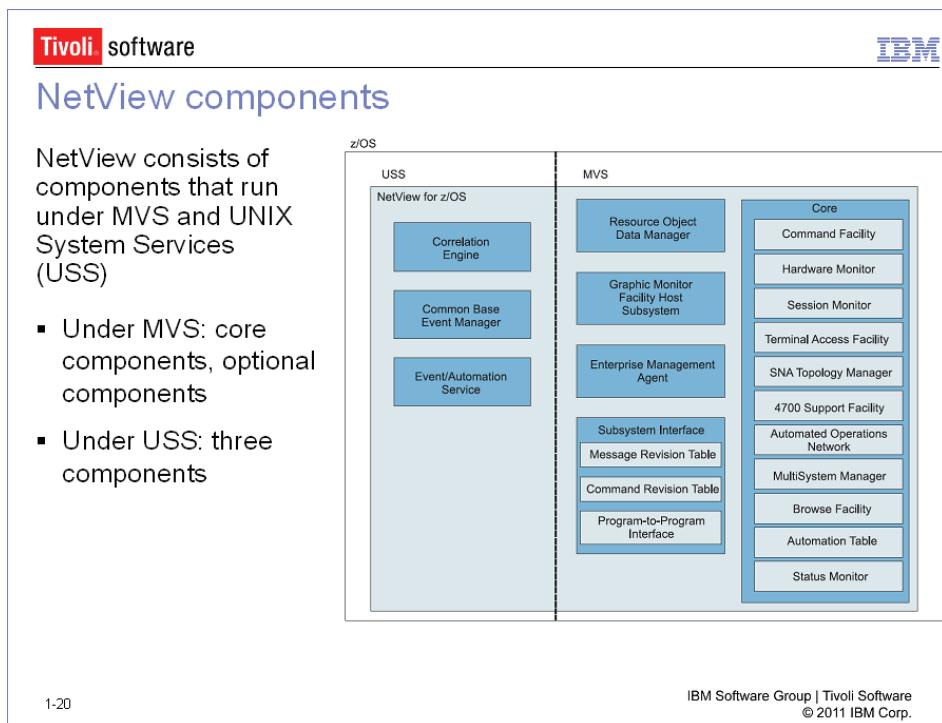
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The Tivoli Enterprise Monitoring Server database can be installed on either z/OS or distributed systems. DB2®, IBM Tivoli Monitoring 6.2.2 for Windows®, Linux®, and Linux® for System z files are included with NetView for z/OS 6.1. You can find IBM Tivoli Monitoring publications at [publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp?topic=/com.ibm.itm.doc\\_6.2.2fp2/welcome.htm](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp?topic=/com.ibm.itm.doc_6.2.2fp2/welcome.htm).

# Lesson 3: NetView structure and components

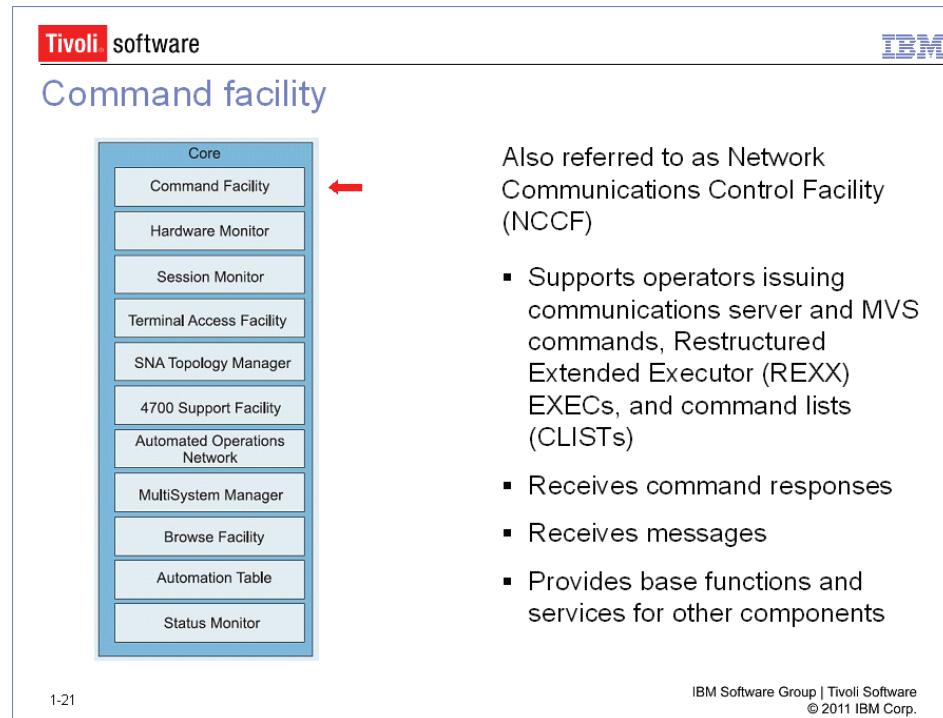
## NetView components



The core components are in the column on the right side of the slide. Most of these components run under the NetView application address space. The subsystem interface (SSI) is a separate address space. The SSI is not necessary for running NetView, but might be necessary for some functions. These two address spaces together are executed for a functioning NetView system. All other components are optional.

In the NetView application, some of the core components are optional and do not need to be enabled.

# Command facility



Network Communications Control Facility (NCCF) runs within the base NetView address space. Virtual Telecommunications Access Method (VTAM) is the Communications Server component that interacts with the Systems Network Architecture (SNA) communications. Communications Server also handles TCP/IP communications, which NetView uses. Base functions and services for other components include the following items:

- Intercomponent communications
- Communication with operating system
- Presentation services
- Database services
- Automation facilities

## Hardware monitor

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### Hardware monitor

Also referred to as Network Problem Determination Application (NPDA)

- Events and statistical data collected and displayed
- Probable causes
- Recommended actions
- Problem determination

Core
Command Facility
Hardware Monitor
Session Monitor
Terminal Access Facility
SNA Topology Manager
4700 Support Facility
Automated Operations Network
MultiSystem Manager
Browse Facility
Automation Table
Status Monitor

1-22

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Network Problem Determination Application (NPDA) runs within the base NetView address space. The hardware monitor creates a database made up of several record types: statistics, events, GMFALERTs, and alerts.

- Statistics are records of traffic and recoverable error counts that have been collected at certain resources and reported to the host system.
- 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 are recorded in the hardware monitor database. The GMFALERT records are a subset of NetView management console event report records,
- Events are unexpected occurrences in network operation. An event can be created when the attempted activation of a resource fails. Resolution major vectors (X'0002'), which inform you that an alert was resolved, are also stored on the database as events.
- Alerts are events (including resolutions) that require attention.

Events and statistical data are also known as *alerts* and *MSUs*. You have several ways of sending this data to the hardware monitor:

- Forwarding an alert from one NetView program to another over an LUC session
- Sending a multiple domain support message unit (MDS-MU) over the MS transport to the ALERT-NETOP application
- Sending a control point management services unit (CP-MSU) or network management vector transport (NMVT) to the hardware monitor over the program-to-program interface

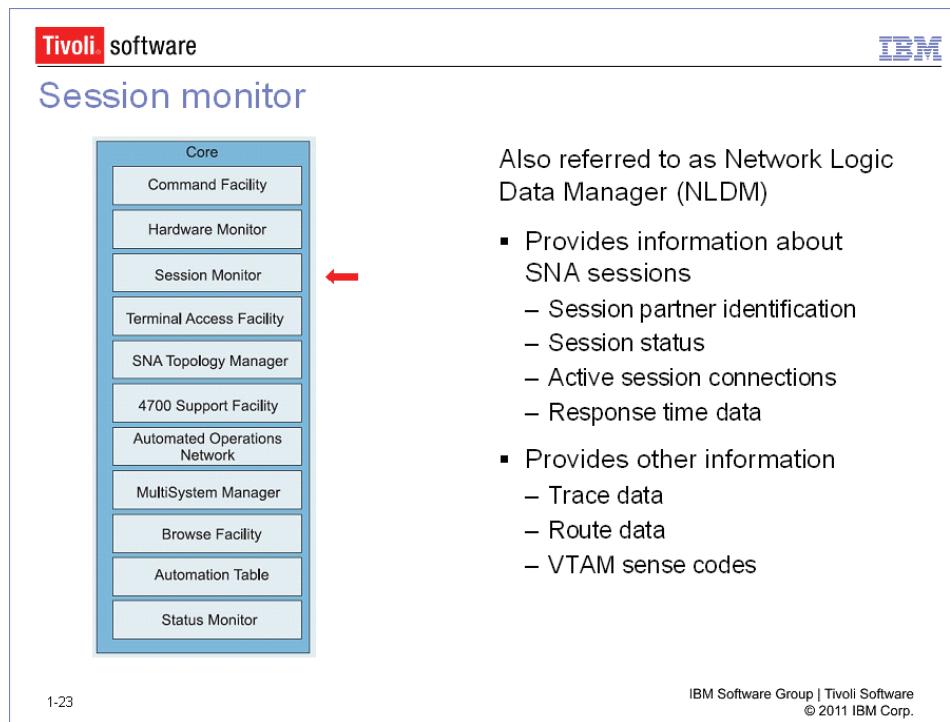
You can also use the hardware monitor for the following actions:

- Receiving a hardware-monitor problem record over the CNM interface. Example records are as follows:
  - NMVT
  - Record maintenance statistics (RECMS)
  - Record formatted maintenance statistics (RECFMS)
- Using the GENALERT command to generate a hardware-monitor record from within NetView.
- Receiving a system-format record for the hardware monitor (OBR, MDR, MCH, CWR, or SLH) from local MVS devices.

Many of the records that the hardware monitor receives go to the automation table during normal processing. The automation table can change filtering and highlighting attributes or issue automatic responses. Specifically, the records that go to the automation table are NMVTs, CP-MSUs, MDS-MUs, RECMSSs, and RECFMSs, collectively known as MSUs. The hardware monitor sends only MSUs that contain the following items:

- Alerts, key X'0000'
- Link events, key X'0001'
- Resolution, key X'0002'
- PD statistics, key X'0025'
- RECMSSs, encapsulated in a X'1044'
- RECFMSs, encapsulated in a X'1045'
- Link configuration data, key X'1332'

## Session monitor



The Network Logic Data Manager (NLDM) component runs within the base NetView address space. This component includes information to help manage SNA sessions that run over IP when the customer uses Enterprise Extender (EE).

## Terminal access facility

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### Terminal access facility

- Numerous applications accessible from a single 3270 display station without logging off
- These applications locatable in different z/OS systems

Core

Command Facility

Hardware Monitor

Session Monitor

Terminal Access Facility

SNA Topology Manager

4700 Support Facility

Automated Operations Network

MultiSystem Manager

Browse Facility

Automation Table

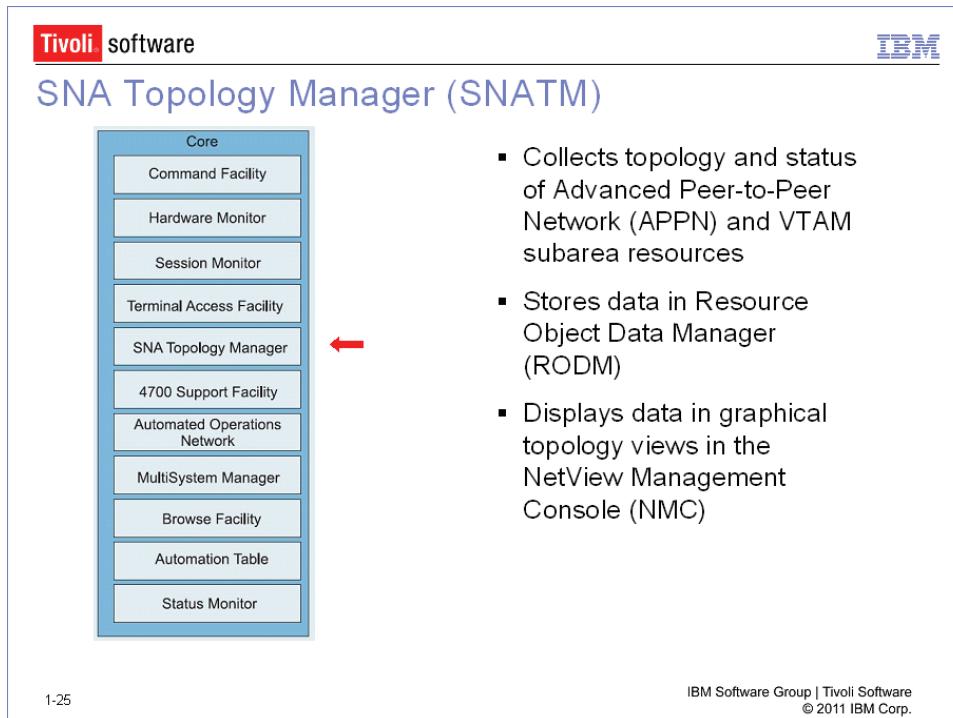
Status Monitor

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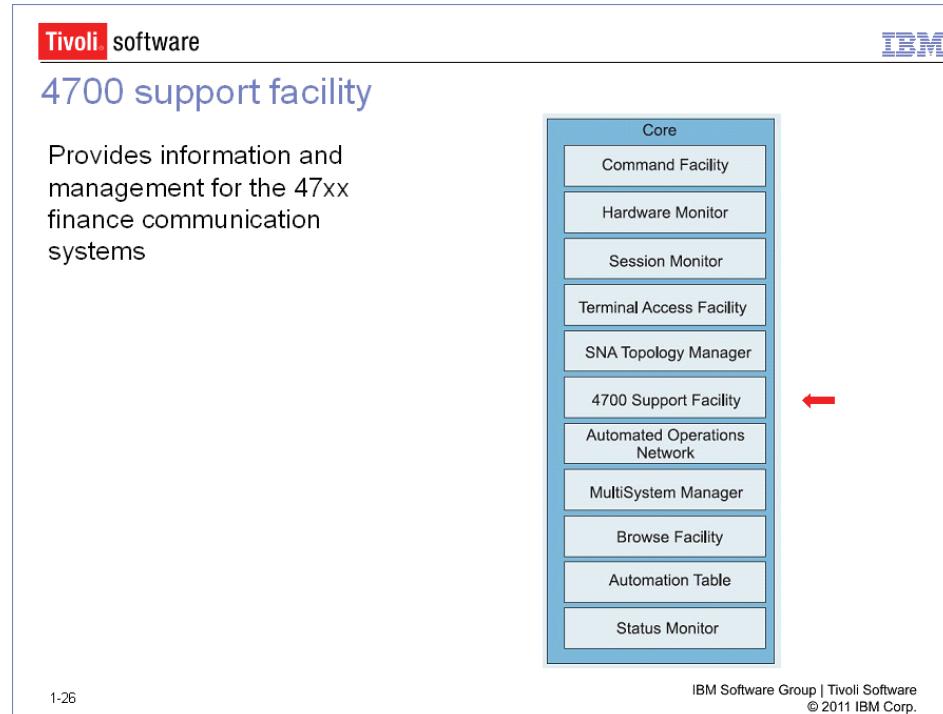
The **terminal access facility (TAF)** component runs within the base NetView address space. VTAM applications, such as TSO, CICS, and Information Management System (IMS) can be accessed from a single 3270 workstation. TAF supports both line-mode devices (LU1) and full-screen display devices (LU2).

## SNA Topology Manager (SNATM)



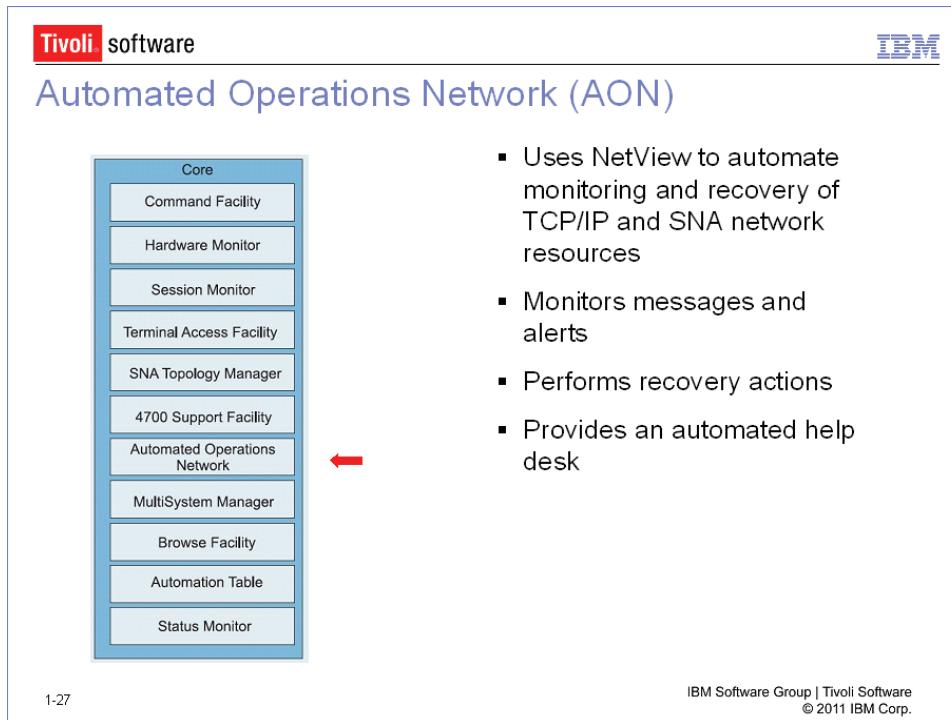
The SNA Topology Manager (SNATM) component uses a separate address space.

## 4700 support facility



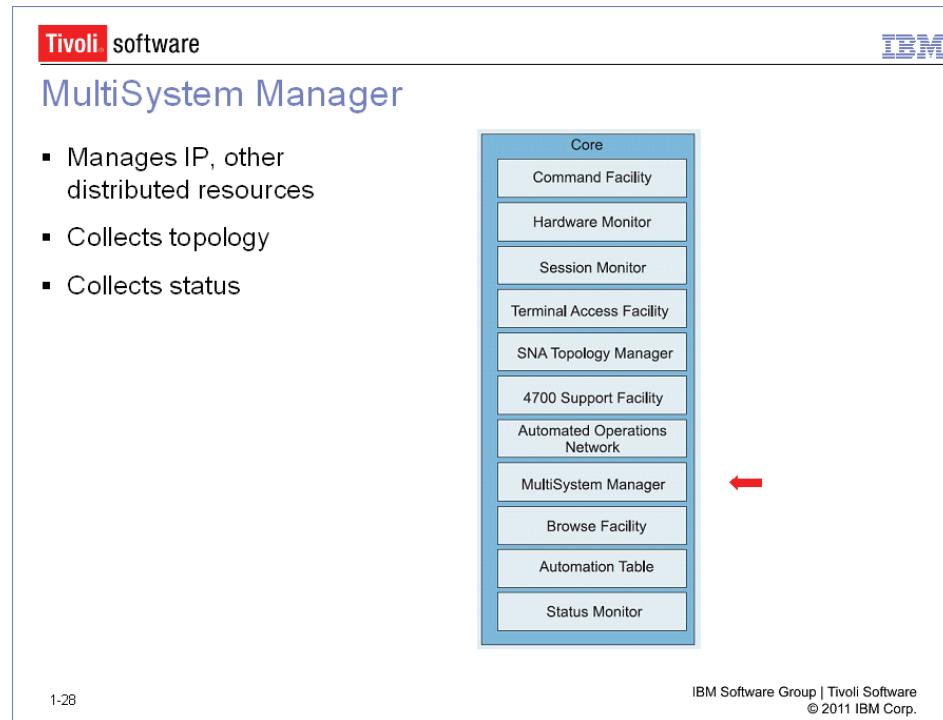
The 4700 support facility component runs within the base NetView address space. The TARA panels are the means to communicate with the 4700 support facility. To view more information, access HELP TARA from the NetView console.

## Automated Operations Network (AON)



The AON component runs within the base NetView address space.

## MultiSystem Manager



The MultiSystem Manager component runs within the base NetView address space. The MSM communicates with IBM Tivoli Network Manager via the MSM IBM Tivoli Network Manager agent. This component that is part of NetView for z/OS 6.1 runs in many different environments, such as the following operating systems:

- Windows®
- AIX®
- Linux
- Linux on zSeries
- Solaris®

Consult publications to find out the releases and other components that are needed.

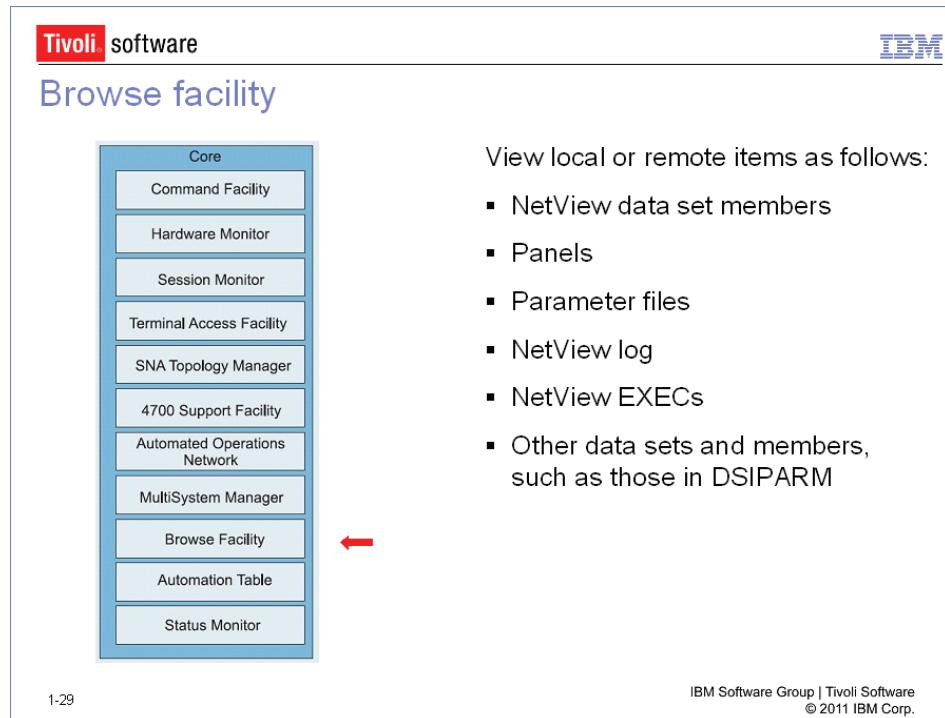
For the NetView for z/OS 6.1 component, an html file is on the workstation DVD LCD7-4914 with detailed information on system pre-requisites and installation instructions.

`file:///dvdroot/msm_nm_ip/msm_nm_ip_readme_en.html`

You can use MultiSystem Manager to manage the following networks:

- IP networks that IBM Tivoli Network Manager manages
- Any network that is supported by MultiSystem Manager Open topology agents. A toolkit is provided for third parties to write agents. The toolkit is available on the web.

## Browse facility



The browse facility component runs within the base NetView address space.

## Automation table

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### Automation table

- Has processing options that you can specify for incoming messages or events
- Contains statements for defining actions to take, for example driving automation responses
- Is one of several components that is used in providing automation

Core

- Command Facility
- Hardware Monitor
- Session Monitor
- Terminal Access Facility
- SNA Topology Manager
- 4700 Support Facility
- Automated Operations Network
- MultiSystem Manager
- Browse Facility
- Automation Table
- Status Monitor

←

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The automation table is a component that runs within the base NetView address space. This component is the heart of NetView automation services. It allows customers to select messages or events of interest, and take automated actions in response. Automated actions can be as simple as issuing a single command. Or it can be complex. One or more processes can be called to do an sophisticated analysis of a message or event. Additional possible action could be correlations of or with other messages or events.



**Note:** The automation table is discussed in the Automation Techniques module if included in this class.

# Subsystem interface

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## Subsystem interface

The diagram illustrates the structure of the Subsystem Interface. It consists of a vertical stack of six blue rectangular boxes, each containing a label. From top to bottom, the boxes are: Resource Object Data Manager, Graphic Monitor Facility Host Subsystem, Enterprise Management Agent, Subsystem Interface, Message Revision Table, and Command Revision Table. A red arrow points from the left towards the 'Subsystem Interface' box.

- Used for receiving messages and entering system commands
- With extended multiple console support (EMCS) consoles, the subsystem interface is used to receive commands, but not messages.
- Usable by NetView and other applications
- For each NetView system that uses the subsystem interface: NetView address space and subsystem address space
- With the message revision table (MRT)
  - z/OS messages can be intercepted before being displayed,
  - logged, automated, or routed through the network
  - Decisions can be made based on message ID, jobname, or other properties for taking an automated action or suppressing
- With the command revision table (CRT)  
Intercept and revise z/OS commands and to make simple modifications inline, without needing to transfer the command to the NetView application address space
- With the program-to-program interface (PPI) address space  
Application programs can communicate with NetView and other applications in the same host

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The subsystem interface component is a separate address space. Discussion about the MRT and CRT is in the *Automation* part of this class if offered. The command revision table (CRT) supersedes “MVS Command Management”. The NetView EMA uses the program-to-program interface (PPI) to communicate with the Tivoli Enterprise Monitoring Server and Tivoli Enterprise Portal Server.

## Resource Object Data Manager (RODM)

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### Resource Object Data Manager (RODM)

- RODM is a separate, optional address space
- It is part of the NetView graphical infrastructure
- If graphics are necessary, RODM also is necessary
- It contains an object-oriented data cache located in memory for fast response
- Objects can represent network resources, system resources, and MSM managed resources
- MSM and SNA Topology Manager populate with topology and resource status
- You can use the RODMVIEW command to display, create, update, and delete the following items:
  - Classes
  - Objects
  - Fields
  - Relationships
  - Customer-defined data



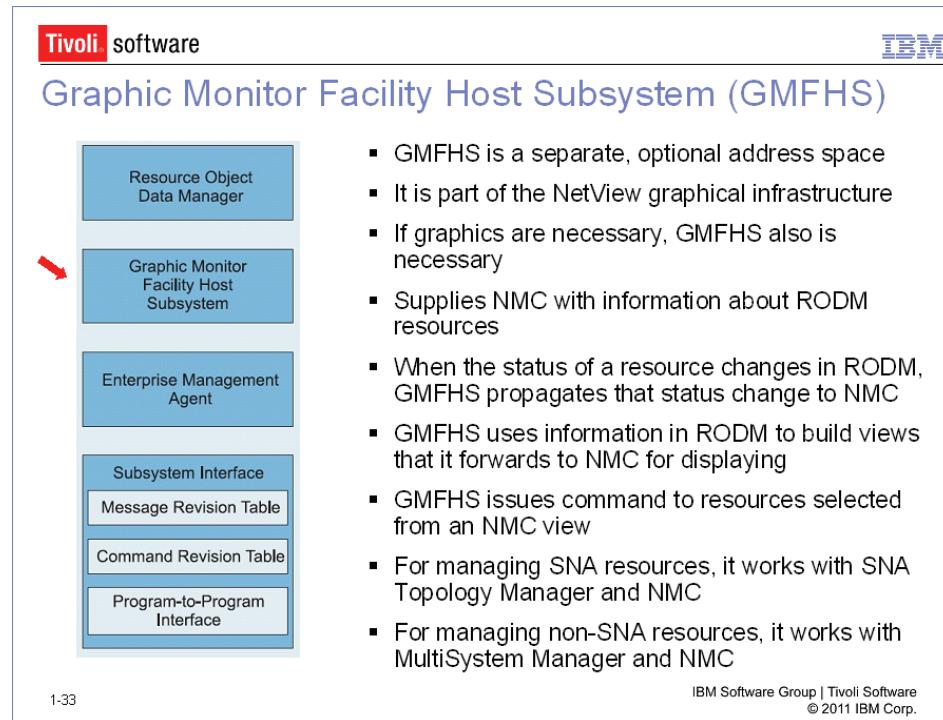
1-32

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The Resource Object Data Manager (RODM) component is a separate address space. The RODMVIEW command is used with 3270 panels. The NMC displays data that is stored in the RODM, including topology and status.

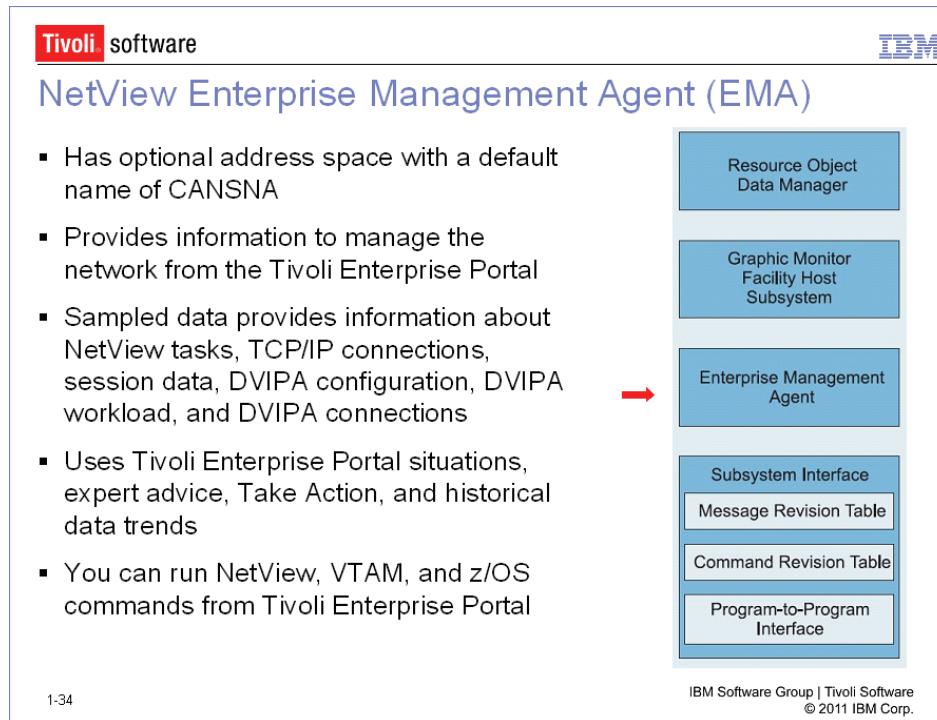
The **NetView Discovery Library Adapter (DLA)** extracts IP resource data from RODM, reformats it, and sends it to the IBM Configuration Management Database (CMDB). From CCMDB, it can be reconciled with data from other management products for a more complete picture of managed resources from multiple perspectives.

# Graphic Monitor Facility Host Subsystem (GMFHS)



The Graphic Monitor Facility Host Subsystem (GMFHS) component is a separate address space. If you want graphics, you must use both RODM and GMFHS (along with NMC and MSM, or NMC, MSM, and SNATM).

## NetView Enterprise Management Agent (EMA)



The NetView **Enterprise Management Agent (EMA)** component is a separate address space. This component provides data to one of the NetView user interfaces, the Tivoli Enterprise Portal.

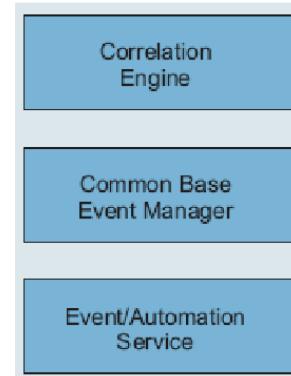
## Correlation engine

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### Correlation engine

- Correlates multiple events over time
- You can correlate data, based on duplicate events, thresholds, the presence or absence of specific events, or user-specified information
- Extends automation capabilities
- Runs under UNIX Systems Services (USS)

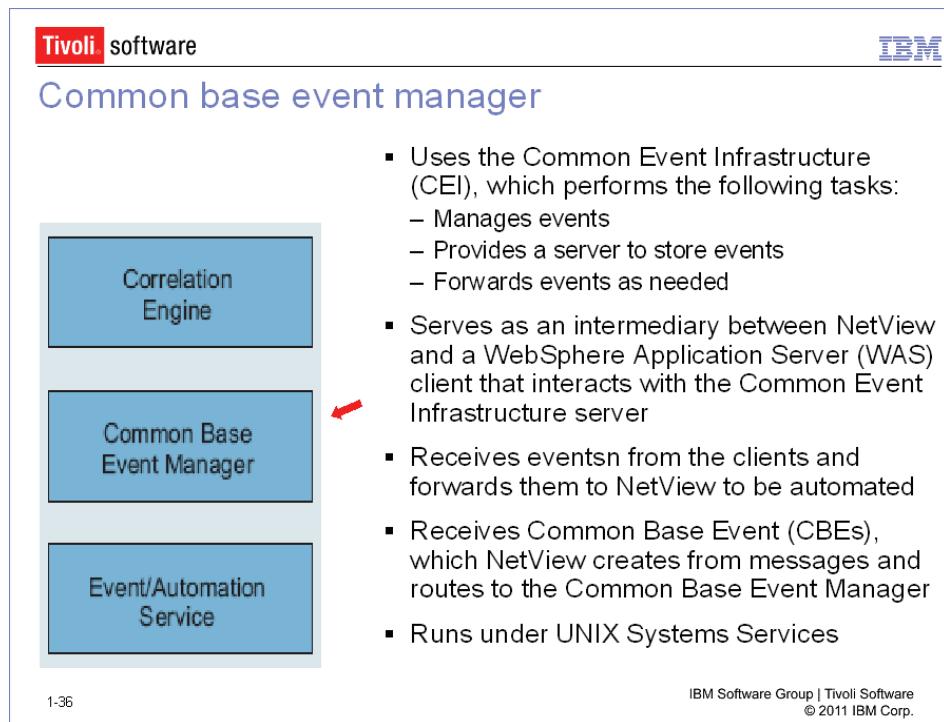


1-35

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The correlation engine extends automation capabilities. Events are sent from the automation table to the correlation engine.

## Common base event manager



NetView can both send and receive CBEs. When appropriate, the common base event manager sends data to the **WebSphere® Application Server (WAS)** client, which submits the event to the database. Connections for forwarding events are accepted from any number of clients.

## Event/Automation Service (E/AS)

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### Event/Automation Service (E/AS)

- Serves as a gateway for event data between the NetView for z/OS management environment, managers and agents that handle Event Integration Facility (EIF) events, and SNMP managers and agents.
- With this component, you can manage data from any of these management platforms
- Runs under UNIX System Services

```
graph TD; CE[Correlation Engine] --- CBE[Common Base Event Manager]; CBE --- EAS[Event/Automation Service]
```

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The Event/Automation Service (E/AS) component is a separate address space and is optional.

# Lesson 4: NetView application procedure parameters and data sets

## NetView procedure parameters

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### NetView procedure parameters

```
//NETVIEW EXEC PGM=&PROG,TIME=1440,  
//           REGION=&REG,  
//           PARM=(&BFSZ.K,&SLSZ,'&CNMDOMN',  
//                  '&DOMAINPW','&ARM','&SUBSYM','&NV2I','&TRSIZE'),  
//           DPRTY=(13,13)
```

Key parameters are as follows:

- PROG: The program is used to start NetView, typically BNJLINTX for network NetView or DSIMNT for System Automation for z/OS (SA z/OS)
- REG: The region size in K for the main task
- DOMAIN: NetView domain name
- NV2I: A unique two-character value used to build a symbolic for creating a unique parameter file name for a particular NetView. It substitutes the xx in CxxSTYLE. The default is NM

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If you enable more components than those enabled by default, consider increasing the region size.



**Note:** If you specify a NV2I value of *xx*, for example, you must copy CNMSTYLE to C*xx*STYLE so that your editing can take place in C*xx*STYLE.

Other parameters are as follows:

- **DOMAINPW:** NetView domain password
- **BFSZ:** Buffer size in K
- **SLSZ:** Slot size, a fixed portion of a buffer to contain incoming error records
- **SUBSYM:** NetView symbolic substitution switch
  - **SUBSYM:** Enables symbolic substitution
  - **\*NOSUBSYM:** Disables symbolic substitution and is the default
- **ARM:** Used for enabling (or not enabling) NetView for MVS automatic restart management
- **TRSIZE:** Size of NetView internal trace table.

## Data definition names

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### Data definition names

Some DDNAMES include the following terms:

- STEPLIB: The NetView load modules data set
- DSICLD: NetView REXX EXECs and command lists
- DSIPARM: NetView definition data set members and sense codes
- DSIPRF: NetView operator and autotask profiles

1-40

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Module loading occurs first from the STEPLIB data set or data set concatenation. Then the data sets that are defined in the z/OS PARMLIB member LNKLSTxx are searched. All NetView STEPLIB data sets must be authorized by the *authorized program facility (APF)*.

Other DDNAMEs in the PROC are as follows:

- **SYSTCPD:** TCPIP parameters
- **CNMXLBIN:** TCP/IP translate data set TCPXLBIN
- **DSIOPEN:** NetView non-secured data sets
- **DSILIST:** Automation table listing
- **DSISARC:** Testing automation tables
- **DSIARPT:** Storage of output reports that are produced from running tests of the automation table
- **DSIVTAM:** VTAM library data sets (VTAMLST)
- **DSIMSG:** Message and translation members
- **BNJPNL1** and **BNJPNL2:** Hardware monitor panel data sets for central system and color maps
- **CNMPNL1:** Online help panels
- **DSILOGP** and **DSILOGS:** NetView Virtual Storage Access Method (VSAM) log data sets
- **DSITRCP** and **DSITRCS:** NetView VSAM trace log data sets
- **DSITCONP** and **DSITCONS:** TCP connection VSAM data sets
- **AAUVSPL** and **AAUVSSL:** Session monitor VSAM data sets
- **BNJLGPR** and **BNJLGSE:** Hardware monitor VSAM databases
- **BNJ36PR** and **BNJ36SE:** 4700 support facility VSAM data sets
- **FKPKTS:** Saved packet trace VSAM data set
- **CNMDVIPP** and **CNMDVIPS:** DVIPA workload statistics
- **DSIKPNL:** Central site control facility VSAM data sets
- **DSISVRT:** Save/Restore VSAM database
- **EZLSTAT:** AON automation status file
- **EZLPSWD:** AON password data sets for gateway session password management
- **EZLLOGP** and **EZLLOGS:** AON automation log data sets
- Several other print and utility data sets

## NetView subsystem interface

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### NetView subsystem interface

```
//NETVIEW EXEC PGM=&PROG,TIME=1440,REGION=&REG.K,  
//           PARM=(&MBUF,&CBUF,'&DSIG','&MSGIFAC','&PPIOPT','&ARM',  
//           '&PFXREG',&P256BUF,&P4000BUF,&ROUTECDE),DPRTY=(13,13)
```

- STEPLIB is the NetView load module library data definition name (DDNAME)
- No other DDNAME statements are necessary

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In NetView for z/OS 6.1, the following parameters are retired, meaning that they still need to be defined for migration purposes, but values are not used:

- MBUF
- CBUF
- DSIG
- PFXREG
- MSGIFAC

Other parameters are as follows:

- **ARM:** Used for enabling (or not enabling) NetView SSI automatic restart
- **PPIOPT:** Specification if you want to initialize the *program-to-program interface (PPI)* facility
- **P256BUF:** Specification of the number of 256-byte PPI buffers
- **P4000BUF:** Specification of the number of 4000-byte PPI buffers
- **REG:** Specification of the region size for the NetView subsystem buffer address space in kilobytes
- **ROUTECDE:** Specification of the route code to be used for messages issued by the SSI address space

# Lesson 5: NetView 3270 interface

## NetView application program

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### NetView application program

- The 3270 sessions provide access to the core components and the command-line interface of the NetView program
- You can run commands to perform the following tasks:
  - Browse initialization parameters and data sets
  - Display TCP/IP information
  - Display VTAM status of devices
  - And so on
- You can run EXEC programs for automation, which is one of the most important uses of NetView
- To begin a NetView session, log on from a VTAM USS screen

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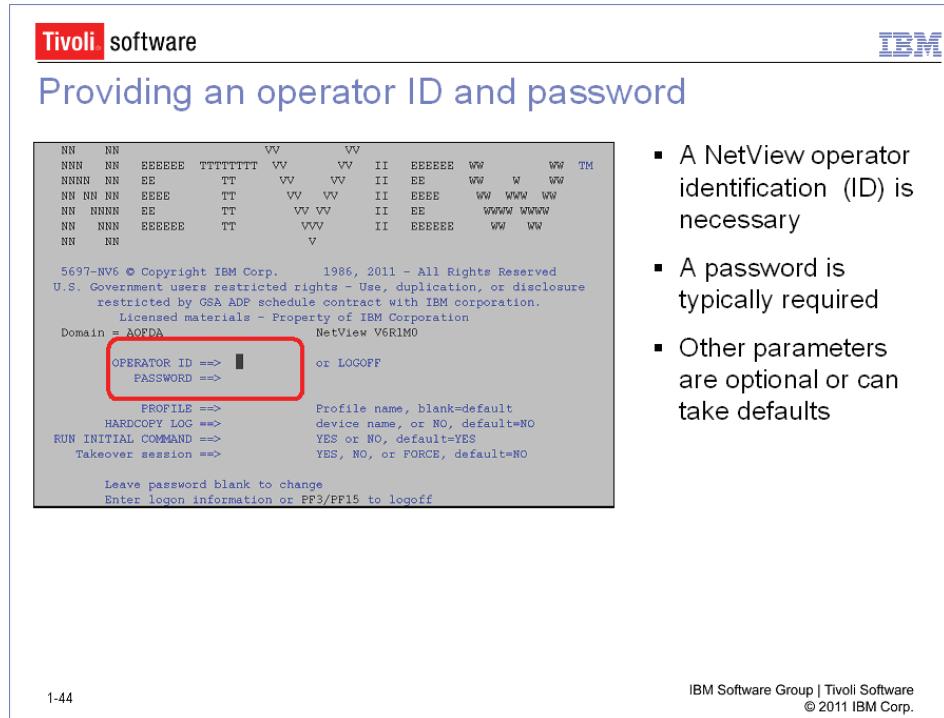
The 3270 interface is the first of the four user interfaces to NetView. Depending on your environment, a VTAM logon command can look like these examples:

```
logon applid(applid) logmode(logmode) data(data)  
logon applid=applid logmode=logmode data='data'
```

Where:

- *Applid* is the name of the NetView application that you are logging on to.
- *LOGMODE* and *DATA* are optional parameters.
- *Logmode* specifies information about your workstation session.
- *Data* specifies information that is inserted in the OPERATOR ID and PASSWORD fields of the NetView logon panel.

## Providing an operator ID and password



- A NetView operator identification (ID) is necessary
  - A password is typically required
  - Other parameters are optional or can take defaults

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 that is specified in the logmode.

If the operator ID is already logged on and you want to take over the session, type “YES” as the Takeover session value. If you receive a message that the takeover is blocked, you can type “FORCE” as the Takeover session value.

## NetView LISTA DSIPARM command

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### NetView LISTA DSIPARM command

DDNAME	DATA SET NAME	MEMBER	DISP
DSIPARM	NV390.V681MO.WORKSHOP.DSIPARM	SHE,KEEP	
	NV390.V681MO.USER.DSIPARM	SHE,KEEP	
	NV390.DSIPARM	SHE,KEEP	
	NV390.SQNPARM	SHE,KEEP	

1-45

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- Running the LISTA DSIPARM command results in display of the data sets allocated to the DSIPARM data definition (DD) statement in the NetView started task
- DSIPARM data sets are part of the initialization process of NetView
- DSIPARM data sets are partitioned data sets (PDS) and can be concatenated

NetView initialization begins with contents in the DSIPARM data sets. In the example, three data sets are concatenated to the DSIPARM DDNAME. The second and third data sets contain product-provided initialization members and samples. The first data set is used by this installation to contain modifications to DSIPARM members that are included with the NetView product.

DSIPARM data sets should not be allocated with secondary extents for disk space. If a data set expands into secondary space extents while NetView runs, problems can occur. Problems include incorrect locating and loading of members from the data set.

# Canzlog

The screenshot shows the 'Specify Canzlog Filters' panel of the Tivoli Canzlog application. The 'Jobname:' field contains 'autossi'. Other fields like 'Text' and 'Name' also have 'autossi' entered. The 'CMD-> save' button is visible at the bottom. The panel is titled 'CNCMZLG' and has sections for 'From:', 'To:', 'MSGID:', 'Jobid:', 'ASType:', 'Route Code:', 'System ID:', 'Desc Code:', and 'AuthGroup:'. There are also sections for 'UCHARS:', 'CHKey:', and 'WTOKkey:'. A note at the bottom says 'TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'.'

**Display**

- MVS messages
- NetView messages
- Broadcast messages
- DOMs
- Command echoes
- Trace and audit messages

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Canzlog (consolidated audit, NetView, and z/OS log) shows all audit, system, and network messages in one place.

Slide shows canzlog filter panel. In this example we set a filter called autossi and save it. The filter looks for messages related to jobname AUTOSSI.

## Canzlog ..

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Canzlog ..  
BR AUTOSSI

```
Canzlog : FILTER=AUTOSSI TAG=(NVMSC,MVSMSC) 07/13/11 13:31:23 -- 13:31:41
13:31:23 $HASP100 AUTOSSI ON STCINRDR
13:31:23 IEF695I START AUTOSSI WITH JOBNAMES AUTOSSI IS ASSIGNED TO USER NETVT
13:31:23 $HASP373 AUTOSSI STARTED
13:31:23 IEF403I AUTOSSI - STARTED - TIME=13.31.23
13:31:23 CNM226I NetView Program to Program Interface initialization is complet
13:31:23 CNM541I NetView subsystem AUTO is fully functional
13:31:41 IEF695I START AUTOSSI WITH JOBNAMES AUTOSSI IS ASSIGNED TO USER NETVT
13:31:41 IEF403I AUTOSSI - STARTED - TIME=13.31.41
13:31:41 CNM226I NetView Program to Program Interface initialization is complet
13:31:41 CNM541I NetView subsystem AUTO is fully functional
Bottom of Data
```

**BR LOG** will browse Canzlog based on filters set by DEFAULTS / OVERRIDE.  
**BR named\_filter {optional\_additional\_filters}** will browse Canzlog based on the specified parameters.  
**BR {filter\_name}** will browse Canzlog based on the parameters specified by the filter.  
**CANZLOG** displays the filter panel. Subcommands are Replace, Save, Common, Task, and Delete

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Browsing a canzlog using filter AUTOSSI set in the previous slide.

For saving filters the following applies:

- Determine which NetView users will save task level filters. A dataset is required in DSIOPEN for each user, {CNMSTYLE.OPDSPREFIX}.{userid}.
- Users without this dataset will still be able to create and save task filters, but the filters will not be restored across logons. The default for CNMSTYLE.OPDSPREFIX is NETVIEW.OPDS
- All users will be able to create common filters as these are stored in the first dataset of DSIOPEN.

## Student exercise

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Student exercise



1.48

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Open your *Student Exercises* book and perform Exercise 1-1.

# Lesson 6: Customizing NetView by using CNMSTYLE

## CNMSTYLE (1 of 2)

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### CNMSTYLE (1 of 2)

- CNMSTYLE sets customization and configuration values during NetView initialization
- CNMSTYLE is a member of DSIPARM
- The sample CNMSTYLE member provided with the installation contains extensive descriptions and comments
- Using %INCLUDE, you can also include other DSIPARM members for CNMSTYLE initialization

1-50

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CNMSTYLE is the first member that is read from the DSIPARM data set or from the concatenation of DSIPARM data sets. It is referred to as a *style sheet*.

The DSIPARM DDNAME can include many concatenated data sets. You can avoid member-loading problems by allocating DSIPARM data sets with only primary disk space and no secondary space.

## CNMSTYLE (2 of 2)

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### CNMSTYLE (2 of 2)

- The second and third characters of your stylesheet name can be variable. Use the &NV2I symbolic in the NetView application startup procedure to set the value for the following two-character positions:
  - The default value NM causes loading of CNMSTYLE
  - Setting &NV2I = LA causes loading of CLASTYLE
- If the C&NV2I.STYLE member cannot be found, NetView reads CNMSTYLE instead by default.
  - Do not make changes directly to the CNMSTYLE member
  - Make changes in CxxSTUSR or CxxSTGEN
- If statements are duplicated in CNMSTYLE and in any included members, the last of the duplicated statements applies

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The CNMSTYLE that is included with the NetView product can be used right after installation. Some parameters might require modification, but do not modify these in CNMSTYLE. Instead, copy the parameters to your CxxSTUSR member, which is to contain your changes. The data set that contains the CxxSTUSR member must be in a data set that is concatenated to the DSIPARM DDNAME. This data set must precede the data set that contains the CNMSTYLE that is supplied by NetView.

If &NV2I is specified incorrectly and C&NV2I.STYLE cannot be located in the DSIPARM PDS concatenation, CNMSTYLE is loaded instead. However, some unexpected results can occur. If %INCLUDE statements are defined in CNMSTYLE using &NV2I, such as %INCLUDE C&NV2I.STGEN, these members might not be located because the &NV2I value is incorrect.

## Included members from DSIPARM (1 of 2)

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### Included members from DSIPARM (1 of 2)

- CNMSTPWD
  - You can use this member to include vital product data (VPD), VSAM, and access-control-block (ACB) passwords
  - You can use the READSEC command to protect CNMSTPWD from being displayed by the BROWSE command
- CNMSTNXT (commented out in CNMSTYLE)
  - Includes modifiable CNMSTYLE statements by release
  - Comes with NetView for documentation purposes and as reference for someone migrating from a modified CNMSTYLE
- CNMSTASK (NetView-provided task statements, not to be modified)
  - If you want to change task statements, you can include the changes directly in CxxSTGEN
  - The task statements in CxxSTGEN override those provided in CNMSTASK, depending on the order of inclusion of these members in CNMSTYLE
- CNMSTUSR
- CxxSTGEN

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If you have modified CNMSTYLE, you can open CNMSTNXT and copy just the statements that are new or changed in the last release or releases. You can add these changes to your older, modified CNMSTYLE. Customers that never change the NetView CNMSTYLE should not need to do this.

Some tasks are defined in the sample CNMSTYLE member with INIT=N (or INIT=NO) in CxxSTASK. If you plan to change these to INIT=Y (or INIT=YES), copy these to CxxSTGEN and change the statements in that member.

Discussion of CNMSTUSR and CxxSTGEN members occur later in this lesson.

## Included members from DSIPARM (2 of 2)

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### Included members from DSIPARM (2 of 2)

- CNMSTIDS
  - Includes statements for automating the detection of intrusions
  - You are to review this member if you are enabling Intrusion Detection Services (IDS) support
- CNMSTACT
  - Includes statements for the ACTIVEACTIVE subtower, LIFELINE or REPLICATION, specified.
- CNMSTTWR
  - Includes style statements from non-NetView towers
  - You are not to edit this member unless specifically instructed by documentation for a tower you are installing
- CNMSTWBM
  - Includes webmenu statements for controlling the web user interface

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CNMSTTWR includes AOFSTYLE if TOWER=SA is specified in CNMSTYLE. SA is not a NetView tower.

## Included member CNMSTUSR from DSIPARM

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### Included member CNMSTUSR from DSIPARM

- You can add modifications to %INCLUDE member CxxSTUSR for changes common to the entire installation or enterprise
- You can include global (enterprise) definition statements that override statements in CNMSTYLE
- You can use %INCLUDE in this member to include other DSIPARM members
- You can make global (enterprise) changes to member CNMSTUSR, and then copy the modified CNMSTUSR to each NetView system
- You can use Data REXX logic

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CNMSTUSR is a sample member that allows you to include any style statements that you write into CNMSTYLE. You can customize NetView and other product style statements. A %INCLUDE CNMSTUSR statement is in CNMSTYLE to include this member. You can copy this member to your own DSIPARM data set. You can change The second and third characters of the member name can be changed and addressed by a variable. This course refers to the two characters as *xx*. (The *xx* is the value of &NV2I, which is initially set to NM.)

Discussion of Data REXX logic, which is used to provide conditional logic in some style sheet members, occurs later.

## Included member CxxSTGEN from DSIPARM

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### Included member CxxSTGEN from DSIPARM

- CxxSTGEN is usable for system-specific changes, where xx is the value of &NV2I, initially set to NM
- You code all override statements for CNMSTYLE and CxxSTUSR in this member
- You can use Data REXX logic
- You can use %INCLUDE to include other DSIPARM members
- Duplicate statements found in CxxSTGEN override earlier statements in CNMSTYLE and CxxSTUSR
- Duplicate statements found in CxxSTUSR override earlier statements found in CNMSTYLE

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The CNMSTGEN member is provided by NetView with only comments. A %INCLUDE CNMSTGEN statement is in CNMSTYLE to include this member. Use this member for organizational purposes, such as adding system-specific modifications. The xx is the value of &NV2I, which is initially set to NM.

You can copy this member to your own DSIPARM data set. Use CxxSTGEN to tailor the style sheet when it is not convenient to have separate copies of CxxSTYLE. If duplicate statements are found during style sheet processing, the last occurrence of the statement is used.

Discussion of Data REXX logic, which is used to provide conditional logic in some style sheet members, occurs later.

## CNMSTYLE changes during NetView execution

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### CNMSTYLE changes during NetView execution

- The RESTYLE command can set and activate some changes without recycling the NetView program
  - Hardware monitor
  - Session monitor
  - Web interface
  - NetView Resource Manager
  - Visual BLDVIEWs
  - Various global variable updates
  - And many more
- With some exceptions, changes made to style sheet members while NetView is running become effective when recycling NetView

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The RESTYLE command reads the style sheet and sets new values pertaining to the specified keyword.

# Data REXX logic

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## Data REXX logic

- The logic is not supported in CNMSTYLE member
- You can use the logic in %INCLUDE members defined in CNMSTYLE
- You can add the logic to CxxSTUSR or CxxSTGEN member to conditionally process definition statements, based on whether a particular tower is enabled or not
  - %> IF tower('towername') THEN
  - %> DO;
  - definition statements
  - %> END;
- Data REXX files must begin with either a /\* %DATA \*/ or /\* %LOGIC \*/ statement
- The first column must begin with %> for the characters
- Lines beginning with a blank are considered continuation statements
- You can code the logic to conditionally change style sheet statements in CxxSTUSR or CxxSTGEN, such as enabling or disabling towers and subtowers

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The publication *IBM Tivoli NetView for z/OS Programming: REXX and the NetView Command List Language* provides more information about Data REXX.

## Towers and subtowers (1 of 6)

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### Towers and subtowers (1 of 6)

- Tower statements activate NetView components
- Tower statements are examined early in the NetView initialization process:

```
TOWER = *SA *AON *MSM *Graphics NPDA NLDM TCPIPCOLLECT
*AMI *TARA *DVIPA *TEMA *IPMGT *NVSQA DISCOVERY
*ACTIVEACTIVE
```
- Removing the asterisk enables that tower or function
- If multiple tower statements exist, the last one processes
- Subtower statements can enable specific components within a tower

```
TOWER.TCPIPCOLLECT = TCPCONN PKTS
```
- Modified tower statements are recognized only after NetView restarts

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To update tower or subtower statements, copy the statements to CxxSTUSR or CxxSTGEN.

## Towers and subtowers (2 of 6)

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### Towers and subtowers (2 of 6)

- SA: Enables SA for z/OS
- AON – Enables network automation (AON component) and has these subtowers:
  - SNA: SNA automation (AON/SNA)  
To also enable AON/SNA X.25 support, remove the asterisk (\*) from the following statement:

```
*TOWER.AON.SNA = X25
```

- TCP: TCP/IP automation (AON/TCP)  
To also enable Intrusion Detection Services (IDS) support, remove the asterisk (\*) from the following statement:

```
*TOWER.AON.TCP = IDS
```

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IBM Tivoli System Automation for z/OS (SA z/OS) is a separate product. Because it is not part of the NetView product, the subtowers that it uses are not listed.

Example of the tower statement for AON is as follows:

```
TOWER = AON
```

Examples of the AON subtower statements are as follows:

```
TOWER.AON.SNA = X25
TOWER.AON.TCP = IDS
```

## Towers and subtowers (3 of 6)

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### Towers and subtowers (3 of 6)

- MSM: Enables the MultiSystem Manager.  
Subtowers:
  - ITNM: IBM Tivoli Network Manager component
  - OPN: Open component
- Graphics: Enables the NetView graphical infrastructure  
Subtower: SNATM (SNA Topology Manager)
- NPDA: Enables the hardware monitor
- NLDM: Enables the session monitor

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The graphics tower enables NMC, RODM, and GMFHS.

## Towers and subtowers (4 of 6)

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### Towers and subtowers (4 of 6)

- TCPIPCOLLECT: Enables the collection of TCP/IP connection and packet trace data from IBM Communications Server for z/OS, with these subtowers
  - TCPCONN: Enables the collection of TCP/IP connection data
  - PKTS: Enables the collection of TCP/IP packet trace data
- AMI: Enables the Application Management Instrumentation
- TARA: Enables the 4700 support facility
- DVIPA: Enables the collection of dynamic virtual IP address (DVIPA) definition and status data. Subtowers:
  - DVTAD: Distributed DVIPAs
  - DVCONN: DVIPA Connections
  - DVROUT: VIPA Routes and DDVIPA Connection Routing

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If TCPIPCOLLECT and DVIPA are enabled, this information can eventually be displayed through the Tivoli Enterprise Portal user interfaces to NetView.

More information about the ***application management instrumentation (AMI)*** are in members DSIAMIAT and DSIAMII.

DSIAMIAT is an automation table for AMI. The member that is provided with NetView has the capability of routing messages to another NetView. Such capabilities are as follows:

- It can route messages to a message adapter.
- Messages may be sent to Tivoli Enterprise Console by a message adapter.
- Messages can be sent to a NetView management console topology server.

DSIAMII is used for customizing monitor default threshold specifications and polling intervals as appropriate for your environment.

## Towers and subtowers (5 of 6)

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### Towers and subtowers (5 of 6)

Tivoli Enterprise Monitoring Agent: Enables the NetView Enterprise Management Agent and uses the following subtowers:

- HEALTH: Enables the collection of NetView health data
- CONNACT: Enables the collection of data on active TCP/IP connections
- CONINACT: Enables the collection of data on inactive TCP/IP connections
- SESSACT: Enables the collection of data on active sessions
- DVDEF: Enables the display of DVIPA definition and status data
- DVTAD: Enables the collection of DVIPA sysplex distributors and distributor targets data
- DVCONN: Enables the collection of data on DVIPA connections
- SYSPLEX :Enables the collection of stack configuration and status data
- TELNET: Enables the display of discovered TELNET servers and ports
- DVROUT: Enables the display of discovered VIPA routes and DDVIPA connection routing
- OSA: Enables the display of OSA channels and ports
- HIPERSOCKETS: Enables the display of discovered HiperSockets
- ACTIVEACTIVE: Shows availability and performance metrics for workload distribution and replication capture and apply servers

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The Tivoli Enterprise Monitoring Agent tower enables communication not only between core NetView and the NetView EMA, but also the entire NetView EMA function. NetView communicates with the Tivoli Enterprise Portal through the NetView EMA. The NACMD command is used for communicating between the NetView and NetView EMA address spaces. If the Tivoli Enterprise Monitoring Agent tower is not enabled, the NACMD command fails.



**Note:** The SESSACT subtower is supported in only one NetView program per z/OS logical partition (LPAR).

## Towers and subtowers (6 of 6)

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### Towers and subtowers (6 of 6)

- IPMGMT: Perform active monitoring without the need for the following AON subtowers:
  - ACTMON
  - IDS
- NVSOA: NetView Web Services Gateway
- DISCOVERY: Discovers telnet servers and interfaces. Subtowers:
  - TELNET
  - INTERFACES
  - OSA
  - HIPERSOCKETS
- ACTIVEACTIVE: GDPS Active/Active. Subtowers:
  - LIFELINE
  - REPLICATION

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The IPMGT ACTMON subtower can be used for performing active monitoring or IP resources without the need for the AON Tower. The IPMGT IDS subtower can be used for Intrusion Detection automation without the need for the AON tower. These towers are mutually exclusive with the AON TCP tower.

# Tower and subtowers for Tivoli Enterprise Monitoring Agent

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## Tower and subtowers for Tivoli Enterprise Monitoring Agent

- You do not enable the Tivoli Enterprise Monitoring Agent tower unless you are installing the NetView EMA
- You need only one NetView EMA per logical partition (LPAR)
- Installing of NetView EMA requires new address spaces to run CANSDSST and CANSNA
  - CANSDSST is the default procedure name for the Tivoli Enterprise Monitoring Server, if the Tivoli Enterprise Monitoring Server is running on a z/OS system
  - CANSNA is the default procedure name for the EMA, which must run on a z/OS system

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The Tivoli Enterprise Monitoring Server does not need to run on a z/OS system, and it can run on a distributed system. Many z/OS installations run the Tivoli Enterprise Monitoring Server on z/OS systems because mainframe operating systems offer reliability, availability, and backup capabilities. In most cases, a remote Tivoli Enterprise Monitoring Server is needed on each z/OS image, as some agents can run only within a Tivoli Enterprise Monitoring Server. Example of this is OMEGAMON XE on z/OS agent.

## Commands automatically run after initialization

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### Commands automatically run after initialization

- You use the auxInitCmd statement in CxxSTUSR or CxxSTGEN
- You specify any number of commands or command lists to run
- The EBCDIC value that follows the auxInitCmd keyword determines the order that the commands run
  - auxInitCmd.A = MSG SYSOP,Auxiliary commands the beginning
  - auxInitCmd.AC = RESTORE TIMER
  - MSG SYSOP command (A) runs before the RESTORE TIMER command (AC)
- AuxInitCmd commands run before any commands at any autotask

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These auxInitCmd commands provide the initial step for triggering automation as NetView starts up. All commands for autotasks are queued, including both task initial command lists and commands that EXCMD sends. These commands run only after all auxInitCmds have completed. Messages are also queued. They do not route to automation nor logging until all auxInitCmd commands finish.

## Setting up security

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### Setting up security

You use SECOPTS statements to specify the following items:

- Operator security
- Command authority
- Span of control authority
- Web browser access

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The *IBM Tivoli NetView for z/OS Administration Reference* manual and the *IBM Tivoli NetView for z/OS Security Reference* manual explain the use of SECOPTS statements. The next slide briefly describes operands.

## SECOPTS statements and options in CNMSTYLE

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### SECOPTS statements and options in CNMSTYLE

SECOPTS.OPERSEC = NETVPW	SECOPTS.OPSPAN = NETV
*SECOPTS.OPERSEC = SAFCHECK	*SECOPTS.OPSPAN = SAF
*SECOPTS.OPERSEC = SAFPW	SECOPTS.SPNAUTH = *NONE*
*SECOPTS.OPERSEC = SAFDEF	*SECOPTS.SPNAUTH = TABLE.CNMSPAN2
*SECOPTS.OPERSEC = MINIMAL	*SECOPTS.SPNAUTH = VTAMLST.CNMSPAN1
SECOPTS.SURROGAT = NO	SECOPTS.SPANCHK = SOURCEID
SECOPTS.CMDAUTH = TABLE.CNMSCAT2	*SECOPTS.SPANCHK = TARGETID
*SECOPTS.CMDAUTH = SAF.CNMSBAK1	SECOPTS.WEBAUTH = PASS
*SECOPTS.CMDAUTH = SAF.PASS	*SECOPTS.WEBAUTH = CHECK
*SECOPTS.CMDAUTH = SAF.FAIL	SECOPTS.RMTAUTH = SENDER
*SECOPTS.CMDAUTH = SCOPE.CNMSCOP1	*SECOPTS.RMTAUTH = ORIGIN
SECOPTS.AUTHCHK = SOURCEID	
*SECOPTS.AUTHCHK = TARGETID	

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You can use operands to the SECOPTS statements as follows:

- OPERSEC defines the method used for logging on to the NetView program.
- SURROGAT specifies if the NetView operator ID is checked to determine if it is a surrogate of a TSO user ID.
- CMDAUTH defines the method that NetView uses for protecting command usage.
- AUTHCHK specifies the user ID that is to be used when verifying command authorization.
- OPSPAN defines the method for determining the authority of an operator to start spans of control.
- SPNAUTH specifies the location of the span definitions for resources and views.
- SPANCHK specifies the operator ID that is used for defining span checking.
- WEBAUTH specifies if authorization checking is to be performed for operator access to the NetView Web server.



**Note:** RMTAUTH specifies the method to determine the operator ID that is used as the remote operator for security checks that are performed on RMTCMD and ENDTASK requests. RMTAUTH is used for only incoming requests, not for command security checking.

## Student exercise

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### Student exercise



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Open your *Student Exercises* book and perform Exercise 1-2.

# Lesson 7: CNMSTYLE report generator

## CNMSTYLE report generator features

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### CNMSTYLE report generator features

- You can analyze CNMSTYLE and its included members
- You can use the report to perform the following tasks:
  - List the %INCLUDE structure
  - Analyze multiple occurrences of statements within CNMSTYLE and its included members
  - Determine the value that is used during NetView initialization. (For statements that are listed multiple times in the report, the last statement listed is the one that is used for initialization.)
  - List the CNMSTYLE towers that are enabled
  - Analyze initialization statements for a particular function
- You can run the report by using the sample CNMSJCRG batch job that is in the INSTALL data set
- By default, the report is written to the data set that is allocated to the DSIWRIT DDNAME

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The CNMSJCRG job runs outside of the NetView address space and runs the CNMECRG REXX program from the TSO terminal monitor program in batch mode. A sample job is located in &HLQ.INSTALL(CNMSJCRG).

CNMSJCRG requires the following data definitions and data sets:

- STEPLIB: The NetView CNMLINK data set from the current release, NETVIEW.V6R1M0.CNMLINK, by default
- SYSEXEC: The concatenated data set list of the NetView CNMCLST data sets from the current release
- DSIPARM: The concatenated data set list containing current release versions of CNMSTYLE. Ensure that the data set concatenation order matches the order that the NetView CNMPROC start procedure specifies.
- CNMPNL1: The NetView CNMPNL1 data set from the current release, NETVIEW.V6R1M0.CNMPNL1.
- DSIWRT: The destination for the report. By default, this is written to NETVIEW.V6R1USER.CNM01.DSILIST(CNMCRG). If the member already exists, CNMCRG is copied to CNMCRGBK before overwriting CNMCRG.

# CNMSJCRG job

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## CNMSJCRG job

- The following example shows keyword parameters for the REXX EXEC CNMECRG that is coded in the batch job CNMSJCRG

```
CNMECRG
  TASKS=NO
  &NV2I=NM
  &DOMAIN=CNM01
  &CNMTCPN=TCPIP
  &CNMRODM=RODMNAME
  &CMNETID=NETA
  &MYSYMBL=' A B C '
```

- The CNMSTYLE report includes the following sections:
  - General information and CNMSTYLE statements that pertain to all of NetView
  - CNMSTYLE statements that pertain to specific functions of NetView
  - auxInitCmd statements and user-defined statements
  - Data REXX statements within CNMSTYLE
- Because the TASKS parameter is set to NO, the report in this example does not include CNMSTASK statements

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The CNMSTYLE report is written to a member of a PDS. The length of each line in the report is 80 bytes.

## Typical CNMSJCRG job

The report that results from running this job is on the slides that follow

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CNMSJCRG job keyword parameter notes are as follows:

- CNMECRG is the invoked command.
- Keyword parameters and values follow CNMECRG.
- Each keyword must be on a separate line.
- A value must not continue into a second line.
- All characters that are typed on a line are interpreted as input to CNMECRG.
- If a keyword parameter is specified more than once, the first value is used and all subsequent values specified are ignored.
- Input ends when either a blank line or a /\* occurs.

CNMSJCRG job keywords are as follows:

- TASKS=YES | NO.
  - Specifies whether to include CNMSTASK statements in the report or not.
  - YES includes statements from CNMSTYLE %INCLUDE member CNMSTASK. YES is the default value.
  - NO excludes CNMSTASK statements.
- &NV2I=xx.
  - The default value for xx is NM.
  - If an incorrect value is specified, an error message is issued and the default value NM is used in the report.
  - If you use alphabetic characters, the characters convert to uppercase.
- &symbolic\_name= value.
  - Provides the value of a system or NetView symbolic variable (&symbolic\_name) that you are using in CNMSTYLE or its included members.
  - A symbolic parameter must be passed to CNMECRG to be resolved in the report.

The following return codes are set by CNMECRG:

- 0 Successful job completion, a file created in DSMWRIT.
- 4 Minor errors encountered during job, a file created in DSMWRIT.
- 8 Major error encountered during job, a file not created in DSMWRIT.



**Note:** For non-zero return codes, error messages are in the CNMSJCRG job log.

Details of the job output are in the next set of slides.

## CNMSTYLE report: First section

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### CNMSTYLE report: First section

The first section contains general information

- The date and time of report creation
- The &NV2I symbolic variable value that is being used
- A nested listing of the members that CNMSTYLE includes
- A list of the CNMSTYLE towers that are enabled when NetView initializes
- A list of CNMSTYLE statements that apply to base NetView. An example is on the next two slides

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The format of the CNMSTYLE statements presented in the generated report includes the following fields:

- **Member:** Member name containing the statement
- **Line#:** Line number within the member where the CNMSTYLE statement is located
- **Indicators:** Information about the statement, formatted with R (Resolve indicator) and CCCCCC (Condition indicator)
- **Resolve:** Indication if the CNMSTYLE statement was modified by the report generator. A specification of Y indicates that the statement was modified.
- **Condition:** Indication that a condition is required for the listed CNMSTYLE statement to be active, such as a tower that must be enabled.
  - If only one tower is required to be enabled, the condition field is set to the required tower name.
  - If more than one tower must be enabled, or if another condition must be met, the condition field is set to four asterisks (\*\*\*\*).
- **Statement:** Listing of the CNMSTYLE statement and its value.
  - Statements are modifiable by having values substituted into either the CNMSTYLE keyword or its value.
  - Values that contain passwords list in the report as four asterisks.

## %INCLUDE structure

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%INCLUDE structure

File Edit Edit\_Settings Menu Utilities Compilers Test Help

VIEW NV390.V6R1M0.USER.DSILIST(CNMCRG) - 01.00 Columns 00001 00072  
Command ==> Scroll ==> CSR

\*\*\*\*\* Top of Data \*\*\*\*\*

000001  
000002 CNMSTYLE REPORT  
000003  
000004 DATE: 23 Jun 2011  
000005 TIME: 08:54:28  
000006  
000007 &NV2I value: NM  
000008  
000009 %INCLUDE structure of: CNMSTYLE  
000010  
000011 CNMSTYLE  
000012 CNMSTPWD  
000013 CNMSTASK  
000014 CNMSTIDS  
000015 CNMSTACT  
000016 CNMSTLIF  
000017 CNMSTREP  
000018 CNMSTTWR  
000019 CNMSTWBM  
000020 CNMSTUSR  
000021 CNMSTGEN  
000022  
000023 Enabled Towers: NPDA NLDM TCPIPCOLLECT IPMGT  
000024  
000025 Statements for function: NetView General

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You can view the output of the job with Interactive System Productivity Facility (ISPF) BROWSE. This is part of the first section of the report.

The display shows the order of members that are being included as follows.

- CNMSTYLE precedes an indentation for the next seven members, indicating that CNMSTYLE includes these seven members.
- CNMSTGEN precedes an indentation and three more members, indicating that CNMSTGEN includes these three members.

## General NetView statements

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### General NetView statements

File	Edit	Edit_Settings	Menu	Utilities	Compilers	Test	Help
VIEW	NV390.V6R1M0.USER.DSILIST(CNMCRG)	- 01.00		Columns 00001 00072			
Command	===>			Scroll ===> CSR			
000025	Statements for function: NetView General						
000026							
000027	Member	Line#	Indicators	Statement			
000028							
000029							
000030	CNMSTYLE	217 Y		DOMAIN = CNM01			
000031	CNMSTGEN	7 Y		DOMAIN = AOFDA			
000032							
000033	CNMSTYLE	304		NetID = &CNMNETID.			
000034							
000035	CNMSTYLE	751		TOWER = *SA *AON *MSM *Graphics NPDA NLDM			
000036				TCPIPCOLLECT *AMI *TARA *DVIPA *TEMA *IP			
000037				*NVSQA DISCOVERY *ACTIVEACTIVE			
000038	CNMSTGEN	112 ****		TOWER = *SA *AON *MSM *Graphics NPDA NLDM			
000039				TCPIPCOLLECT *AMI *TARA *DVIPA TEMA *IPM			
000040				NVSOA DISCOVERY *ACTIVEACTIVE			
000041	CNMSTGEN	140 ****		TOWER = *SA *AON *MSM *Graphics NPDA NLDM			
000042				TCPIPCOLLECT *AMI *TARA *DVIPA *TEMA IPM			
000043				*NVSQA *DISCOVERY *ACTIVEACTIVE			
000044							
000045	CNMSTYLE	1630		CNMI = Yes			
000046	CNMSTGEN	156		CNMI = Yes			
000047							
000048	CNMSTYLE	585		SECOPTS.OPERSEC = NETVPW			
000049	CNMSTGEN	256		SECOPCS.OPERSEC = SAFPW			
000050							

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This slide shows the first section scrolled forward. The screen displays examples of original statements and their statements. The CNMSTGEN member has redefined values for DOMAIN, NETID, and CNMI in this extract of the report. If you specified DOMAIN in the NetView started procedure, the value in CNMSTYLE is ignored.

In this example, note the differences between the two TOWER statements. The second tower enables AON and DVIPA. It disables NLDM. With NetView style sheets, the last one applies. In other words, the last definition of the same statement or parameter in a statement is the one that is used.

## CNMSTYLE report: Second section

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### CNMSTYLE report: Second section

The second section of the report lists CNMSTYLE statements for specific NetView functions, such as the hardware monitor (NPDA) component

- If a CNMSTYLE statement applies to multiple NetView functions, that statement is listed for each applicable NetView function. For example, the TOWER statement applies to the hardware monitor, session monitor, and various other NetView functions
- Within a function, the most critical statements are listed first, followed by less critical statements
- NetView functions in the report are in alphabetical order

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## Example of TCP/IP tower functions

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### Example of TCP/IP tower functions

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW NV390.V6R1M0.USER.DSILIST(CNMCRG) - 01.00 Invalid character string
Command ==> █ Scroll ==> CSR
001959
001960 Statements for function: TCP/IP Alert Receiver
001961
001962 Member Line# Indicators Statement
001963 -----
001964 CNMSTASK 147 TASK.DSIRTTR.MOD = DSIZDST
001965 CNMSTASK 148 TASK.DSIRTTR.MEM = DSIRTTTD
001966 CNMSTASK 149 TASK.DSIRTTR.PRI = 6
001967
001968 CNMSTYLE 1734 TASK.DSIRTTR.INIT = N
001969 CNMSTGEN 167 **** TASK.DSIRTTR.INIT = N
001970 CNMSTGEN 209 **** TASK.DSIRTTR.INIT = N
001971
001972 CNMSTYLE 2221 Y RTT.TCPANAME = TCPIP
001973 CNMSTYLE 2222 RTT.PORT = 4021
001974 CNMSTYLE 2223 RTT.SOCKETS = 50
001975
001976 Statements for function: TCP/IP Connection Data Collector
001977
001978 Member Line# Indicators Statement
001979 -----
001980
001981 CNMSTYLE 751 TOWER = *SA *AON *MSM *Graphics NPDA NLDM
001982 | TCPIPCOLLECT *AMI *TARA *DVIPA *TEMA *IP
001983 | *NVSOA DISCOVERY *ACTIVEACTIVE
001984 CNMSTGEN 112 **** TOWER = *SA *AON *MSM *Graphics NPDA NLDM
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```

This slide displays the second section of the report. An ISPF search has been made for **Statements for function**. The components or towers are listed here. The page heading changes for each of the components that are included in the report.

## CNMSTYLE report: Third section

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### CNMSTYLE report: Third section

The third section of the report lists the auxInitCmd statements and the user-defined statements

- The auxInitCmd statements display in the order that they are encountered in CNMSTYLE and its included members
- For example, you can define an autotask named OPAAA01 as follows:

```
%> IF TOWER('NPDA') THEN DO;
      function.autotask.MyAutoOp = OPAAA01
%> END;
```
- In the example, the function.autotask.MyAutoOp statement is a user-defined statement

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The report generator does not recognize user-defined CNMSTYLE statements as belonging to a specific NetView function. These user-defined statements also do not belong to general NetView information in the first section of the report.

## auxInitCmd statements

This slide displays the result of a search for auxInitCmd statements, the beginning of the third section of the report. In this example, a message goes to the SYSOP operator indicating that the auxiliary commands are starting. This part of the report also includes the user-defined CNMSTYLE statements.

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### auxInitCmd statements

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW NV390.V6R1M0.USER.DSILIST(CNMCRG) - 01.00 Columns 00001 00072
Command ==> █ Scroll ==> CSR
002777
002778 auxInitCmd Statements
002779
002780 Member Line# Indicators Statement
002781 -----
002782 CNMSTYLE 5065 auxInitCmd.A = MSG SYSOP,Auxiliary commands
002783 |ing.
002784 CNMSTYLE 5068 NLDM auxInitCmd.SNLDL = STARTCNM NLDM
002785 CNMSTYLE 5069 NPDA auxInitCmd.SNPDA = STARTCNM NPDA
002786 CNMSTYLE 5070 auxInitCmd.POLICY = EXCMD ?Policy,EZLEANLT
002787 CNMSTYLE 5071 DISCOVERY auxInitCmd.ZDISC = EXCMD ?Policy,CNMEERSC
002788 CNMSTGEN 248 auxInitCmd.AA = EXCMD AUTO1 LOADNDEF
002789 CNMSTGEN 249 auxInitCmd.SSTAT = EXCMD AUTO1,AFTER 00:00:
002790 |TCNM STATMON
002791 CNMSTGEN 250 auxInitCmd.DB1 = DBINIT NLDM NONE CYL 10 10
002792 |E 2 Y PURGE 2 02:00:00
002793 CNMSTGEN 251 auxInitCmd.DB2 = DBINIT NPDA NONE CYL 10 10
002794 |E 5 Y PURGE 5 02:30:00
002795 CNMSTGEN 252 auxInitCmd.SUNIX = EXCMD AUTO1 START UNIXSE
002796 CNMSTGEN 308 **** auxInitCmd.SAON = STARTCNM AON
002797 CNMSTGEN 310 auxInitCmd.PH = PHSLIP
002798
002799 User-Defined/Dormant CNMSTYLE Statements
002800
002801 Member Line# Indicators Statement
002802 -----
```

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## CNMSTYLE report: Fourth section

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### CNMSTYLE report: Fourth section

The fourth section of the report lists Data REXX statements

- These statements display in the report in the order that they are encountered in CNMSTYLE and its included members
- Only the first 63 characters of each Data REXX statement are in the report
- CNMSTYLE statements within a %DATA portion of a Data REXX block that are affected by an IF-THEN statement are also displayed

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The report lists the CNMSTYLE statements with a %DATA statement. This list shows the CNMSTYLE statements that are impacted by your Data REXX statements.

Some %DATA statements that are found are analyzed, and all statements are considered active in the report. Some conditional Data REXX statements are understood in a %DATA portion of code. In general, however, Data REXX statements are not processed. Nothing in a %LOGIC statement is looked at, but all Data REXX show up in the fourth section.

## Data REXX statements

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### Data REXX statements

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW NV390.V6R1M0.USER.DSILIST(CNMCRG) - 01.00 Columns 00001 00072
Command ===> CNMSTASK 44 /*%DATA -----
002820 CNMSTASK 97 %> IF TOWER('NPDA') THEN DO;
002821 CNMSTASK 98 TASK.BNJDSEERV.MOD=DSIZDST
002824 CNMSTASK 99 TASK.BNJDSEERV.MEM=BNJMBDST
002825 CNMSTASK 100 TASK.BNJDSEERV.PRI=6
002826
002827 CNMSTASK 102 TASK.BNJMNPD.A.MOD=BNJMNPD.A
002828 CNMSTASK 103 TASK.BNJMNPD.A.PRI=1
002829
002830 CNMSTASK 105 TASK.CNMCALRT.MOD=CNMCALRT
002831 CNMSTASK 106 TASK.CNMCALRT.PRI=6
002832
002833 CNMSTASK 108 %> END;
002834
002835 CNMSTASK 121 %> IF TOWER('NPDA') THEN
002836 CNMSTASK 122 AUTOTASK.DBAUTO2.Console = *NONE*
002837 CNMSTASK 123 %> IF TOWER('NLDM') THEN
002838 CNMSTASK 124 AUTOTASK.DBAUTO1.Console = *NONE*
002839 CNMSTASK 125 %> IF TOWER('TCPIPCOLLECT.TCPCONN') THEN
002840 CNMSTASK 126 AUTOTASK.DBAUTO2.Console = *NONE*
002841
002842 CNMSTASK 133 %> IF type() = 'SYS' THEN exit 0
002843
002844 CNMSTASK 139 %> IF tower('graphics') THEN
002845 CNMSTASK 140 AUTOTASK.DUIFEAUT.Console = *NONE*
```

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You can find the fourth and final section of the report with ISPF BROWSE by searching for **Data REXX Statements**.

A /\*%DATA statement begins the Data REXX group. The conditional %> IF statement determines if the **network problem determination application (NPDA)** tower is enabled. If the NPDA is enabled, it begins a DO group. Within this group, some task statements are assigned. The %> END statement ends the DO group.

## Student exercise

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Student exercise



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Open your *Student Exercises* book and perform Exercise 1-3.

# Lesson 8: NetView administration

## Defining NetView operators

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### Defining NetView operators

- If SAF security is unused, the OPERATOR statement defines the operators
- DSIOPF is the member that contains the OPERATOR statement
- OPERATOR statements define as follows:
  - Each operator who can log on to this NetView program
  - Each operator who can start a session with this NetView program from a NetView program in another domain
  - Operator identifiers that the AUTOTASK command can start as automation tasks
- You can dynamically add, delete, or change operators as follows:
  - Edit OPERATOR statements
  - Issue the REFRESH OPERS command

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There are two ways to enable SAF:

- Code SECOPTS.OPERSEC=SADFEF in CNMSTYLE.
- Specify OPERSEC=SAFDEF on the REFRESH command.

The OPERATOR statement identifies operators who can perform the following tasks:

- Log on to the NetView program.
- Start a session with this NetView program from a NetView program in another domain.

## Defining NetView operator profiles (1 of 3)

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### Defining NetView operator profiles (1 of 3)

- PROFILE statement defines the profile name to NetView
- PROFILE must be the first statement in each profile definition
- You code this statement in a member specified by a PROFILEN statement that is associated with the operator
- Profiles are unused when OPERSEC=SAFDEF
- NetView supplies sample profiles named DSIPROFA and DSIPROFB

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With OPERATOR defined in DSIOPF and PROFILE defined in a DSIPROFx member, a statement is necessary for connecting the OPERATOR to the PROFILE.

## Defining NetView operator profiles (2 of 3)

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### Defining NetView operator profiles (2 of 3)

- PROFILEN statement associates the name of a particular profile or list of profiles with an operator identification
- You code PROFILEN as often as necessary to ensure that all the possible profile names are associated with a particular operator identification
- An OPERATOR statement must precede each PROFILEN statement or group of statements. You code this statement in DSIOPF
- Profiles are unused when SECOPTS.OPERSEC=SAFDEF is specified in CNMSTYLE

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This slide describes the PROFILEN statement, which connects the OPERATOR to the PROFILE. The statement follows an OPERATOR definition in DSIOPF. PROFILEN specifies the member where the profile is.

## Defining NetView operator profiles (3 of 3)

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### Defining NetView operator profiles (3 of 3)

- Default profile introduced in NetView for z/OS 6.1
- CNMSTYLE definition  
DEFAULTS.LogProf = DLPNAME
- The DEFAULTS command is also available at any time, including  
DEFAULTS LOGPROF=\*NONE\*
- The profile itself is defined in DSIPRF, as before
- Operators who use a default profile do not need PROFILEN statements

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Earlier, SAFCHECK and SAFPW customers needed to define NetView operators in both SAF (e.g. RACF) for passwords, and NetView/DSIOPF for profiles. Also, NETVPW customers needed to specify at least 1 profile for each operator. Now, SAFCHECK and SAFPW customers need not define operators in DSIOPF. NETVPW customers now need not define a profile for each operator.

A new LOGPROF option on the DEFAULTS command must be in effect to enable the DLP before the target logon. A DEFAULTS.LogProf statement is therefore recommended in CNMSTYLE (if DLP is needed).

## Example of DSIOPF defining operators

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### Example of DSIOPF defining operators

```
NETVIEW.BRWS ----- BROWSE DSIOPF  (DSIPARM ) --- LINE 00051 TO 00068 OF 00555
SCROLL ==> CSR
-----+-----+-----+-----+-----+-----+-----+-----+
1      2      3      4      5      6      7
LABUSR0   OPERATOR  PASSWORD=LABUSR0
          PROFILEN  DSIPROFA
LABUSR1   OPERATOR  PASSWORD=LABUSR1
          PROFILEN  DSIPROFA
LABUSR2   OPERATOR  PASSWORD=LABUSR2
          PROFILEN  DSIPROFA
LABUSR3   OPERATOR  PASSWORD=LABUSR3
          PROFILEN  DSIPROFA
LABUSR4   OPERATOR  PASSWORD=LABUSR4
          PROFILEN  DSIPROFA
LABUSR5   OPERATOR  PASSWORD=LABUSR5
          PROFILEN  DSIPROFA
LABUSR6   OPERATOR  PASSWORD=LABUSR6
          PROFILEN  DSIPROFA
LABUSR7   OPERATOR  PASSWORD=LABUSR7
          PROFILEN  DSIPROFA
LABUSR8   OPERATOR  PASSWORD=LABUSR8
          PROFILEN  DSIPROFA
          OPERATOR  PASSWORD=LABUSR8
          PROFILEN  DSIPROFA
CMD==> █
TO SEE YOUR KEY SETTINGS, ENTER 'DISPKF'
MB a
```

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This example is a partial display of the DSIOPF member in the DSIPARM data set. It illustrates how an operator statement defines operators named LABUSR0, LABUSR1, and more. The passwords are defined for each operator.

You can associate profiles with the operator by specifying the profile member in DSIPARM to use by using the PROFILEN statement. In this example, each of these operators has been specified to use DSIPROFA.

## Example of a PROFILEN definition

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### Example of a PROFILEN definition

```
NETVIEW.BRWS ----- BROWSE DSIPROFA (DSIPRF ) --- LINE 00000 TO 00016 OF 00016
SCROLL ==> CSR
-----1-----2-----3-----4-----5-----6-----7-----
*****TOP OF DATA ***** DATASET: 5
*****
* Licensed Materials - Property of IBM *
* 5697-ENV (C) Copyright IBM Corp. 1986, 2007 *
* All rights reserved. *
* US Government Users Restricted Rights - Use, duplication or *
* disclosure restricted by GSA ADP Schedule Contract with IBM Corp. *
*****
*   NAME(DSIPROFA) SAMPLE(DSIPROFA) RELATED-TO()
*   DESCRIPTION: NETVIEW OPERATOR PROFILE DEFINITIONS
*****
* MINIMAL NETVIEW OPERATOR PROFILE STATEMENTS *
* WITH INITIAL CLIST AND ONLY UNRESTRICTED COMMAND USE. *
*****
DSIPROFA PROFILE IC=LOGPROF1
AUTH MSGRECVR=NO,CTL=GLOBAL
END
***** BOTTOM OF DATA *****
CMD==> █
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
MB a
23/009
```

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This slide displays the DSIPROFA member. The profile contains the IC keyword, which is used for starting an initial command when the operator has logged on. You can also use an authority statement. When SAFDEF is used, NetView profiles are ignored. The IC parameter must be specified in the NETVIEW segment of the SAF.

## DSIPARM member CNMSCAT2

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### DSIPARM member CNMSCAT2

- You use it to group operators according to their responsibilities and roles
- Each operator can connect to as many groups as necessary
- Groups can be defined to allow access to any commands
- Groups can have access restrictions to the following commands:
  - Commands such as NETCONV and NACMD
  - Specific commands that are designed to come from the Tivoli Enterprise Portal
- PROTECT statements specify restricted commands and read or write access to some data sets
- PERMIT statements allow specific operator groups access to specific commands that the PROTECT statements restrict

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CNMSCAT2 includes some example statements as follows:

```
GROUP    NVOPS1    NETOP1,NETOP2,OPER1,OPER2,OPER3,AUTO1,AUTO2
PROTECT          *.*.AUTOTASK
PERMIT    NVOPS1    *.*.AUTOTASK
```

# SAF administration with CNMSAF2

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## SAF administration with CNMSAF2

- Batch job is in sample member CNMSAF2
- You use CMNSAF2 to set RACF definitions for NetView operators and commands
- Requires modifications before it is usable
- Contains sample statements you can modify as follows:
  - Adding class for the NetView application and commands
  - Adding users (NetView operators)
  - Adding autotask users
  - Specifying initial command for users
  - Adding groups and connecting users to the groups
  - Adding groups that are permitted to issue Tivoli Enterprise Portal agent or EMA commands
  - Permitting groups to log on to specific NetView domains
  - Defining commands that are restricted
  - Permitting groups to access restricted commands
  - Defining TSO user IDs that the NetView operators are surrogates for

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Some examples of RACF statements in CNMSAF2 are as follows:

```
ADDUSER AUTO1
ALTUSER AUTO1      NETVIEW(MSGRECVR(NO) CTL(GLOBAL))

ADDUSER NETOP1

ALTUSER NETOP1 NETVIEW(IC(LOGPROF1) MSGRECVR(YES) CTL(GLOBAL))

ALTUSER NETOP1      NETVIEW(NGMFADMN(YES))

ADDGROUP NVOPS1
CONNECT AUTO1      GROUP(NVOPS1) UACC(READ)
PERMIT domain_name CLASS(APPL) ID(NVOPS1) ACCESS(READ)

RDEF NETCMDS *.*.AUTOTASK UACC(NONE)
PE *.*.AUTOTASK CLASS(NETCMDS) ID(NVOPS1) ACCESS(READ)

RDEF SURROGAT tso-userid.DSITSOSV UACC(NONE)
PE tso-userid.DSITSOSV CLASS(SURROGAT) ID(AUTO1) ACCESS READ
```

# Lesson 9: NetView IP management

## Management of SNA over IP

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### Management of SNA over IP

- SNA traffic is transportable over an IP network
- Some useful commands are as follows:
  - DIS: The status of system resources is displayed
  - SESS: A session list panel displays sessions, if the NLDM tower is enabled

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The NetView support for SNA over IP is specifically for sessions that use the Communications Server function, Enterprise Extender (EE). NetView does not support other methods of running SNA sessions over IP.

Operators can use the Communications Server DIS EEDIAG command and NetView TRACERTE command to perform analysis for these resources. The operators can browse the data to find congestion or broken links.

## Dynamic virtual IP address

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### Dynamic virtual IP address

- With Dynamic Virtual IP Address (DVIPA), you can assign a specific virtual IP address to an application
- This virtual address is independent of any specific TCP/IP stack within the sysplex
- If an application must move to another z/OS system because of failure or maintenance, the application is accessible under the same virtual IP address
- Usage of DVIPA is a flexible way to be prepared for failure of application or system
- TCP/IP parameters control DVIPA

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For more information about establishing DVIPA addresses, refer to the TCP/IP publications. As an example, for z/OS 1.12, perform the following steps:

1. Navigate to [www-03.ibm.com/systems/z/os/zos/bkserv/r12pdf/](http://www-03.ibm.com/systems/z/os/zos/bkserv/r12pdf/).
2. In the contents, click the Communications Server link.
3. Open the *z/OS VIR12.0 Communications Server IP Configuration Guide*. (Part 1 Chapter 7 is titled “Virtual IP addressing.”)

## Support for DVIPA

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### Support for DVIPA

- DVIPA information availability through the following user interfaces:
  - Tivoli Enterprise Portal
  - 3270 console
- DVIPA definition and status information, including the differentiation of application-instance, stack-defined, and distributed DVIPAs
- 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 information about the current state of the connection
- DVIPA routing information, including VIPA routes and distributed DVIPA connecting routing
- Historical DVIPA information

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Through the NetView interfaces for 3270, and Tivoli Enterprise Portal, you can see DVIPA information in various displays. For Open Systems Adapter (OSA) trace collection, z/OS V1R11 is a prerequisite.

## Dynamic IP resource discovery

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### Dynamic IP resource discovery

- The MSM topology manager dynamically discovers the topology and status of IP resources in the network
  - Includes resources that runs in z/OS and distributed environments
  - Stores the information in the Resource Object Data Manager (RODM)
  - After the information is in RODM, you can view your network resources from the NetView Management Console
- Topology correlation information is as follows
  - Automatically correlates resources that different types of topology functions manage, such as IP and Tivoli management region
  - Available for the following items:
    - MultiSystem Manager topology functions
    - NetView SNA Topology Manager
    - Customer or vendor applications that use the Graphic Monitor Facility host subsystem data model

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Using the NMC user interface, you can view the topology of the network.

# IP connection management

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## IP connection management

- The NetView program provides both real-time and historical connection information, including the following items:
  - Stack name
  - Local and remote addresses and ports
  - Start time
  - End time (for connections that ended)
  - Termination code (for connections that ended)
  - Sent and received byte and segment counts
  - Retransmit counts
  - Information about connection state
  - Interface
  - Host
  - TN3270
  - Application transparent transport layer security (AT-TLS), if applicable
- You can list this data with the TCPCONN and CNMSTCPC commands, and view the data using the Tivoli Enterprise Portal
- Data is available as both a readable form and as binary form for programming use
- Supports host name translation and IPv4 or IPv6 addresses
- You can use cross-domain capabilities of the NetView program for viewing the connection data at remote z/OS hosts

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CNMSTCPC is intended as an operator interface. It is a sample CLIST that formats output for readability. Because it is a sample, you can customize the display. TCPCONN is intended as a programming interface. TCP/IP connections are viewable in these interfaces:

- 3270
- Tivoli Enterprise Portal

## Packet trace collection and formatting

Tivoli software

IBM

### Packet trace collection and formatting

- The NetView program provides real-time capture and formatting of IP packet trace data, including both headers and payloads
- Because the formatter is directly integrated with the IP stack, no translation mismatches occurs
- Highly flexible tracing and formatting options are available so you can filter out unwanted data
- Both IPv4 and IPv6 packets are supported. The data is also available in binary (unformatted) form for use by automation routines

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The formatting of packet trace data is the same as for under IPCS. You do not need to learn a new format. The PKTS command is intended for programming purposes. The FMTPACKT command is intended for operators. Packet trace data is viewable using the 3270 interface. From the Tivoli Enterprise Portal interface, issue a NetView PKTS or FMTPACKT command.

## OSA trace collection and formatting

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### OSA trace collection and formatting

Examining packet content is sometimes necessary to debug a problem

- Supports tracing of OSA packets with OSA-Express2 Network Traffic Analyzer (OSAENTA)
- You can capture the following items:
  - Ethernet data (Ethernet type, source/destination MAC addresses, VLAN tag, LLC fields)
  - IPv4 & IPv6 data
  - ARP packets
  - SNA transmission headers
  - Direction indicators
  - Discard code
  - Interface identification
- Syntax and operation are similar to packet trace function

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For Open Systems Adapter (OSA) trace collection, z/OS V1R11 is a prerequisite. OSAENTA is supported by only the OSA-Express2 feature, which requires OSA Express2 card or higher. OSA Express does not support OSAENTA. The following types of data are collected:

- Data from the Ethernet header as follows (when present):
  - Source and destination MAC addresses
  - Ethernet type
  - VLAN tag (when present)
  - Link Layer Control (LLC) fields (when present)
- IPv4 and IPv6 protocol headers
- ARP packets
- SNA transmission header
- A device identifier that identifies the interface that the packet is flowing through
- A direction flag
- A discard code, such as a non-zero value, that identifies the reason for discarding the packet.

Commands are PKTS and FMTPACKT, the same as for TCPIP tracing but with other options.

## Formatted trace

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### Formatted trace

IPTRACE command

- Manages IP packet traces
- Displays packet trace data

FKXXK2A01                    IPTrace Control Center			AOFDA	
Service Point/Stack: ADCCD1		Proc: TCPPIP	Domain: LOCAL	
		Status/Owner	Start	For Writer
█	CTRACE	SYSTCPPIP	ACTIVE/NA	NA *NONE*
—	PKTTRACE	SYSTCPDA	NONE/NA	NA *NONE*
—	OSATRACE	SYSTCPOT	ACTIVE/NA	NA *NONE*

Command ---->

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The IPTRACE command is used to manage tracing and formatting. IPTRACE uses PKTS, FMTPACKT.

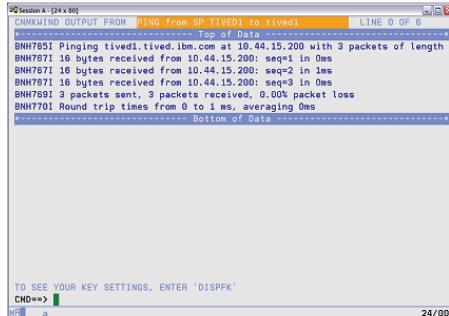
## Command support

**Tivoli** software

**IBM**

### Command support

- Commands can be issued directly from the NetView command line, in REXX procedures, and other automation routines
- Commonly used commands are as follows:
  - PING: Test connectivity to an IP host
  - TRACERTE: From the IP stack on the host where the NetView program runs, trace the routes of data packets to a specified IP host. Determine connectivity, roundtrip times, and routers
  - TN3270: Log on to remote TCP/IP-connected systems, either from the NetView command line or from the NetView management console
  - SNMP commands: Send an SNMP request to a network device to set or obtain information about the device
  - SOCKET: Request IP services to obtain information about the TCP/IP stack being used, or to manage client or server applications (or both)
  - REXEC: Send a command over IP to a remote host for processing by using UNIX RSH protocol. The resulting output is displayed
  - RSH: Send a command over IP to a remote host for processing

A screenshot of the NetView command line interface. The window title is "Session A (128x40) ENHANCED OUTPUT FROM DIND: From SP TIVEDI to tived1". The text area shows the output of a PING command to the host "tived1.tived.ibm.com". The output includes: BNH765I Pinging tived1.tived.ibm.com at 10.44.15.200 with 3 packets of length 1; BNH767I 16 bytes received from 10.44.15.200: seq=1 in 0ms; BNH767I 16 bytes received from 10.44.15.200: seq=2 in 1ms; BNH767I 16 bytes received from 10.44.15.200: seq=3 in 0ms; BNH769I 3 packets sent, 3 packets received, 0.00% packet loss; BNH770I Round trip times from 0 to 1 ms, averaging 0ms. At the bottom, it says "TO SEE YOUR KEY SETTINGS, ENTER 'DISPFP' CHD=2" and "NETVIEW 24/009".

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The example shows the results from a PING command, one of the most commonly used IP commands.

REXEC is available from the command line or in a pipe. REXEC client support is provided for execution of functions in remote systems. REXEC server support executes a command that is sent from a remote host. The remote host must have an REXEC server monitoring at the specified or default port for this command to work.

Remote Shell (RSH) client support starts a UNIX shell on a remote system and runs a single command in that shell. RSH ends on the remote system when the command ends. RSH server support executes a command that is sent from a remote host to NetView. This command is also available from the command line or in a pipe. For RSH, 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 supports it, additional commands can be issued from the panel where the output displays.

# Automated responses to intrusions

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## Automated responses to intrusions

- Within a firewall, systems can be vulnerable to attack or misuse, whether accidental or malicious, referred to as intrusions
- In conjunction with the Intrusion Detection Services (IDS) of z/OS Communications Server, the NetView program offers several kinds of automated responses to intrusions
  - Notifications: Send the following types:
    - An email to security administrators
    - an alert to the NetView console
    - A message to designated NetView operators
    - A Tivoli Enterprise Console event to Tivoli Risk Manager for enterprise-wide correlation and analysis
  - Commands: Issue UNIX, NetView, or z/OS commands to collect more data, or take other actions
  - Statistics: Collect statistics and generate trmdstat reports to send to security administrators by email

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## SNMP support for commands

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### SNMP support for commands

- The NetView SNMP command sends an SNMP request to a network device to set or retrieve information about the device
- The SMNP command can be used for the following purposes:
  - Retrieve management information base (MIB) variable values
  - Set MIB values
  - And more

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The SNMP command is used for retrieving and altering **Management Information Base (MIB)** information. Different versions of SNMP are supported by the SNMP command. Valid versions are 1, 2c, and 3, with the default of 1. The SNMP functions are as follows:

- SNMP BULKWALK: Walk a subtree of a specified MIB variable.
- SNMP GET: Retrieve MIB variable values.
- SNMP GETBULK: Retrieve values for MIB variables in a branch or single leaf node.
- SNMP GETNEXT: Retrieve the value of the MIB variable following the specified MIB variable.
- SNMP INFORM: Send an INFORM request PDU to an SNMP agent or manager.
- SNMP SET: Set MIB variable values.
- SNMP TRAP: Send a TRAP PDU to an SNMP agent.
- SNMP WALK: Retrieve values of all MIB variables in a branch.

The following SNMP example sends a TRAP **protocol data unit (PDU)** request:

```
snmp trap -v2c -p 2005 -c public tvt2010 99
          1.3.6 .1.3.6.1.2.1.1.6.0 s 'this is a trap2_pdu'
```

# Network address translation

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## Network address translation

- IP addresses can change as packets route from one network to another
- For easy recognition, NetView uses a special symbol to flag addresses that are translated
- NetView graphical displays provide the corresponding original address

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## IPv6 support and enablement

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### IPv6 support and enablement

- IPv6 is enabled for NetView commands, services, and components
- IPv6 addresses are enabled as input for commands
- IPv6 addresses can be displayed in most places where an IP address are viewable as follows:
  - Messages
  - Views
- You can operate NetView in an IPv6, IPv4, or mixed environment seamlessly because both IPv4 and IPv6 addresses are recognized as valid IP addresses
- With new environment variable *IPv6Env*, users can isolate NetView from one IP version to another

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NetView supports IPv6 as follows:

- Provides seamless enablement of IPv6 addresses as input to commands and in output.
- Supports the operation of NetView and its components in an IPv6-enabled network environment.
- Enables users to isolate NetView from either IP version (IPv4 or IPv6) by using an environment variable, *IPv6Env*, which is defined in the style sheet.

IP host names are resolved to either an IPv4 or IPv6, or whichever comes back first, depending on the *IPv6Env* environment variable setting. Minimal changes to some AON IP management panel displays have been made. Longer IPv6 addresses can now be accommodated. Few messages and other output displays are fundamentally altered.

# Summary

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## Summary

Now that you have completed this unit, you can perform the following tasks:

- Describe the packaging and installation of NetView
- Describe structure and components of NetView
- Use JCL procedures and parameters that are necessary to run NetView
- Use the NetView 3270 interface
- Customize NetView using CNMSTYLE
- Use the CNMSTYLE report generator
- Describe NetView operator administration
- Describe IP management with NetView

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# Unit 2: NetView user interfaces and product integration

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## Unit 2: NetView user interfaces and product integration



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# Introduction

This unit presents the non-3270 interfaces for accessing NetView functions: Tivoli Enterprise Portal, web application, and NMC. This unit also contains information about product integration with IBM Tivoli OMEGAMON XE products.

## Objectives

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### Objectives

When you complete this unit, you can perform the following tasks:

- Describe the NetView web interface
- Describe the NetView web services gateway interface
- Describe the NetView Management Console (NMC) interface
- Use the Tivoli Enterprise Portal and the NetView EMA workspaces
- Explain how the NetView product integrates with IBM Tivoli OMEGAMON XE products

# Lesson 1: NetView web interface

## NetView web application

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### NetView web application

- Provides web access to NetView
  - Enter the web address of the NetView Web server, which includes the destination NetView domain identifier (ID)
  - Type a valid NetView operator ID and password
- Requires one of the following servers:
  - IBM WebSphere Application Server
  - Embedded version of IBM WebSphere Application Server – Express
- From NetView for z/OS 6.1, the web application is minimal, with no NetView functions available



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This slide shows a logon screen for the NetView Web application, with prompts for a user name and password. After you enter the NetView web address, the logon window opens. Type the user name and password, and click **OK** to enter the application.

## Lesson 2: NetView web services gateway

### NetView web services gateway features

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#### NetView web services gateway features

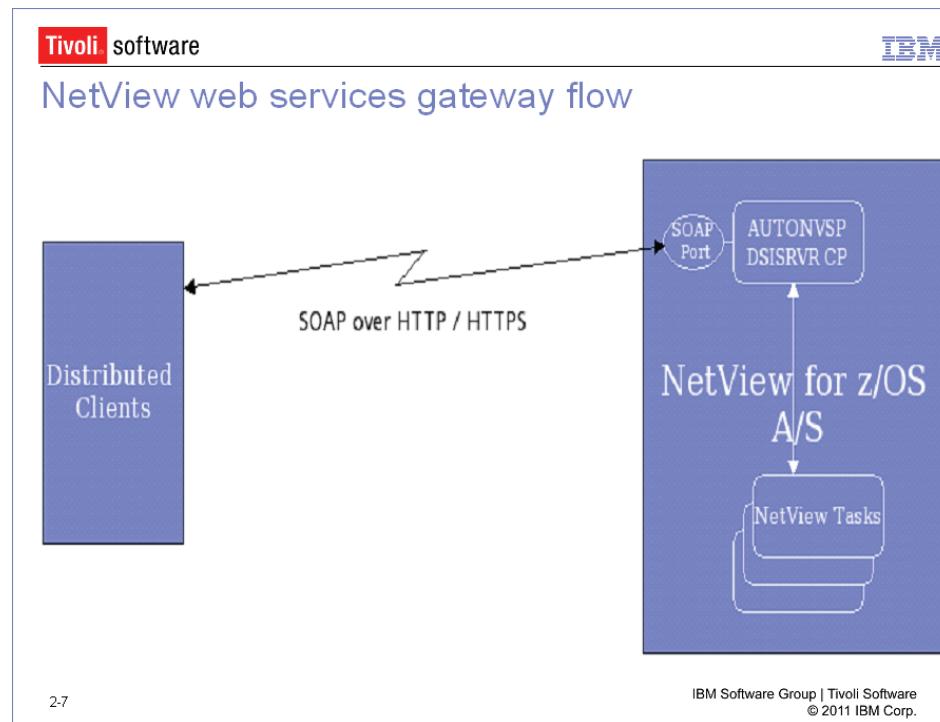
- Provides an industry-standard open interface into the NetView program
- Allows distributed applications (whether written by IBM or customer) for interacting with NetView
- Provides services that are independent of platform, environment, application language, or programming model
- Implemented as SOAP server
- Different types of client applications (such as Java, Microsoft .NET, and third-party applications) can submit SOAP requests to NetView to extract data
- Does not require WebSphere or any other middleware
- Documentation: *IBM Tivoli NetView for z/OS 6.1 Application Programmer's Guide*

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You access data through the gateway. Anything that NetView can access or store, such as RODM, TCP/IP, Sysplex, is available. All data is text-based.

## NetView web services gateway flow



2.7

CNMSTYLE is used for setting up the SOA server, which is IPv6-enabled. The server supports SSL user cache, Cert Auth, and different cipher suites. You can perform the following tasks with the NetView web services gateway:

- Run all NetView line-mode commands.
- Provide automation for external messages.
- Provide both secure and non-secure communication.
- Use the product-supplied file, Web Services Description Language (WSDL), for generating static or dynamic proxy clients.
- Customize the output by using CNMSTYLE.
- Use product-provided debug tools, such as Trace, Simple Object Access Protocol (SOAP) test client, and other help tools.
- Start multiple server sessions for load balancing, security, or customization.
- Use the gateway as a basic HTTP/HTTPS server.

# NetView web services gateway example

The example reflects outcome from the following actions:

1. Connecting to <http://hostip:9998/znvsoatx.htm>.
  2. In the Payload (XML) field, changing the user ID and password to valid ones.

The SOAP Response is for LISTVAR command.

# Lesson 3: NetView Management Console (NMC) interface

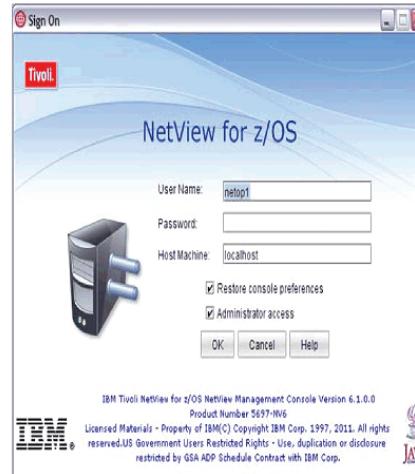
## NetView Management Console (NMC)

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### NetView Management Console (NMC)

- The NetView Management Console (NMC) is a workstation-based application
- The NMC displays graphics with depictions as follows:
  - The resources that represent a network
  - A portion of a network
  - A group of networks at various levels of detail
- These views display the network and systems resources that you are monitoring
- When you monitor a network, the resource statuses graphically change in the views



2-10

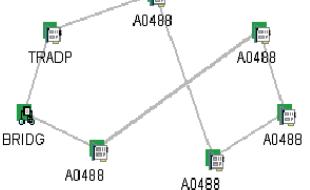
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The NMC displays the resources in the network in several ways, showing the connectivity and topology. When you select the workstation program, a logon screen opens, prompting for a user name, a password, and a host location. The slide shows the NMC logon screen, which is a window on a workstation.

## Performing tasks with NMC (1 of 2)

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### Performing tasks with NMC (1 of 2)



- Monitor and control large portions of complex business systems
- View the topology and connectivity of your network graphically
- Monitor the overall state of a network or a portion of a network by using aggregates. Aggregates represent the combined status of a group of related applications and resources
- Navigate from an aggregate to a real resource that is failing
- Mark resources for your own purposes, for example, to show that they are being serviced
- View a list of events or status changes for a selected resource displays
- Issue commands to a resource

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The graphic on this slide is an example of a *physical configuration view*. This view arranges network resources in a configuration based on a physical relationship between the resources. Commands can be issued against a resource:

- For SNA resources, VTAM commands can be issued.
- For IP resources, IP commands, such as PING and SNMP, can be issued.

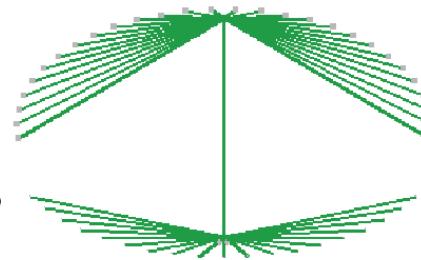
## Performing tasks with NMC (2 of 2)

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### Performing tasks with NMC (2 of 2)

- Issue predefined commands from context menus, or issue your own commands
- Issue the same command to multiple NetView domains at one time
- Stop and restart selected resources
- Monitor and manage multiple NetView programs
- At intervals, cycle through open views automatically
- Build custom view and aggregate resource collections
- Monitor resources by exception, to be displayed on the screen only when the resources need the attention of the operator



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The graphic on this slide is an example of a *configuration backbone view*. This view arranges network resources in a configuration that is based on a subarea backbone relationship.

## Lesson 4: NetView EMA

### NetView EMA overview

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#### NetView EMA overview

- The NetView EMA provides the capability for you to manage your network from the Tivoli Enterprise Portal
- Both sampled and real-time NetView data are available
- With the EMA and OMEGAMON XE performance agents, you can manage and view availability and performance data for your network from a single interface

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The NetView EMA integrates with IBM Tivoli Monitoring. The NetView EMA workspaces are present in the Tivoli Enterprise Portal Navigator, which is described in another lesson.

## Performing tasks with the NetView EMA

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### Performing tasks with the NetView EMA

- 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
- Issue commands to manage your network
- Support for the GDPS® Active/Active Continuous Availability solution

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## NetView EMA and data collectors

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### NetView EMA and data collectors

- NetView EMA
  - Provides more integration into Tivoli Enterprise Portal
  - Provides sampled workspaces, including new NetView Health workspaces
  - Provides Take Action commands with improved interface for security
  - Provides situations and expert advice
  - Provides some historical tables
  - Provides cross-product links with multiple OMEGAMON XE agents that use Dynamic Workspace Linking (DWL)
- Data collectors for NetView EMA
  - Contained within the NetView address space
  - Customization done in CNMSTYLE

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The components of the NetView EMA can run on both the mainframe and distributed environments:

- Mainframe: The collectors collect data from the mainframe and store it in the Tivoli Enterprise Monitoring Server.
- Distributed: The operator accesses data through the Tivoli Enterprise Portal and Tivoli Enterprise Portal Server. The Tivoli Enterprise Monitoring Server provides the data to the operator.

# Deployment

Tivoli software



## Deployment

- The NetView EMA data files are on the data files CD of IBM Tivoli NetView Enterprise Management Agent
- The installation process is the *Installation: Configuring the NetView Enterprise Management Agent* manual (See “Chapter 5, Completing the NetView agent configuration”.)

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Refer to the following sections in the *Installation: Configuring the Tivoli NetView for z/OS Enterprise Agents* manual:

- Windows environment: Follow the instructions in the section titled “Loading files and configuring the Tivoli Enterprise Portal in a Windows environment.”
- Linux or Advanced Interactive Executive (AIX) environment: Follow the instructions in the section titled “Loading files and configuring the Tivoli Enterprise Portal in the Linux and AIX environments.”

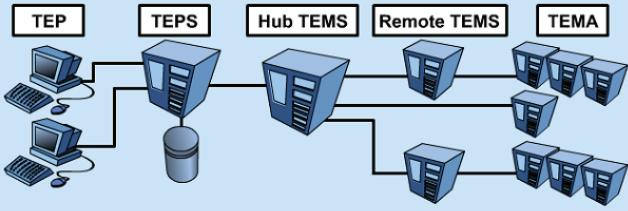
# Lesson 5: Tivoli Enterprise Portal

## Architecture and components

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### Architecture and components

- The Tivoli Enterprise Portal is part of the IBM Tivoli Monitoring client-server architecture
- This infrastructure includes all components needed in an enterprise monitoring solution
- Those components are called Tivoli Monitoring Services (TMS), which include the following items:
  - Tivoli Enterprise Portal: Graphical user interface, either a desktop application or use of a browser
  - Tivoli Enterprise Portal Server: Repository for all user data
  - Tivoli Enterprise Monitoring Server: Central repository for all monitored data. (This can be on a z/OS system.)
  - Tivoli Enterprise Monitoring Agent: The monitoring data collectors for operating systems and application. The NetView Enterprise Management Agent (EMA) is a Tivoli Enterprise



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IBM Tivoli Monitoring can perform the following tasks:

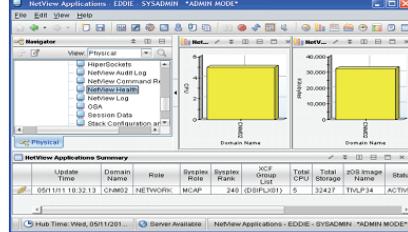
- Monitor and manage operating systems, applications, databases, workloads, networks, and other resources.
- Monitor a variety of platforms, both distributed and mainframe.
- Track availability and performance of the enterprise.
- Establish performance thresholds and raise alerts.
- Monitor resources for certain conditions.
- Provide reports for tracking trends and troubleshooting problems.
- Visualize real-time monitoring data.
- Create and send commands to systems.
- Define custom queries to monitor items of interest.

## Two Tivoli Enterprise Portal modes: Desktop client and browser

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### Two Tivoli Enterprise Portal modes: Desktop client and browser

- The desktop client is installed on a workstation
- An IBM Tivoli Monitoring administrator typically performs the installation
- You start the client by finding and double-clicking the desktop client application icon
- Many users access the Tivoli Enterprise Portal client in browser mode by using the following web address:  
hostname:1920///cnp/kdh/lib/cnp.html



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For the desktop client, the software installs directly on the workstation that is monitoring the environment. For the browser interface, you can enter the web address for Tivoli Enterprise Portal Server and port number on any device in the network.

With either interface, you first see the logon window. This window prompts you to enter the user ID and password, and click **OK**. Some Java code might download when the Tivoli Enterprise Portal starts. When the Tivoli Enterprise Portal starts, a default screen called a *workspace* opens. In the example, the NetView Health workspace was selected from the Navigator.

A third way to access the Tivoli Enterprise Portal is by using Java webstart (javaws). The java code automatically updates when changes occur to the Tivoli Enterprise Portal Server. To use the Java webstart, issue the following command

```
javaws http://tepsserver:1920///cnp/kdh/lib/tep.jnlp
```

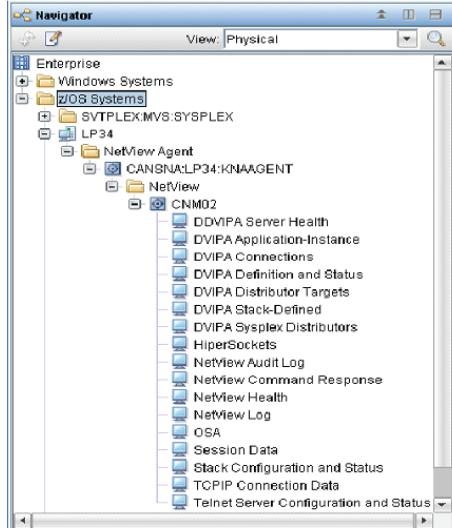
## NetView EMA Navigator

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### NetView EMA Navigator

- The Navigator is in the upper left part of the window and contains items that build the different levels in its hierarchy
- The default navigator view is a physical hierarchy of items
- Each navigator item contains one or more workspaces that provide information relevant to that level of the navigator



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The NetView Navigator is in the upper left corner of the screen. The Navigator contains a hierarchy of operating system types, operating systems, host names, and agents. For NetView, it can further expand to the NetView domain and NetView-specific workspaces.

The slide shows the Navigator view as a *physical* view. You can display a *logical* view by clicking the **View** list and clicking **Logical**. For selected workspaces, you can customize logical views. The NetView EMA workspaces contain views that report information about enterprise resources that you are monitoring.

Most of the following workspaces contain sampled data as follows:

- DVIPA workspaces
- Transmission Control Protocol/Internet Protocol (TCP/IP) workspaces
- NetView Health workspaces
- Session Data workspaces

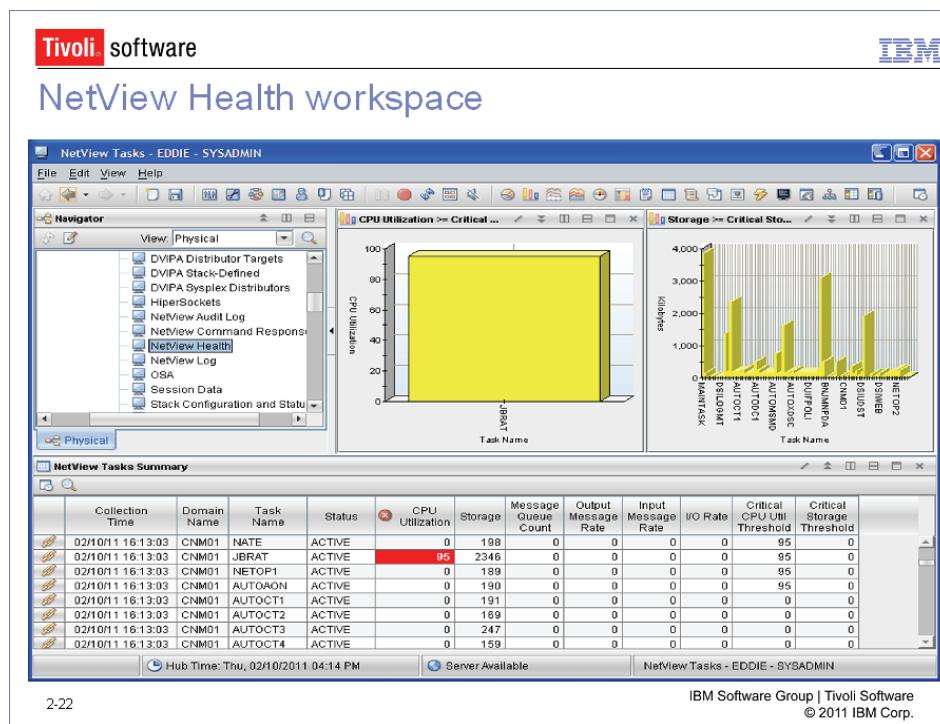
Some of the following workspaces contain real-time data:

- NetView Audit Log workspace
- NetView Command Response workspace
- NetView Log workspace
- Stack Configuration and Status workspace

Use the workspaces to perform the following tasks

- Monitoring NetView task status and performance metrics
- Monitoring the status of your TCP/IP stacks in a sysplex
- Monitoring DVIPA configuration, workload balance, and connections
- Using TCP/IP connections to monitor and diagnose problems
- Monitoring active SNA sessions
- Using packet trace to diagnose TCP/IP problems
- Issuing commands for managing your network

## NetView Health workspace



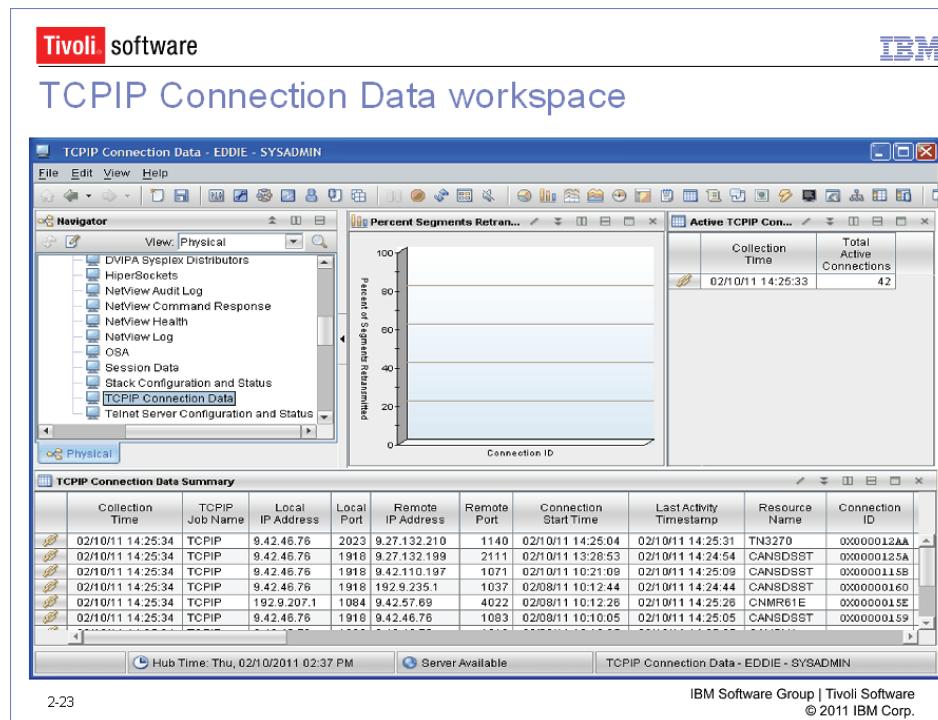
The workspace in the slide example is *NetView Health*. It provides monitoring information about processors, storage, and tasks for NetView.

The view to the immediate right of the Navigator is the *CPU Utilization >= Critical CPU Util Threshold*. It shows the task names and processor utilization for the tasks.

Next to the CPU view is the *Storage >= Critical Storage Threshold*. The bar chart shows the task names and the amount of storage used in kilobytes.

In the view that contains the *NetView Tasks Summary* table of information, each line pertains to a single task. A blue link symbol precedes each line of task data. You can click a link to go directly to a workspace that contains information about that specific task. The second row in the NetView Tasks Summary table has a red field for the CPU usage. In Tivoli Enterprise Portal, you can customize tables so that certain values show up as warnings or errors, making it easier to spot problems.

## TCPIP Connection Data workspace



The workspace in the slide example is **TCPIP Connection Data**. It contains these following views:

- **Percent Segments Retransmitted >= 3** lists the percent of segments retransmitted for connection IDs.
- **Active TCPIP Connection Count** shows the total active connections.
- **Filtered TCPIP Connection Data Summary** contains local and remote IP addresses and ports, resource names, bytes sent and received, and more.

## NetView EMA views

The screenshot shows the Tivoli software interface with the title "NetView EMA views". The workspace contains three views:

- NetView CPU Utilization:** A bar chart showing CPU utilization for three servers: S0001, S0002, and S0003. The Y-axis ranges from 0.00 to 1.00.
- NetView Storage:** A bar chart showing storage usage for three servers: S0001, S0002, and S0003. The Y-axis ranges from 0 to 28,000.
- NetView Applications Summary:** A table listing application details for three domains: CNW01, THU01, and THU02. Columns include Update Time, Domain Name, Role, System Role, Status, Rank, Avg. Overall Util, Total CPU, Total Storage, JES3 Image Name, Status, Network ID, PORTNO, PAddress, Port, and Ver.

At the bottom of the workspace, there are status messages: "Hub Time: Thu 03/08/2011 02:47 PM" and "Server Available".

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- The application window displays a workspace. In this example, the workspace contains three views: two bar charts and a table
- You use different types of views to display enterprise monitoring data or access to other areas of interest
- Each application (type of agent) comes with a set of predefined workspaces
- Workspaces and views are modifiable to fit the interest or responsibility of the users

Default views are provided with each workspace. You can modify views as follows:

1. Click a different view type icon from the toolbar while holding down the left mouse button.
2. Move the cursor to the view that you want to modify.
3. Release the mouse button.
4. When a window opens, select attributes for the view.
5. When you leave the modified workspace, respond to the prompt to either discard the workspace or save it under another file name.

## Online Help

The screenshot shows a Microsoft Internet Explorer window displaying the Tivoli Enterprise Portal online help. The title bar says "Tivoli software" and "IBM". The main content area is titled "Online Help". A sub-section titled "NetView for z/OS Enterprise Management Agent" is shown. It includes a "Contents" sidebar with topics like "Viewing information in the information center", "Tivoli Enterprise Portal", and "Net View for z/OS Enterprise Management Agent". The main pane displays the "NetView for z/OS Enterprise Management Agent" help page, which welcomes users to the help system for the Tivoli Enterprise Portal and its installed Tivoli Monitoring products. It features sections for "Getting started", "Support and assistance", "Customizing", and "Training and certification". At the bottom right of the browser window, it says "Local Intranet".

To access the online help from the Tivoli Enterprise Portal, click **Help** from the menu bar

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The NetView EMA Help explains attributes, situations, Take Action commands, and workspaces.

## Summary

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### Student exercise



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Open your *Student Exercises* book and perform all exercises in Unit 2.

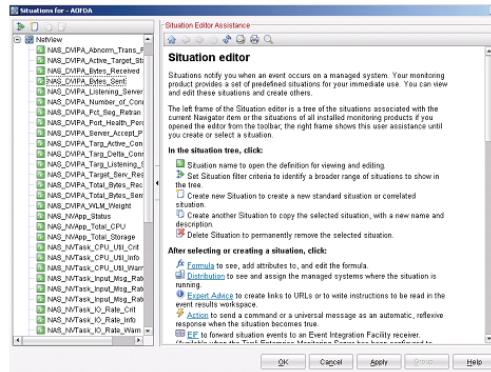
# Product-provided situations

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## Product-provided situations

- Situations set up conditions for alerting and possible automated actions
- You create or modify situations by using the Situation editor
- To access the Situation editor, you click the Situation editor icon on the Tivoli Enterprise Portal toolbar
- To view the situations, you expand the NetView pane
  - The situation names must be unique
  - NetView situations begin with the prefix NAS
  - NA is the product code and S indicates situation



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In the Situation Editor window, product-provided situations display under the NetView heading in the pane on the left side. The Situation Editor Assistance pane is on the right side. This pane provides help for creating a new situation, creating another situation that is based on a copy of an existing situation, and deleting a situation.

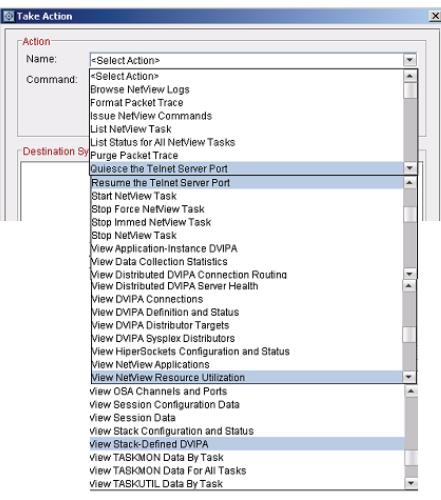
When you create a new situation or create one from an existing situation, a window opens in the right pane of the Situation Editor. In that window, you can define items as follows:

- The situation description
- A formula that calculates in the situation
- The frequency to run the situation
- The systems to run the situation on
- Any expert advice to provide to the operator
- A system command to issue as a Take Action
- The time to stop running the situation

## Take Action commands

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### Take Action commands



- Take Action commands are provided with the NetView EMA so that operators can use Tivoli Enterprise Portal to issue real-time commands to NetView
- Some commands are context-sensitive, which means that they insert a value from a row in a workspace in the command
- The NetView Command Response workspace displays commands and command responses for each Tivoli Enterprise Portal user ID

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The NetView Audit Log, NetView Command Response, Session Data, and Stack Configuration and Status workspaces provide a *Take Action* view. From this view, you can select a Take Action command, supply parameters, and run the command. The **Issue NetView Commands** action provides you with an area for entering the exact command that you plan to run.

## Take Action command execution

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### Take Action command execution

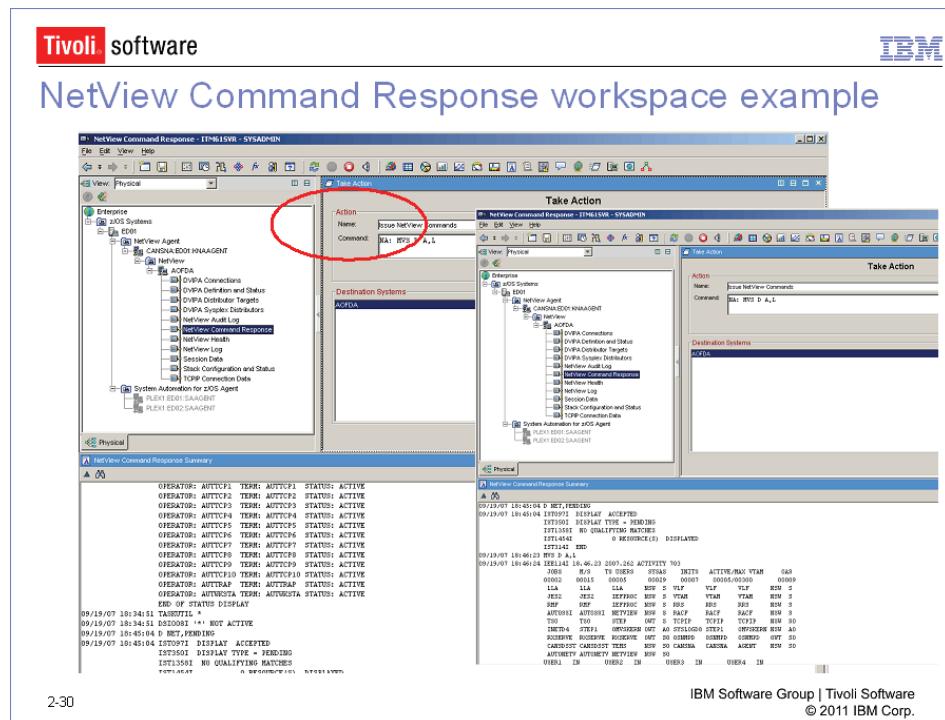
- Take Action commands that route to NetView include the Tivoli Enterprise Portal user ID
- You use the Tivoli Enterprise Portal user ID for determining the NetView operator ID that authorized and ran the command
- The command runs under a NetView ID determined by the following conditions:
  - Validation of the Tivoli Enterprise Portal user ID according to the NetView operator ID criteria. (See *IBM Tivoli NetView for z/OS Administration Reference*.)
  - Mapping of the Tivoli Enterprise Portal user ID to a NetView operator ID in the CNMSTYLE member by using the NACMD.OPID.TEPLogonID variable
  - Use of the Tivoli Enterprise Portal user ID

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The NetView Command Response workspace contains both a *Take Action* view and a *NetView Command Response Summary* view. The result of the command that you issue is in the command response view.

## NetView Command Response workspace example



To run a Take Action command, select a NetView domain for the destination, and click the **Run** button. The output from the command displays in the NetView Command Response Summary view. In the example, an MVS D A,L command is issued. The active tasks are listed in the NetView Command Response Summary view.

## Historical data collection (1 of 3)

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### Historical data collection (1 of 3)

- Both real-time and historical data are available within the NetView EMA workspaces
- After historical data is configured, enabled, and collected, historical reports can display information
- Historical reports are useful for two significant reasons:
  - Finding the root cause of problems that evolved over a period of time
  - Debugging problems that occurred in a previous time period
- Capacity planners can also use historical reports to identify trends and correct imbalances in network load distribution
- To generate reports containing historical data, historical collection must be configured and enabled ,and data must be collected
  - Click the History Configuration icon in the Tivoli Enterprise Portal toolbar
  - Click the NetView for z/OS Enterprise Management Agent product to see the attribute groups that are applicable for historical data collection

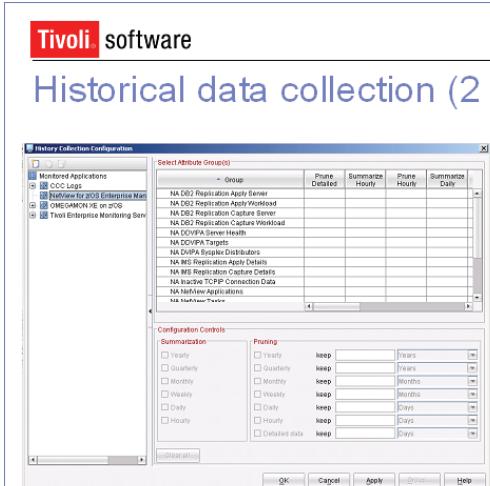
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Historical data collections require the data warehouse database (named WAREHOUS) to be defined. Typically, for warehouses existing on Windows systems, the following command is issued before the IBM Tivoli Monitoring software is installed:

```
db2 create database warehous using codeset utf-8 territory US
```

## Historical data collection (2 of 3)



The screenshot shows the 'History Collection Configuration' dialog box. On the left, a tree view lists 'Monitored Applications' including CCC Logs, NetView for z/OS Enterprise Manager, OMEGAMON HE on z/OS, and Tivoli Enterprise Monitoring Server. A table titled 'Select Attribute Group(s)' lists various monitoring attributes with columns for 'Name', 'Group', 'Summarize', and 'Prune'. Below the table are 'Configuration Controls' sections for 'Summarization' and 'Pruning'. The 'Summarization' section has checkboxes for Yearly, Quarterly, Monthly, Weekly, Daily, and Hourly. The 'Pruning' section has checkboxes for Yearly, Quarterly, Monthly, Weekly, Daily, and Hourly, each with dropdown menus for 'keep' intervals like Years, Months, Days, or Hours. At the bottom are 'OK', 'Cancel', 'Apply', 'Help', and 'Advanced' buttons.

- Expand **Monitored Applications**, and click NetView for z/OS Enterprise Management Agent
- Select groups in the table that you want to collect data from
- Select attributes for the groups: collection intervals, locations, summarization, and pruning
- When you have selected all your criteria, click **Start Collection**

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To control the quantity of historical data collected, start the IBM Tivoli Monitoring Warehouse Summarization and Pruning Agent as follows:

1. From the system where the Tivoli Enterprise Portal desktop client runs, click **Start > All Programs > IBM Tivoli Monitoring > Manage Tivoli Monitoring Services**.
2. When the list of services is displayed, right-click **Warehouse Summarization and Pruning Agent** and click **Start**.

## Historical data collection (3 of 3)

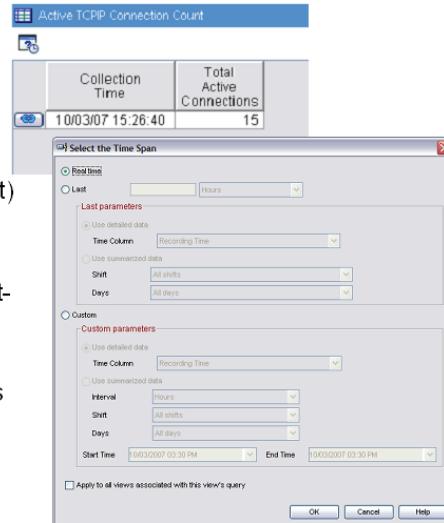
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### Historical data collection (3 of 3)

- After historical data collection is enabled, the upper left corner of qualifying views in Tivoli Enterprise Portal workspaces displays a **Time Span** button 
- Click the icon to extend any existing Tivoli Enterprise Portal view (also called a report) to include historical data
- Tivoli Enterprise Portal reports automatically collects data from both short-term and long-term history, based on the time period that you specify
- You can create summarization data tables (hourly, daily, weekly, quarterly, monthly, and yearly) to reduce the data overload when creating reports
- You can also define pruning intervals to ensure that you save only the needed data

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For more information about creating historical reports, see the *IBM Tivoli Monitoring: User's Guide*.

# Lesson 6: NetView product integration with IBM Tivoli OMEGAMON XE products

## Integration with IBM Tivoli OMEGAMON XE

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### Integration with IBM Tivoli OMEGAMON XE

- The NetView program interoperates with IBM Tivoli OMEGAMON products through the NetView web application and the NetView enterprise agents
- From the NetView web application, you can retrieve performance data for a TCP/IP connection from OMEGAMON XE for Mainframe Networks. You use the Tivoli Enterprise Monitoring Server Web Services interface
- The NetView EMA enables management of both availability and performance data from the Tivoli Enterprise Portal. It uses cross-product links to selected z/OS OMEGAMON XE agents
- The NetView EMA provides linking to OMEGAMON product workspaces
- If the appropriate OMEGAMON products are installed and configured, the links between the NetView EMA workspaces and the OMEGAMON workspaces are operable

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A wide variety of NetView data is available through the Tivoli Enterprise Portal. NetView data correlates with information from Tivoli OMEGAMON XE products, including the following items:

- DVIPA
- Sysplex
- Packet traces
- The NetView log
- IP connection data

The NetView program focuses on *availability* management. The OMEGAMON XE products focus on *performance* management.

You can use the Tivoli Enterprise Portal to integrate these solutions for a complete view of network performance and availability data. You can use this information to improve efficiency and to reduce the time needed for problem resolution.

## IBM Tivoli OMEGAMON XE cross-product workspace links

IBM Tivoli OMEGAMON XE cross-product workspace links				
NetView Agent Workspace	Target Application or Monitoring Agent	Workspace in Target Application or Monitoring Agent	Attributes Used to Locate Target Workspace	Attributes Used to Filter Data in Target Workspace
DVIPA Connections	IBM Tivoli OMEGAMON XE for Mainframe Networks version 4.1.0 or later	TCP Connections Link	System ID	<ul style="list-style-type: none"><li>• Connection Start Time</li><li>• Local IP Address</li><li>• Local Port</li><li>• Remote IP Address</li><li>• Remote Port</li></ul>
Session Data	IBM Tivoli OMEGAMON XE for Mainframe Networks version 4.1.0 or later	HPR Connections	System ID	<ul style="list-style-type: none"><li>• Primary Name</li><li>• Secondary Name</li></ul>
TCPIP Connection Data	IBM Tivoli OMEGAMON XE for Mainframe Networks version 4.1.0 or later	TCPIP Statistics	System ID	<ul style="list-style-type: none"><li>• Connection Start Time</li><li>• Local IP Address</li><li>• Local Port</li><li>• Remote IP Address</li><li>• Remote Port</li></ul>
TCPIP Connection Data	IBM Tivoli OMEGAMON XE for CICS® on z/OS version 4.1.0 or later	System CPU Utilization	Managed system name (Sysplex Name: System ID: "MVSSYS")	Local Port (converted to an integer in the link expression)
Telnet Server Configuration and Status	IBM Tivoli OMEGAMON XE for Mainframe Networks version 4.2.0 or later	TN3270 Server Sessions	System ID	Telnet Server Job Name

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This table shows the OMEGAMON monitoring agents that provide cross-product links. At the time of this publication, the products that provide links are as follows:

- IBM Tivoli OMEGAMON XE for Mainframe Networks 4.1.0 or later
- IBM Tivoli OMEGAMON XE for CICS on z/OS 4.1.0 or later
- IBM Tivoli OMEGAMON XE on z/OS 4.1.0 or later

## Lesson 7: Tivoli Enterprise Portal security

### User authorization and identification for the Tivoli Enterprise Portal

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#### User authorization and identification for the Tivoli Enterprise Portal

- The Tivoli Enterprise Portal logon requires a user ID and password
- Password validation occurs on the operating system that has the Tivoli Enterprise Monitoring Server hub  
For z/OS, that is SAF (RACF, ACF2)
- You can set Tivoli Enterprise Portal security for including or excluding Take Action commands

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You can switch from one Tivoli Enterprise Monitoring Server to another. For example, a distributed environment can be defined to use TEMS A, and a mainframe environment defined to use TEMS B. Switching from one Tivoli Enterprise Monitoring Server to another is a Tivoli Enterprise Portal Server reconfiguration process, pointing to another Tivoli Enterprise Monitoring Server.

Password validation occurs on the system with the Tivoli Enterprise Monitoring Server. It is necessary to define the user ID on that system.

## Tivoli Enterprise Portal Take Action and system command authorization

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### Tivoli Enterprise Portal Take Action and system command authorization

- Commands route to NetView for running for agents that do not have a command handler
- NetView command authorization occurs as follows:
  1. Table authorization
  2. SAF authorization
  3. Tivoli Enterprise Portal user ID for determining the NetView operator and the command authorization
  4. If command authorization passes, the command runs on the NetView operator
- The messages that are written to the NetView Log provide an audit trail of the commands and the user ID that issued them
- You can use Tivoli Enterprise Portal user reporting to view the NetView Log (3270 or workspace) and Take Action status information

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IBM z/OS products that use the Tivoli Management Services components can use NetView for z/OS system command authorization and audit trail support. These products are referred to as agents in these notes.

System commands are routed from the agents to the NetView program. NetView treats these commands as z/OS system commands. NetView prefixes the command that the agent passed with **MVS** before issuing the command. Authorization is performed by using the NetView command authorization table or SAF functions.

Using the NetView OPERSEC SAFCHECK or SAFDEF setting allows more granular z/OS command security. In the *NetView for z/OS Security Reference*, refer to “Chapter 3, Protecting MVS System Commands Using an SAF Product” for more information.

The Tivoli Enterprise Portal user ID is used for determining the NetView operator whose command authorization is checked and where the command runs.

NetView provides the following actions for a system command that is issued by the agent:

- Logging of the command echo and command response to the NetView log
- Logging of the BNH806I audit trail message to the NetView log
- Automation of the command echo and command response

Review your automation and user exits to make sure that the commands and messages that NetView logs are not suppressed.

You can view the NetView Log from the Tivoli Enterprise Portal by logging on to the NetView program from a Terminal View. Alternatively, the NetView for z/OS Tivoli Enterprise Management Agent provides the capability to issue a Take Action command for browsing NetView Log.

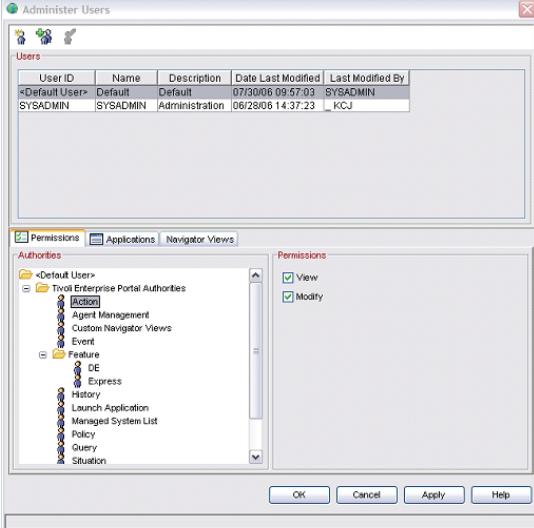
Some agents provide their own Take Action commands, known as agent commands. Agent commands have a two-character prefix, such as pp, where pp is the product code. These commands are not sent to the NetView program for command authorization and execution. An example of an agent that provides agent commands is IBM Tivoli OMEGAMON XE for Messaging on z/OS.

## Controlling Take Action capability

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Controlling Take Action capability

At the Administer Users window, you can modify the Take Action permissions for the <Default User> and each defined Tivoli Enterprise Portal operator



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Immediate options for Take Action commands are as follows:

- Prevent anyone from issuing Take Action commands from Tivoli Enterprise Portal:
  - This option applies to all users for all products.
  - All commands from OMEGAMON are issued from a 3270 interface.
  - The OMEGAMON 3270 window can be implemented within the Tivoli Enterprise Portal.
- Authorize Take Action command authority to a limited number of trusted users.

# Summary

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## Summary

Now that you have completed this unit, you can perform the following tasks:

- Describe the NetView web interface
- Describe the NetView web services gateway interface
- Describe the NetView Management Console (NMC) interface
- Use the Tivoli Enterprise Portal and the NetView EMA workspaces
- Explain how the NetView product integrates with IBM Tivoli OMEGAMON XE products

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# IBM Tivoli certification and training

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In today's global business world, enhancing and maintaining skills is essential to keeping pace with rapidly changing technologies. Businesses need to maximize technology potential and employees need to keep up to date with the latest information. Training and professional certification are two powerful solutions.

## Certification

There are many reasons for certification:

- You demonstrate value to your customer through increased overall performance with shorter time cycles to deliver applications.
- Technical certifications assist technical professionals to obtain more visibility to potential customers.
- You differentiate your skills and knowledge from other professionals and stand out as the committed technical professional in today's competitive global world.

Online certification paths are available to guide you through the process for achieving certification in many IBM Tivoli areas. See [ibm.com/tivoli/education](http://ibm.com/tivoli/education) for more information.

### Special offer for having taken this course

*Now through 31 December 2011:* For having completed this course, you are entitled to a 15% discount on your next examination at any Thomson Prometric testing center worldwide. Use this special promotion code when registering online or by telephone to receive the discount: **15CSWR**. (This offer might be withdrawn. Check with the testing center as described later in this section.)

### Role-based certification

All IBM certifications are based on job roles. They focus on a job a person must do with a product, not just the product's features and functions. Tivoli Professional Certification uses the following job roles used:

- IBM Certified Advanced Deployment Professional
- IBM Certified Deployment Professional
- IBM Certified Administrator
- IBM Certified Solution Advisor
- IBM Certified Specialist
- IBM Certified Operator

# Training

A broad spectrum of courses, delivery options, and tools helps keep your employees up to date with the latest IBM Tivoli information:

- *Instructor-led training (ILT)*  
Live interaction with an IBM instructor, hands-on lab exercises, and networking with your peers from other companies  
**[ibm.com/tivoli/education](http://ibm.com/tivoli/education)**
- *Instructor-led online (ILO)*  
All the benefits of ILT, but savings on travel dollars and training costs  
**[ibm.com/training/ilo](http://ibm.com/training/ilo)**
- *Self-paced virtual classes (SPVC)*  
Interactive and hands-on exercises on your schedule  
**[ibm.com/training/us/spvc](http://ibm.com/training/us/spvc)**
- *Web-based training (WBT)*  
Training anywhere, any time, that saves you money and travel  
**[ibm.com/training/us/tivoli/wbt](http://ibm.com/training/us/tivoli/wbt)**
- *Multimedia library*  
Modules supporting new and experienced learners with fully animated multimedia clips, step-by-step audio, and companion text  
**[ibm.com/software/tivoli/education/multimedialibrary](http://ibm.com/software/tivoli/education/multimedialibrary)**
- *IBM Education Assistant*  
More specific, granular web-based training with individual presentations on specific topics  
**[www-01.ibm.com/software/info/education/assistant/](http://www-01.ibm.com/software/info/education/assistant/)**
- *Corporate Education Licensing Program (CELP)*  
Solutions for large IBM customers who need to adopt IBM Tivoli's tools and technologies  
**[ibm.com/training/us/tivoli/celp](http://ibm.com/training/us/tivoli/celp)**
- *Tivoli training paths*  
Course maps with flow charts and course descriptions to help you find the right course  
**[ibm.com/training/us/tivoli\(paths](http://ibm.com/training/us/tivoli(paths)**





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